2022 Annual Report: Regional Groundwater Monitoring Program

Regional Groundwater Monitoring Program
Fording River Operations
Greenhills Operations
Line Creek Operations
Elkview Operations
Coal Mountain mine

Teck Coal Limited

VOLUME IV OF VI

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Appendix VI

Greenhills Operations 2022 SSGMP and RGMP Annual Report

- Figures
- Tables
- Drawings
- Attachments
    - I. Borehole Logs
    - II. Mann-Kendall Analyses
    - III. Block Diagrams

1 Greenhills Operations SSGMP and RGMP Report

1.1 Overview

This report presents the results for the 2022 Greenhills Operation (GHO) Site-specific Groundwater Monitoring Program (SSGMP) and Regional Groundwater Monitoring Program (RGMP) for Study Areas 1, 3 and 4. The basis for the SSGMP and RGMP is the conceptual site model (CSM) presented in the 2018 SSGMP Update (SNC-Lavalin, 2019), the 2020 RGMP Update (SNC-Lavalin, 2020; approved in March 2023) and the 2021 SSGMP Update (SNC-Lavalin, 2021a; awaiting approval).

The GHO SSGMP covers three primary surface water catchments, including Porter Creek, Greenhills Creek, and the Elk River Valley. Groundwater in the tributary watersheds is monitored by the GHO SSGMP, while the groundwater in the valley bottoms of Elk River and Fording River is monitored by the RGMP.

Monitoring wells are grouped based on sub-areas within three regional RGMP Study Areas adjacent to GHO: Study Areas 1, 3 and 4 (Drawing GH-01). Table A lists surface water catchments, sub-areas and associated Study Area. Within each surface water catchment/Study Area, sub-areas are defined based on geography and well locations. Results in this report are discussed based on these sub-areas.

Table A: GHO SSGMP and RGMP Watersheds and Sub-areas

Surface Water Catchments	Sub-areas	Study Area
Porter Creek	None	Study Area 1
Greenhills Creek and Fording River valley bottom around confluence of Greenhills Creek	• Site A and B Rejects • East and Hawk Spoils • Tailings Storage Facility (TSF) and Site D/E Rejects • Rail Loop Area • Greenhills Creek Alluvial Fan and Fording River Valley Bottom	Study Area 3
Elk River	• Mickelson Drainage • Leask Drainage • Wolfram Drainage • Thompson Drainage • Downgradient of Thompson Drainage	Study Area 4

The RGMP Study Areas discussed in this report are described as follows:

- Study Area 1 is the focal point for most upland and tributary valley groundwater flow to the Fording River valley bottom, near the Fording River Operations (FRO) and GHO mine-permitted boundaries. The Porter Creek watershed contributes groundwater to Study Area 1 and is discussed in this report. The remaining areas in Study Area 1 are discussed in the FRO report (Appendix VIII).
- Study Area 3 monitors potential sources in the GHO Rail Loop Area as well as surface water and groundwater transport pathways that converge in the Fording River valley bottom from the north (SNC-Lavalin, 2020). Greenhills Creek is the main tributary that flows from GHO into the Fording River valley bottom in this area.

- Study Area 4 is downgradient of the west side of GHO and is monitored to understand constituent loading sourced from the Mickelson, Leask, Wolfram, Thompson, Fowler, and Rush Creek drainages into the Elk River Valley bottom. Study Area 4 is also concerned with groundwater flow paths for mining-influenced water along the Elk River Valley bottom downgradient towards Elkford.

GHO surficial geology is characteristic of a post-glacial cordilleran mountain setting. Colluvium covers the upland areas and thicker glaciofluvial and glaciolacustrine deposits are in valley bottoms (Drawing 5 in the main report). Tills are present in some mid-slope areas. Anthropogenically derived materials including waste rock and coarse coal rejects (CCR) from mining operations are present in mining pits, waste spoils, valley flanks and valley bottoms (SNC-Lavalin, 2021a).

Bedrock geology and key structural features at GHO are shown on Drawing 2 (in the main report). Bedrock in GHO consists primarily of sandstones and finer grained clastic sedimentary rock of the Fernie and Mist Mountain formations. There is one major north-trending syncline present at GHO – the Greenhills syncline. The Erickson Fault runs along the eastern edge of GHO and is a west-dipping listric normal fault trending northwest to southeast along the eastern limb of the Greenhills syncline. The Bourgeau Thrust Fault is present west of GHO along the west side of the Elk River Valley bottom. The Greenhills normal fault is interpreted to be a splay of the Erickson Fault as they both have the same sense of movement. Both the Greenhills and Erickson faults trend behind the east highwall slopes from the Phase 3 to Cougar Phase 6 pits at GHO. The area between the Greenhills and Erickson faults is structurally complex and characterized by stacked normal and thrust faults.

The Mist Mountain Formation (Fm) of the Kootenay Group is the host of the economic coal seams and is underlain by the Moose Mountain Member and the Weary Ridge Member of the Morrissey Fm. Along the west side of GHO, the Fernie Fm and the Spray River Group subcrop along the valley flank and valley bottom. In the southern portion of GHO, the Spray River Group outcrops on the west side of the Erickson Fault and the Rocky Mountain Supergroup outcrops on the east side of the Erickson Fault (Cui et al. 2017). The Rocky Mountain Supergroup subcrop extends to north of the Porter Creek watershed where the Etherington Fm, part of the Rundle Group (limestone and dolomite), is exposed in the upper parts of the Greenhills, Porter, and Cataract Creek watersheds. This extent of the Rundle Group has been identified as a karst potential block (referred to as the Cataract Block; SNC-Lavalin, 2020).

1.2 Groundwater Monitoring Locations

The 2022 groundwater monitoring and sampling programs were conducted in accordance with the GHO SSGMP Update (SNC-Lavalin, 2019) and the 2020 RGMP Update (SNC-Lavalin, 2020; approved in March 2023). The 2021 SSGMP Update (SNC-Lavalin, 2021a) has yet to be approved; however, monitoring wells recommended to be added to the GHO SSGMP (GH_MW-PC4A/B, GH_MW_GHC_4A/B, GH_MW-RLP-2, RG_MW_FR11A/B, RG_MW_LC3A/B, RG_MW_LCWC1, RG_MW_WC2A/B) were incorporated into the SSGMP program for 2022.

Tables 1 and 3 in the main report provide a list of monitoring wells associated with each program, as well as monitoring and/or sampling rationale for each location. Drawing GH-01 shows the locations of monitoring wells relative to key surface water and mine site features. Additional well information is provided in Table GH-01 and borehole logs are included as Attachment I. Cross sections showing well installation details, stratigraphy, and groundwater elevations are presented on Drawings GH-04 to GH-14; the cross-section locations are shown on Drawing GH-01. Block diagrams are provided in Attachment III (Diagrams GH-01 and GH-02).

1.3 Program Modifications

Table B provides a summary of modifications for the SSGMP and RGMP programs. Program modifications include any significant change to either program going forward compared to what was completed in previous years, such as the addition or removal of wells or changes in sampling frequency. Program deviations from the monitoring program in 2022 are detailed in Appendix V QAQC.

Table B: Summary of Program Modifications

Well ID	Program	Q[a]	Modification	Reason
GH_GA-MW-2	RGMP/ SSGMP	3	Decommissioned in 2022	Monitoring wells RG_MW_WC2A/B have been added to the SSGMP (SNC-Lavalin, 2021a) therefore GH_GA_MW-2 is no longer needed.
GH_GA-MW-4	RGMP/ SSGMP	3	Decommissioned in 2022	Monitoring wells RG_MW_LC3A/B have been added to the SSGMP (SNC-Lavalin, 2021a) therefore GH_GA_MW-4 is no longer needed.

Notes :
[a] Q = Quarter (Q1, Q2, Q3, Q4).

1.4 Summary of Field Activities

Table C summarizes the field activities that took place in 2022.

Table C: Summary of 2022 Field Activities

#	Location	Quarter	Field Activity	Rationale
1	Site A and B Rejects	Q3	Replaced transducer in GH_MW-GHC-1B.	Transducer was no longer functioning, due to manufacturer defect.
2	Greenhills Creek Alluvial Fan and Fording River Valley Bottom	Q4	Replaced transducer in RG_MW-FR11A	Logger malfunctioned and was replaced September 2022. Logger sent to Solinst to recover data.
3	Leask Creek	Q3	Lowered the hanging depth of transducers installed in RG_MW_LC3A/B.	Transducers installed too high therefore when water levels dropped below the transducer, water levels were not being measured prior to this adjustment.

1.5 Porter Creek Watershed (Study Area 1)

A summary of 2022 groundwater monitoring and sampling results for Porter Creek watershed and the corresponding portion of Study Area 1 is presented in Table D with references to supporting information (Drawings, Figures, Tables, and Attachments).

Table D: Summary of 2022 Groundwater Monitoring and Sampling Results for Porter Creek Watershed and Portion of Study Area 1

Hydrogeological Information		Description	Reference
Monitoring Locations	GHO SSGMP/RGMP Wells (Study Area 1)	GH_MW-PC, GH_MW-PC4A/B	Table GH-01 Drawing GH-01 Attachment I
	Monitoring Wells Under Evaluation[1]	n/a	
	Relevant Surface Water Monitoring Stations[2]	GH_PC1	
	Relevant Seep Monitoring Stations[2]	n/a	
Physical Hydrogeology	Groundwater Elevation Trends	• Manual Groundwater Elevations: – GH_MW-PC: elevations varied by 0.8 m with highs in June and lows in December. – GH_MW_PC4A (bedrock): elevations varied by 0.4 m in 2022. – GH_MW_PC4B: dry in all quarters (<1576.75 masl)	Figure GH-01 Table GH-02
	Hydraulic Gradients and Flow Direction	• Vertical Hydraulic Gradient: – GH_MW_PC4B: dry in all quarters, no vertical hydraulic gradient could be calculated. • Lateral Groundwater Flow: – Insufficient monitoring wells to calculate lateral groundwater gradient or velocity. – Groundwater flow direction is inferred to be similar to the topographic profile, down the mouth of the Porter Creek watershed to the east into the Fording River valley bottom.	Table GH-02 Drawing GH-02
Chemistry	2022 SSGMP/RGMP Order Constituents (OC) Results	• Dissolved Selenium: – GH_MW-PC: exceeded primary screening criteria (Q1 to Q4) and secondary screening criteria (Q1 to Q4); consistent with historical results. • All other OC concentrations were below the primary screening criteria in 2022.	Table E Figures GH-02 to -04 Tables GH-03 to -05 Drawings GH-15 to -18
	Non-Order Mining Related and Naturally Occurring Constituents[3]	• Non-Order Mine Related: All constituents were below the primary screening criteria. • Naturally Occurring: – Dissolved Lithium: ▪ GH_MW-PC: exceeded primary screening criteria in Q4. Occasional exceedances are consistent with historical results at this location. • All other constituents were below the primary screening criteria	Tables GH-03 and -04 SNC-Lavalin, 2020
	Mann-Kendall Trend Analysis	• GH_MW-PC – Decreasing for nitrate-N and sulphate. No trend for dissolved cadmium and dissolved selenium. • GH_MW-PC4A/B – Insufficient data points for analysis.	Table F Attachment II

Notes:
n/a denotes not applicable.
[1] monitoring wells that have yet to be evaluated for inclusion in the SSGMP and/or RGMP
[2] relevant surface water stations and seep monitoring locations were determined in the 2021 SSGMP Update (SNC-Lavalin, 2021a), and represent a sub-set of the surface water and seep monitoring locations present at GHO and within Study Area 1.
[3] non-order mine related and naturally occurring constituents based on the Background Assessment (BGA) completed for the 2020 RGMP Update (SNC-Lavalin, 2020)

A summary of results for OC compared to primary screening criteria is presented in Table E.

Table E: Summary of OC Compared to Primary Screening Criteria in the Porter Creek Watershed

Parameter[1,2,3] / Well ID	Nitrate-N (mg/L)				Sulphate (mg/L)				Dissolved Cadmium (µg/L)				Dissolved Selenium (µg/L)			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
GH_MW-PC	-	-	-	-	-	-	-	-	-	-	-	-	***65.8***	***74.2***	***70.8***	***95.6***
GH_MW_PC4A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GH_MW_PC4B	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CSR AW	400				1,280 – 4,290[4]				0.5 – 4[4]				20			
CSR IW	n/a				n/a				5				20			
CSR LW	100				1,000				80				30			
CSR DW	10				500				5				10			

Notes:

[1] Primary screening criteria are Contaminated Sites Regulation (CSR) (BC ENV, 2021a) standards for **Aquatic Life (AW),** Drinking Water (DW), Livestock (LW), and *Irrigation (IW)*.

[2] '–' denotes result below primary screening criteria for given constituents.

[3] 'NS' denotes no sample because the well was dry.

[4] Where a duplicate was collected, the higher concentration is provided in table. If more than one sample collected in a quarter, the higher of the two samples is provided in the table.

[5] Standard varies with hardness.

Mann-Kendall trend analysis was completed for OC with more than seven sampling events and a summary of results is provided in Table F (Attachment II).

Table F: Summary of Mann-Kendall Trend Analysis for OC in the Porter Creek Watershed

Parameter[1] / Well ID	Nitrate-N	Sulphate	Dissolved Cadmium	Dissolved Selenium
GH_MW-PC	Decreasing	Decreasing	No Trend	*No Trend*

Notes:

[1] Where OC were measured above primary screening criteria in 2022, the trend result is *italics*. Where increasing trends are noted, the cell is shaded yellow.

1.5.1 Discussion

Spoils in the upper catchment of Porter Creek contribute OC to the creek, as indicated by dissolved selenium concentrations above the British Columbia Water Quality Guidelines (BCWQG; BC ENV, 2021b). Porter Creek flows through a rock drain under the spoil and along the valley flanks to unlined Porter Pond, where there may be losses to ground in the Fording River valley.

In 2022, dissolved selenium was greater than primary and secondary screening criteria (Table GH-05) at GH_MW-PC in all four quarterly samples; no exceedances were observed in well GH_MW_PC4A which is completed in bedrock. Well GH_MW_PC4B was dry in all quarters, therefore no water quality samples were collected (Table GH-02).

Concentrations of nitrate-N, sulphate, and dissolved selenium in groundwater from GH_MW-PC continued to be similar to concentrations measured at the outlet of Porter Pond (GH_PC1) and followed similar seasonal trends indicating connectivity between groundwater and surface water (Figures GH-02 to -04). This is also supported by similar water types in both surface water and groundwater (magnesium-calcium-sulphate-bicarbonate; Figure GH-06).

Dissolved selenium to sulphate as S [Se:SO_4 (S)] ratios (Figure GH-05) indicate that GH_MW-PC is a mixture of non-contact water and waste rock influenced water. Mine-influenced groundwater at GH_MW-PC is inferred to be primarily from Porter Creek surface water recharging groundwater. Flow and load accretion study results indicated flow and load increase in the upper part of Porter Creek and seepage of mine-influenced groundwater in Porter Creek about 500 m upstream from the sediment pond (Drawing GH-02 and SNC-Lavalin, 2022c). Assessment of the source of the seepage and associated groundwater flow path is ongoing.

Groundwater from GH_MW-PC4A falls just outside the natural non-contact water bedrock box on the Se:SO_4 (S) plot (Figure GH-05). Relatively lower dissolved selenium concentrations at this well may be due to microbial reduction of dissolved selenium, which is supported by relatively low dissolved oxygen concentrations and higher dissolved iron concentrations (Tables GH-03 and GH-04). The sulphate concentrations at this location (136 to 160 mg/L) may also represent non-mine-influenced water exceeding the 95th percentile value established in the regional background assessment (SNC-Lavalin, 2020).

1.6 Greenhills Creek Watershed and Downgradient Along the Fording River Valley Bottom (Study Area 3)

A summary of 2022 groundwater monitoring and sampling results for the Greenhills Creek watershed and Study Area 3 is presented in Table G with references to supporting information (Drawings, Figures, Tables, and Attachments). This section has been structured by grouping monitoring locations according to the following geographical areas:

- Site A and B Rejects;
- East and Hawk Spoils;
- Tailings Storage Facility (TSF) and Site D/E Rejects;
- Rail Loop Area; and
- Greenhills Creek Alluvial Fan and Fording River Valley Bottom.

Table G: Summary of 2022 Monitoring and Sampling Results for Greenhills Creek Watershed and Study Area 3

Hydrogeological Information		Description	Reference
Site A and B Rejects			
Monitoring Locations	GHO SSGMP Monitoring Wells	GH_MW-GHC-1A/B	Table GH-01 Drawing GH-01 Attachment I
	Monitoring Wells Under Evaluation[1]	n/a	
	Relevant Surface Water Monitoring Stations[2]	GH_GC1, GH_GH1, GH_FR1	
	Relevant Seep Monitoring Stations	GH_SEEP_22, GH_W-SEEP, GH_E-SEEP	
Physical Hydrogeology	Groundwater Elevation Trends	• Manual Groundwater Elevations: – GH_MW-GHC-1A (bedrock): ▪ elevations varied by up to 0.76 m in 2022, consistent with historical results. – GH_MW-GHC-1B (overburden): ▪ elevations varied by up to 1.76 m in 2022, consistent with historical results.	Figure GH-07 Table GH-02
	Hydraulic Gradients and Flow Direction	• Vertical Hydraulic Gradient: – GH_MW-GHC-1A/B: 0.41 to 0.57 m/m, downward. • Lateral Groundwater Flow: – Insufficient monitoring wells to calculate lateral groundwater gradient or velocity. Groundwater flow direction is inferred to be southeast toward Greenhills Creek from the Site A and B Rejects in both the overburden and bedrock, then south towards the Fording River valley bottom along Greenhills Creek.	Table GH-02 Drawing GH-02 SNC-Lavalin, 2021b
Chemistry	2022 SSGMP/RGMP OC Results	• Sulphate: – GH_MW-GHC-1B: exceeded primary screening criteria (CSR DW) in Q1 to Q4, consistent with historical results. • All other OC concentrations were below the primary screening criteria in 2022.	Table H Figures GH-08 to –10 Tables GH-03 to -05 Drawings GH-15 to -18
	Non-Order Mining Related and Naturally Occurring Constituents[3]	• Non-Order Mine Related: All constituents were below the primary screening criteria. • Naturally occurring: – Dissolved Lithium: ▪ GH_MW-GHC-1A and GH_MW-GHC-1B: exceeded primary screening criteria in Q1 to Q4, consistent with historical results. – Dissolved Manganese: ▪ GH_MW-GHC-1B: exceeded primary screening criteria in Q2 to Q4. Frequent and non-continuous exceedance of the CSR IW criterion for manganese is consistent with historical results for this monitoring well. • All other constituents were below the primary screening criteria.	Tables GH-03 to -05 SNC-Lavalin, 2020
	Mann-Kendall Trend Analysis	• GH_MW-GHC-1A – Probably increasing trend in sulphate and stable and/or no trend for all other OC. • GH_MW-GHC-1B – Increasing and probably increasing for nitrate and dissolved cadmium respectively; and stable and/or no trend for all the other OC.	Table I Attachment II
East and Hawk Spoils			
Monitoring Location	Relevant GHO SSGMP Monitoring Wells	GH_MW_GHC_4A (water level only), GH_MW_GHC_4B	Table GH-01 Drawing GH-01 Attachment I
	Monitoring Wells Under Evaluation[1]	n/a	
	Relevant Surface Water Monitoring Stations[2]	GH_GC1, GH_GH1, GH_FR1	
	Relevant Seep Monitoring Stations[2]	GH_SEEP_22, GH_W-SEEP, GH_E-SEEP	
Physical Hydrogeology	Groundwater Elevation Trends	• Manual Groundwater Elevations: – GH_MW_GHC_4A (bedrock): elevations varied by up to 0.93 m in 2022. – GH_MW_GHC_4B (overburden): elevations varied by up to 0.71 m in 2022.	Figure GH-07 Table GH-02
	Hydraulic Gradients and Flow Direction	• Vertical Hydraulic Gradient: – GH_MW_GHC_4A/B: 0.16 to 0.22 m/m, downward. • Lateral Groundwater Flow: – Insufficient monitoring wells to calculate lateral groundwater gradient or velocity. • Groundwater flow direction is inferred to be similar to the topographic profile, with groundwater flowing approximately northeast to southwest aligned with Greenhills Creek valley bottom.	Table GH-02 Drawing GH-02

Table G (Cont'd): Summary of 2022 Monitoring and Sampling Results for Greenhills Creek Watershed and Study Area 3

Hydrogeological Information		Description	Reference
East and Hawk Spoils (Cont'd)			
Chemistry	2022 SSGMP/RGMP OC Results	• Dissolved Selenium: – GH_MW_GHC_4B: exceeded primary screening criteria (Q1 to Q4) and secondary screening criteria (Q2 to Q4). • Sulphate: – GH_MW_GHC_4B: exceeded primary screening criteria in Q4. • All other OC concentrations were below the primary screening criteria in 2022.	Table H Figures GH-08 to -10 Tables GH-03 to -05 Drawings GH-15 to -18
	Non-Order Mining Related and Naturally Occurring Constituents[3]	• Non-Order Mine Related: All constituents were below the primary screening criteria.	Tables GH-03 and -04 SNC-Lavalin, 2020
		• Naturally Occurring – Dissolved Lithium: ▪ GH_MW_GHC_4B: exceeded primary screening criteria in Q1 to Q4. • All other constituents were below the primary screening criteria.	
	Mann-Kendall Trend Analysis	• GH_MW_GHC_4B – Insufficient data points to complete analysis.	Table I Attachment II
Tailings Storage Facility and Site D/E Rejects			
Monitoring Locations	GHO SSGMP Monitoring Wells	GH_MW-TD	Table GH-01 Drawing GH-01 Attachment I
	Monitoring Wells Under Evaluation[1]	GH_MW_E1_1A, GH_MW_GHC_2A, GH_MW_GHC_3B	
	Relevant Surface Water Monitoring Stations[2]	GH_GH1, GH_FR1	
	Relevant Seep Monitoring Stations[2]	GH_E1, GH_E2, GH_E3	
Physical Hydrogeology	Groundwater Elevation Trends	• Artesian conditions in 2022, consistent with historical results (>1591.55 masl). • Logger not installed in this well.	Table GH-02
	Hydraulic Gradients and Flow Direction	• Vertical Hydraulic Gradient: – Artesian pressure at GH_MW-TD suggests upward vertical gradient across the confining layer at this location. • Lateral Groundwater Flow: – Insufficient monitoring wells to calculate lateral groundwater gradient or velocity. – Groundwater flow is interpreted to be generally south toward the Fording River.	Table GH-02 Drawing GH-02
Chemistry	2022 SSGMP/RGMP OC Results	• No OC concentration was greater than primary screening criteria in 2022.	Table H Figures GH-14 to -16 Tables GH-03 to -05 Drawings GH-15 to -18
	Non-Order Mining Related and Naturally Occurring Constituents[3]	• Non-Order Mine Related: All constituents were below the primary screening criteria.	Tables GH-03 and -04 SNC-Lavalin, 2020
		• Naturally Occurring: – Dissolved Lithium: Exceeded primary screening criteria in Q1 to Q4, consistent with historical results. – Dissolved Manganese: Exceeded primary screening criteria in Q1 to Q4, consistent with historical results. • All other constituents were below the primary screening criteria.	
	Mann-Kendall Trend Analysis	• Dissolved cadmium: increasing trend, concentrations remain one order of magnitude below applicable criteria. • Nitrate concentration is probably increasing. • The rest of the concentrations were decreasing, and/or no trend for all other OC.	Table I Attachment II
Rail Loop Area			
Monitoring Locations	GHO SSGMP/RGMP Wells (Study Area 3)	GH_MW_RLP-2, GH_POTW09	Table GH-01 Drawing GH-01 Attachment I
	Monitoring Wells Under Evaluation[1]	GH_MW_FR6, GH_MW_FR7, GH_MW_FR2A/B, GH_MW_FR8A/B	
	Relevant Surface Water Monitoring Stations[2]	GH_GH1, GH_FR1, GH_RLP	
	Relevant Seep Monitoring Stations[2]	GH_SEEP_98	

Table G (Cont'd): Summary of 2022 Monitoring and Sampling Results for Greenhills Creek Watershed and Study Area 3

Hydrogeological Information		Description	Reference
Rail Loop Area (Cont'd)			
Physical Hydrogeology	Groundwater Elevation Trends	• Manual groundwater elevations: – GH_MW_RLP-2: varied by up to 0.2 m in 2022 – GH_POTW09: groundwater elevations influenced by well efficiency due to active pumping, manual measurements not currently possible due to well collar completions.	Figure GH-07 Table GH-02
	Hydraulic Gradients and Flow Direction	• Vertical Hydraulic Gradient: – No nested well pair to calculate vertical hydraulic gradient. • Lateral Groundwater Flow: – Insufficient monitoring wells to calculate lateral groundwater gradient or velocity. – Groundwater flow is interpreted to be generally toward the west/northwest, along the Fording River.	Table GH-02 Drawing GH-02
	Groundwater Withdrawals	• Daily average pumping rate: – GH_POTW09: approximately 38 m^3/hr.	Figure GH-18
Chemistry	2022 SSGMP/RGMP OC Results	• Dissolved Selenium: – GH_POTW09: exceeded primary screening criteria in Q2. One exceedance was previously measured, in 2018.	Table H Figures GH-14 to -16 Tables GH-03 to -05 Drawings GH-15 to -18
	Non-Order Mining Related and Naturally Occurring Constituents[3]	• Non-Order Mine Related: All constituents were below the primary screening criteria.	Tables GH-03 and -04 SNC-Lavalin, 2020
		• Naturally occurring: – Dissolved Lithium: ▪ GH_MW_RLP-2: exceeded primary screening criteria in Q1 to Q4, no historical data for comparison. ▪ GH_POTW09: exceeded primary screening criteria in Q1 to Q4, consistent with historical results. – Dissolved Manganese: ▪ Exceeded primary screening criteria in Q1 to Q4. – Dissolved Molybdenum: ▪ Exceeded in primary screening criteria in Q3. • All other constituents were below the primary screening criteria.	
	Mann-Kendall Trend Analysis	• GH_POTW09 – Increasing trend in sulphate and dissolved selenium, concentrations below applicable criteria, except dissolved selenium in Q2.	Table I Attachment II
Greenhills Creek Alluvial Fan and Fording River Valley Bottom (Study Area 3)			
Monitoring Locations	RGMP Wells (Study Area 3)	GH_POTW10, GH_POTW15, GH_POTW17, RG_MW_FR11A/B	Table GH-01 Drawing GH-01 Attachment I
	Monitoring Wells Under Evaluation[1]	GH_MW_FR1A/B, GH_MW_FR2/B, GH_MW_FR3A/B, GH_MW_FR4A/B, GH_MW_FR5A/B, GH_POTW06	
	Relevant Surface Water Monitoring Stations[2]	GH_FR1, GH_GH1	
	Relevant Seep Monitoring Stations[2]	GH_E1, GH_E2, GH_E3, GH_SEEP_22	
Physical Hydrogeology	Groundwater Elevation Trends	• Manual Groundwater Elevations: – GH_POTW10/15/17: groundwater elevations influenced by well efficiency due to active pumping, manual measurements not currently possible due to well collar completions. – RG_MW_FR11A elevations varied by up to 0.42 m in 2022. – RG_MW_FR111B elevations varied up to 1.36 m in 2022.	Figure GH-18 Table GH-02
	Hydraulic Gradients and Flow Direction	• Vertical Hydraulic Gradient: – RG_MW_FR11A/B: 0.98 to 1.18 m/m, downward. • Lateral Groundwater Flow – Insufficient monitoring wells with available water levels to calculate lateral groundwater gradient or velocity. – Groundwater flow direction in this area is inferred to be southwest towards the Fording River, west along the Fording River, and locally towards the operating supply wells.	Table GH-02 Drawing GH-02 SNC-Lavalin, 2021b

Table G (Cont'd): Summary of 2022 Monitoring and Sampling Results for Greenhills Creek Watershed and Study Area 3

Hydrogeological Information		Description	Reference
Greenhills Creek Alluvial Fan and Fording River Valley Bottom (Study Area 3) (Cont'd)			
Physical Hydrogeology (Cont'd)	Groundwater Withdrawals	• Daily average pumping rate: – GH_POTW15: approximately 12 m^3/hr. – GH_POTW10: approximately 3.9 m^3/hr. – GH_POTW17: approximately 1.5 m^3/hr (not operated in January 2022).	Figure GH-18
Chemistry	2022 SSGMP/RGMP OC Results	• Dissolved Selenium: – GH_POTW17: exceeded primary screening criteria in Q1. Occasional exceedances are consistent with historical results for this well. • All other OC concentrations were below the primary screening criteria in 2022.	Table H Figures GH-14 to -16 Tables GH-03 to -05 Drawings GH-15 to -18
	Non-Order Mining Related and Naturally Occurring Constituents[3]	• Non-Order Mine Related: All constituents were below the primary screening criteria.	Tables GH-03 and -04 SNC-Lavalin, 2020
		• Naturally occurring: – Dissolved Lithium: ▪ GH_POTW10/15/17: exceeded primary screening criteria in Q1 to Q4, consistent with historical results. ▪ RG_MW_FR11A/B: exceeded primary screening criteria in Q1 to Q4. – Dissolved Manganese: ▪ GH_POTW15: exceeded primary screening criteria in Q2, consistent with historical results. – Dissolved Molybdenum: ▪ RG_MW_FR11A/B: Exceeded in primary screening criteria Q2. • All other constituents were below the primary screening criteria.	
	Mann-Kendall Trend Analysis	• GH_POTW10: – Increasing trend for all OC, concentrations below applicable criteria. • GH_POTW15: – Increasing in sulphate, concentrations below applicable criteria. • GH_POTW17: – Probably increasing in dissolved selenium, concentration below applicable criteria, except in Q1. • Concentrations were decreasing, stable and/or no trend for all other OC. • RG_MW_FR11A/B: – Insufficient data points to complete analysis.	Table I Attachment II

Notes:
n/a denotes not applicable.
[1] relevant monitoring wells are those in the area that have yet to be evaluated for inclusion in the SSGMP and/or RGMP
[2] relevant surface water stations and seep monitoring locations were determined in the 2021 SSGMP Update (SNC-Lavalin, 2021a), and represent a sub-set of the surface water and seepage monitoring locations present at GHO and Study Area 3.
[3] non-order mine related and naturally occurring constituents based on the Background Assessment (BGA) completed for the 2020 RGMP Update (SNC-Lavalin, 2020)

A summary of results for OC compared to primary screening criteria is presented in Table H.

Table H: Summary of OC Compared to Primary Screening Criteria in the Greenhills Creek Watershed

Parameter[1,2,3] / Well ID	Nitrate-N (mg/L)				Sulphate (mg/L)				Dissolved Cadmium (µg/L)				Dissolved Selenium (µg/L)			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Site A and B Rejects																
GH_MW-GHC-1A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GH_MW-GHC-1B	-	-	-	-	640	628	564	556	-	-	-	-	-	-	-	-
East and Hawk Spoils																
GH_MW_GHC_4B	-	-	-	-	-	-	-	566	-	-	-	-	14	***30.9***	***61.8***	***110***
Tailings Storage Facility and Site D/E Rejects																
GH_MW-TD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rail Loop Area																
GH_MW-RLP-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Greenhills Creek Alluvial Fan and Fording River Valley Bottom (Study Area 3)																
GH_POTW09	-	-	-	-	-	-	-	-	-	-	-	-	-	***20.4***	-	-
GH_POTW10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GH_POTW15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GH_POTW17	-	-	-	-	-	-	-	-	-	-	-	-	10.5	-	-	-
RG_MW_FR11A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RG_MW_FR11B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CSR AW	400				1,280 – 4,290[4]				0.5 – 4[4]				20			
CSR IW	n/a				n/a				5				20			
CSR LW	100				1,000				80				30			
CSR DW	10				500				5				10			

Notes:

[1] Primary screening criteria are CSR (BC ENV, 2021a) standards for **Aquatic Life (AW),** Drinking Water (DW), Livestock (LW), and *Irrigation (IW)*.

[2] '–' denotes result below primary screening criteria for given constituents.

[3] Where a duplicate was collected, the higher concentration is provided in table. If more than one sample collected in a quarter, the higher of the two samples is provided in the table.

[4] Standard varies with hardness.

NS – No sample.

A summary of the Mann-Kendall trend analysis is provided in Table I below (Attachment II).

Table I: Summary of Mann-Kendall Trend Analysis for OC in the Greenhills Creek Watershed

Parameter[1] Well ID	Nitrate-N	Sulphate	Dissolved Cadmium	Dissolved Selenium
Site A and B Rejects				
GH_MW-GHC-1A	No Trend	Probably Increasing	No Trend	Stable
GH_MW-GHC-1B	Increasing	*Stable*	Probably Increasing	No Trend
Tailings Storage Facility and Site D/E Rejects				
GH_MW-TD	Probably Increasing	Decreasing	Increasing	No Trend
Greenhills Creek Alluvial Fan and Fording River Valley Bottom (Study Area 3)				
GH_MW_RLP-2	No Trend	Decreasing	Decreasing	No Trend
GH_POTW09	Stable	Increasing	No Trend	*Increasing*
GH_POTW10	Increasing	Increasing	Increasing	Increasing
GH_POTW15	No Trend	Increasing	Probably Decreasing	Decreasing
GH_POTW17	Stable	Stable	Decreasing	*Probably Increasing*

Notes:

[1] Where OC were measured above primary screening criteria in 2022, the trend result is *italics*. Where increasing trends are noted, the cell is shaded yellow.

1.6.1 Discussion

Greenhills Creek and its tributary Gardine Creek generally flow across till deposits in a southerly direction. Greenhills Creek daylights at the toe of the East Spoil runout. Gardine Creek flows south adjacent to the Site A and B Rejects. Seeps, including GH_SEEP_22, daylight near the Site A and B Rejects and are inferred to report to Gardine and Greenhills Creeks. The waste rock and the Site A and B Rejects are inferred to contribute OC to surface water and the creeks are interpreted to be mine-influenced, as indicated by dissolved selenium and sulphate concentrations above the BCWQG aquatic life water use (AW; SNC-Lavalin, 2021b). Where the creeks converge, surface water flows towards the valley bottom and infiltrates the Greenhills Creek alluvial fan before joining the Fording River below the Greenhills Sediment Pond (SNC-Lavalin, 2021a).

Site A and B Rejects

GH_MW-GHC-1A, installed in sandstone bedrock, and GH_MW-GHC-1B, installed in lower permeability till, are located directly downslope of the Site A Rejects. Groundwater is inferred to flow southeast towards Greenhills Creek from the Site A Rejects.

Concentrations of dissolved selenium have consistently been greater at bedrock well GH_MW-GHC-1A compared to overburden well GH_MW-GHC-1B (Figure GH-08). Conversely, sulphate concentrations at GH_MW-GHC-1B have historically been greater than concentrations measured at GH_MW-GHC-1A (Figure GH-09). Groundwater from well GH_MW-GHC-1A had similar dissolved selenium concentrations as were encountered in GH_SEEP_22 and Gardine Creek (GH_GC1). Mann-Kendall analyses (Attachment II) indicate an increasing trend in nitrate-N at GH_MW-GHC-1B and probably an increasing trend in sulphate at GH_MW-GHC-1A; both trends have not been identified previously.

The Se:SO_4 (S) plot indicates GH_MW-GHC-1B is influenced by CCR and may have undergone microbial reduction in Q1 and Q4 (Figure GH-11). Similarly, deep well GH_MW-GHC-1A is influenced by CCR (Figure GH-11) and may also be influenced by waste rock from Hawk and East spoils via infiltration from Greenhills Creek, as indicated by the greater dissolved selenium concentrations than shallow well GH_MW-GHC-1B (SNC-Lavalin, 2021b). However, the dissolved selenium and nitrate-N concentrations at GH_MW-GHC-1A are largely below the upper limits for CCR seepage in accordance with the geochemical source terms. For example, SRK (2021) indicates the geochemical source terms for CCR include 95th percentile concentrations of 34 µg/L for dissolved selenium (also shown in Figure GH-11), and 0.4 mg/L for nitrate-N. The differences in OC concentrations at GH_MW_GHC_1A relative to GH_MW-GHC-1B may therefore reflect variability in leaching rates within the CCR pile and less exposure to suboxic conditions in the subsurface for removal of dissolved selenium and nitrate-N upgradient of the well, rather than infiltration from Greenhills Creek, or a combination of both of these.

The Schoeller plot (Figure GH-12) indicates well GH_MW-GHC-1A has a similar major ion composition as Gardine Creek (GH_GC1), with greater chloride concentration in Q2 . Groundwater at well GH_MW-GHC-1B shows greater sodium and chloride concentrations compared to Gardine Creek and Greenhills Creek.

Dissolved selenium concentrations in Greenhills Creek and Fording River (GH_GH1 and GH_FR1) have consistently been one to three orders of magnitude higher than in groundwater at GH_MW-GHC-1A/B (Figure GH-08). This difference is interpreted to be a result of the waste rock influence on Greenhills Creek (Hawk and East Spoils) in contrast with the CCR influence (lower selenium concentration in CCR seepage than waste rock, as illustrated in Figure GH-11) upgradient of GH_MW-GHC-1A and B.

East and Hawk Spoils

Clustered well pair GH_MW_GHC_4A/B was installed to monitor mining influence from waste rock sources (Hawk and East spoils) in groundwater in the Greenhills Creek alluvial sediments and bedrock on approach to the Fording River valley bottom. GH_MW_GHC_4A is monitored for water levels only, in accordance with the 2021 SSGMP Update (SNC-Lavalin, 2021a) and is screened in bedrock.

In 2022, dissolved selenium concentrations at GH_MW_GHC_4B exceeded primary and secondary screening criteria in Q1 to Q4 (Figure GH-08; Table GH-05). These dissolved selenium concentrations are interpreted to be from waste rock influence, inferred to be sourced from contact with the Hawk and East spoils and infiltration from Greenhills Creek. The rest of the OC were below primary screening criteria except for sulphate in Q4.

The Se:SO_4 (S) plot supports the interpretation of waste rock influence at GH_MW_GHC_4B (Figure GH-11). Positions of samples on this cross plot may also reflect mixing with CCR-influenced water in addition to mixing with non-mining-influenced water. Biogeochemical removal of dissolved selenium resulting from exposure to suboxic conditions in the subsurface may also play a role in the lower dissolved selenium concentrations in the well relative to Greenhills Creek. The water type at GH_MW_GHC_4B is calcium-magnesium-sulphate-bicarbonate (Figure GH-13), consistent with Greenhills Creek.

The Schoeller plot (Figure GH-12) indicated that well GH_MW-GHC_4B has a similar major ion composition as Greenhills Creek (GH_GH1).

Tailings Storage Facility and Site D/E Rejects

Monitoring well GH_MW-TD is in the upland area downgradient and south of the TSF and the Site D/E Rejects (Drawing GH-01) and is inferred to intercept a deeper groundwater flow system (SNC-Lavalin, 2021a). The well is an artesian well completed at the base of a thick (35 m) layer of till, in materials consistent with the transitional zone between a dense till and siltstone.

Seeps GH_E1, GH_E2 and GH_E3 are indicative of seepage water quality discharging from the Site D and E rejects, upgradient of GH_MW-TD. Dissolved selenium and nitrate-N concentrations at the seeps have been historically, and continue to be, lower than those measured in the Fording River (GH_FR1), Greenhills Creek (GH_GH1) and Rail Loop Pond (GH_RLP; Figure GH-14). The Se:SO_4 (S) plot indicates the seeps are influenced by CCR and possibly undergoing microbial reduction (Figure GH-17).

In 2022, dissolved selenium, sulphate, and nitrate-N at GH_MW-TD did not display significant variability and remained below the relevant primary screening criteria (Figures GH-14 to -16). The low dissolved oxygen and oxidation-reduction potential, alongside elevated manganese concentrations, indicate reducing conditions are present at GH_MW-TD, and the potential exists for nitrate-N and selenium attenuation in the deeper groundwater south of the TSF (SNC-Lavalin, 2021b).

The Se:SO_4 (S) plot for GH_MW-TD shows the ratios plot just above the unconsolidated non-contact water area. The source of CCR influenced water is the Site D/E Rejects and based on the groundwater chemistry results at GH_MW-TD, there is a limited amount of downward mixing of this seepage in this area.

Mann-Kendall trend analysis indicates an increasing trend in dissolved cadmium, but concentrations remained below primary screening criteria (Attachment II; Table GH-04). Concentrations of cadmium at this location may be a result of being mobilized from solids under iron-reducing conditions. Potential iron-reducing conditions at GH_MW-TD are indicated by elevated manganese concentrations (605 to 669 µg/L in 2022; Table GH-04) and low dissolved oxygen and oxidation-reduction potential (Table GH-03). Reductive dissolution of iron hydroxides has been documented as a mechanism for cadmium mobilization (U.S. Environmental Protection Agency, 2007).

Rail Loop Area

GH_MW_RLP-2

Monitoring well GH_MW_RLP-2 (screened 3.5 to 5 mbgs) was installed adjacent to the Rail Loop sediment pond (Rail Loop Pond) in December 2020 to target the shallower water bearing zone (Drawing GH-06); quarterly sampling was initiated in 2021.

Sources of mining influence in the Rail Loop Area potentially influencing water chemistry at GH_MW_RLP-2 include the Rail Loop Pond and clean coal storage. The Rail Loop Pond receives water from the Dryer and Rail Loadout areas as well as seasonal diversion of TSF and CCR seepage. The water chemistry in the pond is measured at GH_RLP. Concentrations of sulphate at GH_MW_RLP-2 are similar to concentrations measured at GH_RLP, while concentrations of nitrate-N and dissolved selenium are lower in the well than the pond (Figure GH-14 to -16).

The Se:SO_4 (S) plot indicates GH_MW-RLP-2 is influenced by the CCR (Figure GH-17). The leftward shift, i.e. towards lower dissolved selenium relative to SO_4-S of GH_MW_RLP-2 relative to the Rail Loop Pond may indicate biogeochemical attenuation of dissolved selenium or mixing of water contacting the clean coal only in addition to infiltration from the pond. Reducing conditions are indicated to be present at GH_MW_RLP-2 based on relatively low DO, low oxidation-reduction potential (ORP) values, and relatively high concentrations of dissolved iron and manganese, which supports the interpretation that biogeochemical attenuation of dissolved selenium may be occurring.

GH_POTW09

Supply well GH_POTW09, located in the Rail Loadout area, was pumped at rates ranging from 353 to 1,124 m^3/day in 2022, with an average of 914 m^3/day (Figure GH-18). One dissolved selenium exceedance was noted at this well in Q2; there was one previous dissolved selenium exceedance over the period of record (Q3 2018). Dissolved selenium and sulphate concentrations are increasing according to Mann-Kendall analyses. The Se:SO_4 (S) plot indicates GH_POTW09 is a mixture between CCR influence and natural non-contact water (Figure GH-17).

The reason for the isolated dissolved selenium exceedances at GH_POTW09 (Q2) is uncertain. This exceedance may be due to operational water management resulting in isolated elevated discharge from the Rail Loop Pond to the downstream enclosed catchment area, and possible subsequent infiltration to a sand channel, that is not normally wetted at surface, with hydraulic connection to the supply well. High freshet water levels in Greenhills Creek or the Fording River introducing a similar connection with sand channels and the supply well are also possibilities. The pumping records do not indicate a particularly high pumping rate during the period leading up to the Q2 sample collection (Figure GH-18).

Idealized capture zones were calculated for the GH_POTW-series wells (SNC-Lavalin, 2020), which indicated that water flowing down through the silt and clay layer below the Rail Loop Pond is inferred to report, at least in part, to GH_POTW09. A connection with the Rail Loop Pond would corroborate the increasing sulphate and dissolved selenium trends (Figures GH-14 and GH-15), notwithstanding the isolated exceedance in Q2 2022. The pumping rate at this well has been high relative to the other supply wells (GH_POTW10, GH_POTW15, GH_POTW17) and has decreased slightly since 2019 (Figure GH-18).

Greenhills Creek Alluvial Fan and Fording River Valley Bottom

Supply Wells

The four monitored supply wells are screened in glaciofluvial channel deposits along the Fording River valley bottom and the Greenhills Creek alluvial fan. These wells include GH_POTW09 – located east of the Rail Loop Pond (discussed in Rail Loop Area section above); GH_POTW17 – downgradient (south) of the Greenhills Sediment Pond (Greenhills Pond); and GH_POTW10 and GH_POTW15 southwest of Greenhills Pond (Drawing GH-01). The range and average pumping rates for the three wells discussed in this section are:

- GH_POTW10 – 59 to 108 m^3/day with an average of 93 m^3/day;
- GH_POTW15 – 202 to 325 m^3/day with an average of 297 m^3/day; and
- GH_POTW17 – 0 to 61 m^3/day with an average of 35 m^3/day.

Supply well GH_POTW09 was pumped at an average rate of 914 m^3/day in 2022, which is over three times the rate of the other wells (Figure GH-18).

The primary sources of mine-influenced water in the valley bottom deposits around the supply wells are the losing reach of Greenhills Creek just north of Greenhills Pond where the alluvial deposits are unconfined (Drawing GH-02 and SNC-Lavalin, 2020), infiltration from Greenhills Pond and Rail Loop Pond, and CCR and TSF seepage. The Fording River may also be a potential source.

One dissolved selenium exceedance was measured at GH_POTW17 in 2022 (Q1). No other OC exceedances were observed in 2022. POTW17 has had four previous exceedances: one in Q2 2018, one in Q3 2019 and one in each of Q3 and Q4 of 2021 (Figure GH-14 and Table GH-04). Dissolved selenium concentrations at GH_POTW17 have historically been close to the 10 µg/L primary screening criterion, and the Mann-Kendall analysis (Attachment II) identified a probably increasing trend in dissolved selenium which has not been identified previously. Consistent with historical results, Mann-Kendall trend analyses indicate that dissolved selenium concentrations at GH_POTW10 are increasing. An increasing trend in sulphate was identified at GH_POTW15 for the first time.

At GH_POTW10, the increasing trend in dissolved selenium may reflect a flowpath from any of the sources listed previously. The Se:SO4 (S) ratios plot between natural non-contact water and CCR influenced; however, CCR influenced water is characterized by relatively higher sulphate, which is not seen at GH_POTW10 (Figure GH-17).

GH_POTW15 is inferred to receive groundwater flowing down the main stem valley bottom along the Fording River (SNC-Lavalin, 2020). Additional flow from CCR influenced in the north into GH_POTW15 is supported by sulphate concentrations in the well exceeding the Fording River annual mean, and the newly identified increasing sulphate trend. The Se:SO4 (S) plot shows GH_POTW15 groundwater is a mixture between CCR influence and natural non-contact water (Figure GH-17).

GH_POTW17 is installed in deeper sediments near Greenhills Pond. Increasing dissolved selenium at this well may be related to the progressive arrival of Greenhills Creek water or to increasing dissolved selenium in the CCR seepage water, as reflected at seep GH_E2 (Figure GH-14). The Se:SO_4 (S) plot indicates water from GH_POTW17 is influenced by CCR seepage (Figure GH-17).

Overall, the dissolved selenium exceedances are also interpreted to be related to the higher pumping rates influencing the groundwater flow regime in the Greenhills Creek alluvial fan. Groundwater extraction is interpreted to induce downward vertical hydraulic gradients that may result in surface water infiltration from Greenhills Creek or a stronger hydraulic connection with shallow groundwater. A lower permeability silty clay unit overlies the lower portions of the fan and likely impedes downward migration in these areas (Drawings GH-06 and GH-07).

A network of monitoring wells was installed along the Fording River valley bottom in the fall of 2021. These wells are under evaluation for inclusion in the RGMP and GHO SSGMP. Modelling of the supply well capture zones, interactions with the Fording River and Greenhills Creek, and constituent transport paths in the RGMP Study Area 3 were progressed in 2022. Findings will be considered in the 2023 RGMP Update.

RG_MW-FR11A/B

Clustered monitoring well pair RG_MW_FR11A/B was installed in 2021 near Josephine Falls, to assess the potential of a groundwater pathway from the Fording River valley bottom to the Elk River watershed along mapped glaciofluvial sediments. The wells were installed just north of the Fording River in bedrock, which was encountered at 3.3 mbgs (1496.7 masl).

The Fording River in this area is deeply incised and flows over bedrock. Based on LiDAR imagery, the elevation of the Fording River near these wells is approximately 1478 masl, which is 22 m lower than the ground elevation at RG_MW_FR11A/B. The saddle between the Elk and Fording River watersheds has been identified to be just west of where the wells were installed. Groundwater elevations at RG_MW_FR11A/B have been measured to range between 1485 and 1493 masl (Table GH-02; Drawing GH-02). Based on these elevations, groundwater is inferred to be toward the Fording River, and therefore it is also inferred that there is no flowpath from the Fording River valley to the Elk River Valley. Concentrations of OC in 2022 were below the primary screening criteria. The Se:SO_4 (S) plot indicates RG_MW_FR11A/B are natural non-contact water (Figure GH-17).

1.7 Elk River Valley Watershed and Study Area 4

A summary of 2022 groundwater monitoring and sampling results for the Elk Valley Watershed and Study Area 4 is presented in Table J with references to supporting information (Drawings, Figures, Tables, and Attachments). This section has been structured along the following geographical sub-areas:

- Mickelson Drainage;
- Leask Drainage;
- Wolfram Drainage;
- Thompson Drainage and Downgradient of Thompson Drainage; and
- Elk River Valley Downgradient of GHO.

Table J: Summary of 2022 Groundwater Monitoring and Sampling Results for Elk River Valley Watershed and Study Area 4

Hydrogeological Information		Description	Reference
Mickelson Creek Drainage			
Monitoring Locations	GHO SSGMP/RGMP Wells (Study Area 4)	GH_MW-MC-1S/D, GH_MW-MC-2S/D	Table GH-01 Drawing GH-01 Attachment I
	Monitoring Wells Under Evaluation[1]	n/a	
	Relevant Surface Water Monitoring Stations[2]	GH_ER2, GH_MC1	
	Relevant Seep Monitoring Stations[2]	n/a	
Physical Hydrogeology	Groundwater Elevation Trends	• Manual Groundwater Elevations: – Groundwater elevations in shallow groundwater GH_MW-MC-1S varied up to 2.50 m and GH_MW-MC-2S varied up to 1.66 m. – Groundwater elevations in deep groundwater GH_MW-MC-1D varied up to 1.91 m and GH_MW-MC-2D varied up to 0.55 m. – Water levels at all wells were consistent with historical results.	Figure GH-20 Table GH-02
	Hydraulic Gradients and Flow Direction	• Vertical Hydraulic Gradient: – GH_MW-MC-1S/D: 0.005 to 0.02 m/m, downward during high flow periods (March to July) and upward during low flow periods (January to March and July to December). – GH_MW-MC-2S/D: 0.15 to 0.28 m/m, upward. • Lateral Groundwater Flow – Average linear groundwater flow velocity in the shallow alluvial sediments between Mickelson Creek and Wolfram Creek was calculated to be 0.9 m/d using: ▪ A lateral hydraulic gradient of 0.0066, calculated between GH_MW-MC-1S/GH_MW-MC-2S and RG_MW_WC2B using Q4 2022 groundwater elevations ▪ A lateral hydraulic conductivity of 4.9 x 10^{-4} m/s, which is the geometric mean of hydraulic conductivity values for wells GH_MW-MC-1S, GH_MW-MC-2S, RG_MW_LC3B, RG_MW_LCWC1, and RG_MW_WC2B ▪ An assumed effective porosity of 0.3 – Upland groundwater flow in the Mickelson Creek drainage is inferred to be west/southwest toward the Elk River. Once groundwater reaches the Elk River, flow is to the south, along the river valley bottom.	Table GH-02 Drawing GH-03
Chemistry	2022 SSGMP/RGMP OC Results	• Dissolved Selenium: – GH_MW-MC-2D: exceeded primary screening criteria (Q2) and secondary screening criteria (Q2). Occasional exceedances are consistent with historical results for this well. • All other OC concentrations were below the primary screening criteria in 2022.	Table K Figures GH-21 to -23 Tables GH-03 to -05 Drawings GH-19 to -22
	Non-Order Mining Related and Naturally Occurring Constituents[3]	• Non-Order Mine Related: All constituents were below the primary screening criteria. • Naturally occurring: – Dissolved Boron: ▪ GH_MW-MC-2D: exceeded primary screening criteria in Q1 to Q4· consistent with historical results. – Dissolved Chloride: ▪ GH_MW-MC-2D: exceeded primary screening criteria in Q1 to Q4, consistent with historical results. – Dissolved Fluoride: ▪ GH_MW-MC-2D: exceeded primary screening criteria in Q1 to Q4, consistent with historical results. – Dissolved Sodium: ▪ GH_MW-MC-2D: exceeded primary screening criteria in Q1 to Q4, consistent with historical results. – Dissolved Lithium: ▪ GH_MW-MC-1D: exceeded primary screening criteria in Q1 to Q4, consistent with historical results. ▪ GH_MW-MC-2S/D: exceeded primary screening criteria in Q1 to Q4, consistent with historical results. • All other constituents were below the primary screening criteria	Tables GH-03 and -04 SNC-Lavalin, 2020
	Mann-Kendall Trend Analysis	• Stable, decreasing and/or no trend for OC.	Table L Attachment II

Table J (Cont'd): Summary of 2022 Groundwater Monitoring and Sampling Results for Elk River Valley Watershed and Study Area 4

Hydrogeological Information		Description	Reference
Leask Creek			
Monitoring Locations	GHO SSGMP/RGMP Wells (Study Area 4)	GH_GA-MW-4 (only Q1 and Q2), RG_MW_LC3A/B	Table GH-01 Drawing GH-01 Attachment I
	Monitoring Wells Under Evaluation[1]	RG_MW_LC1-A/B, RG_MW_LC2-A/B, RG_MW_LC3C	
	Relevant Surface Water Monitoring Stations[2]	GH_ER2, GH_LC2, GH_LC3, GH_LC1, GH_ERSC4	
	Relevant Seep Monitoring Stations[2]	GH_SEEP_76	
Physical Hydrogeology	Groundwater Elevation Trends	• Manual Groundwater Elevations: – GH_GA_MW-4: elevations varied by 0.50 m in 2022, consistent with historical results. – RG_MW_LC3A: elevations varied by up to 1.98 m in 2022, consistent with historical results. – RG_MW_LC3B: elevations varied by up to 1.49 m in 2022, consistent with historical results.	Figure GH-27 Table GH-02
	Hydraulic Gradients and Flow Direction	• Vertical Hydraulic Gradient: – RG_MW_LC3A/B: 0.19 to 0.31, downward. • Lateral Groundwater Flow: – Average linear groundwater flow velocity in the shallow alluvial sediments between Mickelson Creek and Wolfram Creek was calculated to be 0.9 m/d using: ▪ A lateral hydraulic gradient of 0.0066, calculated between GH_MW-MC-1S/GH_MW-MC-2S and RG_MW_WC2B using Q4 2022 groundwater elevations ▪ A lateral hydraulic conductivity of 4.9×10^{-4} m/s, which is the geometric mean of hydraulic conductivity values for wells GH_MW-MC-1S, GH_MW-MC-2S, RG_MW_LC3B, RG_MW_LCWC1, and RG_MW_WC2B ▪ An assumed effective porosity of 0.3 – Upland groundwater flow in the Leask Creek drainage is inferred to be west/southwest toward the Elk River. Once groundwater reaches the Elk River, flow is to the south, along the river valley bottom.	Table GH-02 Drawing GH-03
Chemistry	2022 SSGMP/RGMP OC Results	• Dissolved Selenium: – RG_MW_LC3A: exceeded primary screening criteria in (Q1 to Q4) and secondary screening criteria in (Q1 to Q4), consistent with historical results. – RG_MW_LC3B: exceeded primary screening criteria in (Q1 to Q4) and secondary screening criteria in (Q1 to Q3), consistent with historical results. • Nitrate-N: – RG_MW_LC3A: exceeded primary screening criteria in Q2 to Q4, consistent with historical results. – RG_MW_LC3B: exceeded primary screening criteria in Q2 and Q3, consistent with historical results. • Sulphate: – RG_MW_LC3B: exceeded primary screening criteria in Q3, consistent with historical results. • All other OC concentrations were below the primary screening criteria in 2022.	Table K Figures GH-28 to -30 Tables GH-03 to -05 Drawings GH-19 to -22
	Non-Order Mining Related and Naturally Occurring Constituents[3]	● Non-Order Mine Related: All constituents were below the primary screening criteria. ● Naturally Occurring: – Dissolved Lithium: ▪ GH_GA-MW-4: exceeded primary screening criteria in Q1 and Q2, consistent with historical results ▪ RG_MW_LC3A/B: exceeded primary screening criteria in Q1 to Q4, consistent with historical results ● All other constituents were below the primary screening criteria	Tables GH-03 and -04
	Mann-Kendall Trend Analysis	● RG_MW_LC3A – Dissolved selenium increasing ● Other OC: stable, decreasing and/or no trend.	Table L Attachment II

Table J (Cont'd): Summary of 2022 Groundwater Monitoring and Sampling Results for Elk River Valley Watershed and Study Area 4

Hydrogeological Information		Description	Reference
Wolfram Creek Drainage			
Monitoring Locations	GHO SSGMP/RGMP Wells (Study Area 4)	GH_GA-MW-2 (only Q1 and Q2), RG_MW_LCWC1, RG_MW_WC2A/B	Table GH-01 Drawing GH-01 Attachment I
	Monitoring Wells Under Evaluation[1]	RG_MW_WC1A/B/C, RG_MW_ER9A/B (note that RG_MW_ER9A was damaged beyond repair in 2022 and therefore decommissioned March 17, 2023)	
	Relevant Surface Water Monitoring Stations[2]	GH_LC3, GH_ERSC4, GH_WC4, GH_WC2, GH_WC1, GH_ER1A	
	Relevant Seep Monitoring Stations[2]	GH_SEEP_77	
	Groundwater Fed Pools	RG_GH_SC2-P1, RG_GH_SC2-P2, RH_GH_SC2-P3, RG_GH_SC3-P13	
Physical Hydrogeology	Groundwater Elevation Trends	• Manual Groundwater Elevations: – GH_GA_MW-2: elevations varied by up to 0.06 m in 2022, consistent with historical results. – RG_MW_WC2A: elevations varied by up to 1.33 m in 2022, consistent with historical results – RG_MW_WC2B: elevations varied by up to 1.20 m in 2022, consistent with historical results – RG_MW_LCWC1: elevations varied by up to 1.31 m in 2022, consistent with historical results.	Figure GH-33 Table GH-02
	Hydraulic Gradients and Flow Direction	• Vertical Hydraulic Gradient: – RG_MW_WC2A/B: 0.01, downward. • Lateral Groundwater Flow: – Average linear groundwater flow velocity in the shallow alluvial sediments between Mickelson Creek and Wolfram Creek was calculated to be 0.9 m/d using: ▪ A lateral hydraulic gradient of 0.0066, calculated between GH_MW-MC-1S/GH_MW-MC-2S and RG_MW_WC2B using Q4 2022 groundwater elevations ▪ A lateral hydraulic conductivity of 4.9 x 10^{-4} m/s, which is the geometric mean of hydraulic conductivity values for wells GH_MW-MC-1S, GH_MW-MC-2S, RG_MW_LC3B, RG_MW_LCWC1, and RG_MW_WC2B ▪ An assumed effective porosity of 0.3 – Upland groundwater flow in the Wolfram Creek drainage is inferred to be west/southwest toward the Elk River. Once groundwater reaches the Elk River, flow is to the south, along the river valley bottom.	Table GH-02 Drawing GH-03
Chemistry	2022 SSGMP/RGMP OC Results	• Dissolved Selenium: – GH_GA-MW-2: exceeded primary and secondary criteria (Q1 and Q2), consistent with historical results. – RG_MW_WC2A/B: exceeded primary and secondary criteria (Q1 to Q4), consistent with historical results. – RG_MW_LCWC1: exceeded primary and secondary criteria (Q1 to Q4) , consistent with historical results. • Nitrate-N – RG_MW_WC2A: exceeded primary screening criteria in Q2. – RG_MW_WC2B: exceeded primary screening criteria in Q1, Q2 and Q4, consistent with historical results. – RG_MW_LCWC1: exceeded primary screening criteria in Q2 to Q4, consistent with historical results. • Sulphate: – GH_GA-MW-2: exceeded primary screening criteria in Q1 and Q2, consistent with historical results • All other OC concentrations were below the primary screening criteria in 2022.	Table K Figures GH-34 to -36 Tables GH-03 to -05 Drawings GH-19 to -22
	Non-Order Mining Related and Naturally Occurring Constituents[3]	• Non-Order Mine Related: All constituents were below the primary screening criteria.	Tables GH-03 and -04
		• Naturally occurring: – Dissolved Lithium: ▪ GH_GA-MW-2: exceeded primary screening criteria in Q1 and Q2, consistent with historical results. ▪ RG_MW_WC2A/B: exceeded primary screening criteria in Q1 to Q4, consistent with historical results. ▪ RG_MW_LCWC1: exceeded primary screening criteria in Q1 to Q4, consistent with historical results. – Dissolved Molybdenum: ▪ GH_GA-MW-2: exceeded in Q1, consistent with historical results. • Based on the BGA completed for the 2020 RGMP Update, dissolved lithium was identified as not being related to mining. • All other constituents were below the primary screening criteria.	

Table J (Cont'd): Summary of 2022 Groundwater Monitoring and Sampling Results for Elk River Valley Watershed and Study Area 4

Hydrogeological Information		Description	Reference
Wolfram Creek Drainage (Cont'd)			
Chemistry (Cont'd)	Mann-Kendall Trend Analysis	• GH_GA-MW-2 – Increasing trend in all OC, cadmium concentrations are up to two orders of magnitude lower than applicable primary screening criteria. • RG_MW_WC2A/B – Trend analysis indicates dissolved selenium probably increasing, and stable or no trend for the rest of the OC. • RG_MW_LCWC1 – Stable, decreasing and/or no trend for all OC.	Table L Attachment II
Thompson Creek Drainage and Downgradient of Thompson Creek Drainage			
Monitoring Locations	GHO SSGMP/RGMP Wells (Study Area 4)	GH_GA-MW-3, GH_MW-ERSC-1	Table GH-01 Drawing GH-01 Attachment I
	Monitoring Wells Under Evaluation[1]	RG_MW_ER1A/B, RG_MW_ER2A/B, RG_MW_ER3A/B, RG_MW_ER4A/B, RG_MW_ER5A/B, RG_MW_ER6A/B, RG_MW_ER7A/B, RG_MW_ER8, RG_MW_ER10A/B, RG_MW11A/B	
	Relevant Surface Water Monitoring Stations[2]	GH_TC2, GH_TC3, GH_TC1, GH_ERSC2, GH_ERC	
	Relevant Seep Monitoring Stations[2]	GH_SEEP_46, GH_SEEP_60	
Physical Hydrogeology	Groundwater Elevation Trends	• Manual Groundwater Elevations: – GH_GA_MW-3: elevations varied by up to 4.80 m in 2022, consistent with historical results. – GH_MW-ERSC-1: elevations varied by up to 1.23 m in 2022, consistent with historical results.	Figure GH-39 Table GH-02
	Hydraulic Gradients and Flow Direction	• Vertical Hydraulic Gradient – No nested well pair to calculate vertical hydraulic gradient. • Lateral Groundwater Flow – The average linear groundwater flow velocity near Thompson Creek could not be calculated due to insufficient compliance wells in the area. However, the geomean of the average linear groundwater flow velocity was calculated for the Mass Balance Investigation (MBI). The geomean velocity was calculated to be 1.3 m/d using: ▪ a geometric mean hydraulic conductivity of 7.2 x 10^{-4} m/s, which was calculated using data from 26 wells screened in permeable sediments (gravel, sand, and gravel) in the Elk River Valley bottom ▪ a lateral hydraulic gradient of 0.0065 m/m ▪ an assumed effective porosity of 0.3 – Upland groundwater flow in the Thompson Creek drainage is inferred to be west/southwest toward the Elk River. Once groundwater reaches the Elk River, flow is to the south, along the river valley bottom.	Table GH-02 Drawing GH-03 SNC-Lavalin, 2022a
Chemistry	2022 SSGMP/RGMP OC Results	• Dissolved Selenium: – GH_GA-MW-3: exceeded primary and secondary screening criteria (Q2 to Q4) consistent with historical results. – GH_MW-ERSC-1: exceeded primary and secondary screening criteria (Q1, to Q4) , consistent with historical results. • Nitrate: – GH_GA-MW-3: exceeded primary screening criteria in Q2, consistent with historical results • Sulphate: – GH_GA-MW-3: exceeded primary screening criteria in Q2, consistent with historical results • All other OC concentrations were below the primary screening criteria in 2022.	Table K Figures GH-40 to -42 Tables GH-03 to -05 Drawings GH-19 to -22
	Non-Order Mining Related and Naturally Occurring Constituents[3]	• Non-Order Mine Related: All constituents were below the primary screening criteria.	Tables GH-03 and -04 SNC-Lavalin, 2020
		• Naturally occurring: – Dissolved lithium ▪ GH_GA-MW-3: exceeded primary screening criteria in Q1 to Q4, consistent with historical results ▪ GH_MW-ERSC-1: exceeded primary screening criteria in Q1 to Q4, consistent with historical results. – Dissolved Molybdenum: ▪ GH_GA-MW-3: exceeded in Q2. – Dissolved Strontium: ▪ GH_GA-MW-3: exceeded primary screening criteria in Q4, consistent with historical results. • All other constituents were below primary screening criteria.	

Table J (Cont'd): Summary of 2022 Groundwater Monitoring and Sampling Results for Elk River Valley Watershed and Study Area 4

Hydrogeological Information		Description	Reference
Thompson Creek Drainage and Downgradient of Thompson Creek Drainage (Cont'd)			
Chemistry (Cont'd)	Mann-Kendall Trend Analysis	• GH_GA-MW-3: – Concentrations were stable and/or no trend for all OC. • GH_MW_ERSC-1: – Increasing trend in dissolved selenium concentrations. – Increasing trend in sulphate and nitrate-N concentrations. – Concentrations were stable for dissolved cadmium.	Table L Attachment II
Elk River Valley Downgradient of GHO (Study Area 4)			
Monitoring Locations	GHO RGMP Wells (Study Area 4)	RG_DW-01-03 (District of Elkford Municipal Supply Well), GH_MW_EF1A/B	Table GH-01 Drawing GH-01 Attachment I
	Monitoring Wells Under Evaluation[1]	n/a	
	Relevant Surface Water Monitoring Stations[2]	GH_ERC, GH_ER1	
	Relevant Seep Monitoring Stations[2]	n/a	
Physical Hydrogeology	Groundwater Elevation Trends	• Manual Groundwater Elevations: – GH_MW_EF1A: elevations varied by up to 0.40 m in 2022. – GH_MW_EF1B: elevations varied by up to 0.42 m in 2022.	Table GH-02 Figure GH-47
	Hydraulic Gradients and Flow Direction	• Vertical Hydraulic Gradient: – GH_MW-EF1A/B: 0.002 to 0.005 m/m, downward. • Lateral Groundwater Flow: – Insufficient monitoring wells to calculate lateral groundwater gradient or velocity.	Table GH-02 Drawing GH-03
Chemistry	2022 SSGMP/RGMP OC Results	• No OC concentration was greater than primary screening criteria in 2022.	Table K Figures GH-48 to -50 Tables GH-03 to -05 Drawings GH-19 to -22
	Non-Order Mining Related and Naturally Occurring Constituents[3]	• Non-Order Mine Related: All constituents were below the primary screening criteria	Tables GH-03 and -04
	Mann-Kendall Trend Analysis	• RG_DW-01-03: – Increasing trend in nitrate-N, sulphate and dissolved selenium. Concentrations of all three parameters were lower than applicable primary screening criteria. – Concentrations were stable for dissolved cadmium. • GH_MW_EF1A/B: – Concentrations were stable and/or decreasing for all OC.	Table L Attachment II

Notes:

n/a denotes not applicable.

[1] relevant monitoring wells are those in the area that have yet to be evaluated for inclusion in the SSGMP and/or RGMP

[2] relevant surface water stations and seep monitoring locations were determined in the 2022 SSGMP Update (SNC-Lavalin, 2021a), and represent a sub-set of the surface water and seepage monitoring locations present at GHO and Study Area 4.

[3] non-order mine related and naturally occurring constituents based on the Background Assessment (BGA) completed for the 2020 RGMP Update (SNC-Lavalin, 2020)

A summary of results for OC compared to primary screening criteria is presented in Table K below.

Table K: Summary of OC compared to Primary Screening Criteria in the Elk River Watershed

Parameter[1,2,3] / Well ID	Nitrate-N (mg/L)				Sulphate (mg/L)				Dissolved Cadmium (µg/L)				Dissolved Selenium (µg/L)			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Mickelson Drainage																
GH_MW-MC-1D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GH_MW-MC-1S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GH_MW-MC-2D	-	-	-	-	-	-	-	-	-	-	-	-	-	***59.6***	-	-
GH_MW-MC-2S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leask Drainage																
GH-GA-MW-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RG_MW_LC3A	-	12.4	12.2	10.5	-	-	-	-	-	-	-	-	***44.3***	***82.2***	***101***	***103***
RG_MW_LC3B	-	20.7	23.3	-	-	-	504	-	-	-	-	-	***45.8***	***131***	***181***	***20.5***
Wolfram Drainage																
GH_GA-MW-2	-	-	-	-	526	602	-	-	-	-	-	-	***31.9***	***24.5***	-	-
RG_MW_LCWC1	-	16.1	21.8	18.6	-	-	-	-					***44.5***	***85.5***	***140***	***138***
RG_MW_WC2A	-	10.1	-	-	-	-	-	-	-	-	-	-	***33.6***	***51.1***	***67.4***	***67.2***
RG_MW_WC2B	24.4	10.9	-	16.9	-	-	-	-	-	-	-	-	***132***	***66.2***	***45.7***	***167***
Thompson Drainage and Downgradient of Thompson Drainage																
GH_GA-MW-3	-	11.4	-	-	-	527	-	-	-	-	-	-	-	**34.6**	11.5	**24.1**
GH_MW-ERSC-1	-	-	-	-	-	-	-	-	-	-	-	-	***34.8***	***30.6***	***28.2***	***70.0***

Notes:

[1] Primary screening criteria are CSR (BC ENV, 2021a) standards for **Aquatic Life (AW),** Drinking Water (DW), Livestock (LW), and *Irrigation (IW)*.

[2] '–' denotes result below primary screening criteria for given constituents.

[3,] Where a duplicate was collected, the higher concentration is provided in table. If more than one sample collected in a quarter, the higher of the two samples is provided in the table.

[4,] Standard varies with hardness.

'NS' denotes no sample.

Table K (Cont'd): Summary of OC compared to Primary Groundwater Screening Criteria in the Elk River Watershed

Parameter[1,2,3] / Well ID	Nitrate-N (mg/L)				Sulphate (mg/L)				Dissolved Cadmium (µg/L)				Dissolved Selenium (µg/L)			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Elk River Valley Downgradient of GHO																
GH_MW_EF1A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GH_MW_EF1B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RG_DW-01-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CSR AW	400				1,280 – 4,290[4]				0.5 – 4[4]				20			
CSR IW	n/a				n/a				5				20			
CSR LW	100				1,000				80				30			
CSR DW	10				500				5				10			

Notes:

[1] Primary screening criteria are CSR (BC ENV, 2021a) standards for **Aquatic Life (AW),** Drinking Water (DW), Livestock (LW), and *Irrigation (IW)*.

[2] '–' denotes result below primary screening criteria for given constituents.

[3] Where a duplicate was collected, the higher concentration is provided in table. If more than one sample collected in a quarter, the higher of the two samples is provided in the table.

[4] Standard varies with hardness.

'NS' denotes no sample.

Mann-Kendall trend analyses were completed for OC at wells where sufficient data and summarized in Table L below (Attachment II).

Table L: Summary of Mann-Kendall Trend Analysis for OC in the Leask and Wolfram Drainages of the Elk River Watershed

Parameter[1] Well ID	Nitrate-N	Sulphate	Dissolved Cadmium	Dissolved Selenium
Mickelson Drainage				
GH_MW-MC-1D	No Trend	Decreasing	Stable	Stable
GH_MW-MC-1S	Stable	Stable	No Trend	Probably Decreasing
GH_MW-MC-2D	No Trend	Stable	Stable	*No Trend*
GH_MW-MC-2S	Probably Decreasing	Decreasing	Probably Decreasing	Stable
Leask Drainage				
GH_GA-MW-4	Decreasing	Decreasing	Decreasing	Probably Decreasing
RG_MW_LC3A	*No Trend*	No Trend	Stable	*Increasing*
RG_MW_LC3B	*No Trend*	*Stable*	No Trend	*No Trend*
Wolfram Drainage				
GH_GA-MW-2	Increasing	*Increasing*	Increasing	*Increasing*
RG_MW_LCWC1	*Stable*	No Trend	Stable	*No Trend*
RG_MW_WC2A	*Stable*	Stable	Stable	*Probably Increasing*
RG_MW_WC2B	*Stable*	No Trend	No Trend	*Probably Increasing*
Thompson Drainage and Downgradient of Thompson Drainage				
GH_GA-MW-3	*No Trend*	*Stable*	No Trend	*No Trend*
GH_MW-ERSC-1	Increasing	Increasing	No Trend	*Increasing*
Elk River Valley Downgradient of GHO				
GH_MW_EF1A	Probably Decreasing	Stable	Decreasing	Stable
GH_MW_EF1B	Probably Decreasing	Stable	Stable	Stable
RG_DW-01-03	Increasing	Increasing	Stable	Increasing

Notes:

[1] Where OC were measured above primary screening criteria in 2022, the trend result is *italics*. Where increasing trends are noted, the cell is shaded yellow.

1.7.1 Discussion

Mickelson Creek Drainage

Nested monitoring wells GH_MW-MC-1S/D and GH_MW-MC-2S/D were installed to monitor groundwater quality downgradient from Mickelson Creek and near the Mickelson sediment ponds (Mickelson Ponds) and to evaluate connectivity between surface water and shallow groundwater. Currently, there are no spoils in the Mickelson Creek drainage; however, cast over material is present in the upper flanks. Based on the GHO Pit Drainage and Pumping Management Plan future pumping from Phase 6 Pit may be periodically directed into Mickelson Creek (Teck, 2022); however, no pit water has been directed to the creek since 2015. Surface water at Mickelson Creek flows over till/morainal materials and loses to ground on the upper valley flanks over debris flow materials (SNC-Lavalin, 2021a).

GH_MW-MC-1S/D

Mickelson Ponds are unlined, and surface water from the ponds is inferred to infiltrate into the ground in the area. Nested well pair GH_MW-MC-1S/D is located between the Mickelson Ponds and the Elk River.

Concentrations of all OC at GH_MW-MC-1S were below the primary screening criteria, and frequently below the method detection limit (MDL) in 2022 (Tables GH-03 and -04). Dissolved selenium and sulphate concentrations were similar to those measured in the Elk River (GH_ER2), while nitrate-N concentrations were slightly greater than at GH_ER2 (Figures GH-21 and -23). Mann-Kendall trend analysis indicates OC concentrations are decreasing, stable or not trending (Attachment II). All OC concentrations at GH_MW-MC-1D were below the MDL in all quarters.

The Se:SO_4 (S) plot suggests that groundwater from both wells is non-contact water. GH_MW-MC-1D has sulphate concentrations at or close to the MDL (Figure GH-24). Selenium concentrations plotting marginally outside the non-contact groundwater boundary for unconsolidated material at GH_MW-MC-1S is consistent with the Elk River at GH_ER2 (Figure GH-21).

A Schoeller plot indicates GH_MW-MC-1D had higher proportions of sodium and chloride than at GH_MW-MC-1S, Mickelson Creek or the Elk River (Figure GH-25). GH_MW-MC-1D is a deep well (screened between 30.4 to 31.9 mbgs) installed in sand and gravel overlying bedrock (Attachment I). The hydraulic conductivity at this well is 3×10^{-4} m/s and an upward vertical gradient is apparent seasonally (Table GH-02). Elevated sodium and chloride from natural sources have been previously identified in groundwater overlying or within bedrock (SNC-Lavalin, 2020). In addition, sodium enrichment in groundwater relative to calcium and magnesium is typical of the evolution of groundwater along a longer flow path due to cation exchange (SNC-Lavalin, 2020).

GH_MW-MC-2S/D

Nested well pair GH_MW-MC-2S/D is farther upgradient in the Mickelson Creek drainage and historically has higher concentrations of OC than at GH_MW-MC-1S/D. In 2022, concentrations of OC in shallow well GH_MW-MC-2S were generally consistent with concentrations measured in Mickelson Creek (Figures GH-21 to GH-23), which is consistent with previous measurements. Monitoring well GH_MW-MC-2D, installed at a similar elevation to well GH_MW-MC-1S (Drawings GH-08 and GH-09). GH_MW-MC-2D, had dissolved selenium concentrations greater than measured in Mickelson Creek (Figure GH-21) in 2022, also consistent with previous monitoring. However, in contrast with previous monitoring results, dissolved selenium concentrations remained below all screening criteria in all four quarters except in Q2 at GH_MW-MC-2D (Figure GH-21). Sulphate concentrations at GH_MW-MC-2D were less than Mickelson Creek in all four quarters (Figure GH-22).

Se:SO_4 (S) ratios at GH_MW-MC-2S indicate diluted mining influence like Mickelson Creek (Figure GH-24). Se:SO_4 (S) ratios at GH_MW-MC-2D plot outside the natural non-contact water area of the graph, with greater selenium concentrations than would be expected for waste rock influence mixing with non-contact water (Figure GH-24).

The Schoeller plot for GH_MW-MC-2S indicates that major ion concentrations were like Mickelson Creek (GH_MC1) in 2022 (Figure GH-25). At GH_MW-MC-2D, the Schoeller plot indicates that groundwater from this well had higher concentrations of sodium and chloride compared to other wells, Mickelson Creek (GH_MC1) and the Elk River (GH_ER2; Figure GH-25). This well is installed in a sand and gravel unit directly above the bedrock contact. According to the mapped bedrock geology (Drawing 2) GH_MW-MC-2D is installed near the contact between the Fernie Fm and the Spray River Group. Elevated sodium and chloride from natural sources have previously been identified in groundwater overlying or within bedrock from the Fernie Fm (SNC-Lavalin, 2020). In addition, sodium enrichment in groundwater relative to calcium and magnesium is typical of the evolution of groundwater along a longer flow path due to cation exchange (SNC-Lavalin, 2020). A low K value (7.1×10^{-8} m/s) and an upward vertical hydraulic gradient were measured at this well.

Water isotope samples were collected at GH_MW-MC-2D as part of the RGMP (^{18}O-H_2O, ^{2}H-H_2O, tritium; SNC-Lavalin, 2022b) as an initial step to investigate the potential mine influences on water chemistry in this catchment. Tritium results were below the detection limit of 0.8 TU which is within the submodern (prior to the 1950s) category. Tritium values from all wells sampled for the RGMP program, screened both in bedrock and unconsolidated materials, were primarily within the submodern to modern (less than 5 to 10 years) range (SNC-Lavalin, 2022b). A submodern mean residence time does not exclude paleo waters (much older than 50 years) and may also include mixing with modern waters. It is not certain whether selenium concentration at this well is sourced from a longer groundwater flow path with long residence time (natural) or if it is mine-influenced as a result from mixing from different groundwater sources. Investigation into the groundwater flowpath at this well is ongoing.

Leask Drainage

The West Spoil is within the upper catchment of Leask Creek, and water from Mickelson Creek is conveyed to the Leask sediment ponds (Leask Ponds) when their infiltration capacities have been exceeded. Dewatering activities from the Phase 6 Pit are directed to Leask Creek and contribute OC to surface water. In 2022, Teck discharged a total of 12,488 m^3 of water from the Phase 6 Pit to Leask Creek, occurring between December 22 and December 31, 2022, at rates up to 2,321 cubic metres per day (m^3/day).

Leask Creek flows over an alluvial fan into the unlined Leask Ponds and is interpreted to be mine influenced as indicated by elevated concentrations of OC above BCWQG in the Leask Pond (GH_LC1). Leask Pond decants to the main stem of the Elk River.

Monitoring well GH_GA-MW-4 has historically been the monitoring well for the Leask Creek area. Monitoring wells RG_MW_LC3A/B are within 250 m of GH_GA-MW-4 and are in a more representative location downgradient of Leask Creek and Leask Ponds, proximal to GH_LC1. The 2021 SSGMP Update (SNC-Lavalin, 2021a), recommended that after sufficient data is collected at RG_MW_LC3A/B that GH_GA-MW-4 be considered for decommissioning. Sufficient data is now available for RG_MW_LC3A/B, therefore on September 23, 2022, monitoring well GH_GA-MW-4 was decommissioned. All OC concentrations at GH_GA-MW-4 were below the primary screening criteria in 2022.

RG_MW_LC3A/B

In 2022, concentrations at RG_MW_LC3A were measured greater than primary screening criteria for nitrate-N and dissolved selenium; dissolved selenium also exceeded the secondary screening criteria (Table K and GH-05). At RG_MW_LC3B, concentrations of sulphate, nitrate-N, and dissolved selenium exceeded the primary screening criteria; dissolved selenium also exceeded the secondary screening criteria (Table GH-05).

Concentrations of all OC were below those measured in surface water at Leask Creek; (Figure GH-28 to 30). Mann-Kendall trend analyses indicates the OC are stable or not trending except for dissolved selenium at RG_MW_LC3A which are increasing; this increasing trend was not identified previously (Attachment II).

The Se:SO_4 (S) plot suggests groundwater at RG_MW_LC3A/B is a mixture of spoils-influenced water and non-contact water (Figure GH-31). The source of the mine-influenced water is interpreted to be infiltration from Leask Creek in a losing reach that was identified downstream of GH_LC3, and infiltration from Leask Ponds (SNC-Lavalin, 2022b).

Wolfram Drainage

Surface water from Wolfram Creek flows from spoils over bedrock and/or till in the upper parts of the catchment and over alluvial deposits in the lower part of the catchment. Waste rock from the West Spoil is present in the upper catchment of the Wolfram Creek watershed. Occasionally, water is pumped from the Leask Ponds to the Wolfram sediment ponds (Wolfram Ponds) and vice versa, to improve water management, facilitate sediment removal, manage fish access to ponds, control total suspended solids (TSS) in either creek or to manage upset conditions. Phase 3, 4 and/or 6 pit waters may be discharged to the Wolfram Creek System or conveyed to the adjacent Phase 6 pits for longer term storage on site or to be pumped to the Leask/Mickelson System (Lotic, 2021). In 2022, Teck did not discharge any water from Phase 3 Pit to Wolfram Creek.

The Wolfram Ponds are unlined and underlain by glaciofluvial deposits. Overland flow has been observed to occur non-continuously between Wolfram Ponds and the Elk River, primarily during seasonal high flow periods (Lotic, 2021).

Monitoring well GH_GA-MW-2 has historically been the monitoring well for the Wolfram Creek area. Clustered monitoring wells RG_MW_WC2A/B were more recently installed within 90 m of GH_GA-MW-2 to monitor shallow and deep groundwater conditions flowing down valley, downgradient of the Wolfram Ponds proximal to GH_WC1. Monitoring well GH_GA-MW-2 was decommissioned on September 23, 2022.

RG_MW_LCWC1

Monitoring well RG_MW_LCWC1 was originally installed as part of the MBI to obtain a better understanding of groundwater quality and groundwater-surface water interaction in the area downgradient of Leask Creek, and upgradient of Wolfram Creek, and was recommended to be added to the SSGMP in the 2021 SSGMP Update (SNC-Lavalin, 2021a). The well is located downgradient of Leask Creek and Leask Ponds but upgradient of Wolfram Creek and Wolfram Ponds (Drawing GH-01). The nearest surface water stations are in Wolfram Creek (GH_WC2 and GH_WC4) and are approximately 150 to 200 m from RG_MW_LCWC1.

In 2022, concentrations of nitrate-N and dissolved selenium were greater than the primary screening criteria (Figures GH-34 and Figure GH-36); the secondary screening criteria were also exceeded for dissolved selenium in all quarters (Table GH-05). Mann-Kendall trend analyses indicate concentrations of all OC are stable and/or not trending (Attachment II). Concentrations of all OC were below those measured in Wolfram Creek (GH_WC1, GH_WC2 and GH_WC4) and Leask Creek (GH_LC3).

The Se:SO_4 (S) plot suggests groundwater at RG_MW_LCWC1 is a mixture of spoils-influenced water and non-contact water (Figure GH-37). Mine-influenced water is interpreted to originate from infiltration of Leask and Wolfram creeks surface water into the ground upstream of the ponds, and infiltration from the ponds (SNC-Lavalin, 2022a).

RG_MW_WC2A/B

In 2022, concentrations of dissolved selenium at RG_MW_WC2A and RG_MW_WC2B were greater than primary and secondary screening criteria (Figure GH-34; Table GH-05). Nitrate-N concentrations at RG_MW_WC2A in Q2 and RG_MW_WC2B in Q1, Q2 and Q4 exceeded the primary screening criteria. Concentrations of all OC were below those measured in the Wolfram Ponds (GH_WC1). Mann-Kendall trend analyses indicate dissolved selenium is probably increasing at both wells, and this trend was not identified previously (Attachment II).

The Se:SO_4 (S) plot indicates that RG_MW_WC2A/B are both a mixture of non-contact water and spoils-influenced water (Figure GH-37). The Piper plot indicates wells RG_MW_WC2A/B are calcium-magnesium-sulphate-bicarbonate water type, supporting the inference that non-contact groundwater is mixing with mine-influenced water (Figure GH-38). Mine-influenced water is interpreted to originate from infiltration of Leask and Wolfram creeks surface water into the ground upstream of the ponds, and infiltration from the ponds.

Thompson Creek Drainage and Downgradient of Thompson Creek Drainage

GH_GA-MW-3

Monitoring well GH_GA-MW-3 is downgradient of Thompson Creek and the Lower Thompson sediment pond (Thompson Pond; Drawing GH-01). The nearest surface water station (GH_TC1) is approximately 90 m away in Thompson Creek and downstream of Lower Thompson Pond.

Groundwater at GH_GA-MW-3 measured dissolved selenium concentrations greater than primary and secondary screening criteria in Q2 to Q4 (Figure GH-40). In addition, concentrations of sulphate and nitrate-N exceeded the primary screening criteria in Q2 (Figure GH-41). OC concentrations from GH_GA-MW-3 were less than concentrations measured in Thompson Creek (GH_TC1, GH_TC3). Mann-Kendall trend analyses indicates the OC are stable or not trending (Attachment II). In 2022, the water type at GH_GA-MW-3 varied from magnesium-calcium-sodium-bicarbonate in Q1, Q2 and Q4 to calcium-magnesium-sulphate-bicarbonate in Q2 when water levels were highest (Figure GH-44). The Se:SO_4 (S) plot suggests Q2 to Q4 groundwater was mixing with spoils-influenced water, while Q1 water chemistry was more consistent with the Elk River (GH_ERC) and is inferred to be more influenced by non-contact water (Figure GH-43). The Schoeller plot compares data from 2019 to 2022 for GH_GA-MW-3, Thompson Pond and the Elk River (GH_ERC and GH_ER2; Figure GH-45). In 2022, major ion concentrations at GH_GA-MW-3 were like Thompson Creek with higher concentrations of sulphate compared to 2021.

The source of mine-influenced water at GH_GA-MW-3 is interpreted to be the losing reach of Thompson Creek downgradient of GH_TC3, with some potential influence from Leask and Wolfram creeks. The Elk River Side Channel (ERSC) is also likely a source of mine-influenced water via infiltration of water that originates upstream from Wolfram and Thompson creeks (SNC-Lavalin, 2022a).

GH_MW-ERSC-1

Monitoring well GH_MW-ERSC-1 is downgradient of Thompson Creek and the confluence of the ERSC and the Elk River. The ERSC in this area is interpreted to receive flow in the spring and summer from the groundwater fed wetted area near where Thompson Creek joins the ERSC and surface water monitoring station GH_ERSC2. The ERSC has been indicated to lose to ground along its length, and in the fall to infiltrate completely into the ground (SNC-Lavalin, 2022a). The nearest surface water station to GH_MW_ERSC-1 is GH_ERC, located approximately 200 m upstream of the well on the Elk River (Drawing GH-01).

In 2022, concentrations of nitrate-N and sulphate at GH_MW-ERSC-1 were measured below the applicable primary screening criteria and below concentrations at Thompson Creek (GH_TC1, GH_TC3). Conversely dissolved selenium concentrations were greater than secondary screening criteria at GH_MW-ERSC-1 in all quarters (Figure GH-40 and Table GH-04). Mann-Kendall trend analyses indicate an increasing trend in nitrate-N, sulphate, and dissolved selenium concentrations (Attachment II).

The Se:SO_4 (S) plot suggests that non-contact groundwater is mixing with spoils-influenced water upgradient of GH_MW_ERSC-1 (Figure GH-43). The water type varied between calcium-magnesium-bicarbonate-sulphate in Q2 and Q3 to calcium-magnesium-sulphate-bicarbonate in Q1 and Q4 (Figure GH-44). Water types similar to those at GH_MW_ERSC-1 are reported in the Elk River Side Channel (GH_ERSC2) and Thompson Creek (GH_TC1, GH_TC3). In addition, the Piper plot shows GH_MW_ERSC-1 plotting in the mine-influenced area of the diagram with higher proportions of sulphate. A Schoeller plot compares data from 2019 to 2022 for GH_MW_ERSC-1, Thompson Creek (GH_TC3) and the Elk River (GH_ERC; Figure GH-46). In 2022, major ion concentrations were more like Thompson

Creek than previously. The source of spoils-influenced water at GH_MW-ERSC-1 is interpreted to be primarily from Thompson Creek surface water, with some possible influence from Leask and Wolfram creeks and ponds, as well as infiltration from of mine-influenced water from Wolfram and Thompson creeks in the ERSC, that is transported via down valley groundwater flow (SNC-Lavalin, 2022a).

Elk River Valley Downgradient of GHO

Clustered monitoring wells GH_MW-EF1A/B were installed in 2020 in the Elk River Valley bottom near Elkford to better understand upland groundwater transport to the valley bottom and inform on subsurface flow and loading along the Elk River valley bottom approaching GH_ER1 and RG_DW-01-03 (Drawing GH-01). Both wells were installed in coarse grained overburden (gravel and gravelly sand; Attachment I). Municipal supply well RG_DW-01-03 is located in the Elk River Valley bottom near Elkford and is sampled to monitor groundwater quality farther downgradient in Study Area 4. Surface water station GH_ER1 is in the Elk River approximately 225 m east of RG_DW-01-03 while GH_ERC is located approximately 5 km upstream near the GHO permitted area.

In 2022, OC concentrations at all three wells remained the same order of magnitude as the Elk River (GH_ER1, GH_ERC), consistent with historical results (Figures GH-48 to 50). OC concentrations at RG_DW-01-03 and GH_MW_EF1A were greater than concentrations measured in the Elk River with greatest concentrations in Q2 and Q3 (Figures GH-48 to 50). No OC or other constituents at these wells exceeded the primary screening criteria. Regionally, concentrations of OC in the Elk River Valley bottom in Study Area 4 decrease downstream of the GHO mine-permitted area. Dissolved selenium concentrations were below screening criteria in supply well RG_DW-01-03, with concentrations further decreasing farther downgradient of Elkford, likely due to mixing with surface water and additional non-contact groundwater inputs.

Se:SO_4 (S) ratios for GH_MW_EF1A/B and RG_DW-01-03 plot similarly with the Elk River surface water just outside the boundary of unconsolidated natural non-contact water, and along the mixing line with spoils-influenced water, indicating water at these wells is a mixture of non-contact and spoils-influenced water (Figure GH-51). The major ion proportions in groundwater and surface water also plot similarly (Figure GH-52).

Mann-Kendall trend analyses (Attachment II) indicate increasing trends in nitrate-N, sulphate, and dissolved selenium at RG_DW-01-03; however, concentrations remained below the primary screening criteria for dissolved selenium, and an order of magnitude lower than the applicable primary screening criteria for sulphate and nitrate-N. The source of mining-influenced water at RG_DW-01-03 is a subject of ongoing investigation and study under Teck's Regional Groundwater Flow Bypass, Bedrock, and Interbasin Flow Study.

2 Recommendations

Recommendations identified for GHO SSGMP and RGMP Study Areas 1, 3 and 4 based on the results of the 2022 programs, are presented in Table M. Appendix II of the main report provides recommendations related to GHO from the 2020 RGMP Update (SNC-Lavalin, 2020; approved in March 2023), 2021 Annual Report (SNC-Lavalin, 2022b), 2021 SSGMP Update (SNC-Lavalin, 2021a). Where previous recommendations were carried over, they are provided in Table N.

Table M: Summary of New Recommendations - GHO SSGMP and RGMP

Program	Recommendation	Rationale
RGMP	Review new data collected under Regional Groundwater Flow Bypass, Bedrock, and Interbasin Flow Study and incorporate relevant findings into 2023 RGMP Update to refine characterization of potential sources of OC at RG_DW-01-03	The source and dynamics of dissolved selenium concentrations at RG_DW-01-03 are not understood.
SSGMP	Install a pressure transducer in GH_MW-PC4A	Compare water levels in this monitoring well to those in nearby wells and Porter Pond.
SSGMP/RGMP	Reduce sampling at GH_MW-MC-1D to biannually	Historical data has established that OC concentrations are generally below the MDL. Sampling twice per year is sufficient monitoring for this well going forward.

Table N: Summary of Outstanding Recommendations - GHO SSGMP and RGMP

Program/Location	Recommendation	Rationale
RGMP - Study Area 1	Review results of ongoing MBI and Porter Creek investigations to assess the potential groundwater transport of OC from the Porter Creek catchment.	Refine understanding of this flow and load input to Study Area 1.
RGMP - Study Area 3	Assess results from GHO Greenhills-Fording Aquifer Study drilling program to consider potential inclusion of the new monitoring wells in the GHO SSGMP.	Assess the potential groundwater bypass of GH_FR1 and consider replacement of the existing supply wells in the RGMP and GHO SSGMP with new monitoring given the supply wells may not be adequately monitoring this gap.
RGMP - Study Area 4	Assess results of isotope samples (18O-H2O, 2HH2O, tritium and sulphate) at GH_MW-MC-2D and GH_MW-MC-1D. If results are inconclusive, further field investigation of the groundwater flow regime will be conducted.	Determine the source of elevated dissolved selenium at well GH_MW-MC-2D.
	Assess results from MBI investigation downgradient of Thompson Creek watershed to consider potential inclusion of new monitoring wells into SSGMP/RGMP.	Assess the potential groundwater bypass of GH_ERC.

3 References

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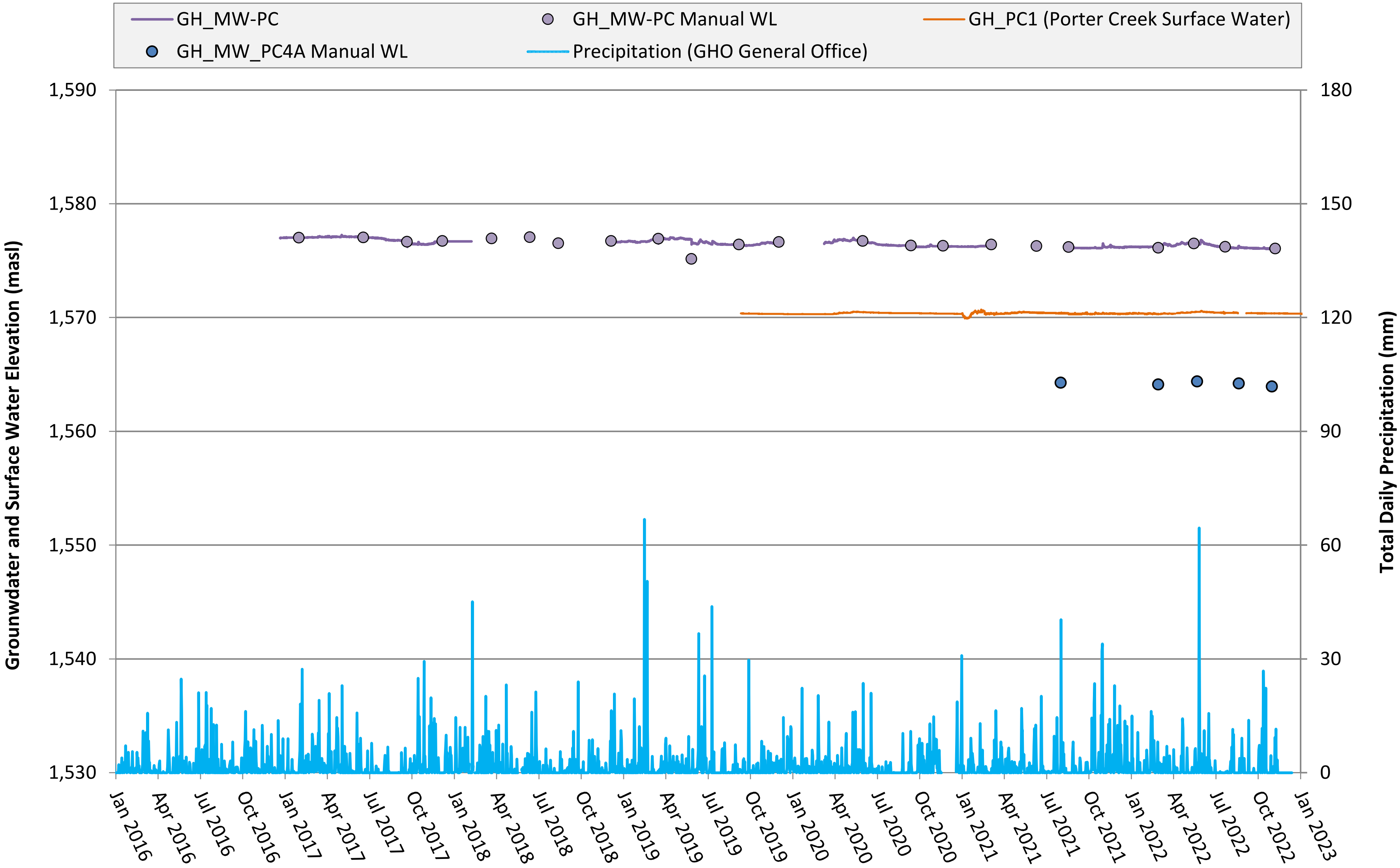
Figures

Figures (Cont'd)

Figure GH-01: Porter Creek - Hydrograph



Note: Data was removed where suspected datalogger removal occured. Precipitation data recorded on February 8, 17 and 18, 2018 have been removed as the data is inferred to be anomalous. Continuos water level data was compensated using barologger GH_MW-PC BARO (GH_MW-PC) and weather station FR_STFMET. GH_PC1 surface data sensor elevation estimated based on 1m LiDAR contours.

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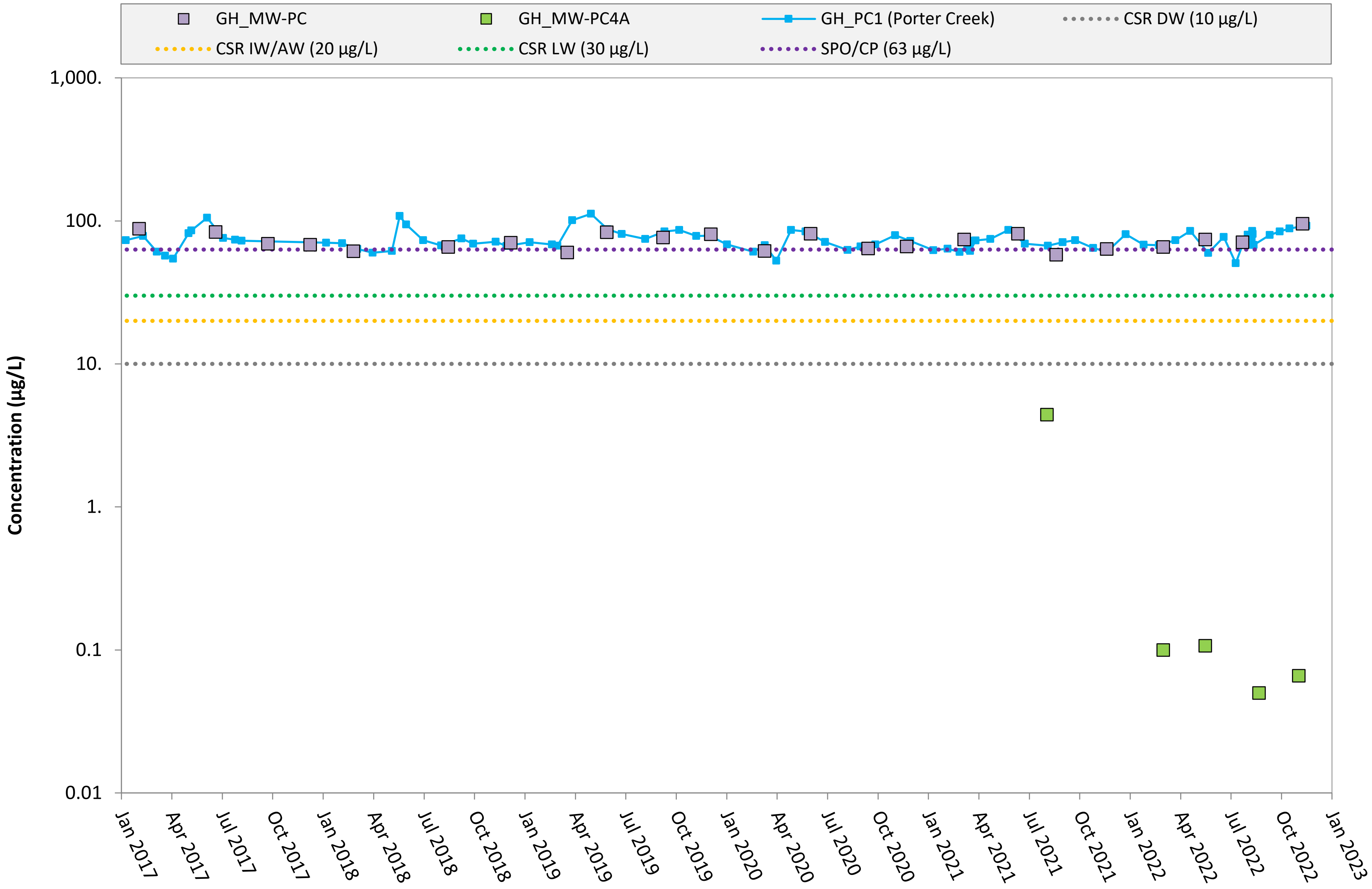
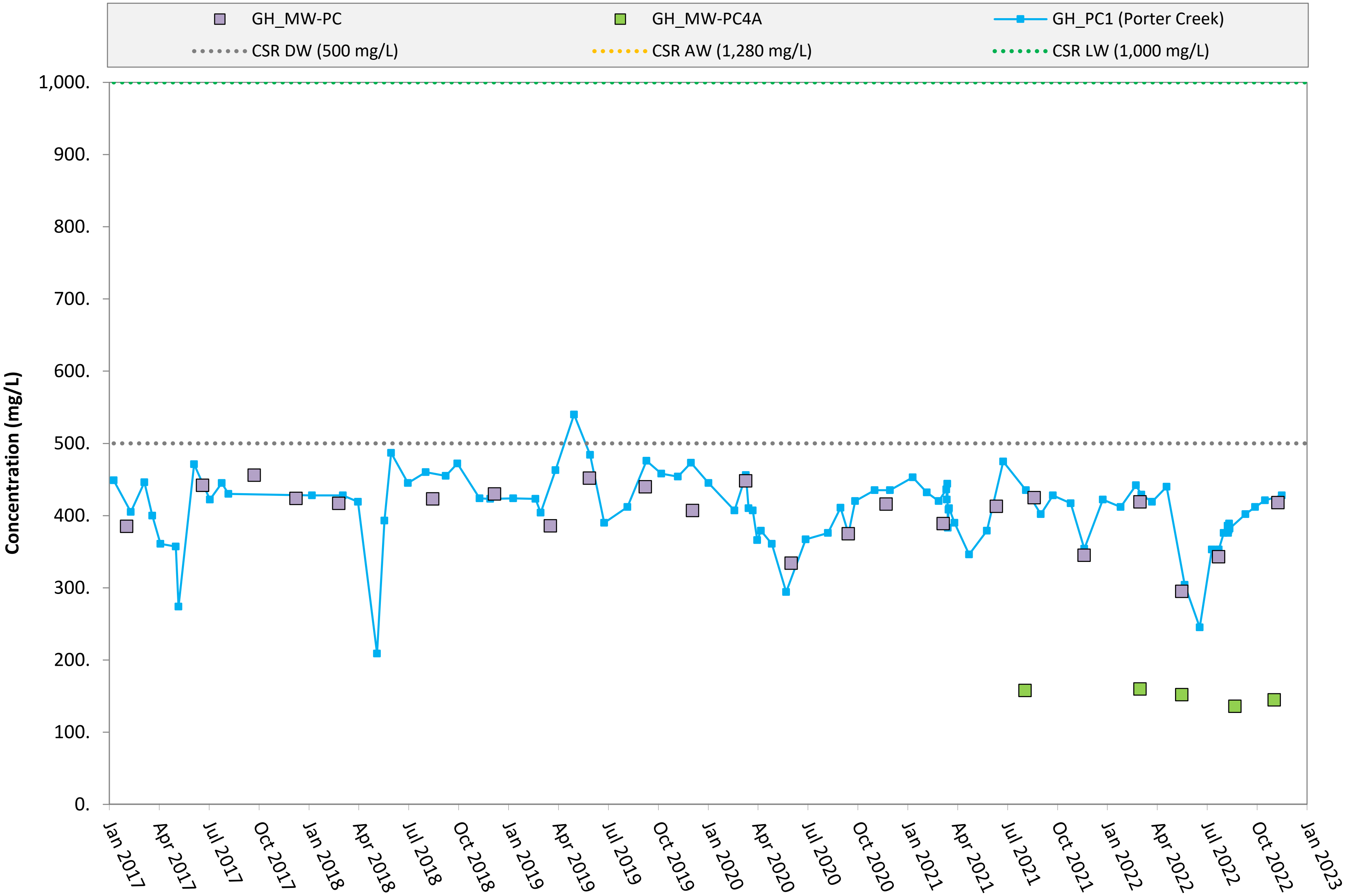
Figure GH-02: Fording River Valley Porter Creek Watershed - Dissolved Selenium Concentrations



Note: For concentrations measured below the method detection limit, the method detection limit (0.05 µg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

Figure GH-03: Fording River Valley Porter Creek Watershed - Sulphate Concentrations



Note: For concentrations measured below the method detection limit, the method detection limit (0.3 mg/L) was utilized for plotting purposes.

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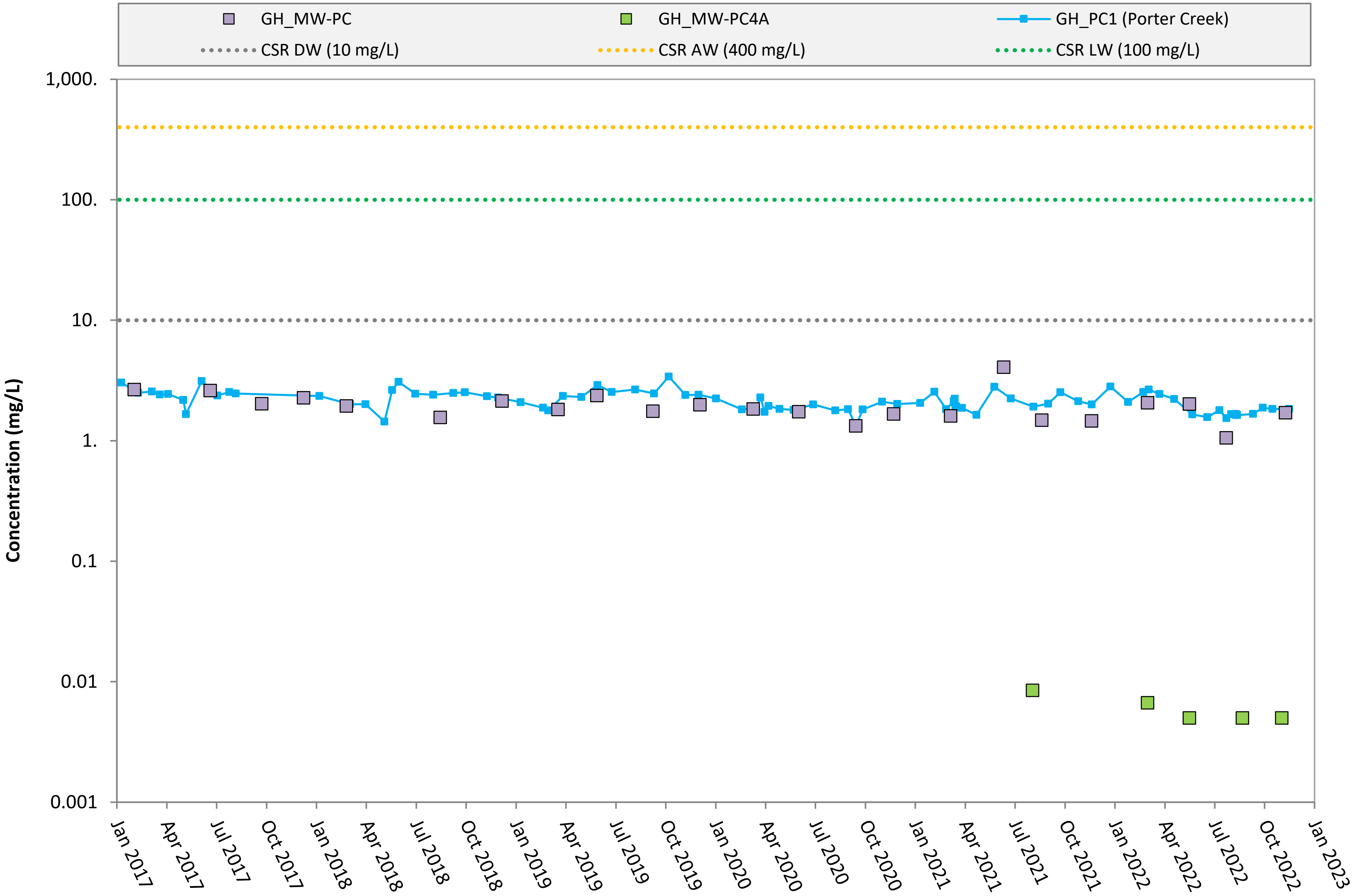
Figure GH-04: Fording River Valley Porter Creek Watershed - Nitrate-N Concentrations



Note: For concentrations measured below the method detection limit, the method detection limit (0.005 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

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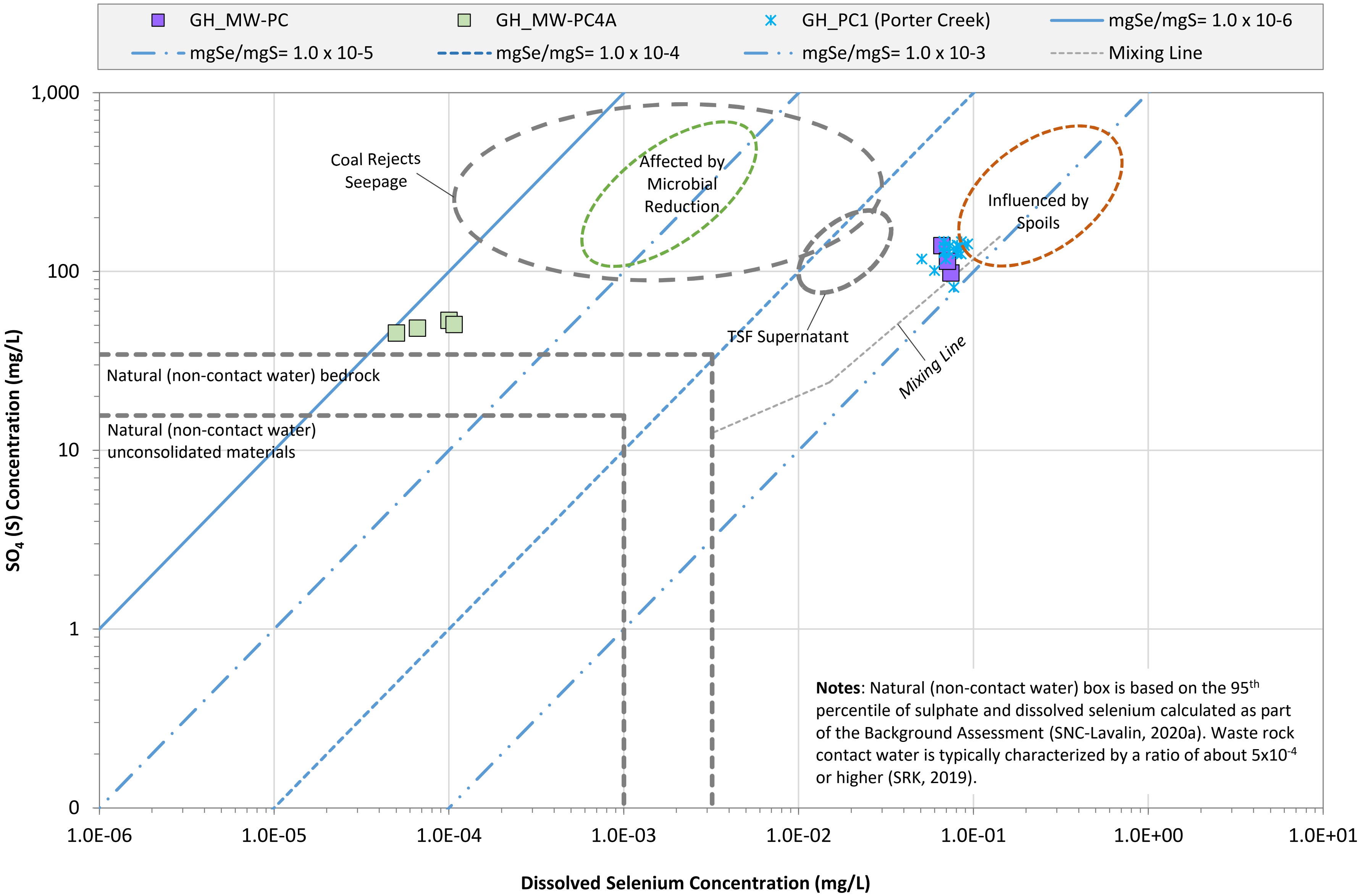
Figure GH-05: Fording River Valley Porter Creek Watershed - Se:SO4 (S)



Notes: Natural (non-contact water) box is based on the 95th percentile of sulphate and dissolved selenium calculated as part of the Background Assessment (SNC-Lavalin, 2020a). Waste rock contact water is typically characterized by a ratio of about 5x10^{-4} or higher (SRK, 2019).

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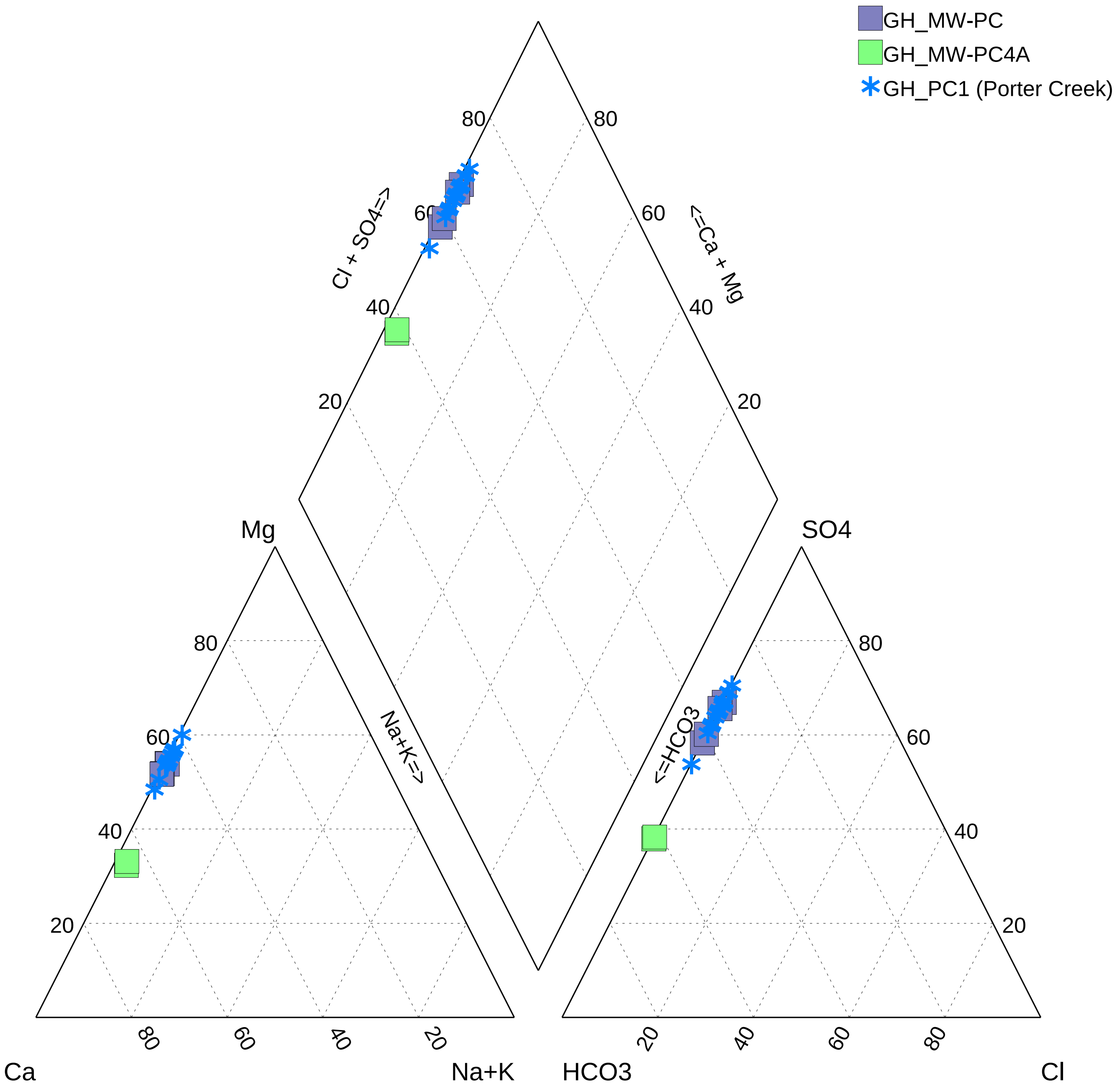

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DESCRIPTION:	Figure GH-06: Fording River Valley Porter Creek Watershed - Piper Diagram	
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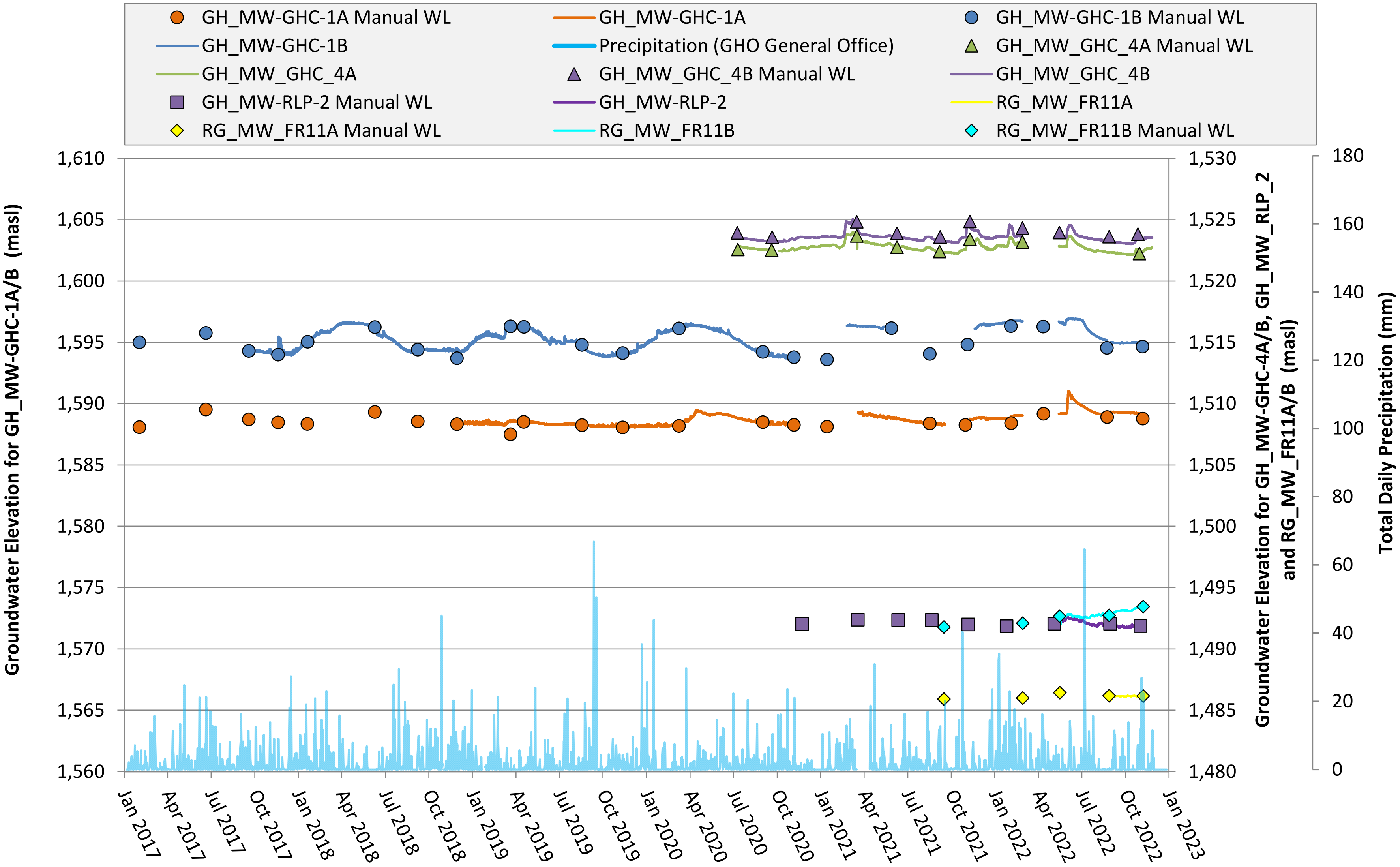
Figure GH-07: Fording River Valley Greenhills Creek Watershed - Hydrograph



Note: Data was removed where suspected datalogger removal occurred. Precipitation data recorded on February 8, 17 and 18, 2018 have been removed as the data is inferred to be anomalous. Continuous water level data was compensated using barologger GH_MW_FC2-BARO (GH_MW_FC2).

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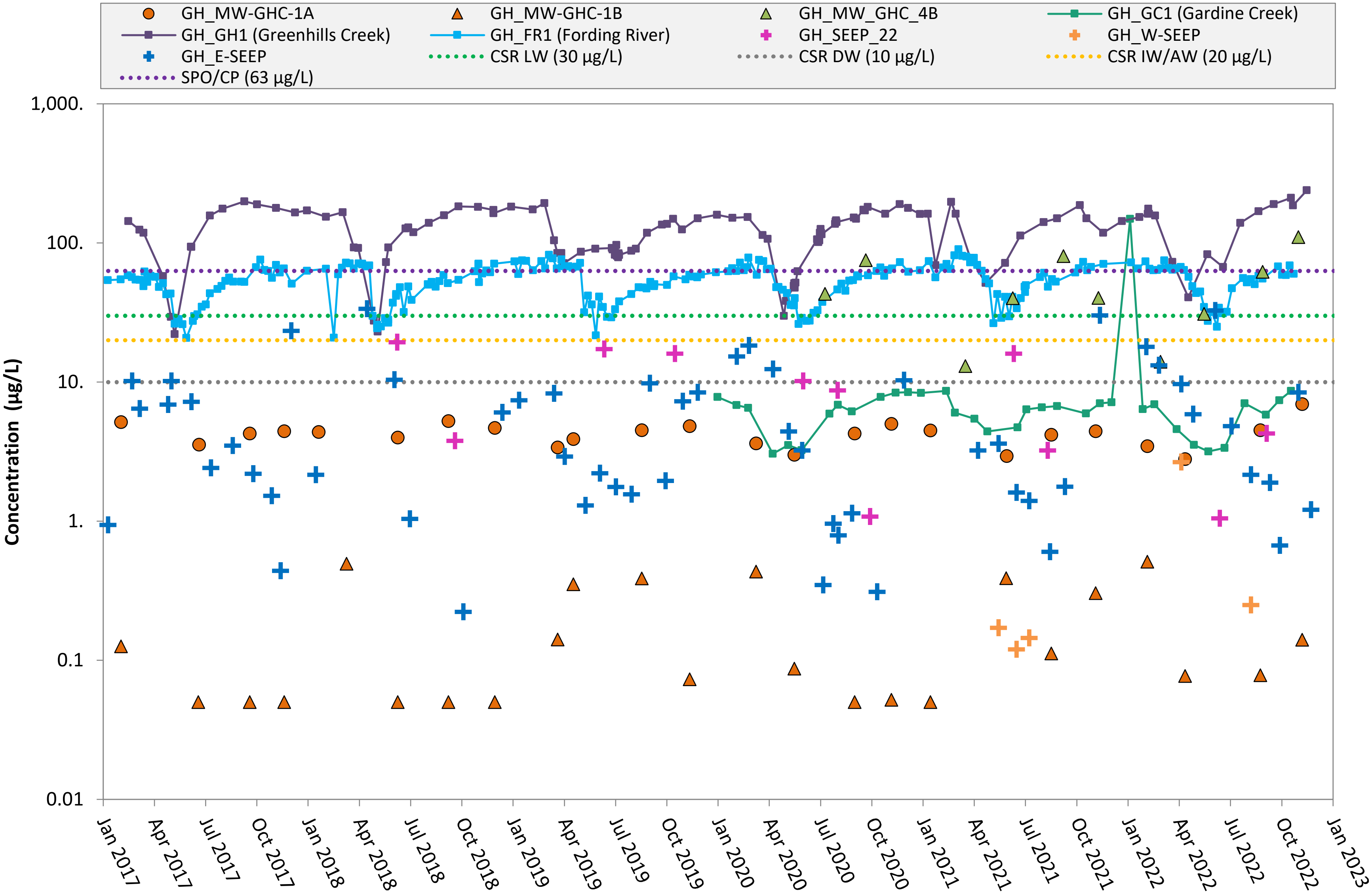
QAQC: TYR

Figure GH-08: Fording River Valley Greenhills Creek Watershed - Dissolved Selenium Concentrations



Note: For concentrations measured below the method detection limit, the method detection limit (0.05 µg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

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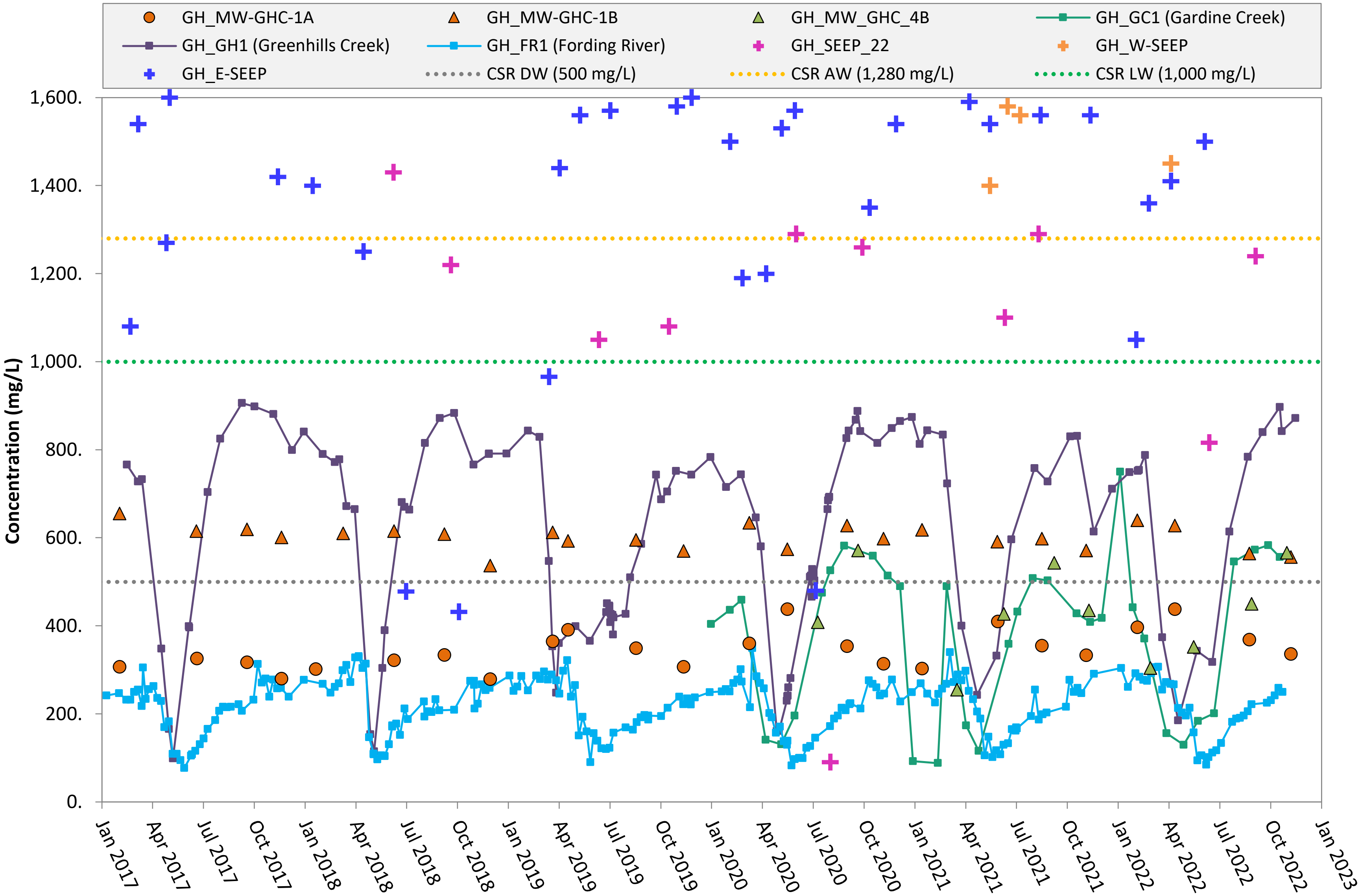
Figure GH-09: Fording River Valley Greenhills Creek Watershed - Sulphate Concentrations



Note: For concentrations measured below the method detection limit, the method detection limit (0.3 mg/L) was utilized for plotting purposes.

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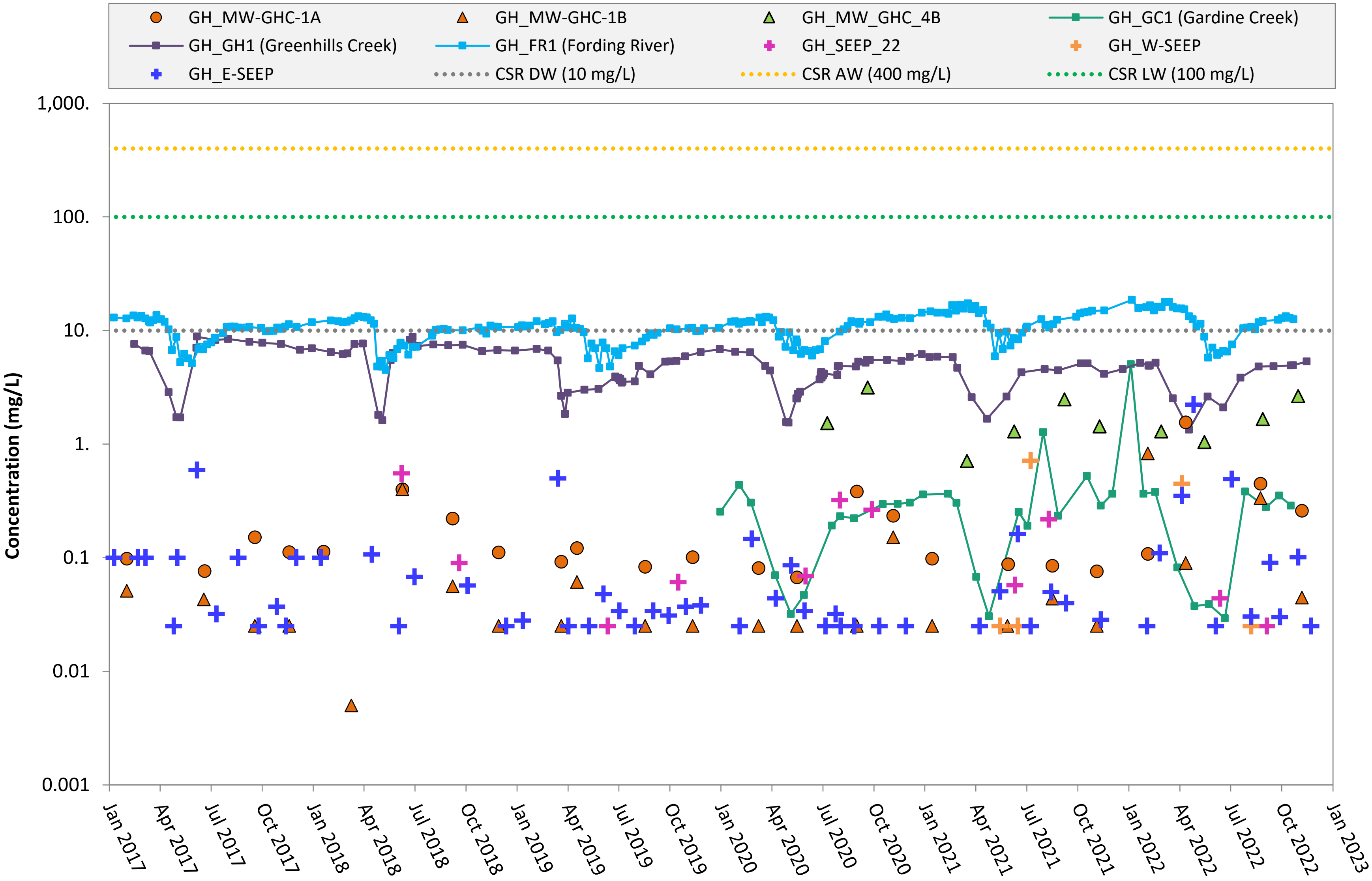
Figure GH-10: Fording River Valley Greenhills Creek Watershed - Nitrate-N Concentrations



Note: For concentrations measured below the method detection limit, the method detection limit (0.005 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

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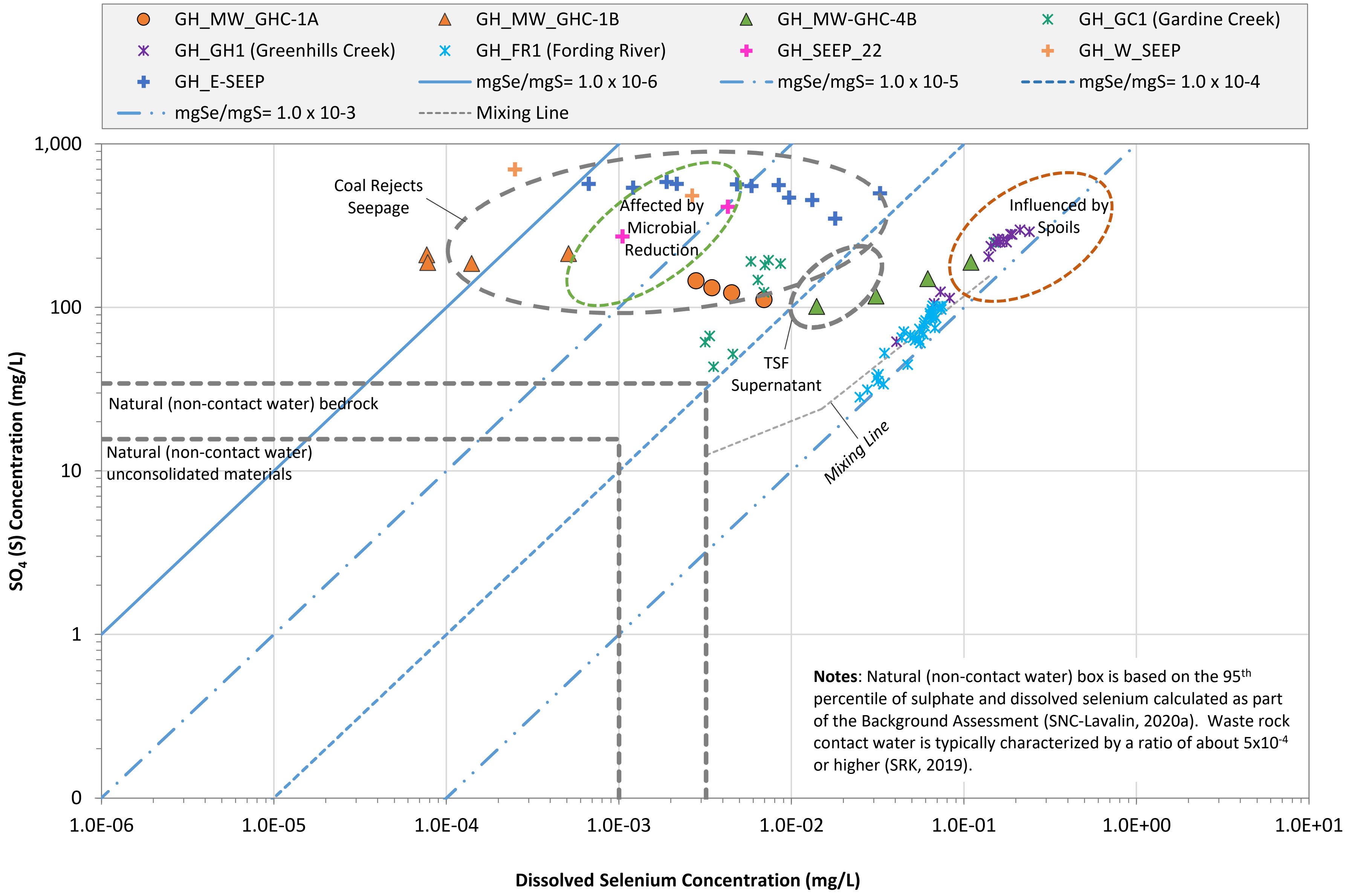
Figure GH-11: Fording River Valley Greenhills Creek - Se:SO_4 (S) Ratios



Notes: Natural (non-contact water) box is based on the 95th percentile of sulphate and dissolved selenium calculated as part of the Background Assessment (SNC-Lavalin, 2020a). Waste rock contact water is typically characterized by a ratio of about $5x10^{-4}$ or higher (SRK, 2019).

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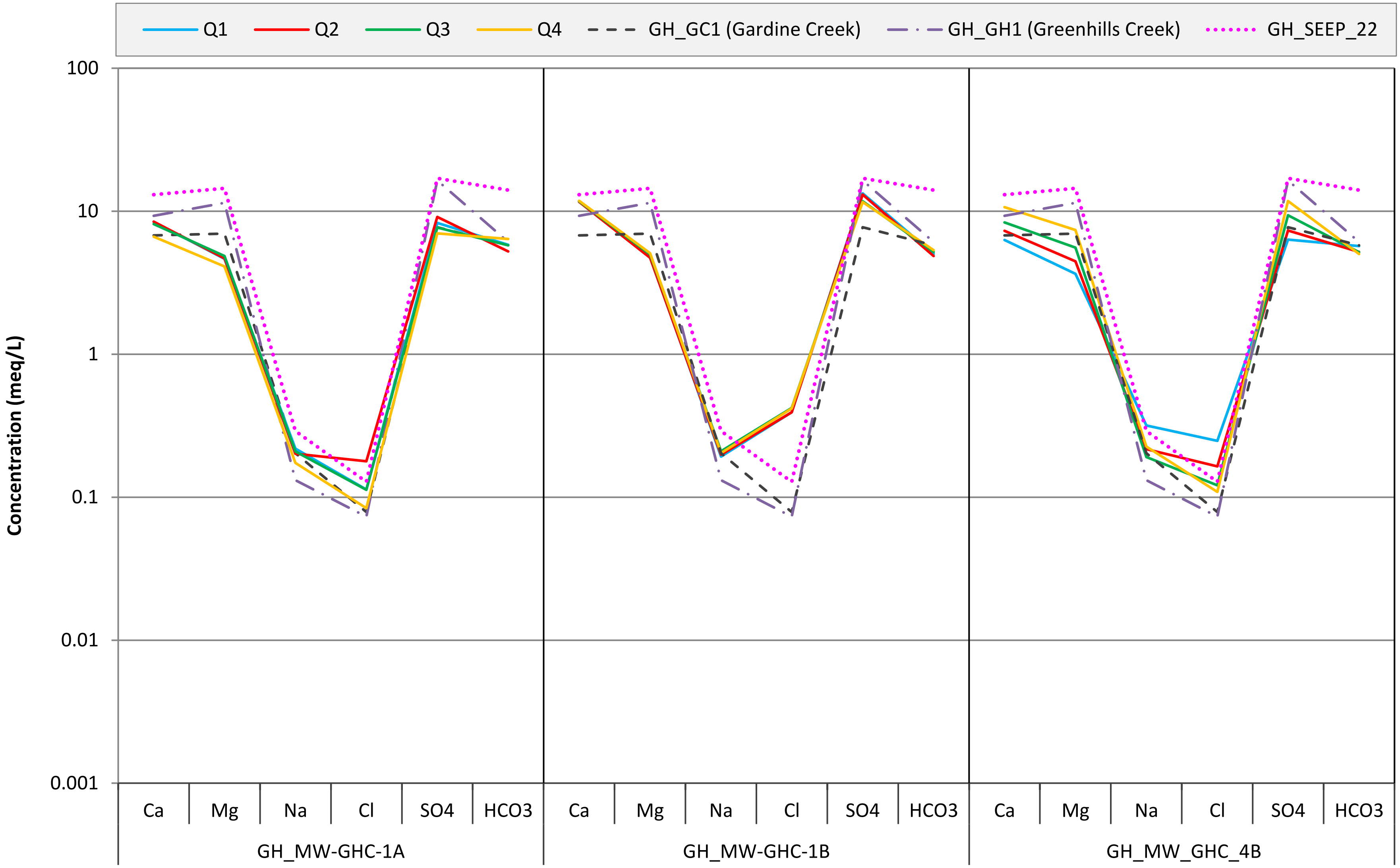
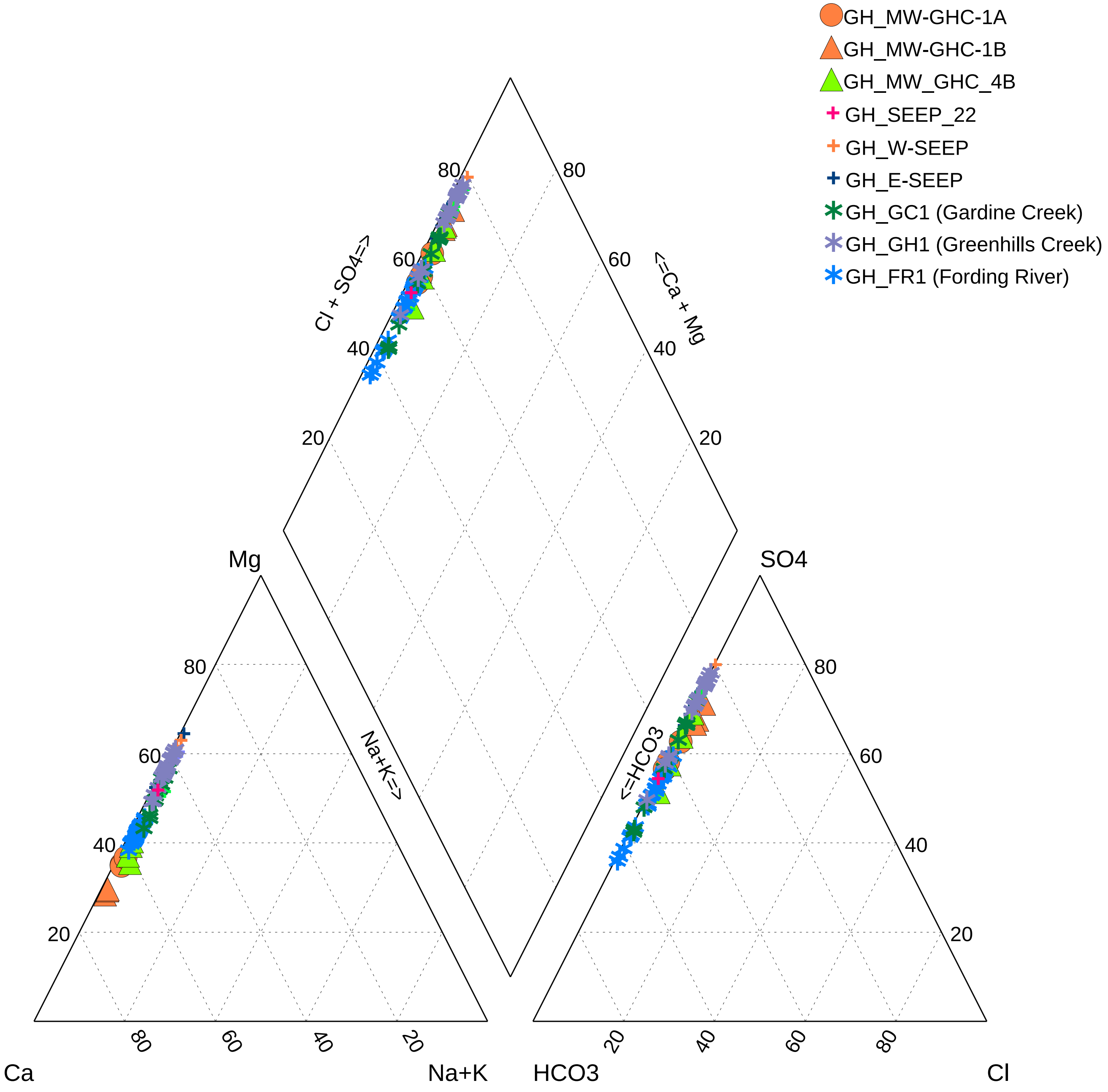
Figure GH-12: Fording River Valley Greenhills Creek Watershed - Schoeller Plot



Note: Analytical data presented for GH_GH1 and GH_GC1 are from Q2 2022.



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DESCRIPTION:	Figure GH-13: Fording River Valley Greenhills Creek Watershed - Piper Diagram

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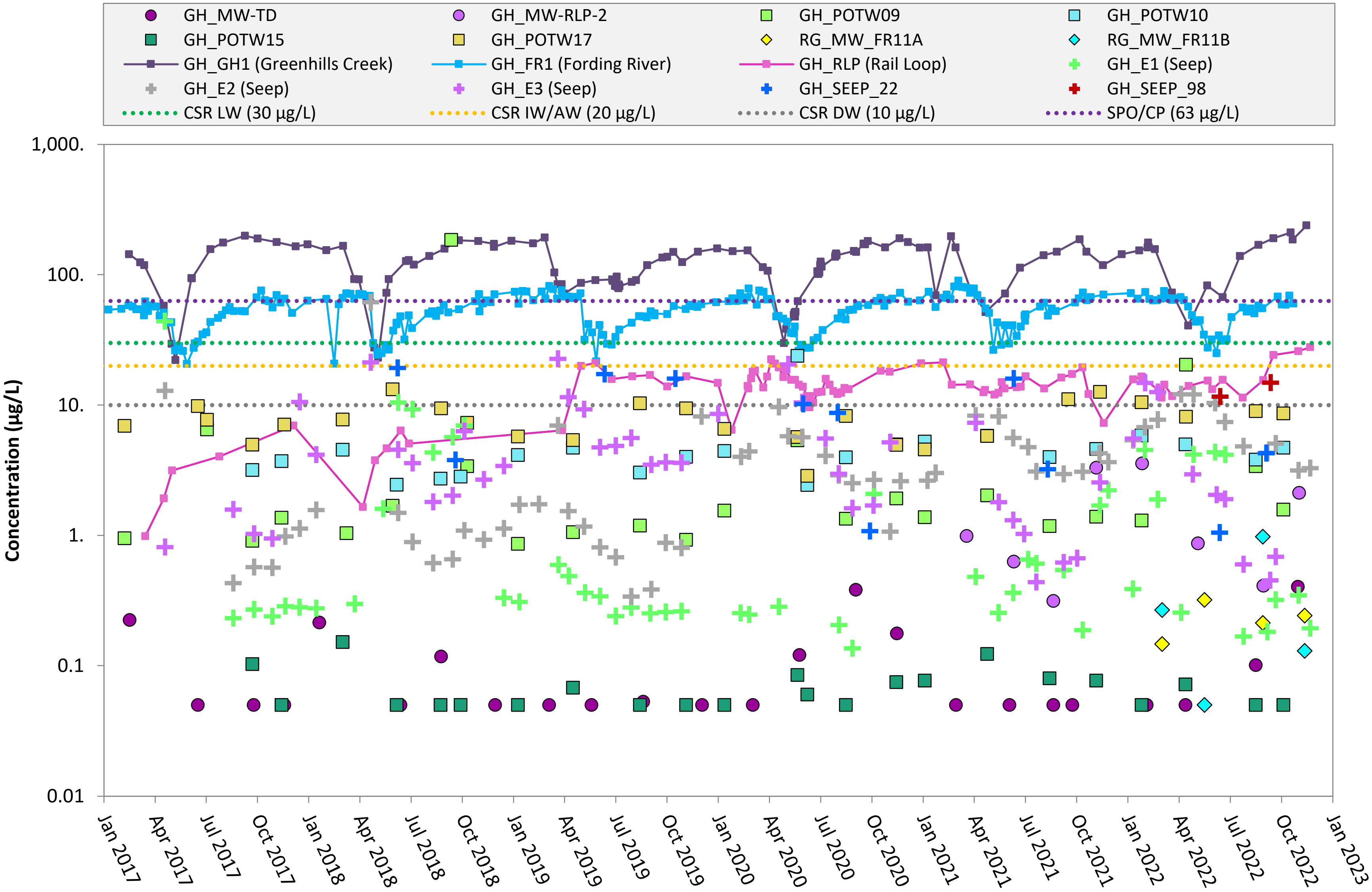
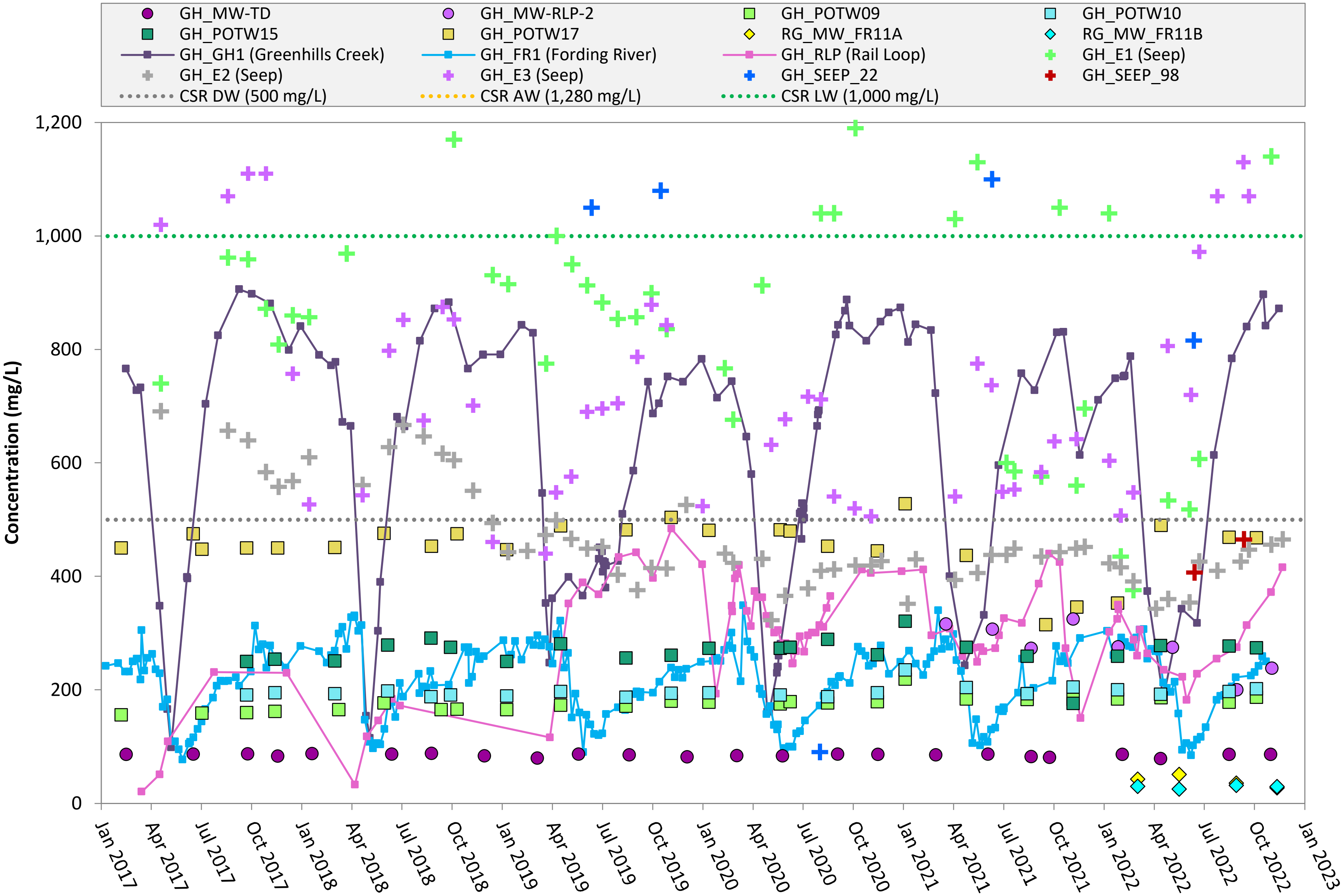
Figure GH-14: Fording River Valley Downgradient of Greenhills Creek Watershed - Dissolved Selenium Concentrations



Note: For concentrations measured below the method detection limit, the method detection limit (0.05 µg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

Figure GH-15: Fording River Valley Downgradient of Greenhills Creek Watershed - Sulphate Concentrations



Note: For concentrations measured below the method detection limit, the method detection limit (0.3 mg/L) was utilized for plotting purposes.

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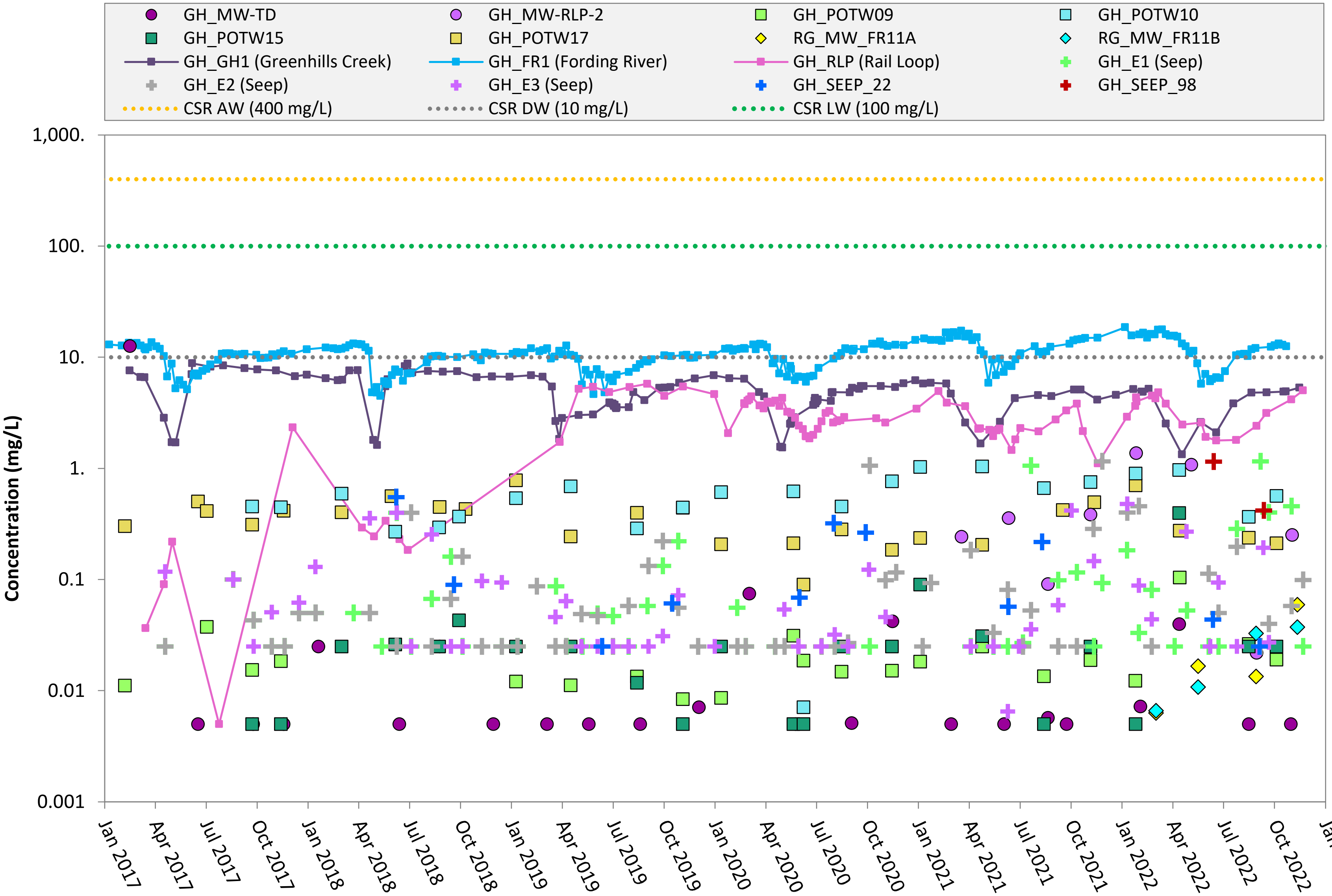
Figure GH-16: Fording River Valley Downgradient of Greenhills Creek Watershed - Nitrate-N Concentrations



Note: For concentrations measured below the method detection limit, the method detection limit (0.005 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

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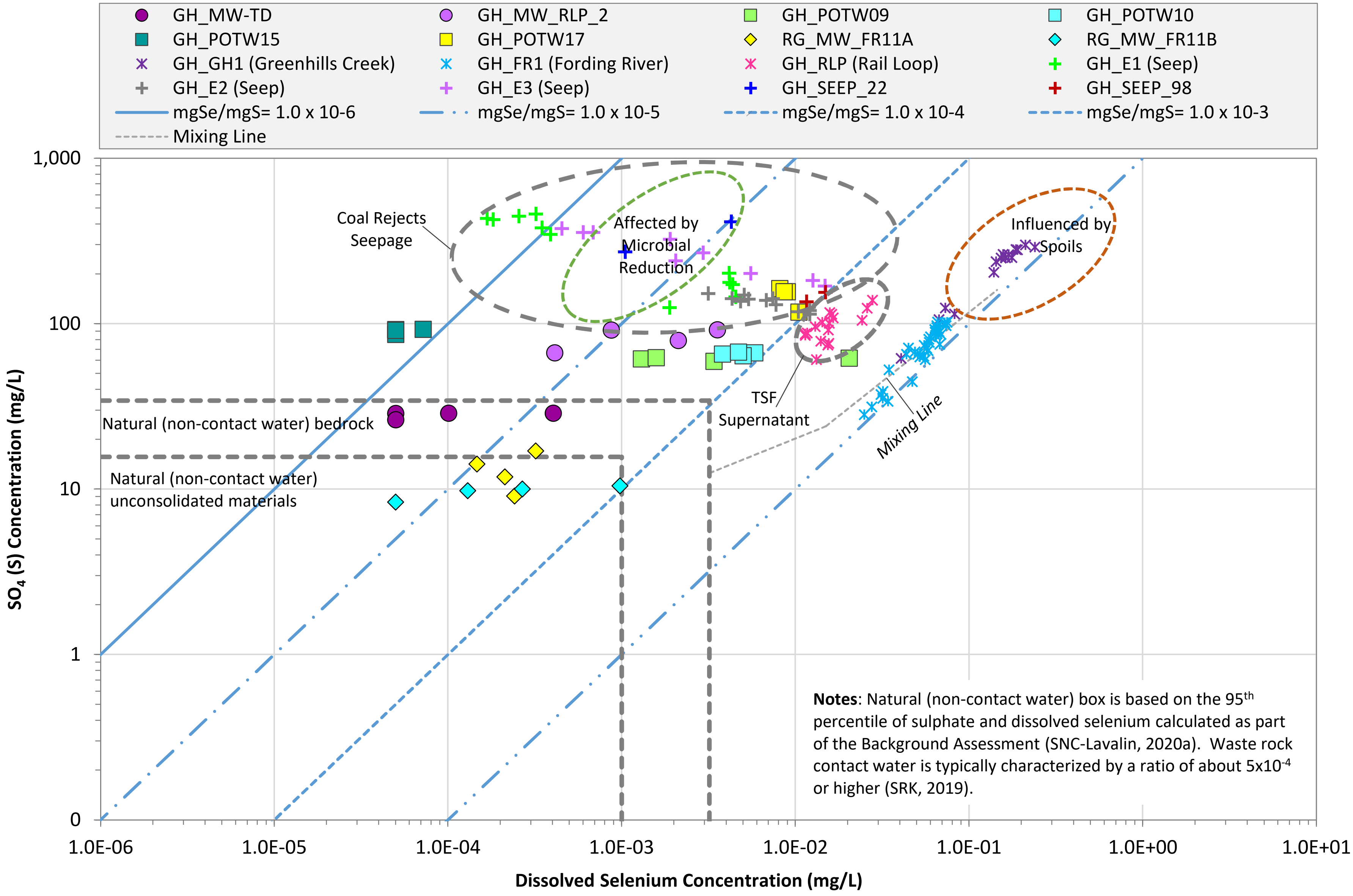
Figure GH-17: Fording River Valley Downgradient of Greenhills Creek Watershed - Se:SO_4 (S) Ratios



Notes: Natural (non-contact water) box is based on the 95th percentile of sulphate and dissolved selenium calculated as part of the Background Assessment (SNC-Lavalin, 2020a). Waste rock contact water is typically characterized by a ratio of about 5x10^{-4} or higher (SRK, 2019).

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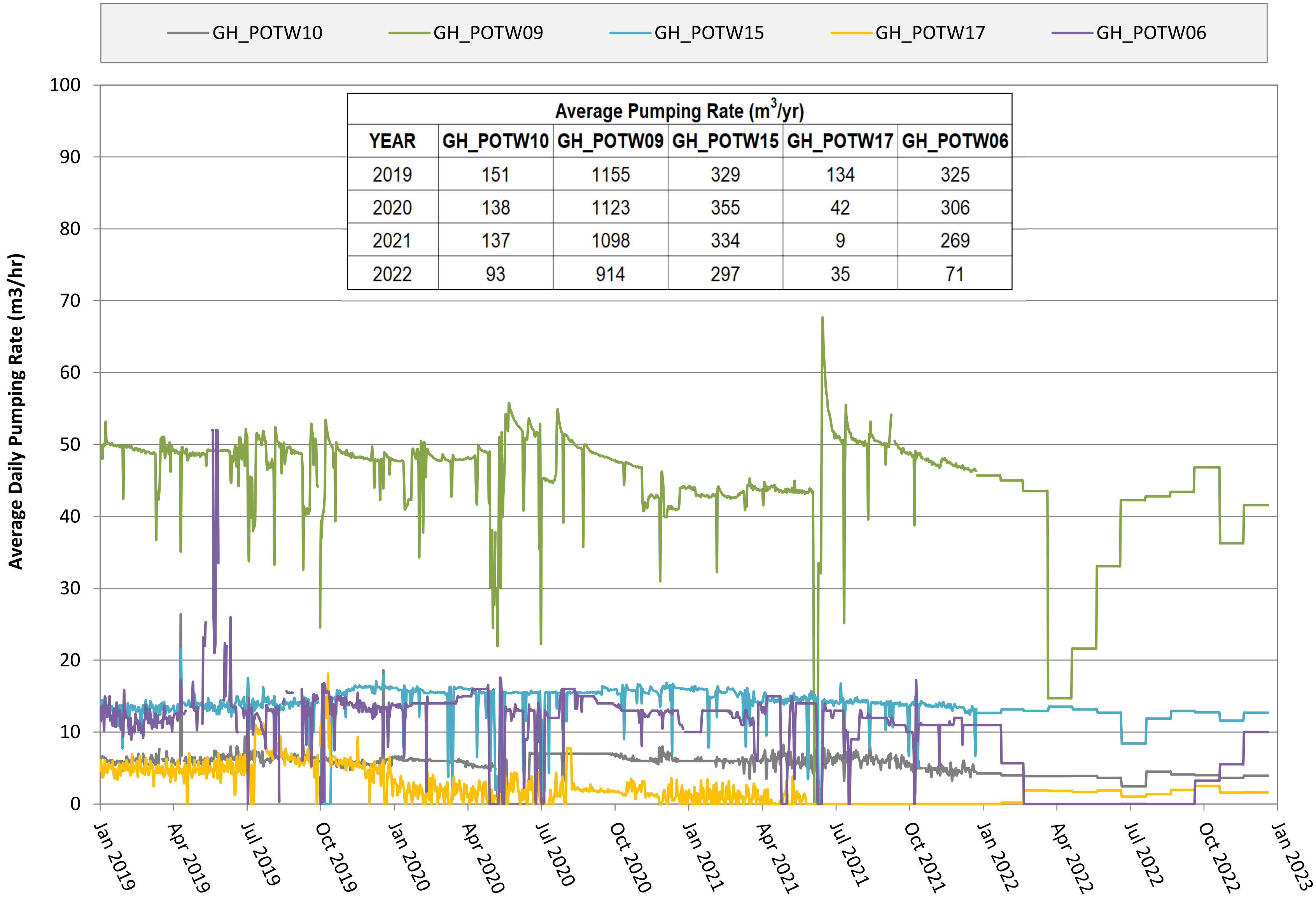
Figure GH-18: Fording River Valley Greenhills Creek Watershed - Supply Well Pumping Rates



Average Pumping Rate (m^3/yr)

YEAR	GH_POTW10	GH_POTW09	GH_POTW15	GH_POTW17	GH_POTW06
2019	151	1155	329	134	325
2020	138	1123	355	42	306
2021	137	1098	334	9	269
2022	93	914	297	35	71

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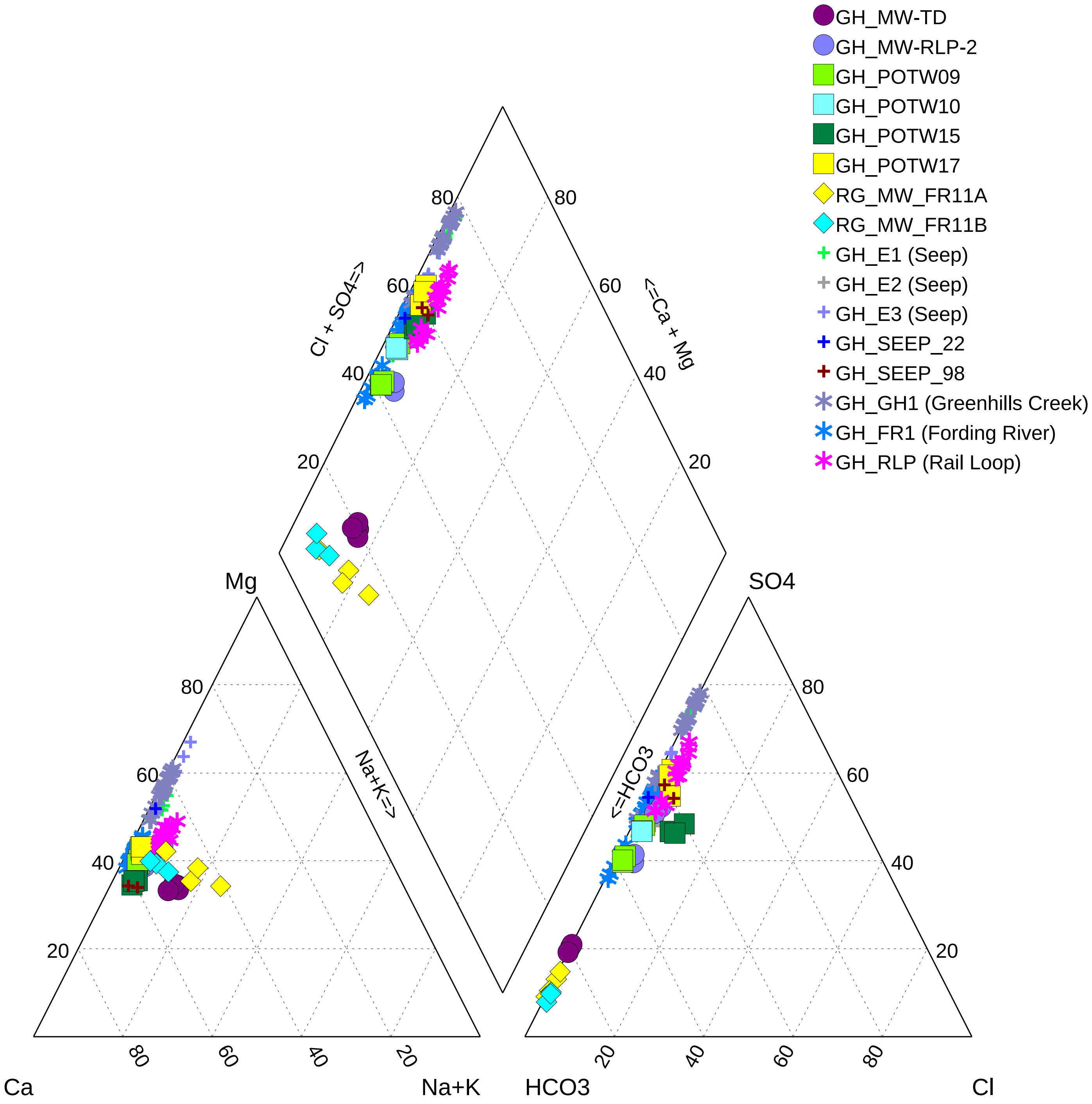

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DESCRIPTION: Figure GH-19: Fording River Valley Downgradient of Greenhills Creek Watershed - Piper Diagram

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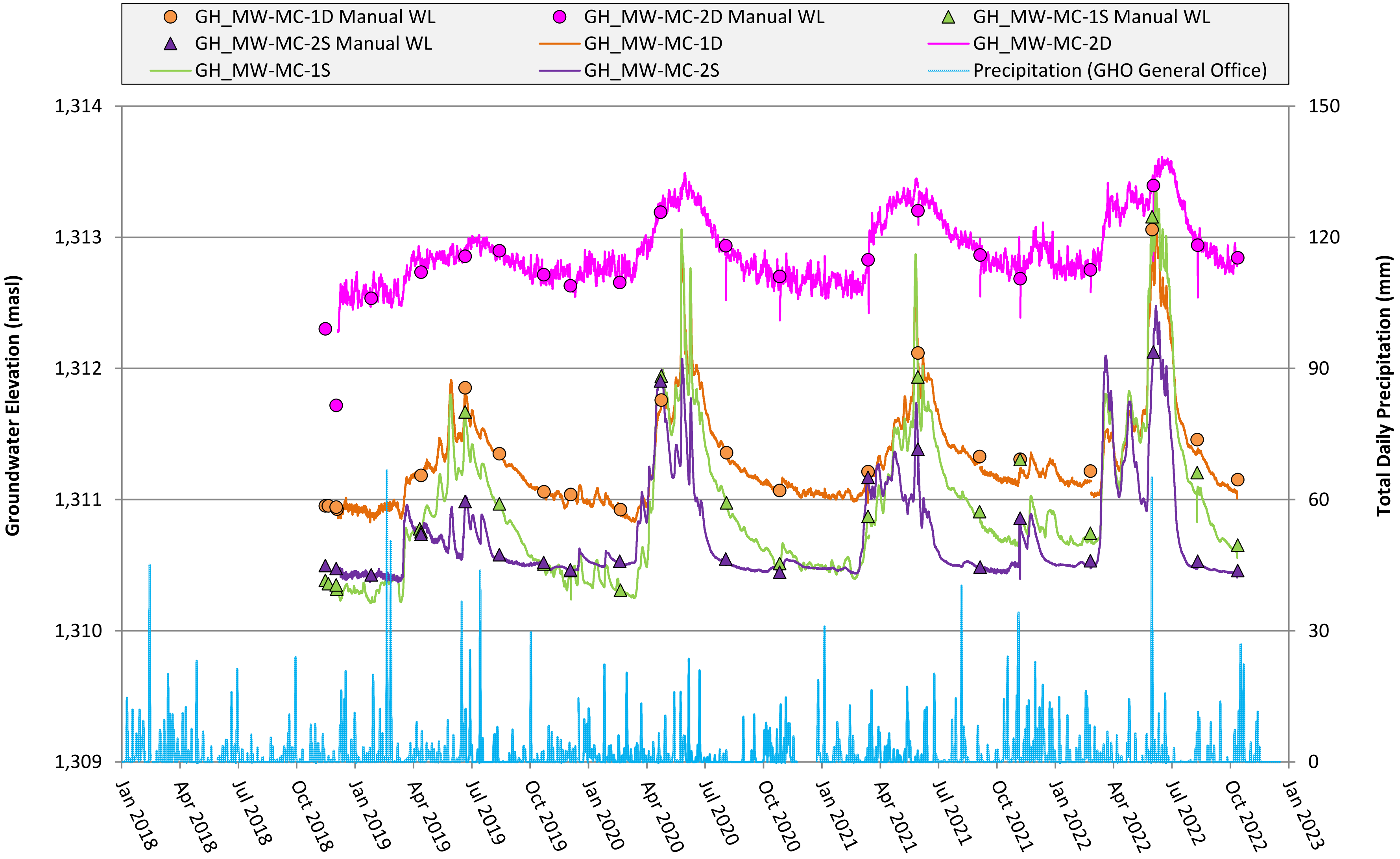
Figure GH-20: Elk River Valley Mickelson Watershed - Hydrograph



Note: Data was removed where suspected datalogger removal occurred. Precipitation data recorded on February 8, 17 and 18, 2018 have been removed as the data is inferred to be anomalous. Continuous water level data was compensated using barologger GH_Barologger (GH_MW-Willow-1S).

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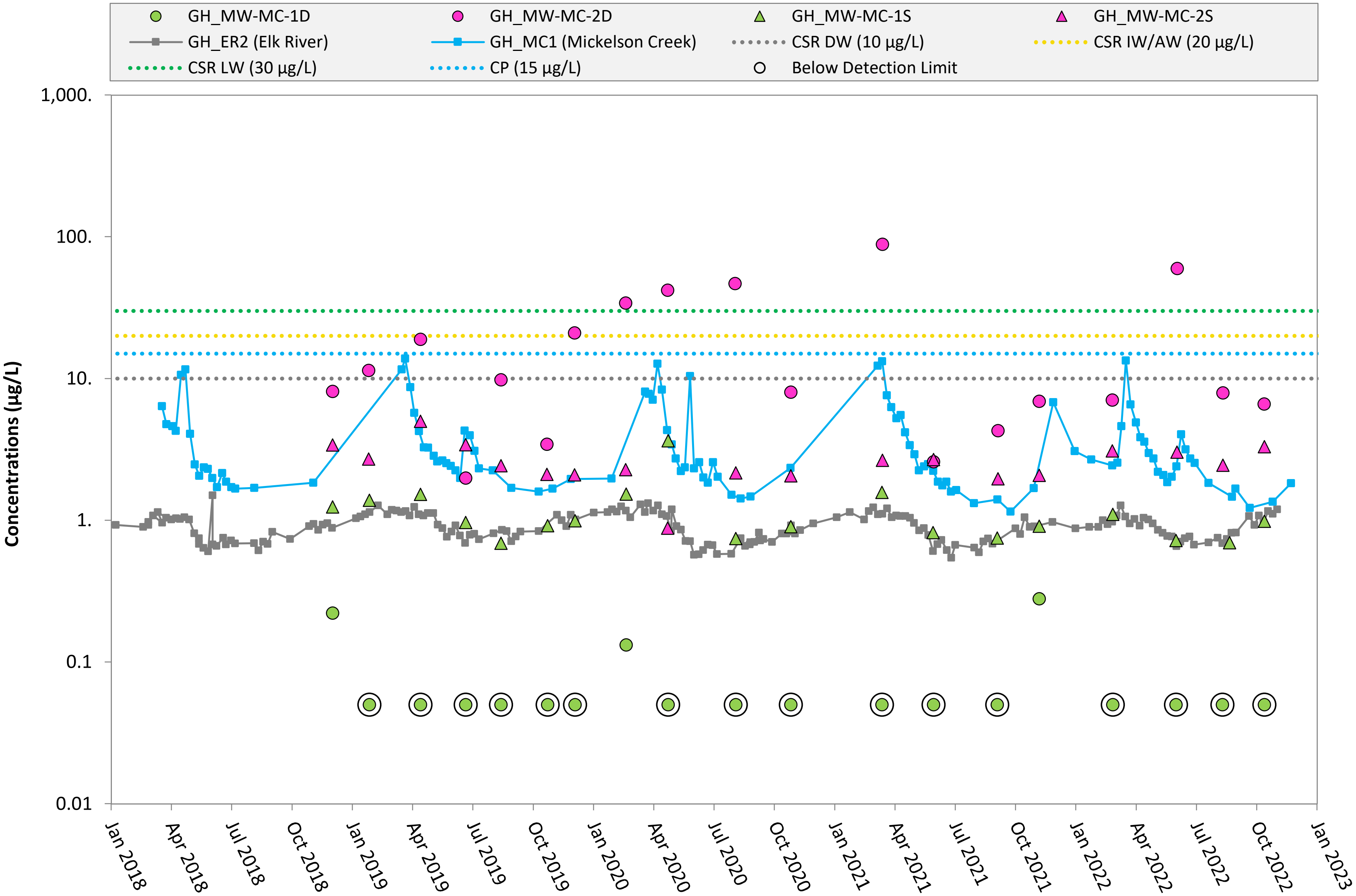
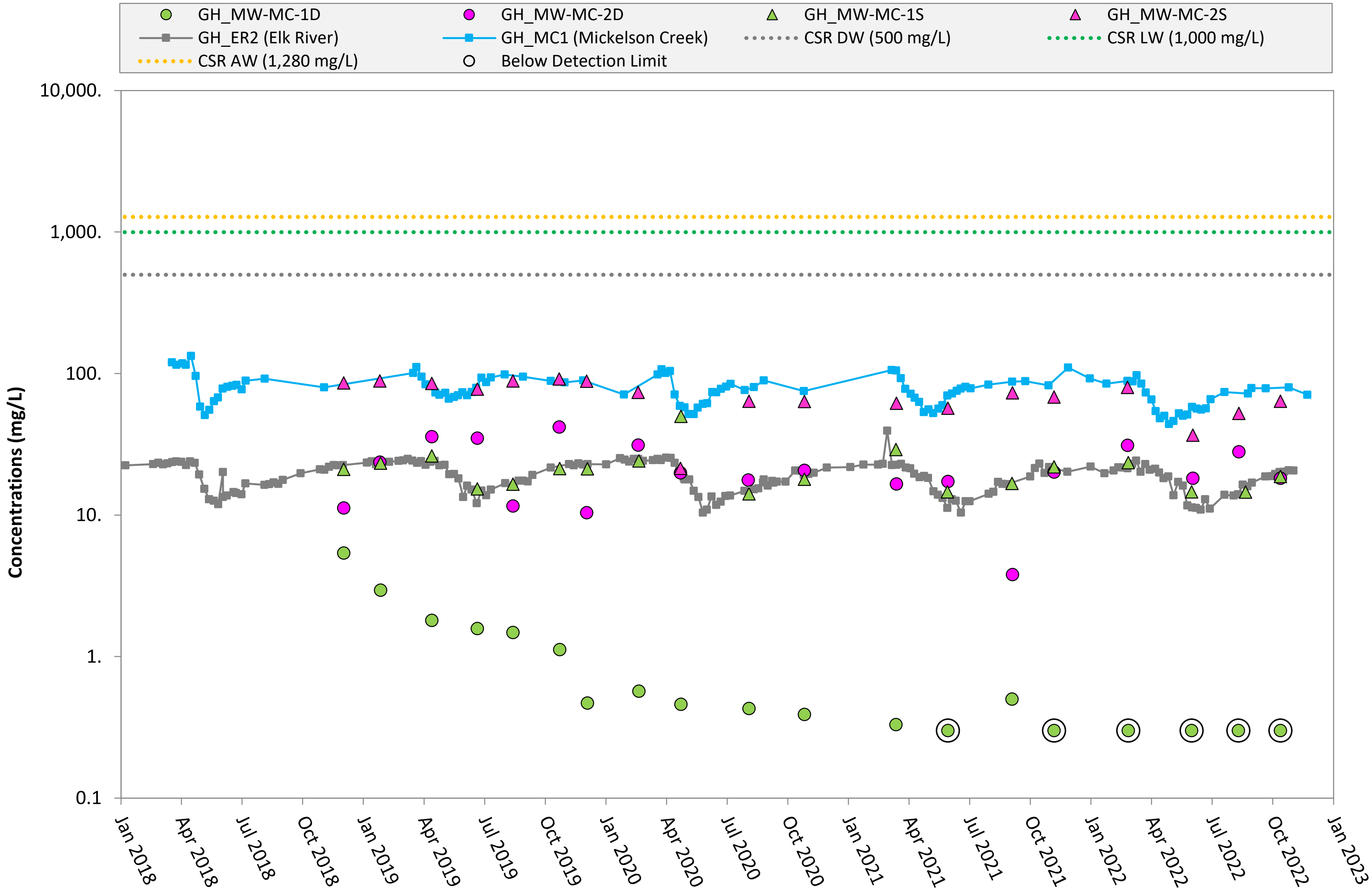
Figure GH-21: Elk River Valley Mickelson Watershed - Dissolved Selenium Concentrations



Note: For concentrations measured below the method detection limit, the method detection limit (0.05 µg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

Figure GH-22: Elk River Valley Mickelson Watershed - Sulphate Concentrations



Note: For concentrations measured below the method detection limit, the method detection limit (0.3 mg/L) was utilized for plotting purposes. Logaritmic scale has been applied based on distribution of concentrations relative to applicable screening criteria.

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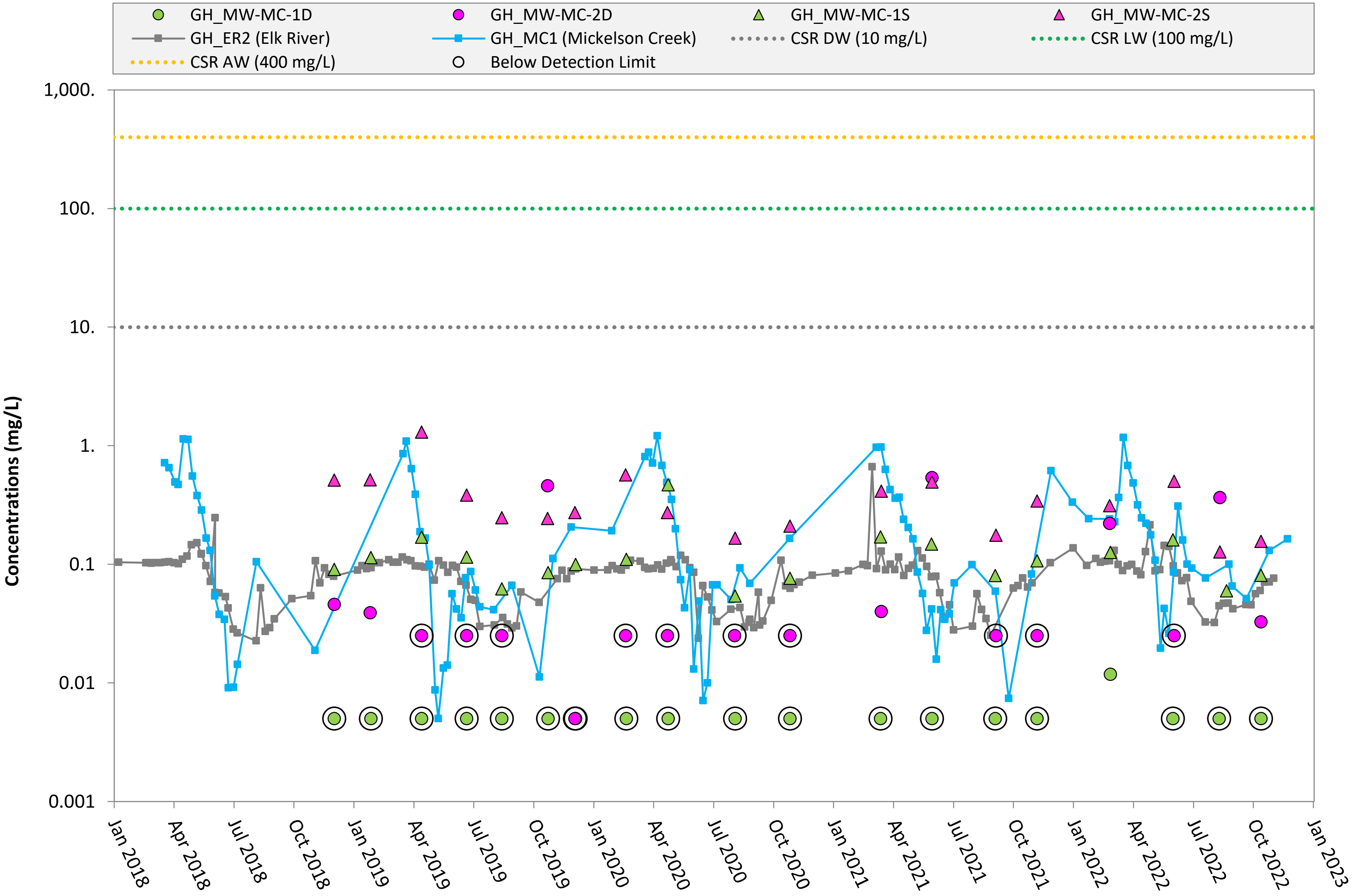
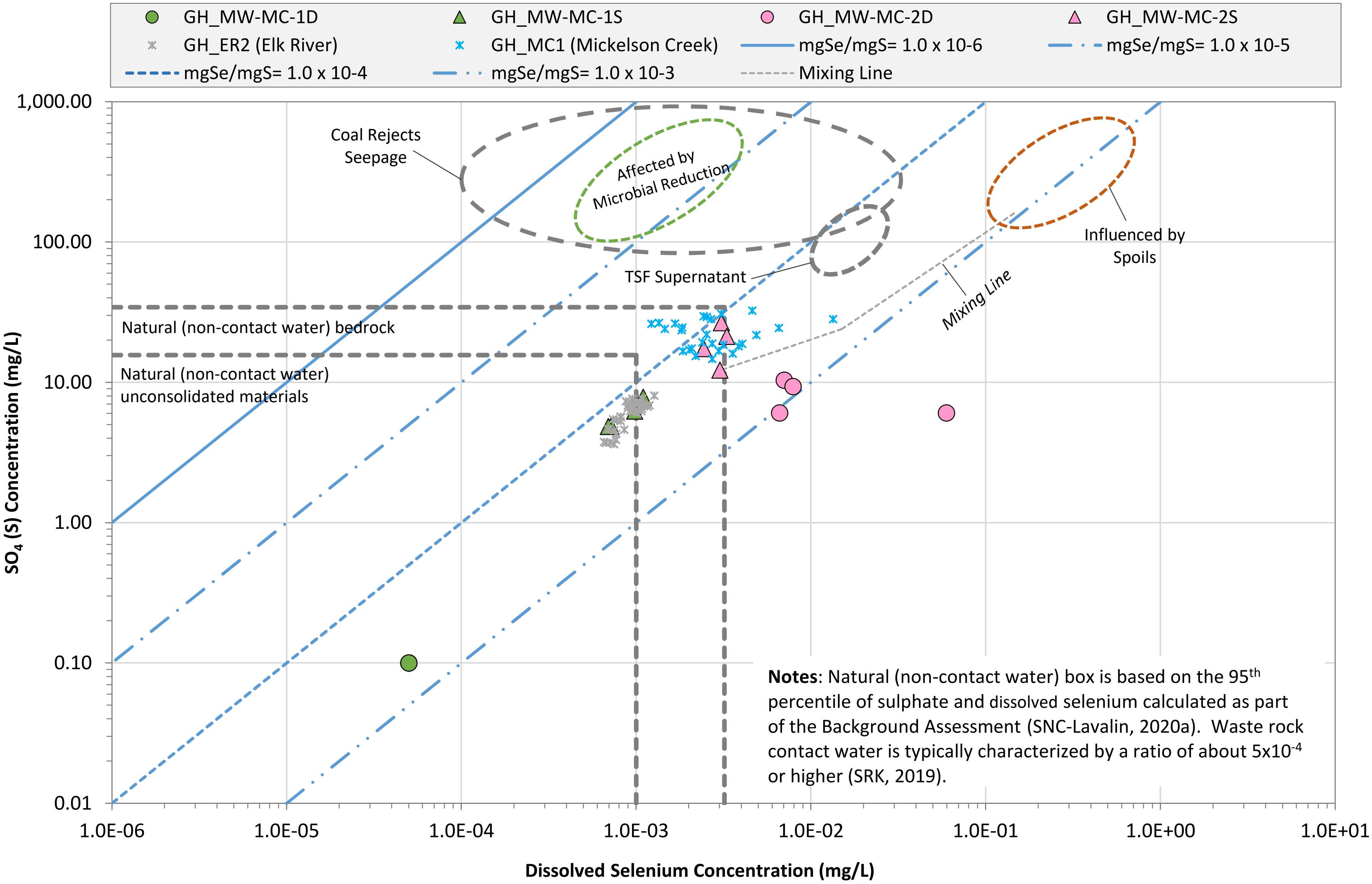
Figure GH-23: Elk River Valley Mickelson Watershed - Nitrate-N Concentrations



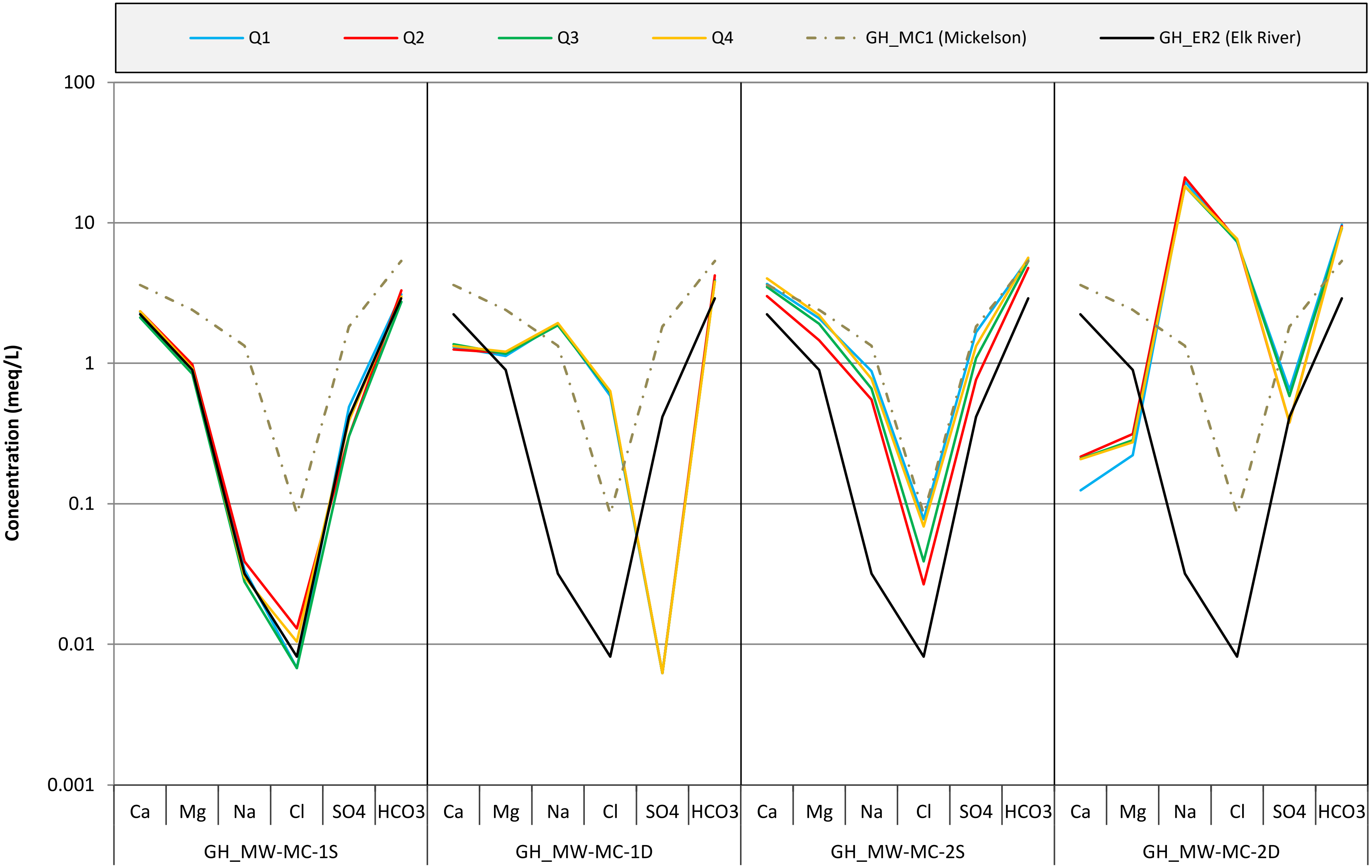
Note: For concentrations measured below the method detection limit, the method detection limit (0.005 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

Figure GH-24: Elk River Valley Mickelson Watershed - Se:SO_4 (S) Ratios



Notes: Natural (non-contact water) box is based on the 95th percentile of sulphate and dissolved selenium calculated as part of the Background Assessment (SNC-Lavalin, 2020a). Waste rock contact water is typically characterized by a ratio of about 5×10^{-4} or higher (SRK, 2019).

Figure GH-25: Elk River Valley Mickelson Watershed 2022 - Schoeller Plot



Note: Analytical data presented for surface water samples are from Q2.

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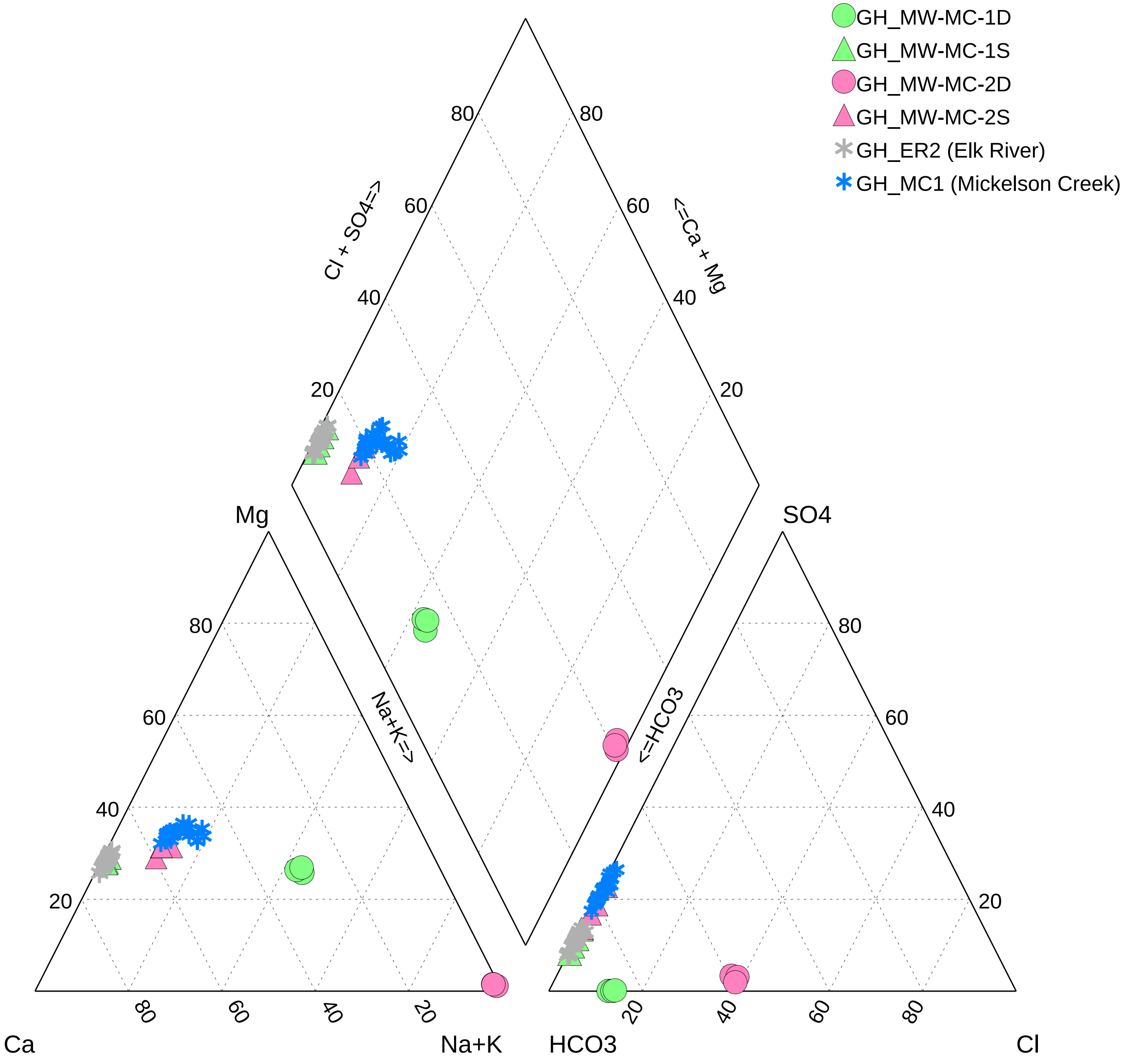

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DESCRIPTION: Figure GH-26: Elk River Valley Mickelson Watershed - Piper Diagram

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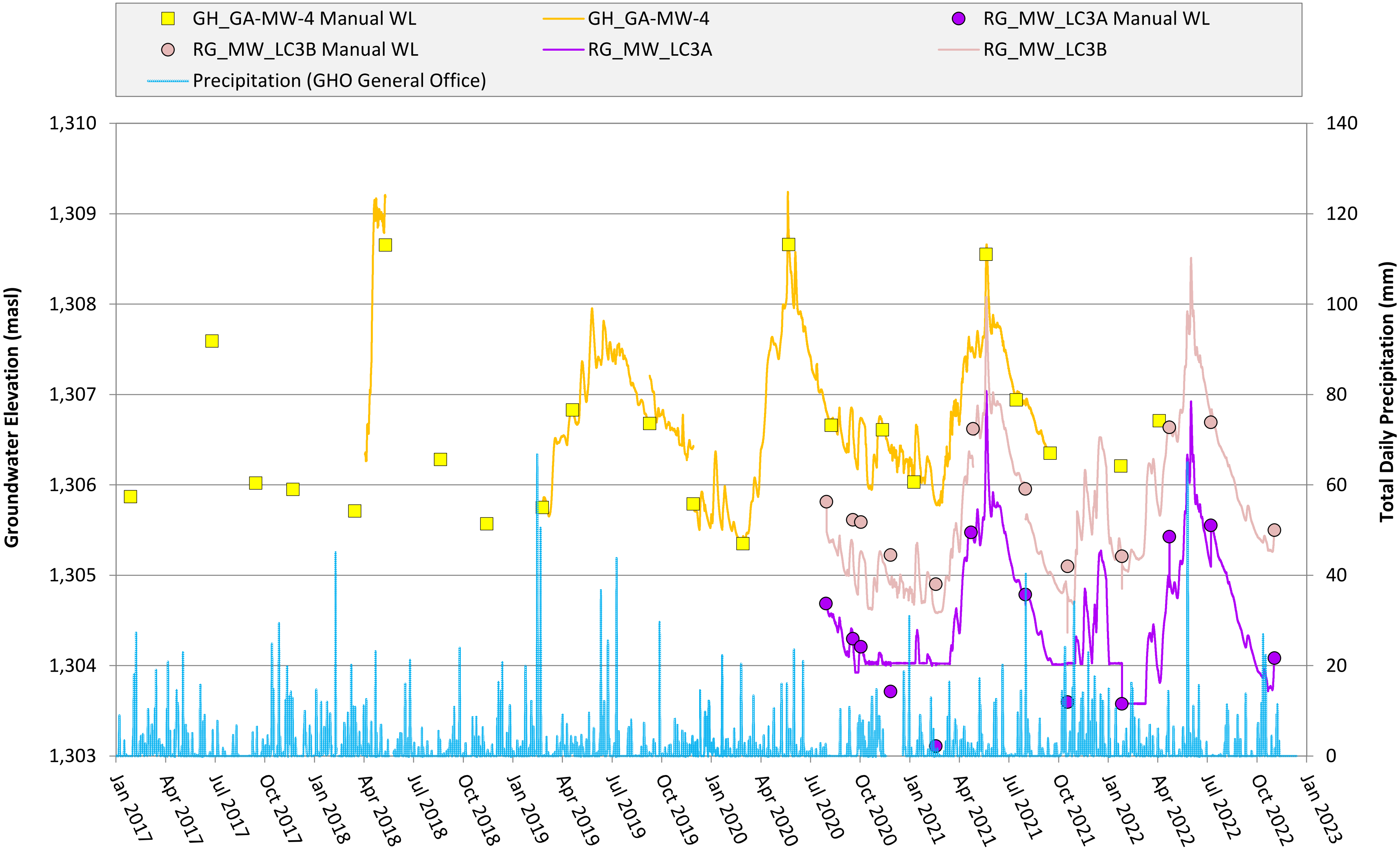
	CLIENT: Teck Coal Limited	DATE: 2023-02-03

Figure GH-27: Elk River Valley Leask Watershed - Hydrograph



Note: Data was removed where suspected datalogger removal occurred. Precipitation data recorded on February 8, 17 and 18, 2018 have been removed as the data is inferred to be anomalous. Continuous water level data was compensated using barologger RG_Baro (RG_MW_LC3C).

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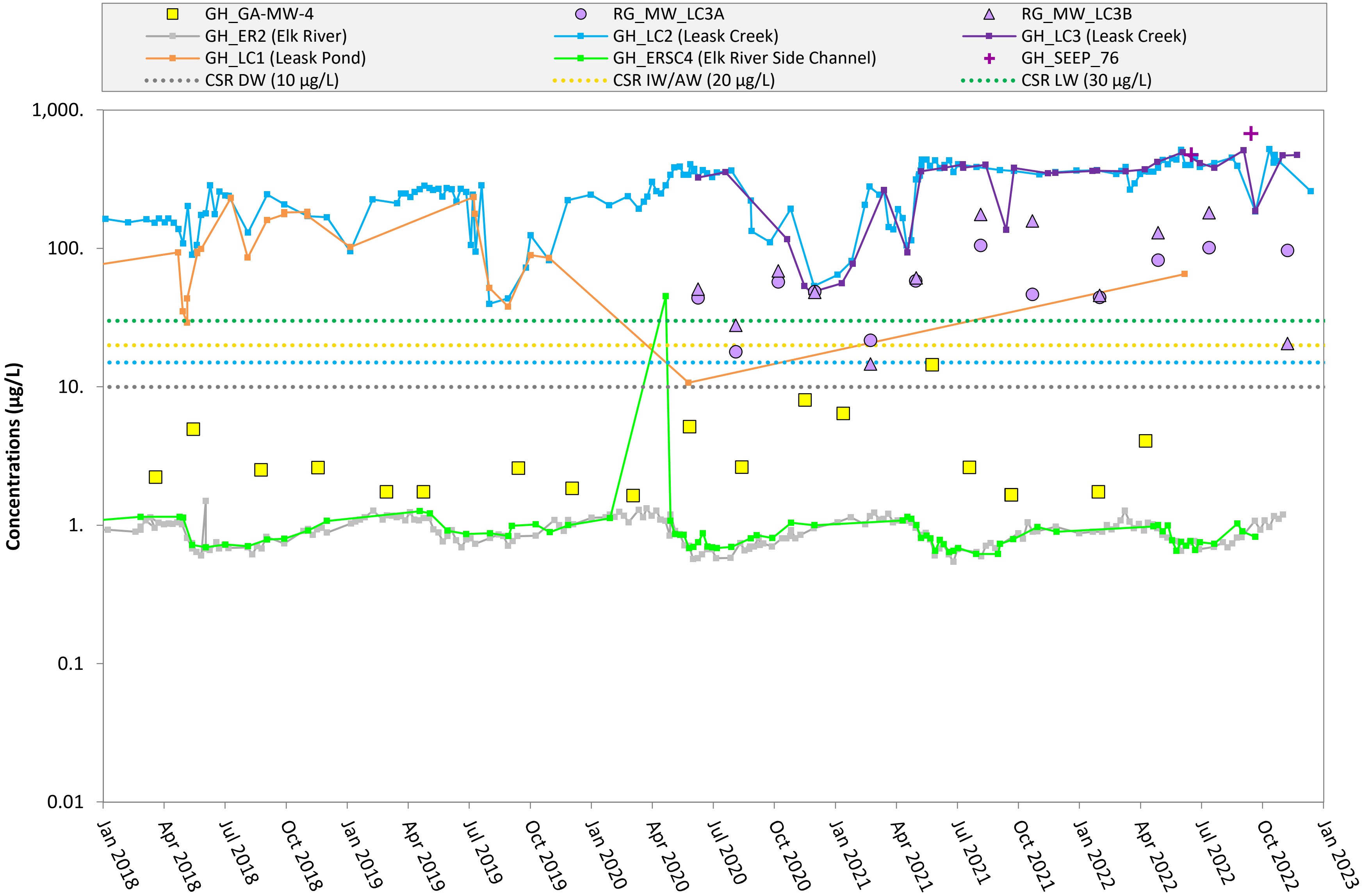
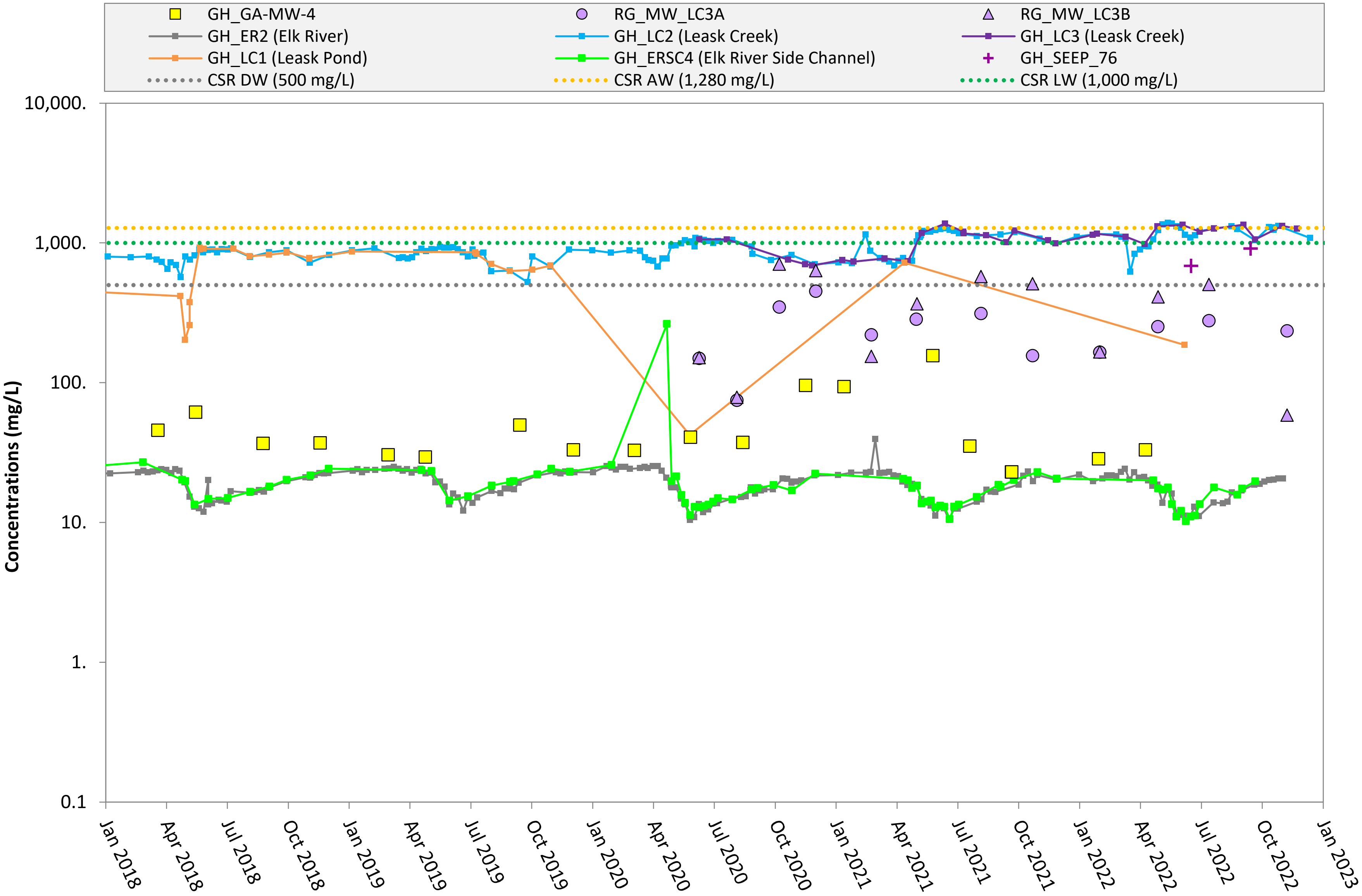
635544/2023-03-02
QAQC:TYR

Figure GH-28: Elk River Valley Leask Watershed - Dissolved Selenium Concentrations



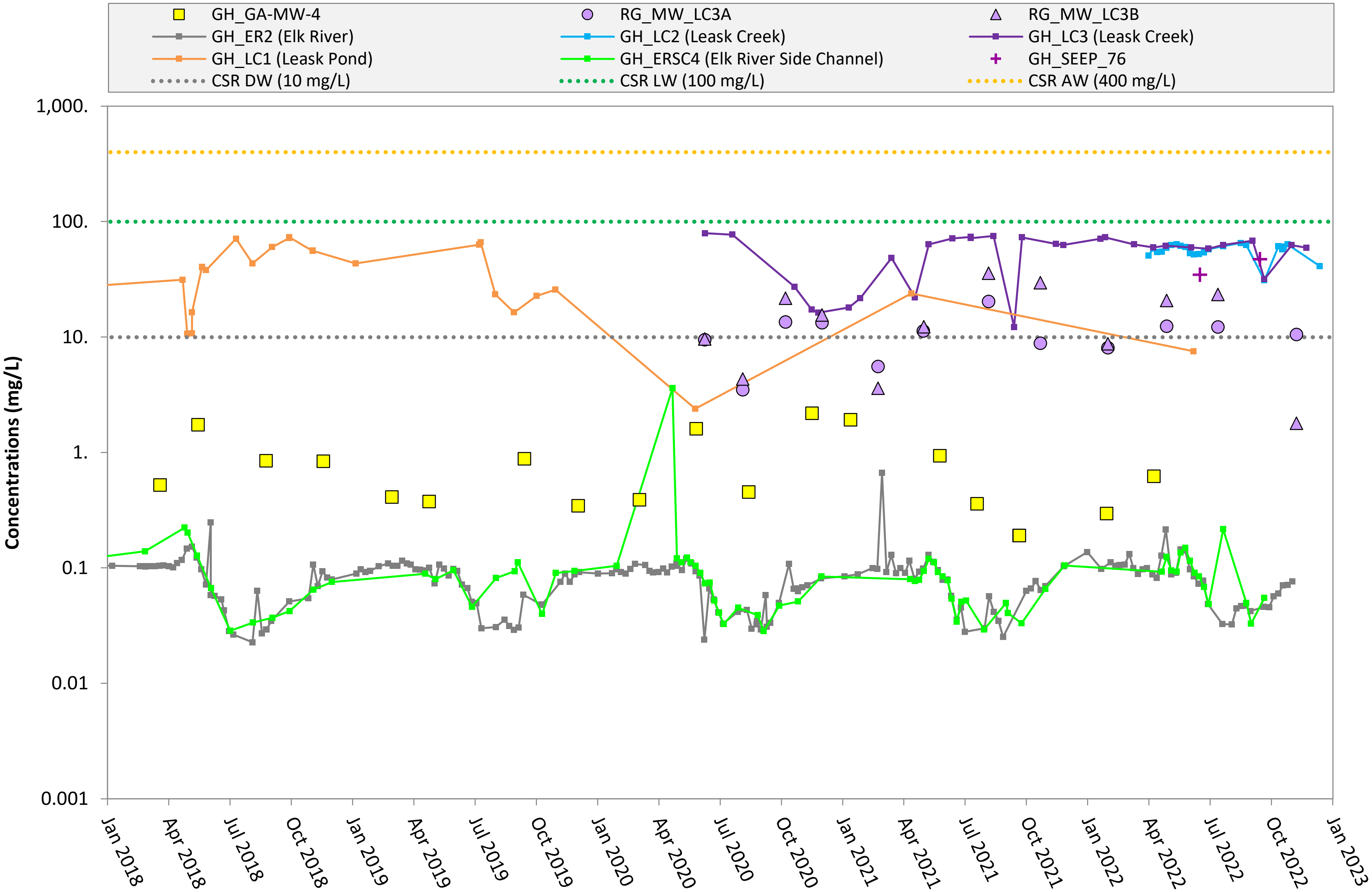
Note: For concentrations measured below the method detection limit, the method detection limit (0.05 µg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

Figure GH-29: Elk River Valley Leask Watershed - Sulphate Concentrations



Note: For concentrations measured below the method detection limit, the method detection limit (0.3 mg/L) was utilized for plotting purposes. Logaritmic scale has been applied based on distribution of concentrations relative to applicable screening criteria.

Figure GH-30: Elk River Valley Leask Watershed - Nitrate-N Concentrations



Note: For concentrations measured below the method detection limit, the method detection limit (0.005 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

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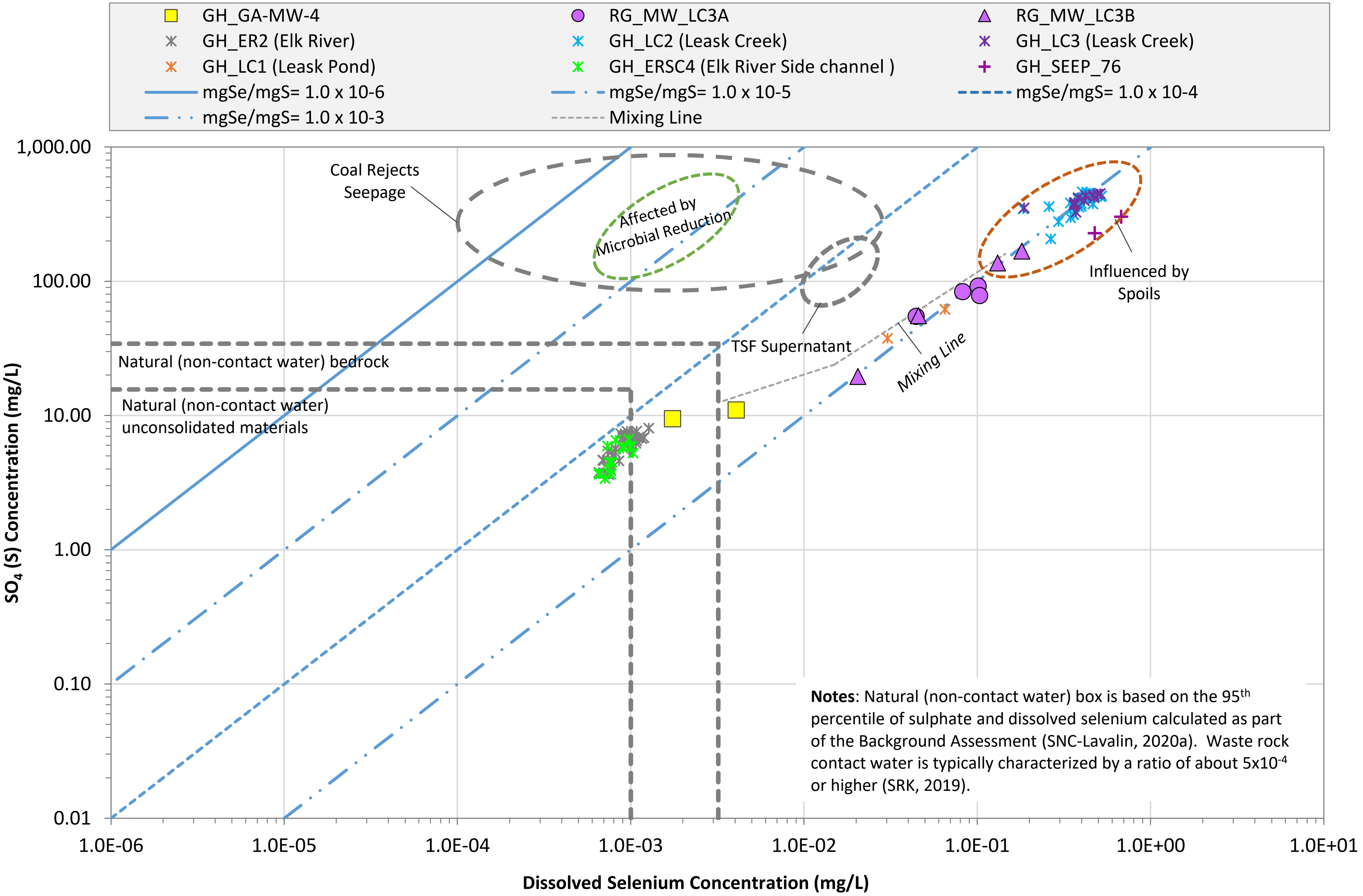
Figure GH-31: Elk River Valley Leask Watershed - Se:SO_4 (S) Ratios



Notes: Natural (non-contact water) box is based on the 95th percentile of sulphate and dissolved selenium calculated as part of the Background Assessment (SNC-Lavalin, 2020a). Waste rock contact water is typically characterized by a ratio of about 5x10^{-4} or higher (SRK, 2019).

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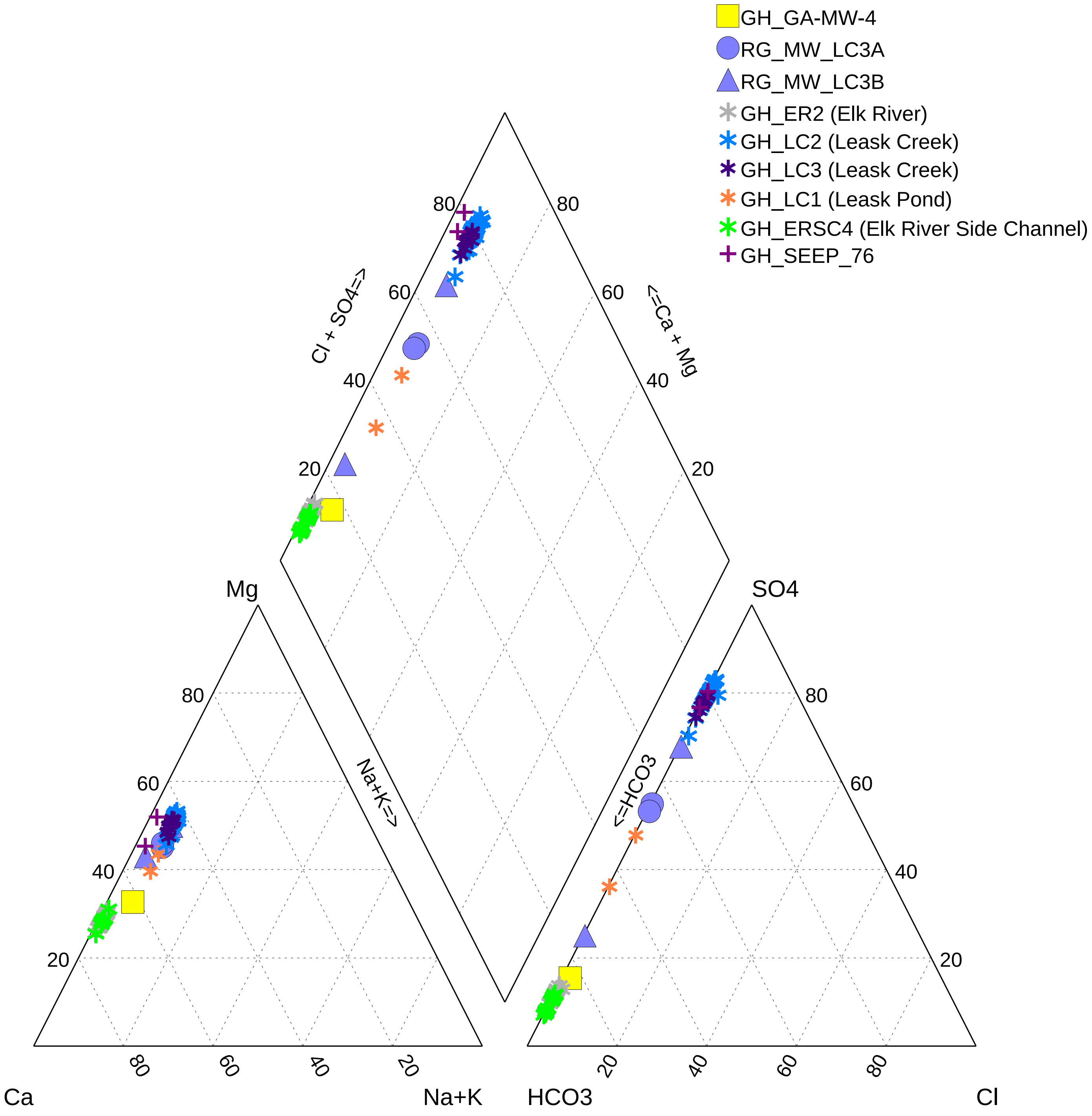

635544 / 2023 02 16

QAQC TYR

DESCRIPTION:	Figure GH-32: Elk River Valley Leask Watershed - Piper Diagram

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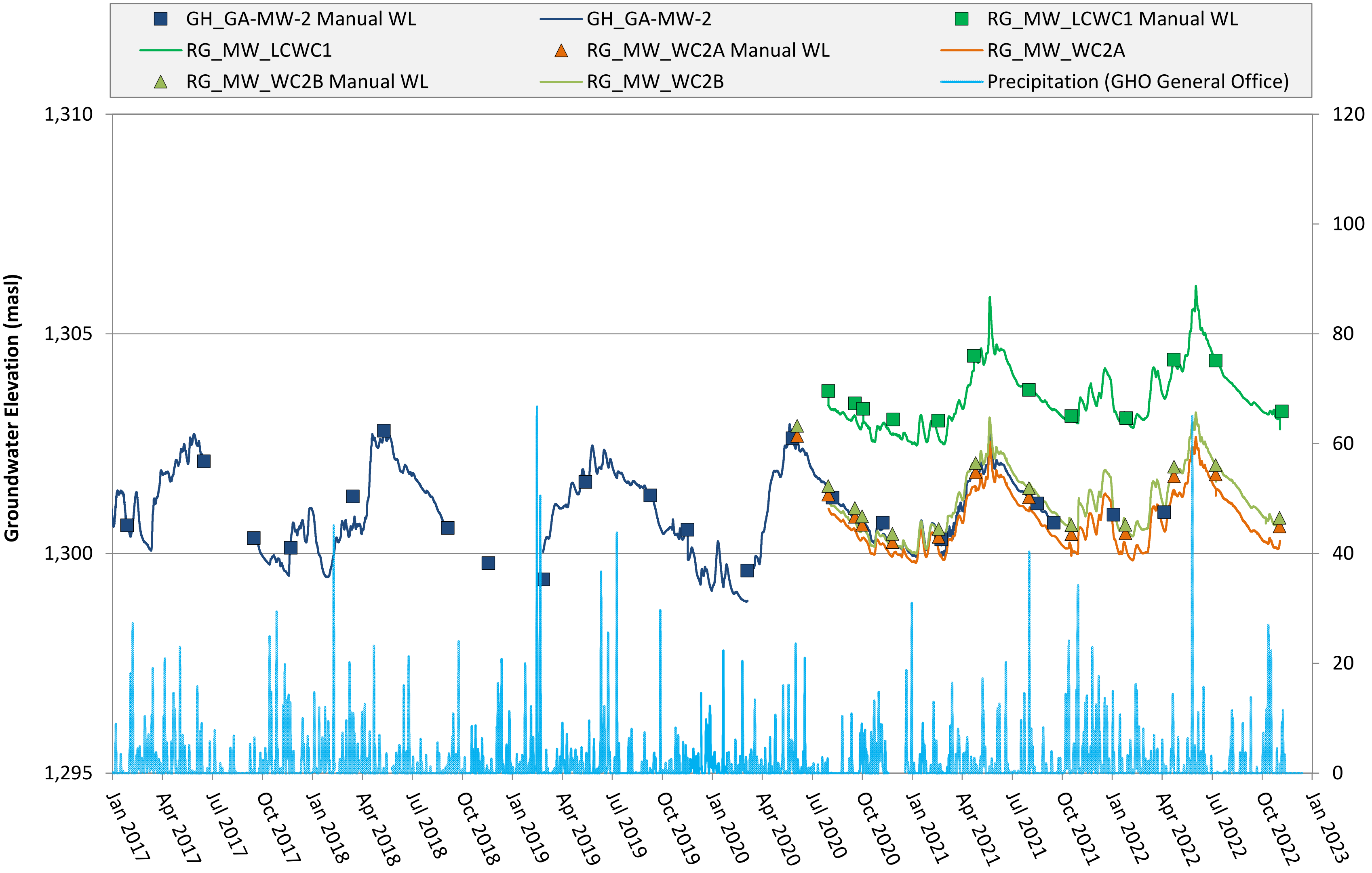
	CLIENT: Teck Coal Limited	DATE: 2023-02-03

Figure GH-33: Elk River Valley Wolfram Watershed - Hydrograph



Note: Data was removed where suspected datalogger removal occured. Precipitation data recorded on February 8, 17 and 18, 2018 have been removed as the data is inferred to be anomalous. Continuos water level data was compensated using barologger RG_Baro (RG_MW_L3C).

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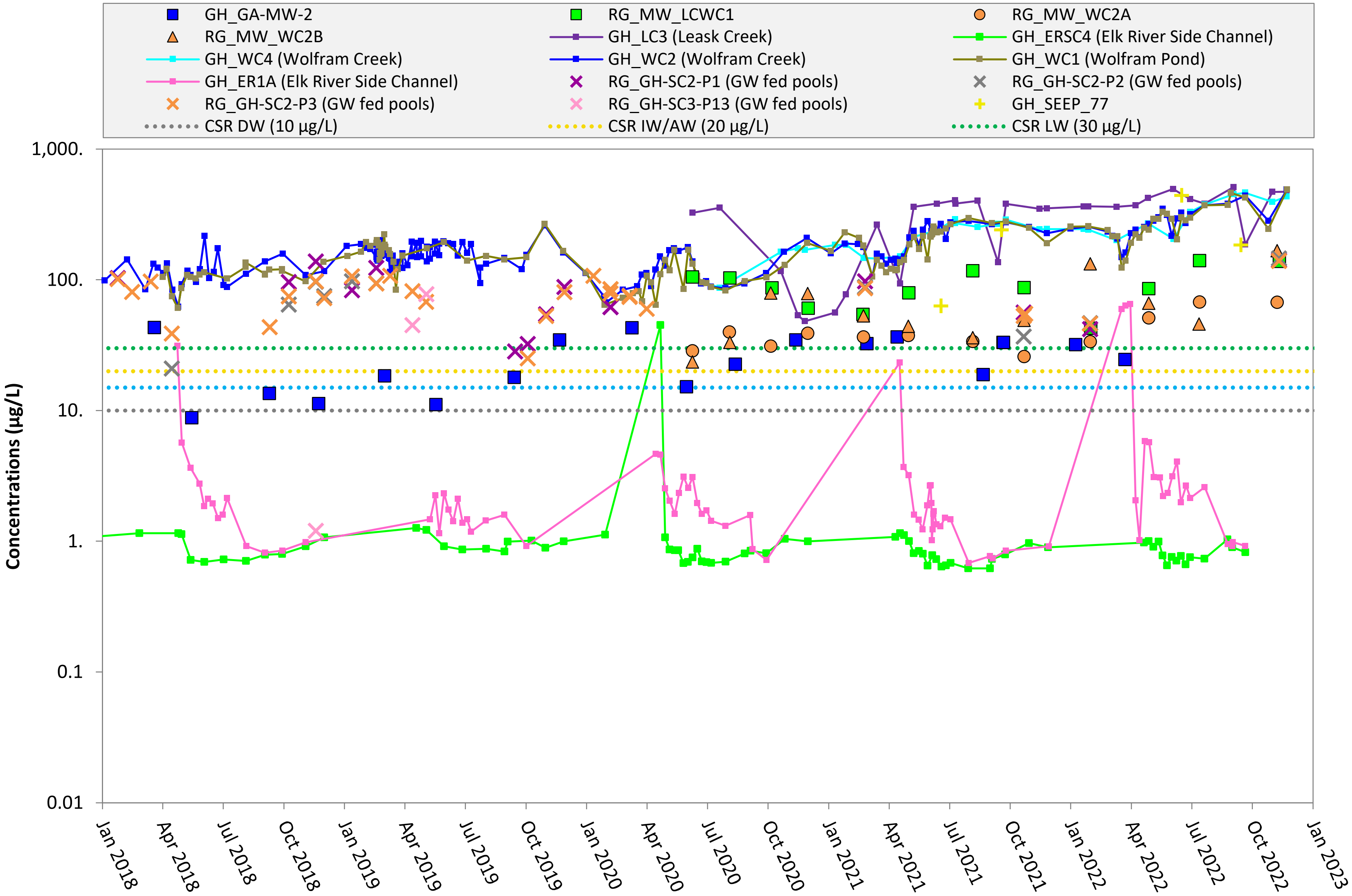
635544/2023-03-20
QAQC:TYR

Figure GH-34: Elk River Valley Wolfram Watershed - Dissolved Selenium Concentrations



Note: For concentrations measured below the method detection limit, the method detection limit (0.05 µg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

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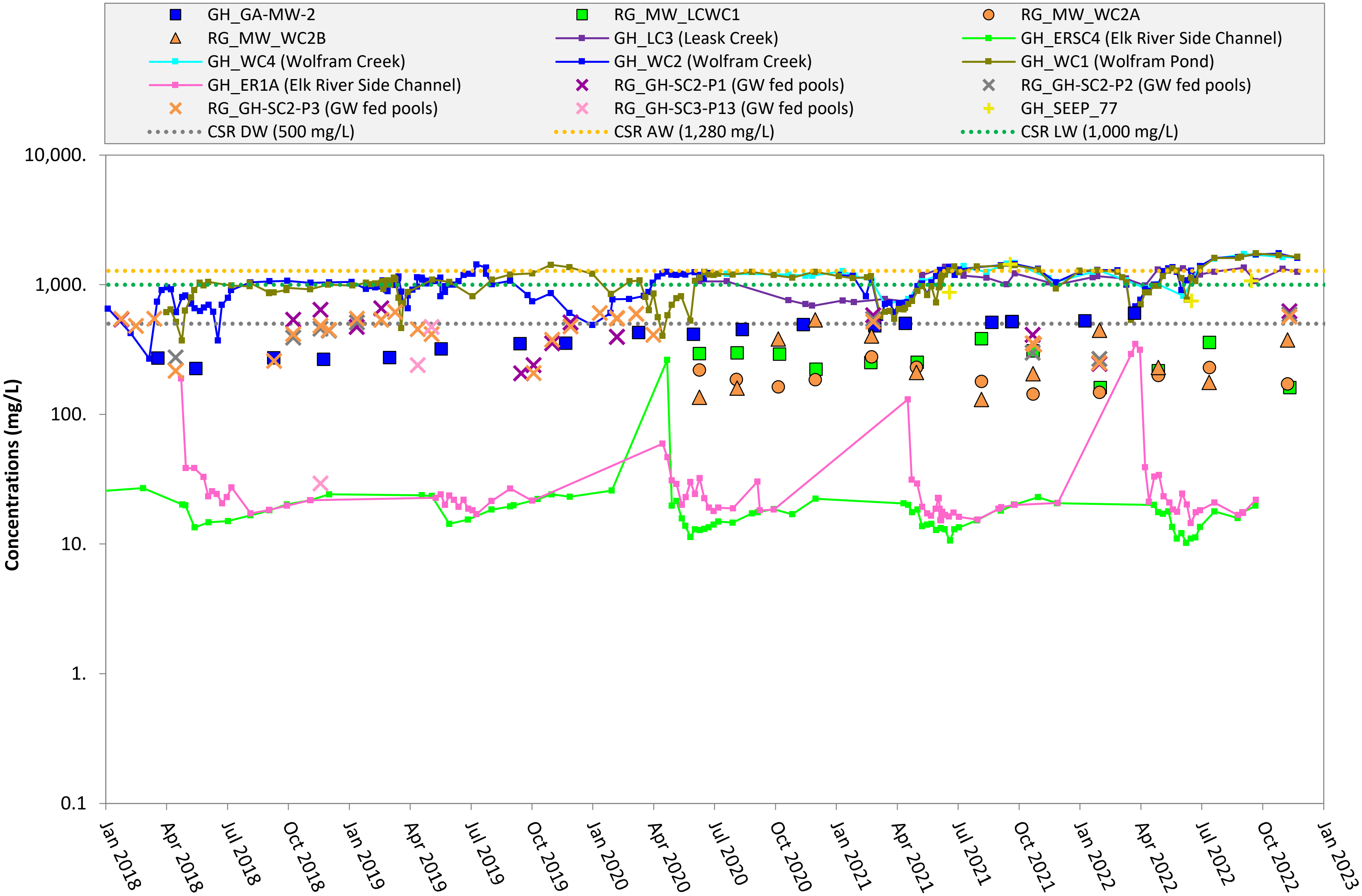
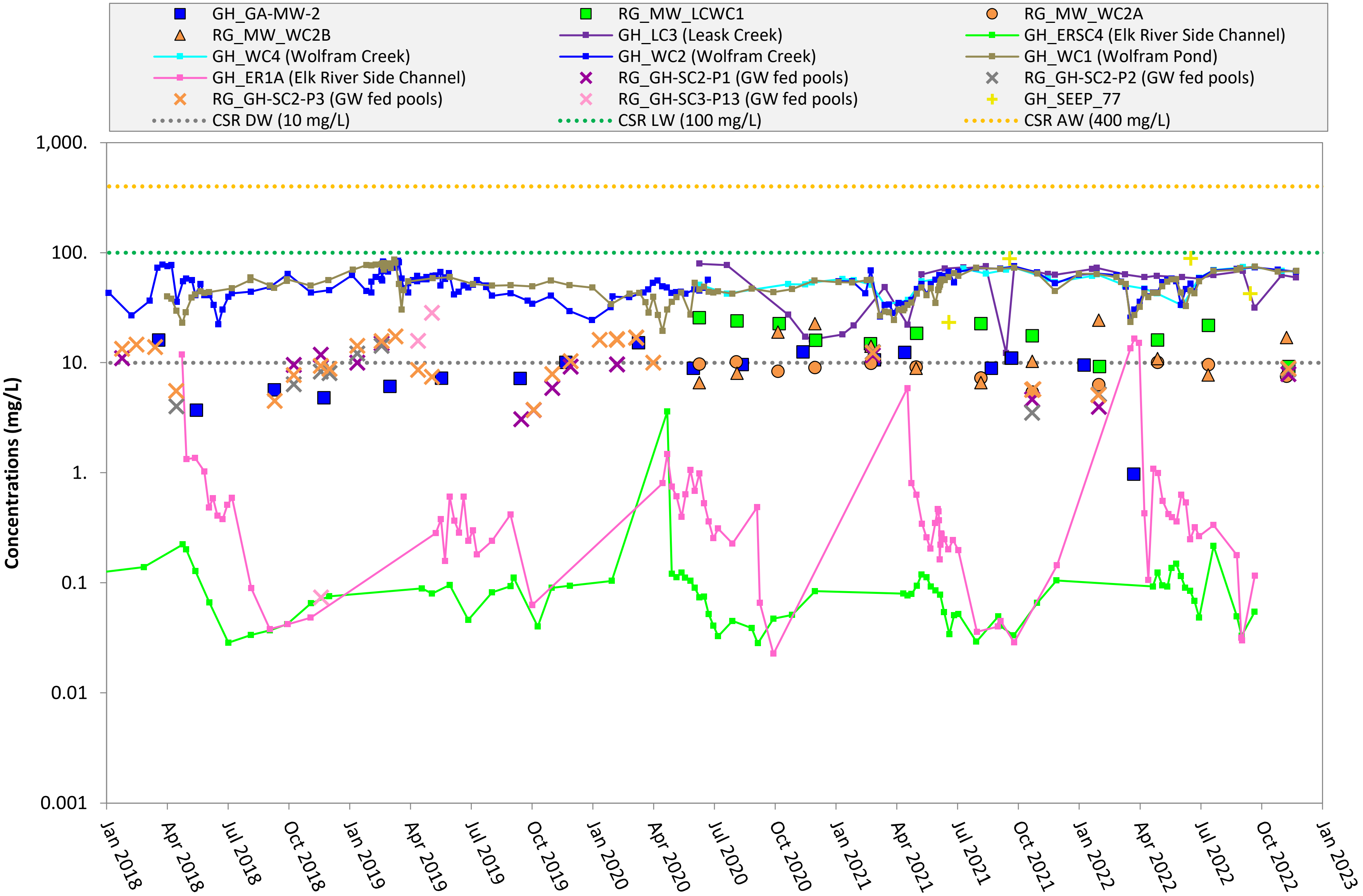
635544 / 2023 02 16
QAQC TYR

Figure GH-35: Elk River Valley Wolfram Watershed - Sulphate Concentrations



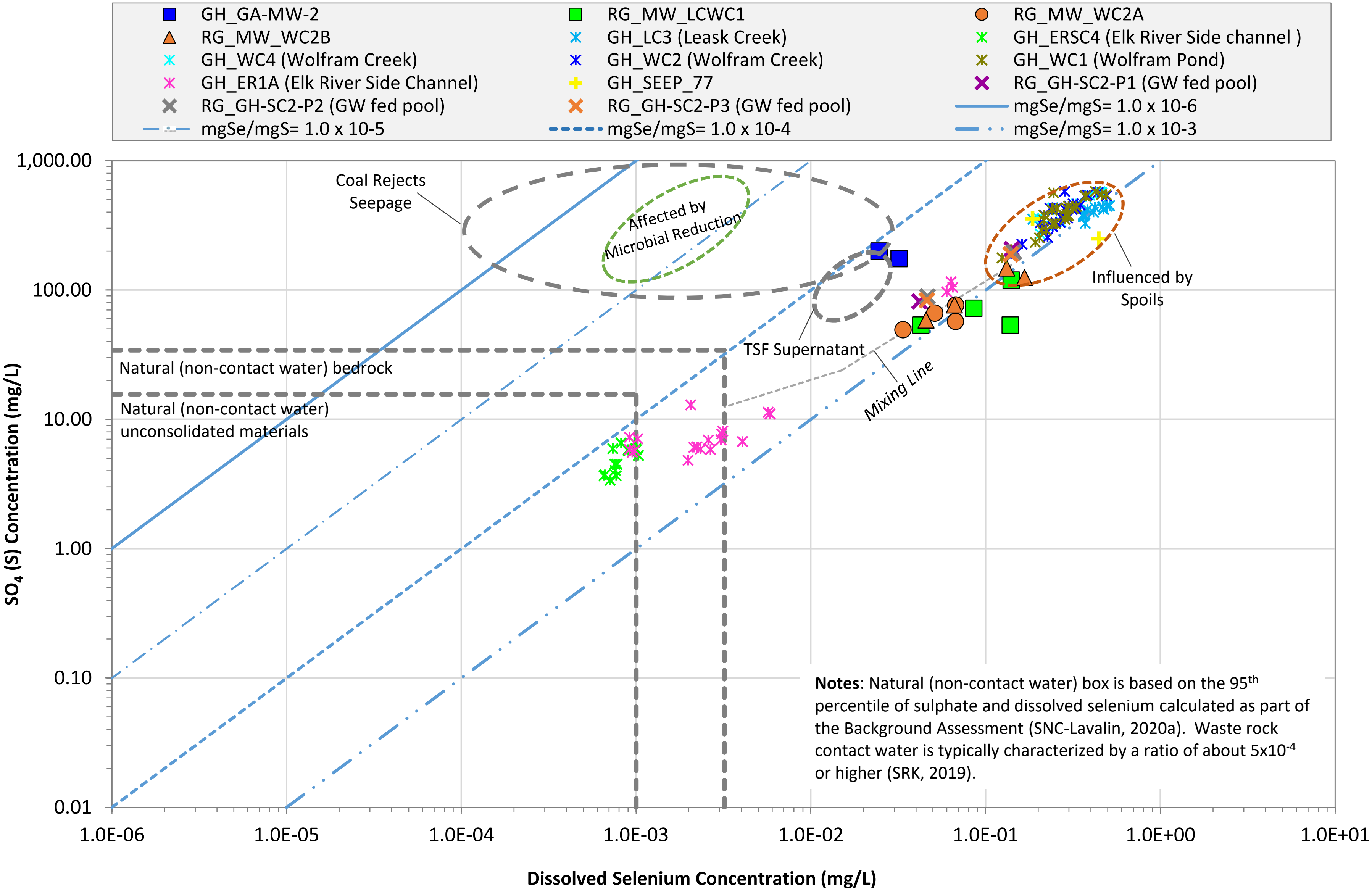
Note: For concentrations measured below the method detection limit, the method detection limit (0.3 mg/L) was utilized for plotting purposes. Logaritmic scale has been applied based on distribution of concentrations relative to applicable screening criteria.

Figure GH-36: Elk River Valley Wolfram Watershed - Nitrate-N Concentrations



Note: For concentrations measured below the method detection limit, the method detection limit (0.005 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

Figure GH-37: Elk River Valley Wolfram Watershed - Se:SO4 (S) Ratios



Notes: Natural (non-contact water) box is based on the 95th percentile of sulphate and dissolved selenium calculated as part of the Background Assessment (SNC-Lavalin, 2020a). Waste rock contact water is typically characterized by a ratio of about 5×10^{-4} or higher (SRK, 2019).

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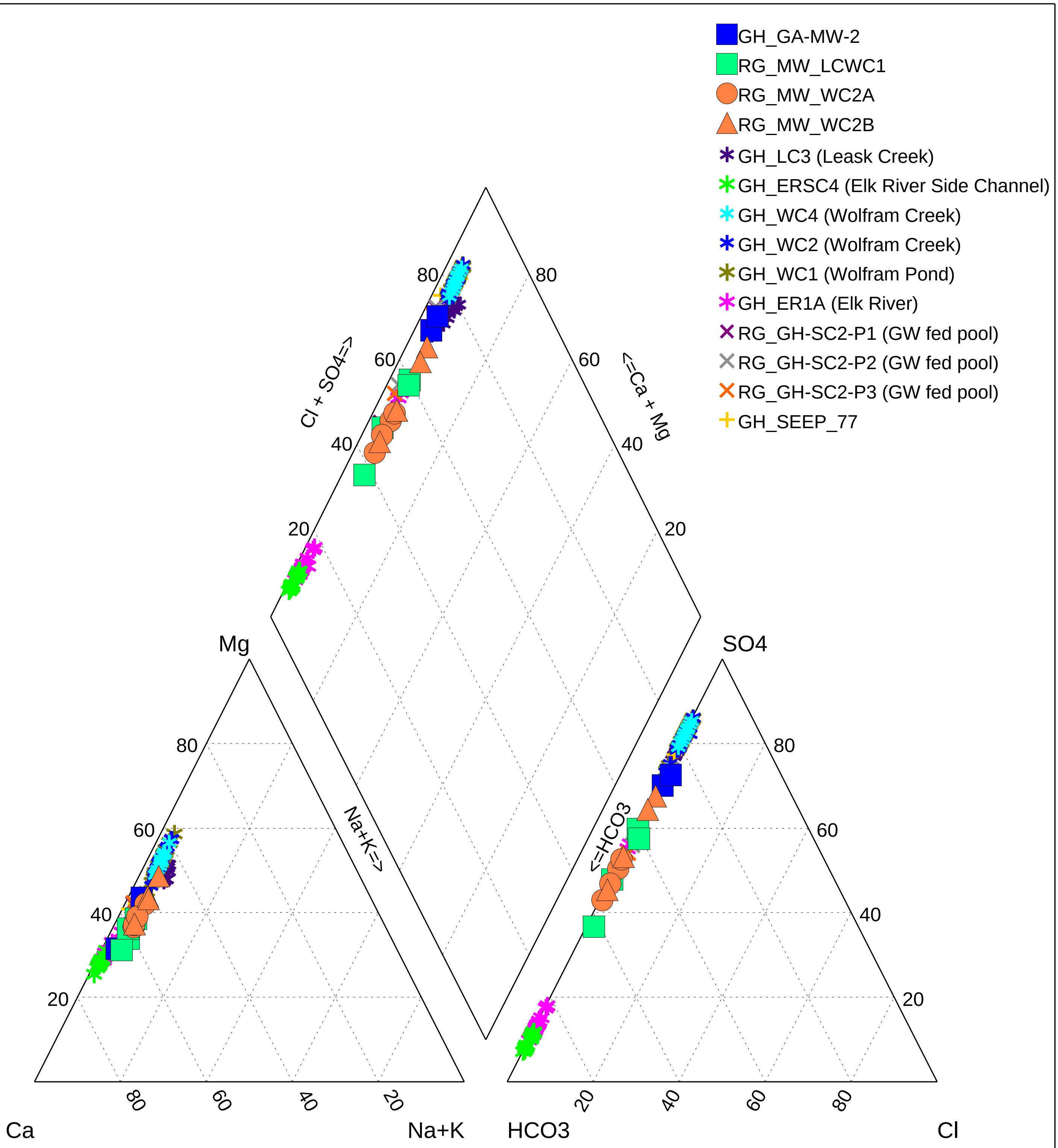
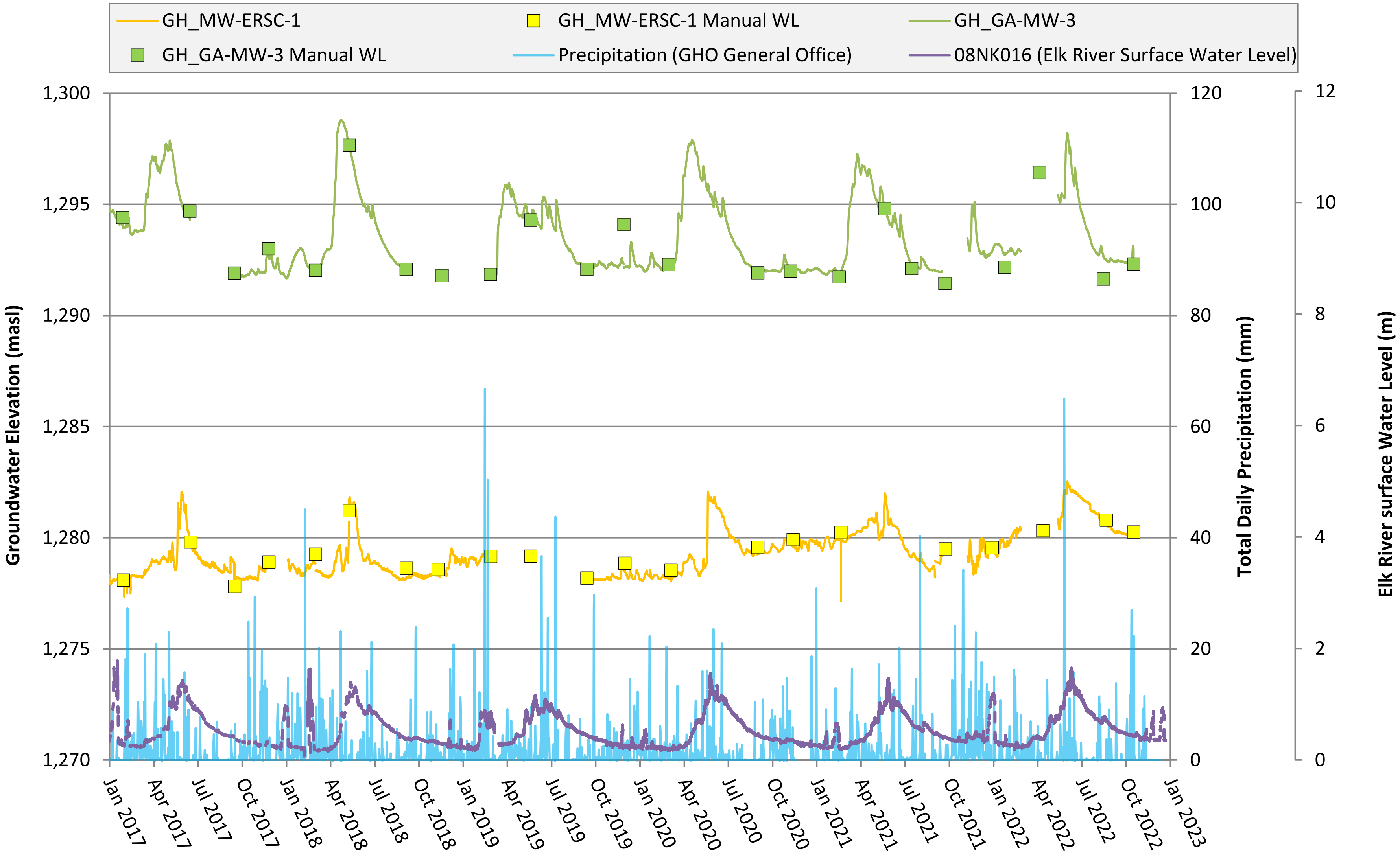


635544 / 2023 02 16
QAQC TYR

DESCRIPTION: Figure GH-38: Elk River Valley Wolfram Watershed - Piper Diagram

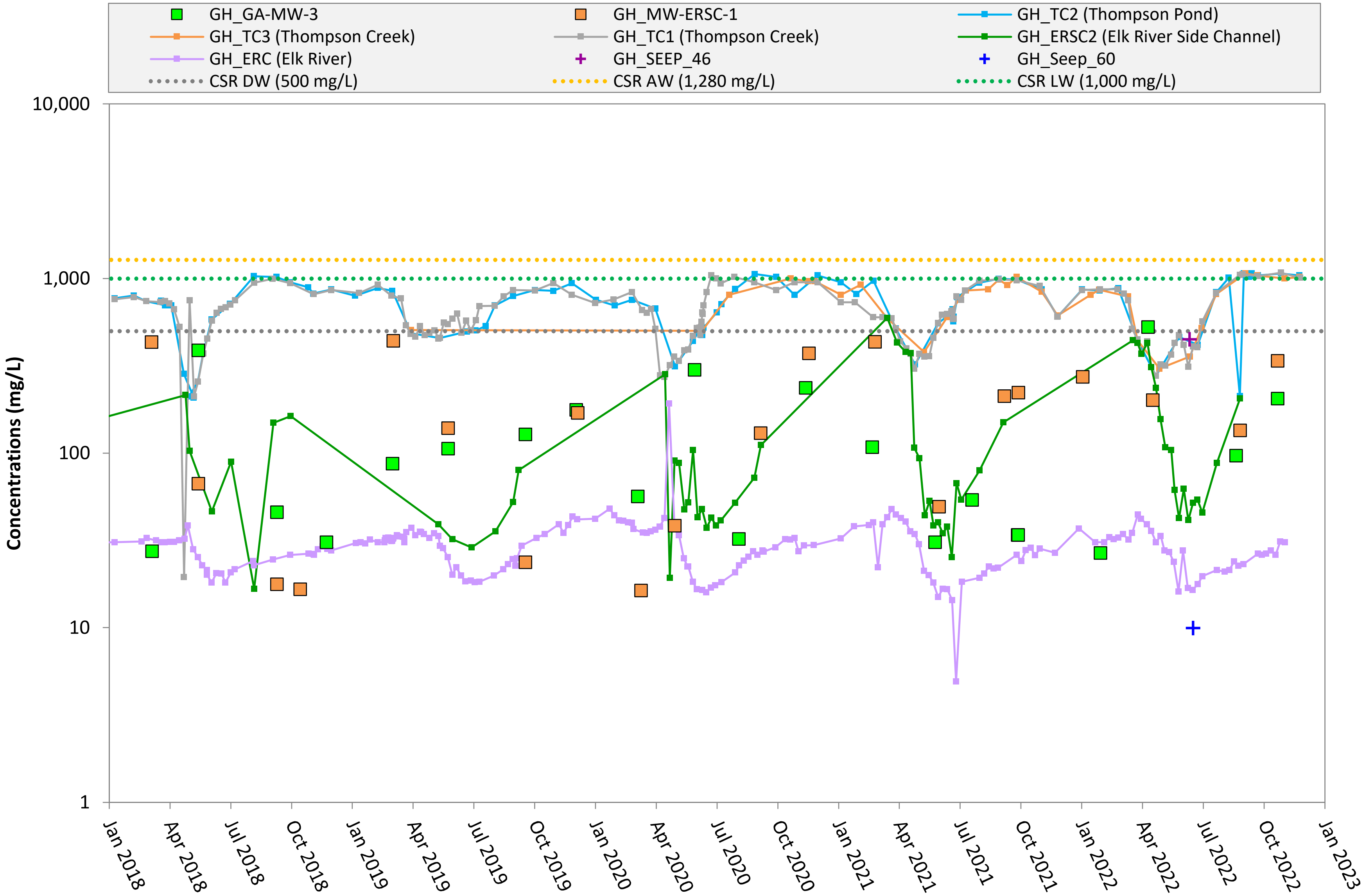
SNC·LAVALIN	PROJECT: 2022 RGMP SSGMP Annual Report	PROJECT NO: 635544
	CLIENT: Teck Coal Limited	DATE: 2023-02-13

Figure GH-39: Elk River Valley Thompson Watershed - Hydrograph



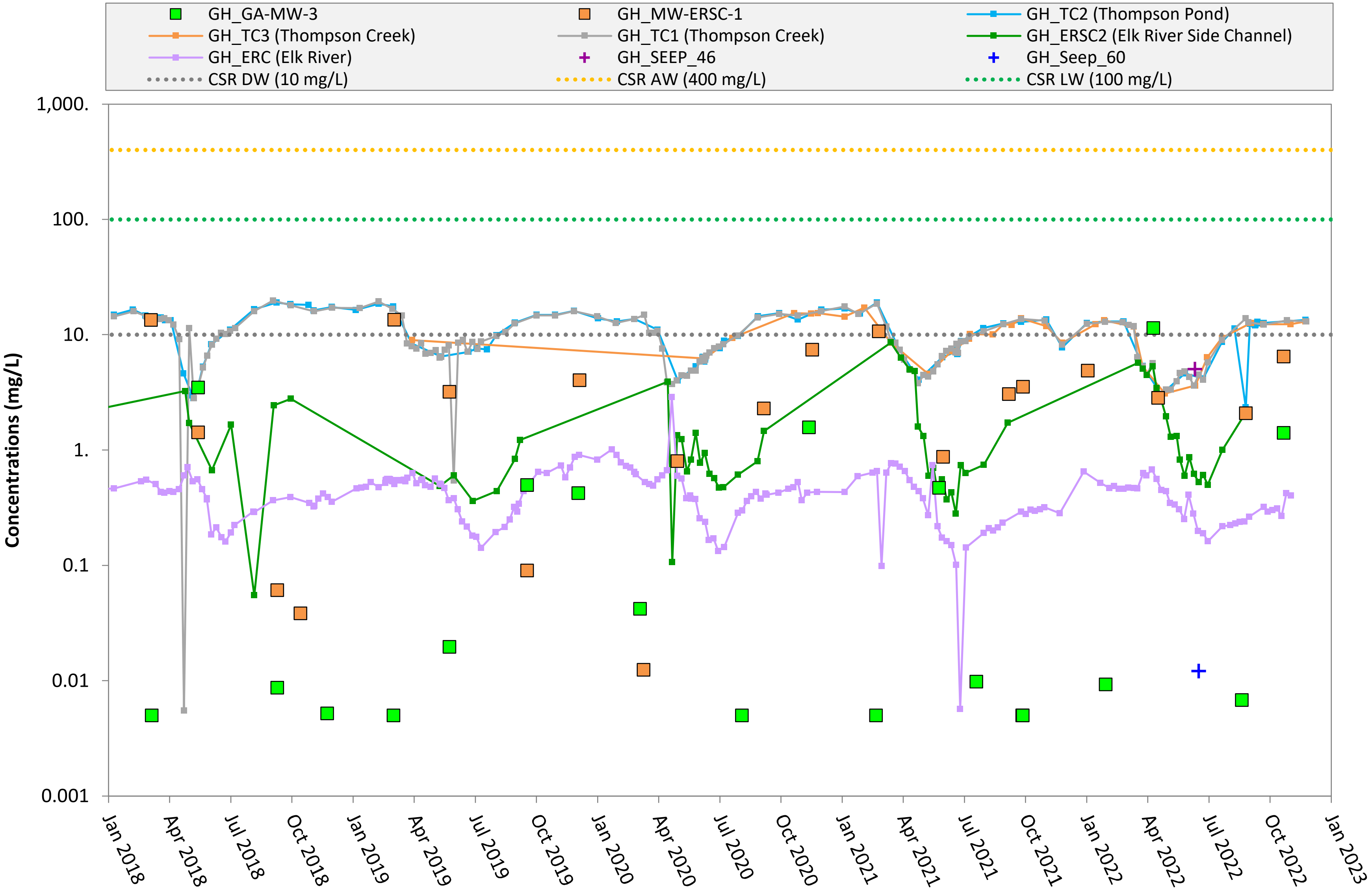
Note: Data was removed where suspected datalogger removal occurred. Precipitation data recorded on February 8, 17 and 18, 2018 have been removed as the data is inferred to be anomalous. Continuous water level data was compensated using barologger GH_MW_ERSC_1-BARO (GH_MW-ERSC-1). Surface water level data downloaded from Environment Canada Gauges: 08NK016-Elk River near Natal.

Figure GH-40: Elk River Valley **Thompson Watershed - Sulphate Concentrations**



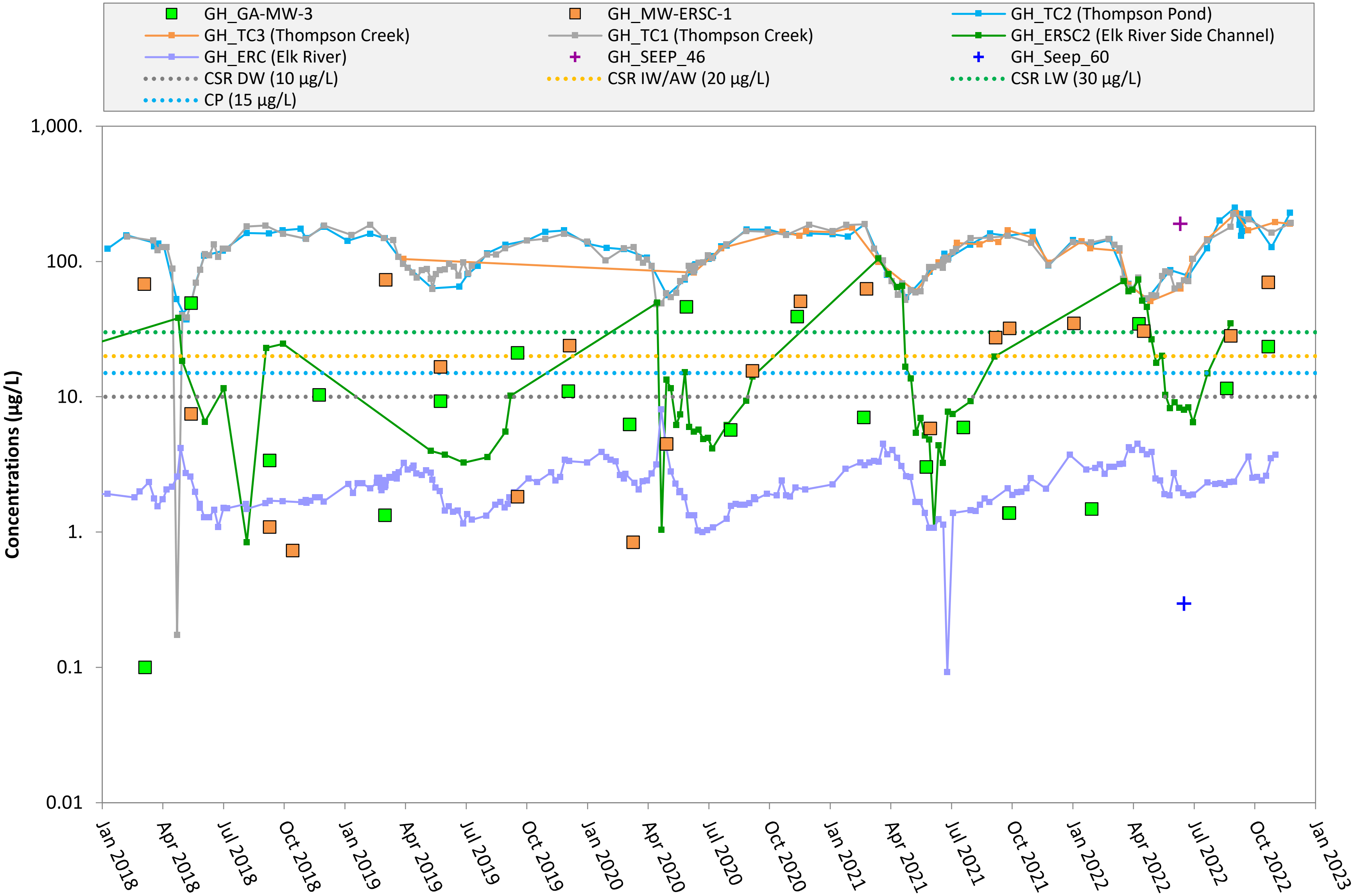
Note: For concentrations measured below the method detection limit, the method detection limit (0.3 mg/L) was utilized for plotting purposes. Logaritmic scale has been applied based on distribution of concentrations relative to applicable screening criteria.

Figure GH-41: Elk River Valley Thompson Watershed - Nitrate-N Concentrations



Note: For concentrations measured below the method detection limit, the method detection limit (0.005 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

Figure GH-42: Elk River Valley Thompson Watershed - Dissolved Selenium Concentrations



Note: For concentrations measured below the method detection limit, the method detection limit (0.05 µg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

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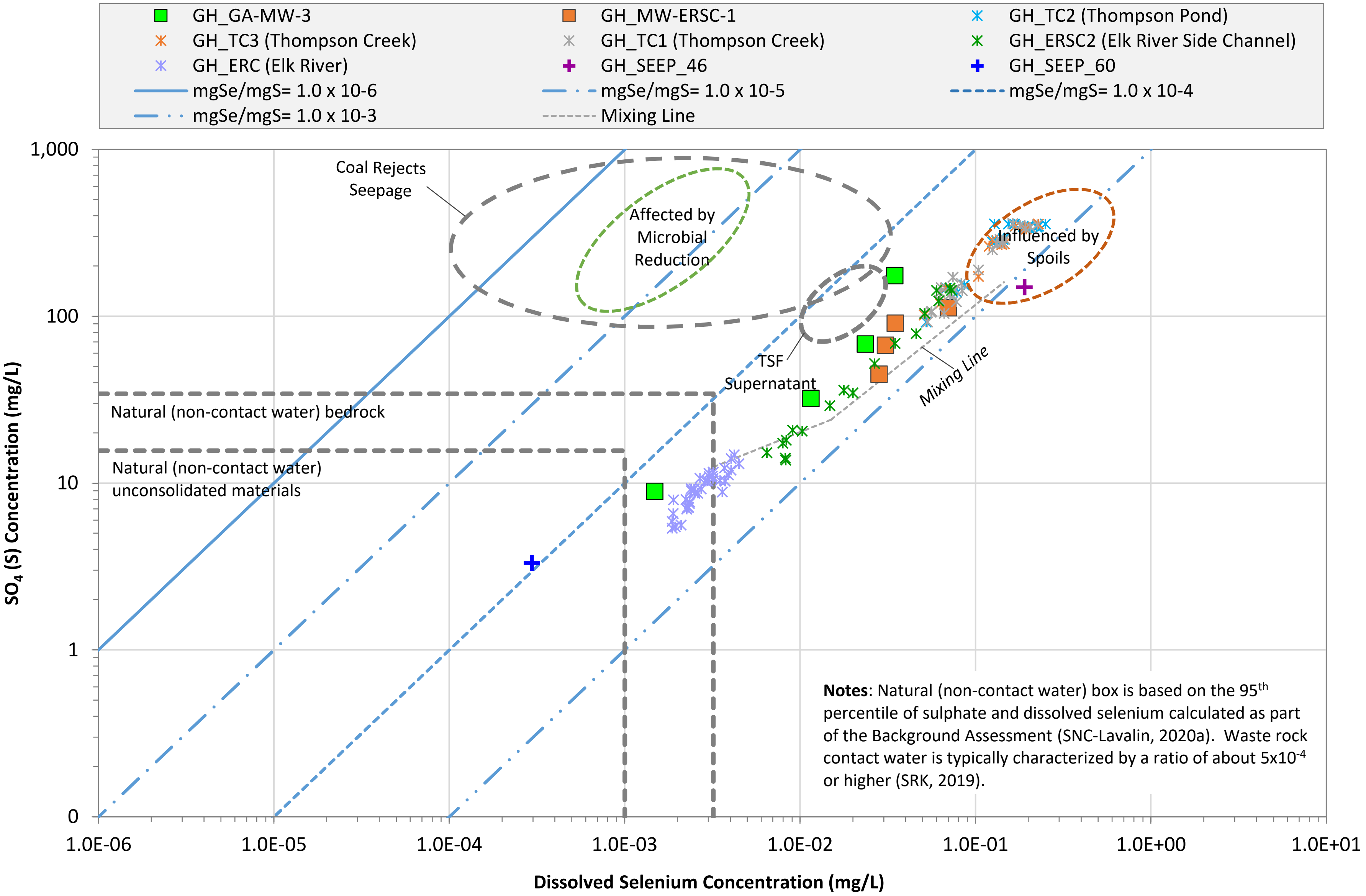
635544 / 2023 02 16
QAQC TYR

Figure GH-43: Elk River Valley Thompson Creek Watershed - Se:SO$_4$ (S) Ratios



Notes: Natural (non-contact water) box is based on the 95th percentile of sulphate and dissolved selenium calculated as part of the Background Assessment (SNC-Lavalin, 2020a). Waste rock contact water is typically characterized by a ratio of about 5x10^{-4} or higher (SRK, 2019).

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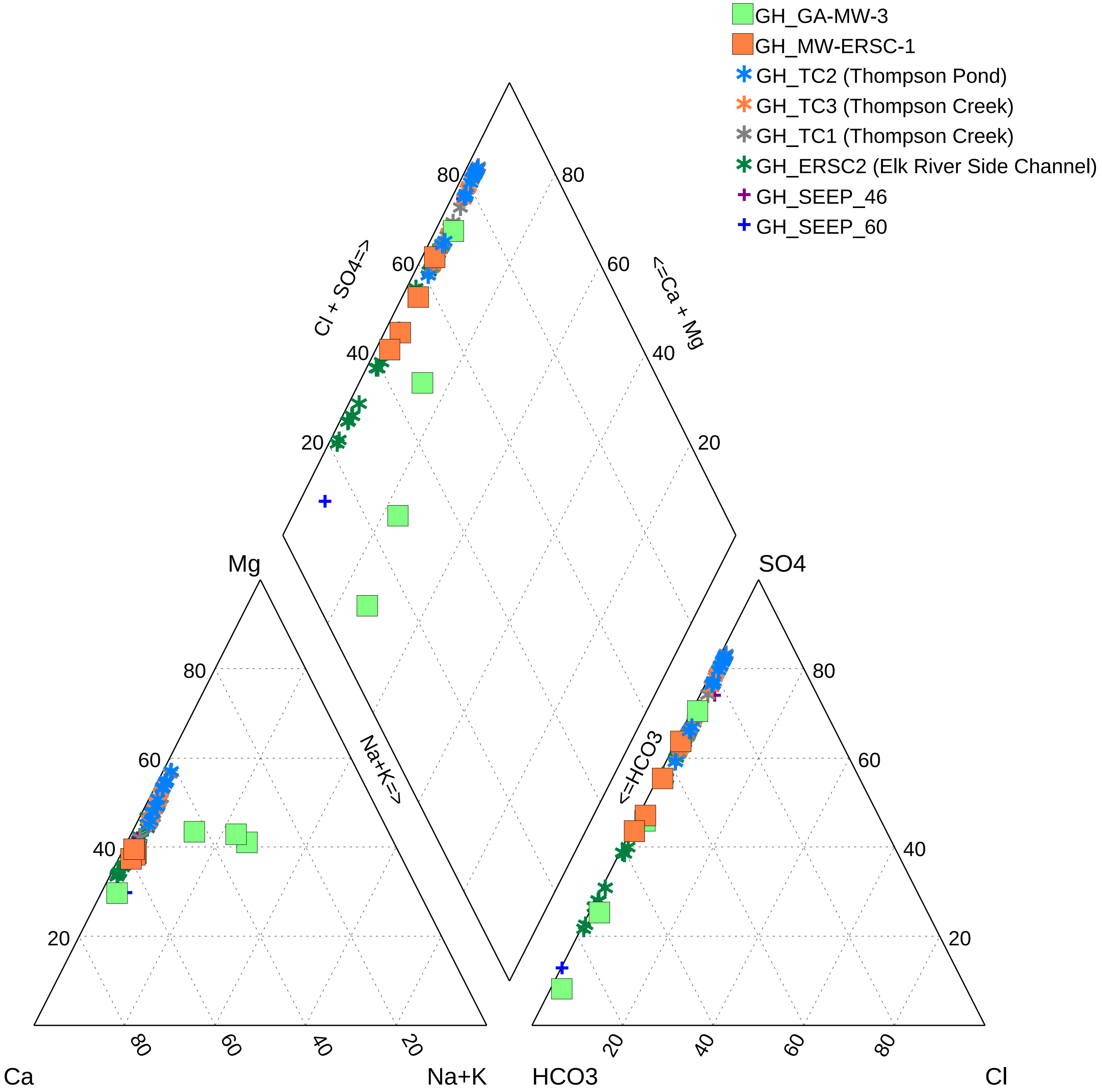
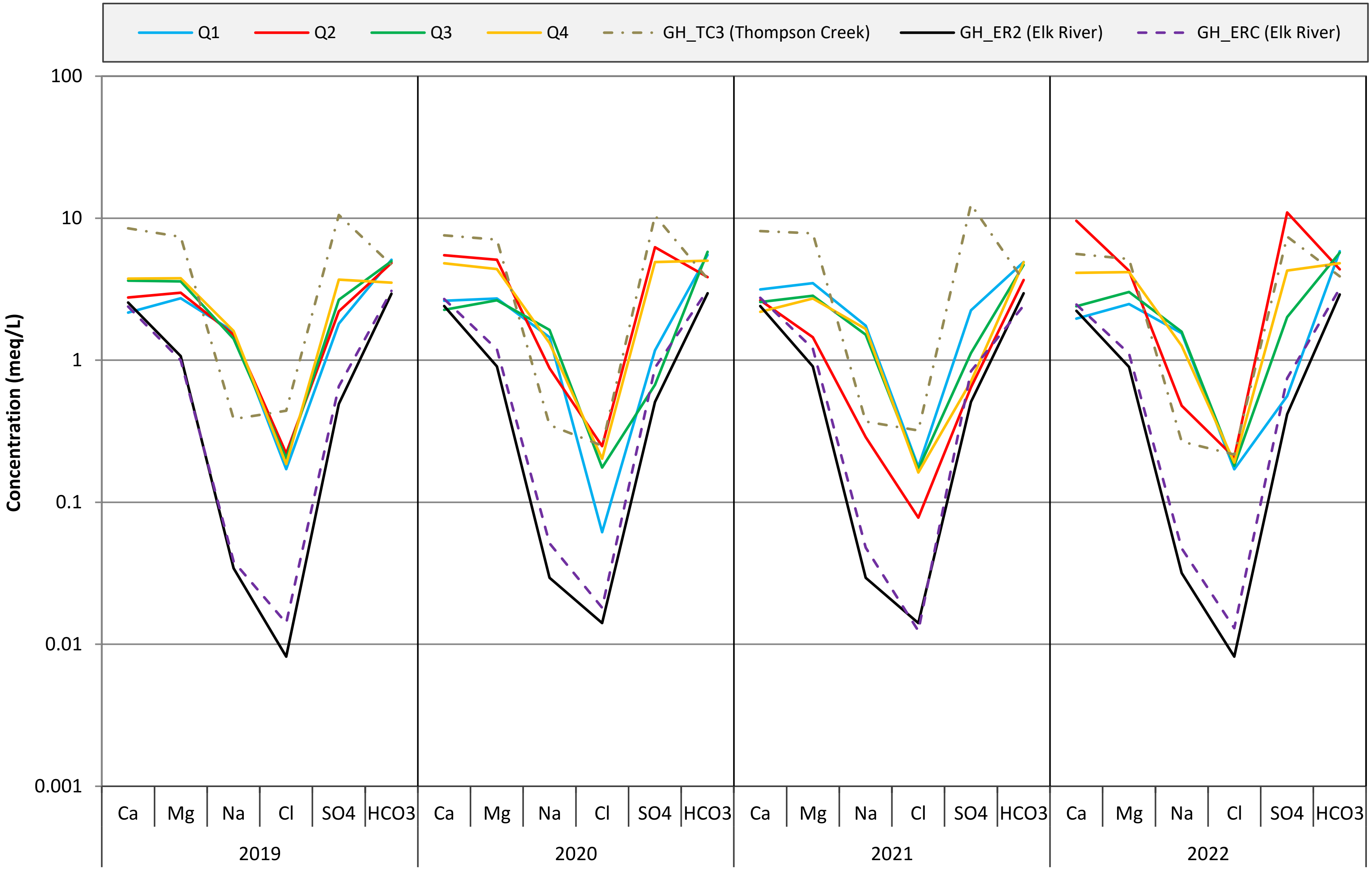


635544 / 2023 02 16
QAQC TYR

DESCRIPTION:	Figure GH-44: Elk River Valley Thompson Watershed - Piper Diagram

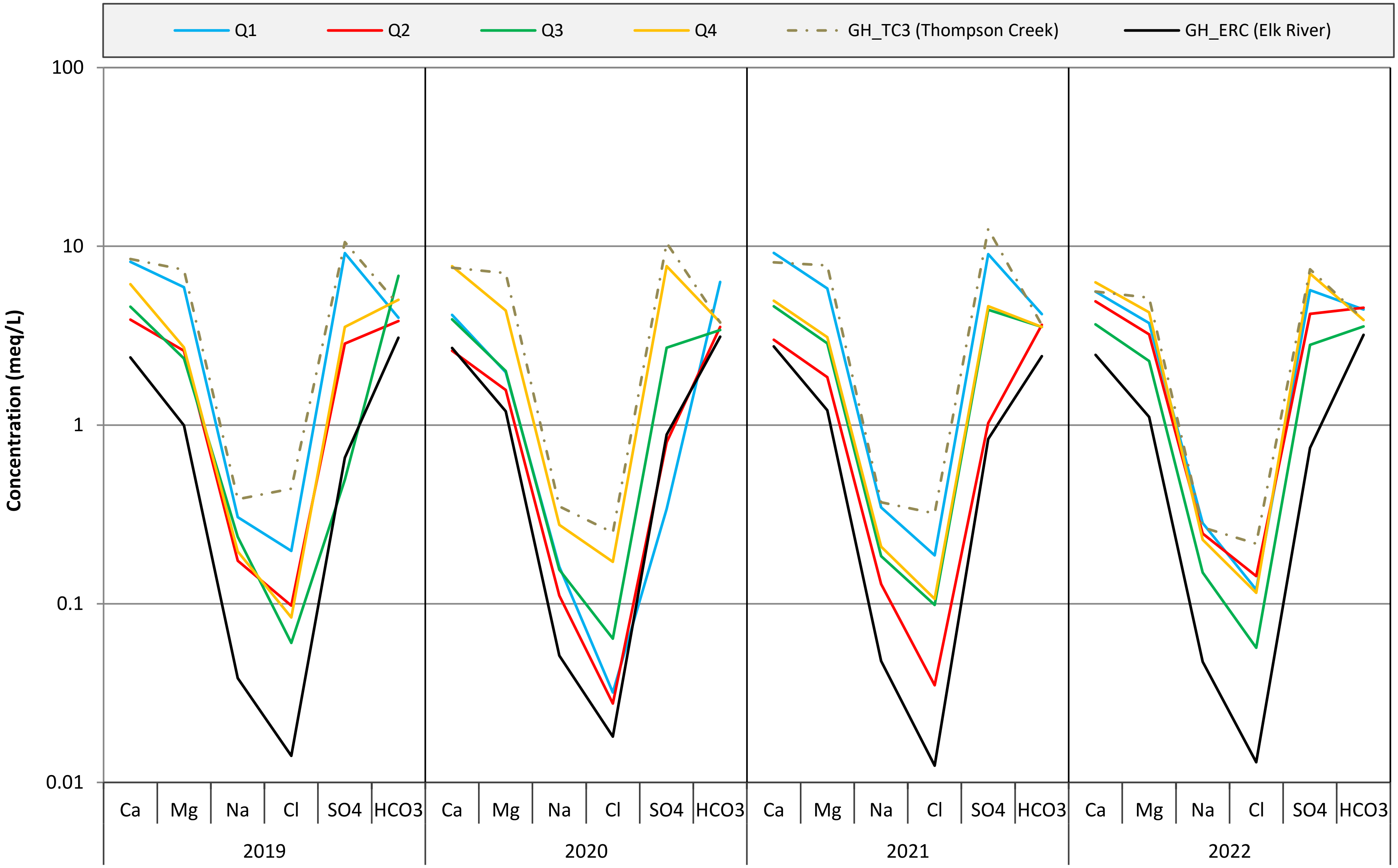
SNC·LAVALIN PEOPLE. DRIVE. RESULTS.	PROJECT: 2022 RGMP SSGMP Annual Report	PROJECT NO: 635544
	CLIENT: Teck Coal Limited	DATE: 2023-02-13

Figure GH-45: Elk River Valley Thompson Watershed (GH_GA-MW-3) - Schoeller Plot



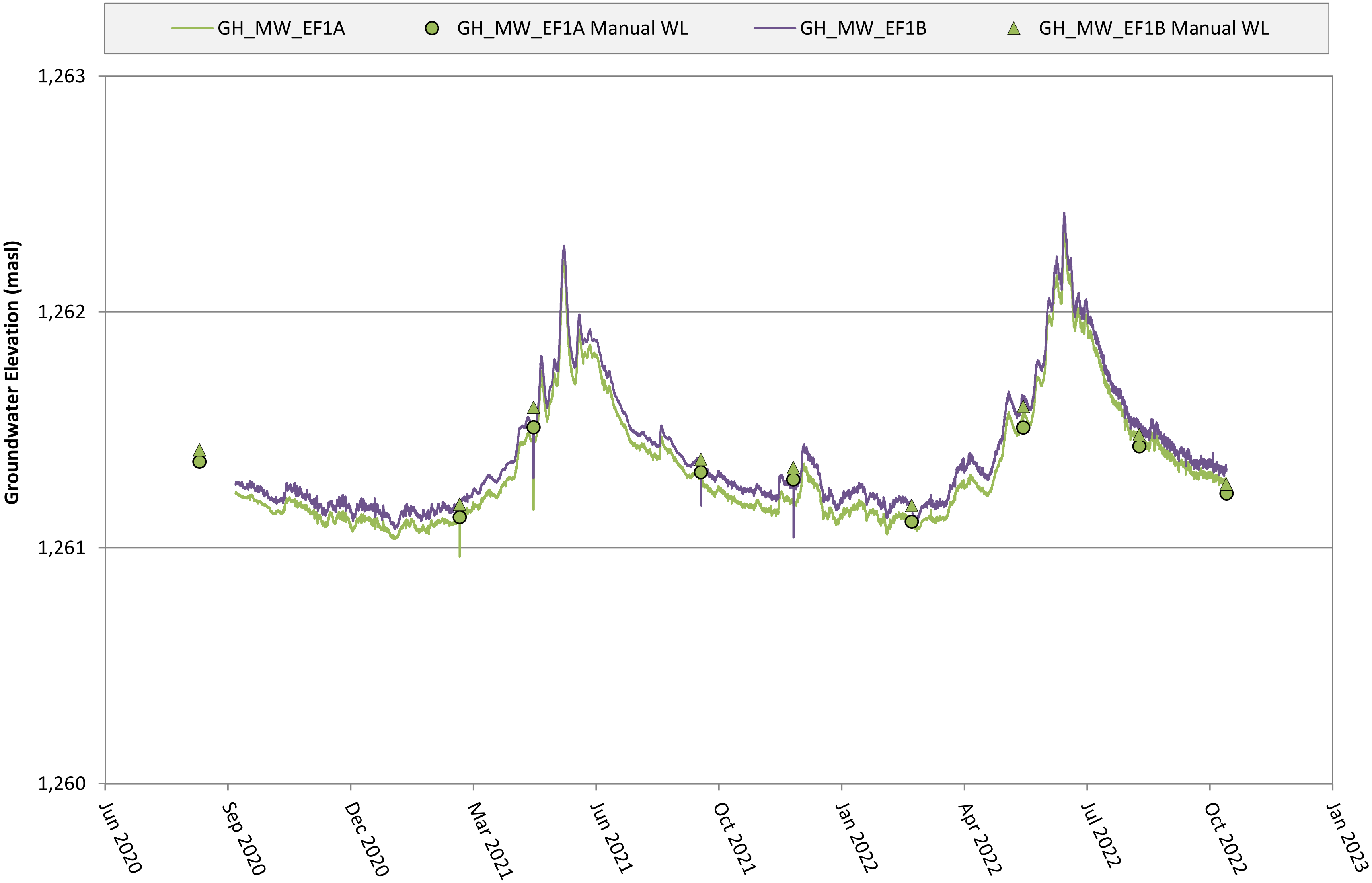
Note: Analytical data presented for surface water samples are from Q2.

Figure GH-46: Elk River Valley Thompson Watershed (GH_MW-ERSC-1) - Schoeller Plot



Note: Analytical data presented for surface water samples are from Q2.

Figure GH-47: Elk River Valley Downgradient - Hydrograph



Note: Data was removed where suspected datalogger removal occurred. Continuous water level data compensated using barologger GH_Barologger (GH_MW-Willow-1S).

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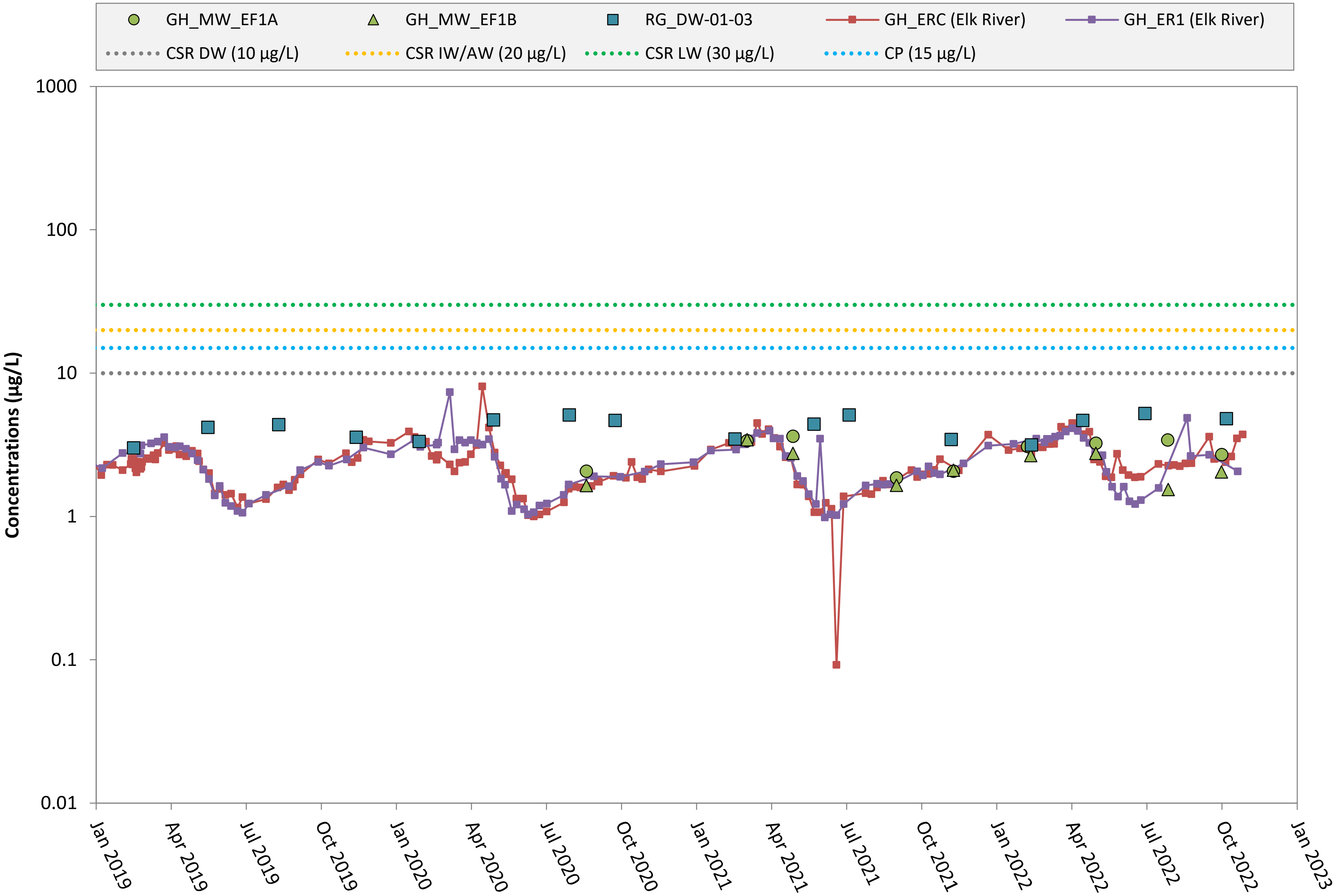
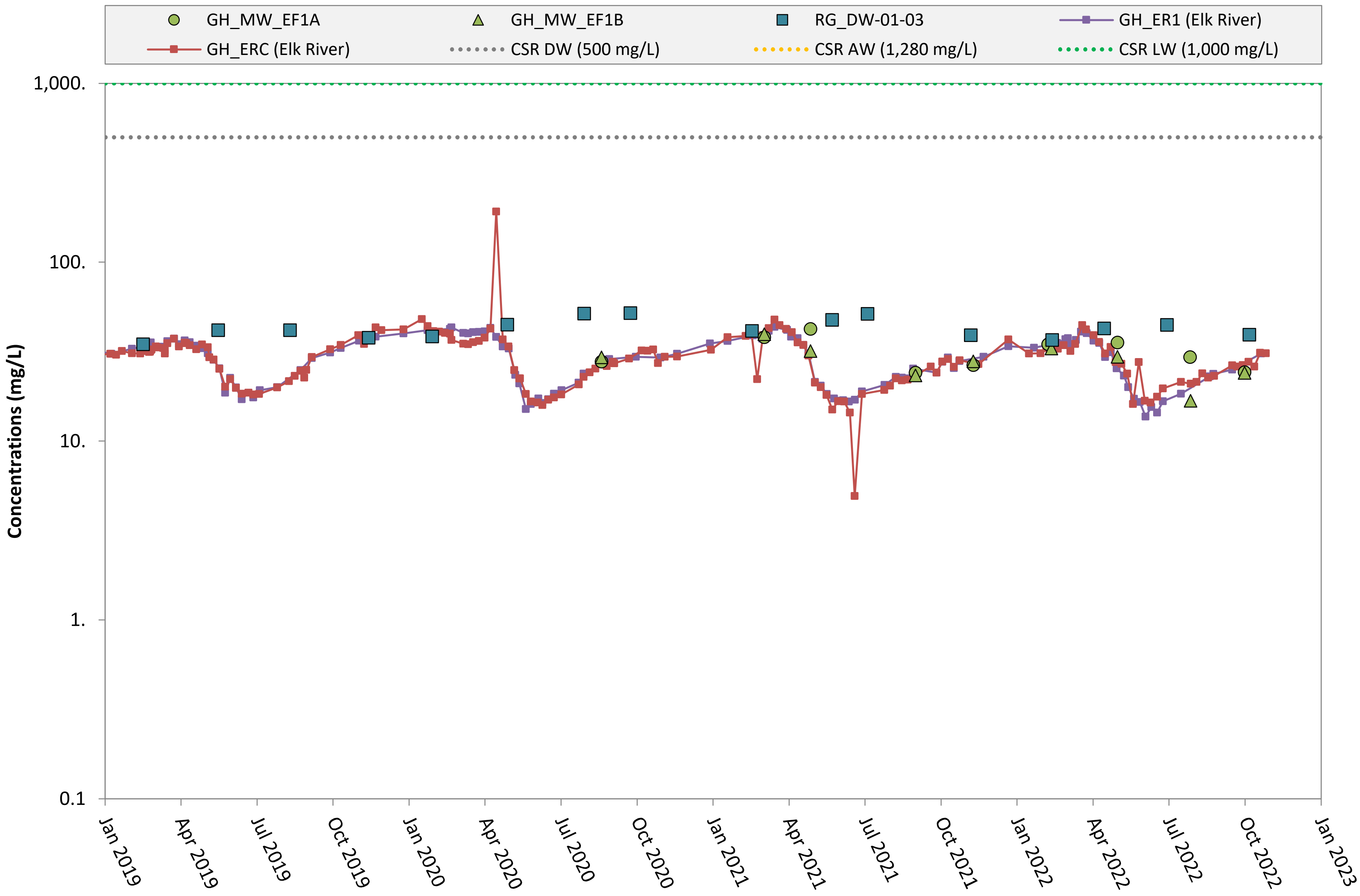
635544/2023-03-02
QAQC:TYR

Figure GH-48: Elk River Valley Downgradient - Dissolved Selenium Concentrations



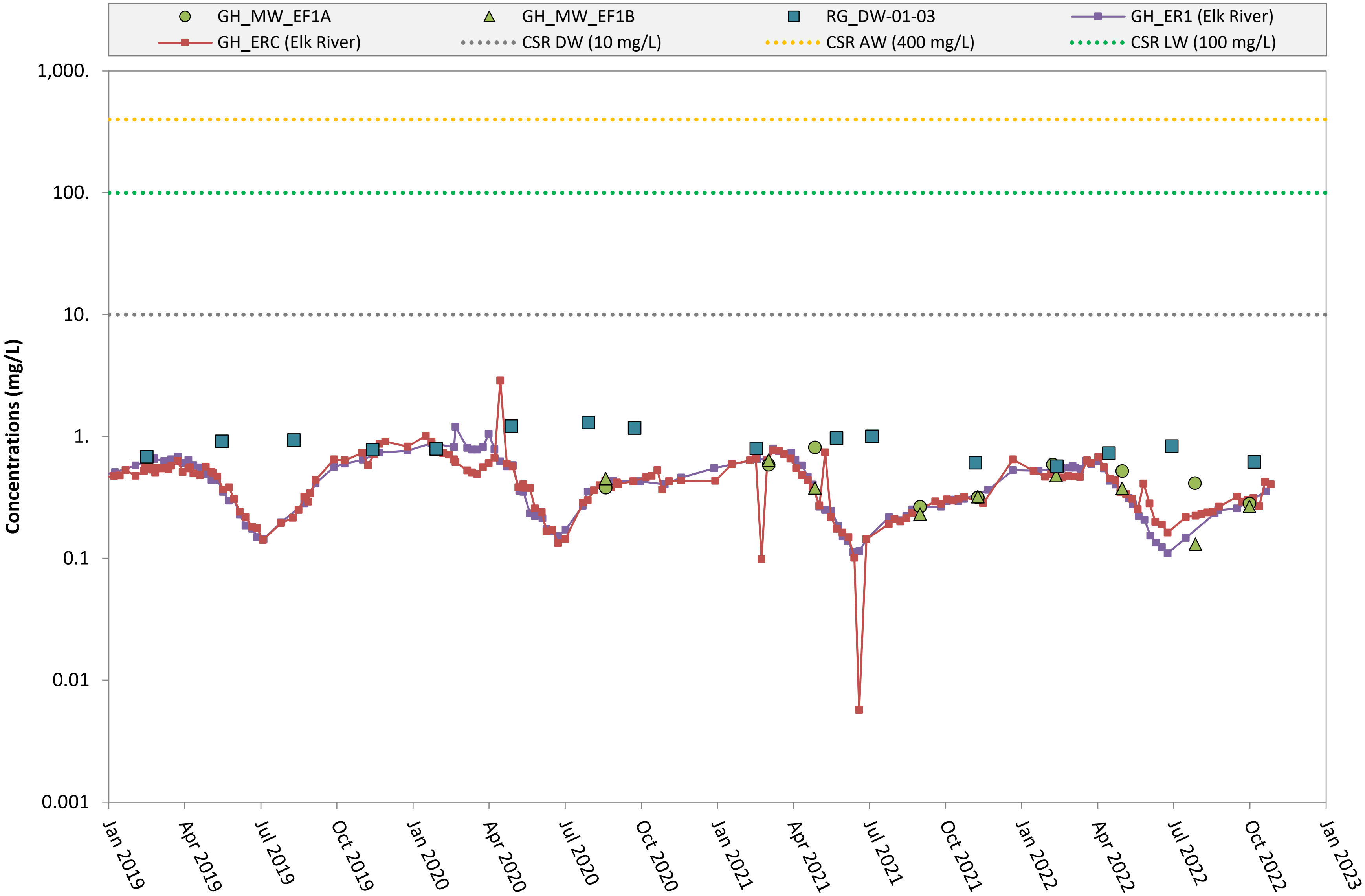
Note: For concentrations measured below the method detection limit, the method detection limit (0.05 µg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

Figure GH-49: Elk River Valley Downgradient - Sulphate Concentrations



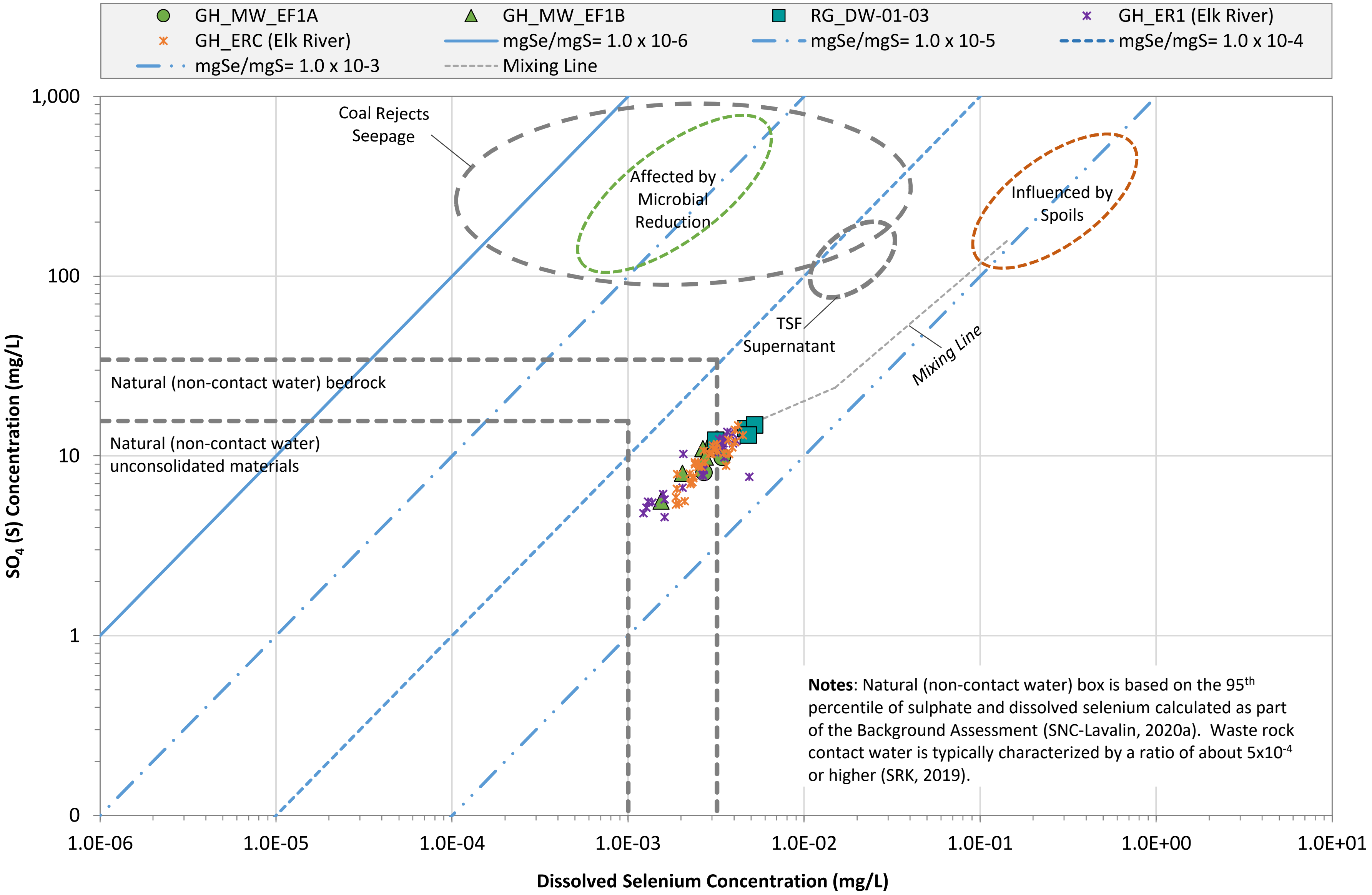
Note: For concentrations measured below the method detection limit, the method detection limit (0.3 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

Figure GH-50: Elk River Valley Downgradient - Nitrate-N Concentrations

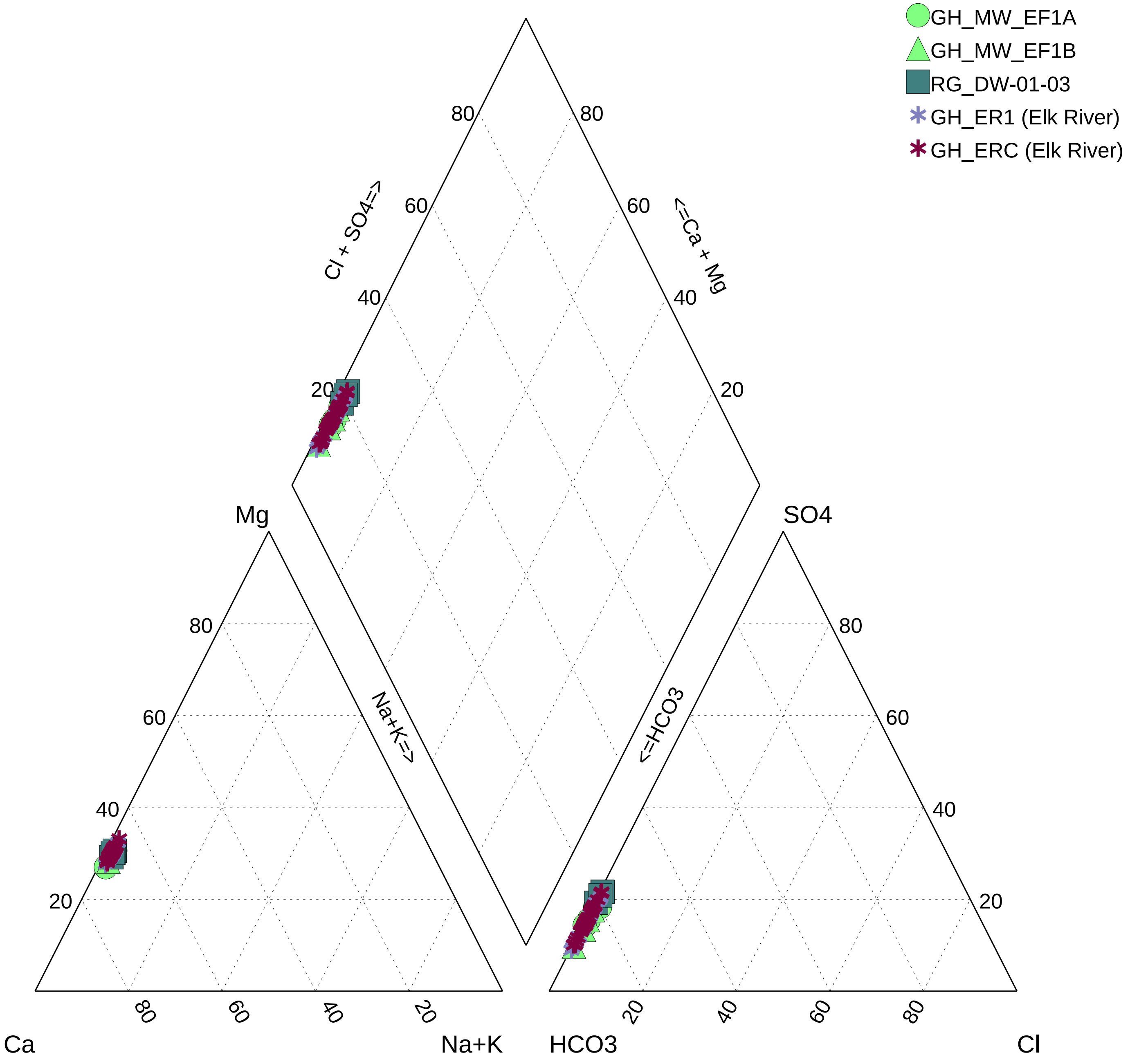


Note: For concentrations measured below the method detection limit, the method detection limit (0.005 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

Figure GH-51: Elk River Valley Downgradient - Se:SO$_4$ (S) Ratios



Notes: Natural (non-contact water) box is based on the 95th percentile of sulphate and dissolved selenium calculated as part of the Background Assessment (SNC-Lavalin, 2020a). Waste rock contact water is typically characterized by a ratio of about 5x10^{-4} or higher (SRK, 2019).



635544 / 2023 02 16
QAQC TYR

DESCRIPTION:	Figure GH-52: Elk River Valley Downgradient - Piper Diagram

SNC·LAVALIN PEOPLE. DRIVE. RESULTS.	PROJECT: 2022 RGMP SSGMP Annual Report	PROJECT NO: 635544
	CLIENT: Teck Coal Limited	DATE: 2023-02-04

Tables

TABLE GH-01: Summary of Well Installation Details and Hydrogeological Information

Area	Well ID	Monitoring Program[a]	Well Type	Monitoring Type[i]	Sampling Frequency		Logs (Y/N)	Coordinates (UTM NAD 83)		Ground Elevation	TOC Elevation	Stick Up Height	Drilled Depth	Well Diameter	Top of Screen Depth	Bottom of Screen Depth	Screened Formation	Depth to Bedrock	Hydraulic Conductivity
					Approved[j]	Recommended[k]		Easting	Northing	masl	masl	m	mbgs	mm	mbgs	mbgs		mbgs	m/s
Porter Creek Watershed (Fording River Valley)	GH_MW-PC	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	653483	5555356	1579.74	1580.94	1.20	45.0	51	3.5	6.5	Gravel and Cobbles	5.5	6.3E-07
	GH_MW-PC4A[b,f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	653498	5555426	1575.69	1576.76	1.07	18.1	51	16.5	18.1	Bedrock	9.6	6.5E-07
	GH_MW-PC4B[b,f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	653498	5555425	1575.75	1576.75	1.00	10.4	51	7.4	9.0	Sand and Gravel	9.6	-
Greenhills Creek Watershed (Fording River Valley)	GH_MW-GHC-1A[c]	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	654058[e]	5547202[e]	1596.42	1597.42	1.00	23.2	51	18.3	21.4	Bedrock	14.6	5.0E-05
	GH_MW-GHC-1B[d]	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	654056[e]	5547200[e]	1596.47	1597.40	0.93	14.6	51	4.6	7.6	Silty Gravel	14.6	3.0E-07
	GH_MW_GHC_4A[f]	SSGMP	Monitoring	WL	-	Q1, Q2, Q3, Q4	Y	653815	5546306	1525.71	1526.63	0.92	11.9	50	8.5	11.6	Bedrock	6.1	3.0E-08
	GH_MW_GHC_4B[f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	653810	5546308	1525.75	1526.73	0.98	5.8	50	1.5	4.6	Gravel and Sand	4.6	2.0E-04
	GH_MW-TD	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	652698	5546537	1590.72	1591.55	0.82	38.1	51	31.4	34.4	Sand and Silt	35.1	-
	GH_MW-RLP-2[f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	654081	5545333	1493.61	1494.54	0.93	10.6	50	3.5	5.0	Gravel and Cobbles	-	9.0E-04
	GH_POTW09	SSGMP, RGMP	Supply	S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	654208	5545404	1494.20	-	0.34	37.0	250	26.8	36.3	Silty Gravel	36.1	-
	GH_POTW10	SSGMP, RGMP	Supply	S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	653291	5545484	1486.00	-	0.00	53.6	-	49.0	52.0	Gravel and Cobbles	-	-
	GH_POTW15	SSGMP, RGMP	Supply	S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	653169	5545667	1490.30	-	1.04	43.9	-	41.5	43.9	Gravel and Cobbles	-	2.8E-04
	GH_POTW17	SSGMP, RGMP	Supply	S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	653698	5545811	1504.00	-	-	47.2	254	39.3	42.4	Sand and Gravel	-	2.5E-04
	RG_MW_FR11A[b,f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	652114	5545334	1500.12	1500.93	0.81	21.4	51	19.5	21.0	Bedrock	3.3	-
	RG_MW_FR11B[b,f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	652113	5545335	1500.15	1501.00	0.85	15.2	51	13.4	15.0	Bedrock	3.3	-
Elk River Valley	GH_MW-MC-1D	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	647979	5553565	1313.38	1314.33	0.96	47.2	51	30.4	31.9	Sand and Gravel	42.7	2.6E-04
	GH_MW-MC-1S	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	647979	5553565	1313.38	1314.33	0.95	47.2	51	9.3	10.8	Sand and Gravel	42.7	2.5E-03
	GH_MW-MC-2D	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	648211	5553498	1314.47	1315.49	1.02	16.8	51	12.2	15.2	Sand and Gravel	15.8	7.1E-08
	GH_MW-MC-2S	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	648211	5553498	1314.47	1315.48	1.01	16.8	51	4.5	6.0	Silt / Sand and Gravel	15.8	2.0E-05
	GH_GA-MW-4[h]	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	648217	5552960	1311.87	-	-	17.2	51	13.7	16.7	Sand and Gravel	-	1.0E-04
	RG_MW_LC3A[f]	SSGMP	Monitoring	WL, S		Q1, Q2, Q3, Q4	Y	648182	5552736	1318.63	1319.37	0.75	27.4	50	18.0	19.5	Sand and Gravel	-	2.2E-04
	RG_MW_LC3B[f]	SSGMP	Monitoring	WL, S		Q1, Q2, Q3, Q4	Y	648182	5552737	1318.61	1319.40	0.79	14.9	50	12.0	13.5	Gravel	-	1.6E-03

Notes:
a: SSGMP denotes GHO Site-Specific Groundwater Monitoring Program; RGMP denotes Regional Groundwater Monitoring Program.
b: Monitoring wells installed in 2021 to support the SSGMP and/or RGMP.
c: Previously known as GH_MW-GHC-1D.
d: Previously known as GH_MW-GHC-1S.
e: UTM coordinates obtained from LiDAR.
f: Monitoring wells added to the SSGMP Program as per the 2021 SSGMP Update.
g: Monitoring wells added to the RGMP Program as per the 2020 RGMP Update.
h: Monitoring well decommisioned September 2022.
i: WL = Water Level. S = Sample.
j: 2018 SSGMP Update Report (approved BC ENV March 2020).
k: 2019, 2020, and 2021 SSGMP Annual Reports; 2021 SSGMP Update Report.
masl denotes metres above sea level.
mbgs denotes metres below ground surface.
TOC denotes top of pipe casing.
"-" denotes data not available.

TABLE GH-01: Summary of Well Installation Details and Hydrogeological Information

Area	Well ID	Monitoring Program[a]	Well Type	Monitoring Type[i]	Sampling Frequency		Logs (Y/N)	Coordinates (UTM NAD 83)		Ground Elevation	TOC Elevation	Stick Up Height	Drilled Depth	Well Diameter	Top of Screen Depth	Bottom of Screen Depth	Screened Formation	Depth to Bedrock	Hydraulic Conductivity
					Approved[j]	Recommended[k]		Easting	Northing	masl	masl	m	mbgs	mm	mbgs	mbgs		mbgs	m/s
Elk River Valley	GH_GA-MW-2[h]	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	648294	5552115	1305.44	-	-	29.6	51	23.0	29.0	Sand/Silt	28.5	1.0E-03
	RG_MW_WC2A[f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	648196	5552079	1304.35	1305.19	0.84	30.5	50	21.1	22.6	Sand and Gravel	-	3.1E-04
	RG_MW_WC2B[f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	648197	5552079	1304.37	1305.11	0.74	7.6	50	4.3	5.8	Sand and Gravel	-	8.3E-04
	RG_MW_LCWC1[f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	648356	5552400	1310.82	1311.58	0.77	11.9	50	7.3	8.8	Sand and Gravel/Sand	-	4.2E-04
	GH_GA-MW-3	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	648577	5550302	1299.96	1300.90	0.94	14.4	51	8.0	14.0	Sand and Gravel	14.4	2.0E-06
	GH_MW-ERSC-1	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	649085	5548700	1283.70	1284.53	0.84	7.9	51	4.1	7.2	Till/Bedrock	6.1	3.0E-06
	GH_MW_EF1A[g]	RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	649058	5544459	1264.29	1265.21	0.92	27.4	50	22.6	24.1	Sand	-	3.2E-03
	GH_MW_EF1B[g]	RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	649057	5544457	1264.34	1265.13	0.79	7.6	50	5.4	7.0	Gravel	-	1.1E-03
	RG_DW-01-03 (Town Centre Well)	RGMP	Supply	S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	649089	5543336	-	-	-	28.0	-	-	-	Sand and Gravel	-	-

Notes:

a: SSGMP denotes GHO Site-Specific Groundwater Monitoring Program; RGMP denotes Regional Groundwater Monitoring Program.
b: Monitoring wells installed in 2021 to support the SSGMP and/or RGMP.
c: Previously known as GH_MW-GHC-1D.
d: Previously known as GH_MW-GHC-1S.
e: UTM coordinates obtained from LiDAR.
f: Monitoring wells added to the SSGMP Program as per the 2021 SSGMP Update.
g: Monitoring wells added to the RGMP Program as per the 2020 RGMP Update.
h: Monitoring well decommisioned September 2022.
i: WL = Water Level. S = Sample.
j: 2018 SSGMP Update Report (approved BC ENV March 2020).
k: 2019, 2020, and 2021 SSGMP Annual Reports; 2021 SSGMP Update Report.
masl denotes metres above sea level.
mbgs denotes metres below ground surface.
TOC denotes top of pipe casing.
"-" denotes data not available.

TABLE GH-02: Summary of Groundwater Levels and Sampling Information (GHO)

Area	Well ID	Ground Elevation	TOC Elevation	Stick Up Height	Date of Static Water Level Measurement	Depth to Water	Potentiometric Elevation	Well Pairs	Calculated Vertical Gradient		Continuous Water Level Monitoring	Purging / Sampling Methodology
		masl	masl	m	yyyy-mm-dd	mbtoc	masl		m/m	Direction		
Porter Creek Watershed (Fording River Valley)	GH_MW-PC	1579.74	1580.94	1.20	2022-03-16	4.80	1576.14	-	-	-	Yes	Bladder
					2022-06-01	4.42	1576.52					
					2022-08-08	4.78	1576.16					
					2022-11-25	4.86	1576.08					
	GH_MW-PC4A	1575.69	1576.76	1.07	2022-03-16	12.62	1564.14	-	-	-	-	Geosub
					2022-06-08	12.36	1564.40					Bladder
					2022-09-07	12.54	1564.22					
					2022-11-18	12.80	1563.96					
	GH_MW-PC4B	1575.75	1576.75	1.00	2022-03-14	Dry	-	-	-	-	-	-
Greenhills Creek Watershed (Fording River Valley)	GH_MW-GHC-1A	1596.42	1597.42	1.00	2022-02-18	9.01	1588.41	GH_MW-GHC-1B and GH_MW-GHC-1A	-0.573	Downward	Yes	Bladder
					2022-04-27	8.25	1589.17		-0.515	Downward		
					2022-09-09	8.52	1588.90		-0.410	Downward		
					2022-11-23	8.64	1588.78		-0.426	Downward		Geosub
	GH_MW-GHC-1B	1596.47	1597.40	0.93	2022-02-18	1.08	1596.32	-	-	-	Yes	Bladder
					2022-04-27	1.12	1596.28					
					2022-09-09	2.84	1594.56					
					2022-11-23	2.74	1594.66					
	GH_MW_GHC_4A	1525.71	1526.63	0.92	2022-03-14	3.45	1523.18	GH_MW-GHC_4B and GH_MW-GHC_4A	-0.162	Downward	Yes	Peristaltic
					-	-	-		-	-		
					-	-	-		-	-		
					2022-11-16	4.38	1522.25		-0.222	Downward		
	GH_MW_GHC_4B	1525.75	1526.73	0.98	2022-03-14	2.41	1524.32	-	-	-	Yes	Peristaltic
					2022-05-31	2.80	1523.94					
					2022-09-13	3.12	1523.61					
					2022-11-16	2.92	1523.81					
	GH_MW-TD	1590.72	1591.55	0.82	2022-02-17	Artesian	-	-	-	-	-	Artesian
					2022-04-28	Artesian	-					
					-	-	-					
					2022-11-16	Artesian	-					
	GH_MW_RLP-2	1493.61	1494.54	0.93	2022-02-09	2.70	1491.84	-	-	-	-	Bladder
					2022-05-20	2.50	1492.04					-
					2022-09-15	2.50	1492.04					Bladder
					2022-11-18	2.68	1491.86					
	GH_POTW09	1494.20	-	0.34	2022	-	-	-	-	-	-	Tap
	GH_POTW10	1486.00	-	0.00	2022	-	-	-	-	-	-	Tap
	GH_POTW15	1490.30	-	1.04	2022	-	-	-	-	-	-	Tap
	GH_POTW17	1504.00	-	-	2022	-	-	-	-	-	-	Tap
	RG_MW_FR11A	1500.12	1500.93	0.81	2022-03-15	14.92	1486.01	GH_MW-FR11B and GH_MW-FR11A	-0.985	Downward	Yes	Geosub
					2022-06-01	14.50	1486.43		-1.014	Downward		Bladder
					2022-09-13	14.75	1486.18		-1.063	Downward		Geosub
					2022-11-24	14.77	1486.16		-1.181	Downward		
	RG_MW_FR11B	1500.15	1501.00	0.85	2022-03-15	8.91	1492.09	-	-	-	Yes	Geosub
					2022-06-01	8.32	1492.68					Bladder
					2022-09-13	8.26	1492.74					Geosub
					2022-11-24	7.55	1493.45					
Mickelson Watershed (Elk River Valley)	GH_MW-MC-1D	1313.38	1314.33	0.96	2022-03-08	3.12	1311.22	GH_MW-MC-1D and GH_MW-MC-1S	0.022	Upward	Yes	Peristaltic
					2022-06-13	1.28	1313.06		-0.005	Downward		
					2022-08-23	2.88	1311.46		0.016	Upward		
					2022-10-26	3.18	1311.15		-	-		
	GH_MW-MC-1S	1313.38	1314.33	0.95	2022-03-08	3.59	1310.74	-	-	-	Yes	Peristaltic
					2022-06-13	1.17	1313.16					
					2022-09-03	3.21	1311.12					
					2022-10-26	3.68	1310.65					
	GH_MW-MC-2D	1314.47	1315.49	1.02	2022-03-08	2.74	1312.84	GH_MW-MC-2D and GH_MW-MC-2S	0.274	Upward	Yes	Peristaltic
					2022-06-15	2.10	1313.39		0.151	Upward		
					2022-08-24	2.56	1312.94		0.286	Upward		
					2022-10-26	2.65	1312.84		0.283	Upward		
	GH_MW-MC-2S	1314.47	1315.48	1.01	2022-03-08	4.95	1310.53	-	-	-	Yes	Peristaltic
					2022-06-15	3.36	1312.13					
					2022-08-24	4.95	1310.53					
					2022-10-26	5.02	1310.46					

Notes:
TOC denotes top of casing.
masl denotes meters above sea level.
mbtoc denotes meters below top of casing.
"-" denotes data not available.
Quarter is represented as Q1, Q2, Q3, Q4.

TABLE GH-02: Summary of Groundwater Levels and Sampling Information (GHO)

Area	Well ID	Ground Elevation	TOC Elevation	Stick Up Height	Date of Static Water Level Measurement	Depth to Water	Potentiometric Elevation	Well Pairs	Calculated Vertical Gradient		Continuous Water Level Monitoring	Purging / Sampling Methodology
		masl	masl	m	yyyy-mm-dd	mbtoc	masl		m/m	Direction		
Leask Watershed (Elk River Valley)	GH_GA-MW-4[a]	1311.58	1312.52	0.94	2022-02-09	6.31	1306.21	-	-	-	Yes	Bladder
					2022-04-21	5.81	1306.71					
					-	-	-					-
					-	-	-					
	RG_MW_LC3A	1318.63	1319.37	0.75	2022-02-11	15.80	1303.58	GH_MW_LC3A and GH_MW_LC3B	-0.309	Downward	Yes	-
					2022-05-10	13.95	1305.43		-0.202	Downward		Geosub
					2022-07-26	13.82	1305.55		-0.191	Downward		
					2022-11-21	15.29	1304.08		-0.261	Downward		
	RG_MW_LC3B	1318.61	1319.40	0.79	2022-02-11	14.19	1305.21	-	-	-	Yes	Geosub
					2022-05-10	12.76	1306.64					
					2022-07-26	12.71	1306.69					
					2022-11-21	13.90	1305.50					
Wolfram Drainage (Elk River Valley)	GH_GA-MW-2[a]	1305.04	1306.13	1.02	2022-01-19	5.25	1300.88	-	-	-	Yes	Bladder
					2022-04-22	5.19	1300.94					
					-	-	-					
					-	-	-					
	RG_MW_WC2A	1304.35	1305.19	0.84	2022-02-10	4.73	1300.46	GH_MW_WC2A and GH_MW_WC2B	-0.011	Downward	Yes	-
					2022-05-10	3.43	1301.76		-0.013	Downward		Peristaltic
					2022-07-26	3.39	1301.80		-0.013	Downward		
					2022-11-21	4.57	1300.62		-0.012	Downward		
	RG_MW_WC2B	1304.37	1305.11	0.74	2022-02-10	4.46	1300.65	-	-	-	Yes	-
					2022-05-10	3.14	1301.98					Peristaltic
					2022-07-26	3.10	1302.01					
					2022-11-21	4.30	1300.81					
	RG_MW_LCWC1	1310.82	1311.58	0.77	2022-02-11	8.50	1303.08	-	-	-	Yes	-
					2022-05-10	7.17	1304.41					Geosub
					2022-07-26	7.19	1304.39					
					2022-11-25	8.35	1303.23					
Thompson Watershed (Elk River Valley)	GH_GA-MW-3	1299.96	1300.90	0.94	2022-02-09	8.73	1292.17	-	-	-	Yes	Bladder
					2022-04-22	4.46	1296.44					
					2022-09-02	9.26	1291.64					
					2022-11-04	8.58	1292.32					
	GH_MW-ERSC-1	1283.70	1284.53	0.84	2022-01-13	4.97	1279.56	-	-	-	Yes	Bladder
					2022-04-29	4.20	1280.33					
					2022-09-08	3.74	1280.79					
					2022-11-04	4.27	1280.26					
Elk River Valley Bottom near Elkford	GH_MW_EF1A	1264.29	1265.21	0.92	2022-02-24	4.10	1261.11	GH_MW_EF1A and GH_MW_EF1B	-0.004	Downward	Yes	Peristaltic
					2022-05-19	3.70	1261.51		-0.005	Downward		
					2022-08-15	3.78	1261.43		-0.003	Downward		
					2022-10-20	3.98	1261.23		-0.002	Downward		
	GH_MW_EF1B	1264.34	1265.13	0.79	2022-02-24	3.95	1261.18	-	-	-	Yes	Peristaltic
					2022-05-19	3.53	1261.60					
					2022-08-15	3.65	1261.48					
					2022-10-20	3.86	1261.27					
	RG_DW-01-03	-	-	-	-	-	-	-	-	-	-	Tap

Notes:
TOC denotes top of casing.
masl denotes meters above sea level.
mbtoc denotes meters below top of casing.
"-" denotes data not available.
Quarter is represented as Q1, Q2, Q3, Q4.
a - well decommissioned in September 2022.

TABLE GH-03: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Inorganics, Nutrients and Organics in Groundwater (GHO)

Sample Location	Sample ID	Sample Date	Field Parameters					Physical Parameters						Dissolved Inorganics								Nutrients						Organics	
		(yyyy mm dd)	Field Temperature C	pH (field) pH	Dissolved Oxygen mg/L	Field Conductivity µS/cm	Field ORP mV	pH pH	Hardness mg/L	Conductivity µS/cm	Total Suspended Solids mg/L	Total Dissolved Solids mg/L	Turbidity ntu	Total Alkalinity mg/L	Bicarbonate mg/L	Carbonate mg/L	Hydroxide mg/L	Bromide mg/L	Chloride mg/L	Fluoride mg/L	Sulphate mg/L	Ammonia Nitrogen mg/L	Nitrate Nitrogen mg/L	Nitrite Nitrogen mg/L	Kjeldahl Nitrogen-N mg/L	Ortho-Phosphate mg/L	Phosphorus, Total mg/L	Total Organic Carbon mg/L	Dissolved Organic Carbon mg/L
BC Standard																													
CSR Aquatic Life (AW)[a]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,500	2-3[b]	1,280-4,290[b]	1.31-18.5[c]	400	0.2-2[d]	n/a	n/a	n/a	n/a	n/a
CSR Irrigation Watering (IW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSR Livestock Watering (LW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	1	1,000	n/a	100	10	n/a	n/a	n/a	n/a	n/a
CSR Drinking Water (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	250	1.5	500	n/a	10	1	n/a	n/a	n/a	n/a	n/a
Fording River Valley (Porter Creek Drainage) (^ denotes well part of Study Area 1)																													
GH_MW-PC^	GH_MW-PC_WG_2022-03-16_NP	2022 03 16	2.4	7.30	10.16	1,065	226.3	7.98	632	1,030	9.0	812	5.27	212	258	< 1.0	< 1.0	< 0.250	2.19	0.267	419	< 0.0050	2.07	< 0.0050	0.186	0.0067	0.0137	0.74	1.07
	GH_MW-PC_WG_2022-04-04_NP	2022 06 01	4.7	7.43	7.4	885	-11.3	8.03	487	854	22.3	624	15.7	217	265	< 1.0	< 1.0	< 0.050	0.80	0.378	295	0.442	2.02	< 0.0010	0.589	0.0039	0.0320	2.19	2.16
	GH_MW-PC_WG_2022-07-04_NP	2022 08 08	8.3	7.22	7.31	1,014	156.1	8.35	563	973	77.3	756	47.8	236	275	6.6	< 1.0	< 0.050	0.52	0.359	343	< 0.0050	1.06	0.0013	0.163	0.0028	0.0872	3.05	2.44
	GH_MW-PC_WG_2022-10-03_NP	2022 11 25	4.0	7.36	10.28	1,051	195.1	8.27	603	1,000	48.2	838	24.2	227	272	2.6	< 1.0	< 0.250	1.14	0.350	418	< 0.0050	1.71	< 0.0050	< 0.500	0.0026	0.0468	1.65	1.06
GH_MW_PC4A^	GH_MW-PC4A_WG_2022-03-16_NP	2022 03 16	3.3	7.15	0.54	738	59.5	8.00	441	715	16.1	467	14.1	271	330	< 1.0	< 1.0	< 0.050	0.71	0.188	160	0.0348	0.0067	< 0.0010	0.073	0.0028	0.0270	0.74	0.72
	GH_MW-PC4A_WG_2022-04-04_NP	2022 06 01	4.3	7.32	0.4	696	57.1	8.04	364	676	8.1	458	5.44	253	308	< 1.0	< 1.0	< 0.050	0.64	0.224	152	0.233	< 0.0050	< 0.0010	0.262	< 0.0010	0.0158	0.70	0.73
	GH_MW-PC4A_WG_2022-07-04_NP	2022 09 07	4.8	7.33	1.04	683	2.5	7.68	346	641	4.3	417	5.99	257	314	< 1	< 1	< 0.05	0.6	0.196	136	0.0151	< 0.005	< 0.001	< 0.05	< 0.001	0.0143	< 0.5	< 0.5
	GH_MW-PC4A_WG_2022-10-03_NP	2022 11 18	2.2	7.40	1.97	697	37.8	7.89	348	645	1.8	447	2.98	263	320	< 1.0	< 1.0	< 0.050	0.60	0.206	145	0.0181	< 0.0050	< 0.0010	< 0.050	< 0.0010	0.0106	< 0.50	< 0.50
Fording River Valley (Greenhills Creek Drainage) (+ denotes well part of Study Area 3)																													
GH_MW-GHC-1A	GH_MW-GHC-1A_WG_2022-01-03_NP	2022 02 18	4.2	7.07	1.02	1,146	97.5	7.86	655	1,120	5.0	880	1.59	291	355	< 1.0	< 1.0	< 0.250	4.01	0.346	397	< 0.0050	0.108	< 0.0050	0.050	0.0016	0.0062	1.15	1.06
	GH_FOX1_WG_2022-01-03_NP	Duplicate	-	-	-	-	-	7.99	632	1,110	1.7	866	1.18	289	353	< 1.0	< 1.0	< 0.250	4.39	0.335	399	< 0.0050	0.703	< 0.0050	< 0.050	0.0014	0.0063	1.06	1.08
	QA/QC RPD%		-	-	-	-	-	2	4	1	*	2	30	1	1	*	*	*	9	3	1	*	147	*	*	*	*	*	*
	GH_MW_GHC-1A_WG_2022-04-04_NP	2022 04 27	5.0	7.06	2.98	1,212	158.9	8.05	657	1,160	3.4	871	1.22	261	319	< 1.0	< 1.0	< 0.250	6.32	0.419	438	< 0.0050	1.55	< 0.0050	0.068	0.0024	0.0062	1.68	1.35
	GH_MW-GHC-1A_WG_2022-07-04_NP	2022 09 09	4.9	6.88	1.21	1,111	110.2	7.90	650	1,060	< 1.0	779	0.76	288	352	< 1.0	< 1.0	< 0.250	3.99	0.483	369	< 0.0050	0.447	< 0.0050	< 0.050	< 0.0010	0.0040	1.44	1.41
	GH_MW-GHC-1A_WG_2022-10-03_NP	2022 11 23	4.7	7.00	4.23	1,049	95.6	8.25	538	993	4.6	725	4.14	320	390	< 1.0	< 1.0	< 0.250	2.97	0.498	336	< 0.0050	0.258	< 0.0050	< 0.050	< 0.0010	0.0171	1.08	0.98
GH_MW-GHC-1B	GH_MW-GHC-1B_WG_2022-01-03_NP	2022 02 18	3.3	7.04	1.25	1,472	30.0	7.92	828	1,420	40.5	1,180	31.1	252	307	< 1.0	< 1.0	< 0.250	13.9	0.107	640	0.0122	0.828	< 0.0050	0.099	< 0.0010	0.0265	2.27	1.57
	GH_MW_GHC-1B_WG_2022-04-04_NP	2022 04 27	3.8	7.04	0.16	1,458	7.3	8.14	818	1,410	14.5	1,130	11.1	243	297	< 1.0	< 1.0	< 0.250	13.9	0.158	628	0.0284	0.0897	< 0.0050	0.126	< 0.0010	0.0102	2.26	1.73
	GH_MW-GHC-1B_WG_2022-07-04_NP	2022 09 09	6.6	7.07	1.70	1,392	15.1	7.23	836	1,270	16.9	1,060	16.0	259	316	< 1.0	< 1.0	< 0.250	14.9	0.187	564	0.0238	0.334	< 0.0050	0.134	< 0.0010	0.0141	2.59	2.16
	GH_MW-GHC-1B_WG_2022-10-03_NP	2022 11 23	5.2	6.91	0.68	1,361	21.8	8.19	846	1,280	42.1	1,010	29.4	267	326	< 1.0	< 1.0	< 0.250	14.8	0.199	556	0.0264	0.0445	< 0.0050	0.144	< 0.0010	0.0492	2.85	1.79
GH_MW_GHC_4B	GH_MW_GHC_4B_WG_2022-03-14_NP	2022 03 14	3.3	6.65	7.81	977	161.0	7.51	497	1,010	< 1.0	714	< 0.10	286	348	< 1.0	< 1.0	< 0.050	8.78	0.096	304	< 0.0050	1.29	< 0.0010	0.196	0.0036	0.0047	1.65	1.53
	GH_MW_GHC_4B_WG_2022-04-04_NP	2022 05 31	5.7	6.97	6.6	1,060	-24.0	8.10	588	1,020	< 1.0	823	0.41	260	317	< 1.0	< 1.0	< 0.250	5.82	0.101	352	< 0.0050	1.04	< 0.0050	0.388	0.0037	0.0078	1.53	1.93
	GH_MW_GHC_4B_WG_2022-07-04_NP	2022 09 13	10.3	6.79	4.17	1,179	64.4	8.10	695	1,120	5.8	867	3.88	258	315	< 1.0	< 1.0	< 0.250	4.29	0.121	450	< 0.0050	1.66	< 0.0050	0.273	0.0046	0.0150	1.22	2.00
	GH_MW_GHC_4B_WG_2022-10-03_NP	2022 11 16	3.8	7.10	8.17	1,332	189.9	8.34	904	1,220	1.2	1,120	0.48	259	307	4.4	< 1.0	< 0.250	3.86	0.142	566	< 0.0050	2.64	< 0.0050	0.204	0.0015	0.0051	1.19	1.23
GH_MW-TD	GH_MW-TD_WG_2022-01-03_NP	2022 02 17	4.2	7.12	3.22	749	-32.9	7.71	366	695	< 1.0	475	1.62	348	424	< 1.0	< 1.0	< 0.050	0.23	0.219	86.1	0.108	0.0072	< 0.0010	0.129	0.0014	< 0.0020	< 0.50	< 0.50
	GH_MW-TD_WG_2022-04-04_NP	2022 04 28	5.9	7.05	3.88	747	43.4	8.07	337	727	5.7	456	0.82	343	418	< 1.0	< 1.0	< 0.050	0.28	0.285	78.9	0.0960	0.0397	0.0010	0.094	< 0.0010	0.0030	< 0.50	< 0.50
	GH_MW-TD_WG_2022-07-04_NP	2022 09 01	10.4	7.17	3.13	757	2.1	7.43	378	705	< 1.0	418	0.66	338	412	< 1.0	< 1.0	< 0.050	0.31	0.280	86.4	0.106	< 0.0050	< 0.0010	0.084	< 0.0010	< 0.0020	0.52	0.56
	GH_MW-TD_WG_2022-10-03_NP	2022 11 16	2.1	7.33	6.32	741	21.9	8.40	395	682	11.2	486	0.97	378	446	7.9	< 1.0	< 0.050	0.31	0.270	86.4	0.114	< 0.0050	< 0.0010	0.204	< 0.0010	0.0227	0.71	< 0.50
GH_MW-RLP-2+	GH_MW-RLP-2_WG_2022-01-03_NP	2022 02 09	4.6	7.21	0.11	945	-31.8	7.88	476	928	2.4	619	3.97	238	290	< 1.0	< 1.0	< 0.050	17.3	0.687	276	0.168	1.37	0.0030	0.470	< 0.0010	0.0044	3.06	2.99
	GH_MW-RLP-2_WG_2022-04-04_NP	2022 05 20	4.5	7.12	0.16	939	-64.9	7.78	520	929	3.2	636	9.11	255	311	< 1.0	< 1.0	< 0.250	14.9	0.606	275	0.201	1.08	< 0.0050	0.386	< 0.0010	0.0045	4.67	4.52
	GH_FOX3_WG_2022-04-04_NP	Duplicate	-	-	-	-	-	7.82	528	926	2.4	683	9.94	256	312	< 1.0	< 1.0	< 0.250	14.9	0.600	272	0.191	0.642	< 0.0050	0.392	< 0.0010	0.0045	4.34	4.36
	QA/QC RPD%		-	-	-	-	-	1	2	0	*	7	9	0	0	*	*	*	0	1	1	5	51	*	2	*	*	7	4
	GH_MW-RLP-2_WG_2022-07-04_NP	2022 09 15	11.6	7.25	0.27	905	-102.9	7.79	497	857	5.5	602	8.26	292	357	< 1.0	< 1.0	0.058	17.1	0.894	200	0.244	0.0219	0.0011	0.228	< 0.0010	0.0078	3.61	3.59
	GH_MW-RLP-2_WG_2022-10-03_NP	2022 11 18	9.2	7.20	0.39	976	-57.7	7.82	553	901	1.0	664	5.24	327	399	< 1.0	< 1.0	0.068	16.0	0.802	238	0.283	0.252	0.0027	0.397	< 0.0010	0.0070	6.74	6.11

All terms defined within the body of SNC-Lavalin's report.

<	Denotes concentration less than indicated detection limit.
-	Denotes analysis not conducted.
n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL	Denotes reported detection limit.

BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH and Temperature. Temperature assumed 10C.

[d] Standard varies with Chloride.

TABLE GH-03: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Inorganics, Nutrients and Organics in Groundwater (GHO)

			Field Parameters					Physical Parameters						Dissolved Inorganics								Nutrients						Organics	
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Field Temperature C	pH (field) pH	Dissolved Oxygen mg/L	Field Conductivity µS/cm	Field ORP mV	pH pH	Hardness mg/L	Conductivity µS/cm	Total Suspended Solids mg/L	Total Dissolved Solids mg/L	Turbidity ntu	Total Alkalinity mg/L	Bicarbonate mg/L	Carbonate mg/L	Hydroxide mg/L	Bromide mg/L	Chloride mg/L	Fluoride mg/L	Sulphate mg/L	Ammonia Nitrogen mg/L	Nitrate Nitrogen mg/L	Nitrite Nitrogen mg/L	Kjeldahl Nitrogen-N mg/L	Ortho-Phosphate mg/L	Phosphorus, Total mg/L	Total Organic Carbon mg/L	Dissolved Organic Carbon mg/L
BC Standard																													
CSR Aquatic Life (AW)[a]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,500	2-3[b]	1,280-4,290[b]	1.31-18.5[c]	400	0.2-2[d]	n/a	n/a	n/a	n/a	n/a
CSR Irrigation Watering (IW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSR Livestock Watering (LW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	1	1,000	n/a	100	10	n/a	n/a	n/a	n/a	n/a
CSR Drinking Water (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	250	1.5	500	n/a	10	1	n/a	n/a	n/a	n/a	n/a
Fording River Valley (Greenhills Creek Drainage) (+ denotes well part of Study Area 3)																													
GH_POTW09+	GH_POTW09_WG_2022-01-03_NP	2022 02 08	6.7	7.61	9.30	792	26.5	8.19	415	769	< 1.0	492	0.58	264	323	< 1.0	< 1.0	< 0.050	6.45	0.659	184	0.0306	0.0123	< 0.0010	0.058	< 0.0010	< 0.0020	< 0.50	< 0.50
	GH_POTW09_WG_2022-04-04_NP	2022 04 29	7.0	7.54	9.15	843	8.3	8.14	432	817	3.3	552	2.06	293	358	< 1.0	< 1.0	< 0.050	10.2	0.737	186	0.0280	0.104	0.0018	0.122	< 0.0010	< 0.0020	< 0.50	< 0.50
	GH_POTW09_WG_2022-07-04_NP	2022 09 01	10.3	7.63	8.63	812	20.8	7.97	462	749	< 1.0	501	0.76	270	330	< 1.0	< 1.0	< 0.050	6.89	0.828	178	0.0228	0.0263	< 0.0010	< 0.050	< 0.0010	< 0.0020	1.04	0.54
	GH_POTW09_WG_2022-10-03_NP	2022 10 21	6.8	7.53	8.39	797	8.5	8.03	430	721	< 1.0	480	0.91	280	342	< 1.0	< 1.0	< 0.050	6.33	0.825	187	0.0240	0.0190	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
GH_POTW10+	GH_POTW10_WG_2022-01-03_NP	2022 02 08	7.5	7.45	5.04	759	3.0	7.98	404	742	< 1.0	491	3.44	211	258	< 1.0	< 1.0	< 0.050	8.41	0.675	200	0.0523	0.900	0.0214	0.184	< 0.0010	< 0.0020	< 0.50	< 0.50
	GH_POTW10_WG_2022-04-04_NP	2022 04 28	7.8	7.41	5.56	764	7.2	8.22	390	751	2.4	527	4.34	214	261	< 1.0	< 1.0	< 0.050	8.82	0.770	192	0.0521	0.969	0.0244	0.190	< 0.0010	< 0.0020	< 0.50	< 0.50
	GH_POTW10_WG_2022-07-04_NP	2022 09 01	9.9	7.48	2.24	763	-16	7.74	434	719	1.4	483	9.17	220	269	< 1.0	< 1.0	< 0.050	9.01	0.821	197	0.0681	0.366	0.0134	0.085	< 0.0010	< 0.0020	< 0.50	< 0.50
	GH_POTW10_WG_2022-10-03_NP	2022 10 21	8.1	7.44	1.94	764	-84.9	8.04	369	696	< 1.0	458	7.92	247	302	< 1.0	< 1.0	< 0.050	9.27	0.824	202	0.0644	0.566	0.0173	0.161	< 0.0010	0.0031	< 0.50	< 0.50
GH_POTW15+	GH_POTW15_WG_2022-01-03_NP	2022 02 08	6.0	7.29	1.87	985	-31.4	7.89	509	955	2.0	634	11.5	254	310	< 1.0	< 1.0	0.125	37.8	0.140	259	0.0407	< 0.0050	< 0.0010	0.068	< 0.0010	< 0.0020	0.80	0.88
	GH_POTW15_WG_2022-04-04_NP	2022 04 28	6.2	7.25	5.17	1,048	-17.2	8.16	516	1,000	1.7	716	11.9	238	291	< 1.0	< 1.0	< 0.250	49.0	0.161	278	0.0371	0.397	0.0067	0.082	< 0.0010	< 0.0020	0.95	0.96
	GH_POTW15_WG_2022-07-04_NP	2022 09 01	7.8	7.31	3.43	1,046	-22.8	7.61	580	975	1.8	687	15.8	269	328	< 1.0	< 1.0	< 0.250	46.2	0.173	277	0.0421	< 0.0250	< 0.0050	< 0.050	< 0.0010	< 0.0020	1.04	< 0.50
	GH_POTW15_WG_2022-10-03_NP	2022 10 21	8	7.3	1.85	1,018	-87.9	7.86	466	908	< 1.0	633	12.0	263	321	< 1.0	< 1.0	< 0.250	40.6	0.182	274	0.0407	< 0.0250	< 0.0050	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
GH_POTW17+	GH_POTW17_WG_2022-01-03_NP	2022 02 08	6.8	7.40	6.37	1,095	1.5	8.00	591	1,070	1.1	766	4.88	268	327	< 1.0	< 1.0	< 0.250	24.6	0.191	353	0.0488	0.705	0.0096	0.134	< 0.0010	< 0.0020	0.90	0.83
	GH_POTW17_WG_2022-04-04_NP	2022 04 29	7.9	7.16	2.63	1,300	19.0	7.91	721	1,260	1.4	956	2.12	294	359	< 1.0	< 1.0	< 0.250	17.0	0.153	490	0.0195	0.275	0.0056	0.108	< 0.0010	< 0.0020	0.66	0.61
	GH_POTW17_WG_2022-07-04_NP	2022 09 01	9.8	7.28	3.51	1,282	4.2	7.68	788	1,200	4.2	925	2.48	294	358	< 1.0	< 1.0	< 0.250	14.8	0.169	469	0.0141	0.238	< 0.0050	< 0.050	< 0.0010	< 0.0020	0.80	0.84
	GH_POTW17_WG_2022-10-03_NP	2022 10 21	8.7	7.19	3.28	1,279	12.3	7.73	740	1,170	1.8	884	1.48	309	377	< 1.0	< 1.0	< 0.250	15.2	0.167	468	0.0147	0.212	< 0.0050	0.147	< 0.0010	< 0.0020	< 0.50	< 0.50
RG_MW_FR11A	RG_MW_FR11A_WG_2022-03-17_NP	2022 03 17	3.9	7.32	3.99	563	244.9	7.86	261	553	146	333	80.5	290	354	< 1.0	< 1.0	< 0.050	1.08	0.348	42.5	0.332	0.0063	< 0.0010	0.482	0.0042	0.173	4.42	1.49
	RG_MW_FR11A_WG_2022-04-04_NP	2022 06 01	13.3	7.43	3.5	593	-3.0	8.06	244	579	40.2	352	11.0	302	369	< 1.0	< 1.0	< 0.050	1.20	0.354	51.0	0.0092	0.0166	0.0134	0.308	< 0.0010	0.0229	2.23	2.21
	RG_MW_FR11A_WG_2022-07-04_NP	2022 09 14	8.2	7.74	1.63	523.3	59.8	8.13	276	539	124	670	45.2	313	381	< 1.0	< 1.0	< 0.050	0.66	0.309	35.5	0.463	0.0134	0.0036	1.48	0.0054	0.0709	2.06	0.98
	RG_MW_FR11A_WG_2022-10-03_N	2022 11 28	3.2	7.29	6.85	509	201.7	7.76	296	508	3.8	313	2.77	281	342	< 1.0	< 1.0	< 0.050	0.41	0.250	27.2	0.439	0.0594	0.0022	< 0.500	0.0055	0.0114	< 0.50	< 0.50
RG_MW_FR11B	RG_MW_FR11B_WG_2022-03-17_NP	2022 03 17	4.6	7.26	7.00	549	270.8	7.84	281	538	41.0	306	21.7	313	381	< 1.0	< 1.0	< 0.050	1.90	0.263	30.0	0.163	0.0066	< 0.0010	0.309	0.0023	0.0876	1.91	1.18
	GH_MW_MC10A_WG_2022-03-17_NP	Duplicate	-	-	-	-	-	7.89	286	534	42.8	304	18.1	288	351	< 1.0	< 1.0	< 0.050	1.91	0.263	29.7	0.171	0.0052	< 0.0010	0.311	0.0017	0.0883	1.96	1.18
	QA/QC RPD%		-	-	-	-	-	1	2	1	4	1	18	8	8	*	*	*	1	0	1	5	*	*	1	*	1	*	*
	RG_MW_FR11B_WG_2022-04-04_NP	2022 06 01	12.6	7.27	1.1	533	-34.4	8.20	277	522	1.7	303	0.66	302	368	< 1.0	< 1.0	< 0.050	2.14	0.223	25.0	0.0250	0.0108	0.0026	0.064	< 0.0010	0.0080	0.72	0.96
	RG_MW_FR11B_WG_2022-07-04_NP	2022 09 14	7.3	7.88	1.92	538.5	60.5	8.08	274	521	332	645	147	287	350	< 1.0	< 1.0	< 0.050	1.83	0.256	31.4	0.266	0.0328	0.0118	1.10	0.0013	0.669	4.03	0.96
	RG_MW_FR11B_WG_2022-10-03_N	2022 11 28	2.2	7.13	8.00	507	127.6	7.70	306	516	14.5	283	6.33	279	340	< 1.0	< 1.0	< 0.050	1.96	0.207	29.3	0.207	0.0374	0.0030	< 0.500	0.0051	0.0174	< 0.50	< 0.50
Elk River Valley (denotes well part of Study Area 4)**																													
GH_MW-MC-1D	GH_MW-MC-1D_WG_2022_03_09_NP	2022 03 09	2.3	7.39	1.96	382.2	-148.0	8.32	122	392	< 1.0	223	1.00	201	241	1.9	< 1.0	0.100	20.8	0.747	< 0.30	0.0335	0.0118	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	GH_MW-MC-1D_WG_2022_06_13_NP	2022 06 13	4.9	7.75	0.21	392.0	30.5	7.92	122	407	7.6	224	5.06	212	258	< 2.0	< 2.0	0.077	22.0	0.713	< 0.30	0.0338	< 0.0050	< 0.0010	< 0.050	< 0.0010	0.0074	0.66	1.35
	GH_MW-MC-1D_WG_2022-07-04_NP	2022 08 23	11.3	7.88	-0.08	377.2	-166.2	8.30	127	395	< 1.0	226	2.15	196	235	2.3	< 1.0	0.109	22.0	0.804	< 0.30	0.0384	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	0.72	1.30
	GH_MW-MC-1D_WG_2022-10-03_NP	2022 10 26	6.7	7.85	0.64	409.3	-34.5	8.17	127	376	1.4	239	1.89	191	233	< 1.0	< 1.0	0.112	22.5	0.830	0.30	0.0354	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
GH_MW-MC-1S	GH_MW-MC-1S_WG_2022_03_09_NP	2022 03 09	1.5	7.30	10.70	278.5	217.1	8.22	164	306	< 1.0	172	< 0.10	155	189	< 1.0	< 1.0	< 0.050	0.24	0.118	23.5	< 0.0050	0.126	< 0.0010	< 0.050	0.0013	< 0.0020	< 0.50	< 0.50
	GH_MW-MC-1S_WG_2022_06_13_NP	2022 06 13	4.8	7.59	6.4	350.0	-5.1	7.72	166	325	< 1.0	192	0.11	166	202	< 2.0	< 2.0	< 0.050	0.46	0.126	14.6	0.0175	0.161	< 0.0010	0.090	< 0.0010	0.0023	0.99	2.28
	GH_MW-MC-1S_WG_2022-07-04_NP	2022 08 23	11.8	7.55	5.34	261.5	66.0	8.12	148	270	< 1.0	168	< 0.10	137	167	< 1.0	< 1.0	< 0.050	0.24	0.169	14.5	0.0076	0.0597	< 0.0010	< 0.050	< 0.0010	< 0.0020	0.93	1.14
	GH_MW-MC-1S_WG_2022-10-03_NP	2022 10 26	7.8	7.67	7.9	291.3	166.5	8.07	163	283	< 1.0	180	< 0.10	150	182	< 1.0	< 1.0	< 0.050	0.37	0.162	18.7	< 0.0050	0.0807	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50

All terms defined within the body of SNC-Lavalin's report.

< Denotes concentration less than indicated detection limit.

\- Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

* RPDs are not calculated where one or more concentrations are less than five times RDL.

RDL Denotes reported detection limit.

BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
<u>UNDERLINE</u>	Concentration greater than CSR Livestock Watering (LW) standard
▨ SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH and Temperature. Temperature assumed 10C.

[d] Standard varies with Chloride.

TABLE GH-03: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Inorganics, Nutrients and Organics in Groundwater (GHO)

			Field Parameters					Physical Parameters						Dissolved Inorganics									Nutrients						Organics	
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Field Temperature C	pH (field) pH	Dissolved Oxygen mg/L	Field Conductivity µS/cm	Field ORP mV	pH pH	Hardness mg/L	Conductivity µS/cm	Total Suspended Solids mg/L	Total Dissolved Solids mg/L	Turbidity ntu	Total Alkalinity mg/L	Bicarbonate mg/L	Carbonate mg/L	Hydroxide mg/L	Bromide mg/L	Chloride mg/L	Fluoride mg/L	Sulphate mg/L	Ammonia Nitrogen mg/L	Nitrate Nitrogen mg/L	Nitrite Nitrogen mg/L	Kjeldahl Nitrogen-N mg/L	Ortho-Phosphate mg/L	Phosphorus, Total mg/L	Total Organic Carbon mg/L	Dissolved Organic Carbon mg/L
BC Standard																													
CSR Aquatic Life (AW)[a]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,500	2-3[b]	1,280-4,290[b]	1.31-18.5[c]	400	0.2-2[d]	n/a	n/a	n/a	n/a	n/a
CSR Irrigation Watering (IW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSR Livestock Watering (LW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	1	1,000	n/a	100	10	n/a	n/a	n/a	n/a	n/a
CSR Drinking Water (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	250	1.5	500	n/a	10	1	n/a	n/a	n/a	n/a	n/a
Elk River Valley (denotes well part of Study Area 4)**																													
GH_MW-MC-2D	GH_MW-MC-2D_WG_2022_03_08_NP	2022 03 08	1.5	8.73	0.08	1,907	-337.4	8.93	17.4	1,920	5.6	1,190	18.4	576	589	55.9	< 1.0	0.786	*258*	***2.73***	31.1	0.575	0.221	< 0.0050	0.667	0.260	0.227	1.34	1.64
	GH_MW-MC-2D_WG_2022_06_15_NP	2022 06 15	7.3	8.79	0.11	1,757	-387.6	8.95	26.6	1,940	5.3	1,200	15.1	562	575	54.0	< 2.0	0.586	*266*	***2.64***	18.2	0.573	< 0.0250	< 0.0050	0.953	0.0721	0.185	2.13	1.39
	GH_MW_MC10A_WG_2022_06_15_NP	Duplicate	-	-	-	-	-	9.01	26.4	1,960	6.1	1,260	17.4	583	585	61.9	< 2.0	0.576	*264*	***2.60***	17.3	0.574	< 0.0250	< 0.0050	< 0.500	0.0711	0.184	2.33	1.47
	QA/QC RPD%		-	-	-	-	-	1	1	1	14	5	14	4	2	14	*	2	1	2	5	0	*	*	*	1	1	*	*
	GH_MW-MC-2D_WG_2022-07-04_NP	2022 08 24	10.7	8.58	-0.25	1,864	-379.2	9.10	24.7	1,840	7.8	1,130	174	553	556	58.3	< 1.0	0.853	*262*	***3.33***	28.0	0.630	0.365	< 0.0050	0.734	0.241	0.291	2.53	2.10
	GH_MW-MC-2D_WG_2022-10-03_NP	2022 10 26	3.9	8.90	0.4	1,866	185.4	9.12	24.1	1,820	6.2	1,100	17.5	582	567	70.4	< 1.0	0.849	*272*	***3.31***	18.2	0.629	0.0328	< 0.0050	0.774	0.0747	0.313	0.92	0.93
GH_MW-MC-2S	GH_MW-MC-2S_WG_2022_03_08_NP	2022 03 08	1.5	6.77	8.37	600	-14.9	7.60	288	602	1.4	355	1.04	277	338	< 1.0	< 1.0	< 0.050	2.76	0.116	79.8	< 0.0050	0.312	0.0019	0.073	0.0029	0.0038	1.83	1.74
	GH_MW-MC-2S_WG_2022_06_15_NP	2022 06 15	5.0	7.28	7.1	448.6	77.4	8.15	223	447	< 1.0	299	0.64	239	291	< 2.0	< 2.0	< 0.050	0.95	0.106	36.7	0.0063	0.500	< 0.0010	0.132	0.0047	0.0054	2.56	3.37
	GH_MW-MC-2S_WG_2022-07-04_NP	2022 08 24	7.4	6.78	8.00	482.5	240.8	7.82	270	525	< 1.0	333	0.60	266	325	< 1.0	< 1.0	< 0.050	1.38	0.148	52.2	< 0.0050	0.127	< 0.0010	< 0.050	0.0048	0.0050	1.85	2.37
	GH_FOX1_WG_2022-07-04_NP	Duplicate	-	-	-	-	-	7.77	269	522	< 1.0	318	0.59	264	322	< 1.0	< 1.0	< 0.050	1.36	0.148	52.2	< 0.0050	0.124	< 0.0010	< 0.050	0.0049	0.0053	1.34	1.80
	QA/QC RPD%		-	-	-	-	-	1	0	1	*	5	2	1	1	*	*	*	1	0	0	*	2	*	*	*	*	*	*
	GH_MW-MC-2S_WG_2022-10-03_NP	2022 10 26	5.3	6.96	4.76	604.4	113.7	8.03	311	571	< 1.0	362	0.66	283	345	< 1.0	< 1.0	< 0.050	2.45	0.143	63.8	< 0.0050	0.156	0.0015	0.054	0.0014	0.0039	1.13	1.45
GH_GA-MW-4**	GH_GA-MW-4_WG_2022-01-03_NP	2022 02 09	4.4	7.60	5.94	373.8	186.6	8.09	180	369	< 1.0	192	< 0.10	189	231	< 1.0	< 1.0	< 0.050	2.25	0.186	28.5	0.0061	0.296	< 0.0010	0.080	0.0013	0.0026	< 0.50	< 0.50
	GH_FOX3_WG_2022-01-03_NP	Duplicate	4.4	7.6	5.94	373.8	186.6	8.10	178	361	< 1.0	207	< 0.10	185	226	< 1.0	< 1.0	0.055	2.08	0.212	28.2	< 0.0050	0.287	< 0.0010	0.082	< 0.0010	0.0023	< 0.50	< 0.50
	QA/QC RPD%		*	*	*	*	*	0	1	2	*	8	*	2	2	*	*	*	8	13	1	*	3	*	*	*	*	*	*
	GH_GA-MW-4_WG_2022-04-04_NP	2022 04 21	3.6	7.53	7.18	405.0	218.2	8.18	197	393	< 1.0	224	< 0.10	183	224	< 1.0	< 1.0	< 0.050	3.07	0.150	33.1	< 0.0050	0.621	< 0.0010	0.157	0.0016	0.0060	0.90	< 0.50
RG_MW_LC3A**	RG_MW_LC3A_WG_2022_02_11_NP	2022 02 11	6.3	7.36	7.08	700	133.4	7.92	348	714	53.7	443	19.2	230	280	< 2.0	< 2.0	< 0.050	2.69	0.134	165	< 0.0050	8.09	< 0.0010	0.406	< 0.0010	0.0368	1.33	1.22
	RG_MW_LC3A_WG_2022_05_10_NP	2022 05 10	5.6	7.39	7.8	904	12.3	7.93	448	885	24.2	622	8.71	223	272	< 2.0	< 2.0	< 0.050	2.70	0.129	252	< 0.0050	12.4	0.0202	1.02	< 0.0010	0.0154	1.71	1.58
	RG_MW_LC3A_WG_2022-07-04_NP	2022 07 26	10.3	7.43	5.6	927	132.2	7.50	515	931	60.2	659	13.1	234	285	< 1.0	< 1.0	< 0.050	1.66	0.175	277	< 0.0050	12.2	< 0.0010	1.08	< 0.0010	0.0635	1.94	1.81
	RG_MW_MC10A_WG_2022-07-26_NP	Duplicate	-	-	-	-	-	7.60	508	932	45.2	648	3.67	230	281	< 1.0	< 1.0	< 0.050	1.64	0.174	277	< 0.0050	12.2	< 0.0010	1.42	< 0.0010	0.0502	1.70	1.43
	QA/QC RPD%		-	-	-	-	-	1	1	0	28	2	112	2	1	*	*	*	1	1	0	*	0	*	27	*	23	*	*
	RG_MW_LC3A_WG_2022-10-03_NP	2022 11 21	7.3	7.37	5.79	819	193.8	7.96	461	857	19.0	598	3.30	211	257	< 1.0	< 1.0	< 0.050	2.23	0.143	235	< 0.0050	10.5	< 0.0010	< 0.500	< 0.0010	0.0278	0.58	0.71
	RG_FOX1_WG_2022-10-03_FD	Duplicate	-	-	-	-	-	8.00	497	862	17.5	602	2.62	214	261	< 1.0	< 1.0	< 0.050	2.21	0.137	236	< 0.0050	10.5	< 0.0010	1.06	< 0.0010	0.0329	0.64	0.67
	QA/QC RPD%		-	-	-	-	-	1	8	1	8	1	23	1	2	*	*	*	1	4	0	*	0	*	*	*	17	*	*
RG_MW_LC3B**	RG_MW_LC3B_WG_2022_02_11_NP	2022 02 11	6.6	7.62	8.68	679	209.9	7.94	325	679	116	433	3.37	211	258	< 2.0	< 2.0	< 0.050	1.58	0.130	166	< 0.0050	8.76	< 0.0010	0.406	< 0.0010	0.0814	1.00	1.46
	RG_MW_LC3B_WG_2022_05_10_NP	2022 05 10	5.5	7.50	9.2	1,158	51.3	7.93	595	1,140	2.8	834	1.18	232	284	< 2.0	< 2.0	< 0.250	2.26	0.142	411	0.0098	20.7	< 0.0050	1.21	< 0.0010	0.0052	2.07	2.03
	RG_MW_MC10A_WG_2022_05_10_NP	Duplicate	5.5	7.50	9.2	1,158	51.3	7.99	597	1,140	3.1	849	1.36	235	286	< 2.0	< 2.0	< 0.250	2.22	0.134	410	< 0.0050	20.2	< 0.0050	1.38	< 0.0010	0.0035	2.08	1.94
	QA/QC RPD%		*	*	*	*	*	1	0	0	*	2	14	1	1	*	*	*	2	6	0	*	2	*	13	*	*	*	*
	RG_MW_LC3B_WG_2022-07-04_NP	2022 07 26	13.1	7.58	5.8	1,350	137.3	7.58	775	1,330	2.0	1,030	0.38	244	298	< 1.0	< 1.0	< 0.250	1.97	0.178	504	< 0.0050	23.3	< 0.0050	< 0.500	< 0.0010	0.0041	2.20	1.89
	RG_MW_LC3B_WG_2022-10-03_NP	2022 11 21	9.6	7.62	6.92	416.2	187.6	8.08	235	444	3.3	264	5.26	180	220	< 1.0	< 1.0	< 0.050	0.60	0.165	58.6	< 0.0050	1.79	< 0.0010	< 0.500	< 0.0010	0.0060	< 0.50	< 0.50
	RG_MW_MC11A_WG_2022-11-21_NP	Duplicate	-	-	-	-	-	8.05	248	438	3.7	275	4.69	179	219	< 1.0	< 1.0	< 0.050	0.62	0.166	58.2	0.0053	1.78	< 0.0010	< 0.500	< 0.0010	0.0059	< 0.50	< 0.50
	QA/QC RPD%		-	-	-	-	-	0	5	1	*	4	11	1	0	*	*	*	3	1	1	*	1	*	*	*	*	*	*

All terms defined within the body of SNC-Lavalin's report.

<	Denotes concentration less than indicated detection limit.
-	Denotes analysis not conducted.
n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL	Denotes reported detection limit.

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH and Temperature. Temperature assumed 10C.

[d] Standard varies with Chloride.

BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

TABLE GH-03: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Inorganics, Nutrients and Organics in Groundwater (GHO)

			Field Parameters					Physical Parameters						Dissolved Inorganics								Nutrients						Organics	
Sample Location	**Sample ID**	**Sample Date (yyyy mm dd)**	**Field Temperature C**	**pH (field) pH**	**Dissolved Oxygen mg/L**	**Field Conductivity µS/cm**	**Field ORP mV**	**pH pH**	**Hardness mg/L**	**Conductivity µS/cm**	**Total Suspended Solids mg/L**	**Total Dissolved Solids mg/L**	**Turbidity ntu**	**Total Alkalinity mg/L**	**Bicarbonate mg/L**	**Carbonate mg/L**	**Hydroxide mg/L**	**Bromide mg/L**	**Chloride mg/L**	**Fluoride mg/L**	**Sulphate mg/L**	**Ammonia Nitrogen mg/L**	**Nitrate Nitrogen mg/L**	**Nitrite Nitrogen mg/L**	**Kjeldahl Nitrogen-N mg/L**	**Ortho-Phosphate mg/L**	**Phosphorus, Total mg/L**	**Total Organic Carbon mg/L**	**Dissolved Organic Carbon mg/L**
BC Standard																													
CSR Aquatic Life (AW)[a]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,500	2-3[b]	1,280-4,290[b]	1.31-18.5[c]	400	0.2-2[d]	n/a	n/a	n/a	n/a	n/a
CSR Irrigation Watering (IW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSR Livestock Watering (LW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	1	1,000	n/a	100	10	n/a	n/a	n/a	n/a	n/a
CSR Drinking Water (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	250	1.5	500	n/a	10	1	n/a	n/a	n/a	n/a	n/a
Elk River Valley (denotes well part of Study Area 4)**																													
RG_MW_LCWC1**	RG_MW_LCWC1_WG_2022_02_11_NP	2022 02 11	5.3	7.24	7.99	811	130.0	7.81	403	813	62.9	528	21.6	278	339	< 2.0	< 2.0	< 0.050	6.14	0.094	161	< 0.0050	9.22	< 0.0010	0.573	< 0.0010	0.0337	2.72	2.24
	RG_MW_MC10A_WG_2022_02_11_NP	Duplicate	-	-	-	-	-	7.77	412	823	87.2	538	29.5	280	342	< 2.0	< 2.0	< 0.050	6.06	0.091	160	< 0.0050	9.22	< 0.0010	0.360	< 0.0010	0.0340	2.72	2.19
	QA/QC RPD%		-	-	-	-	-	1	2	1	32	2	31	1	1	*	*	*	1	*	1	*	0	*	46	*	1	0	*
	RG_MW_LCWC1_WG_2022_05_10_NP	2022 05 10	6.0	7.27	8.5	890	-31.2	7.85	468	874	28.0	630	20.4	241	294	< 2.0	< 2.0	< 0.050	1.87	0.092	217	< 0.0050	16.1	< 0.0010	1.26	0.0010	0.0170	2.14	2.41
	RG_MW_LCWC1_WG_2022-07-04_NP	2022 07 26	6.6	8.10	7.4	1,121	63.5	7.45	632	1,110	28.9	845	10.6	246	300	< 1.0	< 1.0	< 0.250	2.55	< 0.100	358	< 0.0050	21.8	< 0.0050	1.60	< 0.0010	0.0293	2.35	2.15
	RG_MW_LCWC1_WG_2022-10-03_NP	2022 11 25	6.4	7.53	4.1	1,614	35.4	8.13	616	1,080	18.6	824	18.9	251	306	< 1.0	< 1.0	< 0.250	8.52	0.101	343	< 0.0050	18.6	< 0.0050	< 0.050	< 0.0010	0.0412	1.97	1.42
RG_MW_WC2A**	RG_MW_WC2A_WG_2022_02_10_NP	2022 02 10	5.8	7.34	5.69	630	7.6	8.05	339	642	54.5	438	5.50	199	243	< 2.0	< 2.0	< 0.050	1.72	0.133	148	< 0.0050	6.33	< 0.0010	< 0.050	0.0018	0.0518	0.66	0.67
	RG_MW_WC2A_WG_2022_05_10_NP	2022 05 10	5.6	7.52	4.9	764	-90.0	7.93	398	759	11.4	520	4.97	198	242	< 2.0	< 2.0	< 0.050	1.96	0.111	199	< 0.0050	10.1	< 0.0010	1.33	< 0.0010	0.0098	1.17	1.16
	RG_MW_WC2A_WG_2022-07-04_NP	2022 07 26	8.8	7.48	6.6	713.7	145.2	7.43	445	804	1.7	577	0.28	213	260	< 1.0	< 1.0	< 0.050	0.98	0.159	230	< 0.0050	9.61	< 0.0010	< 0.500	0.0013	0.0032	2.07	1.75
	RG_MW_WC2A_WG_2022-10-03_NP	2022 11 21	5.5	7.60	5.3	705.3	25.1	8.03	379	713	23.2	484	12.5	200	244	< 1.0	< 1.0	< 0.050	1.58	0.120	172	< 0.0050	7.53	< 0.0010	< 0.500	< 0.0010	0.0252	0.74	< 0.50
RG_MW_WC2B**	RG_MW_WC2B_WG_2022_02_10_NP	2022 02 10	5.5	7.39	7.69	1,258	144.8	7.92	669	1,230	2.4	974	0.75	214	261	< 2.0	< 2.0	< 0.250	3.40	0.153	444	0.0068	24.4	< 0.0050	< 0.050	0.0030	0.0043	1.36	1.36
	RG_MW_WC2B_WG_2022_05_10_NP	2022 05 10	4.2	7.41	9.0	832	66.6	7.86	435	813	< 1.0	558	0.34	205	250	< 2.0	< 2.0	< 0.050	1.46	0.124	230	< 0.0050	10.9	< 0.0010	1.39	0.0013	0.0036	1.14	2.39
	RG_MW_WC2B_WG_2022-07-04_NP	2022 07 26	9.2	7.83	4.7	811	60.2	7.52	381	717	55.2	491	5.83	217	264	< 1.0	< 1.0	< 0.050	1.70	0.128	176	< 0.0050	7.74	0.0010	0.866	< 0.0010	0.0766	1.18	1.08
	RG_MW_WC2B_WG_2022-10-03_NP	2022 11 21	7.0	7.34	7.75	1,050	188.8	7.96	606	1,100	< 1.0	810	0.61	212	258	< 1.0	< 1.0	< 0.250	2.08	0.120	375	< 0.0050	16.9	< 0.0050	1.18	< 0.0010	0.0044	< 0.50	< 0.50
GH_GA-MW-2**	GH_GA-MW-2_WG_2022-01-03_NP	2022 01 19	3.4	7.17	0.9	1,324	161.3	8.05	708	1,290	2.1	990	0.70	224	273	< 1.0	< 1.0	< 0.250	6.68	< 0.100	526	0.0165	9.53	0.116	0.219	< 0.0010	0.0036	< 0.50	< 0.50
	GH_GA-MW-2_WG_2022-04-04_NP	2022 04 22	5.5	7.29	0.56	1,341	139.7	7.68	734	1,380	4.0	1,080	9.31	220	269	< 1.0	< 1.0	< 0.250	11.1	0.169	602	0.201	0.970	0.0262	0.518	< 0.0010	0.0119	1.26	1.10
GH_GA-MW-3	GH_GA-MW-3_WG_2022-01-03_NP	2022 02 09	2.6	7.54	0.87	601	-289.6	8.38	222	572	5.0	326	60.9	304	357	6.8	< 1.0	< 0.050	6.05	0.723	26.8	0.422	0.0093	< 0.0010	0.431	0.0023	0.0140	< 0.50	< 0.50
	GH_GA-MW-3_WG_2022-04-04_NP	2022 04 22	5.8	7.29	0.23	1,404	-56.3	7.77	692	1,310	3.8	1,010	0.51	218	266	< 1.0	< 1.0	< 0.250	7.34	< 0.100	527	< 0.0050	11.4	0.115	< 0.050	0.0013	0.0057	0.71	0.72
	GH_GA-MW-3_WG_2022-07-04_NP	2022 09 02	7.2	7.46	0.39	664	-326.4	8.19	271	653	3.9	442	31.7	286	349	< 1.0	< 1.0	< 0.050	6.41	0.637	96.5	0.361	0.0068	< 0.0010	0.459	0.0019	0.0278	0.91	0.73
	GH_GA-MW-3_WG_2022-10-03_NP	2022 11 04	4.7	7.46	1.81	865	-251.7	7.86	415	810	5.2	566	41.2	241	294	< 1.0	< 1.0	< 0.050	6.74	0.535	205	0.434	1.41	0.0878	0.493	< 0.0010	0.0101	< 0.50	< 0.50
	GH_FOX2_WG_2022-10-03_NP	Duplicate	-	-	-	-	-	7.94	428	816	4.1	572	37.2	252	307	< 1.0	< 1.0	< 0.050	6.81	0.522	210	0.441	1.39	0.152	0.502	< 0.0010	0.0101	< 0.50	< 0.50
	QA/QC RPD%		-	-	-	-	-	1	3	1	*	1	10	4	4	*	*	*	1	2	2	2	1	54	2	*	0	*	*
GH_MW-ERSC-1**	GH_MW-ERSC-1_WG_2022-01-03_NP	2022 01 13	4.8	7.28	8.77	875	20.8	8.30	466	859	3.1	532	1.36	221	270	< 1.0	< 1.0	< 0.250	4.25	0.112	273	0.0198	4.88	0.0082	0.378	0.0034	0.0254	1.39	1.35
	GH_MW-ERSC-1_WG_2022-04-04_NP	2022 04 29	3.5	7.31	8.64	789	-10.5	8.04	407	761	12.1	528	6.63	227	277	< 1.0	< 1.0	< 0.050	5.06	0.138	201	0.0146	2.84	0.0013	0.357	< 0.0010	0.0186	2.01	1.92
	GH_FOX1_WG_2022-04-04_NP	Duplicate	-	-	-	-	-	7.97	399	769	7.2	528	2.64	234	286	< 1.0	< 1.0	< 0.050	4.99	0.136	203	0.0150	2.86	0.0013	0.316	< 0.0010	0.0158	2.10	2.11
	QA/QC RPD%		-	-	-	-	-	1	2	1	51	0	86	3	3	*	*	*	1	1	1	*	1	*	12	*	16	*	*
	GH_MW-ERSC-1_WG_2022-07-04_NP	2022 09 08	9.7	7.47	5.82	574	124.8	7.59	297	527	14.8	352	2.81	178	217	< 1.0	< 1.0	< 0.050	2.01	0.173	135	0.0087	2.08	< 0.0010	0.241	0.0015	0.0133	1.27	1.14
	GH_FOX3_WG_2022-07-04_NP	Duplicate	-	-	-	-	-	7.58	297	533	3.6	357	1.16	170	207	< 1.0	< 1.0	< 0.050	2.00	0.171	138	0.0094	2.14	< 0.0010	0.325	0.0015	0.0078	0.68	0.75
	QA/QC RPD%		-	-	-	-	-	0	0	1	*	1	83	5	5	*	*	*	0	1	2	*	3	*	*	*	*	*	*
	GH_MW-ERSC-1_WG_2022-10-03_NP	2022 11 04	7.5	7.26	6.75	1,000	-19.2	7.83	528	926	2.7	714	0.35	193	236	< 1.0	< 1.0	< 0.050	4.08	0.136	338	0.0061	6.48	0.0010	0.164	0.0015	0.0059	0.89	0.71

All terms defined within the body of SNC-Lavalin's report.

<   Denotes concentration less than indicated detection limit.

-    Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

*   RPDs are not calculated where one or more concentrations are less than five times RDL.

RDL Denotes reported detection limit.

BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
<u>UNDERLINE</u>	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH and Temperature. Temperature assumed 10C.

[d] Standard varies with Chloride.

TABLE GH-03: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Inorganics, Nutrients and Organics in Groundwater (GHO)

			Field Parameters					Physical Parameters						Dissolved Inorganics								Nutrients						Organics	
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Field Temperature C	pH (field) pH	Dissolved Oxygen mg/L	Field Conductivity µS/cm	Field ORP mV	pH pH	Hardness mg/L	Conductivity µS/cm	Total Suspended Solids mg/L	Total Dissolved Solids mg/L	Turbidity ntu	Total Alkalinity mg/L	Bicarbonate mg/L	Carbonate mg/L	Hydroxide mg/L	Bromide mg/L	Chloride mg/L	Fluoride mg/L	Sulphate mg/L	Ammonia Nitrogen mg/L	Nitrate Nitrogen mg/L	Nitrite Nitrogen mg/L	Kjeldahl Nitrogen-N mg/L	Ortho-Phosphate mg/L	Phosphorus, Total mg/L	Total Organic Carbon mg/L	Dissolved Organic Carbon mg/L
BC Standard																													
CSR Aquatic Life (AW)[a]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,500	2-3[b]	1,280-4,290[b]	1.31-18.5[c]	400	0.2-2[d]	n/a	n/a	n/a	n/a	n/a
CSR Irrigation Watering (IW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSR Livestock Watering (LW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	1	1,000	n/a	100	10	n/a	n/a	n/a	n/a	n/a
CSR Drinking Water (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	250	1.5	500	n/a	10	1	n/a	n/a	n/a	n/a	n/a
Elk River Valley (denotes well part of Study Area 4)**																													
GH_MW_EF1A**	GH_MW_EF1A_WG_2022-01-03_NP	2022 02 24	3.5	7.66	10.09	346.7	163.2	8.10	174	329	< 1.0	194	< 0.10	159	194	< 1.0	< 1.0	< 0.050	0.99	0.113	34.8	< 0.0050	0.587	< 0.0010	0.065	< 0.0010	< 0.0020	< 0.50	< 0.50
	GH_MW_EF1A_WG_2022-04-04_NP	2022 05 19	4.4	7.75	9.29	355.1	161.4	8.13	197	353	2.5	222	< 0.10	161	196	< 1.0	< 1.0	< 0.050	2.51	0.133	35.6	< 0.0050	0.519	0.0010	0.106	< 0.0010	< 0.0020	< 0.50	< 0.50
	GH_MW_EF1A_WG_2022-07-04_NP	2022 08 15	7.9	7.34	8.33	341.0	228.7	8.04	180	323	< 1.0	190	< 0.10	165	202	< 1.0	< 1.0	< 0.050	1.04	0.153	29.5	< 0.0050	0.414	< 0.0010	< 0.050	0.0015	< 0.0020	0.62	0.82
	GH_MW_EF1A_WG_2022-10-03_NP	2022 10 20	7.0	7.70	7.18	321.3	146.8	7.94	172	301	< 1.0	124	< 0.10	149	182	< 1.0	< 1.0	< 0.050	0.61	0.148	24.3	< 0.0050	0.281	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
GH_MW_EF1B**	GH_MW_EF1B_WG_2022-01-03_NP	2022 02 28	2.2	7.68	10.81	350.6	180.1	7.93	177	332	< 1.0	176	< 0.10	157	192	< 1.0	< 1.0	< 0.050	0.69	0.106	32.9	< 0.0050	0.477	< 0.0010	< 0.050	0.0019	0.0025	0.69	0.60
	GH_MW_EF1B_WG_2022-04-04_NP	2022 05 19	4.1	7.78	8.47	345.7	148.6	8.16	188	341	< 1.0	216	< 0.10	166	202	< 1.0	< 1.0	< 0.050	0.80	0.138	29.6	< 0.0050	0.375	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	GH_MW_EF1B_WG_2022-07-04_NP	2022 08 15	10.3	7.45	5.10	304.8	204.2	7.99	161	291	1.5	185	< 0.10	161	196	< 1.0	< 1.0	< 0.050	0.58	0.153	16.8	< 0.0050	0.130	< 0.0010	< 0.050	0.0021	< 0.0020	0.54	0.91
	GH_MW_EF1B_WG_2022-10-03_NP	2022 10 20	8.8	7.62	6.35	333.3	112.0	7.87	173	314	< 1.0	154	< 0.10	160	194	< 1.0	< 1.0	< 0.050	0.92	0.142	24.0	< 0.0050	0.266	< 0.0010	< 0.050	< 0.0010	0.0024	< 0.50	< 0.50
RG_DW-01-03**	RG_DW-01-03_WP_2022_03_01_NP	2022 03 01	5.8	8.12	10.80	348.4	186.6	8.28	184	343	< 1.0	214	< 0.10	158	193	< 1.0	< 1.0	< 0.050	0.60	0.120	36.7	< 0.0050	0.568	< 0.0010	0.134	< 0.0010	< 0.0020	< 0.50	< 0.50
	RG_DW-01-03_WP_2022_05_03_NP	2022 05 03	6.3	7.70	8.80	360.3	320.3	8.08	186	347	< 1.0	197	< 0.10	158	193	< 1.0	< 1.0	< 0.050	0.90	0.140	42.6	< 0.0050	0.728	< 0.0010	0.060	0.0011	< 0.0020	< 0.50	< 0.50
	RG_DW-01-03_WP_2022_07_18_NP	2022 07 18	6.8	7.92	10.56	372.5	182.9	8.07	186	359	< 1.0	235	1.09	166	202	< 1.0	< 1.0	< 0.050	0.97	0.152	44.6	< 0.0050	0.834	0.0011	< 0.500	< 0.0010	< 0.0020	< 0.50	< 0.50
	RG_DW-01-03_WP_2022_10_26_NP	2022 10 26	6.8	7.98	10.43	358.8	240.9	8.12	186	352	< 1.0	195	< 0.10	154	187	< 1.0	< 1.0	< 0.050	0.76	0.148	39.3	< 0.0050	0.616	< 0.0010	< 0.500	< 0.0010	< 0.0020	< 0.50	< 0.50
Blanks																													
Field Blanks																													
GH_GA-MW-4	GH_JDW3_WG_2022-01-03_NP	2022 02 09	-	-	-	-	-	5.35	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
GH_MW-GHC-1A	GH_JDW1_WG_2022-01-03_NP	2022 02 18	-	-	-	-	-	5.60	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
RG_MW_FR11B	GH_MW_MC10B_WG_2022-03-17_NP	2022 03 17	-	-	-	-	-	5.27	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
GH_MW-ERSC-1	GH_JDW1_WG_2022-04-04_NP	2022 04 29	-	-	-	-	-	5.64	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0191	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
GH_MW-RLP-2	GH_JDW3_WG_2022-04-04_NP	2022 05 20	-	-	-	-	-	5.79	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
RG_MW_FR11B	GH_JDW2_WG_2022-04-04_NP	2022 06 01	-	-	-	-	-	5.47	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
GH_MW-ERSC-1	GH_JDW3_WG_2022-07-04_NP	2022 09 08	-	-	-	-	-	5.90	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
GH_GA-MW-3	GH_JDW2_WG_2022-10-03_NP	2022 11 04	-	-	-	-	-	5.20	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
RG_MW_LC3A	RG_JDW1_WG_2022-10-03_FB	2022 11 21	-	-	-	-	-	5.25	< 0.50	< 2.0	< 7.5	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
RG_MW_LC3B	RG_MW_MC11B_WG_2022-11-21_NP	2022 11 21	-	-	-	-	-	5.41	< 0.50	< 2.0	-	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0059	< 0.0050	< 0.0010	< 0.500	< 0.0010	< 0.0020	< 0.50	< 0.50
RG_MW_LCWC1	GH_JDW1_WG_2022-11-25_FB	2022 11 25	-	-	-	-	-	5.67	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0133	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
Trip Blanks																													
	GH_RDI3_WG_2022-01-03_NP	2022 02 09	-	-	-	-	-	5.51	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0214	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	GH_RDI1_WG_2022-01-03_NP	2022 02 18	-	-	-	-	-	5.68	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	GH_MW_MC10C_WG_2022-03-17_NP	2022 03 17	-	-	-	-	-	5.10	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0056	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	GH_RDI1_WG_2022-04-04_NP	2022 04 29	-	-	-	-	-	5.49	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0755	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	GH_RDI3_WG_2022-04-04_NP	2022 05 20	-	-	-	-	-	5.21	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0361	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	GH_RDI2_WG_2022-04-04_NP	2022 06 01	-	-	-	-	-	5.51	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	0.101	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	GH_RDI2_WG_2022-10-03_NP	2022 11 04	-	-	-	-	-	5.25	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0148	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50

All terms defined within the body of SNC-Lavalin's report.

< Denotes concentration less than indicated detection limit.

\- Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

* RPDs are not calculated where one or more concentrations are less than five times RDL.

RDL Denotes reported detection limit.

BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH and Temperature. Temperature assumed 10C.

[d] Standard varies with Chloride.

TABLE GH-04: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Metals in Groundwater (GHO)

			Dissolved Metals																															
Sample Location	**Sample ID**	**Sample Date (yyyy mm dd)**	**Hardness mg/L**	**Aluminum µg/L**	**Antimony µg/L**	**Arsenic µg/L**	**Barium µg/L**	**Beryllium µg/L**	**Bismuth µg/L**	**Boron µg/L**	**Cadmium µg/L**	**Calcium mg/L**	**Chromium µg/L**	**Cobalt µg/L**	**Copper µg/L**	**Iron µg/L**	**Lead µg/L**	**Lithium µg/L**	**Magnesium mg/L**	**Manganese µg/L**	**Mercury µg/L**	**Molybdenum µg/L**	**Nickel µg/L**	**Potassium mg/L**	**Selenium µg/L**	**Silver µg/L**	**Sodium mg/L**	**Strontium µg/L**	**Thallium µg/L**	**Tin µg/L**	**Titanium µg/L**	**Uranium µg/L**	**Vanadium µg/L**	**Zinc[f] µg/L**
BC Standard																																		
CSR Aquatic Life (AW)[a]			n/a	n/a	90	50	10,000	1.5	n/a	12,000	0.5-4[b]	n/a	10[d]	40	20-90[b]	n/a	40-160[b]	n/a	n/a	n/a	0.25	10,000	250-1,500[b]	n/a	20	0.5-15[b]	n/a	n/a	3	n/a	1,000	85	n/a	75-2,400[b]
CSR Irrigation Watering (IW)			n/a	5,000	n/a	100	n/a	100	n/a	500	5	n/a	5[d]	50	200	5,000	200	2,500	n/a	200	1	10	200	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	10	100	1,000-5,000[c]
CSR Livestock Watering (LW)			n/a	5,000	n/a	25	n/a	100	n/a	5,000	80	1,000	50[d]	1,000	300	n/a	100	5,000	n/a	n/a	2	50	1,000	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	200	100	2,000
CSR Drinking Water (DW)			n/a	9,500	6	10	1,000	8	n/a	5,000	5	n/a	50[d]	20[e]	1,500	6,500	10	8	n/a	1,500	1	250	80	n/a	10	20	200	2,500	n/a	2,500	n/a	20	20	3,000
Health-based Value (HBV)[g]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,200	n/a	n/a	n/a	2,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fording River Valley (Porter Creek Drainage) (^ denotes well part of Study Area 1)																																		
GH_MW-PC^	GH_MW-PC_WG_2022-03-16_NP	2022 03 16	632	< 1.0	< 0.10	0.21	72.6	< 0.020	< 0.050	< 10	0.0365	116	0.29	< 0.10	34.9	< 10	< 0.050	7.0	83.2	0.63	< 0.0050	2.69	1.20	0.996	***65.8***	< 0.010	0.875	148	< 0.010	< 0.10	< 0.30	4.48	< 0.50	5.7
	GH_MW-PC_WG_2022-04-04_NP	2022 06 01	487	2.3	< 0.10	0.14	78.2	< 0.020	< 0.050	< 10	0.0311	89.5	0.75	< 0.10	2.67	< 10	< 0.050	6.6	64.1	0.27	< 0.0050	2.65	0.69	0.877	***74.2***	< 0.010	0.952	120	< 0.010	< 0.10	< 0.30	4.35	< 0.50	2.2
	GH_MW-PC_WG_2022-07-04_NP	2022 08 08	563	1.3	< 0.10	0.19	107	< 0.020	< 0.050	< 10	0.0486	108	0.18	< 0.10	1.75	< 10	< 0.050	7.2	71.2	0.23	< 0.0050	2.65	0.56	1.13	***70.8***	< 0.010	0.944	129	< 0.010	< 0.10	< 0.30	4.94	< 0.50	2.5
	GH_MW-PC_WG_2022-10-03_NP	2022 11 25	603	1.8	< 0.10	0.15	103	< 0.020	< 0.050	< 10	0.0368	116	0.49	< 0.10	3.54	< 10	< 0.050	8.3	76.0	0.42	< 0.0050	2.42	0.91	1.10	***95.6***	< 0.010	0.848	152	< 0.010	< 0.10	< 0.30	3.97	< 0.50	3.6
GH_MW_PC4A^	GH_MW-PC4A_WG_2022-03-16_NP	2022 03 16	441	3.4	0.11	0.52	31.2	< 0.020	< 0.050	< 10	0.0101	118	< 0.10	0.40	0.23	29	< 0.050	2.9	35.6	127	< 0.0050	2.13	1.36	1.00	0.100	< 0.010	5.33	132	< 0.010	< 0.10	< 0.30	2.75	< 0.50	3.5
	GH_MW-PC4A_WG_2022-04-04_NP	2022 06 01	364	2.2	< 0.10	0.50	32.2	< 0.020	< 0.050	< 10	0.0136	96.2	< 0.10	0.32	1.09	100	0.073	2.7	30.0	97.6	< 0.0050	6.73	0.97	0.968	0.107	< 0.010	3.78	130	0.013	0.30	< 0.30	2.30	< 0.50	3.4
	GH_MW-PC4A_WG_2022-07-04_NP	2022 09 07	346	< 1	< 0.1	0.52	30.6	< 0.02	< 0.05	< 10	< 0.005	90.8	< 0.1	0.26	< 0.2	40	< 0.05	3	29	87.9	< 0.005	4.15	1.11	0.92	< 0.05	< 0.01	4.71	117	< 0.01	< 0.1	< 0.3	1.98	< 0.5	< 1
	GH_MW-PC4A_WG_2022-10-03_NP	2022 11 18	348	1.3	< 0.10	0.57	31.5	< 0.020	< 0.050	< 10	0.0133	88.1	< 0.10	0.25	0.21	48	< 0.050	2.9	31.2	76.1	< 0.0050	5.78	1.20	0.840	0.066	< 0.010	5.53	113	0.011	< 0.10	< 0.30	2.54	< 0.50	< 1.0
Fording River Valley (Greenhills Creek Drainage) (+ denotes well part of Study Area 3)																																		
GH_MW-GHC-1A	GH_MW-GHC-1A_WG_2022-01-03_NP	2022 02 18	655	1.4	< 0.10	< 0.10	87.4	< 0.020	< 0.050	35	0.0233	169	< 0.10	< 0.10	2.11	< 10	0.098	19.2	56.5	0.25	< 0.0050	0.723	0.71	1.51	3.45	< 0.010	5.02	548	0.023	< 0.10	< 0.30	2.98	< 0.50	3.9
	GH_FOX1_WG_2022-01-03_NP	Duplicate	632	1.1	< 0.10	0.10	85.4	< 0.020	< 0.050	34	0.0243	162	< 0.10	< 0.10	2.15	< 10	0.055	18.1	55.2	0.25	< 0.0050	0.657	0.66	1.49	3.30	< 0.010	4.99	503	0.022	< 0.10	< 0.30	2.73	< 0.50	3.9
	QA/QC RPD%		4	*	*	*	2	*	*	*	*	4	*	*	2	*	*	6	2	*	*	10	*	1	4	*	1	9	*	*	*	9	*	*
	GH_MW_GHC-1A_WG_2022-04-04_NP	2022 04 27	657	< 1.0	< 0.10	< 0.10	90.0	< 0.020	< 0.050	30	0.0244	169	< 0.10	< 0.10	0.82	< 10	< 0.050	16.3	57.0	0.17	< 0.0050	0.706	0.54	1.43	2.79	< 0.010	4.62	556	0.022	< 0.10	< 0.30	3.03	< 0.50	1.8
	GH_MW-GHC-1A_WG_2022-07-04_NP	2022 09 09	650	1.1	< 0.10	< 0.10	85.5	< 0.020	< 0.050	31	0.0282	163	0.14	< 0.10	< 0.20	< 10	< 0.050	17.2	59.0	0.40	< 0.0050	0.829	0.78	1.46	4.50	< 0.010	4.81	510	0.022	< 0.10	< 0.30	2.86	< 0.50	2.3
	GH_MW-GHC-1A_WG_2022-10-03_NP	2022 11 23	538	1.4	< 0.10	< 0.10	71.9	< 0.020	< 0.050	31	0.0221	133	< 0.10	< 0.10	0.20	< 10	< 0.050	16.1	50.0	0.57	< 0.0050	0.801	0.57	1.17	6.93	< 0.010	3.99	442	0.019	< 0.10	< 0.30	2.60	< 0.50	< 1.0
GH_MW-GHC-1B	GH_MW-GHC-1B_WG_2022-01-03_NP	2022 02 18	828	< 1.0	< 0.10	0.73	28.9	< 0.020	< 0.050	33	0.0212	236	< 0.10	0.23	0.35	342	< 0.050	19.4	58.0	93.4	< 0.0050	0.866	1.15	1.85	0.511	< 0.010	4.42	694	0.012	< 0.10	< 0.30	1.48	< 0.50	13.8
	GH_MW_GHC-1B_WG_2022-04-04_NP	2022 04 27	818	1.3	< 0.10	0.68	25.2	< 0.020	< 0.050	33	0.0167	233	< 0.10	0.49	0.48	540	< 0.050	20.3	57.4	*291*	< 0.0050	1.36	1.56	1.80	0.077	< 0.010	4.56	696	0.012	< 0.10	< 0.30	1.78	< 0.50	13.7
	GH_MW-GHC-1B_WG_2022-07-04_NP	2022 09 09	836	< 1.0	< 0.10	0.55	21.5	< 0.020	< 0.050	40	0.0102	235	< 0.10	0.46	0.32	74	< 0.050	21.7	60.6	*317*	< 0.0050	1.23	1.82	1.88	0.078	< 0.010	4.82	700	0.014	< 0.10	< 0.30	1.89	< 0.50	22.0
	GH_MW-GHC-1B_WG_2022-10-03_NP	2022 11 23	846	< 1.0	< 0.10	0.40	24.0	< 0.020	< 0.050	42	0.0168	237	< 0.10	0.55	1.04	< 10	< 0.050	21.8	61.7	*353*	< 0.0050	1.12	2.40	1.98	0.140	< 0.010	4.68	689	0.015	< 0.10	< 0.30	1.89	< 0.50	72.5
GH_MW_GHC_4B	GH_MW_GHC_4B_WG_2022-03-14_NP	2022 03 14	497	< 1.0	< 0.10	0.11	52.8	< 0.020	< 0.050	17	0.0375	126	0.12	< 0.10	0.28	< 10	< 0.050	10.0	44.4	< 0.10	< 0.0050	0.493	0.50	1.57	14.0	< 0.010	7.29	298	< 0.010	< 0.10	< 0.30	1.54	< 0.50	< 1.0
	GH_MW_GHC_4B_WG_2022-04-04_NP	2022 05 31	588	< 1.0	< 0.10	0.10	63.3	< 0.020	< 0.050	18	0.0321	146	0.16	< 0.10	0.24	< 10	< 0.050	9.8	54.2	< 0.10	< 0.0050	0.414	< 0.50	1.74	***30.9***	< 0.010	4.99	328	< 0.010	< 0.10	< 0.30	1.31	< 0.50	< 1.0
	GH_MW_GHC_4B_WG_2022-07-04_NP	2022 09 13	695	2.0	< 0.10	0.12	55.2	< 0.020	< 0.050	21	0.0373	167	0.94	< 0.10	0.22	< 10	< 0.050	10.9	67.5	0.59	< 0.0050	0.490	0.70	2.05	***61.8***	< 0.010	4.39	353	< 0.010	< 0.10	< 0.30	1.43	< 0.50	< 1.0
	GH_MW_GHC_4B_WG_2022-10-03_NP	2022 11 16	904	1.2	< 0.10	0.12	73.4	< 0.020	< 0.050	18	0.0616	214	0.14	< 0.10	0.21	< 10	< 0.050	9.5	89.9	< 0.10	< 0.0050	0.609	< 0.50	1.86	***110***	< 0.010	5.20	430	< 0.010	< 0.10	< 0.30	2.08	< 0.50	< 1.0
GH_MW-TD	GH_MW-TD_WG_2022-01-03_NP	2022 02 17	366	1.1	< 0.10	0.15	23.5	< 0.020	< 0.050	342	0.386	87.2	< 0.10	0.39	< 0.20	76	< 0.050	40.7	35.9	*663*	< 0.0050	2.76	0.62	2.59	< 0.050	< 0.010	28.4	1,220	0.158	< 0.10	< 0.30	0.908	< 0.50	1.3
	GH_MW-TD_WG_2022-04-04_NP	2022 04 28	337	1.5	< 0.10	0.16	23.2	< 0.020	< 0.050	364	0.115	81.5	< 0.10	0.39	< 0.20	97	< 0.050	41.5	32.5	*605*	< 0.0050	2.74	0.75	2.59	< 0.050	< 0.010	27.6	1,180	0.147	< 0.10	< 0.30	0.842	< 0.50	1.1
	GH_MW-TD_WG_2022-07-04_NP	2022 09 01	378	< 1.0	< 0.10	0.13	24.7	< 0.020	< 0.050	407	0.454	90.1	< 0.10	0.39	< 0.20	77	< 0.050	41.0	37.1	*621*	< 0.0050	2.64	0.86	2.37	0.101	< 0.010	27.3	1,150	0.152	< 0.10	< 0.30	0.817	< 0.50	1.1
	GH_MW-TD_WG_2022-10-03_NP	2022 11 16	395	1.1	< 0.10	0.17	23.4	< 0.020	< 0.050	405	0.141	97.4	< 0.10	0.45	< 0.20	72	< 0.050	38.2	36.9	*669*	< 0.0050	3.01	1.19	2.42	0.404	< 0.010	27.2	1,200	0.168	< 0.10	< 0.30	1.04	< 0.50	< 1.0
GH_MW-RLP-2+	GH_MW-RLP-2_WG_2022-01-03_NP	2022 02 09	476	1.2	0.13	0.17	84.6	< 0.020	< 0.050	25	0.0119	109	< 0.10	0.69	0.26	523	< 0.050	36.9	49.6	*834*	< 0.0050	6.14	3.07	3.70	3.56	< 0.010	11.9	340	< 0.010	< 0.10	< 0.30	2.62	< 0.50	1.6
	GH_MW-RLP-2_WG_2022-04-04_NP	2022 05 20	520	3.0	0.14	0.32	100	< 0.020	< 0.050	21	0.0137	123	0.11	0.88	0.37	1,380	< 0.050	35.9	51.8	*1,150*	< 0.0050	6.65	3.49	3.64	0.871	< 0.010	12.0	320	< 0.010	0.11	< 0.30	3.69	0.51	2.4
	GH_FOX3_WG_2022-04-04_NP	Duplicate	528	6.0	0.15	0.35	101	< 0.020	< 0.050	22	0.0163	124	0.11	0.89	0.37	1,480	0.054	37.6	53.0	*1,180*	< 0.0050	6.48	3.63	3.74	0.906	< 0.010	11.9	335	< 0.010	< 0.10	< 0.30	3.70	0.53	2.7
	QA/QC RPD%		2	*	*	*	1	*	*	*	*	1	*	1	*	7	*	5	2	3	*	3	4	3	4	*	1	5	*	*	*	0	*	*
	GH_MW-RLP-2_WG_2022-07-04_NP	2022 09 15	497	1.6	< 0.10	0.90	110	< 0.020	< 0.050	36	0.0128	106	< 0.10	0.65	0.65	1,240	< 0.050	49.0	56.5	*658*	< 0.0050	*14.4*	3.49	5.19	0.412	< 0.010	15.1	418	< 0.010	< 0.10	< 0.30	3.61	< 0.50	6.9
	GH_MW-RLP-2_WG_2022-10-03_NP	2022 11 18	553	2.5	0.12	0.47	108	< 0.020	< 0.050	31	0.0157	118	0.11	0.78	0.84	946	< 0.050	44.0	62.8	*948*	< 0.0050	8.85	3.63	5.13	2.12	< 0.010	14.4	394	0.010	< 0.10	< 0.30	3.42	0.65	5.3

All terms defined within the body of SNC-Lavalin's report.

< Denotes concentration less than indicated detection limit.

\- Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

* RPDs are not calculated where one or more concentrations are less than five times RDL.

RDL Denotes reported detection limit.

BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH.

[d] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.

[e] Interim BC MoE Regional Background Estimate (Protocol 9 Determining Background Groundwater Quality).

[f] There is no Zinc standard specified for H > 400; therefore, the standard for H=300-<400 is applied as a conservative comparison.

[g] Ramboll calculated health-based values for these two parameters based on toxicity values (tolerable daily intakes; TDI) and drinking water allocation factors (DW AFs), documented in Appendix IV.

TABLE GH-04: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Metals in Groundwater (GHO)

				Dissolved Metals																														
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Hardness mg/L	Aluminum µg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Bismuth µg/L	Boron µg/L	Cadmium µg/L	Calcium mg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Lithium µg/L	Magnesium mg/L	Manganese µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Potassium mg/L	Selenium µg/L	Silver µg/L	Sodium mg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Uranium µg/L	Vanadium µg/L	Zinc[f] µg/L
BC Standard																																		
CSR Aquatic Life (AW)[a]			n/a	n/a	90	50	10,000	1.5	n/a	12,000	0.5-4[b]	n/a	10[d]	40	20-90[b]	n/a	40-160[b]	n/a	n/a	n/a	0.25	10,000	250-1,500[b]	n/a	20	0.5-15[b]	n/a	n/a	3	n/a	1,000	85	n/a	75-2,400[b]
CSR Irrigation Watering (IW)			n/a	5,000	n/a	100	n/a	100	n/a	500	5	n/a	5[d]	50	200	5,000	200	2,500	n/a	200	1	10	200	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	10	100	1,000-5,000[c]
CSR Livestock Watering (LW)			n/a	5,000	n/a	25	n/a	100	n/a	5,000	80	1,000	50[d]	1,000	300	n/a	100	5,000	n/a	n/a	2	50	1,000	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	200	100	2,000
CSR Drinking Water (DW)			n/a	9,500	6	10	1,000	8	n/a	5,000	5	n/a	50[d]	20[e]	1,500	6,500	10	8	n/a	1,500	1	250	80	n/a	10	20	200	2,500	n/a	2,500	n/a	20	20	3,000
Health-based Value (HBV)[g]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,200	n/a	n/a	n/a	2,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fording River Valley (Greenhills Creek Drainage) (+ denotes well part of Study Area 3)																																		
GH_POTW09+	GH_POTW09_WG_2022-01-03_NP	2022 02 08	415	< 1.0	< 0.10	0.42	31.4	< 0.020	< 0.050	21	0.0097	98.2	< 0.10	0.18	< 0.20	170	0.127	12.0	41.3	182	< 0.0050	2.53	1.29	1.52	1.30	< 0.010	6.98	354	0.017	< 0.10	< 0.30	2.27	< 0.50	1.5
	GH_POTW09_WG_2022-04-04_NP	2022 04 29	432	< 1.0	< 0.10	0.60	36.4	< 0.020	< 0.050	20	0.0114	104	< 0.10	0.17	0.28	164	0.564	12.4	41.8	164	< 0.0050	2.11	3.29	1.73	***20.4***	< 0.010	7.71	351	0.015	< 0.10	< 0.30	2.96	< 0.50	2.6
	GH_POTW09_WG_2022-07-04_NP	2022 09 01	462	< 1.0	< 0.10	0.70	37.7	< 0.020	< 0.050	24	0.0067	108	< 0.10	0.16	< 0.20	164	0.075	11.7	46.7	160	< 0.0050	2.06	0.54	1.60	3.40	< 0.010	6.98	327	0.016	< 0.10	< 0.30	2.53	< 0.50	1.7
	GH_POTW09_WG_2022-10-03_NP	2022 10 21	430	< 1.0	< 0.10	0.49	32.4	< 0.020	< 0.050	20	0.0110	102	< 0.10	0.17	< 0.20	177	0.084	12.6	42.5	166	< 0.0050	2.26	< 0.50	1.55	1.58	< 0.010	6.73	342	0.016	< 0.10	< 0.30	2.40	< 0.50	< 1.0
GH_POTW10+	GH_POTW10_WG_2022-01-03_NP	2022 02 08	404	< 1.0	< 0.10	1.30	18.1	< 0.020	< 0.050	37	0.0117	91.1	< 0.10	0.20	< 0.20	309	< 0.050	17.0	43.0	55.4	< 0.0050	2.73	1.04	1.75	5.84	< 0.010	5.10	505	0.010	< 0.10	< 0.30	0.743	< 0.50	1.2
	GH_POTW10_WG_2022-04-04_NP	2022 04 28	390	1.5	< 0.10	1.43	18.2	< 0.020	< 0.050	39	0.0159	88.1	< 0.10	0.19	< 0.20	424	< 0.050	17.3	41.3	58.7	< 0.0050	2.96	1.08	1.82	5.00	< 0.010	5.18	537	0.013	< 0.10	< 0.30	0.766	< 0.50	1.0
	GH_POTW10_WG_2022-07-04_NP	2022 09 01	434	< 1.0	< 0.10	1.21	18.1	< 0.020	< 0.050	40	0.0114	97.8	< 0.10	0.16	< 0.20	707	< 0.050	17.2	46.0	59.1	< 0.0050	2.80	0.97	1.63	3.81	< 0.010	5.06	542	0.011	< 0.10	< 0.30	0.644	< 0.50	1.2
	GH_POTW10_WG_2022-10-03_NP	2022 10 21	369	< 1.0	< 0.10	0.87	15.4	< 0.020	< 0.050	35	0.0099	81.9	< 0.10	0.17	0.27	315	< 0.050	15.7	40.0	57.3	< 0.0050	2.40	1.03	1.47	4.70	< 0.010	4.76	455	< 0.010	< 0.10	< 0.30	0.610	< 0.50	1.1
GH_POTW15+	GH_POTW15_WG_2022-01-03_NP	2022 02 08	509	< 1.0	< 0.10	1.61	20.4	< 0.020	< 0.050	22	0.0120	130	< 0.10	0.20	< 0.20	875	< 0.050	15.6	44.8	194	< 0.0050	2.46	0.74	1.52	< 0.050	< 0.010	11.0	394	0.018	< 0.10	< 0.30	1.44	< 0.50	1.4
	GH_POTW15_WG_2022-04-04_NP	2022 04 28	516	6.6	< 0.10	1.73	22.4	< 0.020	< 0.050	20	0.0114	129	< 0.10	0.23	< 0.20	931	< 0.050	16.1	47.0	*208*	< 0.0050	3.04	0.68	1.73	0.072	< 0.010	12.9	410	0.019	< 0.10	< 0.30	1.41	< 0.50	1.1
	GH_POTW15_WG_2022-07-04_NP	2022 09 01	580	< 1.0	< 0.10	1.84	23.6	< 0.020	< 0.050	21	0.0094	146	< 0.10	0.21	< 0.20	939	< 0.050	16.4	52.4	196	< 0.0050	2.33	0.69	1.56	< 0.050	< 0.010	12.7	417	0.017	< 0.10	< 0.30	1.36	< 0.50	1.9
	GH_POTW15_WG_2022-10-03_NP	2022 10 21	466	< 1.0	< 0.10	1.29	19.9	< 0.020	< 0.050	19	0.0059	113	< 0.10	0.20	< 0.20	373	< 0.050	14.0	44.6	186	< 0.0050	2.00	0.69	1.43	< 0.050	< 0.010	11.7	327	0.013	< 0.10	< 0.30	1.13	< 0.50	2.6
GH_POTW17+	GH_POTW17_WG_2022-01-03_NP	2022 02 08	591	< 1.0	< 0.10	0.78	32.4	< 0.020	< 0.050	22	0.0260	135	< 0.10	0.14	1.48	343	0.476	14.8	61.7	117	< 0.0050	1.94	1.56	1.58	10.5	< 0.010	9.03	376	0.010	< 0.10	< 0.30	2.10	< 0.50	4.3
	GH_POTW17_WG_2022-04-04_NP	2022 04 29	721	1.7	< 0.10	0.17	27.2	< 0.020	< 0.050	24	0.0516	168	< 0.10	0.16	0.40	172	0.054	15.2	73.2	77.2	< 0.0050	1.06	4.54	1.79	8.14	< 0.010	8.88	470	0.014	0.24	< 0.30	2.52	< 0.50	2.5
	GH_POTW17_WG_2022-07-04_NP	2022 09 01	788	< 1.0	< 0.10	0.18	29.5	< 0.020	< 0.050	22	0.0427	176	< 0.10	0.11	0.39	128	< 0.050	14.1	84.6	51.3	< 0.0050	1.06	2.19	1.56	8.99	< 0.010	8.27	435	0.012	< 0.10	< 0.30	2.44	< 0.50	2.7
	GH_POTW17_WG_2022-10-03_NP	2022 10 21	740	< 1.0	< 0.10	0.15	27.7	< 0.020	< 0.050	21	0.0511	165	< 0.10	0.11	0.30	126	0.095	14.7	79.6	51.7	< 0.0050	1.06	7.65	1.56	8.62	< 0.010	8.59	418	0.011	< 0.10	< 0.30	2.56	< 0.50	13.3
RG_MW_FR11A	RG_MW_FR11A_WG_2022-03-17_NP	2022 03 17	261	6.1	0.21	0.69	36.1	< 0.020	< 0.050	114	0.0086	59.7	< 0.10	0.32	0.71	10	< 0.050	19.0	27.2	108	< 0.0050	5.35	1.15	2.56	0.147	< 0.010	24.0	446	0.011	0.16	< 0.30	2.78	< 0.50	2.4
	RG_MW_FR11A_WG_2022-04-04_NP	2022 06 01	244	2.8	0.32	1.83	40.9	< 0.020	< 0.050	116	0.0638	53.3	0.25	0.19	1.65	< 10	< 0.050	20.2	27.0	81.0	< 0.0050	*142*	2.44	2.76	0.320	< 0.010	35.4	457	0.020	2.29	< 0.30	3.63	1.22	6.2
	RG_MW_FR11A_WG_2022-07-04_NP	2022 09 14	276	1.6	0.21	0.68	38.8	< 0.020	< 0.050	122	0.0196	59.1	0.12	0.32	2.19	14	< 0.050	21.7	31.2	73.7	< 0.0050	7.41	3.88	2.81	0.213	< 0.010	25.4	504	0.021	0.10	< 0.30	1.84	< 0.50	2.4
	RG_MW_FR11A_WG_2022-10-03_N	2022 11 28	296	2.0	0.23	0.54	46.9	< 0.020	< 0.050	110	0.0179	64.0	0.12	0.10	19.8	< 10	< 0.050	22.1	33.2	38.4	< 0.0050	3.07	1.20	2.33	0.242	< 0.010	11.4	539	0.014	0.28	< 0.30	0.967	< 0.50	7.5
RG_MW_FR11B	RG_MW_FR11B_WG_2022-03-17_NP	2022 03 17	281	3.0	0.24	0.54	51.0	< 0.020	< 0.050	72	0.0169	67.5	< 0.10	0.37	1.16	< 10	< 0.050	17.5	27.4	123	< 0.0050	5.27	1.20	2.19	0.268	< 0.010	11.7	383	0.038	0.12	< 0.30	0.903	< 0.50	3.8
	GH_MW_MC10A_WG_2022-03-17_NP	Duplicate	286	2.5	0.24	0.56	53.4	< 0.020	< 0.050	72	0.0186	68.4	< 0.10	0.38	1.18	< 10	< 0.050	17.7	28.1	128	< 0.0050	5.30	1.24	2.26	0.309	< 0.010	12.1	391	0.037	0.10	< 0.30	0.923	< 0.50	3.1
	QA/QC RPD%		2	*	*	4	5	*	*	0	*	1	*	*	2	*	*	1	3	4	*	1	*	3	14	*	3	2	*	*	*	2	*	*
	RG_MW_FR11B_WG_2022-04-04_NP	2022 06 01	277	2.2	< 0.10	0.75	61.6	< 0.020	< 0.050	68	0.0381	63.6	< 0.10	0.18	1.08	< 10	< 0.050	18.0	28.7	108	< 0.0050	*39.1*	1.50	2.30	< 0.050	< 0.010	9.47	408	0.016	0.44	< 0.30	0.483	0.54	4.4
	RG_MW_FR11B_WG_2022-07-04_NP	2022 09 14	274	8.1	0.30	0.47	47.9	< 0.020	< 0.050	72	0.0118	63.2	0.14	0.44	1.80	15	< 0.050	18.0	28.1	96.7	< 0.0050	6.13	1.98	2.79	0.977	< 0.010	14.7	367	0.030	< 0.10	< 0.30	1.66	< 0.50	< 1.0
	RG_MW_FR11B_WG_2022-10-03_N	2022 11 28	306	1.6	0.12	0.36	57.9	< 0.020	< 0.050	64	0.0228	70.4	0.36	< 0.10	4.28	< 10	< 0.050	17.5	31.6	39.8	< 0.0050	2.64	1.07	2.17	0.130	< 0.010	7.99	399	0.021	0.10	< 0.30	0.295	< 0.50	5.7
Elk River Valley (denotes well part of Study Area 4)**																																		
GH_MW-MC-1D	GH_MW-MC-1D_WG_2022_03_09_NP	2022 03 09	122	1.2	< 0.10	1.06	925	< 0.020	< 0.050	80	< 0.0050	26.2	< 0.10	< 0.10	< 0.20	244	< 0.050	84.0	13.7	118	< 0.0050	7.15	< 0.50	1.25	< 0.050	< 0.010	44.0	392	0.028	< 0.10	< 0.30	0.067	< 0.50	1.6
	GH_MW-MC-1D_WG_2022_06_13_NP	2022 06 13	122	1.4	< 0.10	1.19	872	< 0.020	< 0.050	74	< 0.0050	25.1	< 0.50	< 0.10	< 0.20	211	< 0.050	75.6	14.4	121	< 0.0050	7.20	< 0.50	1.30	< 0.050	< 0.010	43.0	361	0.013	< 0.10	< 0.30	0.074	< 0.50	< 1.0
	GH_MW-MC-1D_WG_2022-07-04_NP	2022 08 23	127	< 1.0	< 0.10	1.12	880	< 0.020	< 0.050	88	< 0.0050	27.4	< 0.10	< 0.10	< 0.20	222	< 0.050	90.3	14.2	122	< 0.0050	7.77	< 0.50	1.30	< 0.050	< 0.010	42.9	400	0.028	< 0.10	< 0.30	0.064	< 0.50	< 1.0
	GH_MW-MC-1D_WG_2022-10-03_NP	2022 10 26	127	< 1.0	< 0.10	1.05	961	< 0.020	< 0.050	81	< 0.0050	26.6	< 0.10	< 0.10	< 0.20	136	< 0.050	78.4	14.7	114	< 0.0050	7.61	< 0.50	1.33	< 0.050	< 0.010	44.5	412	0.026	< 0.10	< 0.30	0.061	< 0.50	< 1.0
GH_MW-MC-1S	GH_MW-MC-1S_WG_2022_03_09_NP	2022 03 09	164	< 1.0	< 0.10	< 0.10	47.4	< 0.020	< 0.050	< 10	< 0.0050	46.2	0.25	< 0.10	< 0.20	< 10	< 0.050	1.7	11.7	< 0.10	< 0.0050	1.09	< 0.50	0.304	1.10	< 0.010	0.783	211	< 0.010	< 0.10	< 0.30	0.818	< 0.50	1.3
	GH_MW-MC-1S_WG_2022_06_13_NP	2022 06 13	166	< 1.0	< 0.10	< 0.10	53.6	< 0.020	< 0.050	< 10	< 0.0050	46.9	< 0.50	< 0.10	< 0.20	< 10	< 0.050	1.9	11.9	< 0.10	< 0.0050	0.892	< 0.50	0.369	0.719	< 0.010	0.896	192	< 0.010	< 0.10	< 0.30	0.672	< 0.50	< 1.0
	GH_MW-MC-1S_WG_2022-07-04_NP	2022 08 23	148	< 1.0	< 0.10	0.12	50.6	< 0.020	< 0.050	< 10	0.0062	42.3	0.24	< 0.10	0.44	< 10	< 0.050	2.5	10.2	< 0.10	< 0.0050	1.23	< 0.50	0.398	0.694	< 0.010	0.643	196	< 0.010	< 0.10	< 0.30	0.623	< 0.50	< 1.0
	GH_MW-MC-1S_WG_2022-10-03_NP	2022 10 26	163	< 1.0	< 0.10	< 0.10	56.1	< 0.020	< 0.050	< 10	< 0.0050	47.0	0.24	< 0.10	< 0.20	< 10	< 0.050	2.0	11.2	< 0.10	< 0.0050	1.10	< 0.50	0.409	0.982	< 0.010	0.691	215	< 0.010	< 0.10	< 0.30	0.646	< 0.50	< 1.0

All terms defined within the body of SNC-Lavalin's report.

<	Denotes concentration less than indicated detection limit.
-	Denotes analysis not conducted.
n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL	Denotes reported detection limit.

BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH.

[d] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.

[e] Interim BC MoE Regional Background Estimate (Protocol 9 Determining Background Groundwater Quality).

[f] There is no Zinc standard specified for H > 400; therefore, the standard for H=300-<400 is applied as a conservative comparison.

[g] Ramboll calculated health-based values for these two parameters based on toxicity values (tolerable daily intakes; TDI) and drinking water allocation factors (DW AFs), documented in Appendix IV.

TABLE GH-04: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Metals in Groundwater (GHO)

				Dissolved Metals																														
Sample Location	**Sample ID**	**Sample Date (yyyy mm dd)**	**Hardness mg/L**	**Aluminum µg/L**	**Antimony µg/L**	**Arsenic µg/L**	**Barium µg/L**	**Beryllium µg/L**	**Bismuth µg/L**	**Boron µg/L**	**Cadmium µg/L**	**Calcium mg/L**	**Chromium µg/L**	**Cobalt µg/L**	**Copper µg/L**	**Iron µg/L**	**Lead µg/L**	**Lithium µg/L**	**Magnesium mg/L**	**Manganese µg/L**	**Mercury µg/L**	**Molybdenum µg/L**	**Nickel µg/L**	**Potassium mg/L**	**Selenium µg/L**	**Silver µg/L**	**Sodium mg/L**	**Strontium µg/L**	**Thallium µg/L**	**Tin µg/L**	**Titanium µg/L**	**Uranium µg/L**	**Vanadium µg/L**	**Zinc[f] µg/L**
BC Standard																																		
CSR Aquatic Life (AW)[a]			n/a	n/a	90	50	10,000	1.5	n/a	12,000	0.5-4[b]	n/a	10[d]	40	20-90[b]	n/a	40-160[b]	n/a	n/a	n/a	0.25	10,000	250-1,500[b]	n/a	20	0.5-15[b]	n/a	n/a	3	n/a	1,000	85	n/a	75-2,400[b]
CSR Irrigation Watering (IW)			n/a	5,000	n/a	100	n/a	100	n/a	500	5	n/a	5[d]	50	200	5,000	200	2,500	n/a	200	1	10	200	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	10	100	1,000-5,000[c]
CSR Livestock Watering (LW)			n/a	5,000	n/a	25	n/a	100	n/a	5,000	80	1,000	50[d]	1,000	300	n/a	100	5,000	n/a	n/a	2	50	1,000	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	200	100	2,000
CSR Drinking Water (DW)			n/a	9,500	6	10	1,000	8	n/a	5,000	5	n/a	50[d]	20[e]	1,500	6,500	10	8	n/a	1,500	1	250	80	n/a	10	20	200	2,500	n/a	2,500	n/a	20	20	3,000
Health-based Value (HBV)[g]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,200	n/a	n/a	n/a	2,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Elk River Valley (denotes well part of Study Area 4)**																																		
GH_MW-MC-2D	GH_MW-MC-2D_WG_2022_03_08_NP	2022 03 08	17.4	18.3	< 0.10	0.85	136	< 0.020	< 0.050	*760*	< 0.0050	2.50	< 0.10	< 0.10	< 0.20	< 10	< 0.050	1,260	2.70	17.7	< 0.0050	0.156	< 0.50	1.64	7.04	< 0.010	451	277	< 0.010	< 0.10	< 0.30	0.525	< 0.50	< 1.0
	GH_MW-MC-2D_WG_2022_06_15_NP	2022 06 15	26.6	22.7	< 0.20	0.81	176	< 0.040	< 0.100	*742*	< 0.0100	4.34	1.18	< 0.20	< 0.40	< 20	< 0.100	992	3.82	52.7	< 0.0500	0.431	< 1.00	2.01	***37.2***	< 0.020	484	287	< 0.020	< 0.20	< 0.60	0.466	< 1.00	< 2.0
	GH_MW_MC10A_WG_2022_06_15_NP	Duplicate	26.4	22.6	< 0.20	0.77	174	< 0.040	< 0.100	*750*	< 0.0100	4.32	1.14	< 0.20	< 0.40	< 20	< 0.100	1,000	3.78	52.1	< 0.0500	0.422	< 1.00	1.98	***59.6***	< 0.020	478	285	< 0.020	< 0.20	< 0.60	0.466	< 1.00	< 2.0
	QA/QC RPD%		1	0	*	5	1	*	*	1	*	0	3	*	*	*	*	1	1	1	*	2	*	2	46	*	1	1	*	*	*	0	*	*
	GH_MW-MC-2D_WG_2022-07-04_NP	2022 08 24	24.7	21.6	0.13	1.83	152	< 0.020	< 0.050	*681*	< 0.0050	4.21	1.10	< 0.10	< 0.20	< 10	< 0.050	950	3.44	52.1	0.0447	0.439	< 0.50	1.81	7.90	< 0.010	418	243	< 0.010	< 0.10	0.34	0.439	0.89	< 1.0
	GH_MW-MC-2D_WG_2022-10-03_NP	2022 10 26	24.1	18.6	0.29	2.48	135	< 0.020	< 0.050	*797*	< 0.0050	4.17	0.74	< 0.10	< 0.20	< 10	< 0.050	1,110	3.33	44.3	< 0.0050	1.51	< 0.50	1.76	6.61	< 0.010	418	235	< 0.010	< 0.10	0.32	0.436	0.68	< 1.0
GH_MW-MC-2S	GH_MW-MC-2S_WG_2022_03_08_NP	2022 03 08	288	1.2	0.11	0.14	104	< 0.020	< 0.050	29	0.0473	73.6	0.12	< 0.10	0.45	< 10	< 0.050	25.0	25.4	4.86	< 0.0050	1.35	0.58	1.22	3.08	< 0.010	20.2	245	< 0.010	< 0.10	< 0.30	1.09	< 0.50	1.0
	GH_MW-MC-2S_WG_2022_06_15_NP	2022 06 15	223	1.8	< 0.10	0.16	83.8	< 0.020	< 0.050	26	0.0322	60.1	0.16	< 0.10	0.50	< 10	< 0.050	17.8	17.7	5.04	< 0.0050	1.38	0.53	0.990	3.02	< 0.010	12.7	220	< 0.010	< 0.10	< 0.30	0.662	< 0.50	< 1.0
	GH_MW-MC-2S_WG_2022-07-04_NP	2022 08 24	270	2.0	0.12	0.18	104	< 0.020	< 0.050	33	0.0482	70.0	0.12	< 0.10	0.50	< 10	< 0.050	25.5	23.2	5.32	< 0.0050	1.28	0.60	1.12	2.44	< 0.010	15.2	247	< 0.010	< 0.10	< 0.30	0.857	< 0.50	< 1.0
	GH_FOX1_WG_2022-07-04_NP	Duplicate	269	4.0	0.12	0.16	103	< 0.020	< 0.050	35	0.0291	69.2	0.13	< 0.10	0.52	< 10	0.263	25.8	23.3	5.52	< 0.0050	1.27	0.60	1.11	2.66	< 0.010	15.4	246	< 0.010	< 0.10	< 0.30	0.867	< 0.50	1.7
	QA/QC RPD%		0	*	*	*	1	*	*	*	49	1	*	*	*	*	*	1	0	4	*	1	*	1	9	*	1	0	*	*	*	1	*	*
	GH_MW-MC-2S_WG_2022-10-03_NP	2022 10 26	311	< 1.0	0.12	0.19	112	< 0.020	< 0.050	34	0.0226	80.4	0.11	< 0.10	0.52	< 10	< 0.050	24.2	26.8	4.84	< 0.0050	1.23	0.53	1.17	3.30	< 0.010	17.8	271	< 0.010	< 0.10	< 0.30	0.974	< 0.50	< 1.0
GH_GA-MW-4**	GH_GA-MW-4_WG_2022-01-03_NP	2022 02 09	180	1.8	0.12	< 0.10	69.5	< 0.020	< 0.050	15	< 0.0050	46.7	0.19	< 0.10	0.22	< 10	< 0.050	12.6	15.3	0.67	< 0.0050	1.55	0.51	0.832	1.74	< 0.010	4.66	167	< 0.010	< 0.10	1.48	1.18	< 0.50	< 1.0
	GH_FOX3_WG_2022-01-03_NP	Duplicate	178	1.2	0.13	< 0.10	69.4	< 0.020	< 0.050	12	0.0055	46.6	0.21	< 0.10	0.21	< 10	< 0.050	12.8	15.0	< 0.10	< 0.0050	1.62	< 0.50	0.829	1.80	< 0.010	4.62	165	< 0.010	< 0.10	< 0.30	1.14	< 0.50	< 1.0
	QA/QC RPD%		1	*	*	*	0	*	*	*	*	0	*	*	*	*	*	2	2	*	*	4	*	0	3	*	1	1	*	*	*	3	*	*
	GH_GA-MW-4_WG_2022-04-04_NP	2022 04 21	197	< 1.0	0.14	< 0.10	81.9	< 0.020	< 0.050	12	0.0062	51.6	0.19	< 0.10	0.24	< 10	< 0.050	13.7	16.6	0.10	< 0.0050	1.54	< 0.50	0.928	4.06	< 0.010	5.08	172	< 0.010	< 0.10	< 0.30	1.27	< 0.50	< 1.0
RG_MW_LC3A**	RG_MW_LC3A_WG_2022_02_11_NP	2022 02 11	348	1.3	0.46	< 0.10	65.0	< 0.020	< 0.050	16	0.0230	78.5	0.26	< 0.10	0.33	< 10	< 0.050	35.2	37.0	0.19	< 0.0050	4.88	< 0.50	1.96	***44.3***	< 0.010	8.76	284	< 0.010	< 0.10	< 0.30	2.55	< 0.50	1.6
	RG_MW_LC3A_WG_2022_05_10_NP	2022 05 10	448	3.5	0.39	< 0.10	85.6	< 0.020	< 0.050	14	0.0238	96.1	< 0.50	< 0.10	0.46	< 10	< 0.050	48.6	50.4	0.42	< 0.0050	2.91	0.59	2.03	***82.2***	< 0.010	13.8	324	< 0.010	< 0.10	< 0.30	3.07	< 0.50	1.0
	RG_MW_LC3A_WG_2022-07-04_NP	2022 07 26	515	< 1.0	0.63	0.12	101	< 0.020	< 0.050	21	0.0298	107	0.19	< 0.10	0.54	< 10	< 0.050	66.0	60.1	0.30	< 0.0050	4.86	0.69	2.70	***101***	< 0.010	14.0	386	< 0.010	< 0.10	< 0.30	4.17	< 0.50	1.1
	RG_MW_MC10A_WG_2022-07-26_NP	Duplicate	508	< 1.0	0.63	0.12	106	< 0.020	< 0.050	20	0.0289	106	0.55	< 0.10	0.66	< 10	< 0.050	66.0	59.2	0.30	< 0.0050	4.89	0.77	2.69	***96.3***	< 0.010	13.7	385	< 0.010	< 0.10	< 0.30	4.28	< 0.50	1.0
	QA/QC RPD%		1	*	0	*	5	*	*	*	3	1	*	*	*	*	*	0	2	*	*	1	*	0	5	*	2	0	*	*	*	3	*	*
	RG_MW_LC3A_WG_2022-10-03_NP	2022 11 21	461	1.1	0.41	< 0.10	95.8	< 0.020	< 0.050	18	0.112	94.6	0.16	< 0.10	0.24	< 10	< 0.050	38.6	54.6	0.54	< 0.0050	2.38	0.56	2.00	***96.8***	< 0.010	11.9	318	< 0.010	< 0.10	< 0.30	2.40	< 0.50	< 1.0
	RG_FOX1_WG_2022-10-03_FD	Duplicate	497	< 1.0	0.43	< 0.10	96.8	< 0.020	< 0.050	20	0.120	109	0.24	< 0.10	0.31	< 10	< 0.050	43.9	54.6	0.60	< 0.0050	2.74	< 0.50	1.98	***103***	< 0.010	11.5	353	< 0.010	< 0.10	< 0.30	2.72	< 0.50	< 1.0
	QA/QC RPD%		8	*	*	*	1	*	*	*	7	14	*	*	*	*	*	13	0	11	*	14	*	1	6	*	3	10	*	*	*	13	*	*
RG_MW_LC3B**	RG_MW_LC3B_WG_2022_02_11_NP	2022 02 11	325	< 1.0	0.62	< 0.10	46.6	< 0.020	< 0.050	13	0.0204	69.0	0.25	< 0.10	0.44	< 10	< 0.050	36.7	37.0	1.06	< 0.0050	5.95	1.32	1.84	***45.8***	< 0.010	7.19	230	< 0.010	< 0.10	< 0.30	2.96	< 0.50	2.5
	RG_MW_LC3B_WG_2022_05_10_NP	2022 05 10	595	1.2	0.93	0.12	79.0	< 0.020	< 0.050	18	0.0348	124	< 0.50	0.15	0.60	< 10	< 0.050	81.5	69.4	0.22	< 0.0050	5.67	2.03	2.79	***130***	< 0.010	17.7	419	< 0.010	< 0.10	< 0.30	5.41	< 0.50	1.9
	RG_MW_MC10A_WG_2022_05_10_NP	Duplicate	597	1.6	0.91	0.13	79.4	< 0.020	< 0.050	17	0.0318	122	< 0.50	0.16	0.53	< 10	< 0.050	79.4	71.1	0.21	< 0.0050	5.56	2.15	2.81	***131***	< 0.010	18.0	407	< 0.010	< 0.10	< 0.30	5.25	< 0.50	1.8
	QA/QC RPD%		0	*	2	*	1	*	*	*	9	2	*	*	*	*	*	3	2	*	*	2	*	1	1	*	2	3	*	*	*	3	*	*
	RG_MW_LC3B_WG_2022-07-04_NP	2022 07 26	775	< 1.0	1.21	0.18	103	< 0.020	< 0.050	24	0.0473	146	0.13	0.99	0.52	< 10	< 0.050	109	99.7	0.13	< 0.0050	7.22	3.10	4.07	***181***	< 0.010	19.6	518	< 0.010	< 0.10	< 0.30	6.82	< 0.50	< 1.0
	RG_MW_LC3B_WG_2022-10-03_NP	2022 11 21	235	1.9	0.82	0.11	72.6	< 0.020	< 0.050	14	0.0566	52.2	0.39	< 0.10	8.87	12	< 0.050	20.8	25.4	1.58	< 0.0050	3.47	1.86	1.32	**20.5**	< 0.010	3.12	175	< 0.010	< 0.10	< 0.30	1.67	< 0.50	1.5
	RG_MW_MC11A_WG_2022-11-21_NP	Duplicate	248	1.4	0.76	0.11	77.1	< 0.020	< 0.050	13	0.0669	52.8	0.44	< 0.10	9.64	13	< 0.050	19.8	28.1	1.28	< 0.0050	3.42	1.97	1.43	19.0	< 0.010	3.45	169	< 0.010	< 0.10	< 0.30	1.70	< 0.50	1.8
	QA/QC RPD%		5	*	8	*	6	*	*	*	17	1	*	*	8	*	*	5	10	21	*	1	*	8	8	*	10	3	*	*	*	2	*	*

All terms defined within the body of SNC-Lavalin's report.

< Denotes concentration less than indicated detection limit.

- Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

* RPDs are not calculated where one or more concentrations are less than five times RDL.

RDL Denotes reported detection limit.

BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH.

[d] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.

[e] Interim BC MoE Regional Background Estimate (Protocol 9 Determining Background Groundwater Quality).

[f] There is no Zinc standard specified for H > 400; therefore, the standard for H=300-<400 is applied as a conservative comparison.

[g] Ramboll calculated health-based values for these two parameters based on toxicity values (tolerable daily intakes; TDI) and drinking water allocation factors (DW AFs), documented in Appendix IV.

TABLE GH-04: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Metals in Groundwater (GHO)

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Hardness mg/L	Dissolved Metals Aluminum µg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Bismuth µg/L	Boron µg/L	Cadmium µg/L	Calcium mg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Lithium µg/L	Magnesium mg/L	Manganese µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Potassium mg/L	Selenium µg/L	Silver µg/L	Sodium mg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Uranium µg/L	Vanadium µg/L	Zinc[f] µg/L
BC Standard																																		
CSR Aquatic Life (AW)[a]			n/a	n/a	90	50	10,000	1.5	n/a	12,000	0.5-4[b]	n/a	10[d]	40	20-90[b]	n/a	40-160[b]	n/a	n/a	n/a	0.25	10,000	250-1,500[b]	n/a	20	0.5-15[b]	n/a	n/a	3	n/a	1,000	85	n/a	75-2,400[b]
CSR Irrigation Watering (IW)			n/a	5,000	n/a	100	n/a	100	n/a	500	5	n/a	5[d]	50	200	5,000	200	2,500	n/a	200	1	10	200	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	10	100	1,000-5,000[c]
CSR Livestock Watering (LW)			n/a	5,000	n/a	25	n/a	100	n/a	5,000	80	1,000	50[d]	1,000	300	n/a	100	5,000	n/a	n/a	2	50	1,000	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	200	100	2,000
CSR Drinking Water (DW)			n/a	9,500	6	10	1,000	8	n/a	5,000	5	n/a	50[d]	20[e]	1,500	6,500	10	8	n/a	1,500	1	250	80	n/a	10	20	200	2,500	n/a	2,500	n/a	20	20	3,000
Health-based Value (HBV)[g]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,200	n/a	n/a	n/a	2,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Elk River Valley (denotes well part of Study Area 4)**																																		
RG_MW_LCWC1**	RG_MW_LCWC1_WG_2022_02_11_NP	2022 02 11	403	25.2	< 0.10	0.16	113	< 0.020	< 0.050	16	0.0355	104	0.25	< 0.10	0.37	38	< 0.050	31.3	34.9	1.56	< 0.0050	1.48	< 0.50	1.25	***42.5***	< 0.010	9.16	334	< 0.010	< 0.10	0.54	1.38	< 0.50	1.8
	RG_MW_MC10A_WG_2022_02_11_NP	Duplicate	412	20.3	< 0.10	0.13	116	< 0.020	< 0.050	17	0.0343	108	0.28	< 0.10	1.10	33	< 0.050	30.5	34.6	1.62	< 0.0050	1.57	0.57	1.25	***44.5***	< 0.010	9.08	350	< 0.010	< 0.10	0.52	1.41	< 0.50	1.0
	QA/QC RPD%		2	22	*	*	3	*	*	*	3	4	*	*	*	*	*	3	1	4	*	6	*	0	5	*	1	5	*	*	*	2	*	*
	RG_MW_LCWC1_WG_2022_05_10_NP	2022 05 10	468	1.3	< 0.10	< 0.10	127	< 0.020	< 0.050	15	0.0348	117	< 0.50	< 0.10	0.38	< 10	< 0.050	33.3	42.7	0.43	< 0.0050	1.03	0.57	1.40	***85.5***	< 0.010	7.50	343	< 0.010	< 0.10	< 0.30	1.66	< 0.50	1.6
	RG_MW_LCWC1_WG_2022-07-04_NP	2022 07 26	632	< 1.0	0.11	0.12	172	< 0.020	< 0.050	16	0.0546	151	0.10	< 0.10	0.93	< 10	< 0.050	45.7	61.8	0.19	< 0.0050	1.22	0.51	2.00	***140***	< 0.010	12.2	460	< 0.010	< 0.10	< 0.30	2.35	< 0.50	2.6
	RG_MW_LCWC1_WG_2022-10-03_NP	2022 11 25	616	1.6	< 0.10	0.15	163	< 0.020	< 0.050	16	0.0621	166	0.28	< 0.10	14.8	< 10	< 0.050	38.1	48.9	0.57	< 0.0050	0.998	0.64	1.54	***138***	< 0.010	13.2	498	< 0.010	< 0.10	< 0.30	1.58	< 0.50	1.8
RG_MW_WC2A**	RG_MW_WC2A_WG_2022_02_10_NP	2022 02 10	339	< 1.0	0.11	< 0.10	41.5	< 0.020	< 0.050	14	0.0198	83.5	0.18	< 0.10	0.41	< 10	< 0.050	31.2	31.6	1.02	< 0.0050	6.41	< 0.50	1.07	***33.6***	< 0.010	7.29	270	0.014	< 0.10	< 0.30	1.68	< 0.50	< 1.0
	RG_MW_WC2A_WG_2022_05_10_NP	2022 05 10	398	1.0	0.11	< 0.10	51.8	< 0.020	< 0.050	13	0.0198	97.4	< 0.50	< 0.10	< 0.20	< 10	< 0.050	32.6	37.6	0.38	< 0.0050	1.24	< 0.50	1.30	***51.1***	< 0.010	8.28	307	< 0.010	< 0.10	< 0.30	1.90	< 0.50	< 1.0
	RG_MW_WC2A_WG_2022-07-04_NP	2022 07 26	445	< 1.0	0.50	0.13	82.9	< 0.020	< 0.050	14	0.0412	99.5	0.17	< 0.10	0.29	< 10	< 0.050	44.9	47.7	< 0.10	< 0.0050	3.27	4.04	2.01	***67.4***	< 0.010	9.16	374	< 0.010	< 0.10	< 0.30	3.23	< 0.50	3.5
	RG_MW_WC2A_WG_2022-10-03_NP	2022 11 21	379	< 1.0	< 0.10	0.13	39.0	< 0.020	< 0.050	13	0.0146	89.8	0.10	< 0.10	< 0.20	< 10	< 0.050	27.4	37.6	0.12	< 0.0050	1.00	< 0.50	1.01	***67.2***	< 0.010	7.52	276	< 0.010	< 0.10	< 0.30	1.66	< 0.50	< 1.0
RG_MW_WC2B**	RG_MW_WC2B_WG_2022_02_10_NP	2022 02 10	669	< 1.0	0.48	0.10	79.6	< 0.020	< 0.050	16	0.0536	145	0.20	< 0.10	0.30	< 10	< 0.050	55.3	74.6	< 0.10	< 0.0050	7.77	3.99	2.39	***132***	< 0.010	13.0	483	< 0.010	< 0.10	< 0.30	4.16	< 0.50	1.2
	RG_MW_WC2B_WG_2022_05_10_NP	2022 05 10	435	< 1.0	0.45	0.10	64.8	< 0.020	< 0.050	12	0.0398	94.9	< 0.50	< 0.10	0.24	< 10	< 0.050	43.3	48.0	< 0.10	< 0.0050	2.78	4.13	1.90	***66.2***	< 0.010	9.22	312	< 0.010	< 0.10	< 0.30	3.05	< 0.50	< 1.0
	RG_MW_WC2B_WG_2022-07-04_NP	2022 07 26	381	< 1.0	< 0.10	0.11	48.2	< 0.020	< 0.050	12	0.0206	92.9	0.16	< 0.10	< 0.20	< 10	< 0.050	30.9	36.2	0.54	< 0.0050	1.22	< 0.50	1.33	***45.7***	< 0.010	7.74	309	0.011	< 0.10	< 0.30	1.84	< 0.50	< 1.0
	RG_MW_WC2B_WG_2022-10-03_NP	2022 11 21	606	< 1.0	0.45	0.11	95.3	< 0.020	< 0.050	16	0.0600	119	0.18	< 0.10	0.22	< 10	< 0.050	50.9	75.1	< 0.10	< 0.0050	2.38	5.33	2.00	***167***	< 0.010	12.4	392	< 0.010	< 0.10	< 0.30	3.20	< 0.50	1.2
GH_GA-MW-2**	GH_GA-MW-2_WG_2022-01-03_NP	2022 01 19	708	1.2	1.58	0.19	27.6	< 0.020	< 0.050	22	0.0718	191	0.15	0.60	3.40	< 10	< 0.050	21.8	56.0	101	< 0.0050	*30.2*	8.86	1.46	***31.9***	< 0.010	11.0	705	0.011	< 0.10	< 0.30	8.65	< 0.50	13.2
	GH_GA-MW-2_WG_2022-04-04_NP	2022 04 22	734	2.5	0.22	0.12	66.2	< 0.020	< 0.050	52	< 0.0050	162	< 0.10	< 0.10	0.30	949	< 0.050	37.3	80.1	96.7	< 0.0050	1.87	1.00	2.05	***24.5***	< 0.010	10.3	1,360	< 0.010	0.21	< 0.30	2.57	< 0.50	3.3
GH_GA-MW-3	GH_GA-MW-3_WG_2022-01-03_NP	2022 02 09	222	2.0	< 0.10	< 0.10	88.8	< 0.020	< 0.050	296	0.0060	39.3	< 0.10	< 0.10	< 0.20	22	< 0.050	91.6	30.2	9.60	< 0.0050	< 0.050	1.13	2.42	1.48	< 0.010	35.6	2,120	< 0.010	0.13	< 0.30	0.037	< 0.50	4.0
	GH_GA-MW-3_WG_2022-04-04_NP	2022 04 22	692	< 1.0	1.62	0.20	27.6	< 0.020	< 0.050	20	0.0749	192	< 0.10	0.50	1.97	< 10	< 0.050	19.6	51.7	86.7	< 0.0050	*27.4*	8.04	1.46	***34.6***	< 0.010	11.0	708	0.014	< 0.10	< 0.30	7.69	< 0.50	12.8
	GH_GA-MW-3_WG_2022-07-04_NP	2022 09 02	271	1.9	< 0.10	< 0.10	101	< 0.020	< 0.050	209	< 0.0050	48.0	0.22	< 0.10	< 0.20	15	< 0.050	76.5	36.8	7.44	< 0.0050	0.068	3.13	2.32	11.5	< 0.010	36.5	2,290	< 0.010	< 0.10	< 0.30	0.194	< 0.50	< 1.0
	GH_GA-MW-3_WG_2022-10-03_NP	2022 11 04	415	2.8	< 0.10	< 0.10	135	< 0.020	< 0.050	204	< 0.0050	82.6	0.11	< 0.10	< 0.20	38	< 0.050	88.4	50.8	7.77	0.0114	0.555	0.66	2.56	***23.5***	< 0.010	29.0	2,560	< 0.010	< 0.10	< 0.30	0.553	< 0.50	< 1.0
	GH_FOX2_WG_2022-10-03_NP	Duplicate	428	2.3	< 0.10	0.11	135	< 0.020	< 0.050	204	< 0.0050	85.5	< 0.10	< 0.10	< 0.20	45	< 0.050	89.6	52.0	8.02	0.0100	0.371	0.69	2.56	***24.1***	< 0.010	28.9	2,560	< 0.010	< 0.10	< 0.30	0.570	< 0.50	1.8
	QA/QC RPD%		3	*	*	*	0	*	*	0	*	3	*	*	*	*	*	1	2	3	*	40	*	0	3	*	0	0	*	*	*	3	*	*
GH_MW-ERSC-1**	GH_MW-ERSC-1_WG_2022-01-03_NP	2022 01 13	466	3.3	0.20	0.20	161	< 0.020	< 0.050	15	0.0360	112	0.18	< 0.10	4.41	< 10	0.086	15.8	45.2	8.01	< 0.0050	1.53	1.48	1.10	***34.8***	< 0.010	6.49	478	< 0.010	< 0.10	< 0.30	1.61	< 0.50	13.7
	GH_MW-ERSC-1_WG_2022-04-04_NP	2022 04 29	407	1.2	< 0.10	0.23	140	< 0.020	< 0.050	14	< 0.0050	98.6	0.14	< 0.10	0.20	38	< 0.050	15.0	39.1	6.55	< 0.0050	1.48	0.53	1.01	***30.6***	< 0.010	5.68	373	< 0.010	< 0.10	< 0.30	1.80	< 0.50	1.1
	GH_FOX1_WG_2022-04-04_NP	Duplicate	399	2.4	< 0.10	0.24	136	< 0.020	< 0.050	14	< 0.0050	96.3	0.14	< 0.10	< 0.20	38	< 0.050	14.6	38.6	6.26	< 0.0050	1.48	0.52	0.986	***32.5***	< 0.010	5.79	368	< 0.010	< 0.10	< 0.30	1.79	< 0.50	1.8
	QA/QC RPD%		2	*	*	*	3	*	*	*	*	2	*	*	*	*	*	3	1	5	*	0	*	2	6	*	2	1	*	*	*	1	*	*
	GH_MW-ERSC-1_WG_2022-07-04_NP	2022 09 08	297	< 1.0	< 0.10	0.22	102	< 0.020	< 0.050	14	0.0192	73.3	0.19	< 0.10	7.44	< 10	< 0.050	12.8	27.7	7.39	< 0.0050	1.50	1.90	0.901	***28.2***	< 0.010	3.44	296	< 0.010	< 0.10	< 0.30	1.09	< 0.50	96.5
	GH_FOX3_WG_2022-07-04_NP	Duplicate	297	1.1	< 0.10	0.19	104	< 0.020	< 0.050	15	0.0310	73.9	0.18	< 0.10	6.55	14	< 0.050	12.5	27.4	7.18	< 0.0050	1.36	1.20	0.905	***27.2***	< 0.010	3.32	292	< 0.010	< 0.10	< 0.30	1.09	< 0.50	74.9
	QA/QC RPD%		0	*	*	*	2	*	*	*	*	1	*	*	13	*	*	2	1	3	*	10	*	0	4	*	4	1	*	*	*	0	*	25
	GH_MW-ERSC-1_WG_2022-10-03_NP	2022 11 04	528	< 1.0	< 0.10	0.21	190	< 0.020	< 0.050	15	0.0270	126	0.20	< 0.10	0.31	14	< 0.050	16.8	51.9	6.43	< 0.0050	1.01	0.67	1.14	***70.0***	< 0.010	5.25	494	< 0.010	< 0.10	< 0.30	1.60	< 0.50	12.2

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[a] Standard to protect freshwater aquatic life.

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TABLE GH-04: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Metals in Groundwater (GHO)

				Dissolved Metals																														
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Hardness mg/L	Aluminum µg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Bismuth µg/L	Boron µg/L	Cadmium µg/L	Calcium mg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Lithium µg/L	Magnesium mg/L	Manganese µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Potassium mg/L	Selenium µg/L	Silver µg/L	Sodium mg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Uranium µg/L	Vanadium µg/L	Zinc[f] µg/L
BC Standard																																		
CSR Aquatic Life (AW)[a]			n/a	n/a	90	50	10,000	1.5	n/a	12,000	0.5-4[b]	n/a	10[d]	40	20-90[b]	n/a	40-160[b]	n/a	n/a	n/a	0.25	10,000	250-1,500[b]	n/a	20	0.5-15[b]	n/a	n/a	3	n/a	1,000	85	n/a	75-2,400[b]
CSR Irrigation Watering (IW)			n/a	5,000	n/a	100	n/a	100	n/a	500	5	n/a	5[d]	50	200	5,000	200	2,500	n/a	200	1	10	200	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	10	100	1,000-5,000[c]
CSR Livestock Watering (LW)			n/a	5,000	n/a	25	n/a	100	n/a	5,000	80	1,000	50[d]	1,000	300	n/a	100	5,000	n/a	n/a	2	50	1,000	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	200	100	2,000
CSR Drinking Water (DW)			n/a	9,500	6	10	1,000	8	n/a	5,000	5	n/a	50[d]	20[e]	1,500	6,500	10	8	n/a	1,500	1	250	80	n/a	10	20	200	2,500	n/a	2,500	n/a	20	20	3,000
Health-based Value (HBV)[g]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,200	n/a	n/a	n/a	2,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Elk River Valley (denotes well part of Study Area 4)**																																		
GH_MW_EF1A**	GH_MW_EF1A_WG_2022-01-03_NP	2022 02 24	174	1.2	< 0.10	< 0.10	59.6	< 0.020	< 0.050	< 10	0.0052	49.0	0.23	< 0.10	< 0.20	< 10	< 0.050	3.1	12.6	< 0.10	< 0.0050	1.03	< 0.50	0.402	3.08	< 0.010	1.20	204	< 0.010	< 0.10	< 0.30	0.765	< 0.50	< 1.0
	GH_MW_EF1A_WG_2022-04-04_NP	2022 05 19	197	< 1.0	< 0.10	< 0.10	59.0	< 0.020	< 0.050	< 10	< 0.0050	57.2	0.23	< 0.10	0.36	< 10	< 0.050	3.1	13.1	< 0.10	< 0.0050	0.968	< 0.50	0.385	3.24	< 0.010	1.32	221	< 0.010	< 0.10	< 0.30	0.786	< 0.50	1.7
	GH_MW_EF1A_WG_2022-07-04_NP	2022 08 15	180	1.4	< 0.10	< 0.10	59.2	< 0.020	< 0.050	< 10	< 0.0050	49.6	0.22	< 0.10	0.42	< 10	< 0.050	3.0	13.6	< 0.10	< 0.0050	0.937	< 0.50	0.386	3.42	< 0.010	1.42	215	< 0.010	< 0.10	< 0.30	0.766	< 0.50	< 1.0
	GH_MW_EF1A_WG_2022-10-03_NP	2022 10 20	172	1.7	< 0.10	< 0.10	58.6	< 0.020	< 0.050	< 10	< 0.0050	48.1	0.21	< 0.10	< 0.20	< 10	< 0.050	3.1	12.5	< 0.10	< 0.0050	1.03	< 0.50	0.370	2.70	< 0.010	1.19	203	< 0.010	< 0.10	< 0.30	0.708	< 0.50	< 1.0
GH_MW_EF1B**	GH_MW_EF1B_WG_2022-01-03_NP	2022 02 28	177	1.2	< 0.10	< 0.10	51.9	< 0.020	< 0.050	< 10	0.0061	49.2	0.22	< 0.10	< 0.20	< 10	< 0.050	3.1	13.1	< 0.10	< 0.0050	0.949	< 0.50	0.358	2.66	< 0.010	1.09	210	< 0.010	< 0.10	< 0.30	0.830	< 0.50	< 1.0
	GH_MW_EF1B_WG_2022-04-04_NP	2022 05 19	188	1.0	< 0.10	< 0.10	53.2	< 0.020	< 0.050	< 10	0.0066	53.8	0.21	< 0.10	0.20	< 10	< 0.050	2.8	13.1	< 0.10	< 0.0050	1.03	< 0.50	0.376	2.75	< 0.010	1.21	215	< 0.010	< 0.10	< 0.30	0.856	< 0.50	< 1.0
	GH_MW_EF1B_WG_2022-07-04_NP	2022 08 15	161	1.2	< 0.10	< 0.10	55.1	< 0.020	< 0.050	< 10	0.0070	45.5	0.18	< 0.10	< 0.20	< 10	< 0.050	2.8	11.6	< 0.10	< 0.0050	1.09	< 0.50	0.439	1.54	< 0.010	0.800	203	< 0.010	< 0.10	< 0.30	0.648	< 0.50	< 1.0
	GH_MW_EF1B_WG_2022-10-03_NP	2022 10 20	173	1.1	< 0.10	< 0.10	60.8	< 0.020	< 0.050	< 10	0.0102	48.7	0.23	< 0.10	< 0.20	< 10	< 0.050	3.2	12.5	< 0.10	< 0.0050	0.892	< 0.50	0.423	2.04	< 0.010	1.09	207	< 0.010	< 0.10	< 0.30	0.652	< 0.50	< 1.0
RG_DW-01-03**	RG_DW-01-03_WP_2022_03_01_NP	2022 03 01	184	1.2	< 0.10	< 0.10	72.1	< 0.020	< 0.050	< 10	0.0191	50.8	0.24	< 0.10	1.75	< 10	0.107	2.9	13.9	< 0.10	-	1.18	< 0.50	0.451	3.15	< 0.010	1.35	199	< 0.010	< 0.10	< 0.30	0.790	< 0.50	42.4
	RG_DW-01-03_WP_2022_05_03_NP	2022 05 03	186	1.7	< 0.10	< 0.10	73.4	< 0.020	< 0.050	< 10	< 0.0050	52.5	0.30	< 0.10	0.95	< 10	0.056	2.6	13.4	< 0.10	-	5.78	< 0.50	0.435	4.68	< 0.010	1.37	205	< 0.010	< 0.10	< 0.30	0.842	< 0.50	2.8
	RG_DW-01-03_WP_2022_07_18_NP	2022 07 18	186	< 1.0	< 0.10	< 0.10	78.0	< 0.020	< 0.050	< 10	0.0074	51.6	0.27	< 0.10	0.98	< 10	0.061	2.5	13.8	< 0.10	-	0.997	< 0.50	0.448	5.23	< 0.010	1.32	216	< 0.010	< 0.10	< 0.30	0.828	< 0.50	5.2
	RG_DW-01-03_WP_2022_10_26_NP	2022 10 26	186	3.8	< 0.10	< 0.10	80.0	< 0.020	< 0.050	< 10	< 0.0050	51.7	0.28	< 0.10	0.99	< 10	0.066	2.6	13.8	< 0.10	-	0.943	< 0.50	0.406	4.81	< 0.010	1.22	206	< 0.010	< 0.10	< 0.30	0.745	< 0.50	3.6
Blanks																																		
Field Blanks																																		
GH_GA-MW-4	GH_JDW3_WG_2022-01-03_NP	2022 02 09	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
GH_MW-GHC-1A	GH_JDW1_WG_2022-01-03_NP	2022 02 18	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
RG_MW_FR11B	GH_MW_MC10B_WG_2022-03-17_NP	2022 03 17	< 0.50	< 1.0	< 0.10	< 0.10	0.20	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	3.1
GH_MW-ERSC-1	GH_JDW1_WG_2022-04-04_NP	2022 04 29	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	0.24	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
GH_MW-RLP-2	GH_JDW3_WG_2022-04-04_NP	2022 05 20	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
RG_MW_FR11B	GH_JDW2_WG_2022-04-04_NP	2022 06 01	< 0.50	< 1.0	< 0.10	< 0.10	0.40	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	0.27	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
GH_MW-ERSC-1	GH_JDW3_WG_2022-07-04_NP	2022 09 08	< 0.50	< 1.0	< 0.10	< 0.10	0.36	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	1.45	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	0.241	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
GH_GA-MW-3	GH_JDW2_WG_2022-10-03_NP	2022 11 04	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
RG_MW_LC3A	RG_JDW1_WG_2022-10-03_FB	2022 11 21	< 0.50	< 1.0	< 0.10	< 0.10	4.41	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	2.32	< 10	< 0.050	< 1.0	0.0074	0.13	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	0.424	0.42	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	1.8
RG_MW_LC3B	RG_MW_MC11B_WG_2022-11-21_NP	2022 11 21	< 0.50	< 1.0	< 0.10	< 0.10	5.01	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	2.33	< 10	< 0.050	< 1.0	0.0059	0.17	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	0.410	0.35	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	1.6
RG_MW_LCWC1	GH_JDW1_WG_2022-11-25_FB	2022 11 25	< 0.50	< 1.0	< 0.10	< 0.10	0.41	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
Trip Blanks																																		
	GH_RDI3_WG_2022-01-03_NP	2022 02 09	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
	GH_RDI1_WG_2022-01-03_NP	2022 02 18	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
	GH_MW_MC10C_WG_2022-03-17_NP	2022 03 17	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	2.2
	GH_RDI1_WG_2022-04-04_NP	2022 04 29	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
	GH_RDI3_WG_2022-04-04_NP	2022 05 20	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	1.36	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
	GH_RDI2_WG_2022-04-04_NP	2022 06 01	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
	GH_RDI2_WG_2022-10-03_NP	2022 11 04	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0

All terms defined within the body of SNC-Lavalin's report.

<	Denotes concentration less than indicated detection limit.
-	Denotes analysis not conducted.
n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL	Denotes reported detection limit.

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH.

[d] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.

[e] Interim BC MoE Regional Background Estimate (Protocol 9 Determining Background Groundwater Quality).

[f] There is no Zinc standard specified for H > 400; therefore, the standard for H=300-<400 is applied as a conservative comparison.

[g] Ramboll calculated health-based values for these two parameters based on toxicity values (tolerable daily intakes; TDI) and drinking water allocation factors (DW AFs), documented in Appendix IV.

BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

TABLE GH-05: Summary of Analytical Results Compared to Secondary Screening Criteria for Selenium (GHO)

Sample Location	Sample ID	Sample Date (yyyy mm dd)	SPO/Compliance Point	Selenium µg/L
Groundwater Quality Benchmarks				
SPO			Elk River [GH_ER1 (E206661)	19
Compliance Point			Elk River [GH_ERC (E300090)]	15
			Fording River [GH_FR1 (0200378)]	63
			Fording River [FR_FRABCH (EMS E223753)]	85
Fording River Valley (Porter Creek Drainage) (^ denotes well part of Study Area 1)				
GH_MW-PC^	GH_MW-PC_WG_2022-03-16_NP	2022 03 16	FR_FRABCH (EMS E223753)	65.8
	GH_MW-PC_WG_2022-04-04_NP	2022 06 01	FR_FRABCH (EMS E223753)	74.2
	GH_MW-PC_WG_2022-07-04_NP	2022 08 08	FR_FRABCH (EMS E223753)	70.8
	GH_MW-PC_WG_2022-10-03_NP	2022 11 25	FR_FRABCH (EMS E223753)	95.6
Fording River Valley (Greenhills Creek Drainage) (+ denotes well part of Study Area 3)				
GH_MW_GHC_4B	GH_MW_GHC_4B_WG_2022-03-14_NP	2022 03 14	GH_FR1 (0200378)	14.0
	GH_MW_GHC_4B_WG_2022-04-04_NP	2022 05 31	GH_FR1 (0200378)	30.9
	GH_MW_GHC_4B_WG_2022-07-04_NP	2022 09 13	GH_FR1 (0200378)	61.8
	GH_MW_GHC_4B_WG_2022-10-03_NP	2022 11 16	GH_FR1 (0200378)	110
GH_POTW09+	GH_POTW09_WG_2022-04-04_NP	2022 04 29	GH_FR1 (0200378)	20.4
GH_POTW17+	GH_POTW17_WG_2022-01-03_NP	2022 02 08	GH_FR1 (0200378)	10.5
Elk River Valley (denotes well part of Study Area 4)**				
GH_MW-MC-2D	GH_MW-MC-2D_WG_2022_06_15_NP	2022 06 15	GH_ERC (E300090)	37.2
	GH_MW_MC10A_WG_2022_06_15_NP	Duplicate	GH_ERC (E300090)	59.6
		QA/QC RPD%		46
RG_MW_LC3A**	RG_MW_LC3A_WG_2022_02_11_NP	2022 02 11	GH_ER1 (E206661) / GH_ERC (E300090)	44.3
	RG_MW_LC3A_WG_2022_05_10_NP	2022 05 10	GH_ER1 (E206661) / GH_ERC (E300090)	82.2
	RG_MW_LC3A_WG_2022-07-04_NP	2022 07 26	GH_ER1 (E206661) / GH_ERC (E300090)	101
	RG_MW_MC10A_WG_2022-07-26_NP	Duplicate	GH_ER1 (E206661) / GH_ERC (E300090)	96.3
		QA/QC RPD%		5
	RG_MW_LC3A_WG_2022-10-03_NP	2022 11 21	GH_ER1 (E206661) / GH_ERC (E300090)	96.8
	RG_FOX1_WG_2022-10-03_FD	Duplicate	GH_ER1 (E206661) / GH_ERC (E300090)	103
		QA/QC RPD%		6
RG_MW_LC3B**	RG_MW_LC3B_WG_2022_02_11_NP	2022 02 11	GH_ER1 (E206661) / GH_ERC (E300090)	45.8
	RG_MW_LC3B_WG_2022_05_10_NP	2022 05 10	GH_ER1 (E206661) / GH_ERC (E300090)	130
	RG_MW_MC10A_WG_2022_05_10_NP	Duplicate	GH_ER1 (E206661) / GH_ERC (E300090)	131
		QA/QC RPD%		1
	RG_MW_LC3B_WG_2022-07-04_NP	2022 07 26	GH_ER1 (E206661) / GH_ERC (E300090)	181
	RG_MW_LC3B_WG_2022-10-03_NP	2022 11 21	GH_ER1 (E206661) / GH_ERC (E300090)	20.5
	RG_MW_MC11A_WG_2022-11-21_NP	Duplicate	GH_ER1 (E206661) / GH_ERC (E300090)	19.0
		QA/QC RPD%		8
RG_MW_LCWC1**	RG_MW_LCWC1_WG_2022_02_11_NP	2022 02 11	GH_ER1 (E206661) / GH_ERC (E300090)	42.5
	RG_MW_MC10A_WG_2022_02_11_NP	Duplicate	GH_ER1 (E206661) / GH_ERC (E300090)	44.5
		QA/QC RPD%		5
	RG_MW_LCWC1_WG_2022_05_10_NP	2022 05 10	GH_ER1 (E206661) / GH_ERC (E300090)	85.5
	RG_MW_LCWC1_WG_2022-07-04_NP	2022 07 26	GH_ER1 (E206661) / GH_ERC (E300090)	140
	RG_MW_LCWC1_WG_2022-10-03_NP	2022 11 25	GH_ER1 (E206661) / GH_ERC (E300090)	138
RG_MW_WC2A**	RG_MW_WC2A_WG_2022_02_10_NP	2022 02 10	GH_ER1 (E206661) / GH_ERC (E300090)	33.6
	RG_MW_WC2A_WG_2022_05_10_NP	2022 05 10	GH_ER1 (E206661) / GH_ERC (E300090)	51.1
	RG_MW_WC2A_WG_2022-07-04_NP	2022 07 26	GH_ER1 (E206661) / GH_ERC (E300090)	67.4
	RG_MW_WC2A_WG_2022-10-03_NP	2022 11 21	GH_ER1 (E206661) / GH_ERC (E300090)	67.2
RG_MW_WC2B**	RG_MW_WC2B_WG_2022_02_10_NP	2022 02 10	GH_ER1 (E206661) / GH_ERC (E300090)	132
	RG_MW_WC2B_WG_2022_05_10_NP	2022 05 10	GH_ER1 (E206661) / GH_ERC (E300090)	66.2
	RG_MW_WC2B_WG_2022-07-04_NP	2022 07 26	GH_ER1 (E206661) / GH_ERC (E300090)	45.7
	RG_MW_WC2B_WG_2022-10-03_NP	2022 11 21	GH_ER1 (E206661) / GH_ERC (E300090)	167
GH_GA-MW-2**	GH_GA-MW-2_WG_2022-01-03_NP	2022 01 19	GH_ERC (E300090)	31.9
	GH_GA-MW-2_WG_2022-04-04_NP	2022 04 22	GH_ERC (E300090)	24.5
GH_GA-MW-3	GH_GA-MW-3_WG_2022-04-04_NP	2022 04 22	GH_ERC (E300090)	34.6
	GH_GA-MW-3_WG_2022-07-04_NP	2022 09 02	GH_ERC (E300090)	11.5
	GH_GA-MW-3_WG_2022-10-03_NP	2022 11 04	GH_ERC (E300090)	23.5
	GH_FOX2_WG_2022-10-03_NP	Duplicate	GH_ERC (E300090)	24.1
		QA/QC RPD%		3
GH_MW-ERSC-1**	GH_MW-ERSC-1_WG_2022-01-03_NP	2022 01 13	GH_ER1 (E206661)	34.8
	GH_MW-ERSC-1_WG_2022-04-04_NP	2022 04 29	GH_ER1 (E206661)	30.6
	GH_FOX1_WG_2022-04-04_NP	Duplicate	GH_ER1 (E206661)	32.5
		QA/QC RPD%		6
	GH_MW-ERSC-1_WG_2022-07-04_NP	2022 09 08	GH_ER1 (E206661)	28.2
	GH_FOX3_WG_2022-07-04_NP	Duplicate	GH_ER1 (E206661)	27.2
		QA/QC RPD%		4
	GH_MW-ERSC-1_WG_2022-10-03_NP	2022 11 04	GH_ER1 (E206661)	70.0

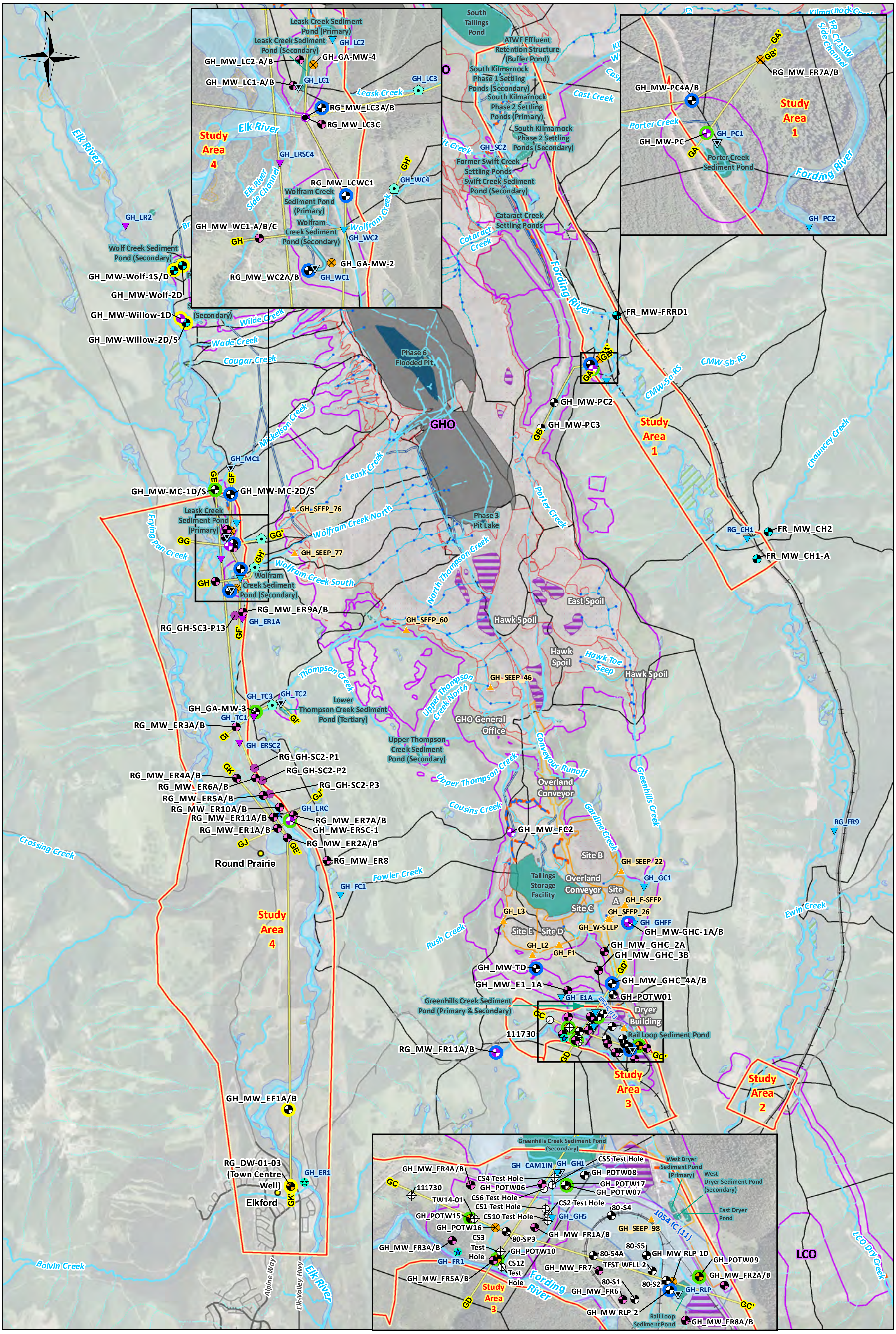
All terms defined within the body of SNC-Lavalin's report.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

* RPDs are not calculated where one or more concentrations are less than five times RDL.

SHADED	Concentration greater than SPO by Area/Compliance Point by Area

Drawings



Legend

Groundwater Stations
- ◐ Monitoring Well
- ◐ Background Monitoring Well
- ◐ Supply Well
- ◐ Well included in the RGMP
- ◐ Well included in the SSGMP
- ◐ Well included in both the RGMP and the SSGMP
- ◐ Monitoring wells to be considered for inclusion
- ⊗ Decommissioned Well
- ● Groundwater Fed Pool
- ⊕ Borehole
- ◐ Barologgers associated the SSGMP/RGMP

Surface Water Stations
- ★ Compliance Point
- ☆ Order Station
- ★ Order Station and Compliance Point
- ▼ Receiving Environment
- ▽ Authorized Discharge
- ▼ Monitoring
- ⬠ Hydrometric stations
- ▲ Seep

Site Features
- Highway/Arterial
- Secondary Road
- Rails
- Geological Cross Section
- ☐ Plant Site
- ☐ Study Areas
- ■ Tailings/Settling/Sediment Pond
- ■ Waste Water Pond
- ■ End-Pit Lake
- ■ Pit
- ▤ Stockpiles
- ☐ Waste Dump (Spoils)
- ☐ Watersheds
- ☐ Mine Permitted Areas

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- ☐ Mapped Aquifers
- Ditch
- Rock Drain
- Water Pipeline
- Bypass/Diversion Channel
- ☐ Island
- ☐ Lake/River Bed
- ▨ Wetted Area/Wetland (Based on 1:55000 Scale)

Notes:
1. Original in colour.
2. Numerical scale reflects full-size print. Print scaling will distort this scale, however scale bar will remain accurate.
3. Intended for illustration purposes, accuracy has not been verified for construction or navigation purposes.
4. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Information provided by Teck Coal Limited.

0 0.25 0.5 1 1.5 2 km

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

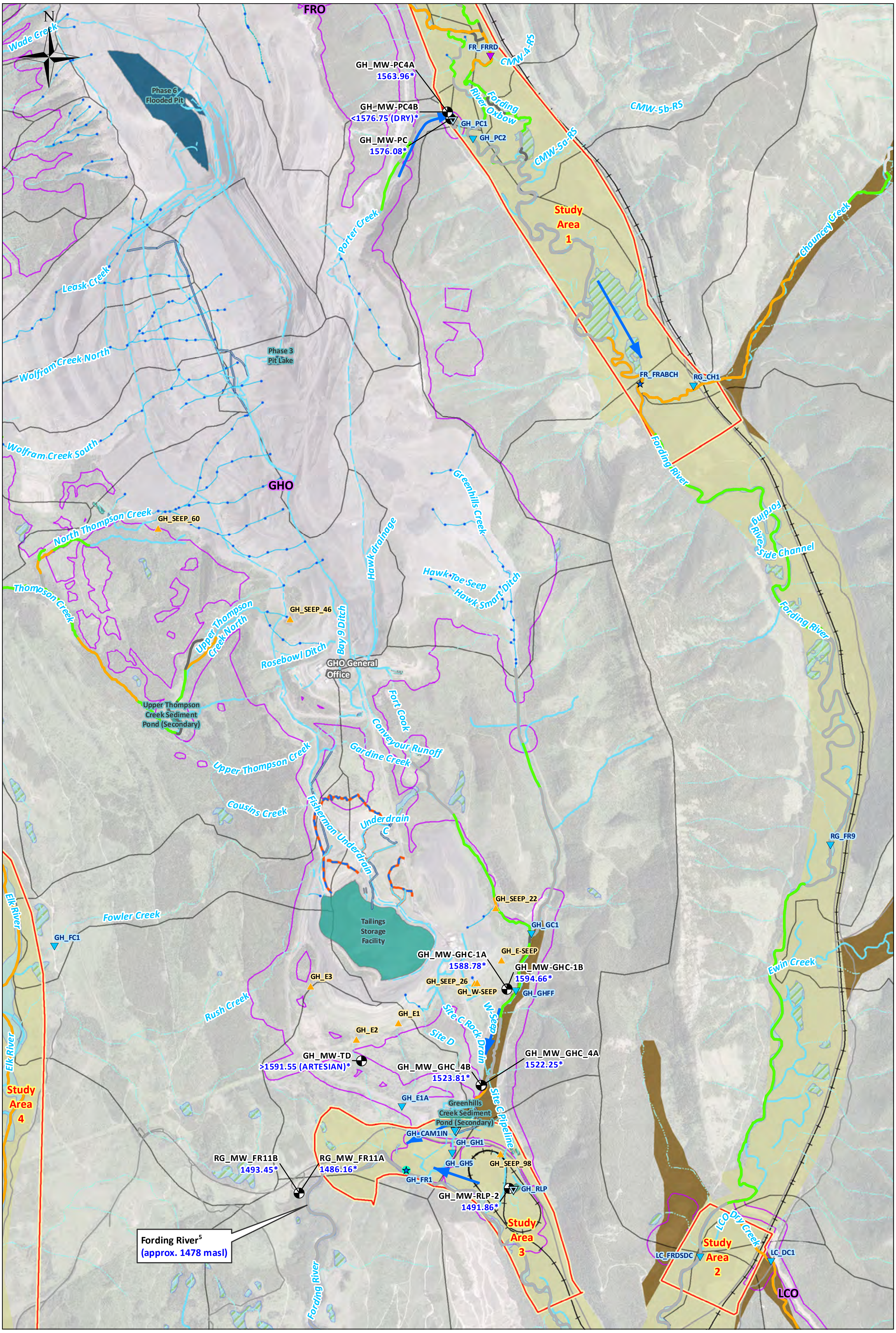
SNC·LAVALIN

Greenhills Operations - Sample Location Plan

CHK'D: EC	DATE: 2023-03-14	SCALE: 1:55,000	Ref Num:
BY: CW	COORD SYS: NAD 1983 UTM Zone 11N		DRAWING GH-01

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-LocPlan_GHO.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



Legend

Groundwater Stations
- ◐ Monitoring Well

Surface Water Stations
- ★ Compliance Point
- ★ Order Station and Compliance Point
- ▼ Receiving Environment
- ▽ Authorized Discharge
- ▼ Monitoring
- ▲ Seep

Flow Status
- Gaining
- Losing
- Dry
- No Change
- Not Available/ Insufficient Information

Site Features
- Secondary Road
- Rails

- ➡ Interpreted GW flow direction
- ☐ Study Areas
- Tailings/Settling/ Sediment Pond
- Waste Water Pond
- End-Pit Lake
- ☐ Watersheds
- ☐ Mine Permitted Areas
- Interpreted Tributary Valley-bottom Extent

- Interpreted Main Valley-bottom Extent

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Rock Drain
- Water Pipeline

- Bypass/Diversion Channel
- Island
- Lake/River Bed
- ▨ Wetted Area/Wetland (Based on 1:35000 Scale)

1143.80 Water level (masl) measured in October 2022

1538.70* Water level (masl) measured in November 2022

1143.80 Water level (masl) used for contouring

Notes:
1. Original in colour.
2. Numerical scale reflects full-size print. Print scaling will distort this scale, however scale bar will remain accurate.
3. Intended for illustration purposes, accuracy has not been verified for construction or navigation purposes.
4. Flow accretion studies completion dates:
   - Elk River, Fording River: combined 2020/2021 studies
   - Greenhills and Gardine Creek: August 2020
   - Upper Greenhills Creek: March 2021
   - Porter Creek: June 2021
   - Dry Creek: November 2018
   - Chauncey Creek: July, September, and November 2020
5. Based on LiDAR imagery, the elevation of the Fording River near RG_MW_FR11A/B is approximately 1478 masl.
6. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Information provided by Teck Coal Limited.

0 250 500 1,000
Meters

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

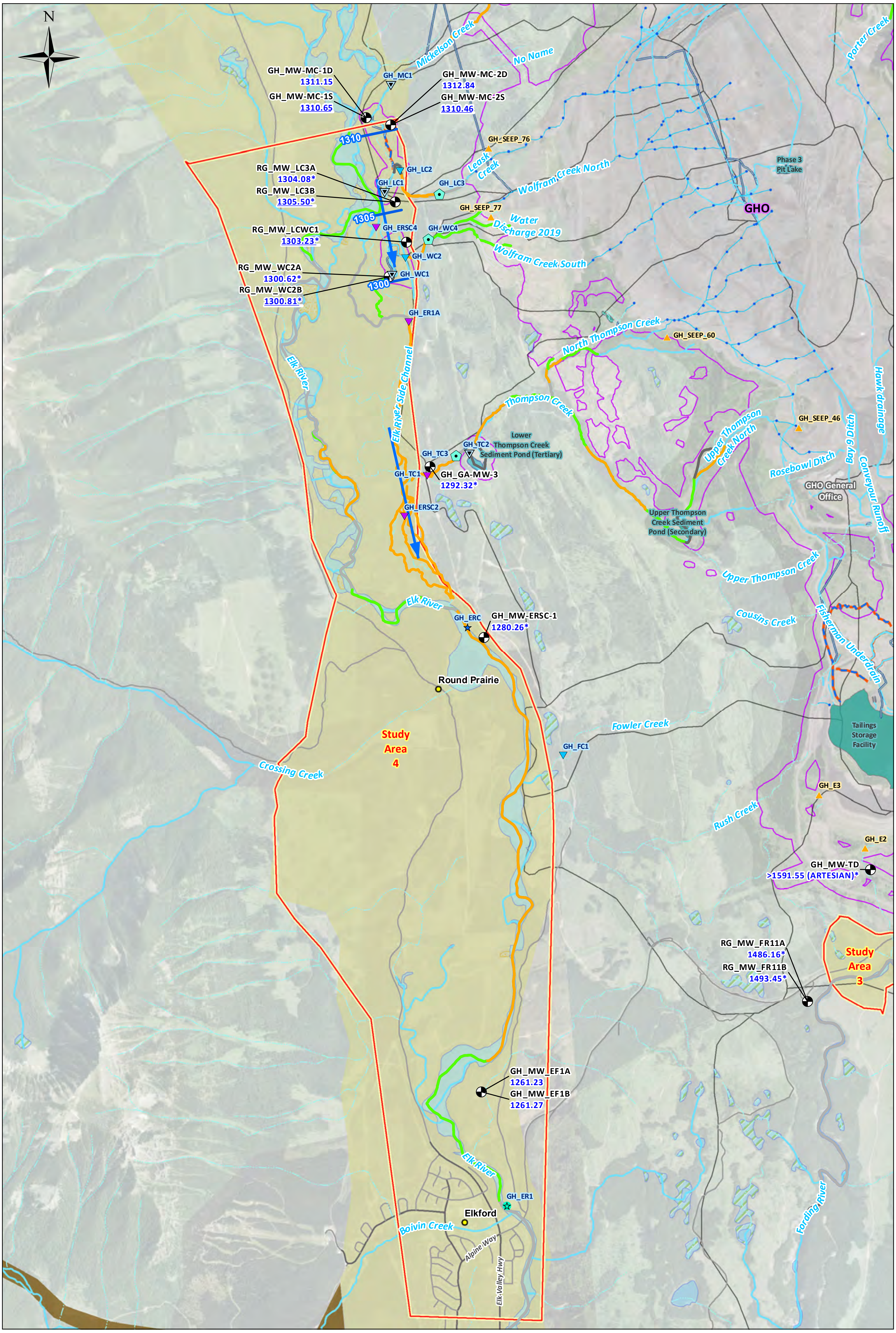
SNC • LAVALIN

Greenhills Operations
Groundwater Elevations from Q4 2022 and Inferred Groundwater Flow Direction (East)

CHK'D: EC	DATE: 2023-03-14	SCALE: 1:35,000	Ref Num:
BY: CW	COORD SYS: NAD 1983 UTM Zone 11N		DRAWING GH-02

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-GWElev_GHO_E.mxd



Legend

Groundwater Stations
- ◑ Monitoring Well

Surface Water Stations
- ★ Compliance Point
- ☆ Order Station
- ▼ Receiving Environment
- ▽ Authorized Discharge
- ▼ Monitoring
- ⬟ Hydrometric stations
- ▲ Seep

Flow Status
- 🟩 Gaining
- 🟧 Losing
- No Change
- Not Available/ Insufficient Information

Site Features
- Highway/Arterial
- Secondary Road

- ➡ Interpreted GW flow direction
- 🟥 Study Areas
- Tailings/Settling/ Sediment Pond
- Waste Water Pond
- End-Pit Lake
- Watersheds
- Mine Permitted Areas
- Interpreted Tributary Valley-bottom Extent
- Interpreted Main Valley-bottom Extent

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Water Pipeline
- Bypass/Diversion Channel
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:35000 Scale)

1143.80 Water level (masl) measured in October 2022

1538.70* Water level (masl) measured in November 2022

1143.80 Water level (masl) used for contouring

Notes:
1. Original in colour.
2. Numerical scale reflects full-size print. Print scaling will distort this scale, however scale bar will remain accurate.
3. Intended for illustration purposes, accuracy has not been verified for construction or navigation purposes.
4. Flow accretion studies completion dates:
· Elk River and side channels: combined 2020/2021 studies
· GHO Tributaries: 2019
5. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Information provided by Teck Coal Limited.
2. Service Layer Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

0 250 500 1,000 Meters

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

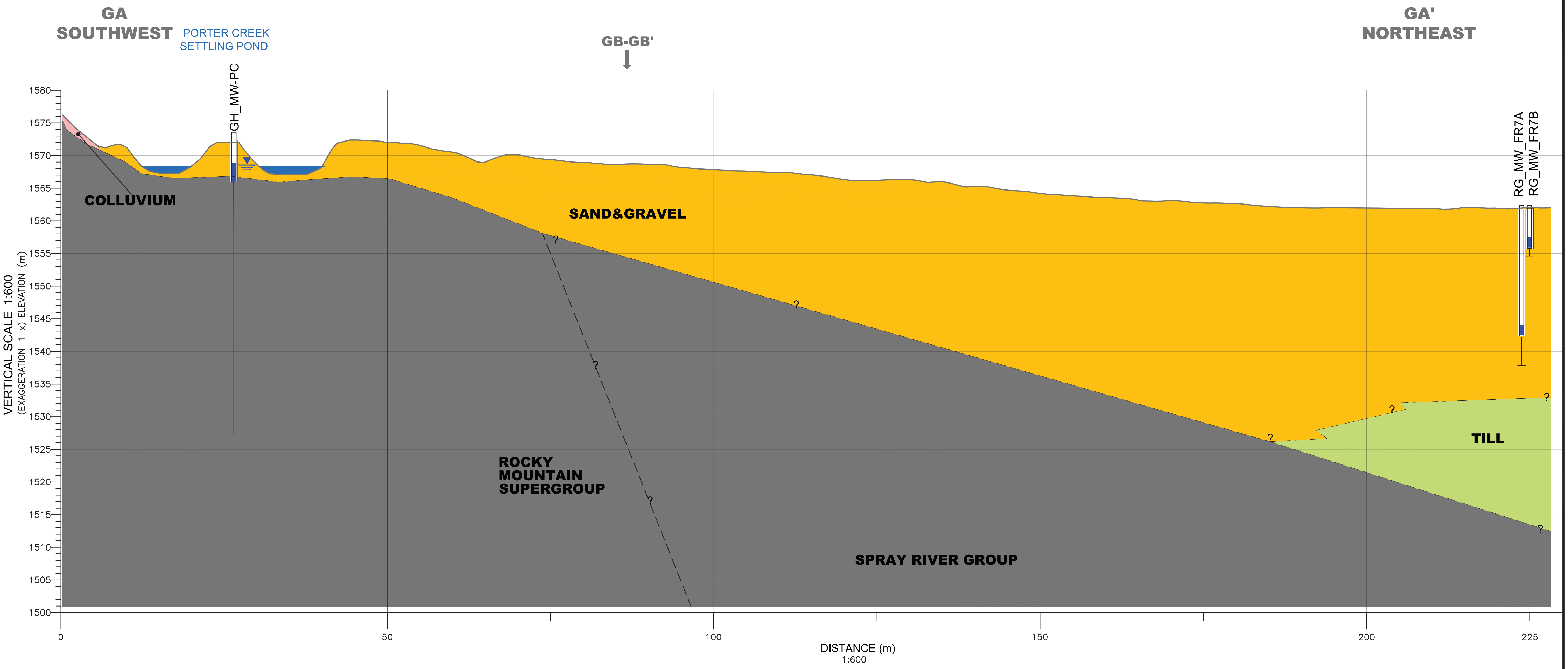
SNC·LAVALIN

Greenhills Operations
Groundwater Elevations from Q4 2022 and Inferred Groundwater Flow Direction (West)

CHK'D: EC
BY: CW
DATE: 2023-03-14
SCALE: 1:35,000
COORD SYS: NAD 1983 UTM Zone 11N
Ref Num:
DRAWING GH-03

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-GWElev_GHO_W.mxd

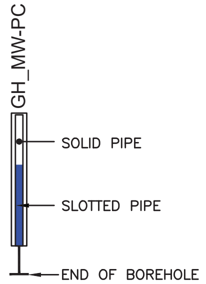


BOREHOLE LEGEND

🟥	**COLLUVIUM**
🟧	**SAND & GRAVEL**
🟩	**TILL**
⬛	**BEDROCK**

– – – – INFERRED STRATIGRAPHIC BOUNDARY

▽ GROUNDWATER ELEVATION (2022 Q4)



NOTES

1. THE CROSS SECTION DEPICTED IS BASED ON INTERPRETATION OF LIMITED GEOLOGICAL DATA. ACTUAL GEOLOGICAL CONDITIONS MAY BE DIFFERENT FROM THOSE INTERPRETED.
2. INFORMATION PRESENTED IS WITHIN 25m OF SECTION LINE UNLESS INDICATED OTHERWISE ON DRAWING.
3. ORIGINAL DRAWING IN COLOUR.
4. FRO LOCAL DATUM USED (ELEVATIONS ARE +0.94m HIGHER THAN UTM NAD83)
5. THE INFERRED PRESENCE OF CLAY AT RG_MW_7A/B IS BASED ON CONTINUITY OF FINE–GRAINED UNIT ALONG FORDING RIVER VALLEY, ENCOUNTERED AT RG_MW_FR8A AND RG_MW_FR5A.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–22	ISSUED TO CLIENT	AJK	EC
0	2022–03–14	ISSUED TO CLIENT	AJK	KH

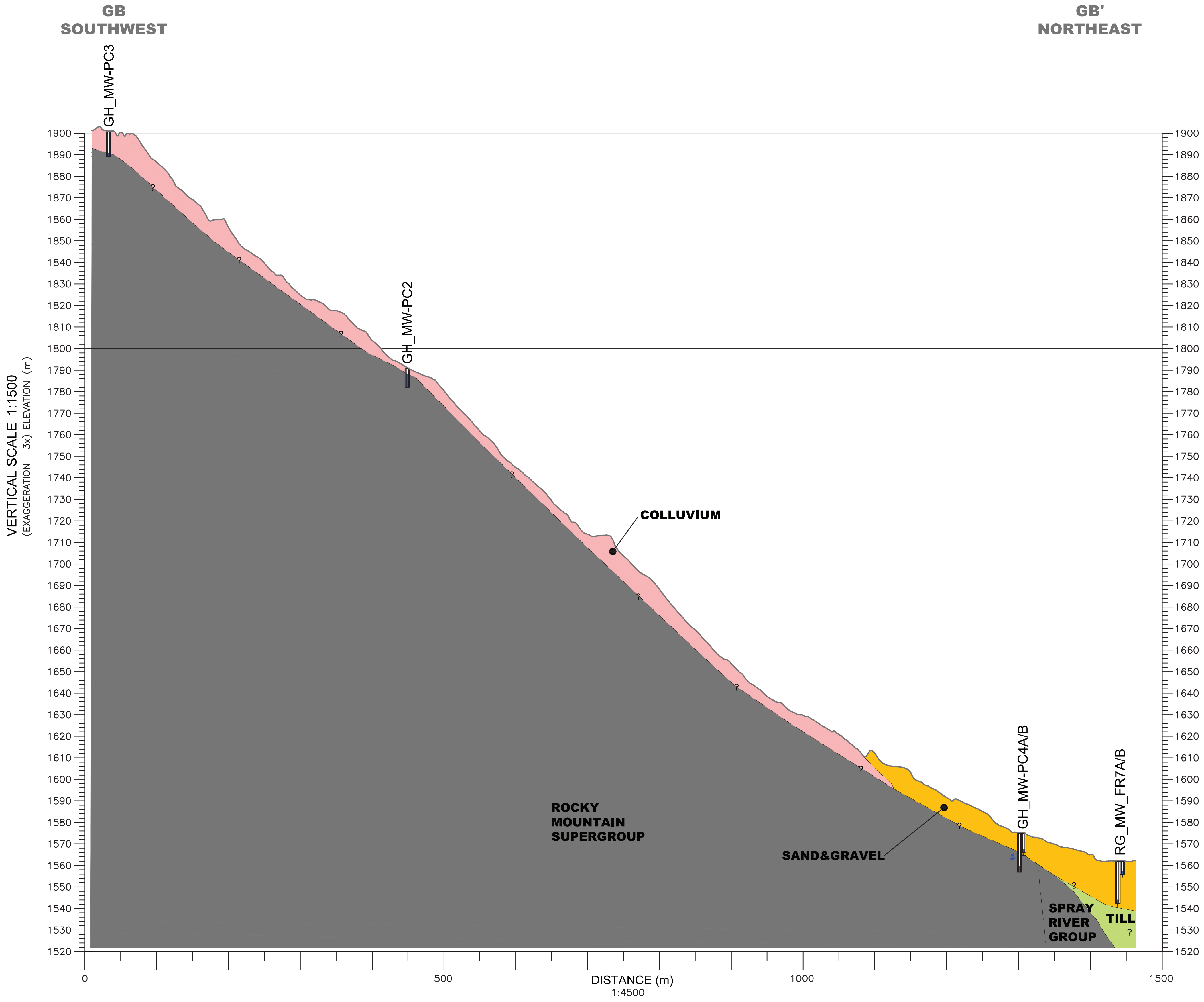
CLIENT NAME:
TECK COAL LIMITED
–

PROJECT LOCATION:
ELK VALLEY, BC

SNC·LAVALIN

TITLE:
GREENHILLS OPERATIONS
INFERRED GEOLOGICAL CROSS SECTION GA-GA'

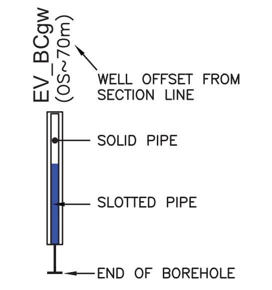
DWN BY: AJK	SCALE: AS SHOWN	DATE: 2020–02–10	DWG No: REV.: **1**
CHK'D: CH	PLOT: 20230322.0904	CADFILE: 635544–X2R20	**DRAWING GH-04**



▨ **COLLUVIUM**
▨ **SAND & GRAVEL**
▨ **TILL**
▨ **BEDROCK**

— — — INFERRED STRATIGRAPHIC BOUNDARY

GROUNDWATER ELEVATION (2022 Q4)



NOTES

1. THE CROSS SECTION DEPICTED IS BASED ON INTERPRETATION OF LIMITED GEOLOGICAL DATA. ACTUAL GEOLOGICAL CONDITIONS MAY BE DIFFERENT FROM THOSE INTERPRETED.
2. INFORMATION PRESENTED IS WITHIN 25m OF SECTION LINE UNLESS INDICATED OTHERWISE ON DRAWING.
3. ORIGINAL DRAWING IN COLOUR.
4. FRO LOCAL DATUM USED (ELEVATIONS ARE +0.94m HIGHER THAN UTM NAD83)

REFERENCE DRAWINGS

–	–	–
DWG. NO.	DATE	DESCRIPTION

REVISIONS

1	2023–03–22	ISSUED TO CLIENT	AJK	EC
0	2022–03–14	ISSUED TO CLIENT	AJK	KH
REV.	DATE	DESCRIPTION	BY	CHK

CLIENT NAME:
TECK COAL LIMITED
–

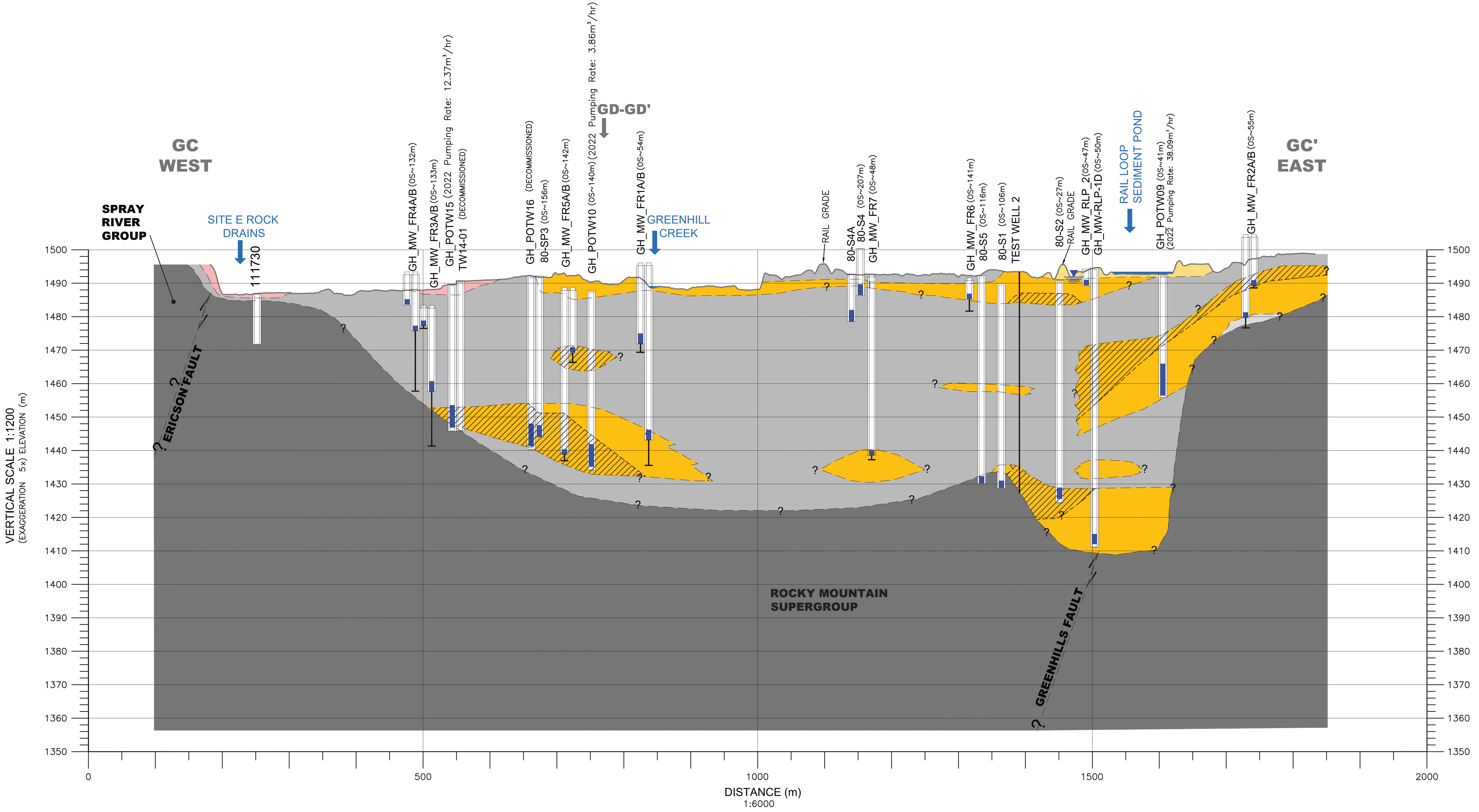
PROJECT LOCATION:
ELK VALLEY, BC
–

SNC·LAVALIN

TITLE:
GREENHILLS OPERATIONS
INFERRED GEOLOGICAL CROSS SECTION GB-GB'

DRN BY: AJK	SCALE: AS SHOWN	DATE: 2022–03–02	DWG No: REV.: **1**
CHK'D: KH	PLOT: 20230322.0903	CADFILE:635544–X2R20	**DRAWING GH-05**

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R20.DWG



LEGEND

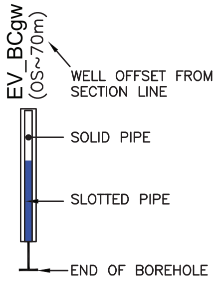
🟨	**FILL**
🟥	**COLLUVIUM**
🟧	**SAND & GRAVEL**
⬜	**SILT/CLAY**
▨	**SILTY SAND AND GRAVEL**
⬛	**BEDROCK**

— — — — INFERRED STRATIGRAPHIC BOUNDARY

▽ GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)

// NORMAL FAULT

BOREHOLE LEGEND



NOTES

1. THE CROSS SECTION DEPICTED IS BASED ON INTERPRETATION OF LIMITED GEOLOGICAL DATA. ACTUAL GEOLOGICAL CONDITIONS MAY BE DIFFERENT FROM THOSE INTERPRETED.
2. INFORMATION PRESENTED IS WITHIN 25m OF SECTION LINE UNLESS INDICATED OTHERWISE ON DRAWING.
3. ORIGINAL DRAWING IN COLOUR.
4. DETAILED INSTALL RECORDS WERE NOT AVAILABLE FOR WELL GH_POTW01 AND GH_POTW10. ESTIMATED 6m SCREEN.
5. PUMPING RATES ARE AN AVERAGE OF ALL DATA AVAILABLE FOR 2022.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–22	ISSUED TO CLIENT	AJK	EC
0	2022–03–14	ISSUED TO CLIENT	AJK	KH

CLIENT NAME:
TECK COAL LIMITED
–

PROJECT LOCATION:
ELK VALLEY, BC

SNC•LAVALIN

TITLE:

GREENHILLS OPERATONS
INFERRED GEOLOGICAL CROSS SECTION GC-GC'

DWN BY: AJK
SCALE: AS SHOWN
DATE: 2020–02–10
DWG No: DRAWING GH-06
REV.: 1
CHK'D: CH
PLOT: 20230322.0903
CADFILE: 635544–X2R20

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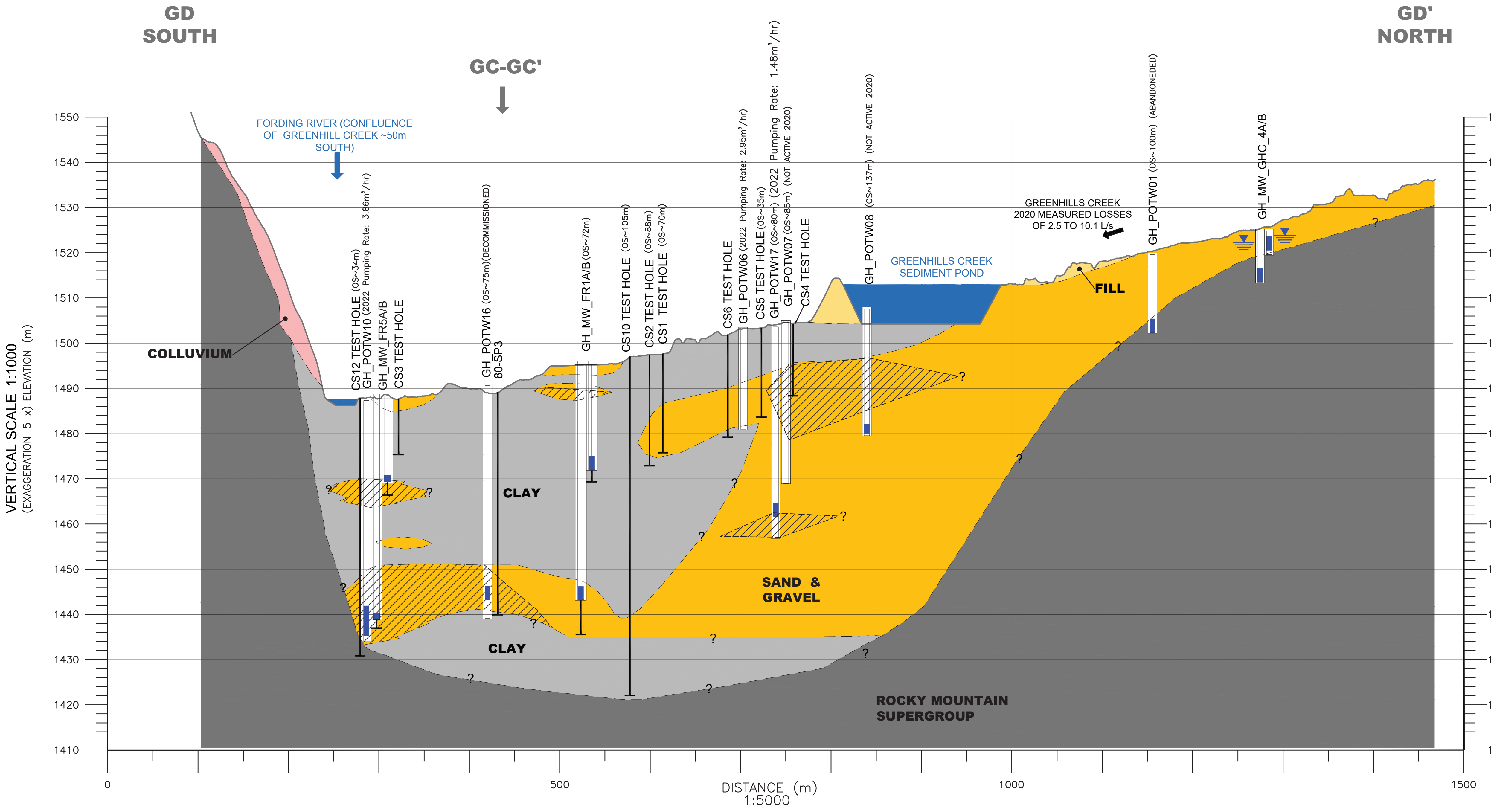


LEGEND

- 🟨 **FILL**
- 🟥 **COLLUVIUM**
- 🟧 **SAND & GRAVEL**
- ⬜ **CLAY**
- ▨ **SILTY SAND AND GRAVEL**
- ⬛ **BEDROCK**

— — — — INFERRED STRATIGRAPHIC BOUNDARY

▼ GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)

BOREHOLE LEGEND

EV_BCgw (OS~70m)

WELL OFFSET FROM SECTION LINE

SOLID PIPE

SLOTTED PIPE

END OF BOREHOLE

NOTES

1. THE CROSS SECTION DEPICTED IS BASED ON INTERPRETATION OF LIMITED GEOLOGICAL DATA. ACTUAL GEOLOGICAL CONDITIONS MAY BE DIFFERENT FROM THOSE INTERPRETED.
2. INFORMATION PRESENTED IS WITHIN 25m OF SECTION LINE UNLESS INDICATED OTHERWISE ON DRAWING.
3. ORIGINAL DRAWING IN COLOUR.
4. DETAILED INSTALL RECORDS WERE NOT AVAILABLE FOR WELL GH_POTW01 AND GH_POTW10. ESTIMATED 6m SCREEN.
5. PUMPING RATES ARE AN AVERAGE OF ALL DATA AVAILABLE FOR 2022.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–22	ISSUED TO CLIENT	AJK	EC
0	2022–03–14	ISSUED TO CLIENT	AJK	KH

CLIENT NAME:
TECK COAL LIMITED
–

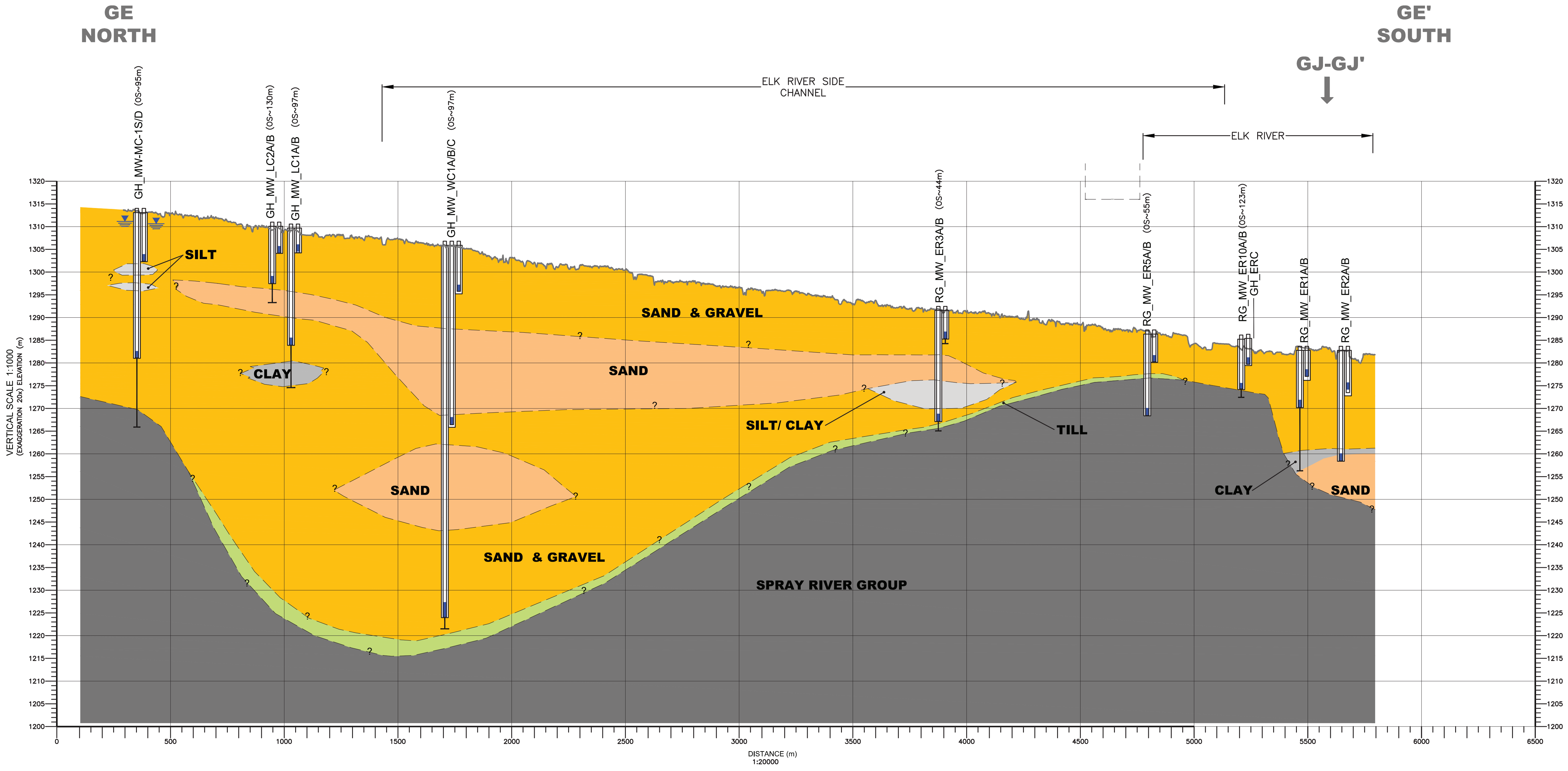
PROJECT LOCATION:
ELK VALLEY, BC

SNC·LAVALIN

TITLE:
GREENHILLS OPERATONS
INFERRED GEOLOGICAL CROSS SECTION GD-GD'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2020–02–10	DWG No: REV.: **1**
CHK'D: CH	PLOT: 20230322.0903	CADFILE: 635544–X2R20	**DRAWING GH-07**

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R20.DWG



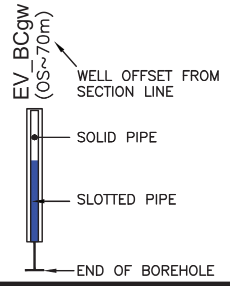
LEGEND

🟨 **SAND & GRAVEL**
🟧 **SAND**
⬜ **SILT**
▩ **CLAY**
🟩 **TILL**
⬛ **BEDROCK**

— — — — INFERRED STRATIGRAPHIC BOUNDARY

▽ GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)

BOREHOLE LEGEND



NOTES

1. THE CROSS SECTION DEPICTED IS BASED ON INTERPRETATION OF LIMITED GEOLOGICAL DATA. ACTUAL GEOLOGICAL CONDITIONS MAY BE DIFFERENT FROM THOSE INTERPRETED.
2. INFORMATION PRESENTED IS WITHIN 25m OF SECTION LINE UNLESS INDICATED OTHERWISE ON DRAWING.
3. ORIGINAL DRAWING IN COLOUR.
4. RG_MW_ER6A/B WAS ORIGINALLY ON THIS CROSS–SECTION (NORTH OF RG_MW_ER5A/B) BUT WAS REMOVED BECAUSE THIS WELL IS ON THE VALLEY FLANK WHERE THE BEDROCK IS INTERPRETED TO BE SHALLOWER.

REFERENCE DRAWINGS

–	–	–
DWG. NO.	DATE	DESCRIPTION

REVISIONS

1	2023–03–22	ISSUED TO CLIENT	AJK	EC
0	2022–03–14	ISSUED TO CLIENT	AJK	KH
REV.	DATE	DESCRIPTION	BY	CHK

CLIENT NAME:
TECK COAL LIMITED
–

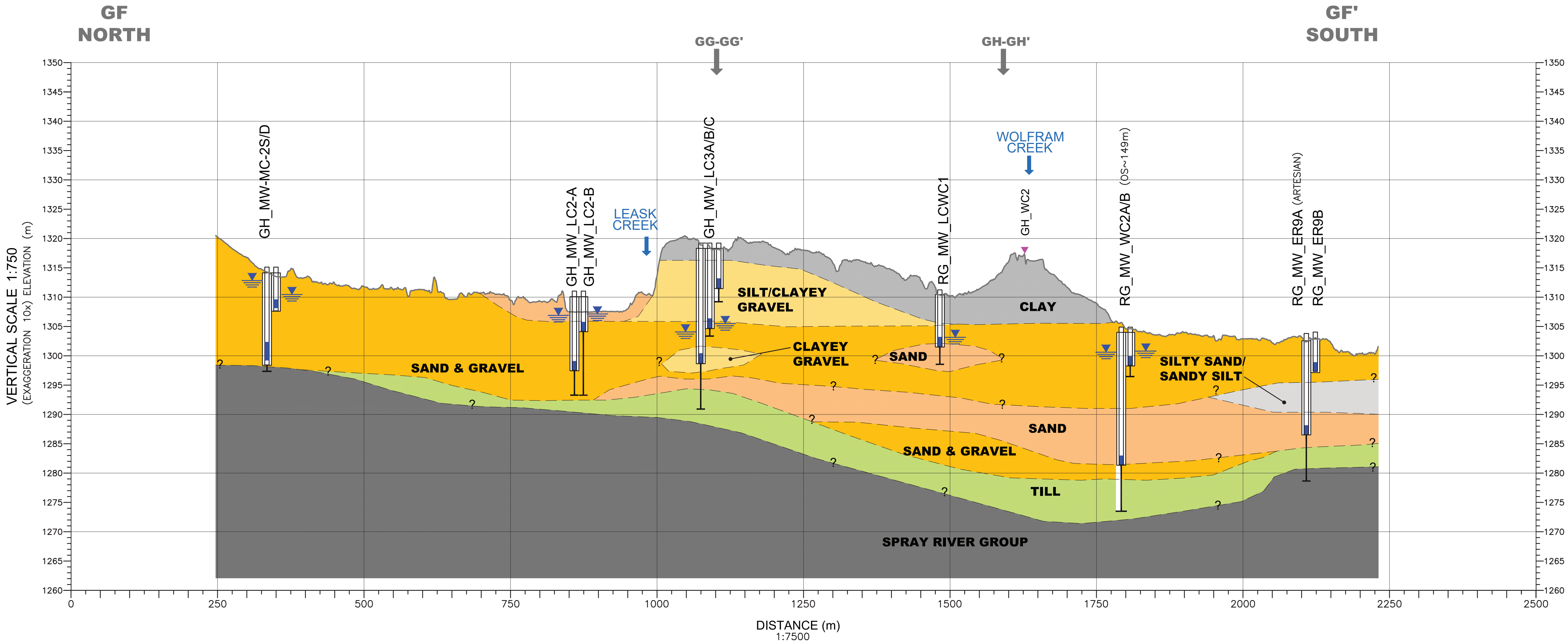
PROJECT LOCATION:
ELK VALLEY, BC

SNC·LAVALIN

TITLE:
GREENHILLS OPERATONS
INFERRED GEOLOGICAL CROSS SECTION GE-GE'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2020–02–10	DWG No: REV.: **1**
CHK'D: CH	PLOT: 20230322.0902	CADFILE: 635544–X2R20	**DRAWING GH-08**

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R20.DWG



LEGEND

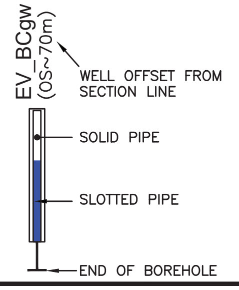
🟧	**SAND & GRAVEL**
🟧	**SAND**
🟨	**SILT/CLAYEY GRAVEL**
⬜	**SILT**
⬜	**CLAY**
🟩	**TILL**
⬛	**BEDROCK**

— — — — INFERRED STRATIGRAPHIC BOUNDARY

▼ GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)

▼ SURFACE WATER

BOREHOLE LEGEND



NOTES

1. THE CROSS SECTION DEPICTED IS BASED ON INTERPRETATION OF LIMITED GEOLOGICAL DATA. ACTUAL GEOLOGICAL CONDITIONS MAY BE DIFFERENT FROM THOSE INTERPRETED.
2. INFORMATION PRESENTED IS WITHIN 25m OF SECTION LINE UNLESS INDICATED OTHERWISE ON DRAWING.
3. ORIGINAL DRAWING IN COLOUR.
4. WATER LEVEL FOR RG_MW_ER9B IS FROM 2021-05-07.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023-03-22	ISSUED TO CLIENT	AJK	EC
0	2022-03-14	ISSUED TO CLIENT	AJK	KH

CLIENT NAME:
TECK COAL LIMITED
–

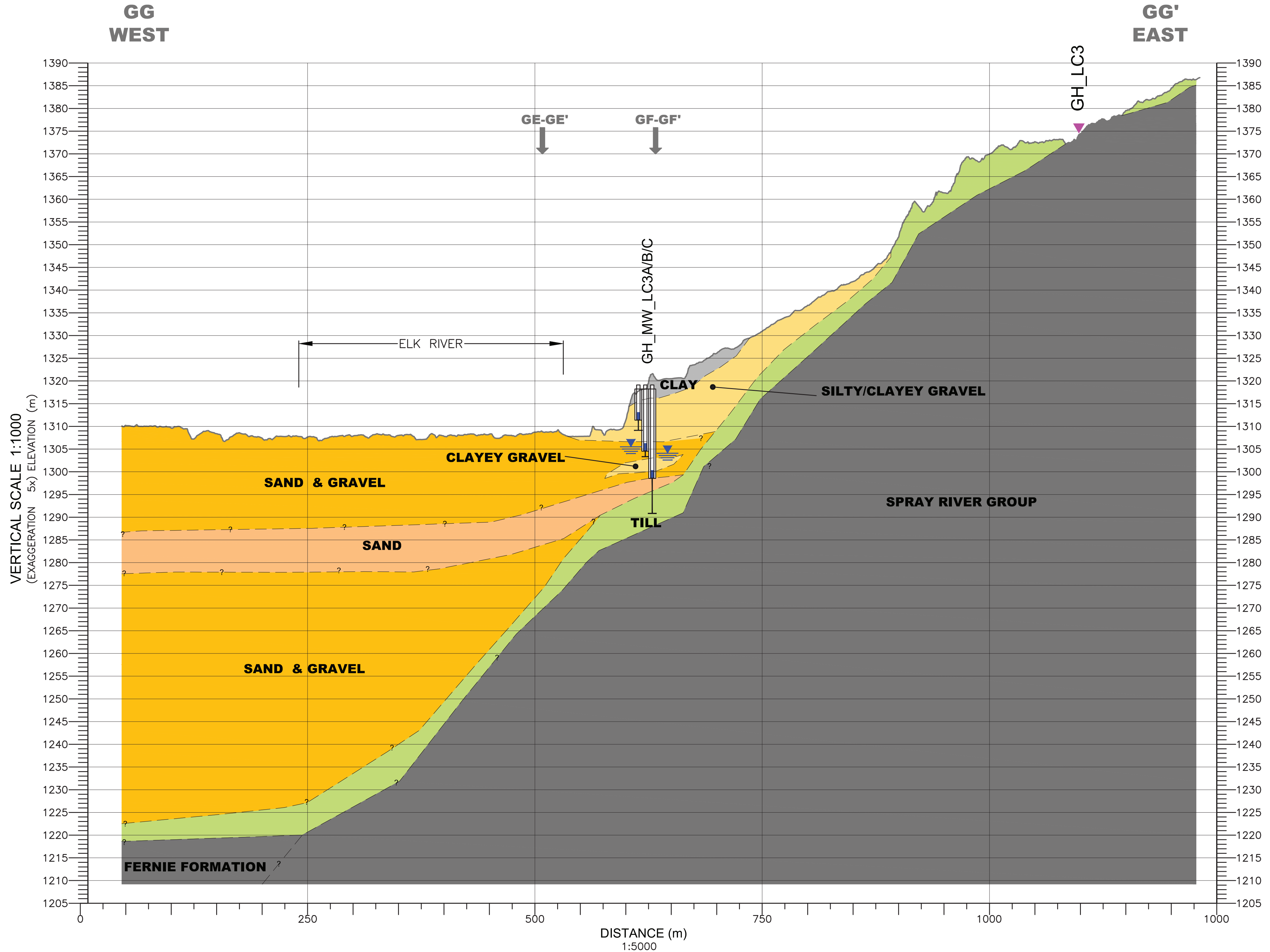
PROJECT LOCATION:
ELK VALLEY, BC

SNC·LAVALIN

TITLE:
GREENHILLS OPERATONS
INFERRED GEOLOGICAL CROSS SECTION GF-GF'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2020-02-10	DWG No: REV.: 1
CHK'D: CH	PLOT: 20230322.0902	CADFILE: 635544-X2R20	**DRAWING GH-09**

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544-X2R20.DWG

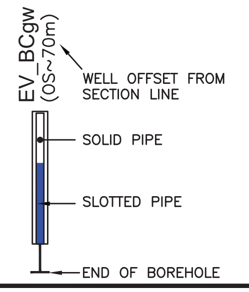


LEGEND

■ **SAND & GRAVEL**
■ **GRAVEL**
■ **SAND**
■ **CLAY**
■ **TILL**
■ **BEDROCK**

— — — INFERRED STRATIGRAPHIC BOUNDARY
▼ GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)
▼ SURFACE WATER

BOREHOLE LEGEND



NOTES

1. THE CROSS SECTION DEPICTED IS BASED ON INTERPRETATION OF LIMITED GEOLOGICAL DATA. ACTUAL GEOLOGICAL CONDITIONS MAY BE DIFFERENT FROM THOSE INTERPRETED.
2. INFORMATION PRESENTED IS WITHIN 25m OF SECTION LINE UNLESS INDICATED OTHERWISE ON DRAWING.
3. ORIGINAL DRAWING IN COLOUR.
4. FRO LOCAL DATUM USED (ELEVATIONS ARE +0.94m HIGHER THAN UTM NAD83.)
5. BEDROCK TOPOGRAPHY ON THE WEST SIDE OF GHO WAS INFERRED BASED ON ELECTRICAL RESISTIVITY SURVEYS COMPLETED ALONG THE LENGTH OF LEASK CREEK IN OCTOBER 2019 BY ADVISIAN (2020).
6. TILL ON THE WEST SIDE OF GHO IS INFERRED BASED ON SURFICIAL MAPPING COMPLETED BY GOLDER (2014) – WEST SPOILS EXPANSION GEOMORPHOLOGICAL AND TERRAIN HAZARD ASSESSMENT.

REFERENCE DRAWINGS

–	–	–
DWG. NO.	DATE	DESCRIPTION

REVISIONS

1	2023–03–22	ISSUED TO CLIENT	AJK	EC
0	2022–03–14	ISSUED TO CLIENT	AJK	KH
REV.	DATE	DESCRIPTION	BY	CHK

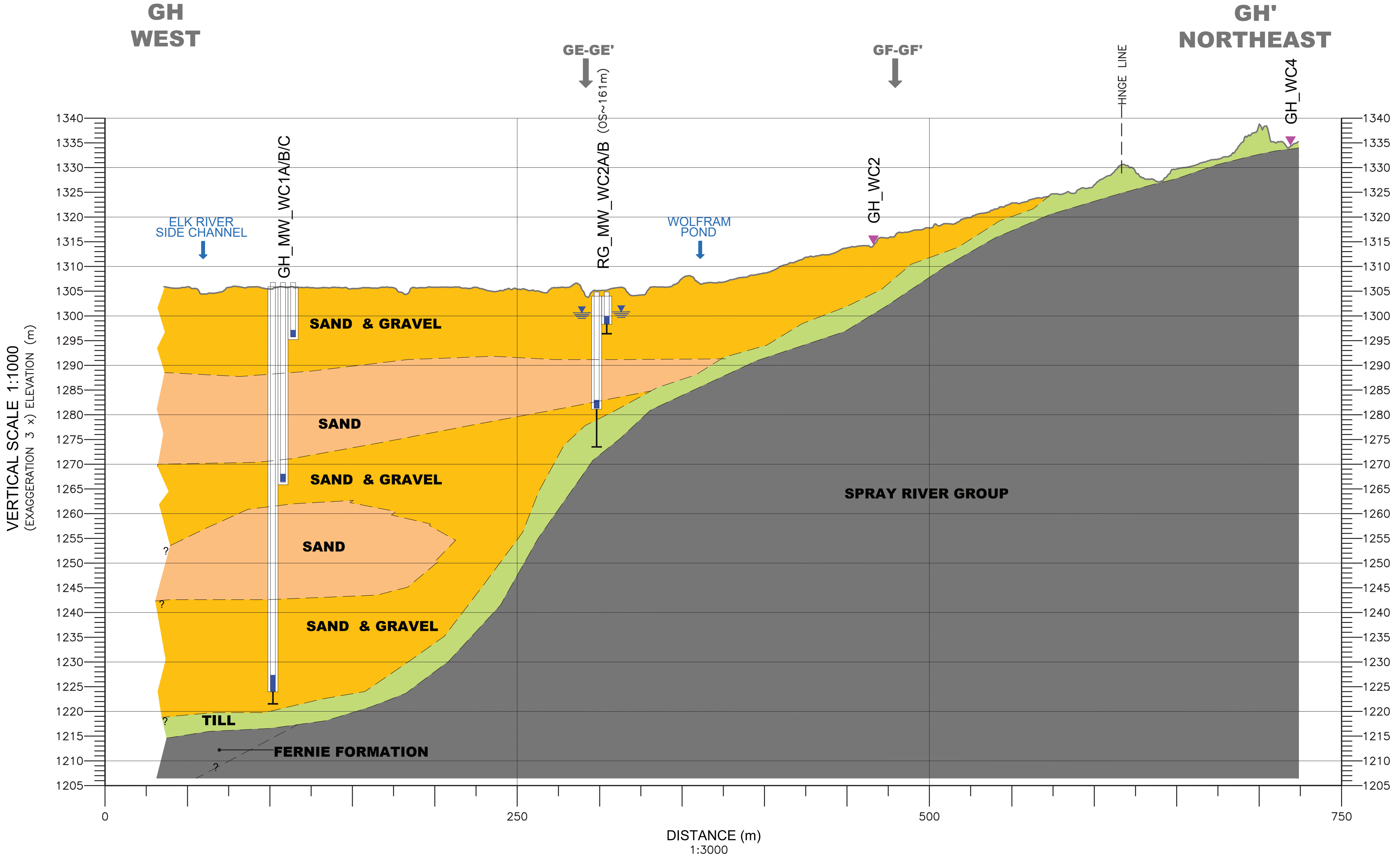
CLIENT NAME:
TECK COAL LIMITED
–

PROJECT LOCATION:
ELK VALLEY, BC

SNC • LAVALIN

TITLE:
GREENHILLS OPERATONS
INFERRED GEOLOGICAL CROSS SECTION GG-GG'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2020–02–10	DWG No: REV.: **1**
CHK'D: CH	PLOT: 20230322.0902	CADFILE: 635544–X2R20	**DRAWING GH-10**



LEGEND

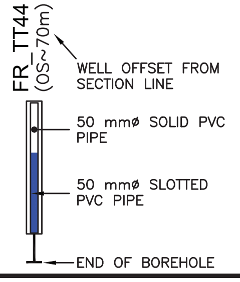
🟨	**SAND & GRAVEL**
🟧	**SAND**
🟩	**TILL**
⬛	**BEDROCK**

– – – – INFERRED STRATIGRAPHIC BOUNDARY

▼ GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)

▼ SURFACE WATER

BOREHOLE LEGEND



NOTES

1. THE CROSS SECTION DEPICTED IS BASED ON INTERPRETATION OF LIMITED GEOLOGICAL DATA. ACTUAL GEOLOGICAL CONDITIONS MAY BE DIFFERENT FROM THOSE INTERPRETED.
2. INFORMATION PRESENTED IS WITHIN 25m OF SECTION LINE UNLESS INDICATED OTHERWISE ON DRAWING.
3. ORIGINAL DRAWING IN COLOUR.
4. BEDROCK TOPOGRAPHY ON THE WEST SIDE OF GHO WAS INFERRED BASED ON ELECTRICAL RESISTIVITY SURVEYS COMPLETED ALONG THE LENGTH OF WOLFRAM CREEK IN OCTOBER 2019 BY ADVISIAN (2020).
5. TILL ON THE WEST SIDE OF GHO IS INFERRED BASED ON SURFICIAL MAPPING COMPLETED BY GOLDER (2014) – WEST SPOILS EXPANSION GEOMORPHOLOGICAL AND TERRAIN HAZARD ASSESSMENT.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–22	ISSUED TO CLIENT	AJK	EC
0	2022–03–14	ISSUED TO CLIENT	AJK	KH

CLIENT NAME:
TECK COAL LIMITED
–

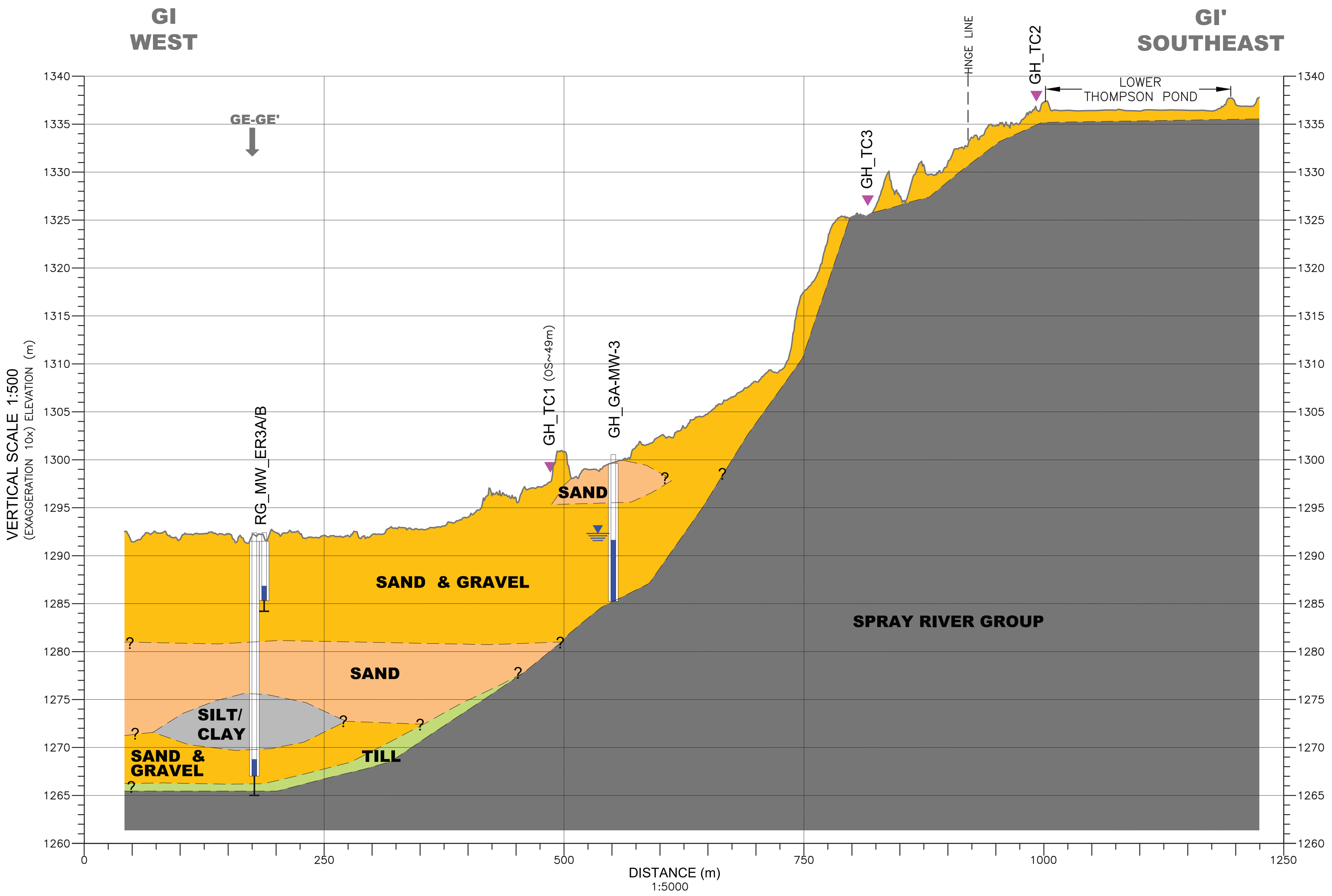
PROJECT LOCATION:
ELK VALLEY, BC

SNC•LAVALIN

TITLE:
GREENHILLS OPERATONS
INFERRED GEOLOGICAL CROSS SECTION GH-GH'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2020–02–10	DWG No: REV.: **1**
CHK'D: CH	PLOT: 20230322.0901	CADFILE: 635544–X2R20	**DRAWING GH-11**

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R20.DWG



LEGEND

🟨 **SAND & GRAVEL**

🟧 **SAND**

⬜ **SILT**

▒ **CLAY**

🟩 **TILL**

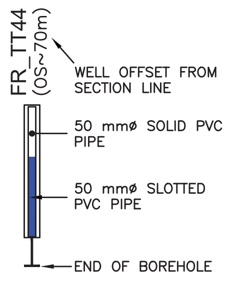
⬛ **BEDROCK**

— — — — INFERRED STRATIGRAPHIC BOUNDARY

▽ GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)

▼ SURFACE WATER

BOREHOLE LEGEND



NOTES

1. THE CROSS SECTION DEPICTED IS BASED ON INTERPRETATION OF LIMITED GEOLOGICAL DATA. ACTUAL GEOLOGICAL CONDITIONS MAY BE DIFFERENT FROM THOSE INTERPRETED.
2. INFORMATION PRESENTED IS WITHIN 25m OF SECTION LINE UNLESS INDICATED OTHERWISE ON DRAWING.
3. ORIGINAL DRAWING IN COLOUR.
4. BEDROCK TOPOGRAPHY ON THE WEST SIDE OF GHO WAS INFERRED BASED ON ELECTRICAL RESISITIVITY SURVEYS COMPLETED ALONG THE LENGTH OF THOMSON CREEK IN OCTOBER 2019 BY ADVISIAN (2020).
5. SURFICIAL GEOLOGY ON THE WEST SIDE OF GHO IS INFERRED BASED ON SURFICIAL MAPPING COMPLETED BY GOLDER (2014) – WEST SPOILS EXPANSION GEOMORPHOLOGICAL AND TERRAIN HAZARD ASSESSMENT. SAND AND GRAVEL WAS INFERRED BASED ON A MAPPED ALLUVIAL FAN COINCIDENT WITH THE SECTION LINE.

REFERENCE DRAWINGS

–	–	–
DWG. NO.	DATE	DESCRIPTION

REVISIONS

1	2023–03–22	ISSUED TO CLIENT	AJK	EC
0	2022–03–14	ISSUED TO CLIENT	AJK	KH
REV.	DATE	DESCRIPTION	BY	CHK

CLIENT NAME:
TECK COAL LIMITED
–

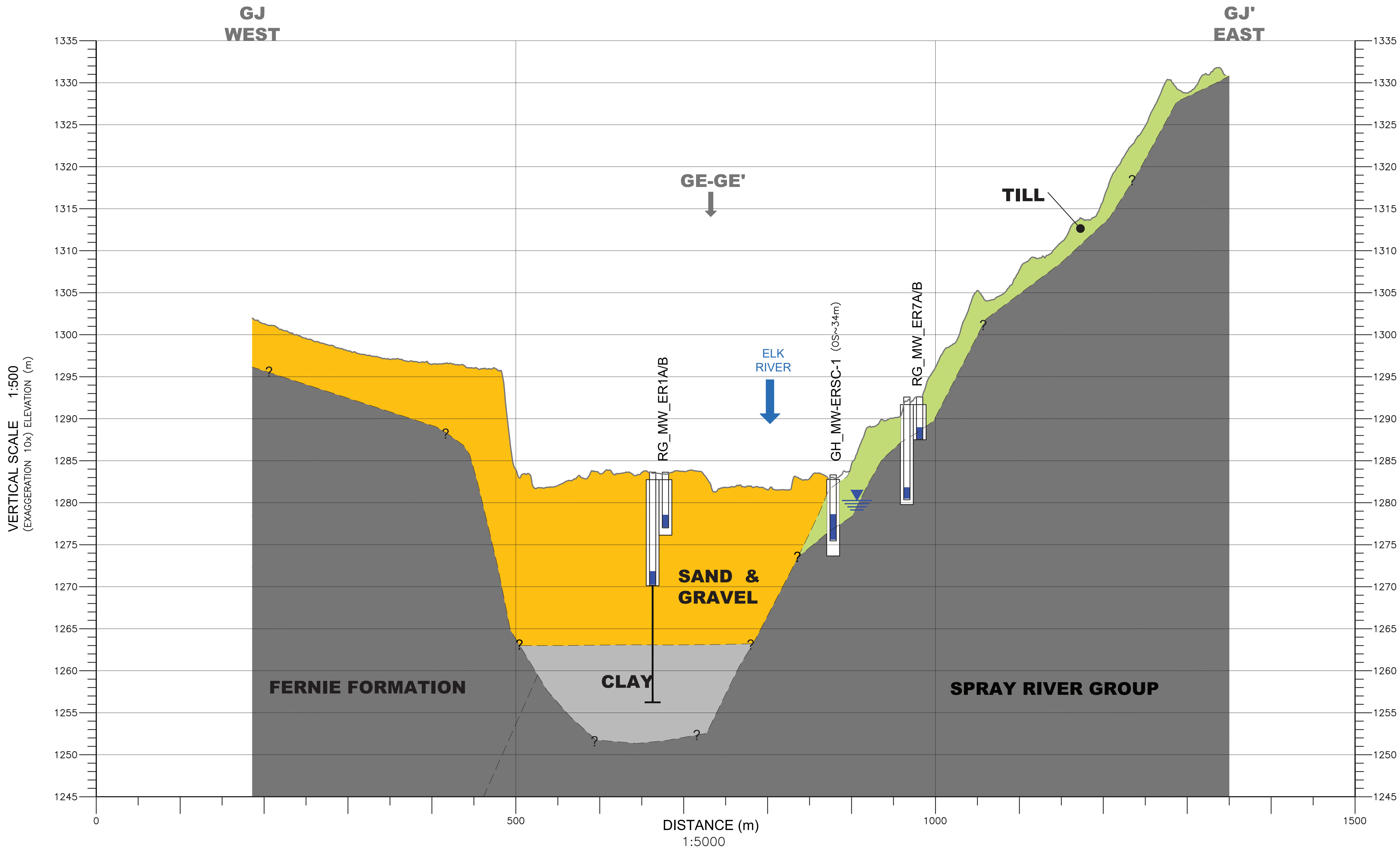
PROJECT LOCATION:
ELK VALLEY, BC

SNC·LAVALIN

TITLE:
GREENHILLS OPERATONS
INFERRED GEOLOGICAL CROSS SECTION GI-GI'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2020–02–10	DWG No: REV.: **1**
CHK'D: CH	PLOT: 20230322.0855	CADFILE: 635544–X2R20	**DRAWING GH-12**

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R20.DWG



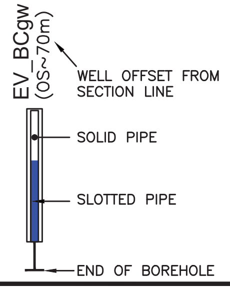
LEGEND

🟧	**SAND & GRAVEL**
⬜	**CLAY**
🟩	**TILL**
⬛	**BEDROCK**

— — — — INFERRED STRATIGRAPHIC BOUNDARY

GROUNDWATER ELEVATION (2022 Q4) MANUAL WATER LEVEL MEASUREMENT)

BOREHOLE LEGEND



NOTES

1. THE CROSS SECTION DEPICTED IS BASED ON INTERPRETATION OF LIMITED GEOLOGICAL DATA. ACTUAL GEOLOGICAL CONDITIONS MAY BE DIFFERENT FROM THOSE INTERPRETED.
2. INFORMATION PRESENTED IS WITHIN 25m OF SECTION LINE UNLESS INDICATED OTHERWISE ON DRAWING.
3. ORIGINAL DRAWING IN COLOUR.
4. BEDROCK SURFACE TOPOGRAPHY ON THE WEST SIDE OF THE ELK VALLEY WAS INFERRED BASED ON AN OUTCROP PROVIDED IN BC GEOLOGICAL SURVEY PRELIMINARY MAP 63.
5. TILL ON THE EAST SIDE OF THE ELK VALLEY WAS INFERRED BASED ON MAPPING OF SURFICIAL GEOLOGY (GEORGE ET AL., 1986).

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–22	ISSUED TO CLIENT	AJK	EC
0	2022–03–14	ISSUED TO CLIENT	AJK	KH

CLIENT NAME:
TECK COAL LIMITED
–

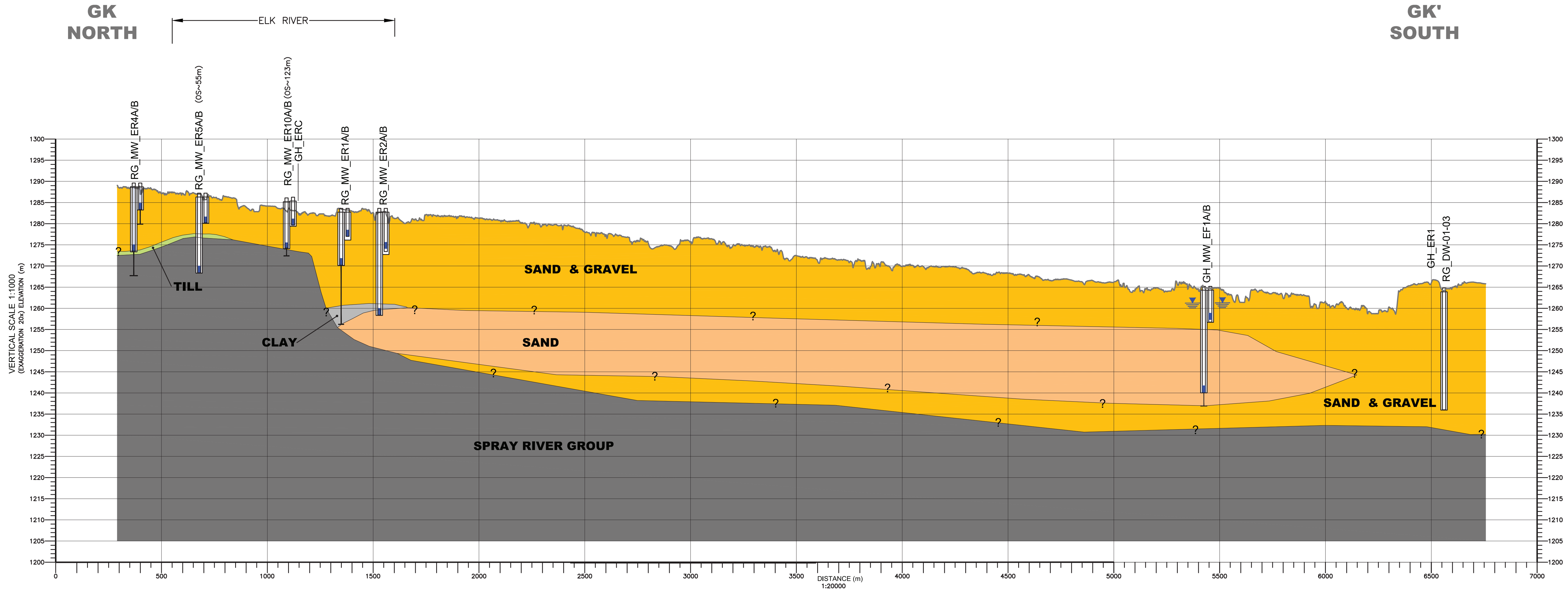
PROJECT LOCATION:
ELK VALLEY, BC

SNC•LAVALIN

TITLE:
GREENHILLS OPERATONS
INFERRED GEOLOGICAL CROSS SECTION GJ-GJ'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2020–02–10	DWG No: REV.: **1**
CHK'D: CH	PLOT: 20230322.0855	CADFILE: 635544–X2R20	**DRAWING GH-13**

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R20.DWG



LEGEND

🟨 **SAND & GRAVEL**

🟧 **SAND**

⬜ **CLAY**

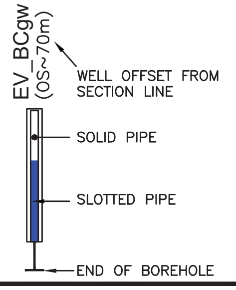
🟩 **TILL**

⬛ **BEDROCK**

— — — — INFERRED STRATIGRAPHIC BOUNDARY

GROUNDWATER ELEVATION (2022 Q4) MANUAL WATER LEVEL MEASUREMENT)

BOREHOLE LEGEND



NOTES

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2. INFORMATION PRESENTED IS WITHIN 25m OF SECTION LINE UNLESS INDICATED OTHERWISE ON DRAWING.
3. ORIGINAL DRAWING IN COLOUR.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–22	ISSUED TO CLIENT	AJK	EC
0	2022–03–14	ISSUED TO CLIENT	AJK	KH

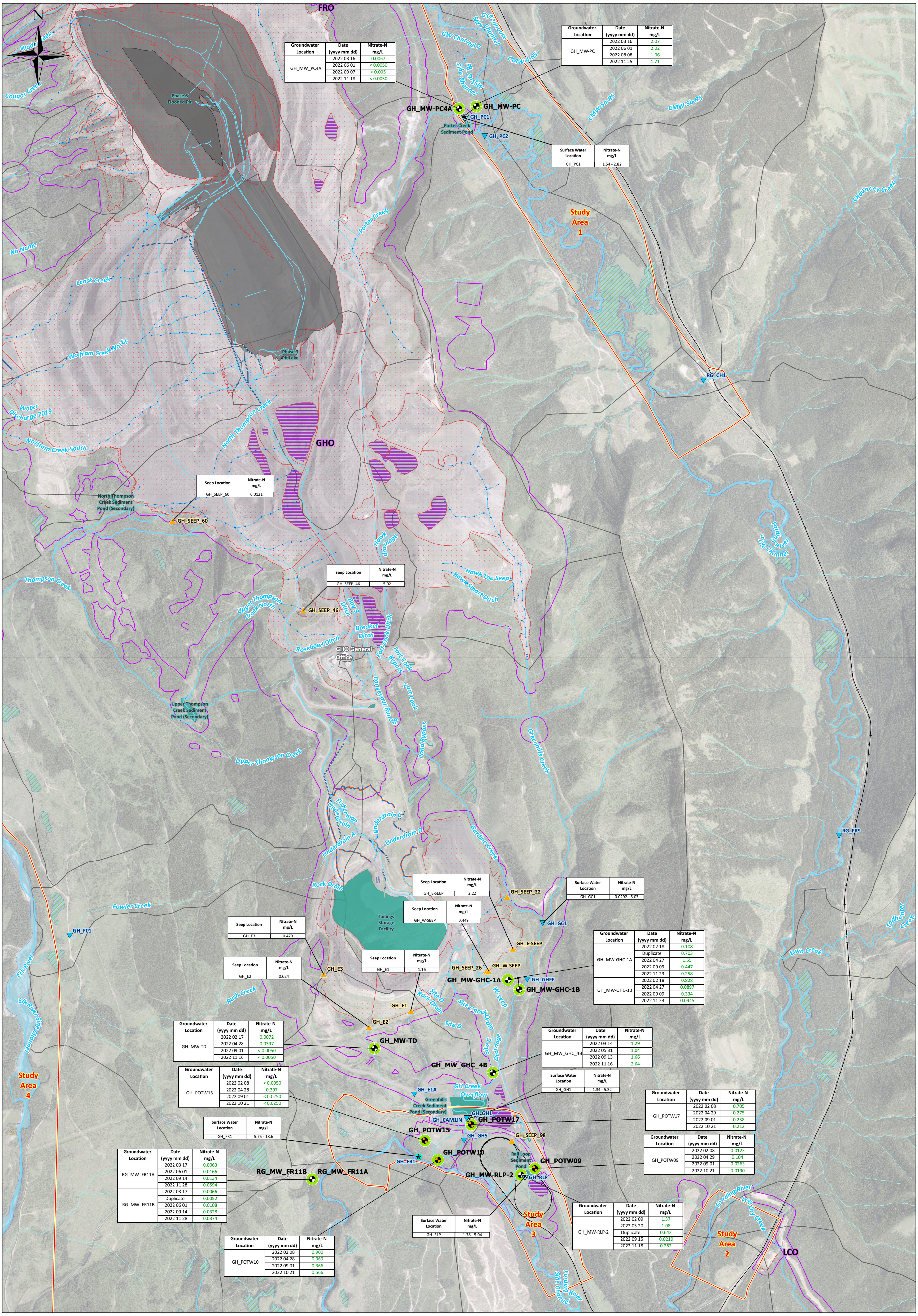
CLIENT NAME:
TECK COAL LIMITED
–

PROJECT LOCATION:
ELK VALLEY, BC

SNC·LAVALIN

TITLE:
GREENHILLS OPERATONS
INFERRED GEOLOGICAL CROSS SECTION GK-GK'

DWN BY: AJK
SCALE: AS SHOWN
DATE: 2020–02–10
DWG No: REV.: **1**
CHK'D: KMC
PLOT: 20230322.0854
CADFILE: 635544–X2R20
DRAWING GH-14



Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
GH_MW_PC4A	2022 03 16	0.0067
	2022 06 01	< 0.0050
	2022 09 07	< 0.005
	2022 11 18	< 0.0050

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
GH_MW-PC	2022 03 16	2.07
	2022 06 01	2.02
	2022 08 08	1.06
	2022 11 25	1.71

Surface Water Location	Nitrate-N mg/L
GH_PC1	1.54 - 2.82

Seep Location	Nitrate-N mg/L
GH_SEEP_60	0.0121

Seep Location	Nitrate-N mg/L
GH_SEEP_46	5.02

Seep Location	Nitrate-N mg/L
GH_E-SEEP	2.22

Surface Water Location	Nitrate-N mg/L
GH_GC1	0.0292 - 5.03

Seep Location	Nitrate-N mg/L
GH_W-SEEP	0.449

Seep Location	Nitrate-N mg/L
GH_E3	0.479

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
GH_MW-GHC-1A	2022 02 18	0.108
	Duplicate	0.703
	2022 04 27	1.55
	2022 09 09	0.447
	2022 11 23	0.258
GH_MW-GHC-1B	2022 02 18	0.828
	2022 04 27	0.0897
	2022 09 09	0.334
	2022 11 23	0.0445

Seep Location	Nitrate-N mg/L
GH_E1	1.16

Seep Location	Nitrate-N mg/L
GH_E2	0.624

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
GH_MW-TD	2022 02 17	0.0072
	2022 04 28	0.0397
	2022 09 01	< 0.0050
	2022 11 16	< 0.0050

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
GH_MW_GHC_4B	2022 03 14	1.29
	2022 05 31	1.04
	2022 09 13	1.66
	2022 11 16	2.64

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
GH_POTW15	2022 02 08	< 0.0050
	2022 04 28	0.397
	2022 09 01	< 0.0250
	2022 10 21	< 0.0250

Surface Water Location	Nitrate-N mg/L
GH_GH1	1.34 - 5.32

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
GH_POTW17	2022 02 08	0.705
	2022 04 29	0.275
	2022 09 01	0.238
	2022 10 21	0.212

Surface Water Location	Nitrate-N mg/L
GH_FR1	5.75 - 18.6

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
GH_POTW09	2022 02 08	0.0123
	2022 04 29	0.104
	2022 09 01	0.0263
	2022 10 21	0.0190

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
RG_MW_FR11A	2022 03 17	0.0063
	2022 06 01	0.0166
	2022 09 14	0.0134
	2022 11 28	0.0594
RG_MW_FR11B	2022 03 17	0.0066
	Duplicate	0.0052
	2022 06 01	0.0108
	2022 09 14	0.0328
	2022 11 28	0.0374

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
GH_MW-RLP-2	2022 02 09	1.37
	2022 05 20	1.08
	Duplicate	0.642
	2022 09 15	0.0219
	2022 11 18	0.252

Surface Water Location	Nitrate-N mg/L
GH_RLP	1.78 - 5.04

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
GH_POTW10	2022 02 08	0.900
	2022 04 28	0.969
	2022 09 01	0.366
	2022 10 21	0.566

Legend

Groundwater Stations[4]

- ◕ Monitoring Well
- ◕ Supply

Surface Water Stations

- ★ Order Station and Compliance Point
- ▽ Authorized Discharge
- ▼ Monitoring
- ▲ Seep

Site Features

- Secondary Road
- Rails
- Study Areas
- Tailings/Settling/Sediment Pond
- Waste Water Pond
- End-Pit Lake
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds
- Mine Permitted Areas

Water Features

- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Rock Drain
- Water Pipeline
- Bypass/Diversion Channel
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:17000 Scale)

Q4	Q1
Q3	Q2

symbol locations have been adjusted relative to well locations for visibility

Green below the applicable screening criteria

Blue above the applicable screening criteria

Grey no sample collected

Primary Screening Criteria	Nitrate-N mg/L
CSR Aquatic Life	**400**
CSR Irrigation Watering	*n/a*
CSR Livestock Watering	100
CSR Drinking Water	10

Notes:
1. Original in colour at paper size ANSI C (17x22 in).
2. Numerical scale reflects full-size print. Print scaling will distort this scale; however, scale bar will remain accurate.
3. Intended for illustration purposes. Accuracy has not been verified for construction or navigation.
4. Locations of overlapping wells have been adjusted for clarity.
5. Nitrate-N = Nitrate Nitrogen
6. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Data provided by Teck Coal Limited

0 0.25 0.5 1 1.5 km

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

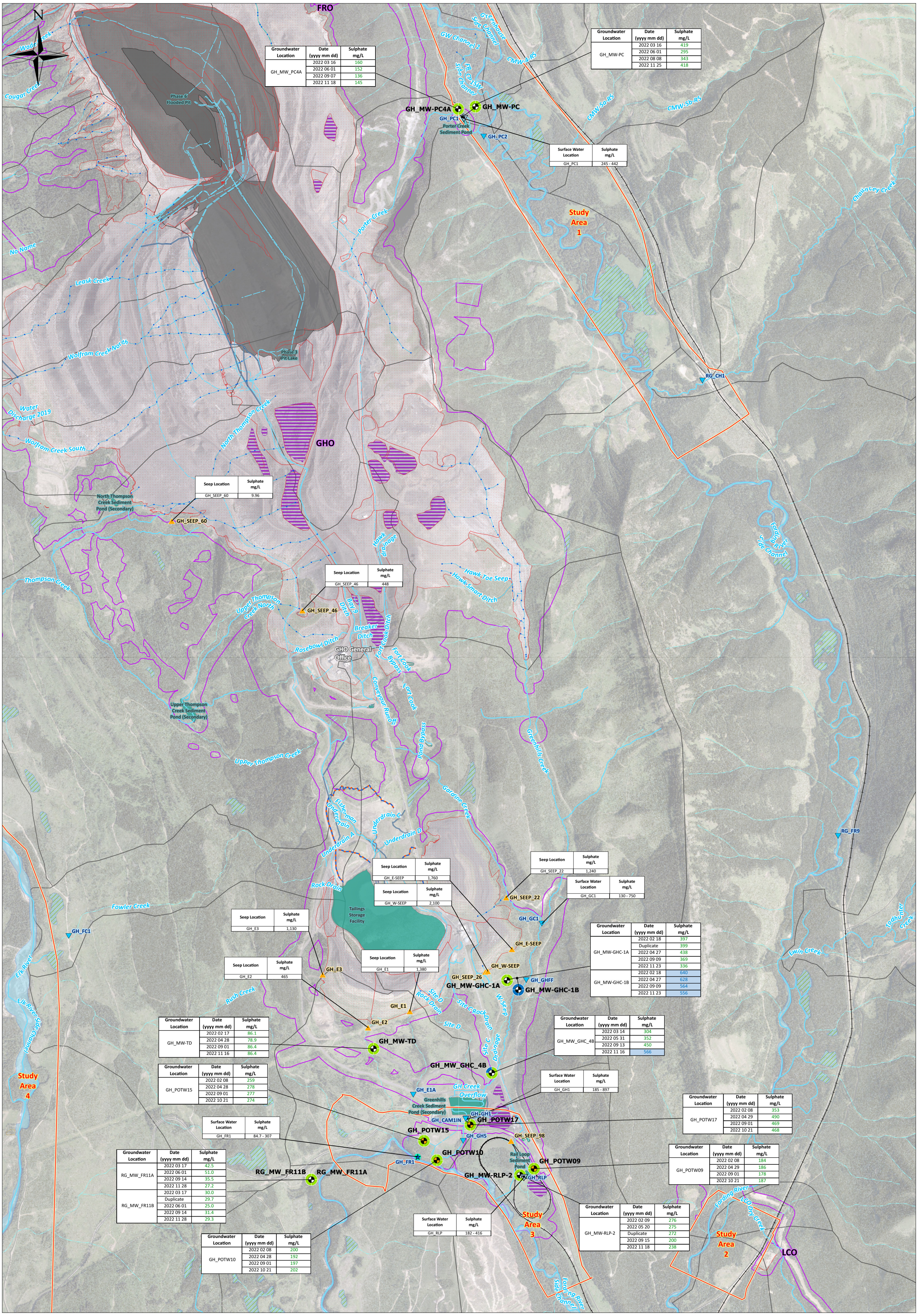
SNC·LAVALIN

Greenhills Operations - Spatial Distribution of Nitrate Nitrogen in Groundwater (East)

CHK'D: EC
DATE: 2023-03-14 SCALE: 1:17,000
REF NUM:
BY: CW
COORD SYS: NAD 1983 UTM Zone 11N
DRAWING GH-15

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\AnalyticalDrawings_2022AnnRpt.aprx

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
GH_MW_PC4A	2022 03 16	160
	2022 06 01	152
	2022 09 07	136
	2022 11 18	145

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
GH_MW-PC	2022 03 16	419
	2022 06 01	295
	2022 08 08	343
	2022 11 25	418

Surface Water Location	Sulphate mg/L
GH_PC1	245 - 442

Seep Location	Sulphate mg/L
GH_SEEP_60	9.96

Seep Location	Sulphate mg/L
GH_SEEP_46	448

Seep Location	Sulphate mg/L
GH_E-SEEP	1,760

Seep Location	Sulphate mg/L
GH_SEEP_22	1,240

Seep Location	Sulphate mg/L
GH_W-SEEP	2,100

Surface Water Location	Sulphate mg/L
GH_GC1	130 - 750

Seep Location	Sulphate mg/L
GH_E3	1,130

Seep Location	Sulphate mg/L
GH_E1	1,380

Seep Location	Sulphate mg/L
GH_E2	465

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
GH_MW-GHC-1A	2022 02 18	397
	Duplicate	399
	2022 04 27	438
	2022 09 09	369
	2022 11 23	336
GH_MW-GHC-1B	2022 02 18	640
	2022 04 27	628
	2022 09 09	564
	2022 11 23	556

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
GH_MW-TD	2022 02 17	86.1
	2022 04 28	78.9
	2022 09 01	86.4
	2022 11 16	86.4

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
GH_MW_GHC_4B	2022 03 14	304
	2022 05 31	352
	2022 09 13	450
	2022 11 16	566

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
GH_POTW15	2022 02 08	259
	2022 04 28	278
	2022 09 01	277
	2022 10 21	274

Surface Water Location	Sulphate mg/L
GH_GH1	185 - 897

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
GH_POTW17	2022 02 08	353
	2022 04 29	490
	2022 09 01	469
	2022 10 21	468

Surface Water Location	Sulphate mg/L
GH_FR1	84.7 - 307

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
GH_POTW09	2022 02 08	184
	2022 04 29	186
	2022 09 01	178
	2022 10 21	187

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
RG_MW_FR11A	2022 03 17	42.5
	2022 06 01	51.0
	2022 09 14	35.5
	2022 11 28	27.2
RG_MW_FR11B	2022 03 17	30.0
	Duplicate	29.7
	2022 06 01	25.0
	2022 09 14	31.4
	2022 11 28	29.3

Surface Water Location	Sulphate mg/L
GH_RLP	182 - 416

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
GH_MW-RLP-2	2022 02 09	276
	2022 05 20	275
	Duplicate	272
	2022 09 15	200
	2022 11 18	238

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
GH_POTW10	2022 02 08	200
	2022 04 28	192
	2022 09 01	197
	2022 10 21	202

Legend

Groundwater Stations[4]

- ◕ Monitoring Well
- ◕ Supply

Surface Water Stations

- ★ Order Station and Compliance Point
- ▽ Authorized Discharge
- ▼ Monitoring
- ▲ Seep

Site Features

- Secondary Road
- Rails
- Study Areas
- Tailings/Settling/Sediment Pond
- Waste Water Pond
- End-Pit Lake
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds
- Mine Permitted Areas

Water Features

- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Rock Drain
- Water Pipeline
- Bypass/Diversion Channel
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:17000 Scale)

Q4 Q1
Q3 Q2

symbol locations have been adjusted relative to well locations for visibility

Green below the applicable screening criteria

Blue above the applicable screening criteria

Grey no sample collected

Primary Screening Criteria	Sulphate mg/L
CSR Aquatic Life	1,280-4,290
CSR Irrigation Watering	n/a
CSR Livestock Watering	1,000
CSR Drinking Water	500

Notes:
1. Original in colour at paper size ANSI C (17x22 in).
2. Numerical scale reflects full-size print. Print scaling will distort this scale; however, scale bar will remain accurate.
3. Intended for illustration purposes. Accuracy has not been verified for construction or navigation.
4. Locations of overlapping wells have been adjusted for clarity.
5. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Data provided by Teck Coal Limited

0 0.25 0.5 1 1.5 km

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

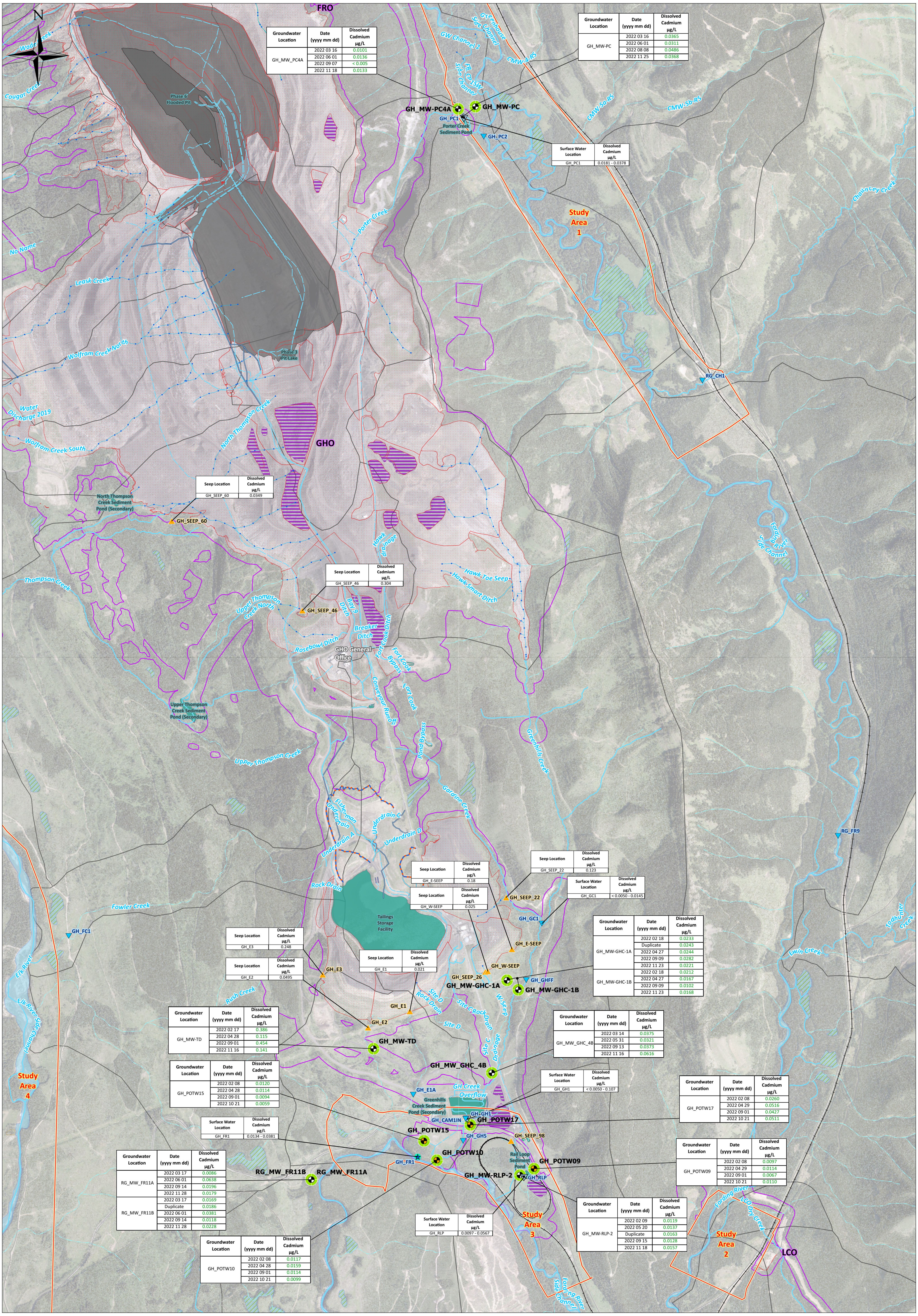
SNC·LAVALIN

Greenhills Operations - Spatial Distribution of Sulphate in Groundwater (East)

CHK'D: EC
DATE: 2023-03-14 SCALE: 1:17,000
BY: CW
COORD SYS: NAD 1983 UTM Zone 11N
REF NUM:
DRAWING GH-16

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\AnalyticalDrawings_2022AnnRpt.aprx

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
GH_MW_PC4A	2022 03 16	0.0101
	2022 06 01	0.0136
	2022 09 07	< 0.005
	2022 11 18	0.0133

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
GH_MW-PC	2022 03 16	0.0365
	2022 06 01	0.0311
	2022 08 08	0.0486
	2022 11 25	0.0368

Surface Water Location	Dissolved Cadmium µg/L
GH_PC1	0.0181 - 0.0378

Seep Location	Dissolved Cadmium µg/L
GH_SEEP_60	0.0349

Seep Location	Dissolved Cadmium µg/L
GH_SEEP_46	0.304

Seep Location	Dissolved Cadmium µg/L
GH_SEEP_22	0.123

Seep Location	Dissolved Cadmium µg/L
GH_E-SEEP	0.18

Surface Water Location	Dissolved Cadmium µg/L
GH_GC1	< 0.0050 - 0.0145

Seep Location	Dissolved Cadmium µg/L
GH_W-SEEP	0.025

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
GH_MW-GHC-1A	2022 02 18	0.0233
	Duplicate	0.0243
	2022 04 27	0.0244
	2022 09 09	0.0282
	2022 11 23	0.0221
GH_MW-GHC-1B	2022 02 18	0.0212
	2022 04 27	0.0167
	2022 09 09	0.0102
	2022 11 23	0.0168

Seep Location	Dissolved Cadmium µg/L
GH_E3	0.248

Seep Location	Dissolved Cadmium µg/L
GH_E2	0.0495

Seep Location	Dissolved Cadmium µg/L
GH_E1	0.021

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
GH_MW-TD	2022 02 17	0.386
	2022 04 28	0.115
	2022 09 01	0.454
	2022 11 16	0.141

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
GH_MW_GHC_4B	2022 03 14	0.0375
	2022 05 31	0.0321
	2022 09 13	0.0373
	2022 11 16	0.0616

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
GH_POTW15	2022 02 08	0.0120
	2022 04 28	0.0114
	2022 09 01	0.0094
	2022 10 21	0.0059

Surface Water Location	Dissolved Cadmium µg/L
GH_GH1	< 0.0050 - 0.107

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
GH_POTW17	2022 02 08	0.0260
	2022 04 29	0.0516
	2022 09 01	0.0427
	2022 10 21	0.0511

Surface Water Location	Dissolved Cadmium µg/L
GH_FR1	0.0134 - 0.0381

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
GH_POTW09	2022 02 08	0.0097
	2022 04 29	0.0114
	2022 09 01	0.0067
	2022 10 21	0.0110

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
RG_MW_FR11A	2022 03 17	0.0086
	2022 06 01	0.0638
	2022 09 14	0.0196
	2022 11 28	0.0179
RG_MW_FR11B	2022 03 17	0.0169
	Duplicate	0.0186
	2022 06 01	0.0381
	2022 09 14	0.0118
	2022 11 28	0.0228

Surface Water Location	Dissolved Cadmium µg/L
GH_RLP	0.0097 - 0.0567

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
GH_MW-RLP-2	2022 02 09	0.0119
	2022 05 20	0.0137
	Duplicate	0.0163
	2022 09 15	0.0128
	2022 11 18	0.0157

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
GH_POTW10	2022 02 08	0.0117
	2022 04 28	0.0159
	2022 09 01	0.0114
	2022 10 21	0.0099

Legend

Groundwater Stations[4]
- ◕ Monitoring Well
- ◕ Supply

Surface Water Stations
- ★ Order Station and Compliance Point
- ▽ Authorized Discharge
- ▼ Monitoring
- ▲ Seep

Site Features
- Secondary Road
- Rails
- Study Areas
- Tailings/Settling/Sediment Pond
- Waste Water Pond
- End-Pit Lake
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds
- Mine Permitted Areas

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Rock Drain
- Water Pipeline
- Bypass/Diversion Channel
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:17000 Scale)

Q4 Q1
Q3 Q2

symbol locations have been adjusted relative to well locations for visibility

Green below the applicable screening criteria

Blue above the applicable screening criteria

Grey no sample collected

^ Dissolved phase of the parameter is shown in the spatial plot.

Primary Screening Criteria	Cadmium^ µg/L
CSR Aquatic Life	0.5-4
CSR Irrigation Watering	5
CSR Livestock Watering	80
CSR Drinking Water	5

Notes:
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4. Locations of overlapping wells have been adjusted for clarity.
5. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Data provided by Teck Coal Limited

0 0.25 0.5 1 1.5 km

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

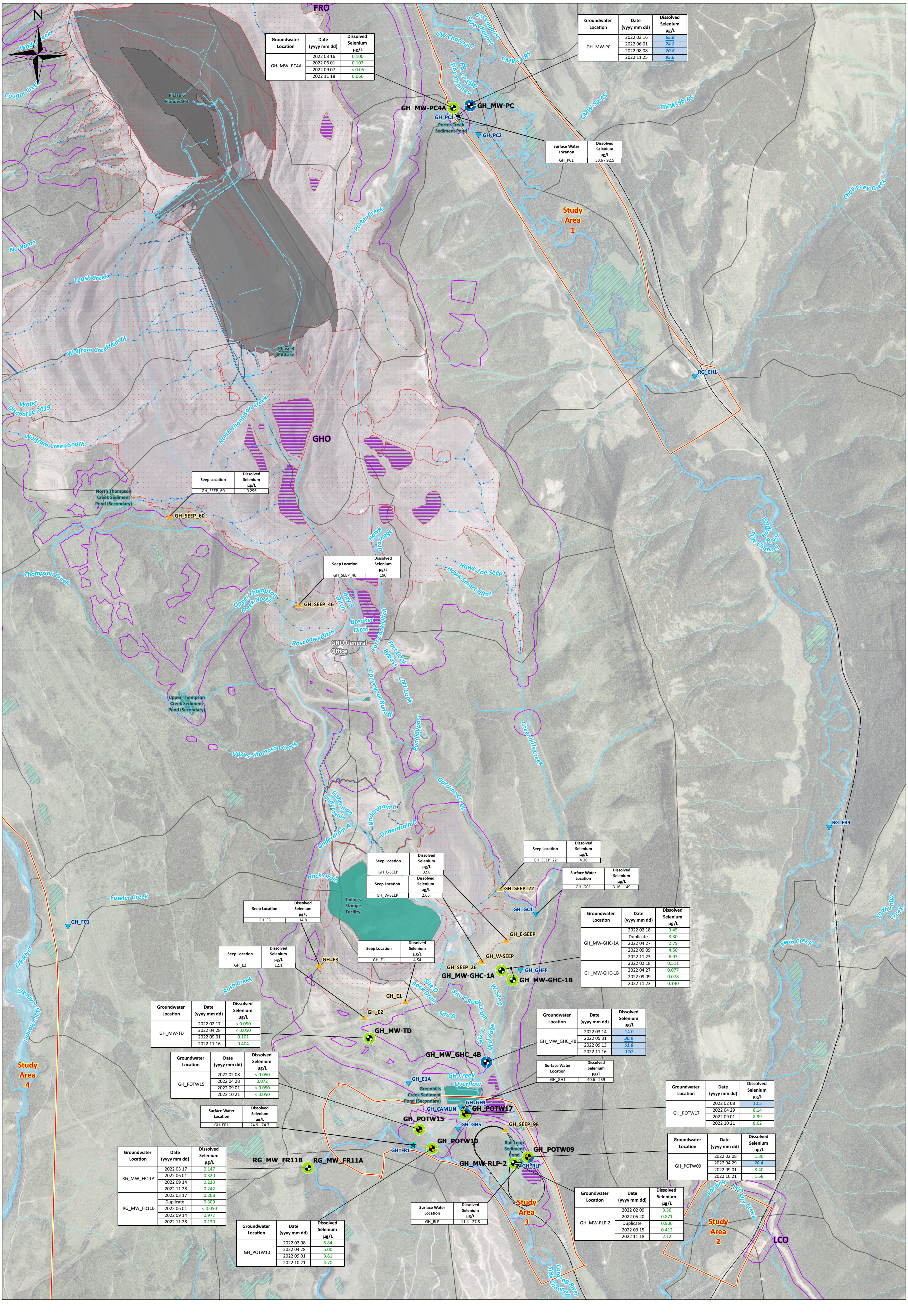
SNC·LAVALIN

Greenhills Operations - Spatial Distribution of Dissolved Cadmium in Groundwater (East)

CHK'D: EC
BY: CW
DATE: 2023-03-14
SCALE: 1:17,000
COORD SYS: NAD 1983 UTM Zone 11N
REF NUM:
DRAWING GH-17

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\AnalyticalDrawings_2022AnnRpt.aprx

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
GH_MW_PC4A	2022 03 16	0.100
	2022 06 01	0.107
	2022 09 07	< 0.05
	2022 11 18	0.066

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
GH_MW-PC	2022 03 16	*__65.8__*
	2022 06 01	*__74.2__*
	2022 08 08	*__70.8__*
	2022 11 25	*__95.6__*

Surface Water Location	Dissolved Selenium µg/L
GH_PC1	50.6 - 92.5

Seep Location	Dissolved Selenium µg/L
GH_SEEP_60	0.296

Seep Location	Dissolved Selenium µg/L
GH_SEEP_46	190

Seep Location	Dissolved Selenium µg/L
GH_SEEP_22	4.28

Seep Location	Dissolved Selenium µg/L
GH_E-SEEP	32.6

Seep Location	Dissolved Selenium µg/L
GH_W-SEEP	2.66

Surface Water Location	Dissolved Selenium µg/L
GH_GC1	3.16 - 149

Seep Location	Dissolved Selenium µg/L
GH_E3	14.8

Seep Location	Dissolved Selenium µg/L
GH_E1	4.54

Seep Location	Dissolved Selenium µg/L
GH_E2	12.1

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
GH_MW-GHC-1A	2022 02 18	3.45
	Duplicate	3.30
	2022 04 27	2.79
	2022 09 09	4.50
	2022 11 23	6.93
GH_MW-GHC-1B	2022 02 18	0.511
	2022 04 27	0.077
	2022 09 09	0.078
	2022 11 23	0.140

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
GH_MW-TD	2022 02 17	< 0.050
	2022 04 28	< 0.050
	2022 09 01	0.101
	2022 11 16	0.404

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
GH_MW_GHC_4B	2022 03 14	14.0
	2022 05 31	*__30.9__*
	2022 09 13	*__61.8__*
	2022 11 16	*__110__*

Surface Water Location	Dissolved Selenium µg/L
GH_GH1	40.6 - 239

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
GH_POTW15	2022 02 08	< 0.050
	2022 04 28	0.072
	2022 09 01	< 0.050
	2022 10 21	< 0.050

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
GH_POTW17	2022 02 08	10.5
	2022 04 29	8.14
	2022 09 01	8.99
	2022 10 21	8.62

Surface Water Location	Dissolved Selenium µg/L
GH_FR1	24.9 - 74.7

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
GH_POTW09	2022 02 08	1.30
	2022 04 29	*__20.4__*
	2022 09 01	3.40
	2022 10 21	1.58

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
RG_MW_FR11A	2022 03 17	0.147
	2022 06 01	0.320
	2022 09 14	0.213
	2022 11 28	0.242
RG_MW_FR11B	2022 03 17	0.268
	Duplicate	0.309
	2022 06 01	< 0.050
	2022 09 14	0.977
	2022 11 28	0.130

Surface Water Location	Dissolved Selenium µg/L
GH_RLP	11.4 - 27.8

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
GH_MW-RLP-2	2022 02 09	3.56
	2022 05 20	0.871
	Duplicate	0.906
	2022 09 15	0.412
	2022 11 18	2.12

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
GH_POTW10	2022 02 08	5.84
	2022 04 28	5.00
	2022 09 01	3.81
	2022 10 21	4.70

Legend

Groundwater Stations[4]
- ● Monitoring Well
- ● Supply

Surface Water Stations
- ★ Order Station and Compliance Point
- ▽ Authorized Discharge
- ▼ Monitoring
- ▲ Seep

Site Features
- Highway/Arterial
- Secondary Road
- Rails
- Study Areas
- Tailings/Settling/Sediment Pond
- Waste Water Pond
- End-Pit Lake
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds
- Mine Permitted Areas

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Rock Drain
- Water Pipeline
- Bypass/Diversion Channel
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:17000 Scale)

Q4	Q1
Q3	Q2

symbol locations have been adjusted relative to well locations for visibility

Green below the applicable screening criteria

Blue above the applicable screening criteria

Grey no sample collected

^ Dissolved phase of the parameter is shown in the spatial plot.

Primary Screening Criteria	Selenium^ µg/L
CSR Aquatic Life	**20**
CSR Irrigation Watering	*20*
CSR Livestock Watering	30
CSR Drinking Water	10

Notes:
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4. Locations of overlapping wells have been adjusted for clarity.
5. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Data provided by Teck Coal Limited

0 0.25 0.5 1 1.5 km

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

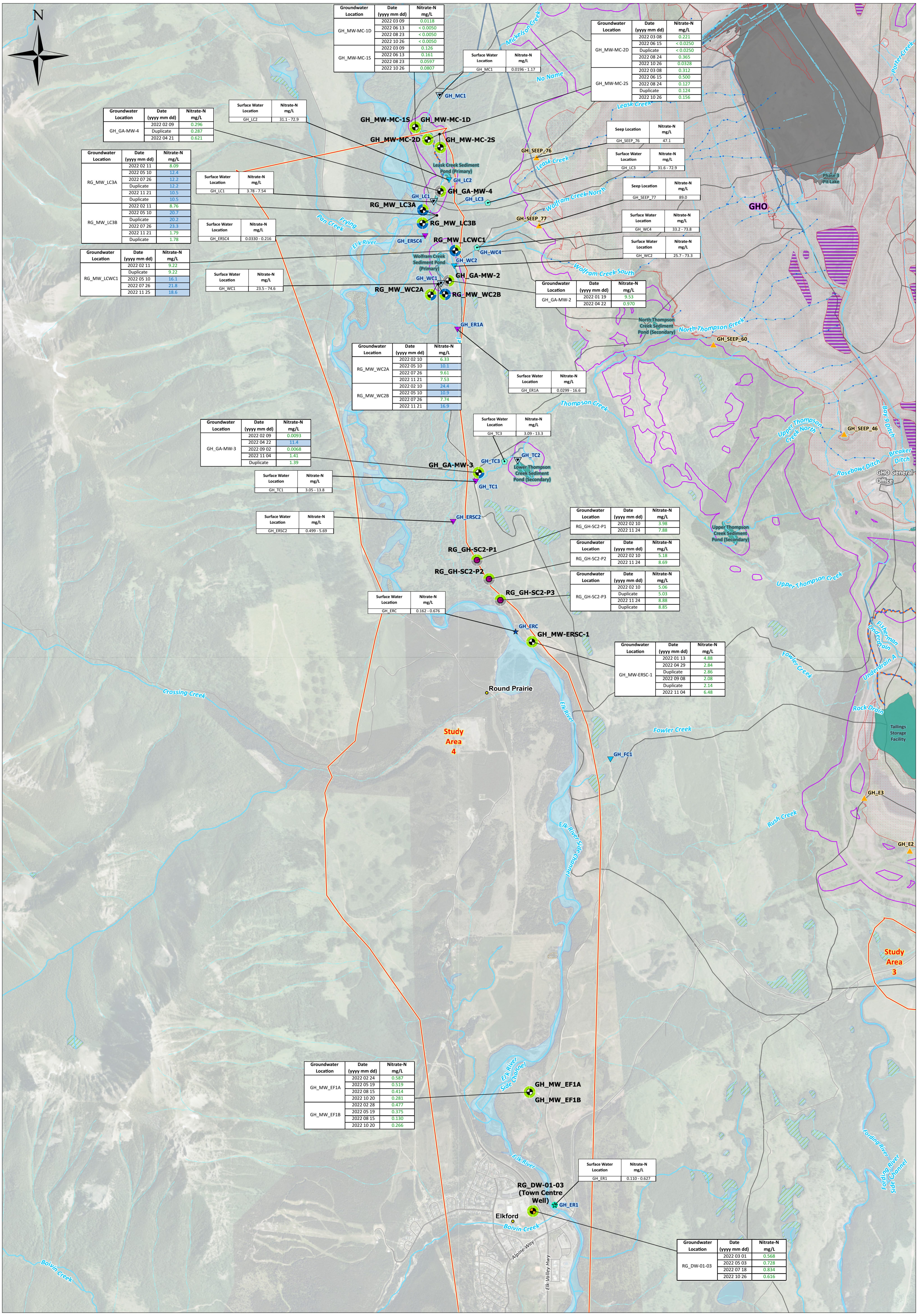
SNC·LAVALIN

Greenhills Operations - Spatial Distribution of Dissolved Selenium in Groundwater (East)

CHK'D: EC
DATE: 2023-03-14 SCALE: 1:17,000
BY: CW
COORD SYS: NAD 1983 UTM Zone 11N
REF NUM:
DRAWING GH-18

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\AnalyticalDrawings_2022AnnRpt.aprx

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
GH_MW-MC-1D	2022 03 09	0.0118
	2022 06 13	< 0.0050
	2022 08 23	< 0.0050
	2022 10 26	< 0.0050
GH_MW-MC-1S	2022 03 09	0.126
	2022 06 13	0.161
	2022 08 23	0.0597
	2022 10 26	0.0807

Surface Water Location	Nitrate-N mg/L
GH_MC1	0.0196 - 1.17

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
GH_MW-MC-2D	2022 03 08	0.221
	2022 06 15	< 0.0250
	Duplicate	< 0.0250
	2022 08 24	0.365
	2022 10 26	0.0328
GH_MW-MC-2S	2022 03 08	0.312
	2022 06 15	0.500
	2022 08 24	0.127
	Duplicate	0.124
	2022 10 26	0.156

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
GH_GA-MW-4	2022 02 09	0.296
	Duplicate	0.287
	2022 04 21	0.621

Surface Water Location	Nitrate-N mg/L
GH_LC2	31.1 - 72.9

Seep Location	Nitrate-N mg/L
GH_SEEP_76	47.1

Surface Water Location	Nitrate-N mg/L
GH_LC3	31.6 - 72.9

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
RG_MW_LC3A	2022 02 11	8.09
	2022 05 10	12.4
	2022 07 26	12.2
	Duplicate	12.2
	2022 11 21	10.5
	Duplicate	10.5
RG_MW_LC3B	2022 02 11	8.76
	2022 05 10	20.7
	Duplicate	20.2
	2022 07 26	23.3
	2022 11 21	1.79
	Duplicate	1.78

Surface Water Location	Nitrate-N mg/L
GH_LC1	3.78 - 7.54

Seep Location	Nitrate-N mg/L
GH_SEEP_77	89.0

Surface Water Location	Nitrate-N mg/L
GH_ERSC4	0.0330 - 0.216

Surface Water Location	Nitrate-N mg/L
GH_WC4	33.2 - 73.8

Surface Water Location	Nitrate-N mg/L
GH_WC2	25.7 - 73.3

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
RG_MW_LCWC1	2022 02 11	9.22
	Duplicate	9.22
	2022 05 10	16.1
	2022 07 26	21.8
	2022 11 25	18.6

Surface Water Location	Nitrate-N mg/L
GH_WC1	23.5 - 74.6

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
GH_GA-MW-2	2022 01 19	9.53
	2022 04 22	0.970

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
RG_MW_WC2A	2022 02 10	6.33
	2022 05 10	10.1
	2022 07 26	9.61
	2022 11 21	7.53
RG_MW_WC2B	2022 02 10	24.4
	2022 05 10	10.9
	2022 07 26	7.74
	2022 11 21	16.9

Surface Water Location	Nitrate-N mg/L
GH_ER1A	0.0299 - 16.6

Surface Water Location	Nitrate-N mg/L
GH_TC3	3.09 - 13.3

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
GH_GA-MW-3	2022 02 09	0.0093
	2022 04 22	11.4
	2022 09 02	0.0068
	2022 11 04	1.41
	Duplicate	1.39

Surface Water Location	Nitrate-N mg/L
GH_TC1	3.05 - 13.8

Surface Water Location	Nitrate-N mg/L
GH_ERSC2	0.499 - 5.69

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
RG_GH-SC2-P1	2022 02 10	3.98
	2022 11 24	7.88

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
RG_GH-SC2-P2	2022 02 10	5.18
	2022 11 24	8.69

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
RG_GH-SC2-P3	2022 02 10	5.06
	Duplicate	5.03
	2022 11 24	8.88
	Duplicate	8.85

Surface Water Location	Nitrate-N mg/L
GH_ERC	0.162 - 0.676

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
GH_MW-ERSC-1	2022 01 13	4.88
	2022 04 29	2.84
	Duplicate	2.86
	2022 09 08	2.08
	Duplicate	2.14
	2022 11 04	6.48

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
GH_MW_EF1A	2022 02 24	0.587
	2022 05 19	0.519
	2022 08 15	0.414
	2022 10 20	0.281
GH_MW_EF1B	2022 02 28	0.477
	2022 05 19	0.375
	2022 08 15	0.130
	2022 10 20	0.266

Surface Water Location	Nitrate-N mg/L
GH_ER1	0.110 - 0.627

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
RG_DW-01-03	2022 03 01	0.568
	2022 05 03	0.728
	2022 07 18	0.834
	2022 10 26	0.616

Legend

Groundwater Stations[4]
- ◕ Monitoring Well
- ◕ Supply
- ● Groundwater Fed Pool

Surface Water Stations
- ★ Compliance Point
- ✩ Order Station
- ▼ Receiving Environment
- ▽ Authorized Discharge
- ▼ Monitoring
- ⬠ Hydrometric stations
- ▲ Seep

Site Features
- Highway/Arterial
- Secondary Road
- Study Areas
- Tailings/Settling/Sediment Pond
- End-Pit Lake
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds
- Mine Permitted Areas

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Water Pipeline
- Bypass/Diversion Channel
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:17000 Scale)

Q4	Q1
Q3	Q2

symbol locations have been adjusted relative to well locations for visibility

Green below the applicable screening criteria

Blue above the applicable screening criteria

Grey no sample collected

Primary Screening Criteria	Nitrate-N mg/L
CSR Aquatic Life	400
CSR Irrigation Watering	*n/a*
CSR Livestock Watering	100
CSR Drinking Water	10

Notes:
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4. Locations of overlapping wells have been adjusted for clarity.
5. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Data provided by Teck Coal Limited
2. Service Layer Credits: District of Elkford, Maxar

0 0.25 0.5 1 1.5 km

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

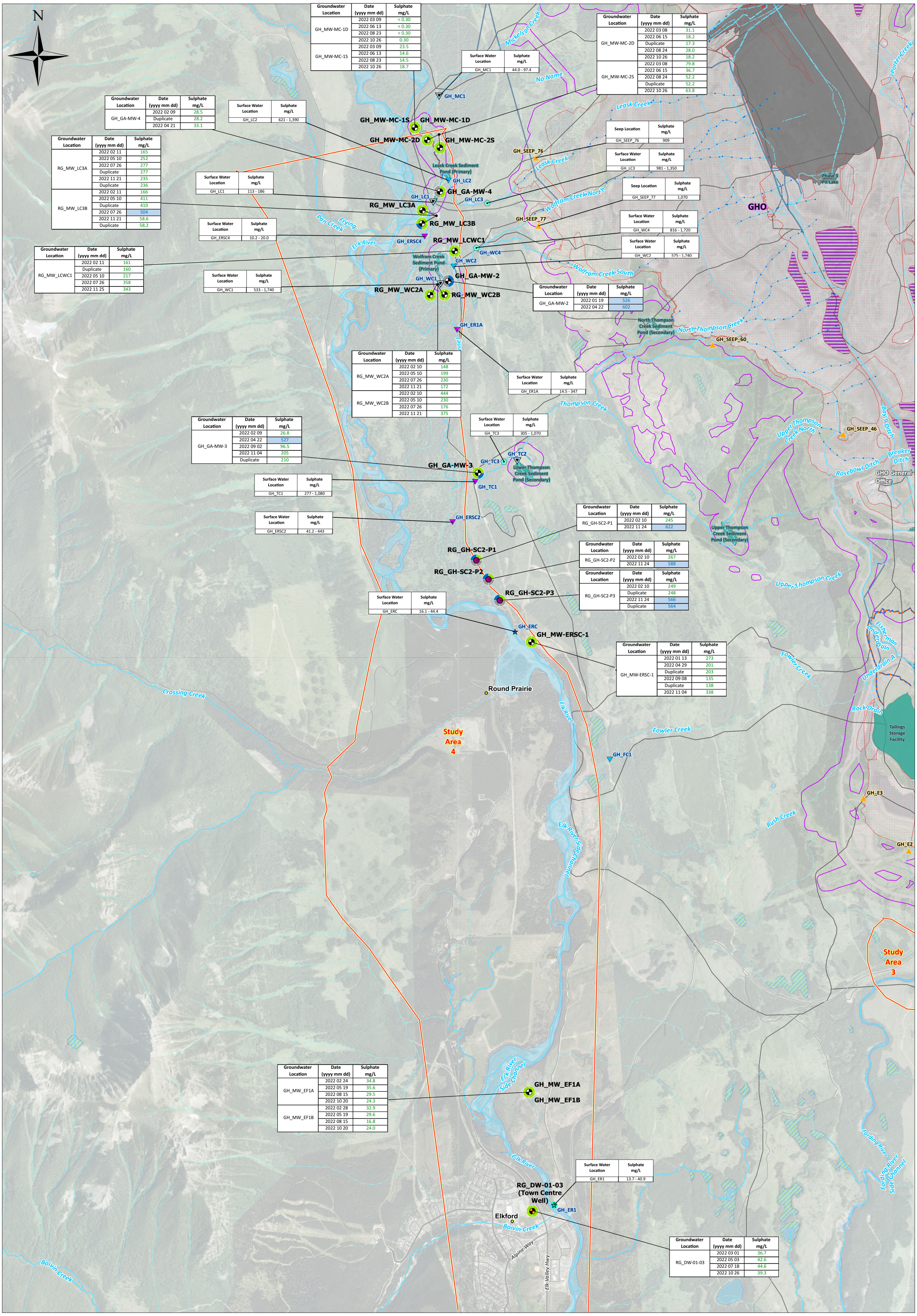
SNC·LAVALIN

Greenhills Operations - Spatial Distribution of Nitrate Nitrogen in Groundwater (West)

CHK'D: EC
BY: CW
DATE: 2023-03-14 SCALE: 1:17,000
COORD SYS: NAD 1983 UTM Zone 11N
REF NUM:
DRAWING GH-19

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\AnalyticalDrawings_2022AnnRpt.aprx

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
GH_MW-MC-1D	2022 03 09	< 0.30
	2022 06 13	< 0.30
	2022 08 23	< 0.30
	2022 10 26	0.30
GH_MW-MC-1S	2022 03 09	23.5
	2022 06 13	14.6
	2022 08 23	14.5
	2022 10 26	18.7

Surface Water Location	Sulphate mg/L
GH_MC1	44.0 - 97.4

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
GH_MW-MC-2D	2022 03 08	31.1
	2022 06 15	18.2
	Duplicate	17.3
	2022 08 24	28.0
	2022 10 26	18.2
GH_MW-MC-2S	2022 03 08	79.8
	2022 06 15	36.7
	2022 08 24	52.2
	Duplicate	52.2
	2022 10 26	63.8

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
GH_GA-MW-4	2022 02 09	28.5
	Duplicate	28.2
	2022 04 21	33.1

Surface Water Location	Sulphate mg/L
GH_LC2	621 - 1,390

Seep Location	Sulphate mg/L
GH_SEEP_76	909

Surface Water Location	Sulphate mg/L
GH_LC3	981 - 1,350

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
RG_MW_LC3A	2022 02 11	165
	2022 05 10	252
	2022 07 26	277
	Duplicate	277
	2022 11 21	235
	Duplicate	236
RG_MW_LC3B	2022 02 11	166
	2022 05 10	411
	Duplicate	410
	2022 07 26	504
	2022 11 21	58.6
	Duplicate	58.2

Surface Water Location	Sulphate mg/L
GH_LC1	113 - 186

Seep Location	Sulphate mg/L
GH_SEEP_77	1,070

Surface Water Location	Sulphate mg/L
GH_ERSC4	10.2 - 20.0

Surface Water Location	Sulphate mg/L
GH_WC4	816 - 1,720

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
RG_MW_LCWC1	2022 02 11	161
	Duplicate	160
	2022 05 10	217
	2022 07 26	358
	2022 11 25	343

Surface Water Location	Sulphate mg/L
GH_WC2	575 - 1,740

Surface Water Location	Sulphate mg/L
GH_WC1	533 - 1,740

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
GH_GA-MW-2	2022 01 19	526
	2022 04 22	602

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
RG_MW_WC2A	2022 02 10	148
	2022 05 10	199
	2022 07 26	230
	2022 11 21	172
RG_MW_WC2B	2022 02 10	444
	2022 05 10	230
	2022 07 26	176
	2022 11 21	375

Surface Water Location	Sulphate mg/L
GH_ER1A	14.5 - 347

Surface Water Location	Sulphate mg/L
GH_TC3	305 - 1,070

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
GH_GA-MW-3	2022 02 09	26.8
	2022 04 22	527
	2022 09 02	96.5
	2022 11 04	205
	Duplicate	210

Surface Water Location	Sulphate mg/L
GH_TC1	277 - 1,080

Surface Water Location	Sulphate mg/L
GH_ERSC2	41.2 - 443

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
RG_GH-SC2-P1	2022 02 10	245
	2022 11 24	622

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
RG_GH-SC2-P2	2022 02 10	267
	2022 11 24	588

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
RG_GH-SC2-P3	2022 02 10	249
	Duplicate	248
	2022 11 24	566
	Duplicate	564

Surface Water Location	Sulphate mg/L
GH_ERC	16.1 - 44.4

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
GH_MW-ERSC-1	2022 01 13	273
	2022 04 29	201
	Duplicate	203
	2022 09 08	135
	Duplicate	138
	2022 11 04	338

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
GH_MW_EF1A	2022 02 24	34.8
	2022 05 19	35.6
	2022 08 15	29.5
	2022 10 20	24.3
GH_MW_EF1B	2022 02 28	32.9
	2022 05 19	29.6
	2022 08 15	16.8
	2022 10 20	24.0

Surface Water Location	Sulphate mg/L
GH_ER1	13.7 - 40.9

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
RG_DW-01-03	2022 03 01	36.7
	2022 05 03	42.6
	2022 07 18	44.6
	2022 10 26	39.3

Legend

Groundwater Stations[4]
- ◕ Monitoring Well
- ◕ Supply
- ● Groundwater Fed Pool

Surface Water Stations
- ★ Compliance Point
- ✪ Order Station
- ▼ Receiving Environment
- ▽ Authorized Discharge
- ▼ Monitoring
- ⬟ Hydrometric stations
- ▲ Seep

Site Features
- Highway/Arterial
- Secondary Road
- Study Areas
- Tailings/Settling/Sediment Pond
- End-Pit Lake
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds
- Mine Permitted Areas

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Water Pipeline
- Bypass/Diversion Channel
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:17000 Scale)

Q4	Q1
Q3	Q2

symbol locations have been adjusted relative to well locations for visibility

Green below the applicable screening criteria

Blue above the applicable screening criteria

Grey no sample collected

Primary Screening Criteria	Sulphate mg/L
CSR Aquatic Life	1,280-4,290
CSR Irrigation Watering	n/a
CSR Livestock Watering	1,000
CSR Drinking Water	500

Notes:
1. Original in colour at paper size ANSI C (17x22 in).
2. Numerical scale reflects full-size print. Print scaling will distort this scale; however, scale bar will remain accurate.
3. Intended for illustration purposes. Accuracy has not been verified for construction or navigation.
4. Locations of overlapping wells have been adjusted for clarity.
5. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Data provided by Teck Coal Limited
2. Service Layer Credits: District of Elkford, Maxar

0 0.25 0.5 1 1.5 km

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

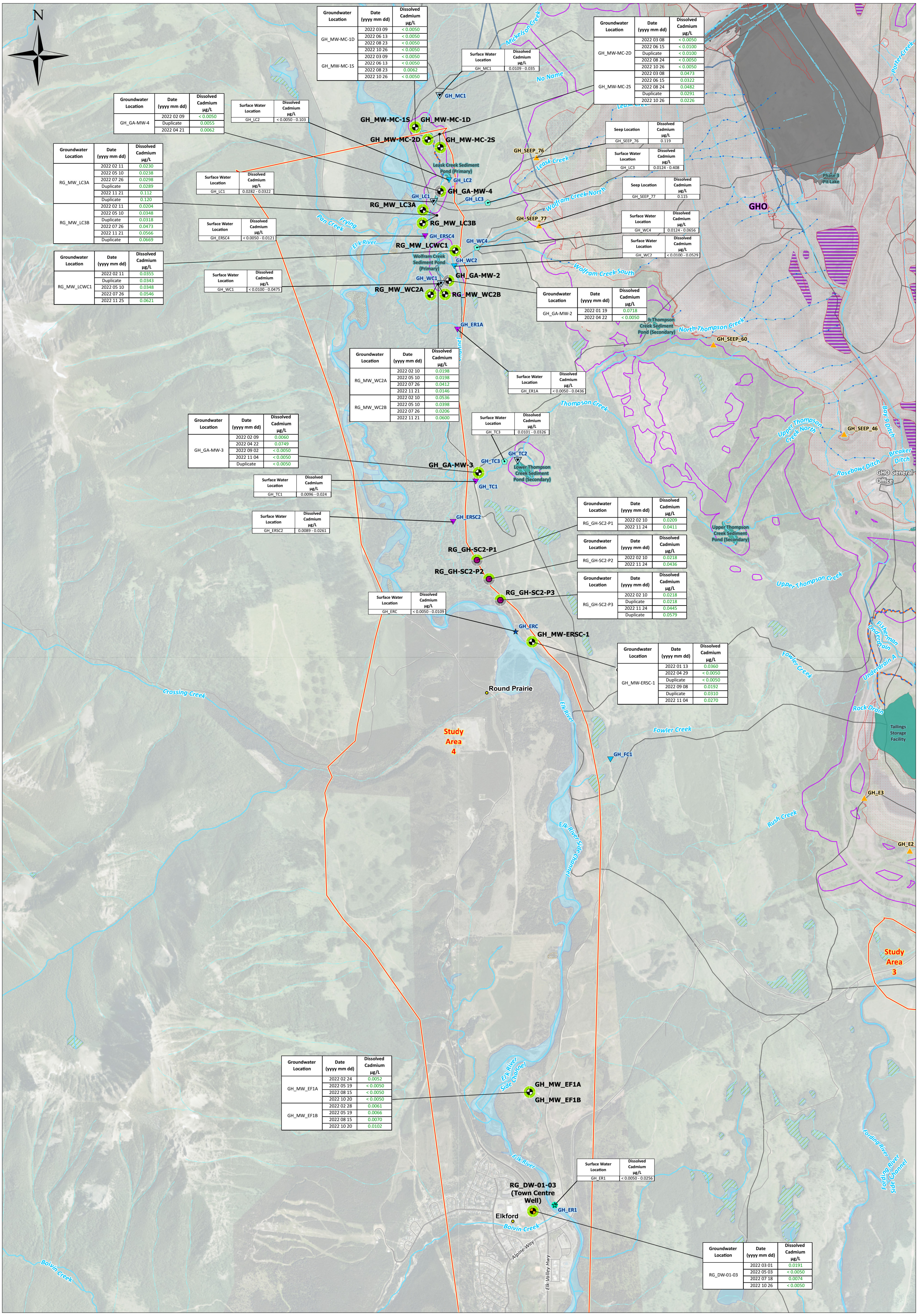
SNC·LAVALIN

Greenhills Operations - Spatial Distribution of Sulphate in Groundwater (West)

CHK'D: EC
BY: CW
DATE: 2023-03-14 SCALE: 1:17,000
COORD SYS: NAD 1983 UTM Zone 11N
REF NUM:
DRAWING GH-20

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRptAnalyticalDrawings_2022AnnRpt.aprx

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
GH_MW-MC-1D	2022 03 09	< 0.0050
	2022 06 13	< 0.0050
	2022 08 23	< 0.0050
	2022 10 26	< 0.0050
GH_MW-MC-1S	2022 03 09	< 0.0050
	2022 06 13	< 0.0050
	2022 08 23	0.0062
	2022 10 26	< 0.0050

Surface Water Location	Dissolved Cadmium µg/L
GH_MC1	0.0109 - 0.035

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
GH_MW-MC-2D	2022 03 08	< 0.0050
	2022 06 15	< 0.0100
	Duplicate	< 0.0100
	2022 08 24	< 0.0050
	2022 10 26	< 0.0050
GH_MW-MC-2S	2022 03 08	0.0473
	2022 06 15	0.0322
	2022 08 24	0.0482
	Duplicate	0.0291
	2022 10 26	0.0226

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
GH_GA-MW-4	2022 02 09	< 0.0050
	Duplicate	0.0055
	2022 04 21	0.0062

Surface Water Location	Dissolved Cadmium µg/L
GH_LC2	< 0.0050 - 0.103

Seep Location	Dissolved Cadmium µg/L
GH_SEEP_76	0.119

Surface Water Location	Dissolved Cadmium µg/L
GH_LC3	0.0124 - 0.408

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
RG_MW_LC3A	2022 02 11	0.0230
	2022 05 10	0.0238
	2022 07 26	0.0298
	Duplicate	0.0289
	2022 11 21	0.112
	Duplicate	0.120
RG_MW_LC3B	2022 02 11	0.0204
	2022 05 10	0.0348
	Duplicate	0.0318
	2022 07 26	0.0473
	2022 11 21	0.0566
	Duplicate	0.0669

Surface Water Location	Dissolved Cadmium µg/L
GH_LC1	0.0282 - 0.0322

Seep Location	Dissolved Cadmium µg/L
GH_SEEP_77	0.115

Surface Water Location	Dissolved Cadmium µg/L
GH_ERSC4	< 0.0050 - 0.0121

Surface Water Location	Dissolved Cadmium µg/L
GH_WC4	0.0124 - 0.0656

Surface Water Location	Dissolved Cadmium µg/L
GH_WC2	< 0.0100 - 0.0529

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
RG_MW_LCWC1	2022 02 11	0.0355
	Duplicate	0.0343
	2022 05 10	0.0348
	2022 07 26	0.0546
	2022 11 25	0.0621

Surface Water Location	Dissolved Cadmium µg/L
GH_WC1	< 0.0100 - 0.0475

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
GH_GA-MW-2	2022 01 19	0.0718
	2022 04 22	< 0.0050

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
RG_MW_WC2A	2022 02 10	0.0198
	2022 05 10	0.0198
	2022 07 26	0.0412
	2022 11 21	0.0146
RG_MW_WC2B	2022 02 10	0.0536
	2022 05 10	0.0398
	2022 07 26	0.0206
	2022 11 21	0.0600

Surface Water Location	Dissolved Cadmium µg/L
GH_ER1A	< 0.0050 - 0.0436

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
GH_GA-MW-3	2022 02 09	0.0060
	2022 04 22	0.0749
	2022 09 02	< 0.0050
	2022 11 04	< 0.0050
	Duplicate	< 0.0050

Surface Water Location	Dissolved Cadmium µg/L
GH_TC3	0.0101 - 0.0326

Surface Water Location	Dissolved Cadmium µg/L
GH_TC1	0.0096 - 0.024

Surface Water Location	Dissolved Cadmium µg/L
GH_ERSC2	0.0089 - 0.0261

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
RG_GH-SC2-P1	2022 02 10	0.0209
	2022 11 24	0.0411

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
RG_GH-SC2-P2	2022 02 10	0.0218
	2022 11 24	0.0436

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
RG_GH-SC2-P3	2022 02 10	0.0218
	Duplicate	0.0218
	2022 11 24	0.0445
	Duplicate	0.0579

Surface Water Location	Dissolved Cadmium µg/L
GH_ERC	< 0.0050 - 0.0109

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
GH_MW-ERSC-1	2022 01 13	0.0360
	2022 04 29	< 0.0050
	Duplicate	< 0.0050
	2022 09 08	0.0192
	Duplicate	0.0310
	2022 11 04	0.0270

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
GH_MW_EF1A	2022 02 24	0.0052
	2022 05 19	< 0.0050
	2022 08 15	< 0.0050
	2022 10 20	< 0.0050
GH_MW_EF1B	2022 02 28	0.0061
	2022 05 19	0.0066
	2022 08 15	0.0070
	2022 10 20	0.0102

Surface Water Location	Dissolved Cadmium µg/L
GH_ER1	< 0.0050 - 0.0256

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
RG_DW-01-03	2022 03 01	0.0191
	2022 05 03	< 0.0050
	2022 07 18	0.0074
	2022 10 26	< 0.0050

Legend

Groundwater Stations[4]
- ◐ Monitoring Well
- ◐ Supply
- ● Groundwater Fed Pool

Surface Water Stations
- ★ Compliance Point
- ☆ Order Station
- ▼ Receiving Environment
- ▽ Authorized Discharge
- ▼ Monitoring
- ⬠ Hydrometric stations
- ▲ Seep

Site Features
- Highway/Arterial
- Secondary Road
- Study Areas
- Tailings/Settling/Sediment Pond
- End-Pit Lake
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds
- Mine Permitted Areas

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Water Pipeline
- Bypass/Diversion Channel
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:17000 Scale)

Q4	Q1
Q3	Q2

symbol locations have been adjusted relative to well locations for visibility

Green below the applicable screening criteria

Blue above the applicable screening criteria

Grey no sample collected

^ Dissolved phase of the parameter is shown in the spatial plot.

Primary Screening Criteria	Cadmium^ µg/L
CSR Aquatic Life	**0.5-4**
CSR Irrigation Watering	*5*
CSR Livestock Watering	80
CSR Drinking Water	5

Notes:
1. Original in colour at paper size ANSI C (17x22 in).
2. Numerical scale reflects full-size print. Print scaling will distort this scale; however, scale bar will remain accurate.
3. Intended for illustration purposes. Accuracy has not been verified for construction or navigation.
4. Locations of overlapping wells have been adjusted for clarity.
5. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Data provided by Teck Coal Limited
2. Service Layer Credits: District of Elkford, Maxar

0 0.25 0.5 1 1.5 km

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

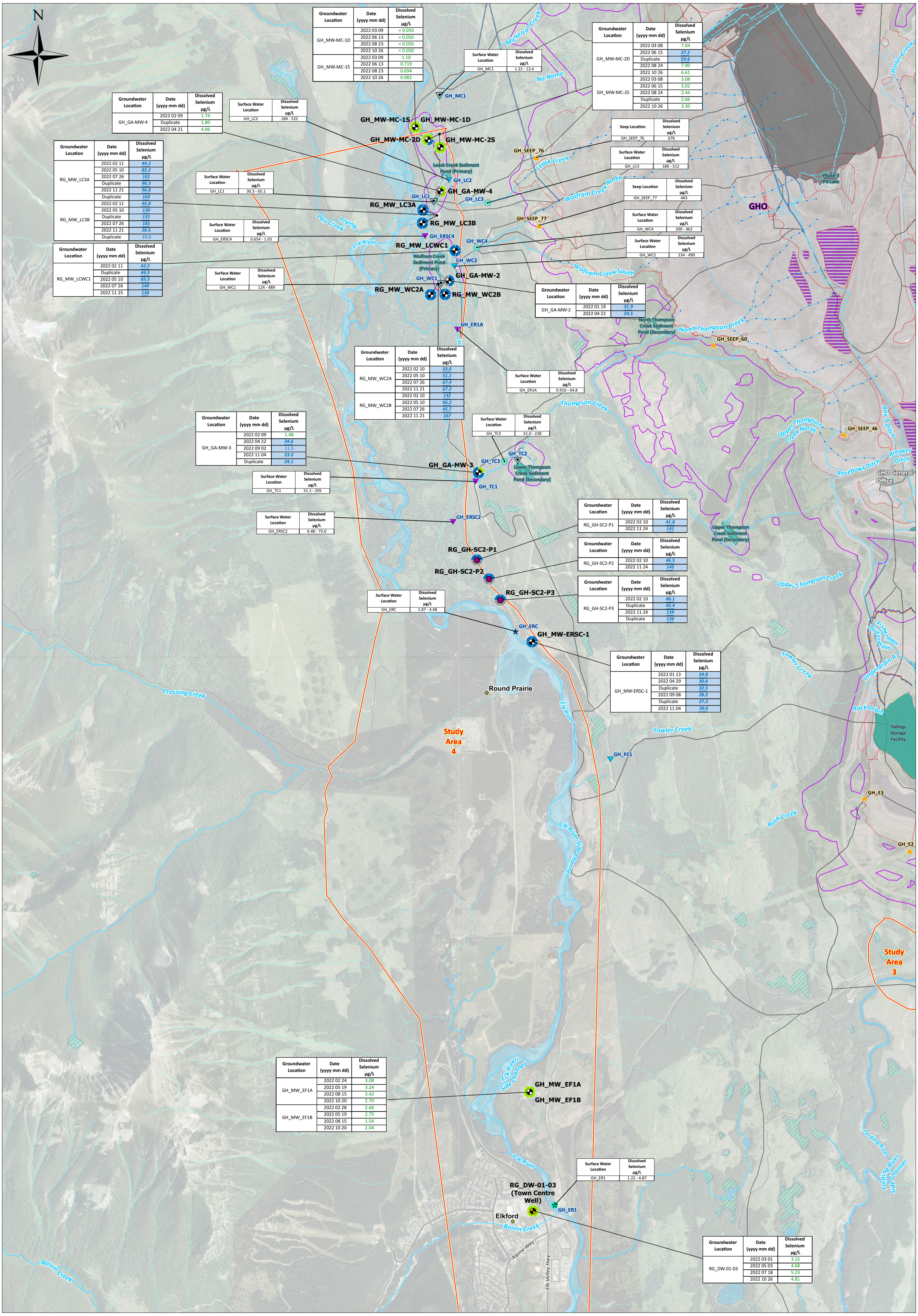
SNC·LAVALIN

Greenhills Operations - Spatial Distribution of Dissolved Cadmium in Groundwater (West)

CHK'D: EC
DATE: 2023-03-14 SCALE: 1:17,000
REF NUM:
BY: CW
COORD SYS: NAD 1983 UTM Zone 11N
DRAWING GH-21

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\AnalyticalDrawings_2022AnnRpt.aprx

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
GH_MW-MC-1D	2022 03 09	< 0.050
	2022 06 13	< 0.050
	2022 08 23	< 0.050
	2022 10 26	< 0.050
GH_MW-MC-1S	2022 03 09	1.10
	2022 06 13	0.719
	2022 08 23	0.694
	2022 10 26	0.982

Surface Water Location	Dissolved Selenium µg/L
GH_MC1	1.22 - 13.4

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
GH_MW-MC-2D	2022 03 08	7.04
	2022 06 15	37.2
	Duplicate	59.6
	2022 08 24	7.90
	2022 10 26	6.61
GH_MW-MC-2S	2022 03 08	3.08
	2022 06 15	3.02
	2022 08 24	2.44
	Duplicate	2.66
	2022 10 26	3.30

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
GH_GA-MW-4	2022 02 09	1.74
	Duplicate	1.80
	2022 04 21	4.06

Surface Water Location	Dissolved Selenium µg/L
GH_LC2	184 - 522

Seep Location	Dissolved Selenium µg/L
GH_SEEP_76	676

Surface Water Location	Dissolved Selenium µg/L
GH_LC3	186 - 512

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
RG_MW_LC3A	2022 02 11	44.3
	2022 05 10	82.2
	2022 07 26	101
	Duplicate	96.3
	2022 11 21	96.8
	Duplicate	103
RG_MW_LC3B	2022 02 11	45.8
	2022 05 10	130
	Duplicate	131
	2022 07 26	181
	2022 11 21	20.5
	Duplicate	19.0

Surface Water Location	Dissolved Selenium µg/L
GH_LC1	30.3 - 65.1

Seep Location	Dissolved Selenium µg/L
GH_SEEP_77	443

Surface Water Location	Dissolved Selenium µg/L
GH_WC4	200 - 462

Surface Water Location	Dissolved Selenium µg/L
GH_ERSC4	0.654 - 1.03

Surface Water Location	Dissolved Selenium µg/L
GH_WC2	134 - 490

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
RG_MW_LCWC1	2022 02 11	42.5
	Duplicate	44.5
	2022 05 10	85.5
	2022 07 26	140
	2022 11 25	138

Surface Water Location	Dissolved Selenium µg/L
GH_WC1	124 - 489

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
GH_GA-MW-2	2022 01 19	31.9
	2022 04 22	24.5

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
RG_MW_WC2A	2022 02 10	33.6
	2022 05 10	51.1
	2022 07 26	67.4
	2022 11 21	67.2
RG_MW_WC2B	2022 02 10	132
	2022 05 10	66.2
	2022 07 26	45.7
	2022 11 21	167

Surface Water Location	Dissolved Selenium µg/L
GH_ER1A	0.916 - 64.8

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
GH_GA-MW-3	2022 02 09	1.48
	2022 04 22	34.6
	2022 09 02	11.5
	2022 11 04	23.5
	Duplicate	24.1

Surface Water Location	Dissolved Selenium µg/L
GH_TC3	51.0 - 228

Surface Water Location	Dissolved Selenium µg/L
GH_TC1	51.1 - 205

Surface Water Location	Dissolved Selenium µg/L
GH_ERSC2	6.48 - 73.0

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
RG_GH-SC2-P1	2022 02 10	41.8
	2022 11 24	141

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
RG_GH-SC2-P2	2022 02 10	46.5
	2022 11 24	145

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
RG_GH-SC2-P3	2022 02 10	46.1
	Duplicate	45.4
	2022 11 24	139
	Duplicate	136

Surface Water Location	Dissolved Selenium µg/L
GH_ERC	1.87 - 4.48

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
GH_MW-ERSC-1	2022 01 13	34.8
	2022 04 29	30.6
	Duplicate	32.5
	2022 09 08	28.2
	Duplicate	27.2
	2022 11 04	70.0

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
GH_MW_EF1A	2022 02 24	3.08
	2022 05 19	3.24
	2022 08 15	3.42
	2022 10 20	2.70
GH_MW_EF1B	2022 02 28	2.66
	2022 05 19	2.75
	2022 08 15	1.54
	2022 10 20	2.04

Surface Water Location	Dissolved Selenium µg/L
GH_ER1	1.22 - 4.87

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
RG_DW-01-03	2022 03 01	3.15
	2022 05 03	4.68
	2022 07 18	5.23
	2022 10 26	4.81

Legend

Groundwater Stations[4]
- ◑ Monitoring Well
- ◑ Supply
- ● Groundwater Fed Pool

Surface Water Stations
- ★ Compliance Point
- ☆ Order Station
- ▼ Receiving Environment
- ▽ Authorized Discharge
- ▼ Monitoring
- ⬠ Hydrometric stations
- ▲ Seep

Site Features
- Highway/Arterial
- Secondary Road
- Study Areas
- Tailings/Settling/Sediment Pond
- End-Pit Lake
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds
- Mine Permitted Areas

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Water Pipeline
- Bypass/Diversion Channel
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:17000 Scale)

Q4	Q1
Q3	Q2

symbol locations have been adjusted relative to well locations for visibility

Green below the applicable screening criteria

Blue above the applicable screening criteria

Grey no sample collected

^ Dissolved phase of the parameter is shown in the spatial plot.

Primary Screening Criteria	Selenium^ µg/L
CSR Aquatic Life	20
CSR Irrigation Watering	20
CSR Livestock Watering	30
CSR Drinking Water	10

Notes:
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5. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Data provided by Teck Coal Limited
2. Service Layer Credits: District of Elkford, Maxar

0 0.25 0.5 1 1.5 km

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

SNC·LAVALIN

Greenhills Operations - Spatial Distribution of Dissolved Selenium in Groundwater (West)

CHK'D: EC
BY: CW
DATE: 2023-03-14 SCALE: 1:17,000
COORD SYS: NAD 1983 UTM Zone 11N
REF NUM:
DRAWING GH-22

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\AnalyticalDrawings_2022AnnRpt.aprx

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022

Attachment I

Borehole Logs

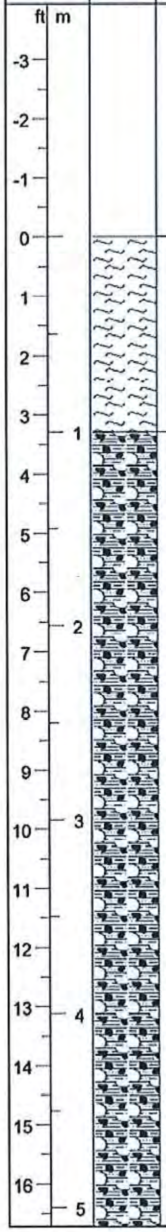
Log of Monitoring Well: GH_MW-PC

HEMMERA

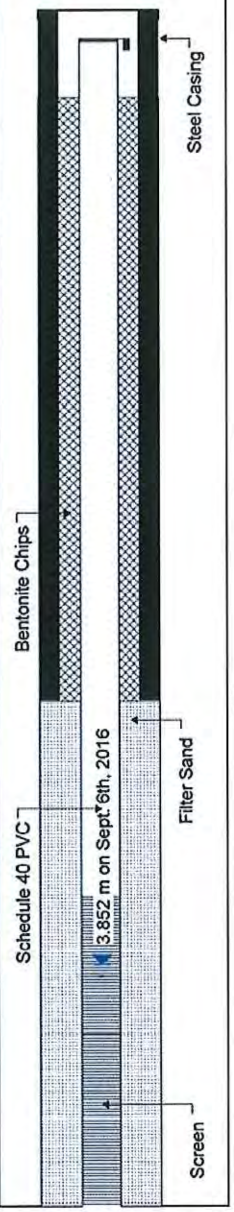
Project Name/No: 577-016.07
Client: Teck Coal Greenhills Operation
Date Drilled: September 2nd, 2016
Site Location: Elkford, BC

Drilling Company: JR Drilling
Drilling Method: Dual Rotary
Logged by: TK

Sheet: 1 of 8



SUBSURFACE PROFILE		SAMPLE					
Description	**Depth/Elev (m)**	**Sample ID**	**Analysed Y,N**	**Sample Type**	**Vapour ppm** 0 250 500	**LEL %** 0 50 100	**Backfill details**
Ground Surface	0.00						
TOPSOIL TOPSOIL, brown, fine to medium silty sand with fine sub-angular gravel and rootlets	0.00						
	-1.00						
COBBLES and GRAVEL COBBLES and GRAVEL, with silt and sand, pulverized from drilling.	1.00						
Groundwater encountered at approximately 4.5 mbgs							



Well location: Porter Creek
Depth to water level (TOC): 3.852
Date of water level: September 6th, 2016
Borehole diameter: 15.24

Well casing diameter: 50.8mm
Well casing material: Schedule 40 PVC
Well screen slot size: 0.25mm
Well screen interval (bgs): 3.5-6.5

Depth of well (TOC): 7.601
Well Elevation (TOC): -
Ground Elevation: -

Log of Monitoring Well: GH_MW-PC

HEMMERA

Project Name/No: 577-016.07

Client: Teck Coal Greenhills Operation

Date Drilled: September 2nd, 2016

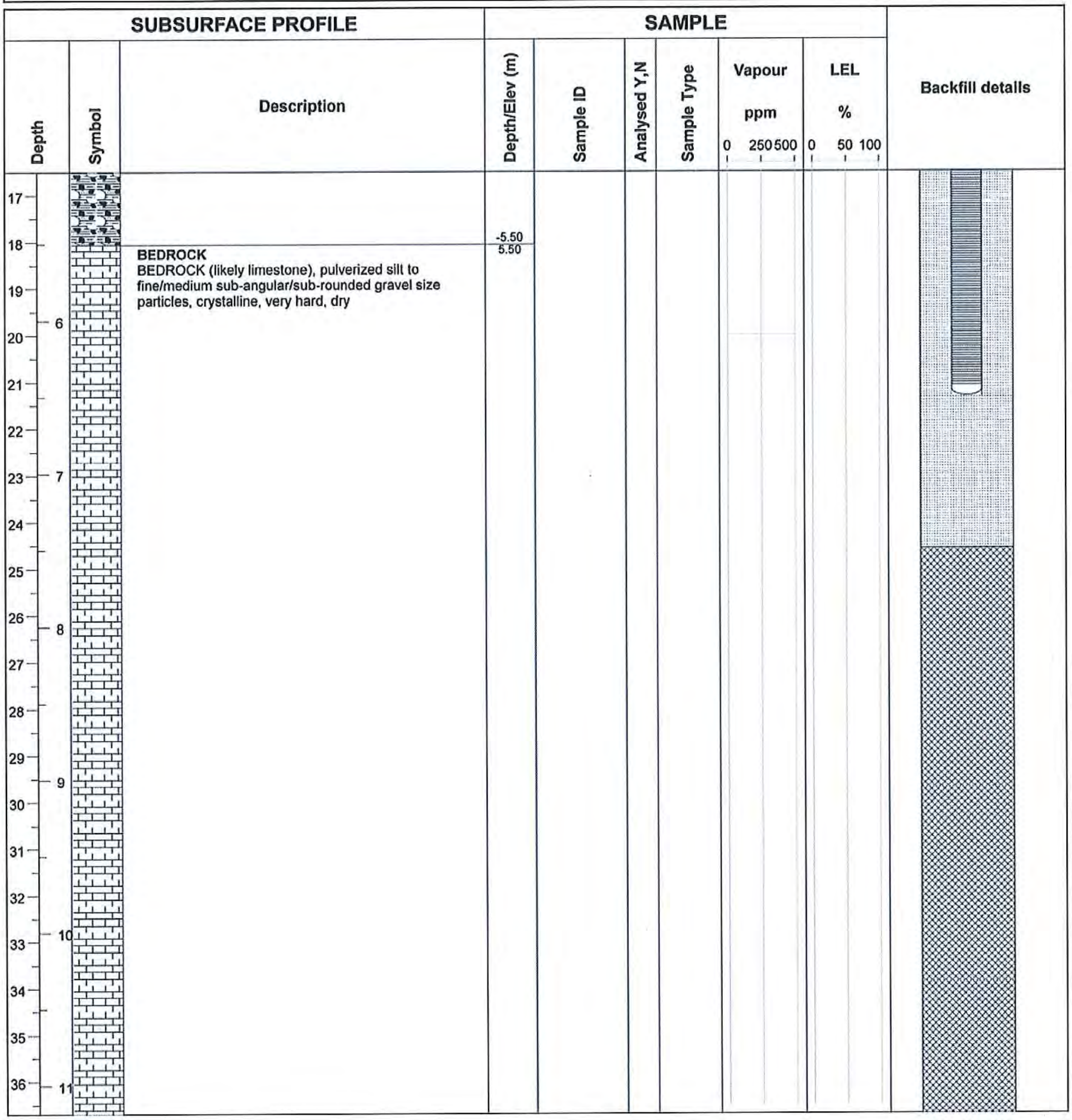
Site Location: Elkford, BC

Drilling Company: JR Drilling

Drilling Method: Dual Rotary

Logged by: TK

Sheet: 2 of 8



Description	Depth/Elev (m)
BEDROCK BEDROCK (likely limestone), pulverized silt to fine/medium sub-angular/sub-rounded gravel size particles, crystalline, very hard, dry	-5.50 5.50

Well location: Porter Creek

Depth to water level (TOC): 3.852

Date of water level: September 6th, 2016

Borehole diameter: 15.24

Well casing diameter: 50.8mm

Well casing material: Schedule 40 PVC

Well screen slot size: 0.25mm

Well screen interval (bgs): 3.5-6.5

Depth of well (TOC): 7.601

Well Elevation (TOC): -

Ground Elevation: -

Log of Monitoring Well: GH_MW-PC

HEMMERA

Project Name/No: 577-016.07

Client: Teck Coal Greenhills Operation

Date Drilled: September 2nd, 2016

Site Location: Elkford, BC

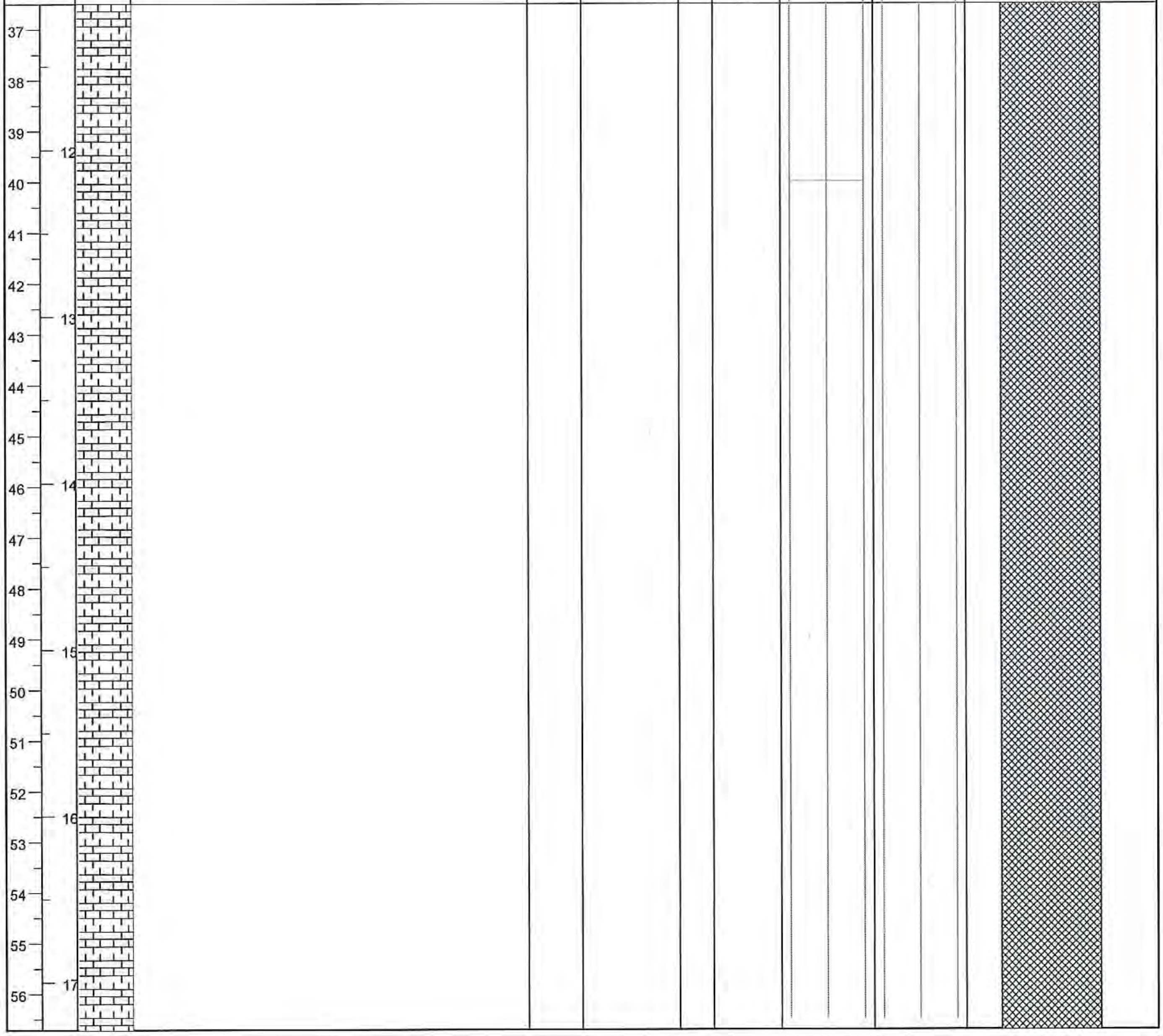
Drilling Company: JR Drilling

Drilling Method: Dual Rotary

Logged by: TK

Sheet: 3 of 8

SUBSURFACE PROFILE			SAMPLE						
Depth	Symbol	Description	Depth/Elev (m)	Sample ID	Analysed Y,N	Sample Type	Vapour ppm 0 250 500	LEL % 0 50 100	Backfill details



Well location: Porter Creek

Depth to water level (TOC): 3.852

Date of water level: September 6th, 2016

Borehole diameter: 15.24

Well casing diameter: 50.8mm

Well casing material: Schedule 40 PVC

Well screen slot size: 0.25mm

Well screen interval (bgs): 3.5-6.5

Depth of well (TOC): 7.601

Well Elevation (TOC): -

Ground Elevation: -

Log of Monitoring Well: GH_MW-PC

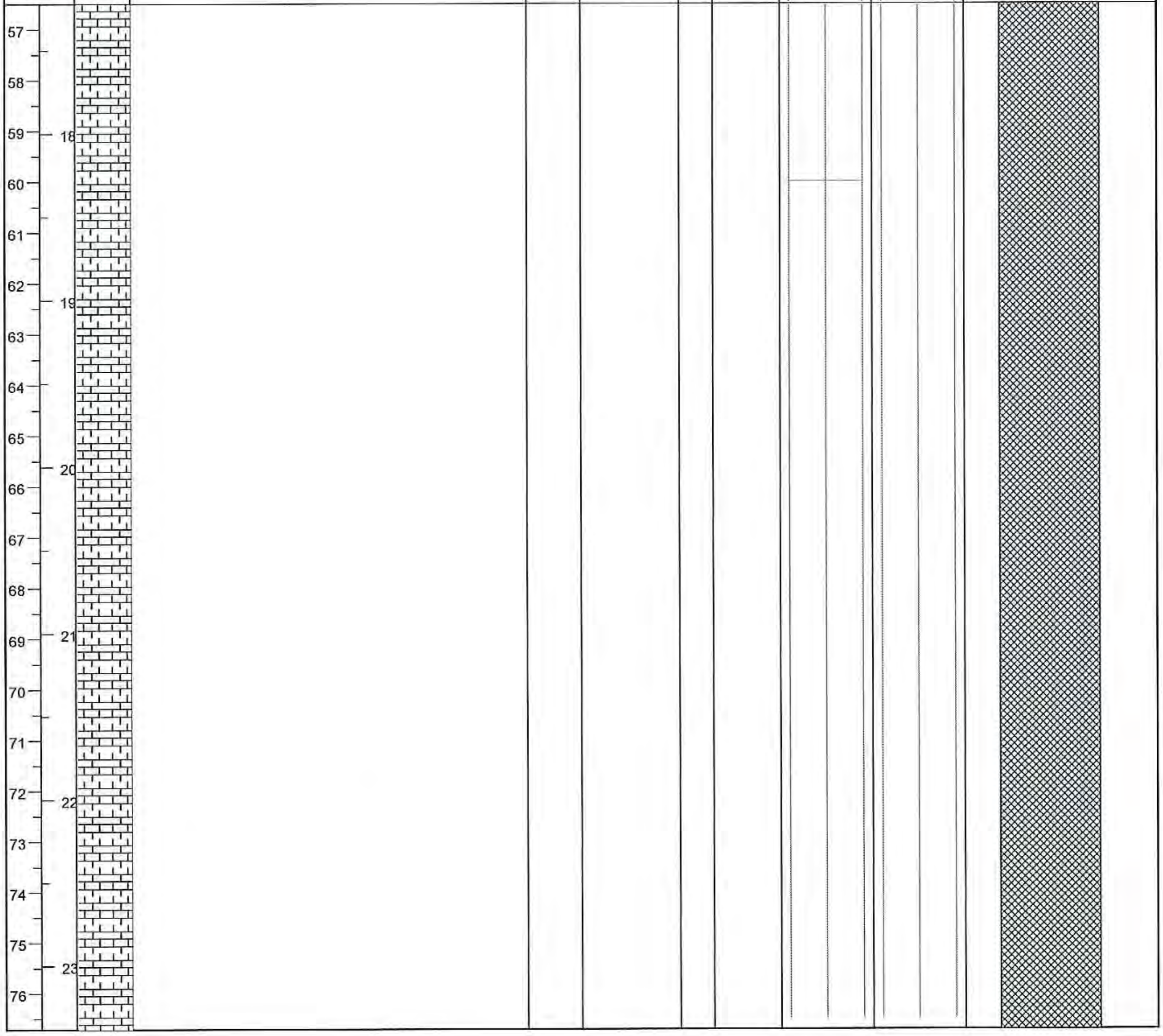
HEMMERA

Project Name/No: 577-016.07
Client: Teck Coal Greenhills Operation
Date Drilled: September 2nd, 2016
Site Location: Elkford, BC

Drilling Company: JR Drilling
Drilling Method: Dual Rotary
Logged by: TK

Sheet: 4 of 8

SUBSURFACE PROFILE			SAMPLE						
Depth	Symbol	Description	Depth/Elev (m)	Sample ID	Analysed Y,N	Sample Type	Vapour ppm 0 250 500	LEL % 0 50 100	Backfill details



Well location: Porter Creek
Depth to water level (TOC): 3.852
Date of water level: September 6th, 2016
Borehole diameter: 15.24

Well casing diameter: 50.8mm
Well casing material: Schedule 40 PVC
Well screen slot size: 0.25mm
Well screen interval (bgs): 3.5-6.5

Depth of well (TOC): 7.601
Well Elevation (TOC): -
Ground Elevation: -

Log of Monitoring Well: GH_MW-PC

HEMMERA

Project Name/No: 577-016.07	**Drilling Company:** JR Drilling
Client: Teck Coal Greenhills Operation	**Drilling Method:** Dual Rotary
Date Drilled: September 2nd, 2016	**Logged by:** TK
Site Location: Elkford, BC	**Sheet:** 5 of 8

SUBSURFACE PROFILE			SAMPLE						
Depth	Symbol	Description	Depth/Elev (m)	Sample ID	Analysed Y,N	Sample Type	Vapour ppm 0 250 500	LEL % 0 50 100	Backfill details
77									
78									
24		Small fracture encountered at 24 mbgs but was not found to have enough water to conduct a flow test							
79									
80									
81									
82									
25									
83									
84									
85									
26									
86									
87									
88									
27									
89									
90		From 27.5 mbgs drilling was noted to be smoother/easier; no observable change was identified in rock chips							
91									
92									
28									
93									
94									
95									
29									
96									

Well location: Porter Creek	**Well casing diameter:** 50.8mm	**Depth of well (TOC):** 7.601
Depth to water level (TOC): 3.852	**Well casing material:** Schedule 40 PVC	**Well Elevation (TOC):** -
Date of water level: September 6th, 2016	**Well screen slot size:** 0.25mm	**Ground Elevation:** -
Borehole diameter: 15.24	**Well screen interval (bgs):** 3.5-6.5	

Log of Monitoring Well: GH_MW-PC

HEMMERA

Project Name/No: 577-016.07

Client: Teck Coal Greenhills Operation

Date Drilled: September 2nd, 2016

Site Location: Elkford, BC

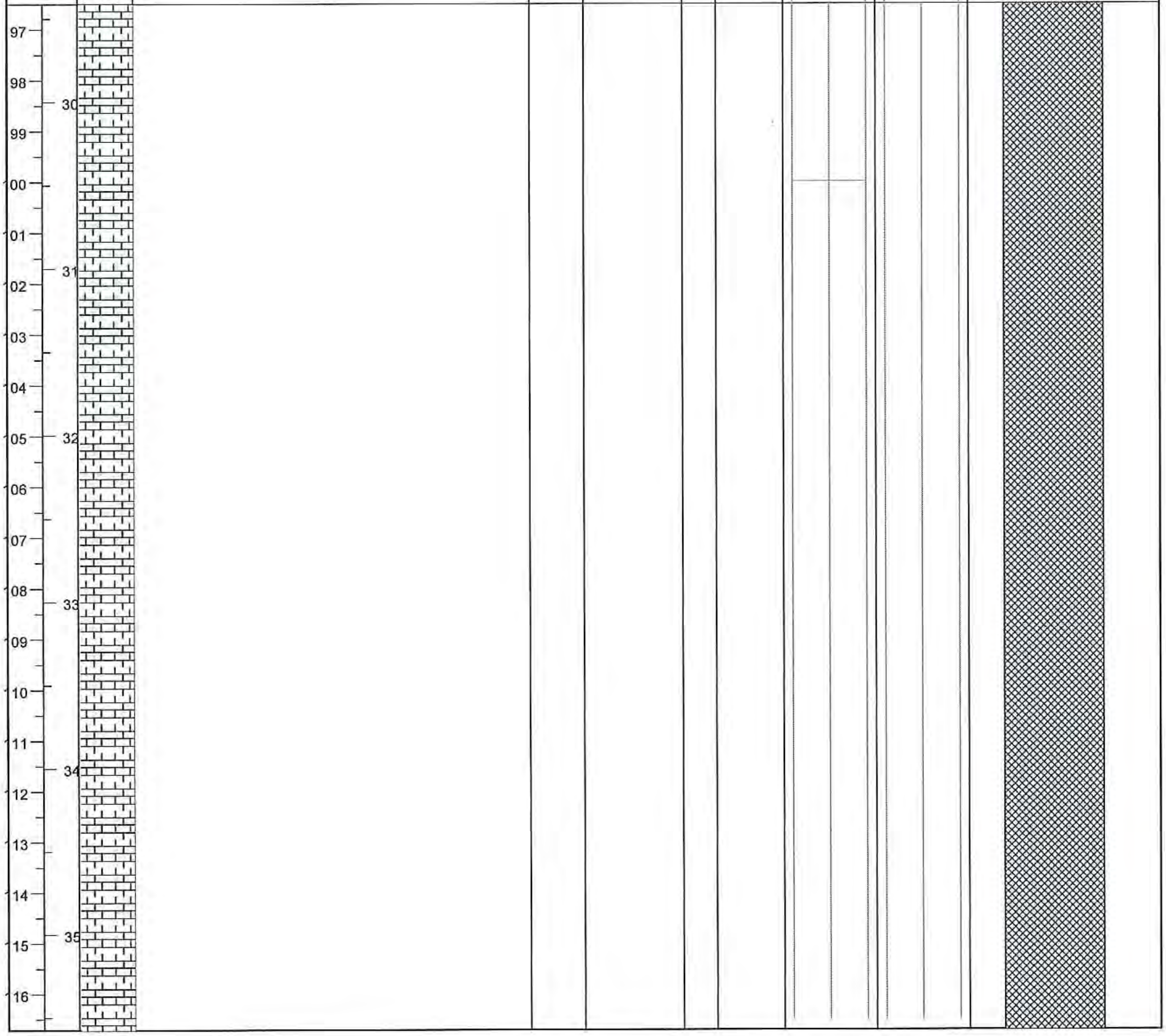
Drilling Company: JR Drilling

Drilling Method: Dual Rotary

Logged by: TK

Sheet: 6 of 8

SUBSURFACE PROFILE			SAMPLE						
Depth	Symbol	Description	Depth/Elev (m)	Sample ID	Analysed Y,N	Sample Type	Vapour ppm 0 250 500	LEL % 0 50 100	Backfill details



Well location: Porter Creek

Depth to water level (TOC): 3.852

Date of water level: September 6th, 2016

Borehole diameter: 15.24

Well casing diameter: 50.8mm

Well casing material: Schedule 40 PVC

Well screen slot size: 0.25mm

Well screen interval (bgs): 3.5-6.5

Depth of well (TOC): 7.601

Well Elevation (TOC): -

Ground Elevation: -

Log of Monitoring Well: GH_MW-PC

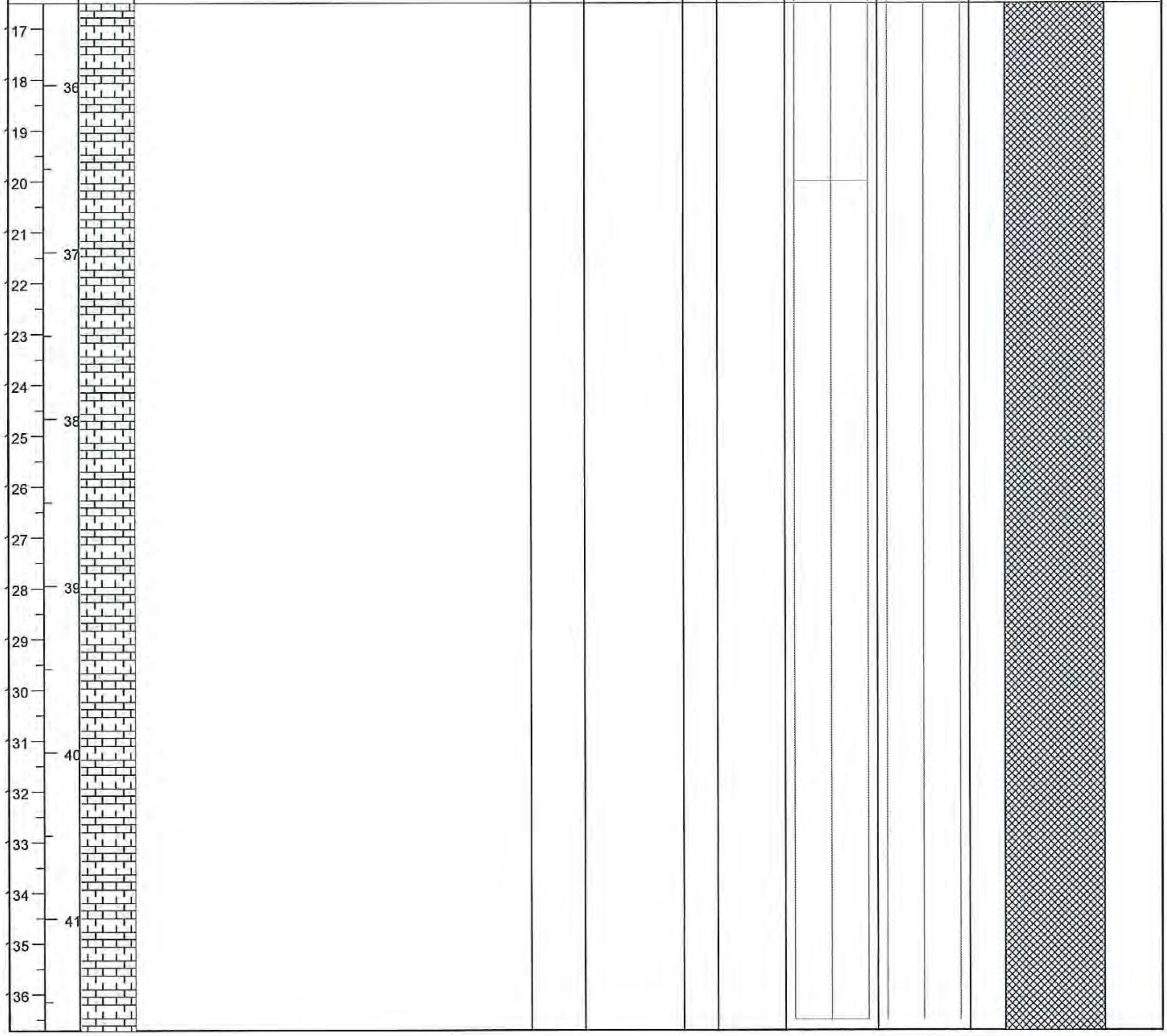
HEMMERA

Project Name/No: 577-016.07
Client: Teck Coal Greenhills Operation
Date Drilled: September 2nd, 2016
Site Location: Elkford, BC

Drilling Company: JR Drilling
Drilling Method: Dual Rotary
Logged by: TK

Sheet: 7 of 8

SUBSURFACE PROFILE			SAMPLE						
Depth	Symbol	Description	Depth/Elev (m)	Sample ID	Analysed Y,N	Sample Type	Vapour ppm 0 250 500	LEL % 0 50 100	Backfill details



Well location: Porter Creek
Depth to water level (TOC): 3.852
Date of water level: September 6th, 2016
Borehole diameter: 15.24

Well casing diameter: 50.8mm
Well casing material: Schedule 40 PVC
Well screen slot size: 0.25mm
Well screen interval (bgs): 3.5-6.5

Depth of well (TOC): 7.601
Well Elevation (TOC): -
Ground Elevation: -

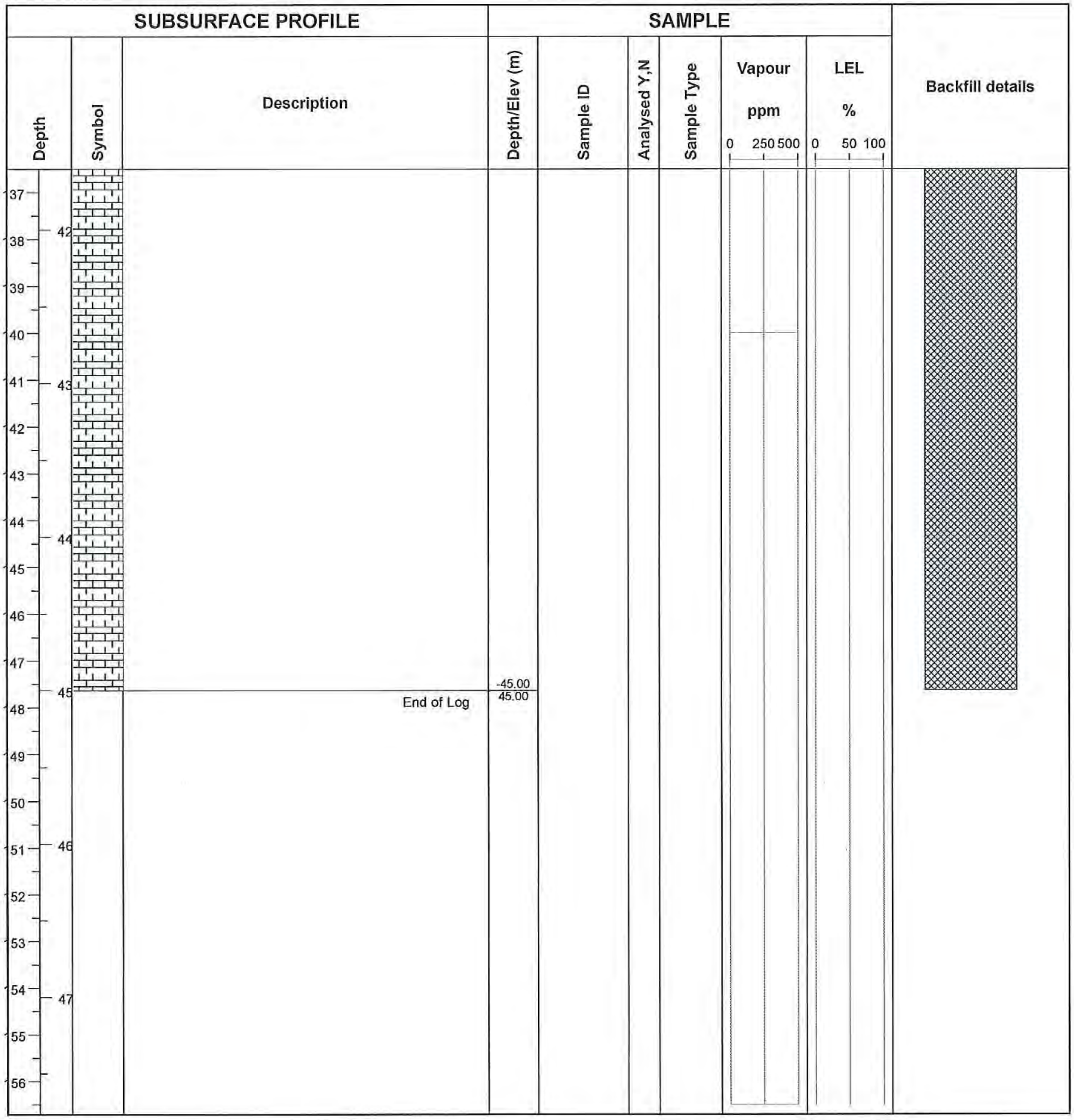
Log of Monitoring Well: GH_MW-PC

HEMMERA

Project Name/No: 577-016.07
Client: Teck Coal Greenhills Operation
Date Drilled: September 2nd, 2016
Site Location: Elkford, BC

Drilling Company: JR Drilling
Drilling Method: Dual Rotary
Logged by: TK

Sheet: 8 of 8



Well location: Porter Creek
Depth to water level (TOC): 3.852
Date of water level: September 6th, 2016
Borehole diameter: 15.24

Well casing diameter: 50.8mm
Well casing material: Schedule 40 PVC
Well screen slot size: 0.25mm
Well screen interval (bgs): 3.5-6.5

Depth of well (TOC): 7.601
Well Elevation (TOC): -
Ground Elevation: -

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : GH_BH_PC4A**
	Location **Greenhills Operations - Porter Creek**	PAGE 1 OF 2

Drilling Contractor	JR Drilling	Date Monitored	n/a	Project Number:	683032
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	TBD	Borehole Logged By:	SE
Borehole Dia. (m)	0.18	Top of Casing Elev. (m)	TBD	Date Drilled:	2021 08 05
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: n/a	Easting: n/a	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼ Air Rotary

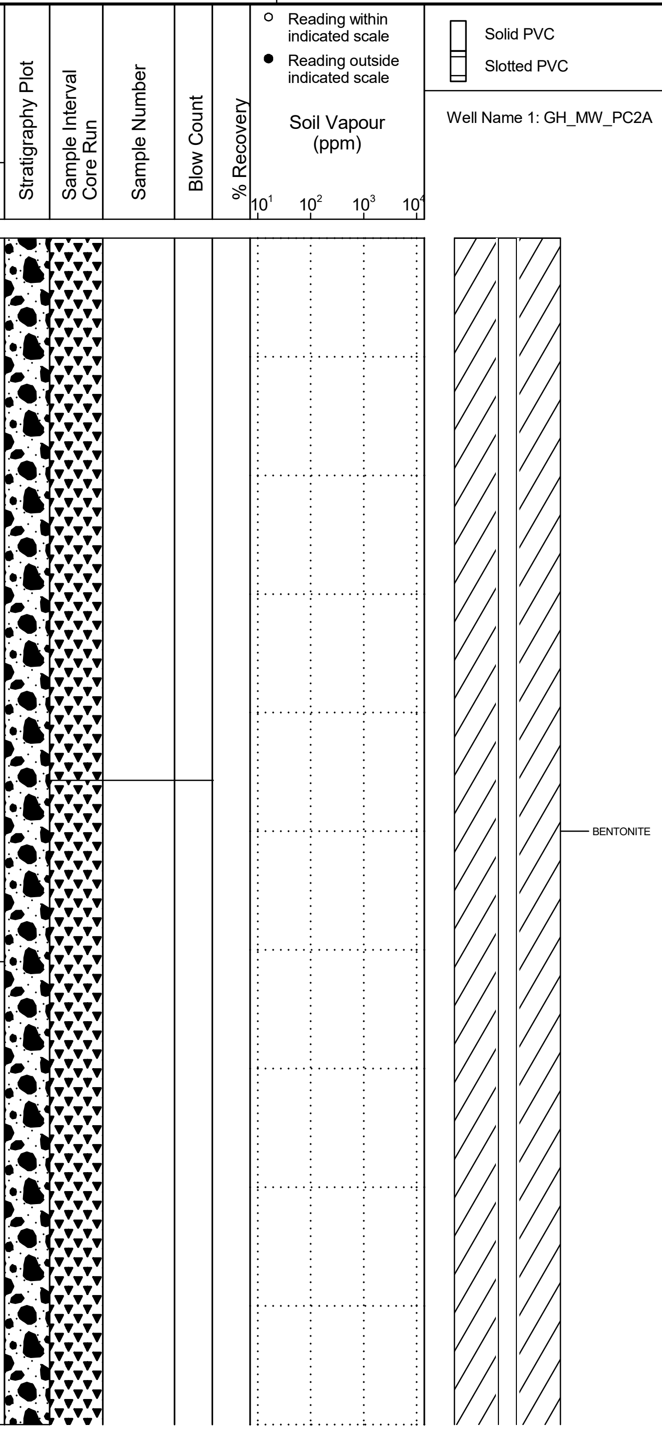
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

☐ Solid PVC
☐ Slotted PVC

Well Name 1: GH_MW_PC2A

Depth in Metres	Soil Description
0	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subangular, trace silt, containing cobbles, dark brown, dry to damp.
3.7	At 3.7 m - light brown/grey, dry.
6.1	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subangular, trace silt, dark brown, loose, damp.
6.6	At 6.6 m - containing cobbles.
7.0	At 7.0 m - intermittent sand lenses.
7.9	At 7.9 m - intermittent gravel layers.
9.1	At 9.1 m - damp to moist.



NOTES
Casing: 0 – 16.5 m; Screen Interval: 16.5 – 18.1 m; Total Depth: 18.1 m
Bentonite: 0 - 16.2 m; Sand Pack: 16.2 – 18.1 m
Casing: 2-inch Schedule 40 PVC; Screens: 2-inch Schedule 40 PVC, 0.100 slot size; Sand Pack: 10/20 Frac Sand

QA/QC: KH 2021 09 15 Print Date:2021-09-21

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : GH_BH_PC4A**
	Location **Greenhills Operations - Porter Creek**	PAGE 2 OF 2

Drilling Contractor	JR Drilling	Date Monitored	n/a	Project Number:	683032
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	TBD	Borehole Logged By:	SE
Borehole Dia. (m)	0.18	Top of Casing Elev. (m)	TBD	Date Drilled:	2021 08 05
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: n/a	Easting: n/a	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ▼▼▼ Air Rotary

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

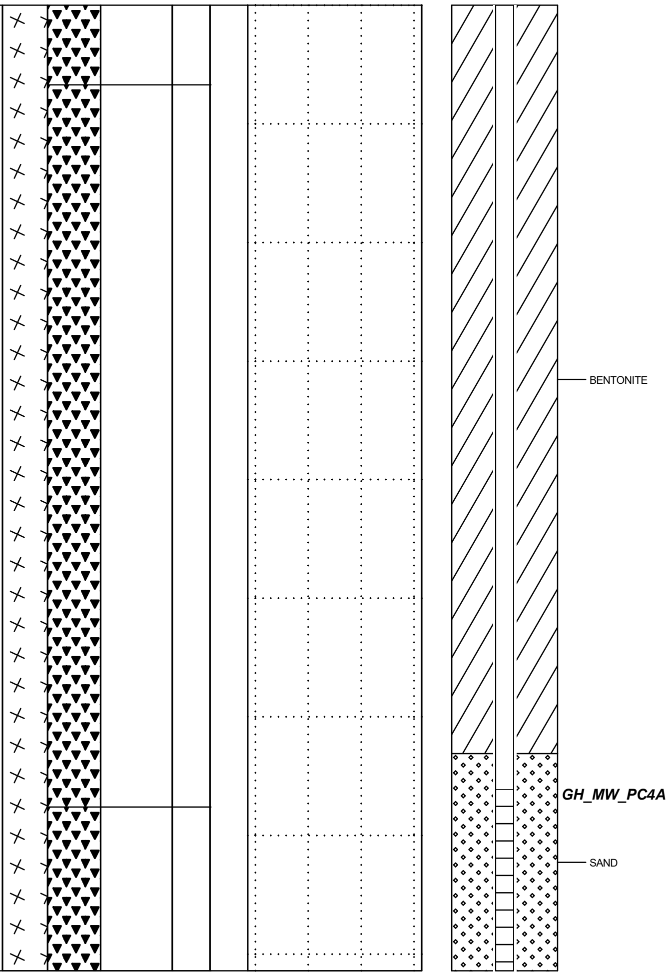
- ○ Reading within indicated scale
- ● Reading outside indicated scale

- Solid PVC
- Slotted PVC

Well Name 1: GH_MW_PC2A

Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm)

Depth (m)	Soil Description
10	WEATHERED BEDROCK, siltstone.
	Between 10.7 m and 12.2 m - dark grey, dry.
	At 15.8 m - damp.
	At 17.1 m - water.
18.1	Bottom of hole at 18.1 m.



10
11
12
13
14
15
16
17
18
19
20

NOTES
Casing: 0 – 16.5 m; Screen Interval: 16.5 – 18.1 m; Total Depth: 18.1 m
Bentonite: 0 - 16.2 m; Sand Pack: 16.2 – 18.1 m
Casing: 2-inch Schedule 40 PVC; Screens: 2-inch Schedule 40 PVC, 0.100 slot size; Sand Pack: 10/20 Frac Sand

QA/QC: KH 2021 09 15 Print Date:2021-09-21

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : GH_BH_PC4B**
	Location **Greenhills Operations - Porter Creek**	PAGE 1 OF 2

Drilling Contractor	JR Drilling	Date Monitored	n/a	Project Number:	683032
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1575.35	Borehole Logged By:	SE
Borehole Dia. (m)	0.18	Top of Casing Elev. (m)	1576.36	Date Drilled:	2021 08 06
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5555426	Easting: 653497	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ▼▼▼ Air Rotary

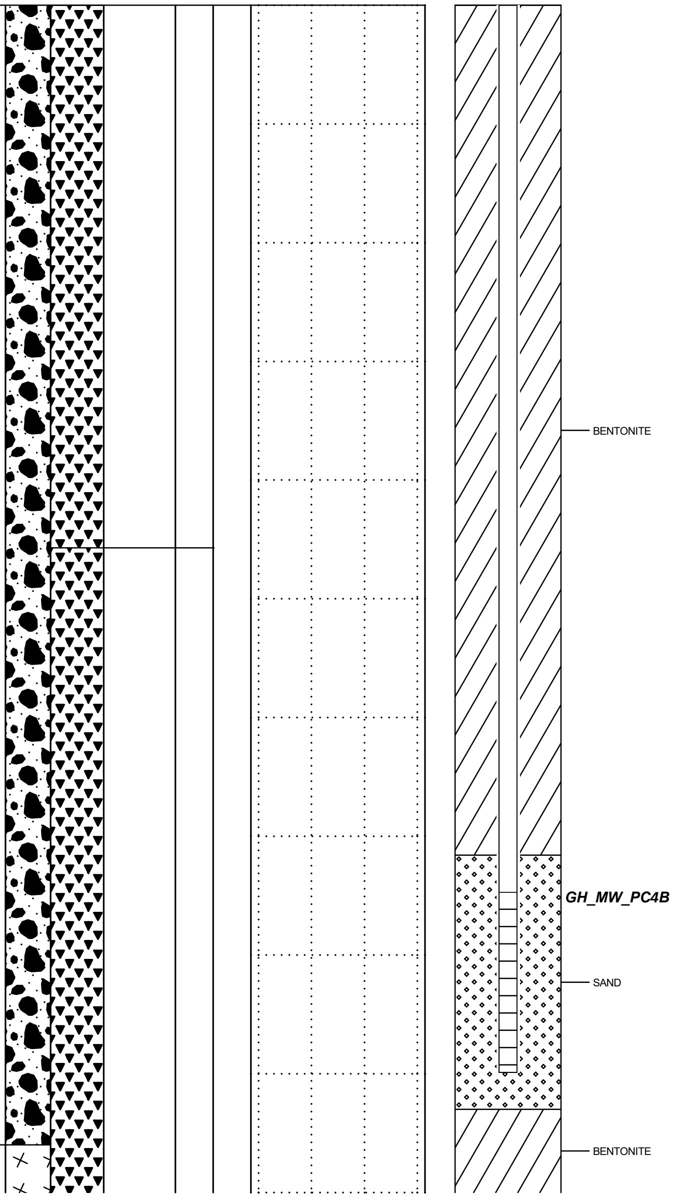
Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- Solid PVC
- Slotted PVC

Well Name 1: GH_MW_PC4B

Depth in Metres	Soil Description
0	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subangular, trace silt, dark brown, dry to damp. At 0.2 m - containing cobbles (approximately 50 cm).
2	At 1.8 m - dark brown, damp.
9	At 8.8 m - gravel.
9.6	WEATHERED BEDROCK, siltstone.



NOTES
Casing: 0 – 7.4 m; Screen Interval: 7.4 – 9 m; Total Depth: 10.4 m
Bentonite: 0 – 7.1 m; Sand Pack: 7.1 – 9.3 m
Casing: 2-inch Schedule 40 PVC; Screens: 2-inch Schedule 40 PVC, 0.100 slot size; Sand Pack: 10/20 Frac Sand

QA/QC: KH 2021 09 15 Print Date:2021-09-21

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : GH_BH_PC4B**
	Location **Greenhills Operations - Porter Creek**	PAGE 2 OF 2

Drilling Contractor	JR Drilling	Date Monitored	n/a	Project Number:	683032
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	TBD	Borehole Logged By:	SE
Borehole Dia. (m)	0.18	Top of Casing Elev. (m)	TBD	Date Drilled:	2021 08 06
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: n/a	Easting: n/a	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ▼▼▼ Air Rotary

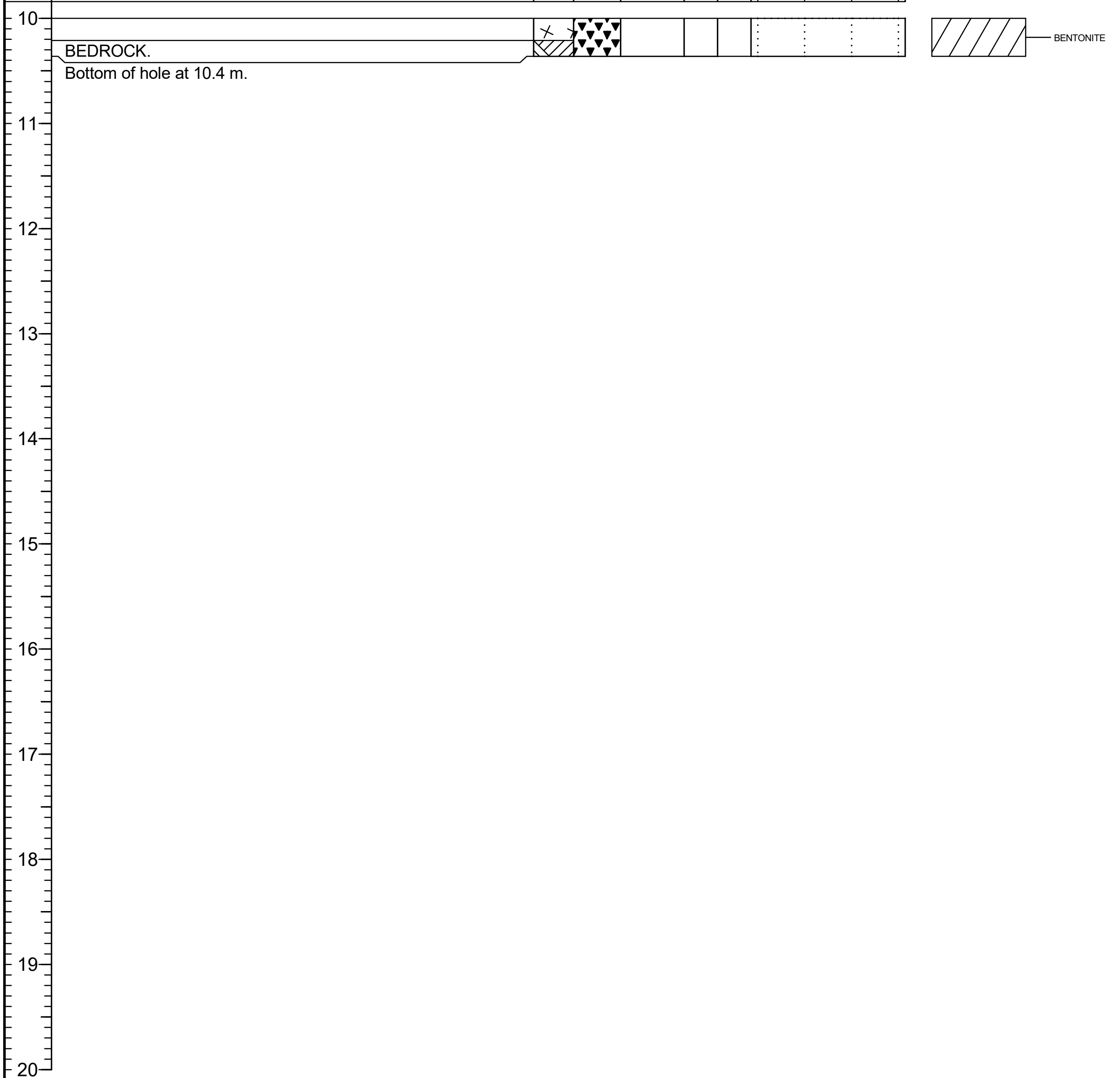
Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- ▯ Solid PVC
- ⊟ Slotted PVC

Well Name 1: GH_MW_PC2B

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm) 10^1 10^2 10^3 10^4



BEDROCK.

Bottom of hole at 10.4 m.

NOTES

Casing: 0 – 7.4 m; Screen Interval: 7.4 – 9 m; Total Depth: 10.4 m
Bentonite: 0 – 7.1 m; Sand Pack: 7.1 – 9.3 m
Casing: 2-inch Schedule 40 PVC; Screens: 2-inch Schedule 40 PVC, 0.100 slot size; Sand Pack: 10/20 Frac Sand

QA/QC: KH 2021 09 15 Print Date:2021-09-21

Log of Monitoring Well: GH_MW-GHC-1D

HEMMERA

Project Name/No: Greenhills Ops Elkford BC/577-016.04

Drilling Company: JR Drilling

Client: Teck Coal Ltd.

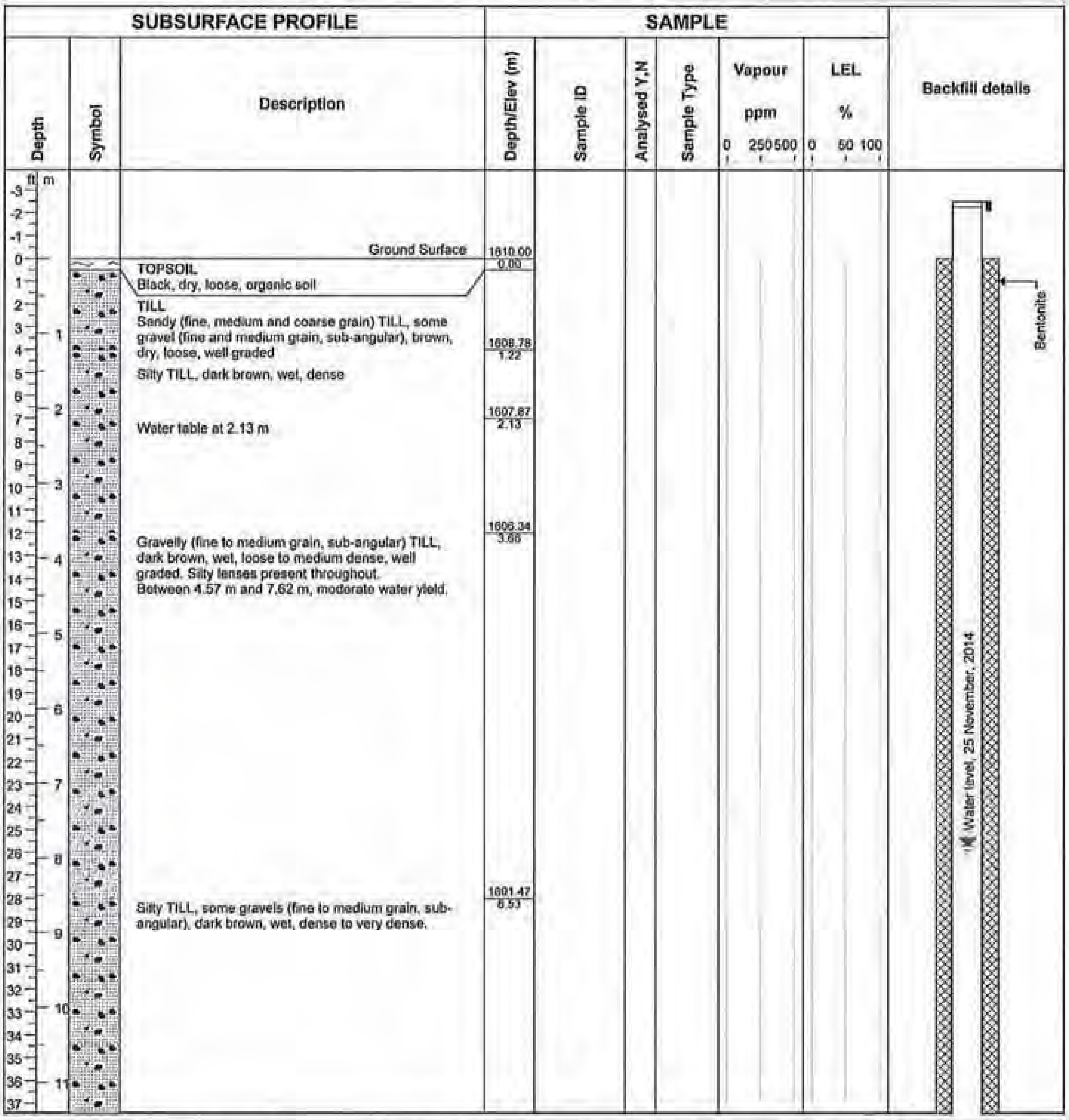
Drilling Method: Dual air rotary

Date Drilled: November 20, 2014

Logged by: RM

Site Location: Greenhills Operations, BC

Sheet: 1 of 2



Depth/Elev (m)	Description
1610.00 0.00	Ground Surface
	TOPSOIL Black, dry, loose, organic soil
	TILL Sandy (fine, medium and coarse grain) TILL, some gravel (fine and medium grain, sub-angular), brown, dry, loose, well graded
1608.78 1.22	Silty TILL, dark brown, wet, dense
1607.87 2.13	Water table at 2.13 m
1606.34 3.66	Gravelly (fine to medium grain, sub-angular) TILL, dark brown, wet, loose to medium dense, well graded. Silty lenses present throughout. Between 4.57 m and 7.62 m, moderate water yield.
1601.47 8.53	Silty TILL, some gravels (fine to medium grain, sub-angular), dark brown, wet, dense to very dense.

Well location: 5,547,207 N, 654,052 E

Well casing diameter: 2"

Depth of well (TOC): 21.36 m

Depth to water level (TOC): 8.639 m

Well casing material: Sch. 80 PVC

Well Elevation (TOC): 1610.8 m

Date of water level: 25 November, 2014

Well screen slot size: 010

Ground Elevation: 1610 m

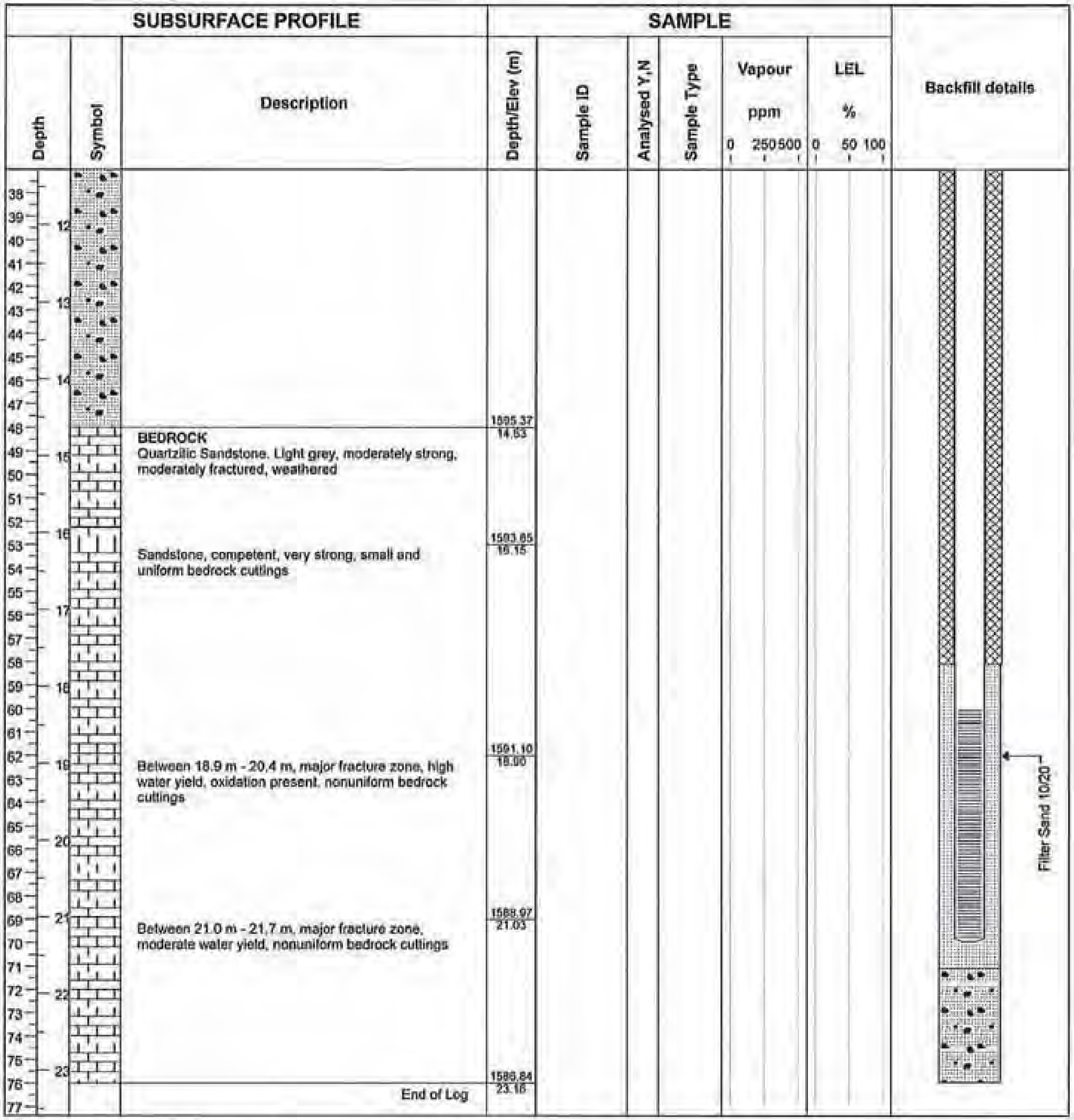
Borehole diameter: 0.15 m

Well screen interval (bgs): 18.31 m - 21.36 m

Log of Monitoring Well: GH_MW-GHC-1D

HEMMERA

Project Name/No: Greenhills Ops Elkford BC/577-016.04
Drilling Company: JR Drilling
Client: Teck Coal Ltd.
Drilling Method: Dual air rotary
Date Drilled: November 20, 2014
Logged by: RM
Site Location: Greenhills Operations, BC
Sheet: 2 of 2



Depth/Elev (m)	Description
1595.37 14.63	**BEDROCK** Quartzitic Sandstone. Light grey, moderately strong, moderately fractured, weathered
1593.85 16.15	Sandstone, competent, very strong, small and uniform bedrock cuttings
1591.10 18.90	Between 18.9 m - 20.4 m, major fracture zone, high water yield, oxidation present, nonuniform bedrock cuttings
1588.97 21.03	Between 21.0 m - 21.7 m, major fracture zone, moderate water yield, nonuniform bedrock cuttings
1586.84 23.16	End of Log

Well location: 5,547,207 N, 654,052 E
Well casing diameter: 2"
Depth of well (TOC): 21.36 m
Depth to water level (TOC): 8.639 m
Well casing material: Sch. 80 PVC
Well Elevation (TOC): 1610.8 m
Date of water level: 25 Novermber, 2014
Well screen slot size: 010
Ground Elevation: 1610 m
Borehole diameter: 0.15 m
Well screen interval (bgs): 18.31 m - 21.36 m

Log of Monitoring Well: GH_MW-GHC-1S

HEMMERA

Project Name/No: Greenhills Ops Elkford BC/577-016.04

Drilling Company: JR Drilling

Client: Teck Coal Ltd.

Drilling Method: Dual air rotary

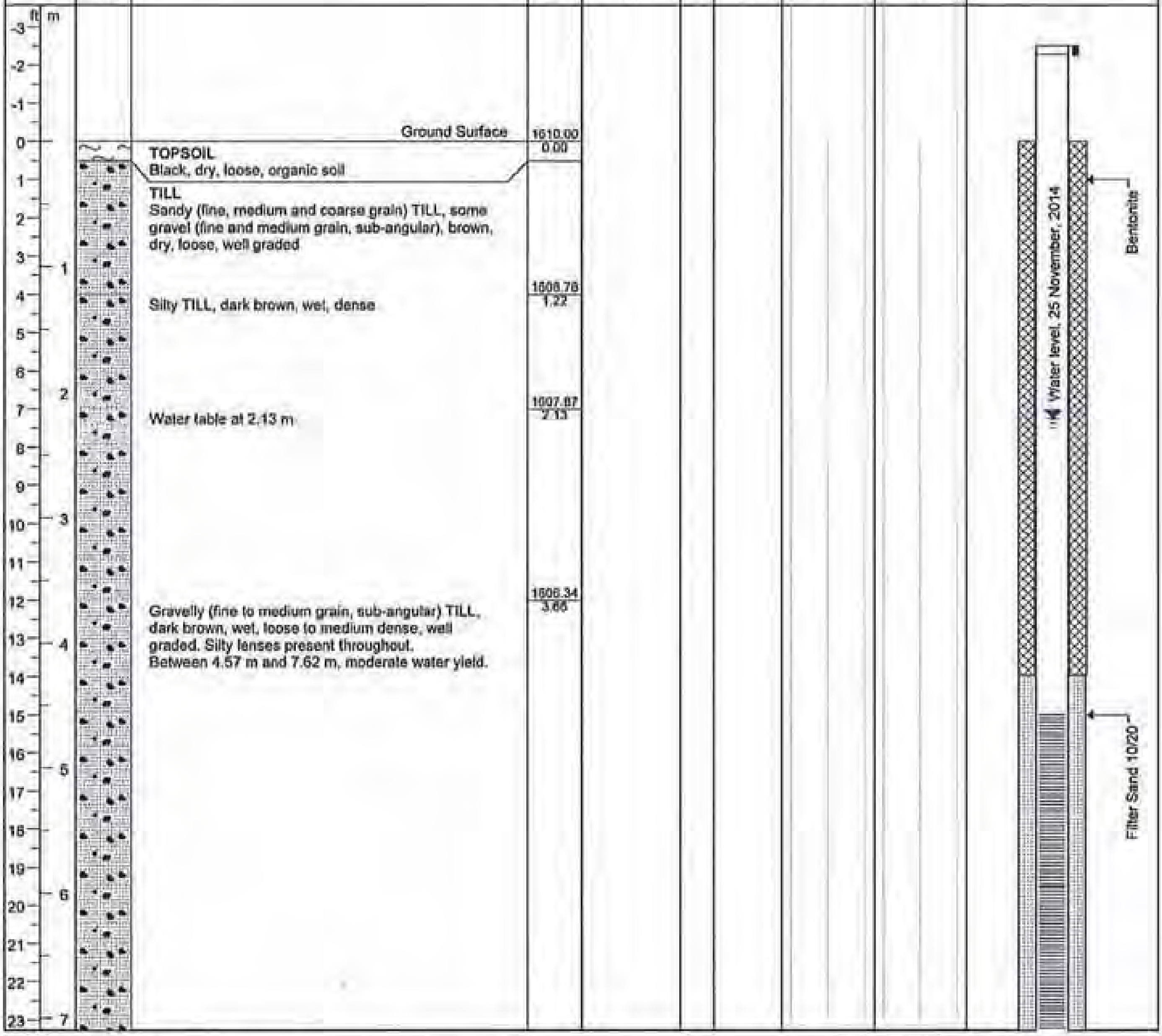
Date Drilled: November 18, 2014

Logged by: RM

Site Location: Greenhills Operations, BC

Sheet: 1 of 2

SUBSURFACE PROFILE	SAMPLE					
Description	Depth/Elev (m)	Sample ID	Analysed Y,N	Sample Type	Vapour ppm 0 250 500	LEL % 0 50 100
Ground Surface	1610.00 0.00					
TOPSOIL Black, dry, loose, organic soil						
TILL Sandy (fine, medium and coarse grain) TILL, some gravel (fine and medium grain, sub-angular), brown, dry, loose, well graded						
Silty TILL, dark brown, wet, dense	1608.78 1.22					
Water table at 2.13 m	1607.87 2.13					
Gravelly (fine to medium grain, sub-angular) TILL, dark brown, wet, loose to medium dense, well graded. Silty lenses present throughout. Between 4.57 m and 7.62 m, moderate water yield.	1606.34 3.66					



Well location: 5,547,205 N, 654,050 E

Well casing diameter: 2"

Depth of well (TOC): 7.63 m

Depth to water level (TOC): 2.976 m

Well casing material: Sch. 80 PVC

Well Elevation (TOC): 1610.8 m

Date of water level: 25 Novermber, 2014

Well screen slot size: 010

Ground Elevation: 1610 m

Borehole diameter: 0.17 m

Well screen interval (bgs): 4.58 m - 7.63 m

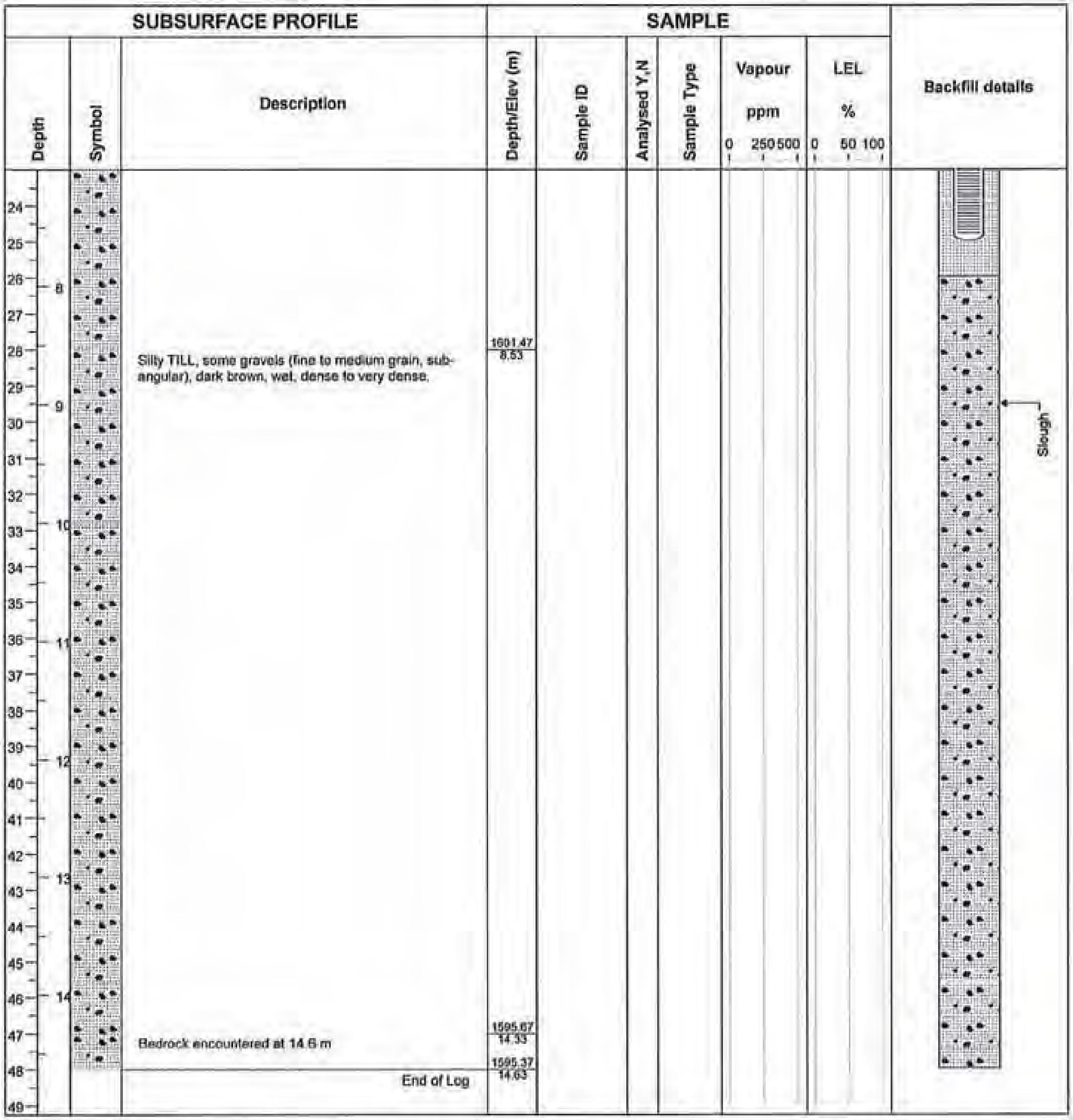
Log of Monitoring Well: GH_MW-GHC-1S

HEMMERA

Project Name/No: Greenhills Ops Elkford BC/577-016.04
Client: Teck Coal Ltd.
Date Drilled: November 18, 2014
Site Location: Greenhills Operations, BC

Drilling Company: JR Drilling
Drilling Method: Dual air rotary
Logged by: RM

Sheet: 2 of 2



Description	Depth/Elev (m)
	1601.47 8.53
Silty TILL, some gravels (fine to medium grain, sub-angular), dark brown, wet, dense to very dense.	
Bedrock encountered at 14.6 m	1595.67 14.33
End of Log	1595.37 14.63

Well location: 5,547,205 N, 654,050 E
Depth to water level (TOC): 2.976 m
Date of water level: 25 Novermber, 2014
Borehole diameter: 0.17 m

Well casing diameter: 2"
Well casing material: Sch. 80 PVC
Well screen slot size: 010
Well screen interval (bgs): 4.58 m - 7.63 m

Depth of well (TOC): 7.63 m
Well Elevation (TOC): 1610.8 m
Ground Elevation: 1610 m

SNC·LAVALIN

Client **Teck Coal Limited**		**Borehole No. : GH_BH_GHC_4A**
Location **Greenhills Operations**		PAGE 1 OF 2

Drilling Contractor	Owen's Drilling	Date Monitored	n/a	Project Number:	674842
Drilling Method	Odex	Ground Surface Elev. (m)	1525.264	Borehole Logged By:	RAS
Borehole Dia. (m)	0.10	Top of Casing Elev. (m)	1526.254	Date Drilled:	2020 07 16
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5546305.746	Easting: 653814.809	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ☰ Odex
- ▧ Split Spoon

Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- ▯ Solid PVC
- ☷ Slotted PVC

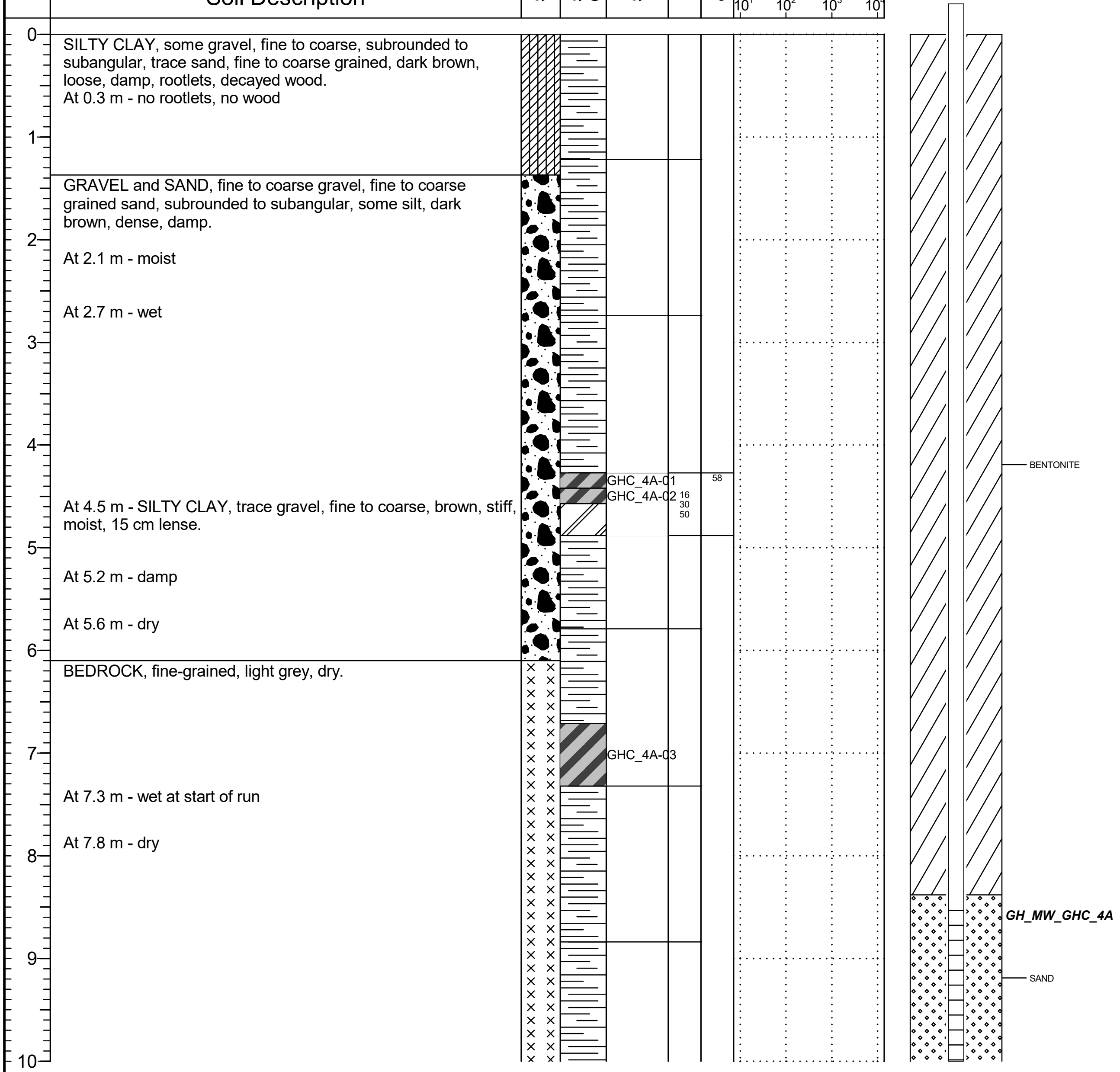
Well Name 1: GH_MW_GHC_4A

Depth in Metres | Soil Description

0 – SILTY CLAY, some gravel, fine to coarse, subrounded to subangular, trace sand, fine to coarse grained, dark brown, loose, damp, rootlets, decayed wood.
At 0.3 m - no rootlets, no wood

GRAVEL and SAND, fine to coarse gravel, fine to coarse grained sand, subrounded to subangular, some silt, dark brown, dense, damp.
At 2.1 m - moist
At 2.7 m - wet
At 4.5 m - SILTY CLAY, trace gravel, fine to coarse, brown, stiff, moist, 15 cm lense.
At 5.2 m - damp
At 5.6 m - dry

BEDROCK, fine-grained, light grey, dry.
At 7.3 m - wet at start of run
At 7.8 m - dry



NOTES
Moisture contents are as logged in recovered samples and may be biased drier than in situ conditions.

QA: TG 2020 08 11 Print Date:2020-08-14

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : GH_BH_GHC_4A**
	Location **Greenhills Operations**	PAGE 2 OF 2

Drilling Contractor Owen's Drilling
Drilling Method Odex
Borehole Dia. (m) 0.10
Pipe/Slotted Pipe Dia. (m) 0.05/0.05

Date Monitored n/a
Ground Surface Elev. (m) 1525.264
Top of Casing Elev. (m) 1526.254
Northing: 5546305.746 Easting: 653814.809

Project Number: 674842
Borehole Logged By: RAS
Date Drilled: 2020 07 16
Log Typed By: VL

Drilling Legend
- ▨ Sample Interval
- ▭ Odex
- ▱ Split Spoon

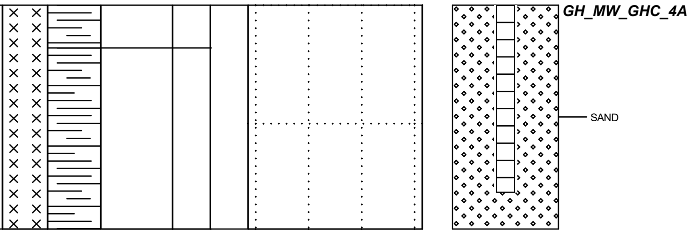
Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- ▭ Solid PVC
- ▤ Slotted PVC

Well Name 1: GH_MW_GHC_4A

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm) 10^1 10^2 10^3 10^4
10	BEDROCK, fine-grained, light grey, dry. *(continued)*						
12	Bottom of hole at 11.9 m.						



Depth scale: 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20

NOTES
Moisture contents are as logged in recovered samples and may be biased drier than in situ conditions.

QA: TG 2020 08 11 Print Date:2020-08-14

SNC·LAVALIN

Client **Teck Coal Limited**		**Borehole No. : GH_BH_GHC_4B**
Location **Greenhills Operations**		PAGE 1 OF 1

Drilling Contractor	Owen's Drilling	Date Monitored	n/a	Project Number:	674842
Drilling Method	Odex	Ground Surface Elev. (m)	1525.363	Borehole Logged By:	RAS
Borehole Dia. (m)	0.10	Top of Casing Elev. (m)	1526.363	Date Drilled:	2020 07 16
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5546308.488	Easting: 653810.098	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ☰ Odex
- ▧ Split Spoon

Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- Solid PVC
- Slotted PVC

Well Name 1: GH_MW_GHC_4B

Depth in Metres

Soil Description

SILTY CLAY, some gravel, fine to coarse, subrounded to subangular, trace sand, fine to coarse grained, brown, loose, damp.

GRAVEL and SAND, fine to coarse gravel, subrounded to subangular, fine to coarse grained sand, some silt, containing cobbles, dark brown, dense, damp.

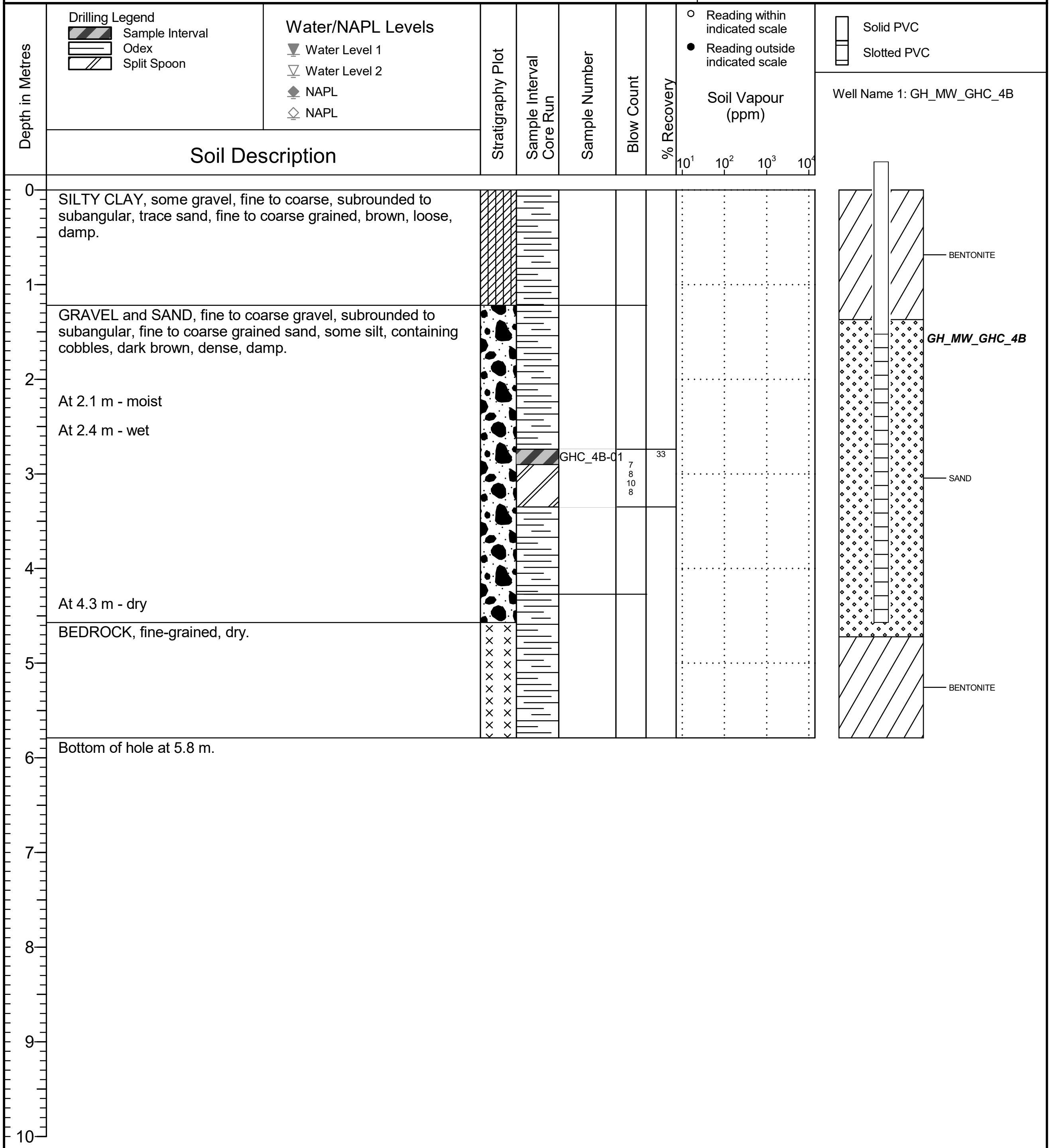
At 2.1 m - moist

At 2.4 m - wet

At 4.3 m - dry

BEDROCK, fine-grained, dry.

Bottom of hole at 5.8 m.



NOTES
Moisture contents are as logged in recovered samples and may be biased drier than in situ conditions.

QA: TG 2020 08 11 Print Date:2020-08-14

Log of Monitoring Well: GH_MW-TD

HEMMERA

Project Name/No: Greenhills Ops Elkford BC/577-016.04

Drilling Company: JR Drilling

Client: Teck Coal Ltd.

Drilling Method: Dual air rotary

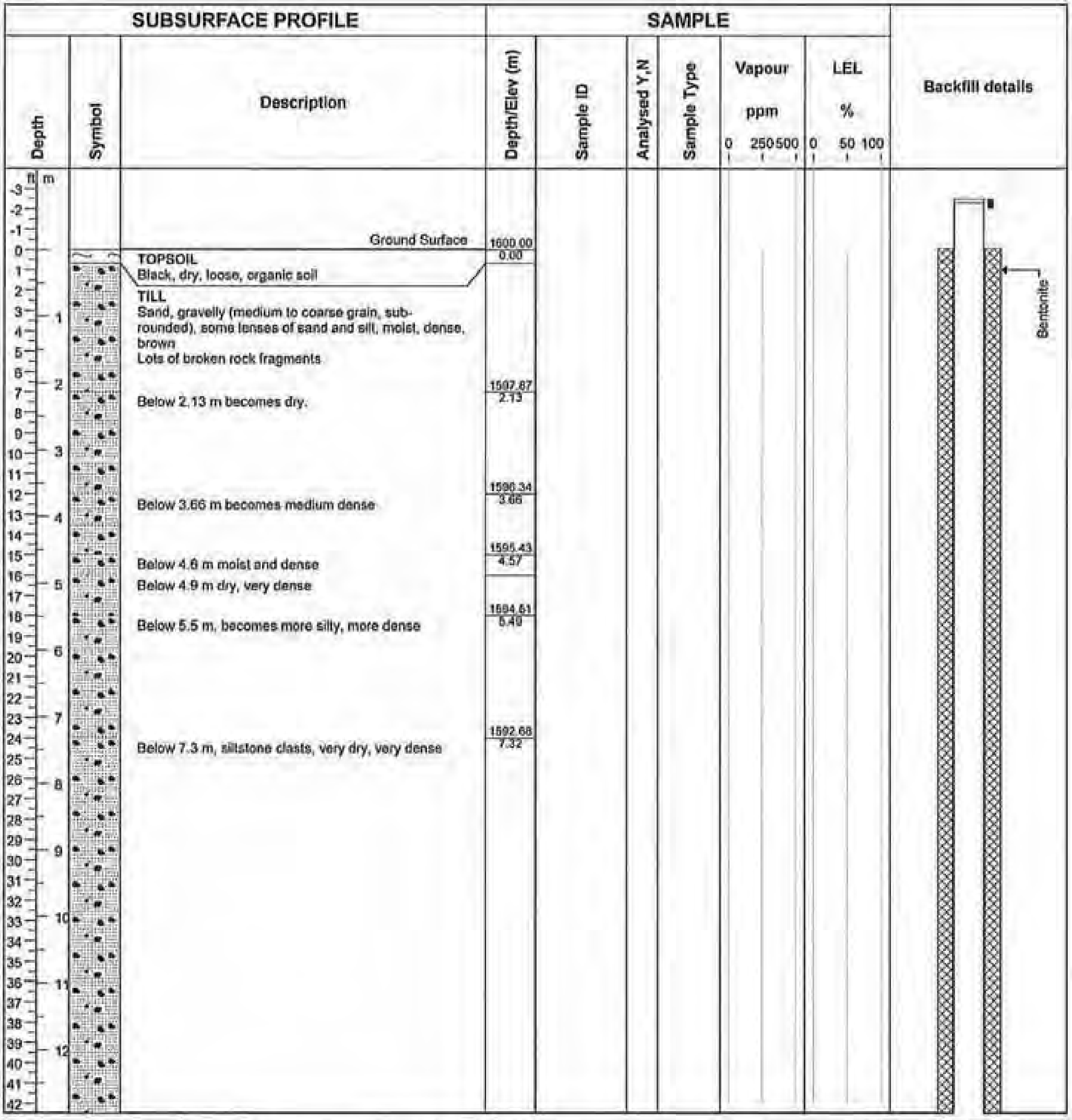
Date Drilled: November 21, 2014

Logged by: RM

Site Location: Greenhills Operations, BC

Sheet: 1 of 3

SUBSURFACE PROFILE / SAMPLE



Description	Depth/Elev (m)	Sample ID	Analysed Y,N	Sample Type	Vapour ppm	LEL %
Ground Surface	1600.00 0.00					
TOPSOIL Black, dry, loose, organic soil						
TILL Sand, gravelly (medium to coarse grain, sub-rounded), some lenses of sand and silt, moist, dense, brown Lots of broken rock fragments						
Below 2.13 m becomes dry.	1597.87 2.13					
Below 3.66 m becomes medium dense	1596.34 3.66					
Below 4.6 m moist and dense Below 4.9 m dry, very dense	1595.43 4.57					
Below 5.5 m, becomes more silty, more dense	1594.51 5.49					
Below 7.3 m, siltstone clasts, very dry, very dense	1592.68 7.32					

Well location: 5,546,536 N, 652,694 E

Well casing diameter: 2"

Depth of well (TOC): 34.44 m

Depth to water level (TOC): Flowing artesian well

Well casing material: Sch. 80 PVC

Well Elevation (TOC): 1600.75 m asl

Date of water level: N/A

Well screen slot size: 010

Ground Elevation: 1600 m asl

Borehole diameter: 0.17 m

Well screen interval (bgs): 31.39 - 34.44 m

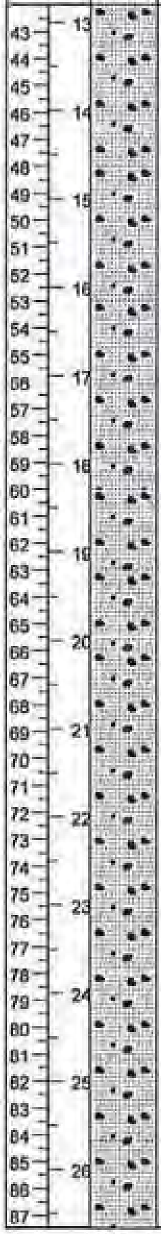
Log of Monitoring Well: GH_MW-TD

HEMMERA

Project Name/No: Greenhills Ops Elkford BC/577-016.04
Client: Teck Coal Ltd.
Date Drilled: November 21, 2014
Site Location: Greenhills Operations, BC

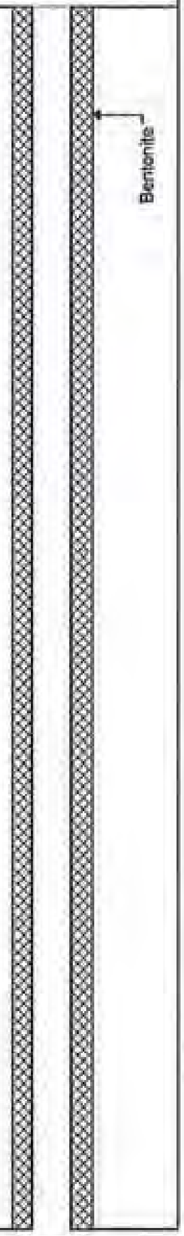
Drilling Company: JR Drilling
Drilling Method: Dual air rotary
Logged by: RM

Sheet: 2 of 3



SUBSURFACE PROFILE	SAMPLE					
Description	Depth/Elev (m)	Sample ID	Analysed Y,N	Sample Type	Vapour ppm 0 250 500	LEL % 0 50 100
Below 14.6 m medium dense, increasing sand content	1585.37 14.63					
Below 16.2 m very dense, dry, siltstone clasts (angular to sub-angular), trace sandstone clasts	1583.85 16.15					
Below 18.3 m Silt and Sand (fine), some siltstone clasts, dark brown	1581.71 18.29					
Below 19.2 m medium dense	1580.80 19.20					
Below 20.1 m very dense	1579.88 20.12					

Backfill details



Well location: 5,546,536 N, 652,694 E
Depth to water level (TOC): Flowing artesian well
Date of water level: N/A
Borehole diameter: 0.17 m

Well casing diameter: 2"
Well casing material: Sch. 80 PVC
Well screen slot size: 010
Well screen interval (bgs): 31.39 - 34.44 m

Depth of well (TOC): 34.44 m
Well Elevation (TOC): 1600.75 m asl
Ground Elevation: 1600 m asl

Log of Monitoring Well: GH_MW-TD

HEMMERA

Project Name/No: Greenhills Ops Elkford BC/577-016.04

Drilling Company: JR Drilling

Client: Teck Coal Ltd.

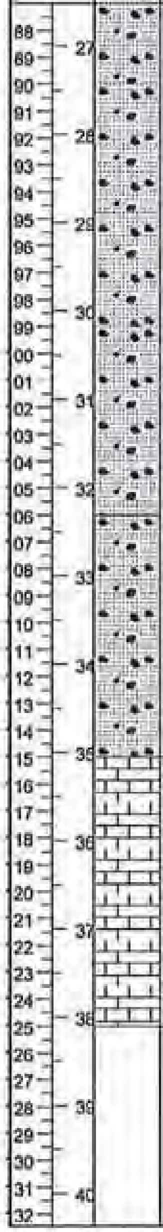
Drilling Method: Dual air rotary

Date Drilled: November 21, 2014

Logged by: RM

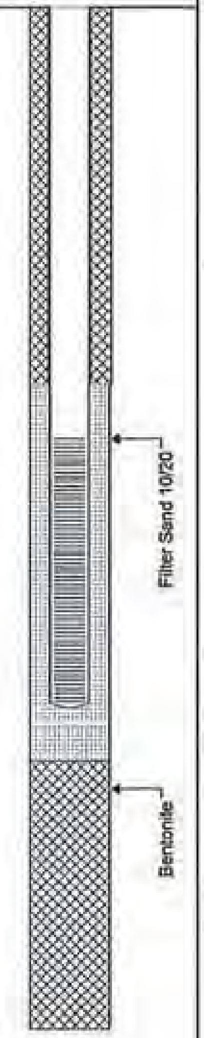
Site Location: Greenhills Operations, BC

Sheet: 3 of 3



SUBSURFACE PROFILE: Description	Depth/Elev (m)	Sample ID	Analysed Y,N	Sample Type	Vapour ppm (0 250 500)	LEL % (0 50 100)
Below 27.4 m increasing sand concent, decreasing silt content, trace mudstone clasts, light brown, dense, dry	1572.57 27.43					
Below 30.2 m sand and silt till with siltstone clast, wet. First water bearing unit.	1569.82 30.18					
Moderate water yield between 32.3 m and 34.1 m	1567.69 32.31					
BEDROCK Siltstone, fresh, competent, very dense, dry.	1564.95 35.05					
End of Log	1561.90 38.10					

Backfill details



Well location: 5,546,536 N, 652,694 E

Well casing diameter: 2"

Depth of well (TOC): 34.44 m

Depth to water level (TOC): Flowing artesian well

Well casing material: Sch. 80 PVC

Well Elevation (TOC): 1600.75 m asl

Date of water level: N/A

Well screen slot size: 010

Ground Elevation: 1600 m asl

Borehole diameter: 0.17 m

Well screen interval (bgs): 31.39 - 34.44 m

DRAFT

SNC • LAVALIN	Client **Teck Coal Limited**	**Borehole No. : GH_BH_RLP_2**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 2

Drilling Contractor	Owen's Drilling	Date Monitored	2020 12 03	Project Number:	682279
Drilling Method	Odex	Ground Surface Elev. (m)	1492.250	Borehole Logged By:	VD
Borehole Dia. (m)	0.16	Top of Casing Elev. (m)	1493.080	Date Drilled:	2020 02 12
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5545343.000	Easting: 654075.000	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ☰ Odex
- ▧ Split Spoon

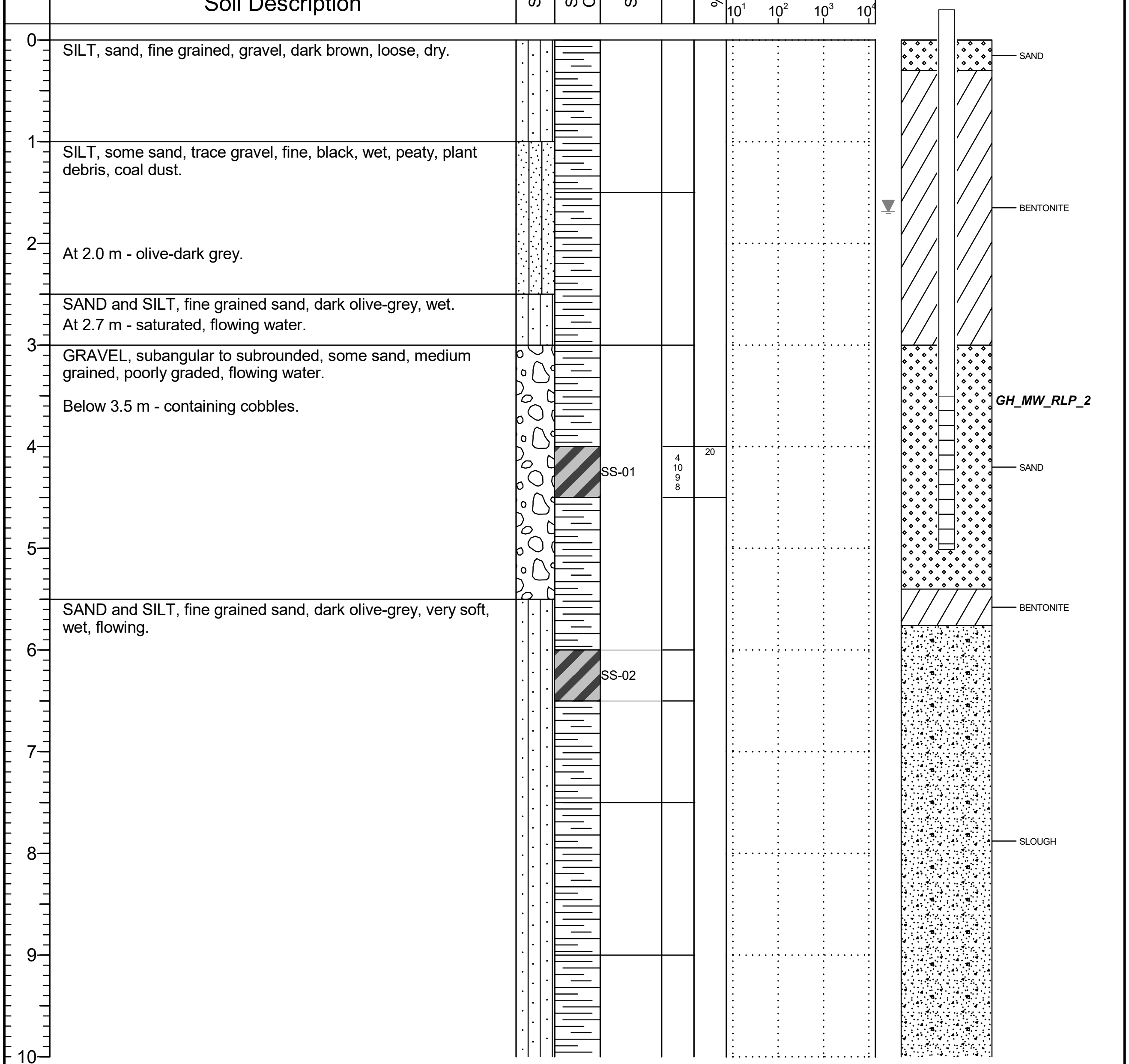
Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- Solid PVC
- Slotted PVC

Well Name 1: GH_MW_RLP_2

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm)



SILT, sand, fine grained, gravel, dark brown, loose, dry.

SILT, some sand, trace gravel, fine, black, wet, peaty, plant debris, coal dust.

At 2.0 m - olive-dark grey.

SAND and SILT, fine grained sand, dark olive-grey, wet.
At 2.7 m - saturated, flowing water.

GRAVEL, subangular to subrounded, some sand, medium grained, poorly graded, flowing water.

Below 3.5 m - containing cobbles.

SAND and SILT, fine grained sand, dark olive-grey, very soft, wet, flowing.

NOTES
GPS coordinates recorded using hand held GPS.
Bolded sample denotes sample analyzed.

QA/QC: MB 2021 07 06 Print Date:2021-07-08

DRAFT

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : GH_BH_RLP_2**
	Location **Regional Groundwater Monitoring**	PAGE 2 OF 2

Drilling Contractor	Owen's Drilling	Date Monitored	2020 12 03	Project Number:	682279
Drilling Method	Odex	Ground Surface Elev. (m)	1492.250	Borehole Logged By:	VD
Borehole Dia. (m)	0.16	Top of Casing Elev. (m)	1493.080	Date Drilled:	2020 02 12
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5545343.000	Easting: 654075.000	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ▤ Odex
- ▧ Split Spoon

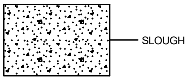
Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- ▯ Solid PVC
- ▯ Slotted PVC

Well Name 1: GH_MW_RLP_2

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm) 10^1 10^2 10^3 10^4
10	SAND and SILT, fine grained sand, dark olive-grey, very soft, wet, flowing. *(continued)*						
	Bottom of hole at 10.6 m.						
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							



NOTES
GPS coordinates recorded using hand held GPS.
Bolded sample denotes sample analyzed.

QA/QC: MB 2021 07 06 Print Date:2021-07-08

GH_POTW09

Greenhills Well 9

Report 1 - Detailed Well Record

Well Tag Number: 85223

Owner: ELK VALLEY COAL - GREENHILLS OPERATION

Address:

Area: GREENHILLS

WELL LOCATION:
Land District
District Lot: 4588 Plan: 11279 Lot: 1
Township: Section: Range:
Indian Reserve: Meridian: Block:
Quarter:
Island:
BCGS Number (NAD 83): Well: 5

Class of Well:
Subclass of Well:
Orientation of Well:
Status of Well:
Well Use:
Observation Well Number:
Observation Well Status:
Construction Method:
Diameter: 10.75 inches
Casing drive shoe:
Well Depth: 117 feet
Elevation: feet (ASL)
Final Casing Stick Up: inches
Well Cap Type:
Bedrock Depth: 117 feet
Lithology Info Flag: Y
File Info Flag: N
Sieve Info Flag: N
Screen Info Flag: Y

Site Info Details:
Other Info Flag:
Other Info Details:

Construction Date: 1992-06-29 00:00:00

Driller:
Well Identification Plate Number: 15802
Plate Attached By: KIMBERLY RASMUSSEN
Where Plate Attached: WELL CASING

PRODUCTION DATA AT TIME OF DRILLING:
Well Yield: (Driller's Estimate)
Development Method:
Pump Test Info Flag: N
Artesian Flow: UNKNOWN YIELD
Artesian Pressure (ft):
Static Level:

WATER QUALITY:
Character:
Colour:
Odour:
Well Disinfected: N
EMS ID:
Water Chemistry Info Flag: N
Field Chemistry Info Flag:
Site Info (SEAM): N

Water Utility: N
Water Supply System Name: GREENHILLS WATER SUPPLY SYSTEM
Water Supply System Well Name: WELL 9

SURFACE SEAL:
Flag: Y
Material:
Method:
Depth (ft): 88 feet
Thickness (in):

WELL CLOSURE INFORMATION:
Reason For Closure:
Method of Closure:
Closure Sealant Material:
Closure Backfill Material:
Details of Closure:

Screen from	to feet	Type	Slot Size
88	119		.25
null	null		.12

Casing from	to feet	Diameter	Material	Drive Shoe
0	88	10.75	Other	null

GENERAL REMARKS:

LITHOLOGY INFORMATION:
From 0 to 19.7 Ft. GRAVELY CLAY 0 nothing entered
From 19.7 to 21.4 Ft. GRAVELY CLAY 0 nothing entered
From 21.4 to 43 Ft. GRAVELY CLAY COLLUVIUM 0 nothing entered
From 43 to 65 Ft. SILTY CLAY - LACUSTRINE 0 nothing entered
From 65 to 70 Ft. GRAVEL- DIRTY - WATER 0 nothing entered
From 70 to 98.43 Ft. CLEANER GRAVEL 0 nothing entered
From 98.43 to 118 Ft. GRAVEL SILTY 0 nothing entered
From 118.4 to 121.4 Ft. SANDSTONE AND SHALE 0 nothing entered

- Return to Main
- Return to Search Options
- Return to Search Criteria

GH_POTW10

Greenhills Well 10

Report 1 - Detailed Well Record

Well Tag Number: 85218

Owner: ELK VALLEY COAL - GREENHILLS OPERATION

Address:

Area: GREENHILLS

WELL LOCATION:
Land District
District Lot: 4588 Plan: 11279 Lot: 1
Township: Section: Range:
Indian Reserve: Meridian: Block:
Quarter:
Island:
BCGS Number (NAD 83): Well: 5

Class of Well:
Subclass of Well:
Orientation of Well:
Status of Well:
Well Use:
Observation Well Number:
Observation Well Status:
Construction Method:
Diameter: 8" inches
Casing drive shoe:
Well Depth: 176 feet
Elevation: feet (ASL)
Final Casing Stick Up: inches
Well Cap Type:
Bedrock Depth: feet
Lithology Info Flag: Y
File Info Flag: N
Sieve Info Flag: N
Screen Info Flag: N

Site Info Details:
Other Info Flag:
Other Info Details:

Construction Date: 2001-06-22 00:00:00

Driller:
Well Identification Plate Number: 15805
Plate Attached By:
Where Plate Attached:

PRODUCTION DATA AT TIME OF DRILLING:
Well Yield: 50 (Driller's Estimate)
Development Method:
Pump Test Info Flag: N
Artesian Flow:
Artesian Pressure (ft):
Static Level:

WATER QUALITY:
Character:
Colour:
Odour:
Well Disinfected: N
EMS ID:
Water Chemistry Info Flag: N
Field Chemistry Info Flag:
Site Info (SEAM): N

Water Utility: N
Water Supply System Name: GREENHILLS WATER SUPPLY SYSTEM
Water Supply System Well Name: WELL 10

SURFACE SEAL:
Flag: N
Material:
Method:
Depth (ft):
Thickness (in):

WELL CLOSURE INFORMATION:
Reason For Closure:
Method of Closure:
Closure Sealant Material:
Closure Backfill Material:
Details of Closure:

Screen from	to feet	Type	Slot Size

Casing from	to feet	Diameter	Material	Drive Shoe
0	176	null	Other	null

GENERAL REMARKS:
WATER QUALITY GUARANTEED BY CONTRACTOR

LITHOLOGY INFORMATION:
From 0 to 58 Ft. CLAY 0 nothing entered
From 58 to 78 Ft. GRAVEL AND BOULDERS 0 nothing entered
From 78 to 110 Ft. CLAY AND GRAVEL 0 nothing entered
From 110 to 176 Ft. COURSE GRAVEL 0 nothing entered

- Return to Main
- Return to Search Options
- Return to Search Criteria

Information Disclaimer

GH_POTW15

Greenhills Well 15

Report 1 - Detailed Well Record

Well Tag Number: 85221

Owner: ELK VALLEY COAL - GREENHILLS OPERATION

Address:

Area:

WELL LOCATION:
Land District
District Lot: 4588 Plan: 11279 Lot: 1
Township: Section: Range:
Indian Reserve: Meridian: Block:
Quarter:
Island:
BCGS Number (NAD 83): Well: 7

Class of Well:
Subclass of Well:
Orientation of Well:
Status of Well:
Well Use:
Observation Well Number:
Observation Well Status:
Construction Method:
Diameter: inches
Casing drive shoe:
Well Depth: 144 feet
Elevation: feet (ASL)
Final Casing Stick Up: inches
Well Cap Type:
Bedrock Depth: feet
Lithology Info Flag: Y
File Info Flag: N
Sieve Info Flag: N
Screen Info Flag: N

Site Info Details:
Other Info Flag:
Other Info Details:

Construction Date: 2001-11-01 00:00:00

Driller:
Well Identification Plate Number: 15803
Plate Attached By: KIMBERLY RASMUSSEN
Where Plate Attached: WELL CASING

PRODUCTION DATA AT TIME OF DRILLING:
Well Yield: 100 (Driller's Estimate)
Development Method:
Pump Test Info Flag: N
Artesian Flow:
Artesian Pressure (ft):
Static Level: 11 feet

WATER QUALITY:
Character:
Colour:
Odour:
Well Disinfected: N
EMS ID:
Water Chemistry Info Flag: N
Field Chemistry Info Flag:
Site Info (SEAM): N

Water Utility: N
Water Supply System Name: GREENHILLS WATER SUPPLY SYSTEM
Water Supply System Well Name: WELL 15

SURFACE SEAL:
Flag: N
Material:
Method:
Depth (ft):
Thickness (in):

WELL CLOSURE INFORMATION:
Reason For Closure:
Method of Closure:
Closure Sealant Material:
Closure Backfill Material:
Details of Closure:

Screen from	to feet	Type	Slot Size

Casing from	to feet	Diameter	Material	Drive Shoe
0	144	null	Other	null

GENERAL REMARKS:
WATER QUALITY GUARANTEED BY CONTRACTOR

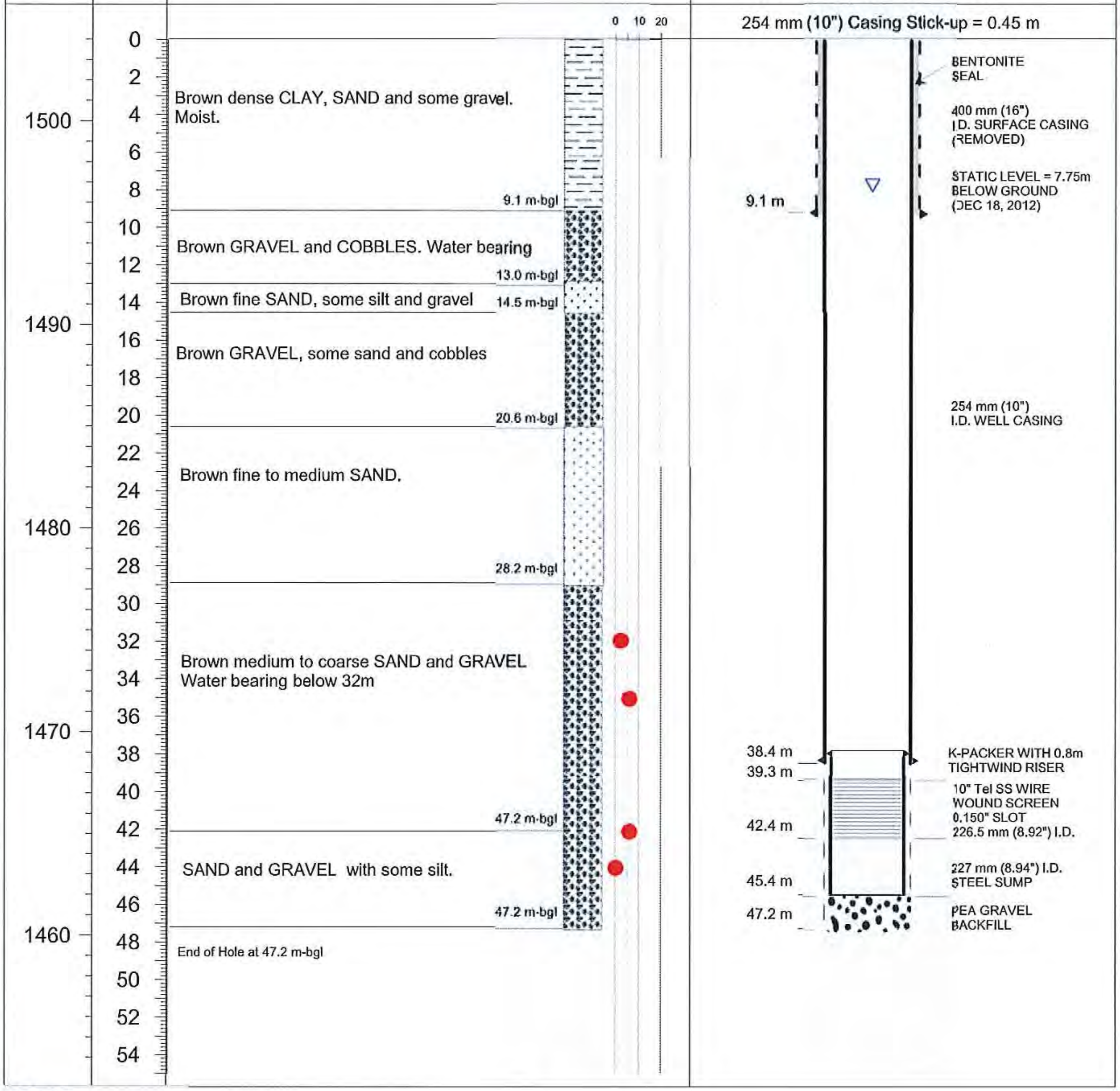
LITHOLOGY INFORMATION:
From 0 to 7 Ft. FILL 0 nothing entered
From 7 to 15 Ft. CLAY AND GRAVEL 0 nothing entered
From 15 to 125 Ft. SILTY CLAY 0 nothing entered
From 125 to 144 Ft. COARSE GRAVEL AND COBBLE 0 nothing entered

- Return to Main
- Return to Search Options
- Return to Search Criteria

GH_POTW17

H:\Project\3148\Well_Log\Well17_Greenhill.grf

ELEV. (m-GEOD)	DEPTH (m-BGL)	GEOLOGICAL DESCRIPTION	AIR LIFT YIELD (L/s)	WELL / PIEZOMETER CONSTRUCTION
				EASTING: 653592 NORTHING: 554520 GROUND ELEVATION: 1504 m
				254 mm (10") Casing Stick-up = 0.45 m
	0 – 9.1 m-bgl	Brown dense CLAY, SAND and some gravel. Moist.		
	9.1 – 13.0 m-bgl	Brown GRAVEL and COBBLES. Water bearing		
	13.0 – 14.5 m-bgl	Brown fine SAND, some silt and gravel		
	14.5 – 20.6 m-bgl	Brown GRAVEL, some sand and cobbles		
	20.6 – 28.2 m-bgl	Brown fine to medium SAND.		
	28.2 – 47.2 m-bgl	Brown medium to coarse SAND and GRAVEL Water bearing below 32m		
	47.2 m-bgl	SAND and GRAVEL with some silt.		
	47.2 m-bgl	End of Hole at 47.2 m-bgl		



LEGEND

▤	Clay
▩	Gravel
▨	Sand

Note:
Coordinates and elevation not surveyed

DRILLING CONTRACTOR:	J.R. Drilling Ltd.
DRILLING METHOD:	DUAL ROTARY
START DATE:	19-Nov-12
END DATE:	21-Nov-12
HYDROGEOLOGY:	Eric Pastora

KERR WOOD LEIDAL ASSOCIATES LTD.
TECK COAL LTD. - GREENHILLS OPERATIONS
GROUNDWATER SUPPLY ASSESSMENT

PITEAU ASSOCIATES
GEOTECHNICAL AND HYDROGEOLOGICAL CONSULTANTS

WELL 17 LOG

BY EP	DATE JAN 13
APPROVED ATH	FIG. 2

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : RG_BH_FR11A**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 3

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	n/a	Project Number:	683032
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	1499.780	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1500.597	Date Drilled:	2021 09 11
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5545334.013	Easting: 652113.837	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▨ Vibrasonic

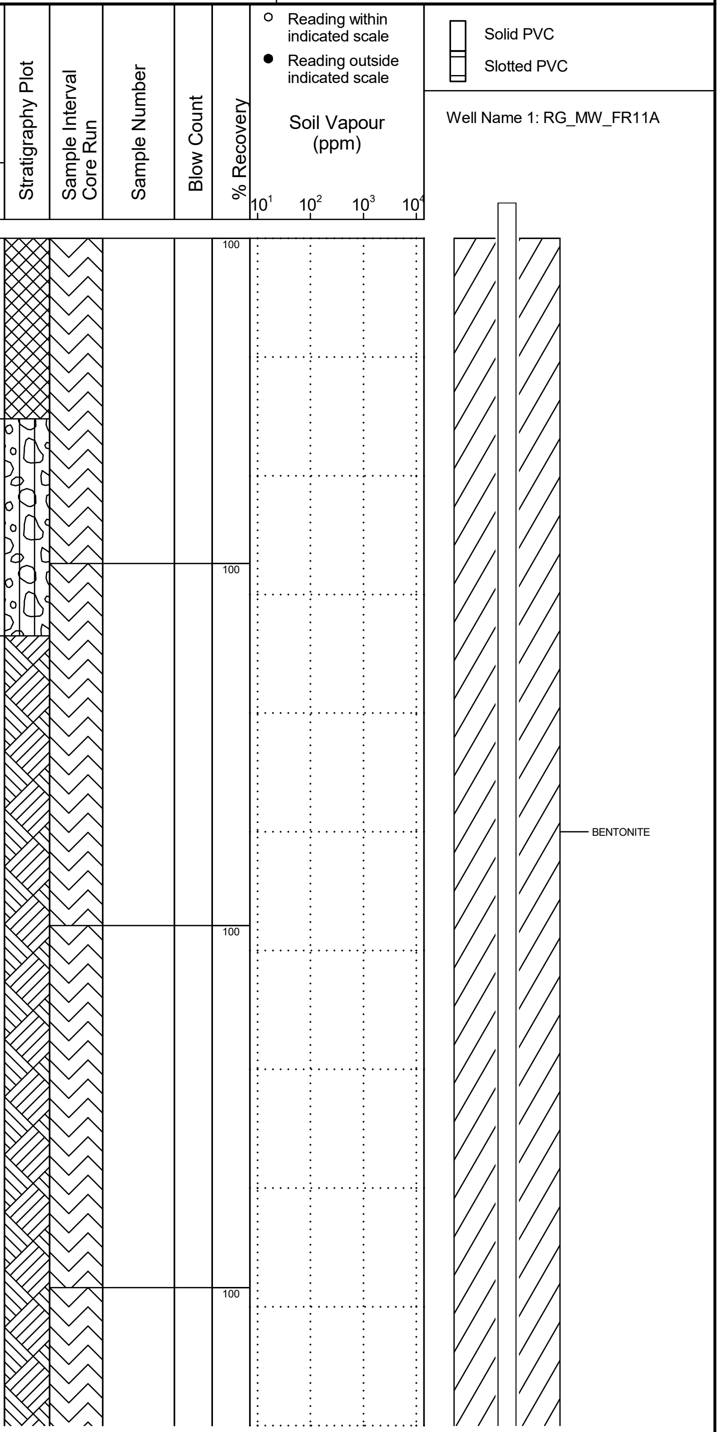
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

☐ Solid PVC
☐ Slotted PVC

Well Name 1: RG_MW_FR11A

Depth in Metres	Soil Description
0	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded, some silt, brown, loose, damp, fill material. At 0.6 m - wood debris.
	GRAVELLY SILT, fine to coarse gravel, subangular, trace sand, fine to coarse grained, brown, dense, damp. At 2.7 m - orange oxidation.
	BEDROCK, siltstone, dark grey, competent, fine grained, thinly bedded, intensely fractured with calcite mineralization restricted.



NOTES

QA/QC: KH 2022 01 25 Print Date:2022-03-17

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : RG_BH_FR11A**
	Location **Regional Groundwater Monitoring**	PAGE 2 OF 3

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	n/a	Project Number:	683032
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	1499.780	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1500.597	Date Drilled:	2021 09 11
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5545334.013	Easting: 652113.837	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- Vibrasonic

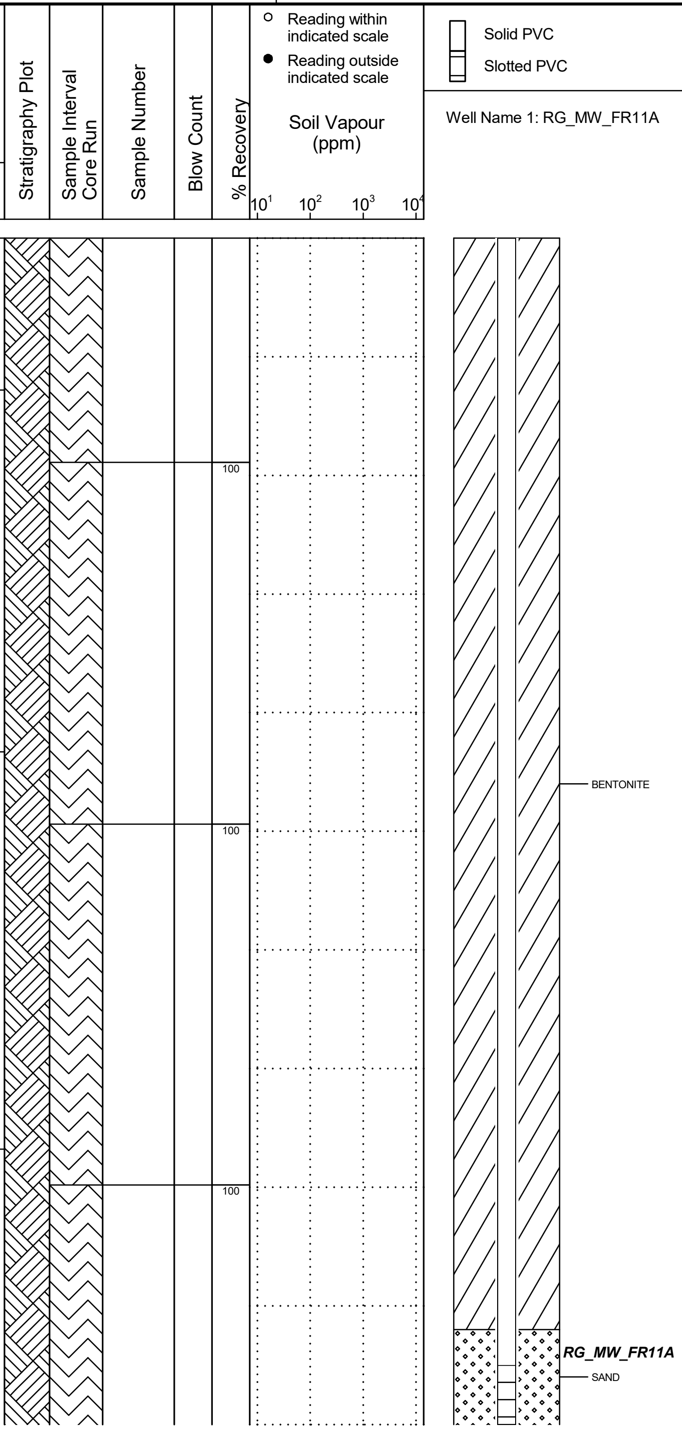
Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- Solid PVC
- Slotted PVC

Well Name 1: RG_MW_FR11A

Depth in Metres	Soil Description
10	BEDROCK, siltstone, dark grey, competent, fine grained, thinly bedded, intensely fractured with calcite mineralization restricted. *(continued)*
11	BEDROCK, siltstone, dark grey, competent, fine grained, thinly bedded, intensely fractured.
12	
13	
14	BEDROCK, siltstone, dark grey, competent, fine grained, medium bedded, moderately fractured with calcite mineralization.
15	
16	
17	BEDROCK, siltstone, dark grey, competent, fine grained, thinly bedded, intensely fractured.
18	
19	
20	



NOTES

QA/QC: KH 2022 01 25 Print Date:2022-03-17

FINAL

SNC•LAVALIN	Client **Teck Coal Limited**	**Borehole No. : RG_BH_FR11A**
	Location **Regional Groundwater Monitoring**	PAGE 3 OF 3

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	n/a	Project Number:	683032
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	1499.780	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1500.597	Date Drilled:	2021 09 11
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5545334.013	Easting: 652113.837	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ⋈ Vibrasonic

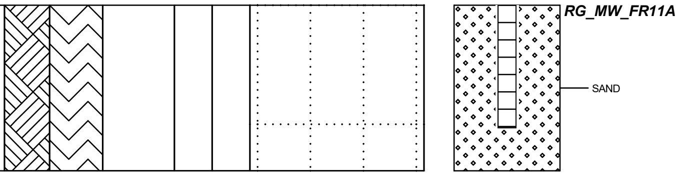
Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- Solid PVC
- Slotted PVC

Well Name 1: RG_MW_FR11A

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm) 10^1 10^2 10^3 10^4
20	BEDROCK, siltstone, dark grey, competent, fine grained, thinly bedded, intensely fractured. *(continued)*						
21.4	Bottom of hole at 21.4 m.						



NOTES

FINAL

SNC • LAVALIN	Client **Teck Coal Limited**	**Borehole No. : RG_BH_FR11B**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 2

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	n/a	Project Number:	683032
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	1499.791	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1500.662	Date Drilled:	2021 09 11
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5545335.311	Easting: 652112.884	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ⊠ Vibrasonic

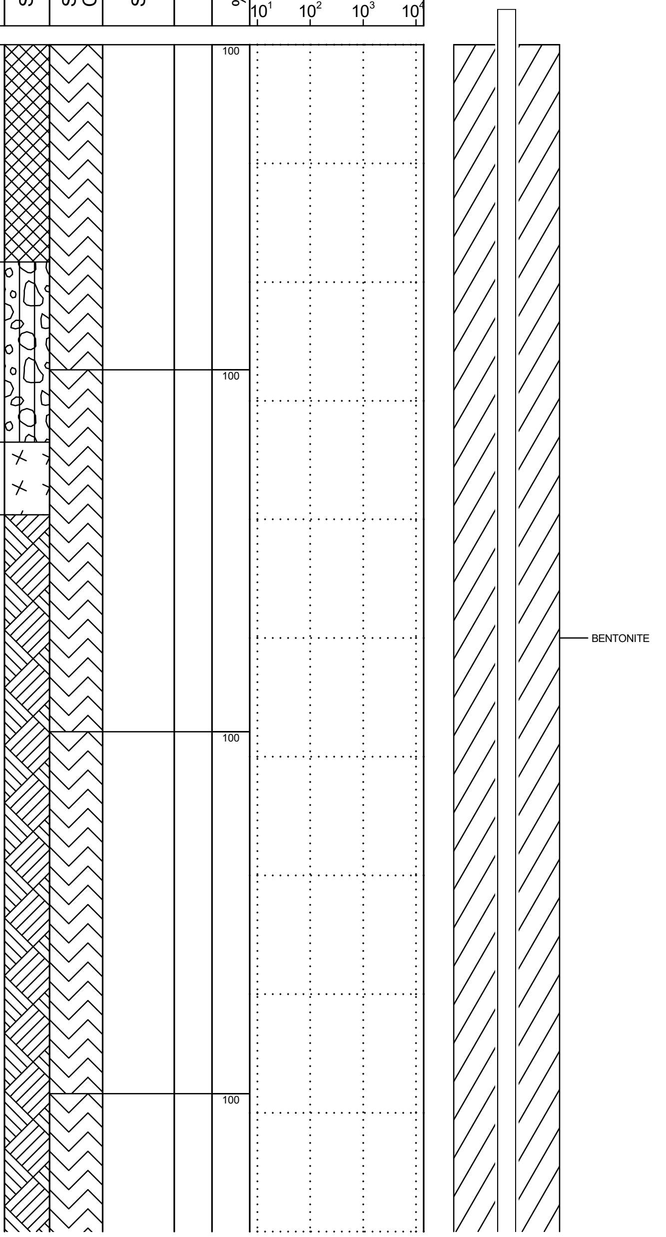
Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- Solid PVC
- Slotted PVC

Well Name 1: RG_MW_FR11B

Depth in Metres	Soil Description
0	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded, some silt, brown, loose, damp, fill material.
2	GRAVELLY SILT, fine to coarse gravel, subangular, trace sand, fine to coarse grained, trace clay, brown, dense, damp.
3	WEATHERED BEDROCK, siltstone, dark grey with light grey with light brown oxidation, moderate strength, intensely fractured.
4	BEDROCK, siltstone, dark grey, competent, fine grained, thinly bedded, intensely fractured with calcite mineralization restricted.



NOTES

QA/QC: KH 2022 01 25 Print Date:2022-03-17

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : RG_BH_FR11B**
	Location **Regional Groundwater Monitoring**	PAGE 2 OF 2

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	n/a	Project Number:	683032
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	1499.791	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1500.662	Date Drilled:	2021 09 11
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5545335.311	Easting: 652112.884	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ⋈ Vibrasonic

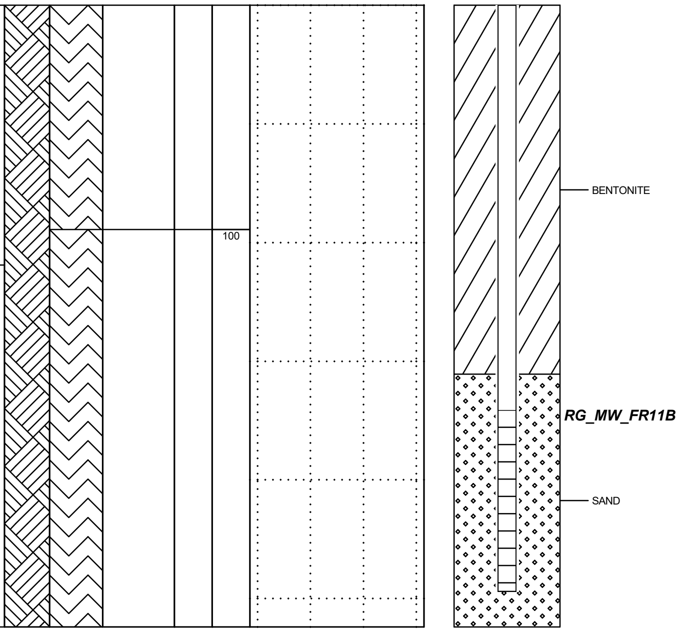
Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- Solid PVC
- Slotted PVC

Well Name 1: RG_MW_FR11B

Depth in Metres	Soil Description
10	BEDROCK, siltstone, dark grey, competent, fine grained, thinly bedded, intensely fractured with calcite mineralization restricted. *(continued)*
12.2	BEDROCK, siltstone, dark grey, competent, fine grained, thinly bedded, intensely fractured.
15.2	Bottom of hole at 15.2 m.



NOTES

SNC • LAVALIN	Client **Teck Coal Limited**	**Borehole No. : GH_BH-MC-1**
	Location **Greenhills Operations Mickelson Pond**	PAGE 1 OF 5

Drilling Contractor	Owen's Drilling	Date Monitored	2018 12 06	Project Number:	658004
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1313.098	Borehole Logged By:	MCA
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1314.011 1313.988	Date Drilled:	2018 11 15
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5553565.222	Easting: 647979.304	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
Auger Flight

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: GH_MW-MC-1S
Well Name 2: GH_MW-MC-1D

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm) 10^1 10^2 10^3 10^4

0

SAND, fine grained, silty, trace fine gravel, subrounded, loose, moist, some to trace organics (roots/rootlets).

1

SAND and GRAVEL, fine to medium grained sand, fine to coarse gravel, cobbles present, trace silt, subrounded, well graded, brown, loose to medium dense, damp to dry.

2

3

At 3.1 m - fine to coarse grained sand, no silt

4

From 4.3 m to 4.9 m - wet

5

SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, cobbles present, trace to some silt, subrounded, well graded, medium dense, wet.

6

7

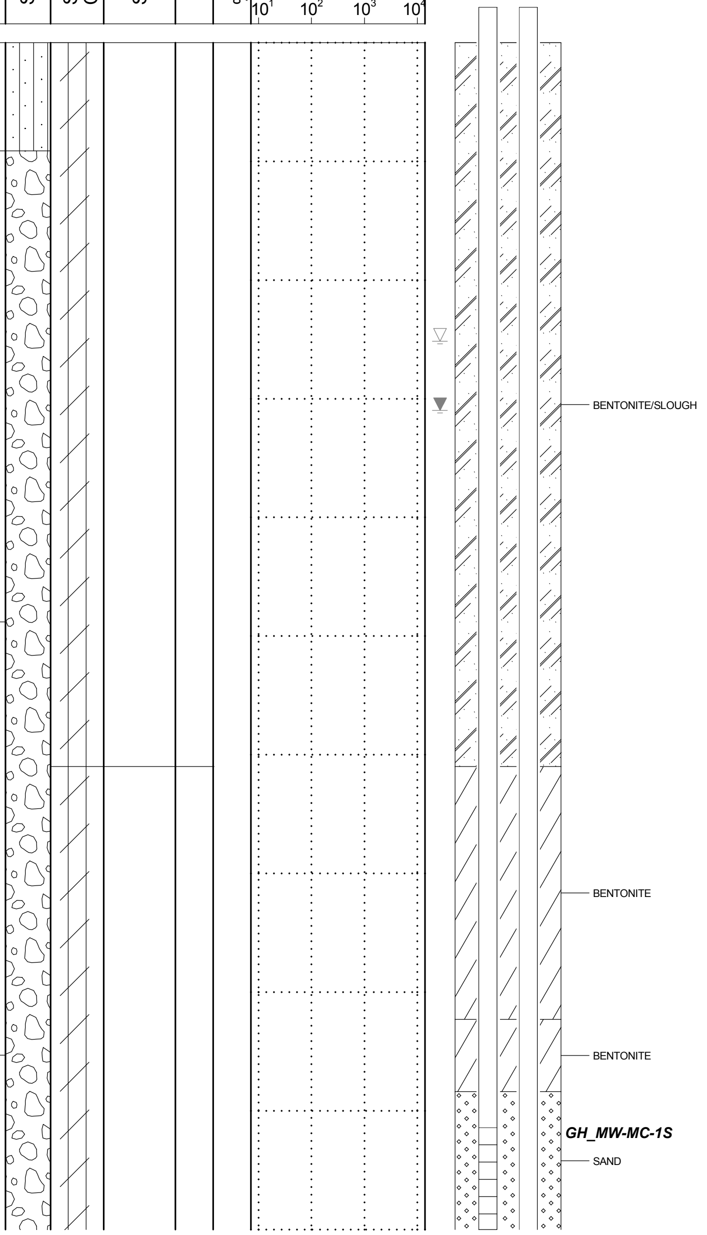
At 7.0 m - increase in gravel, dense, wet to moist

8

SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, trace silt, subrounded to rounded, well graded, brown, loose, wet.

9

10



NOTES
Water level 1 and first top of casing elevation is for GH_MW-MC-1S.
Water level 2 and second top of casing elevation is for GH_MW-MC-1D.

QA: MCA 2019 01 14 Print Date:2019-12-04

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : GH_BH-MC-1**
	Location **Greenhills Operations Mickelson Pond**	PAGE 2 OF 5

Drilling Contractor	Owen's Drilling	Date Monitored	2018 12 06	Project Number:	658004
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1313.098	Borehole Logged By:	MCA
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1314.011 1313.988	Date Drilled:	2018 11 15
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5553565.222	Easting: 647979.304	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
Auger Flight

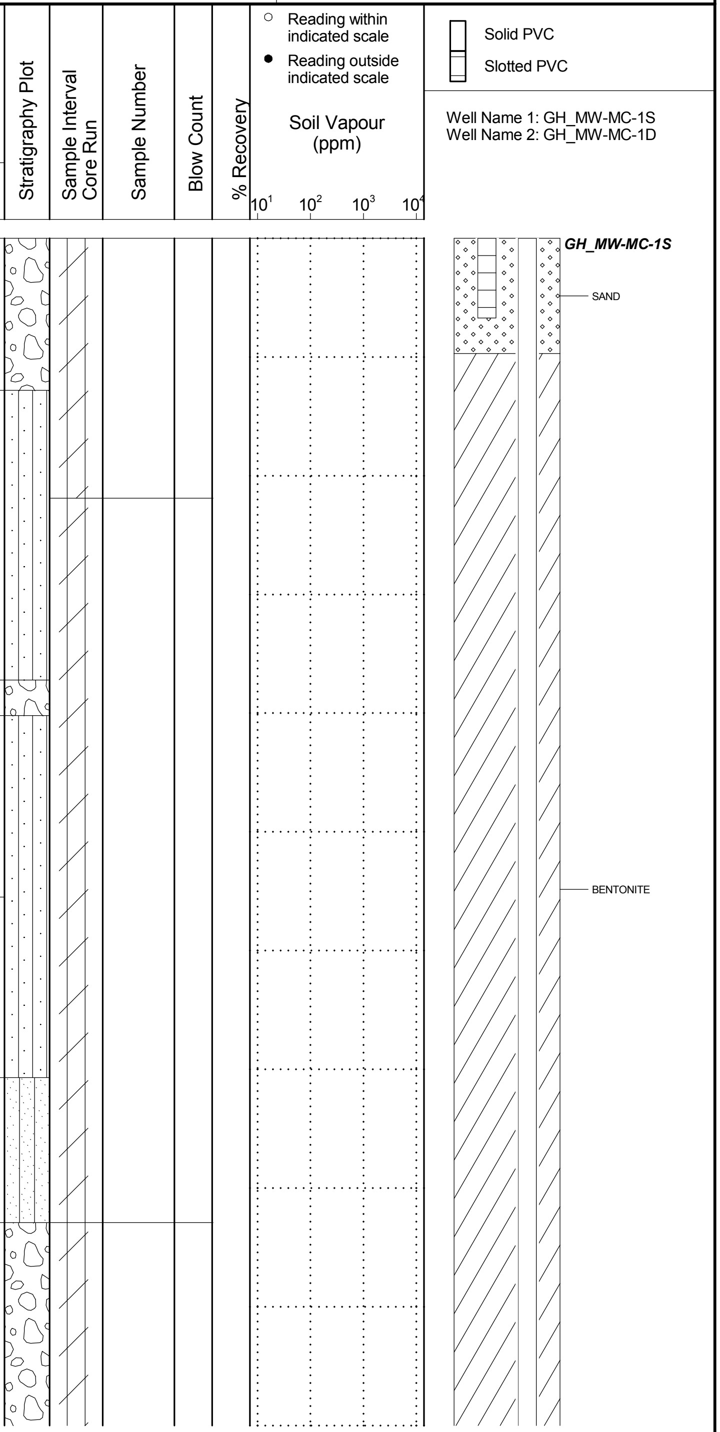
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: GH_MW-MC-1S
Well Name 2: GH_MW-MC-1D

Depth in Metres	Soil Description
10	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, trace silt, subrounded to rounded, well graded, brown, loose, wet. *(continued)*
11	SILT, some fine grained sand, trace fine to coarse gravel, subrounded, brown to dark brown, firm, damp.
12	At 12.2 m - damp to dry
13	
14	SAND and GRAVEL, fine to medium grained sand, fine to coarse gravel, some silt, subrounded, well graded, brown, dense, damp to dry.
	SAND, fine grained, silty, some to trace gravel, fine to coarse, subrounded, poorly graded, brown, dense, damp to dry.
15	SILT, sandy, fine grained, trace fine gravel, brown, firm, damp to dry.
16	
17	SAND, fine to medium grained, silty, some gravel, fine to coarse, subrounded, well graded, brown, damp.
18	SAND and GRAVEL, fine to medium grained sand, fine to coarse gravel, some silt, subrounded, well graded, brown, dense, damp.
19	
20	



NOTES
Water level 1 and first top of casing elevation is for GH_MW-MC-1S.
Water level 2 and second top of casing elevation is for GH_MW-MC-1D.

QA: MCA 2019 01 14 Print Date:2019-12-04

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : GH_BH-MC-1**
	Location **Greenhills Operations Mickelson Pond**	PAGE 3 OF 5

Drilling Contractor	Owen's Drilling	Date Monitored	2018 12 06	Project Number:	658004
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1313.098	Borehole Logged By:	MCA
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1314.011 1313.988	Date Drilled:	2018 11 15
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5553565.222	Easting: 647979.304	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
☐ Auger Flight

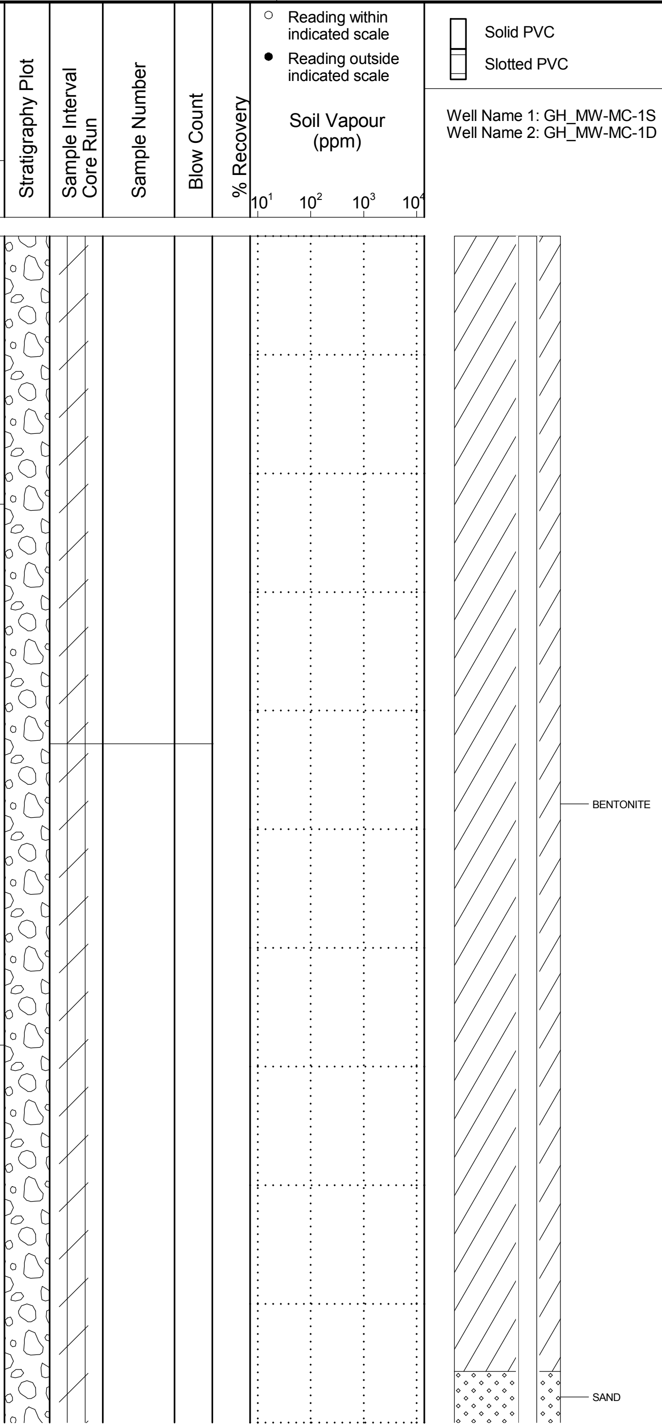
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

☐ Solid PVC
☐ Slotted PVC

Well Name 1: GH_MW-MC-1S
Well Name 2: GH_MW-MC-1D

Depth in Metres	Soil Description
20	SAND and GRAVEL, fine to medium grained sand, fine to coarse gravel, some silt, subrounded, well graded, brown, dense, damp. *(continued)*
21	
22	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, trace silt, well graded, brown, medium dense, moist. At 22.6 m - some silt to silty, loose, wet
23	
24	
25	
26	
27	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, some to trace silt, subrounded to subangular, well graded, loose, wet. At 27.7 m - some silt
28	
29	At 29.0 m - trace silt
30	



NOTES
Water level 1 and first top of casing elevation is for GH_MW-MC-1S.
Water level 2 and second top of casing elevation is for GH_MW-MC-1D.

SNC • LAVALIN

Client
Teck Coal Limited

Location
Greenhills Operations Mickelson Pond

Borehole No. : GH_BH-MC-1

PAGE 4 OF 5

Drilling Contractor	Owen's Drilling	Date Monitored	2018 12 06	Project Number:	658004
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1313.098	Borehole Logged By:	MCA
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1314.011 1313.988	Date Drilled:	2018 11 15
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5553565.222	Easting: 647979.304	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
Auger Flight

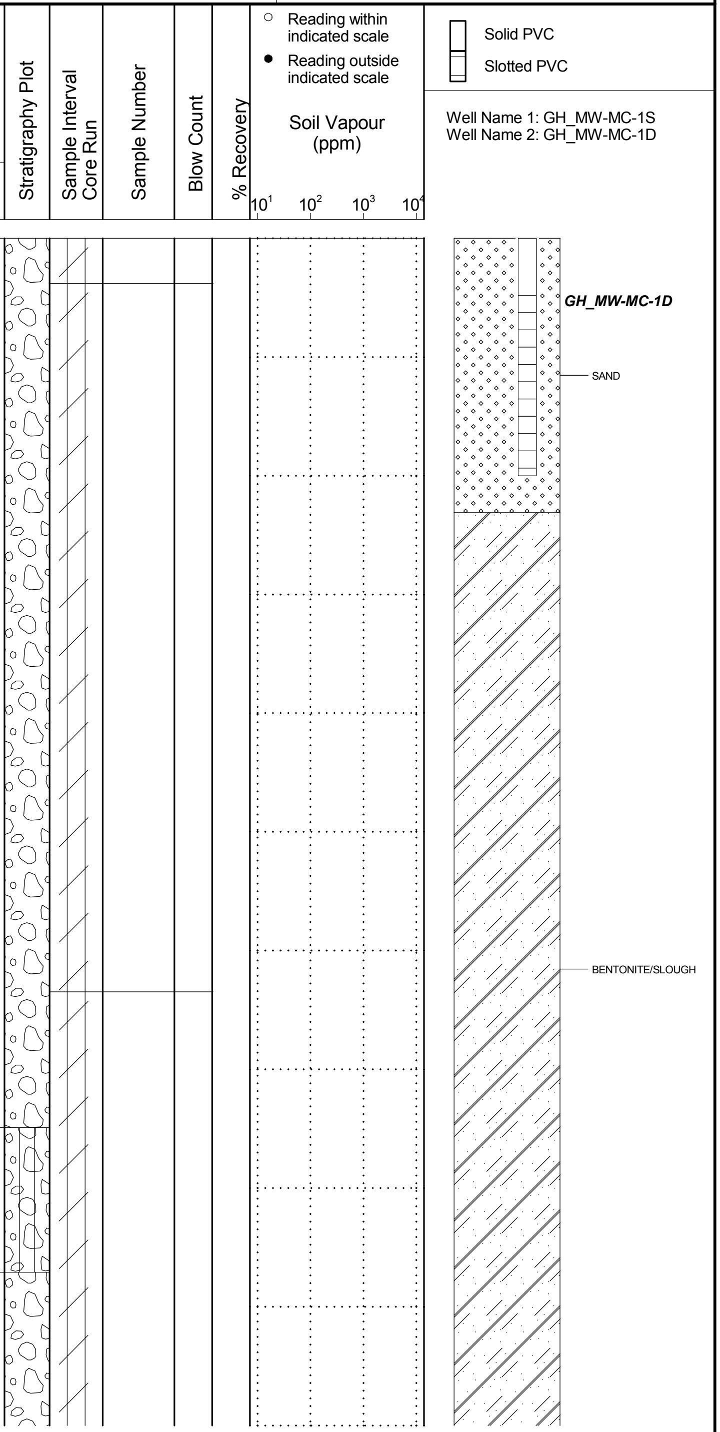
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: GH_MW-MC-1S
Well Name 2: GH_MW-MC-1D

Depth in Metres	Soil Description
30	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, some to trace silt, subrounded to subangular, well graded, loose, wet. *(continued)*
31	
32	
33	
34	
35	At 35.4 m - some silt
36	At 36.3 m - silty
37	SAND and GRAVEL, fine grained sand, fine to coarse gravel, silty, subrounded to subangular, poorly graded, wet.
38	GRAVEL, fine to coarse, some fine grained sand, some silt to silty, subangular to angular, poorly graded, dark grey to brown, wet to moist (possibly weathered bedrock).
39	
40	



NOTES
Water level 1 and first top of casing elevation is for GH_MW-MC-1S.
Water level 2 and second top of casing elevation is for GH_MW-MC-1D.

SNC·LAVALIN

Client
Teck Coal Limited

Location
Greenhills Operations Mickelson Pond

Borehole No. : GH_BH-MC-1

Drilling Contractor	Owen's Drilling	Date Monitored	2018 12 06	Project Number:	658004
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1313.098	Borehole Logged By:	MCA
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1314.011 1313.988	Date Drilled:	2018 11 15
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5553565.222	Easting: 647979.304	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
☐ Auger Flight

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

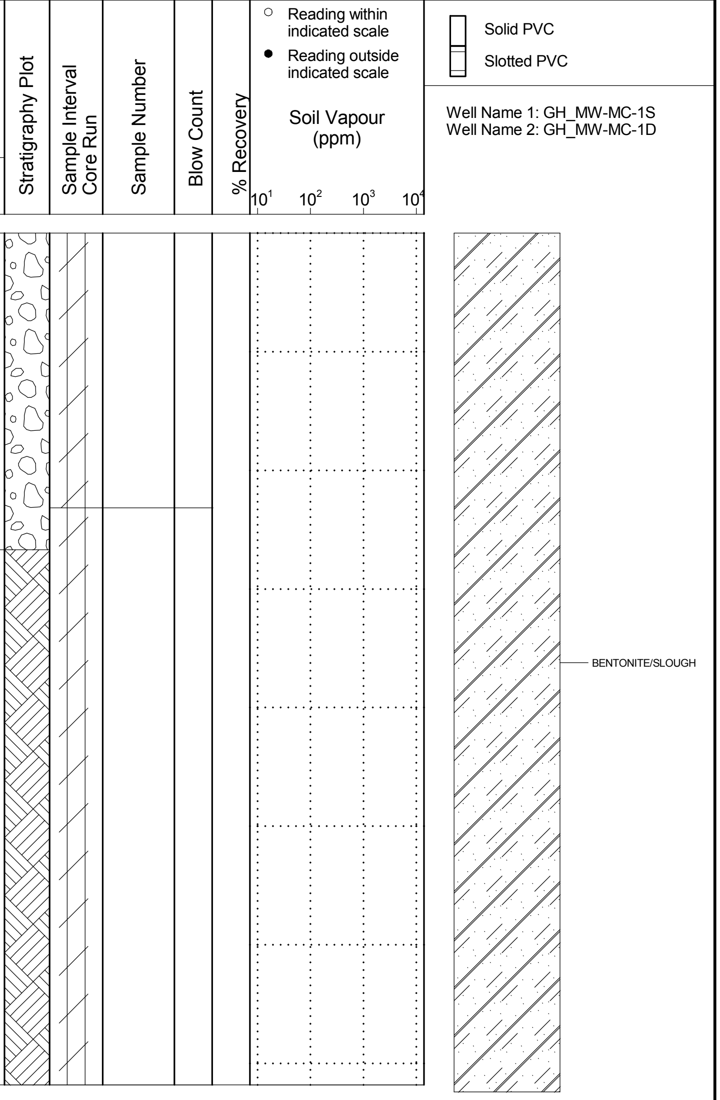
○ Reading within indicated scale
● Reading outside indicated scale

Soil Vapour (ppm)

Solid PVC
Slotted PVC

Well Name 1: GH_MW-MC-1S
Well Name 2: GH_MW-MC-1D

Depth in Metres	Soil Description
40	GRAVEL, fine to coarse, some fine grained sand, some silt to silty, subangular to angular, poorly graded, dark grey to brown, wet to moist (possibly weathered bedrock). *(continued)* At 40.2 m - moist At 40.8 m - wet
42.7	BEDROCK, fine grained, grey to dark grey, moderately weathered.
47.2	Bottom of hole at 47.2 m.



Depth scale: 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50

NOTES
Water level 1 and first top of casing elevation is for GH_MW-MC-1S.
Water level 2 and second top of casing elevation is for GH_MW-MC-1D.

SNC·LAVALIN

Client
Teck Coal Limited

Location
Greenhills Operations Mickelson Pond

Borehole No. : GH_BH-MC-2

PAGE 1 OF 2

Drilling Contractor	Owen's Drilling	Date Monitored	2018 12 06	Project Number:	658004
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1314.150	Borehole Logged By:	MCA
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1315.115 1315.132	Date Drilled:	2018 11 14
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5553498.261	Easting: 648210.667	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▭ Auger Flight

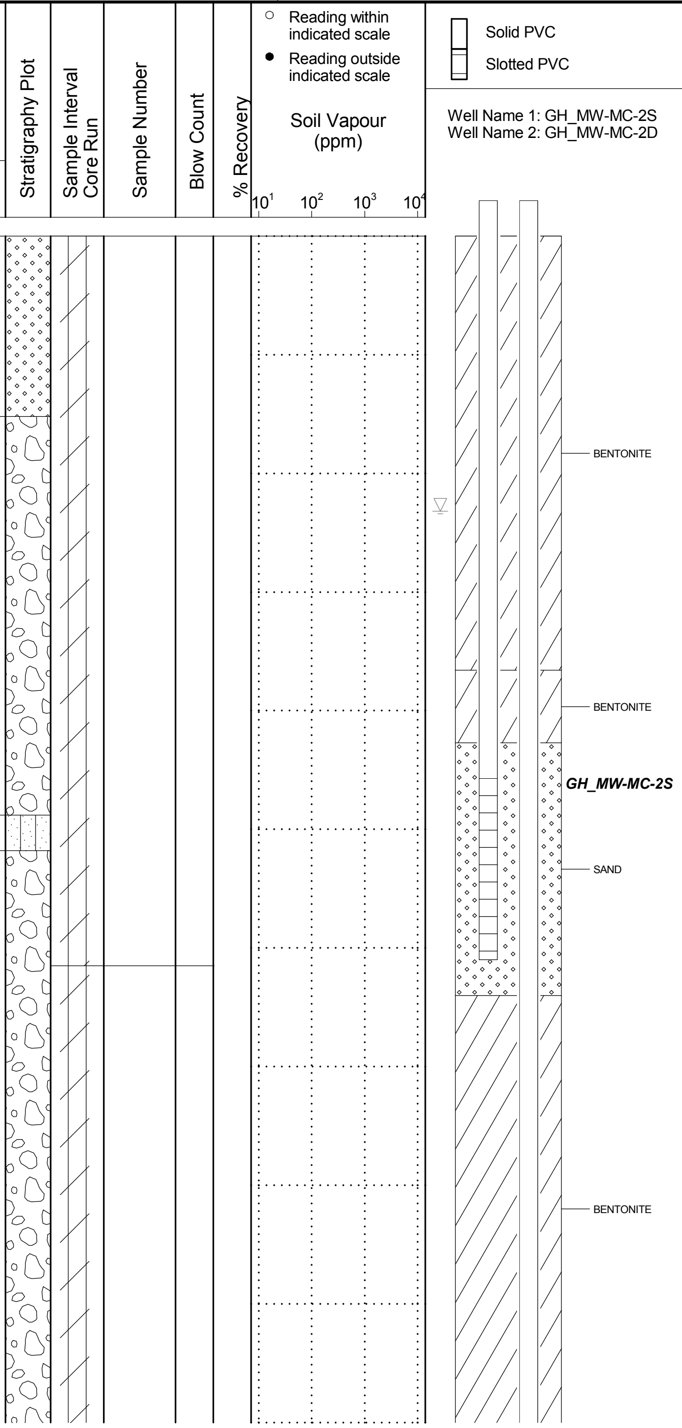
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

▯ Solid PVC
▤ Slotted PVC

Well Name 1: GH_MW-MC-2S
Well Name 2: GH_MW-MC-2D

Depth in Metres	Soil Description
0	SAND, fine to medium grained, trace fine gravel, subrounded to subangular, poorly graded, dark brown, loose, dry.
1	
2	SAND and GRAVEL, fine to medium grained sand, fine to coarse gravel, subangular to subrounded, cobbles present, well graded, brown, loose, damp/dry.
3	At 3.1 m - fine grained sand, poorly graded
4	
5	SILT, some fine to medium grained sand, trace to some fine to coarse gravel, subangular to subrounded, soft to medium firm, wet.
	SAND and GRAVEL, fine to medium grained sand, fine to coarse gravel, some silt, subangular to subrounded, well graded, brown to dark brown, medium dense, damp to dry.
6	At 6.1 m - increased fine grained sand, trace to some silt, dense
7	
8	
9	
10	



NOTES
Water level 1 and first top of casing elevation is for GH_MW-MC-2S.
Water level 2 and second top of casing elevation is for GH_MW-MC-2D.
GH_MW-MC-2S monitored 2018 11 18.

SNC·LAVALIN

Client
Teck Coal Limited

Location
Greenhills Operations Mickelson Pond

Borehole No. : GH_BH-MC-2

PAGE 2 OF 2

Drilling Contractor	Owen's Drilling	Date Monitored	2018 12 06	Project Number:	658004
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1314.150	Borehole Logged By:	MCA
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1315.115 1315.132	Date Drilled:	2018 11 14
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5553498.261	Easting: 648210.667	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
Auger Flight

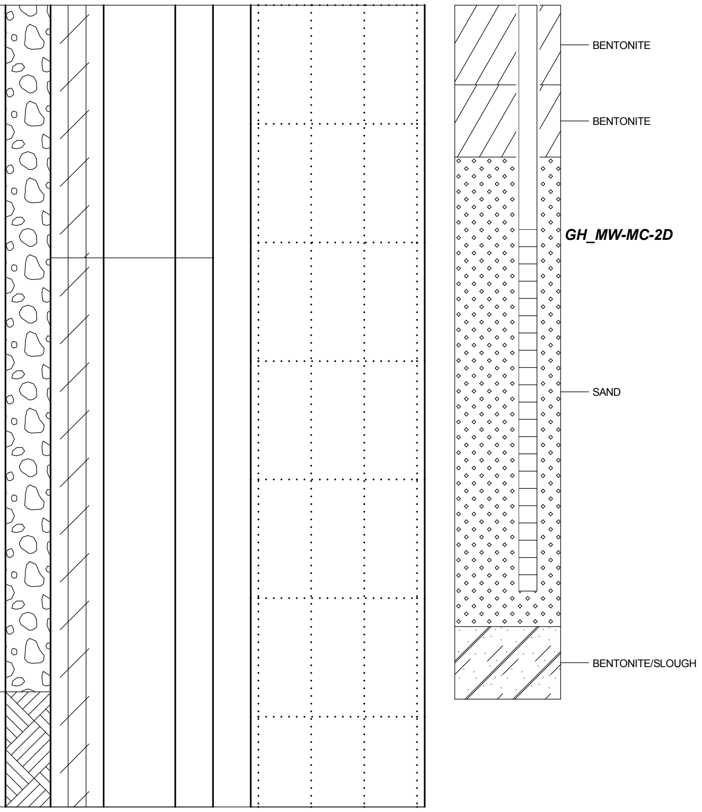
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: GH_MW-MC-2S
Well Name 2: GH_MW-MC-2D

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm) 10^1 10^2 10^3 10^4
10	SAND and GRAVEL, fine to medium grained sand, fine to coarse gravel, some silt, subangular to subrounded, well graded, brown to dark brown, medium dense, damp to dry. *(continued)*						
11.6	At 11.6 m - moist						
12.2	At 12.2 m - damp to dry						
15.8	BEDROCK, fine grained, grey to dark grey, moderately weathered.						
16.8	Bottom of hole at 16.8 m.						



Depth scale: 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20

NOTES
Water level 1 and first top of casing elevation is for GH_MW-MC-2S.
Water level 2 and second top of casing elevation is for GH_MW-MC-2D.
GH_MW-MC-2S monitored 2018 11 18.

QA: MCA 2019 01 14 Print Date:2019-12-04

DATA ENTRY: IPG

RECORD OF MONITORING WELL: GA-MW-04

PROJECT No.: 11.1422.0052
LOCATION: See Location Plan
N: 5552963 E: 648217

BORING DATE: September 20, 2012

SHEET 1 OF 2

DATUM: UTM Zone 11
(Nad 83)

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20 40 60 80
SHEAR STRENGTH Cu, kPa: nat V. + Q - ● rem V. ⊕ U - ○ 20 40 60 80
HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-6} 10^{-5} 10^{-4} 10^{-3}
WATER CONTENT PERCENT: Wp ⊢—○W—⊣ Wl 10 20 30 40

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	ELEV. DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	ADDITIONAL LAB. TESTING
0	Barber Rig – Air Rotary Tervita	Ground Surface	1304.00				
		(SP) GRAVELLY SAND, coarse-grained, fine gravel, sub-angular, poorly-graded, dark grey	0.00				
4.5				1	GRAB		
9		(SM) SILTY SAND, medium to fine-grained, sub-rounded, poorly-graded, brown and dark grey	1295.00 9.00				
9.5				2	GRAB		
10			1294.00				

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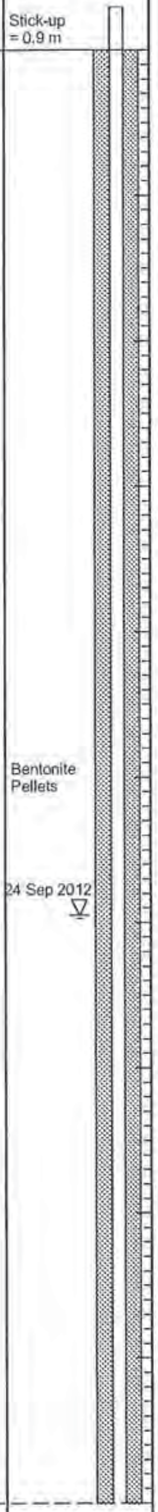
PIEZOMETER OR STANDPIPE INSTALLATION



DEPTH SCALE
1 : 50

Golder Associates

LOGGED: TG
CHECKED: JW

DATA ENTRY: IPG

PROJECT No.: 11.1422.0052

LOCATION: See Location Plan

N: 5552963 E: 648217

RECORD OF MONITORING WELL: GA-MW-04

BORING DATE: September 20, 2012

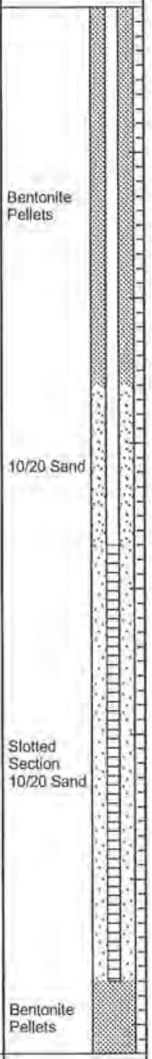
SHEET 2 OF 2

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○ (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}); WATER CONTENT PERCENT Wp ⊢ ○W ⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING
10	Barber Rig – Air Rotary Tervita	(SP) GRAVELLY SAND, coarse-grained, fine gravel, sub-angular, poorly-graded, dark grey	10.00						
12				3	GRAB				
14		(SM) SILTY SAND, medium to fine-grained, sub-rounded, poorly-graded, brown and dark grey	1290.00 14.00	4	GRAB				
		(GW) GRAVEL, fine with coarse, sub-angular to sub-rounded, well graded, grey	1289.50 14.50						
16				5	GRAB				
17		(SP) GRAVELLY SAND, coarse-grained, fine gravel, poorly-graded, sub-angular, dark grey	1287.00 17.00	6	GRAB				
		End of MONITORING WELL.	17.20						

NOTES:
Standpipe installed to 16.7 m.
Groundwater present at 6.0 m on September 24, 2012.

PIEZOMETER OR STANDPIPE INSTALLATION



DEPTH SCALE
1 : 50

Golder Associates

LOGGED: TG
CHECKED: JW

BOREHOLE - EXPANDED ADD. LAB TESTING 11.1422.0052_BH LOGS.GPJ CALGARY.GDT 7/30/15

FINAL

SNC-LAVALIN	Client **Teck Coal Limited**	**Borehole No. : RG_BH_LC3A**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 3

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	2020 06 16	Project Number:	631283
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	1318.325	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1319.040	Date Drilled:	2020 06 05
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5552736.051	Easting: 648181.849	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
⋀ Vibrasonic

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

☐ Solid PVC
☐ Slotted PVC

Well Name 1: RG_MW_LC3A

Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm)

SILTY CLAY (TOPSOIL), some gravel, fine to coarse, rounded to subrounded, medium plastic, damp, organics.

SILTY CLAY, trace gravel, fine, rounded to subrounded, grey-brown, mottled, high plastic, damp.

SILTY GRAVEL, some clay, grey-brown, mottled, low plastic, damp.

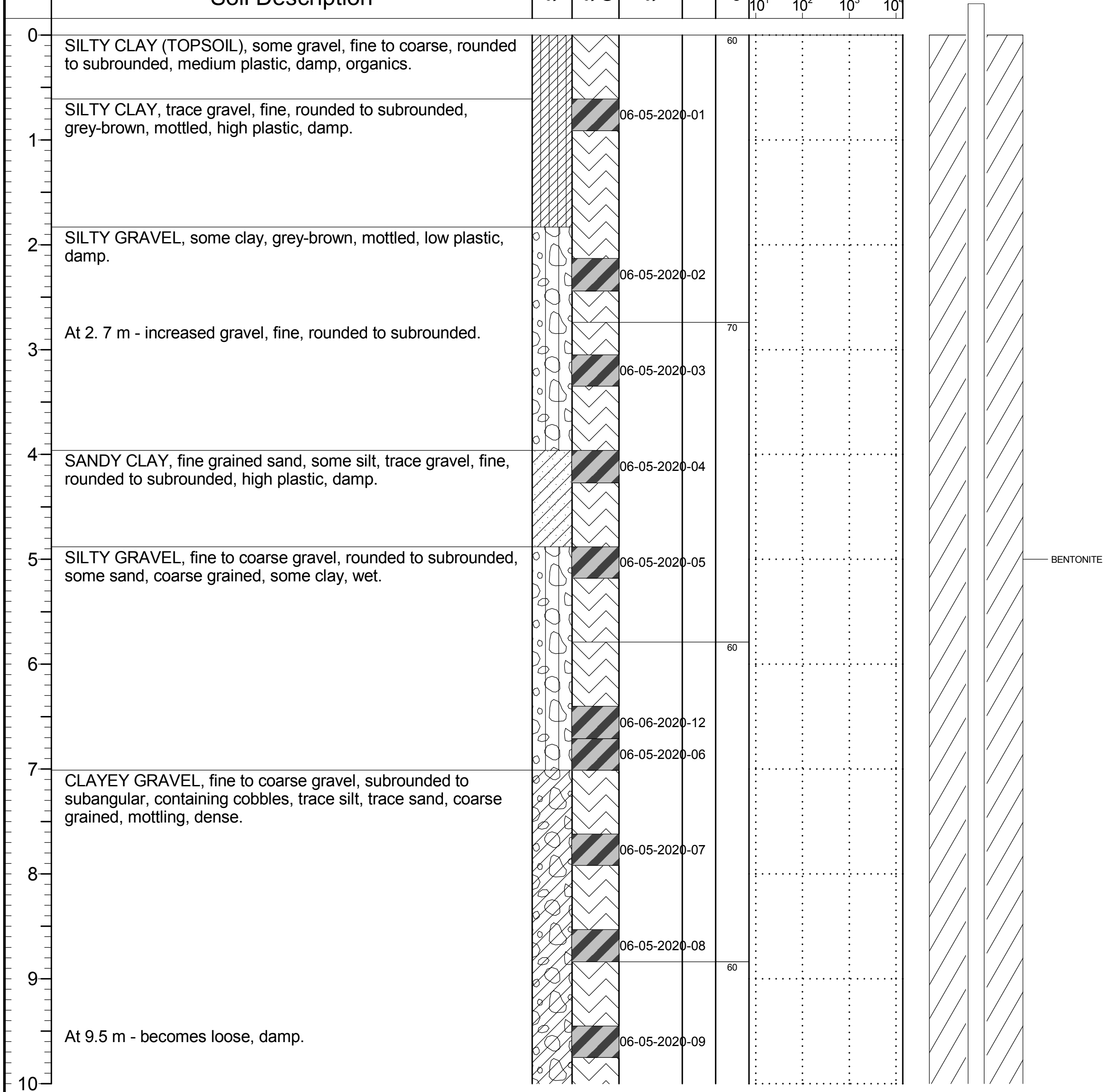
At 2. 7 m - increased gravel, fine, rounded to subrounded.

SANDY CLAY, fine grained sand, some silt, trace gravel, fine, rounded to subrounded, high plastic, damp.

SILTY GRAVEL, fine to coarse gravel, rounded to subrounded, some sand, coarse grained, some clay, wet.

CLAYEY GRAVEL, fine to coarse gravel, subrounded to subangular, containing cobbles, trace silt, trace sand, coarse grained, mottling, dense.

At 9.5 m - becomes loose, damp.



NOTES
Bolded sample denotes sample analyzed.

QA/QC: LLH 2020 09 02 Print Date:2020-12-02

FINAL

SNC • LAVALIN

Client **Teck Coal Limited**		**Borehole No. : RG_BH_LC3A**
Location **Regional Groundwater Monitoring**		PAGE 2 OF 3

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	2020 06 16	Project Number:	631283
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	1318.325	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1319.040	Date Drilled:	2020 06 05
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5552736.051	Easting: 648181.849	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
⋀⋀ Vibrasonic

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

▯ Solid PVC
▤ Slotted PVC

Well Name 1: RG_MW_LC3A

Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) 10^1 10^2 10^3 10^4

10

CLAYEY GRAVEL, fine to coarse gravel, subrounded to subangular, containing cobbles, trace silt, trace sand, coarse grained, mottling, dense. *(continued)*

11

At 11.3 m - dry.

12

GRAVEL, fine to coarse, rounded, containing cobbles, some sand, fine to coarse grained, trace silt, wet.

13

14

SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, rounded to subrounded, containing cobbles, trace silt, trace clay, wet.

15

CLAY and GRAVEL, fine to coarse gravel, rounded to subrounded, brown, very dense.

16

At 15.8 m - grey.

At 16.5 m - increased coarse gravel.

17

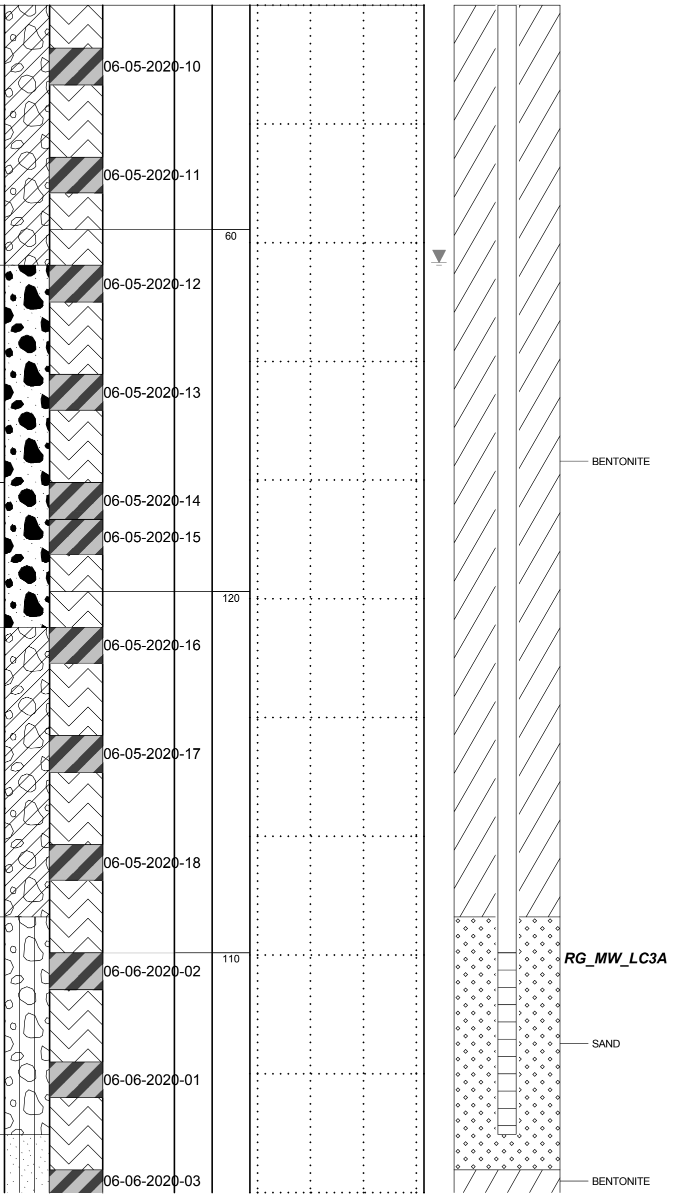
SAND and GRAVEL, coarse grained sand, rounded to subrounded, fine gravel, trace coarse gravel, rounded to subrounded, some silt, brown, loose, wet.

18

19

SAND, fine to medium grained, some silt, trace gravel, fine, subrounded, trace clay, brown, loose, wet.

20



NOTES
Bolded sample denotes sample analyzed.

QA/QC: LLH 2020 09 02 Print Date:2020-12-02

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : RG_BH_LC3A**
	Location **Regional Groundwater Monitoring**	PAGE 3 OF 3

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	2020 06 16	Project Number:	631283
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	1318.325	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1319.040	Date Drilled:	2020 06 05
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5552736.051	Easting: 648181.849	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
Vibrasonic

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: RG_MW_LC3A

Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) 10^1 10^2 10^3 10^4

20 — SAND, fine to medium grained, some silt, trace gravel, fine, subrounded, trace clay, brown, loose, wet. *(continued)*
At 20.1 m - increased fine grained sand, increased silt.

21 — At 21.0 m - increased fine gravel, loose.

SILTY SAND, fine grained sand, some clay, trace gravel, fine, rounded to subrounded, dense, wet.

23 — At 23.5 m - increased fine gravel.

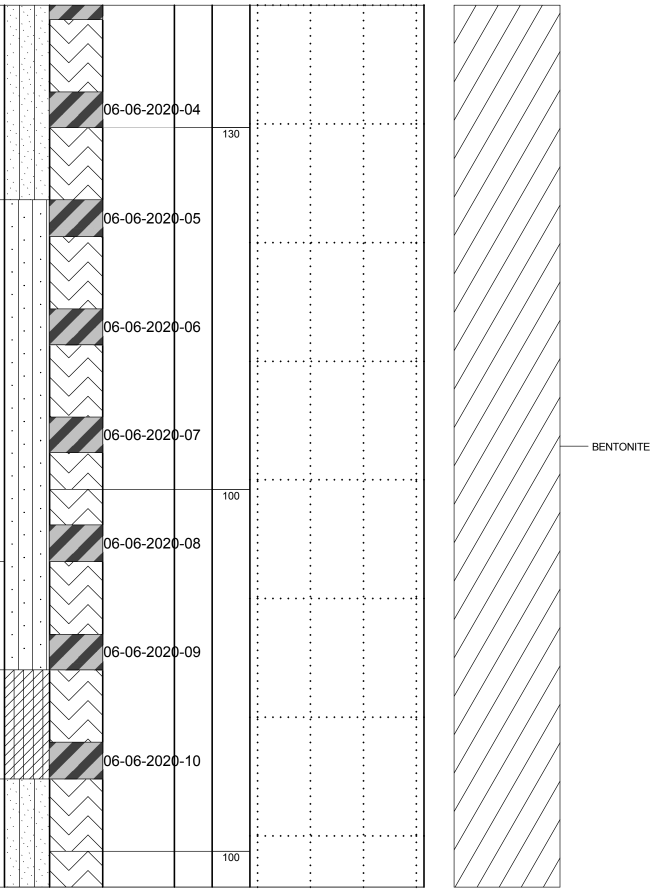
SILTY SAND, fine grained sand, some clay, trace gravel, fine, dense, damp.

SILTY CLAY, some sand, medium grained, dense, high plasticity, damp.

SILTY SAND, fine to medium grained sand, some clay, high plasticity, moist.

Bottom of hole at 27.4 m.

20 21 22 23 24 25 26 27 28 29 30



NOTES
Bolded sample denotes sample analyzed.

QA/QC: LLH 2020 09 02 Print Date:2020-12-02

FINAL

SNC • LAVALIN	Client **Teck Coal Limited**	**Borehole No. : RG_BH_LC3B**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 2

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	2020 06 16	Project Number:	631283
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	1318.281	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1319.075	Date Drilled:	2020 06 06
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5552736.874	Easting: 648181.728	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
Vibrasonic

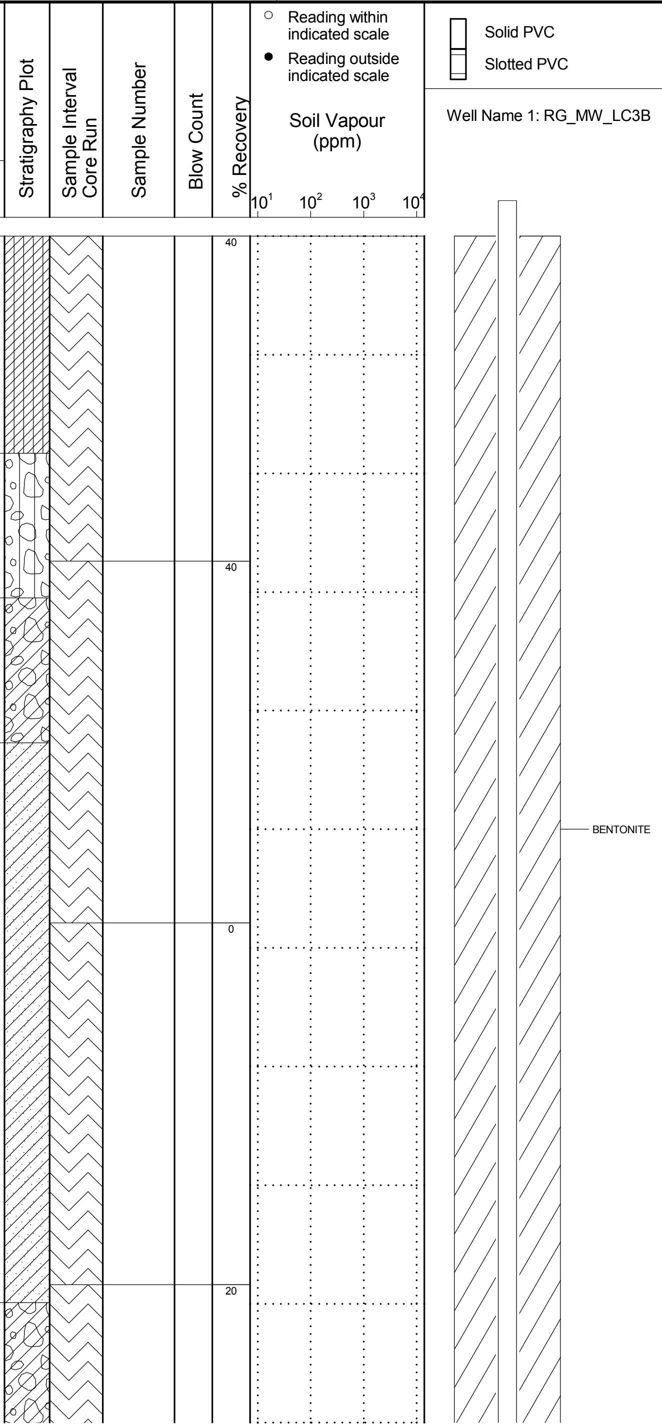
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

● Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: RG_MW_LC3B

Depth in Metres	Soil Description
0	SILTY CLAY, trace gravel, fine, trace sand, fine grained, grey, high plasticity, damp.
2	SILTY GRAVEL, fine to coarse gravel, rounded to subrounded, some sand, coarse grained, some clay, mottled, high plasticity, moist.
3	GRAVEL, fine to coarse, rounded to subrounded, containing cobbles, some clay, loose, moist.
4	CLAYEY SAND, fine grained sand, some gravel, fine to coarse, rounded to subrounded, dense, damp.
9	CLAYEY GRAVEL, fine to coarse gravel, rounded to subrounded, containing cobbles, some silt, loose, wet.
10	



NOTES
Bolded sample denotes sample analyzed.

QA/QC: LLH 2020 09 02 Print Date:2020-12-02

FINAL

SNC·LAVALIN

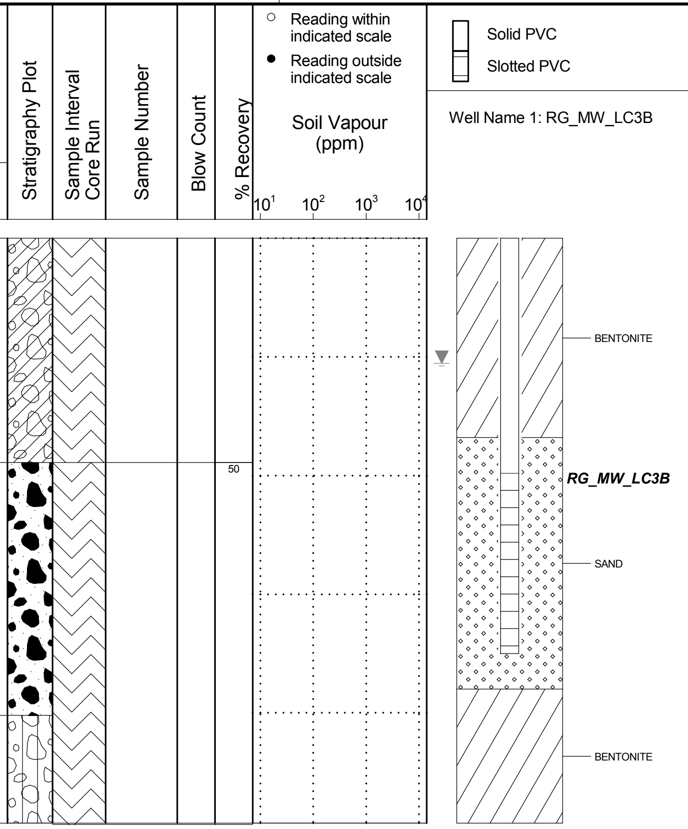
	Client **Teck Coal Limited**	**Borehole No. : RG_BH_LC3B**
	Location **Regional Groundwater Monitoring**	PAGE 2 OF 2

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	2020 06 16	Project Number:	631283
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	1318.281	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1319.075	Date Drilled:	2020 06 06
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5552736.874	Easting: 648181.728	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- Vibrasonic

Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

Depth in Metres	Soil Description
10	CLAYEY GRAVEL, fine to coarse gravel, rounded to subrounded, containing cobbles, some silt, loose, wet. *(continued)*
11.9	GRAVEL, fine to coarse, rounded, containing cobbles (0.1 m), some sand, coarse grained, subrounded, trace silt, loose, wet.
14	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, rounded, some silt, trace clay, dense, moist.
14.9	Bottom of hole at 14.9 m.



Depth scale: 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20

NOTES
Bolded sample denotes sample analyzed.

QA/QC: LLH 2020 09 02 Print Date:2020-12-02

GH_GA-MW-2

DATA ENTRY: IPG

PROJECT No.: 11.1422.0052

RECORD OF MONITORING WELL: GA-MW-02

SHEET 1 OF 3

LOCATION: See Location Plan

N: 5552115 E: 648291

BORING DATE: September 19, 2012

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○ (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		Ground Surface		1310.00							Stick-up = 1.02 m
0	Barber Rig – Air Rotary Tervita	(SP) SAND, coarse-grained, trace fine gravel, angular, poorly-graded, grey		0.00							
1											
2					1	GRAB					
3											
4											19 Sep 2012 ∇
5		(GP) GRAVEL, coarse-grained, sub-rounded, brown		1305.00 5.00							Bentonite Pellets
6					2	GRAB					
7		(CI) SILTY CLAY, some fine gravel, brown, cohesive, water content is close to plastic limit, very soft		1303.00 7.00							
8					3	GRAB					
9											
10				1300.00							

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: TG
CHECKED: JW

BOREHOLE - EXPANDED ADD. LAB TESTING 11.1422.0052_BH LOGS.GPJ CALGARY.GDT 7/30/15

DATA ENTRY: IPG

PROJECT No.: 11.1422.0052

RECORD OF MONITORING WELL: GA-MW-02

SHEET 2 OF 3

LOCATION: See Location Plan
N: 5552115 E: 648291

BORING DATE: September 19, 2012

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}); WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10	Barber Rig – Air Rotary Tervita	(GW) GRAVEL, coarse-grained, sub-angular, well graded, grey		10.00	4	GRAB					Bentonite Pellets
11				1298.50							
		(CI) SILTY CLAY, with some fine gravel, brown, cohesive, very soft, w~PL		11.50							
12											
13											
14					5	GRAB					
15											
16											
17				1292.80							
		(SP) SAND, coarse-grained, some fine gravel, angular, poorly-graded, dark grey		17.20							
18					6	GRAB					
19				1290.50							
		(GW) GRAVEL, coarse-grained, sub-angular, well graded, grey		19.50	7	GRAB					
20											

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: TG
CHECKED: JW

BOREHOLE - EXPANDED ADD. LAB TESTING 11.1422.0052_BH LOGS.GPJ CALGARY.GDT 7/30/15

DATA ENTRY: IPG

PROJECT No.: 11.1422.0052

RECORD OF MONITORING WELL: GA-MW-02

SHEET 3 OF 3

LOCATION: See Location Plan
N: 5552115 E: 648291

BORING DATE: September 19, 2012

DATUM: UTM Zone 11 (Nad 83)

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20 40 60 80
SHEAR STRENGTH Cu, kPa: nat V. + Q - ● rem V. ⊕ U - ○ 20 40 60 80
HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-6} 10^{-5} 10^{-4} 10^{-3}
WATER CONTENT PERCENT: Wp ⊢—○W—⊣ Wl 10 20 30 40

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
20	Barber Rig – Air Rotary Tervita	(GW) GRAVEL, coarse-grained, sub-angular, well graded, grey *(continued)*						Bentonite Pellets
21				7	GRAB			10/20 Sand
22								
23		(ML) SILT, some fine gravel, trace coarse gravel, dark grey, non-cohesive, dry	1287.00 23.00	8	GRAB			
24		(SP) SAND, coarse-grained, some fine gravel, angular, poorly-graded, dark grey	1286.00 24.00					
25								
26				9	GRAB			Slotted Section 10/20 Sand
27								
28		— Bedrock at 28.5 m						
29		NOTES: Encountered BEDROCK at 28.5 m. Standpipe installed to 29.0 m. Groundwater level measured at 11.0 mGL on September 19, 2012.						Bentonite Pellets
		(SP) SAND, coarse-grained, coarse gravel, bits of bedrock, sub-angular, poorly-graded, light grey	1280.50 29.60	10	GRAB			
30		End of MONITORING WELL.						

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: TG
CHECKED: JW

BOREHOLE - EXPANDED ADD. LAB TESTING 11.1422.0052_BH LOGS.GPJ CALGARY.GDT 7/30/15

FINAL

SNC·LAVALIN

Client **Teck Coal Limited**		**Borehole No. : RG_BH_WC2A**
Location **Regional Groundwater Monitoring**		PAGE 1 OF 4

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	2020 06 16	Project Number:	631283
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	1304.009	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1304.868	Date Drilled:	2020 06 08
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5552079.286	Easting: 648195.937	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ⋀ Vibrasonic

Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- Solid PVC
- Slotted PVC

Well Name 1: RG_MW_WC2A

Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm)

SILTY SAND (TOPSOIL), black, damp, organics.

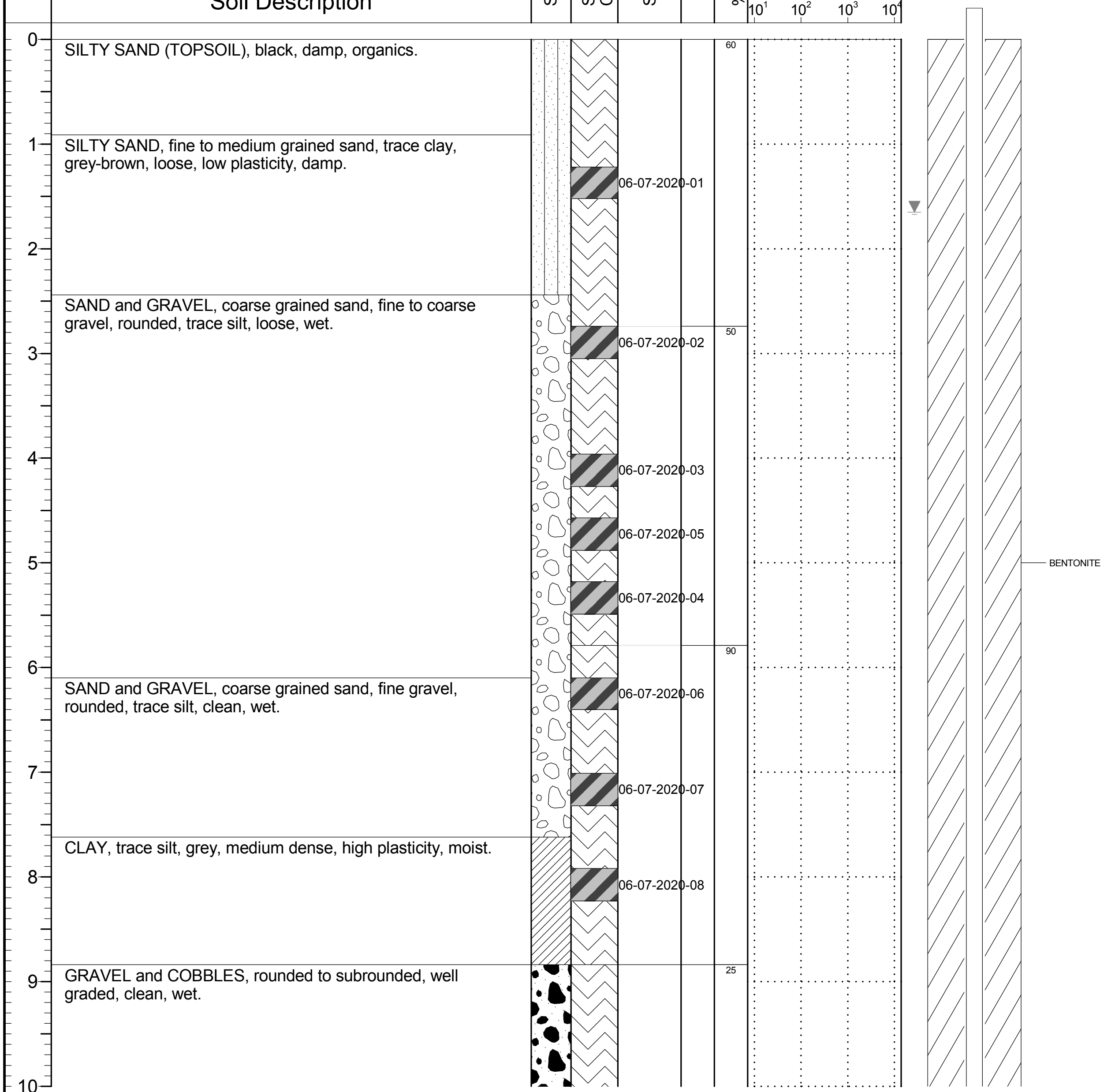
SILTY SAND, fine to medium grained sand, trace clay, grey-brown, loose, low plasticity, damp.

SAND and GRAVEL, coarse grained sand, fine to coarse gravel, rounded, trace silt, loose, wet.

SAND and GRAVEL, coarse grained sand, fine gravel, rounded, trace silt, clean, wet.

CLAY, trace silt, grey, medium dense, high plasticity, moist.

GRAVEL and COBBLES, rounded to subrounded, well graded, clean, wet.



NOTES
Bolded sample denotes sample analyzed.

FINAL

SNC • LAVALIN	Client **Teck Coal Limited**	**Borehole No. : RG_BH_WC2A**
	Location **Regional Groundwater Monitoring**	PAGE 2 OF 4

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	2020 06 16	Project Number:	631283
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	1304.009	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1304.868	Date Drilled:	2020 06 08
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5552079.286	Easting: 648195.937	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
⩘ Vibrasonic

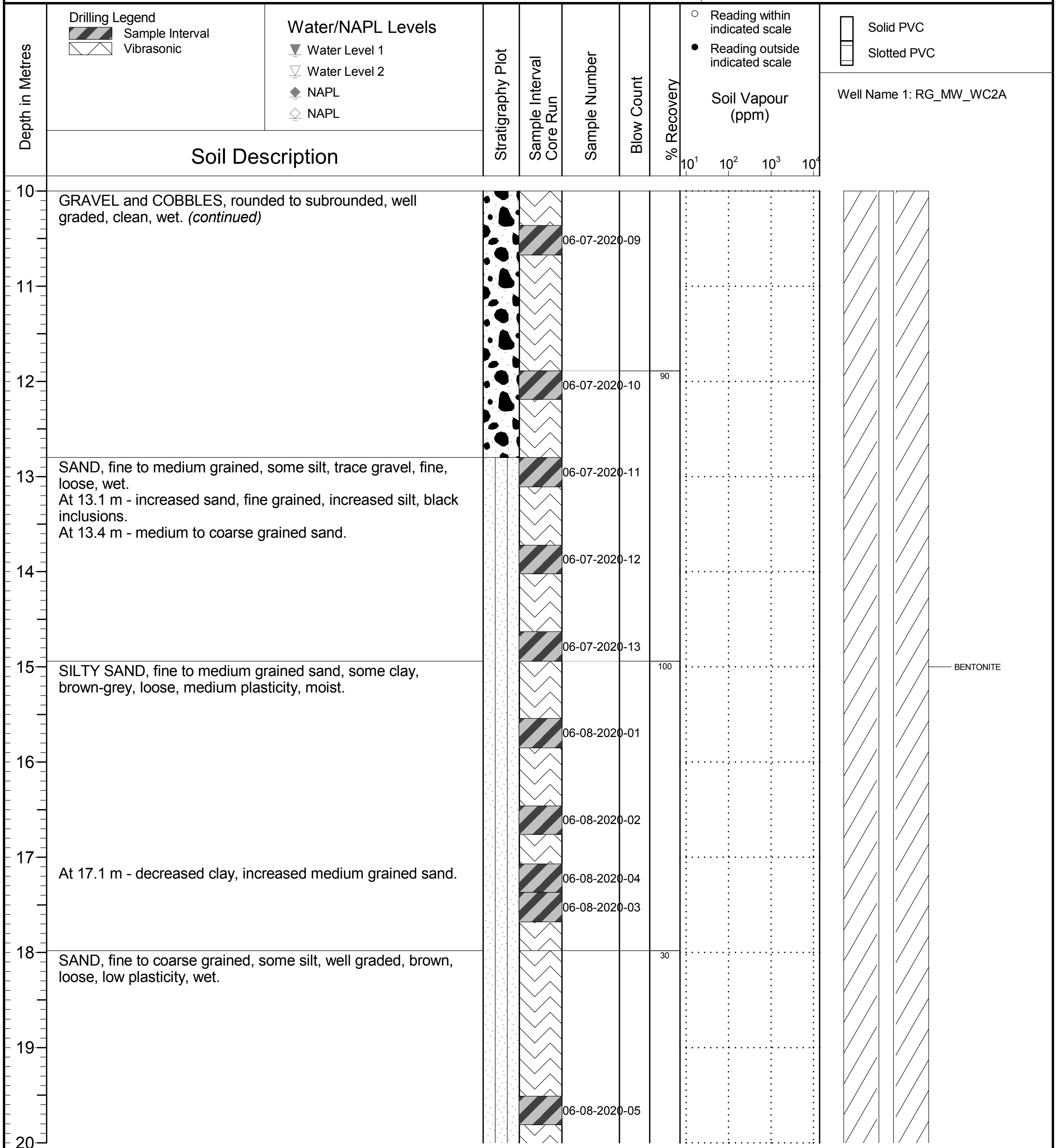
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

▯ Solid PVC
▯ Slotted PVC

Well Name 1: RG_MW_WC2A

Depth in Metres	Soil Description
10	GRAVEL and COBBLES, rounded to subrounded, well graded, clean, wet. *(continued)*
12.8	SAND, fine to medium grained, some silt, trace gravel, fine, loose, wet. At 13.1 m - increased sand, fine grained, increased silt, black inclusions. At 13.4 m - medium to coarse grained sand.
15	SILTY SAND, fine to medium grained sand, some clay, brown-grey, loose, medium plasticity, moist. At 17.1 m - decreased clay, increased medium grained sand.
18	SAND, fine to coarse grained, some silt, well graded, brown, loose, low plasticity, wet.



NOTES
Bolded sample denotes sample analyzed.

QA/QC: LLH 2020 09 02 Print Date:2020-12-02

FINAL

SNC·LAVALIN

Client
Teck Coal Limited

Location
Regional Groundwater Monitoring

Borehole No. : RG_BH_WC2A

PAGE 3 OF 4

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	2020 06 16	Project Number:	631283
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	1304.009	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1304.868	Date Drilled:	2020 06 08
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5552079.286	Easting: 648195.937	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
Vibrasonic

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: RG_MW_WC2A

Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm)

SAND, fine to coarse grained, some silt, well graded, brown, loose, low plasticity, wet. *(continued)*
At 20.1 m - trace silt.

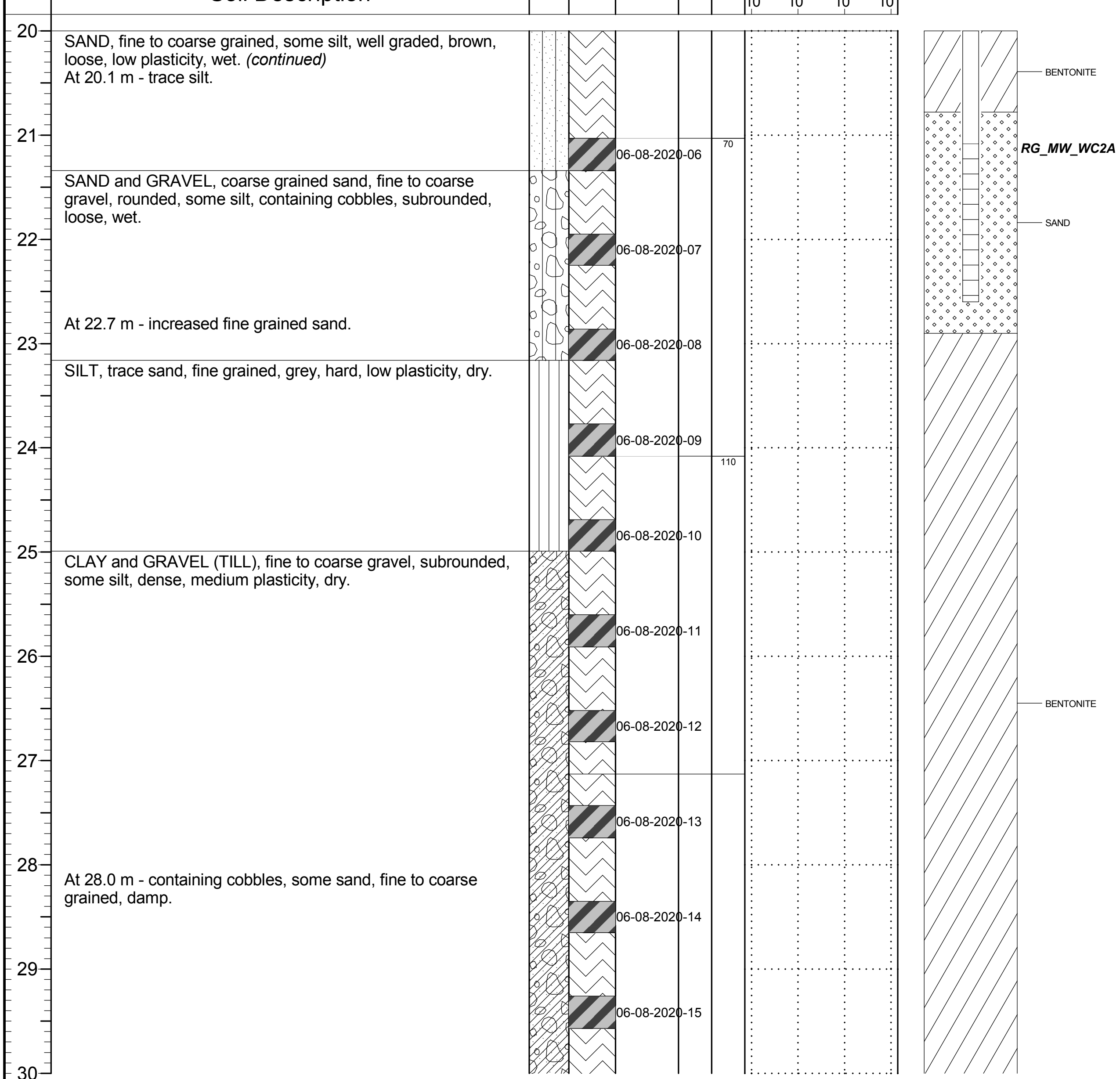
SAND and GRAVEL, coarse grained sand, fine to coarse gravel, rounded, some silt, containing cobbles, subrounded, loose, wet.

At 22.7 m - increased fine grained sand.

SILT, trace sand, fine grained, grey, hard, low plasticity, dry.

CLAY and GRAVEL (TILL), fine to coarse gravel, subrounded, some silt, dense, medium plasticity, dry.

At 28.0 m - containing cobbles, some sand, fine to coarse grained, damp.



NOTES
Bolded sample denotes sample analyzed.

QA/QC: LLH 2020 09 02 Print Date:2020-12-02

FINAL

SNC·LAVALIN

	Client **Teck Coal Limited**	**Borehole No. : RG_BH_WC2A**
	Location **Regional Groundwater Monitoring**	PAGE 4 OF 4

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	2020 06 16	Project Number:	631283
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	1304.009	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1304.868	Date Drilled:	2020 06 08
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5552079.286	Easting: 648195.937	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- Vibrasonic

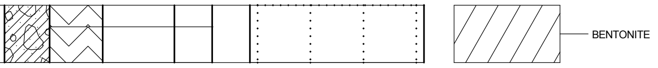
Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- Solid PVC
- Slotted PVC

Well Name 1: RG_MW_WC2A

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm) 10^1 10^2 10^3 10^4
30	CLAY and GRAVEL (TILL), fine to coarse gravel, subrounded, some silt, dense, medium plasticity, dry. *(continued)*						
	Bottom of hole at 30.5 m.						



Depth scale: 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40

NOTES
Bolded sample denotes sample analyzed.

FINAL

SNC·LAVALIN

Client
Teck Coal Limited

Location
Regional Groundwater Monitoring

Borehole No. : RG_BH_WC2B

PAGE 1 OF 1

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	2020 06 16	Project Number:	631283
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	1304.038	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1304.795	Date Drilled:	2020 06 08
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5552078.858	Easting: 648197.172	Log Typed By:	VL

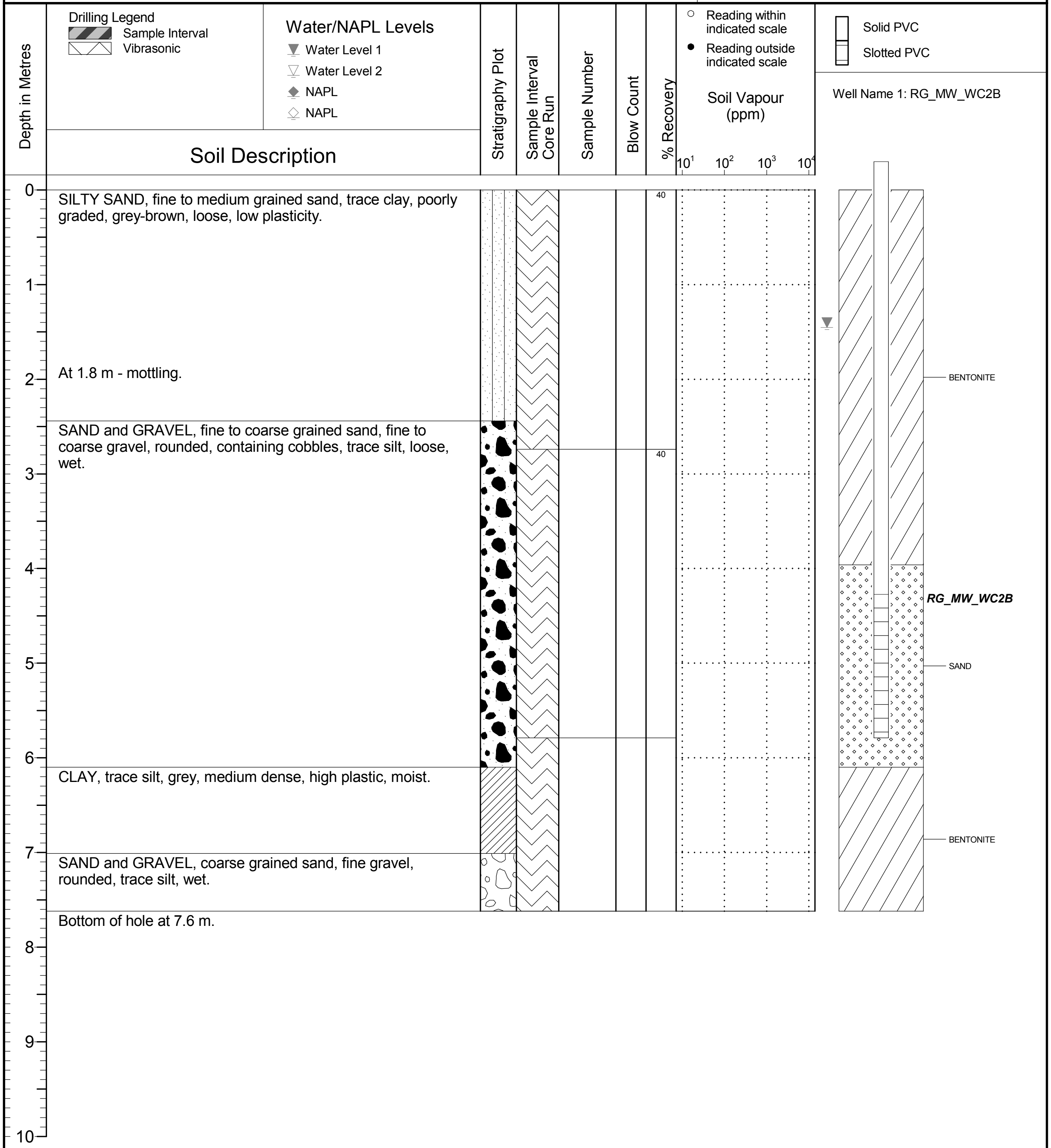
Drilling Legend
▨ Sample Interval
Vibrasonic

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: RG_MW_WC2B



Soil Description

SILTY SAND, fine to medium grained sand, trace clay, poorly graded, grey-brown, loose, low plasticity.

At 1.8 m - mottling.

SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, rounded, containing cobbles, trace silt, loose, wet.

CLAY, trace silt, grey, medium dense, high plastic, moist.

SAND and GRAVEL, coarse grained sand, fine gravel, rounded, trace silt, wet.

Bottom of hole at 7.6 m.

NOTES
Bolded sample denotes sample analyzed.

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : RG_BH_LCWC1**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 2

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	2020 06 16	Project Number:	631283
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	1310.453	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1311.258	Date Drilled:	2020 06 07
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5552399.910	Easting: 648356.101	Log Typed By:	VL

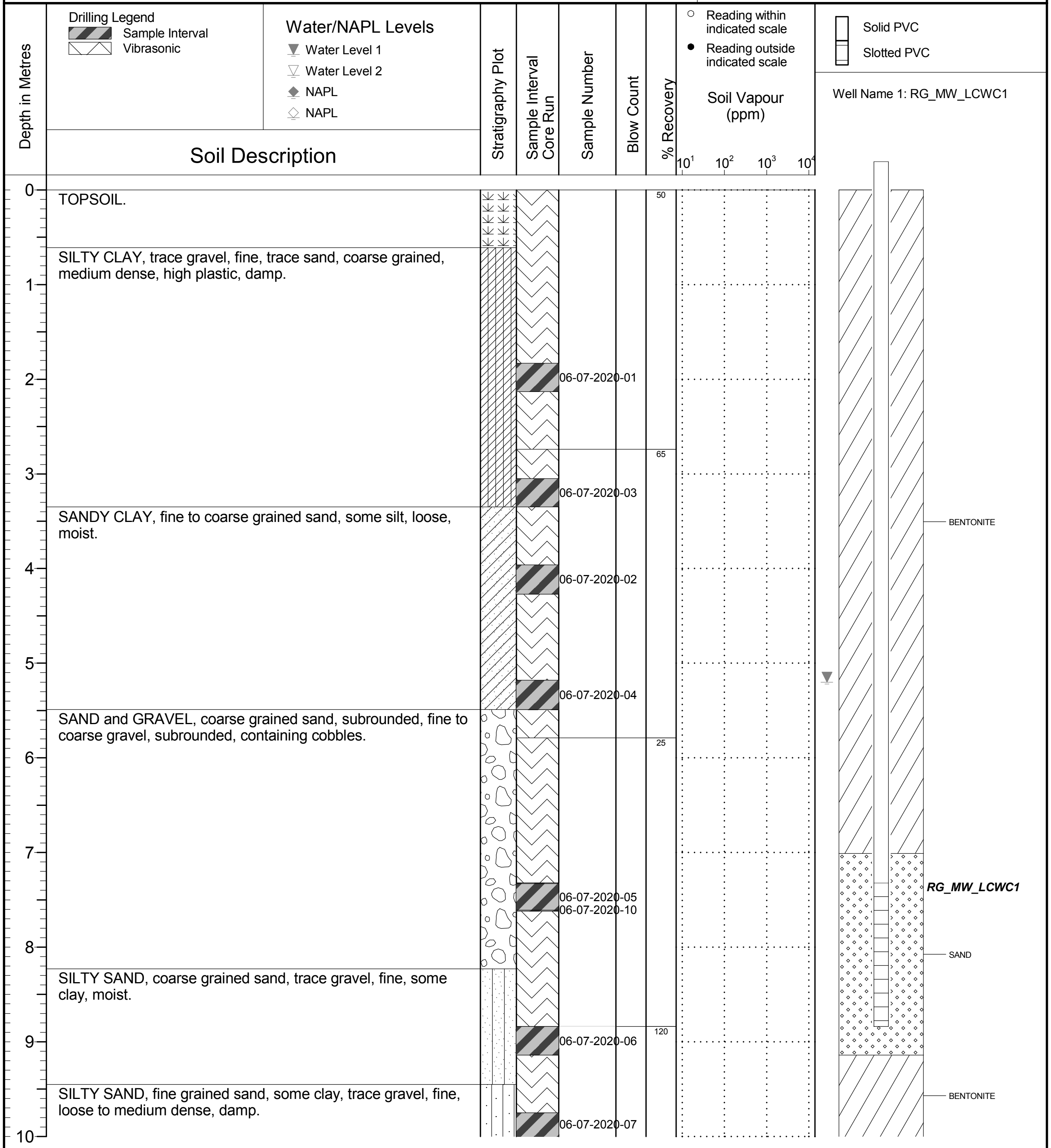
Drilling Legend
▨ Sample Interval
Vibrasonic

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: RG_MW_LCWC1



TOPSOIL.

SILTY CLAY, trace gravel, fine, trace sand, coarse grained, medium dense, high plastic, damp.

SANDY CLAY, fine to coarse grained sand, some silt, loose, moist.

SAND and GRAVEL, coarse grained sand, subrounded, fine to coarse gravel, subrounded, containing cobbles.

SILTY SAND, coarse grained sand, trace gravel, fine, some clay, moist.

SILTY SAND, fine grained sand, some clay, trace gravel, fine, loose to medium dense, damp.

NOTES
Bolded sample denotes sample analyzed.

QA/QC: LLH 2020 09 02 Print Date:2020-12-02

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : RG_BH_LCWC1**
	Location **Regional Groundwater Monitoring**	PAGE 2 OF 2

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	2020 06 16	Project Number:	631283
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	1310.453	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1311.258	Date Drilled:	2020 06 07
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5552399.910	Easting: 648356.101	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
⋀⋀ Vibrasonic

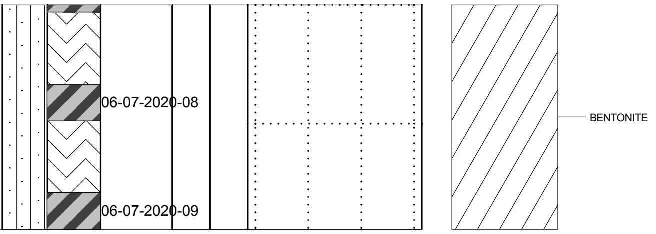
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

▯ Solid PVC
▤ Slotted PVC

Well Name 1: RG_MW_LCWC1

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm) 10^1 10^2 10^3 10^4
10	SILTY SAND, fine grained sand, some clay, trace gravel, fine, loose to medium dense, damp. *(continued)* At 10.5 m - increased density.			06-07-2020-08 06-07-2020-09			
11.9	Bottom of hole at 11.9 m.						



Depth scale: 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20

NOTES
Bolded sample denotes sample analyzed.

DATA ENTRY: IFG

PROJECT No.: 11.1422.0052

LOCATION: See Location Plan

N: 5550296 E: 648578

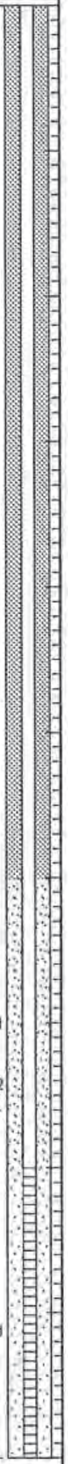
RECORD OF MONITORING WELL: GA-MW-3S

BORING DATE: September 23, 2012

SHEET 1 OF 2

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - O (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}); WATER CONTENT PERCENT Wp ⊢—OW—⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Barber Rig – Air Rotary Tervita	Ground Surface		1294.00							
		(SP) SAND, coarse-grained, sub-angular, poorly-graded, dark grey, homogenous, moist		0.00							
2					1	GRAB					
3											Bentonite Pellets
4.5		(SP) GRAVELY SAND, coarse-grained, fine gravel, poorly-graded, sub-angular, grey		1289.50 4.50							
7					2	GRAB					10/20 Sand
											23 Sep 2012 ∇
9											Slotted Section 10/20 Sand
10											



CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: TG
CHECKED: JW

DATA ENTRY: IPG

PROJECT No.: 11.1422.0052

RECORD OF MONITORING WELL: GA-MW-3S

SHEET 2 OF 2

LOCATION: See Location Plan

N: 5550296 E: 648578

BORING DATE: September 23, 2012

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80 SHEAR STRENGTH Cu, kPa nat V. + Q- ● rem V. ⊕ U- ○ 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3} WATER CONTENT PERCENT Wp ⊢ ○W ⊣ Wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10	Barber Rig – Air Rotary Tervita	(SP) GRAVELY SAND, coarse-grained, fine gravel, poorly-graded, sub-angular, grey *(continued)*									
11					3	GRAB					
12											Slotted Section 10/20 Sand
13					4	GRAB					
14				1279.60 14.40							Bentonite Pellets
		End of MONITORING WELL. NOTES: Encountered BEDROCK at 14.4 m									
15											
16											
17											
18											
19											
20											

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: TG

CHECKED: JW

BOREHOLE - EXPANDED ADD. LAB TESTING 11.1422.0052_BH LOGS.GPJ CALGARY.GDT 7/30/15

Log of Monitoring Well: GH_MW-ERSC-1

HEMMERA

Project Name/No: Greenhills Ops Elkford BC/577-016.04

Client: Teck Coal Ltd.

Date Drilled: November 24, 2014

Site Location: Greenhills Operations, BC

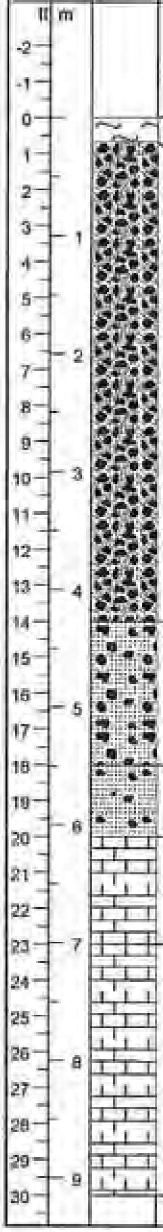
Drilling Company: JR Drilling

Drilling Method: Dual air rotary

Logged by: RM

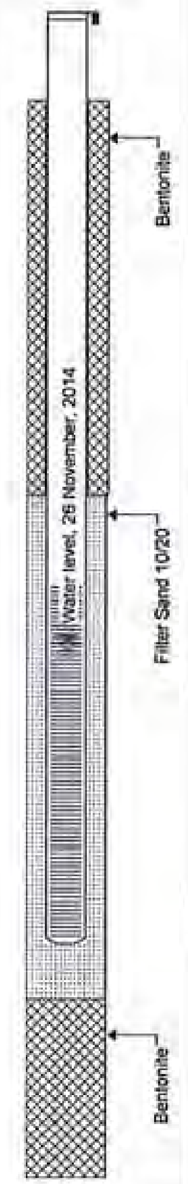
Sheet: 1 of 1

SUBSURFACE PROFILE



Depth	Symbol	Description	Depth/Elev (m)	Sample ID	Analysed Y,N	Sample Type	Vapour ppm (0 250 500)	LEL % (0 50 100)
		Ground Surface	1293.00 0.00					
		TOPSOIL Black, dry, loose, organic soil						
		TILL Gravelly Till (rounded to subrounded, medium to coarse grain), brown, dry, dense, well graded, lots of rock cuttings.						
		Sandy Till (medium grain) and Gravel (rounded to subrounded, medium to coarse grain), brown, moist, dense, well graded, lots of rock cuttings.	1288.73 4.27					
		Below 5.2 m, a water bearing seam <0.31 m width.	1287.82 5.18					
		Sandy Till (medium grain) and Gravel (rounded to subrounded, medium to coarse grain), brown, moist, dense, well graded, lots of rock cuttings.	1287.51 5.49					
		BEDROCK Siltstone, grey, dry, competent, very hard	1286.90 6.10					
		Between 6.7 m and 7.0 m, fracture zone, moist	1286.29 6.71					
		Below 7.2 m material is dry, very hard, uniform size cuttings, dusty drilling conditions	1285.99 7.01					
		End of Log	1283.86 9.14					

Backfill details



Well location: 5,548,704 N, 649,081 E

Depth to water level (TOC): 5.349 m

Date of water level: 26 November, 2014

Borehole diameter: 0.17 m

Well casing diameter: 2"

Well casing material: Sch. 80 PVC

Well screen slot size: 010

Well screen interval (bgs): 4.12 m - 7.17 m

Depth of well (TOC): 7.924 m

Well Elevation (TOC): 1293.75 m

Ground Elevation: 1293 m

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : GH_BH_EF1A**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2020 09 02	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1264.288	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1265.209	Date Drilled:	2020 08 08
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5544459.208	Easting: 649058.221	Log Typed By:	AS

Drilling Legend
▨ Sample Interval
☰ Odex

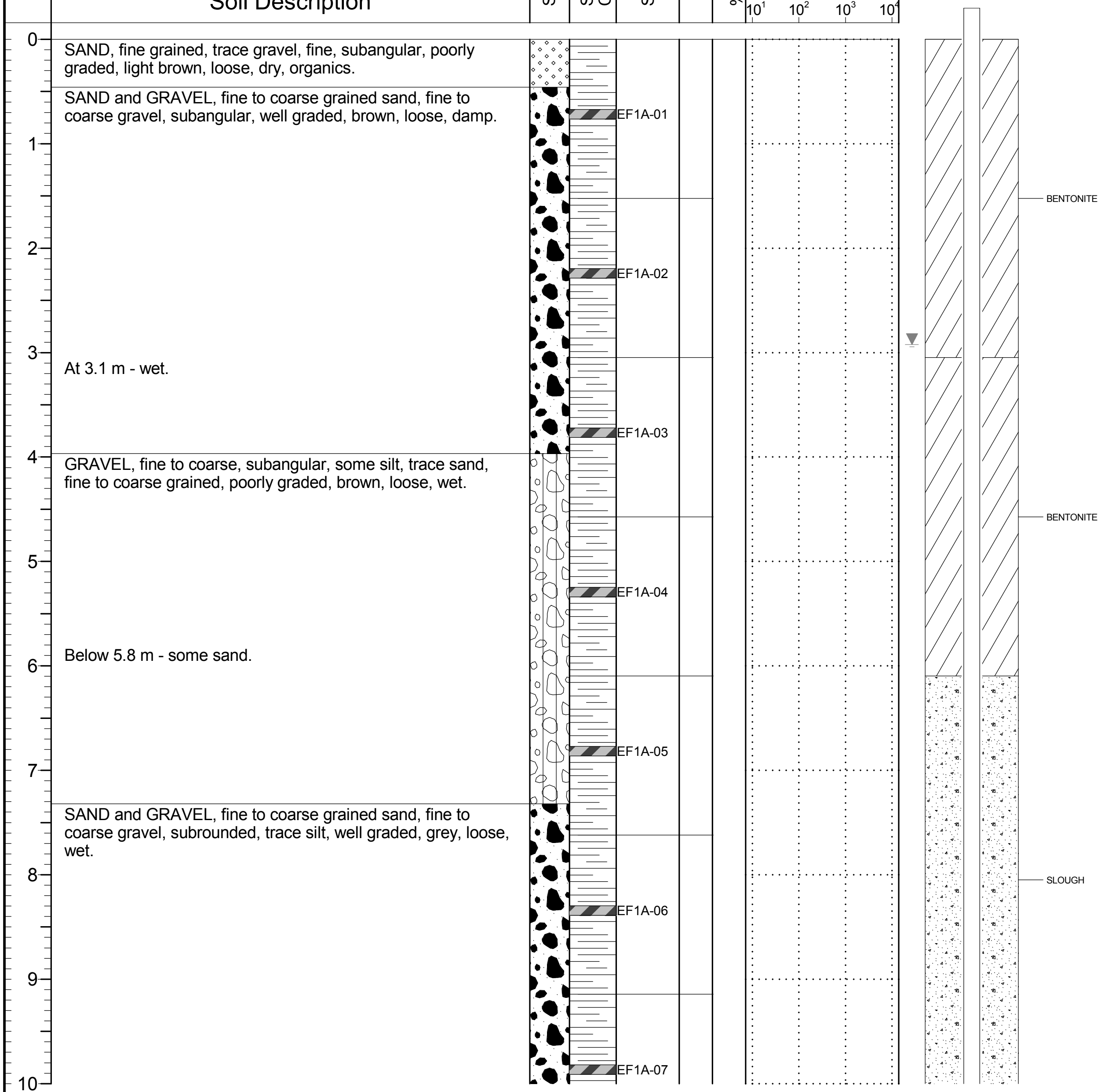
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: GH_MW_EF1A

Depth in Metres	Soil Description
0	SAND, fine grained, trace gravel, fine, subangular, poorly graded, light brown, loose, dry, organics.
	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subangular, well graded, brown, loose, damp.
3	At 3.1 m - wet.
4	GRAVEL, fine to coarse, subangular, some silt, trace sand, fine to coarse grained, poorly graded, brown, loose, wet.
6	Below 5.8 m - some sand.
7	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded, trace silt, well graded, grey, loose, wet.



NOTES
Bolded sample denotes sample analyzed.
* Denotes blind field duplicate.

QA/QC: LLH 2020 10 19 Print Date:2020-12-02

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : GH_BH_EF1A**
	Location **Regional Groundwater Monitoring**	PAGE 2 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2020 09 02	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1264.288	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1265.209	Date Drilled:	2020 08 08
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5544459.208	Easting: 649058.221	Log Typed By:	AS

Drilling Legend
▨ Sample Interval
☰ Odex

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Soil Vapour (ppm)

☐ Solid PVC
☐ Slotted PVC

Well Name 1: GH_MW_EF1A

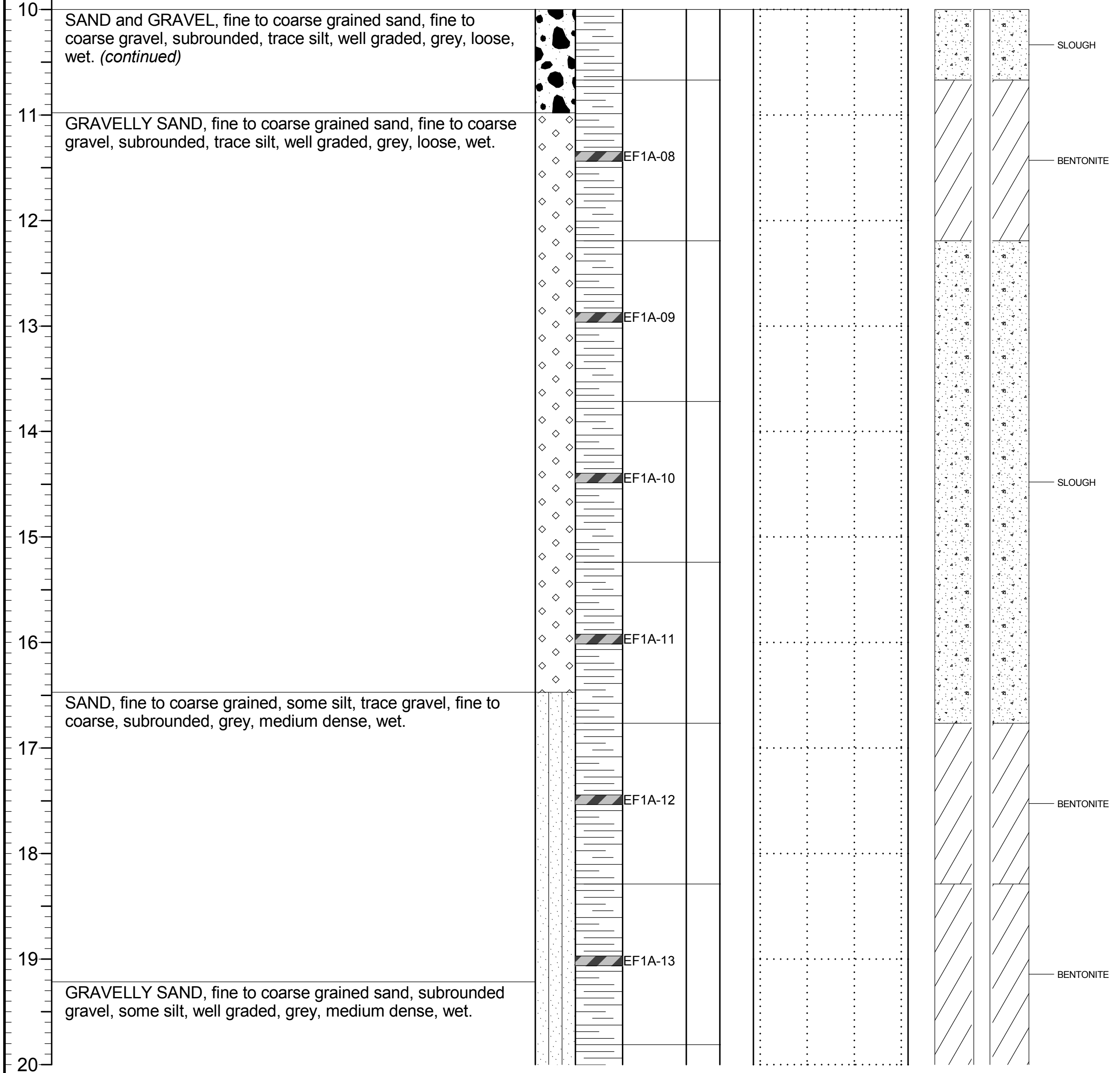
Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery

SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded, trace silt, well graded, grey, loose, wet. *(continued)*

GRAVELLY SAND, fine to coarse grained sand, fine to coarse gravel, subrounded, trace silt, well graded, grey, loose, wet.

SAND, fine to coarse grained, some silt, trace gravel, fine to coarse, subrounded, grey, medium dense, wet.

GRAVELLY SAND, fine to coarse grained sand, subrounded gravel, some silt, well graded, grey, medium dense, wet.



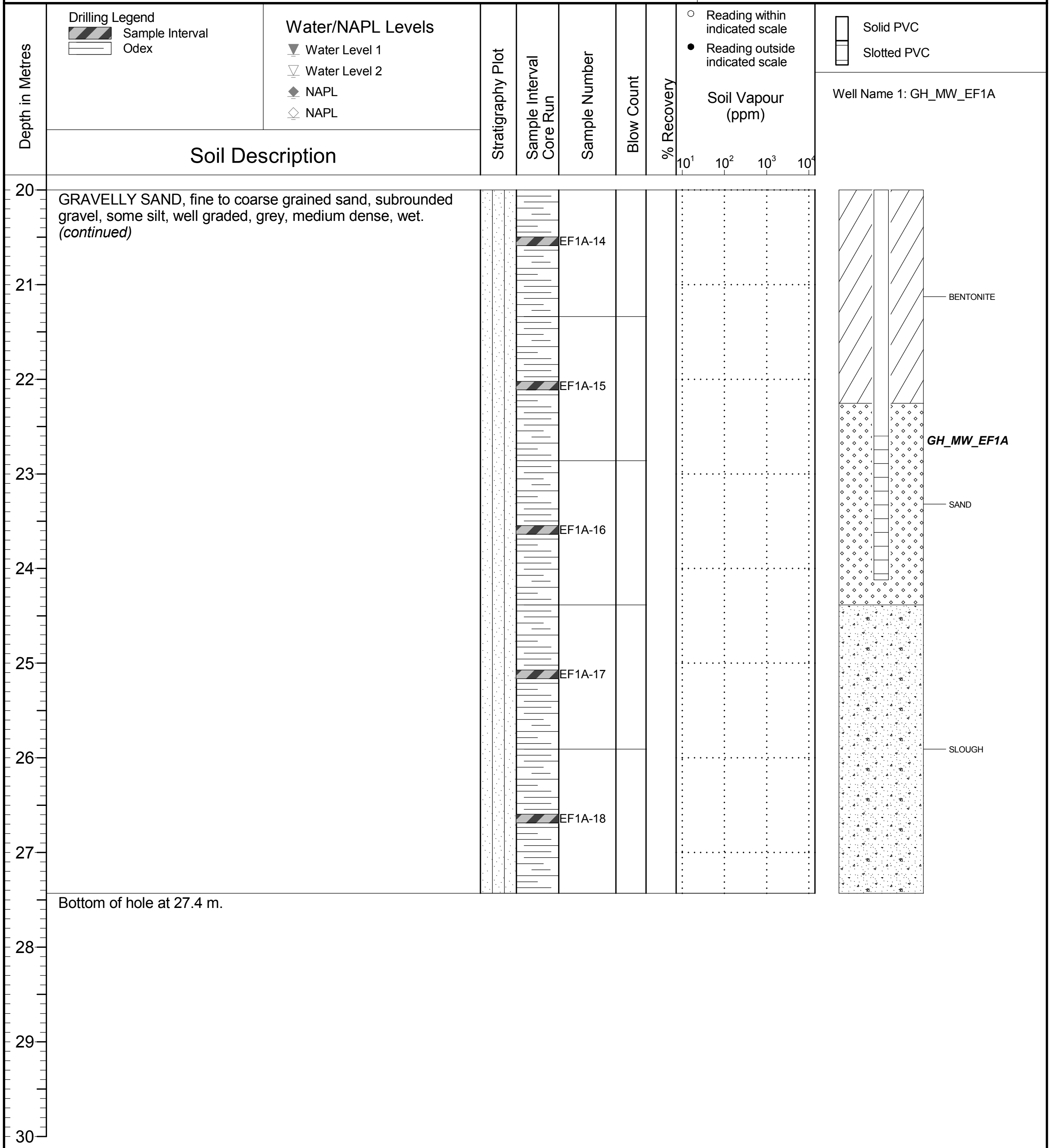
NOTES
Bolded sample denotes sample analyzed.
* Denotes blind field duplicate.

QA/QC: LLH 2020 10 19 Print Date:2020-12-02

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : GH_BH_EF1A**
	Location **Regional Groundwater Monitoring**	PAGE 3 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2020 09 02	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1264.288	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1265.209	Date Drilled:	2020 08 08
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5544459.208	Easting: 649058.221	Log Typed By:	AS



GRAVELLY SAND, fine to coarse grained sand, subrounded gravel, some silt, well graded, grey, medium dense, wet. *(continued)*

Bottom of hole at 27.4 m.

NOTES
Bolded sample denotes sample analyzed.
* Denotes blind field duplicate.

QA/QC: LLH 2020 10 19 Print Date:2020-12-02

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : GH_BH_EF1B**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 1

Drilling Contractor	Owen's Drilling	Date Monitored	2020 09 02	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1264.341	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1265.127	Date Drilled:	2020 08 08
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5544457.462	Easting: 649056.933	Log Typed By:	AS

Drilling Legend
- ▨ Sample Interval
- ☰ Odex

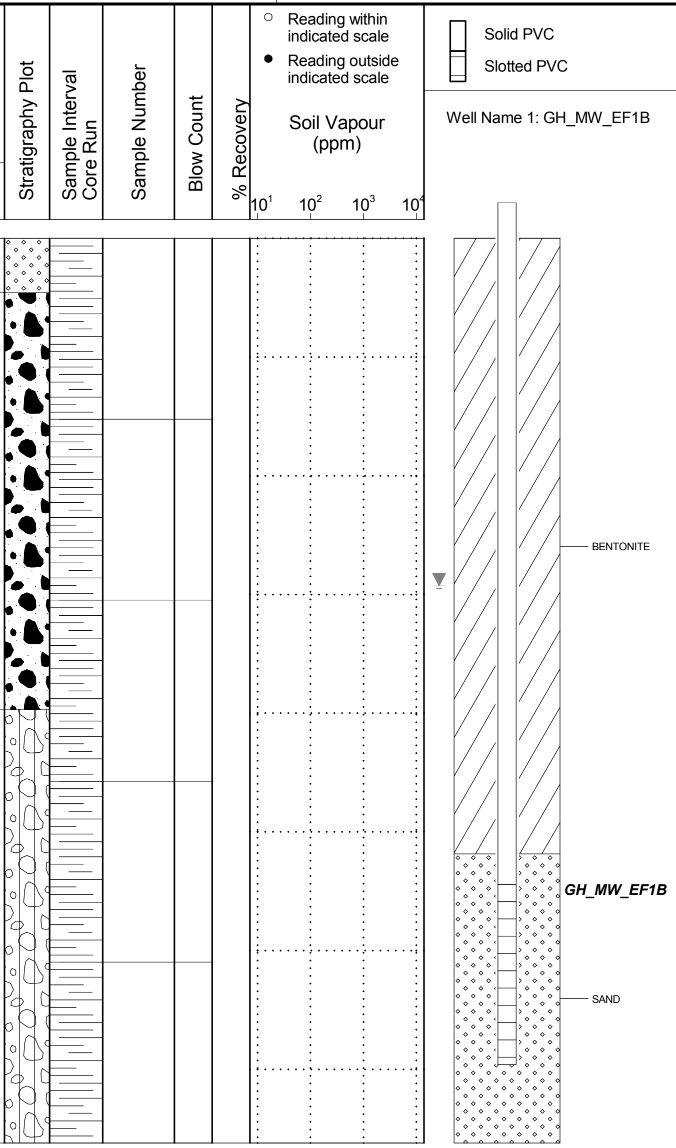
Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- Solid PVC
- Slotted PVC

Well Name 1: GH_MW_EF1B

Depth in Metres	Soil Description
0	SAND, fine grained, trace gravel, fine, subangular, poorly graded, light brown, loose, dry, organics.
	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subangular, well graded, brown, loose, damp.
	At 3.1 m - wet.
4	GRAVEL, fine to coarse, subangular, some silt, trace sand, fine to coarse grained, poorly graded, brown, loose, wet.
	Below 5.8 m - some sand.
	Bottom of hole at 7.6 m.



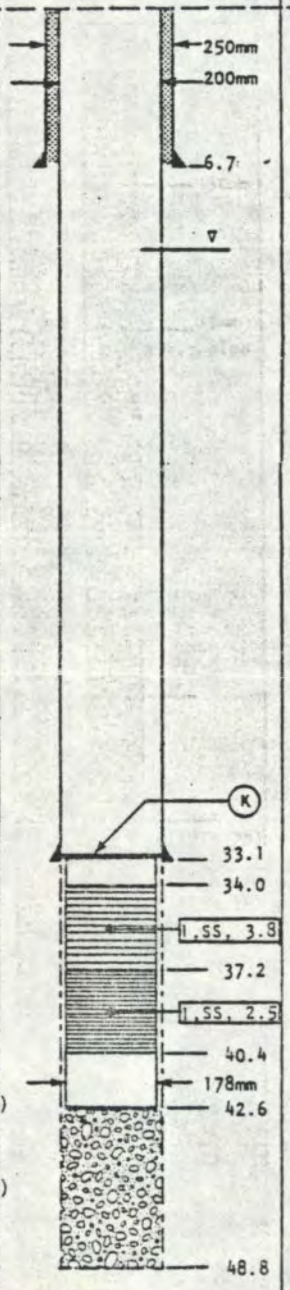
NOTES

QA/QC: LLH 2020 10 19 Print Date:2020-12-02

HYDROGEOLOGIC LOG

DRILLHOLE No. 79-6
Sheet 1 of 1

Project: ELKFORD VILLAGE GROUND WATER SURVEY
Type of drilling: Rotary
Rig: CP
Drilling fluid: Air/Foam
Coordinates: E 649,190
N 5,543,380
Angle from horizontal: 90°
Bearing: °Azimuth
Reference elevation: 1266m
Elevation type: surveyed ☐ altimeter ☐ from map ☒
Purpose of hole: Water well and exploration.



(1) (2) * Lithology	During Drilling (2) Depth (m)	During Drilling (2)(4) Water Level (m)	During Drilling (5) Water Flow (l/s)	During Drilling (6) Other	After Drilling (2)(7) Water Level (m)	Permeability (8) (2) Depth (m)	Permeability (8) Method	Permeability (8) Value (m/s)	Comments
Ground Surface									
UNSAMPLED Surficial Deposits 6.1 (1259.9)			Lw						
Sandy GRAVEL with silt variable from trace of silt to some silt. Subrounded gravel from ½cm to 1½cm ϕ.					9.3 (1256.7)				Water level on June 14th.
	15.2		3.8	EC=395 pH=6.6 H =290 I =0.6 T =5°C					
21.6	18.3			pH=7.1					Sulfur odor noted @ 18.3m depth
(1244.4) Fine Cobbly GRAVEL with some sand 24.4				EC=380 pH=7.0 H =257 I =0.5 T =6					
(1241.6) Fine sandy GRAVEL with tr. of silt. 27.4	24.4	9.10 8.93							
(1238.6) GRAVEL, some sand and silt, tr. of cobbles. 31.7	27.4		10.2						Sulfur odor noted @ 27.4m depth.
	30.5		13.6	EC=395 pH=8.1 I =0.5 T =6.5					
(1234.3) GRAVEL, some sand with tr. of cobbles and silt. 39.6	36.6	9.120	EC=270 I =0.5 T =6.5	● 1 ● 2 ● 3 ● 4		36.3 36.9 38.1 38.7	h h h h	3.8(-4) 4 (-4) 8 (-4) 1.5(-3)	
(1266.4) Fine sandy GRAVEL with tr. of silt. 41.1				● 5 ● 6 ● 7		39.3 39.9 40.5	h h h	3.6(-3) 4.1(-3) 4 (-3)	
Silty SAND tr. of pebbles.									
(41.8) Sandy GRAVEL with some silt, increasing w/depth 44.2				● 8 ● 9 ●10		42.4 43.0 43.6	h h h	1.6(-3) 1.1(-3) 4 (-4)	
Grading to silt (1221.8)									
(45.1) Sandy SILT trace of clay 46.9									
(1219.1) Sandy GRAVEL with some silt, tr. clay 48.8			<6						
(1217.2)									

Contractor: R.J. Drilling
Date started: May 30, 1979
Date finished: June 14, 1979
Logged by: D.M.
Checked by:
Date: July/79

* NOTE: Bracketed numbers refer to notes preceding the logs.

PITEAU & ASSOCIATES
GEOTECHNICAL CONSULTANTS

Scale: 0 5m

HYDROGEOLOGIC LOG

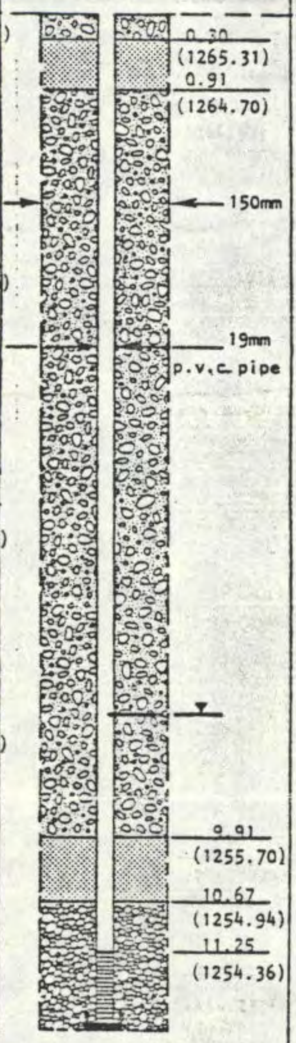
DRILLHOLE No. 79-6-1
Sheet 1 of 1 Piezometer log.

Project ELKFORD VILLAGE GROUNDWATER SURVEY

Type of drilling Rotary
Rig CP
Drilling fluid Air/Foam

Coordinates: E 649,190
N 5,543,380
Angle from horizontal 90°
Bearing -- °Azimuth

Reference elevation 1265.608 M
Elevation type: surveyed ☒ altimeter ☐ from map ☐
Purpose of hole Observation Piezometer for well No. 79-6.



(1) (2) * Lithology	(2) (3) Completed Construction	During Drilling (2) Depth (m)	During Drilling (2) (4) Water Level (m)	During Drilling (5) Water Flow (l/s)	During Drilling (6) Other	After Drilling (2) (7) Water Level (m)	After Drilling Permeability (8) (2) Depth (m)	After Drilling Permeability (8) Method	After Drilling Permeability (8) Value (m/s)	Comments
Ground Surface 0.00 (1265.608)										NOTE; P.V.C. tubing stick-up is less than 1 cm above ground.
Unsampled surficial deposits.										
3.05 (1262.56) Sandy GRAVEL with Trace of silt.										
6.10 (1259.51) Sandy GRAVEL with some silt.										
8.53 (1257.07) Coarser clean Sandy GRAVEL with trace of silt.						8.46 (1257.15)				S.W.L. on June 14.
										Slots cut in last 0.9 metres of p.v.c Tubing.
END OF DRILLHOLE 12.19 (1253.42)										End of p.v.c. Tubing sealed with cap.

Contractor R.J. DRILLING LTD.
Date started [illegible]
Date finished May 29, 1979
Logged by: D.M.
Checked by:
Date: August 1979

* NOTE: Bracketed numbers refer to notes preceding the logs.

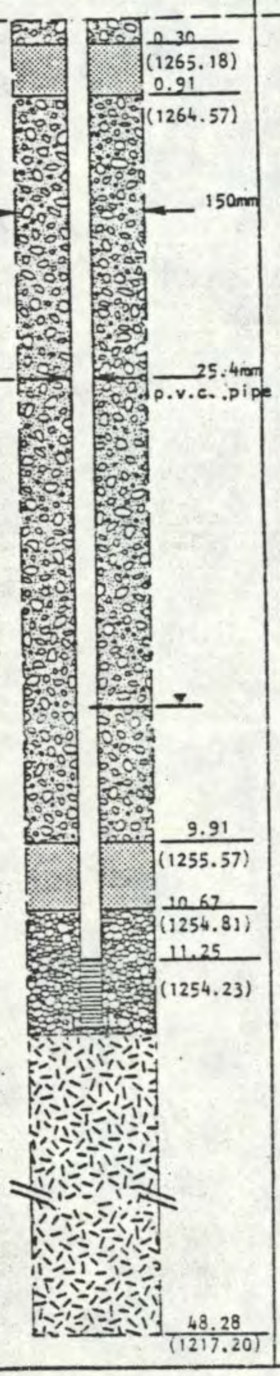
PITEAU & ASSOCIATES
GEOTECHNICAL CONSULTANTS
VANCOUVER CALGARY

Scale: 0 1m 2m

HYDROGEOLOGIC LOG

DRILLHOLE No. 79-6-2
Sheet 1 of 1 Piezometer log

Project ELKFORD VILLAGE GROUNDWATER SURVEY
Type of drilling Rotary
Rig CP
Drilling fluid Air/Foam
Coordinates: E 649, 190
N 5,543,380
Angle from horizontal 90°
Bearing --- °Azimuth
Reference elevation 1265.480 M
Elevation type: surveyed ☒ altimeter ☐ from map ☐
Purpose of hole Observation Piezometer for well No. 79-6



(1) (2) * Lithology	(2) (3) Completed Construction	During Drilling (2) Depth (m)	During Drilling (2) (4) Water Level (m)	During Drilling (5) Water Flow (l/s)	During Drilling (6) Other	After Drilling (2) (7) Water Level (m)	After Drilling Permeability (8) (2) Depth (m)	After Drilling Permeability (8) Method	After Drilling Permeability (8) Value (m/s)	Comments
Ground Surface 0.00 (1265.480)										NOTE: P.V.C. tubing stick-up less than 1 cm above ground.
Unsampled surficial deposits. 2.92 (1262.56)										
Sandy GRAVEL with trace of silt. 5.97 (1259.51)										
Sandy GRAVEL with some silt. 8.40 (1257.08)						8.30 (1257.18)				S.W.L. on June 14.
Coarser clean Sandy GRAVEL with trace of silt. 12.19										Slots cut in last 0.9 metres on p.v.c. tubing. End of p.v.c. tubing sealed with cap.
FOR LITHOLOGIC DETAILS SEE LOG FOR WELL No. 79-6 (1253.29)										Part of log omitted for clarity.

Contractor R.J. DRILLING LTD
Date started May 30, 1979
Logged by D.M.
Checked by P.W.

* NOTE Bracketed numbers refer to notes preceding the logs.

PITEAU & ASSOCIATES
GEOTECHNICAL CONSULTANTS

Scale: 0 1m 2m

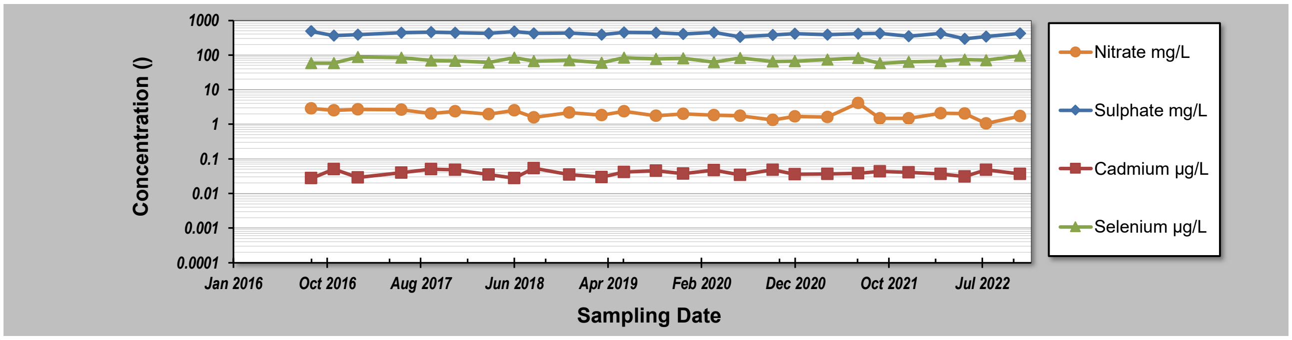
Attachment II

Mann-Kendall Analyses

GSI MANN-KENDALL TOOLKIT

Evaluation Date:	15-Jan-23	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - GHO	**Location**	GH_MW-PC
Conducted By:	MF	**Reviewed By:**	

Sampling Event	Sampling Date	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
		GH_MW-PC CONCENTRATION							
1	5-Sep-16	2.8500	485.00	0.0276	58.200				
2	17-Nov-16	2.5200	366.00	0.0500	58.400				
3	2-Feb-17	2.6600	385.00	0.0292	88.100				
4	22-Jun-17	2.6100	442.00	0.0397	83.700				
5	25-Sep-17	2.0300	456.00	0.0503	69.300				
6	11-Dec-17	2.3600	440.00	0.0481	68.100				
7	28-Mar-18	1.9400	417.00	0.0350	61.300				
8	19-Jun-18	2.4900	481.00	0.0280	84.000				
9	20-Aug-18	1.5600	423.00	0.0536	65.900				
10	12-Dec-18	2.1400	430.00	0.0353	70.300				
11	25-Mar-19	1.8200	386.00	0.0296	60.000				
12	5-Jun-19	2.3700	452.00	0.0417	83.300				
13	16-Sep-19	1.7600	440.00	0.0450	76.400				
14	12-Dec-19	1.9900	407.00	0.0372	80.500				
15	19-Mar-20	1.8400	448.00	0.0468	61.500				
16	11-Jun-20	1.7400	334.00	0.0340	81.200				
17	24-Sep-20	1.3300	375.00	0.0480	64.200				
18	3-Dec-20	1.6700	416.00	0.0360	66.100				
19	18-Mar-21	1.6100	389.00	0.0368	74.000				
20	24-Jun-21	4.0900	413.00	0.0379	81.400				
21	2-Sep-21	1.4800	425.00	0.0430	58.000				
22	3-Dec-21	1.4600	345.00	0.0410	63.700				
23	16-Mar-22	2.0700	419.00	0.0365	65.800				
24	1-Jun-22	2.0200	295.00	0.0311	74.200				
25	8-Aug-22	1.0600	343.00	0.0486	70.800				
26	25-Nov-22	1.7100	418.00	0.0368	95.600				
27									
28									
29									
30									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		0.30	0.11	0.19	0.15				
Mann-Kendall Statistic (S):		-161	-104	14	23				
Confidence Factor:		>99.9%	98.9%	61.2%	68.4%				
Concentration Trend:		Decreasing	Decreasing	No Trend	No Trend				



Notes:

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3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

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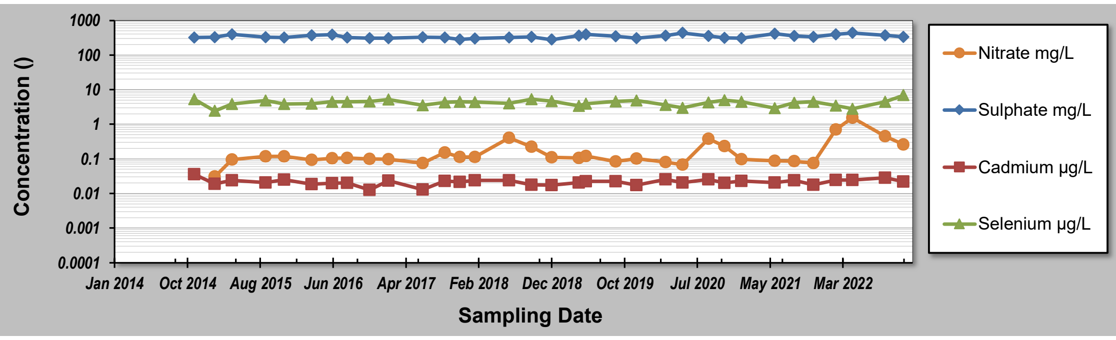
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 15-Jan-23
Facility Name: Teck Coal Regional Groundwater - GHO
Conducted By: MF

Job ID: 635544
Location GH_MW-GHC-1A
Reviewed By:

Sampling Event	Sampling Date	Nitrate	Sulphate	Cadmium	Selenium				
Parameter units		mg/L	mg/L	µg/L	µg/L				
		GH_MW-GHC-1A CONCENTRATION							
1	25-Nov-14		316.00	0.0360	5.260				
2	17-Feb-15	0.0310	328.00	0.0190	2.450				
3	29-Apr-15	0.0950	398.00	0.0241	3.850				
4	15-Sep-15	0.1170	329.00	0.0205	4.810				
5	30-Nov-15	0.1180	322.00	0.0250	3.830				
6	22-Mar-16	0.0930	369.00	0.0186	3.940				
7	14-Jun-16	0.1040	383.00	0.0198	4.430				
8	16-Aug-16	0.1060	320.00	0.0200	4.460				
9	16-Nov-16	0.0990	306.00	0.0127	4.530				
10	2-Feb-17	0.0980	307.00	0.0232	5.150				
11	22-Jun-17	0.0760	326.00	0.0129	3.550				
12	21-Sep-17	0.1510	317.00	0.0229	4.270				
13	22-Nov-17	0.1120	280.00	0.0213	4.430				
14	23-Jan-18	0.1130	302.00	0.0240	4.370				
15	14-Jun-18	0.4000	322.00	0.0239	3.980				
16	13-Sep-18	0.2210	334.00	0.0179	5.240				
17	5-Dec-18	0.1110	279.00	0.0175	4.680				
18	28-Mar-19	0.1050	365.00	0.0207	3.390				
19	25-Apr-19	0.1210	391.00	0.0224	3.890				
20	26-Aug-19	0.0829	349.00	0.0222	4.510				
21	20-Nov-19	0.1010	307.00	0.0175	4.810				
22	18-Mar-20	0.0810	360.00	0.0255	3.620				
23	27-May-20	0.0670	438.00	0.0207	3.000				
24	11-Sep-20	0.3810	354.00	0.0257	4.260				
25	16-Nov-20	0.2330	314.00	0.0201	4.990				
26	25-Jan-21	0.0980	303.00	0.0228	4.490				
27	11-Jun-21	0.0875	410.00	0.0206	2.940				
28	30-Aug-21	0.0847	355.00	0.0238	4.170				
29	18-Nov-21	0.0759	333.00	0.0177	4.420				
30	18-Feb-22	0.7030	399.00	0.0243	3.450				
31	27-Apr-22	1.5500	438.00	0.0244	2.790				
32	9-Sep-22	0.4470	369.00	0.0282	4.500				
33	23-Nov-22	0.2580	336.00	0.0221	6.930				
34									
35									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		1.39	0.12	0.20	0.20				
Mann-Kendall Statistic (S):		79	104	68	-24				
Confidence Factor:		89.6%	94.5%	84.9%	63.8%				
Concentration Trend:		No Trend	Prob. Increasing	No Trend	Stable				



Notes:

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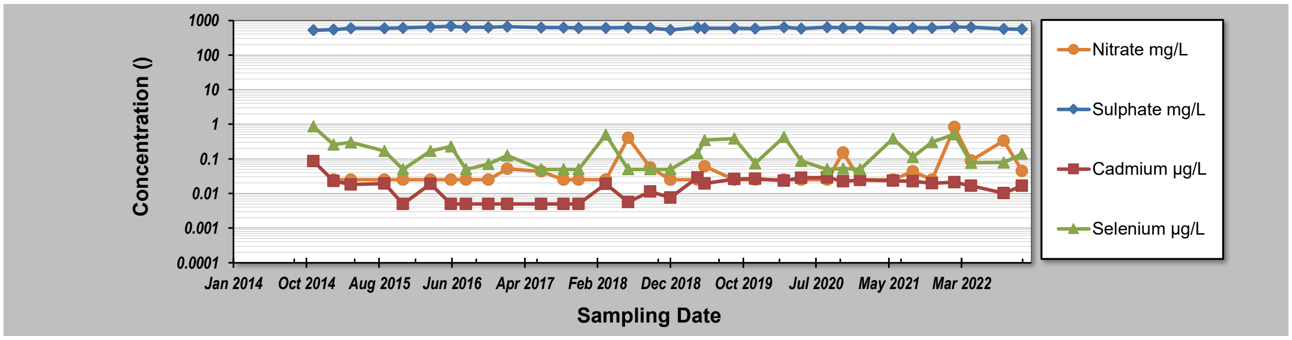
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	15-Jan-23	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - GHO	**Location**	GH_MW-GHC-1B
Conducted By:	MF	**Reviewed By:**	

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	Sampling Date	GH_MW_GHC-1B CONCENTRATION							
1	26-Nov-14		518.00	0.0860	0.860				
2	17-Feb-15	0.0250	548.00	0.0230	0.260				
3	29-Apr-15	0.0250	595.00	0.0180	0.300				
4	15-Sep-15	0.0250	587.00	0.0195	0.167				
5	30-Nov-15	0.0250	602.00	0.0050	0.050				
6	22-Mar-16	0.0250	638.00	0.0190	0.170				
7	14-Jun-16	0.0250	682.00	0.0050	0.227				
8	16-Aug-16	0.0250	629.00	0.0050	0.050				
9	16-Nov-16	0.0250	636.00	0.0050	0.070				
10	2-Feb-17	0.0510	655.00	0.0050	0.126				
11	21-Jun-17	0.0430	615.00	0.0050	0.050				
12	21-Sep-17	0.0250	619.00	0.0050	0.050				
13	22-Nov-17	0.0250	601.00	0.0050	0.050				
14	14-Mar-18	0.0250	610.00	0.0191	0.494				
15	14-Jun-18	0.4000	615.00	0.0056	0.050				
16	13-Sep-18	0.0560	608.00	0.0113	0.050				
17	5-Dec-18	0.0250	537.00	0.0076	0.050				
18	28-Mar-19	0.0250	612.00	0.0289	0.141				
19	25-Apr-19	0.0610	593.00	0.0195	0.351				
20	26-Aug-19	0.0250	595.00	0.0261	0.387				
21	20-Nov-19	0.0250	573.00	0.0264	0.073				
22	18-Mar-20	0.0250	634.00	0.0235	0.433				
23	27-May-20	0.0250	574.00	0.0281	0.087				
24	11-Sep-20	0.0250	628.00	0.0292	0.050				
25	16-Nov-20	0.1510	598.00	0.0225	0.052				
26	25-Jan-21	0.0250	618.00	0.0246	0.050				
27	10-Jun-21	0.0250	591.00	0.0235	0.389				
28	30-Aug-21	0.0436	598.00	0.0222	0.112				
29	18-Nov-21	0.0250	610.00	0.0198	0.304				
30	18-Feb-22	0.8280	640.00	0.0212	0.511				
31	27-Apr-22	0.0897	628.00	0.0167	0.077				
32	9-Sep-22	0.3340	564.00	0.0102	0.078				
33	23-Nov-22	0.0445	556.00	0.0168	0.140				
34									
35									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	1.96	0.06	0.80	0.98				
	Mann-Kendall Statistic (S):	126	-33	100	7				
	Confidence Factor:	97.9%	68.9%	93.7%	53.7%				
	Concentration Trend:	Increasing	Stable	Prob. Increasing	No Trend				



Notes:

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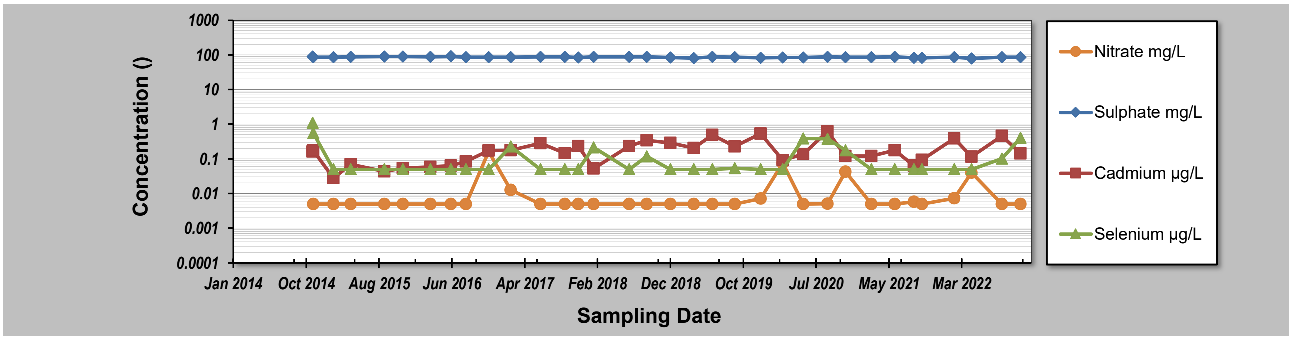
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	15-Jan-23	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - GHO	**Location**	GH_MW-TD
Conducted By:	MF	**Reviewed By:**	

Sampling Event	Sampling Date	Nitrate	Sulphate	Cadmium	Selenium				
	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
		GH_MW-TD CONCENTRATION							
1	24-Nov-14		89.60	0.1620	1.100				
2	26-Nov-14	0.0050	85.80	0.1730	0.560				
3	17-Feb-15	0.0050	86.10	0.0280	0.050				
4	29-Apr-15	0.0050	87.40	0.0691	0.050				
5	15-Sep-15	0.0050	88.50	0.0434	0.050				
6	30-Nov-15	0.0050	88.30	0.0530	0.050				
7	22-Mar-16	0.0050	87.90	0.0589	0.050				
8	14-Jun-16	0.0050	90.20	0.0638	0.050				
9	16-Aug-16	0.0050	85.90	0.0836	0.050				
10	17-Nov-16	0.1640	86.10	0.1730	0.050				
11	16-Feb-17	0.0126	86.30	0.1760	0.225				
12	19-Jun-17	0.0050	86.60	0.2810	0.050				
13	27-Sep-17	0.0050	87.30	0.1440	0.050				
14	21-Nov-17	0.0050	83.40	0.2300	0.050				
15	23-Jan-18	0.0050	87.60	0.0526	0.215				
16	18-Jun-18	0.0050	86.60	0.2320	0.050				
17	30-Aug-18	0.0050	87.90	0.3390	0.118				
18	5-Dec-18	0.0050	83.60	0.2880	0.050				
19	12-Mar-19	0.0050	79.70	0.2030	0.050				
20	27-May-19	0.0050	86.70	0.4880	0.050				
21	28-Aug-19	0.0050	85.50	0.2270	0.053				
22	12-Dec-19	0.0071	81.80	0.5300	0.050				
23	12-Mar-20	0.0748	83.90	0.0917	0.050				
24	4-Jun-20	0.0050	83.60	0.1350	0.389				
25	13-Sep-20	0.0051	86.80	0.6210	0.382				
26	26-Nov-20	0.0420	86.30	0.1200	0.177				
27	12-Mar-21	0.0050	85.60	0.1210	0.050				
28	16-Jun-21	0.0050	86.90	0.1750	0.050				
29	3-Sep-21	0.0057	82.20	0.0636	0.050				
30	7-Oct-21	0.0050	81.10	0.0921	0.050				
31	17-Feb-22	0.0072	86.10	0.3860	0.050				
32	28-Apr-22	0.0397	78.90	0.1150	0.050				
33	1-Sep-22	0.0050	86.40	0.4540	0.101				
34	16-Nov-22	0.0050	86.40	0.1410	0.404				
35									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	2.11	0.03	0.77	1.49				
	Mann-Kendall Statistic (S):	86	-179	148	16				
	Confidence Factor:	90.5%	99.6%	98.6%	58.8%				
	Concentration Trend:	Prob. Increasing	Decreasing	Increasing	No Trend				



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GSI MANN-KENDALL TOOLKIT

Evaluation Date: 15-Jan-22
Facility Name: Teck Coal Regional Groundwater - GHO
Conducted By: MF
Job ID: 635544
Location GH_MW-RLP-2
Reviewed By:

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	Sampling Date	GH_MW-RLP-2 CONCENTRATION							
1	3-Dec-20		336.00	0.0231	0.651				
2	31-Mar-21	0.2430	316.00	0.0224	0.992				
3	24-Jun-21	0.3580	307.00	0.0180	0.630				
4	3-Sep-21	0.0910	273.00	0.0217	0.314				
5	19-Nov-21	0.3850	325.00	0.0166	3.310				
6	9-Feb-22	1.3700	276.00	0.0119	3.560				
7	20-May-22	1.0800	275.00	0.0163	0.906				
8	15-Sep-22	0.0219	200.00	0.0128	0.412				
9	18-Nov-22	0.2520	238.00	0.0157	2.120				
10									
11									
12									
13									
14									
15									
16									
17									
18									
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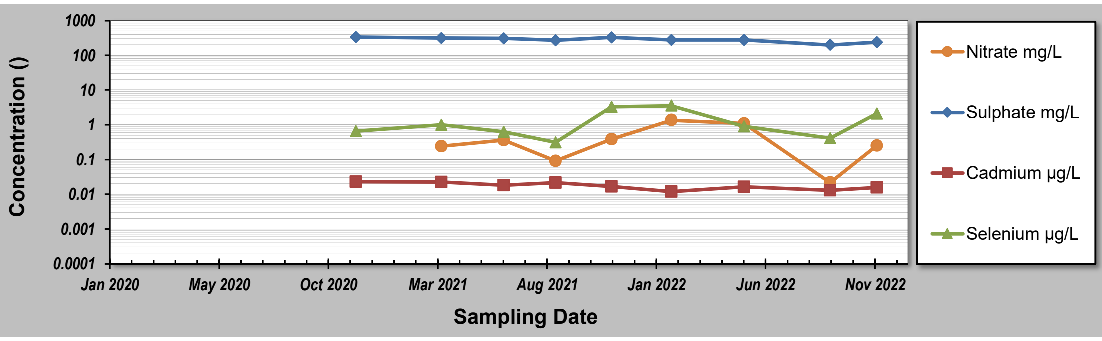
43									
44									
45									
46									
	Coefficient of Variation:	1.02	0.15	0.23	0.87				
	Mann-Kendall Statistic (S):	2	-24	-26	4				
	Confidence Factor:	54.8%	99.4%	99.7%	61.9%				
	Concentration Trend:	No Trend	Decreasing	Decreasing	No Trend				



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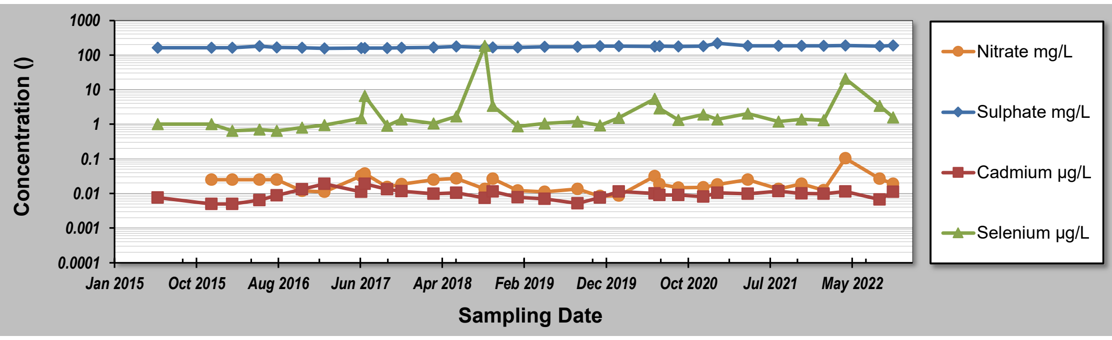
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	15-Jan-23	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - GHO	**Location**	GH_POTW09
Conducted By:	MF	**Reviewed By:**	

Parameter		**Nitrate**	**Sulphate**	**Cadmium**	**Selenium**
units		mg/L	mg/L	µg/L	µg/L
Sampling Event	**Sampling Date**	**GH_POTW09 CONCENTRATION**			
1	8-Jun-15		161.00	0.0075	1.000
2	21-Dec-15	0.0250	161.00	0.0050	1.010
3	7-Mar-16	0.0250	161.00	0.0050	0.647
4	14-Jun-16	0.0250	178.00	0.0064	0.705
5	16-Aug-16	0.0250	166.00	0.0088	0.645
6	17-Nov-16	0.0119	163.00	0.0133	0.788
7	7-Feb-17	0.0111	156.00	0.0191	0.951
8	22-Jun-17	0.0323	158.00	0.0111	1.480
9	5-Jul-17	0.0375	159.00	0.0191	6.490
10	25-Sep-17	0.0154	160.00	0.0131	0.910
11	16-Nov-17	0.0184	162.00	0.0115	1.370
12	13-Mar-18	0.0250	165.00	0.0098	1.040
13	4-Jun-18	0.0270	177.00	0.0104	1.690
14	17-Sep-18	0.0135	165.00	0.0074	185.000
15	16-Oct-18	0.0263	166.00	0.0114	3.390
16	15-Jan-19	0.0121	165.00	0.0077	0.861
17	24-Apr-19	0.0112	173.00	0.0070	1.060
18	22-Aug-19	0.0134	171.00	0.0052	1.190
19	13-Nov-19	0.0084	180.00	0.0075	0.926
20	21-Jan-20	0.0086	178.00	0.0114	1.550
21	31-May-20	0.0313	175.00	0.0099	5.370
22	18-Jun-20	0.0186	179.00	0.0089	2.860
23	26-Aug-20	0.0148	177.00	0.0090	1.340
24	25-Nov-20	0.0151	179.00	0.0080	1.920
25	15-Jan-21	0.0183	219.00	0.0105	1.380
26	7-May-21	0.0250	184.00	0.0098	2.030
27	27-Aug-21	0.0135	183.00	0.0116	1.180
28	19-Nov-21	0.0188	183.00	0.0099	1.390
29	8-Feb-22	0.0123	184.00	0.0097	1.300
30	29-Apr-22	0.1040	186.00	0.0114	20.400
31	1-Sep-22	0.0263	178.00	0.0067	3.400
32	21-Oct-22	0.0190	187.00	0.0110	1.580
33					
34					
35					
41					
42					
43					
44					
45					
46					
Coefficient of Variation:		0.76	0.07	0.34	4.05
Mann-Kendall Statistic (S):		-16	332	30	194
Confidence Factor:		60.0%	>99.9%	68.0%	99.9%
Concentration Trend:		Stable	Increasing	No Trend	Increasing



Notes:

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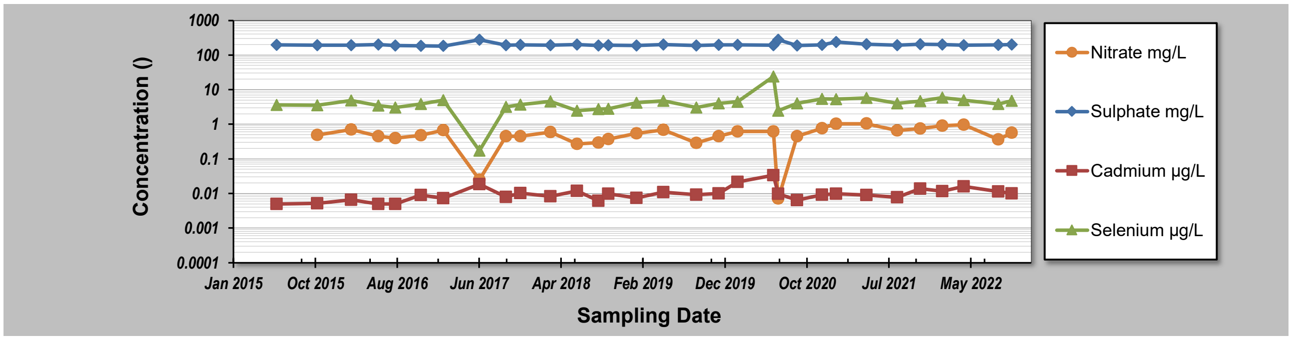
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	15-Jan-23	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - GHO	**Location**	GH_POTW10
Conducted By:	MF	**Reviewed By:**	

Sampling Event	Sampling Date	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
		GH_POTW10 CONCENTRATION							
1	8-Jun-15		196.00	0.0050	3.620				
2	4-Nov-15	0.4930	190.00	0.0052	3.490				
3	7-Mar-16	0.7050	191.00	0.0065	4.800				
4	14-Jun-16	0.4450	200.00	0.0050	3.420				
5	16-Aug-16	0.3910	186.00	0.0050	3.020				
6	17-Nov-16	0.4780	185.00	0.0089	3.800				
7	7-Feb-17	0.6770	182.00	0.0073	4.990				
8	19-Jun-17	0.0250	278.00	0.0184	0.173				
9	25-Sep-17	0.4530	191.00	0.0079	3.170				
10	16-Nov-17	0.4480	195.00	0.0101	3.710				
11	6-Mar-18	0.5910	193.00	0.0083	4.550				
12	11-Jun-18	0.2690	198.00	0.0119	2.450				
13	29-Aug-18	0.2950	188.00	0.0061	2.730				
14	4-Oct-18	0.3690	191.00	0.0097	2.820				
15	15-Jan-19	0.5390	189.00	0.0074	4.140				
16	24-Apr-19	0.6880	198.00	0.0108	4.720				
17	22-Aug-19	0.2880	187.00	0.0091	3.030				
18	13-Nov-19	0.4450	194.00	0.0100	4.000				
19	21-Jan-20	0.6110	195.00	0.0215	4.440				
20	31-May-20	0.6210	191.00	0.0339	23.900				
21	18-Jun-20	0.0071	275.00	0.0098	2.440				
22	26-Aug-20	0.4530	188.00	0.0064	3.970				
23	25-Nov-20	0.7640	195.00	0.0091	5.340				
24	15-Jan-21	1.0300	235.00	0.0098	5.240				
25	7-May-21	1.0400	204.00	0.0089	5.810				
26	27-Aug-21	0.6640	193.00	0.0077	3.990				
27	19-Nov-21	0.7540	205.00	0.0138	4.600				
28	8-Feb-22	0.9000	200.00	0.0117	5.840				
29	28-Apr-22	0.9690	192.00	0.0159	5.000				
30	1-Sep-22	0.3660	197.00	0.0114	3.810				
31	21-Oct-22	0.5660	202.00	0.0099	4.700				
32									
33									
34									
35									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	0.47	0.11	0.55	0.82				
	Mann-Kendall Statistic (S):	111	118	185	141				
	Confidence Factor:	97.5%	97.7%	99.9%	99.2%				
	Concentration Trend:	Increasing	Increasing	Increasing	Increasing				



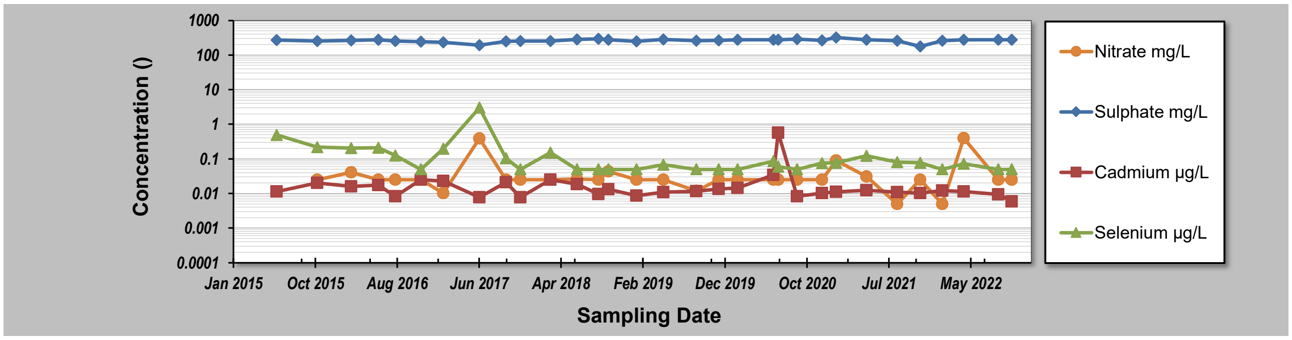
Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

Evaluation Date: 15-Jan-23
Facility Name: Teck Coal Regional Groundwater - GHO
Conducted By: MF
Job ID: 635544
Location GH_POTW15
Reviewed By:

	Parameter	**Nitrate**	**Sulphate**	**Cadmium**	**Selenium**				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	**Sampling Date**	**GH_POTW15 CONCENTRATION**							
1	8-Jun-15		272.00	0.0114	0.486				
2	4-Nov-15	0.0250	254.00	0.0201	0.216				
3	7-Mar-16	0.0410	261.00	0.0161	0.206				
4	14-Jun-16	0.0250	273.00	0.0175	0.207				
5	16-Aug-16	0.0250	254.00	0.0082	0.125				
6	17-Nov-16	0.0250	244.00	0.0250	0.050				
7	7-Feb-17	0.0103	234.00	0.0229	0.197				
8	19-Jun-17	0.3900	190.00	0.0077	3.030				
9	25-Sep-17	0.0250	250.00	0.0212	0.103				
10	16-Nov-17	0.0250	254.00	0.0078	0.050				
11	6-Mar-18	0.0250	251.00	0.0249	0.152				
12	11-Jun-18	0.0260	279.00	0.0186	0.050				
13	29-Aug-18	0.0250	291.00	0.0096	0.050				
14	4-Oct-18	0.0430	275.00	0.0133	0.050				
15	15-Jan-19	0.0250	250.00	0.0086	0.050				
16	24-Apr-19	0.0250	281.00	0.0109	0.068				
17	22-Aug-19	0.0118	256.00	0.0116	0.050				
18	13-Nov-19	0.0250	261.00	0.0134	0.050				
19	21-Jan-20	0.0250	273.00	0.0143	0.050				
20	31-May-20	0.0250	273.00	0.0341	0.085				
21	18-Jun-20	0.0250	275.00	0.5720	0.060				
22	26-Aug-20	0.0250	289.00	0.0082	0.050				
23	25-Nov-20	0.0250	262.00	0.0101	0.075				
24	15-Jan-21	0.0900	321.00	0.0112	0.077				
25	7-May-21	0.0309	275.00	0.0124	0.123				
26	27-Aug-21	0.0050	259.00	0.0109	0.080				
27	19-Nov-21	0.0250	176.00	0.0103	0.077				
28	8-Feb-22	0.0050	259.00	0.0120	0.050				
29	28-Apr-22	0.3970	278.00	0.0114	0.072				
30	1-Sep-22	0.0250	277.00	0.0094	0.050				
31	21-Oct-22	0.0250	274.00	0.0059	0.050				
32									
33									
34									
35									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	1.85	0.10	3.14	2.72				
	Mann-Kendall Statistic (S):	-17	119	-88	-144				
	Confidence Factor:	61.1%	97.8%	93.0%	99.3%				
	Concentration Trend:	No Trend	Increasing	Prob. Decreasing	Decreasing				



Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
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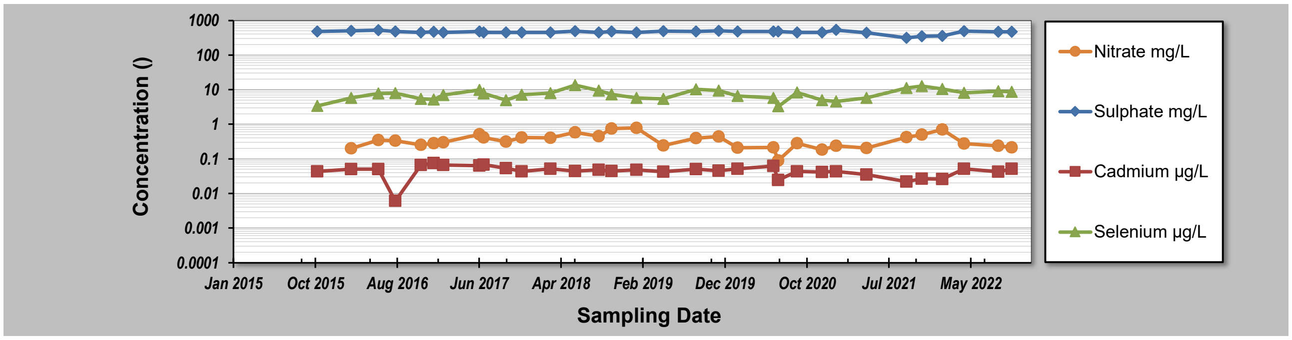
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 15-Jan-23
Facility Name: Teck Coal Regional Groundwater - GHO
Conducted By: MF

Job ID: 635544
Location GH_POTW17
Reviewed By:

Sampling Event	Sampling Date	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
		GH_POTW17 CONCENTRATION							
1	4-Nov-15		482.00	0.0437	3.400				
2	7-Mar-16	0.1980	498.00	0.0500	5.760				
3	14-Jun-16	0.3450	522.00	0.0506	7.710				
4	16-Aug-16	0.3300	480.00	0.0061	7.980				
5	17-Nov-16	0.2550	448.00	0.0660	5.410				
6	3-Jan-17	0.2810	464.00	0.0750	5.150				
7	7-Feb-17	0.3020	450.00	0.0665	6.930				
8	19-Jun-17	0.5050	475.00	0.0630	9.830				
9	5-Jul-17	0.4140	448.00	0.0671	7.710				
10	25-Sep-17	0.3110	450.00	0.0539	4.980				
11	21-Nov-17	0.4150	450.00	0.0429	7.090				
12	6-Mar-18	0.4020	451.00	0.0509	7.960				
13	4-Jun-18	0.5820	492.00	0.0444	13.500				
14	30-Aug-18	0.4500	453.00	0.0477	9.420				
15	16-Oct-18	0.7520	475.00	0.0440	7.300				
16	15-Jan-19	0.7820	447.00	0.0477	5.730				
17	24-Apr-19	0.2440	489.00	0.0420	5.390				
18	22-Aug-19	0.3980	482.00	0.0498	10.300				
19	13-Nov-19	0.4430	504.00	0.0450	9.420				
20	21-Jan-20	0.2080	481.00	0.0515	6.550				
21	31-May-20	0.2120	482.00	0.0624	5.690				
22	18-Jun-20	0.0900	480.00	0.0242	3.290				
23	26-Aug-20	0.2820	453.00	0.0436	8.230				
24	25-Nov-20	0.1850	445.00	0.0413	4.940				
25	15-Jan-21	0.2370	528.00	0.0434	4.570				
26	7-May-21	0.2050	437.00	0.0348	5.800				
27	30-Sep-21	0.4210	315.00	0.0217	11.100				
28	26-Nov-21	0.4960	346.00	0.0268	12.600				
29	8-Feb-22	0.7050	353.00	0.0260	10.500				
30	29-Apr-22	0.2750	490.00	0.0516	8.140				
31	1-Sep-22	0.2380	469.00	0.0427	8.990				
32	21-Oct-22	0.2120	468.00	0.0511	8.620				
33									
34									
35									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	0.47	0.10	0.31	0.33				
	Mann-Kendall Statistic (S):	-36	-72	-157	88				
	Confidence Factor:	72.3%	87.4%	99.5%	92.0%				
	Concentration Trend:	Stable	Stable	Decreasing	Prob. Increasing				



Notes:

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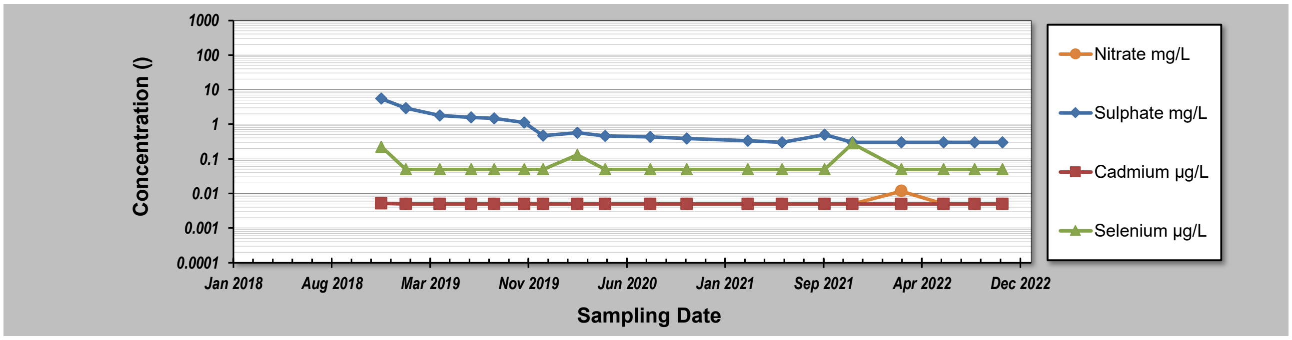
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	15-Jan-23	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - GHO	**Location**	GH_MW-MC-1D
Conducted By:	MF	**Reviewed By:**	

Sampling Event	Sampling Date	Nitrate	Sulphate	Cadmium	Selenium				
Parameter / **units**		mg/L	mg/L	µg/L	µg/L				
		GH_MW-MC-1D CONCENTRATION							
1	5-Dec-18		5.47	0.0052	0.2210				
2	30-Jan-19	0.0050	2.94	0.0050	0.0500				
3	18-Apr-19	0.0050	1.80	0.0050	0.0500				
4	28-Jun-19	0.0050	1.58	0.0050	0.0500				
5	20-Aug-19	0.0050	1.48	0.0050	0.0500				
6	28-Oct-19	0.0050	1.12	0.0050	0.0500				
7	10-Dec-19	0.0050	0.47	0.0050	0.0500				
8	26-Feb-20	0.0050	0.57	0.0050	0.1320				
9	30-Apr-20	0.0050	0.46	0.0050	0.0500				
10	11-Aug-20	0.0050	0.43	0.0050	0.0500				
11	3-Nov-20	0.0050	0.39	0.0050	0.0500				
12	22-Mar-21	0.0050	0.33	0.0050	0.0500				
13	9-Jun-21	0.0050	0.30	0.0050	0.0500				
14	14-Sep-21	0.0050	0.50	0.0050	0.0500				
15	17-Nov-21	0.0050	0.30	0.0050	0.2790				
16	9-Mar-22	0.0118	0.30	0.0050	0.0500				
17	13-Jun-22	0.0050	0.30	0.0050	0.0500				
18	23-Aug-22	0.0050	0.30	0.0050	0.0500				
19	26-Oct-22	0.0050	0.30	0.0050	0.0500				
20									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		0.30	1.27	0.01	0.86				
Mann-Kendall Statistic (S):		11	-142	-18	-11				
Confidence Factor:		64.6%	>99.9%	72.2%	63.5%				
Concentration Trend:		No Trend	Decreasing	Stable	Stable				



Notes:

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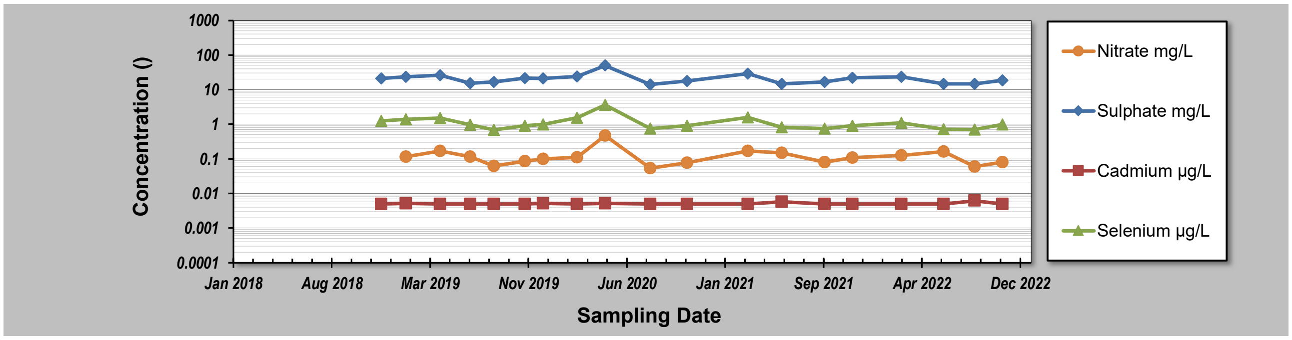
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 15-Jan-23
Facility Name: Teck Coal Regional Groundwater - GHO
Conducted By: MF

Job ID: 635544
Location GH_MW-MC-1S
Reviewed By:

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	Sampling Date	GH_MW-MC-1S CONCENTRATION							
1	5-Dec-18		21.00	0.0050	1.240				
2	30-Jan-19	0.1140	23.30	0.0052	1.380				
3	18-Apr-19	0.1690	26.10	0.0050	1.520				
4	26-Jun-19	0.1150	15.30	0.0050	0.963				
5	19-Aug-19	0.0621	16.50	0.0050	0.687				
6	29-Oct-19	0.0852	21.30	0.0050	0.914				
7	10-Dec-19	0.0995	21.20	0.0052	0.993				
8	26-Feb-20	0.1100	24.10	0.0050	1.530				
9	30-Apr-20	0.4690	49.90	0.0052	3.630				
10	11-Aug-20	0.0540	14.10	0.0050	0.741				
11	3-Nov-20	0.0762	17.90	0.0050	0.901				
12	22-Mar-21	0.1700	29.00	0.0050	1.570				
13	8-Jun-21	0.1480	14.60	0.0057	0.819				
14	14-Sep-21	0.0804	16.70	0.0050	0.749				
15	17-Nov-21	0.1070	21.90	0.0050	0.908				
16	9-Mar-22	0.1260	23.50	0.0050	1.100				
17	13-Jun-22	0.1610	14.60	0.0050	0.719				
18	23-Aug-22	0.0597	14.50	0.0062	0.694				
19	26-Oct-22	0.0807	18.70	0.0050	0.982				
20									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		**0.73**	**0.38**	**0.06**	**0.57**				
Mann-Kendall Statistic (S):		**-11**	**-26**	**5**	**-41**				
Confidence Factor:		**64.6%**	**80.7%**	**55.5%**	**91.8%**				
Concentration Trend:		**Stable**	**Stable**	**No Trend**	**Prob. Decreasing**				



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DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of the information contained herein, and no such party shall be liable for any direct, indirect, consequential, incidental or other damages resulting from the use of this product or the information contained herein. Information in this publication is subject to change without notice. GSI Environmental Inc., disclaims any responsibility or obligation to update the information contained herein.*

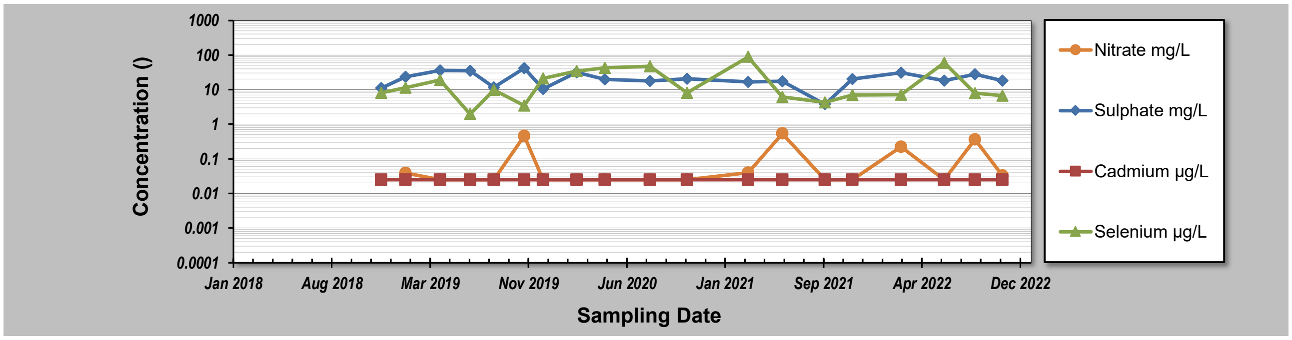
GSI Environmental Inc., www.gsi-net.com

GSI MANN-KENDALL TOOLKIT

Evaluation Date: 15-Jan-23
Facility Name: Teck Coal Regional Groundwater - GHO
Conducted By: MF

Job ID: 635544
Location GH_MW-MC-2D
Reviewed By:

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	Sampling Date	GH_MW-MC-2D CONCENTRATION							
1	5-Dec-18		11.20	0.0250	8.110				
2	29-Jan-19	0.0390	23.60	0.0250	11.400				
3	18-Apr-19	0.0250	35.80	0.0250	18.900				
4	26-Jun-19	0.0250	35.00	0.0250	1.980				
5	19-Aug-19	0.0250	11.60	0.0250	9.800				
6	28-Oct-19	0.4600	41.90	0.0250	3.440				
7	10-Dec-19	0.0250	10.40	0.0250	21.000				
8	25-Feb-20	0.0250	31.20	0.0250	34.100				
9	29-Apr-20	0.0250	19.90	0.0250	42.000				
10	10-Aug-20	0.0250	17.70	0.0250	46.700				
11	3-Nov-20	0.0250	20.70	0.0250	8.000				
12	23-Mar-21	0.0400	16.60	0.0250	88.500				
13	9-Jun-21	0.5390	17.30	0.0250	6.190				
14	15-Sep-21	0.0250	3.80	0.0250	4.280				
15	17-Nov-21	0.0250	20.10	0.0250	6.900				
16	8-Mar-22	0.2210	31.10	0.0250	7.040				
17	15-Jun-22	0.0250	18.20	0.0250	59.600				
18	24-Aug-22	0.3650	28.00	0.0250	7.900				
19	26-Oct-22	0.0328	18.20	0.0250	6.610				
20									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		1.53	0.46	0.00	1.13				
Mann-Kendall Statistic (S):		24	-14	0	3				
Confidence Factor:		80.6%	67.4%	48.6%	52.7%				
Concentration Trend:		No Trend	Stable	Stable	No Trend				



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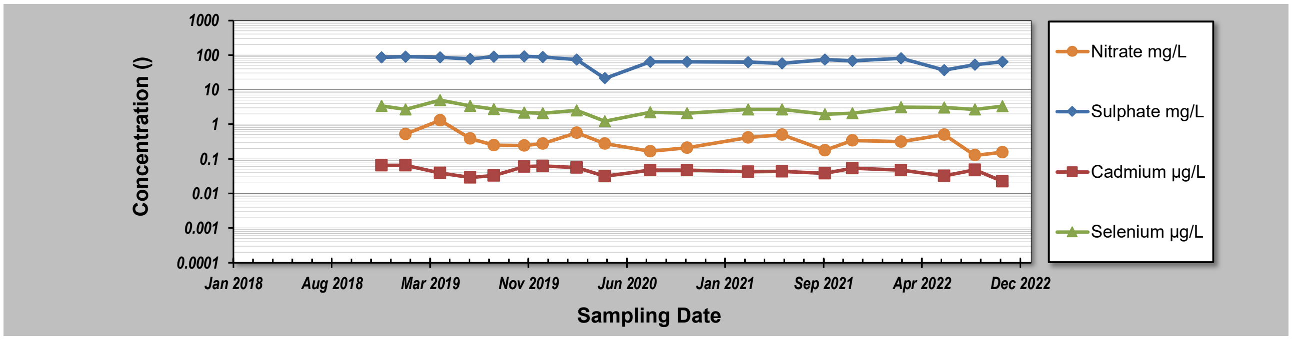
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	15-Jan-23	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - GHO	**Location**	GH_MW-MC-2S
Conducted By:	MF	**Reviewed By:**	

	Parameter	**Nitrate**	**Sulphate**	**Cadmium**	**Selenium**				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	**Sampling Date**	**GH_MW-MC-2S CONCENTRATION**							
1	5-Dec-18		85.90	0.0650	3.400				
2	29-Jan-19	0.5160	88.50	0.0644	2.700				
3	18-Apr-19	1.3000	85.10	0.0391	4.990				
4	26-Jun-19	0.3830	77.50	0.0289	3.410				
5	19-Aug-19	0.2470	89.10	0.0331	2.750				
6	28-Oct-19	0.2430	91.40	0.0597	2.150				
7	9-Dec-19	0.2730	88.10	0.0616	2.090				
8	25-Feb-20	0.5710	73.70	0.0559	2.510				
9	29-Apr-20	0.2750	21.40	0.0316	1.230				
10	11-Aug-20	0.1660	63.80	0.0468	2.230				
11	3-Nov-20	0.2100	63.40	0.0468	2.060				
12	23-Mar-21	0.4140	61.70	0.0425	2.650				
13	9-Jun-21	0.4940	56.90	0.0430	2.680				
14	15-Sep-21	0.1760	73.10	0.0379	1.960				
15	17-Nov-21	0.3420	68.30	0.0534	2.070				
16	8-Mar-22	0.3120	79.80	0.0473	3.080				
17	15-Jun-22	0.5000	36.70	0.0322	3.020				
18	24-Aug-22	0.1270	52.20	0.0482	2.660				
19	26-Oct-22	0.1560	63.80	0.0226	3.300				
20									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		0.72	0.27	0.28	0.30				
Mann-Kendall Statistic (S):		-43	-80	-44	-19				
Confidence Factor:		94.4%	99.8%	93.3%	73.3%				
Concentration Trend:		Prob. Decreasing	Decreasing	Prob. Decreasing	Stable				



Notes:

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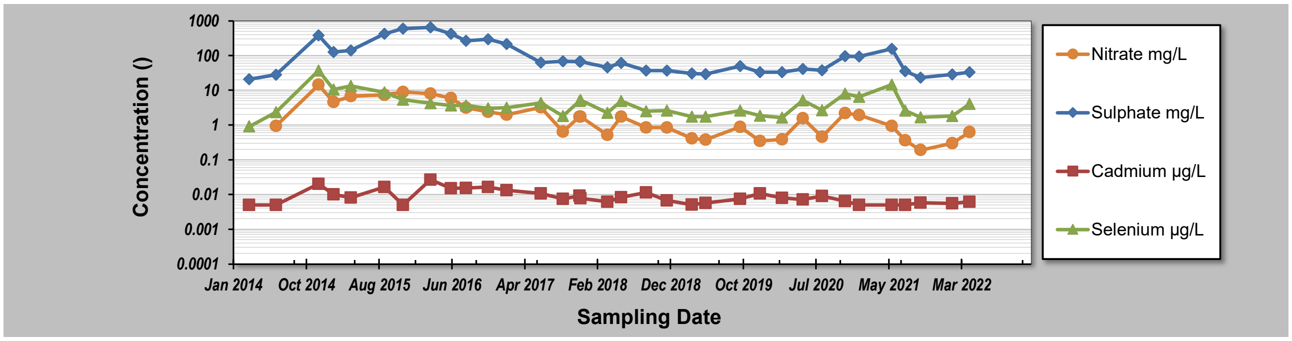
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

Evaluation Date:	15-Jan-23	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - GHO	**Location**	GH_GA-MW-4
Conducted By:	MF	**Reviewed By:**	

Sampling Event	**Sampling Date**	**Parameter** Nitrate **units** mg/L	Sulphate mg/L	Cadmium µg/L	Selenium µg/L				
		GH_GA-MW-4 CONCENTRATION							
1	7-Mar-14		21.00	0.0050	0.910				
2	25-Jun-14	0.9360	27.80	0.0050	2.320				
3	17-Dec-14	14.4000	381.00	0.0200	37.100				
4	17-Feb-15	4.6300	125.00	0.0100	10.500				
5	29-Apr-15	6.6800	141.00	0.0081	13.200				
6	15-Sep-15	7.3500	425.00	0.0164	8.740				
7	30-Nov-15	8.9800	599.00	0.0050	5.310				
8	22-Mar-16	8.0200	646.00	0.0266	4.190				
9	14-Jun-16	5.9700	425.00	0.0150	3.660				
10	16-Aug-16	3.1600	266.00	0.0152	3.620				
11	14-Nov-16	2.4100	294.00	0.0162	3.000				
12	30-Jan-17	1.9600	215.00	0.0131	3.160				
13	20-Jun-17	3.1800	63.00	0.0106	4.310				
14	19-Sep-17	0.6380	68.00	0.0074	1.830				
15	27-Nov-17	1.7300	66.40	0.0092	4.930				
16	30-Nov-17	1.7400	66.70	0.0078	5.230				
17	21-Mar-18	0.5230	45.70	0.0062	2.230				
18	17-May-18	1.7400	61.60	0.0082	4.950				
19	27-Aug-18	0.8480	36.70	0.0114	2.510				
20	21-Nov-18	0.8380	37.10	0.0067	2.610				
21	4-Mar-19	0.4110	30.50	0.0051	1.740				
22	29-Apr-19	0.3750	29.40	0.0056	1.740				
23	19-Sep-19	0.8830	49.70	0.0075	2.580				
24	9-Dec-19	0.3450	33.20	0.0106	1.860				
25	10-Mar-20	0.3880	32.80	0.0080	1.640				
26	3-Jun-20	1.5500	40.70	0.0071	5.140				
27	21-Aug-20	0.4530	37.40	0.0091	2.630				
28	24-Nov-20	2.1900	95.70	0.0064	8.040				
29	21-Jan-21	1.9200	93.70	0.0050	6.410				
30	4-Jun-21	0.9350	156.00	0.0050	14.400				
31	30-Jul-21	0.3590	35.10	0.0050	2.620				
32	1-Oct-21	0.1910	23.00	0.0058	1.660				
33	9-Feb-22	0.2960	28.50	0.0055	1.800				
34	21-Apr-22	0.6210	33.10	0.0062	4.060				
35									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		1.23	1.22	0.54	1.22				
Mann-Kendall Statistic (S):		-305	-214	-198	-106				
Confidence Factor:		>99.9%	99.9%	99.9%	94.0%				
Concentration Trend:		Decreasing	Decreasing	Decreasing	Prob. Decreasing				



Notes:
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GSI MANN-KENDALL TOOLKIT

Evaluation Date: 15-Jan-23
Facility Name: Teck Coal Regional Groundwater - GHO
Conducted By: MF

Job ID: 635544
Location GH_GA-MW-2
Reviewed By:

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	μg/L	μg/L				
Sampling Event	Sampling Date	GH_GA-MW-2 CONCENTRATION							
1	7-Mar-14		84.00	0.0150	7.090				
2	25-Jun-14	1.6100	95.40	0.0130	8.500				
3	17-Dec-14	2.6100	104.00	0.0140	8.990				
4	17-Feb-15	1.6500	99.90	0.0240	6.780				
5	29-Apr-15	1.7000	115.00	0.0251	8.560				
6	15-Sep-15	3.0100	134.00	0.0200	9.130				
7	30-Nov-15	4.0000	141.00	0.0270	12.000				
8	22-Mar-16	3.4900	158.00	0.0312	13.500				
9	14-Jun-16	0.7510	160.00	0.0204	5.700				
10	15-Aug-16	1.6300	157.00	0.0338	10.400				
11	14-Nov-16	4.2200	181.00	0.0428	17.900				
12	30-Jan-17	0.8370	176.00	0.0401	7.870				
13	20-Jun-17	1.5000	171.00	0.0189	7.410				
14	20-Sep-17	1.5600	192.00	0.0600	9.490				
15	27-Nov-17	5.5200	214.00	0.0584	18.900				
16	21-Mar-18	16.1000	272.00	0.0660	43.100				
17	17-May-18	3.7000	226.00	0.0600	8.780				
18	12-Sep-18	5.6800	273.00	0.0600	13.500				
19	26-Nov-18	4.8000	265.00	0.0720	11.300				
20	6-Mar-19	6.0900	274.00	0.0600	18.400				
21	23-May-19	7.2300	320.00	0.0600	11.100				
22	19-Sep-19	7.2100	351.00	0.0600	17.900				
23	27-Nov-19	10.1000	354.00	0.0618	34.700				
24	16-Mar-20	15.2000	427.00	0.0841	42.900				
25	7-Jun-20	8.9000	415.00	0.0600	15.200				
26	20-Aug-20	9.6000	451.00	0.0663	22.600				
27	20-Nov-20	12.5000	492.00	0.0599	34.600				
28	8-Mar-21	10.6000	481.00	0.0688	32.400				
29	23-Apr-21	12.4000	504.00	0.0787	36.500				
30	1-Sep-21	8.9100	513.00	0.0600	18.800				
31	1-Oct-21	11.0000	519.00	0.0942	33.200				
32	19-Jan-22	9.5300	526.00	0.0718	31.900				
33	22-Apr-22	0.9700	602.00	0.0600	24.500				
34									
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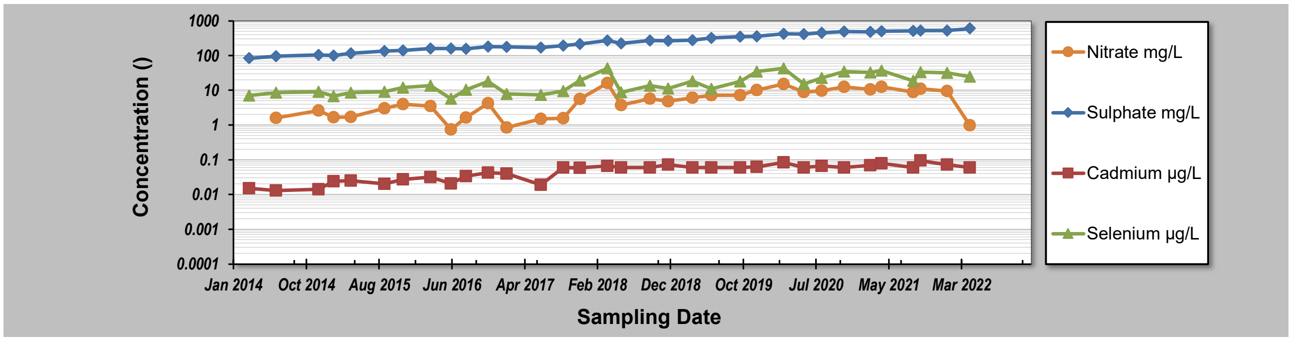
44									
45									
46									
Coefficient of Variation:		0.73	0.55	0.45	0.63				
Mann-Kendall Statistic (S):		258	506	352	296				
Confidence Factor:		>99.9%	>99.9%	>99.9%	>99.9%				
Concentration Trend:		Increasing	Increasing	Increasing	Increasing				



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GSI MANN-KENDALL TOOLKIT

Evaluation Date:	15-Jan-23	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - GHO	**Location**	RG_MW_WC2A
Conducted By:	MF	**Reviewed By:**	

Sampling Event	Sampling Date	Nitrate	Sulphate	Cadmium	Selenium				
	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
		RG_MW_WC2A CONCENTRATION							
1	16-Jun-20		220.00	0.0237	28.600				
2	11-Aug-20	10.2000	186.00	0.0224	39.800				
3	13-Oct-20	8.3800	163.00	0.0202	31.100				
4	8-Dec-20	9.0500	185.00	0.0197	39.000				
5	3-Mar-21	9.8600	277.00	0.0254	36.500				
6	10-May-21	9.1400	231.00	0.0217	37.500				
7	16-Aug-21	7.2500	179.00	0.0291	33.700				
8	2-Nov-21	5.4100	143.00	0.0259	25.800				
9	10-Feb-22	6.3300	148.00	0.0198	33.600				
10	10-May-22	10.1000	199.00	0.0198	51.100				
11	26-Jul-22	9.6100	230.00	0.0412	67.400				
12	21-Nov-22	7.5300	172.00	0.0146	67.200				
13									
14									
15									
16									
17									
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42									
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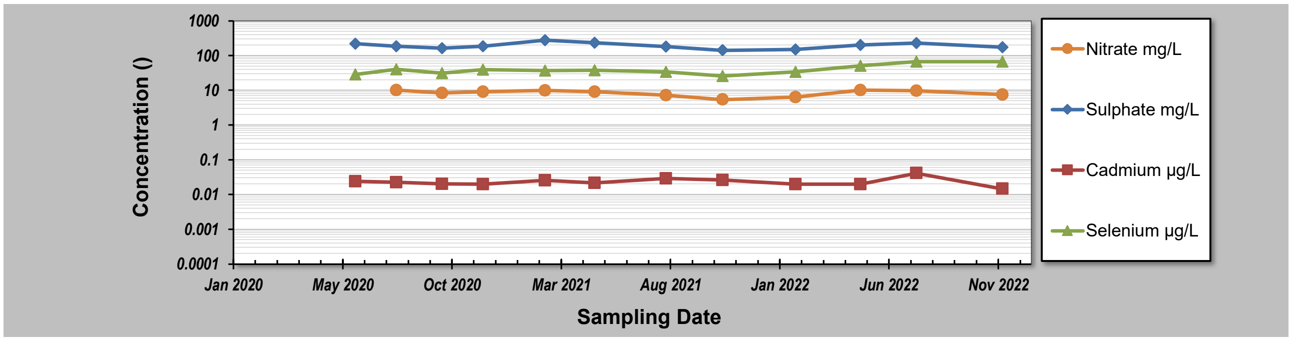
45									
46									
	Coefficient of Variation:	0.19	0.20	0.28	0.34				
	Mann-Kendall Statistic (S):	-11	-10	-5	20				
	Confidence Factor:	77.7%	72.7%	60.6%	90.2%				
	Concentration Trend:	Stable	Stable	Stable	Prob. Increasing				



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GSI MANN-KENDALL TOOLKIT

Evaluation Date:	15-Jan-23	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - GHO	**Location**	RG_MW_WC2B
Conducted By:	MF	**Reviewed By:**	

Sampling Event	**Sampling Date**	**Nitrate**	**Sulphate**	**Cadmium**	**Selenium**				
	units	mg/L	mg/L	µg/L	µg/L				
		RG_MW_WC2B CONCENTRATION							
1	16-Jun-20		135.00	0.0288	23.500				
2	12-Aug-20	8.0200	159.00	0.0335	33.100				
3	13-Oct-20	19.0000	381.00	0.0525	78.900				
4	8-Dec-20	22.6000	534.00	0.0570	78.200				
5	3-Mar-21	14.3000	405.00	0.0563	52.900				
6	10-May-21	8.8900	210.00	0.0319	44.100				
7	16-Aug-21	6.5900	130.00	0.0319	36.000				
8	2-Nov-21	10.3000	206.00	0.0394	49.000				
9	10-Feb-22	24.4000	444.00	0.0536	132.000				
10	10-May-22	10.9000	230.00	0.0398	66.200				
11	26-Jul-22	7.7400	176.00	0.0206	45.700				
12	21-Nov-22	16.9000	375.00	0.0600	167.000				
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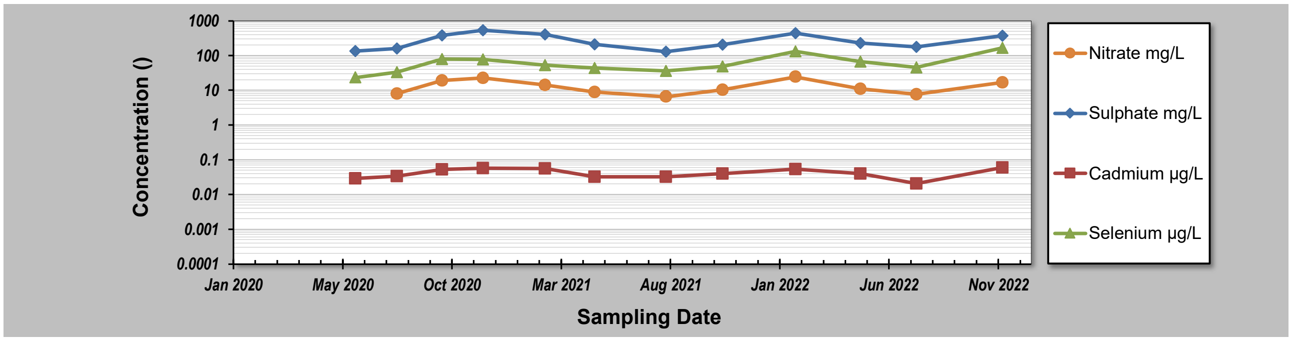
45									
46									
	Coefficient of Variation:	0.46	0.49	0.31	0.63				
	Mann-Kendall Statistic (S):	-1	6	9	22				
	Confidence Factor:	50.0%	63.1%	70.4%	92.4%				
	Concentration Trend:	Stable	No Trend	No Trend	Prob. Increasing				



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GSI MANN-KENDALL TOOLKIT

Evaluation Date:	15-Jan-23	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - GHO	**Location**	RG_MW_LC3A
Conducted By:	MF	**Reviewed By:**	

	Parameter	**Nitrate**	**Sulphate**	**Cadmium**	**Selenium**				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	**Sampling Date**	**RG_MW_LC3A CONCENTRATION**							
1	16-Jun-20		149.00	0.0300	44.000				
2	12-Aug-20	3.500	74.90	0.0215	18.300				
3	15-Oct-20	13.500	347.00	0.0314	57.400				
4	9-Dec-20	13.300	452.00	0.0437	48.700				
5	3-Mar-21	5.550	220.00	0.0286	21.700				
6	10-May-21	11.300	284.00	0.0285	58.300				
7	16-Aug-21	20.300	313.00	0.0286	105.000				
8	2-Nov-21	8.840	156.00	0.0206	46.600				
9	11-Feb-22	8.090	165.00	0.0230	44.300				
10	10-May-22	12.400	252.00	0.0238	82.200				
11	26-Jul-22	12.200	277.00	0.0298	101.000				
12	21-Nov-22	10.500	236.00	0.1200	103.000				
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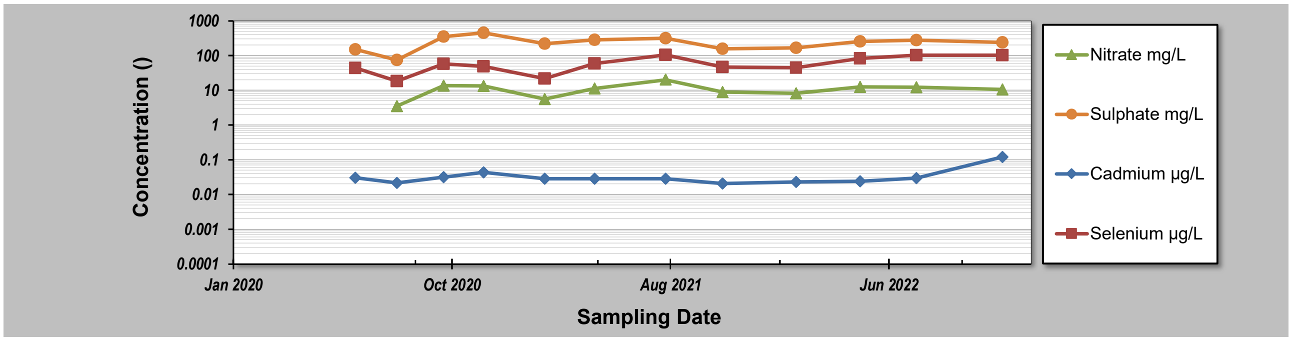
Coefficient of Variation:		0.41	0.42	0.76	0.50				
Mann-Kendall Statistic (S):		1	4	-1	32				
Confidence Factor:		50.0%	58.0%	50.0%	98.4%				
Concentration Trend:		No Trend	No Trend	Stable	Increasing				



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GSI MANN-KENDALL TOOLKIT

Evaluation Date:	15-Jan-23	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - GHO	**Location**	RG_MW_LC3B
Conducted By:	MF	**Reviewed By:**	

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	**Sampling Date**	**RG_MW_LC3B CONCENTRATION**							
1	16-Jun-20		151.00	0.0260	50.700				
2	12-Aug-20	4.3200	78.60	0.0207	27.800				
3	15-Oct-20	21.7000	704.00	0.0620	71.300				
4	9-Dec-20	15.5000	634.00	0.0423	48.200				
5	3-Mar-21	3.5900	154.00	0.0272	14.600				
6	11-May-21	12.3000	367.00	0.0421	61.200				
7	16-Aug-21	35.7000	574.00	0.0450	176.000				
8	2-Nov-21	29.5000	510.00	0.0375	158.000				
9	11-Feb-22	8.7600	166.00	0.0204	45.800				
10	10-May-22	20.7000	411.00	0.0348	131.000				
11	26-Jul-22	23.3000	504.00	0.0473	181.000				
12	21-Nov-22	1.7900	58.60	0.0669	20.500				
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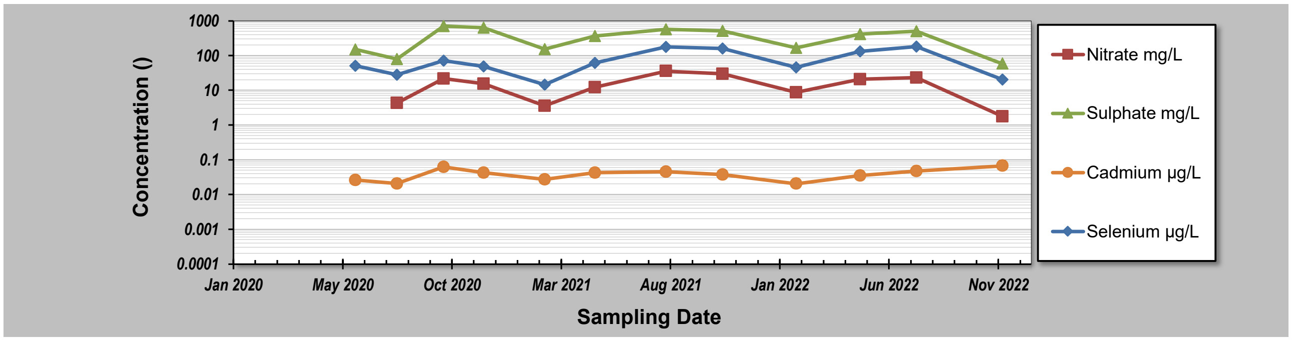
	Coefficient of Variation:	0.69	0.64	0.38	0.75				
	Mann-Kendall Statistic (S):	1	-4	16	12				
	Confidence Factor:	50.0%	58.0%	84.5%	77.0%				
	Concentration Trend:	No Trend	Stable	No Trend	No Trend				



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GSI MANN-KENDALL TOOLKIT

Evaluation Date:	15-Jan-23	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - GHO	**Location**	RG_MW_LCWC1
Conducted By:	MF	**Reviewed By:**	

	Parameter	**Nitrate**	**Sulphate**	**Cadmium**	**Selenium**				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	**Sampling Date**	**RG_MW_LCWC1 CONCENTRATION**							
1	16-Jun-20		294.00	0.0637	105.000				
2	12-Aug-20	24.0000	298.00	0.0454	103.000				
3	15-Oct-20	22.6000	291.00	0.0435	86.600				
4	9-Dec-20	16.0000	223.00	0.0347	60.600				
5	2-Mar-21	14.9000	251.00	0.0302	54.300				
6	11-May-21	18.5000	252.00	0.0445	79.300				
7	16-Aug-21	22.6000	382.00	0.0541	117.000				
8	2-Nov-21	17.6000	308.00	0.0399	87.000				
9	11-Feb-22	9.2200	161.00	0.0355	44.500				
10	10-May-22	16.1000	217.00	0.0348	85.500				
11	26-Jul-22	21.8000	358.00	0.0546	140.000				
12	25-Nov-22	18.6000	343.00	0.0621	138.000				
13									
14									
15									
16									
17									
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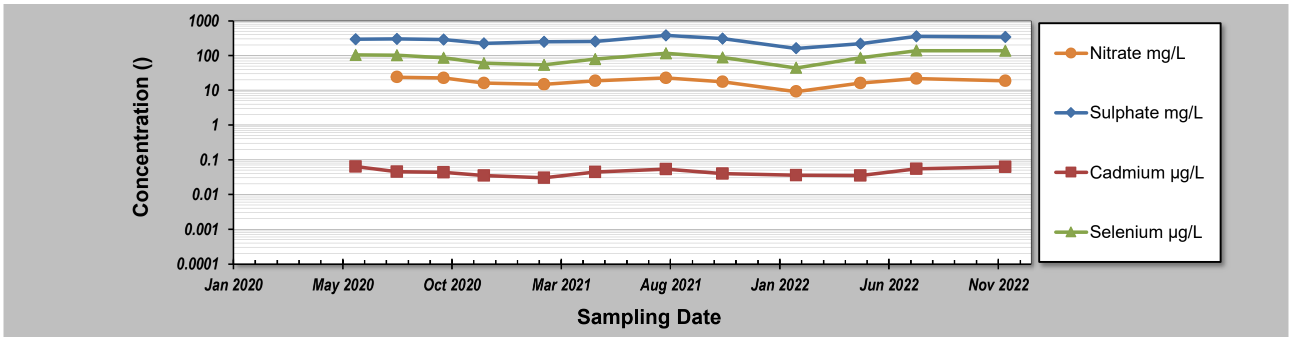
46									
Coefficient of Variation:		0.24	0.23	0.25	0.33				
Mann-Kendall Statistic (S):		-10	4	0	6				
Confidence Factor:		75.3%	58.0%	47.3%	63.1%				
Concentration Trend:		Stable	No Trend	Stable	No Trend				



Notes:
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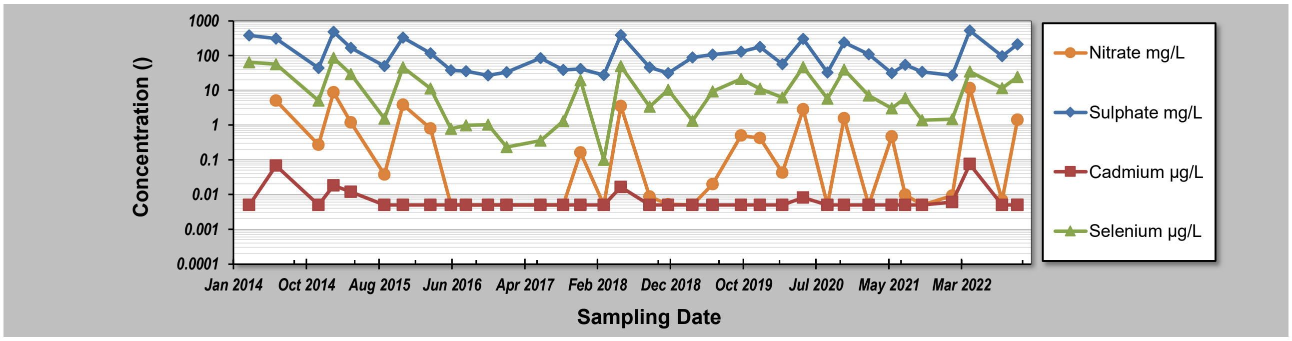
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

Evaluation Date:	15-Jan-23	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - GHO	**Location**	GH_GA-MW-3
Conducted By:	MF	**Reviewed By:**	

	Parameter	**Nitrate**	**Sulphate**	**Cadmium**	**Selenium**				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	**Sampling Date**	**GH_GA-MW-3 CONCENTRATION**							
1	7-Mar-14		382.00	0.0050	64.600				
2	25-Jun-14	5.0400	310.00	0.0670	56.900				
3	17-Dec-14	0.2710	43.50	0.0050	5.030				
4	17-Feb-15	8.7100	481.00	0.0180	85.300				
5	29-Apr-15	1.1900	165.00	0.0119	29.400				
6	15-Sep-15	0.0374	50.00	0.0050	1.530				
7	30-Nov-15	3.7700	330.00	0.0050	45.400				
8	22-Mar-16	0.7890	117.00	0.0050	11.300				
9	14-Jun-16	0.0050	37.70	0.0050	0.783				
10	15-Aug-16	0.0050	35.30	0.0050	0.972				
11	14-Nov-16	0.0050	26.90	0.0050	1.030				
12	30-Jan-17	0.0050	33.30	0.0050	0.231				
13	19-Jun-17	0.0050	84.00	0.0050	0.354				
14	20-Sep-17	0.0050	38.70	0.0050	1.290				
15	30-Nov-17	0.1610	41.10	0.0050	19.400				
16	7-Mar-18	0.0050	27.40	0.0050	0.100				
17	16-May-18	3.4800	387.00	0.0164	49.200				
18	12-Sep-18	0.0087	45.80	0.0050	3.380				
19	26-Nov-18	0.0052	30.90	0.0050	10.300				
20	6-Mar-19	0.0050	87.00	0.0050	1.330				
21	29-May-19	0.0196	106.00	0.0050	9.260				
22	23-Sep-19	0.4980	128.00	0.0050	21.100				
23	9-Dec-19	0.4220	177.00	0.0050	11.000				
24	11-Mar-20	0.0421	56.40	0.0050	6.230				
25	5-Jun-20	2.8100	300.00	0.0081	46.200				
26	13-Sep-20	0.0050	32.20	0.0050	5.690				
27	20-Nov-20	1.5700	236.00	0.0050	39.100				
28	1-Mar-21	0.0050	108.00	0.0050	7.040				
29	4-Jun-21	0.4700	30.90	0.0050	3.020				
30	30-Jul-21	0.0098	53.90	0.0050	5.940				
31	7-Oct-21	0.0050	34.00	0.0050	1.380				
32	9-Feb-22	0.0093	26.80	0.0060	1.480				
33	22-Apr-22	11.4000	527.00	0.0749	34.600				
34	2-Sep-22	0.0068	96.50	0.0050	11.500				
35	4-Nov-22	1.3900	210.00	0.0050	24.100				
36	4-Nov-22	1.3900	210.00	0.0050	24.100				
37									
38									
39									
40									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	2.05	0.99	1.60	1.21				
	Mann-Kendall Statistic (S):	-3	-22	-30	1				
	Confidence Factor:	51.1%	61.2%	65.3%	50.0%				
	Concentration Trend:	No Trend	Stable	No Trend	No Trend				



Notes:
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3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

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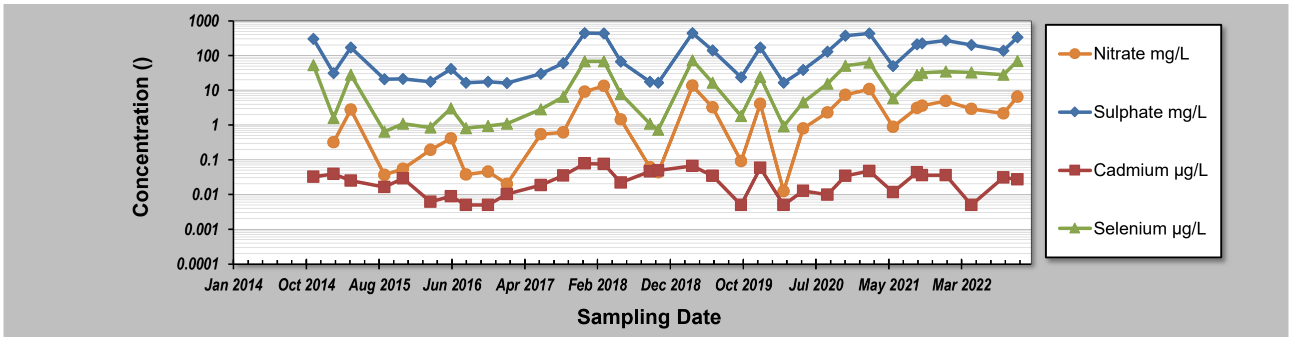
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 15-Jan-23
Facility Name: Teck Coal Regional Groundwater - GHO
Conducted By: MF

Job ID: 635544
Location GH_MW-ERSC-1
Reviewed By:

Sampling Event	Sampling Date	Parameter: Nitrate units: mg/L	Sulphate mg/L	Cadmium µg/L	Selenium µg/L				
		GH_MW-ERSC-1 CONCENTRATION							
1	26-Nov-14		301.00	0.0320	52.600				
2	17-Feb-15	0.3180	31.00	0.0390	1.580				
3	29-Apr-15	2.7900	168.00	0.0252	28.200				
4	15-Sep-15	0.0368	20.70	0.0164	0.646				
5	30-Nov-15	0.0543	21.10	0.0290	1.080				
6	22-Mar-16	0.1900	17.60	0.0062	0.847				
7	14-Jun-16	0.4120	40.90	0.0088	3.010				
8	15-Aug-16	0.0370	16.30	0.0050	0.815				
9	14-Nov-16	0.0453	17.40	0.0050	0.932				
10	31-Jan-17	0.0202	16.10	0.0103	1.080				
11	20-Jun-17	0.5430	29.70	0.0185	2.850				
12	20-Sep-17	0.6080	59.60	0.0349	6.530				
13	18-Dec-17	9.0400	442.00	0.0777	68.700				
14	7-Mar-18	13.4000	432.00	0.0747	68.100				
15	16-May-18	1.4200	66.80	0.0219	7.750				
16	12-Sep-18	0.0609	17.70	0.0459	1.090				
17	17-Oct-18	0.0437	16.60	0.0497	0.730				
18	7-Mar-19	13.5000	440.00	0.0662	73.200				
19	29-May-19	3.1900	139.00	0.0344	16.600				
20	23-Sep-19	0.0903	23.70	0.0050	1.820				
21	11-Dec-19	4.0300	170.00	0.0580	23.900				
22	16-Mar-20	0.0124	16.30	0.0050	0.911				
23	5-Jun-20	0.8000	38.40	0.0126	4.480				
24	13-Sep-20	2.2900	130.00	0.0098	15.500				
25	25-Nov-20	7.4200	372.00	0.0343	50.700				
26	5-Mar-21	10.7000	434.00	0.0469	62.800				
27	10-Jun-21	0.8720	49.30	0.0117	5.820				
28	17-Sep-21	3.0500	212.00	0.0429	27.400				
29	8-Oct-21	3.5400	222.00	0.0357	32.000				
30	13-Jan-22	4.8800	273.00	0.0360	34.800				
31	29-Apr-22	2.8600	203.00	0.0050	32.500				
32	8-Sep-22	2.1400	138.00	0.0310	28.200				
33	4-Nov-22	6.4800	338.00	0.0270	70.000				
34									
35									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		1.32	1.01	0.71	1.13				
Mann-Kendall Statistic (S):		172	141	24	184				
Confidence Factor:		99.8%	98.6%	63.8%	99.8%				
Concentration Trend:		Increasing	Increasing	No Trend	Increasing				



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

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GSI MANN-KENDALL TOOLKIT

Evaluation Date: 15-Jan-22
Facility Name: Teck Coal Regional Groundwater - GHO
Conducted By: MF
Job ID: 635544
Location GH_MW_EF1A
Reviewed By:

	Parameter	**Nitrate**	**Sulphate**	**Cadmium**	**Selenium**				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	**Sampling Date**	**GH_MW_EF1A CONCENTRATION**							
1	2-Sep-20		27.90	0.0059	2.070				
2	18-Mar-21	0.6220	37.10	0.0058	3.500				
3	18-Mar-21	0.6220	37.10	0.0058	3.500				
4	13-May-21	0.8120	42.30	0.0050	3.620				
5	17-Sep-21	0.2650	24.10	0.0057	1.860				
6	26-Nov-21	0.3150	26.60	0.0050	2.070				
7	24-Feb-22	0.5870	34.80	0.0052	3.080				
8	19-May-22	0.5190	35.60	0.0050	3.240				
9	15-Aug-22	0.4140	29.50	0.0050	3.420				
10	20-Oct-22	0.2810	24.30	0.0050	2.700				
11									
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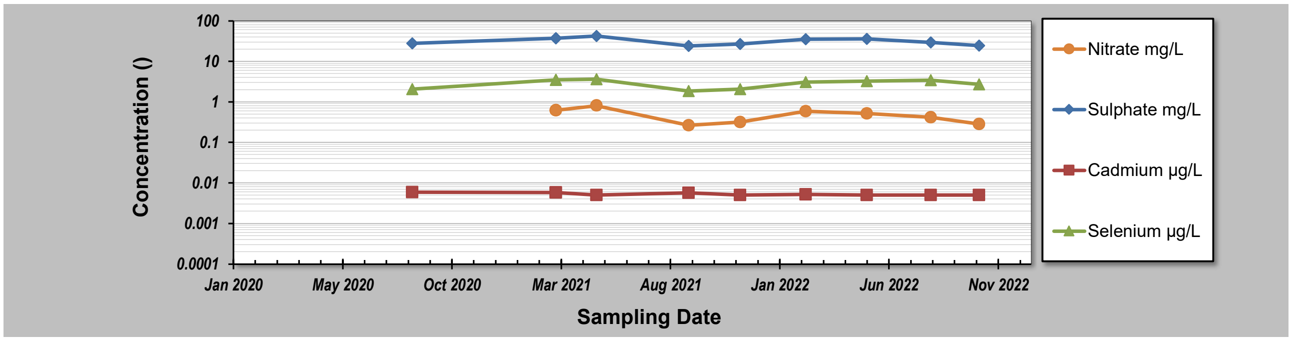
46									
Coefficient of Variation:		0.38	0.20	0.08	0.23				
Mann-Kendall Statistic (S):		-15	-10	-28	-1				
Confidence Factor:		92.5%	78.4%	99.4%	50.0%				
Concentration Trend:		Prob. Decreasing	Stable	Decreasing	Stable				



Notes:

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3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

Evaluation Date:	15-Jan-22	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - GHO	**Location**	GH_MW_EF1B
Conducted By:	MF	**Reviewed By:**	

Sampling Event	Sampling Date	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
		GH_MW_EF1B CONCENTRATION							
1	2-Sep-20		29.40	0.0079	1.640				
2	18-Mar-21	0.6390	39.60	0.0071	3.430				
3	13-May-21	0.3780	31.90	0.0069	2.750				
4	17-Sep-21	0.2310	23.30	0.0083	1.650				
5	26-Nov-21	0.3200	27.90	0.0081	2.380				
6	28-Feb-22	0.4770	32.90	0.0061	2.660				
7	19-May-22	0.3750	29.60	0.0066	2.750				
8	15-Aug-22	0.1300	16.80	0.0070	1.540				
9	20-Oct-22	0.2660	24.00	0.0102	2.040				
10									
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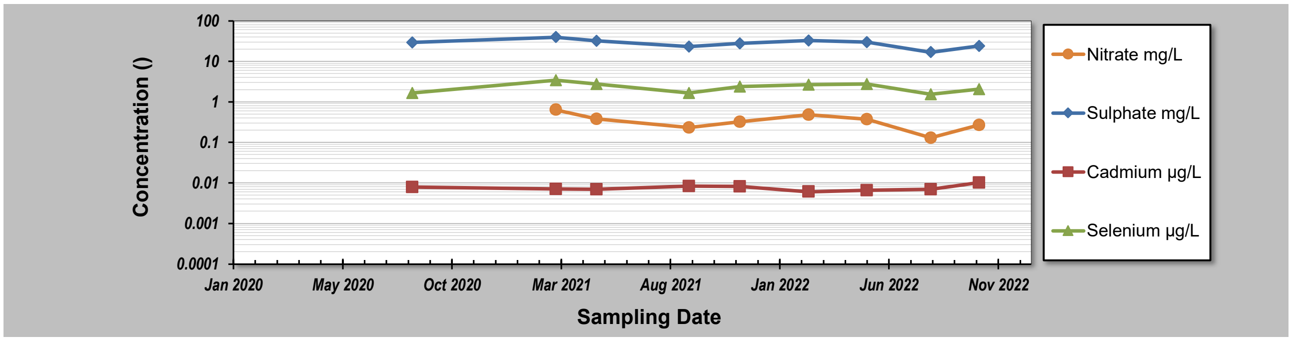
46									
	Coefficient of Variation:	0.44	0.23	0.16	0.28				
	Mann-Kendall Statistic (S):	-12	-12	0	-5				
	Confidence Factor:	91.1%	87.0%	46.0%	65.7%				
	Concentration Trend:	Prob. Decreasing	Stable	Stable	Stable				



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3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

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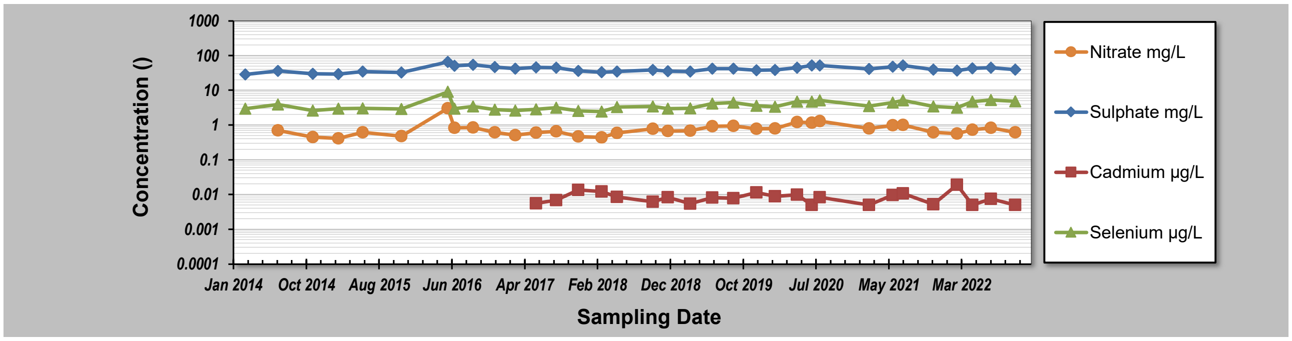
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 15-Jan-23
Facility Name: Teck Coal Regional Groundwater - GHO
Conducted By: MF

Job ID: 635544
Location RG_DW-01-03
Reviewed By:

Sampling Event	Sampling Date	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
		RG_DW-01-03 CONCENTRATION							
1	19-Feb-14		28.8		2.940				
2	3-Jul-14	0.7010	36.1		3.900				
3	24-Nov-14	0.4420	30.0		2.620				
4	9-Mar-15	0.4130	29.4		2.980				
5	18-Jun-15	0.6140	34.6		3.030				
6	24-Nov-15	0.4730	32.4		2.910				
7	1-Jun-16	3.0200	65.6		9.060				
8	29-Jun-16	0.8330	50.7		2.920				
9	14-Sep-16	0.8400	53.7		3.420				
10	12-Dec-16	0.6100	46.5		2.770				
11	6-Mar-17	0.5120	42.1		2.580				
12	31-May-17	0.5960	46.0	0.0055	2.800				
13	22-Aug-17	0.6550	44.8	0.0069	3.160				
14	21-Nov-17	0.4700	35.7	0.0134	2.530				
15	26-Feb-18	0.4410	33.0	0.0121	2.450				
16	30-Apr-18	0.5910	34.4	0.0084	3.250				
17	25-Sep-18	0.7820	38.5	0.0061	3.460				
18	26-Nov-18	0.6700	35.4	0.0082	2.980				
19	25-Feb-19	0.6830	34.8	0.0054	3.010				
20	27-May-19	0.9130	41.6	0.0081	4.180				
21	22-Aug-19	0.9350	41.7	0.0077	4.370				
22	25-Nov-19	0.7770	37.8	0.0115	3.560				
23	10-Feb-20	0.7900	38.4	0.0088	3.330				
24	11-May-20	1.2100	44.7	0.0098	4.710				
25	10-Jul-20	1.1700	51.9	0.0050	4.670				
26	12-Aug-20	1.3000	51.5	0.0082	5.110				
27	3-Mar-21	0.7970	41.3	0.0050	3.470				
28	8-Jun-21	0.9690	47.5	0.0097	4.400				
29	21-Jul-21	1.0000	51.4	0.0106	5.110				
30	23-Nov-21	0.6090	39.0	0.0052	3.440				
31	1-Mar-22	0.5680	36.7	0.0191	3.150				
32	3-May-22	0.7280	42.6	0.0050	4.680				
33	18-Jul-22	0.8340	44.6	0.0074	5.230				
34	26-Oct-22	0.6160	39.3	0.0050	4.810				
35									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	0.57	0.20	0.41	0.34				
	Mann-Kendall Statistic (S):	146	123	-34	243				
	Confidence Factor:	98.8%	96.5%	80.6%	>99.9%				
	Concentration Trend:	Increasing	Increasing	Stable	Increasing				



Notes:

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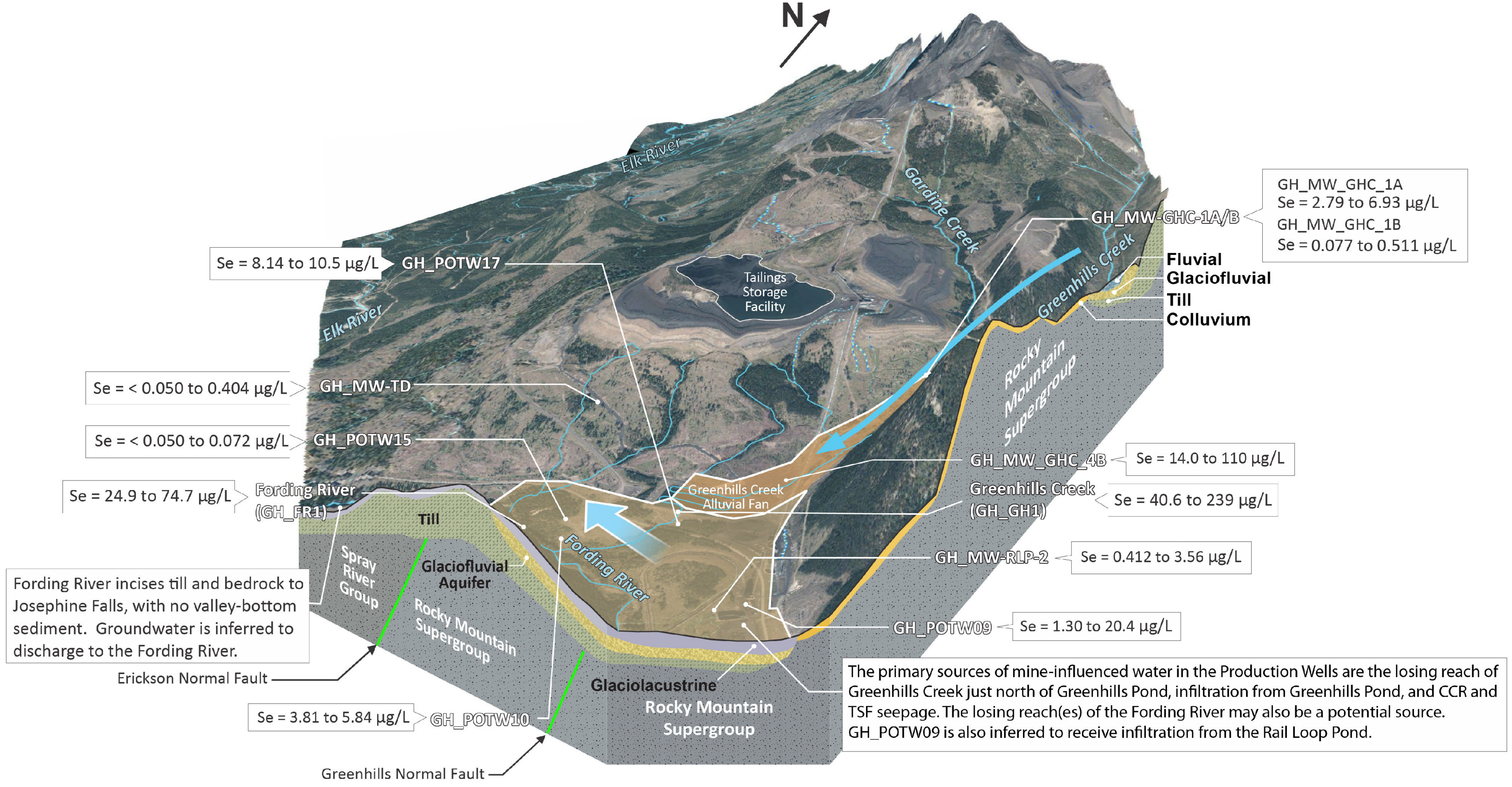
Attachment III

Block Diagrams

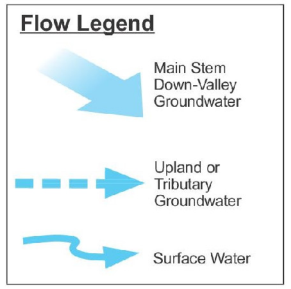
Diagram GH-01: 3D Conceptual Hydrogeology and Transport Pathways of Order Constituents at GHO – Fording River, Greenhills Creek and Study Area 3

Diagram GH-02: 3D Conceptual Hydrogeology and Transport Pathways of Order Constituents at GHO – Elk River and Study Area 4



Fording River incises till and bedrock to Josephine Falls, with no valley-bottom sediment. Groundwater is inferred to discharge to the Fording River.

The primary sources of mine-influenced water in the Production Wells are the losing reach of Greenhills Creek just north of Greenhills Pond, infiltration from Greenhills Pond, and CCR and TSF seepage. The losing reach(es) of the Fording River may also be a potential source. GH_POTW09 is also inferred to receive infiltration from the Rail Loop Pond.



NOTES:
1. Original in colour.
2. All concentrations shown are for 2022 minimum and maximum unless otherwise stated.
3. Subsurface geology is not to scale.
4. Vertical exaggeration 2x for topographic profile.
5. Groundwater transport pathways are conceptual only.

References:
1. Graphics from Brick Tudor Studios, LLC.
2. Bedrock geology derived from Monahan, 2000, BC Government.

Revisions:
0 - CW - 2023-02-14 - DRAFT - EC
1 - CW - 2023-03-23 - FINAL - EC

CLIENT:
Teck Coal Limited

PROJECT LOCATION:
Elk Valley, BC

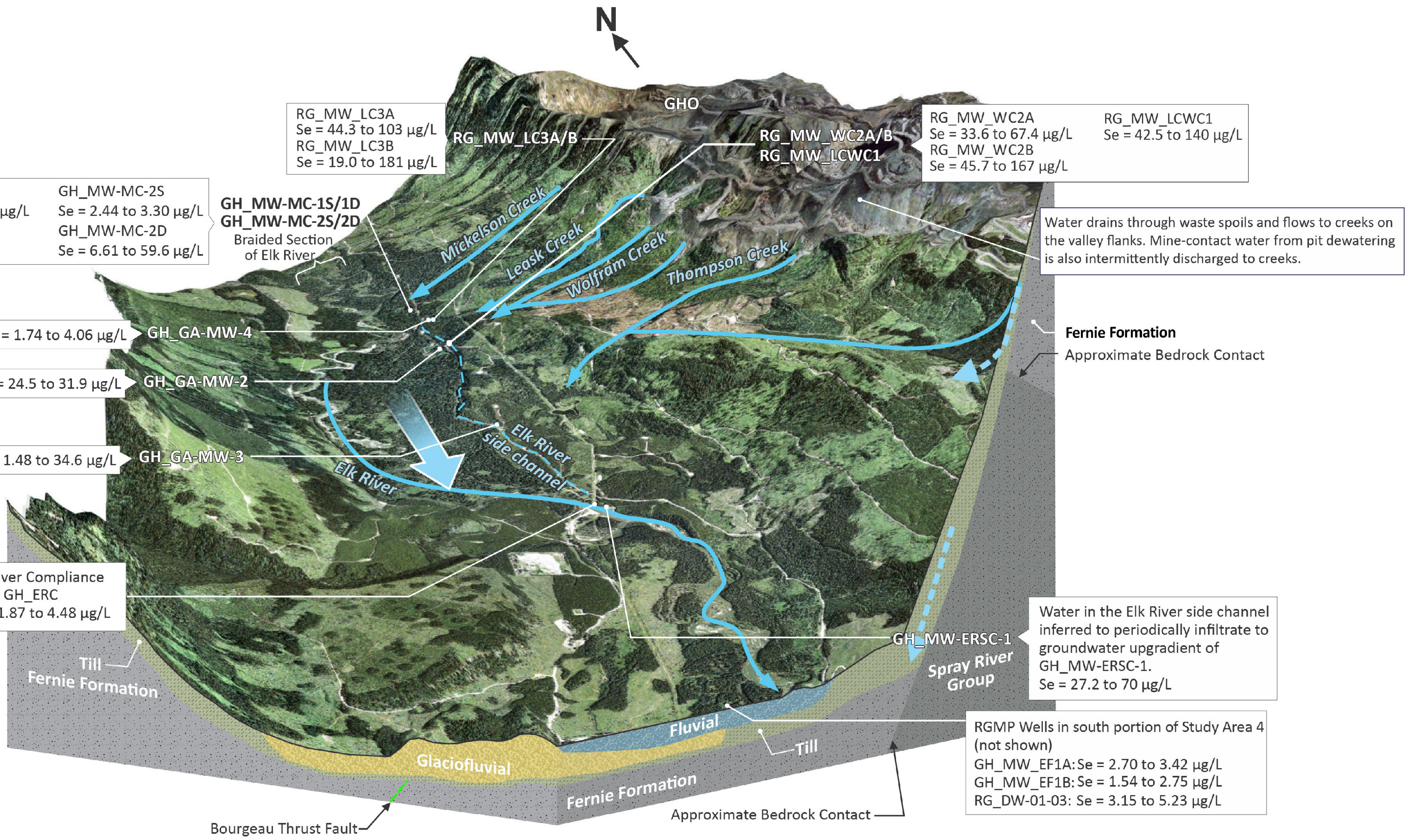
SNC·LAVALIN

Block Diagram Showing 3D Conceptual Hydrogeology and Transport Pathways of Order Constituents at GHO - Fording River and Greenhills Creek and Study Area 3

BY: CW
CHK'D: EC
SCALE:
Proj Coord Sys:
DATE: 2023-03-14
REF No:
DIAGRAM GH-01

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-BlockDiagram_GH01.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



RG_MW_LC3A
Se = 44.3 to 103 µg/L
RG_MW_LC3B
Se = 19.0 to 181 µg/L

RG_MW_WC2A
Se = 33.6 to 67.4 µg/L
RG_MW_WC2B
Se = 45.7 to 167 µg/L

RG_MW_LCWC1
Se = 42.5 to 140 µg/L

GH_MW-MC-1S
Se = 0.694 to 1.10 µg/L
GH_MW-MC-1D
Se = < 0.050 µg/L

GH_MW-MC-2S
Se = 2.44 to 3.30 µg/L
GH_MW-MC-2D
Se = 6.61 to 59.6 µg/L

Water drains through waste spoils and flows to creeks on the valley flanks. Mine-contact water from pit dewatering is also intermittently discharged to creeks.

Se = 1.74 to 4.06 µg/L

Se = 24.5 to 31.9 µg/L

Se = 1.48 to 34.6 µg/L

Elk River Compliance Point GH_ERC
Se = 1.87 to 4.48 µg/L

Water in the Elk River side channel inferred to periodically infiltrate to groundwater upgradient of GH_MW-ERSC-1.
Se = 27.2 to 70 µg/L

RGMP Wells in south portion of Study Area 4 (not shown)
GH_MW_EF1A: Se = 2.70 to 3.42 µg/L
GH_MW_EF1B: Se = 1.54 to 2.75 µg/L
RG_DW-01-03: Se = 3.15 to 5.23 µg/L

Flow Legend

- ➡ Main Stem Down-Valley Groundwater
- ⇢ Upland or Tributary Groundwater
- → Surface Water

NOTES:
1. Original in colour.
2. All concentrations shown are for 2022 minimum and maximum unless otherwise stated.
3. Subsurface geology is not to scale.
4. Vertical exaggeration 2x for topographic profile.
5. Groundwater transport pathways are conceptual only.

References:
1. Graphics from Brick Tudor Studios, LLC.
2. Bedrock geology derived from Monahan, 2000, BC Government.

Revisions:
0 - CW - 2023-02-14 - DRAFT - EC
1 - CW - 2023-03-23 - FINAL - EC

CLIENT:
Teck Coal Limited

PROJECT LOCATION:
Elk Valley, BC

SNC·LAVALIN

Block Diagram Showing 3D Conceptual Hydrogeology and Transport Pathways of Order Constituents at GHO - Elk River and Study Area 4

BY: CW
SCALE:
DATE: 2023-03-14
REF No:
DIAGRAM GH-02
CHK'D: EC
Proj Coord Sys:

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-BlockDiagram_GH02.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022

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Appendix VII

Line Creek Operations 2022 SSGMP and RGMP Annual Report

- Figures
- Tables
- Drawings
- Attachments
    - I. Borehole Logs
    - II. Block Diagrams
    - III. Mann-Kendall Analyses

1 Line Creek Operations GWMP, SSGMP and RGMP

1.1 Overview

This report presents the annual groundwater monitoring results from 2022 for Teck Coal Limited's (Teck) Line Creek Operation (LCO) Site-specific Groundwater Monitoring Program (SSGMP) and the Regional Groundwater Monitoring Program (RGMP) Study Areas 2, 5, and 6 in accordance with Section 9.4.1 of the Amended Permit 107517 as of December 19, 2022. Reporting requirements under Section 8.2.2.1 of the Amended Permit 107517 related to the groundwater monitoring program (GWMP) for LCO Phase II are also addressed in this report.

The basis for the groundwater monitoring program is the conceptual site model (CSM) presented in the approved 2018 SSGMP Update (Golder, 2019), the approved 2020 RGMP Update (SNC-Lavalin, 2020a) and the 2021 SSGMP Update (SNC-Lavalin, 2021b). The CSMs include descriptions of the physical setting, hydrology, geology, mine-related features, physical hydrogeology, and chemical hydrogeology, and present detailed analysis and interpretation of groundwater flow patterns, groundwater geochemistry, groundwater – surface water interactions and potential sources and transport pathways of order constituents (OCs - nitrate, sulphate, cadmium, and selenium) in groundwater to the main stem valley bottoms (i.e., valleys containing the Fording River and Elk River).

The LCO C-129 permitted mine boundary is divided into three geographical areas to facilitate reporting of groundwater monitoring results (Table A, Drawing LC-01). This includes the Phase II area for the GWMP while the Phase I and Process Plant areas apply to the LCO SSGMP. RGMP Study Area 2 is located north of the northern extent of Phase II while Study Area 5 and Study Area 6 are adjacent to the Process Plant. RGMP study areas are generally outside of the permitted mine boundary but can overlap to some extent.

Table A: GWMP and SSGMP Areas and Relevant RGMP Study Areas

Geographical Area	Sub-Area	RGMP Study Area (1)
GWMP		
Phase II Dry Creek	• Upper LCO Dry Creek	-
	• Lower LCO Dry Creek	Study Area 2
SSGMP		
Phase I Line Creek Operations	• Centre Line Creek (North)	-
	• Centre Line Creek (South)	-
	• West Line Creek	-
	• Lower Line Creek (end of canyon)	-
Process Plant	• Process Plant	Study Area 5 and 6

Notes:
1 RGMP study areas are noted with the closest sub-area. All sub-areas drain to a study area.

For Phase II, groundwater wells installed near the Dry Creek settling ponds are within Upper LCO Dry Creek, while wells near the valley outlet are included in Lower LCO Dry Creek. RGMP Study Area 2 is in the Fording River valley bottom and is closest to Lower LCO Dry Creek. Phase I is separated into four groundwater monitoring zones including Center Line Creek (North), Center Line Creek (South), West Line Creek, and Lower Line Creek. Centre Line Creek (North) and Centre Line Creek (South) are adjacent to West Line Creek. Lower Line Creek is the most downgradient area. Except for the 'West Line Creek' area (which is sub-catchment of Line Creek), the references of 'upper', 'center' and 'lower' are geographic locations defined by well locations and not necessarily sub-catchments although they may overlap in some places. The Process Plant area includes one sub-area and is adjacent to Study Area 5 and Study Area 6.

A general overview of the hydrogeologic setting for each geographical area is provided below with reference to hydrogeological cross-sections presented on Drawings LC-03 to LC-10 and block diagrams included in Attachment II as well as geologic mapping included in the main report.

1.1.1 Phase II (Study Area 2)

Phase II is in the LCO Dry Creek watershed, which includes a narrow valley that drains to the north and discharges to Fording River, southeast and upstream of Greenhills Operation (GHO). In the headwaters of the watershed, some former stream features are buried by waste rock and now act as rock drains. The Dry Creek Management System is constructed in the upper portion of the valley near the confluence of Dry Creek East Tributary and LCO Dry Creek (Drawing LC-01). This water management infrastructure includes a head pond, diversion structure, two sedimentation ponds, piping, and calcite treatment. Sedimentation ponds are double lined and have a leak detection system.

Sedimentary bedrock belonging to the Kootenay Group underlies the upper portion of the Dry Creek watershed, while the Fernie Formation underlies the Fording River valley bottom (main report, Drawing 3). The narrow valley consists primarily of colluvium along the valley flanks with till in the valley bottom based on surficial mapping (main report, Drawing 6; Block Diagram LC-01, Attachment II). Near the valley outlet, an alluvial fan is inferred while glaciofluvial and fluvial deposits have been mapped along the Fording River valley.

1.1.2 Phase I

Phase I includes the upper portion of Line Creek watershed to the end of the canyon before Line Creek valley outlets to the main stem valleys (Fording River and Elk River valley bottoms). Phase I is separated from Phase II by a topographic divide. Mining works include waste rock and coal stockpiles, active pits, end-pit lakes, and water management infrastructure (e.g., rock drains, sedimentation ponds, water treatment facilities). Some former stream features are buried by waste rock and now act as rock drains. The West Line Creek Active Water Treatment Facility (WLC AWTF) residual landfill is also located in Phase I on a relatively flat terrace approximately 60 m higher compared to the Line Creek valley bottom in this area (Drawing LC-01).

Sedimentary bedrock from the Kootenay Group and the older Fernie Formation underlies the upper portion of Line Creek (main report, Drawing 3). The bedrock units are intersected by the Erickson Fault and Ewin Pass Thrust Fault (LI-LI', Drawing LC-11). The Ewin Pass Thrust Fault is a regional fault, oriented from northwest to southeast and inferred to dip to the west. The canyon coincides where the Alexander Thrust Fault is intersected, marking the transition to Wisukitsak and Salter karst potential blocks of the Rundle Group (SNC-Lavalin 2022a; main report, Drawing 8).

The upper portion of the Line Creek watershed consists primarily of colluvium, till, and fluvial/glaciofluvial sediments (main report, Drawing 6; Block Diagram LC-02, Attachment II). The upper portion of Line Creek contains most of the permitted mining area and disturbed footprint for LCO. Waste rock material over 200 m thick has been placed within the upper elevations of the West Line Creek (WLC) sub-catchment (Drawing LC-04). Downgradient of the WLC waste rock toe, a sand and gravel unit generally between 15 to 55 m thick occurs (Drawing LC-04, LC-05, LC-06, and LC-07) where fluvial deposits have been mapped. A terrace of predominantly fine-grained materials (silt, clay) interlayered with sand exists where the WLC AWTF residual landfill has been constructed. Contact springs discharge along the slope of this terrace toward Line Creek just before the topography begins to constrict into a narrow valley. Surficial deposits thin along the narrow valley towards the canyon (Drawing LC-06).

1.1.3 Process Plant (Study Areas 5 and 6)

The Process Plant is located downgradient of Phase I on a bench along the eastern flank of the main stem valley bottom containing Fording River and Elk River. It includes the lower portion of the Line Creek watershed, downgradient of the canyon where Line Creek flows over an alluvial fan and discharges into the Fording River. A small footprint of the permitted mine boundary overlaps the lower Line Creek watershed. Mine works within this area include the Process Plant, Coarse Coal Rejects (CCR) spoils and sedimentation ponds. RGMP Study Area 5 and 6 are adjacent to the Process Plant.

Meta-sedimentary bedrock from the Spray River Group and Fernie Formation underlies the Process Plant area. The Rundle Group is mapped along the eastern extent of the bench area where the northwest to southeast trending Erickson Fault has been mapped. A bedrock ridge likely coincides along a topographic divide, isolating Grave Lake within a local depression (Drawing LC-08) with till and/or colluvium deposits based on surficial mapping (main report, Drawing 6). Bathymetry data indicates the bottom of Grave Lake deepens to the south (BC ENV 1986).

Till deposits exist along the bench area and fluvial deposits within the lower portion of Line Creek watershed and the main stem valley (Block Diagram LC-03, Attachment II). Based on borehole logs, the till unit is 30 m thick near the CCR spoils and is inferred to thin towards the east as the bedrock surface rises to the east in this area (LF-LF’, Drawing LC-08). Near the canyon outlet, surface water from Line Creek is inferred to recharge groundwater where permeable sand and gravel deposits occur (Drawing LC-09, LC-10). A silt unit, generally 30 m thick, is in the lower portion of Line Creek watershed adjacent to fluvial deposits along the Fording River valley bottom (Drawing LC-08). Permeable sand and gravel material over 40 m thick occurs at lower elevations along the bench adjacent to fluvial deposits within the Elk River valley bottom (Drawing LC-09).

1.2 Groundwater Monitoring Program

The groundwater monitoring program terms of reference were based on conditional approval of the 2018 SSGMP Update (Golder, 2019) obtained from BC ENV in March 2020. The 2021 SSGMP Update (SNC-Lavalin, 2021b) has been submitted and is pending regulatory approval. The 2020 RGMP Update (SNC-Lavalin, 2020a) was recently approved by BC ENV on March 20, 2023 (main report, Appendix II).

Groundwater monitoring results from 35 wells are included in this report. Thirteen of these wells are from the approved 2018 SSGMP Update (Golder, 2019). Groundwater monitoring at 18 additional wells recommended in the 2021 SSGMP Update are also included. These wells provide additional spatial coverage, particularly in Phase I. Reporting also includes four additional regional wells included in the recently approved 2020 RGMP Update (SNC-Lavalin, 2020a). Wells considered to be ‘Under Evaluation’ are not included in this annual report and require further evaluation prior to including them in the monitoring program.

Tables 1 and 4 in the main report provide a list of monitoring wells associated with each program and a monitoring and/or sampling rationale for each location. Drawing LC-01 shows the location of monitoring wells relative to geographical areas, as well as key surface water and mine site features. Table LC-01 provides a summary of well details and monitoring terms of reference (i.e., type of monitoring, frequency) for wells included in this report. Borehole logs are presented in Attachment I.

For each geographical area, groundwater monitoring results are discussed for sub-areas determined based on the relative location of monitoring wells. Table A provides a summary of geographical areas, sub-areas used for discussion of results and linkages with the RGMP. The groundwater program specifications generally include quarterly monitoring of water levels and sampling with some exceptions (Table LC-01). Quarterly monitoring of groundwater levels and no water quality sampling is conducted at LC_PIZP1001, LC_PIZP1002, LC_PIZP1003 in the Process Plant area. Semi-annual monitoring was proposed at WL_MW-15-02-A, WL_MW-15-02-B, and WL_MW-15-04-B in Phase I near the former AWTF residual landfill. The analytical program includes physical parameters, dissolved inorganics, nutrients, organics, and dissolved metals. Field parameters were also measured during sample collection.

The 2022 groundwater monitoring results include manual groundwater level measurements (converted to potentiometric elevations) and calculated vertical gradients provided in Table LC-02. Fourth quarter groundwater elevations and inferred flow directions are presented on Drawing LC-02. Field parameters and analytical results are presented in Table LC-03 to LC-05. Drawings LC-12 to -15 provide a spatial summary of OC concentrations (nitrate, sulphate, cadmium, and selenium) in 2022. A discussion of the water quantity and quality is included with consideration of mine-influenced sources as well as temporal and spatial trends to evaluate changes or increases to contaminant loading and to identify the need for any mitigation measures.

1.3 Program Modifications

Program modifications include any significant change compared to what was completed in previous years, such as the addition or removal of wells or changes in sampling frequency. No program modifications were made in 2022. Deviations from the program specifications are detailed in Appendix XIII.

1.4 Summary of 2022 Field Activities

Table B summarizes field activities conducted in 2022, in addition to the prescribed SSGMP and RGMP monitoring and sampling. The majority of field activities were conducted to address recommendations made in the LCO 2021 Annual Report (SNC-Lavalin, 2022). Additional field activities related to 2022 projects are provided in the main report.

Table B: Summary of 2022 Field Activities

Location	Q[a]	Field Activity	Rationale
Site wide	4	Geodetic survey of select well locations was undertaken. See Table LC-01 for specific well locations.	Recommendation made in the LCO 2021 Annual Report to confirm coordinates and elevation of ground surface and top of casing.
Phase II, Upper LCO Dry Creek	4	Installed pressure transducers in LC_PIZDC1306 and LC_PIZDC1404S.	Recommendation made in the LCO 2021 Annual Report to facilitate a more detailed assessment of groundwater at these locations.

Table B (Cont'd): Summary of 2022 Field Activities

Location	Q[a]	Field Activity	Rationale
Phase II, Upper LCO Dry Creek (Cont'd)	4	Drilled and installed two monitoring wells (LC_MW22_DCDS_1A, LC_MW22_DCDS_1C) in the LCO Dry Creek drainage, downgradient/north from Dry Creek Sedimentation Pond 2.	Recommendation made in the 2021 SSGMP Update to characterize the bedrock and surficial groundwater pathways.
Study Area 2	4 (2021)	Installed pressure transducers in RG_MW_DC1A and RG_MW_DC1B.	Recommendation made in the LCO 2021 Annual Report to facilitate an in-depth assessment of groundwater at these locations. This activity was conducted in Q4 of 2021 but was not reported in the previous annual report.
	3	Geodetic survey was conducted at and around RG_MW_DC1A and RG_MW_DC1B for proximity to LCO Dry Creek. These wells were surveyed to be greater than 10 m from the high-water mark.	Recommendation made in LCO 2021 Annual Report to confirm applicable water quality guidelines.
Phase I, Upper Line Creek	3	Drilled and installed a bedrock monitoring well (LC_MW22_LC1_1ABR) near the upgradient extent of the permitted mine area. Develop, sample and fit the well with a pressure transducer.	This bedrock well in addition to three wells screened in unconsolidated completed in 2021 (LC_MW_LC1_1A, LC_MW_LC1_2A, LC_MW_LC1_3A) satisfy conditional approval of the 2018 SSGMP Update for LCO (BC ENV 2020).
	3	Installed pressure transducers in LC_MW_LC1_1A, LC_MW_LC1_2A, LC_MW_LC1_3A.	Recommendation in LCO 2021 Annual Report to facilitate an in-depth assessment of groundwater at these locations.
Phase I, Central Line Creek	1	Installed pressure transducers in LC_MW20_01, LC_MW20_02A, LC_MW20_03, LC_PIZ1206A, LC_PIZ1206C, LC_PIZ1212. Installed a barometric pressure sensor at LC_PIZP1212.	Continuous groundwater level measurements to facilitate groundwater assessment. Completed by Teck.
Phase I, Lower Line Creek	4	Installed pressure transducers in LC_MW_CP1A and LC_MW_CP1B.	Recommendation made in the LCO 2021 Annual Report to facilitate an in-depth assessment of groundwater at this location.

Table B (Cont'd): Summary of 2022 Field Activities

Location	Q[a]	Field Activity	Rationale
Process Plant	4	Installed pressure transducers in LC_MW_LC4A, LC_MW_LC4B, and LC_PIZ1002.	Recommendation made in the LCO 2021 Annual Report to facilitate a more detailed assessment of groundwater at these locations.
	4	Conducted well inspections of LC_PIZP1002 and LC_PIZP1003 including validation of depth to bottom and groundwater. LC_PIZP1003 was found to have large diameter tubing inside the PVC casing, which may be interfering with accurate water level measurements.	Recommendation made in the LCO 2021 Annual Report to investigate the anomalously high groundwater elevations.
	4	LC_PIZP1105 was inspected by SNC staff to confirm well integrity. Bladder pump installation was attempted but was unsuccessful as there was insufficient water head and volume.	Recommendation made in the LCO 2021 Annual Report to use of a bladder pump for sampling at this well because of well depth and high turbidity. The well integrity and development status was uncertain.
Study Area 6	3	Geodetic survey was conducted at and around LC_MW_ER4A, and LC_MW_ER4B for proximity to the Elk River. These wells were surveyed to be greater than 10 m from the high-water mark.	Recommendation made in the LCO 2021 Annual Report to confirm applicable water quality guidelines.

Notes:

[a] Q denotes Quarter (Q1, Q2, Q3, Q4) in which the modification was implemented.

1.5 GWMP Phase II (Study Area 2)

A summary of 2022 groundwater monitoring and sampling results for the Upper and Lower LCO Dry Creek sub-areas and Study Area 2 is presented in Table C with references to supporting information (Figure, Tables, Drawings, Attachments).

Table C: Summary of 2022 Groundwater Monitoring and Sampling Results for LCO Phase II (Study Area 2)

Hydrogeological Information		Description	Reference
Monitoring Location	Relevant RGMP (Study Area 2)/SSGMP Wells	**Upper LCO Dry Creek:** LC_PIZDC0901, LC_PIZDC1306, LC_PIZDC1307, LC_PIZDC1308, LC_PIZDC1404S, and LC_PIZDC1404D **Lower LCO Dry Creek:** RG_MW_DC1A, RG_MW_DC1B	Table LC-01 Drawings LC-01, 03
	Other Relevant Monitoring Wells[a]	None	
	Relevant Surface Water Monitoring Stations[b]	**Upper LCO Dry Creek:** LC_DC3, LC_DC2, LC_DC4 **Lower LCO Dry Creek:** LC_DC1, LC_FRDSDC	
	Relevant Seep Monitoring Locations[b]	LC_SEEP8 was dry in 2022 (SRK 2023).	
Physical Hydrogeology	Groundwater Elevation Trends	• Highest groundwater levels typically occur during freshet (June), during high surface water levels and following snowmelt, and show a rapid response. • Lowest groundwater levels coincide with the end of winter (mid-March), when recharge is expected to be lowest due to frozen conditions. • Seasonal water level fluctuations of 1.4 to 3.7 m in the unconsolidated unit, deeper wells showed the greatest variation.	Figures LC-01 and LC-02 Table LC-02 Drawing LC-02
	Hydraulic Gradients and Flow Direction	• Vertical Hydraulic Gradients: – Flowing artesian conditions noted at LC_PIZDC1306 and RG_MW_DC1A; – RG_MW_DC1A (deep) and RG_MW_DC1B (shallow): 0.5 m/m upwards; – LC_PIZDC1307 (deep) and LC_PIZDC1308 (shallow): -0.03 to -0.08 m/m downwards, except Q2 0.001 m/m upwards (freshet); – LC_PIZDC1404S (shallow) and LC_PIZDC1404D (deep): -0.002 to -0.04 m/m downwards; and – Generally, downward vertical flow in upper LCO Dry Creek with potential variation during freshet and upward vertical flow in lower LCO Dry Creek. • Flow Direction: – Shallow groundwater flow likely follows topography, down the valley flanks and then parallel to the valley bottom towards the north to the Fording River valley; and – Losing and gaining reaches of LCO Dry Creek were inferred based on flow accretion studies (SNC-Lavalin 2020d) and generally corresponds with potential groundwater recharge and discharge areas respectively.	
Chemistry	2022 SSGMP/RGMP OC Results	• All OC concentrations were less than the primary screening criteria in 2022.	Table D Figures LC-03 to 05 Tables LC-03 to 05 Drawings LC-12 to 15
	Non-Order Mine-Related and Naturally Occurring Constituents[c]	• Concentrations Greater than Primary Screening Criteria – Non-Order Mine Related: – None. • Concentrations Greater than Primary Screening Criteria – Naturally Occurring Constituents: – Barium: LC_PIZDC1307 (Q1 to Q4) and LC_PIZDC1404D (Q1 to Q4), typically above background 95th percentile; – Lithium: All samples from all wells except LC_PIZDC0901 (Q1 to Q4); LC_PIZDC1404S (Q1 to Q4), and LC_PIZDC1308 (Q2). LC_PIZDC1404D above background 95th percentile; and – Molybdenum: LC_PIZDC1307 (Q1 to Q4) and LC_PIZDC1404D (Q1 to Q4), above background 95th percentile. • Barium, lithium, and molybdenum are associated with background conditions (SNC-Lavalin 2020a). Molybdenum has been identified in operations (Azimuth 2022) and may be a mining order constituent, depending on antiscalant activities. • Concentrations of barium, lithium, and molybdenum above the background 95th percentile indicates local variability or mine-related influences. • All other non-order mining related and naturally occurring constituents were less than primary screening criteria.	Table DTables LC-03 to 05
	Mann-Kendall Trend Analysis	• Increasing nitrate trend at LC_PIZDC1306 with concentrations below primary screening criteria. • Probably increasing dissolved cadmium trend at LC_PIZDC0901 with concentrations below primary screening criteria. • Concentrations of all other OCs were non-trending, stable, or decreasing where sufficient samples have been collected for trend analysis and analytical results were above detection limits.	Table E Attachment III

Notes:

[a] Relevant monitoring wells from other programs are those in the area that are under evaluation for potential inclusion in the SSGMP and/or RGMP.

[b] Relevant surface water stations and seep monitoring locations are as determined in the 2021 SSGMP Update (SNC-Lavalin 2021a), and represent a sub-set of the surface water and seepage monitoring locations at LCO. LC_FRDSDC added for Study Area 2.

[c] Non-order mine-related and naturally occurring constituents based on the background assessment (BGA) completed for the 2020 RGMP Update (SNC-Lavalin 2020a).

A summary of results for OC compared to primary screening criteria is presented in Table D below.

Table D: Summary of OC Compared to Primary Screening Criteria in LCO Phase II (Study Area 2)

Parameter / Well ID	Nitrate-N (mg/L)				Sulphate (mg/L)				Dissolved Cadmium (µg/L)				Dissolved Selenium (µg/L)			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Lower LCO Dry Creek (Study Area 2)																
RG_MW_DC1A	'NS'	-	-	-	'NS'	-	-	-	'NS'	-	-	-	'NS'	-	-	-
RG_MW_DC1B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Upper LCO Dry Creek																
LC_PIZDC0901	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LC_PIZDC1306	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LC_PIZDC1307	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LC_PIZDC1308	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LC_PIZDC1404S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LC_PIZDC1404D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CSR AW	400				1,280 – 4,290*				0.5 – 4*				20			
CSR IW	n/s				n/s				5				20			
CSR LW	100				1,000				80				30			
CSR DW	10				500				5				10			

Notes:
Primary screening criteria applied are CSR standards for **Aquatic Life (AW)**, Drinking Water (DW), Livestock (LW) and *Irrigation (IW)*.
'–' denotes result less than primary screening criteria for given constituents.
Where a duplicate was collected, the higher concentration is provided in table. If more than one sample collected in a quarter, the higher of the two samples is provided in the table.
* Standard varies with hardness.
'NS' denotes no sample. 'n/s' denotes no standard.

Mann-Kendall trend analyses for Phase II wells are summarized in Table E, with further details provided in Attachment III.

Table E: Summary of Mann-Kendall Trend Analysis for OCs in Phase II LCO Dry Creek

Parameter / Well ID	Nitrate-N	Sulphate	Dissolved Cadmium	Dissolved Selenium
Upper LCO Dry Creek				
LC_PIZDC0901	Decreasing	Stable	Prob. Increasing	Decreasing
LC_PIZDC1306	Increasing	Stable	No Trend	No Trend
LC_PIZDC1307	No Trend	-	-	-
LC_PIZDC1308	Decreasing	No Trend	Stable	Prob. Decreasing
LC_PIZDC1404S	-	Decreasing	-	-

Notes:
'–' denotes Mann-Kendall trend analysis was not completed as concentrations were consistently less than or marginally greater than the detection limit.
Where OC were greater than the primary screening criteria in 2022, the trend result is ***bold italics***.
Where increasing trends are noted, the cell is shaded yellow.

1.5.1 Discussion

1.5.1.1 Upper LCO Dry Creek

Monitoring results from a total of six wells, including two well clusters, are discussed for Upper LCO Dry Creek. These wells monitor groundwater quality downgradient of waste rock spoils and potential seepage from sedimentation ponds (Drawing LC-01, Table LC-01), although the sedimentation ponds also have a leak detection system. Relevant surface water stations for discussion include LC_DC2, LC_DC3, and LC_DC4. LC_DC3 is located upstream of the Dry Creek Head Pond & Diversion Structure and sedimentation ponds (Drawing LC-01). A local rock drain discharges in the headwaters of LCO Dry Creek and flows towards LC_DC3. LC_DC2 and LC_DC4 are located further downstream along LCO Dry Creek. LC_DC4 is located upstream of the alluvial deposits near the valley outlet.

LC_PIDZC1306 and well cluster LC_PIZDC1404S/D are located near the Dry Creek Head Pond & Diversion Structure. LC_PIDZC1306 is 17 m deep, located to the northeast of the diversion structure where a confined gravel lens of relatively high permeability has been inferred (Golder, 2016a). LC_PIZDC1404S is 13 m deep, while LC_PIZDC1404D is 35 m deep and both are located downgradient, near the northwestern extent of the diversion structure. All three wells are screened in unconsolidated sediments. Water levels in 2022 were generally in the same range as historical data (Figure LC-01), except for flowing artesian conditions at LC_PIZDC1306 in April and August. Frozen conditions at LC_PIZDC1306 were observed in the first quarter of 2022 and were likely due to groundwater levels being close to or above ground surface. Artesian conditions could be attributed to recharge from the valley flanks after snowmelt and may only seasonally occur at LC_PIDZC1306. Both LC_PIZDC1404S/D have historically had similar seasonal fluctuations (of around 5 m), indicating potential hydraulic connection between upper and lower unconsolidated sediments. The highest groundwater levels have coincided with freshet. Continued monitoring is required to confirm trends in potentiometric elevations.

There were differences in groundwater elevation fluctuations and groundwater quality at LC_PIZDC1306 compared to nearby well cluster LC_PIZDC1404S/D (Figure LC-01, LC-03 to LC-05). Differences in groundwater quality include redox levels which were generally oxic for LC_PIZDC1306 while seasonal variations were noted for the LC_PIZDC1404S/D well cluster. Like 2021, groundwater at LC_PIZDC1404 in both the shallow and deep wells was oxic in Q1 and anoxic from Q2 to Q4. Temporal plots (Figure LC-03 to LC-05) and Mann-Kendall trend analyses (Table E) of OC concentrations generally show stable or no trends, except for increasing nitrate concentration trends at LC_PIZDC1306 but below screening criteria. Dissolved selenium concentrations in groundwater have historically been the highest at LC_PIZDC1306 in the Upper LCO Dry Creek area, fluctuating seasonally between 2 µg/L in Q1 (late winter) to 6 µg/L in Q4 (later summer/early fall).

LC_PIZDC1307/1308 are a well cluster located between the Dry Creek Head Pond & Diversion Structure and Dry Creek Sedimentation Pond 1 (Drawing LC-01). LC_PIZDC0901 is located between the northwestern extent of Dry Creek Sedimentation Pond 1 and LCO Dry Creek, 300 m downgradient and 16 m lower in elevation from LC_PIZDC1307 and PIZDC1308. Both LC_PIZDC1308 and LC_PIZDC0901 are shallow wells (9 m) while LC_PIZDC1307 is 35 m deep. Water levels in 2022 were generally within historical ranges (Figure LC-01). Historical groundwater fluctuations at LC_PIZDC1307 and LC_PIZDC0901 were more consistent with clustered wells LC_PIZDC1404S/D (around 5 m) compared to LC_PIZDC1308 which historically has had more muted seasonal variations (around 1.5 m). Temporal plots (Figure LC-03 to LC-05) and Mann-Kendall trends (Table E) of OC concentrations generally show stable or no trends except for probably increasing trends for cadmium at LC_PIZDC0901 but with concentrations below screening criteria.

The chemistry plots (Figures LC-03 to -05) show OC concentrations in groundwater have been lower than surface water. OC concentrations in surface water from LC_DC3 have typically been one to two orders in magnitude higher compared to groundwater and have increased since 2017. Conversely, OC concentrations in groundwater have been relatively low and/or stable since 2018. Since 2018, nitrate concentrations at LC_PIZDC0901 have stabilized after a decreasing period from a historical high of 10 mg/L in 2015. All other OC concentrations have longer periods of chemical stability.

Selenium/sulphate (Se:SO_4) ratios (Figure LC-06) show groundwater quality from wells in Upper LCO Dry Creek is consistent with non-contact waters (i.e., not mine-affected) except for LC_PIZDC1306. Potential mixing with mine-influenced water may be occurring at groundwater from LC_PIZDC1306 primary due to selenium concentrations outside of the boundary for natural waters in unconsolidated sediments. The piper plot (Figure LC-07) highlights the similarity in groundwater quality between the deep monitoring wells in this area (LC_PIZDC1307 and LC_PIZDC1404D).

Surface water is the primary pathway for OCs to the Fording River valley bottom. Flow accretion studies (SNC-Lavalin 2020d) along LCO Dry Creek indicated a losing reach near the Head Pond Diversion Structure and sedimentation ponds in the fall (Drawing LC-02). Downward vertical gradients generally occur at well clusters LC_1404S/D and LC_PIZDC1307/1308. However, seasonal flowing artesian conditions at LC_PIZDC1306 observed in 2022 indicated upward gradients can occur near the LCO Dry Creek Head Pond & Diversion Structure, closer to the eastern flank of the valley. LCO Dry Creek changes to a gaining reach downstream of the sedimentation ponds. As LCO Dry Creek flows down the valley, OC concentrations decrease due to mixing from groundwater discharge of non-contact water and/or flow contributions from tributaries. A losing reach of LCO Dry Creek begins before the valley outlet and over an alluvial fan deposit (main report, Drawing 6) to the confluence with Fording River.

1.5.1.2 Lower LCO Dry Creek (Study Area 2)

Monitoring results for one well cluster RG_MW_DC1A/B are discussed for Lower LCO Dry Creek. Monitoring is conducted to evaluate potential changes to groundwater from surface water infiltration over the LCO Dry Creek alluvial fan (main report, Drawing 6). Relevant surface water stations include LC_DC1 and LC_FRDSDC. LC_DC1 is located along LCO Dry Creek next to RG_MW_DC1A/B. Surface water station LC_FRDSDC is on the Fording River, downstream of the confluence with LCO Dry Creek (Drawing LC-01).

Both RG_MW_DC1A and RG_MW_DC1B are unconsolidated wells 21 and 7 m deep, respectively. RG_MW_DC1A is screened in sand and gravel/gravelly silt deposits below a 4 m thick clay unit. RG_MW_DC1B is screened within alluvial deposits above the clay unit. Flow accretion studies have indicated LCO Dry Creek is a losing reach within this area (Drawing LC-02; Golder 2020; SNC-Lavalin, 2020c).

Because of their recent installation at the end of 2021, water level and chemistry data acquisition is ongoing and the current data set is limited (Figure LC-02, Figure LC-03 - 05). Flowing artesian conditions have been observed at RG_MW_DC1A and the current configuration for the pressure transducer does not collect accurate data; therefore, continuous water levels for RG_MW_DC1A are not presented on Figure LC-02. A margo plug has been installed to control artesian flows but freezing conditions have recently resulted in plug damage and leakage at the top of the well. Artesian conditions indicate the lower aquifer is under confining conditions. Groundwater levels for RG_MW_DC1B show seasonal fluctuations in the shallow water table with the highest groundwater levels coinciding with freshet. The concentrations of OCs in groundwater from both RG_MW_DC1A and RG_MW_DC1B have been typically one to two orders of magnitude lower compared to surface water quality at LC_DC1.

Se:SO$_4$ ratios (Figure LC-06) show groundwater quality from the RG_MW_DC1A and RG_MW_DC1B represent non-contact waters. Mine influence is not suspected given low OC concentrations, selenium and nitrate at or near detection limits, and analytical results below screening criteria. Higher oxidation-reduction potential (ORP) values were noted in Q1 at both wells compared to the other sampling events in 2022. This trend was also observed at several other groundwater wells within the LCO Dry Creek valley (e.g., LC_PIZDC0901, LC_PIZDC1308, LC_PIZDC1404S/D) in 2022. Redox conditions can strongly affect the mobility and persistence of many parameters in groundwater. For example, concentrations of nitrate and selenium are more likely to be elevated in oxic groundwater. The redox condition of groundwater can be related to groundwater age (i.e., more time for chemical reactions that consume dissolved oxygen to occur in older groundwater) and are not necessarily indicative of mine-influence.

1.6 Phase I - Line Creek Operations

A summary of 2022 groundwater monitoring and sampling results for Phase I, including sub-areas Center Line Creek (North), Center Line Creek (South), West Line Creek, and Lower Line Creek, are presented in Table F with references to supporting information (Figures, Tables, Drawings, and Attachments).

Table F: Summary of 2022 Groundwater Monitoring and Sampling Results for LCO Phase I

Hydrogeological Information		Description	Reference
Monitoring Location	Relevant SSGMP/RGMP Wells	**Center Line Creek (North):** LC_PIZM0903 **Center Line Creek (South):** LC_MW20_01, LC_MW20_02A/B, , and LC_MW20_03 **West Line Creek:** LC_PIZ1206A/C, LC_PIZ1207A/B, LC_PIZ1210B/C, LC_PIZ1211N, and LC_PIZ1212 **Lower Line Creek:** WL_MW-15-02-A/B, WL_MW-15-04-B, and LC_MW_CP1A/B	Table LC-01 Drawings LC-01, 04 to 07
	Other Relevant Monitoring Wells[a]	LC_MW_LC1-1A, LC_MW_LC1-2A, LC_MW_LC1-3A, LC_MW22_LC-1ABR, LC_MW_WLC-1A, LC_MW_WLC-2A, LC_MW_WLC-3A	
	Relevant Surface Water Monitoring Stations[b]	**Center Line Creek (North):** LC_LC2 **Center Line Creek (South):** LC_LCUSWLC **West Line Creek:** LC_WLC **Lower Line Creek:** LC_LC3, LC_LCDSSLCC, LC_BR7	
	Relevant Seep Monitoring Locations[b]	**Center Line Creek (South):** LC_LC3GS (also known as AWTF-Seep)	
Physical Hydrogeology	Groundwater Elevation Trends	• Highest groundwater levels typically occur during freshet (June), during high surface water levels and following snow melt. • Lowest groundwater levels coincide with the end of winter (mid-March), when recharge is expected to be lowest due to frozen conditions. • Seasonal fluctuations vary from 0.3 to 2.3 m for wells screened in unconsolidated sediments and 0.3 to 1.4 m for wells screened in bedrock.	Figures LC-08 to 10 Table LC-02 Drawing LC-02
	Hydraulic Gradients and Flow Direction	• Vertical Hydraulic Gradients (based on descending order of geographical areas): – LC_MW20_02B (shallow) and LC_MW20_02A (deep): -0.03 to -0.04 m/m downwards (unconsolidated), reverse of vertical gradients compared to 2021; – LC_PIZ1206A (shallow) and LC_PIZ1206C (deep): -0.5 to -0.6 m/m downwards (unconsolidated/bedrock, toe of spoils); – LC_PIZ1207A (shallow) and LC_PIZ1207B (deep): -0.8 m/m downwards (bedrock, downgradient from spoils); – LC_PIZ1210B (shallow) and LC_PIZ1210C (deep): -0.2 m/m downwards for all monitoring events (unconsolidated/bedrock, downgradient of spoils); – WL_MW-15-02B (shallow) and WL_MW-15-02-A (deep): -0.3 m/m downwards for all monitoring events (unconsolidated, adjacent to landfill); and – LC_MW_CP1B (shallow) and LC_MW_CP1A (deep): 0.04 m/m upwards (unconsolidated/bedrock). • **Flow Direction:** – Groundwater flow in unconsolidated sediments is likely controlled by the bedrock surface or low permeability material where perched zones exist, and generally flows from high to low elevation towards Line Creek. The bedrock surface may not follow topography because of mine development.	
Chemistry	2022 SSGMP/RGMP OC Results	• **Centre Line Creek (North)**: – Concentrations greater than primary screening criteria: ▪ Dissolved selenium at LC_PIZM0903 (Q1, Q2). • **Centre Line Creek (South)**: – Concentrations greater than primary screening criteria: ▪ Dissolved selenium at LC_MW20_01 (Q1 to Q4; also exceeded secondary criteria Q1 to Q4), LC_MW20_02B (Q1 to Q4; also exceeded secondary screening criteria Q1 to Q3); and ▪ Nitrate-N at LC_MW20_01 (Q1 to Q4) and LC_MW20_02B (Q1 to Q3). • **West Line Creek**: – Concentrations greater than primary screening criteria: ▪ Dissolved selenium at LC_PIZ1206A (Q1 to Q4), LC_PIZ1206C (Q1 to Q4), LC_PIZ1210B (Q4), LC_PIZ1211N (Q1 to Q4), LC_PIZ1212 (Q1 to Q4). All reported selenium concentrations that exceeded primary screening criteria also exceeded secondary screening criteria; ▪ Nitrate-N at LC_PIZ1206A (Q1, Q2 and Q4), LC_PIZ1211N (Q1 to Q4), LC_PIZ1212 (Q1 to Q4); and ▪ Sulphate at LC_PIZ1206A (Q1 to Q4), LC_PIZ1206C (Q2 to Q4), LC_PIZ1211N (Q2 to Q4), LC_PIZ1212 (Q1, Q2). • **Lower Line Creek**: – Concentrations greater than primary screening criteria: ▪ Dissolved selenium exceeded primary screening criteria at WL_MW-15-02-B (Q2, Q3, Q4; also exceeded secondary screening criteria in Q2), LC_MW_CP1A (Q1 to Q4; also exceeded secondary screening criteria in Q1, Q2 and Q4), LC_MW_CP1B (Q1 to Q4; also exceeded secondary screening criteria in Q1). • All other OC concentrations were less than the primary screening criteria in 2022.	Table G Figures LC-11 to 13 Tables LC-03 to 05 Drawings LC-12 to 15

Table F (Cont'd): Summary of 2022 Groundwater Monitoring and Sampling Results for LCO Phase I

Hydrogeological Information		Description	Reference
Chemistry (Cont'd)	Non-Order Mine -Related and Naturally Occurring Constituents[c]	• Concentrations Greater than Primary Screening Criteria – Non-Order Mine Related: – None[d]. • Concentrations Greater than Primary Screening Criteria – Naturally Occurring Constituents: – **Center Line Creek (South)**: ▪ Lithium: all wells, every monitoring event; and ▪ Manganese: LC_MW20_02A (Q1 to Q4). – **West Line Creek**: ▪ Lithium: all wells except for LC_PIZ1210B, every monitoring event; and ▪ Molybdenum: LC_PIZ1207A (Q2, Q3), LC_PIZ1207B (Q2, Q3, Q4) seasonally above background 95th percentile, and LC_PIZ1210C (Q2, Q3, Q4) above background 95th percentile. – **Lower Line Creek**: ▪ Barium: WL_MW-15-04-B (Q4); ▪ Lithium: three wells (WL_MW-15-02-B, LC_MW_CP1A, LC_MW_CP1B), every monitoring event; and ▪ Manganese: WL_MW-15-04-B, every monitoring event, above background 95th percentile for unconsolidated materials. • Barium, lithium, manganese and molybdenum may be associated with background conditions (SNC-Lavalin 2020a). Molybdenum has been identified in operations (Azimuth 2022) and may be a mining order constituent, depending on antiscalant activities. All wells except those in Lower Line Creek are upgradient of antiscalant activities. • Concentrations of molybdenum and manganese above background 95th percentiles indicate local variability or mine-related influences. • All other non-order mining related and naturally occurring constituents were less than primary screening criteria.	Tables LC-03 and 04
	Mann-Kendall Trend Analysis	• Increasing dissolved selenium trend at LC_PIZ1206C and WL_MW-15-02B, with concentrations above screening criteria. • Increasing sulphate trend at LC_PIZ1206C and LC_PIZ1211N, with concentrations above screening criteria. • Increasing sulphate trend at LC_MW20_02A and WL_MW-15-04B, with concentrations below screening criteria. • Increasing nitrate trend at LC_PIZ1206C with concentrations below screening criteria. • Increasing dissolved cadmium trend at LC_PIZ1211N and WL_MW-15-02A with concentrations below screening criteria. • Concentrations of all other OCs were non-trending, stable, or decreasing where sufficient samples have been collected for trend analysis and analytical results were above detection limits.	Table H Attachment III

Notes:

[a] Relevant monitoring wells from other programs are those in the area that are under evaluation for potential inclusion in the SSGMP and/or RGMP.

[b] Relevant surface water stations and seep monitoring locations are as determined in the 2021 SSGMP Update (SNC-Lavalin 2021a) and represent a sub-set of the surface water and seepage monitoring locations at LCO. LC_LCDSSLCC and LC_LC3GS (AWTF-Seep) added.

[c] Non-order mine-related and naturally occurring constituents based on the background assessment (BGA) completed for the 2020 RGMP Update (SNC-Lavalin 2020).

[d] The concentrations of sodium at LC_PIZ1210C (Q1 to Q4), chloride at WL_MW-15-02-B (Q1, Q2), arsenic at WL_MW-15-04-B (Q4) and iron at WL_MW-15-04-B (Q1, Q4) were greater than the primary screening criteria. These parameters were not included in the BGA and are therefore not defined as a non-order mining-related constituent or a natural occurring constituent.

A summary of results for OC compared to primary screening criteria is presented in Table G below.

Table G: Summary of OC Compared to Primary Screening Criteria in LCO Phase I

Parameter / Well ID	Nitrate-N (mg/L)				Sulphate (mg/L)				Dissolved Cadmium (µg/L)				Dissolved Selenium (µg/L)			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Center Line Creek (North)																
LC_PIZM0903	-	-	-	-	-	-	-	-	-	-	-	-	11.2	11.0	-	-
Center Line Creek (South)																
LC_MW20_01	13.0	13.6	12.9	12.6	-	-	-	-	-	-	-	-	***50.1***	***50.6***	***56.6***	***65.0***
LC_MW20_02A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LC_MW20_02B	12.1	13.9	12.2	-	-	-	-	-	-	-	-	-	***51.8***	***53.6***	***51.2***	***49.1***
LC_MW20_03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
West Line Creek																
LC_PIZ1206A	11.5	12.5	-	10.5	1040	1180	852	996	-	-	-	-	***361***	***385***	***319***	***536***
LC_PIZ1206C	-	-	-	-	-	521	518	521	-	-	-	-	***82.6***	***94.8***	***131***	***147***
LC_PIZ1207A	-	-	-	NS	-	-	-	NS	-	-	-	NS	-	-	-	NS
LC_PIZ1207B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LC_PIZ1210B	NS	NS	NS	-	NS	NS	NS	-	NS	NS	NS	-	NS	NS	NS	***72.3***
LC_PIZ1210C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LC_PIZ1212	19.5	12.6	14.0	13.6	511	599	-	-	-	-	-	-	***119***	***233***	***147***	***131***
LC_PIZ1211N	19.8	12.8	10.6	20.2	-	646	518	599	-	-	-	-	***99.6***	***244***	***184***	***113***
Lower Line Creek																
WL_MW-15-02-A	-	-	NS	-	-	-	NS	-	-	-	NS	-	-	-	NS	-
WL_MW-15-02-B	-	-	NS	-	-	-	NS	-	-	-	NS	-	***49.7***	***71.5***	NS	***33.1***
WL_MW-15-04-B	-	-	NS	-	-	-	NS	-	-	-	NS	-	-	-	NS	-
LC_MW_CP1A	-	-	-	-	-	-	-	-	-	-	-	-	***55.8***	***55.9***	***49.9***	***73.4***
LC_MW_CP1B	-	-	-	-	-	-	-	-	-	-	-	-	***56.0***	***46.9***	21.8	***48.1***
CSR AW	400				1,280 – 4,290*				0.5 – 4*				20			
CSR IW	n/s				n/s				5				20			
CSR LW	100				1,000				80				30			
CSR DW	10				500				5				10			

Notes:

Primary screening criteria applied are CSR standards for **Aquatic Life (AW)**, Drinking Water (DW), Livestock (LW) and *Irrigation (IW)*.

'–' denotes result less than primary screening criteria for given constituents.

Where a duplicate was collected, the higher concentration is provided in table. If more than one sample collected in a quarter, the higher of the two samples is provided in the table.

* Standard varies with hardness.

'NS' denotes no sample. 'n/s' denotes no standard.

Mann-Kendall trend analyses for Phase I wells with sufficient data are summarized in Table H with further details provided in Attachment III.

Table H: Summary of Mann-Kendall Trend Analysis for OC in LCO Phase I

Parameter Well ID	Nitrate	Sulphate	Dissolved Cadmium	Dissolved Selenium
Centre Line Creek (South)				
LC_MW20_01	***Decreasing***	No Trend	Stable	***No Trend***
LC_MW20_02A	-	Increasing	-	-
LC_MW20_02B	***Stable***	No Trend	Stable	***No Trend***
LC_MW20_03	-	Stable	Stable	-
West Line Creek				
LC_PIZ1206A	***Stable***	***No Trend***	No Trend	***No Trend***
LC_PIZ1206C	Increasing	***Increasing***	Decreasing	***Increasing***
LC_PIZ1211N	***No Trend***	***Increasing***	Increasing	***No Trend***
LC_PIZ1212	***Stable***	***No Trend***	No Trend	***Stable***
Lower Line Creek				
WL-MW-15-02A	No Trend	Decreasing	Increasing	No Trend
WL-MW-15-02B	Stable	Decreasing	Stable	***Increasing***
WL-MW-15-04B	-	Increasing	-	Stable

Notes:

'–' denotes Mann-Kendall trend analysis was not completed as concentrations were consistently less than or marginally greater than the detection limit.

Where OC were greater than the primary screening criteria in 2022, the trend result is ***bold italics***.

Where increasing trends are noted, the cell is shaded yellow.

1.6.1 Discussion

1.6.1.1 Centre Line Creek (North)

LC_PIZM0903 is a shallow, unconsolidated well monitored to evaluate groundwater quality in the northern extent of the Line Creek watershed. Limited continuous historical monitoring data is available for this location. Surface water station LC_LC2 is located northeast of LC_PIZM0903, along Line Creek within the permitted mining boundary.

Continued monitoring is required to determine any trends because of the limited water level and chemistry data for LC_PIZM0903 (Figure LC-08, Figures LC-11 to LC-13). OC concentrations at LC_LC2 were similar to LC_PIZM0903 and showed seasonal fluctuations with the lowest levels coinciding with freshet.

Based on Se:SO_4 ratios (Figure LC-14), groundwater mixing with a waste rock influenced source appears to be occurring at LC_PIZM0903 and is similar to results for LC_LC2 outside of the freshet window. Mine-influences are interpreted to be relatively low compared to other wells in Phase I (Table G, Drawing LC-12 to LC-15).

1.6.1.2 Centre Line Creek (South)

Groundwater monitoring results for four monitoring wells, including one well cluster, are discussed for Centre Line Creek (South). Wells are monitored to evaluate groundwater quality upgradient of the confluence of Line Creek and West Line Creek (WLC). A four-kilometre portion of Line Creek north of the confluence with WLC is buried by waste rock and now serves as a rock drain that daylights near station LC_LCUSWLC. Surface water quality results at LC_LCUSWLC reflects water quality influenced by waste rock in this area.

LC_MW20_01 is located at the toe of a waste rock spoil. This unconsolidated well is 21 m deep and screened 4 m above the bedrock surface. Groundwater elevations in 2022 were similar to those in 2021, with seasonal fluctuations influenced by spring freshet (Figure LC-08). OC concentrations in groundwater for LC_MW20_01 were comparable with concentrations at LC_LCUSWLC (Figure LC-11 to LC-13). Nitrate concentrations exceeded primary screening criteria (Table G) although a decreasing nitrate trend was noted (Table H). Selenium concentrations exceeded primary and secondary screening criteria.

Well cluster LC_MW20_02A/B are located 150 m east of and downgradient from LC_MW20_01. Both wells are screened in unconsolidated sediments at well depths of 19 m for LC_MW20_02A (just above bedrock) and 14 m for LC_MW20_02B. Groundwater elevations in 2022 were comparable to 2021 (Figure LC-08). Based on chemistry plots, selenium and nitrate concentrations are typically an order of magnitude higher in LC_MW20_02B compared to LC_MW20_02A, while sulphate concentrations are similar (Figure LC-11 to LC-13). Mann-Kendall analysis (Table H) indicated an increasing trend for sulphate concentrations at LC_MW20_02A.

LC_MW20_03 is located near the eastern extents of the disturbed mine area. This well is 39 m deep and screened in sand below a clay/silt unit. Groundwater elevations in 2022 were higher than 2021 with no apparent seasonal trend (Figure LC-08). Continued monitoring is required to confirm water level trends. OC concentrations in groundwater for LC_MW20_03 are below primary screening criteria (Figure LC-11 to LC-13) with stable or no trends identified (Table H).

Se:SO_4 ratios (Figure LC-14) indicate groundwater quality has been influenced by waste rock at LC_MW20_01 and LC_MW20_02B based on plotting results close to LC_LCUSWLC. Groundwater quality at LC_MW20_02A may be influenced by redox conditions based on relatively high iron, manganese, and sulphate concentrations as well as negative ORP. Groundwater quality at LC_MW20_03 plots within the boundary for natural waters from unconsolidated materials. Based on the borehole log for LC_MW20_03 (Attachment II), there is 10 m of waste rock underlain by a thick layer of fine-grained materials (silts, clays) that may limit vertical migration of pore water from the waste rock to the deeper aquifer in this area. Lithium is the only parameter above screening guidelines and is likely naturally-occurring (SNC-Lavalin, 2020a).

1.6.1.3 West Line Creek

Groundwater monitoring results for eight monitoring wells, including three well clusters, are discussed for WLC. Wells are monitored to evaluate water quality in unconsolidated and bedrock units underlying and immediately downgradient of WLC waste rock spoils. LC_WLC is a relevant surface water station along ditching used to collect and direct flows from the WLC rock drain to the WLC AWTF. Surface water quality at LC_WLC represents water quality influenced by waste rock in this area. The highest concentrations of OCs at LC_WLC typically occur during low flow periods (October through April), followed by sharply decreasing concentrations during freshet (typically May to June), and a more gradual increase in concentrations (July through September) (Figure LC-11 to LC-13).

The well cluster LC_PIZ1206A/C is located at the toe of a WLC waste rock spoil. LC_PIZ1206A is a shallow well (14 m deep) screened within an inferred perched unconsolidated aquifer (Golder, 2022; Attachment I, Drawings LC-04 and 05) while PIZ1206C is a deep well (76 m deep) installed 20 m below the bedrock surface. Groundwater elevations in 2022 were within the same range as 2021 (Figure LC-09). Chemistry plots (Figure LC-11 to LC-13) and Mann-Kendall trends analyses (Table H) for

LC_PIZ1206A show elevated OC concentrations that are stable or have no trends. Groundwater from LC_PIZ1206A has the highest sulphate and selenium concentrations within the LCO groundwater monitoring network. At LC_PIZ1206C, OC concentrations have been typically lower compared to LC_PIZ1206A but still greater than primary screening criteria for sulphate and secondary screening criteria for selenium with increasing trends noted for nitrate, sulphate, and selenium.

Well clusters LC_PIZ1207A/B and LC_PIZ1210B/C are located within the disturbed mine footprint and southeast of LC_PIZ1206A/C. LC_PIZ1207A and LC_PIZ1207B are relatively shallow wells (11 and 14 m deep) screened in weathered bedrock within 5m of the bedrock surface). LC_PIZ1210B and LC_PIZ1210C are deep wells (47 and 64 m) installed in unconsolidated sediments and bedrock, respectively. OC concentrations in groundwater from bedrock wells LC_PIZ1207A, LC_PIZ1207B, and LC_PIZ1210C have historically been below screening criteria. For LC_PIZ1210B, OC concentrations are higher compared to the bedrock wells with selenium concentrations above primary and secondary screening criteria. There is insufficient data to evaluate temporal trends (Figure LC-09, Figure LC-11 to LC-13).

Monitoring wells LC_PIZ1211N and LC_PIZ1212 are located adjacent to the WLC AWTF. LC_PIZ1211N and LC_PIZ1212 are both screened in unconsolidated sediments at 7 and 24 m below ground surface respectively. Groundwater elevations in 2022 for LC_PIZ1211N were within the same range as 2021 (Figure LC-09). Chemistry plots (Figure LC-11 to LC-13) of OC concentrations, except for cadmium, have historically been near or greater than primary screening criteria and greater than secondary screening criteria for selenium for these wells. Concentrations of selenium and sulphate at LC_PIZ1211N and LC_PIZ1212 have been lower than upgradient well LC_PIZ1206A; whereas nitrate concentrations have been higher or similar. Increasing trends for sulphate and cadmium have been noted at LC_PIZ1211N (Table H). Stable or no trends for OC concentrations were noted for LC_PIZ1212.

Se:SO_4 ratios (Figure LC-14) for the following wells indicate groundwater quality that has been influenced by waste rock based on plotting close to LC_WLC: LC_PIZ1206A, LC_PIZ1206C (bedrock), LC_PIZ1210B, LC_PIZ1211N, and LC_PIZ1212. Some mixing with mine-influenced waters from waste rock occurs for groundwater at LC_PIZ1207B. Increasing trends for two or more OC concentrations were noted at LC_PIZ1206C (nitrate, sulphate, selenium) and LCPIZ1211N (sulphate, cadmium) which indicates the potential for changes to groundwater quality and an increase in contaminant loading in these areas. Groundwater quality for both LC_PIZ1207A and LC_PIZ1210C plot within the boundary for natural waters for bedrock. Mine influences on groundwater quality are not suspected at these two wells given low OC concentrations. Lithium and molybdenum concentrations greater than primary screening criteria at LC_PIZ1207A and LC_PIZ1210C are below background 95th percentile values; therefore, concentrations are considered naturally occurring. LC_PIZ1210C was the only well with sodium concentrations greater than screening criteria. The source of sodium is uncertain.

1.6.1.4 Lower Line Creek

Groundwater monitoring results for five wells are discussed for Lower Line Creek. Wells are monitored to evaluate groundwater quality near the AWTF residual landfill and potential groundwater bypass relative to surface water station LC_LCDSSLCC. The AWTF residual landfill is lined and has a leachate collection system. Additional monitoring locations considered include seep LC_LC3GS (also known as AWTF-Seep) located along a road-cut slope between the landfill and Line Creek (Drawing LC-01; Golder, 2016b). Relevant surface water stations include LC_LC3, LC_LCDSSLCC, and LC_BR7. LC_LC3 is located adjacent to the WLC Buffer Pond and 100 m downstream from the WLC AWTF outfall (LC_WTF_OUT). South Line Creek discharges into Line Creek downstream of LC_LC3 and surface water flows southwest down a narrowing valley to LC_LCDSSLCC. LC_LCDSSLCC is a permitted compliance point along Line Creek and located 1.5 km downstream from the WLC AWTF outfall. LC_BR7 is located downstream of LC_LCDSSLCC to monitor surface water conditions before Line Creek flows through the canyon.

WL_MW-15-02-A and WL_MW-15-02-B are nested wells (installed in same borehole) along the eastern extent of the WLC AWTF residuals landfill. WL_MW-15-02-A is 12 m deep and screened in clay while WL_MW-15-02-B is 8 m deep and screened in sand. WL_MW-15-04-B is situated east of the landfill at the toe of slope. It is 7 m deep and screened in clay. Groundwater elevations in 2022 from these wells were within the same general range as 2021, except for WL_MW-15-04-B which had higher groundwater elevations by 4 m (Figure LC-10). Downward vertical gradients suggest a recharge area consistent with the landfills position on a terrace above the western bank of Line Creek.

Chemistry plots (Figure LC-11 to LC-13) show nitrate, sulphate, and selenium concentrations have been an order of magnitude higher in groundwater from WL_MW-15-02-B compared to WL_MW-15-02-A and WL_MW-15-04-B. Selenium concentrations at WL_MW-15-02-B have historically exceeded primary screening criteria with seasonal exceedances of secondar screening criteria. An increasing selenium trend is noted for WL_MW-15-02-B (Table H). Several parameters (i.e., chloride, arsenic, and iron) not associated with non-order mine-related or naturally occurring constituents were also above primary screening criteria at WL_MW-15-02-B. Seep LC_L3GS has historically had higher concentrations of OCs compared to WL_MW-15-02-B (Figure LC-11 to LC-13).

LC_MW_CP1A/B are a well cluster located 500 m downgradient from the Contingency Ponds, along the western banks of Line Creek. LC_MW_CP1A is 21 m deep and screened in fractured bedrock within 6 m of the bedrock surface. LC_MW_CP1B is 11 m deep and screened in sand and gravel. These wells are about 300 m upgradient of LCO's permitted compliance point LC_LCDSSLCC. These wells were installed in 2021 and therefore, have limited historical water level and chemistry data. Groundwater elevations in 2022 were similar to elevations along Line Creek with upward vertical gradients, which is consistent with gaining reach interpretations from flow accretion studies (Drawing LC-02, SNC-Lavalin, 2020d). Selenium concentrations were above primary screening criteria for both wells and above secondary screening criteria in LC_MW_CP1A. Selenium concentrations at these wells were similar to those measured at LC_LCDSSLCC outside of freshet.

Se:SO_4 ratios (Figure LC-14) show groundwater from LC_MW_CP1A/B and WL_MW-15-02-B plot just below the mixing line because of lower sulphate compared to other samples with similar selenium concentrations. Groundwater from WL_MW-15-02-A and WL_MW-15-04-B plots within the boundary for natural waters from unconsolidated materials. Se:SO_4 ratio results for LC_L3GS indicate water quality that is more influenced by waste rock spoils compared to landfill wells. This aligns with previous interpretation of this seep having a larger catchment area than the terrace footprint near the landfill (as cited in Golder 2016b) with potential hydraulic connection to seepage from the WLC waste rock spoils.

Groundwater quality at WL_MW-15-02-B may be impacted by landfill activities based on non-order parameters (i.e., chloride, arsenic, iron) greater than primary screening criteria. Monitoring and reporting specific to the landfill is conducted under separate cover to meet conditions of refuse discharge permit 106789. Upgradient mine activities may be influencing groundwater quality at LC_MW_CP1A/B based on elevated selenium concentrations.

1.7 Process Plant (Study Areas 5 and 6)

A summary of 2022 groundwater monitoring and sampling results for the Process Plant area, including Study Areas 5 and 6, is presented in Table I with references to supporting information (Figures, Tables, Drawings, Attachments).

Table I: Summary of 2022 Groundwater Monitoring and Sampling Results for the Process Plant (Study Areas 5 and 6)

Hydrogeological Information		Description	Reference
Monitoring Location	Relevant SSGMP/RGMP Wells (Study Areas 5 and 6)	**Process Plant:** LC_PIZP1001*, LC_PIZP1002*, LC_PIZP1003*, LC_PIZP1101, LC_PIZP1103, LC_PIZP1104, and LC_PIZP1105 **Study Areas 5 and 6:** LC_MW_ER4A/B	Table LC-01 Drawings LC-01, 08 to 10
	Other Relevant Monitoring Wells[a]	RG_MW_LC4A/B, LC_MW_ERX1A/B, LC_MW_SRD1A/B, LC_MW_SRD2A/B, LC_MW22_GL1A/B, LC_MW22_GL2A/B	
	Relevant Surface Water Monitoring Stations[b]	Process Plant: LC_LC4 Study Areas 5 and 6: LC_LC5, EV_ER4	
	Relevant Seep Monitoring Locations[b]	Process Plant: LC_SEEP10, LC_SEEP11, LC_ERX	
	Pumping Wells	Plant River Well #1 (Well ID 48438), Plant River Well #2 (Well ID 48439)	
Physical Hydrogeology	Groundwater Elevation Trends	• Groundwater surface elevations have historically been variable. Continued monitoring is required to confirm trends. • Groundwater surface elevations for wells located in the Elk Valley (LC_MW_ER4A/B) mimic Elk River stage data. • LC_PIZP1001 and LC_PIZP1003, which are 50 m apart and both screened in unconsolidated sediments at similar depths with groundwater elevations that differ by over 25m. Water level measurements at LC_PIZP1003 are suspect. • Seasonal fluctuations vary from 0.2 to 1.3 m for wells screened in unconsolidated sediments.	Figures LC-16 to 18 Table LC-02 Drawing LC-02
	Hydraulic Gradients and Flow Direction	• Vertical Hydraulic Gradients: – LC_MW_ER4A (deep) and LC_MW_ER4B (shallow): 0.06 m/m upwards for all monitoring events. • Flow Direction**:** – Groundwater flow in the unconsolidated sediments and shallow bedrock is interpreted to generally follow topography with radial flow from the canyon bottom and westerly to southwesterly flow along the valley bench towards Elk River. – A groundwater divide for unconsolidated and shallow bedrock units may exist between the Process Plant and Grave Lake (drawing LC-08, LF-LF') where a local topographic high may coincide with a local bedrock high. Grave Lake is located in local bedrock depression. – Groundwater recharge likely occurs along the losing reach of Line Creek where it flows across alluvial fan deposits, regional discharge is inferred in the main valley bottom.	
Chemistry	2022 SSGMP/RGMP OC Results	• Concentrations greater than primary screening criteria: – Cadmium: LC_PIZP1104 (Q2). The cadmium concentration of 16.4 ug/L in Q2 may be anomalous given it is two orders of magnitude higher compared to other sampling results in 2022 and historical data. – Selenium: LC_MW_ER4B (Q1, Q2, Q4). • All other OC concentrations were less than the primary screening criteria in 2022.	Table I Figures LC-19 to 21 Tables LC-03 to 05 Drawings LC-12 to 15 Attachment III
	Non-Order Mine -Related and Naturally Occurring Constituents	• Concentrations Greater than Primary Screening Criteria – Non-Order Mine Related: – None[d]. • Concentration Greater than Primary Screening Criteria – Naturally Occurring Constituents: – Fluoride: LC_PIZP1101 (Q1 to Q4), above background 95th percentile; – Lithium: all samples except LC_MW_ER4A (Q1 to Q4) and LC_MW_ER4B (Q1); – Manganese: LC_PIZP1104 (Q1 to Q4), above background 95th percentile; and – Molybdenum: LC_PIZP1101 (Q1 to Q4), LC_PIZP1103 (Q1 to Q4), above background 95th percentile. • Fluoride, lithium, manganese and molybdenum are associated with background conditions (SNC-Lavalin 2020a). Molybdenum has been identified in operations (Azimuth 2022) and may be a mining order constituent, depending on antiscalant activities. • Concentrations of fluoride, manganese, and molybdenum above background 95th percentiles indicate local variability or mine-related influences. • All other non-order mining related and naturally occurring constituents were less than primary screening criteria.	Tables LC-03 and 04

Table I (Cont'd): Summary of 2022 Groundwater Monitoring and Sampling Results for the Process Plant (Study Areas 5 and 6)

Hydrogeological Information		Description	Reference
Chemistry (Cont'd)	Mann-Kendall Trend Analysis	• Increasing cadmium trend at LC_PIZP1104, with one potentially anomalous concentration above the primary screening criteria in 2022. • Increasing nitrate trend at LC_PIZP1103 and LC_PIZP1105 with concentrations below screening criteria. • Increasing sulphate trend at LC_PIZP1105 with concentrations below screening criteria. • Increasing cadmium trend at LC_PIZP1105 and LC_MW_ER4B with concentrations below screening criteria. • Increasing selenium trend at LC_PIZP1104 with concentrations below screening criteria. • Concentrations of all other OCs were non-trending, stable, or decreasing where sufficient samples have been collected for trend analysis and analytical results were above detection limits.	Table K Attachment III

Notes:

*Monitoring only includes water level measurements.

[a] Relevant monitoring wells from other programs are those in the area that are under evaluation for potential inclusion in the SSGMP and/or RGMP.

[b] Relevant surface water stations and seep monitoring locations are as determined in the 2021 SSGMP Update (SNC-Lavalin 2021a) and represent a sub-set of the surface water and seepage monitoring locations at LCO. EV_ER4 included for Study Area 6.

[c] Non-order mine-related and naturally occurring constituents based on the background assessment (BGA) completed for the 2020 RGMP Update (SNC-Lavalin 2020).

[d] The concentrations of chloride at LC_PIZP1104 (Q1 to Q4) and LC_PIZP1105 (Q1 to Q4) as well as iron at LC_PIZP1104 (Q2) were greater than the primary screening criteria. These parameters were not included in the BGA and are therefore not defined as a non-order mining-related constituent or a natural occurring constituent.

A summary of results for OC compared to primary screening criteria is presented in Table J below.

Table J: Summary of OC Compared to Primary Screening Criteria in the Process Plant (Study Areas 5 and 6)

Parameter / Well ID	Nitrate-N (mg/L)				Sulphate (mg/L)				Dissolved Cadmium (µg/L)				Dissolved Selenium (µg/L)			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Process Plant																
LC_PIZP1101	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LC_PIZP1103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LC_PIZP1104	-	-	-	-	-	-	-	-	-	***16.4***	-	-	-	-	-	-
LC_PIZP1105	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Southwest of Process Plant (Study Area 6)																
LC_MW_ER4A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LC_MW_ER4B	-	-	-	-	-	-	-	-	-	-	-	-	17.3	19.8	-	12.3
CSR AW	400				1,280 – 4,290*				0.5 – 4*				20			
CSR IW	n/s				n/s				5				20			
CSR LW	100				1,000				80				30			
CSR DW	10				500				5				10			

Notes:

Primary screening criteria applied are CSR standards for **Aquatic Life (AW)**, Drinking Water (DW), Livestock (LW) and *Irrigation (IW)*.

'–' denotes result less than primary screening criteria for given constituents.

Where a duplicate was collected, the higher concentration is provided in table. If more than one sample collected in a quarter, the higher of the two samples is provided in the table.

* Standard varies with hardness.

'NS' denotes no sample. 'n/s' denotes no standard.

Mann-Kendall trend analyses for Process Area wells with sufficient data are summarized in Table K with further details provided in Attachment III.

Table K: Summary of Mann-Kendall Trend Analysis for OC in the Process Plant (Study Areas 5 and 6)

Parameter / Well ID	Nitrate	Sulphate	Dissolved Cadmium	Dissolved Selenium
LC_PIZP1101	No Trend	Stable	-	No Trend
LC_PIZP1103	Increasing	Decreasing	-	Decreasing
LC_PIZP1104	No Trend	Stable	***Increasing***	Increasing
LC_PIZP1105	Increasing	Increasing	Increasing	Decreasing
LC_MW_ER4A	No Trend	No Trend	-	-
LC_MW_ER4B	No Trend	Stable	Increasing	***No Trend***

Notes:

'–' denotes Mann-Kendall trend analysis was not completed as concentrations were consistently less than or marginally greater than the detection limit.

Where OC were greater than the primary screening criteria in 2022, the trend result is ***bold italics***.

Where increasing trends are noted, the cell is shaded yellow.

1.7.1 Discussion

1.7.1.1 Process Plant

Groundwater monitoring results from seven monitoring wells are discussed for the Process Plant area. Wells are monitored to evaluate groundwater in unconsolidated units. Surface water monitoring station LC_LC4 is along Line Creek at the outlet of the canyon with water quality influenced by upgradient mining activities. Three seeps (LC_SEEP10, LC_SEEP11, and LC_ERX) are located downgradient from or within CCR spoil extents. These seeps are used to characterize mine influences on groundwater quality from CCR spoils.

Only water level monitoring is conducted at LC_PIZP1001, LC_PIZP1002, and LC_PIZP1003. These wells are located near the Process Plant facility and vary in depth from 43 to 58 m. These three monitoring wells are located the closest to Plant River Well #1 (Well Plate ID 48438) and Plant River Well #2 (Well Plate ID 48439). The Plant River wells are pumping wells used to supply water to the processing plant facility in addition to water from the rail loop ponds. Total annual groundwater withdrawals in 2022 were lower by 5% compared to 2021 (683,800 m^3 in 2022; 717,300 m^3 in 2021) with lower withdrawals of 3 to 6% for each quarter (Table L). There is insufficient data to evaluate any correlation between pumping rates and groundwater elevations at this time.

Table L: Total Annual Groundwater Withdrawals from Plant River Well #1 and #2

	2018		2019		2020		2021		2022	
	Average Rate	Volume	Average Rate	Volume	Average Rate	Volume	Average Rate	Volume	Average Rate	Volume
	m^3/hr	m^3	m^3/hr	m^3	m^3/hr	m^3	m^3/hr	m^3	m^3/hr	m^3
Jan-Mar	59	126,480	68	147,888	54	116,688	73	157,968	69	148,224
Apr-Jun	54	118,704	83	181,176	69	150,816	89	195,120	84	183,576
Jul-Sep	94	208,296	89	197,544	85	188,376	84	186,072	82	180,552
Oct-Dec	81	178,992	88	194,712	82	181,128	81	178,128	78	171,456
Annual	72	632,472	82	721,320	73	637,008	82	717,288	78	683,808

Notes: Calculated using monthly average values.

Historical water levels for the monitoring wells and combined monthly average pumping rates from the pumping wells are shown in Figure LC-16. Similar to previous years, groundwater elevations at LC_PIZP1003 in 2022 were over 20 m higher compared to nearby well LC_PIZP1001. A well inspection conducted in Q4 identified large diameter tubing in LC_PIZ1003 that may be interfering with water level measurements and resulting in anomalously high groundwater levels. These water levels likely do not represent true groundwater conditions and may be influenced by moisture in the well activating the water level meter sensor before reaching the water table. Groundwater elevations at LC_PIZP1001 and LC_PIZP1002 were generally higher in 2022 compared to 2021.

LC_PIZP1101, LC_PIZP1103, LC_PIZP1104, and PIZP1105 are in the northern portion of the Process Plant area near the Rail Loop Sedimentation Ponds. These wells are screened in sand (LC_PIZP1101), silt (LC_PIZP1103), or sand and gravel interlayered between silt (LC_PIZP1104, LC_PIZP1105) at screen depths of 36 to 42 m. Screen elevations for LC_PIZP1104 and PIZP1105 are 10 m higher compared to the other wells because of topographic differences. Groundwater elevations in 2022 were generally higher by 0.3 to 1.0 m compared to 2021 (Figure LC-17). Groundwater elevations at PIZP1101 are approximate because surveying has not been completed after well repairs were made to this well in 2021. There is some uncertainty in groundwater elevations for LC_PIZP1103 given differences between manual measurements and pressure transducer readings. Continued monitoring is required to evaluate water level trends.

Nitrate and selenium concentrations in groundwater at these wells were below screening criteria and were generally at least an order of magnitude lower compared surface water quality at LC_LC4 (Line Creek), LC_LC5 (Fording River), and EV_ER4 (Elk River) (Figure LC-19 to LC-21). Nitrate trends have been increasing at LC_PIZP1103 and LC_PIZP1105, while selenium trends have been decreasing at LC_PIZP1103 and LC_PIZP1105 but increasing at LC_PIZP1104 (Table K). Sulphate concentrations have historically been higher in groundwater from LC_PIZP1104 (average 80 mg/L) and LC_PIZP1105 (average 100 mg/L) compared to the other wells in the Process Plant area but approximately half of the concentrations measured at LC_LC4 (around 200 mg/L). Sulphate concentrations have been increasing at LC_PIZP1105 and decreasing at LC_PIZP1103 (Table K). Increasing cadmium trends area noted for LC_PIZ1104 and LC_PIZP1105. The elevated cadmium concentration of 16.4 ug/L in Q2 2022 at LC_PIZP1104 affects trend analysis results. This elevated cadmium concentration may be anomalous given that it is two orders of magnitude higher than other sampling results in 2022 and historical data (Attachment III).

Se:SO_4 ratios (Figure LC-22) show groundwater quality from LC_PIZP1101 and LC_PIZP1103 as non-contact waters for unconsolidated materials. Some influence of seepage from CCR may occur at groundwater from LC_PIZP1104 and PIZP1105 as well as seep LC_SEEP10 based on Se:SO_4 ratios. LC_SEEP10 is downgradient of CCR spoils but LC_PIZP1104 and PIZP1105 are upgradient or cross-gradient of CCR spoils. Chloride, which is not associated with non-order mine-related or naturally occurring constituents, had concentrations greater than primary screening criteria during every sampling event in 2022 at LC_PIZP1104 and LC_PIZP1105. Several naturally occurring constituents were elevated compared to primary screening criteria at LC_PIZP1101 (fluoride) and LC_PIZP1104 (manganese) at concentrations above background 95th percentile values. This suggests mine-related influences not directly related to CCR spoils are affecting groundwater quality at these wells. A better understanding of possible source terms in the Process Plant area (e.g., sedimentation ponds) is required to facilitate evaluation of groundwater.

1.7.1.2 Study Area 5 and Study Area 6

Study Area 5 (Drawing LC-01) was selected to assess possible inputs of OCs from Line Creek and from the Process Plant area that may be occurring in the Fording River valley bottom (SNC-Lavalin, 2015). Two monitoring wells (RG_MW_LC4A/B) were installed in 2021 and are currently under evaluation for inclusion into Study Area 5 as part of the RGMP.

Study Area 6 (Drawing LC-01) spans the Elk River valley bottom and is downgradient of the Process Plant area. One well cluster (LC_MW_ER4A/B) are monitored in this area. These wells are located along the eastern banks of the Elk River and were surveyed to be greater than 10 m from the high-water mark (main report, Appendix XII). LC_MW_ER4A is 15 m deep and screened in a sand and gravel unit below a 4 m clay unit. LC_MW_ER4B is 5 m deep and screened in a sand and gravel unit above the aforementioned 4 m clay unit.

Groundwater elevations in 2022 at LC_MW_ER4A and LC_MW_ER4B were comparable to historical data (Figure LC-18). An upward vertical gradient has been consistent at this well cluster. Vertical gradients have been less pronounced during freshet likely owing to increased surficial pressures from spring melt water volumes. Groundwater level changes at these wells have reflected seasonal river stage levels at EV_ER4. A better understanding of the Elk River in relation to groundwater elevations is required to determine if this is a groundwater discharge or recharge area and any seasonal variations. A review of groundwater flow and bypass near LC_MWER4A/B is currently on-going. Once the findings of this study are available, they will be incorporated into the understanding of groundwater flow in Study Areas 5 and 6.

Chemistry plots of OCs (Figure LC-19 to LC-21) indicated some variation in groundwater quality between LC_MW_ER4A and LC_MW_ER4B. Selenium and nitrate concentrations were higher at LC_MW_ER4B compared to LC_MW_ER4A by at least an order of magnitude with seasonal differences that reflect surface water quality at EV_ER4. However, sulphate concentrations were generally comparable between groundwater from both wells and surface water quality at EV_ER4. Nitrate, sulphate, and selenium trends have been stable or there was no trend at both wells. An increasing trend for cadmium was noted at LC_MW_ER4B.

Se:SO_4 ratios (Figure LC-22) indicate groundwater from LC_MW_ER4B is similar to surface water from EV_ER4 and both are influenced by mining activities. Groundwater at LC_MW_ER4A plots outside of the boundary for natural waters from unconsolidated materials and away from LC_MW_ER4B. Dissolved selenium concentrations at LC_MW_ER4A in 2022 were below detection limits but sulphate concentrations were above natural waters.

2 Recommendations

New recommendations identified for the LCO SSGMP and the RGMP based on this report are presented in Table M. Appendix II of the main report summarizes recommendations related to LCO from the 2020 Annual Report (SNC-Lavalin, 2021a), the 2021 SSGMP Update Report (SNC-Lavalin, 2021b), and the 2021 Annual Report (SNC-Lavalin, 2022a). Previous recommendations that have been initiated but not completed are provided in Table N.

Table M: Summary of New Recommendations for LCO GWMP/SSGMP and RGMP

Area	Recommendation	Rationale
GWMP and SSGMP		
LCO Phase II	Replace or repair artesian control measures at LC_PIZDC1306 and RG_MW_DC1A.	To control artesian flow, to prevent potential damage to well from freezing conditions, and to obtain better continuous water level measurements.
Process Plant	Discontinue water level monitoring at LC_PIZP1003 as part of the monitoring program. Decommissioning of this well is recommended.	There is large diameter tubing in the well believed to be interfering with water level measurements. The large diameter tubing could be removed to facilitate water level measurements; however, LC_PIZP1001 is in the same general area with a similar screen interval. Water level monitoring is conducted at LC_PIZP1001 as part of the existing program.
	Investigate alternative sampling methods for LC_PIZP1105 such as a stainless-steel bailer.	Bladder pump installation attempted in 2022 was unsuccessful to address historically high turbidity levels at this well. Continued monitoring is recommended given concentrations of non-OC parameters.
RGMP		
Study Area 6	A study was conducted to evaluate groundwater flow paths from the ERX CCR deposit towards Grave Lake as part of the ERX CCR Phase 2 Project (Teck 2022). This study should be reviewed as part of the next RGMP update.	To facilitate understanding of groundwater flow in this area.

Table N: Summary of Outstanding Recommendations for LCO GWMP/SSGMP and RGMP

Area	Recommendation	Rationale
GWMP and SSGMP		
Phase II	Quarterly monitoring of water levels at LC_PIZDC1306 and no water quality sampling as the OC concentrations are below primary screening levels, there is a relatively long period of record, and concentration trends are stable or decreasing based on a MK statistical analysis. This well is located in Upper LCO Creek, east of the Head Pond Diversion Structure.	Included in the 2021 SSGMP Update. Pending regulatory approval.
	Reduce sampling frequency to twice per year at LC_PIZDC1307 and LC_PIZDC1308 because OCs are less than primary screening levels, baseline chemistry data has been established and OC trends are stable or decreasing according to Mann-Kendall statistical analysis.	Included in the 2021 SSGMP Update. Pending regulatory approval.
Process Plant	Reduce manual water level measurement frequency to twice a year for the following wells: LC_PIZP1001, LC_PIZP1002 and LC_PIZP1003. Groundwater levels for these wells are only needed to augment interpretated groundwater flow direction at the Process Plant. Recommend continuous groundwater level monitoring of all three wells.	Included in the 2021 SSGMP Update. Pending regulatory approval. Pressure transducers have been installed in LC_PIZP1001 (2020) and LC_PIZP1002 (2022). A Solinst Levelogger could not be installed in LC_PIZP1003 due to insufficient space because of large diameter tubing in the well. Decommissioning of LC_PIZP1003 is recommended in 2022.
	Reduce monitoring to twice a year at LC_PIZP1101 and LC_PIZP1103 because OCs are less than primary screening levels, baseline data has been established (currently 5 years of data) and OC trends are generally stable or decreasing according to Mann-Kendall statistical analysis. An increasing nitrate trend was noted in 2022 but at concentrations below primary screening criteria.	Included in the 2021 SSGMP Update. Pending regulatory approval.
	Redevelop repaired well LC_PIZP1101 prior to next round of sampling and assess whether water quality is representative of the aquifer. Conduct new geodetic survey of ground surface and top of casing. Deploy protection measures to mitigate future damage.	Included in the 2022 Annual Report. Well repairs have been completed. Well development, survey, and deployment of protection measures are still pending.
RGMP		
Study Areas 5/6	Teck has existing water supply wells near the top of the Line Creek alluvial fan. It may be possible that one or some of the existing water supply wells near LC_LC4 can provide supplemental information to facilitate characterization of groundwater - surface water interactions in the alluvial fan. Assess available relevant data for inclusion into the SSGMP and potentially validate through monitoring.	Included in the 2020 RGMP Update. In progress. Groundwater withdrawals from two pumping wells have been incorporated into the 2022 annual SSGMP report.

3 References

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SNC-Lavalin Inc. (SNC-Lavalin) 2020b. Grave Creek and Line Creek Flow Accretion Studies, Summer and Fall 2020. Technical Memorandum prepared for Teck Coal Limited. December 4, 2020.

SNC-Lavalin Inc. (SNC-Lavalin) 2020c. Elk River and Fording River Flow Accretion Studies, October 2019. Prepared for Teck Coal Limited. Memorandum. August 27, 2020.

SNC-Lavalin Inc. (SNC-Lavalin) 2020d. Line Creek Operations Flow Accretion Studies, November 2019. Technical Memorandum prepared for Teck Coal Limited. February 5th, 2020.

SNC-Lavalin 2021a. 2020 Annual Report: Elk-Valley Regional and Site-Specific Groundwater Monitoring Programs. Prepared for Teck Coal Limited. March 31, 2021.

SNC-Lavalin 2021b. 2021 Site-specific Groundwater Monitoring Program Update (2021 SSGMP Update). Prepared for Teck Coal Limited. October 31, 2021.

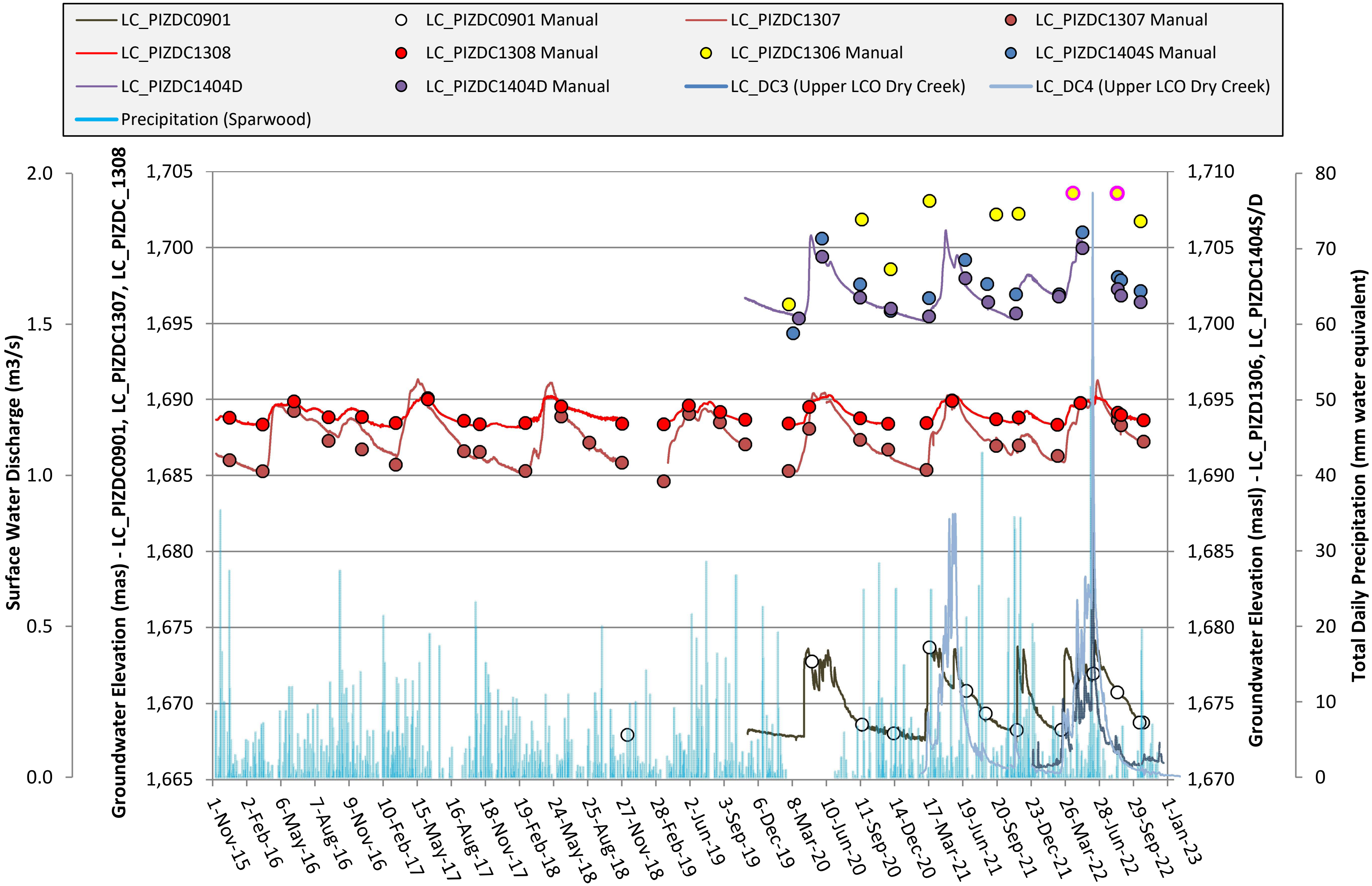
SNC-Lavalin 2022. 2021 Annual Report: Elk Valley Regional and Site-Specific Groundwater Monitoring Programs, Fording River Operations, Greenhills Operations, Line Creek Operations, Elkview Operations, Coal Mountain Mine, Regional Groundwater Monitoring Program. Prepared for Teck Coal Limited. March 31, 2022.

SRK Consulting (SRK) 2023. Elk Valley Regional Seep Monitoring: 2022 Annual Report. Prepared for Teck Coal Limited. March 2023.

Teck Coal Limited (Teck) 2022. Line Creek Operations ERX CCR Phase 2 Project Joint Application. Prepared for the Ministry of Energy, Mines and Low Carbon Innovation and the Ministry of Environment and Climate Change Strategy. December 2022.

Figures

Figure LC-01: Phase II, Upper Dry Creek - Hydrograph



Notes: Pressure transducer data removed where data logger removal occured; Precipitation Environment Canada Sparwood 1157630. Precipitation missing Feb. to July 2020; Precipitation July 2020 - Dec. 2022 Environment Canada Sparwood 1157631; Continuous water level data was compensated using barologger GH_MW_FC2-BARO; Discharge data is preliminary from continuous monitoring device. No discharge data for LC_DC2. *Pink outline indicates flowing artesian conditions where the top of casing elevation is used and is not representative of the potentiometric surface.*

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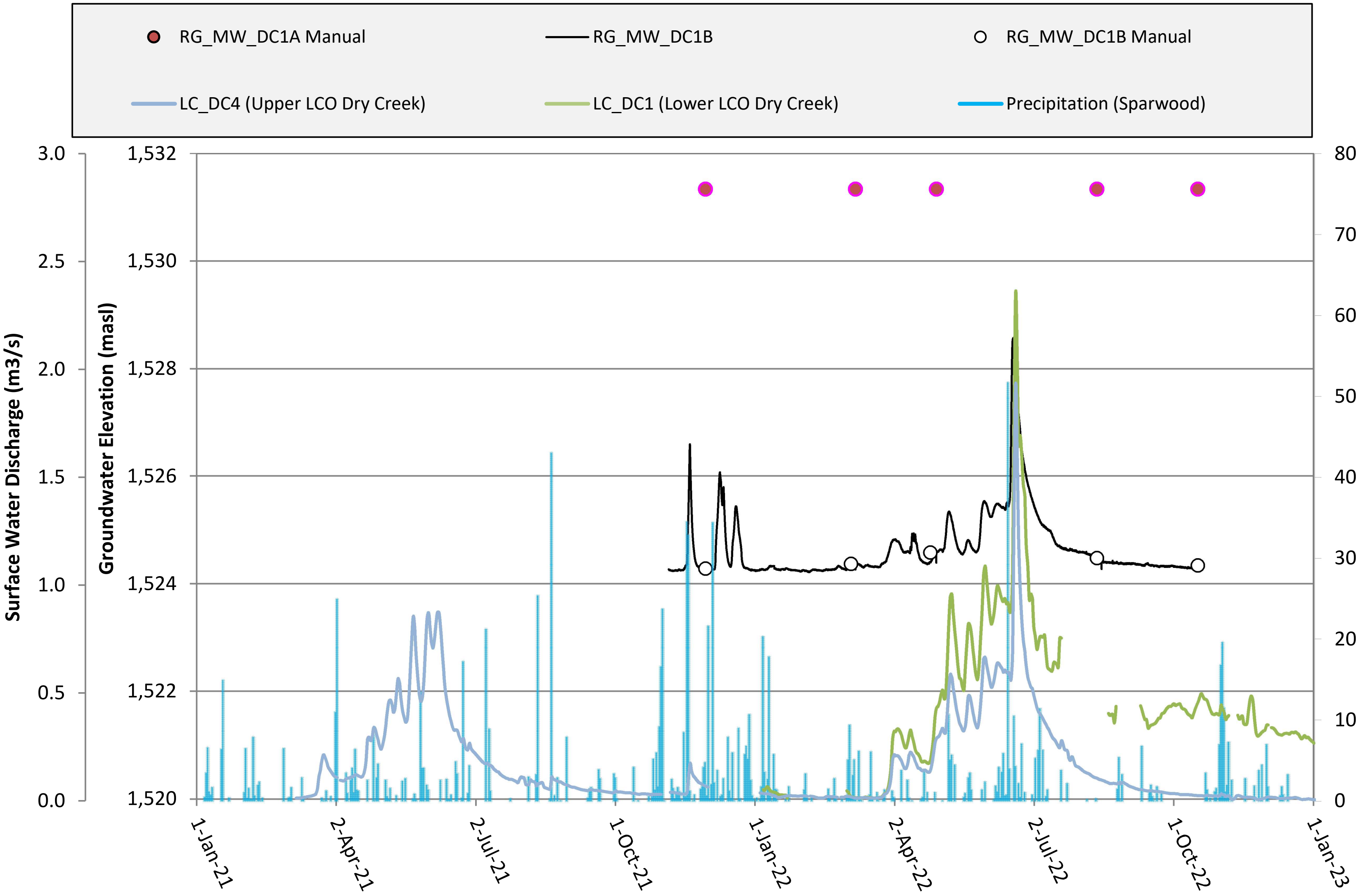
Figure LC-02: Phase II, Lower Dry Creek and Study Area 2 - Hydrograph



Notes: Pressure transducer data removed where data logger removal occured; Transducer installed in RB_MW_DC1A but not shown due to inaccurate data; Precipitation Environment Canada Sparwood 1157631; Continuous water level data compensated using barometric pressure from FR_STFMET (FRO WWT weather station) corrected for elevation; Discharge data is preliminary from continuous monitoring device. No discharge data for LC_FRDSDC. *Pink outline indicates flowing artesian conditions where the top of casing elevation is used and is not representative of the potentiometric surface.*

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635544 / 2023 03 09
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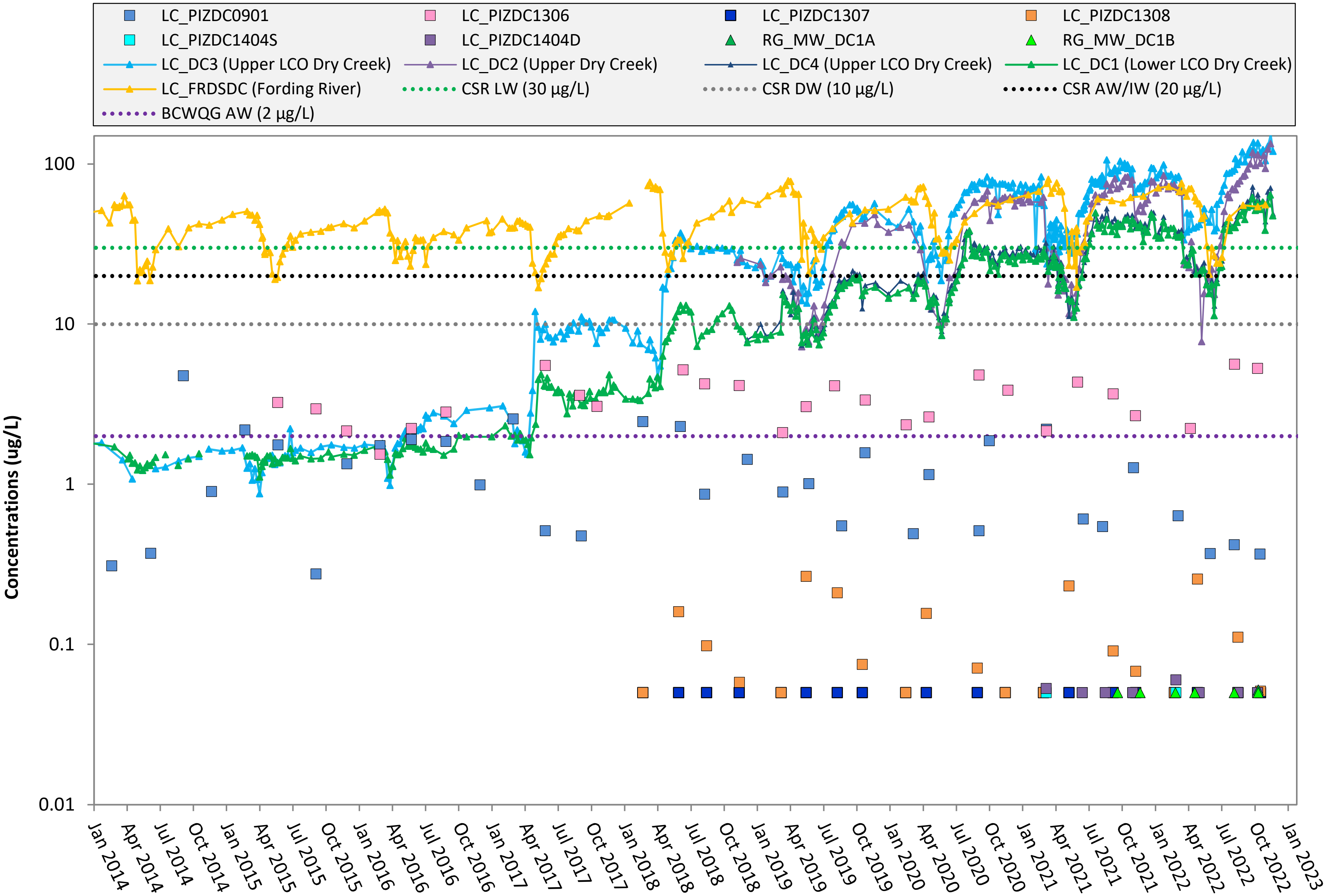
Figure LC-03: Phase II, Dry Creek and Study Area 2 - Dissolved Selenium



Note: For concentrations measured below the method detection limit, the method detection limit (0.005 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

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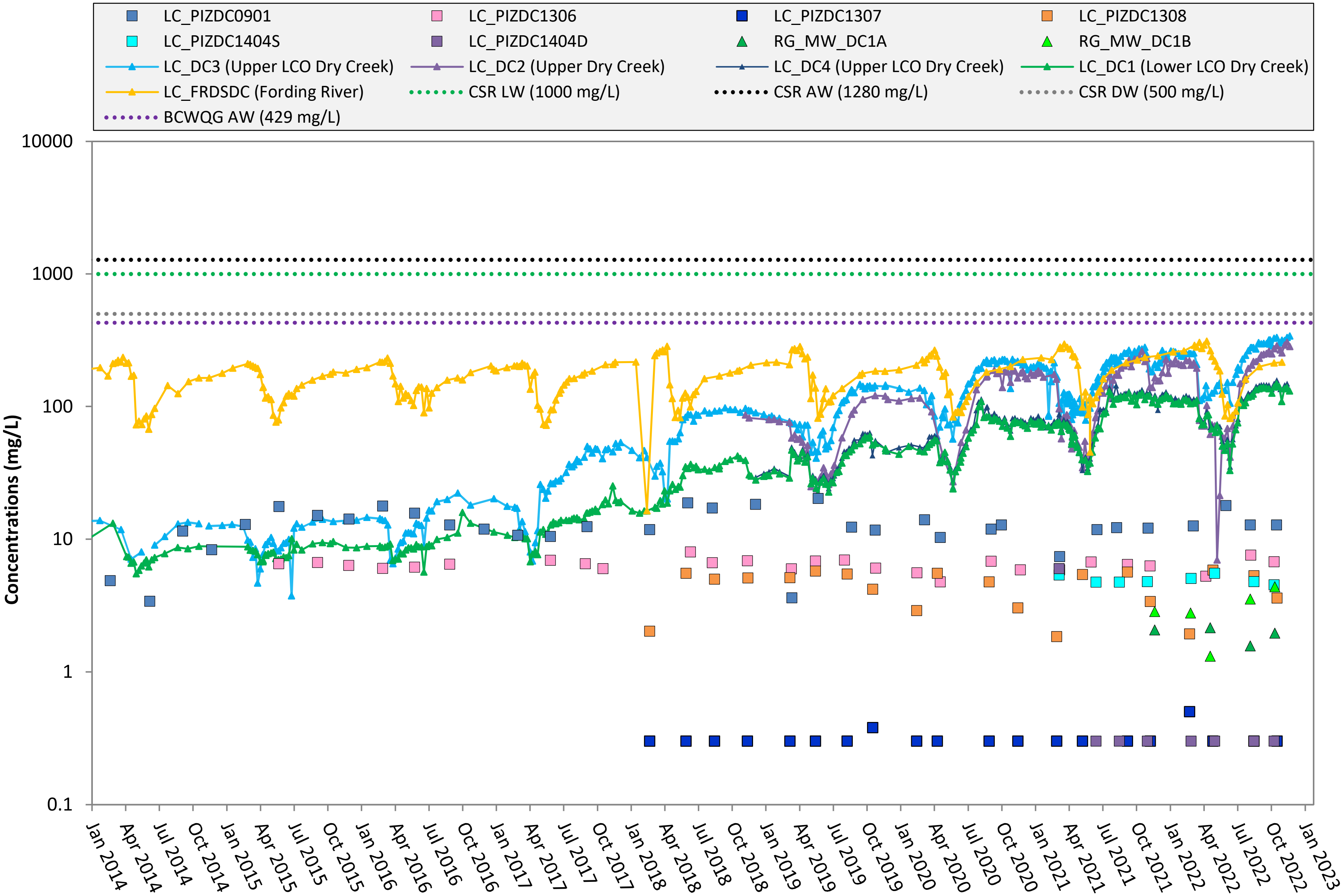
Figure LC-04: Phase II, Dry Creek and Study Area 2 - Sulphate



Note: For concentrations measured below the method detection limit, the method detection limit (0.005 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

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635544/ 2023 03 16
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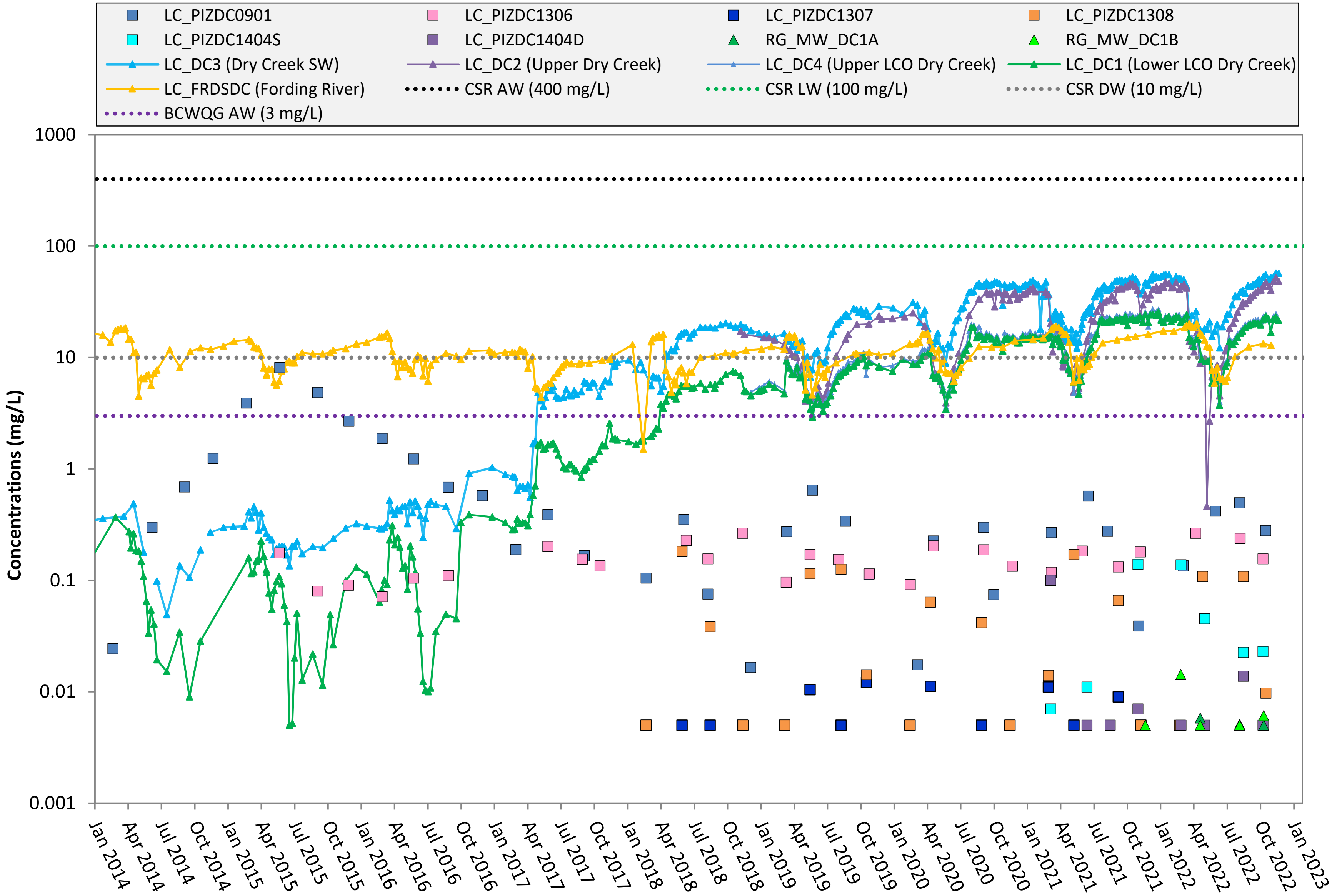
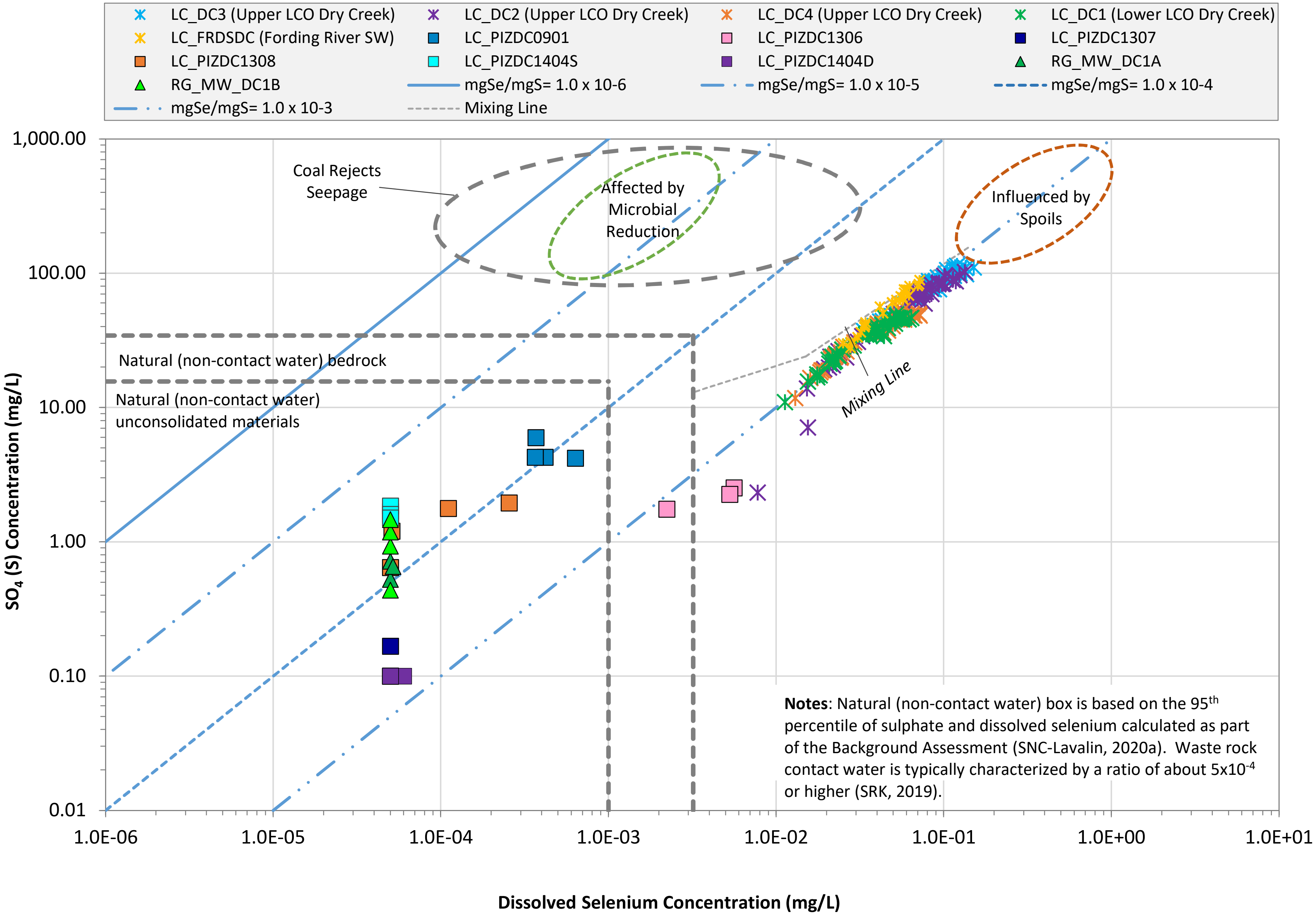
Figure LC-05: Phase II, Dry Creek and Study Area 2 - Nitrate-N



Note: For concentrations measured below the method detection limit, the method detection limit (0.005 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

Figure LC-06: Phase II, Dry Creek and Study Area 2 - Se:SO$_4$(S) Ratio Plot



Notes: Natural (non-contact water) box is based on the 95th percentile of sulphate and dissolved selenium calculated as part of the Background Assessment (SNC-Lavalin, 2020a). Waste rock contact water is typically characterized by a ratio of about 5x10^{-4} or higher (SRK, 2019).

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635544 / 2023 03 01

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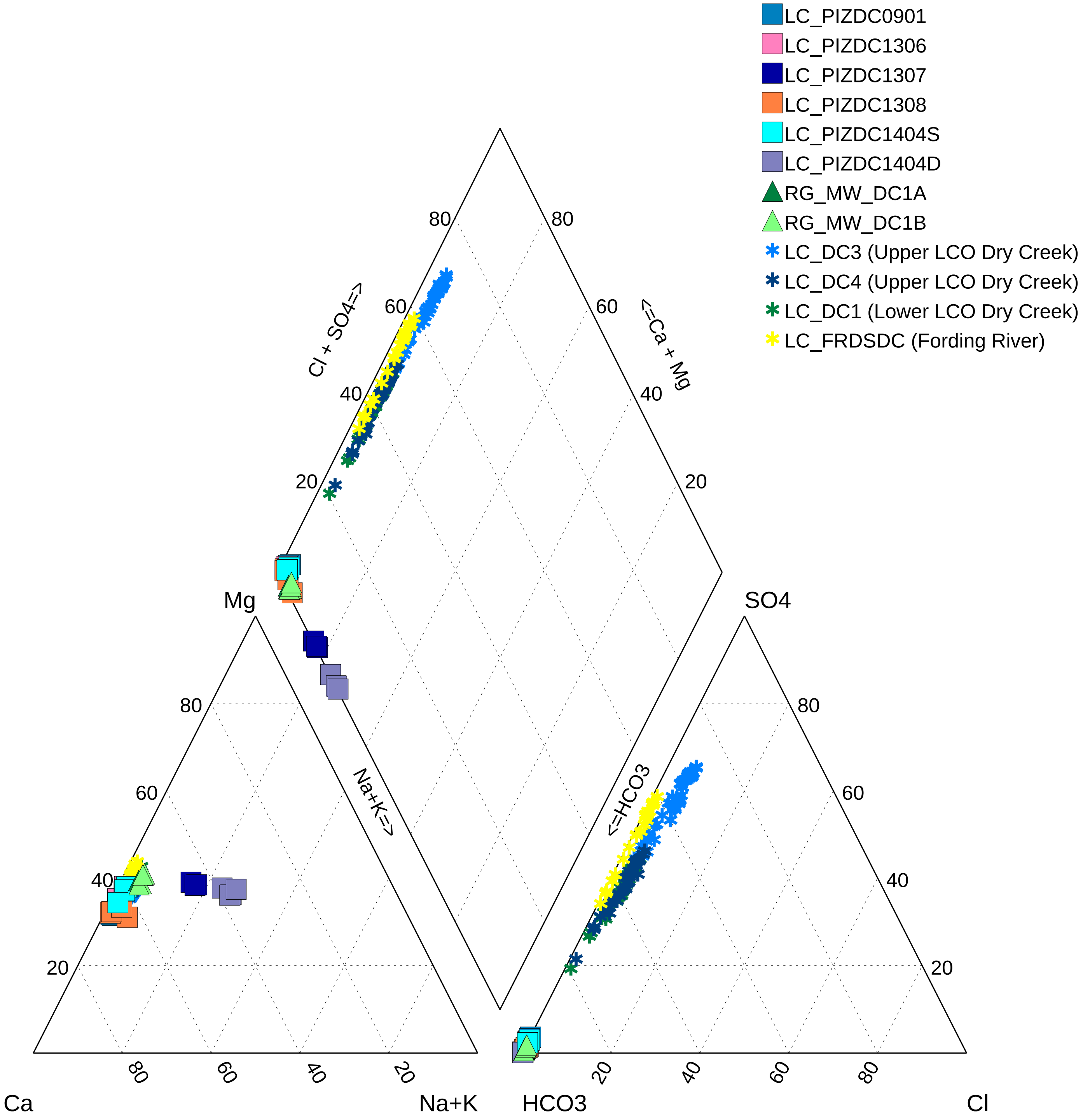

DESCRIPTION: Figure LC-07: LCO Phase II, Study Area 2 - Piper Plot

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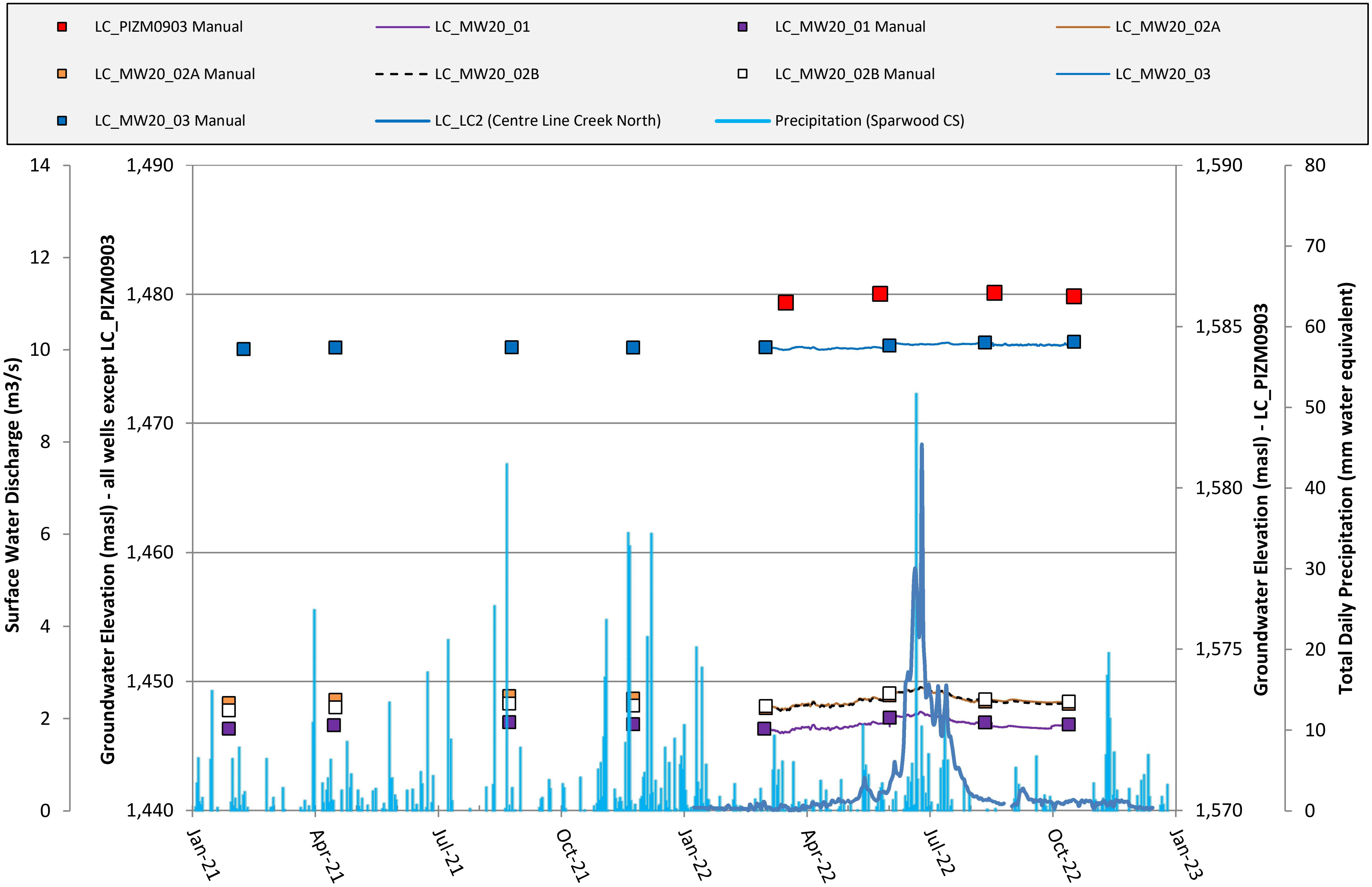
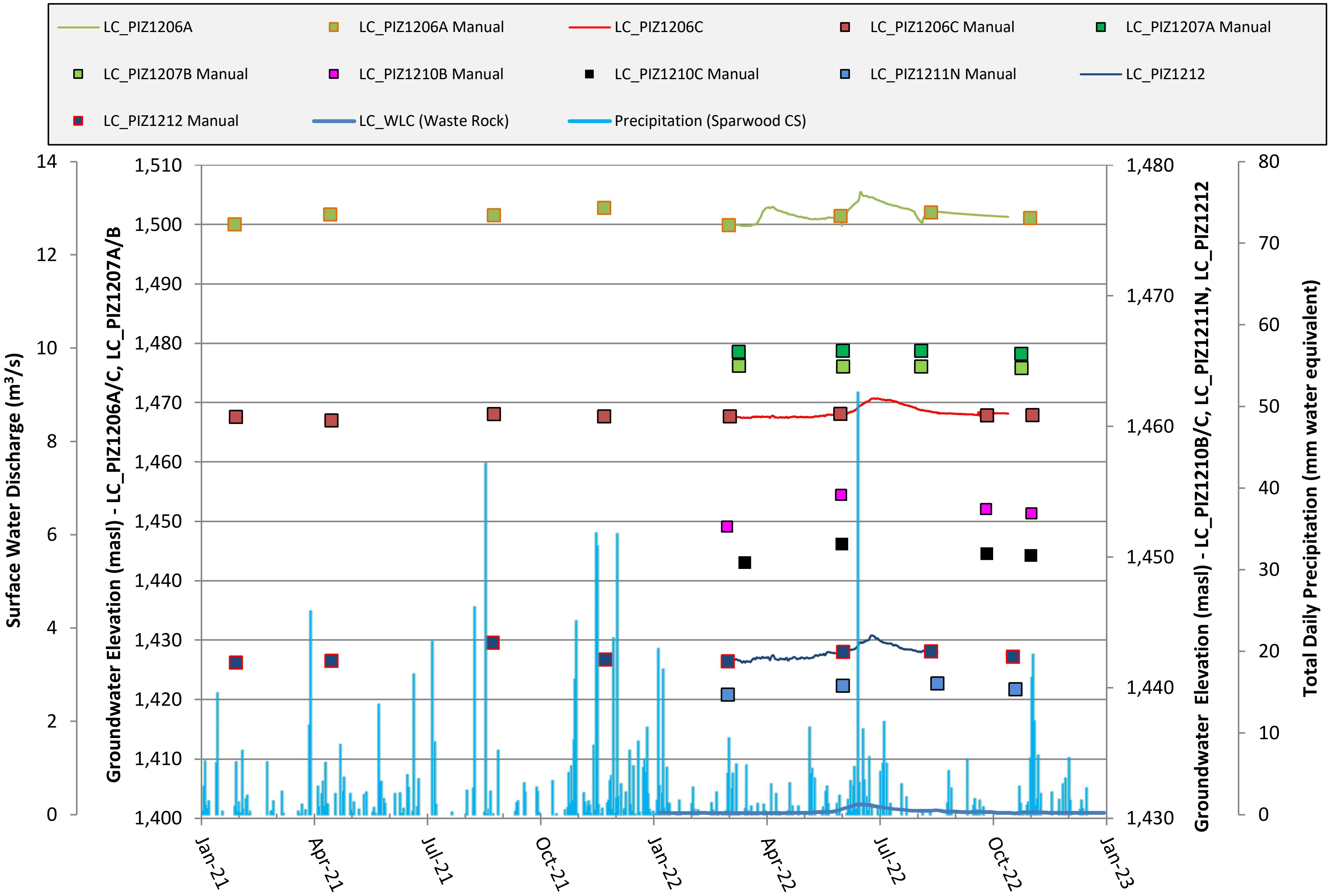
PROJECT: 2022 RGMP SSGMP Annual Report	PROJECT NO: 635544
CLIENT: Teck Coal Limited	DATE: 2023-02-23

Figure LC-08: Phase I, Centre Line Creek (North & South) - Hydrograph



Notes: Pressure transducer data removed where data logger removal occured; Precipitation Environment Canada Sparwood 1157631; Continuous water level data was compensated using barologger GH_MW_ERB Baro corrected for elevation; Preliminary discharge data from continuous monitoring device. No discharge data for LC_LCUSWLC.

Figure LC-09: Phase I, West Line Creek - Hydrograph



Notes: Pressure transducer data removed where data logger removal occured; Precipitation Environment Canada Sparwood 1157631; Continuous water level data was compensated using barologger GH_MW_ERB Baro corrected for elevation; Discharge data is preliminary from continuous monitoring device.

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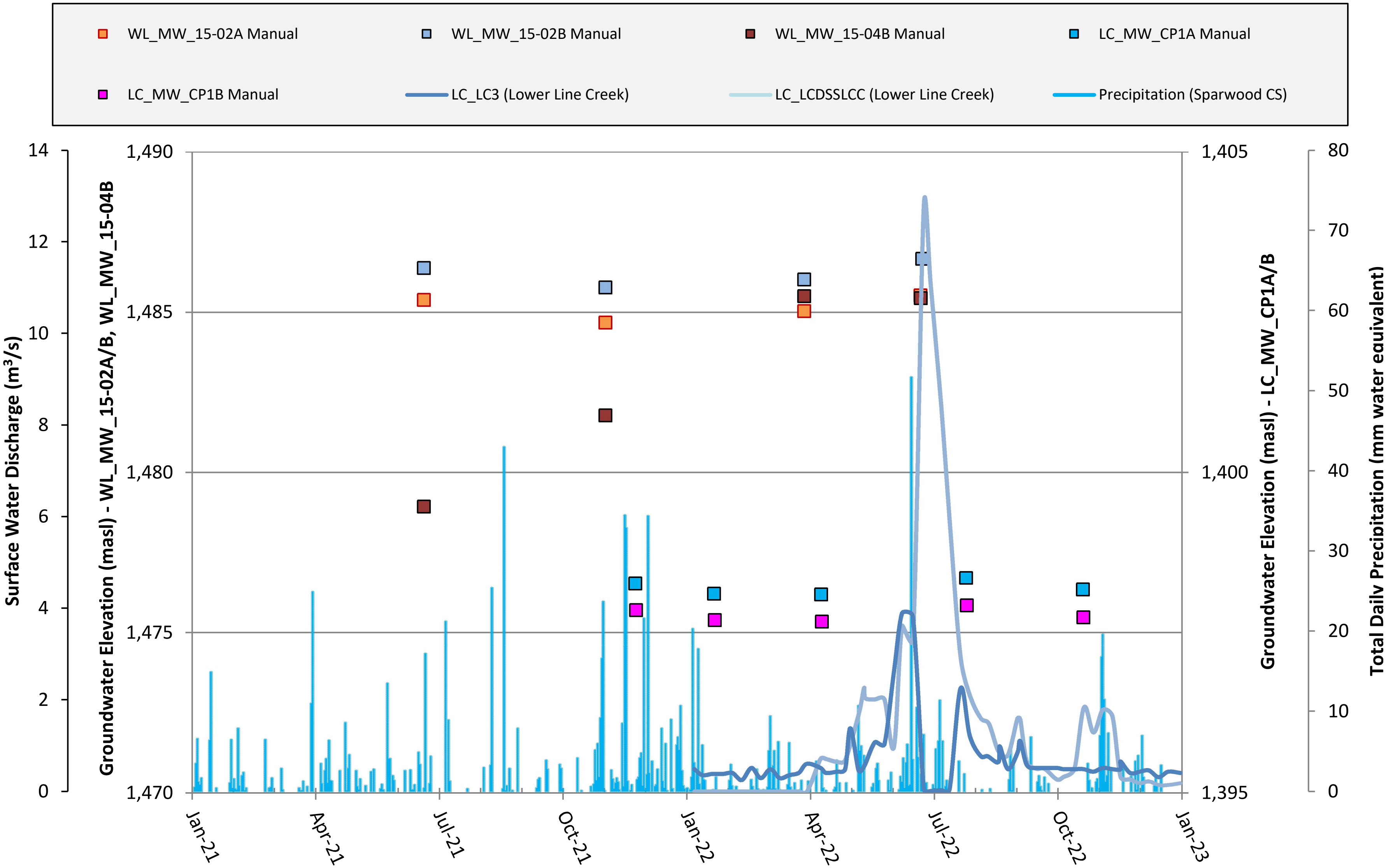
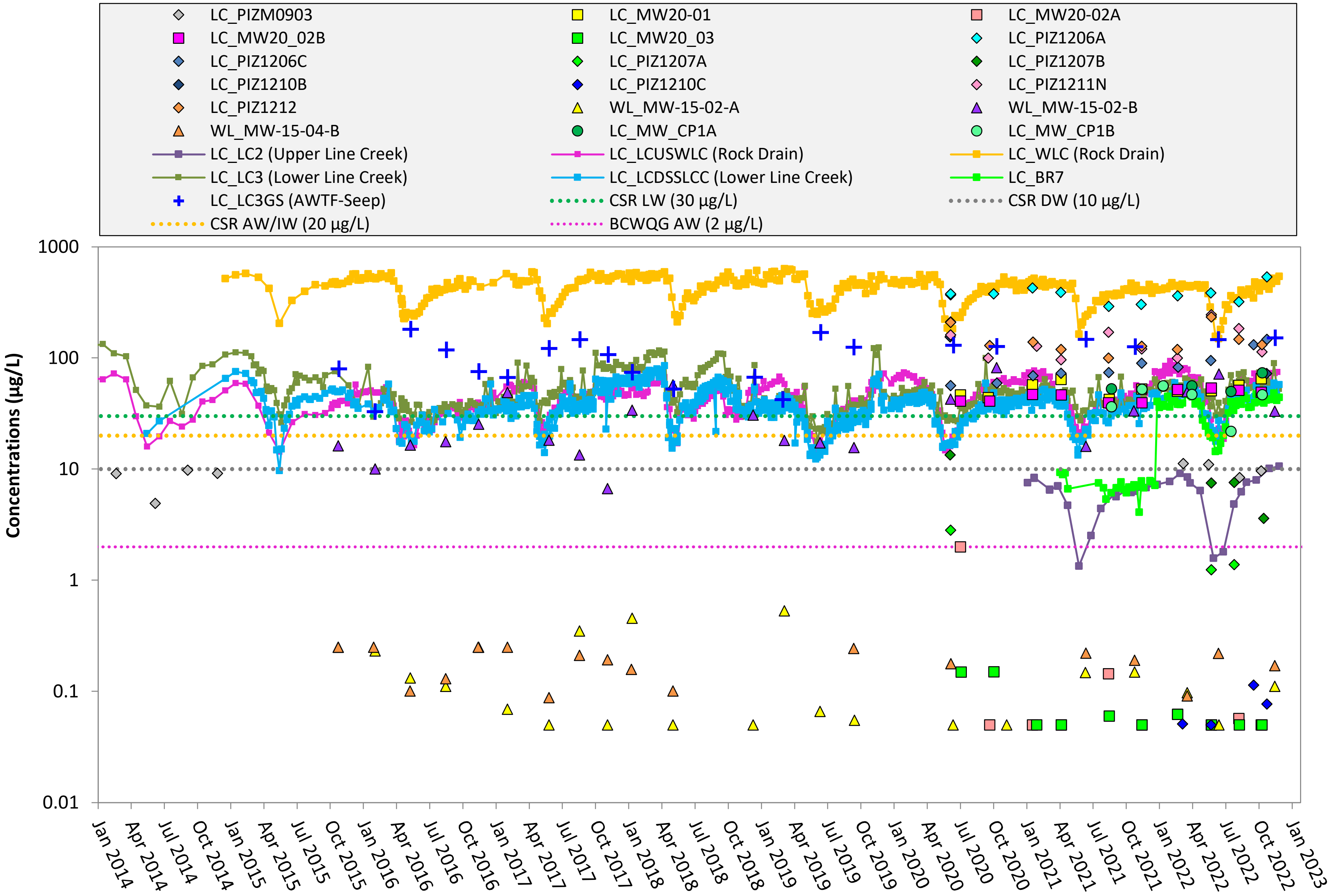
QAQC ZH 2023 02 24

Figure LC-10: Phase I, Lower Line Creek - Hydrograph



Notes: Pressure transducer data removed where data logger removal occured; Precipitation Environment Canada Sparwood 1157631; Continuous water level data was compensated using barologger GH_MW_ERB Baro corrected for elevation; Preliminary surface water discharge data from continuous monitoring device. No discharge data for LC_BR7.

Figure LC-11: Phase I - Dissolved Selenium



Note: For concentrations measured below the method detection limit, the method detection limit (0.05 µg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

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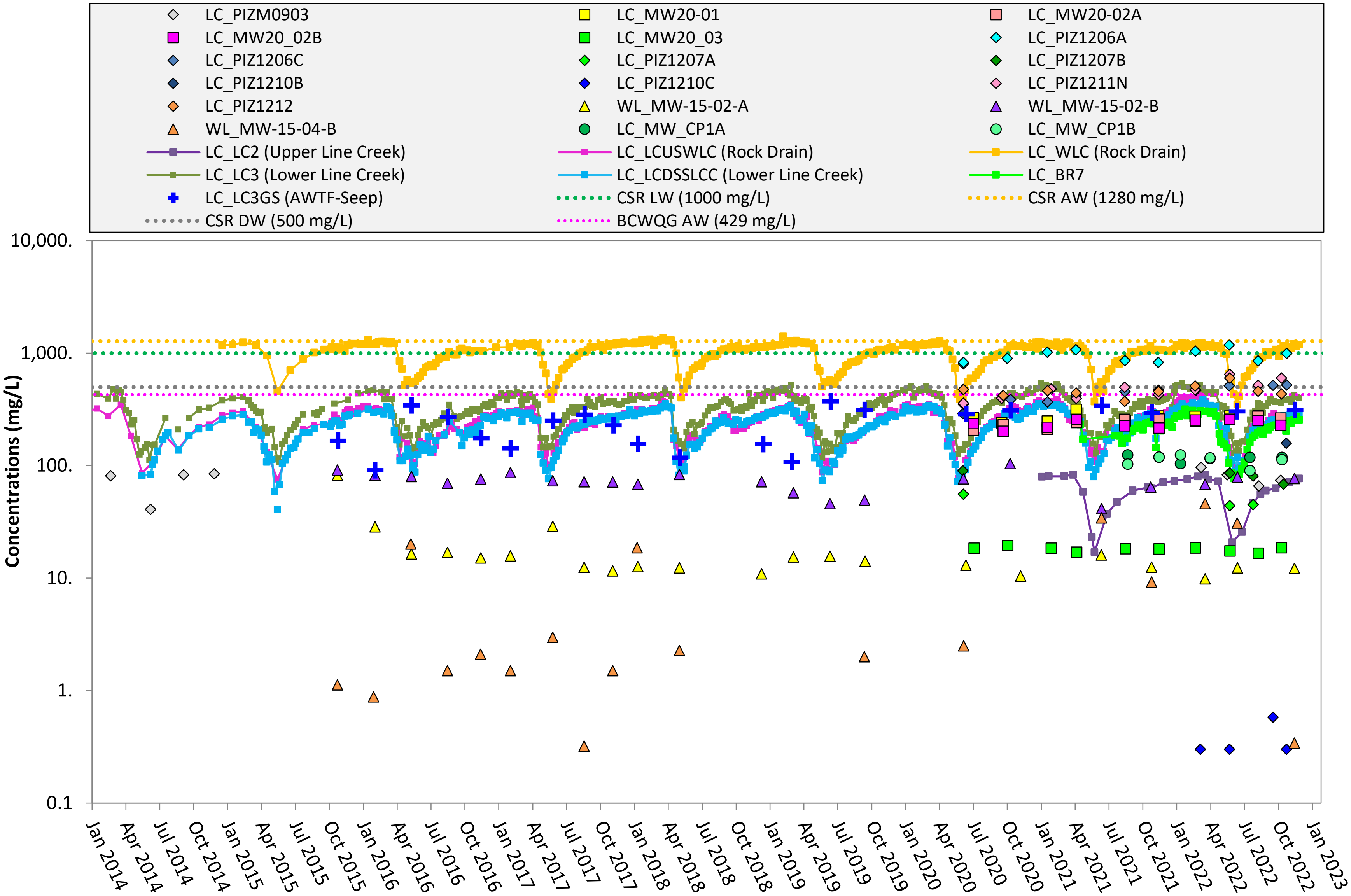
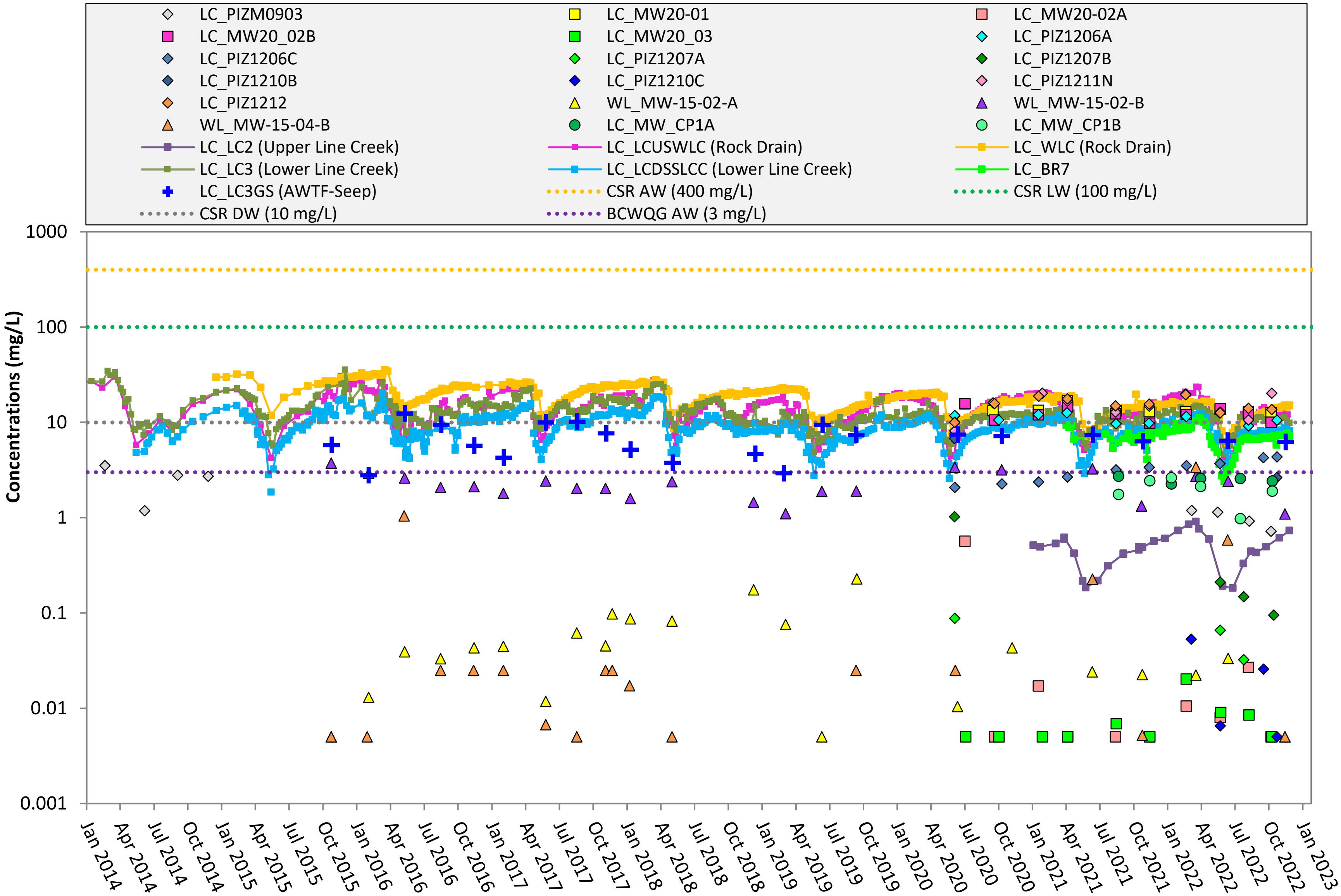
635544/ 2023 03 16
QAQC ZH 2023 03 16

Figure LC-12: Phase I - Sulphate



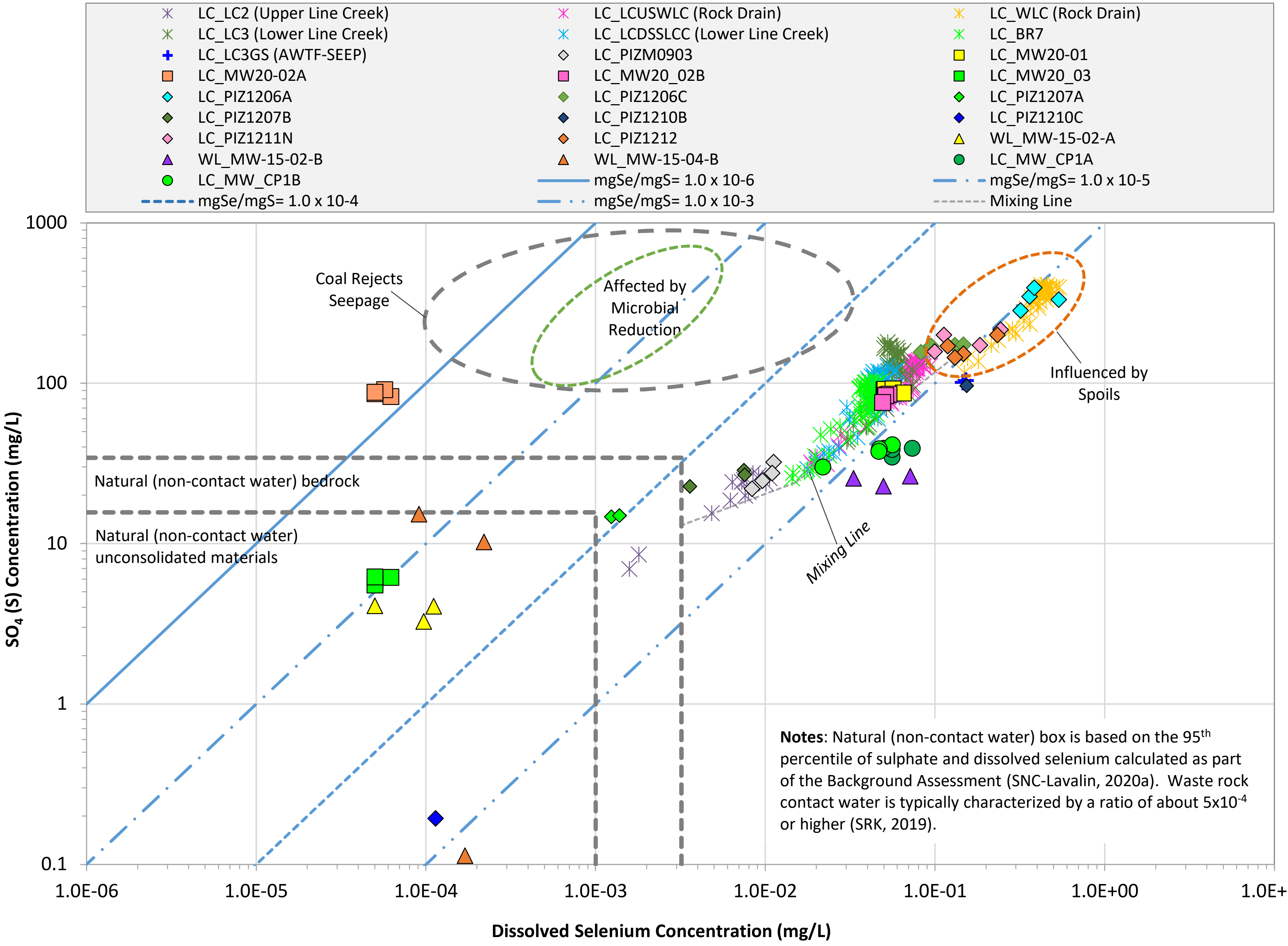
Note: For concentrations measured below the method detection limit, the method detection limit (0.3 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

Figure LC-13: Phase I - Nitrate-N

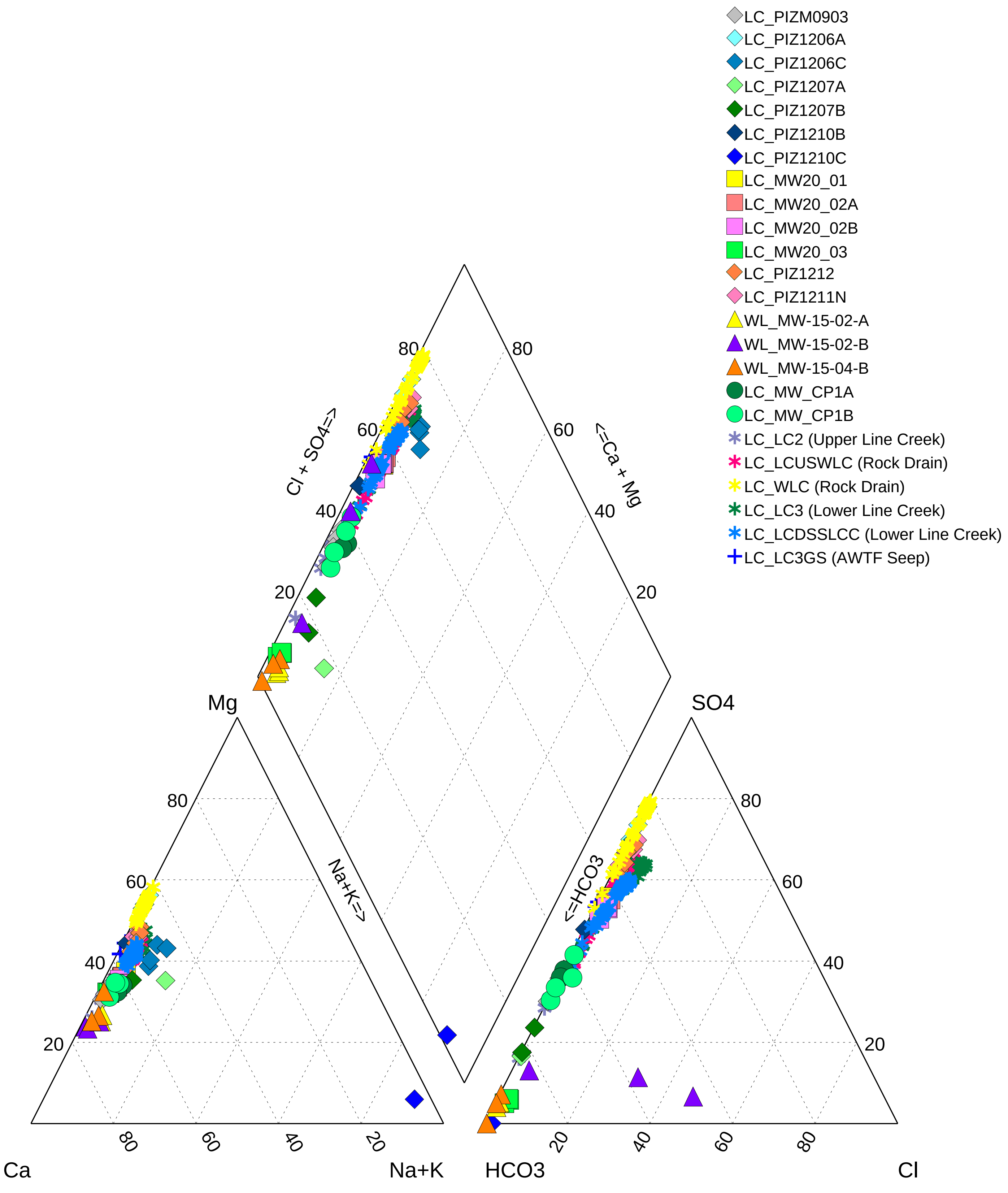


Note: For concentrations measured below the method detection limit, the method detection limit (0.005 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

Figure LC-14: Phase I - Se:SO_4 (S) Ratio Plot



Notes: Natural (non-contact water) box is based on the 95th percentile of sulphate and dissolved selenium calculated as part of the Background Assessment (SNC-Lavalin, 2020a). Waste rock contact water is typically characterized by a ratio of about $5x10^{-4}$ or higher (SRK, 2019).



DESCRIPTION: Figure LC-15: LCO Phase I - Piper Plot		
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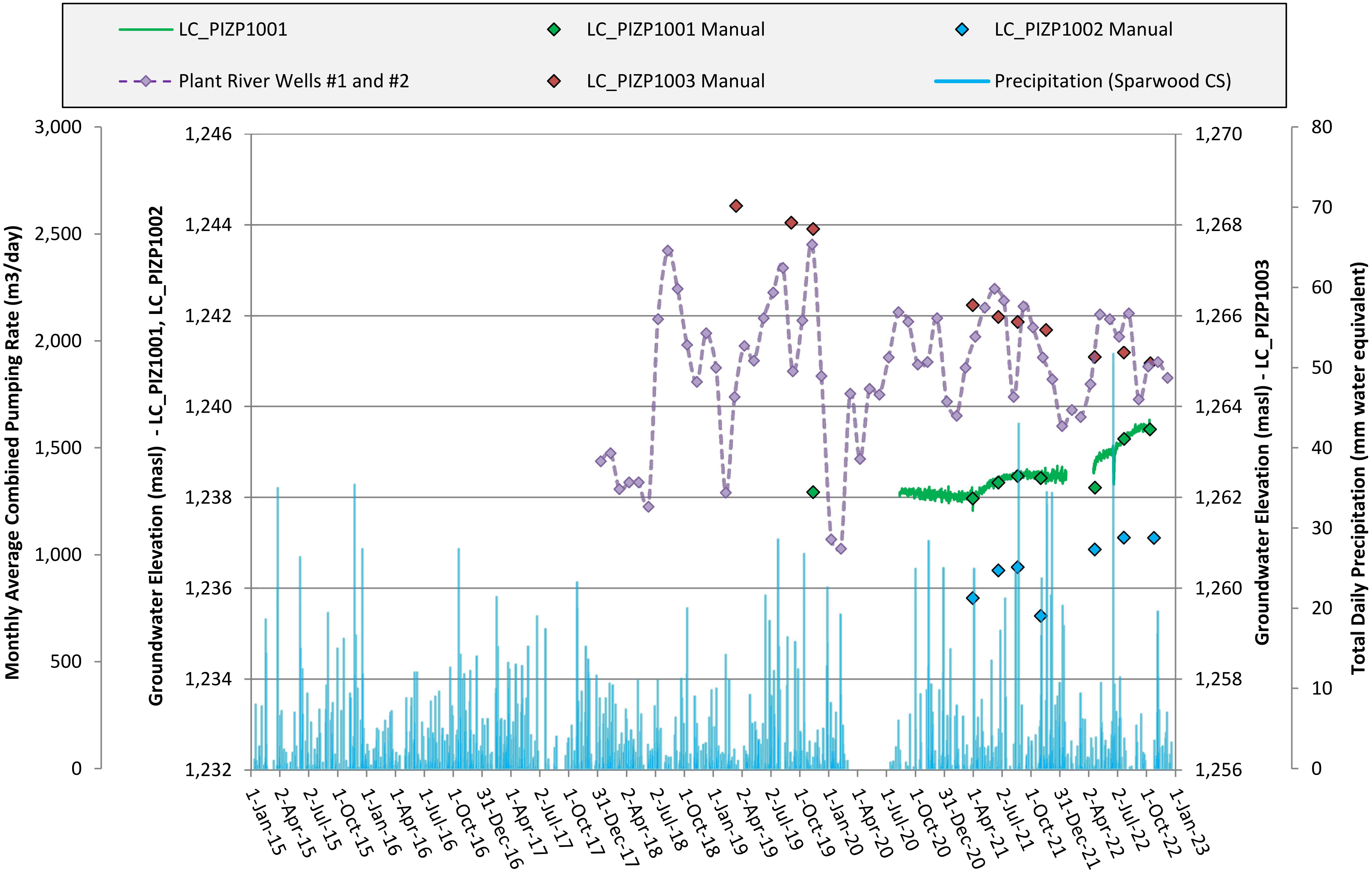
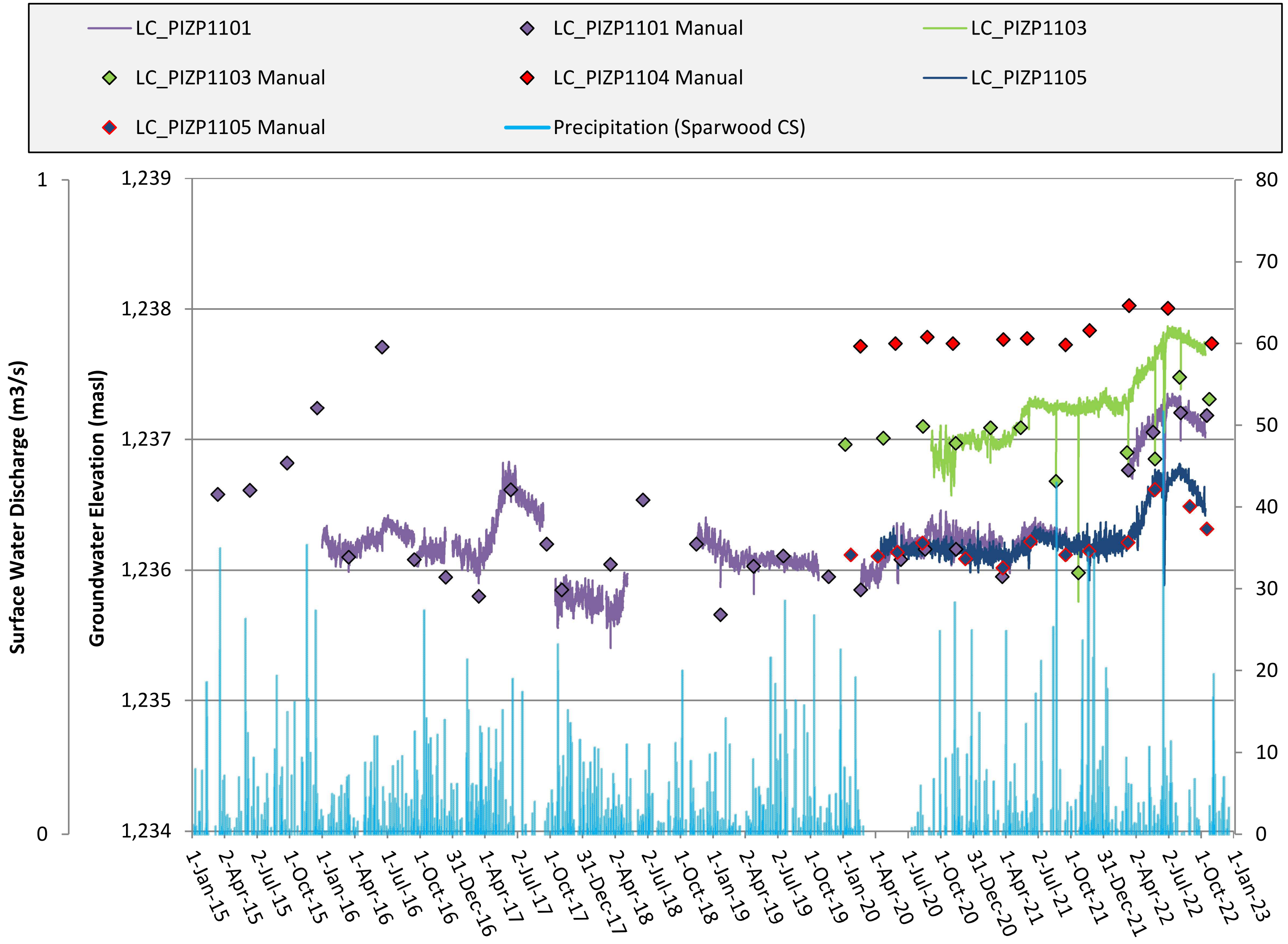
	CLIENT: Teck Coal Limited	DATE: 2023-02-24

Figure LC-16: Process Plant - Hydrograph and Pumping Rates



Notes: Pressure transducer data removed where data logger removal occured; Precipitation Jan. 2015 - Feb. 2020 Environment Canada Sparwood 1157630. Precipitation missing Feb. to July 2020; Precipitation July 2020 - Dec. 2022 Environment Canada Sparwood 1157631; Continuous water level data was compensated using barologger GH_MW_ERB Baro. Groundwater elevations for LC_PIZP1003 are suspect because of large diameter tubing that may be intereferring with water level measurements. Discharge data for LC_LC4 was not available.

Figure LC-17: Process Plant - Hydrograph



Notes: Pressure transducer data removed where data logger removal occured. Groundwater elevations for LC_PIZP1101 are approximate as this well has been recently repaired and needs to be re-surveyed. Precipitation Jan. 2015 - Feb. 2020 Environment Canada Sparwood 1157630. Precipitation missing Feb. to July 2020. Precipitation July 2020 - Dec. 2022 Environment Canada Sparwood 1157631. Continuous water level data was compensated using barologger GH_MW_ERB Baro. Discharge data for LC_LC4 was not available.

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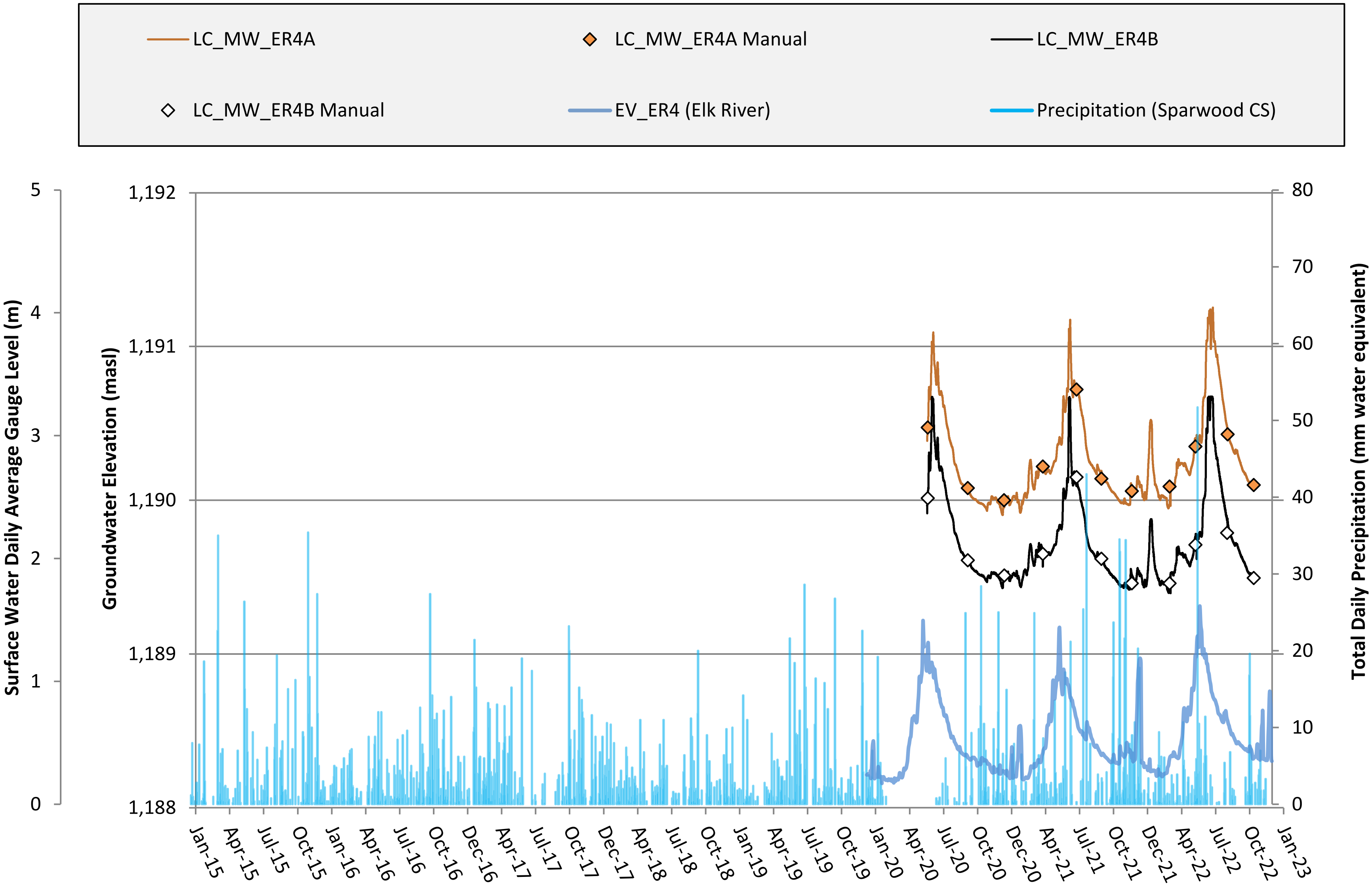
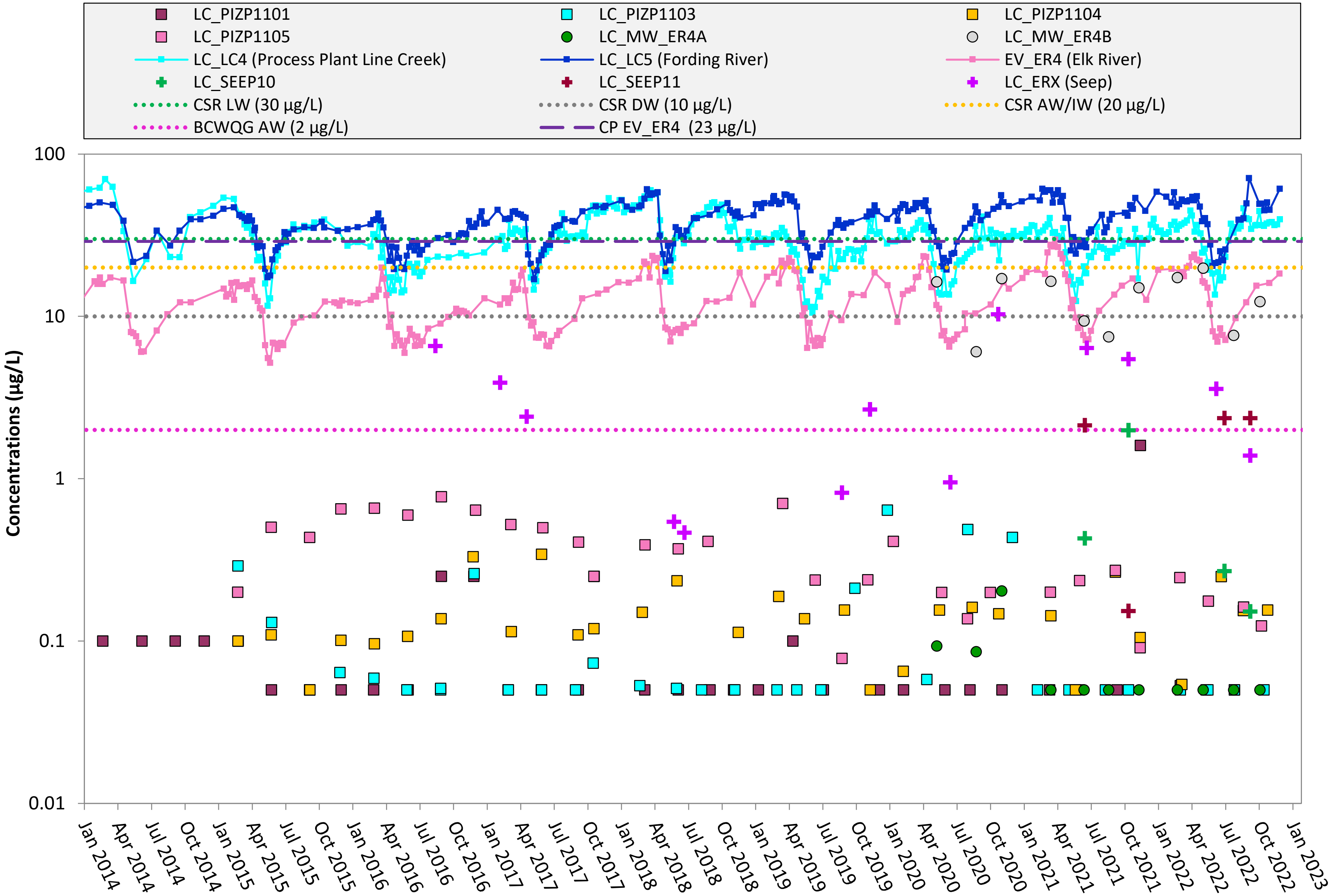
635544 / 2023 03 16
QAQC ZH 2023 03 16

Figure LC-18: Study Area 5 and 6 - Hydrograph



Notes: Pressure transducer data removed where data logger removal occured; Continuous water level data was compensated using barologger GH_MW_ERB Baro; Discharge data for LC_LC5 and EV_ER4 was not available.

Figure LC-19: Process Plant, Study Area 5 and Study Area 6 - Dissolved Selenium



Note: For concentrations measured below the method detection limit, the method detection limit (0.05 µg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

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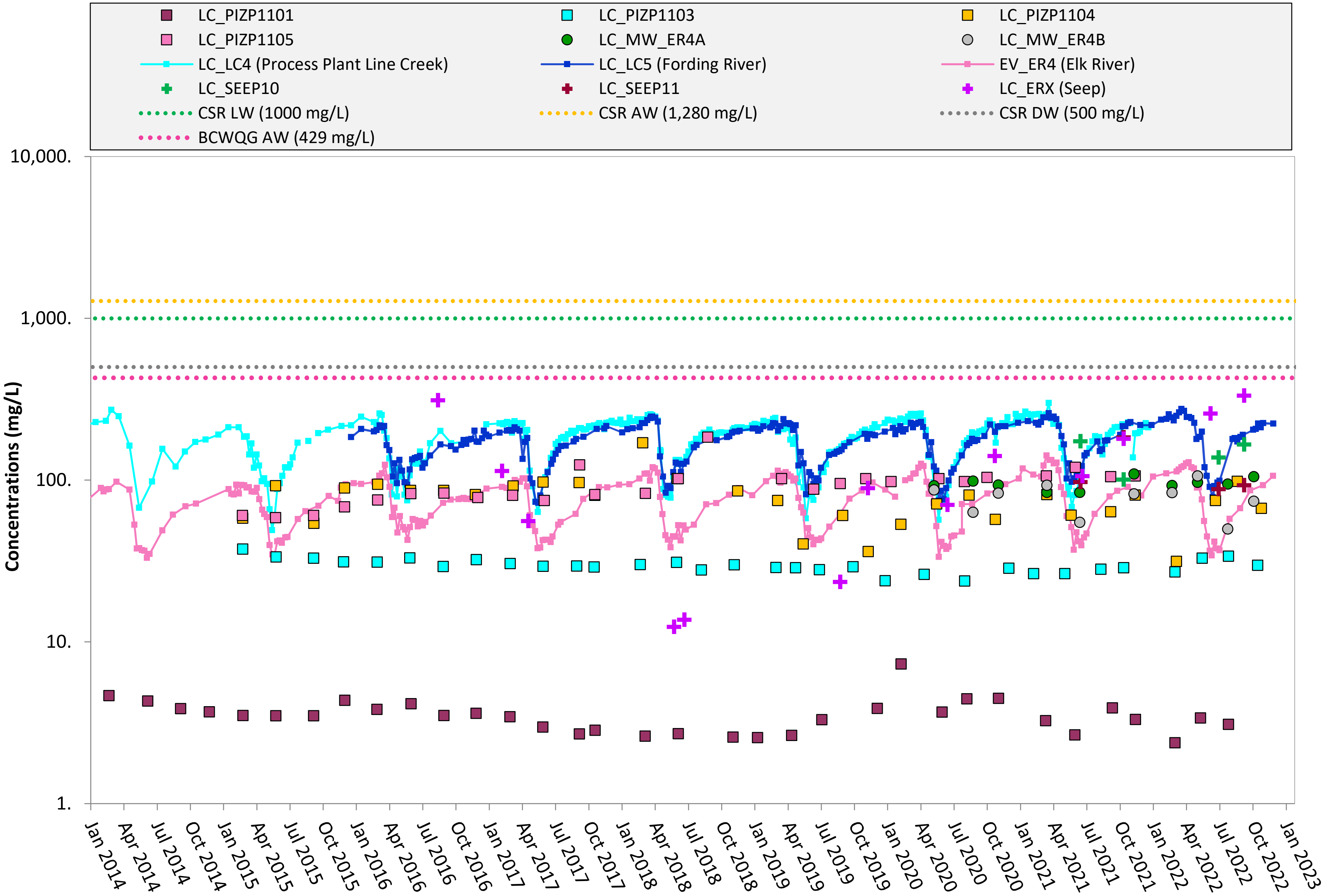
635544/ 2023 03 16
QAQC ZH 2023 03 16

Figure LC-20: Process Plant, Study Area 5, and Study Area 6 - Sulphate



Note: For concentrations measured below the method detection limit, the method detection limit (0.3 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

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635544/ 2023 03 16
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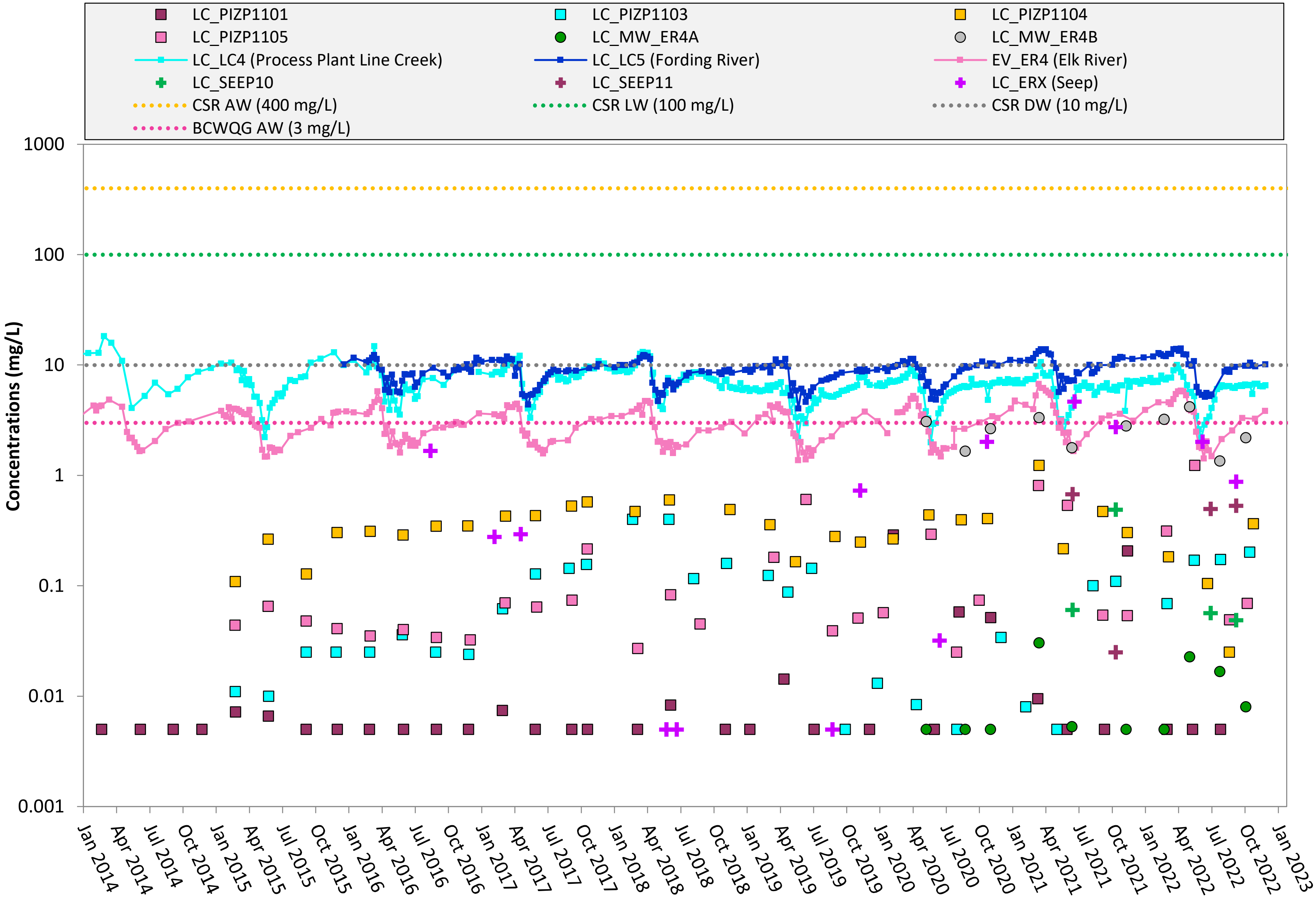
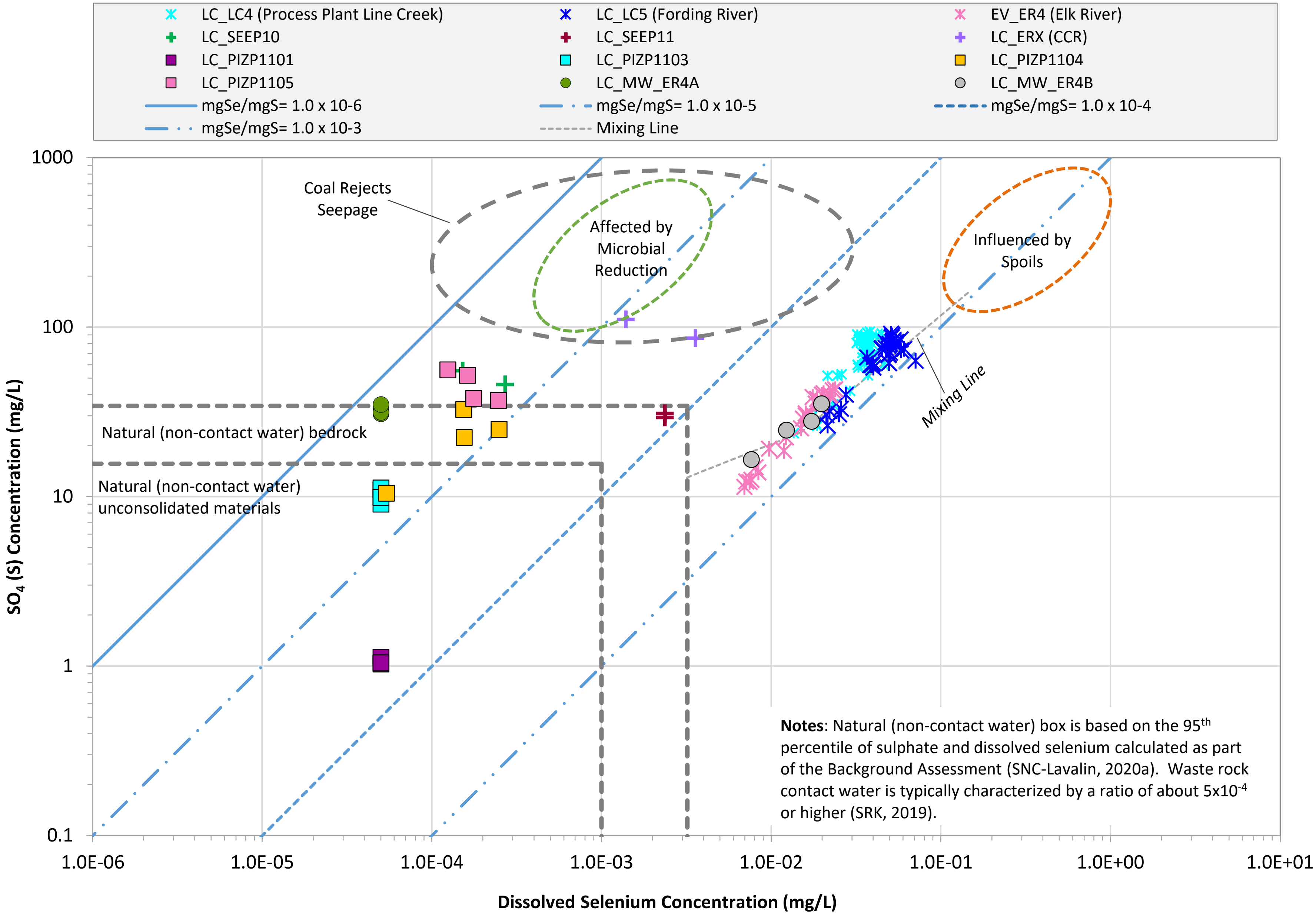
Figure LC-21: Process Plant, Study Area 5, and Study Area 6 - Nitrate-N

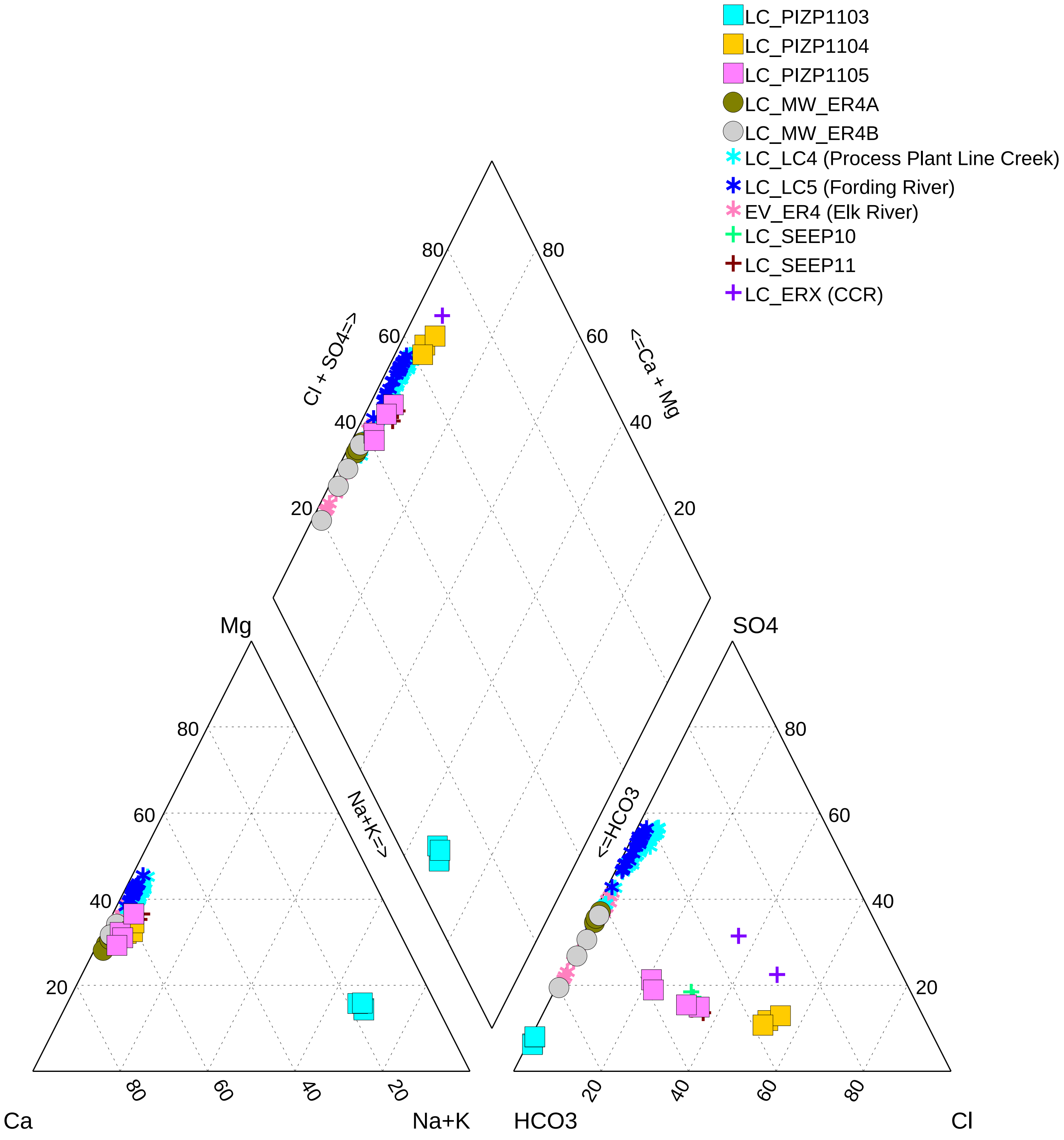


Note: For concentrations measured below the method detection limit, the method detection limit (0.005 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

Figure LC-22: Process Plant, Study Area 5 and Study Area 6 - Se:SO$_4$ (S) Ratio Plot



Notes: Natural (non-contact water) box is based on the 95th percentile of sulphate and dissolved selenium calculated as part of the Background Assessment (SNC-Lavalin, 2020a). Waste rock contact water is typically characterized by a ratio of about 5x10^{-4} or higher (SRK, 2019).



DESCRIPTION: Figure LC-23: Process Plant, Study Area 5 and Study Area 6 - Piper Plot		
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	CLIENT: Teck Coal Limited	DATE: 2023-02-23

Tables

TABLE LC-01: Summary of Well Installation Details and Hydrogeological Information (LCO)

Area	Well ID	Monitoring Program[a]	Well Type	Monitoring Type[d]	Sampling Frequency		Logs (Y/N)	Coordinates (UTM NAD 83)		Ground Elevation	TOC Elevation	Stick Up Height	Drilled Depth	Well Diameter	Top of Screen Depth	Bottom of Screen Depth	Screened Formation	Depth to Bedrock	Hydraulic Conductivity
					Approved[e]	Recommended[g]		Easting	Northing	masl	masl	m	mbgs	mm	mbgs	mbgs		mbgs	m/s
LCO Phase II Upper Dry Creek	LC_PIZDC0901[f]	GWMP, SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	658046	5541494	1674.84	1675.78	0.94	9.4	50	3.3	9.4	Till and Clay	-	2.0E-07
	LC_PIZDC1306[f]	GWMP, SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4 Water levels only	Y	658278	5541056	1707.58	1708.58	1.00	16.8	50	14.6	16.6	Sandy Gravel	-	3.0E-05
	LC_PIZDC1307[b,f]	GWMP, SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q2, Q3	Y	658169	5541230	1690.85	1691.77	0.92	35.1	49	32.8	34.8	Silt	-	1.0E-07
	LC_PIZDC1308[b,f]	GWMP, SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q2, Q3	Y	658168	5541232	1690.85	1691.68	0.83	19.8	49	6.1	9.1	Gravel and Silt	-	7.0E-07
	LC_PIZDC1404S[f]	GWMP, SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	658192	5541069	1705.81	1706.99	1.17	12.8	-	9.5	12.6	Clayey Silt and Gravel	-	5.0E-08
	LC_PIZDC1404D[f]	GWMP, SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	658195	5541064	1705.55	1707.21	1.66	35.4	-	32.3	35.3	Sandy Gravel	-	4.0E-08
LCO Phase II Lower Dry Creek (Study Area 2)	RG_MW_DC1A[b]	GWMP, SSGMP, RGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	656510	5544637	1530.32	1531.34	1.02	21.3	50	19.5	21.0	Sand and Gravel, Gravelly Silt	-	-
	RG_MW_DC1B[b]	GWMP, SSGMP, RGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	656510	5544636	1530.27	1531.27	1.00	7.5	50	5.5	7.0	Sand and Gravel	-	7.5E-05
LCO Phase I Centre Line Creek (North)	LC_PIZM0903[c,f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	661411	5536288	1579.20	1580.01	0.81	6.2	50	1.7	6.2	Gravel	-	-
LCO Phase I Centre Line Creek (South)	LC_MW20_01[c,f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	660104	5532280	1452.01	1452.84	0.83	25.9	51	17.6	20.6	Silty Sandy Gravel	24.4	>1.0E-04[h]
	LC_MW20_02A[c,f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	660266	5532230	1451.90	1452.74	0.84	23.2	51	17.0	18.5	Gravel	19.2	1.0E-04
	LC_MW20_02B[c,f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	660262	5532226	1451.73	1452.53	0.80	14.9	51	11.1	14.1	Gravel	-	>1.0E-04[h]
	LC_MW20_03[c,f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	660483	5532203	1510.66	1511.45	0.79	44.2	51	36.0	39.0	Sand	44.2	1.0E-05
LCO Phase I West Line Creek	LC_PIZ1206A[c,f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	659677	5532418	1510.07	1511.01	0.94	44.2	51	10.7	13.7	Sand	-	1.0E-04
	LC_PIZ1206C[c,f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	659679	5532410	1510.15	1511.14	0.98	76.2	51	72.7	75.7	Bedrock - siltstone	48.2	2.0E-08

Notes:

a: SSGMP denotes LCO Site-Specific Groundwater Monitoring Program; RGMP denotes Regional Groundwater Monitoring Program; GWMP denotes Groundwater Monitoring Program Phase II LCO.
b: Monitoring well installed in 2021 to support the RGMP and/or SSGMP.
c: Monitoring well added to the SSGMP Program as per the 2021 SSGMP Update.
d: WL = Water Level. S = Sample.
e: 2018 SSGMP Update Report (approved BC ENV March 2020).
f: Location resurveyed in 2022.
g: 2019, 2020, 2021, and 2022 (2022 recommendations provided in brackets) SSGMP Annual Reports; 2021 SSGMP Update Report.
h: Near instantaneous recovery, hydraulic conductivity results considered a lower-bound value. Actual values may be greater.
WL_MW-15-02-A and B previously known as AWTF-MW-15-02-A and -B. WL_MW-15-04-B previously known as AWTF-MW-15-04-B.
Hydraulic conductivity testing at these wells considered to be preliminary/draft.
masl denotes metres above sea level.
mbgs denotes metres below ground surface.
TOC denotes top of pipe casing.
"-" denotes data not available.

TABLE LC-01: Summary of Well Installation Details and Hydrogeological Information (LCO)

Area	Well ID	Monitoring Program[a]	Well Type	Monitoring Type	Sampling Frequency		Logs (Y/N)	Coordinates (UTM NAD 83)		Ground Elevation	TOC Elevation	Stick Up Height	Drilled Depth	Well Diameter	Top of Screen Depth	Bottom of Screen Depth	Screened Formation	Depth to Bedrock	Hydraulic Conductivity
					Approved[e]	Recommended[g]		Easting	Northing	masl	masl	m	mbgs	mm	mbgs	mbgs		mbgs	m/s
LCO Phase I West Line Creek	LC_PIZ1207A[c,f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	659855	5532380	1489.45	1490.48	1.03	12.8	51	10.3	11.3	Bedrock	9.2	-
	LC_PIZ1207B[c,f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	659863	5532375	1489.03	1490.18	1.15	16.8	51	11.4	14.4	Bedrock - siltstone	10.1	-
	LC_PIZ1210B[c,f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	659817	5532283	1498.58	1499.39	0.81	56.4	51	44.2	47.2	Gravel	53.3	3.0E-04
	LC_PIZ1210C[c,f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	659825	5532277	1497.89	1498.62	0.74	65.8	51	60.7	63.7	Bedrock	54.7	8.0E-08
	LC_PIZ1211N[c,f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	659965	5532041	1442.76	1443.65	0.89	7.6	51	3.7	6.7	Gravel	-	1.0E-04
	LC_PIZ1212[c,f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	660004	5532172	1447.91	1448.59	0.69	32.0	51	21.1	24.1	Gravel	28.0	1.0E-06
LCO Phase I Lower Line Creek to LC_LC4	WL_MW-15-02-A[c,f]	SSGMP	Monitoring	WL, S	-	Q2, Q3 (quarterly recommended in 2022)	Y	659624	5531823	1494.05	1494.96	0.91	12.3	51	10.7	12.2	Silty Clay	-	-
	WL_MW-15-02-B[c,f]	SSGMP	Monitoring	WL, S	-	Q2, Q3 (quarterly recommended in 2022)	Y	659624	5531823	1494.05	1494.92	0.87	12.3	51	7.5	9.0	Silty Sand	-	5.0E-06
	WL_MW-15-04-B[c,f]	SSGMP	Monitoring	WL, S	-	Q2, Q3 (quarterly recommended in 2022)	Y	659651	5531802	1488.45	1489.35	0.90	10.5	51	5.1	6.8	Silty Clay	-	9.0E-06
	LC_MW_CP1A[b,c,f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	659278	5530776	1403.09	1403.77	0.67	23.2	51	19.5	21.0	Bedrock - shale	13.1	3.3E-05
	LC_MW_CP1B[b,c,f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	659277	5530775	1403.09	1403.83	0.74	11.1	51	9.1	10.7	Sand and Gravel	-	1.9E-04
Process Plant	LC_PIZP1001[f]	SSGMP	Monitoring	WL	Q1, Q2, Q3, Q4	Q2, Q3	Y	654579	5528153	1287.10	1287.92	0.82	56.4	-	53.4	56.4	Coarse Sand	-	-
	LC_PIZP1002	SSGMP	Monitoring	WL	Q1, Q2, Q3, Q4	Q2, Q3	Y	654191	5527889	1272.13	1273.13	1.00	43.6	-	41.0	43.5	Coarse Sand and Gravel	-	-
	LC_PIZP1003	SSGMP	Monitoring	WL	Q1, Q2, Q3, Q4	Q2, Q3 (decommissioning recommended in 2022)	Y	654546	5528194	1283.39	1284.39	1.00	57.8	-	52.8	57.8	Sand and Gravel	-	-
	LC_PIZP1101[i]	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q2, Q3	Y	653960	5528263	1266.06	1267.06	1.00	41.2	-	38.2	41.2	Sand and Gravel	-	7.4E-04

Notes:

a: SSGMP denotes LCO Site-Specific Groundwater Monitoring Program; RGMP denotes Regional Groundwater Monitoring Program; GWMP denotes Groundwater Monitoring Program Phase II LCO.
b: Monitoring well installed in 2021 to support the RGMP and/or SSGMP.
c: Monitoring well added to the SSGMP Program as per the 2021 SSGMP Update.
d: WL = Water Level. S = Sample.
e: 2018 SSGMP Update Report (approved BC ENV March 2020).
f: Location resurveyed in 2022.
g: 2019, 2020, 2021, and 2022 (2022 recommendations provided in brackets) SSGMP Annual Reports; 2021 SSGMP Update Report.
h: Near instantaneous recovery, hydraulic conductivity results considered a lower-bound value. Actual values may be greater.
i: LC_PIZP1101 has been recently repaired. Re-surveying is required to update ground surface elevation and stickup.
WL_MW-15-02-A and B previously known as AWTF-MW-15-02-A and -B. WL_MW-15-04-B previously known as AWTF-MW-15-04-B.
Hydraulic conductivity testing at these wells considered to be preliminary/draft.
masl denotes metres above sea level.
mbgs denotes metres below ground surface.
TOC denotes top of pipe casing.
"-" denotes data not available.

TABLE LC-01: Summary of Well Installation Details and Hydrogeological Information (LCO)

Area	Well ID	Monitoring Program[a]	Well Type	Monitoring Type	Sampling Frequency		Logs (Y/N)	Coordinates (UTM NAD 83)		Ground Elevation	TOC Elevation	Stick Up Height	Drilled Depth	Well Diameter	Top of Screen Depth	Bottom of Screen Depth	Screened Formation	Depth to Bedrock	Hydraulic Conductivity
					Approved[e]	Recommended[g]		Easting	Northing	masl	masl	m	mbgs	mm	mbgs	mbgs		mbgs	m/s
Process Plant	LC_PIZP1103[f]	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q2, Q3	Y	654250	5528633	1264.06	1265.13	1.07	41.2	-	35.1	38.1	Clayey Silt	38.8	7.5E-08
	LC_PIZP1104[f]	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	653940	5528165	1271.77	1272.72	0.95	38.1	-	33.8	36.8	Sand and Gravel / Silt	-	3.4E-04
	LC_PIZP1105[f]	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	653985	5528075	1273.54	1274.52	0.98	40.5	-	35.1	38.1	Silt / Sand and Gravel	38.5	-
Elk River Valley (Study Area 6)	LC_MW_ER4A	RGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	653205	5525919	1192.96	1193.92	0.96	21.3	50	13.4	14.9	Sand and Gravel	17.7	8.5E-05
	LC_MW_ER4B	RGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	653206	5525917	1192.89	1193.85	0.96	6.1	50	3.7	5.2	Sand and Gravel	-	8.2E-05

Notes:

a: SSGMP denotes LCO Site-Specific Groundwater Monitoring Program; RGMP denotes Regional Groundwater Monitoring Program; GWMP denotes Groundwater Monitoring Program Phase II LCO.

b: Monitoring well installed in 2021 to support the RGMP and/or SSGMP.

c: Monitoring well added to the SSGMP Program as per the 2021 SSGMP Update.

d: WL = Water Level. S = Sample.

e: 2018 SSGMP Update Report (approved BC ENV March 2020).

f: Location resurveyed in 2022.

g: 2019, 2020, 2021, and 2022 (2022 recommendations provided in brackets) SSGMP Annual Reports; 2021 SSGMP Update Report.

h: Near instantaneous recovery, hydraulic conductivity results considered a lower-bound value. Actual values may be greater.

i: LC_PIZP1101 has been recently repaired. Re-surveying is required to update ground surface elevation and stickup.

WL_MW-15-02-A and B previously known as AWTF-MW-15-02-A and -B. WL_MW-15-04-B previously known as AWTF-MW-15-04-B.

Hydraulic conductivity testing at these wells considered to be preliminary/draft.

masl denotes metres above sea level.

mbgs denotes metres below ground surface.

TOC denotes top of pipe casing.

"-" denotes data not available.

TABLE LC-02: Summary of Groundwater Level and Sampling Information (LCO)

Area	Well ID	Ground Elevation	TOC Elevation	Stick Up Height	Date of Static Water Level Measurement	Depth to Water	Potentiometric Elevation	Well Pairs	Calculated Vertical Gradient		Continuous Water Level Monitoring	Purging / Sampling Methodology
		masl	masl	m	yyyy-mm-dd	mbtoc	masl		m/m	Direction		
LCO Phase II Upper Dry Creek	LC_PIZDC0901	1674.84	1675.78	0.94	2022-03-14	7.50	1668.28	-	-	-	Yes	Peristaltic
					2022-06-10	3.81	1671.97					
					2022-08-15	5.05	1670.73					
					2022-10-25	7.02	1668.76					
	LC_PIZDC1306	1707.58	1708.58	1.00	2022-03-08	Frozen	-	-	-	-	Yes[c]	Not Sampled
					2022-04-17	Artesian	>1708.58					Artesian
					2022-08-16	Artesian	>1708.58					
					2022-10-18	1.84	1706.73					Peristaltic
	LC_PIZDC1307	1690.85	1691.77	0.92	2022-03-04	5.47	1686.30	LC_PIZDC1307 (deep) and LC_PIZDC1308 (shallow)	-0.078	Downward	Yes	Peristaltic
					2022-05-06	1.99	1689.78		0.001	Upward		
					2022-08-25	3.47	1688.30		-0.026	Downward		
					2022-10-26	4.53	1687.24		-0.053	Downward		
	LC_PIZDC1308	1690.85	1691.68	0.83	2022-03-04	3.34	1688.34	-	-	-	Yes	Peristaltic
					2022-05-06	1.93	1689.75					
					2022-08-25	2.71	1688.98					
					2022-10-26	3.06	1688.63					
	LC_PIZDC1404S	1705.81	1706.99	1.17	2022-03-08	5.06	1701.93	LC_PIZDC1404S (shallow) and LC_PIZDC1404D (deep)	-0.006	Downward	Yes[c]	Peristaltic
					2022-05-11	1.98	1705.01		-0.002	Downward		
					2022-08-25	4.14	1702.85		-0.044	Downward		
					2022-10-18	4.85	1702.14		-0.031	Downward		
	LC_PIZDC1404D	1705.55	1707.21	1.66	2022-03-08	5.42	1701.79	-	-	-	Yes	Peristaltic
					2022-05-11	2.24	1704.97					
					2022-08-25	5.36	1701.85					
					2022-10-18	5.78	1701.43					
LCO Phase II Lower Dry Creek (Study Area 2)	RG_MW_DC1A	1530.32	1531.34	1.02	2022-03-30	Frozen	-	RG_MW_DC1A (deep) and RG_MW_DC1B (shallow)	-	-	Yes[c]	Not Sampled
					2022-04-29	Artesian	>1531.34		0.483	Upward[a]		Artesian
					2022-08-15	Artesian	>1531.34		0.492	Upward[a]		Artesian / Peristaltic
					2022-10-20	Artesian	>1531.34		0.505	Upward[a]		
	RG_MW_DC1B	1530.27	1531.27	1.00	2022-03-07	6.90	1524.37	-	-	-	Yes[c]	Peristaltic
					2022-04-29	6.69	1524.58					
					2022-08-15	6.79	1524.48					
					2022-10-20	6.93	1524.34					

Notes:

a: Gradient is considered to be a minimum as the true groundwater elevation of RG_MW_DC1A is not known.

b: Location resurveyed in 2022.

c: Datalogger was installed in 2022 Q4.

masl denotes metres above sea level.

mbtoc denotes meters below top of casing.

TOC denotes top of pipe casing.

"-" denotes data not available.

TABLE LC-02: Summary of Groundwater Level and Sampling Information (LCO)

Area	Well ID	Ground Elevation	TOC Elevation	Stick Up Height	Date of Static Water Level Measurement	Depth to Water	Potentiometric Elevation	Well Pairs	Calculated Vertical Gradient		Continuous Water Level Monitoring	Purging / Sampling Methodology
		masl	masl	m	yyyy-mm-dd	mbtoc	masl		m/m	Direction		
LCO Phase I Centre Line Creek (North)	LC_PIZM0903	1579.20	1580.01	0.81	2022-03-17	2.15	1577.86	-	-	-	-	Peristaltic
					2022-05-26	1.88	1578.13					
					2022-08-19	1.85	1578.16					
					2022-10-17	1.96	1578.05					
LCO Phase I Centre Line Creek (South)	LC_MW20_01	1452.01	1452.84	0.83	2022-03-01	6.50	1446.34	-	-	-	Yes	Bladder
					2022-06-02	5.63	1447.21					Peristaltic
					2022-08-17	6.00	1446.84					
					2022-10-17	6.16	1446.68					
	LC_MW20_02A	1451.90	1452.74	0.84	2022-03-02	4.80	1447.94	LC_MW20_02A (deep) and LC_MW_02B (shallow)	-0.032	Downward	Yes	Peristaltic
					2022-06-02	3.82	1448.92		-0.034	Downward		
					2022-08-17	4.30	1448.44		-0.035	Downward		
					2022-10-17	4.47	1448.27		-0.034	Downward		
	LC_MW20_02B	1451.73	1452.53	0.80	2022-03-02	4.43	1448.10	-	-	-	Yes	Peristaltic
					2022-06-02	3.44	1449.09					
					2022-08-17	3.91	1448.62					
					2022-10-17	4.09	1448.44					
	LC_MW20_03	1510.66	1511.45	0.79	2022-03-02	35.54	1475.91	-	-	-	Yes	Bladder
					2022-06-03	35.40	1476.05					
					2022-08-18	35.17	1476.28					
					2022-10-19	35.12	1476.33					
LCO Phase I West Line Creek	LC_PIZ1206A	1510.07	1511.01	0.94	2022-03-02	11.12	1499.89	LC_PIZ1206A (shallow) and LC_PIZ1206C (deep)	-0.521	Downward	Yes	Bladder
					2022-06-01	9.59	1501.42		-0.538	Downward		
					2022-08-18	9.00	1502.01		-0.552	Downward		
					2022-11-02	9.93	1501.09		-0.536	Downward		
	LC_PIZ1206C	1510.15	1511.14	0.98	2022-03-03	43.50	1467.64	-	-	-	Yes	Bladder
					2022-06-01	43.05	1468.09					
					2022-09-26	43.30	1467.84					Hydrasleeve
					2022-11-02	43.25	1467.89					
	LC_PIZ1207A	1489.45	1490.48	1.03	2022-03-10	11.62	1478.86	LC_PIZ1207A (shallow) and LC_PIZ1207B (deep)	-0.835	Downward	-	Bladder
					2022-06-02	11.43	1479.05		-0.835	Downward		
					2022-08-04	11.44	1479.05		-0.839	Downward		
					2022-10-24	11.95	1478.53		-0.785	Downward		
	LC_PIZ1207B	1489.03	1490.18	1.15	2022-03-10	13.53	1476.65	-	-	-	-	Bladder
					2022-06-02	13.65	1476.53					
					2022-08-04	13.68	1476.50					
					2022-10-24	13.92	1476.26					

Notes:

a: Gradient is considered to be a minimum as the true groundwater elevation of RG_MW_DC1A is not known.

b: Location resurveyed in 2022.

c: Datalogger was installed in 2022 Q4.

masl denotes metres above sea level.

mbtoc denotes meters below top of casing.

TOC denotes top of pipe casing.

"-" denotes data not available.

TABLE LC-02: Summary of Groundwater Level and Sampling Information (LCO)

Area	Well ID	Ground Elevation	TOC Elevation	Stick Up Height	Date of Static Water Level Measurement	Depth to Water	Potentiometric Elevation	Well Pairs	Calculated Vertical Gradient		Continuous Water Level Monitoring	Purging / Sampling Methodology
		masl	masl	m	yyyy-mm-dd	mbtoc	masl		m/m	Direction		
LCO Phase I West Line Creek	LC_PIZ1210B	1498.58	1499.39	0.81	2022-03-01	46.48	1452.91	LC_PIZ1210B (shallow) and LC_PIZ1210C (deep)	-0.184	Downward	-	Water Levels Only
					2022-06-01	44.32	1455.07		-0.219	Downward		
					2022-09-26	45.41	1453.98		-0.201	Downward		
					2022-11-01	45.78	1453.61		-0.190	Downward		Hydrasleeve
	LC_PIZ1210C	1497.89	1498.62	0.74	2022-03-15	48.75	1449.87	-	-	-	-	Bladder
					2022-06-01	47.32	1451.30					
					2022-09-26	48.07	1450.55					Hydrasleeve
					2022-11-01	48.20	1450.42					Bladder
	LC_PIZ1211N	1442.76	1443.65	0.89	2022-03-01	4.19	1439.46	-	-	-	Yes	Peristaltic
					2022-06-02	3.51	1440.14					
					2022-08-17	3.34	1440.31					
					2022-10-19	3.78	1439.87					
	LC_PIZ1212	1447.91	1448.59	0.69	2022-03-01	6.59	1442.00	-	-	-	Yes	Bladder
					2022-06-02	5.86	1442.73					Peristaltic
					2022-08-17	5.82	1442.78					
					2022-10-19	6.23	1442.36					
LCO Phase I Lower Line Creek to LC_LC4	WL_MW-15-02-A	1494.05	1494.96	0.91	2022-03-28	9.56	1485.40	WL_MW-15-02-A (deep) and WL_MW-15-02B (shallow)	-0.316	Downward	-	Bladder
					2022-06-23	9.07	1485.89		-0.358	Downward		
					2022-11-23	9.97	1484.99		-0.344	Downward		
	WL_MW-15-02-B	1494.05	1494.92	0.87	2022-03-28	8.53	1486.39	-	-	-	-	Bladder
					2022-06-23	7.88	1487.04					
					2022-11-23	8.92	1486.00					
	WL_MW-15-04-B	1488.452	1489.351	0.90	2022-03-28	3.41	1485.94	-	-	-	-	Peristaltic
					2022-06-22	3.47	1485.88					
					2022-11-23	5.74	1483.61					
	LC_MW_CP1A	1403.09	1403.77	0.67	2022-01-22	5.65	1398.12	LC_MW_CP1A (deep) and LC_MW_CP1B (shallow)	0.041	Upward	Yes[c]	Peristaltic
					2022-04-10	5.67	1398.10		0.041	Upward		
					2022-07-26	5.41	1398.36		0.042	Upward		
					2022-10-20	5.60	1398.17		0.042	Upward		
	LC_MW_CP1B	1403.09	1403.83	0.74	2022-01-22	6.14	1397.70	-	-	-	Yes[c]	Peristaltic
					2022-04-10	6.16	1397.67					
					2022-07-26	5.91	1397.92					
					2022-10-20	6.09	1397.74					

Notes:
a: Gradient is considered to be a minimum as the true groundwater elevation of RG_MW_DC1A is not known.
b: Location resurveyed in 2022.
c: Datalogger was installed in 2022 Q4.
masl denotes metres above sea level.
mbtoc denotes meters below top of casing.
TOC denotes top of pipe casing.
"-" denotes data not available.

TABLE LC-02: Summary of Groundwater Level and Sampling Information (LCO)

Area	Well ID	Ground Elevation	TOC Elevation	Stick Up Height	Date of Static Water Level Measurement	Depth to Water	Potentiometric Elevation	Well Pairs	Calculated Vertical Gradient		Continuous Water Level Monitoring	Purging / Sampling Methodology
		masl	masl	m	yyyy-mm-dd	mbtoc	masl		m/m	Direction		
Process Plant	LC_PIZP1001	1287.10	1287.92	0.82	-	-	-	-	-	-	Yes	Water Levels Only
					2022-04-21	49.70	1238.22					
					2022-07-22	48.63	1239.29					
					2022-10-22	48.42	1239.50					
	LC_PIZP1002	1272.13	1273.13	1.00	-	-	-	-	-	-	Yes[c]	Water Levels Only
					2022-04-21	36.27	1236.86					
					2022-07-22	36.01	1237.12					
					2022-10-25	36.02	1237.12					
	LC_PIZP1003	1283.39	1284.39	1.00	-	-	-	-	-	-	-	Water Levels Only
					2022-04-21	19.30	1265.09					
					2022-07-22	19.20	1265.19					
					2022-10-14	19.44	1264.95					
	LC_PIZP1101[d]	1266.06	1267.06	1.00	2022-03-11	30.03	1237.03	-	-	-	Yes	Bladder
					2022-05-20	29.74	1237.32					
					2022-08-05	29.59	1237.47					
					2022-10-22	29.61	1237.45					
	LC_PIZP1103	1264.06	1265.13	1.07	2022-03-11	28.23	1236.90	-	-	-	Yes	Bladder
					2022-05-25	27.79	1237.34					
					2022-08-05	27.65	1237.48					
					2022-10-24	27.82	1237.31					
	LC_PIZP1104	1271.77	1272.72	0.95	2022-03-15	34.69	1238.03	-	-	-	-	Bladder
					2022-06-30	34.71	1238.01					Bailer
					-	-	-					
					2022-11-03	34.98	1237.74					Bladder
	LC_PIZP1105	1273.54	1274.52	0.98	2022-03-10	38.29	1236.23	-	-	-	Yes	Bailer
					2022-05-25	37.90	1236.62					
					2022-08-30	38.03	1236.49					
					2022-10-17	38.20	1236.32					
Study Area 6	LC_MW_ER4A	1192.96	1193.92	0.96	2022-03-03	3.83	1190.09	LC_MW_ER4A (deep) and LC_MW_ER4B (shallow)	0.065	Upward	Yes	Peristaltic
					2022-05-12	3.57	1190.35		0.066	Upward		
					2022-08-03	3.49	1190.43		0.066	Upward		
					2022-10-13	3.82	1190.10		0.063	Upward		
	LC_MW_ER4B	1192.89	1193.85	0.96	2022-03-03	4.39	1189.46	-	-	-	Yes	Peristaltic
					2022-05-12	4.14	1189.71					
					2022-08-03	4.06	1189.79					
					2022-10-13	4.36	1189.50					

Notes:

a: Gradient is considered to be a minimum as the true groundwater elevation of RG_MW_DC1A is not known.
b: Location resurveyed in 2022.
c: Datalogger was installed in 2022 Q4.
d: Groundwater elevations are approximate. LC_PIZP1101 has been repaired and needs to re-surveyed.
masl denotes metres above sea level.
mbtoc denotes meters below top of casing.
TOC denotes top of pipe casing.
"-" denotes data not available.

TABLE LC-03: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Inorganics, Nutrients and Organics in Groundwater (LCO)

			Field Parameters					Physical Parameters						Dissolved Inorganics								Nutrients						Organics	
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Field Temperature C	pH (field) pH	Dissolved Oxygen mg/L	Field Conductivity µS/cm	Field ORP mV	pH pH	Hardness mg/L	Conductivity µS/cm	Total Suspended Solids mg/L	Total Dissolved Solids mg/L	Turbidity ntu	Total Alkalinity mg/L	Bicarbonate mg/L	Carbonate mg/L	Hydroxide mg/L	Bromide mg/L	Chloride mg/L	Fluoride mg/L	Sulphate mg/L	Ammonia Nitrogen mg/L	Nitrate Nitrogen mg/L	Nitrite Nitrogen mg/L	Kjeldahl Nitrogen-N mg/L	Ortho-Phosphate mg/L	Phosphorus, Total mg/L	Total Organic Carbon mg/L	Dissolved Organic Carbon mg/L
BC Standard																													
CSR Aquatic Life (AW)[a]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,500	2-3[b]	1,280-4,290[b]	1.31-18.5[c]	400	0.2-2[d]	n/a	n/a	n/a	n/a	n/a
CSR Irrigation Watering (IW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSR Livestock Watering (LW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	1	1,000	n/a	100	10	n/a	n/a	n/a	n/a	n/a
CSR Drinking Water (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	250	1.5	500	n/a	10	1	n/a	n/a	n/a	n/a	n/a
Phase II Upper LCO Dry Creek																													
LC_PIZDC0901	LC_PIZDC0901_WG_Q1-2022_NP	2022 03 14	3.3	6.92	1.9	568.6	222.0	7.22	334	590	20.7	348	21.3	348	425	< 1.0	< 1.0	< 0.050	0.38	0.084	12.6	< 0.0050	0.135	< 0.0010	0.128	0.0103	0.0450	5.79	3.80
	LC_PIZDC0901_WG_Q2-2022_NP	2022 06 10	6.8	6.80	6.80	706	188.6	8.11	362	678	8.1	341	6.86	405	494	< 1.0	< 1.0	< 0.050	< 0.10	0.064	17.9	0.0101	0.417	< 0.0010	< 0.500	0.0156	0.0234	3.65	4.61
	LC_PIZDC0901_WG_Q3-2022_NP	2022 08 15	9.5	6.87	2.37	680	95.6	7.36	387	659	8.4	357	6.83	403	492	< 1.0	< 1.0	< 0.050	0.35	0.077	12.8	< 0.0050	0.496	< 0.0010	< 0.500	0.0136	0.0297	1.94	2.30
	LC_PIZDC0901_WG_Q4_2022_N	2022 10 25	4.78	7.01	5.12	668.8	96.1	8.05	462	616	3.3	356	2.04	397	484	< 1.0	< 1.0	< 0.050	0.67	0.107	12.8	< 0.0050	0.279	< 0.0010	< 0.500	0.0069	0.0148	2.26	2.14
	LC_CC1_WG_Q4_2022_NP3	Duplicate	-	-	-	-	-	8.09	453	613	2.5	366	1.62	414	504	< 1.0	< 1.0	< 0.050	0.69	0.106	12.8	< 0.0050	0.278	< 0.0010	< 0.500	0.0081	0.0141	2.42	2.07
	QA/QC RPD%		-	-	-	-	-	0	2	0	*	3	23	4	4	*	*	*	3	1	0	*	0	*	*	16	5	*	*
LC_PIZDC1306	LC_PIZDC1306_Q2_2022_NP	2022 04 17	3.9	7.26	5.43	494.0	181.0	7.89	243	498	6.1	301	5.87	288	351	< 1.0	< 1.0	< 0.050	< 0.10	0.144	5.25	< 0.0050	0.265	< 0.0010	< 0.050	< 0.0010	0.124	1.99	1.85
	LC_PIZDC1306_WG_Q3-2022_NP	2022 08 16	4.925	7.30	5.12	494.6	167.9	8.16	266	457	4.3	290	3.23	274	334	< 1.0	< 1.0	< 0.050	0.10	0.169	7.58	< 0.0050	0.237	< 0.0010	0.053	0.0014	0.0054	1.60	1.57
	LC_PIZDC1306_WG_Q4_2022_N	2022 10 18	7.46	7.23	2.16	476	176.2	7.70	286	443	< 1.0	258	2.00	272	332	< 1.0	< 1.0	< 0.050	0.12	0.167	6.76	< 0.0050	0.156	< 0.0010	< 0.050	< 0.0010	< 0.0020	0.94	0.81
LC_PIZDC1307	LC_PIZDC1307_WG_Q1-2022_NP	2022 03 04	2.6	7.90	0.44	395.7	-214.3	8.13	169	383	2.4	198	7.06	228	278	< 1.0	< 1.0	< 0.050	0.21	0.465	0.50	0.0896	< 0.0050	< 0.0010	0.140	< 0.0010	0.0108	1.44	1.37
	LC_PIZDC1307_WG_Q2_2022_NP	2022 05 06	3.5	7.96	0.46	400.7	-219.3	8.24	184	378	< 1.0	234	7.25	218	266	< 1.0	< 1.0	< 0.050	0.22	0.543	< 0.30	0.0946	< 0.0050	< 0.0010	< 0.500	0.0018	0.0117	1.55	1.23
	LC_PIZDC1307_WG_Q3-2022_NP	2022 08 25	10.1	8.07	0.29	407.7	-206.2	8.31	174	380	3.3	216	6.23	247	295	3.1	< 1.0	< 0.050	0.19	0.556	< 0.30	0.101	0.0082	< 0.0010	0.115	< 0.0010	0.0156	1.28	3.84
	LC_PIZDC1307_WG_Q4_2022_NP	2022 10 26	2.93	7.73	0.40	390.0	-17.9	8.06	180	368	6.3	191	13.0	220	269	< 1.0	< 1.0	< 0.050	0.18	0.540	< 0.30	0.105	< 0.0050	< 0.0010	< 0.500	< 0.0010	0.0191	1.22	1.38
	LC_CC1_WG_Q4_2022_NP1307	Duplicate	-	-	-	-	-	8.10	194	363	5.8	207	12.3	225	275	< 1.0	< 1.0	< 0.050	0.18	0.535	< 0.30	0.104	< 0.0050	< 0.0010	< 0.500	< 0.0010	0.0184	1.05	1.42
	QA/QC RPD%		-	-	-	-	-	0	7	1	8	8	6	2	2	*	*	*	*	1	*	1	*	*	*	*	4	*	*
LC_PIZDC1308	LC_PIZDC1308_WG_Q1-2022_NP	2022 03 04	2.7	7.22	0.39	485	-128	7.79	263	474	1.2	252	3.97	280	342	< 1.0	< 1.0	< 0.050	0.49	0.212	1.93	0.0409	< 0.0050	< 0.0010	0.079	< 0.0010	0.0022	1.64	1.42
	LC_PIZDC1308_WG_Q2_2022_NP	2022 05 06	3.1	6.88	0.70	707	56.6	7.72	388	674	< 1.0	412	0.27	404	493	< 1.0	< 1.0	< 0.050	1.97	0.141	5.84	< 0.0050	0.108	< 0.0010	< 0.500	0.0016	< 0.0020	2.56	2.86
	LC_PIZDC1308_WG_Q3-2022_NP	2022 08 25	7.6	7.01	0.26	745	65.5	7.93	394	683	< 1.0	411	0.19	418	510	< 1.0	< 1.0	< 0.050	1.84	0.152	5.31	< 0.0050	0.108	0.0024	0.065	< 0.0010	0.0072	2.78	5.02
	LC_PIZDC1308_WG_Q4_2022_NP	2022 10 26	4.29	7.32	0.18	530.70	4.20	7.63	296	526	< 1.0	294	0.40	319	389	< 1.0	< 1.0	< 0.050	0.83	0.213	3.60	0.0157	0.0097	< 0.0010	< 0.500	< 0.0010	0.0020	1.71	2.24
	LC_CC1_WG_Q4_2022_NP5	Duplicate	-	-	-	-	-	7.77	298	537	< 1.0	299	0.36	323	394	< 1.0	< 1.0	< 0.050	0.87	0.211	3.80	0.0163	0.0098	0.0010	< 0.500	< 0.0010	< 0.0020	1.72	1.80
	QA/QC RPD%		-	-	-	-	-	2	1	2	*	2	*	1	1	*	*	*	5	1	5	*	*	*	*	*	*	*	*
LC_PIZDC1404S	LC_PIZDC1404S_WG_Q1-2022_NP	2022 03 08	1.4	6.94	0.9	200.6	67.1	7.66	205	342	2.3	208	2.86	199	243	< 1.0	< 1.0	< 0.050	0.17	0.118	5.05	0.0096	0.138	< 0.0010	0.060	< 0.0010	0.0172	2.57	2.32
	LC_PIZDC1404S_WG_Q2-2022_NP	2022 05 11	3.6	7.41	0.45	363.9	-82.3	8.13	193	344	< 1.0	248	5.24	193	235	< 1.0	< 1.0	< 0.050	0.36	0.145	5.54	< 0.0050	0.0452	< 0.0010	< 0.500	< 0.0010	0.0060	1.86	1.96
	LC_PIZDC1404S_WG_Q3-2022_NP	2022 08 25	7.6	7.62	0.39	368.2	-74.6	8.14	183	338	2.4	193	7.27	202	246	< 1.0	< 1.0	< 0.050	0.13	0.143	4.79	0.0071	0.0225	< 0.0010	0.055	< 0.0010	0.0104	1.94	2.55
	LC_PIZDC1404S_WG_Q4_2022_N	2022 10 18	6.13	6.96	0.36	357	-73.1	7.91	207	330	1.7	194	7.97	196	239	< 1.0	< 1.0	< 0.050	0.12	0.142	4.52	0.0065	0.0229	0.0012	< 0.050	< 0.0010	0.0123	1.64	2.26
LC_PIZDC1404D	LC_PIZDC1404D_WG_Q1-2022_NP	2022 03 08	1.6	7.52	0.1	196.8	88.2	7.96	307	669	5.8	390	17.9	415	506	< 1.0	< 1.0	< 0.050	0.61	0.167	< 0.30	2.41	< 0.0050	< 0.0010	2.58	< 0.0010	0.0223	3.52	3.06
	LC_PIZDC1404D_WG_Q2-2022_NP	2022 05 11	5.5	7.86	0.32	741	-221.5	8.27	298	701	8.8	435	22.6	441	538	< 1.0	< 1.0	< 0.050	0.42	0.193	< 0.30	2.41	< 0.0050	< 0.0010	2.59	< 0.0010	0.0197	1.68	2.14
	LC_PIZDC1404D_WG_Q3-2022_NP	2022 08 25	9.7	8.01	0.23	764	-218.2	8.35	283	687	7.6	397	18.9	424	500	8.9	< 1.0	< 0.050	0.42	0.209	< 0.30	2.69	0.0138	< 0.0010	2.51	< 0.0010	0.0198	1.53	1.94
	LC_PIZDC1404D_WG_Q4_2022_N	2022 10 18	9.59	7.76	0.22	713	-197.8	8.18	324	670	6.6	377	21.5	423	516	< 1.0	< 1.0	< 0.050	0.40	0.203	< 0.30	2.73	< 0.0050	< 0.0010	3.54	< 0.0010	0.0201	1.54	1.96

All terms defined within the body of SNC-Lavalin's report.

< Denotes concentration less than indicated detection limit.

\- Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

* RPDs are not calculated where one or more concentrations are less than five times RDL.

RDL Denotes reported detection limit.

BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH and Temperature. Temperature assumed 10C.

[d] Standard varies with Chloride.

TABLE LC-03: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Inorganics, Nutrients and Organics in Groundwater (LCO)

			Field Parameters					Physical Parameters						Dissolved Inorganics								Nutrients						Organics	
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Field Temperature	pH (field)	Dissolved Oxygen	Field Conductivity	Field ORP	pH	Hardness	Conductivity	Total Suspended Solids	Total Dissolved Solids	Turbidity	Total Alkalinity	Bicarbonate	Carbonate	Hydroxide	Bromide	Chloride	Fluoride	Sulphate	Ammonia Nitrogen	Nitrate Nitrogen	Nitrite Nitrogen	Kjeldahl Nitrogen-N	Ortho-Phosphate	Phosphorus, Total	Total Organic Carbon	Dissolved Organic Carbon
			C	pH	mg/L	µS/cm	mV	pH	mg/L	µS/cm	mg/L	mg/L	ntu	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
BC Standard																													
CSR Aquatic Life (AW)[a]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,500	2-3[b]	1,280-4,290[b]	1.31-18.5[c]	400	0.2-2[d]	n/a	n/a	n/a	n/a	n/a
CSR Irrigation Watering (IW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSR Livestock Watering (LW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	1	1,000	n/a	100	10	n/a	n/a	n/a	n/a	n/a
CSR Drinking Water (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	250	1.5	500	n/a	10	1	n/a	n/a	n/a	n/a	n/a
Phase II Lower LCO Dry Creek (+ denotes part of Study Area 2)																													
RG_MW_DC1A^{+}	RG_MW_DC1A_WG_Q2_2022_NP	2022 04 29	4.6	7.68	8.63	447.7	-73	8.12	220	423	4.6	230	26.4	250	305	< 1.0	< 1.0	< 0.050	0.22	0.231	2.15	0.106	0.0058	< 0.0010	0.241	< 0.0010	0.0034	1.68	1.56
	RG_MW_DC1A_WG_Q3-2022_NP	2022 08 15	8.8	7.49	0.57	458.9	-136.2	7.68	247	431	305	252	351	276	336	< 1.0	< 1.0	< 0.050	0.18	0.249	1.57	0.214	0.0051	< 0.0010	< 0.500	< 0.0010	0.0861	3.01	2.31
	RG_MW_DC1A_WG_Q4_2022_N	2022 10 20	3.83	7.43	0.16	456.8	-113.7	8.09	243	406	33.7	203	41.4	253	308	< 1.0	< 1.0	< 0.050	0.19	0.300	1.96	0.105	< 0.0050	< 0.0010	< 0.500	< 0.0010	0.0360	0.97	0.95
	LC_CC3_WG_Q4_2022_NP	Duplicate	-	-	-	-	-	8.06	239	407	24.7	213	37.2	263	321	< 1.0	< 1.0	< 0.050	0.18	0.310	1.79	0.116	< 0.0050	< 0.0010	< 0.500	< 0.0010	0.0391	0.93	0.93
	QA/QC RPD%		-	-	-	-	-	0	2	0	31	5	11	4	4	*	*	*	*	3	9	10	*	*	*	*	8	*	*
RG_MW_DC1B^{+}	EXT GW TD Q1	2022 03 07	4.8	7.20	0.3	409.5	69.0	8.29	224	412	4.7	230	24.6	252	308	< 1.0	< 1.0	< 0.050	0.19	0.238	2.78	0.106	0.0143	< 0.0010	0.170	< 0.0010	0.307	1.31	1.19
	RG_MW_DC1B_WG_Q2_2022_NP	2022 04 29	3.6	7.59	0.47	439.7	-154.2	8.17	224	426	12.0	258	18.4	251	306	< 1.0	< 1.0	< 0.050	0.28	0.241	1.31	0.101	< 0.0050	< 0.0010	0.193	< 0.0010	0.0249	1.69	1.22
	RG_MW_DC1B_WG_Q3-2022_NP	2022 08 15	8.9	7.56	0.55	449.3	-139.8	7.70	241	427	< 1.0	208	24.6	268	327	< 1.0	< 1.0	< 0.050	0.23	0.239	3.54	0.107	< 0.0050	< 0.0010	< 0.500	< 0.0010	< 0.0020	0.82	0.97
	RG_MW_DC1B_WG_Q4_2022_N	2022 10 20	4.14	7.19	0.23	455.8	-117.0	7.90	243	395	2.9	194	28.8	248	302	< 1.0	< 1.0	< 0.050	0.26	0.302	4.38	0.114	0.0061	< 0.0010	< 0.500	< 0.0010	< 0.0020	0.82	1.16
LCO Phase I Centre Line Creek North																													
LC_PIZM0903	LC_PIZM0903_WG_Q1_2022_NP	2022 03 17	2.6	7.44	6.6	440.7	153.6	7.91	242	448	7.3	278	7.76	162	198	< 1.0	< 1.0	< 0.050	0.37	0.247	96.4	< 0.0050	1.19	< 0.0010	0.158	0.0036	0.0172	< 0.50	1.49
	LC_PIZM0903_WG_Q2-2022_NP	2022 05 26	5.50	7.57	8.66	453.8	269.6	8.17	228	426	20.3	266	7.75	153	186	< 1.0	< 1.0	< 0.050	0.27	0.205	82.6	0.0222	1.14	< 0.0010	< 0.500	< 0.0010	0.149	2.82	0.61
	LC_PIZM0903_WG_Q3-2022_NP	2022 08 19	9.3	7.23	7.20	405.5	178.2	7.76	230	374	27.8	228	22.0	157	192	< 1.0	< 1.0	< 0.050	0.30	0.272	65.8	< 0.0050	0.917	< 0.0010	< 0.500	< 0.0010	0.0714	0.87	0.91
	LC_PIZM0903_WG_Q4_2022_N	2022 10 17	5.47	7.16	7.80	427	205	7.89	218	381	1.4	257	1.15	148	180	< 1.0	< 1.0	< 0.050	0.30	0.239	74.0	< 0.0050	0.717	< 0.0010	< 0.500	0.0012	0.0036	< 0.50	0.60
LCO Phase I Centre Line Creek South																													
LC_MW20_01	LC_MW20_01_WG_2022-Q1_NP	2022 03 01	5.16	7.16	5.69	955.59	263.0	7.88	542	942	1.8	691	0.68	213	260	< 1.0	< 1.0	< 0.050	8.81	0.110	274	< 0.0050	13.0	0.0011	0.059	0.0017	0.0035	< 0.50	< 0.50
	LC_CC3_WG_2022-Q1_NP	Duplicate	-	-	-	-	-	7.88	537	939	2.0	679	0.75	213	259	< 1.0	< 1.0	< 0.050	8.75	0.109	272	< 0.0050	13.0	< 0.0010	0.181	< 0.0010	0.0044	< 0.50	< 0.50
	QA/QC RPD%		-	-	-	-	-	0	1	0	*	2	10	0	0	*	*	*	1	1	1	*	0	*	*	*	*	*	*
	LC_MW20_01_WG_2022-Q2_NP	2022 06 02	12.3	7.23	2.7	982	195.5	8.10	509	959	2.9	658	0.11	228	278	< 1.0	< 1.0	< 0.250	9.29	0.121	275	< 0.0050	13.6	< 0.0050	2.71	0.0024	0.0061	< 0.50	< 0.50
	LC_MW20_01_WG_Q3-2022_NP	2022 08 17	8.4	7.45	6.00	983	73.9	7.85	499	914	6.6	680	0.31	230	281	< 1.0	< 1.0	< 0.250	8.86	0.146	277	< 0.0050	12.9	< 0.0050	< 0.500	< 0.0010	0.0076	< 0.50	0.92
	LC_MW20_01_WG_Q4_2022_N	2022 10 17	8.04	7.31	5.33	946	57.7	7.76	537	876	1.2	657	0.11	216	264	< 1.0	< 1.0	< 0.050	8.74	0.140	261	< 0.0050	12.6	< 0.0010	0.548	< 0.0010	0.0078	< 0.50	0.54
LC_MW20_02A	LC_MW20_02A_WG_2022-Q1_NP	2022 03 02	4.99	7.59	0.63	795.43	-151.5	7.91	446	792	9.0	529	47.9	204	249	< 1.0	< 1.0	< 0.050	9.08	0.122	248	0.0469	0.0105	< 0.0010	0.072	< 0.0010	0.0090	< 0.50	< 0.50
	LC_MW20_02A_WG_2022-Q2_NP	2022 06 02	7.6	7.72	0.1	863	-93.5	8.13	457	843	7.5	586	42.3	215	262	< 1.0	< 1.0	< 0.050	9.70	0.140	258	0.0475	0.0080	< 0.0010	< 0.500	< 0.0010	0.0054	< 0.50	< 0.50
	LC_MW20_02A_WG_Q3-2022_NP	2022 08 17	8.8	7.83	0.44	888	-192.8	7.91	477	830	6.7	620	53.1	216	263	< 1.0	< 1.0	< 0.250	10.7	0.131	274	0.0474	0.0268	< 0.0050	< 0.050	< 0.0010	0.0054	< 0.50	1.02
	LC_MW20_02A_WG_Q4_2022_N	2022 10 17	5.36	7.59	0.15	885	-163	7.73	492	807	7.3	604	< 0.10	217	265	< 1.0	< 1.0	< 0.050	9.77	0.148	264	0.0433	< 0.0050	< 0.0010	< 0.500	< 0.0010	0.0048	< 0.50	< 0.50
LC_MW20_02B	LC_MW20_02B_WG_2022-Q1_NP	2022 03 02	4.52	7.15	6.82	894.83	93.7	7.78	485	903	< 1.0	568	< 0.10	211	258	< 1.0	< 1.0	< 0.050	10.0	0.106	254	< 0.0050	12.1	< 0.0010	0.190	0.0014	0.0024	< 0.50	0.51
	LC_MW20_02B_WG_2022-Q2_NP	2022 06 02	6.0	7.31	4.6	976	250.5	8.10	506	953	3.8	661	< 0.10	219	268	< 1.0	< 1.0	< 0.050	12.0	0.119	257	< 0.0050	13.9	< 0.0010	1.74	< 0.0010	0.0034	< 0.50	< 0.50
	LC_MW20_02B_WG_Q3-2022_NP	2022 08 17	7.8	7.39	5.46	959	93.4	7.82	494	881	< 1.0	639	0.47	214	261	< 1.0	< 1.0	< 0.250	10.3	0.138	251	0.0643	12.2	< 0.0050	< 0.500	< 0.0010	< 0.0020	< 0.50	1.77
	LC_MW20_02B_WG_Q4_2022_N	2022 10 17	6.52	7.39	5.51	892	39.9	7.62	487	818	< 1.0	588	53.5	221	269	< 1.0	< 1.0	< 0.050	8.52	0.139	228	< 0.0050	10.0	0.0017	0.558	< 0.0010	0.0030	< 0.50	0.58
LC_MW20_03	LC_MW20_03_WG_2022-Q1_NP	2022 03 02	6.43	7.01	0.92	566.97	29.1	7.79	303	564	34.1	300	19.6	300	365	< 1.0	< 1.0	< 0.050	7.04	0.152	18.5	0.0107	0.0202	< 0.0010	0.122	< 0.0010	0.134	1.09	1.28
	LC_MW20_03_WG_2022-Q2_NP	2022 06 03	9.3	7.12	0.4	593.0	36.5	7.96	301	590	108	354	23.4	320	391	< 1.0	< 1.0	< 0.050	7.90	0.169	17.4	0.0065	0.0090	< 0.0010	< 0.500	< 0.0010	0.349	0.87	1.15
	LC_MW20_03_WG_Q3-2022_NP	2022 08 18	15.2	9.52	1.10	610	-163.1	8.12	319	571	2.5	306	4.97	322	392	< 1.0	< 1.0	< 0.050	5.67	0.188	16.6	0.0074	0.0085	< 0.0010	< 0.500	< 0.0010	0.0021	< 0.50	0.99
	LC_MW20_03_WG_Q4_2022_N	2022 10 19	8.94	7.12	0.54	582.3	-45.1	7.78	322	509	32.5	311	14.8	290	354	< 1.0	< 1.0	< 0.050	6.10	0.181	18.6	0.0073	< 0.0050	< 0.0010	< 0.500	< 0.0010	0.0033	0.55	0.58

All terms defined within the body of SNC-Lavalin's report.

<	Denotes concentration less than indicated detection limit.
-	Denotes analysis not conducted.
n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL	Denotes reported detection limit.

BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH and Temperature. Temperature assumed 10C.

[d] Standard varies with Chloride.

TABLE LC-03: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Inorganics, Nutrients and Organics in Groundwater (LCO)

			Field Parameters					Physical Parameters						Dissolved Inorganics								Nutrients						Organics	
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Field Temperature C	pH (field) pH	Dissolved Oxygen mg/L	Field Conductivity µS/cm	Field ORP mV	pH pH	Hardness mg/L	Conductivity µS/cm	Total Suspended Solids mg/L	Total Dissolved Solids mg/L	Turbidity ntu	Total Alkalinity mg/L	Bicarbonate mg/L	Carbonate mg/L	Hydroxide mg/L	Bromide mg/L	Chloride mg/L	Fluoride mg/L	Sulphate mg/L	Ammonia Nitrogen mg/L	Nitrate Nitrogen mg/L	Nitrite Nitrogen mg/L	Kjeldahl Nitrogen-N mg/L	Ortho-Phosphate mg/L	Phosphorus, Total mg/L	Total Organic Carbon mg/L	Dissolved Organic Carbon mg/L
BC Standard																													
CSR Aquatic Life (AW)[a]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,500	2-3[b]	1,280-4,290[b]	1.31-18.5[c]	400	0.2-2[d]	n/a	n/a	n/a	n/a	n/a
CSR Irrigation Watering (IW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSR Livestock Watering (LW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	1	1,000	n/a	100	10	n/a	n/a	n/a	n/a	n/a
CSR Drinking Water (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	250	1.5	500	n/a	10	1	n/a	n/a	n/a	n/a	n/a
LCO Phase I West Line Creek																													
LC_PIZ1206A	LC_PIZ1206A_WG_2022-Q1_NP	2022 03 02	4.65	6.89	6.25	2,095.1	236.8	7.51	1,400	2,040	23.9	1,770	18.2	328	400	< 1.0	< 1.0	< 0.250	3.61	0.104	1,040	< 0.0050	11.5	< 0.0050	0.165	0.0015	0.0316	1.14	0.90
	LC_PIZ1206A_WG_2022-Q2_NP	2022 06 01	7.1	7.18	5.3	2,231	247.1	8.01	1,500	2,190	11.1	1,780	12.4	338	413	< 1.0	< 1.0	< 0.250	4.15	0.127	1,180	< 0.0050	12.5	< 0.0050	1.70	< 0.0010	0.0182	< 0.50	0.83
	LC_PIZ1206A_WG_Q3-2022_NP	2022 08 17	11.0	8.15	6.21	1,922	116.8	7.93	1,190	1,810	4.7	1,520	2.42	377	460	< 1.0	< 1.0	< 0.250	2.58	0.129	852	< 0.0050	9.17	< 0.0050	< 0.500	< 0.0010	0.0072	< 0.50	< 0.50
	LC_PIZ1206A_WG_Q4_2022_N	2022 11 02	4.35	7.01	5.93	2,079	88.6	7.84	1,360	2,040	< 1.0	1,770	0.99	368	448	< 1.0	< 1.0	< 0.250	2.99	0.124	996	< 0.0050	10.5	< 0.0050	0.685	< 0.0010	0.0026	0.80	0.89
LC_PIZ1206C	LC_PIZ1206C_WG_2022-Q1_NP	2022 03 03	4.01	7.23	10.80	1,205.3	317.1	7.84	618	1,130	2.7	750	2.10	218	266	< 1.0	< 1.0	< 0.250	4.39	0.163	468	< 0.0050	3.51	< 0.0050	0.361	< 0.0010	0.0050	0.91	1.01
	LC_PIZ1206C_WG_2022-Q2_NP	2022 06 01	12.3	7.48	6.5	1,220	239.1	8.21	666	1,240	1.4	882	0.28	225	275	< 1.0	< 1.0	< 0.250	4.67	0.191	512	< 0.0050	3.68	< 0.0050	2.64	0.0038	0.0042	0.63	0.52
	LC_CC3_WG_2022-Q2_NP	Duplicate	-	-	-	-	-	8.29	665	1,220	< 1.0	888	0.26	220	264	2.6	< 1.0	< 0.250	4.84	0.197	521	< 0.0050	3.74	< 0.0050	1.59	< 0.0010	0.0034	0.56	< 0.50
	QA/QC RPD%		-	-	-	-	-	1	0	2	*	1	*	2	4	*	*	*	4	3	2	*	2	*	50	*	*	*	*
	LC_PIZ1206C_WG_Q3-2022_NP	2022 09 26	14.08	7.63	6.99	1,321	217.9	8.15	766	1,220	105	986	79.1	239	291	< 1.0	< 1.0	< 0.250	4.22	0.216	518	0.0177	4.26	< 0.0050	< 0.500	< 0.0010	0.0639	2.22	2.82
	LC_PIZ1206C_WG_Q4_2022_N	2022 11 02	3.12	7.3	6.47	1,226	69.0	7.95	696	1,280	19.3	996	13.0	265	323	< 1.0	< 1.0	< 0.250	4.49	0.212	521	< 0.0050	4.34	0.0068	< 0.500	< 0.0010	0.0155	3.94	1.44
LC_PIZ1207A	LC_PIZ1207A_WG_Q1-2022_NP	2022 03 11	2.9	7.56	7.0	441.7	134.6	7.98	217	451	8.5	283	7.88	208	254	< 1.0	< 1.0	< 0.050	1.09	0.340	48.5	< 0.0050	0.0873	0.0059	0.069	0.0646	0.0290	0.77	0.53
	LC_PIZ1207A_WG_Q2-2022_NP	2022 06 02	12.6	7.90	10.05	460.2	146.1	8.20	184	430	89.7	279	101	206	251	< 1.0	< 1.0	< 0.050	0.99	0.399	44.0	0.0252	0.0657	< 0.0010	0.239	0.0095	0.157	6.77	3.95
	LC_PIZ1207A_WG_Q3-2022_NP	2022 08 04	15.1	7.64	7.01	497.3	176.1	8.23	222	463	34.7	300	42.9	232	283	< 1.0	< 1.0	< 0.050	0.97	0.348	44.9	< 0.0050	0.0322	< 0.0010	< 0.500	0.0028	0.0420	2.20	3.58
LC_PIZ1207B	LC_PIZ1207B_WG_Q1-2022_NP	2022 03 11	4.5	7.28	5.9	600.0	164.3	7.84	326	632	41.6	415	116	274	334	< 1.0	< 1.0	< 0.050	0.84	0.134	94.0	0.0083	0.487	0.0022	0.195	< 0.0010	0.0283	1.38	0.77
	LC_PIZ1207B_WG_Q2-2022_NP	2022 06 02	10.6	7.43	8.87	614	156.2	7.99	300	581	15.5	402	49.3	258	314	< 1.0	< 1.0	< 0.050	0.75	0.151	85.9	< 0.0050	0.210	< 0.0010	0.105	< 0.0010	0.0142	1.32	3.67
	LC_PIZ1207B_WG_Q3-2022_NP	2022 08 04	13.4	7.42	7.03	635	162.4	8.10	313	585	4.8	386	11.9	269	328	< 1.0	< 1.0	< 0.050	0.64	0.163	80.5	< 0.0050	0.148	< 0.0010	< 0.500	< 0.0010	0.0056	0.95	2.55
	LC_PIZ1207B_WG_Q4_2022_N	2022 10 24	6.32	7.29	4.32	585.8	84.70	7.93	349	572	19.5	346	47.0	332	405	< 1.0	< 1.0	< 0.050	0.71	0.191	68.2	0.0070	0.0946	< 0.0010	< 0.500	< 0.0010	0.0136	0.52	0.52
LC_PIZ1210B	LC_PIZ1210B_WG_Q4_2022_N	2022 11 01	3.44	7.97	10.63	580	62.6	8.08	354	595	202	414	71.5	177	216	< 1.0	< 1.0	< 0.050	0.87	0.211	158	0.0114	2.64	< 0.0010	< 0.500	< 0.0010	0.0387	1.78	< 0.50
LC_PIZ1210C	LC_PIZ1210C_WG_Q1_2022_NP	2022 03 15	2.8	8.77	1.1	882	228.0	8.84	55.9	925	4.6	569	3.84	562	608	37.9	< 1.0	< 0.050	6.50	0.624	< 0.30	0.453	0.0530	< 0.0010	0.563	0.0472	0.0515	3.06	2.34
	LC_PIZ1210C_WG_Q2-2022_NP	2022 06 01	10.00	9.01	2.84	988	-23.00	8.81	51.8	968	4.5	570	1.92	545	593	35.2	< 1.0	0.059	7.63	0.844	< 0.30	0.478	0.0065	0.0084	0.627	0.0515	0.0658	1.30	4.54
	LC_PIZ1210C_WG_Q3-2022_NP	2022 09 26	10.90	8.22	3.12	972	251.8	8.86	53.8	906	27.0	598	20.1	552	614	29.2	< 1.0	0.051	6.28	0.690	0.58	0.0117	0.0257	0.0023	< 0.500	< 0.0010	0.108	35.3	30.8
	LC_PIZ1210C_WG_Q4_2022_N	2022 11 01	3.38	8.84	1.56	903	16.60	8.73	54.8	885	17.4	540	14.1	557	621	28.4	< 1.0	0.050	6.62	0.693	< 0.30	0.180	< 0.0050	< 0.0010	0.788	< 0.0010	0.0392	17.0	17.7
LC_PIZ1211N	LC_PIZ1211N_WG_2022-Q1_NP	2022 03 01	3.58	7.29	9.32	1,310.8	282.3	7.93	744	1,260	1.4	1,000	0.11	219	268	< 1.0	< 1.0	< 0.250	11.5	0.154	472	< 0.0050	19.8	< 0.0050	0.086	0.0018	0.0023	< 0.50	< 0.50
	LC_PIZ1211N_WG_2022-Q2_NP	2022 06 02	14.8	7.12	6.2	1,597	190.6	8.02	974	1,550	12.3	1,230	0.50	326	397	< 1.0	< 1.0	< 0.250	6.44	0.185	646	< 0.0050	12.8	< 0.0050	2.35	< 0.0010	0.0030	< 0.50	< 0.50
	LC_PIZ1211N_WG_Q3-2022_NP	2022 08 17	14.2	7.87	7.27	1,421	113.3	7.75	819	1,320	2.8	1,060	0.43	300	366	< 1.0	< 1.0	< 0.250	4.95	0.187	518	< 0.0050	10.6	< 0.0050	< 0.500	< 0.0010	0.0029	0.86	1.03
	LC_PIZ1211N_WG_Q4_2022_N	2022 10 19	8.41	7.22	7.31	1,255.0	59.8	8.16	783	1,170	1.1	835	0.15	251	306	< 1.0	< 1.0	< 0.250	12.7	0.254	599	0.0082	20.2	< 0.0050	1.50	0.0013	< 0.0020	< 0.50	< 0.50
LC_PIZ1212	LC_PIZ1212_WG_2022-Q1_NP	2022 03 01	4.09	7.30	9.63	1,370.5	289.3	7.96	821	1,330	37.4	1,080	39.9	228	278	< 1.0	< 1.0	< 0.250	10.3	0.151	511	0.0114	19.5	< 0.0050	0.130	0.0022	0.0037	0.62	< 0.50
	LC_PIZ1212_WG_2022-Q2_NP	2022 06 02	7.0	7.17	4.9	1,526	215.9	8.10	915	1,480	1.2	1,160	< 0.10	298	364	< 1.0	< 1.0	< 0.250	6.08	0.162	599	< 0.0050	12.6	< 0.0050	2.24	< 0.0010	0.0039	0.61	0.70
	LC_PIZ1212_WG_Q3-2022_NP	2022 08 17	20.8	7.93	6.17	1,316	74.6	7.80	754	1,240	1.9	981	0.72	276	336	< 1.0	< 1.0	< 0.250	7.48	0.172	458	< 0.0050	14.0	< 0.0050	0.817	< 0.0010	0.0066	0.60	1.23
	LC_PIZ1212_WG_Q4_2022_N	2022 10 19	7.88	7.33	7.79	1,245.7	57.5	8.03	707	1,150	2.1	864	2.03	239	291	< 1.0	< 1.0	< 0.250	8.72	0.188	434	< 0.0050	13.6	< 0.0050	1.09	< 0.0010	0.0043	< 0.50	< 0.50

All terms defined within the body of SNC-Lavalin's report.
< Denotes concentration less than indicated detection limit.
- Denotes analysis not conducted.
n/a Denotes no applicable standard/guideline.
QA/QC RPD Denotes quality assurance/quality control relative percent difference
* RPDs are not calculated where one or more concentrations are less than five times RDL.
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BOLD	Concentration greater than CSR Aquatic Life (AW) standard
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SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.
[b] Standard varies with Hardness.
[c] Standard varies with pH and Temperature. Temperature assumed 10C.
[d] Standard varies with Chloride.

TABLE LC-03: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Inorganics, Nutrients and Organics in Groundwater (LCO)

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Field Parameters					Physical Parameters						Dissolved Inorganics								Nutrients						Organics	
			Field Temperature	pH (field)	Dissolved Oxygen	Field Conductivity	Field ORP	pH	Hardness	Conductivity	Total Suspended Solids	Total Dissolved Solids	Turbidity	Total Alkalinity	Bicarbonate	Carbonate	Hydroxide	Bromide	Chloride	Fluoride	Sulphate	Ammonia Nitrogen	Nitrate Nitrogen	Nitrite Nitrogen	Kjeldahl Nitrogen-N	Ortho-Phosphate	Phosphorus, Total	Total Organic Carbon	Dissolved Organic Carbon
			C	pH	mg/L	µS/cm	mV	pH	mg/L	µS/cm	mg/L	mg/L	ntu	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
BC Standard																													
CSR Aquatic Life (AW)[a]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,500	2-3[b]	1,280-4,290[b]	1.31-18.5[c]	400	0.2-2[d]	n/a	n/a	n/a	n/a	n/a
CSR Irrigation Watering (IW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSR Livestock Watering (LW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	1	1,000	n/a	100	10	n/a	n/a	n/a	n/a	n/a
CSR Drinking Water (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	250	1.5	500	n/a	10	1	n/a	n/a	n/a	n/a	n/a
LCO Phase I Lower Line Creek																													
WL_MW-15-02-A	WL_MW-15-02-A_2022-03-28_N	2022 03 28	8.9	7.18	0.7	470.9	181.9	7.68	251	433	4.1	254	3.08	235	287	< 1.0	< 1.0	< 0.050	1.37	0.096	9.81	0.0177	0.0222	< 0.0010	0.138	0.0032	0.0064	1.00	3.89
	WL_MW-15-02-A_WG_2022-SA-01_N	2022 06 23	12.6	-	3.40	474.1	42.8	8.02	233	402	16.1	298	1.27	239	292	< 1.0	< 1.0	< 0.050	1.43	0.092	12.3	0.0211	0.0332	< 0.0010	< 0.050	< 0.0010	0.0050	1.77	2.97
	WL_MW-15-02-A_WG_2022-SA-02_N	2022 11 23	2.2	7.6	1.7	469	147	8.15	234	407	10.6	244	13.6	221	270	< 1.0	< 1.0	< 0.050	1.56	0.128	12.2	0.0171	< 0.0050	< 0.0010	< 0.050	0.0013	0.0052	0.62	1.02
WL_MW-15-02-B	WL_MW-15-02-B_2022-03-28_N	2022 03 28	7.2	6.7	2.3	2,103.0	191.6	7.05	1,150	2,010	2.2	1,310	1.30	493	602	< 1.0	< 1.0	< 0.250	*358*	< 0.100	68.3	< 0.0050	2.72	< 0.0050	0.281	0.0016	0.0027	0.85	3.14
	WL_MW-15-02-B_WG_2022-SA-01_N	2022 06 23	11.4	6.55	1.28	1,482	162.6	7.70	764	1,380	1.7	1,160	0.47	412	502	< 1.0	< 1.0	< 0.250	*161*	< 0.100	78.9	< 0.0050	2.41	< 0.0050	0.083	< 0.0010	0.0042	1.00	1.51
	WL_MW-15-02-B_WG_2022-SA-02_N	2022 11 23	6.5	6.85	1	1,080	188	7.61	592	950	< 1.0	605	0.40	503	613	< 1.0	< 1.0	< 0.250	18.2	< 0.100	76.5	< 0.0050	1.09	< 0.0050	0.076	< 0.0010	0.0026	< 0.50	< 0.50
WL_MW-15-04-B	WL_MW-15-04-B_2022-03-28_N	2022 03 28	6.1	6.39	0.3	1,174.0	165.4	6.95	702	1,110	23.2	701	48.8	612	746	< 1.0	< 1.0	< 0.050	1.60	0.102	45.7	0.214	3.38	0.0266	0.986	< 0.0010	0.0664	6.35	6.17
	WL_MW-15-04-B_WG_2022-SA-01_N	2022 06 22	7.4	6.45	0.03	1,101	55.4	7.34	626	1,070	4.5	659	5.25	599	731	< 1.0	< 1.0	< 0.050	1.28	0.085	30.7	0.143	0.584	0.117	1.76	0.0021	0.123	23.8	23.1
	WL_MW-15-04-B_WG_2022-SA-02_N	2022 11 23	6.8	6.74	0.8	1,166	4	7.26	603	943	108	555	403	655	799	< 1.0	< 1.0	0.058	2.04	0.116	0.34	0.778	< 0.0050	< 0.0010	1.23	< 0.0010	0.269	11.6	11.7
LC_MW_CP1A	CP SPO Deep Q1	2022 01 21	3.92	7.22	3.58	567	187.3	8.06	298	560	< 1.0	348	< 0.10	176	215	< 1.0	< 1.0	< 0.050	0.76	0.269	104	0.0137	2.26	0.0028	0.395	< 0.0010	0.0034	< 0.50	0.69
	LC_MW_CP1A_WG_Q2_2022_NP	2022 04 10	4.2	7.41	4.15	581	102.8	7.62	315	564	< 1.0	369	0.20	212	259	< 1.0	< 1.0	< 0.050	0.93	0.354	116	< 0.0050	2.58	0.0010	0.176	0.0025	0.0030	< 0.50	< 0.50
	LC_MW_CP1A_WG_Q3-2022_NP	2022 07 26	9.3	7.50	3.80	598	178.2	7.86	272	548	< 1.0	360	0.19	197	240	< 1.0	< 1.0	< 0.050	0.86	0.349	118	-	2.57	< 0.0010	< 0.500	< 0.0010	-	< 0.50	< 0.50
	LC_MW_CP1A_WG_Q4_2022_N	2022 10 20	8.22	7.51	4.10	584.8	57.1	7.95	273	529	< 1.0	330	< 0.10	205	250	< 1.0	< 1.0	< 0.050	0.84	0.332	118	< 0.0050	2.43	< 0.0010	< 0.500	0.0013	0.0025	< 0.50	0.95
LC_MW_CP1B	CP SPO Shallow Q1	2022 01 21	4.44	7.10	7.50	598	206	7.96	322	587	< 1.0	390	< 0.10	178	217	< 1.0	< 1.0	< 0.050	2.08	0.264	124	< 0.0050	2.62	< 0.0010	0.256	< 0.0010	0.0036	< 0.50	0.68
	LC_MW_CP1B_WG_Q2_2022_NP	2022 04 10	3.8	7.32	7.76	612	110.2	7.62	333	589	< 1.0	478	0.28	205	250	< 1.0	< 1.0	< 0.050	7.92	0.302	117	< 0.0050	2.12	< 0.0010	0.191	0.0014	< 0.0020	< 0.50	< 0.50
	LC_MW_CP1B_WG_Q3-2022_NP	2022 07 26	9.9	7.41	6.86	562	246.4	7.82	280	520	< 1.0	345	0.36	212	259	< 1.0	< 1.0	< 0.050	1.76	0.300	90.2	-	0.973	< 0.0010	< 0.500	< 0.0010	-	< 0.50	1.41
	LC_MW_CP1B_WG_Q4_2022_N	2022 10 20	8.58	7.35	7.27	616.9	70.5	7.85	315	556	< 1.0	326	< 0.10	231	282	< 1.0	< 1.0	< 0.050	1.07	0.315	113	< 0.0050	1.90	< 0.0010	< 0.500	< 0.0010	0.0025	< 0.50	< 0.50
	LC_CC2_WG_Q4_2022_NPCP1B	Duplicate	-	-	-	-	-	7.89	329	555	< 1.0	334	0.12	213	260	< 1.0	< 1.0	< 0.050	1.04	0.314	112	< 0.0050	1.90	< 0.0010	< 0.500	< 0.0010	0.0031	< 0.50	< 0.50
	QA/QC RPD%		-	-	-	-	-	1	4	0	*	2	*	8	8	*	*	*	3	0	1	*	0	*	*	*	*	*	*
Process Plant (^ denotes part of Study Area 5/6)																													
LC_PIZP1101	LC_PIZP1101_WG_Q2-2022_N	2022 05 20	7.0	7.68	0.88	310.0	6.5	7.97	123	283	161	226	170	189	230	< 1.0	< 1.0	< 0.050	1.12	*1.79*	3.39	0.0587	< 0.0050	< 0.0010	< 0.500	0.0040	0.335	4.33	0.55
	LC_PIZP1101_WG_Q3-2022_N	2022 08 05	11.0	7.85	0.23	310.8	-115.6	8.22	120	295	185	277	225	182	222	< 1.0	< 1.0	< 0.050	1.18	*1.54*	3.09	0.0226	< 0.0050	< 0.0010	0.763	< 0.0010	0.604	2.35	1.22
	LC_CC3_WG_Q3-2022_NP	Duplicate	-	-	-	-	-	8.25	124	295	196	281	225	181	220	< 1.0	< 1.0	< 0.050	1.18	*1.56*	3.08	0.0223	< 0.0050	< 0.0010	0.793	< 0.0010	0.566	2.62	1.59
	QA/QC RPD%		-	-	-	-	-	0	3	0	6	1	0	1	1	*	*	*	0	1	0	*	*	*	4	*	6	*	*
	LC_PIZP1101_WG_Q4_2022_N	2022 10 20	9.1	7.99	0.18	293.4	-200.3	8.07	124	282	279	193	259	190	232	< 1.0	< 1.0	< 0.050	1.18	*1.85*	3.14	0.0520	< 0.0050	< 0.0010	< 0.500	< 0.0010	0.386	< 0.50	3.23
LC_PIZP1103	LC_PIZP1103_WG_Q1_2022_NP	2022 03 11	4.6	7.38	1.5	711.3	156.7	8.04	131	751	39.7	462	44.8	421	514	< 1.0	< 1.0	< 0.050	3.90	0.354	27.1	0.0644	0.0690	0.0014	0.110	0.0492	0.0860	1.31	0.59
	LC_PIZP1103_WG_Q2-2022_NP	2022 05 25	10.2	7.56	3.1	777	70.1	8.05	137	716	15.5	434	15.6	391	477	< 1.0	< 1.0	< 0.050	2.76	0.372	32.9	0.0145	0.170	0.0019	< 0.500	0.0284	0.0397	0.81	0.82
	LC_PIZP1103_WG_Q3-2022_NP	2022 08 05	11.5	7.51	3.65	750	140.0	8.32	143	713	13.3	473	15.0	400	470	8.5	< 1.0	< 0.050	2.66	0.325	33.8	0.0148	0.173	< 0.0010	< 0.500	0.0267	0.0508	1.00	3.58
	LC_PIZP1103_WG_Q4_2022_N	2022 10 24	6.70	7.68	3.18	751.90	59.50	8.05	148	739	5.0	464	2.17	447	545	< 1.0	< 1.0	< 0.050	4.02	0.416	29.7	0.0509	0.202	< 0.0010	< 0.500	0.0399	0.0412	0.82	1.20
LC_PIZP1104	LC_PIZP1104_WG_Q1_2022_NP	2022 03 15	4.6	7.05	1.5	1,060	178.9	7.30	448	1,120	316	708	238	294	359	< 1.0	< 1.0	2.11	*194*	0.261	31.5	0.0181	0.183	< 0.0050	0.158	< 0.0010	0.567	5.71	1.01
	LC_PIZP1104_WG_Q2-2022_NP	2022 06 30	12.30	7.01	4.69	1,379	-45.8	7.59	657	1,210	303	910	167	236	288	< 1.0	< 1.0	2.98	*245*	0.230	74.9	0.0508	0.105	< 0.0050	0.763	< 0.0010	0.277	8.66	1.12
	LC_PIZP1104_WG_Q3-2022_NP	2022 08 29	11.2	7.35	6.89	1,592	114.5	7.29	738	1,450	1,660	1,020	1,020	256	312	< 1.0	< 1.0	3.76	*306*	0.250	98.2	0.0686	< 0.0250	< 0.0050	1.96	< 0.0010	1.34	134	103
	LC_PIZP1104_WG_Q4_2022_N	2022 11 03	5.0	7.27	2.41	1,226	-65.7	7.60	580	1,160	501	763	300	242	296	< 1.0	< 1.0	3.15	*238*	0.314	67.0	0.0769	0.365	0.0133	0.300	< 0.0010	0.242	5.08	1.18

All terms defined within the body of SNC-Lavalin's report.

<   Denotes concentration less than indicated detection limit.

-    Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

*   RPDs are not calculated where one or more concentrations are less than five times RDL.

RDL Denotes reported detection limit.

BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH and Temperature. Temperature assumed 10C.

[d] Standard varies with Chloride.

TABLE LC-03: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Inorganics, Nutrients and Organics in Groundwater (LCO)

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Field Parameters					Physical Parameters						Dissolved Inorganics								Nutrients						Organics	
			Field Temperature C	pH (field) pH	Dissolved Oxygen mg/L	Field Conductivity µS/cm	Field ORP mV	pH pH	Hardness mg/L	Conductivity µS/cm	Total Suspended Solids mg/L	Total Dissolved Solids mg/L	Turbidity ntu	Total Alkalinity mg/L	Bicarbonate mg/L	Carbonate mg/L	Hydroxide mg/L	Bromide mg/L	Chloride mg/L	Fluoride mg/L	Sulphate mg/L	Ammonia Nitrogen mg/L	Nitrate Nitrogen mg/L	Nitrite Nitrogen mg/L	Kjeldahl Nitrogen-N mg/L	Ortho-Phosphate mg/L	Phosphorus, Total mg/L	Total Organic Carbon mg/L	Dissolved Organic Carbon mg/L
BC Standard																													
CSR Aquatic Life (AW)[a]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,500	2-3[b]	1,280-4,290[b]	1.31-18.5[c]	400	0.2-2[d]	n/a	n/a	n/a	n/a	n/a
CSR Irrigation Watering (IW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSR Livestock Watering (LW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	1	1,000	n/a	100	10	n/a	n/a	n/a	n/a	n/a
CSR Drinking Water (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	250	1.5	500	n/a	10	1	n/a	n/a	n/a	n/a	n/a
Process Plant (^ denotes part of Study Area 5/6)																													
LC_PIZP1105	LC_PIZP1105_WG_Q1-2022_N	2022 03 10	4.1	6.77	5.76	1,410	110	7.20	679	1,360	620	821	339	386	471	< 1.0	< 1.0	2.16	*192*	0.124	111	0.0070	0.313	< 0.0050	0.064	0.0022	0.916	2.45	1.62
	WG_Q1-2022_CC3	Duplicate	-	-	-	-	-	7.24	708	1,360	1,070	841	510	390	476	< 1.0	< 1.0	2.21	*195*	0.127	104	0.0078	0.0973	< 0.0050	< 0.050	0.0024	1.81	2.14	1.92
	QA/QC RPD%		-	-	-	-	-	1	4	0	53	2	40	1	1	*	*	2	2	2	7	*	105	*	*	*	66	*	*
	LC_PIZP1105_WG_Q2-2022_N	2022 05 26	8.6	6.85	3.8	1,234	108.7	7.66	757	1,340	75.9	752	31.2	404	493	< 1.0	< 1.0	1.93	*174*	0.178	114	0.0155	1.23	< 0.0050	< 0.500	0.0054	0.128	1.21	< 0.50
	LC_PIZP1105_WG_Q3-2022_N	2022 08 30	14.64	6.52	4.71	22.3	266.9	7.13	803	1,320	3,070	823	3,010	501	612	< 1.0	< 1.0	1.45	*137*	0.199	156	0.0183	0.0492	< 0.0050	2.81	< 0.0010	3.84	29.0	0.91
	LC_PIZP1105_WG_Q4_2022_N	2022 10 17	8.8	6.79	5.0	1,305	156.9	7.14	790	1,300	2,070	899	1,740	474	579	< 1.0	< 1.0	1.57	*122*	0.221	168	0.0239	0.0693	< 0.0050	0.776	0.0026	0.576	2.42	0.66
LC_MW_ER4A^	LC_MW_ER4A_WG_Q1-2022_N	2022 03 03	5.5	7.45	0.48	522	-133.3	7.87	284	501	< 1.0	351	1.62	178	217	< 1.0	< 1.0	< 0.050	2.40	0.110	92.7	0.0137	< 0.0050	< 0.0010	< 0.050	< 0.0010	0.0036	< 0.50	1.50
	LC_MW_ER4A_WG_Q2-2022_N	2022 05 12	6.7	7.50	0.62	519	-113.2	8.07	268	496	< 1.0	310	1.46	179	218	< 1.0	< 1.0	< 0.050	2.20	0.124	97.0	0.0205	0.0227	< 0.0010	< 0.500	< 0.0010	0.0029	< 0.50	0.66
	LC_MW_ER4A_WG_Q3-2022_NP	2022 08 03	9.9	7.51	0.28	523	-96.0	8.01	273	482	1.2	347	1.15	210	257	< 1.0	< 1.0	< 0.050	2.31	0.131	94.4	0.0165	0.0167	< 0.0010	< 0.500	< 0.0010	0.0040	< 0.50	< 0.50
	LC_MW_ER4A_WG_Q4_2022_N	2022 10 13	9.76	7.41	0.26	528	-60.8	7.97	285	490	< 1.0	311	1.42	181	220	< 1.0	< 1.0	< 0.050	2.74	0.156	105	0.0167	0.0080	0.0010	< 0.500	< 0.0010	0.0032	< 0.50	0.74
LC_MW_ER4B^	LC_MW_ER4B_WG_Q1-2022_N	2022 03 03	4.6	7.34	8.27	541	64.9	7.88	296	524	< 1.0	323	0.15	192	234	< 1.0	< 1.0	< 0.050	2.99	0.125	83.6	< 0.0050	3.22	0.0013	0.194	< 0.0010	< 0.0020	< 0.50	0.78
	LC_MW_ER4B_WG_Q2-2022_N	2022 05 12	6.8	7.34	8.12	589	61.3	8.07	309	565	1.1	366	< 0.10	189	230	< 1.0	< 1.0	< 0.050	3.21	0.133	106	< 0.0050	4.17	< 0.0010	< 0.500	< 0.0010	< 0.0020	< 0.50	0.58
	LC_MW_ER4B_WG_Q3-2022_NP	2022 08 03	13.5	7.36	4.00	462.5	111.1	7.99	250	426	< 1.0	286	0.21	211	258	< 1.0	< 1.0	< 0.050	1.25	0.180	49.8	< 0.0050	1.35	< 0.0010	< 0.500	< 0.0010	< 0.0020	< 0.50	1.72
	LC_MW_ER4B_WG_Q4_2022_N	2022 10 13	12.29	7.33	3.29	523	44.5	7.96	286	492	< 1.0	300	< 0.10	206	252	< 1.0	< 1.0	< 0.050	2.33	0.201	74.1	< 0.0050	2.19	0.0012	< 0.500	< 0.0010	< 0.0020	< 0.50	< 0.50
Blanks																													
Field Blanks																													
LC_MW20_01	LC_MT3_WG_2022-Q1_NP	2022 03 01	-	-	-	-	-	5.11	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
LC_PIZP1105	WG_Q1-2022_MT2	2022 03 10	-	-	-	-	-	5.23	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
LC_PIZP1101	WG_Q1-2022_013_MT3	2022 03 11	-	-	-	-	-	5.47	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0408	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
LC_PIZP1105	LC_MT2_WG_Q4_2022_NP2	2022 10 17	-	-	-	-	-	5.61	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0206	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
LC_PIZDC0901	LC_MT1_WG_Q4_2022_NP2	2022 10 25	-	-	-	-	-	5.18	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0234	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
LC_PIZDC1307	LC_MT1_WG_Q4_2022_NP1	2022 10 26	-	-	-	-	-	5.52	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0407	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
Trip Blanks																													
	LC_RD3_WG_2022-Q1_NP	2022 03 01	-	-	-	-	-	5.23	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	-
	WG_Q1-2022_RD2	2022 03 10	-	-	-	-	-	5.54	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	-
	WG_Q2-2022_012_RD2	2022 05 20	-	-	-	-	-	5.17	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	-
	LC_RD3_WG_Q3-2022_NP	2022 10 25	-	-	-	-	-	-	< 0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.50

All terms defined within the body of SNC-Lavalin's report.

< Denotes concentration less than indicated detection limit.

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n/a Denotes no applicable standard/guideline.

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* RPDs are not calculated where one or more concentrations are less than five times RDL.

RDL Denotes reported detection limit.

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH and Temperature. Temperature assumed 10C.

[d] Standard varies with Chloride.

BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

TABLE LC-04: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Metals in Groundwater (LCO)

				Dissolved Metals																															
Sample Location	**Sample ID**	**Sample Date (yyyy mm dd)**	**Hardness mg/L**	**Aluminum µg/L**	**Antimony µg/L**	**Arsenic µg/L**	**Barium µg/L**	**Beryllium µg/L**	**Bismuth µg/L**	**Boron µg/L**	**Cadmium µg/L**	**Calcium mg/L**	**Chromium µg/L**	**Cobalt µg/L**	**Copper µg/L**	**Iron µg/L**	**Lead µg/L**	**Lithium µg/L**	**Magnesium mg/L**	**Manganese µg/L**	**Mercury µg/L**	**Molybdenum µg/L**	**Nickel µg/L**	**Potassium mg/L**	**Selenium µg/L**	**Silver µg/L**	**Sodium mg/L**	**Strontium µg/L**	**Thallium µg/L**	**Tin µg/L**	**Titanium µg/L**	**Uranium µg/L**	**Vanadium µg/L**	**Zinc[f] µg/L**
BC Standard																																			
CSR Aquatic Life (AW)[a]			n/a	n/a	90	50	10,000	1.5	n/a	12,000	0.5-4[b]	n/a	10[d]	40	20-90	n/a	40-160[b]	n/a	n/a	n/a	0.25	10,000	250-1,500[b]	n/a	20	0.5-15[b]	n/a	n/a	3	n/a	1,000	85	n/a	75-2,400[b]
CSR Irrigation Watering (IW)			n/a	5,000	n/a	100	n/a	100	n/a	500	5	n/a	5[d]	50	200	5,000	200	2,500	n/a	200	1	10	200	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	10	100	1,000-5,000[c]
CSR Livestock Watering (LW)			n/a	5,000	n/a	25	n/a	100	n/a	5,000	80	1,000	50[d]	1,000	300	n/a	100	5,000	n/a	n/a	2	50	1,000	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	200	100	2,000
CSR Drinking Water (DW)			n/a	9,500	6	10	1,000	8	n/a	5,000	5	n/a	50[d]	20[e]	1,500	6,500	10	8	n/a	1,500	1	250	80	n/a	10	20	200	2,500	n/a	2,500	n/a	20	20	3,000
Health-based Value (HBV)[g]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,200	n/a	n/a	n/a	2,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Phase II Upper LCO Dry Creek																																			
LC_PIZDC0901	LC_PIZDC0901_WG_Q1-2022_NP	2022 03 14	334	1.1	0.34	0.29	245	< 0.020	< 0.050	< 10	0.0690	90.8	< 0.10	< 0.10	0.83	< 10	< 0.050	3.2	26.1	0.44	< 0.0050	0.876	1.48	1.22	0.635	< 0.010	2.50	159	< 0.010	< 0.10	< 0.30	2.55	< 0.50	2.0
	LC_PIZDC0901_WG_Q2-2022_NP	2022 06 10	362	3.3	0.16	0.25	236	< 0.020	< 0.050	< 10	0.110	101	< 0.10	< 0.10	0.60	< 10	< 0.050	2.3	26.7	0.83	< 0.0050	0.530	0.89	1.18	0.369	< 0.010	2.86	184	< 0.010	< 0.10	< 0.30	4.61	0.59	1.3
	LC_PIZDC0901_WG_Q3-2022_NP	2022 08 15	387	1.3	0.17	0.27	262	< 0.020	< 0.050	< 10	0.115	105	< 0.10	< 0.10	0.89	< 10	< 0.050	3.1	30.3	0.24	< 0.0050	0.601	0.85	1.28	0.419	< 0.010	2.44	181	< 0.010	< 0.10	< 0.30	3.19	0.76	1.1
	LC_PIZDC0901_WG_Q4_2022_N	2022 10 25	462	5.1	0.27	0.29	271	< 0.020	< 0.050	11	0.0964	134	0.11	< 0.10	0.56	< 10	< 0.050	4.9	31.0	0.19	< 0.0050	0.877	2.71	1.32	0.366	< 0.010	2.40	184	0.018	< 0.10	< 0.30	2.93	< 0.50	2.3
	LC_CC1_WG_Q4_2022_NP3	Duplicate	453	3.8	0.25	0.26	254	< 0.020	< 0.050	10	0.0945	132	< 0.10	< 0.10	0.53	< 10	< 0.050	4.6	30.0	0.23	< 0.0050	0.829	2.46	1.25	0.359	< 0.010	2.26	178	0.018	< 0.10	< 0.30	2.68	< 0.50	2.1
	QA/QC RPD%		2	*	*	*	6	*	*	*	2	2	*	*	*	*	*	*	3	*	*	6	*	5	2	*	6	3	*	*	*	9	*	*
LC_PIZDC1306	LC_PIZDC1306_Q2_2022_NP	2022 04 17	243	2.0	0.18	< 0.10	164	< 0.020	< 0.050	< 10	0.118	59.9	< 0.10	< 0.10	0.30	< 10	< 0.050	11.6	22.7	< 0.10	< 0.0050	1.57	1.06	2.09	2.23	< 0.010	0.836	70.8	< 0.010	0.12	< 0.30	0.878	0.56	11.6
	LC_PIZDC1306_WG_Q3-2022_NP	2022 08 16	266	1.0	0.21	< 0.10	163	< 0.020	< 0.050	10	0.125	65.4	< 0.10	< 0.10	0.49	< 10	< 0.050	9.7	25.0	< 0.10	< 0.0050	1.93	1.13	2.13	5.61	< 0.010	0.722	69.4	< 0.010	< 0.10	< 0.30	0.939	0.52	3.2
	LC_PIZDC1306_WG_Q4_2022_N	2022 10 18	286	< 1.0	0.20	< 0.10	168	< 0.020	< 0.050	10	0.128	73.7	< 0.10	< 0.10	0.33	< 10	< 0.050	9.8	24.9	< 0.10	< 0.0050	2.17	1.13	2.00	5.29	< 0.010	0.668	82.7	< 0.010	< 0.10	< 0.30	0.866	0.55	2.9
LC_PIZDC1307	LC_PIZDC1307_WG_Q1-2022_NP	2022 03 04	169	< 1.0	< 0.10	1.58	1,450	< 0.020	< 0.050	21	< 0.0100	36.2	< 0.10	< 0.10	< 0.20	1,120	< 0.050	69.2	19.2	8.06	< 0.0050	*31.9*	< 0.50	5.11	< 0.050	< 0.010	13.6	137	< 0.010	0.12	< 0.30	0.026	< 0.50	9.6
	LC_PIZDC1307_WG_Q2_2022_NP	2022 05 06	184	< 1.0	< 0.10	1.69	1,460	< 0.020	< 0.050	24	< 0.0050	39.5	< 0.10	< 0.10	< 0.20	1,120	< 0.050	76.0	20.7	8.21	< 0.0050	*31.4*	< 0.50	5.22	< 0.050	< 0.010	14.5	130	< 0.010	< 0.10	< 0.30	0.024	< 0.50	< 1.0
	LC_PIZDC1307_WG_Q3-2022_NP	2022 08 25	174	1.2	< 0.10	1.54	1,440	< 0.020	< 0.050	25	0.0093	37.0	< 0.10	< 0.10	< 0.20	975	< 0.050	72.1	19.8	7.81	< 0.0050	*33.1*	< 0.50	5.03	< 0.050	< 0.010	14.2	135	< 0.010	< 0.10	< 0.30	0.020	< 0.50	< 1.0
	LC_PIZDC1307_WG_Q4_2022_NP	2022 10 26	180	< 1.0	< 0.10	1.62	1,340	< 0.020	< 0.050	24	0.0091	38.5	< 0.10	< 0.10	< 0.20	941	< 0.050	73.5	20.3	7.44	< 0.0050	*31.2*	< 0.50	4.66	< 0.050	< 0.010	13.0	124	< 0.010	< 0.10	< 0.30	0.019	< 0.50	< 1.0
	LC_CC1_WG_Q4_2022_NP1307	Duplicate	194	1.3	< 0.10	1.63	1,430	< 0.020	< 0.050	26	0.0073	42.9	< 0.10	< 0.10	< 0.20	1,020	< 0.050	77.8	21.0	7.89	< 0.0050	*34.3*	< 0.50	4.90	< 0.050	< 0.010	13.9	140	< 0.010	< 0.10	< 0.30	0.019	< 0.50	1.8
	QA/QC RPD%		7	*	*	1	6	*	*	*	*	11	*	*	*	8	*	6	3	6	*	9	*	5	*	*	7	12	*	*	*	*	*	*
LC_PIZDC1308	LC_PIZDC1308_WG_Q1-2022_NP	2022 03 04	263	2.7	< 0.10	0.18	404	< 0.020	< 0.050	13	0.0192	70.6	< 0.10	1.01	< 0.20	734	< 0.050	24.6	21.0	69.2	< 0.0050	8.54	2.03	2.73	< 0.050	< 0.010	5.66	111	0.035	< 0.10	< 0.30	0.730	< 0.50	3.8
	LC_PIZDC1308_WG_Q2_2022_NP	2022 05 06	388	1.1	0.10	< 0.10	306	< 0.020	< 0.050	12	0.155	105	< 0.10	0.52	2.04	< 10	< 0.050	8.0	30.6	1.55	< 0.0050	1.27	1.28	1.92	0.256	< 0.010	1.40	106	0.017	< 0.10	< 0.30	1.59	< 0.50	2.8
	LC_PIZDC1308_WG_Q3-2022_NP	2022 08 25	394	2.0	< 0.10	< 0.10	320	< 0.020	< 0.050	12	0.135	106	< 0.10	0.58	0.59	12	< 0.050	8.8	31.4	9.82	< 0.0050	1.43	1.06	2.05	0.111	< 0.010	1.66	117	0.015	< 0.10	< 0.30	1.74	< 0.50	2.3
	LC_PIZDC1308_WG_Q4_2022_NP	2022 10 26	296	< 1.0	< 0.10	< 0.10	309	< 0.020	< 0.050	14	0.0298	77.6	< 0.10	0.50	< 0.20	79	< 0.050	18.1	24.8	39.9	< 0.0050	5.84	1.13	2.17	0.051	< 0.010	3.30	92.9	0.016	< 0.10	< 0.30	0.941	< 0.50	1.2
	LC_CC1_WG_Q4_2022_NP5	Duplicate	298	< 1.0	< 0.10	< 0.10	321	< 0.020	< 0.050	14	0.0350	78.4	< 0.10	0.51	< 0.20	80	< 0.050	17.8	24.8	39.0	< 0.0050	5.53	1.04	2.22	< 0.050	< 0.010	3.24	94.2	0.015	< 0.10	< 0.30	0.958	< 0.50	1.4
	QA/QC RPD%		1	*	*	*	4	*	*	*	16	1	*	2	*	1	*	2	0	2	*	5	*	2	*	*	2	1	*	*	*	2	*	*
LC_PIZDC1404S	LC_PIZDC1404S_WG_Q1-2022_NP	2022 03 08	205	2.0	< 0.10	1.41	243	< 0.020	< 0.050	< 10	< 0.0050	51.0	< 0.10	0.21	0.47	570	< 0.050	5.7	18.8	15.6	< 0.0050	3.21	1.24	1.57	< 0.050	< 0.010	0.991	46.0	< 0.010	< 0.10	< 0.30	0.492	< 0.50	5.9
	LC_PIZDC1404S_WG_Q2-2022_NP	2022 05 11	193	1.6	< 0.10	1.89	238	< 0.020	< 0.050	< 10	< 0.0050	47.4	< 0.10	0.32	< 0.20	759	< 0.050	5.2	18.2	27.8	< 0.0050	3.41	1.37	1.56	< 0.050	< 0.010	0.949	45.5	< 0.010	< 0.10	< 0.30	0.517	< 0.50	3.8
	LC_PIZDC1404S_WG_Q3-2022_NP	2022 08 25	183	1.6	< 0.10	1.45	212	< 0.020	< 0.050	12	< 0.0050	45.4	< 0.10	0.34	2.31	716	< 0.050	5.4	16.9	24.3	< 0.0050	3.32	1.34	1.45	< 0.050	< 0.010	0.824	44.4	< 0.010	< 0.10	< 0.30	0.556	< 0.50	2.0
	LC_PIZDC1404S_WG_Q4_2022_N	2022 10 18	207	1.4	< 0.10	1.73	241	< 0.020	< 0.050	< 10	< 0.0050	53.8	< 0.10	0.30	< 0.20	621	< 0.050	5.6	17.6	25.1	< 0.0050	3.63	1.28	1.45	< 0.050	< 0.010	0.999	50.0	< 0.010	< 0.10	< 0.30	0.489	< 0.50	< 1.0
LC_PIZDC1404D	LC_PIZDC1404D_WG_Q1-2022_NP	2022 03 08	307	3.3	0.15	1.84	4,280	< 0.020	< 0.050	25	0.0451	62.3	< 0.10	0.94	0.35	2,340	< 0.050	613	36.7	30.5	< 0.0050	*19.9*	0.60	26.6	0.060	< 0.010	35.0	233	< 0.010	< 0.10	< 0.30	0.106	< 0.50	8.6
	LC_PIZDC1404D_WG_Q2-2022_NP	2022 05 11	298	1.6	0.20	2.97	4,190	< 0.020	< 0.050	27	< 0.0050	61.0	< 0.10	0.42	< 0.20	2,820	< 0.050	651	35.4	22.7	< 0.0050	*22.4*	< 0.50	24.7	< 0.050	< 0.010	34.2	239	< 0.010	< 0.10	< 0.30	0.090	< 0.50	2.1
	LC_PIZDC1404D_WG_Q3-2022_NP	2022 08 25	283	1.8	< 0.10	2.26	4,070	< 0.020	< 0.050	32	0.0089	55.3	< 0.10	0.42	0.80	2,480	< 0.050	680	35.3	22.8	< 0.0050	*21.1*	< 0.50	23.9	< 0.050	< 0.010	34.1	232	< 0.010	< 0.10	< 0.30	0.084	< 0.50	2.5
	LC_PIZDC1404D_WG_Q4_2022_N	2022 10 18	324	1.6	< 0.10	2.74	4,650	< 0.020	< 0.050	25	< 0.0050	65.6	< 0.10	0.42	< 0.20	2,870	< 0.050	605	38.9	22.3	< 0.0050	*22.4*	< 0.50	25.5	0.050	< 0.010	31.2	260	< 0.010	< 0.10	< 0.30	0.085	< 0.50	2.7

All terms defined within the body of SNC-Lavalin's report.

<	Denotes concentration less than indicated detection limit.
-	Denotes analysis not conducted.
n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL	Denotes reported detection limit.

BOLD	Concentration greater than CSR Aquatic Life (AW) FR standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH.

[d] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.

[e] Interim BC MoE Regional Background Estimate (Protocol 9 Determining Background Groundwater Quality).

[f] There is no Zinc standard specified for H > 400; therefore, the standard for H=300-<400 is applied as a conservative comparison.

[g] Ramboll calculated health-based values for these two parameters based on toxicity values (tolerable daily intakes; TDI) and drinking water allocation factors (DW AFs), documented in Appendix IV.

TABLE LC-04: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Metals in Groundwater (LCO)

				Dissolved Metals																															
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Hardness mg/L	Aluminum µg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Bismuth µg/L	Boron µg/L	Cadmium µg/L	Calcium mg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Lithium µg/L	Magnesium mg/L	Manganese µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Potassium mg/L	Selenium µg/L	Silver µg/L	Sodium mg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Uranium µg/L	Vanadium µg/L	Zinc[f] µg/L
BC Standard																																			
CSR Aquatic Life (AW)[a]			n/a	n/a	90	50	10,000	1.5	n/a	12,000	0.5-4[b]	n/a	10[d]	40	20-90	n/a	40-160[b]	n/a	n/a	n/a	0.25	10,000	250-1,500[b]	n/a	20	0.5-15[b]	n/a	n/a	3	n/a	1,000	85	n/a	75-2,400[b]
CSR Irrigation Watering (IW)			n/a	5,000	n/a	100	n/a	100	n/a	500	5	n/a	5[d]	50	200	5,000	200	2,500	n/a	200	1	10	200	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	10	100	1,000-5,000[c]
CSR Livestock Watering (LW)			n/a	5,000	n/a	25	n/a	100	n/a	5,000	80	1,000	50[d]	1,000	300	n/a	100	5,000	n/a	n/a	2	50	1,000	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	200	100	2,000
CSR Drinking Water (DW)			n/a	9,500	6	10	1,000	8	n/a	5,000	5	n/a	50[d]	20[e]	1,500	6,500	10	8	n/a	1,500	1	250	80	n/a	10	20	200	2,500	n/a	2,500	n/a	20	20	3,000
Health-based Value (HBV)[g]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,200	n/a	n/a	n/a	2,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Phase II Lower LCO Dry Creek (+ denotes part of Study Area 2)																																			
RG_MW_DC1A[+]	RG_MW_DC1A_WG_Q2_2022_NP	2022 04 29	220	< 1.0	< 0.10	2.38	452	< 0.020	< 0.050	22	< 0.0050	52.0	< 0.10	0.88	0.66	1,970	< 0.050	14.8	21.9	56.2	< 0.0050	5.88	1.30	2.50	< 0.050	< 0.010	3.32	118	0.014	< 0.10	< 0.30	0.132	< 0.50	1.6
	RG_MW_DC1A_WG_Q3-2022_NP	2022 08 15	247	< 1.0	< 0.10	2.21	441	< 0.020	< 0.050	24	< 0.0050	56.8	< 0.10	0.87	0.29	1,460	< 0.050	13.9	25.5	67.9	< 0.0050	6.59	1.45	2.48	< 0.050	< 0.010	3.70	151	0.018	< 0.10	< 0.30	0.210	< 0.50	< 1.0
	RG_MW_DC1A_WG_Q4_2022_N	2022 10 20	243	< 1.0	< 0.10	2.54	432	< 0.020	< 0.050	28	< 0.0050	57.3	< 0.10	0.80	< 0.20	1,540	< 0.050	11.2	24.2	56.8	< 0.0050	7.10	1.32	2.27	0.052	< 0.010	3.32	158	0.013	< 0.10	< 0.30	0.204	< 0.50	< 1.0
	LC_CC3_WG_Q4_2022_NP	Duplicate	239	< 1.0	< 0.10	2.45	415	< 0.020	< 0.050	27	< 0.0050	55.0	< 0.10	0.83	< 0.20	1,440	< 0.050	10.6	24.8	56.5	< 0.0050	6.94	1.36	2.24	0.114	< 0.010	3.26	155	0.015	< 0.10	< 0.30	0.216	< 0.50	< 1.0
	QA/QC RPD%		2	*	*	4	4	*	*	*	*	4	*	4	*	7	*	6	2	1	*	2	*	1	*	*	2	2	*	*	*	6	*	*
RG_MW_DC1B[+]	EXT GW TD Q1	2022 03 07	224	1.7	< 0.10	2.63	421	< 0.020	< 0.050	22	0.0586	53.2	< 0.10	0.92	0.29	1,610	< 0.050	16.7	22.2	77.9	< 0.0050	5.90	1.61	2.62	< 0.050	< 0.010	3.76	118	0.023	< 0.10	< 0.30	0.134	< 0.50	8.3
	RG_MW_DC1B_WG_Q2_2022_NP	2022 04 29	224	1.1	< 0.10	2.28	402	< 0.020	< 0.050	25	< 0.0050	53.6	< 0.10	0.83	< 0.20	1,460	< 0.050	12.2	22.0	61.2	< 0.0050	6.91	1.34	2.42	< 0.050	< 0.010	3.48	142	< 0.010	< 0.10	< 0.30	0.212	< 0.50	7.5
	RG_MW_DC1B_WG_Q3-2022_NP	2022 08 15	241	< 1.0	< 0.10	2.70	479	< 0.020	< 0.050	22	< 0.0050	55.0	< 0.10	0.92	< 0.20	2,000	< 0.050	16.0	25.1	61.7	< 0.0050	6.52	1.42	2.65	< 0.050	< 0.010	3.75	130	0.018	< 0.10	< 0.30	0.136	< 0.50	1.0
	RG_MW_DC1B_WG_Q4_2022_N	2022 10 20	243	< 1.0	< 0.10	2.85	502	< 0.020	< 0.050	26	< 0.0050	55.8	< 0.10	0.88	0.27	1,860	< 0.050	13.8	25.1	55.9	< 0.0050	6.12	1.38	2.77	< 0.050	< 0.010	3.33	119	0.019	< 0.10	< 0.30	0.123	< 0.50	1.5
LCO Phase I Centre Line Creek North																																			
LC_PIZM0903	LC_PIZM0903_WG_Q1_2022_NP	2022 03 17	242	< 1.0	< 0.10	< 0.10	76.4	< 0.020	< 0.050	< 10	0.0110	66.9	0.16	< 0.10	0.23	< 10	< 0.050	5.4	18.3	0.22	< 0.0050	1.17	< 0.50	0.482	11.2	< 0.010	2.02	166	< 0.010	< 0.10	< 0.30	1.05	< 0.50	< 1.0
	LC_PIZM0903_WG_Q2-2022_NP	2022 05 26	228	1.2	< 0.10	0.11	86.4	< 0.020	< 0.050	< 10	0.0062	61.7	0.17	< 0.10	0.22	< 10	< 0.050	5.6	18.0	5.54	< 0.0050	1.09	< 0.50	0.489	11.0	< 0.010	1.91	149	< 0.010	< 0.10	< 0.30	1.05	< 0.50	< 1.0
	LC_PIZM0903_WG_Q3-2022_NP	2022 08 19	230	< 1.0	< 0.10	0.20	91.3	< 0.020	< 0.050	16	0.0155	59.3	0.17	< 0.10	0.32	< 10	< 0.050	6.1	19.9	2.58	< 0.0050	1.92	< 0.50	0.687	8.36	< 0.010	3.11	183	< 0.010	< 0.10	< 0.30	1.14	< 0.50	< 1.0
	LC_PIZM0903_WG_Q4_2022_N	2022 10 17	218	< 1.0	< 0.10	0.12	82.4	< 0.020	< 0.050	< 10	0.0117	56.7	0.24	< 0.10	< 0.20	< 10	< 0.050	5.4	18.7	0.11	< 0.0050	1.12	< 0.50	0.568	9.64	< 0.010	2.05	144	< 0.010	< 0.10	< 0.30	0.976	< 0.50	< 1.0
LCO Phase I Centre Line Creek South																																			
LC_MW20_01	LC_MW20_01_WG_2022-Q1_NP	2022 03 01	542	1.9	< 0.10	< 0.10	57.2	< 0.020	< 0.050	14	0.0351	141	0.13	< 0.10	1.79	< 10	0.080	50.2	46.1	0.73	< 0.0050	0.509	< 0.50	0.998	***50.1***	< 0.010	9.60	265	< 0.010	0.14	< 0.30	1.97	< 0.50	5.3
	LC_CC3_WG_2022-Q1_NP	Duplicate	537	1.5	< 0.10	< 0.10	55.4	< 0.020	< 0.050	14	0.0279	140	0.12	< 0.10	1.53	< 10	0.074	50.3	45.6	0.68	< 0.0050	0.545	< 0.50	0.954	***50.5***	< 0.010	9.34	263	< 0.010	0.12	< 0.30	1.99	< 0.50	4.2
	QA/QC RPD%		1	*	*	*	3	*	*	*	23	1	*	*	16	*	*	0	1	7	*	7	*	5	1	*	3	1	*	*	*	1	*	*
	LC_MW20_01_WG_2022-Q2_NP	2022 06 02	509	1.6	< 0.10	< 0.10	58.8	< 0.020	< 0.050	12	0.0289	127	0.15	< 0.10	1.29	< 10	< 0.050	46.4	46.5	< 0.10	< 0.0050	0.514	< 0.50	0.988	***50.6***	< 0.010	9.62	253	< 0.010	< 0.10	< 0.30	1.88	< 0.50	2.6
	LC_MW20_01_WG_Q3-2022_NP	2022 08 17	499	1.1	< 0.10	< 0.10	56.6	< 0.020	< 0.050	14	0.0235	125	< 0.10	< 0.10	0.39	< 10	< 0.050	53.2	45.5	0.16	< 0.0050	0.486	< 0.50	0.987	***56.6***	< 0.010	9.23	235	< 0.010	< 0.10	< 0.30	2.26	< 0.50	< 1.0
	LC_MW20_01_WG_Q4_2022_N	2022 10 17	537	1.1	< 0.10	< 0.10	56.0	< 0.020	< 0.050	14	0.0247	131	0.11	< 0.10	0.38	< 10	< 0.050	50.4	50.9	< 0.10	< 0.0050	0.491	< 0.50	1.10	***65.0***	< 0.010	10.7	249	< 0.010	< 0.10	< 0.30	2.07	< 0.50	< 1.0
LC_MW20_02A	LC_MW20_02A_WG_2022-Q1_NP	2022 03 02	446	< 1.0	< 0.10	0.65	53.0	< 0.020	< 0.050	< 10	< 0.0050	116	< 0.10	< 0.10	< 0.20	3,730	< 0.050	24.0	38.1	*241*	< 0.0050	3.96	< 0.50	0.737	0.062	< 0.010	8.47	315	< 0.010	< 0.10	< 0.30	0.267	< 0.50	< 1.0
	LC_MW20_02A_WG_2022-Q2_NP	2022 06 02	457	1.4	< 0.10	0.63	52.8	< 0.020	< 0.050	< 10	< 0.0050	114	< 0.10	< 0.10	< 0.20	3,620	< 0.050	25.1	41.9	*256*	< 0.0050	3.68	< 0.50	0.732	< 0.050	< 0.010	8.64	288	< 0.010	< 0.10	< 0.30	0.291	< 0.50	< 1.0
	LC_MW20_02A_WG_Q3-2022_NP	2022 08 17	477	< 1.0	< 0.10	0.62	51.8	< 0.020	< 0.050	< 10	< 0.0050	122	< 0.10	< 0.10	< 0.20	3,670	< 0.050	27.9	41.9	*258*	< 0.0050	3.33	< 0.50	0.748	0.057	< 0.010	8.78	281	< 0.010	< 0.10	< 0.30	0.347	< 0.50	< 1.0
	LC_MW20_02A_WG_Q4_2022_N	2022 10 17	492	< 1.0	< 0.10	0.71	50.2	< 0.020	< 0.050	11	< 0.0050	123	< 0.10	< 0.10	< 0.20	3,840	< 0.050	25.5	45.0	*258*	< 0.0050	3.66	< 0.50	0.772	< 0.050	< 0.010	9.69	294	< 0.010	< 0.10	< 0.30	0.306	< 0.50	< 1.0
LC_MW20_02B	LC_MW20_02B_WG_2022-Q1_NP	2022 03 02	485	< 1.0	< 0.10	< 0.10	99.8	< 0.020	< 0.050	12	0.0298	126	0.10	< 0.10	< 0.20	< 10	< 0.050	43.8	41.3	0.12	< 0.0050	0.490	< 0.50	1.08	***51.8***	< 0.010	8.55	262	< 0.010	< 0.10	< 0.30	1.59	< 0.50	< 1.0
	LC_MW20_02B_WG_2022-Q2_NP	2022 06 02	506	< 1.0	< 0.10	< 0.10	99.7	< 0.020	< 0.050	11	0.0302	128	0.12	< 0.10	0.22	< 10	< 0.050	42.8	45.3	< 0.10	< 0.0050	0.466	< 0.50	1.06	***53.6***	< 0.010	8.74	250	< 0.010	< 0.10	< 0.30	1.55	< 0.50	< 1.0
	LC_MW20_02B_WG_Q3-2022_NP	2022 08 17	494	< 1.0	< 0.10	< 0.10	93.9	< 0.020	< 0.050	13	0.0243	127	0.12	< 0.10	0.39	< 10	< 0.050	45.0	43.0	0.24	< 0.0050	0.472	< 0.50	1.05	***51.2***	< 0.010	8.44	236	< 0.010	< 0.10	< 0.30	1.58	< 0.50	< 1.0
	LC_MW20_02B_WG_Q4_2022_N	2022 10 17	487	< 1.0	< 0.10	< 0.10	85.1	< 0.020	< 0.050	13	0.0277	125	0.12	< 0.10	< 0.20	< 10	< 0.050	42.9	42.4	< 0.10	< 0.0050	0.515	< 0.50	1.11	***49.1***	< 0.010	8.92	240	< 0.010	< 0.10	< 0.30	1.48	< 0.50	< 1.0
LC_MW20_03	LC_MW20_03_WG_2022-Q1_NP	2022 03 02	303	< 1.0	< 0.10	2.10	281	< 0.020	< 0.050	12	0.0315	81.3	< 0.10	0.58	1.29	810	0.194	10.5	24.4	87.4	< 0.0050	1.33	1.18	1.10	0.062	< 0.010	3.69	228	0.013	0.19	< 0.30	0.665	< 0.50	8.4
	LC_MW20_03_WG_2022-Q2_NP	2022 06 03	301	< 1.0	< 0.10	1.90	272	< 0.020	< 0.050	10	0.0122	81.8	< 0.10	0.54	< 0.20	578	< 0.050	9.1	23.4	82.9	< 0.0050	1.37	1.30	0.858	< 0.050	< 0.010	3.24	215	0.015	< 0.10	< 0.30	0.685	< 0.50	4.5
	LC_MW20_03_WG_Q3-2022_NP	2022 08 18	319	< 1.0	< 0.10	1.00	360	< 0.020	< 0.050	< 10	0.0154	85.4	< 0.10	0.71	0.59	413	< 0.050	8.8	25.6	88.9	< 0.0050	5.58	1.68	0.748	< 0.050	< 0.010	3.10	179	0.016	0.12	< 0.30	0.768	< 0.50	3.4
	LC_MW20_03_WG_Q4_2022_N	2022 10 19	322	4.2	< 0.10	2.10	302	< 0.020	< 0.050	10	0.0068	86.2	< 0.10	0.62	0.24	751	< 0.050	10.4	25.9	91.8	< 0.0050	1.41	1.20	0.893	< 0.050	< 0.010	3.73	214	0.017	< 0.10	< 0.30	0.650	< 0.50	3.7

All terms defined within the body of SNC-Lavalin's report.

<	Denotes concentration less than indicated detection limit.
-	Denotes analysis not conducted.
n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL	Denotes reported detection limit.

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH.

[d] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.

[e] Interim BC MoE Regional Background Estimate (Protocol 9 Determining Background Groundwater Quality).

[f] There is no Zinc standard specified for H > 400; therefore, the standard for H=300-<400 is applied as a conservative comparison.

[g] Ramboll calculated health-based values for these two parameters based on toxicity values (tolerable daily intakes; TDI) and drinking water allocation factors (DW AFs), documented in Appendix IV.

BOLD	Concentration greater than CSR Aquatic Life (AW) FR standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
▨ SHADED	Concentration greater than CSR Drinking Water (DW) standard

TABLE LC-04: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Metals in Groundwater (LCO)

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Hardness mg/L	Aluminum µg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Bismuth µg/L	Boron µg/L	Cadmium µg/L	Calcium mg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Lithium µg/L	Magnesium mg/L	Manganese µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Potassium mg/L	Selenium µg/L	Silver µg/L	Sodium mg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Uranium µg/L	Vanadium µg/L	Zinc[f] µg/L
				Dissolved Metals																														
BC Standard																																		
CSR Aquatic Life (AW)[a]			n/a	n/a	90	50	10,000	1.5	n/a	12,000	0.5-4[b]	n/a	10[d]	40	20-90	n/a	40-160[b]	n/a	n/a	n/a	0.25	10,000	250-1,500[b]	n/a	20	0.5-15[b]	n/a	n/a	3	n/a	1,000	85	n/a	75-2,400[b]
CSR Irrigation Watering (IW)			n/a	5,000	n/a	100	n/a	100	n/a	500	5	n/a	5[d]	50	200	5,000	200	2,500	n/a	200	1	10	200	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	10	100	1,000-5,000[c]
CSR Livestock Watering (LW)			n/a	5,000	n/a	25	n/a	100	n/a	5,000	80	1,000	50[d]	1,000	300	n/a	100	5,000	n/a	n/a	2	50	1,000	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	200	100	2,000
CSR Drinking Water (DW)			n/a	9,500	6	10	1,000	8	n/a	5,000	5	n/a	50[d]	20[e]	1,500	6,500	10	8	n/a	1,500	1	250	80	n/a	10	20	200	2,500	n/a	2,500	n/a	20	20	3,000
Health-based Value (HBV)[g]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,200	n/a	n/a	n/a	2,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LCO Phase I West Line Creek																																		
LC_PIZ1206A	LC_PIZ1206A_WG_2022-Q1_NP	2022 03 02	1,400	< 2.0	< 0.20	< 0.20	30.0	< 0.040	< 0.100	< 20	0.0589	266	0.22	< 0.20	0.90	< 20	< 0.100	31.6	179	1.19	< 0.0050	2.34	< 1.00	2.35	***361***	< 0.020	3.73	224	< 0.020	< 0.20	< 0.60	*15.2*	< 1.00	3.5
	LC_PIZ1206A_WG_2022-Q2_NP	2022 06 01	1,500	2.8	< 0.20	< 0.20	33.4	< 0.040	< 0.100	< 20	0.0471	281	0.22	< 0.20	1.80	< 20	< 0.100	31.4	194	0.61	< 0.0050	1.94	< 1.00	2.23	***385***	< 0.020	2.56	218	< 0.020	< 0.20	< 0.60	*14.7*	< 1.00	290
	LC_PIZ1206A_WG_Q3-2022_NP	2022 08 17	1,190	3.3	< 0.20	< 0.20	23.4	< 0.040	< 0.100	< 20	0.0438	218	< 0.20	< 0.20	0.42	< 20	< 0.100	29.0	157	0.29	< 0.0050	5.21	< 1.00	2.06	***319***	< 0.020	2.07	174	< 0.020	< 0.20	< 0.60	*12.5*	< 1.00	3.4
	LC_PIZ1206A_WG_Q4_2022_N	2022 11 02	1,360	< 1.0	0.17	0.10	26.2	< 0.020	< 0.050	16	0.0563	236	0.19	< 0.10	0.24	< 10	< 0.050	29.3	186	< 0.10	< 0.0050	1.81	0.81	2.06	***536***	< 0.010	2.63	184	< 0.010	< 0.10	< 0.30	*14.2*	< 0.50	1.8
LC_PIZ1206C	LC_PIZ1206C_WG_2022-Q1_NP	2022 03 03	618	< 1.0	1.08	0.12	25.1	< 0.020	< 0.050	24	0.0322	142	0.44	< 0.10	1.90	< 10	0.067	54.9	64.1	0.32	< 0.0050	3.31	0.65	1.26	***82.6***	< 0.010	27.8	242	< 0.010	0.29	< 0.30	4.22	< 0.50	8.4
	LC_PIZ1206C_WG_2022-Q2_NP	2022 06 01	666	1.8	1.04	0.13	26.8	< 0.020	< 0.050	31	0.0315	149	0.42	< 0.10	1.89	< 10	0.072	56.3	71.3	0.86	< 0.0050	8.46	0.95	1.28	***94.8***	< 0.010	28.8	238	< 0.010	0.32	< 0.30	4.66	< 0.50	158
	LC_CC3_WG_2022-Q2_NP	Duplicate	665	1.8	1.04	0.14	26.4	< 0.020	< 0.050	28	0.0282	150	0.40	< 0.10	1.66	< 10	0.070	53.9	70.6	0.87	< 0.0050	3.26	0.95	1.26	***93.8***	< 0.010	29.1	234	< 0.010	0.32	< 0.30	4.72	< 0.50	192
	QA/QC RPD%		0	*	0	*	2	*	*	*	11	1	*	*	13	*	*	4	1	1	*	89	*	2	1	*	1	2	*	*	*	1	*	19
	LC_PIZ1206C_WG_Q3-2022_NP	2022 09 26	766	220	2.40	0.45	23.3	0.070	< 0.050	26	0.0652	159	0.69	0.31	8.83	936	5.35	60.0	89.6	80.8	< 0.0050	4.52	1.56	1.48	***131***	< 0.010	32.3	230	0.015	0.58	5.02	5.38	< 0.50	27.4
	LC_PIZ1206C_WG_Q4_2022_N	2022 11 02	696	1.1	1.57	0.11	25.3	< 0.020	< 0.050	29	0.0238	143	0.21	< 0.10	0.77	< 10	0.106	70.5	82.3	13.1	< 0.0050	6.17	1.49	1.37	***147***	< 0.010	40.1	232	< 0.010	0.28	< 0.30	5.32	< 0.50	13.1
LC_PIZ1207A	LC_PIZ1207A_WG_Q1-2022_NP	2022 03 11	217	2.9	0.43	0.26	78.5	< 0.020	< 0.050	85	0.0420	53.4	0.34	< 0.10	5.45	< 10	0.287	23.3	20.4	0.88	< 0.0050	2.39	1.35	1.48	1.99	< 0.010	16.1	612	< 0.010	0.19	< 0.30	0.472	< 0.50	14.5
	LC_PIZ1207A_WG_Q2-2022_NP	2022 06 02	184	3.2	0.34	0.30	62.2	< 0.020	< 0.050	85	< 0.0150	44.8	0.11	< 0.10	2.59	< 10	< 0.050	23.2	17.5	2.03	< 0.0050	*42.6*	0.80	1.21	1.24	< 0.010	14.1	569	< 0.010	0.92	< 0.30	0.402	1.38	6.1
	LC_PIZ1207A_WG_Q3-2022_NP	2022 08 04	222	2.5	0.38	0.28	83.6	< 0.020	< 0.050	95	0.0801	52.0	0.28	< 0.10	3.37	< 10	< 0.050	27.1	22.3	1.11	< 0.0050	*63.6*	1.47	1.57	1.38	< 0.010	17.1	699	< 0.010	0.41	< 0.30	0.441	1.88	8.8
LC_PIZ1207B	LC_PIZ1207B_WG_Q1-2022_NP	2022 03 11	326	1.4	0.11	< 0.10	69.2	< 0.020	< 0.050	33	0.0097	91.8	< 0.10	< 0.10	2.03	< 10	0.078	10.2	23.5	18.3	< 0.0050	0.931	< 0.50	1.60	7.06	< 0.010	16.8	251	< 0.010	< 0.10	< 0.30	1.31	< 0.50	42.7
	LC_PIZ1207B_WG_Q2-2022_NP	2022 06 02	300	1.2	0.29	< 0.10	60.9	< 0.020	< 0.050	25	< 0.0150	86.7	< 0.10	< 0.10	1.46	< 10	< 0.050	8.1	20.2	10.5	< 0.0050	*70.6*	0.70	1.31	7.50	< 0.010	5.25	168	< 0.010	1.12	< 0.30	1.21	1.22	7.1
	LC_PIZ1207B_WG_Q3-2022_NP	2022 08 04	313	< 1.0	0.17	< 0.10	66.6	< 0.020	< 0.050	81	0.0260	82.5	< 0.10	< 0.10	0.86	< 10	< 0.050	18.5	26.0	3.66	< 0.0050	*25.2*	< 0.50	1.44	7.57	< 0.010	5.73	458	< 0.010	< 0.10	< 0.30	0.914	< 0.50	1.7
	LC_PIZ1207B_WG_Q4_2022_N	2022 10 24	349	5.4	0.14	< 0.10	79.8	< 0.020	< 0.050	162	0.0115	86.8	< 0.10	< 0.10	0.48	< 10	< 0.050	29.1	32.2	25.4	< 0.0050	*17.9*	0.51	1.43	3.59	< 0.010	11.1	724	< 0.010	< 0.10	< 0.30	0.781	< 0.50	1.7
LC_PIZ1210B	LC_PIZ1210B_WG_Q4_2022_N	2022 11 01	354	1.4	0.17	< 0.10	50.1	< 0.020	< 0.050	< 10	0.0110	78.1	0.32	< 0.10	0.43	< 10	0.081	7.7	38.5	0.21	< 0.0050	0.927	< 0.50	0.613	***72.3***	< 0.010	1.41	130	< 0.010	< 0.10	< 0.30	2.10	< 0.50	2.2
LC_PIZ1210C	LC_PIZ1210C_WG_Q1_2022_NP	2022 03 15	55.9	1.2	0.24	0.41	216	< 0.020	< 0.050	318	< 0.0050	11.6	0.11	< 0.10	< 0.20	< 10	< 0.050	329	6.55	25.6	< 0.0050	4.84	< 0.50	1.30	0.051	< 0.010	206	804	< 0.010	0.15	< 0.30	0.049	< 0.50	4.4
	LC_PIZ1210C_WG_Q2-2022_NP	2022 06 01	51.8	2.2	< 0.10	0.50	195	< 0.020	< 0.050	320	0.0143	9.59	< 0.10	< 0.10	< 0.20	34	< 0.050	368	6.76	22.5	< 0.0050	*69.0*	0.54	1.42	< 0.050	< 0.010	235	683	< 0.010	1.06	< 0.30	0.039	1.15	2.3
	LC_PIZ1210C_WG_Q3-2022_NP	2022 09 26	53.8	4.1	4.48	0.48	173	< 0.020	< 0.050	274	0.0129	9.33	0.37	< 0.10	0.39	33	0.156	317	7.42	4.55	< 0.0050	*11.0*	< 0.50	1.47	0.114	< 0.010	201	710	< 0.010	0.24	< 0.30	0.074	< 0.50	2.4
	LC_PIZ1210C_WG_Q4_2022_N	2022 11 01	54.8	2.1	2.19	0.60	196	< 0.020	< 0.050	292	< 0.0050	8.89	1.03	< 0.10	0.73	23	0.272	346	7.93	7.04	< 0.0050	*11.6*	0.67	2.15	0.077	0.022	224	711	< 0.010	0.31	< 0.30	0.036	< 0.50	< 1.0
LC_PIZ1211N	LC_PIZ1211N_WG_2022-Q1_NP	2022 03 01	744	1.3	0.28	< 0.10	52.1	< 0.020	< 0.050	16	0.0557	168	0.15	< 0.10	0.23	< 10	0.056	80.0	78.8	0.70	< 0.0050	2.19	2.04	2.01	***99.6***	< 0.010	11.7	313	< 0.010	< 0.10	< 0.30	6.24	< 0.50	2.1
	LC_PIZ1211N_WG_2022-Q2_NP	2022 06 02	974	1.2	0.25	< 0.10	58.5	< 0.020	< 0.050	21	0.0702	197	0.11	< 0.10	< 0.20	< 10	< 0.050	60.6	117	1.96	< 0.0050	1.94	2.65	2.20	***244***	< 0.010	8.92	359	< 0.010	< 0.10	< 0.30	7.95	< 0.50	2.0
	LC_PIZ1211N_WG_Q3-2022_NP	2022 08 17	819	< 1.0	0.20	< 0.10	60.8	< 0.020	< 0.050	22	0.0602	174	0.14	< 0.10	3.16	< 10	0.065	48.0	93.3	0.48	< 0.0050	1.46	1.76	1.64	***184***	< 0.010	6.68	324	< 0.010	< 0.10	< 0.30	6.19	< 0.50	2.8
	LC_PIZ1211N_WG_Q4_2022_N	2022 10 19	783	3.6	0.25	< 0.10	49.0	< 0.020	< 0.050	22	0.0540	165	0.16	< 0.10	0.23	< 10	< 0.050	64.4	90.0	< 0.10	< 0.0050	1.58	1.86	1.99	***113***	< 0.010	10.0	295	< 0.010	< 0.10	< 0.30	5.32	< 0.50	4.4
LC_PIZ1212	LC_PIZ1212_WG_2022-Q1_NP	2022 03 01	821	1.9	0.29	0.10	50.7	< 0.020	< 0.050	19	0.0891	185	0.14	< 0.10	0.53	< 10	< 0.050	79.2	87.1	0.83	< 0.0050	2.15	4.13	1.94	***119***	< 0.010	10.9	315	< 0.010	< 0.10	< 0.30	6.19	< 0.50	4.6
	LC_PIZ1212_WG_2022-Q2_NP	2022 06 02	915	< 1.0	0.30	0.11	55.8	< 0.020	< 0.050	20	0.116	185	0.13	< 0.10	0.28	< 10	< 0.050	60.5	110	< 0.10	< 0.0050	1.95	5.42	2.13	***233***	< 0.010	8.19	337	< 0.010	< 0.10	< 0.30	7.25	< 0.50	4.7
	LC_PIZ1212_WG_Q3-2022_NP	2022 08 17	754	< 1.0	0.30	< 0.10	48.4	< 0.020	< 0.050	25	0.0993	156	0.15	< 0.10	0.82	< 10	< 0.050	67.9	88.6	0.11	< 0.0050	1.65	4.73	2.06	***147***	< 0.010	9.29	287	< 0.010	< 0.10	< 0.30	5.79	< 0.50	4.5
	LC_PIZ1212_WG_Q4_2022_N	2022 10 19	707	5.2	0.30	< 0.10	48.1	< 0.020	< 0.050	19	0.0963	153	< 0.10	< 0.10	0.26	< 10	< 0.050	66.8	78.9	0.24	< 0.0050	1.53	4.35	1.97	***131***	< 0.010	9.76	287	< 0.010	< 0.10	< 0.30	5.18	< 0.50	3.7

All terms defined within the body of SNC-Lavalin's report.

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BOLD	Concentration greater than CSR Aquatic Life (AW) FR standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH.

[d] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.

[e] Interim BC MoE Regional Background Estimate (Protocol 9 Determining Background Groundwater Quality).

[f] There is no Zinc standard specified for H > 400; therefore, the standard for H=300-<400 is applied as a conservative comparison.

[g] Ramboll calculated health-based values for these two parameters based on toxicity values (tolerable daily intakes; TDI) and drinking water allocation factors (DW AFs), documented in Appendix IV.

TABLE LC-04: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Metals in Groundwater (LCO)

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Hardness mg/L	Aluminum µg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Bismuth µg/L	Boron µg/L	Cadmium µg/L	Calcium mg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Lithium µg/L	Magnesium mg/L	Manganese µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Potassium mg/L	Selenium µg/L	Silver µg/L	Sodium mg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Uranium µg/L	Vanadium µg/L	Zinc[f] µg/L
				Dissolved Metals																														
BC Standard																																		
CSR Aquatic Life (AW)[a]			n/a	n/a	90	50	10,000	1.5	n/a	12,000	0.5-4[b]	n/a	10[d]	40	20-90	n/a	40-160[b]	n/a	n/a	n/a	0.25	10,000	250-1,500[b]	n/a	20	0.5-15[b]	n/a	n/a	3	n/a	1,000	85	n/a	75-2,400[b]
CSR Irrigation Watering (IW)			n/a	5,000	n/a	100	n/a	100	n/a	500	5	n/a	5[d]	50	200	5,000	200	2,500	n/a	200	1	10	200	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	10	100	1,000-5,000[c]
CSR Livestock Watering (LW)			n/a	5,000	n/a	25	n/a	100	n/a	5,000	80	1,000	50[d]	1,000	300	n/a	100	5,000	n/a	n/a	2	50	1,000	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	200	100	2,000
CSR Drinking Water (DW)			n/a	9,500	6	10	1,000	8	n/a	5,000	5	n/a	50[d]	20[e]	1,500	6,500	10	8	n/a	1,500	1	250	80	n/a	10	20	200	2,500	n/a	2,500	n/a	20	20	3,000
Health-based Value (HBV)[g]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,200	n/a	n/a	n/a	2,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LCO Phase I Lower Line Creek																																		
WL_MW-15-02-A	WL_MW-15-02-A_2022-03-28_N	2022 03 28	251	< 1.0	< 0.10	1.09	245	< 0.020	< 0.050	< 10	0.0084	74.3	0.27	< 0.10	0.44	< 10	< 0.050	6.3	16.0	45.7	< 0.0050	1.97	< 0.50	0.969	0.097	< 0.010	4.23	117	0.011	< 0.10	< 0.30	0.972	< 0.50	1.2
	WL_MW-15-02-A_WG_2022-SA-01_N	2022 06 23	233	1.2	< 0.10	1.14	248	< 0.020	< 0.050	16	0.0203	68.8	< 0.10	0.13	2.47	17	< 0.050	6.7	14.9	78.2	< 0.0050	2.16	< 0.50	0.999	< 0.050	< 0.010	4.42	120	0.018	< 0.10	< 0.30	0.943	< 0.50	2.2
	WL_MW-15-02-A_WG_2022-SA-02_N	2022 11 23	234	< 1.0	< 0.10	1.07	242	< 0.020	< 0.050	10	< 0.0050	67.6	0.20	< 0.10	0.32	< 10	< 0.050	6.9	15.8	37.8	< 0.0050	2.21	< 0.50	0.965	0.111	< 0.010	3.88	123	0.015	< 0.10	< 0.30	0.926	< 0.50	< 1.0
WL_MW-15-02-B	WL_MW-15-02-B_2022-03-28_N	2022 03 28	1,150	2.1	< 0.20	< 0.20	381	< 0.040	< 0.100	< 20	0.0831	349	< 0.20	< 0.20	0.68	< 20	< 0.100	10.9	67.4	9.86	< 0.0050	0.174	1.50	2.02	***49.7***	< 0.020	5.86	351	< 0.020	< 0.20	< 0.60	0.619	< 1.00	< 2.0
	WL_MW-15-02-B_WG_2022-SA-01_N	2022 06 23	764	1.6	< 0.10	0.14	251	< 0.020	< 0.050	14	0.0508	233	< 0.10	< 0.10	2.26	< 10	0.056	9.6	44.2	2.42	< 0.0050	0.234	0.93	1.78	***71.5***	< 0.010	6.49	256	0.016	< 0.10	< 0.30	0.530	< 0.50	2.5
	WL_MW-15-02-B_WG_2022-SA-02_N	2022 11 23	592	< 1.0	< 0.10	0.14	201	< 0.020	< 0.050	10	0.0272	175	< 0.10	< 0.10	0.59	< 10	< 0.050	9.0	37.6	5.79	< 0.0050	0.193	0.83	1.69	***33.1***	< 0.010	10.6	200	0.019	< 0.10	< 0.30	0.551	< 0.50	< 1.0
WL_MW-15-04-B	WL_MW-15-04-B_2022-03-28_N	2022 03 28	702	3.2	0.13	1.07	808	< 0.020	< 0.050	13	0.0102	204	< 0.10	7.15	0.33	*7,430*	< 0.050	5.1	46.7	*2,740*	< 0.0050	1.21	15.4	1.64	0.091	< 0.010	9.65	597	0.012	0.17	< 0.30	3.10	< 0.50	3.5
	WL_MW-15-04-B_WG_2022-SA-01_N	2022 06 22	626	8.0	0.18	1.20	613	< 0.020	< 0.050	15	0.0979	186	0.12	3.75	1.30	1,100	0.054	3.5	39.2	*1,350*	< 0.0050	1.09	13.1	1.73	0.220	0.012	5.28	549	0.032	< 0.10	0.38	2.48	< 0.50	2.9
	WL_MW-15-04-B_WG_2022-SA-02_N	2022 11 23	603	10.2	< 0.10	13.6	1,010	< 0.020	< 0.050	11	< 0.0050	162	0.26	15.3	< 0.20	*45,100*	< 0.050	3.2	48.3	*3,430*	< 0.0050	5.48	23.3	2.24	0.170	< 0.010	3.00	271	0.010	< 0.10	1.52	0.111	1.18	1.9
LC_MW_CP1A	CP SPO Deep Q1	2022 01 21	298	1.8	< 0.10	0.15	33.8	< 0.020	< 0.050	37	0.0089	76.6	0.17	< 0.10	0.25	< 10	< 0.050	19.9	26.0	8.29	< 0.0050	1.16	0.64	1.22	***55.8***	< 0.010	6.93	436	< 0.010	0.15	< 0.30	1.59	< 0.50	5.5
	LC_MW_CP1A_WG_Q2_2022_NP	2022 04 10	315	2.4	< 0.10	0.14	34.6	< 0.020	< 0.050	45	0.0069	83.3	0.17	< 0.10	2.89	< 10	0.054	20.8	26.0	1.52	< 0.0050	1.19	< 0.50	1.09	***55.9***	< 0.010	6.56	448	< 0.010	0.15	< 0.30	1.67	< 0.50	2.8
	LC_MW_CP1A_WG_Q3-2022_NP	2022 07 26	272	1.8	< 0.10	0.16	31.7	< 0.020	< 0.050	42	< 0.0050	65.7	0.18	< 0.10	3.60	< 10	0.069	22.2	26.2	0.89	< 0.0050	1.09	< 0.50	1.12	***49.9***	< 0.010	6.33	399	< 0.010	0.13	< 0.30	1.42	< 0.50	2.6
	LC_MW_CP1A_WG_Q4_2022_N	2022 10 20	273	1.4	< 0.10	0.14	31.8	< 0.020	< 0.050	36	0.0059	62.0	0.21	< 0.10	< 0.20	< 10	< 0.050	14.9	28.8	0.51	< 0.0050	1.05	< 0.50	1.06	***73.4***	< 0.010	5.89	355	< 0.010	< 0.10	< 0.30	1.26	< 0.50	< 1.0
LC_MW_CP1B	CP SPO Shallow Q1	2022 01 21	322	< 1.0	< 0.10	< 0.10	100	< 0.020	< 0.050	30	0.0122	86.9	0.27	< 0.10	< 0.20	< 10	< 0.050	18.1	25.4	< 0.10	< 0.0050	1.20	< 0.50	0.841	***56.0***	< 0.010	4.25	399	< 0.010	< 0.10	< 0.30	1.25	< 0.50	4.6
	LC_MW_CP1B_WG_Q2_2022_NP	2022 04 10	333	1.1	< 0.10	< 0.10	102	< 0.020	< 0.050	34	0.0152	90.4	0.31	< 0.10	2.59	< 10	0.062	18.1	26.1	< 0.10	< 0.0050	1.19	< 0.50	0.816	***46.9***	< 0.010	5.03	400	< 0.010	< 0.10	< 0.30	1.38	< 0.50	2.1
	LC_MW_CP1B_WG_Q3-2022_NP	2022 07 26	280	< 1.0	< 0.10	0.12	96.4	< 0.020	< 0.050	35	0.0119	71.7	0.26	< 0.10	0.23	< 10	< 0.050	20.3	24.4	< 0.10	< 0.0050	1.46	< 0.50	1.03	***21.8***	< 0.010	5.11	354	< 0.010	< 0.10	< 0.30	1.24	< 0.50	< 1.0
	LC_MW_CP1B_WG_Q4_2022_N	2022 10 20	315	< 1.0	< 0.10	0.10	101	< 0.020	< 0.050	39	0.0178	81.0	0.28	< 0.10	< 0.20	< 10	< 0.050	15.6	27.4	< 0.10	< 0.0050	1.23	< 0.50	0.930	***46.6***	< 0.010	4.26	384	< 0.010	< 0.10	< 0.30	1.33	< 0.50	< 1.0
	LC_CC2_WG_Q4_2022_NPCP1B	Duplicate	329	< 1.0	< 0.10	< 0.10	101	< 0.020	< 0.050	40	0.0166	88.0	0.23	< 0.10	0.21	< 10	< 0.050	17.6	26.5	< 0.10	< 0.0050	1.34	< 0.50	0.920	***48.1***	< 0.010	4.17	412	< 0.010	< 0.10	< 0.30	1.34	< 0.50	< 1.0
	QA/QC RPD%		4	*	*	*	0	*	*	*	*	8	*	*	*	*	*	12	3	*	*	9	*	1	3	*	2	7	*	*	*	1	*	*
Process Plant (^ denotes part of Study Area 5/6)																																		
LC_PIZP1101	LC_PIZP1101_WG_Q2-2022_N	2022 05 20	123	3.1	< 0.10	0.98	404	< 0.020	< 0.050	22	< 0.0050	26.2	< 0.10	0.21	< 0.20	138	< 0.050	9.6	13.9	175	< 0.0050	*11.5*	0.72	0.756	< 0.050	< 0.010	21.5	194	< 0.010	< 0.10	< 0.30	1.91	< 0.50	< 1.0
	LC_PIZP1101_WG_Q3-2022_N	2022 08 05	120	8.4	< 0.10	0.98	373	< 0.020	< 0.050	29	0.0051	24.9	< 0.10	0.19	< 0.20	176	< 0.050	9.2	14.1	156	< 0.0050	*10.9*	< 0.50	0.770	< 0.050	< 0.010	22.9	180	< 0.010	< 0.10	< 0.30	2.00	< 0.50	< 1.0
	LC_CC3_WG_Q3-2022_NP	Duplicate	124	10.0	< 0.10	0.93	370	< 0.020	< 0.050	28	0.0072	26.6	< 0.10	0.19	< 0.20	168	< 0.050	9.8	14.0	154	< 0.0050	*11.6*	< 0.50	0.766	< 0.050	< 0.010	22.8	193	< 0.010	< 0.10	< 0.30	2.15	< 0.50	< 1.0
	QA/QC RPD%		3	17	*	5	1	*	*	*	*	7	*	*	*	5	*	6	1	1	*	6	*	1	*	*	0	7	*	*	*	7	*	*
	LC_PIZP1101_WG_Q4_2022_N	2022 10 20	124	70.4	< 0.10	1.04	392	< 0.020	< 0.050	24	0.0105	27.3	0.11	0.27	0.27	298	< 0.050	8.7	13.6	172	< 0.0050	*10.4*	0.52	0.776	< 0.050	< 0.010	19.9	185	< 0.010	< 0.10	1.75	2.06	< 0.50	1.0
LC_PIZP1103	LC_PIZP1103_WG_Q1_2022_NP	2022 03 11	131	6.1	0.17	0.86	63.7	< 0.020	< 0.050	472	< 0.0200	28.7	0.14	0.19	0.84	< 10	< 0.050	113	14.5	118	< 0.0050	*18.6*	0.60	1.49	< 0.050	< 0.010	131	828	0.012	0.12	< 0.30	1.86	< 0.50	6.9
	LC_PIZP1103_WG_Q2-2022_NP	2022 05 25	137	1.5	0.28	0.83	67.1	< 0.020	< 0.050	411	< 0.0150	29.1	1.07	< 0.10	1.58	24	< 0.050	107	15.7	108	< 0.0050	*17.2*	0.65	1.73	< 0.050	< 0.010	124	844	< 0.010	0.13	< 0.30	1.76	< 0.50	5.0
	LC_PIZP1103_WG_Q3-2022_NP	2022 08 05	143	1.7	0.26	0.84	68.6	< 0.020	< 0.050	*564*	0.0102	29.4	0.73	< 0.10	1.57	< 10	< 0.050	120	17.0	50.7	< 0.0050	*15.4*	< 0.50	1.60	< 0.050	< 0.010	136	848	< 0.010	0.11	< 0.30	1.68	< 0.50	2.3
	LC_PIZP1103_WG_Q4_2022_N	2022 10 24	148	96.8	0.32	0.84	72.6	< 0.020	< 0.050	*555*	0.0114	31.9	0.43	0.16	1.68	< 10	< 0.050	121	16.7	117	< 0.0050	*16.9*	1.19	1.78	< 0.050	< 0.010	147	846	0.012	< 0.10	< 0.30	2.10	< 0.50	2.5
LC_PIZP1104	LC_PIZP1104_WG_Q1_2022_NP	2022 03 15	448	< 1.0	< 0.10	1.44	328	< 0.020	< 0.050	18	0.0164	112	< 0.10	1.31	0.25	2,650	< 0.050	16.0	40.9	*665*	< 0.0050	2.18	5.92	2.13	0.054	< 0.010	11.3	427	< 0.010	< 0.10	< 0.30	2.45	< 0.50	6.6
	LC_PIZP1104_WG_Q2-2022_NP	2022 06 30	657	815	0.78	3.46	318	0.166	< 0.050	20	***16.4***	174	4.39	3.20	8.40	*6,380*	3.69	22.6	54.0	*891*	0.0295	1.71	7.93	3.07	0.249	0.048	15.3	574	0.130	0.32	19.4	3.48	4.14	30.0
	LC_PIZP1104_WG_Q3-2022_NP	2022 08 29	738	28.6	3.98	0.37	207	< 0.020	< 0.050	31	0.482	193	0.12	0.57	1.01	79	< 0.050	31.6	62.3	*280*	< 0.0050	1.25	1.81	3.78	0.154	< 0.010	22.0	638	0.023	0.37	1.06	2.18	< 0.50	6.1
	LC_PIZP1104_WG_Q4_2022_N	2022 11 03	580	25.8	0.78	0.87	284	< 0.020	< 0.050	22	0.175	147	1.24	1.24	0.59	659	0.231	22.1	51.6	*624*	< 0.0050	1.60	3.57	2.65	0.155	< 0.010	15.3	530	0.019	0.96	< 0.30	2.48	< 0.50	3.3

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\- Denotes analysis not conducted.

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* RPDs are not calculated where one or more concentrations are less than five times RDL.

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[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH.

[d] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.

[e] Interim BC MoE Regional Background Estimate (Protocol 9 Determining Background Groundwater Quality).

[f] There is no Zinc standard specified for H > 400; therefore, the standard for H=300-<400 is applied as a conservative comparison.

[g] Ramboll calculated health-based values for these two parameters based on toxicity values (tolerable daily intakes; TDI) and drinking water allocation factors (DW AFs), documented in Appendix IV.

TABLE LC-04: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Metals in Groundwater (LCO)

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Hardness mg/L	Aluminum µg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Bismuth µg/L	Boron µg/L	Cadmium µg/L	Calcium mg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Lithium µg/L	Magnesium mg/L	Manganese µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Potassium mg/L	Selenium µg/L	Silver µg/L	Sodium mg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Uranium µg/L	Vanadium µg/L	Zinc[f] µg/L
				Dissolved Metals																														
BC Standard																																		
CSR Aquatic Life (AW)[a]			n/a	n/a	90	50	10,000	1.5	n/a	12,000	0.5-4[b]	n/a	10[d]	40	20-90	n/a	40-160[b]	n/a	n/a	n/a	0.25	10,000	250-1,500[b]	n/a	20	0.5-15[b]	n/a	n/a	3	n/a	1,000	85	n/a	75-2,400[b]
CSR Irrigation Watering (IW)			n/a	5,000	n/a	100	n/a	100	n/a	500	5	n/a	5[d]	50	200	5,000	200	2,500	n/a	200	1	10	200	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	10	100	1,000-5,000[c]
CSR Livestock Watering (LW)			n/a	5,000	n/a	25	n/a	100	n/a	5,000	80	1,000	50[d]	1,000	300	n/a	100	5,000	n/a	n/a	2	50	1,000	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	200	100	2,000
CSR Drinking Water (DW)			n/a	9,500	6	10	1,000	8	n/a	5,000	5	n/a	50[d]	20[e]	1,500	6,500	10	8	n/a	1,500	1	250	80	n/a	10	20	200	2,500	n/a	2,500	n/a	20	20	3,000
Health-based Value (HBV)[g]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,200	n/a	n/a	n/a	2,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Process Plant (^ denotes part of Study Area 5/6)																																		
LC_PIZP1105	LC_PIZP1105_WG_Q1-2022_N	2022 03 10	679	3.3	1.22	< 0.10	113	< 0.020	< 0.050	19	0.0833	183	< 0.10	< 0.10	< 0.20	< 10	< 0.050	21.3	53.9	53.0	< 0.0050	0.345	1.48	2.02	0.246	< 0.010	15.6	418	0.050	0.21	< 0.30	0.346	< 0.50	3.6
	WG_Q1-2022_CC3	Duplicate	708	3.8	1.18	0.11	119	< 0.020	< 0.050	19	0.0888	191	< 0.10	0.14	< 0.20	< 10	< 0.050	21.6	56.2	86.4	< 0.0050	0.389	1.73	2.12	0.280	< 0.010	16.3	421	0.055	0.17	< 0.30	0.350	< 0.50	3.6
	QA/QC RPD%		4	*	3	*	5	*	*	*	6	4	*	*	*	*	*	1	4	48	*	12	*	5	*	*	4	1	10	*	*	1	*	*
	LC_PIZP1105_WG_Q2-2022_N	2022 05 26	757	4.2	0.15	0.19	127	< 0.020	< 0.050	20	0.0311	210	0.11	0.29	0.22	20	0.060	21.6	56.4	72.0	< 0.0050	0.447	1.44	1.85	0.176	< 0.010	16.0	428	< 0.010	0.21	< 0.30	0.529	< 0.50	9.0
	LC_PIZP1105_WG_Q3-2022_N	2022 08 30	803	1.7	0.16	0.10	126	< 0.020	< 0.050	29	0.0868	198	< 0.10	< 0.10	< 0.20	< 10	< 0.050	28.6	75.0	22.2	< 0.0050	0.309	1.50	2.39	0.162	< 0.010	17.6	458	0.032	< 0.10	< 0.30	0.711	< 0.50	3.4
	LC_PIZP1105_WG_Q4_2022_N	2022 10 17	790	< 1.0	< 0.10	0.25	90.3	< 0.020	< 0.050	22	0.0397	210	< 0.10	0.42	< 0.20	< 10	< 0.050	20.0	64.4	50.6	< 0.0050	0.308	1.56	2.21	0.124	< 0.010	13.6	414	< 0.010	0.12	< 0.30	0.414	< 0.50	3.8
LC_MW_ER4A^	LC_MW_ER4A_WG_Q1-2022_N	2022 03 03	284	1.3	< 0.10	< 0.10	49.1	< 0.020	< 0.050	< 10	< 0.0050	79.5	< 0.10	< 0.10	< 0.20	153	< 0.050	5.9	20.8	55.8	< 0.0050	5.53	< 0.50	0.552	< 0.050	< 0.010	2.54	303	< 0.010	< 0.10	< 0.30	0.285	< 0.50	4.6
	LC_MW_ER4A_WG_Q2-2022_N	2022 05 12	268	1.8	< 0.10	< 0.10	49.5	< 0.020	< 0.050	11	< 0.0050	76.6	< 0.10	< 0.10	1.03	176	< 0.050	5.8	18.7	54.4	< 0.0050	5.11	< 0.50	0.524	< 0.050	< 0.010	2.40	304	< 0.010	< 0.10	< 0.30	0.289	< 0.50	2.6
	LC_MW_ER4A_WG_Q3-2022_NP	2022 08 03	273	1.1	< 0.10	< 0.10	58.5	< 0.020	< 0.050	19	< 0.0050	77.0	< 0.10	< 0.10	0.40	158	< 0.050	7.0	19.6	55.5	< 0.0050	4.29	< 0.50	0.506	< 0.050	< 0.010	2.62	293	< 0.010	< 0.10	< 0.30	0.294	< 0.50	1.3
	LC_MW_ER4A_WG_Q4_2022_N	2022 10 13	285	< 1.0	< 0.10	< 0.10	49.8	< 0.020	< 0.050	< 10	< 0.0050	78.2	< 0.10	< 0.10	< 0.20	169	< 0.050	6.6	21.7	57.3	< 0.0050	5.48	< 0.50	0.576	< 0.050	< 0.010	2.80	323	< 0.010	< 0.10	< 0.30	0.294	< 0.50	< 1.0
LC_MW_ER4B^	LC_MW_ER4B_WG_Q1-2022_N	2022 03 03	296	< 1.0	< 0.10	< 0.10	79.5	< 0.020	< 0.050	< 10	0.0145	80.3	0.18	< 0.10	< 0.20	< 10	< 0.050	8.0	23.1	< 0.10	< 0.0050	1.21	< 0.50	0.421	17.3	< 0.010	2.72	257	< 0.010	< 0.10	< 0.30	1.09	< 0.50	5.2
	LC_MW_ER4B_WG_Q2-2022_N	2022 05 12	309	< 1.0	< 0.10	< 0.10	84.3	< 0.020	< 0.050	< 10	0.0180	83.5	0.15	< 0.10	0.33	< 10	< 0.050	8.8	24.5	< 0.10	< 0.0050	1.14	< 0.50	0.443	19.8	< 0.010	2.89	278	< 0.010	< 0.10	< 0.30	1.22	< 0.50	< 1.0
	LC_MW_ER4B_WG_Q3-2022_NP	2022 08 03	250	< 1.0	< 0.10	0.10	90.3	< 0.020	< 0.050	< 10	0.0188	65.1	0.14	< 0.10	0.65	< 10	< 0.050	10.2	21.2	< 0.10	< 0.0050	1.62	< 0.50	0.567	7.64	< 0.010	2.16	238	< 0.010	< 0.10	< 0.30	0.984	< 0.50	< 1.0
	LC_MW_ER4B_WG_Q4_2022_N	2022 10 13	286	1.2	< 0.10	< 0.10	90.3	< 0.020	< 0.050	< 10	0.0301	77.5	< 0.10	< 0.10	0.22	< 10	< 0.050	10.7	22.4	< 0.10	< 0.0050	1.40	< 0.50	0.542	12.3	< 0.010	2.32	271	< 0.010	< 0.10	< 0.30	1.04	< 0.50	< 1.0
Blanks																																		
Field Blanks																																		
LC_MW20_01	LC_MT3_WG_2022-Q1_NP	2022 03 01	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
LC_PIZP1105	WG_Q1-2022_MT2	2022 03 10	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
LC_PIZP1101	WG_Q1-2022_013_MT3	2022 03 11	< 0.50	-	-	-	-	-	-	-	-	< 0.050	-	-	-	-	-	-	< 0.0050	-	< 0.0050	-	-	< 0.050	-	-	< 0.050	-	-	-	-	-	-	-
LC_PIZP1105	LC_MT2_WG_Q4_2022_NP2	2022 10 17	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
LC_PIZDC0901	LC_MT1_WG_Q4_2022_NP2	2022 10 25	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	0.198	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
LC_PIZDC1307	LC_MT1_WG_Q4_2022_NP1	2022 10 26	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	1.2
Trip Blanks																																		
	LC_RD3_WG_2022-Q1_NP	2022 03 01	< 0.50	-	-	-	-	-	-	-	-	< 0.050	-	-	-	-	-	-	< 0.0050	-	-	-	-	< 0.050	-	-	< 0.050	-	-	-	-	-	-	-
	WG_Q1-2022_RD2	2022 03 10	< 0.50	-	-	-	-	-	-	-	-	< 0.050	-	-	-	-	-	-	< 0.0050	-	-	-	-	< 0.050	-	-	< 0.050	-	-	-	-	-	-	-
	WG_Q2-2022_012_RD2	2022 05 20	< 0.50	-	-	-	-	-	-	-	-	< 0.050	-	-	-	-	-	-	< 0.0050	-	-	-	-	< 0.050	-	-	< 0.050	-	-	-	-	-	-	-
	LC_RD3_WG_Q3-2022_NP	2022 10 25	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0

All terms defined within the body of SNC-Lavalin's report.

< Denotes concentration less than indicated detection limit.

- Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

* RPDs are not calculated where one or more concentrations are less than five times RDL.

RDL Denotes reported detection limit.

BOLD	Concentration greater than CSR Aquatic Life (AW) FR standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
▨ SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH.

[d] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.

[e] Interim BC MoE Regional Background Estimate (Protocol 9 Determining Background Groundwater Quality).

[f] There is no Zinc standard specified for H > 400; therefore, the standard for H=300-<400 is applied as a conservative comparison.

[g] Ramboll calculated health-based values for these two parameters based on toxicity values (tolerable daily intakes; TDI) and drinking water allocation factors (DW AFs), documented in Appendix IV.

TABLE LC-05: Summary of Analytical Results Compared to Secondary Screening Criteria for Selenium (LCO)

Sample Location	Sample ID	Sample Date (yyyy mm dd)	SPO/Compliance Point	Selenium µg/L
Groundwater Quality Benchmarks				
Compliance Point			LC_LCDSSLCC (E297110)	50
			EV_ER4 (0200027)	23
LCO Phase I Centre Line Creek North				
LC_PIZM0903	LC_PIZM0903_WG_Q1_2022_NP	2022 03 17	LC_LCDSSLCC (E297110)	11.2
	LC_PIZM0903_WG_Q2-2022_NP	2022 05 26	LC_LCDSSLCC (E297110)	11.0
LCO Phase I Centre Line Creek South				
LC_MW20_01	LC_MW20_01_WG_2022-Q1_NP	2022 03 01	LC_LCDSSLCC (E297110)	50.1
	LC_CC3_WG_2022-Q1_NP	Duplicate	LC_LCDSSLCC (E297110)	50.5
	QA/QC RPD%			1
	LC_MW20_01_WG_2022-Q2_NP	2022 06 02	LC_LCDSSLCC (E297110)	50.6
	LC_MW20_01_WG_Q3-2022_NP	2022 08 17	LC_LCDSSLCC (E297110)	56.6
	LC_MW20_01_WG_Q4_2022_N	2022 10 17	LC_LCDSSLCC (E297110)	65.0
LC_MW20_02B	LC_MW20_02B_WG_2022-Q1_NP	2022 03 02	LC_LCDSSLCC (E297110)	51.8
	LC_MW20_02B_WG_2022-Q2_NP	2022 06 02	LC_LCDSSLCC (E297110)	53.6
	LC_MW20_02B_WG_Q3-2022_NP	2022 08 17	LC_LCDSSLCC (E297110)	51.2
	LC_MW20_02B_WG_Q4_2022_N	2022 10 17	LC_LCDSSLCC (E297110)	49.1
LCO Phase I West Line Creek				
LC_PIZ1206A	LC_PIZ1206A_WG_2022-Q1_NP	2022 03 02	LC_LCDSSLCC (E297110)	361
	LC_PIZ1206A_WG_2022-Q2_NP	2022 06 01	LC_LCDSSLCC (E297110)	385
	LC_PIZ1206A_WG_Q3-2022_NP	2022 08 17	LC_LCDSSLCC (E297110)	319
	LC_PIZ1206A_WG_Q4_2022_N	2022 11 02	LC_LCDSSLCC (E297110)	536
LC_PIZ1206C	LC_PIZ1206C_WG_2022-Q1_NP	2022 03 03	LC_LCDSSLCC (E297110)	82.6
	LC_PIZ1206C_WG_2022-Q2_NP	2022 06 01	LC_LCDSSLCC (E297110)	94.8
	LC_CC3_WG_2022-Q2_NP	Duplicate	LC_LCDSSLCC (E297110)	93.8
	QA/QC RPD%			1
	LC_PIZ1206C_WG_Q3-2022_NP	2022 09 26	LC_LCDSSLCC (E297110)	131
	LC_PIZ1206C_WG_Q4_2022_N	2022 11 02	LC_LCDSSLCC (E297110)	147
LC_PIZ1210B	LC_PIZ1210B_WG_Q4_2022_N	2022 11 01	LC_LCDSSLCC (E297110)	72.3
LC_PIZ1211N	LC_PIZ1211N_WG_2022-Q1_NP	2022 03 01	LC_LCDSSLCC (E297110)	99.6
	LC_PIZ1211N_WG_2022-Q2_NP	2022 06 02	LC_LCDSSLCC (E297110)	244
	LC_PIZ1211N_WG_Q3-2022_NP	2022 08 17	LC_LCDSSLCC (E297110)	184
	LC_PIZ1211N_WG_Q4_2022_N	2022 10 19	LC_LCDSSLCC (E297110)	113
LC_PIZ1212	LC_PIZ1212_WG_2022-Q1_NP	2022 03 01	LC_LCDSSLCC (E297110)	119
	LC_PIZ1212_WG_2022-Q2_NP	2022 06 02	LC_LCDSSLCC (E297110)	233
	LC_PIZ1212_WG_Q3-2022_NP	2022 08 17	LC_LCDSSLCC (E297110)	147
	LC_PIZ1212_WG_Q4_2022_N	2022 10 19	LC_LCDSSLCC (E297110)	131
LCO Phase I Lower Line Creek				
WL_MW-15-02-B	WL_MW-15-02-B_2022-03-28_N	2022 03 28	LC_LCDSSLCC (E297110)	49.7
	WL_MW-15-02-B_WG_2022-SA-01_N	2022 06 23	LC_LCDSSLCC (E297110)	71.5
	WL_MW-15-02-B_WG_2022-SA-02_N	2022 11 23	LC_LCDSSLCC (E297110)	33.1
LC_MW_CP1A	CP SPO Deep Q1	2022 01 21	LC_LCDSSLCC (E297110)	55.8
	LC_MW_CP1A_WG_Q2_2022_NP	2022 04 10	LC_LCDSSLCC (E297110)	55.9
	LC_MW_CP1A_WG_Q3-2022_NP	2022 07 26	LC_LCDSSLCC (E297110)	49.9
	LC_MW_CP1A_WG_Q4_2022_N	2022 10 20	LC_LCDSSLCC (E297110)	73.4
LC_MW_CP1B	CP SPO Shallow Q1	2022 01 21	LC_LCDSSLCC (E297110)	56.0
	LC_MW_CP1B_WG_Q2_2022_NP	2022 04 10	LC_LCDSSLCC (E297110)	46.9
	LC_MW_CP1B_WG_Q3-2022_NP	2022 07 26	LC_LCDSSLCC (E297110)	21.8
	LC_MW_CP1B_WG_Q4_2022_N	2022 10 20	LC_LCDSSLCC (E297110)	46.6
	LC_CC2_WG_Q4_2022_NPCP1B	Duplicate	LC_LCDSSLCC (E297110)	48.1
	QA/QC RPD%			3
Process Plant (^ denotes part of Study Area 5/6)				
LC_MW_ER4B^	LC_MW_ER4B_WG_Q1-2022_N	2022 03 03	EV_ER4 (0200027)	17.3
	LC_MW_ER4B_WG_Q2-2022_N	2022 05 12	EV_ER4 (0200027)	19.8
	LC_MW_ER4B_WG_Q4_2022_N	2022 10 13	EV_ER4 (0200027)	12.3

All terms defined within the body of SNC-Lavalin's report.

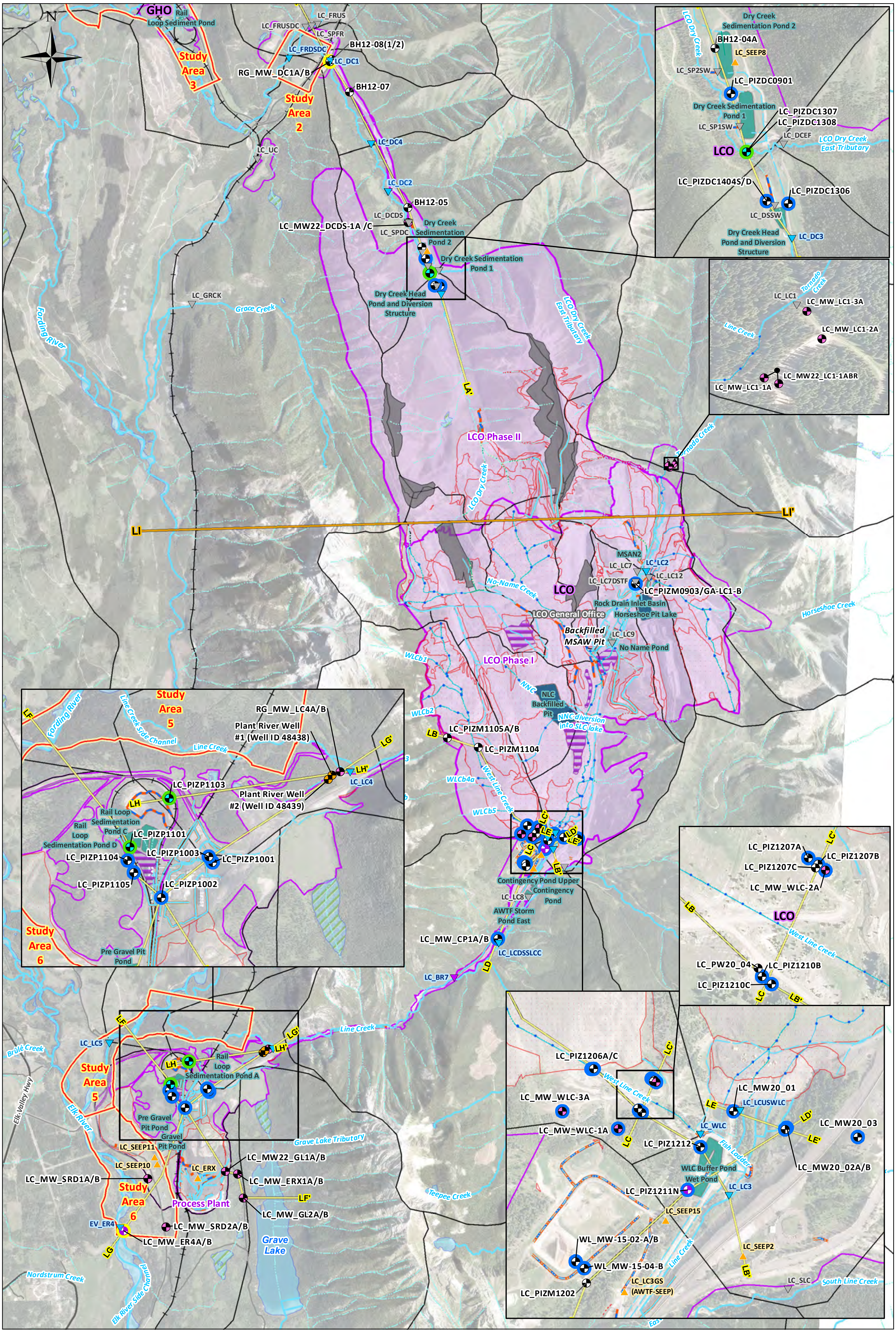
QA/QC RPD Denotes quality assurance/quality control relative percent difference

* RPDs are not calculated where one or more concentrations are less than five times RDL.

SHADED	Concentration greater than SPO by Area/Compliance Point by Area

Drawings

LC-01: Sample Location Plan – Line Creek Operations
LC-02: Groundwater Elevations from Q4 2022 and Inferred Groundwater Flow Direction – Line Creek Operations
LC-03: Line Creek Operations Inferred Geological Cross Section LA-LA’
LC-04: Line Creek Operations Inferred Geological Cross Section LB-LB’
LC-05: Line Creek Operations Inferred Geological Cross Section LC-LC’
LC-06: Line Creek Operations Inferred Geological Cross Section LD-LD’
LC-07: Line Creek Operations Inferred Geological Cross Section LE-LE’
LC-08: Line Creek Operations Inferred Geological Cross Section LF-LF’
LC-09: Line Creek Operations Inferred Geological Cross Section LG-LG’
LC-10: Line Creek Operations Inferred Geological Cross Section LH-LH’
LC-11: Line Creek Operations Inferred Geological Cross Section LI-LI’
LC-12: Spatial Distribution of Nitrate Nitrogen in Groundwater – Line Creek Operations
LC-13: Spatial Distribution of Sulphate in Groundwater – Line Creek Operations
LC-14: Spatial Distribution of Dissolved Cadmium in Groundwater – Line Creek Operations
LC-15: Spatial Distribution of Dissolved Selenium in Groundwater – Line Creek Operations



Legend

Groundwater Stations
- Monitoring Well
- Background Monitoring Well
- Well included in the RGMP
- Well included in the SSGMP/GWMP
- Well included in both the RGMP and the SSGMP/GWMP
- Barologgers associated the SSGMP/RGMP
- Monitoring Wells to be considered for inclusion
- Pumping Wells
- ▼ Permit 107517 Surface Water Stations (included in groundwater assessment)
- ▽ Permit 107517 Surface Water Stations (excluded from groundwater assessment)
- ▼ Non-permitted Surface Water Stations (included in groundwater assessment)
- ▲ Seep

Site Features
- Highway/Arterial
- Secondary Road
- Rails
- Bedrock Cross Section
- Geological Cross Section
- Study Areas
- Tailings/Settling/ Sediment Pond
- End-Pit Lake
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds
- Mine Permitted Areas
- LCO Phase 1 and 2

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Rock Drain
- Water Pipeline
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:60000 Scale)

Notes:
1. Original in colour.
2. Numerical scale reflects full-size print. Print scaling will distort this scale, however scale bar will remain accurate.
3. Intended for illustration purposes, accuracy has not been verified for construction or navigation purposes.
4. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Information provided by Teck Coal Limited.
2. LCO Phase 1 and 2 boundaries provided by Teck Coal Limited.

0 0.5 1 2 3 km

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

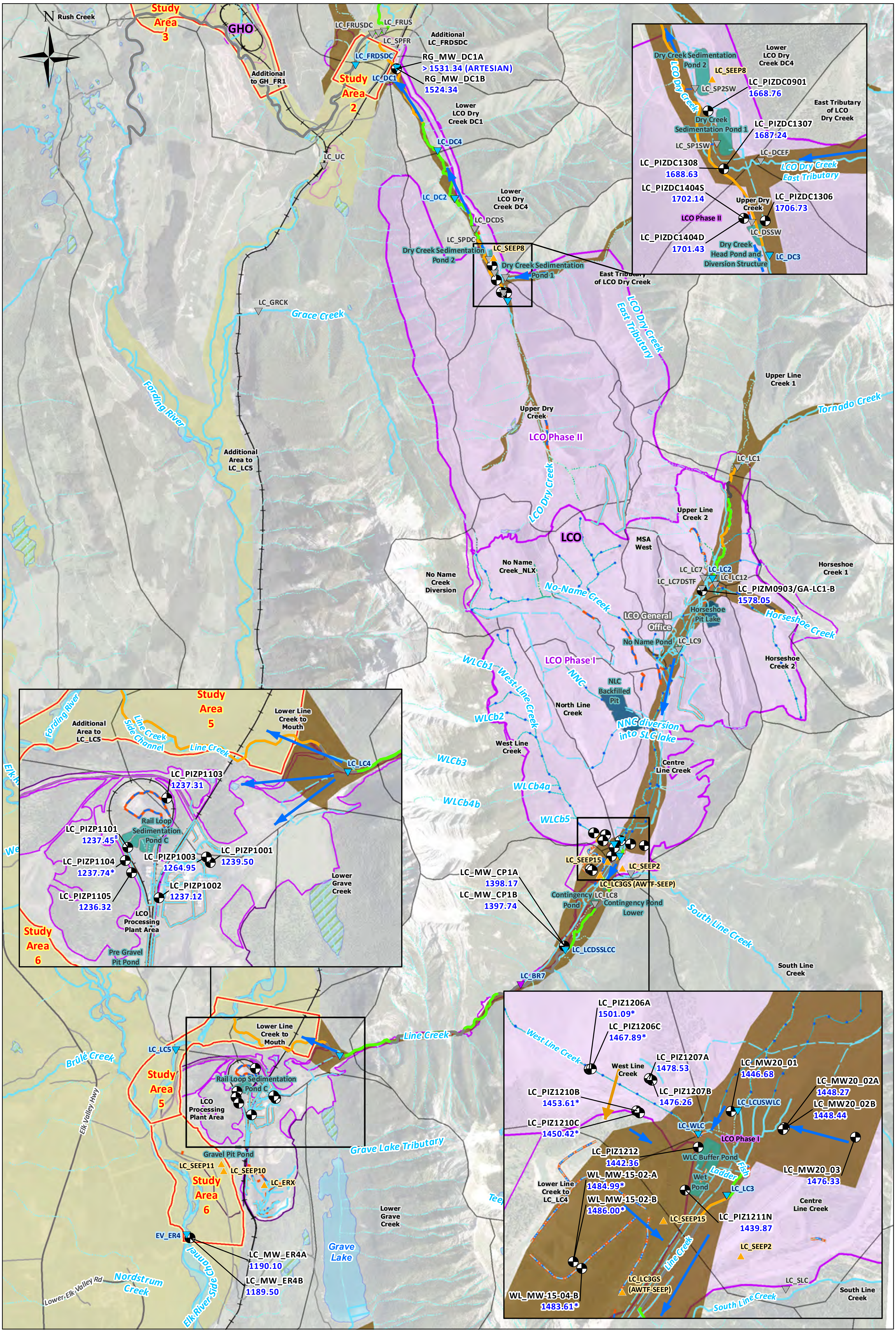
SNC·LAVALIN

Line Creek Operations - Sample Location Plan

CHK'D: MG	DATE: 2023-03-21 SCALE: 1:60,000	Ref Num:
BY: CW	COORD SYS: NAD 1983 UTM Zone 11N	**DRAWING LC-01**

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-LocPlan_LCO.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



Legend

- ● Monitoring Well
- ▽ Permit 107517 Surface Water Stations (included in groundwater assessment)
- ▽ Permit 107517 Surface Water Stations (excluded from groundwater assessment)
- ▽ Non-permitted Surface Water Stations (included in groundwater assessment)
- ▲ Seep

Flow Accretion

- Gaining
- Losing
- No Change
- Insufficient Information

Site Features

- Highway/Arterial
- Secondary Road
- Rails
- Interpreted GW flow direction (Unconsolidated)
- Interpreted GW flow direction (Bedrock)
- Study Areas
- Tailings/Settling/ Sediment Pond
- End-Pit Lake
- Watersheds
- Interpreted Tributary Valley-bottom Extent
- Interpreted Main Valley-bottom Extent
- Mine Permitted Areas
- LCO Phase 1 and 2

Water Features

- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Rock Drain
- Water Pipeline
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:60000 Scale)

1143.80	Water level (masl) measured in October 2022
1538.70*	Water level (masl) measured in November 2022

< : Groundwater elevation below bottom of screen.

Notes:
1. Original in colour.
2. Numerical scale reflects full-size print. Print scaling will distort this scale, however scale bar will remain accurate.
3. Intended for illustration purposes, accuracy has not been verified for construction or navigation purposes.
4. Overlapping wells have been adjusted for clarity.
5. Stations used to assess flow status are not shown on the map. Readers are referred to report references.
6. Flow accretion studies completion dates:
· GHO Tributaries, Elk River, Fording River: combined 2019/2020 studies
· Dry Creek: November, 2018
· Line Creek: October, 2020
7. Groundwater elevation contours could not be completed due to lateral and vertical spatial distribution of wells.
8. Groundwater elevations for LC_PIZP1101 are approximate. LC_PIZP1101 has been repaired and needs to re-surveyed.
9. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

0 0.5 1 2 km

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

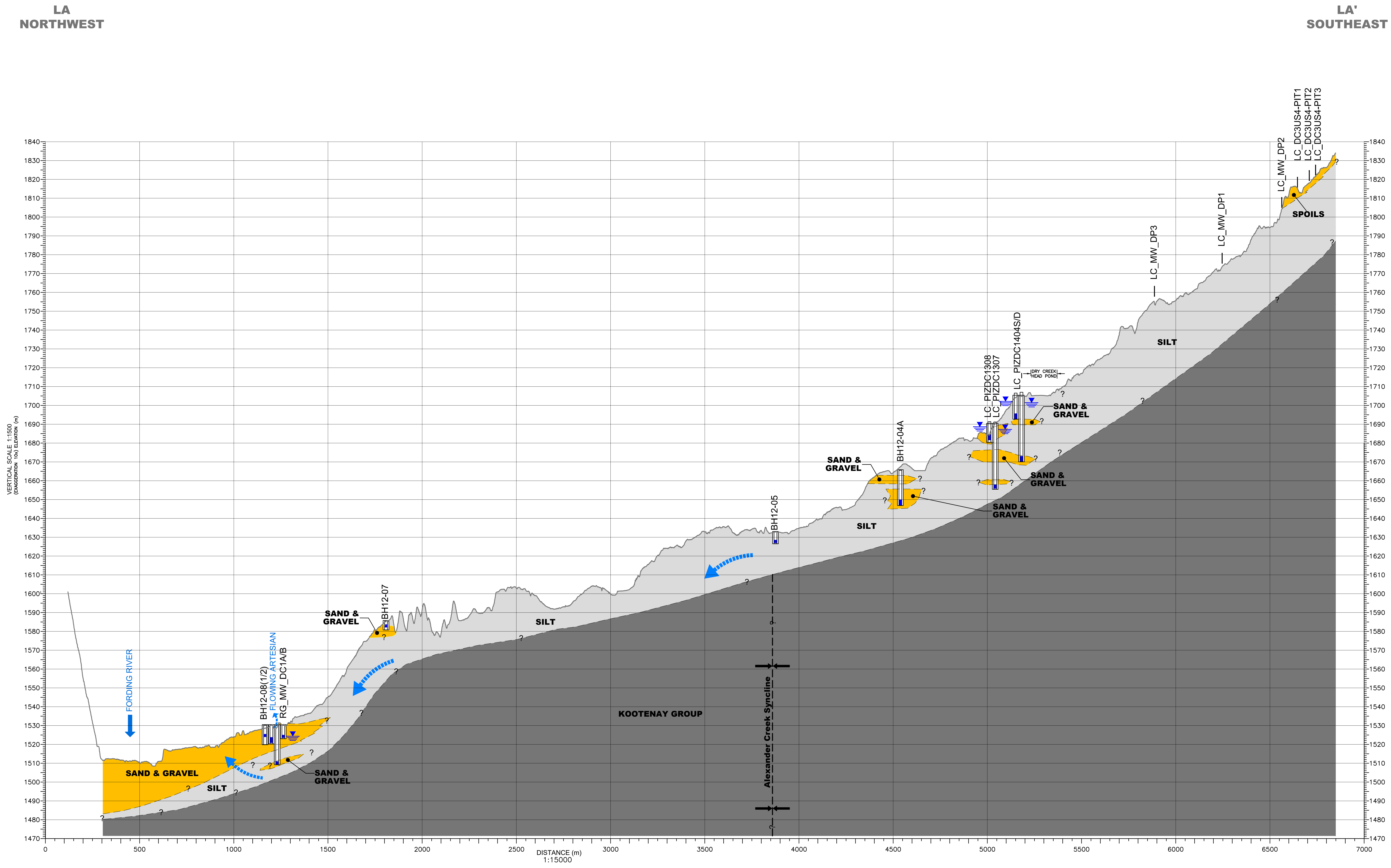
SNC·LAVALIN

Line Creek Operations
Groundwater Elevations from Q4 2022 and Inferred Groundwater Flow Direction

CHK'D: EC
BY: CW
DATE: 2023-03-27
SCALE: 1:60,000
COORD SYS: NAD 1983 UTM Zone 11N
Ref Num:
DRAWING LC-02

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-GWElev_LCO.mxd

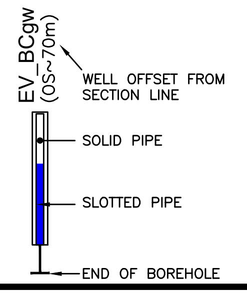
Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



LEGEND

- ▨ SAND & GRAVEL
- ▨ SILT
- ▨ BEDROCK
- – – – INFERRED STRATIGRAPHIC BOUNDARY
- ▼ GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)
- ↖ INFERRED GROUNDWATER FLOW DIRECTION

BOREHOLE LEGEND



NOTES

1. THE CROSS SECTION DEPICTED IS BASED ON INTERPRETATION OF LIMITED GEOLOGICAL DATA. ACTUAL GEOLOGICAL CONDITIONS MAY BE DIFFERENT FROM THOSE INTERPRETED.
2. INFORMATION PRESENTED IS WITHIN 25m OF SECTION LINE UNLESS INDICATED OTHERWISE ON DRAWING.
3. ORIGINAL DRAWING IN COLOUR.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–22	ISSUED TO CLIENT	AJK	MG
0	2022–03–14	ISSUED TO CLIENT	AJK	MG

CLIENT NAME:
TECK COAL LIMITED
–

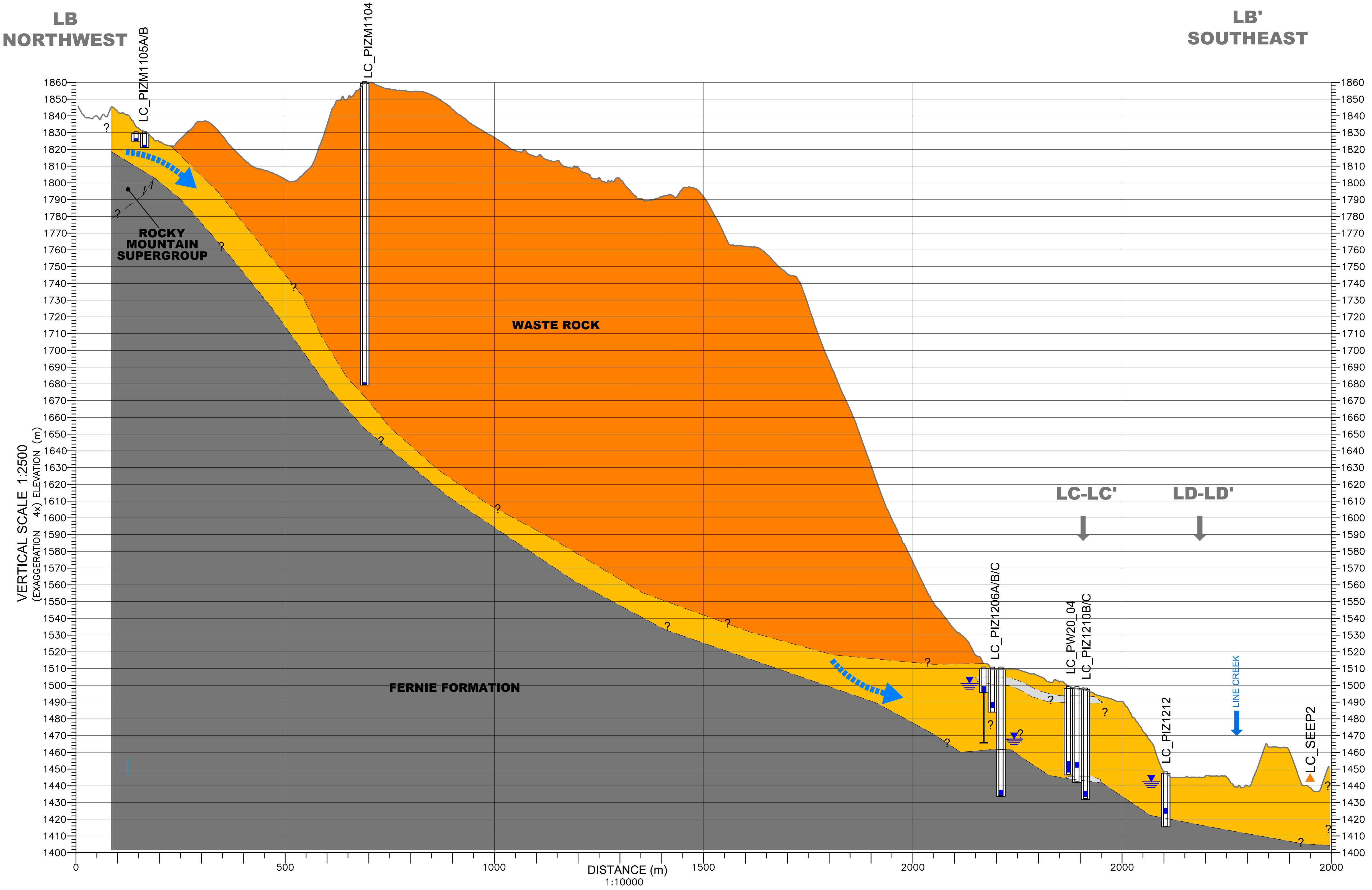
PROJECT LOCATION:
LINE CREEK OPERATONS
ELK VALLEY, BC

SNC·LAVALIN

TITLE:
LINE CREEK OPERATIONS
- INFERRED GEOLOGICAL CROSS SECTION LA-LA'

DWN BY: AJK
SCALE: AS SHOWN
DATE: 2021–10–01
DWG No: REV.: **1**
CHK'D: KC
PLOT: 20230322.0851
CADFILE: 635544–X2R20
DRAWING LC-03

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R20.DWG



LEGEND

🟧	**WASTE ROCK**
🟨	**SAND & GRAVEL**
⬜	**SILT**
⬛	**BEDROCK**

BOREHOLE LEGEND

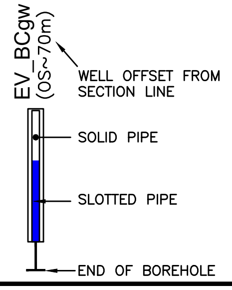
— — — — INFERRED STRATIGRAPHIC BOUNDARY

▼ GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)

▲ SEEP

⬅ INFERRED GROUNDWATER FLOW DIRECTION

↗ THRUST FAULT



NOTES

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2. INFORMATION PRESENTED IS WITHIN 25m OF SECTION LINE UNLESS INDICATED OTHERWISE ON DRAWING.
3. ORIGINAL DRAWING IN COLOUR.
4. GROUND SURFACE ELEVATION OF WELLS WAS OBTAINED FROM LIDAR. GROUNDWATER ELEVATIONS SHOWN ON SECTIONS WERE CALCULATED USING LIDAR GROUND SURFACE ELEVATIONS.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–22	ISSUED TO CLIENT	AJK	MG
0	2022–03–14	ISSUED TO CLIENT	AJK	MG

CLIENT NAME:
TECK COAL LIMITED
–

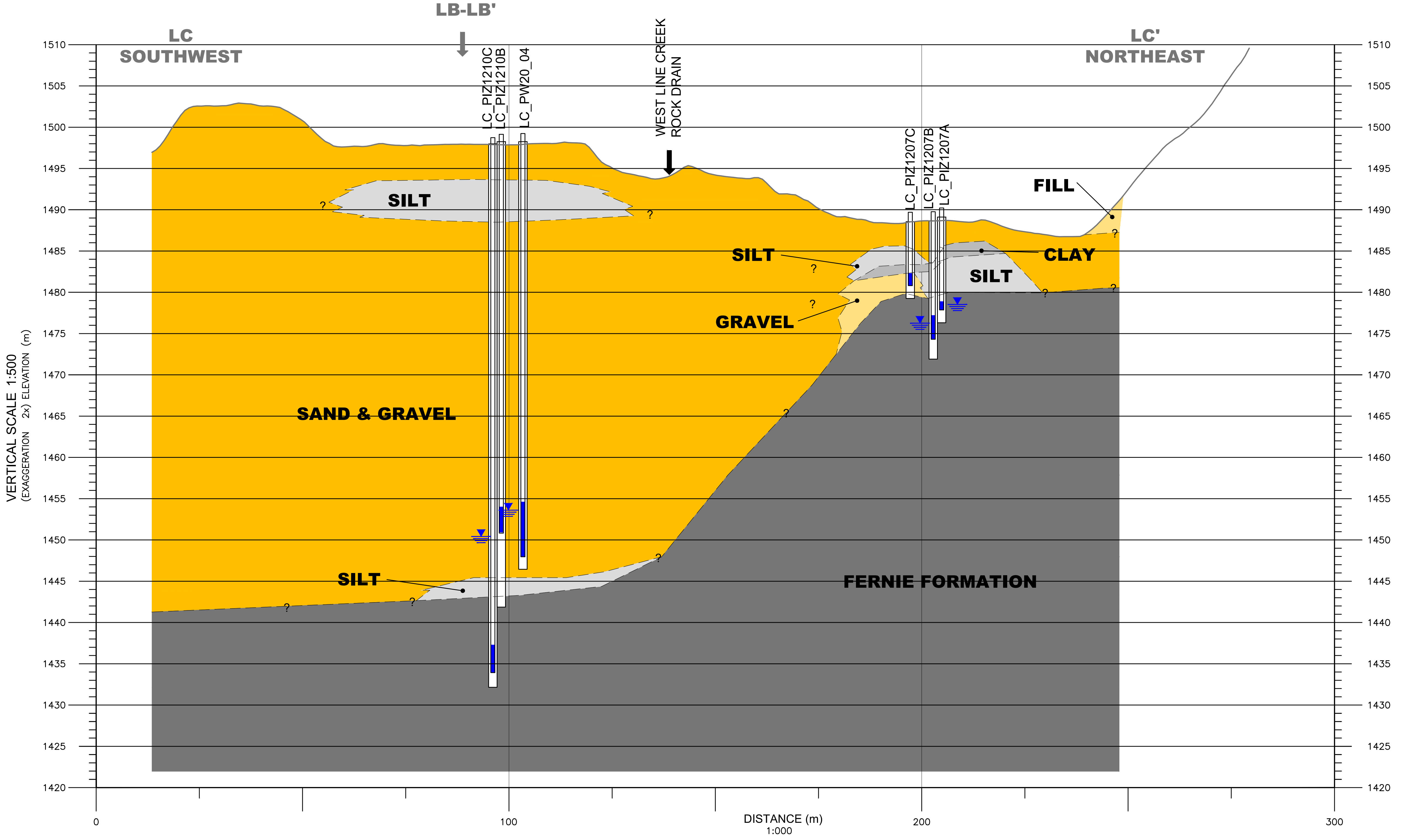
PROJECT LOCATION:
LINE CREEK OPERATONS
ELK VALLEY, BC

SNC•LAVALIN

TITLE:
LINE CREEK OPERATIONS
- INFERRED GEOLOGICAL CROSS SECTION LB-LB'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2021–10–01	DWG No: REV.: **1**
CHK'D: KC	PLOT: 20230322.0851	CADFILE: 635544–X2R20	**DRAWING LC-04**

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R20.DWG



LEGEND

▨	**FILL**
▨	**SAND & GRAVEL**
▨	**SILT**
▨	**CLAY**
▨	**BEDROCK**

— — — — INFERRED STRATIGRAPHIC BOUNDARY

GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)

BOREHOLE LEGEND

EV_BCgw (OS~70m)

WELL OFFSET FROM SECTION LINE

SOLID PIPE

SLOTTED PIPE

END OF BOREHOLE

NOTES

1. THE CROSS SECTION DEPICTED IS BASED ON INTERPRETATION OF LIMITED GEOLOGICAL DATA. ACTUAL GEOLOGICAL CONDITIONS MAY BE DIFFERENT FROM THOSE INTERPRETED.
2. INFORMATION PRESENTED IS WITHIN 25m OF SECTION LINE UNLESS INDICATED OTHERWISE ON DRAWING.
3. ORIGINAL DRAWING IN COLOUR.
4. GROUND SURFACE ELEVATION OF WELLS WAS OBTAINED FROM LIDAR. GROUNDWATER ELEVATIONS SHOWN ON SECTIONS WERE CALCULATED USING LIDAR GROUND SURFACE ELEVATIONS.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023-03-22	ISSUED TO CLIENT	AJK	MG
0	2022-03-14	ISSUED TO CLIENT	AJK	MG

CLIENT NAME:
TECK COAL LIMITED
–

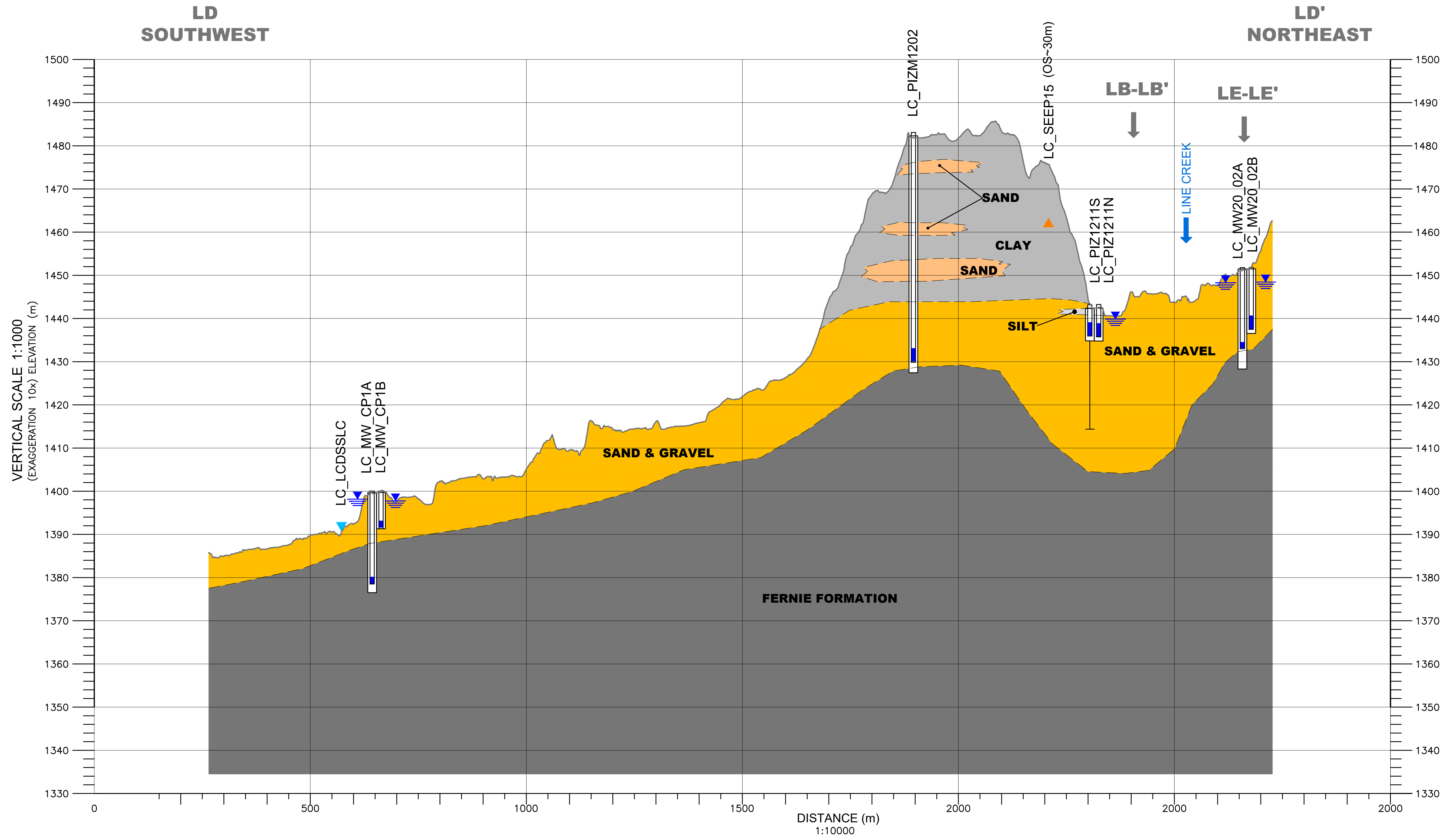
PROJECT LOCATION:
LINE CREEK OPERATONS
ELK VALLEY, BC

SNC·LAVALIN

TITLE:
LINE CREEK OPERATIONS
- INFERRED GEOLOGICAL CROSS SECTION LC-LC'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2021-10-01	DWG No: REV.: **1**
CHK'D: KC	PLOT: 20230322.0851	CADFILE: 635544-X2R20	**DRAWING LC-05**

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544-X2R20.DWG



LEGEND

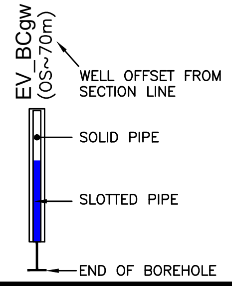
🟨	**SAND & GRAVEL**
🟧	**SAND**
⬜	**SILT**
▨	**CLAY**
⬛	**BEDROCK**

— — — — INFERRED STRATIGRAPHIC BOUNDARY

GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)

▼ SURFACE WATER STATION

BOREHOLE LEGEND



NOTES

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4. GROUND SURFACE ELEVATION OF WELLS WAS OBTAINED FROM LIDAR. GROUNDWATER ELEVATIONS SHOWN ON SECTIONS WERE CALCULATED USING LIDAR GROUND SURFACE ELEVATIONS.
5. MINOR EDITS ON CROSS SECTIONS WHICH INCLUDE WELLS DRILLED IN Q3 AND Q4 2021.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–22	ISSUED TO CLIENT	AJK	MG
0	2022–03–14	ISSUED TO CLIENT	AJK	MG

CLIENT NAME:
TECK COAL LIMITED
–

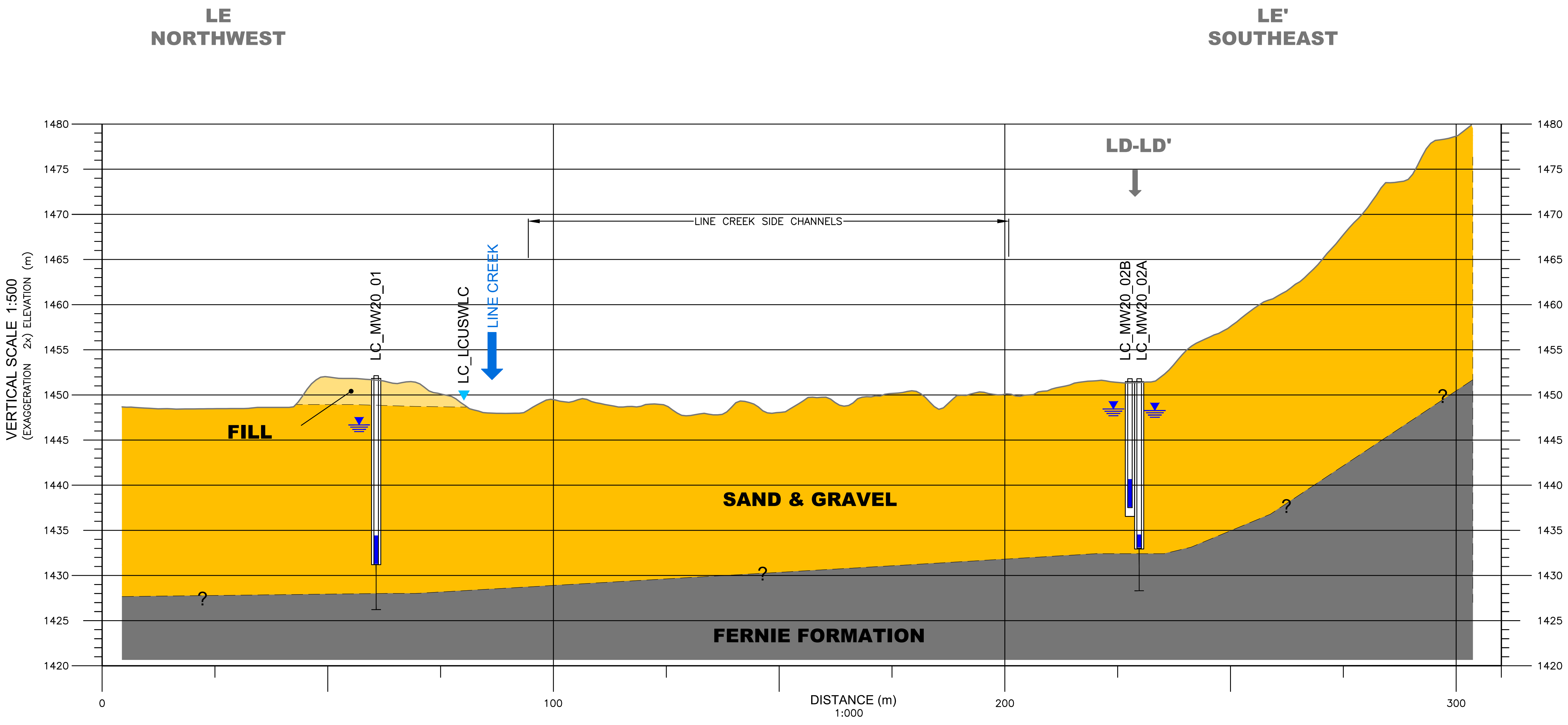
PROJECT LOCATION:
LINE CREEK OPERATONS
ELK VALLEY, BC

SNC·LAVALIN

TITLE:
LINE CREEK OPERATIONS
- INFERRED GEOLOGICAL CROSS SECTION LD-LD'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2021–10–01	DWG No: REV.: **1**
CHK'D: KC	PLOT: 20230322.0850	CADFILE: 635544–X2R20	**DRAWING LC-06**

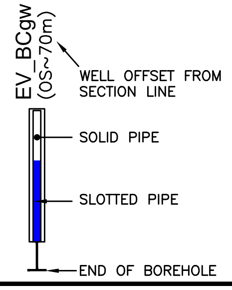
PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R20.DWG



LEGEND

▨	**FILL**
▨	**SAND & GRAVEL**
▨	**BEDROCK**
— — — —	INFERRED STRATIGRAPHIC BOUNDARY
▼	GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)
▼	SURFACE WATER STATION

BOREHOLE LEGEND



NOTES

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5. MINOR EDITS ON CROSS SECTIONS WHICH INCLUDE WELLS DRILLED IN Q3 AND Q4 2021.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–22	ISSUED TO CLIENT	AJK	MG
0	2022–03–14	ISSUED TO CLIENT	AJK	MG

CLIENT NAME:
TECK COAL LIMITED
–

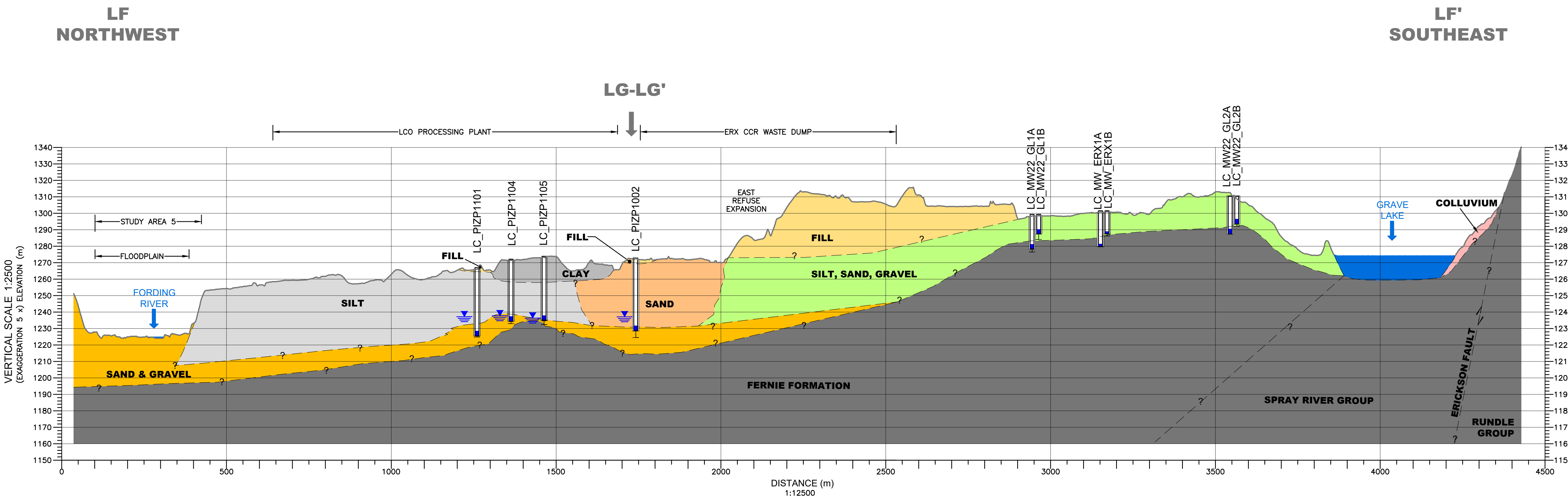
PROJECT LOCATION:
LINE CREEK OPERATONS
ELK VALLEY, BC

SNC·LAVALIN

TITLE:
LINE CREEK OPERATIONS
- INFERRED GEOLOGICAL CROSS SECTION LE-LE'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2021–10–01	DWG No: REV.: **1**
CHK'D: KC	PLOT: 20230322.0847	CADFILE: 635544–X2R20	**DRAWING LC-07**

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R20.DWG



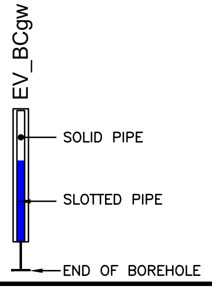
LEGEND

🟨	**FILL**
🟩	**SILT, SAND, GRAVEL (TILL)**
🟥	**COLLUVIUM**
🟧	**SAND & GRAVEL**
🟧	**SAND (WITH GRAVEL)**
⬜	**SILT**
▨	**CLAY**
⬛	**BEDROCK**

– – – – INFERRED STRATIGRAPHIC BOUNDARY

GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)

BOREHOLE LEGEND



NOTES

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5. MINOR EDITS ON CROSS SECTIONS WHICH INCLUDE WELLS DRILLED IN Q3 AND Q4 2021.
6. BEDROCK GEOLOGY REFERENCE: PRICE, R.A., GIEVE, D.A., AND PATENAUDE, C. 1992: GEOLOGY, TORNADO MOUNTAIN, BC–AB; GEOLOGICAL SURVEY OF CANADA, MAP, 1823A.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–22	ISSUED TO CLIENT	AJK	MG
0	2022–03–14	ISSUED TO CLIENT	AJK	MG

CLIENT NAME:
TECK COAL LIMITED
–

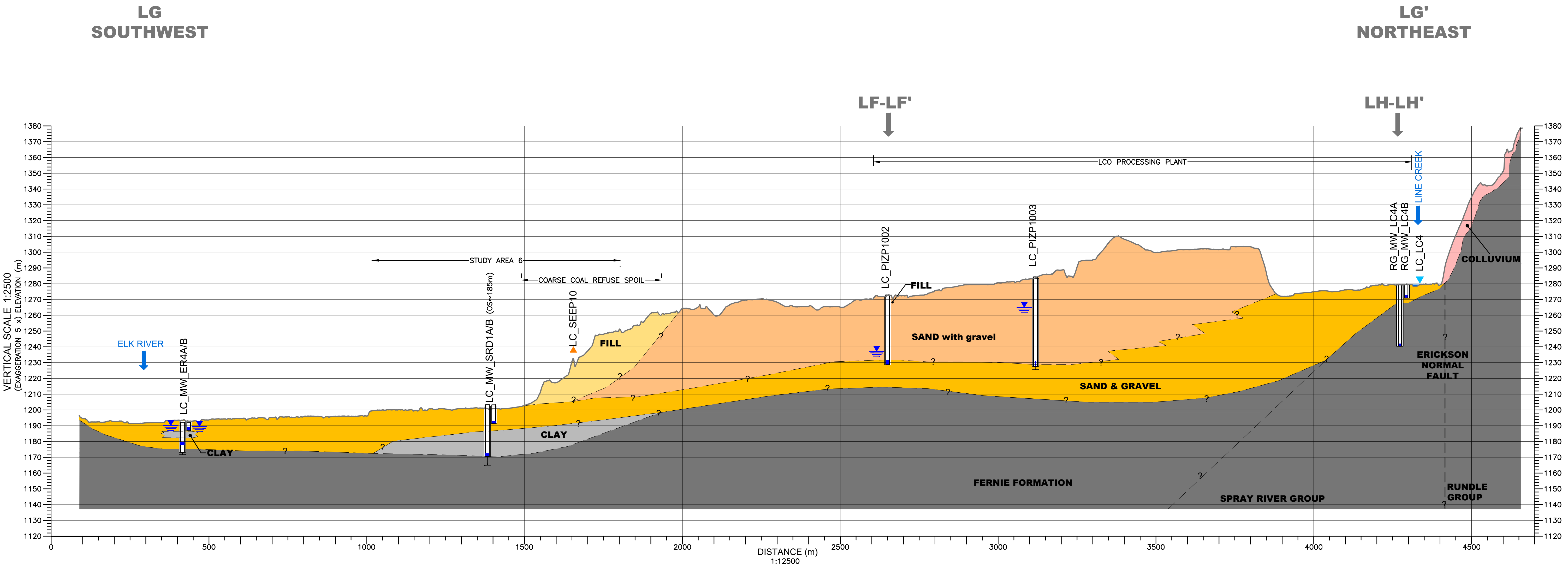
PROJECT LOCATION:
LINE CREEK OPERATONS
ELK VALLEY, BC

SNC·LAVALIN

TITLE:
LINE CREEK OPERATIONS
- INFERRED GEOLOGICAL CROSS SECTION LF-LF'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2021–10–01	DWG No: REV.: **1**
CHK'D: KC	PLOT: 20230322.0847	CADFILE: 635544–X2R20	**DRAWING LC-08**

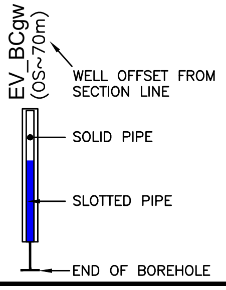
PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R20.DWG



LEGEND

🟨	**FILL**
🟥	**COLLUVIUM**
🟧	**SAND & GRAVEL**
🟧	**SAND (WITH GRAVEL)**
⬜	**CLAY**
⬛	**BEDROCK**
— — — —	INFERRED STRATIGRAPHIC BOUNDARY
▲	SEEP
▼	GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)

BOREHOLE LEGEND



NOTES

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3. ORIGINAL DRAWING IN COLOUR.
4. GROUND SURFACE ELEVATION OF WELLS WAS OBTAINED FROM LIDAR. GROUNDWATER ELEVATIONS SHOWN ON SECTIONS WERE CALCULATED USING LIDAR GROUND SURFACE ELEVATIONS.
5. MINOR EDITS ON CROSS SECTIONS WHICH INCLUDE WELLS DRILLED IN Q3 AND Q4 2021.

REFERENCE DRAWINGS

–	–	–
DWG. NO.	DATE	DESCRIPTION

REVISIONS

1	2023–03–22	ISSUED TO CLIENT	AJK	MG
0	2022–03–14	ISSUED TO CLIENT	AJK	MG
REV.	DATE	DESCRIPTION	BY	CHK

CLIENT NAME:
TECK COAL LIMITED
–

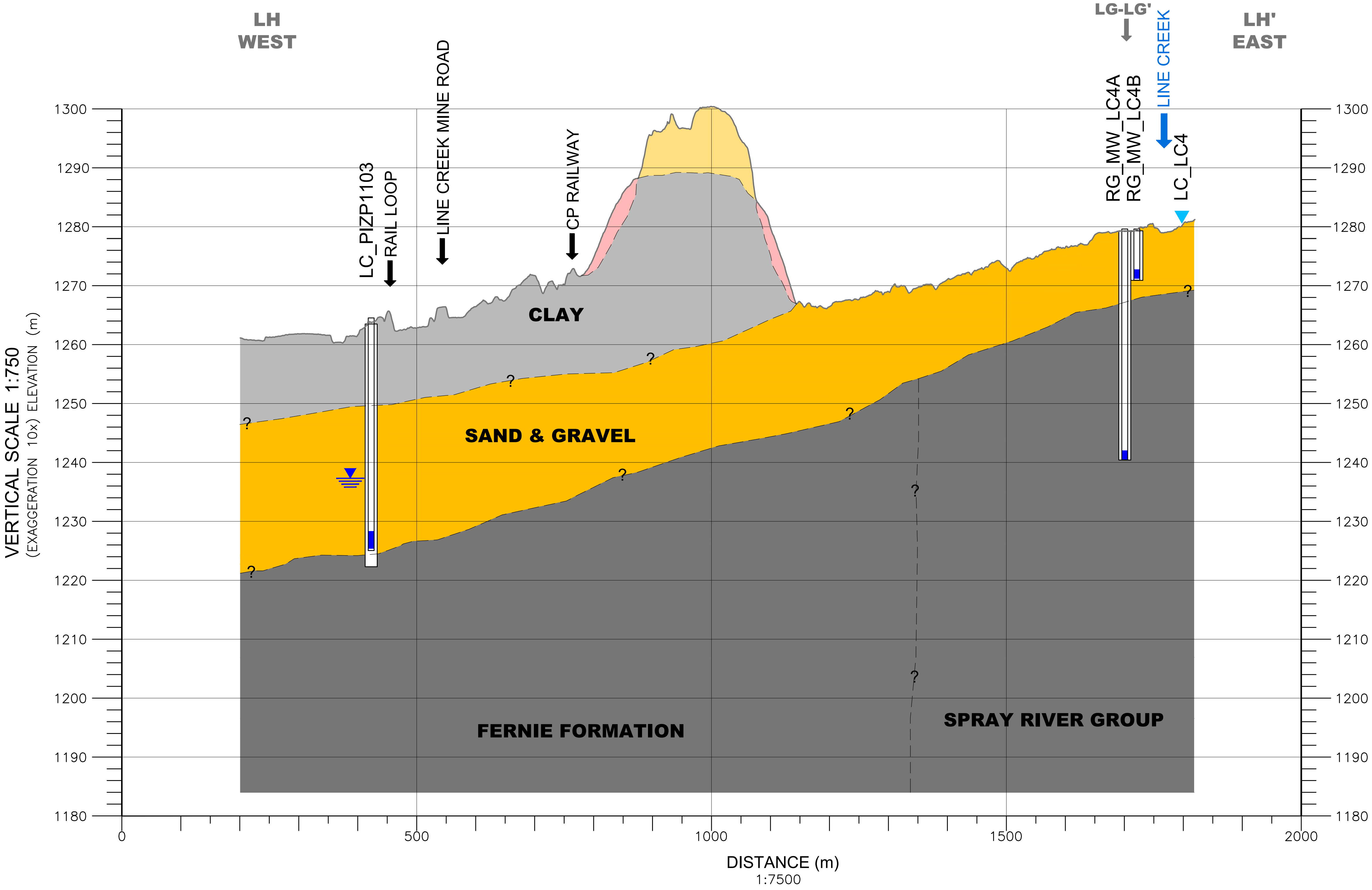
PROJECT LOCATION:
LINE CREEK OPERATONS
ELK VALLEY, BC

SNC•LAVALIN

TITLE:
LINE CREEK OPERATIONS
- INFERRED GEOLOGICAL CROSS SECTION LG-LG'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2021–10–01	DWG No: REV.: **1**
CHK'D: KC	PLOT: 20230322.0847	CADFILE: 635544–X2R20	**DRAWING LC-09**

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R20.DWG



LEGEND

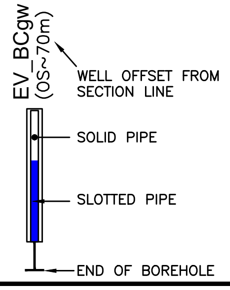
🟨	**FILL**
🟥	**COLLUVIUM**
🟧	**SAND & GRAVEL**
▨	**CLAY**
⬛	**BEDROCK**

— — — — INFERRED STRATIGRAPHIC BOUNDARY

GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)

▼ SURFACE WATER STATION

BOREHOLE LEGEND



NOTES

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4. GROUND SURFACE ELEVATION OF WELLS WAS OBTAINED FROM LIDAR. GROUNDWATER ELEVATIONS SHOWN ON SECTIONS WERE CALCULATED USING LIDAR GROUND SURFACE ELEVATIONS.
5. MINOR EDITS ON CROSS SECTIONS WHICH INCLUDE WELLS DRILLED IN Q3 AND Q4 2021.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–22	ISSUED TO CLIENT	AJK	MG
0	2022–03–14	ISSUED TO CLIENT	AJK	MG

CLIENT NAME:
TECK COAL LIMITED
–

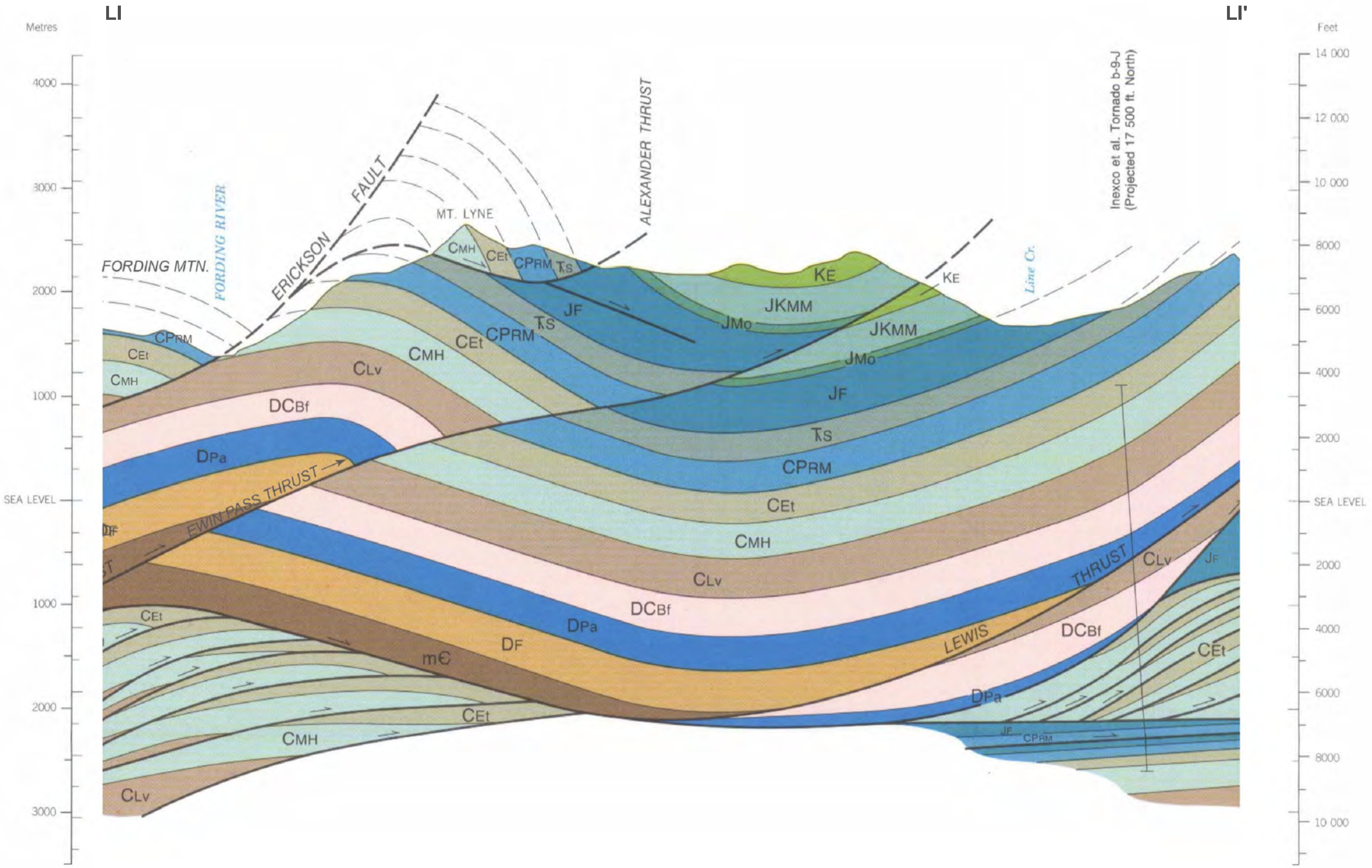
PROJECT LOCATION:
LINE CREEK OPERATONS
ELK VALLEY, BC

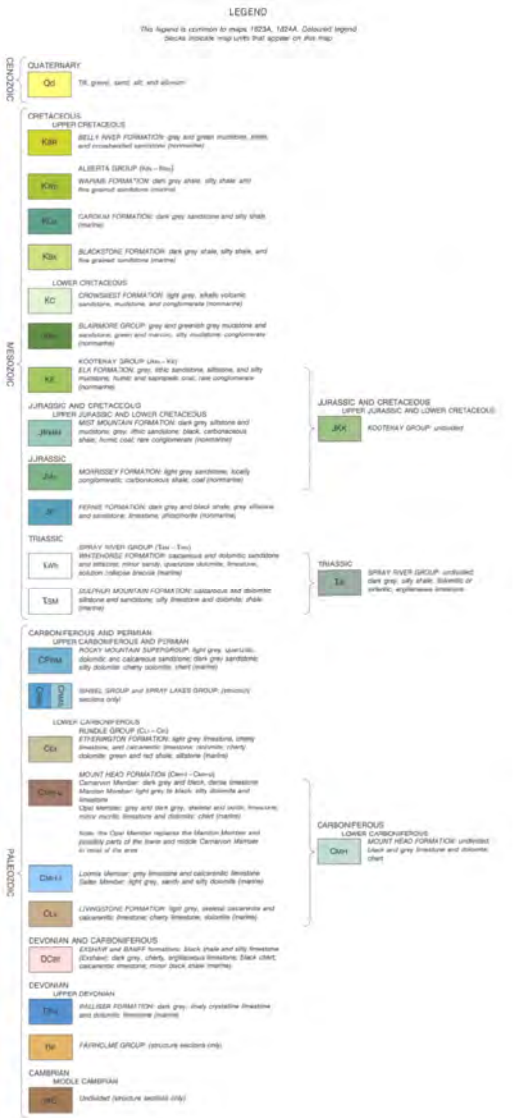
SNC·LAVALIN

TITLE:
LINE CREEK OPERATIONS
- INFERRED GEOLOGICAL CROSS SECTION LH-LH'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2021–10–01	DWG No: REV.: **1**
CHK'D: KC	PLOT: 20230322.0846	CADFILE: 635544–X2R20	**DRAWING LC-10**

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R20.DWG





NOTES:
1. Original in colour.
2. Numerical scale reflects full-size print. Print scaling will distort this scale, however scale bar will remain accurate.
3. Intended for illustration purposes, accuracy has not been verified for construction or navigation

REFERENCES:
1. Information provided by Teck Coal Limited.
2. Cross section geology source: Price, R.A., Grieve, D.A., and Patenaude,C.1992: Geology and structure cross-section, Tornado Mountain, British Columbia-Alberta; Geological Survey of Canada, Map 1823A, scale 1:50000.

REVISIONS:
0 - CW - 2023-02-22 - DRAFT - MG
1 - CW - 2023-03-27 - FINAL - MG

CLIENT:
Teck Coal Limited

PROJECT LOCATION:
Line Creek Operations, BC

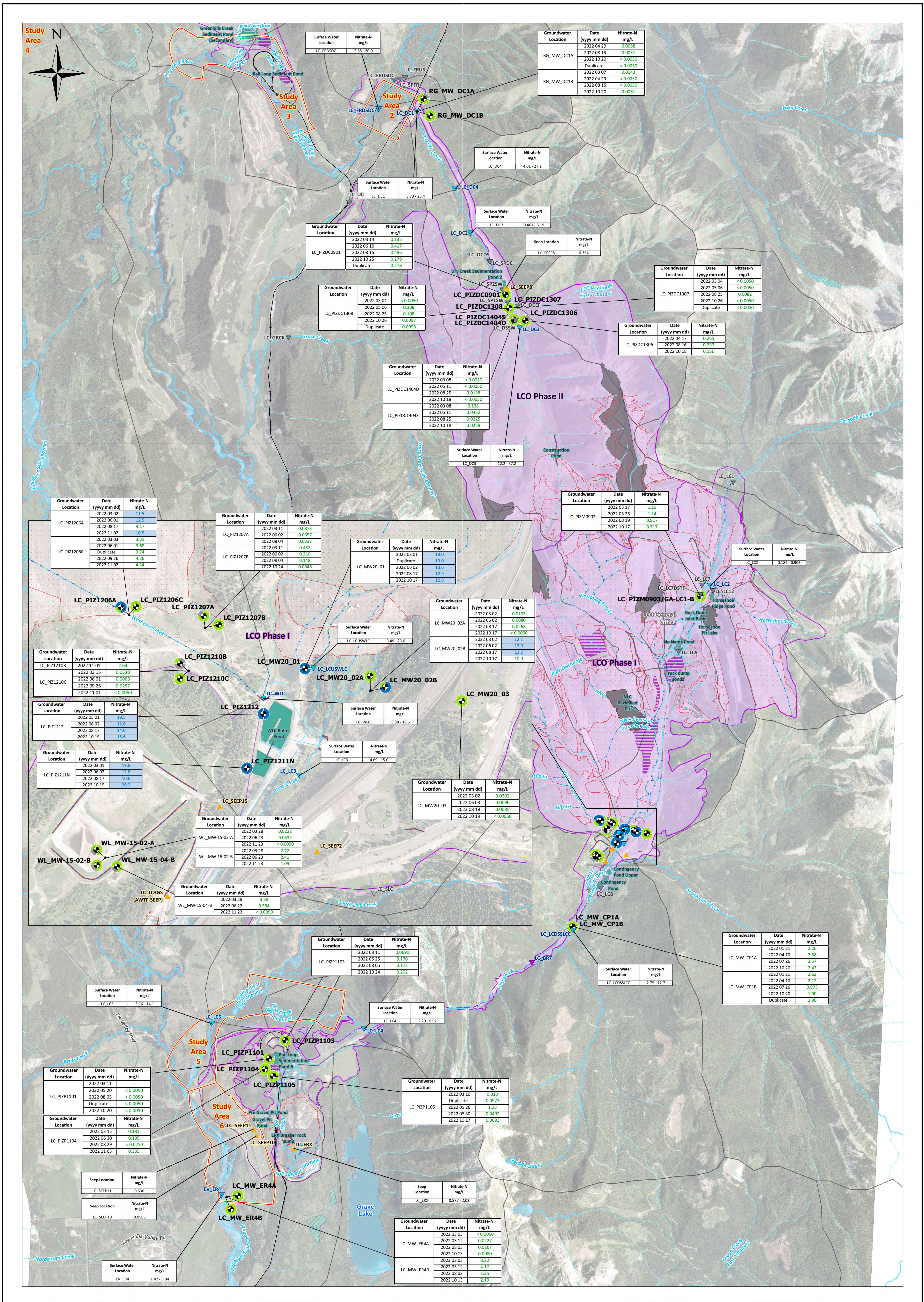
SNC·LAVALIN

Line Creek Operations
Inferred Geological Cross Section LI-LI'

BY: CW	SCALE: SEE MAP	DATE: 2023-02-22	REF No:
CHK'D: MG	Proj Coord Sys: NAD 1983 UTM Zone 11N		DRAWING LC-11

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-XSection_LI_LI_LCO.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



Surface Water Location	Nitrate-N mg/L
LC_FRDSDC	5.88 - 20.0

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
RG_MW_DC1A	2022 04 29	0.0058
	2022 08 15	0.0051
	2022 10 20	< 0.0050
	Duplicate	< 0.0050
RG_MW_DC1B	2022 03 07	0.0143
	2022 04 29	< 0.0050
	2022 08 15	< 0.0050
	2022 10 20	0.0061

Surface Water Location	Nitrate-N mg/L
LC_DC4	4.01 - 27.1

Surface Water Location	Nitrate-N mg/L
LC_DC1	3.73 - 25.4

Surface Water Location	Nitrate-N mg/L
LC_DC2	0.461 - 51.9

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
LC_PIZDC0901	2022 03 14	0.135
	2022 06 10	0.417
	2022 08 15	0.496
	2022 10 25	0.279
	Duplicate	0.278

Seep Location	Nitrate-N mg/L
LC_SEEP8	0.354

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
LC_PIZDC1307	2022 03 04	< 0.0050
	2022 05 06	< 0.0050
	2022 08 25	0.0082
	2022 10 26	< 0.0050
	Duplicate	< 0.0050

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
LC_PIZDC1308	2022 03 04	< 0.0050
	2022 05 06	0.108
	2022 08 25	0.108
	2022 10 26	0.0097
	Duplicate	0.0098

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
LC_PIZDC1306	2022 04 17	0.265
	2022 08 16	0.237
	2022 10 18	0.156

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
LC_PIZDC1404D	2022 03 08	< 0.0050
	2022 05 11	< 0.0050
	2022 08 25	0.0138
	2022 10 18	< 0.0050
LC_PIZDC1404S	2022 03 08	0.138
	2022 05 11	0.0452
	2022 08 25	0.0225
	2022 10 18	0.0229

Surface Water Location	Nitrate-N mg/L
LC_DC3	12.2 - 57.2

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
LC_PIZM0903	2022 03 17	1.19
	2022 05 26	1.14
	2022 08 19	0.917
	2022 10 17	0.717

Surface Water Location	Nitrate-N mg/L
LC_LC2	0.182 - 0.905

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
LC_PIZ1206A	2022 03 02	11.5
	2022 06 01	12.5
	2022 08 17	9.17
	2022 11 02	10.5
LC_PIZ1206C	2022 03 03	3.51
	2022 06 01	3.68
	Duplicate	3.74
	2022 09 26	4.26
	2022 11 02	4.34

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
LC_PIZ1207A	2022 03 11	0.0873
	2022 06 02	0.0657
	2022 08 04	0.0322
LC_PIZ1207B	2022 03 11	0.487
	2022 06 02	0.210
	2022 08 04	0.148
	2022 10 24	0.0946

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
LC_MW20_01	2022 03 01	13.0
	Duplicate	13.0
	2022 06 02	13.6
	2022 08 17	12.9
	2022 10 17	12.6

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
LC_MW20_02A	2022 03 02	0.0105
	2022 06 02	0.0080
	2022 08 17	0.0268
	2022 10 17	< 0.0050
LC_MW20_02B	2022 03 02	12.1
	2022 06 02	13.9
	2022 08 17	12.2
	2022 10 17	10.0

Surface Water Location	Nitrate-N mg/L
LC_LCUSWLC	3.49 - 23.6

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
LC_PIZ1210B	2022 11 01	2.64
LC_PIZ1210C	2022 03 15	0.0530
	2022 06 01	0.0065
	2022 09 26	0.0257
	2022 11 01	< 0.0050

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
LC_PIZ1212	2022 03 01	19.5
	2022 06 02	12.6
	2022 08 17	14.0
	2022 10 19	13.6

Surface Water Location	Nitrate-N mg/L
LC_WLC	5.88 - 16.6

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
LC_PIZ1211N	2022 03 01	19.8
	2022 06 02	12.8
	2022 08 17	10.6
	2022 10 19	20.2

Surface Water Location	Nitrate-N mg/L
LC_LC3	4.69 - 15.0

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
LC_MW20_03	2022 03 02	0.0202
	2022 06 03	0.0090
	2022 08 18	0.0085
	2022 10 19	< 0.0050

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
WL_MW-15-02-A	2022 03 28	0.0222
	2022 06 23	0.0332
	2022 11 23	< 0.0050
WL_MW-15-02-B	2022 03 28	2.72
	2022 06 23	2.41
	2022 11 23	1.09

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
WL_MW-15-04-B	2022 03 28	3.38
	2022 06 22	0.584
	2022 11 23	< 0.0050

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
LC_PIZP1103	2022 03 11	0.0690
	2022 05 25	0.170
	2022 08 05	0.173
	2022 10 24	0.202

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
LC_MW_CP1A	2022 01 21	2.26
	2022 04 10	2.58
	2022 07 26	2.57
	2022 10 20	2.43
LC_MW_CP1B	2022 01 21	2.62
	2022 04 10	2.12
	2022 07 26	0.973
	2022 10 20	1.90
	Duplicate	1.90

Surface Water Location	Nitrate-N mg/L
LC_LCDSSLCC	2.75 - 12.7

Surface Water Location	Nitrate-N mg/L
LC_LC5	5.16 - 14.1

Surface Water Location	Nitrate-N mg/L
LC_LC4	2.20 - 9.97

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
LC_PIZP1101	2022 03 11	-
	2022 05 20	< 0.0050
	2022 08 05	< 0.0050
	Duplicate	< 0.0050
	2022 10 20	< 0.0050

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
LC_PIZP1104	2022 03 15	0.183
	2022 06 30	0.105
	2022 08 29	< 0.0250
	2022 11 03	0.365

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
LC_PIZP1105	2022 03 10	0.313
	Duplicate	0.0973
	2022 05 26	1.23
	2022 08 30	0.0492
	2022 10 17	0.0693

Seep Location	Nitrate-N mg/L
LC_SEEP11	0.530

Seep Location	Nitrate-N mg/L
LC_SEEP10	0.0565

Seep Location	Nitrate-N mg/L
LC_ERX	0.877 - 2.02

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
LC_MW_ER4A	2022 03 03	< 0.0050
	2022 05 12	0.0227
	2022 08 03	0.0167
	2022 10 13	0.0080
LC_MW_ER4B	2022 03 03	3.22
	2022 05 12	4.17
	2022 08 03	1.35
	2022 10 13	2.19

Surface Water Location	Nitrate-N mg/L
EV_ER4	1.42 - 5.84

Legend

Groundwater Stations[4]

- Monitoring Well

Surface Water Stations

- ▲ Seep
- ▼ Permit 107517 Surface Water Stations (included in groundwater assessment)
- ▼ Permit 107517 Surface Water Stations (excluded from groundwater assessment)
- ▼ Non-permitted Surface Water Stations (included in groundwater assessment)

Site Features

- Highway/Arterial
- Secondary Road
- Rails
- Study Areas
- Tailings/Settling/Sediment Pond
- End-Pit Lake
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds
- LCO Phase 1 and 2
- Mine Permitted Areas

Water Features

- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Rock Drain
- Water Pipeline
- Bypass/Diversion Channel
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:30000 Scale)

symbol locations have been adjusted relative to well locations for visibility

Green below the applicable screening criteria

Blue above the applicable screening criteria

Grey no sample collected

Primary Screening Criteria	Nitrate-N mg/L
CSR Aquatic Life	400
CSR Irrigation Watering	*n/a*
CSR Livestock Watering	100
CSR Drinking Water	10

Notes:
1. Original in colour at paper size ANSI C (17x22 in).
2. Numerical scale reflects full-size print. Print scaling will distort this scale; however, scale bar will remain accurate.
3. Intended for illustration purposes. Accuracy has not been verified for construction or navigation.
4. Locations of overlapping wells have been adjusted for clarity.
5. Nitrate-N = Nitrate Nitrogen
6. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Data provided by Teck Coal Limited

0 0.5 1 2 3 km

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

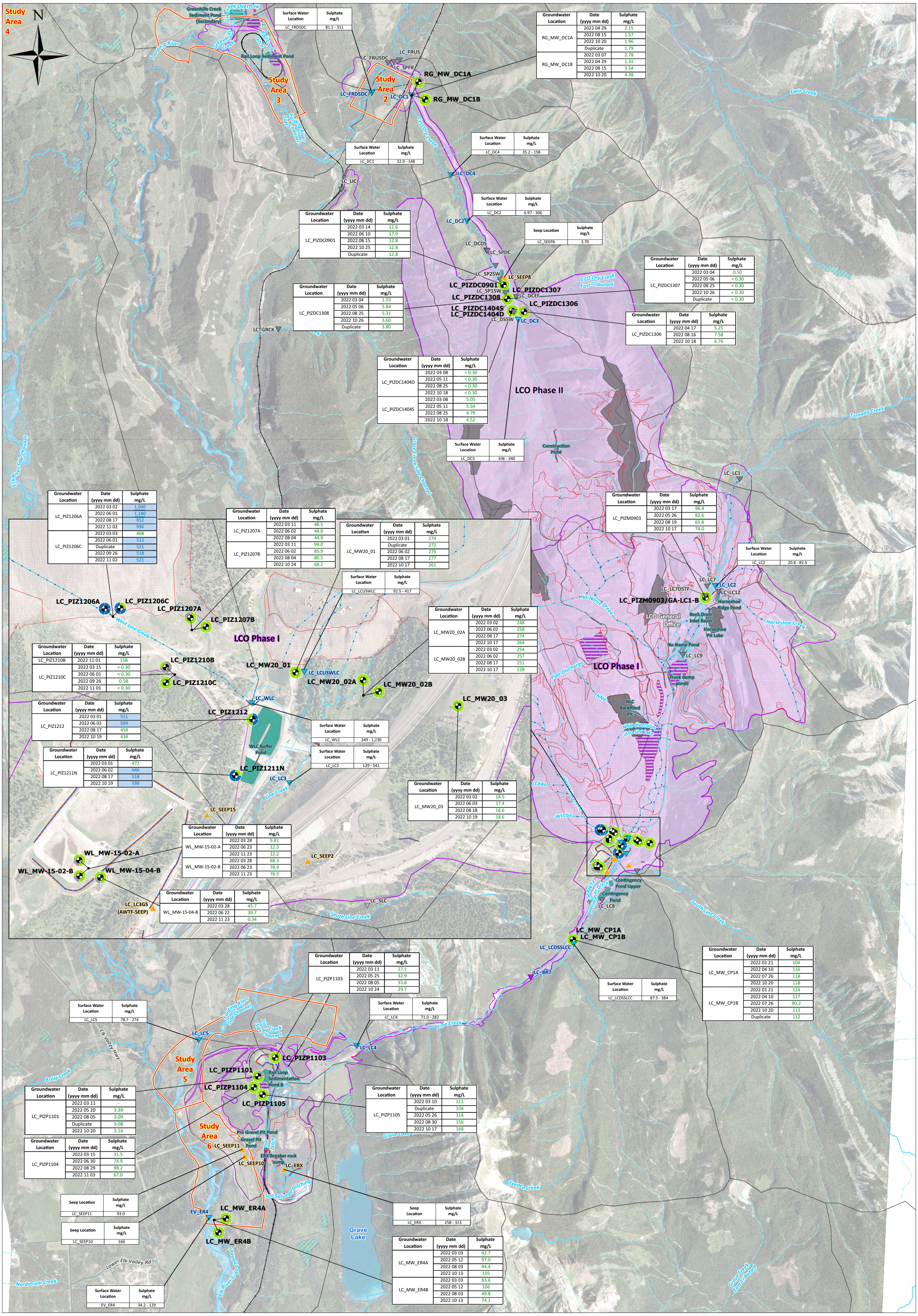
SNC·LAVALIN

Line Creek Operations - Spatial Distribution of Nitrate Nitrogen in Groundwater

CHK'D: MG
DATE: 2023-03-17 SCALE: 1:30,000
BY: CW
COORD SYS: NAD 1983 UTM Zone 11N
REF NUM:
DRAWING LC-12

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\AnalyticalDrawings_2022AnnRpt.aprx

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



Surface Water Location	Sulphate mg/L
LC_FRDSDC	81.2 - 311

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
RG_MW_DC1A	2022 04 29	2.15
	2022 08 15	1.57
	2022 10 20	1.96
	Duplicate	1.79
RG_MW_DC1B	2022 03 07	2.78
	2022 04 29	1.31
	2022 08 15	3.54
	2022 10 20	4.38

Surface Water Location	Sulphate mg/L
LC_DC1	32.9 - 148

Surface Water Location	Sulphate mg/L
LC_DC4	35.2 - 158

Surface Water Location	Sulphate mg/L
LC_DC2	6.97 - 306

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
LC_PIZDC0901	2022 03 14	12.6
	2022 06 10	17.9
	2022 08 15	12.8
	2022 10 25	12.8
	Duplicate	12.8

Seep Location	Sulphate mg/L
LC_SEEP8	3.70

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
LC_PIZDC1307	2022 03 04	0.50
	2022 05 06	< 0.30
	2022 08 25	< 0.30
	2022 10 26	< 0.30
	Duplicate	< 0.30

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
LC_PIZDC1308	2022 03 04	1.93
	2022 05 06	5.84
	2022 08 25	5.31
	2022 10 26	3.60
	Duplicate	3.80

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
LC_PIZDC1306	2022 04 17	5.25
	2022 08 16	7.58
	2022 10 18	6.76

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
LC_PIZDC1404D	2022 03 08	< 0.30
	2022 05 11	< 0.30
	2022 08 25	< 0.30
	2022 10 18	< 0.30
LC_PIZDC1404S	2022 03 08	5.05
	2022 05 11	5.54
	2022 08 25	4.79
	2022 10 18	4.52

Surface Water Location	Sulphate mg/L
LC_DC3	106 - 340

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
LC_PIZ1206A	2022 03 02	1,040
	2022 06 01	1,180
	2022 08 17	852
	2022 11 02	996
LC_PIZ1206C	2022 03 03	468
	2022 06 01	512
	Duplicate	521
	2022 09 26	518
	2022 11 02	521

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
LC_PIZ1207A	2022 03 11	48.5
	2022 06 02	44.0
	2022 08 04	44.9
LC_PIZ1207B	2022 03 11	94.0
	2022 06 02	85.9
	2022 08 04	80.5
	2022 10 24	68.2

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
LC_MW20_01	2022 03 01	274
	Duplicate	272
	2022 06 02	275
	2022 08 17	277
	2022 10 17	261

Surface Water Location	Sulphate mg/L
LC_LCUSWLC	92.5 - 417

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
LC_PIZM0903	2022 03 17	96.4
	2022 05 26	82.6
	2022 08 19	65.8
	2022 10 17	74.0

Surface Water Location	Sulphate mg/L
LC_LC2	20.8 - 82.5

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
LC_MW20_02A	2022 03 02	248
	2022 06 02	258
	2022 08 17	274
	2022 10 17	264
LC_MW20_02B	2022 03 02	254
	2022 06 02	257
	2022 08 17	251
	2022 10 17	228

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
LC_PIZ1210B	2022 11 01	158
LC_PIZ1210C	2022 03 15	< 0.30
	2022 06 01	< 0.30
	2022 09 26	0.58
	2022 11 01	< 0.30

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
LC_PIZ1212	2022 03 01	511
	2022 06 02	599
	2022 08 17	458
	2022 10 19	434

Surface Water Location	Sulphate mg/L
LC_WLC	349 - 1,230

Surface Water Location	Sulphate mg/L
LC_LC3	129 - 541

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
LC_PIZ1211N	2022 03 01	472
	2022 06 02	646
	2022 08 17	518
	2022 10 19	599

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
LC_MW20_03	2022 03 02	18.5
	2022 06 03	17.4
	2022 08 18	16.6
	2022 10 19	18.6

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
WL_MW-15-02-A	2022 03 28	9.81
	2022 06 23	12.3
	2022 11 23	12.2
WL_MW-15-02-B	2022 03 28	68.3
	2022 06 23	78.9
	2022 11 23	76.5

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
WL_MW-15-04-B	2022 03 28	45.7
	2022 06 22	30.7
	2022 11 23	0.34

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
LC_MW_CP1A	2022 01 21	104
	2022 04 10	116
	2022 07 26	118
	2022 10 20	118
LC_MW_CP1B	2022 01 21	124
	2022 04 10	117
	2022 07 26	90.2
	2022 10 20	113
	Duplicate	112

Surface Water Location	Sulphate mg/L
LC_LCDSSLCC	87.5 - 384

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
LC_PIZP1103	2022 03 11	27.1
	2022 05 25	32.9
	2022 08 05	33.8
	2022 10 24	29.7

Surface Water Location	Sulphate mg/L
LC_LC5	78.7 - 274

Surface Water Location	Sulphate mg/L
LC_LC4	71.0 - 282

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
LC_PIZP1101	2022 03 11	-
	2022 05 20	3.39
	2022 08 05	3.09
	Duplicate	3.08
	2022 10 20	3.14

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
LC_PIZP1105	2022 03 10	111
	Duplicate	104
	2022 05 26	114
	2022 08 30	156
	2022 10 17	168

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
LC_PIZP1104	2022 03 15	31.5
	2022 06 30	74.9
	2022 08 29	98.2
	2022 11 03	67.0

Seep Location	Sulphate mg/L
LC_SEEP11	93.0

Seep Location	Sulphate mg/L
LC_SEEP10	166

Seep Location	Sulphate mg/L
LC_ERX	258 - 333

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
LC_MW_ER4A	2022 03 03	92.7
	2022 05 12	97.0
	2022 08 03	94.4
	2022 10 13	105
LC_MW_ER4B	2022 03 03	83.6
	2022 05 12	106
	2022 08 03	49.8
	2022 10 13	74.1

Surface Water Location	Sulphate mg/L
EV_ER4	34.2 - 129

Legend

Groundwater Stations[4]
- ◐ Monitoring Well

Surface Water Stations
- ▲ Seep
- ▼ Permit 107517 Surface Water Stations (included in groundwater assessment)
- ▼ Permit 107517 Surface Water Stations (excluded from groundwater assessment)
- ▼ Non-permitted Surface Water Stations (included in groundwater assessment)

Site Features
- Highway/Arterial
- Secondary Road
- Rails
- Study Areas
- Tailings/Settling/Sediment Pond
- End-Pit Lake
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds
- LCO Phase 1 and 2
- Mine Permitted Areas

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Rock Drain
- Water Pipeline
- Bypass/Diversion Channel
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:30000 Scale)

Q4 Q1
Q3 Q2

symbol locations have been adjusted relative to well locations for visibility

Green below the applicable screening criteria

Blue above the applicable screening criteria

Grey no sample collected

Primary Screening Criteria	Sulphate mg/L
CSR Aquatic Life	1,280-4,290
CSR Irrigation Watering	*n/a*
CSR Livestock Watering	1,000
CSR Drinking Water	500

Notes:
1. Original in colour at paper size ANSI C (17x22 in).
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4. Locations of overlapping wells have been adjusted for clarity.
5. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Data provided by Teck Coal Limited

0 0.5 1 2 3 km

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

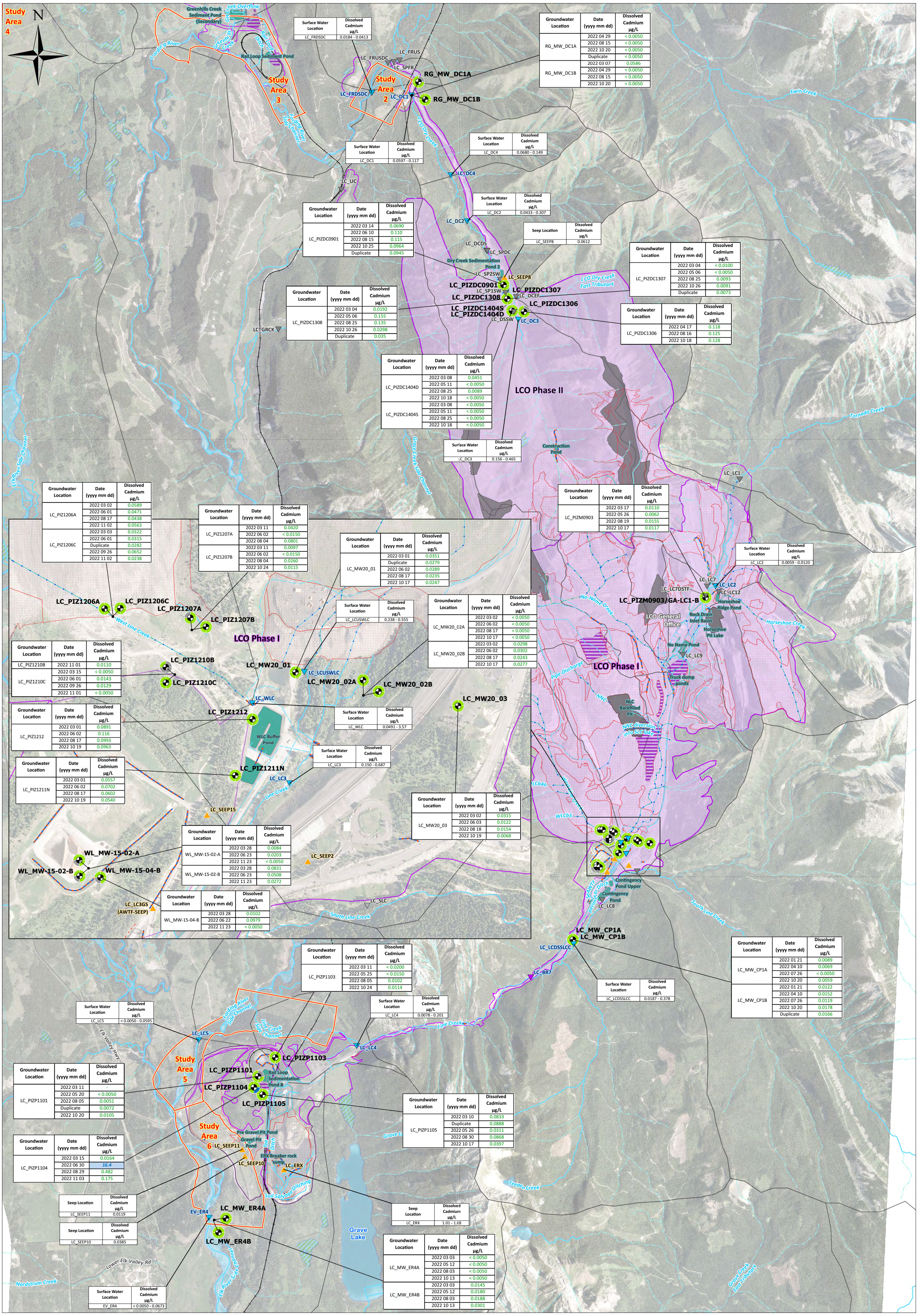
SNC·LAVALIN

Line Creek Operations - Spatial Distribution of Sulphate in Groundwater

CHK'D: MG
DATE: 2023-03-17
SCALE: 1:30,000
REF NUM: DRAWING LC-13
BY: CW
COORD SYS: NAD 1983 UTM Zone 11N

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\AnalyticalDrawings_2022AnnRpt.aprx



Surface Water Location	Dissolved Cadmium µg/L
LC_FRDSDC	0.0184 - 0.0413

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
RG_MW_DC1A	2022 04 29	< 0.0050
	2022 08 15	< 0.0050
	2022 10 20	< 0.0050
	Duplicate	< 0.0050
RG_MW_DC1B	2022 03 07	0.0586
	2022 04 29	< 0.0050
	2022 08 15	< 0.0050
	2022 10 20	< 0.0050

Surface Water Location	Dissolved Cadmium µg/L
LC_DC1	0.0597 - 0.117

Surface Water Location	Dissolved Cadmium µg/L
LC_DC4	0.0680 - 0.149

Surface Water Location	Dissolved Cadmium µg/L
LC_DC2	0.0433 - 0.307

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
LC_PIZDC0901	2022 03 14	0.0690
	2022 06 10	0.110
	2022 08 15	0.115
	2022 10 25	0.0964
	Duplicate	0.0945

Seep Location	Dissolved Cadmium µg/L
LC_SEEP8	0.0612

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
LC_PIZDC1307	2022 03 04	< 0.0100
	2022 05 06	< 0.0050
	2022 08 25	0.0093
	2022 10 26	0.0091
	Duplicate	0.0073

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
LC_PIZDC1308	2022 03 04	0.0192
	2022 05 06	0.155
	2022 08 25	0.135
	2022 10 26	0.0298
	Duplicate	0.035

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
LC_PIZDC1306	2022 04 17	0.118
	2022 08 16	0.125
	2022 10 18	0.128

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
LC_PIZDC1404D	2022 03 08	0.0451
	2022 05 11	< 0.0050
	2022 08 25	0.0089
	2022 10 18	< 0.0050
LC_PIZDC1404S	2022 03 08	< 0.0050
	2022 05 11	< 0.0050
	2022 08 25	< 0.0050
	2022 10 18	< 0.0050

Surface Water Location	Dissolved Cadmium µg/L
LC_DC3	0.156 - 0.465

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
LC_PIZM0903	2022 03 17	0.0110
	2022 05 26	0.0062
	2022 08 19	0.0155
	2022 10 17	0.0117

Surface Water Location	Dissolved Cadmium µg/L
LC_LC2	0.0059 - 0.0120

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
LC_PIZ1206A	2022 03 02	0.0589
	2022 06 01	0.0471
	2022 08 17	0.0438
	2022 11 02	0.0563
LC_PIZ1206C	2022 03 03	0.0322
	2022 06 01	0.0315
	Duplicate	0.0282
	2022 09 26	0.0652
	2022 11 02	0.0238

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
LC_PIZ1207A	2022 03 11	0.0420
	2022 06 02	< 0.0150
	2022 08 04	0.0801
LC_PIZ1207B	2022 03 11	0.0097
	2022 06 02	< 0.0150
	2022 08 04	0.0260
	2022 10 24	0.0115

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
LC_MW20_01	2022 03 01	0.0351
	Duplicate	0.0279
	2022 06 02	0.0289
	2022 08 17	0.0235
	2022 10 17	0.0247

Surface Water Location	Dissolved Cadmium µg/L
LC_LCUSWLC	0.238 - 0.555

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
LC_MW20_02A	2022 03 02	< 0.0050
	2022 06 02	< 0.0050
	2022 08 17	< 0.0050
	2022 10 17	< 0.0050
LC_MW20_02B	2022 03 02	0.0298
	2022 06 02	0.0302
	2022 08 17	0.0243
	2022 10 17	0.0277

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
LC_PIZ1210B	2022 11 01	0.0110
LC_PIZ1210C	2022 03 15	< 0.0050
	2022 06 01	0.0143
	2022 09 26	0.0129
	2022 11 01	< 0.0050

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
LC_PIZ1212	2022 03 01	0.0891
	2022 06 02	0.116
	2022 08 17	0.0993
	2022 10 19	0.0963

Surface Water Location	Dissolved Cadmium µg/L
LC_WLC	0.0491 - 3.57

Surface Water Location	Dissolved Cadmium µg/L
LC_LC3	0.150 - 0.687

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
LC_PIZ1211N	2022 03 01	0.0557
	2022 06 02	0.0702
	2022 08 17	0.0602
	2022 10 19	0.0540

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
LC_MW20_03	2022 03 02	0.0315
	2022 06 03	0.0122
	2022 08 18	0.0154
	2022 10 19	0.0068

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
WL_MW-15-02-A	2022 03 28	0.0084
	2022 06 23	0.0203
	2022 11 23	< 0.0050
WL_MW-15-02-B	2022 03 28	0.0831
	2022 06 23	0.0508
	2022 11 23	0.0272

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
WL_MW-15-04-B	2022 03 28	0.0102
	2022 06 22	0.0979
	2022 11 23	< 0.0050

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
LC_PIZP1103	2022 03 11	< 0.0200
	2022 05 25	< 0.0150
	2022 08 05	0.0102
	2022 10 24	0.0114

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
LC_MW_CP1A	2022 01 21	0.0089
	2022 04 10	0.0069
	2022 07 26	< 0.0050
	2022 10 20	0.0059
LC_MW_CP1B	2022 01 21	0.0122
	2022 04 10	0.0152
	2022 07 26	0.0119
	2022 10 20	0.0178
	Duplicate	0.0166

Surface Water Location	Dissolved Cadmium µg/L
LC_LCDSSLCC	0.0187 - 0.378

Surface Water Location	Dissolved Cadmium µg/L
LC_LC5	< 0.0050 - 0.0595

Surface Water Location	Dissolved Cadmium µg/L
LC_LC4	0.0078 - 0.201

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
LC_PIZP1101	2022 03 11	-
	2022 05 20	< 0.0050
	2022 08 05	0.0051
	Duplicate	0.0072
	2022 10 20	0.0105

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
LC_PIZP1105	2022 03 10	0.0833
	Duplicate	0.0888
	2022 05 26	0.0311
	2022 08 30	0.0868
	2022 10 17	0.0397

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
LC_PIZP1104	2022 03 15	0.0164
	2022 06 30	*16.4*
	2022 08 29	0.482
	2022 11 03	0.175

Seep Location	Dissolved Cadmium µg/L
LC_SEEP11	0.0119

Seep Location	Dissolved Cadmium µg/L
LC_ERX	1.01 - 1.68

Seep Location	Dissolved Cadmium µg/L
LC_SEEP10	0.0385

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
LC_MW_ER4A	2022 03 03	< 0.0050
	2022 05 12	< 0.0050
	2022 08 03	< 0.0050
	2022 10 13	< 0.0050
LC_MW_ER4B	2022 03 03	0.0145
	2022 05 12	0.0180
	2022 08 03	0.0188
	2022 10 13	0.0301

Surface Water Location	Dissolved Cadmium µg/L
EV_ER4	< 0.0050 - 0.0673

Legend

Groundwater Stations[4]
- ◕ Monitoring Well

Surface Water Stations
- ▲ Seep
- ▼ Permit 107517 Surface Water Stations (included in groundwater assessment)
- ▼ Permit 107517 Surface Water Stations (excluded from groundwater assessment)
- ▼ Non-permitted Surface Water Stations (included in groundwater assessment)

Site Features
- Highway/Arterial
- Secondary Road
- Rails
- Study Areas
- Tailings/Settling/Sediment Pond
- End-Pit Lake
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds
- LCO Phase 1 and 2
- Mine Permitted Areas

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Rock Drain
- Water Pipeline
- Bypass/Diversion Channel
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:30000 Scale)

Q4	Q1
Q3	Q2

symbol locations have been adjusted relative to well locations for visibility

Green below the applicable screening criteria

Blue above the applicable screening criteria

Grey no sample collected

Dissolved phase of the parameter is shown in the spatial plot.

Primary Screening Criteria	Cadmium^ µg/L
CSR Aquatic Life	0.5-4
CSR Irrigation Watering	5
CSR Livestock Watering	80
CSR Drinking Water	5

Notes:
1. Original in colour at paper size ANSI C (17x22 in).
2. Numerical scale reflects full-size print. Print scaling will distort this scale; however, scale bar will remain accurate.
3. Intended for illustration purposes. Accuracy has not been verified for construction or navigation.
4. Locations of overlapping wells have been adjusted for clarity.
5. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Data provided by Teck Coal Limited

0 0.5 1 2 3 km

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

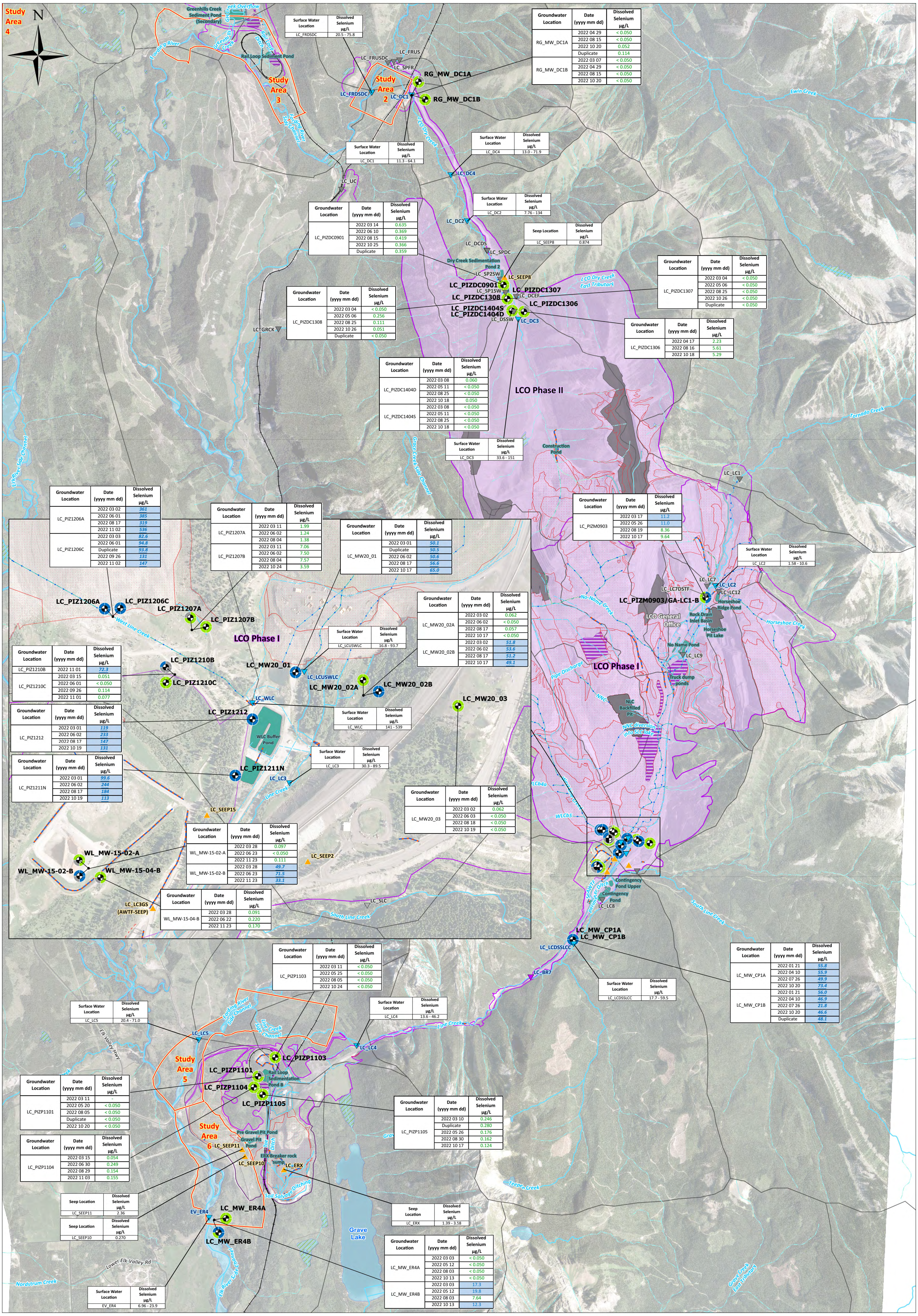
SNC · LAVALIN

Line Creek Operations - Spatial Distribution of Dissolved Cadmium in Groundwater

CHK'D: MG	DATE: 2023-03-17 SCALE: 1:30,000	REF NUM:
BY: CW	COORD SYS: NAD 1983 UTM Zone 11N	DRAWING LC-14

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\AnalyticalDrawings_2022AnnRpt.aprx

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



Surface Water Location	Dissolved Selenium µg/L
LC_FRDSDC	20.5 - 75.8

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
RG_MW_DC1A	2022 04 29	< 0.050
	2022 08 15	< 0.050
	2022 10 20	0.052
	Duplicate	0.114
RG_MW_DC1B	2022 03 07	< 0.050
	2022 04 29	< 0.050
	2022 08 15	< 0.050
	2022 10 20	< 0.050

Surface Water Location	Dissolved Selenium µg/L
LC_DC1	11.3 - 64.1

Surface Water Location	Dissolved Selenium µg/L
LC_DC4	13.0 - 71.9

Surface Water Location	Dissolved Selenium µg/L
LC_DC2	7.76 - 134

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
LC_PIZDC0901	2022 03 14	0.635
	2022 06 10	0.369
	2022 08 15	0.419
	2022 10 25	0.366
	Duplicate	0.359

Seep Location	Dissolved Selenium µg/L
LC_SEEP8	0.874

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
LC_PIZDC1307	2022 03 04	< 0.050
	2022 05 06	< 0.050
	2022 08 25	< 0.050
	2022 10 26	< 0.050
	Duplicate	< 0.050

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
LC_PIZDC1308	2022 03 04	< 0.050
	2022 05 06	0.256
	2022 08 25	0.111
	2022 10 26	0.051
	Duplicate	< 0.050

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
LC_PIZDC1306	2022 04 17	2.23
	2022 08 16	5.61
	2022 10 18	5.29

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
LC_PIZDC1404D	2022 03 08	0.060
	2022 05 11	< 0.050
	2022 08 25	< 0.050
	2022 10 18	0.050
LC_PIZDC1404S	2022 03 08	< 0.050
	2022 05 11	< 0.050
	2022 08 25	< 0.050
	2022 10 18	< 0.050

Surface Water Location	Dissolved Selenium µg/L
LC_DC3	33.6 - 151

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
LC_PIZM0903	2022 03 17	11.2
	2022 05 26	11.0
	2022 08 19	8.36
	2022 10 17	9.64

Surface Water Location	Dissolved Selenium µg/L
LC_LC2	1.58 - 10.6

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
LC_PIZ1206A	2022 03 02	361
	2022 06 01	385
	2022 08 17	319
	2022 11 02	536
LC_PIZ1206C	2022 03 03	82.6
	2022 06 01	94.8
	Duplicate	93.8
	2022 09 26	131
	2022 11 02	147

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
LC_PIZ1207A	2022 03 11	1.99
	2022 06 02	1.24
	2022 08 04	1.38
LC_PIZ1207B	2022 03 11	7.06
	2022 06 02	7.50
	2022 08 04	7.57
	2022 10 24	3.59

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
LC_MW20_01	2022 03 01	50.1
	Duplicate	50.5
	2022 06 02	50.6
	2022 08 17	56.6
	2022 10 17	65.0

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
LC_MW20_02A	2022 03 02	0.062
	2022 06 02	< 0.050
	2022 08 17	0.057
	2022 10 17	< 0.050
LC_MW20_02B	2022 03 02	51.8
	2022 06 02	53.6
	2022 08 17	51.2
	2022 10 17	49.1

Surface Water Location	Dissolved Selenium µg/L
LC_LCUSWLC	16.8 - 93.7

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
LC_PIZ1210B	2022 11 01	72.3
LC_PIZ1210C	2022 03 15	0.051
	2022 06 01	< 0.050
	2022 09 26	0.114
	2022 11 01	0.077

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
LC_PIZ1212	2022 03 01	119
	2022 06 02	233
	2022 08 17	147
	2022 10 19	131

Surface Water Location	Dissolved Selenium µg/L
LC_WLC	141 - 539

Surface Water Location	Dissolved Selenium µg/L
LC_LC3	30.3 - 89.5

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
LC_PIZ1211N	2022 03 01	99.6
	2022 06 02	244
	2022 08 17	184
	2022 10 19	113

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
LC_MW20_03	2022 03 02	0.062
	2022 06 03	< 0.050
	2022 08 18	< 0.050
	2022 10 19	< 0.050

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
WL_MW-15-02-A	2022 03 28	0.097
	2022 06 23	< 0.050
	2022 11 23	0.111
WL_MW-15-02-B	2022 03 28	49.7
	2022 06 23	71.5
	2022 11 23	33.1

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
WL_MW-15-04-B	2022 03 28	0.091
	2022 06 22	0.220
	2022 11 23	0.170

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
LC_PIZP1103	2022 03 11	< 0.050
	2022 05 25	< 0.050
	2022 08 05	< 0.050
	2022 10 24	< 0.050

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
LC_MW_CP1A	2022 01 21	55.8
	2022 04 10	55.9
	2022 07 26	49.9
	2022 10 20	73.4
LC_MW_CP1B	2022 01 21	56.0
	2022 04 10	46.9
	2022 07 26	21.8
	2022 10 20	46.6
	Duplicate	48.1

Surface Water Location	Dissolved Selenium µg/L
LC_LCDSSLCC	17.7 - 59.5

Surface Water Location	Dissolved Selenium µg/L
LC_LC5	20.4 - 71.0

Surface Water Location	Dissolved Selenium µg/L
LC_LC4	13.6 - 46.2

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
LC_PIZP1101	2022 03 11	-
	2022 05 20	< 0.050
	2022 08 05	< 0.050
	Duplicate	< 0.050
	2022 10 20	< 0.050

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
LC_PIZP1105	2022 03 10	0.246
	Duplicate	0.280
	2022 05 26	0.176
	2022 08 30	0.162
	2022 10 17	0.124

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
LC_PIZP1104	2022 03 15	0.054
	2022 06 30	0.249
	2022 08 29	0.154
	2022 11 03	0.155

Seep Location	Dissolved Selenium µg/L
LC_SEEP11	2.36

Seep Location	Dissolved Selenium µg/L
LC_SEEP10	0.270

Seep Location	Dissolved Selenium µg/L
LC_ERX	1.39 - 3.58

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
LC_MW_ER4A	2022 03 03	< 0.050
	2022 05 12	< 0.050
	2022 08 03	< 0.050
	2022 10 13	< 0.050
LC_MW_ER4B	2022 03 03	17.3
	2022 05 12	19.8
	2022 08 03	7.64
	2022 10 13	12.3

Surface Water Location	Dissolved Selenium µg/L
EV_ER4	6.96 - 23.9

Legend

Groundwater Stations[4]

- ◐ Monitoring Well

Surface Water Stations

- ▲ Seep
- ▼ Permit 107517 Surface Water Stations (included in groundwater assessment)
- ▼ Permit 107517 Surface Water Stations (excluded from groundwater assessment)
- ▼ Non-permitted Surface Water Stations (included in groundwater assessment)

Site Features

- Highway/Arterial
- Secondary Road
- Rails
- Study Areas
- Tailings/Settling/Sediment Pond
- End-Pit Lake
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds
- LCO Phase 1 and 2
- Mine Permitted Areas

Water Features

- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Rock Drain
- Water Pipeline
- Bypass/Diversion Channel
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:30000 Scale)

symbol locations have been adjusted relative to well locations for visibility

Green below the applicable screening criteria

Blue above the applicable screening criteria

Grey no sample collected

^ Dissolved phase of the parameter is shown in the spatial plot.

Primary Screening Criteria	Selenium^ µg/L
CSR Aquatic Life	20
CSR Irrigation Watering	20
CSR Livestock Watering	30
CSR Drinking Water	10

Notes:
1. Original in colour at paper size ANSI C (17x22 in).
2. Numerical scale reflects full-size print. Print scaling will distort this scale; however, scale bar will remain accurate.
3. Intended for illustration purposes. Accuracy has not been verified for construction or navigation.
4. Locations of overlapping wells have been adjusted for clarity.
5. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Data provided by Teck Coal Limited

0 0.5 1 2 3 km

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

SNC·LAVALIN

Line Creek Operations - Spatial Distribution of Dissolved Selenium in Groundwater

CHK'D: MG
DATE: 2023-03-17 SCALE: 1:30,000
BY: CW
COORD SYS: NAD 1983 UTM Zone 11N
REF NUM:
DRAWING LC-15

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\AnalyticalDrawings_2022AnnRpt.aprx

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022

Attachment I

Borehole Logs

FINAL

RG_MW_DC1A

SNC·LAVALIN

Client **Teck Coal Limited**		**Borehole No. : RG_BH_DC1A**
Location **Dry Creek**		PAGE 1 OF 3

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	n/a	Project Number:	683032
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	TBD	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	TBD	Date Drilled:	2021 09 09
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: n/a	Easting: n/a	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- Vibrasonic

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

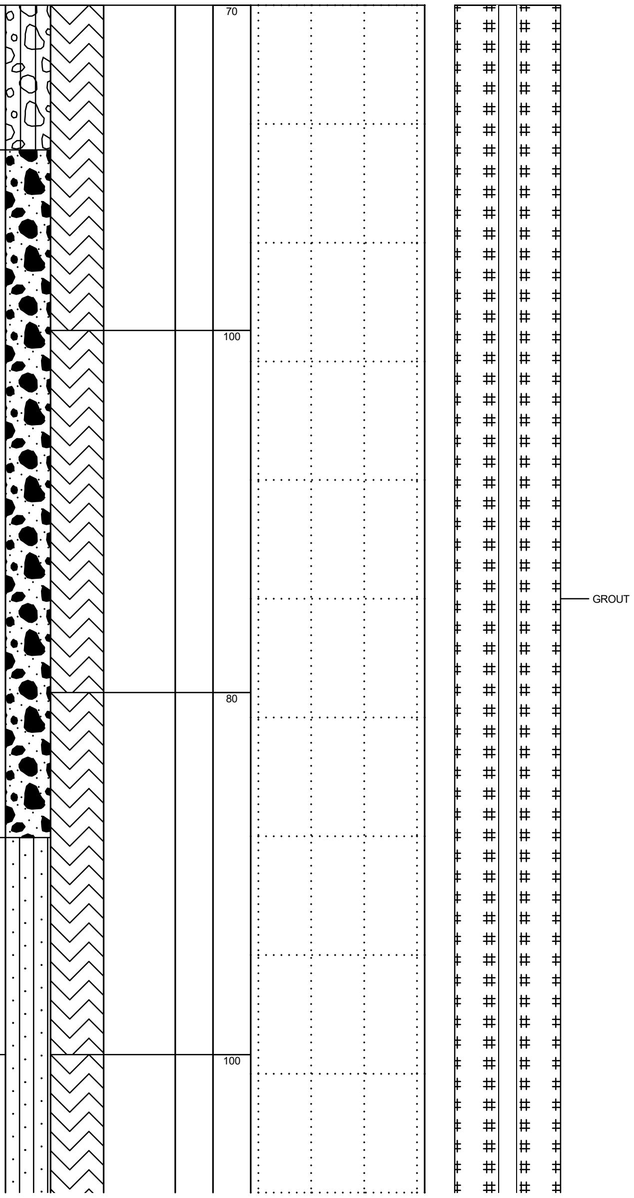
- ○ Reading within indicated scale
- ● Reading outside indicated scale

- Solid PVC
- Slotted PVC

Well Name 1: RG_MW_DC1A

Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) 10^1 10^2 10^3 10^4

Depth (m)	Soil Description
0	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded, some silt, containing cobbles, dark brown, loose, damp (topsoil). At 0.9 m - contains organic material.
	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded, trace silt, containing cobbles (80->150 mm), brown, loose, damp. At 2.4 m - orange oxidation. At 3.4 m - moist. At 4.6 m - wet. At 5.2 m - orange oxidation.
7	SILTY SAND, fine grained sand, trace gravel, coarse, subrounded, dark grey, dense, moist.
	SILTY SAND, fine grained sand, trace gravel, coarse, subrounded, grey-brown, dense, moist. Between 9.4 m and 10.4 m - stratified layers of silt (100 mm) and fine grained sand (10 mm).
10	



NOTES

QA/QC: SD 2021 09 22 Print Date:2021-09-24

FINAL

SNC•LAVALIN	Client **Teck Coal Limited**	**Borehole No. : RG_BH_DC1A**
	Location **Dry Creek**	PAGE 2 OF 3

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	n/a	Project Number:	683032
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	TBD	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	TBD	Date Drilled:	2021 09 09
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: n/a	Easting: n/a	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
⋈ Vibrasonic

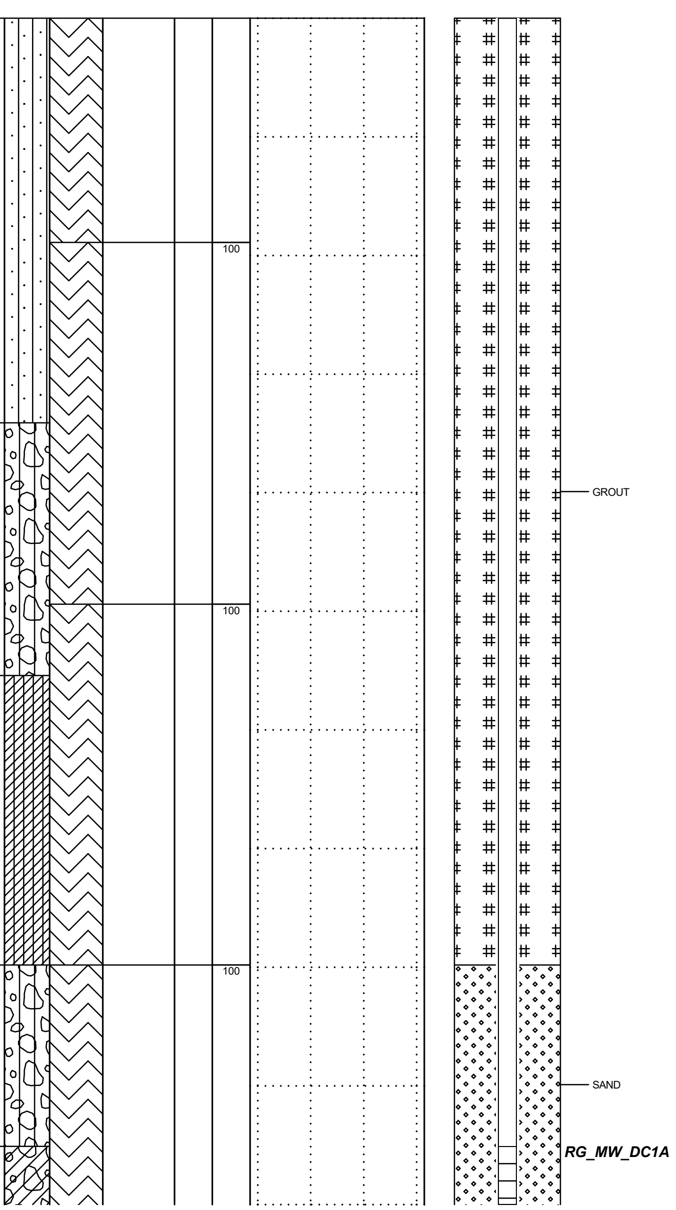
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: RG_MW_DC1A

Depth in Metres	Soil Description
10	SILTY SAND, fine grained sand, trace gravel, coarse, subrounded, grey-brown, dense, moist. *(continued)* At 10.0 m - 5 mm seam of medium grained sand, wet.
11	At 11.0 m - 10 mm seam of medium grained sand, wet. Between 11.3 m and 11.6 m - some fine to coarse gravel, subrounded.
12	
13	GRAVELLY SILT, fine to coarse gravel, subrounded, trace sand, fine to medium grained, dark grey, very dense, damp.
14	
15	CLAYEY SILT, trace sand, fine grained, dark grey, very stiff, medium plasticity, damp.
16	At 16.8 m - 5 mm seam of fine to medium grained sand.
17	
18	GRAVELLY SILT, fine to coarse gravel, subrounded, some clay, dark grey, dense, moist.
19	At 19.2 m - seam of medium to coarse grained sand.
20	



NOTES

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : RG_BH_DC1A**
	Location **Dry Creek**	PAGE 3 OF 3

Drilling Contractor Mud Bay Drilling Co. Ltd.
Drilling Method Vibratory Sonic
Borehole Dia. (m) 0.15
Pipe/Slotted Pipe Dia. (m) 0.05/0.05

Date Monitored n/a
Ground Surface Elev. (m) TBD
Top of Casing Elev. (m) TBD
Northing: n/a Easting: n/a

Project Number: 683032
Borehole Logged By: AH
Date Drilled: 2021 09 09
Log Typed By: VL

Drilling Legend
▨ Sample Interval
Vibrasonic

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

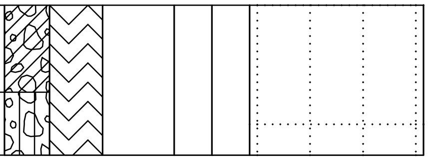
○ Reading within indicated scale
● Reading outside indicated scale

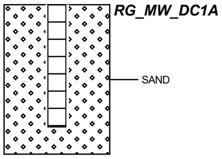
Soil Vapour (ppm)
10^1 10^2 10^3 10^4

Solid PVC
Slotted PVC

Well Name 1: RG_MW_DC1A

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery
20	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded, some clay, trace silt, dark grey, loose, wet. *(continued)*					
21	GRAVELLY SILT, fine to coarse gravel, subrounded, trace clay, dark grey, very dense, moist. At 21.0 m - 50 mm seam of coarse grained sand.					
	Bottom of hole at 21.3 m.					





22
23
24
25
26
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29
30

NOTES

FINAL

RG_MW_DC1B

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : RG_BH_DC1B**
	Location **Dry Creek**	PAGE 1 OF 1

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	n/a	Project Number:	683032
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	TBD	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	TBD	Date Drilled:	2021 09 10
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: n/a	Easting: n/a	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
Vibrasonic

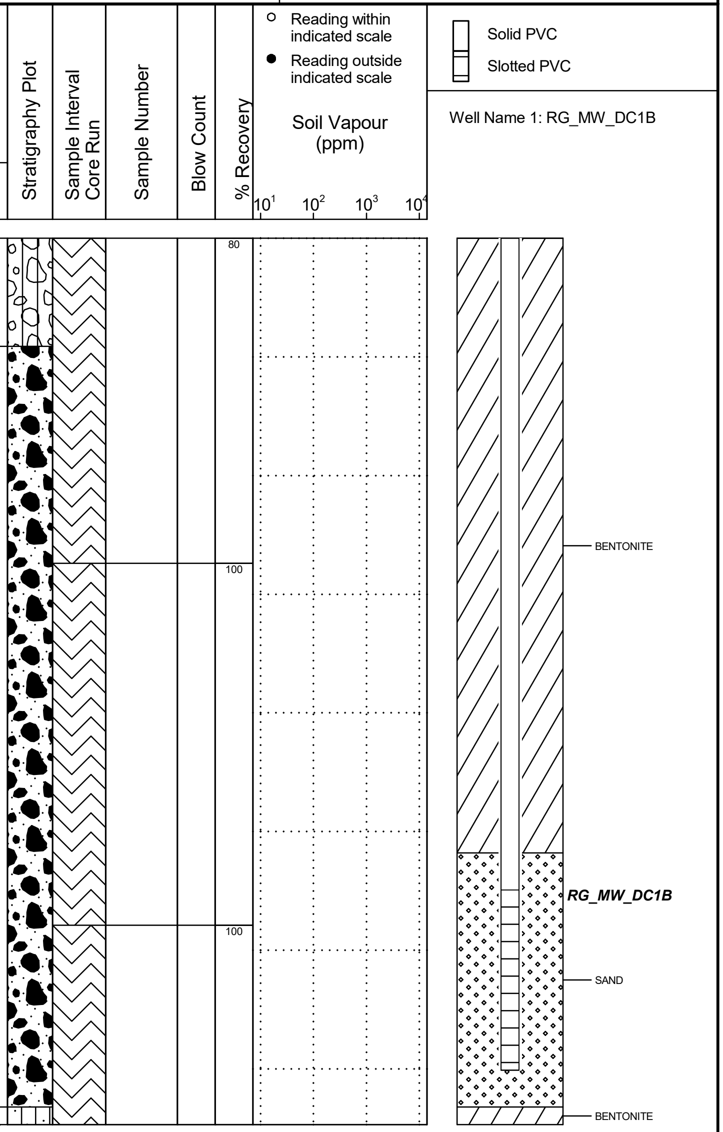
Water/NAPL Levels
Water Level 1
Water Level 2
NAPL
NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: RG_MW_DC1B

Depth in Metres	Soil Description
0	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded, some silt, dark brown, loose, dense, contains organic material.
1	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded, trace silt, containing cobbles (80->150 mm), brown, loose, damp.
2	At 2.1 m - 100 mm seam of silt, dark grey,
3	At 3.4 m - wet.
4	
5	At 5.2 m - orange oxidation.
6	
7	Between 7.0 m and 7.3 m - some silt.
	SILTY SAND, fine grained sand, trace gravel, coarse, subrounded, dark grey, dense, wet.
	Bottom of hole at 7.5 m.
8	
9	
10	



NOTES

QS/QC: SD 2021 09 22 Print Date:2021-09-24

LC_PIZDC0901

WELL LITHOLOGY & CONSTRUCTION FORM

Golder Associates

Well Number:
GA-DC1-A

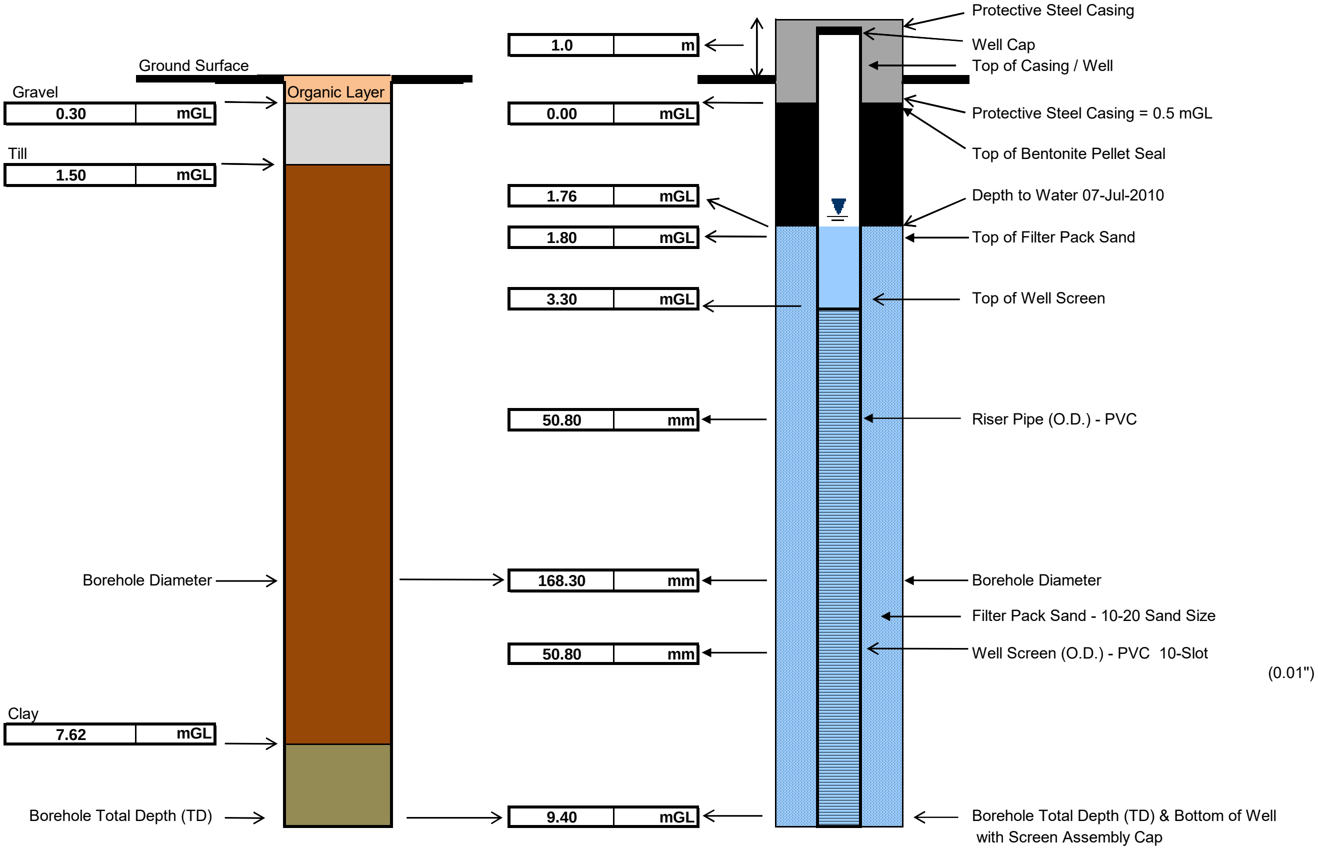
Project Number:	0913490005-1109-1002
Project Name:	Teck Coal Line Creek Operations
Location:	Elk Valley, British Columbia, Canada
Site Area:	Dry Creek

Completion Date:	31-Oct-09
Drill Contractor:	Beck Drilling
Drilling Method:	ODEX
Personnel:	Tim Crowell

Well Summary Table		
Northing	658048	NAD83
Easting	5541500	NAD83
Ground Elevation	1692	masl
Top of Casing Elevation	1693	masl
Water Level Elevation	1690	masl

Input Parameters
Datum Reference:
mGL
Diameter Units:
mm

Borehole Lithology ***Water Monitoring Well***



Note:
mGL = metres below ground level
mm = millimetres
masl = metres above sea level

PROJECT No.: 13-1345-0010

RECORD OF MONITORING WELL: LC_PIZDC1306

SHEET 1 OF 2

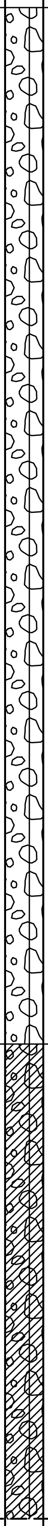
LOCATION: See Location Plan

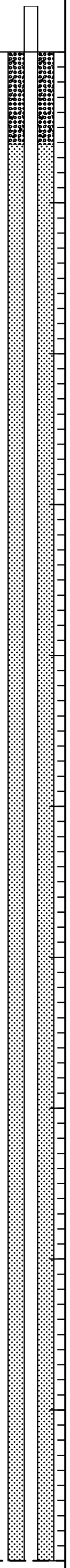
N: 5541058.793 E: 658278.011

BORING DATE: 18 August 2013

DATUM: UTM Zone 11
(Nad 83)
Elev = 1708.15 masl

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	ELEV. DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa nat V. ⊗ Q - ● rem V. ⊕ U - ○ (10 20 30 40)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}); WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		Ground Surface	1708.14							Stickup =0.9 m
0	Sonic Rig - SR152 Boart LongYear Group	SILTY GRAVEL, angular to sub-angular, poorly-graded, some sand, trace clay, low plasticity, w~PL, moist, loose to compact	0.00							Cement **WL= 0.21 meters above ground surface on 21 Aug 2013**
5										Bentonite Plug
		Gravelly CLAYEY SILT, some angular to sub-angular, poorly-graded gravel, some sand, low to medium plasticity, dark brown to black, w~PL, moist, compact to dense --- Compact below 7.6 m	1701.29 6.86							
10		*CONTINUED NEXT PAGE*								





DEPTH SCALE
1 : 50

LOGGED: RQ
CHECKED: TG

PROJECT No.: 13-1345-0010

RECORD OF MONITORING WELL: LC_PIZDC1306

SHEET 2 OF 2

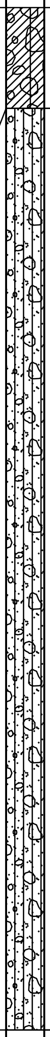
LOCATION: See Location Plan

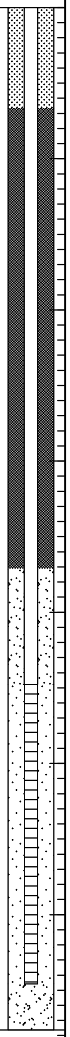
BORING DATE: 18 August 2013

DATUM: UTM Zone 11
(Nad 83)

N: 5541058.793 E: 658278.011

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa nat V. ⊗ Q - ● rem V. ⊕ U - ○ (10 20 30 40)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}); WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10	Sonic Rig - SR152 Boart LongYear Group	Gravelly CLAYEY SILT, some angular to sub-angular, poorly-graded gravel, some sand, low to medium plasticity, dark brown to black, w~PL, moist, compact to dense *(continued)* --- Boulder (>300 mm in diameter) at 10.4 m		1697.48 10.67							Bentonite Plug
11		Silty SANDY GRAVEL, angular to sub-angular,trace clay, occasional cobbles, dark brown to black, w~PL, moist, dence to very dence									
12											Bentonite Seal
13											
14											10/20 Colorado Silica Sand
15											Slotted Screen Section
16		--- Boulder at 16.8 m		1691.38 16.76							
17		End of MONITORING WELL. Notes: WL= water level. masl = metres above sea level.									
18											
19											
20											





DEPTH SCALE
1 : 50

GOLDER

LOGGED: RQ
CHECKED: TG

PROJECT No.: 13-1345-0010

RECORD OF MONITORING WELL: LC_PIZDC1307

SHEET 1 OF 4

LOCATION: See Location Plan

N: 5541229.978 E: 658168.873

BORING DATE: 19 August 2013

DATUM: UTM Zone 11
(Nad 83)
Elev = 1690.51 masl

DEPTH SCALE METRES | BORING METHOD | SOIL PROFILE: DESCRIPTION, STRATA PLOT, ELEV. DEPTH (m) | SAMPLES: NUMBER, TYPE, BLOWS/0.3m | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80; SHEAR STRENGTH Cu, kPa nat V. ⊗ Q - ● rem V. ⊕ U - ○ 10 20 30 40 | HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3}; WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl 10 20 30 40 | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION

Depth (m)	Boring Method	Description	Elev. / Depth (m)	Piezometer or Standpipe Installation
		Ground Surface	1690.50	Stickup= 0.71 m
0	Sonic Rig - SR152 Boart LongYear Group	FILL	0.00	Cement
		ORGANIC SOIL, black	1689.74 0.76	
1		GRAVEL and SAND, sub-angular to angular (up to 100 mm in diameter), some silt, w<PL, compact to dense	1689.13 1.37	∇ ***WL=2.31 mbgs 24 Aug 2013**
3		SILTY GRAVEL, sub-rounded to sub-angular (up to 50 mm in diameter), some sand, trace clay, w~PL, wet, compact	1687.15 3.35	Bentonite Plug
6		SILTY GRAVEL, angular to sub-angular, some sand, trace clay, local cobbles, w~PL, moist, very dense	1684.41 6.10	
8		GRAVELY SILT, sub-rounded to sub-angular, trace sand, trace clay, w~PL, wet, very dense	1681.97 8.53	
10				

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

GOLDER

LOGGED: RT
CHECKED: TG

PROJECT No.: 13-1345-0010

RECORD OF MONITORING WELL: LC_PIZDC1307

SHEET 2 OF 4

LOCATION: See Location Plan

BORING DATE: 19 August 2013

DATUM: UTM Zone 11 (Nad 83)

N: 5541229.978 E: 658168.873

BORING METHOD: Sonic Rig - SR152, Boart LongYear Group

DEPTH SCALE METRES	SOIL PROFILE DESCRIPTION	ELEV. DEPTH (m)	PIEZOMETER OR STANDPIPE INSTALLATION
10	GRAVELY SILT, sub-rounded to sub-angular, trace sand, trace clay, w~PL, wet, very dense *(continued)*		
12	--- w<PL, moist to dry below 12.2 m		
13		1676.79 13.72	
14	SILTY GRAVEL, sub-rounded to sub-angular, some sand, trace clay, w<PL, moist, dense		
15			Bentonite Plug
17	--- Gravel is sub-angular to angular, w~PL, wet below 16.8 m		
18	--- Gravel is sub-rounded to sub-angular, moist to locally dry, loose below 18.3 m		
19		1670.69 19.81	
20			

Column headings: SAMPLES (NUMBER, TYPE, BLOWS/0.3m); DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20, 40, 60, 80); SHEAR STRENGTH Cu, kPa nat V. ⊗ Q - ● rem V. ⊕ U - ○ (10, 20, 30, 40); HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6}, 10^{-5}, 10^{-4}, 10^{-3}); WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10, 20, 30, 40); ADDITIONAL LAB. TESTING

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

GOLDER

LOGGED: RT
CHECKED: TG

PROJECT No.: 13-1345-0010

RECORD OF MONITORING WELL: LC_PIZDC1307

SHEET 3 OF 4

LOCATION: See Location Plan

N: 5541229.978 E: 658168.873

BORING DATE: 19 August 2013

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	ELEV. DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa nat V. ⊗ Q - ● rem V. ⊕ U - ○ (10 20 30 40)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}); WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
20	Sonic Rig - SR152 Boart LongYear Group	SANDY SILT, some sub-rounded to sub-angular gravel, localized sub-rounded to sub-angular cobbles (up to 150 mm in diameter), brown to dark brown, w~PL, moist, compact to dense, stiff *(continued)*								
23		SANDY GRAVEL, sub-angular to angular (up to 100 mm in diameter), some silt, light brown to grey, w<PL, dry, very loose	1667.34 23.16							
		SANDY SILT, some sub-rounded to sub-angular gravel, localized sub-rounded to sub-angular cobbles (up to 100 mm in diameter), brown to dark brown, w~PL, moist, very dense, stiff	1667.04 23.47							
24										Bentonite Plug
26		SILT, some sand, some sub-rounded to sub-angular gravel (<30 mm in diameter), brown to dark brown, w~PL, wet, compact to dense, firm	1664.60 25.91							
29										Bentonite Seal
30		*CONTINUED NEXT PAGE*								

DEPTH SCALE

1 : 50

GOLDER

LOGGED: RT

CHECKED: TG

DATA ENTRY: VI

PROJECT No.: 13-1345-0010

RECORD OF MONITORING WELL: LC_PIZDC1307

SHEET 4 OF 4

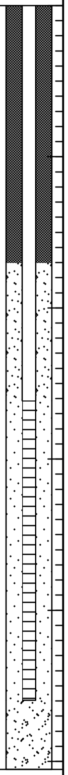
LOCATION: See Location Plan

BORING DATE: 19 August 2013

DATUM: UTM Zone 11 (Nad 83)

N: 5541229.978 E: 658168.873

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	ELEV. DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa nat V. ⊗ Q - ● rem V. ⊕ U - ○ (10 20 30 40)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}); WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
30	Sonic Rig - SR152 Boart LongYear Group		1660.33 30.18							Bentonite Seal
		SILTY GRAVEL, sub-rounded to sub-angular (<50 mm in diameter), localized clay, w<PL, dry, very dense, hard --- Localized zones of increased clay, very dry								
31										
32		SILT, some sand, some sub-angular to angular gravel, localized boulders, dark brown, w<PL, moist, dense	1658.50 32.00							10/20 Colorado Silica Sand
33										Slotted Screen Section
34										
35		End of MONITORING WELL.	1655.45 35.05							
36										
37										
38										
39										
40										



Notes:
WL= water level.
masl = metres above sea level.
* WL measured while LC_PIZDC1309 was flowing at surface.
mbgs= metres below ground surface.

BOREHOLE - EXPANDED ADD. LAB TESTING 13.1345.0010_ BH LOGS.GPJ CALGARY.GDT 10/22/21

DEPTH SCALE
1 : 50

GOLDER

LOGGED: RT
CHECKED: TG

DATA ENTRY: VI

PROJECT No.: 13-1345-0010

RECORD OF MONITORING WELL: LC_PIZDC1308

SHEET 1 OF 2

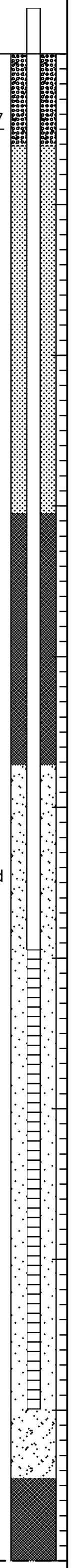
LOCATION: See Location Plan

N: 5541232.317 E: 658167.9

BORING DATE: 21 August 2013

DATUM: UTM Zone 11
(Nad 83)
Elev = 1690.42 masl

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa nat V. ⊗ Q - ● rem V. ⊕ U - ○ (10 20 30 40)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}); WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		Ground Surface	1690.42							Stickup= 0.95 m
0	Sonic Rig - SR152 Boart LongYear Group	FILL	0.00							Cement
		ORGANIC SOIL, black	1689.65 0.76							*WL=0.50 mbgs 24 Aug 2013
1										
2		SANDY GRAVEL, sub-angular to angular (up to 100 mm in diameter), some silt, w<PL, dry, very loose	1688.59 1.83							Bentonite Plug
		SILTY GRAVEL, sub-rounded to sub-angular (up to 50 mm in diameter), some sand, trace clay, w~PL, wet, loose	1688.28 2.13							
3										
4										Bentonite Seal
		SILTY GRAVEL, angular to sub-angular, some sand, trace clay, local cobbles, w~PL, moist to wet, compact	1685.84 4.57							
5		--- Localized dry loose gravel zone (looks like pad fill material, fresh, dry, powdery, likely sloughed into hole) from 5.5 to 5.8 m								10/20 Colorado Silica Sand
6		--- Localized dry loose gravel zone (looks like pad fill material, fresh, dry, powdery, likely sloughed into hole) from 6.6 to 6.7 m								
7		GRAVELY SILT, sub-rounded to sub-angular, trace sand, trace clay, w~PL, wet, dense to very dense	1682.80 7.62							Slotted Screen Section
8		--- Decrease in gravel and clay content below 8.5 m								
9										Bentonite Seal
10		*CONTINUED NEXT PAGE*								



DEPTH SCALE
1 : 50

GOLDER

LOGGED: RT
CHECKED: TG

BOREHOLE - EXPANDED ADD. LAB TESTING 13.1345.0010_ BH LOGS.GPJ CALGARY.GDT 10/22/21

DATA ENTRY: VI

PROJECT No.: 13-1345-0010

RECORD OF MONITORING WELL: LC_PIZDC1308

SHEET 2 OF 2

LOCATION: See Location Plan

BORING DATE: 21 August 2013

DATUM: UTM Zone 11 (Nad 83)

N: 5541232.317 E: 658167.9

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES (NUMBER / TYPE / BLOWS/0.3m)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa nat V. ⊗ Q - ● rem V. ⊕ U - ○ (10 20 30 40)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}); WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10	Sonic Rig - SR152 Boart LongYear Group	GRAVELY SILT, sub-rounded to sub-angular, trace sand, trace clay, w~PL, wet, dense to very dense *(continued)*						▩
12		GRAVELY SILT, sub-rounded to sub-angular, trace sand, trace clay, local cobbles, w<PL, moist, very dense	1678.22 12.19					▩
13		GRAVELY SILT, sub-rounded to sub-angular, some sand, trace clay, brown to dark brown, w<PL, moist, very dense	1676.70 13.72					Bentonite Seal ▩
16		SILTY GRAVEL, sub-angular to angular, some sand, trace clay, w~PL, moist, dense Notes: WL= water level. masl = metres above sea level. * WL measured while LC PIZDC1309 was flowing at surface. mbgs= metres below ground surface.	1673.65 16.76					▩
19		End of MONITORING WELL.	1670.60 19.81					

DEPTH SCALE
1 : 50

GOLDER

LOGGED: RT
CHECKED: TG

BOREHOLE - EXPANDED ADD. LAB TESTING 13.1345.0010_ BH LOGS.GPJ CALGARY.GDT 10/22/21

PROJECT No.: 13-1345-0010

RECORD OF MONITORING WELL: LC_PIZD1404S

SHEET 1 OF 2

LOCATION: See Location Plan, West side of Dry Creek

BORING DATE: 25 April, 2014

DATUM: Local

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	ELEV. DEPTH (m)	PIEZOMETER OR STANDPIPE INSTALLATION
		Ground Surface		Stickup = 1.14 m
0	DR-24 – Air Rotary 150 mm Casing Sierra Drilling & Blasting Ltd.	TOPSOIL – (OL) Gravelly ORGANIC SILT, angular, some sand, roots and rootlets, black, moist, loose	0.00	Bentonite Grout
		(ML) SANDY SILT, light brown, moist, compact	0.30	
1		TILL – (MH) Sandy gravelly CLAYEY SILT, sub-rounded, contains cobbles, dark brown, cohesive, w<PL, very soft to soft	0.91	
4		--- Becoming grey, firm at 4.0 m		Bentonite Pellet Plug
5.6		TILL – (MH) Sandy gravelly CLAYEY SILT, sub-rounded, contains cobbles, grey-brown, cohesive, w<PL, soft to firm	5.64	
8.5				Colorado Silica Sand
9.7				Slotted Section
10		*CONTINUED NEXT PAGE*		

SAMPLES: NUMBER, TYPE, BLOWS/0.3m

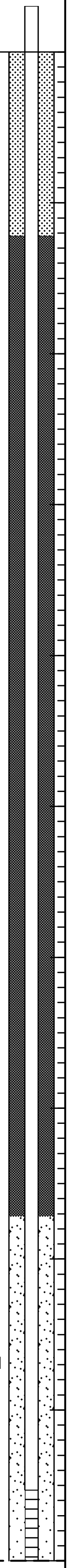
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20 40 60 80

SHEAR STRENGTH Cu, kPa: nat V. ⊗ Q - ● rem V. ⊕ U - ○ — 10 20 30 40

HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-6} 10^{-5} 10^{-4} 10^{-3}

WATER CONTENT PERCENT: Wp ⊢—○W—⊣ Wl — 10 20 30 40

ADDITIONAL LAB. TESTING



DEPTH SCALE

1 : 50

GOLDER

LOGGED: DE

CHECKED: TG

DATA ENTRY: IPG

PROJECT No.: 13-1345-0010

RECORD OF MONITORING WELL: LC_PIZD1404S

SHEET 2 OF 2

LOCATION: See Location Plan, West side of Dry Creek

BORING DATE: 25 April, 2014

DATUM: Local

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	ELEV. DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa nat V. ⊗ Q - ● rem V. ⊕ U - ○ (10 20 30 40)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10	DR-24 – Air Rotary 150 mm Casing Sierra Drilling & Blasting Ltd.	TILL – (MH) Sandy gravelly CLAYEY SILT, sub-rounded, contains cobbles, grey-brown, cohesive, w<PL, soft to firm *(continued)* --- Becoming firm to stiff at 10.2 m								
11										Slotted Section
12		(GP-GM) GRAVEL, sub-angular, trace sub-rounded, fine-grained, some silt to silty, dark grey, wet, compact	11.89							Colorado Silica Sand
13		End of MONITORING WELL. NOTES: Standpipe installed to 12.6 m.	12.75							
14										
15										
16										
17										
18										
19										
20										

DEPTH SCALE
1 : 50

GOLDER

LOGGED: DE
CHECKED: TG

BOREHOLE - EXPANDED ADD. LAB TESTING 13.1345.0010_ BH LOGS_APPENDIX.GPJ CALGARY.GDT 10/22/21

PROJECT No.: 13-1345-0010

RECORD OF MONITORING WELL: LC_PIZD1404D

SHEET 1 OF 4

LOCATION: See Location Plan, West side of Dry Creek

BORING DATE: 26 April, 2014

DATUM: Local

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20 40 60 80

SHEAR STRENGTH Cu, kPa: nat V. ⊗ Q - ● rem V. ⊕ U - ○: 10 20 30 40

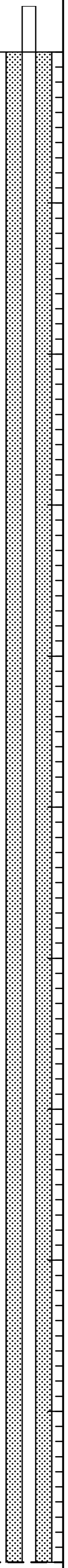
HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-6} 10^{-5} 10^{-4} 10^{-3}

WATER CONTENT PERCENT: Wp ⊢—○W—⊣ Wl: 10 20 30 40

BORING METHOD: DR-24 – Air Rotary 219 mm Casing from 0.0 m to 9.8 m; 305 mm Casing from 9.8 m to 10.1 m

Sierra Drilling & Blasting Ltd.

DEPTH SCALE METRES	SOIL PROFILE DESCRIPTION	ELEV. DEPTH (m)	PIEZOMETER OR STANDPIPE INSTALLATION
	Ground Surface		Stickup = 1.57 m
0	TOPSOIL – (OL) Gravelly ORGANIC SILT, angular, some sand, roots and rootlets, black, moist, loose	0.00	
	(ML) SANDY SILT, light brown, moist, compact	0.30	
1	TILL – (ML) Sandy gravelly CLAYEY SILT, sub-rounded, contains cobbles, dark brown, cohesive, w<PL, very soft to soft	0.91	
4	--- Becoming grey, firm at 4.0 m		
5			Bentonite Grout
	--- Water in cutting starting at 5.5 m		
6	(GP) GRAVEL, fine to coarse-grained, dark grey, wet, dense	6.10	
	TILL – (ML) Sandy gravelly CLAYEY SILT, sub-rounded, contains cobbles, grey-brown, w>PL, soft	6.71	
7	--- w<PL, very stiff from 7.3 to 8.8 m		
9	--- w>PL, soft at 8.8 m		
10			



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DEPTH SCALE
1 : 50

GOLDER

LOGGED: DE
CHECKED: TG

DATA ENTRY: IPG

PROJECT No.: 13-1345-0010

RECORD OF MONITORING WELL: LC_PIZD1404D

SHEET 2 OF 4

LOCATION: See Location Plan, West side of Dry Creek

BORING DATE: 26 April, 2014

DATUM: Local

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	ELEV. DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10	DR-24 – Air Rotary Sierra Drilling & Blasting Ltd.	TILL – (ML) Sandy gravelly CLAYEY SILT, sub-rounded, contains cobbles, grey-brown, w>PL, soft *(continued)*						
12.80		(GM) Sandy SILTY GRAVEL, angular, grey, moist, dense	12.80					
15								Bentonite Grout
15.24		TILL – (ML) Sandy gravelly CLAYEY SILT, sub-rounded, contains cobbles, grey-brown, w<PL, soft	15.24					
17.7		--- Boulder at 17.7 m						
20								

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20 40 60 80

SHEAR STRENGTH Cu, kPa: nat V. ⊗ Q - ● rem V. ⊕ U - ○ : 10 20 30 40

HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-6} 10^{-5} 10^{-4} 10^{-3}

WATER CONTENT PERCENT: Wp ⊢—○W—⊣ Wl : 10 20 30 40

CONTINUED NEXT PAGE

DEPTH SCALE

1 : 50

GOLDER

LOGGED: DE

CHECKED: TG

PROJECT No.: 13-1345-0010

RECORD OF MONITORING WELL: LC_PIZD1404D

SHEET 3 OF 4

LOCATION: See Location Plan, West side of Dry Creek

BORING DATE: 26 April, 2014

DATUM: Local

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80 SHEAR STRENGTH Cu, kPa nat V. ⊗ Q - ● rem V. ⊕ U - ○ 10 20 30 40	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3} WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
20	DR-24 – Air Rotary Sierra Drilling & Blasting Ltd.	TILL – (ML) Sandy gravelly CLAYEY SILT, sub-rounded, contains cobbles, grey-brown, w<PL, soft *(continued)*									
21											
22											
23											Bentonite Grout
24		--- Cobble / boulder content increasing (possible silty gravel layers) at 24.1 m									
25											
26		--- Cobbles decreasing at 25.9 m									
27											
28											Bentonite Pellet Plug
29											
30											

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DEPTH SCALE

1 : 50

GOLDER

LOGGED: DE

CHECKED: TG

DATA ENTRY: IPG

PROJECT No.: 13-1345-0010

RECORD OF MONITORING WELL: LC_PIZD1404D

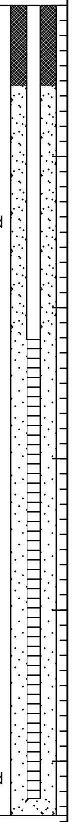
SHEET 4 OF 4

LOCATION: See Location Plan, West side of Dry Creek

BORING DATE: 26 April, 2014

DATUM: Local

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa nat V. ⊗ Q - ● rem V. ⊕ U - ○ (10 20 30 40)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}); WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
30	DR-24 – Air Rotary Sierra Drilling & Blasting Ltd.	TILL – (ML) Sandy gravelly CLAYEY SILT, sub-rounded, contains cobbles, grey-brown, w<PL, soft *(continued)*									Bentonite Pellet Plug Colorado Silica Sand
32		(GP) SANDY GRAVEL, fine to medium-grained, sub-angular with trace sub-rounded, some silt, dark grey, wet, dense		32.31							Slotted Section Colorado Silica Sand
35		End of MONITORING WELL. NOTES: Standpipe installed to 35.3 m.		35.36							



Depth scale: 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40

BOREHOLE - EXPANDED ADD. LAB TESTING 13.1345.0010_ BH LOGS_APPENDIX.GPJ CALGARY.GDT 10/22/21

DEPTH SCALE

1 : 50

GOLDER

LOGGED: DE

CHECKED: TG

LC_PIZM0903

WELL LITHOLOGY & CONSTRUCTION FORM

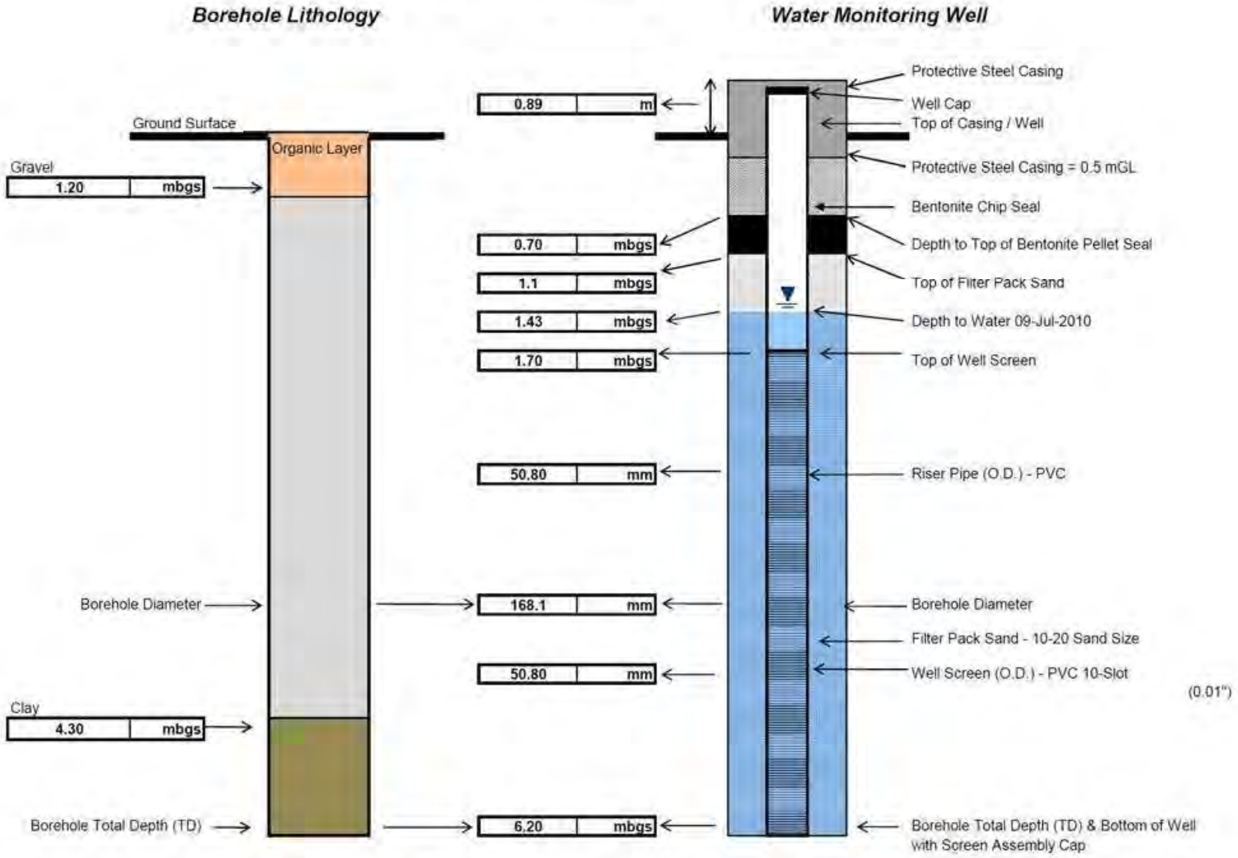
Well Number:
GA-LC1-A

Project Number:	0913490005-1109-1002
Project Name:	Teck Coal Line Creek Operations
Location:	Elk Valley, British Columbia, Canada
Site Area:	Line Creek

Completion Date:	30-Oct-09
Drill Contractor:	Beck Drilling
Drilling Method:	ODEX
Personnel:	Tim Crowell

Well Summary Table		
Northing	661410	NAD83
Easting	5536285	NAD83
Ground Elevation	1587.0	masl
Top of Casing Elevation	1587.9	masl
Water Level Elevation	1585.6	masl

Input Parameters
Datum Reference:
mbgs
Diameter Units:
mm



Note:
mbgs = metres below ground surface
mm = millimetres
masl = metres above sea level

PhaseIIEsia/EIA_Report/02_Annexes/Annex_C/Figures_Base_Files_

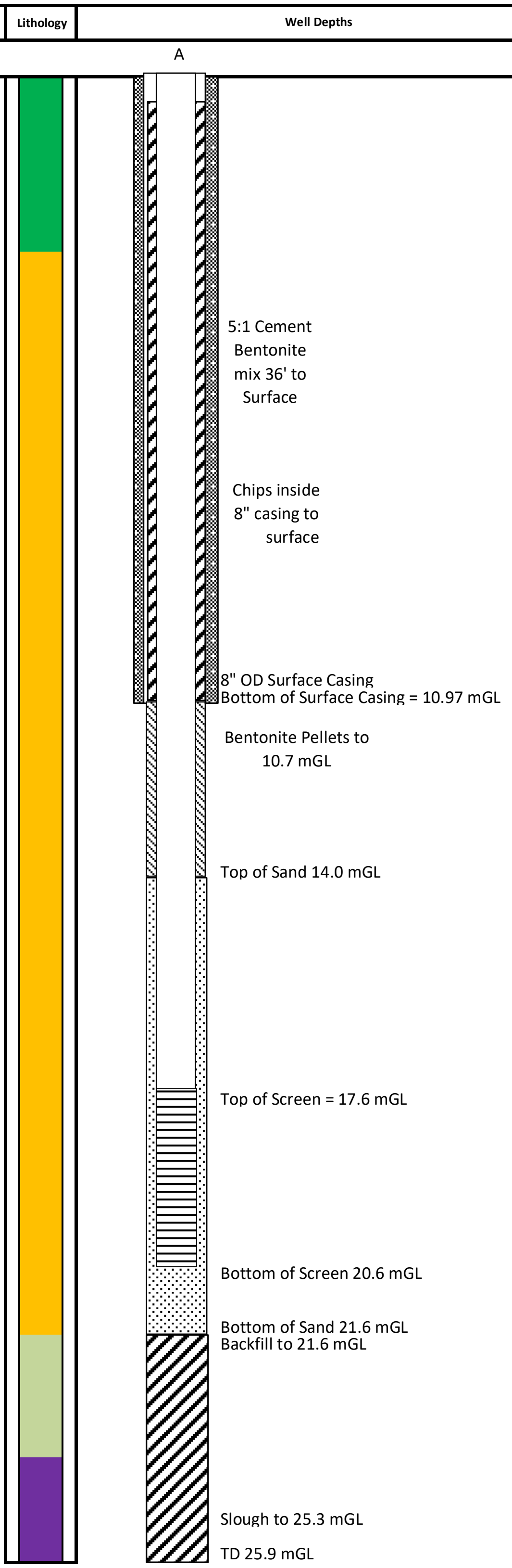
Teck LCO
Monitoring Well Drilling Logs

WELL ID : LC_MW20_01

Teck

NOTE: This is the proposed installation and is pending actual depths

Depth (ftGL)	Depth (mGL)	Lithological Description
0	0	0 - 3.0 mGL: FILL, sandy gravel, very fine to fine sand, angular to rounded, brown, dry, Boulders prevelant 7-10'.
1	0.3048	
2	0.6096	
3	0.9144	
4	1.2192	
5	1.524	
6	1.8288	
7	2.1336	
8	2.4384	
9	2.7432	
10	3.048	3.1 - 4.6 mGL: GRAVEL, with sand, medium to coarse, well graded, sub-angular to rounded, dry until 12' then wet.
11	3.3528	
12	3.6576	
13	3.9624	
14	4.2672	
15	4.572	4.6 - 6.1 mGL: GRAVEL, coarse to very coarse, well graded, angular to sub-rounded, varied colour, wet
16	4.8768	
17	5.1816	
18	5.4864	
19	5.7912	
20	6.096	6.1 - 7.6 mGL: Silty Sandy GRAVEL, coarse to very coarse, angular to sub-rounded, brown, wet.
21	6.4008	
22	6.7056	
23	7.0104	
24	7.3152	
25	7.62	7.6 - 9.1 mGL: GRAVEL, coarse to very coarse, well graded, angular to sub-rounded, varied colour, wet
26	7.9248	
27	8.2296	
28	8.5344	
29	8.8392	
30	9.144	9.1 - 10.7 mGL: GRAVEL, fine to very coarse, well graded, angular to sub-rounded, varied colour, wet. Appearance of water indicates sand and possibly some silt also present but washing out of collected cuttings.
31	9.4488	
32	9.7536	
33	10.0584	
34	10.3632	
35	10.668	10.7 - 16.8 mGL: Silty Sandy GRAVEL, course gravel, medium sand, well graded, angular to sub-rounded, brown, wet.
36	10.9728	
37	11.2776	
38	11.5824	
39	11.8872	
40	12.192	
41	12.4968	
42	12.8016	
43	13.1064	
44	13.4112	
45	13.716	
46	14.0208	
47	14.3256	
48	14.6304	
49	14.9352	
50	15.24	
51	15.5448	
52	15.8496	
53	16.1544	
54	16.4592	
55	16.764	
56	17.0688	
57	17.3736	
58	17.6784	
59	17.9832	
60	18.288	
61	18.5928	
62	18.8976	16.8 - 21.9 mGL: Silty Sandy GRAVEL, course gravel, medium sand, well graded, angular to sub-rounded, brown, wet. Water seemed to be lost at 72', Driller also noted it started to feel different at the controls and that the casing was going in easier. Pulled back to 71' and returned water, noticed significant colour change, from a brown to a dark brown.
63	19.2024	
64	19.5072	
65	19.812	
66	20.1168	
67	20.4216	
68	20.7264	
69	21.0312	
70	21.336	
71	21.6408	
72	21.9456	
73	22.2504	
74	22.5552	
75	22.86	22.9 - 24.4 mGL: Silty SAND, fine sand, loss of water, moist.
76	23.1648	
77	23.4696	
78	23.7744	
79	24.0792	
80	24.384	
81	24.6888	
82	24.9936	24.4 - 25.9 mGL: SHALE, weathered, soft, fissile, blackish grey, dry.
83	25.2984	
84	25.6032	



Legend

Waste Rock/Fill	🟩	Silty Sand	🟩
Gravel	🟧	Clayey Silt	🟫
Sand & Gravel	🟫	Silty Clay	🟩
Sand	🟨	Clay	🟥
Silty Gravel	🟫	Shale	🟪
Gravelly Silt	⬜	No Recovery	▦
Silt	🟥		

WELL ID : LC_MW20_02A and LC_MW20_02B

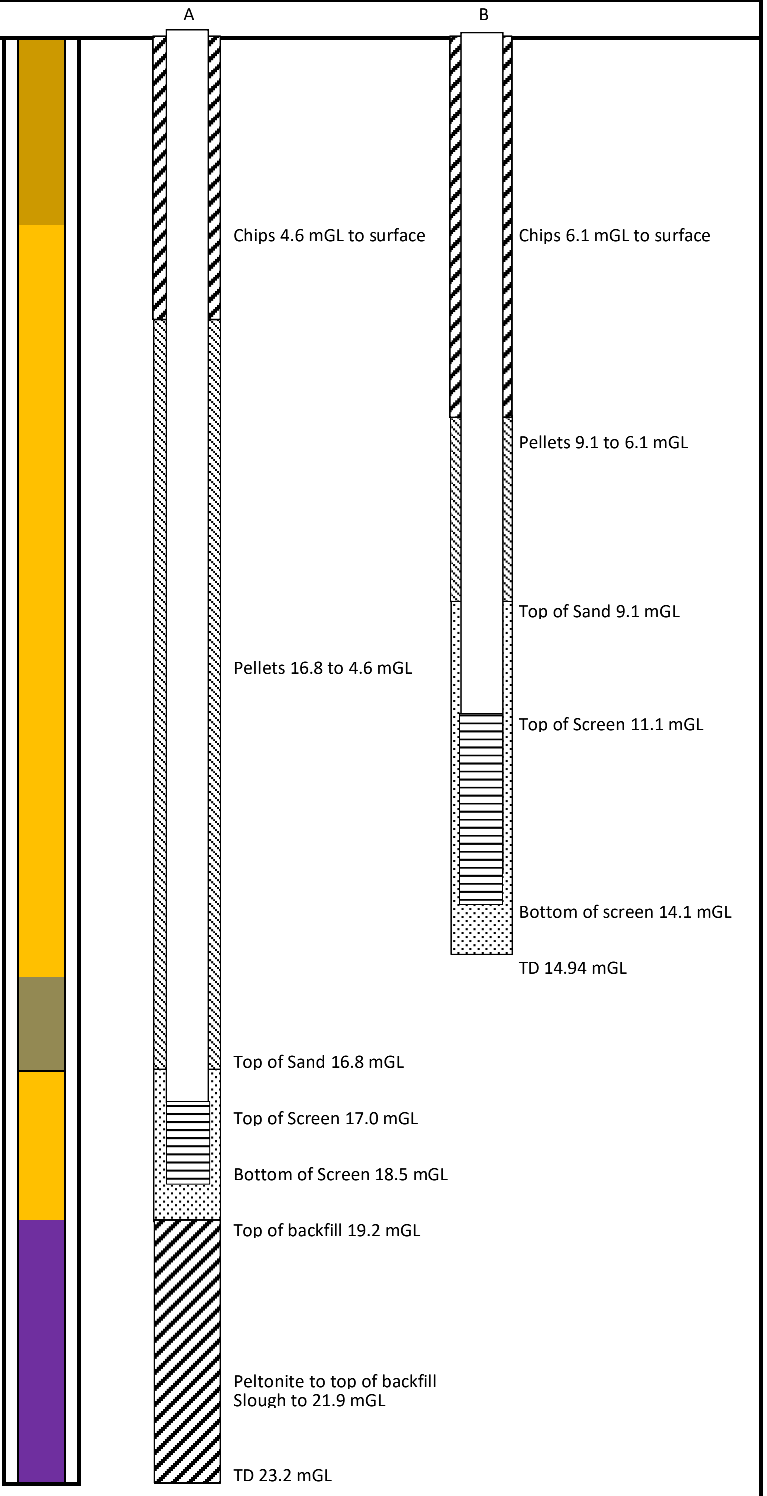
Teck

NOTE: This is the proposed installation and is pending actual depths

Depth (ftGL)	Depth (mGL)	Lithological Description
0	0	0 - 3.0 mGL: SAND and GRAVEL, coarse sands, fine to coarse gravel, well graded, angular to sub-rounded, brown, dry.
1	0.3048	
2	0.6096	
3	0.9144	
4	1.2192	
5	1.524	
6	1.8288	
7	2.1336	
8	2.4384	
9	2.7432	
10	3.048	3.0 - 4.6 mGL: GRAVEL, with sand, trace silt, medium to coarse grained gravel, sub-angular to sub-rounded, well graded, medium grained sand. Brown, dry. Wet at 15', driller thinks water was encountered at 13' but only observed at 15'.
11	3.3528	
12	3.6576	
13	3.9624	
14	4.2672	
15	4.572	4.6 - 6.1 mGL: GRAVEL, some sand and silt, well graded, angular to sub-rounded. Brown, wet. The way the cuttings are angular the how it is drilling it would be larger/cobbles downhole.
16	4.8768	
17	5.1816	
18	5.4864	
19	5.7912	
20	6.096	6.1 - 9.1 mGL: GRAVEL and SAND, trace silt, medium to coarse sand, well graded, sub-rounded, lost angular at around 21'. Light brown to brown, wet. Cuttings are dry due to circulation issues with formation water.
21	6.4008	
22	6.7056	
23	7.0104	
24	7.3152	
25	7.62	
26	7.9248	
27	8.2296	
28	8.5344	
29	8.8392	
30	9.144	9.1 - 15.2 mGL: GRAVEL, well graded, angular to sub-rounded, brown, wet. Fines are washing out with waater when circulated uphole, observations of water colour and consistency suggest silty sand present. At 45' in 02B orange/red shale noticed in cuttings, were not observed in 02A at this depth. Similar colour change noticed at 49' compared to 51' at 02A.
31	9.4488	
32	9.7536	
33	10.0584	
34	10.3632	
35	10.668	
36	10.9728	
37	11.2776	
38	11.5824	
39	11.8872	
40	12.192	
41	12.4968	
42	12.8016	
43	13.1064	
44	13.4112	
45	13.716	
46	14.0208	
47	14.3256	
48	14.6304	
49	14.9352	
50	15.24	15.2 - 16.8 mGL: Silty GRAVEL, angular to sub-angular, well graded, colour change from brown to greyish blue at 51'. WET. Driller thought bedrock at first but pushed casing through. Potentially slab/boulder.
51	15.5448	
52	15.8496	
53	16.1544	
54	16.4592	
55	16.764	16.8 - 18.3 mGL: GRAVEL, angular, well graded, shale-sandstone rocks, yellowish brown and blueish grey, wet.
56	17.0688	
57	17.3736	
58	17.6784	
59	17.9832	
60	18.288	18.3 - 19.0 mGL: GRAVEL, with silty sand, angular to sub-angular, well graded, brown, wet.
61	18.5928	
62	18.8976	
63	19.2024	19.2 - 23.2 mGL: SHALE, soft, blackish blue, fissile, dry, organic shale.
64	19.5072	
65	19.812	
66	20.1168	
67	20.4216	
68	20.7264	
69	21.0312	
70	21.336	
71	21.6408	
72	21.9456	
73	22.2504	
74	22.5552	
75	22.86	
76	23.1648	

Lithology

Well Depths

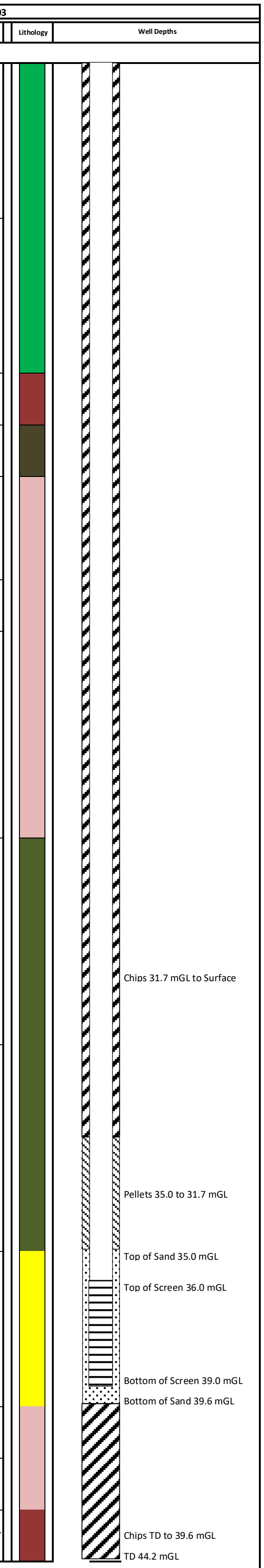


Legend			
Waste Rock/Fill	🟩	Silty Sand	🟩
Gravel	🟧	Clayey Silt	⬛
Sand & Gravel	🟫	Silty Clay	🟩
Sand	🟨	Clay	🟥
Silty Gravel	🟫	Shale	🟪
Gravelly Silt	⬜	No Recovery	▦
Silt	🟥		

WELL ID : LC_MW20_03

NOTE: This is the proposed installation and is pending actual depths

Depth (ftGL)	Depth (mGL)	Lithological Description
0	0	0 - 4.6 mGL: WASTE ROCK, very fine to coarse, angular, black, dry. Last 2' was shale refuse, angular, fissile, greyish blue.
1	0.3048	
2	0.6096	
3	0.9144	
4	1.2192	
5	1.524	
6	1.8288	
7	2.1336	
8	2.4384	
9	2.7432	
10	3.048	
11	3.3528	
12	3.6576	
13	3.9624	
14	4.2672	
15	4.572	4.6 - 9.1 mGL: WASTE ROCK, shale refuse, angular, greyish blue, dry.
16	4.8768	
17	5.1816	
18	5.4864	
19	5.7912	
20	6.096	
21	6.4008	
22	6.7056	
23	7.0104	
24	7.3152	
25	7.62	
26	7.9248	
27	8.2296	
28	8.5344	
29	8.8392	
30	9.144	9.1 - 10.7 mGL: SILT, trace organics, soft to firm, dark brown, dry-moist.
31	9.4488	
32	9.7536	
33	10.0584	
34	10.3632	
35	10.668	10.7 - 11.9 mGL: Clayey SILT, soft to firm, dark brown, dry-moist.
36	10.9728	
37	11.2776	
38	11.5824	
39	11.8872	
40	12.192	11.9 - 15.2 mGL: CLAY, trace silt, soft to firm, w=PL rolled to small diameter, light brown, moist.
41	12.4968	
42	12.8016	
43	13.1064	
44	13.4112	
45	13.716	
46	14.0208	
47	14.3256	
48	14.6304	
49	14.9352	
50	15.24	15.2 - 16.8 mGL: CLAY, very soft, brown, wet. Driller did add water to flush casing to get returns back. Hammer won't 'fire' basically just pushing dopwnhole.
51	15.5448	
52	15.8496	
53	16.1544	
54	16.4592	
55	16.764	16.8 - 22.9 mGL: CLAY, some silt, very soft, brown, wet. Driller added water to flush casing to get returns back. Trace fine gravel, angular.
56	17.0688	
57	17.3736	
58	17.6784	
59	17.9832	
60	18.288	
61	18.5928	
62	18.8976	
63	19.2024	
64	19.5072	
65	19.812	
66	20.1168	
67	20.4216	
68	20.7264	
69	21.0312	
70	21.336	
71	21.6408	
72	21.9456	
73	22.2504	
74	22.5552	
75	22.86	22.9-29.0 mGL: SILT and CLAY, brown, soft, wet. Driller still pumping water as returns are clogging without it. No excess water has been observed other than what is pumped downhole.
76	23.1648	
77	23.4696	
78	23.7744	
79	24.0792	
80	24.384	
81	24.6888	
82	24.9936	
83	25.2984	
84	25.6032	
85	25.908	
86	26.2128	
87	26.5176	
88	26.8224	
89	27.1272	
90	27.432	
91	27.7368	
92	28.0416	
93	28.3464	
94	28.6512	
95	28.956	29.0-35.1 mGL: SILT and CLAY, some sand, brown, soft, wet. Driller is still pumping water due to clogging issues. No water picked up in section.
96	29.2608	
97	29.5656	
98	29.8704	
99	30.1752	
100	30.48	
101	30.7848	
102	31.0896	
103	31.3944	
104	31.6992	
105	32.004	
106	32.3088	
107	32.6136	
108	32.9184	
109	33.2232	
110	33.528	
111	33.8328	
112	34.1376	
113	34.4424	
114	34.7472	
115	35.052	35.1 - 39.6 mGL: SAND (started at 118'), very fine, brown, wet. Poorly graded. May have picked up some water but not much.
116	35.3568	
117	35.6616	
118	35.9664	
119	36.2712	
120	36.576	
121	36.8808	
122	37.1856	
123	37.4904	
124	37.7952	
125	38.1	
126	38.4048	
127	38.7096	
128	39.0144	
129	39.3192	
130	39.624	39.6-41.1 mGL: CLAY, soft to firm, w=PL, brown, wet. Driller still adding water. CLAY stops at 133'.
131	39.9288	
132	40.2336	
133	40.5384	
134	40.8432	
135	41.148	41.1 - 42.7 mGL: CLAY and BOULDERS (TILL), soft, brown, wet. "gravel" in cuttings is angular fine to medium and resulting from drilling through boulders. Driller noted the bit and casing were catching at some points but for the most part drilled like clay. Still pumping water downhole.
136	41.4528	
137	41.7576	
138	42.0624	
139	42.3672	
140	42.672	42.7 - 43.9 mGL: SILT, some fine gravel (rounded) firm to stiff, cohesive (came out as little round balls), w<PL, dark brown, dry.
141	42.9768	
142	43.2816	
143	43.5864	
144	43.8912	



Legend

Waste Rock/Fill	🟩	Silty Sand	▧
Gravel	🟧	Clayey Silt	■
Sand & Gravel	🟫	Silty Clay	▩
Sand	🟨	Clay	▢
Silty Gravel	▨	Shale	🟪
Gravelly Silt	▤	No Recovery	▦
Silt	🟥		

srk consulting
Teck

HOLE ID: LCO-WLC-12-06a
LOCATION: Line Creek
PROJECT NO: 1CT017.020
DRILLING CONTRACTOR: Boart Longyear
DRILLING TYPE: Sonic
PROJECT: Teck Coal Watershed R&D
CLIENT: Teck Coal Ltd.
LOGGED BY: MJM
BORING DATE: 4-Jul-12 to 7-Jul-12

COORDINATES: E 659672 N 5532409
DATUM: NAD 83 Zone 11
GROUND ELEV (m): 1509.919
AZIMUTH: 0 DIP: 90
EOH ELEV. (m): 1465.723
TOTAL DEPTH (m / ft): 44.2 / 145
INSTALLATION TYPE: 2" Mon. Well
P.1 of 1

General Geology: Natural Ground
Levelogger Installation: None (Dry)
Top of PVC Elev (m): 1510.897
Top of PVC Elev (m): 0.978 / 3.21
Water Level (m / ft bgs):
Water Level Note: Dry based on 2012/09/17-20 measurements

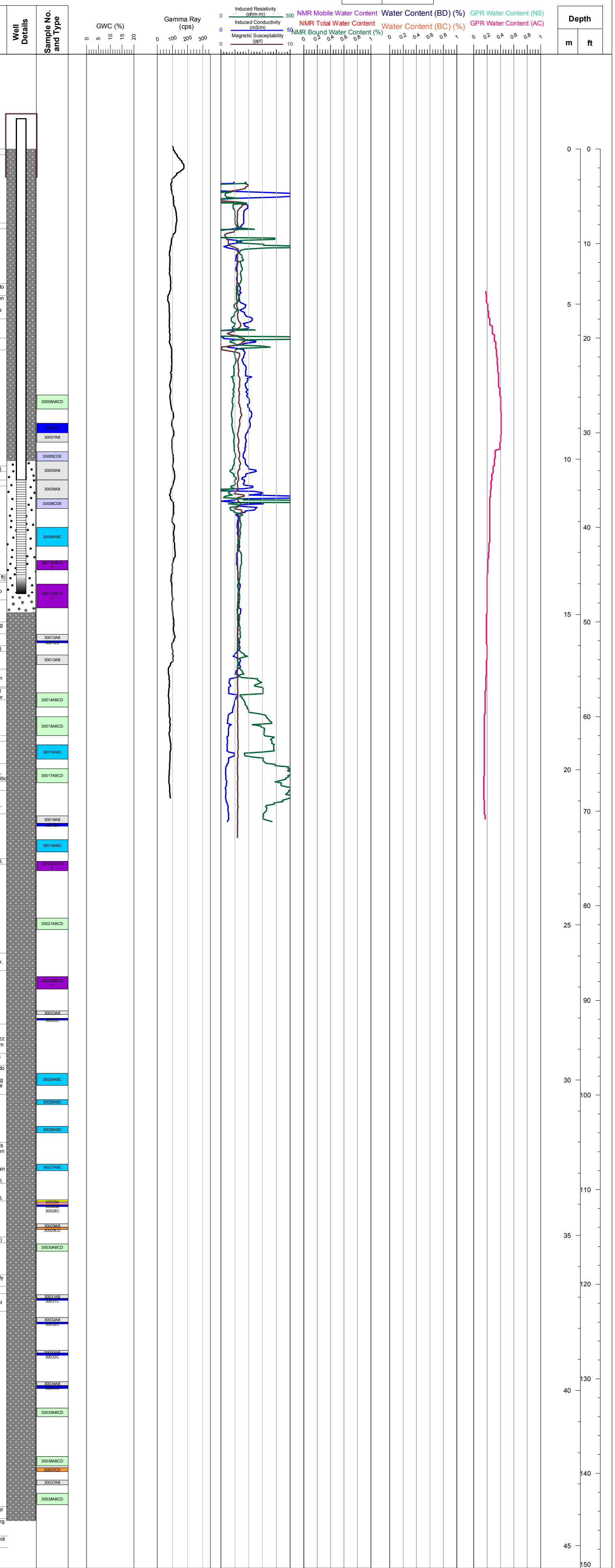
Recent Water Level Measurement

Date	Water Level (ft bgs)

LC_PIZ1206A

Primary Grain Size
▨ Bedrock
Cobble
Sand
Boulder
Gravel
Silt
Clay
■ No Recovery

Description	Drilling Notes
Gravel, some sand (GW) - Very dark grayish brown, dry to moist, dense, well-graded, subrounded, non-plastic, massive. Disturbed.	SONIC DRY
Sand, few silt, few gravel (SM) - Dark brown, moist to wet, medium dense, well-graded, subrounded, no to low plastic, cohesive, low dilatancy, massive, gradual contact.	Increased sand at 12 feet.
Clay, some silt (CL) - Dark brown, moist, stiff, medium plastic, cohesive, massive, sharp contact.	(Glacial lacustrine from 14.25 to 15 ft) Visible pyrite forming in vugs on one gravel piece. Sulfides pressent. Dolomitic siltstones and sandstones.
Sand, some gravel, little silt (SM) - Brown, dry to moist, dense, well-graded, subangular, non-plastic, massive, sharp contact.	
Silt, little sand, little clay (ML) - Dark brown, moist to wet, medium, non-plastic, cohesive, low to rapid dilatancy, massive, gradual contact.	Few zones of low plastic throughout.
Sand, few gravel, little silt (SM) - Black, dense, well-graded, subangular, non-plastic, cohesive, massive, gradual contact.	(Glacial till from 33.5 to 35 ft) Medium plastic fines
Sand, some gravel, trace clay (SW-SC) - Black, wet, medium dense, well-graded, subrounded, non-plastic, cohesive, low to rapid dilatancy, massive, gradual contact.	
Gravel, some sand, little silt (GW-GM) - Dark reddish brown, moist, medium dense, well-graded, subrounded, non-plastic, massive, gradual contact.	(Glacial fluvial from 45 to 45.8 ft) Fines cohesive, medium plasticity, gravel subangular to subrounded
Gravel, some sand, trace silt (GW) - Dark reddish brown, moist to wet, medium dense, well-graded, subrounded, non-plastic, massive, gradual contact.	Increasing sand and decreaing moisture.
Sand, few gravel, little silt (SM) - Dark brown, dry, dense, well-graded, subangular, non-plastic, massive, gradual contact.	(Glacial till from 52.5 to 55 ft)
No Recovery. Interpreted as Sand.	Redrilled soils. No reliable definition of transition between units.
Gravel, few sand, little clay (GW-GC) - Dusky red, moist to wet, medium dense, well-graded, subrounded, massive, gradual contact.	Fines are medium plastic and cohesive, gravel is subangular
Sand, some gravel, little silt (SM) - Dark reddish brown to brown, dry, dense, well-graded, subangular, non-plastic, massive, gradual contact.	(Glacial till from 62 to 65 ft)
Gravel, some silt, little fines (GM) - Dark reddish gray, moist to wet, medium dense, well-graded, subrounded, non-plastic, massive, gradual contact.	Carbonates present in some gravel, siltstone or sandstone, sulfide smell disseminated afinitic Changes to dry to moist, carbonates present in some gravel, siltstone or sandstone, sulfide smells.
Sand, some gravel, little silt (SM) - Dark brown, moist, dense, well-graded, subangular, no to low plastic, massive, gradual contact.	Cohesive matrix, sulfide smell.
Lean clay, some sand, few gravel (CL) - Dark reddish gray, wet, soft, well-graded, subangular, medium plastic, cohesive, massive, gradual contact.	Gravel and Sand are well graded, up to small cobble size. Sulfide smell.
Sand, some gravel/cobble, little silt (SM) - Brown, dry, very dense, well-graded, subangular, non-plastic, cohesive, massive, gradual contact.	Fine grained sandstone / siltstone gravels. Aphanitic sulfides with dolomite / (high fizz calcite?). Hot temperature from dry dense drilling. Very gradual transition to this unit, 93-98ft Becomes moist, Some gravel do not have sulfide smells (sandstone possibly containing dolomite). Clay lumps, posible decomposing gravels.
Sand, little gravel and cobble, little clay (SC) - Black, moist, very dense, well-graded, angular, low plastic, cohesive, massive, gradual contact.	Fine grained sandstone gravels with carbonate mineralization on outides, fizz on scratched surfaces inside. Gravel distributed throughout, max grain size small cobbles to course gravel. Boiled vegetable smell. Very fine, reflective minerals (posibly pyrite) 109 -115 feet. Carbonate minerals. Basal till.
Clay, few sand, little gravel (CL) - Very dark brown, moist to wet, very stiff, well-graded, angular, medium plastic, cohesive, massive, gradual contact.	(Glacial till from 115 to 121 ft) Becomes dry to damp gradually over a few feet.
Sand, some gravel/cobble, little clay (SC) - Black, moist, dense, well-graded, subangular, low plastic, cohesive fines, massive, gradual contact.	Gravel coating carbonate alteration. Few internal gravel carbonate.
Gravel, some sand, little clay (GC) - Black, wet, medium dense, well-graded, subrounded, non-plastic, cohesive fines, massive, gradual contact.	Oxidization / staining on gravel surface Sulfur smell, some decomposing gravel. Carbonate gravel coatings. EOH @ 145ft. Practical drill limit reached.



Well Legend
Chips
Cuttings
Casing
Gas Port
Water Port
Slough
Sand
☐ PVC
Screen
Sump

Sample Analysis Type
A = Geochemical
B = Isotopes
C = Microbial
D = Cultivation
E = Anaerobic Cultivation

Sample Legend
🟨 A
AB
ABC
🟩 ABCD
🟪 ABCDE
🟩 AC
🟦 ACD
🟥 B
🟦 C
🟧 CD
CDE

LC_PIZ1206C

Teck

PROJECT: Teck Coal Watershed R&D
CLIENT: Teck Coal Ltd.

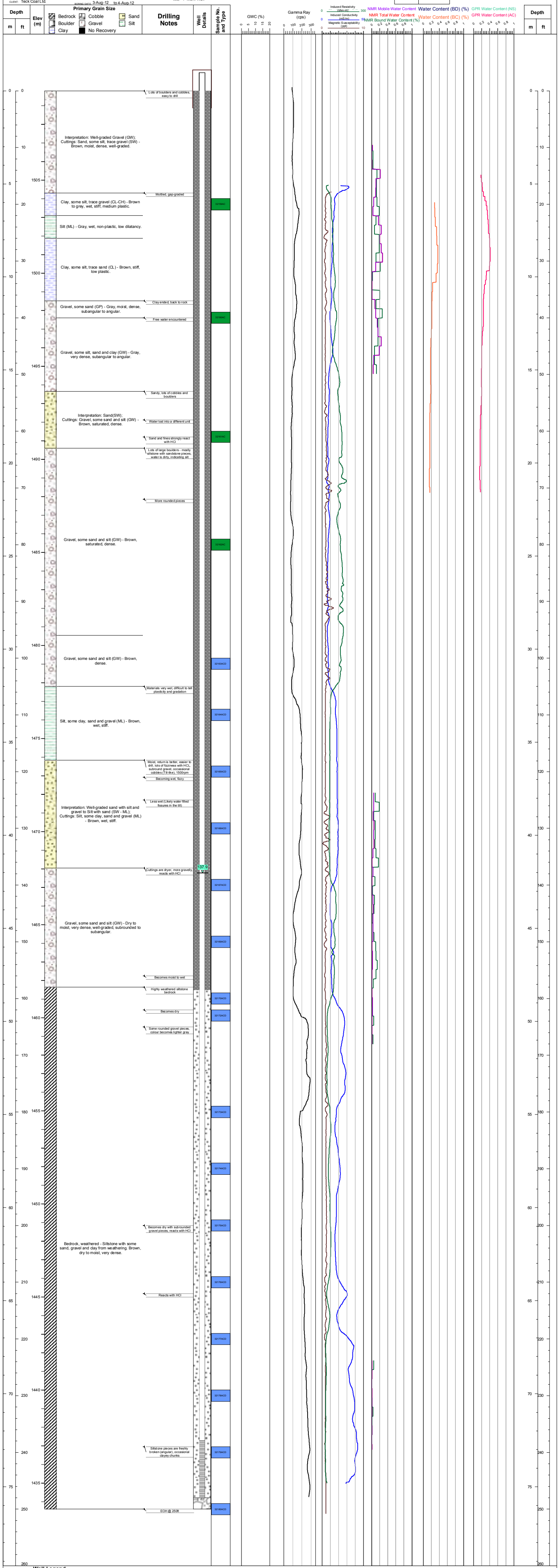
HOLE ID: LCO-WLC-12-06c
LOCATION: Line Creek
PROJECT NO: 1CT017.020
DRILLING CONTRACTOR: JR Drilling
DRILLING TYPE: Air Rotary
LOGGED BY: LD/BS
BORING DATE: 3-Aug-12 to 4-Aug-12

COORDINATES: E 659679 N 5532410
DATUM: NAD 83 Zone 11
GROUND ELEV (m): 1509.801
AZIMUTH: 0 DIP: 90
EOH ELEV. (m): 1433.601
TOTAL DEPTH (m / ft): 76.2 / 250
INSTALLATION TYPE: 4" Mon. Well
P.1 of 1

General Geology: Natural Ground
Levelogger Installation: Yes (Level)
Top of PVC Elev (m): 1510.886
Top of PVC Elev (m): 1.085 / 3.56
Water Level (m / ft bgs): 42.02 / 137.9
Water Level Note: Water level based on 2012/09/17-20 measurements

Recent Water Level Measurement

Date	Water Level (ft bgs)



Interpretation: Well-graded Gravel (GW); Cuttings: Sand, some silt, trace gravel (SW) - Brown, moist, dense, well-graded.

Clay, some silt, trace gravel (CL-CH) - Brown to grey, wet, stiff, medium plastic.

Silt (ML) - Gray, wet, non-plastic, low dilatancy.

Clay, some silt, trace sand (CL) - Brown, stiff, low plastic.

Gravel, some sand (GP) - Gray, moist, dense, subangular to angular.

Gravel, some silt, sand and clay (GW) - Gray, very dense, subangular to angular.

Interpretation: Sand(SW); Cuttings: Gravel, some sand and silt (GW) - Brown, saturated, dense.

Gravel, some sand and silt (GW) - Brown, saturated, dense.

Gravel, some sand and silt (GW) - Brown, dense.

Silt, some clay, sand and gravel (ML) - Brown, wet, stiff.

Interpretation: Well-graded sand with silt and gravel to Silt with sand (SW - ML); Cuttings: Silt, some clay, sand and gravel (ML) - Brown, wet, stiff.

Gravel, some sand and silt (GW) - Dry to moist, very dense, well-graded, subrounded to subangular.

Bedrock, weathered - Siltstone with some sand, gravel and clay from weathering. Brown, dry to moist, very dense.

Drilling Notes

- Lots of boulders and cobbles, easy to drill
- Mottled, gap-graded
- Clay ended, back to rock
- Free water encountered
- Sandy, lots of cobbles and boulders
- Water lost into a different unit
- Sand and fines strongly react with HCl
- Lots of large boulders - mostly siltstone with sandstone pieces, water is dirty, indicating silt
- More rounded pieces
- Materials very wet, difficult to tell plasticity and gradation
- Moist, return is better, easier to drill, lots of fizziness with HCL, subround gravel, occassional cobbles (Till-like), 1500rpm
- Becoming wet, fizzy
- Less wet (Likely water filled fissures in the till)
- Cuttings are dryer, more gravelly, reacts with HCl
- Becomes moist to wet
- Highly weathered siltstone bedrock
- Becomes dry
- Some rounded gravel pieces, colour becomes lighter gray
- Becomes dry with subrounded gravel pieces, reacts with HCl
- Reacts with HCl
- Siltstone pieces are freshly broken (angular), occasional clayey chunks
- EOH @ 250ft

Well Legend

Chips	Water Port	PVC
Cuttings	Slough	Screen
Casing	Sand	Sump
Gas Port		

Sample Analysis Type
A = Geochemical
B = Isotopes
C = Microbial
D = Cultivation
E = Anaerobic Cultivation

Sample Legend

🟨 A	🟩 ABCD	🟦 ACD	🟧 CD
⬜ AB	🟪 ABCDE	🟥 B	⬜ CDE
🟦 ABC	🟩 AC	🟦 C	

LC_PIZ1207A

HOLE ID: LCO-WLC-12-07a
LOCATION: Line Creek
PROJECT NO: 1CT017.020
DRILLING CONTRACTOR: Boart Longyear
DRILLING TYPE: Sonic
PROJECT: Teck Coal Watershed R&D
CLIENT: Teck Coal Ltd.
LOGGED BY: LD/AL/MP
BORING DATE: 25-Jul-12 to 26-Jul-12

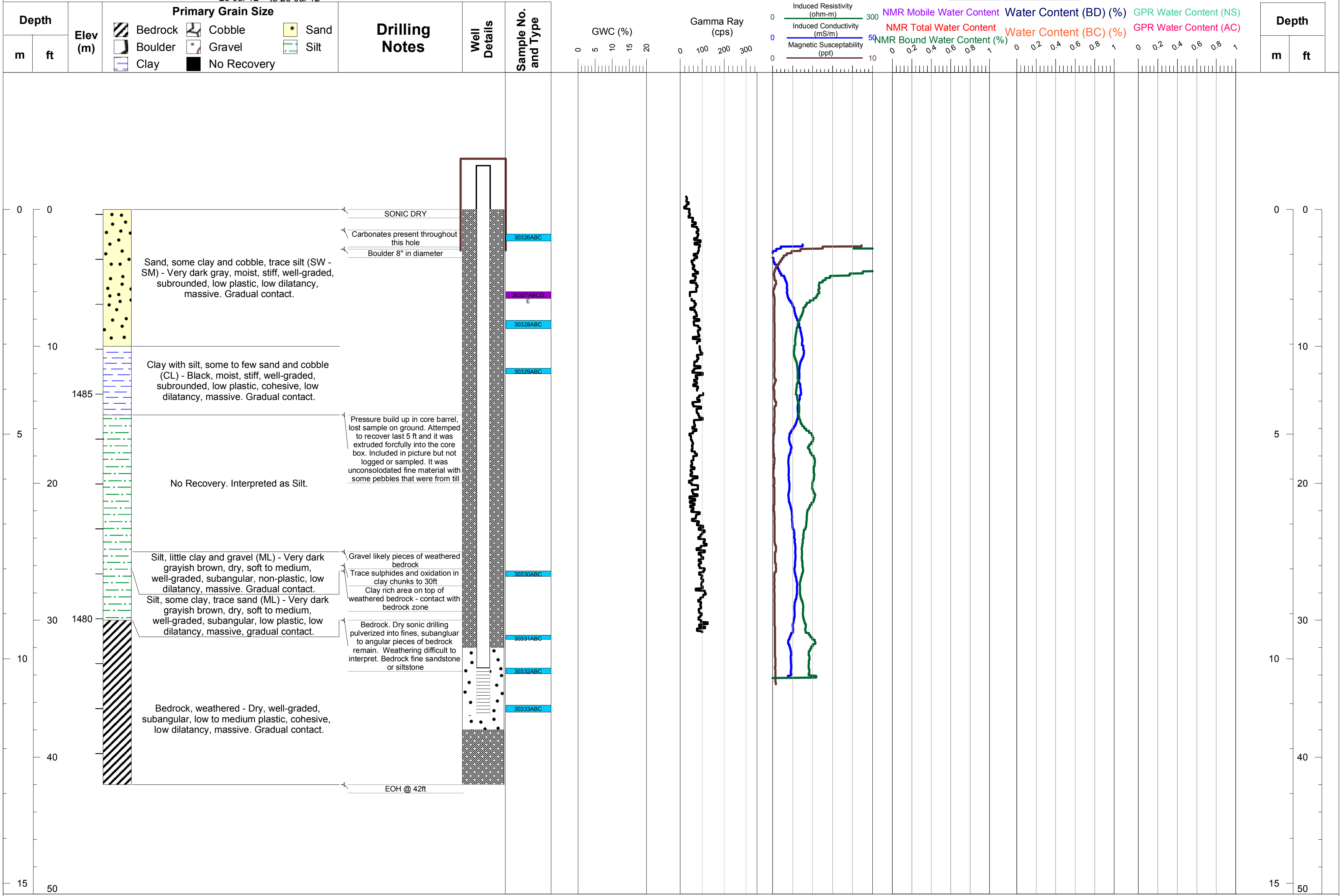
COORDINATES: E 659855 N 5532380
DATUM: NAD 83 Zone 11
GROUND ELEV (m): 1489.111
AZIMUTH: 0 DIP: 90
EOH ELEV. (m): 1476.3094
TOTAL DEPTH (m / ft): 12.8 / 42
INSTALLATION TYPE: 4" Vapour Well

P.1 of 1

General Geology: Natural Ground
Levelogger Installation: None (Dry)
Top of PVC Elev (m): 1490.197
Top of PVC Elev (m): 1.086 / 3.56
Water Level (m / ft bgs):
Water Level Note: Dry based on 2012/09/17-20 measurements

Recent Water Level Measurement

Date	Water Level (ft bgs)



Sand, some clay and cobble, trace silt (SW - SM) - Very dark gray, moist, stiff, well-graded, subrounded, low plastic, low dilatancy, massive. Gradual contact.

Clay with silt, some to few sand and cobble (CL) - Black, moist, stiff, well-graded, subrounded, low plastic, cohesive, low dilatancy, massive. Gradual contact.

No Recovery. Interpreted as Silt.

Silt, little clay and gravel (ML) - Very dark grayish brown, dry, soft to medium, well-graded, subangular, non-plastic, low dilatancy, massive. Gradual contact.

Silt, some clay, trace sand (ML) - Very dark grayish brown, dry, soft to medium, well-graded, subangular, low plastic, low dilatancy, massive, gradual contact.

Bedrock, weathered - Dry, well-graded, subangular, low to medium plastic, cohesive, low dilatancy, massive. Gradual contact.

SONIC DRY

Carbonates present throughout this hole

Boulder 8" in diameter

Pressure build up in core barrel, lost sample on ground. Attemped to recover last 5 ft and it was extruded forcfully into the core box. Included in picture but not logged or sampled. It was unconsolodated fine material with some pebbles that were from till

Gravel likely pieces of weathered bedrock

Trace sulphides and oxidation in clay chunks to 30ft

Clay rich area on top of weathered bedrock - contact with bedrock zone

Bedrock. Dry sonic drilling pulverized into fines, subangluar to angular pieces of bedrock remain. Weathering difficult to interpret. Bedrock fine sandstone or siltstone

EOH @ 42ft

30326ABC
30327ABCD
E
30328ABC
30329ABC
30330ABC
30331ABC
30332ABC
30333ABC

Well Legend

▩ Chips	▨ Water Port	☐ PVC
▧ Cuttings	Slough	▤ Screen
Casing	⁘ Sand	▆ Sump
▦ Gas Port		

Sample Analysis Type
A = Geochemical
B = Isotopes
C = Microbial
D = Cultivation
E = Anaerobic Cultivation

Sample Legend

🟨 A	🟩 ABCD	🟦 ACD	🟧 CD
⬜ AB	🟪 ABCDE	🟥 B	⬜ CDE
🟦 ABC	🟩 AC	🟦 C	

srk consulting

Teck

LC_PIZ1207B

HOLE ID: LCO-WLC-12-07b
LOCATION: Line Creek
PROJECT NO: 1CT017.020
DRILLING CONTRACTOR: JR Drilling
DRILLING TYPE: Air Rotary
PROJECT: Teck Coal Watershed R&D
CLIENT: Teck Coal Ltd.
LOGGED BY: JK
BORING DATE: 7-Jul-12 to 7-Jul-12

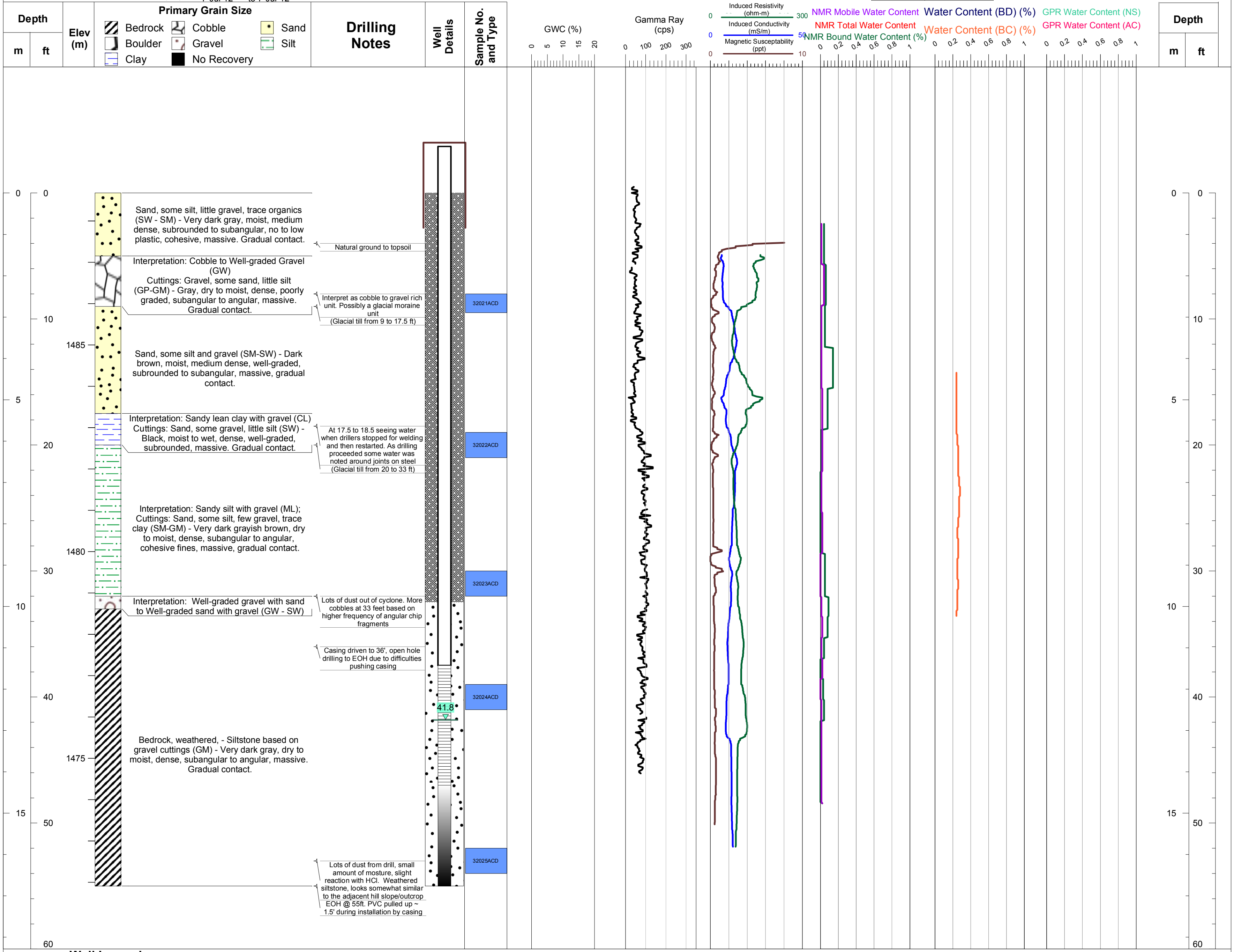
COORDINATES: E 659863 N 5532375
DATUM: NAD 83 Zone 11
GROUND ELEV (m): 1488.674
AZIMUTH: 0 DIP: 90
EOH ELEV. (m): 1471.91
TOTAL DEPTH (m / ft): 16.76 / 55
INSTALLATION TYPE: 4" Mon. Well

P.1 of 1

General Geology: Natural Ground
Levelogger Installation: Yes (Baro and Level)
Top of PVC Elev (m): 1489.776
Top of PVC Elev (m): 1.102 / 3.62
Water Level (m / ft bgs): 12.75 / 41.8
Water Level Note: Water level based on 2012/09/17-20 measurements

Recent Water Level Measurement

Date	Water Level (ft bgs)



Sand, some silt, little gravel, trace organics (SW - SM) - Very dark gray, moist, medium dense, subrounded to subangular, no to low plastic, cohesive, massive. Gradual contact.

Interpretation: Cobble to Well-graded Gravel (GW)
Cuttings: Gravel, some sand, little silt (GP-GM) - Gray, dry to moist, dense, poorly graded, subangular to angular, massive. Gradual contact.

Sand, some silt and gravel (SM-SW) - Dark brown, moist, medium dense, well-graded, subrounded to subangular, massive, gradual contact.

Interpretation: Sandy lean clay with gravel (CL)
Cuttings: Sand, some gravel, little silt (SW) - Black, moist to wet, dense, well-graded, subrounded, massive. Gradual contact.

Interpretation: Sandy silt with gravel (ML); Cuttings: Sand, some silt, few gravel, trace clay (SM-GM) - Very dark grayish brown, dry to moist, dense, subangular to angular, cohesive fines, massive, gradual contact.

Interpretation: Well-graded gravel with sand to Well-graded sand with gravel (GW - SW)

Bedrock, weathered, - Siltstone based on gravel cuttings (GM) - Very dark gray, dry to moist, dense, subangular to angular, massive. Gradual contact.

Natural ground to topsoil

Interpret as cobble to gravel rich unit. Possibly a glacial moraine unit
(Glacial till from 9 to 17.5 ft)

At 17.5 to 18.5 seeing water when drillers stopped for welding and then restarted. As drilling proceeded some water was noted around joints on steel
(Glacial till from 20 to 33 ft)

Lots of dust out of cyclone. More cobbles at 33 feet based on higher frequency of angular chip fragments

Casing driven to 36', open hole drilling to EOH due to difficulties pushing casing

Lots of dust from drill, small amount of mosture, slight reaction with HCl. Weathered siltstone, looks somewhat similar to the adjacent hill slope/outcrop
EOH @ 55ft. PVC pulled up ~ 1.5' during installation by casing

Well Legend

▩ Chips	▨ Water Port	☐ PVC
▧ Cuttings	Slough	▤ Screen
Casing	∵ Sand	Sump
▦ Gas Port		

Sample Analysis Type
A = Geochemical
B = Isotopes
C = Microbial
D = Cultivation
E = Anaerobic Cultivation

Sample Legend

🟨 A	ABCD	🟦 ACD	🟧 CD
AB	🟪 ABCDE	B	CDE
ABC	🟩 AC	🟦 C	

Teck

PROJECT: Teck Coal Watershed R&D
CLIENT: Teck Coal Ltd.

HOLE ID: LCO-WLC-12-10b
LOCATION: Line Creek
PROJECT NO: 1CT017.020
DRILLING CONTRACTOR: Boart Longyear
DRILLING TYPE: Sonic Dry
Wet@175' to free casing
LOGGED BY: MP
BORING DATE: 21-Jul-12 to 25-Jul-12

COORDINATES: E 659817 N 5532283
DATUM: NAD 83 Zone 11
GROUND ELEV (m): 1498.252
AZIMUTH: 0 DIP: 90
EOH ELEV. (m): 1441.864
TOTAL DEPTH (m / ft): 56.39 / 185
INSTALLATION TYPE: 4" Mon. Well

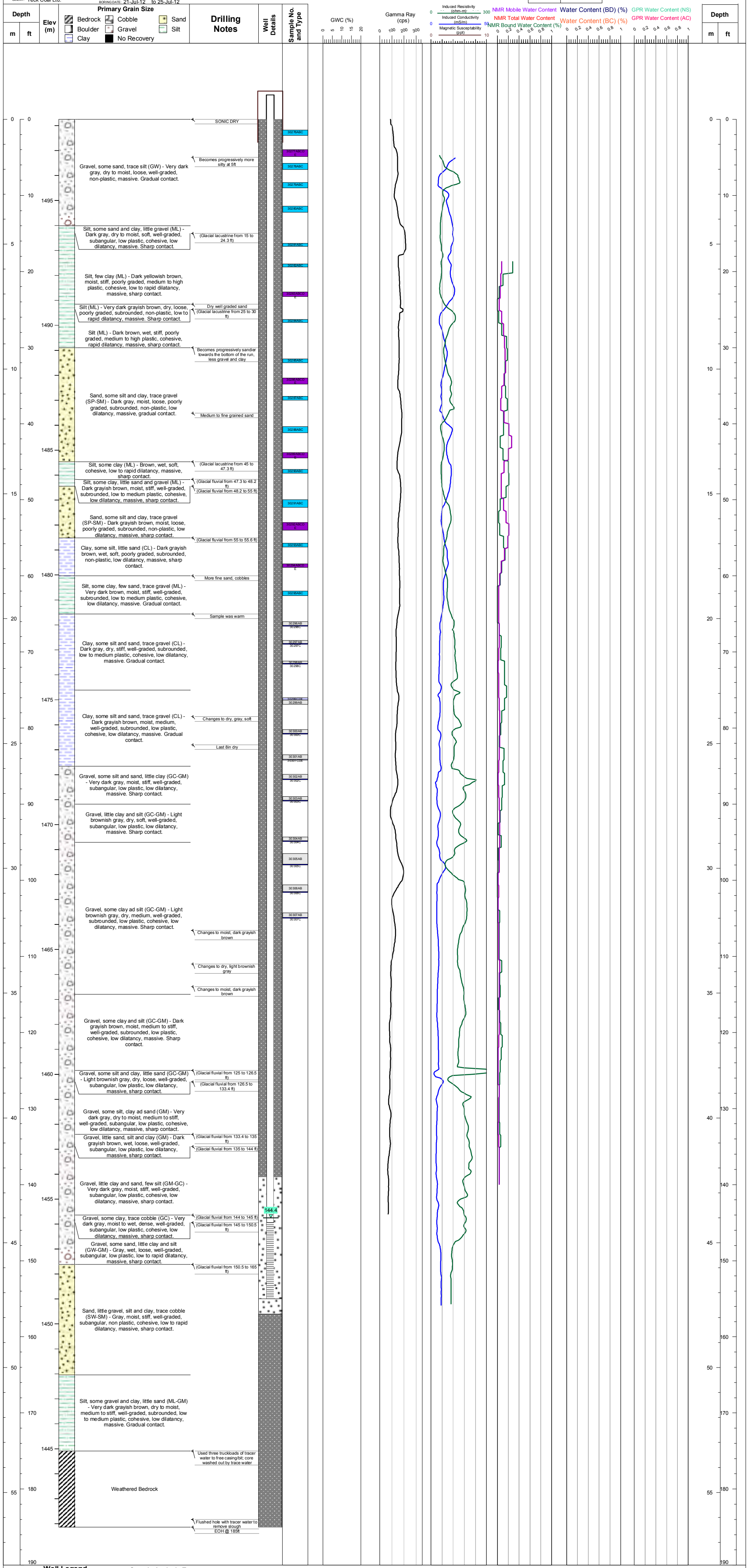
P.1 of 1

General Geology: Natural Ground
Levelogger Installation: Yes (Level)
Top of PVC Elev (m): 1499.086
Top of PVC Elev (m): 0.834 / 2.74
Water Level (m / ft bgs): 44 / 144.4
Water Level Note: Water level based on 2012/09/17-20 measurements.
Bentonite noted in water during initial purging.

Recent Water Level Measurement

Date	Water Level (ft bgs)

LC_PIZ1210B



Gravel, some sand, trace silt (GW) - Very dark gray, dry to moist, loose, well-graded, non-plastic, massive. Gradual contact.

Silt, some sand and clay, little gravel (ML) - Dark gray, dry to moist, soft, well-graded, subangular, low plastic, cohesive, low dilatancy, massive. Sharp contact.

Silt, few clay (ML) - Dark yellowish brown, moist, stiff, poorly graded, medium to high plastic, cohesive, low to rapid dilatancy, massive, sharp contact.

Silt (ML) - Very dark grayish brown, dry, loose, poorly graded, subrounded, non-plastic, low to rapid dilatancy, massive. Sharp contact.

Silt (ML) - Dark brown, wet, stiff, poorly graded, medium to high plastic, cohesive, rapid dilatancy, massive, sharp contact.

Sand, some silt and clay, trace gravel (SP-SM) - Dark gray, moist, loose, poorly graded, subrounded, non-plastic, low dilatancy, massive, gradual contact.

Silt, some clay (ML) - Brown, wet, soft, cohesive, low to rapid dilatancy, massive, sharp contact.

Silt, some clay, little sand and gravel (ML) - Dark grayish brown, moist, stiff, well-graded, subrounded, low to medium plastic, cohesive, low dilatancy, massive, sharp contact.

Sand, some silt and clay, trace gravel (SP-SM) - Dark grayish brown, moist, loose, poorly graded, subrounded, non-plastic, low dilatancy, massive, sharp contact.

Clay, some silt, little sand (CL) - Dark grayish brown, wet, soft, poorly graded, subrounded, non-plastic, low dilatancy, massive, sharp contact.

Silt, some clay, few sand, trace gravel (ML) - Very dark brown, moist, stiff, well-graded, subrounded, low to medium plastic, cohesive, low dilatancy, massive. Gradual contact.

Clay, some silt and sand, trace gravel (CL) - Dark gray, dry, stiff, well-graded, subrounded, low to medium plastic, cohesive, low dilatancy, massive. Gradual contact.

Clay, some silt and sand, trace gravel (CL) - Dark grayish brown, moist, medium, well-graded, subrounded, low plastic, cohesive, low dilatancy, massive. Gradual contact.

Gravel, some silt and sand, little clay (GC-GM) - Very dark gray, moist, stiff, well-graded, subangular, low plastic, low dilatancy, massive. Sharp contact.

Gravel, little clay and silt (GC-GM) - Light brownish gray, dry, soft, well-graded, subangular, low plastic, low dilatancy, massive. Sharp contact.

Gravel, some clay ad silt (GC-GM) - Light brownish gray, dry, medium, well-graded, subrounded, low plastic, cohesive, low dilatancy, massive. Sharp contact.

Gravel, some clay and silt (GC-GM) - Dark grayish brown, moist, medium to stiff, well-graded, subrounded, low plastic, cohesive, low dilatancy, massive. Sharp contact.

Gravel, some silt and clay, little sand (GC-GM) - Light brownish gray, dry, loose, well-graded, subangular, low plastic, low dilatancy, massive, sharp contact.

Gravel, some silt, clay ad sand (GM) - Very dark gray, dry to moist, medium to stiff, well-graded, subangular, low plastic, cohesive, low dilatancy, massive, sharp contact.

Gravel, little sand, silt and clay (GM) - Dark grayish brown, wet, loose, well-graded, subangular, low plastic, low dilatancy, massive, sharp contact.

Gravel, little clay and sand, few silt (GM-GC) - Very dark gray, moist, stiff, well-graded, subangular, low plastic, cohesive, low dilatancy, massive, sharp contact.

Gravel, some clay, trace cobble (GC) - Very dark gray, moist to wet, dense, well-graded, subangular, low plastic, cohesive, low dilatancy, massive, sharp contact.

Gravel, some sand, little clay and silt (GW-GM) - Gray, wet, loose, well-graded, subangular, low plastic, low to rapid dilatancy, massive, sharp contact.

Sand, little gravel, silt and clay, trace cobble (SW-SM) - Gray, moist, stiff, well-graded, subangular, non plastic, cohesive, low to rapid dilatancy, massive, sharp contact.

Silt, some gravel and clay, little sand (ML-GM) - Very dark grayish brown, dry to moist, medium to stiff, well-graded, subrounded, low to medium plastic, cohesive, low dilatancy, massive. Gradual contact.

Weathered Bedrock

Drilling Notes

SONIC DRY
Becomes progressively more silty at 5ft
(Glacial lacustrine from 15 to 24.3 ft)
Dry well graded sand
(Glacial lacustrine from 25 to 30 ft)
Becomes progressively sandier towards the bottom of the run, less gravel and clay
Medium to fine grained sand
(Glacial lacustrine from 45 to 47.3 ft)
(Glacial fluvial from 47.3 to 48.2 ft)
(Glacial fluvial from 48.2 to 55 ft)
(Glacial fluvial from 55 to 55.6 ft)
More fine sand, cobbles
Sample was warm
Changes to dry, gray, soft
Last 8in dry
Changes to moist, dark grayish brown
Changes to dry, light brownish gray
Changes to moist, dark grayish brown
(Glacial fluvial from 125 to 126.5 ft)
(Glacial fluvial from 126.5 to 133.4 ft)
(Glacial fluvial from 133.4 to 135 ft)
(Glacial fluvial from 135 to 144 ft)
(Glacial fluvial from 144 to 145 ft)
(Glacial fluvial from 145 to 150.5 ft)
(Glacial fluvial from 150.5 to 165 ft)
Used three truckloads of tracer water to free casing/bit; core washed out by trace water
Flushed hole with tracer water to remove slough
EOH @ 185ft

Well Legend

▦ Chips	▩ Water Port	☐ PVC
▦ Cuttings	▤ Slough	▤ Screen
⊓ Casing	▦ Sand	▤ Sump
▦ Gas Port		

Sample Analysis Type
A = Geochemical
B = Isotopes
C = Microbial
D = Cultivation
E = Anaerobic Cultivation

Sample Legend

🟨 A	🟩 ABCD	🟦 ACD	🟧 CD
⬜ AB	🟪 ABCDE	🟥 B	🟪 CDE
🟦 ABC	🟩 AC	🟦 C	

LC_PIZ1210C

Teck

HOLE ID: LCO-WLC-12-10c
LOCATION: Line Creek
PROJECT NO: 1CT017.020
DRILLING CONTRACTOR: JR Drilling
DRILLING TYPE: Air Rotary
LOGGED BY: JK
BORING DATE: 9-Jul-12 to 10-Jul-12

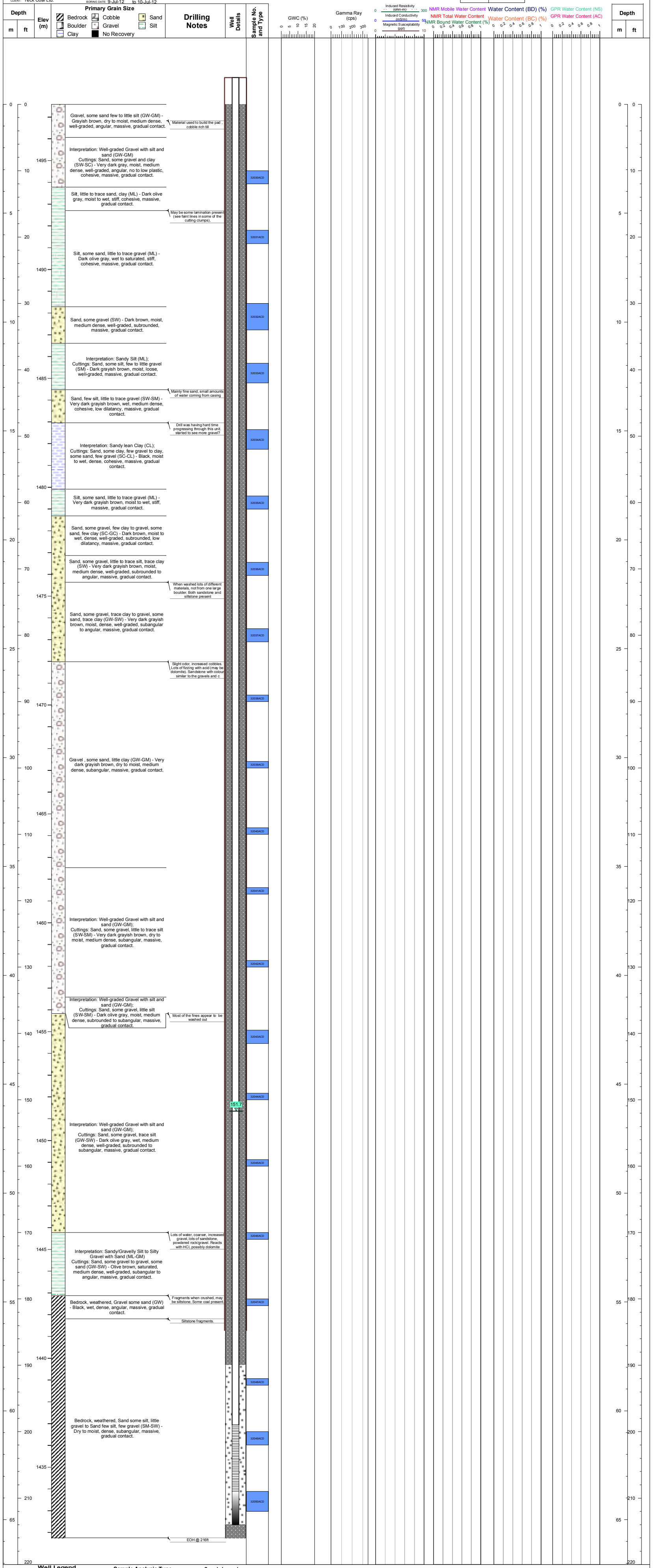
PROJECT: Teck Coal Watershed R&D
CLIENT: Teck Coal Ltd.

COORDINATES: E 659825 N 5532277
DATUM: NAD 83 Zone 11
GROUND ELEV (m): 1497.586
AZIMUTH: 0 DIP: 90
EOH ELEV. (m): 1431.7492
TOTAL DEPTH (m / ft): 65.84 / 216
INSTALLATION TYPE: 4" Mon. Well
P.1 of 1

General Geology: Natural Ground
Levelogger Installation: Yes (Baro and Level)
Top of PVC Elev (m): 1498.321
Top of PVC Elev (m): 0.735 / 2.41
Water Level (m / ft bgs): 46.24 / 151.7
Water Level Note: Water level based on 2012/09/17-20 measurements

Recent Water Level Measurement

Date	Water Level (ft bgs)



Description	Drilling Notes
Gravel, some sand few to little silt (GW-GM) - Grayish brown, dry to moist, medium dense, well-graded, angular, massive, gradual contact.	Material used to build the pad , cobble rich till
Interpretation: Well-graded Gravel with silt and sand (GW-GM) Cuttings: Sand, some gravel and clay (SW-SC) - Very dark gray, moist, medium dense, well-graded, angular, no to low plastic, cohesive, massive, gradual contact.	
Silt, little to trace sand, clay (ML) - Dark olive gray, moist to wet, stiff, cohesive, massive, gradual contact.	
Silt, some sand, little to trace gravel (ML) - Dark olive gray, wet to saturated, stiff, cohesive, massive, gradual contact.	May be some lamination present (see faint lines in some of the cutting clumps).
Sand, some gravel (SW) - Dark brown, moist, medium dense, well-graded, subrounded, massive, gradual contact.	
Interpretation: Sandy Silt (ML); Cuttings: Sand, some silt, few to little gravel (SM) - Dark grayish brown, moist, loose, well-graded, massive, gradual contact.	
Sand, few silt, little to trace gravel (SW-SM) - Very dark grayish brown, wet, medium dense, cohesive, low dilatancy, massive, gradual contact.	Mainly fine sand, small amounts of water coming from casing
Interpretation: Sandy lean Clay (CL); Cuttings: Sand, some clay, few gravel to clay, some sand, few gravel (SC-CL) - Black, moist to wet, dense, cohesive, massive, gradual contact.	Drill was having hard time progressing through this unit. started to see more gravel?
Silt, some sand, little to trace gravel (ML) - Very dark grayish brown, moist to wet, stiff, massive, gradual contact.	
Sand, some gravel, few clay to gravel, some sand, few clay (SC-GC) - Dark brown, moist to wet, dense, well-graded, subrounded, low dilatancy, massive, gradual contact.	
Sand, some gravel, little to trace silt, trace clay (SW) - Very dark grayish brown, moist, medium dense, well-graded, subrounded to angular, massive, gradual contact.	
Sand, some gravel, trace clay to gravel, some sand, trace clay (GW-SW) - Very dark grayish brown, moist, dense, well-graded, subangular to angular, massive, gradual contact.	When washed lots of different materials, not from one large boulder. Both sandstone and siltstone present
Gravel , some sand, little clay (GW-GM) - Very dark grayish brown, dry to moist, medium dense, subangular, massive, gradual contact.	Slight odor, increased cobbles. Lots of fizzing with acid (may be dolomite). Sandstone with colour similar to the gravels and c
Interpretation: Well-graded Gravel with silt and sand (GW-GM); Cuttings: Sand, some gravel, little to trace silt (SW-SM) - Very dark grayish brown, dry to moist, medium dense, subangular, massive, gradual contact.	
Interpretation: Well-graded Gravel with silt and sand (GW-GM); Cuttings: Sand, some gravel, little silt (SW-SM) - Dark olive gray, moist, medium dense, subrounded to subangular, massive, gradual contact.	Most of the fines appear to be washed out
Interpretation: Well-graded Gravel with silt and sand (GW-GM); Cuttings: Sand, some gravel, trace silt (GW-SW) - Dark olive gray, wet, medium dense, well-graded, subrounded to subangular, massive, gradual contact.	
Interpretation: Sandy/Gravelly Silt to Silty Gravel with Sand (ML-GM) Cuttings: Sand, some gravel to gravel, some sand (GW-SW) - Olive brown, saturated, medium dense, well-graded, subangular to angular, massive, gradual contact.	Lots of water, coarser, increased gravel, lots of sandstone, powdered rock/gravel. Reacts with HCl, possibly dolomite
Bedrock, weathered, Gravel some sand (GW) - Black, wet, dense, angular, massive, gradual contact.	Fragments when crushed, may be siltstone. Some coal present.
Bedrock, weathered, Sand some silt, little gravel to Sand few silt, few gravel (SM-SW) - Dry to moist, dense, subangular, massive, gradual contact.	Siltstone fragments.
	EOH @ 216ft

Well Legend

▩ Chips	▨ Water Port	☐ PVC
☐ Cuttings	▒ Slough	☰ Screen
⊓ Casing	░ Sand	▤ Sump
▦ Gas Port		

Sample Analysis Type

A = Geochemical
B = Isotopes
C = Microbial
D = Cultivation
E = Anaerobic Cultivation

Sample Legend

🟨 A	🟩 ABCD	🟦 ACD	🟧 CD
⬜ AB	🟪 ABCDE	🟥 B	⬜ CDE
🟦 ABC	🟩 AC	🟦 C	

srk consulting

Teck

HOLE ID: LCO-WLC-12-11N
LOCATION: Line Creek
PROJECT NO: 1CT017.020
DRILLING CONTRACTOR: Boart Longyear
DRILLING TYPE: Sonic

PROJECT: Teck Coal Watershed R&D
CLIENT: Teck Coal Ltd.

LOGGED BY: MP/MJM
BORING DATE: 14-Jul-12 to 16-Jul-12

COORDINATES: E 659964 N 5532041
DATUM: NAD 83 Zone 11
GROUND ELEV (m): 1442.395
AZIMUTH: 0 DIP: 90
EOH ELEV. (m): 1434.775
TOTAL DEPTH (m / ft): 7.62 / 25
INSTALLATION TYPE: 2" Mon. well (x2)

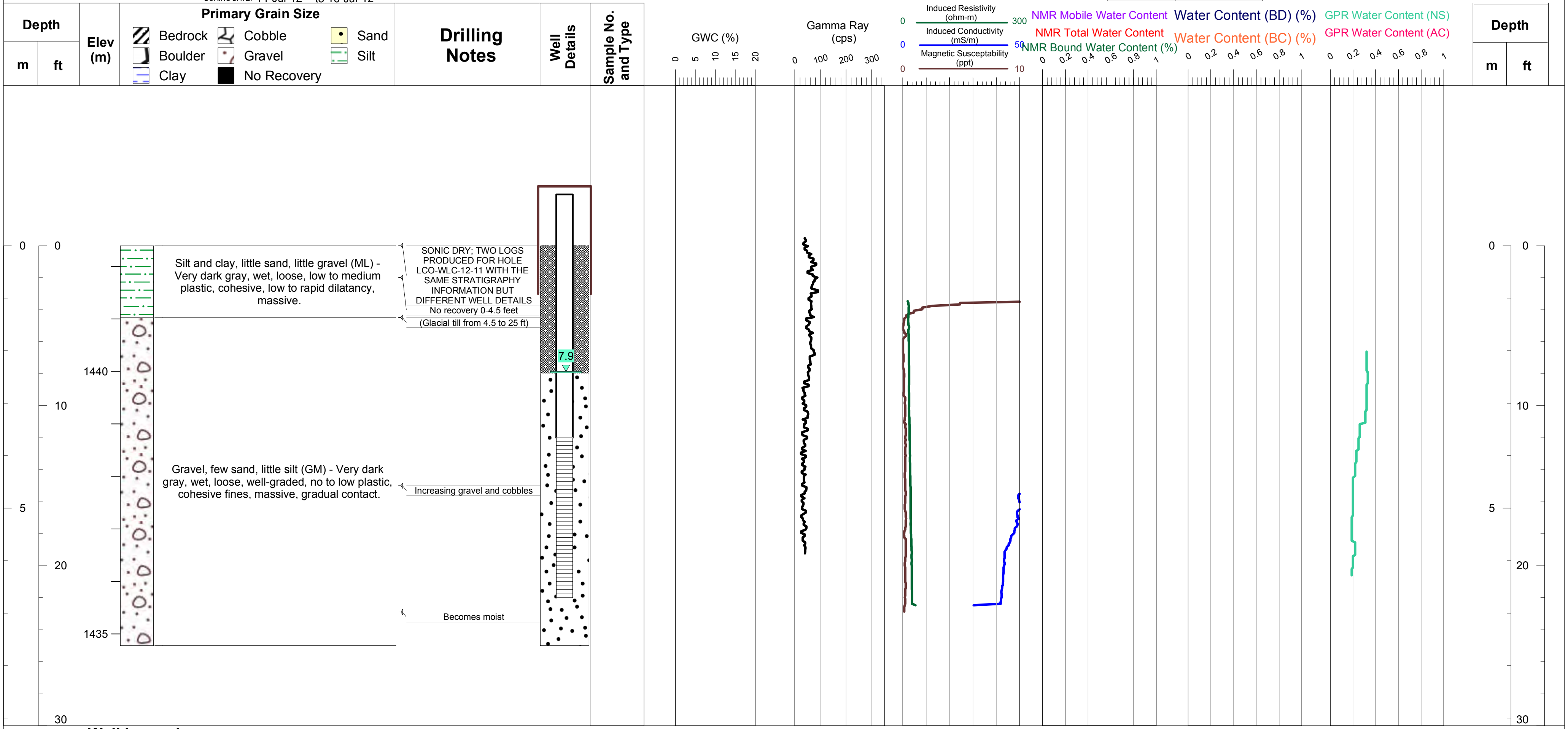
P.1 of 1

General Geology:
Levelogger Installation:
Top of PVC Elev (m): 1443.245
Top of PVC Elev (m): 0.85 / 2.79
Water Level (m / ft bgs): 2.41 / 7.9
Water Level Note:

Recent Water Level Measurement

Date	Water Level (ft bgs)

LC_PIZ1211N



Silt and clay, little sand, little gravel (ML) - Very dark gray, wet, loose, low to medium plastic, cohesive, low to rapid dilatancy, massive.

Gravel, few sand, little silt (GM) - Very dark gray, wet, loose, well-graded, no to low plastic, cohesive fines, massive, gradual contact.

SONIC DRY; TWO LOGS PRODUCED FOR HOLE LCO-WLC-12-11 WITH THE SAME STRATIGRAPHY INFORMATION BUT DIFFERENT WELL DETAILS

No recovery 0-4.5 feet

(Glacial till from 4.5 to 25 ft)

Increasing gravel and cobbles

Becomes moist

Well Legend

- ▩ Chips
- ▨ Cuttings
- ⊓ Casing
- ▦ Gas Port
- ▨ Water Port
- ▨ Slough
- ▨ Sand
- ☐ PVC
- ▤ Screen
- ▨ Sump

Sample Analysis Type

A = Geochemical
B = Isotopes
C = Microbial
D = Cultivation
E = Anaerobic Cultivation

Sample Legend

🟨	A	🟩	ABCD	🟦	ACD	🟧	CD
⬜	AB	🟪	ABCDE	🟥	B	🟪	CDE
🟦	ABC	🟩	AC	🟦	C		

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Teck

PROJECT: Teck Coal Watershed R&D
CLIENT: Teck Coal Ltd.

HOLE ID: LCO-WLC-12-12
LOCATION: Line Creek
PROJECT NO: 1CT017.020
DRILLING CONTRACTOR: Boart Longyear
DRILLING TYPE: Sonic
LOGGED BY: MP
BORING DATE: 16-Jul-12 to 18-Jul-12

COORDINATES: E 660004 N 5532172
DATUM: NAD 83 Zone 11
GROUND ELEV (m): 1447.477
AZIMUTH: 0 DIP: 90
EOH ELEV. (m): 1415.473
TOTAL DEPTH (m / ft): 32 / 105
INSTALLATION TYPE: 4" Mon. Well

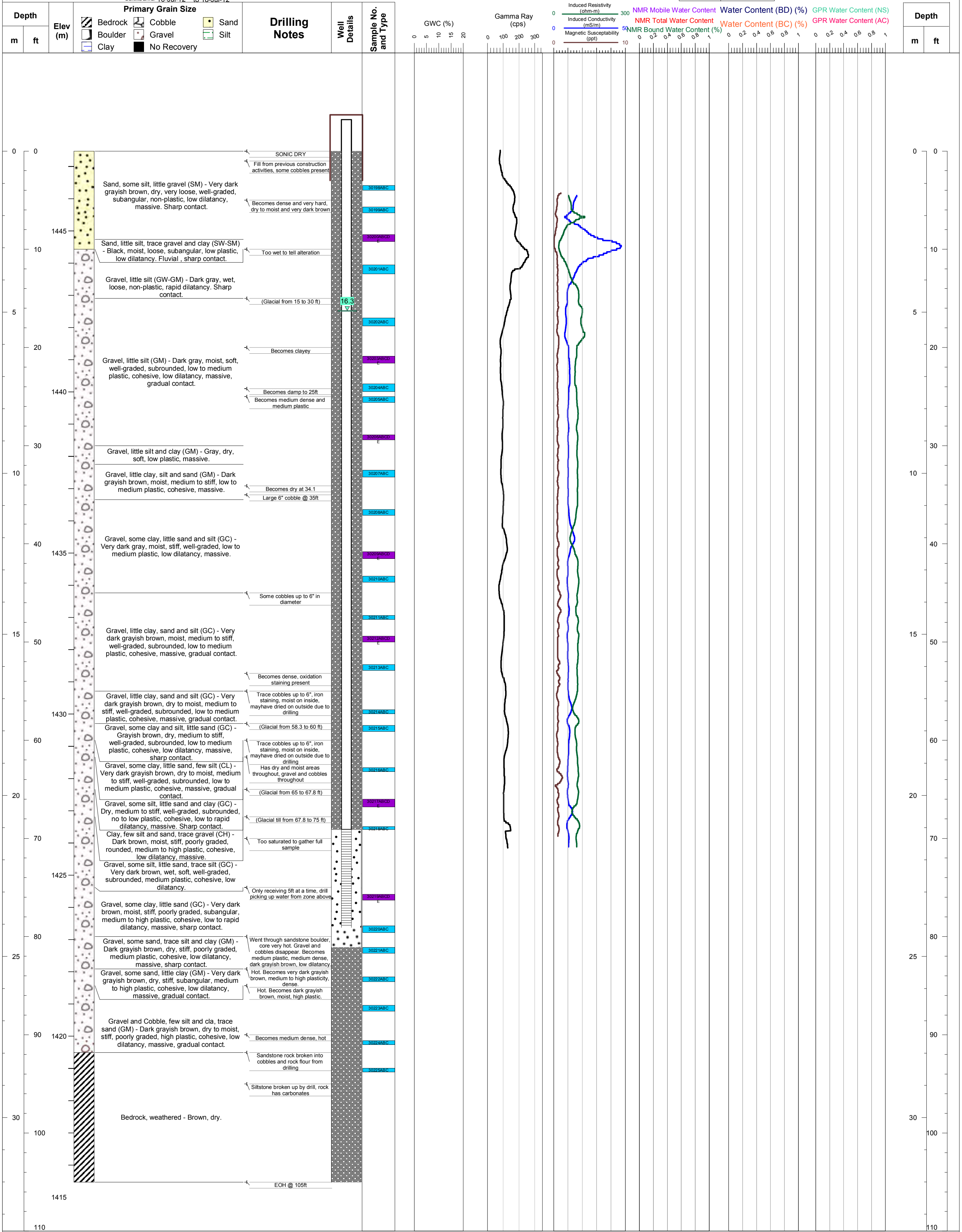
P.1 of 1

General Geology: Natural Ground
Levelogger Installation: Yes (Baro and Level)
Top of PVC Elev (m): 1448.261
Top of PVC Elev (m): 0.784 / 2.57
Water Level (m / ft bgs): 4.96 / 16.3
Water Level Note: Water level based on 2012/09/17-20 measurements

Recent Water Level Measurement

Date	Water Level (ft bgs)

LC_PIZ1212



Sand, some silt, little gravel (SM) - Very dark grayish brown, dry, very loose, well-graded, subangular, non-plastic, low dilatancy, massive. Sharp contact.

Sand, little silt, trace gravel and clay (SW-SM) - Black, moist, loose, subangular, low plastic, low dilatancy. Fluvial , sharp contact.

Gravel, little silt (GW-GM) - Dark gray, wet, loose, non-plastic, rapid dilatancy. Sharp contact.

Gravel, little silt (GM) - Dark gray, moist, soft, well-graded, subrounded, low to medium plastic, cohesive, low dilatancy, massive, gradual contact.

Gravel, little silt and clay (GM) - Gray, dry, soft, low plastic, massive.

Gravel, little clay, silt and sand (GM) - Dark grayish brown, moist, medium to stiff, low to medium plastic, cohesive, massive.

Gravel, some clay, little sand and silt (GC) - Very dark gray, moist, stiff, well-graded, low to medium plastic, low dilatancy, massive.

Gravel, little clay, sand and silt (GC) - Very dark grayish brown, moist, medium to stiff, well-graded, subrounded, low to medium plastic, cohesive, massive, gradual contact.

Gravel, little clay, sand and silt (GC) - Very dark grayish brown, dry to moist, medium to stiff, well-graded, subrounded, low to medium plastic, cohesive, massive, gradual contact.

Gravel, some clay and silt, little sand (GC) - Grayish brown, dry, medium to stiff, well-graded, subrounded, low to medium plastic, cohesive, low dilatancy, massive, sharp contact.

Gravel, some clay, little sand, few silt (CL) - Very dark grayish brown, dry to moist, medium to stiff, well-graded, subrounded, low to medium plastic, cohesive, massive, gradual contact.

Gravel, some silt, little sand and clay (GC) - Dry, medium to stiff, well-graded, subrounded, no to low plastic, cohesive, low to rapid dilatancy, massive. Sharp contact.

Clay, few silt and sand, trace gravel (CH) - Dark brown, moist, stiff, poorly graded, rounded, medium to high plastic, cohesive, low dilatancy, massive.

Gravel, some silt, little sand, trace silt (GC) - Very dark brown, wet, soft, well-graded, subrounded, medium plastic, cohesive, low dilatancy.

Gravel, some clay, little sand (GC) - Very dark brown, moist, stiff, poorly graded, subangular, medium to high plastic, cohesive, low to rapid dilatancy, massive, sharp contact.

Gravel, some sand, trace silt and clay (GM) - Dark grayish brown, dry, stiff, poorly graded, medium plastic, cohesive, low dilatancy, massive, sharp contact.

Gravel, some sand, little clay (GM) - Very dark grayish brown, dry, stiff, subangular, medium to high plastic, cohesive, low dilatancy, massive, gradual contact.

Gravel and Cobble, few silt and cla, trace sand (GM) - Dark grayish brown, dry to moist, stiff, poorly graded, high plastic, cohesive, low dilatancy, massive, gradual contact.

Bedrock, weathered - Brown, dry.

SONIC DRY
Fill from previous construction activities, some cobbles present
Becomes dense and very hard, dry to moist and very dark brown
Too wet to tell alteration
(Glacial from 15 to 30 ft)
Becomes clayey
Becomes damp to 25ft
Becomes medium dense and medium plastic
Becomes dry at 34.1
Large 6" cobble @ 35ft
Some cobbles up to 6" in diameter
Becomes dense, oxidation staining present
Trace cobbles up to 6", iron staining, moist on inside, mayhave dried on outside due to drilling
(Glacial from 58.3 to 60 ft)
Trace cobbles up to 6", iron staining, moist on inside, mayhave dried on outside due to drilling
Has dry and moist areas throughout, gravel and cobbles throughout
(Glacial from 65 to 67.8 ft)
(Glacial till from 67.8 to 75 ft)
Too saturated to gather full sample
Only receiving 5ft at a time, drill picking up water from zone above
Went through sandstone boulder, core very hot. Gravel and cobbles disappear. Becomes medium plastic, medium dense, dark grayish brown, low dilatancy.
Hot. Becomes very dark grayish brown, medium to high plasticity, dense.
Hot. Becomes dark grayish brown, moist, high plastic.
Becomes medium dense, hot
Sandstone rock broken into cobbles and rock flour from drilling
Siltstone broken up by drill, rock has carbonates
EOH @ 105ft

30198ABC
30199ABC
30200ABCD E
30201ABC
30202ABC
30203ABCD E
30204ABC
30205ABC
30206ABCD E
30207ABC
30208ABC
30209ABCD E
30210ABC
30211ABC
30212ABCD E
30213ABC
30214ABC
30215ABC
30216ABC
30217ABCD E
30218ABC
30219ABCD E
30220ABC
30221ABC
30222ABC
30223ABC
30224ABC
30225ABC

Well Legend

▦ Chips
▨ Cuttings
⊓ Casing
▦ Gas Port
▨ Water Port
▨ Slough
▨ Sand
☐ PVC
☰ Screen
▤ Sump

Sample Analysis Type

A = Geochemical
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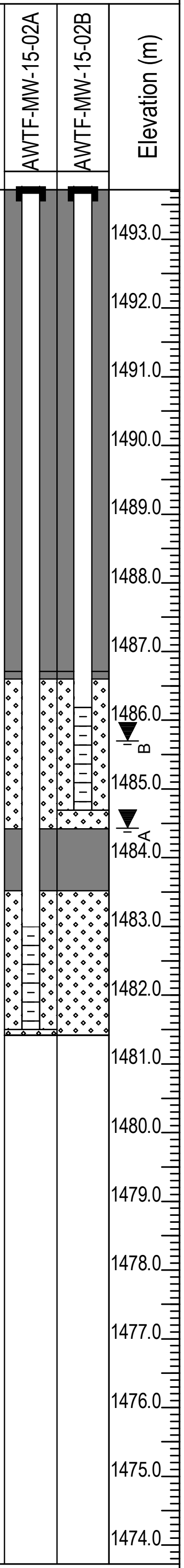
Sample Legend

🟨	A	🟩	ABCD	🟦	ACD	🟧	CD
⬜	AB	🟪	ABCDE	🟥	B	⬜	CDE
🟦	ABC	🟩	AC	🟦	C		

AWTF Landfill GW Monitoring Wells	Teck Coal	BOREHOLE NO: AWTF-MW-15-02
West Line Creek	Drill: Sonic Drill	PROJECT: ENVMIN03066-01
British Columbia	5531822.81N; 659624.35E; Zone 10	ELEVATION: 1493.72 m

SAMPLE TYPE	■ DISTURBED	▨ NO RECOVERY	☒ SPT	☰ A-CASING	▥ SHELBY TUBE	▮ CORE
BACKFILL TYPE	■ BENTONITE	⁘ PEA GRAVEL	▥ SLOUGH	⁘ GROUT	▨ DRILL CUTTINGS	⁘ SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE		NOTES & COMMENTS
0	SAND AND GRAVEL (FILL) - up to cobble size, damp, dark brown			MW-15-02A pipe stickup = 0.88 metres MW-15-02B pipe stickup = 0.83 metres
1				
2	SILT - sandy, clayey, gravelly, dry, stiff, dark brown to grey			
3	- some cobbles SAND - silty, subangular, coarse grained, wet, compact, dark grey SILT - gravelly, clayey, wet to dry with depth, stiff, low plastic, dark grey			
4	- dry - wet			
5	SAND - silty, cobbly, coarse grained, dark grey SILT - sandy, gravelly, dry to damp, stiff, low plastic, dark grey - dry, dark grey to black, some interbedded coal			
6	- some cobbles, loose, brown black			
7				
8	- compact SAND - silty, gravelly, coarse grained, subangular, wet, dark grey			
9	CLAY - silty, sandy, moist, soft, low plastic, dark grey - no visible sand, medium plastic			
10				
11	- some gravel, stiff			
12				
13	END OF BOREHOLE (12.30 metres) AWTF-MW-15-02A installed to 12.22 metres water - 9.29 metres on June 16, 2015 AWTF-MW-15-02B installed to 9.03 metres water - 8.02 metres on June 16, 2015			
14				
15				
16				
17				
18				
19				
20				



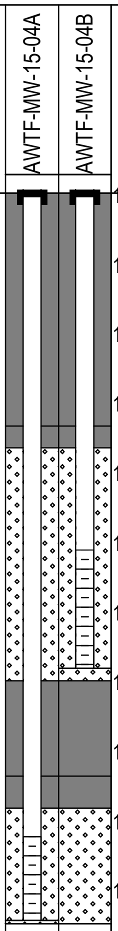
TETRA TECH EBA

LOGGED BY: JB	COMPLETION DEPTH: 12.3 m
REVIEWED BY: CF	COMPLETE: 15/05/26
DRAWING NO:	Page 1 of 1

AWTF Landfill GW Monitoring Wells	Teck Coal	BOREHOLE NO: AWTF-MW-15-04
West Line Creek	Drill: Sonic Drill	PROJECT: ENVMIN03066-01
British Columbia	5531802.38N; 659651.03E; Zone 10	ELEVATION: 1488.14 m

SAMPLE TYPE	▩ DISTURBED	▨ NO RECOVERY	☒ SPT	☰ A-CASING	▥ SHELBY TUBE	▮ CORE
BACKFILL TYPE	▩ BENTONITE	⁖ PEA GRAVEL	▥ SLOUGH	⁘ GROUT	▧ DRILL CUTTINGS	⁙ SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE		NOTES & COMMENTS	Elevation (m)
0	GRAVEL AND COBBLES - silty, damp, dark brown			MW-15-04A pipe stickup = 0.80 metres MW-15-04B pipe stickup = 0.77 metres	1488.0
1					1487.0
2	CLAY - silty, moist, stiff, medium brown grey, boulder pushed out of the way				1486.0
3	- gravelly, orange brown oxidation staining				1485.0
4 B	- wet, soft				1484.0
5	- moist, stiff, plastic, light brown grey, yellowish brown oxidation				1483.0
6	- wet, soft, medium grey brown, some light yellowish brown oxidation				1482.0
7	- some gravel, moist to wet				1481.0
8	- moist, medium grey				1480.0
9 A					1479.0
10	SAND - very fine grained, wet, black CLAY - moist, stiff, plastic, dark grey				1478.0
11	END OF BOREHOLE (10.50 metres) AWTF-MW-15-04A installed to 10.45 metres water - 8.89 metres on June 16, 2015				1477.0
12	AWTF-MW-15-04B installed to 6.83 metres water - 3.91 metres on June 16, 2015				1476.0
13					1475.0
14					1474.0
15					1473.0
16					1472.0
17					1471.0
18					1470.0
19					1469.0
20					



TETRA TECH EBA

LOGGED BY: JB	COMPLETION DEPTH: 10.5 m
REVIEWED BY: CF	COMPLETE: 15/05/29
DRAWING NO:	Page 1 of 1

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : LC_BH_CP1A**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 3

Drilling Contractor	JR Drilling	Date Monitored	n/a	Project Number:	631283
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	n/a	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	n/a	Date Drilled:	2021 09 27
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: n/a	Easting: n/a	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼▼▼ Air Rotary

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

☐ Solid PVC
☐ Slotted PVC

Well Name 1: LC_MW_CP1A

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm) 10^1 10^2 10^3 10^4

SILTY SAND, fine to medium grained sand, trace gravel, fine, subrounded to subangular, black, loose, damp, contains coal fragments (spoils).

SAND and GRAVEL, fine grained sand, fine gravel, subrounded to subangular, some silt, dark brown, loose, damp, fill material.

SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded, trace silt, containing cobbles, brown, loose, damp.

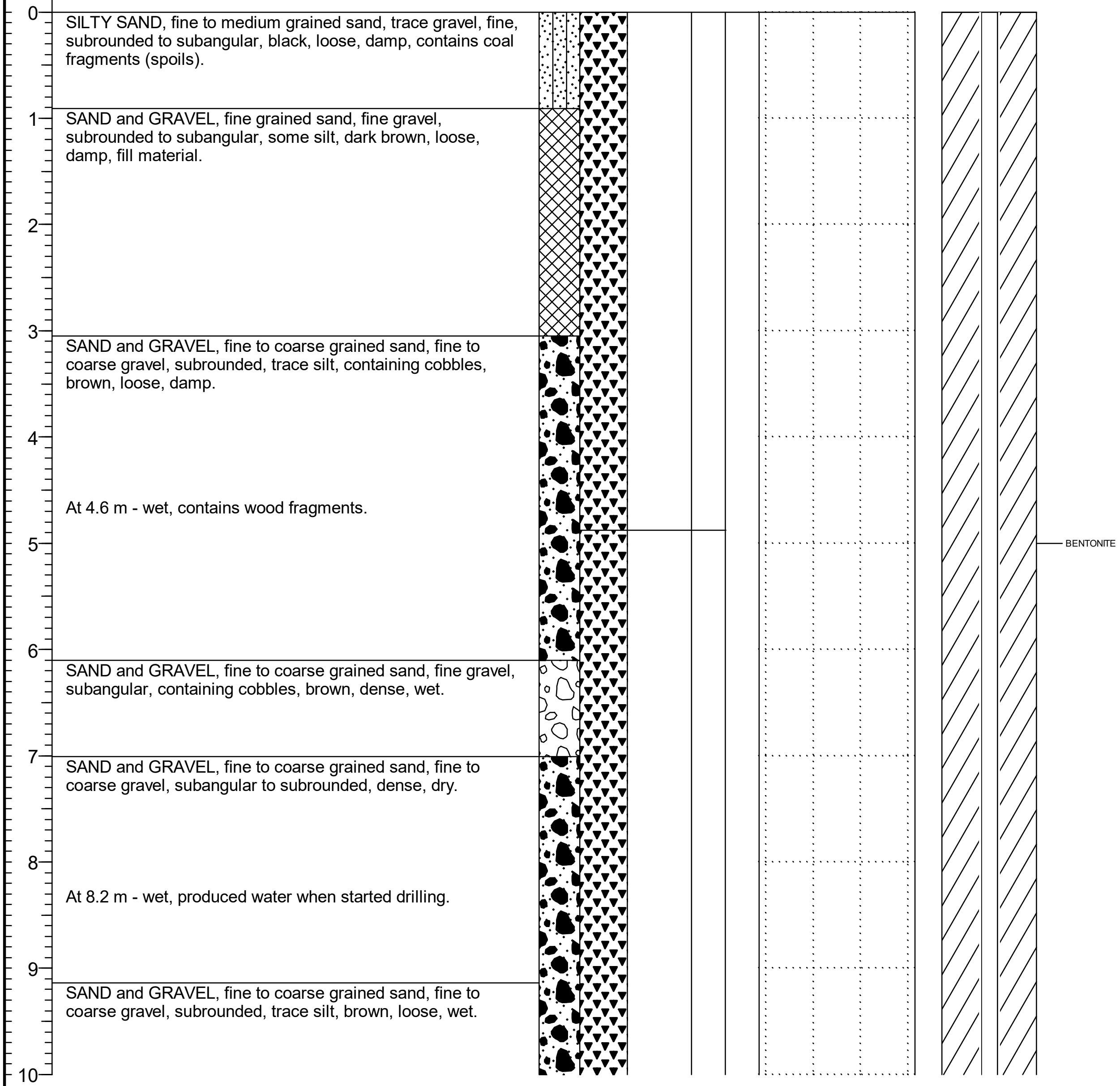
At 4.6 m - wet, contains wood fragments.

SAND and GRAVEL, fine to coarse grained sand, fine gravel, subangular, containing cobbles, brown, dense, wet.

SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subangular to subrounded, dense, dry.

At 8.2 m - wet, produced water when started drilling.

SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded, trace silt, brown, loose, wet.



NOTES

QA/QC: SD 2021 09 29 Print Date:2021-10-21

FINAL

SNC•LAVALIN

Client
Teck Coal Limited

Location
Regional Groundwater Monitoring

Borehole No. : LC_BH_CP1A

PAGE 2 OF 3

Drilling Contractor	JR Drilling	Date Monitored	n/a	Project Number:	631283
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	n/a	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	n/a	Date Drilled:	2021 09 27
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: n/a	Easting: n/a	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼ Air Rotary

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

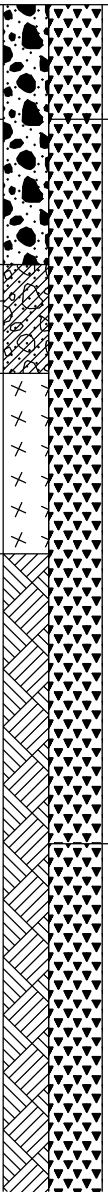
○ Reading within indicated scale
● Reading outside indicated scale

Soil Vapour (ppm)
10^1 10^2 10^3 10^4

▯ Solid PVC
▤ Slotted PVC

Well Name 1: LC_MW_CP1A

Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery



SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded, trace silt, brown, loose, wet. *(continued)*

Between 10.7 m and 11.0 m - some silt.

GRAVEL, fine to coarse, subrounded to subangular, trace silt, containing cobbles, brown, dense, wet.

SAND and GRAVEL (TILL), fine to coarse grained sand, fine gravel, some silt, trace clay, brown, medium dense, low plasticity, moist.

SILTY CLAY (TILL), trace sand, fine to coarse grained, trace gravel, fine, subangular, brown, dense, medium plasticity, moist.

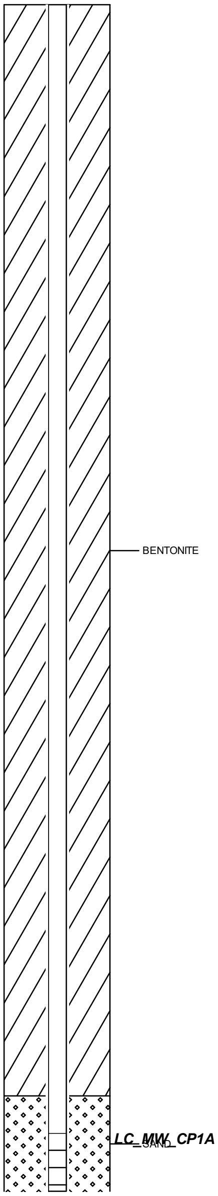
WEATHERED BEDROCK, shale, brown-grey, dry, dusty.

BEDROCK, shale, grey-brown, fractured, dry.

Between 15.2 m and 17.4 m - damp.

Between 17.4 m and 19.8 m - fractured, wet.

Between 19.8 m and 21.3 m - large fractures.



NOTES

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : LC_BH_CP1A**
	Location **Regional Groundwater Monitoring**	PAGE 3 OF 3

Drilling Contractor	JR Drilling	Date Monitored	n/a	Project Number:	631283
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	n/a	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	n/a	Date Drilled:	2021 09 27
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: n/a	Easting: n/a	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼▼▼ Air Rotary

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Soil Vapour (ppm)
10^1 10^2 10^3 10^4

▯ Solid PVC
▯ Slotted PVC

Well Name 1: LC_MW_CP1A

Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery

20
BEDROCK, shale, grey-brown, fractured, dry. *(continued)*

21

BEDROCK, shale, black, competent, soft.

At 21.6 m - fracture.

22

At 22.6 m - fracture.

23

Bottom of hole at 23.2 m.

24

25

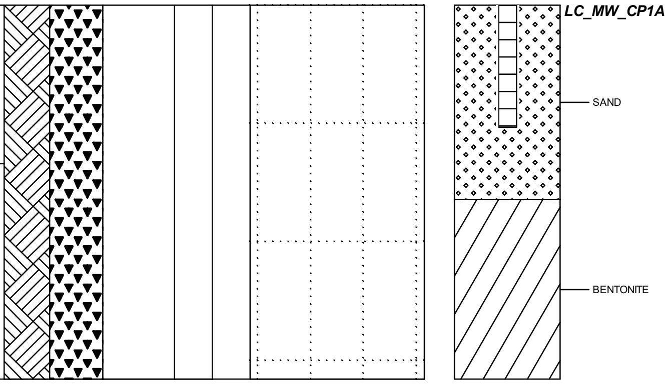
26

27

28

29

30



NOTES

FINAL

SNC·LAVALIN

Client **Teck Coal Limited**		**Borehole No. : LC_BH_CP1B**
Location **Regional Groundwater Monitoring**		PAGE 1 OF 2

Drilling Contractor	JR Drilling	Date Monitored	n/a	Project Number:	631283
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	n/a	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	n/a	Date Drilled:	2021 09 27
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: n/a	Easting: n/a	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼▼▼ Air Rotary

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

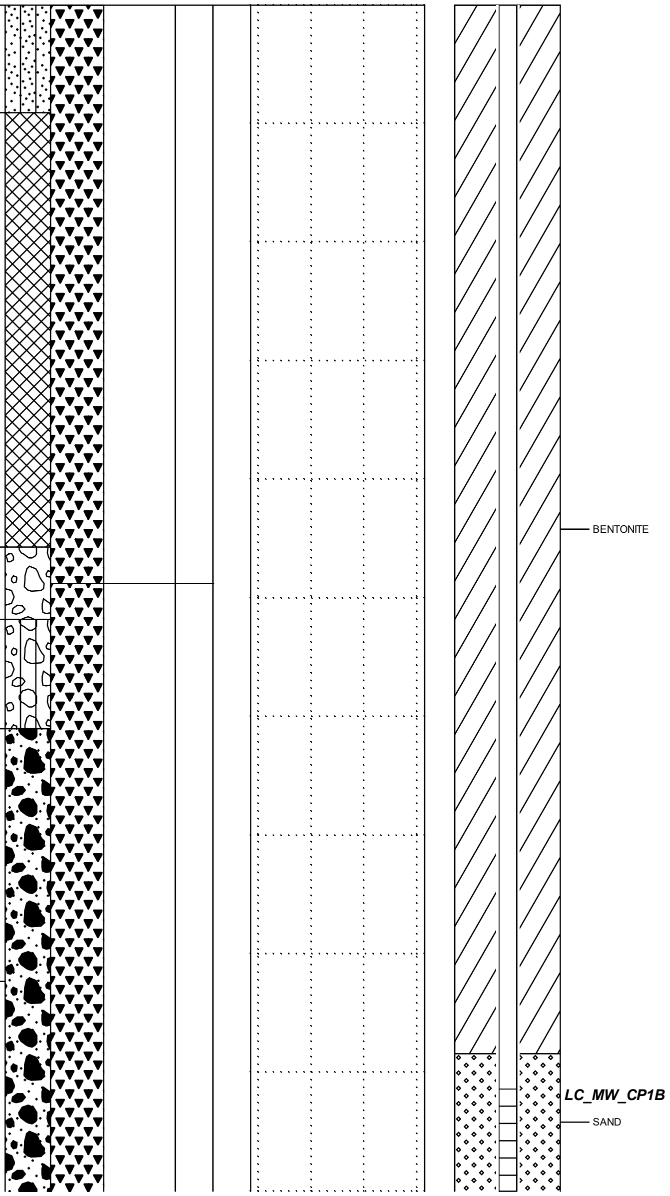
○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: LC_MW_CP1B

Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) 10^1 10^2 10^3 10^4

Depth in Metres	Soil Description
0	SILTY SAND, fine to medium grained, trace gravel, fine, dark grey, loose, damp.
1	SAND and GRAVEL (FILL), fine to coarse grained sand, fine to coarse gravel, subrounded to subangular, trace silt, containing cobbles, brown, loose, damp. Between 0.9 m and 1.5 m - some silt.
2	
3	At 2.7 m - boulder.
4	
	SAND and GRAVEL, medium to coarse grained sand, fine to coarse gravel, subrounded to subangular, containing cobbles, brown, loose, wet, contains wood fragments.
5	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded, some silt, trace clay, moist.
6	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded, trace silt, containing cobbles/boulders, brown, dense, dry.
7	
8	Between 7.6 m and 7.9 m - seam fine to medium grained sand.
	At 8.2 m - boulder.
9	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded, trace silt, containing cobbles, brown, loose, wet. At 8.8 m - boulder. At 9.1 m - boulder.
10	Between 9.8 m and 10.1 m - some silt, trace clay.



NOTES

QA/QC: SD 2021/09/29 Print Date:2021-10-21

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : LC_BH_CP1B**
	Location **Regional Groundwater Monitoring**	PAGE 2 OF 2

Drilling Contractor	JR Drilling	Date Monitored	n/a	Project Number:	631283
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	n/a	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	n/a	Date Drilled:	2021 09 27
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: n/a	Easting: n/a	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ▼ Air Rotary

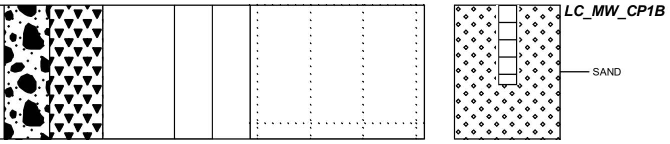
Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- ☐ Solid PVC
- ☐ Slotted PVC

Well Name 1: LC_MW_CP1B

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm) 10^1 10^2 10^3 10^4
10	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded, trace silt, containing cobbles, brown, loose, wet. *(continued)*						
11	Bottom of hole at 11.1 m.						
12							
13							
14							
15							
16							
17							
18							
19							
20							



NOTES

QA/QC: SD 2021/09/29 Print Date:2021-10-21

LC_PIZP1001

CLIENT: Teck Coal Ltd.	PROJECT: Soil and Groundwater Assessment	BOREHOLE NO: **MW10-01**
DRILLER: J.R. Drilling	LOCATION: Line Creek Mine, Sparwood, B.C.	PROJECT NO: BX05973
DRILL/METHOD: Air Rotary	BOREHOLE LOCATION:X - 54656.9090,Y - 27929.7910	ELEVATION: 1287.025 m

SAMPLE TYPE	■ Shelby Tube	▨ No Recovery	☒ SPT Test (N)	☰ Grab Sample	▥ Split-Pen	◨ Core
BACKFILL TYPE	■ Bentonite	⁘ Pea Gravel	▥ Slough	⁘ Grout	▨ Drill Cuttings	⁘ Sand

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	OTHER TESTS COMMENTS	ELEVATION (m)
0	**Fine-grained Sand** - trace fines, trace gravel, dense, light brown, moist				Top of Pipe Elevation - 1287.825 m 50 mm PVC, Schedule 40 Monitoring Well, 10 Slot Well Screen with Steel Stick Up Casing Protector	
1						1286
2						1285
2.8	...trace coarse-grained sand, slight moisture increase					
3						1284
4						1283
4.7	...some cobbles	☰	A1			
5						1282
5.6	...some gravel, medium brown					
5.8	**Sand** - some gravel, trace cobbles, trace fines, dense, medium brown, moist					
6						1281
6.5	...trace fines, gravelly, light brown					
7	...no cobbles, medium brown					1280
7.4	...trace cobbles					
8						1279
9						1278
10						

STANDARD PEN (N): 20 40 60 80

PLASTIC M.C. LIQUID: 20 40 60 80

amec

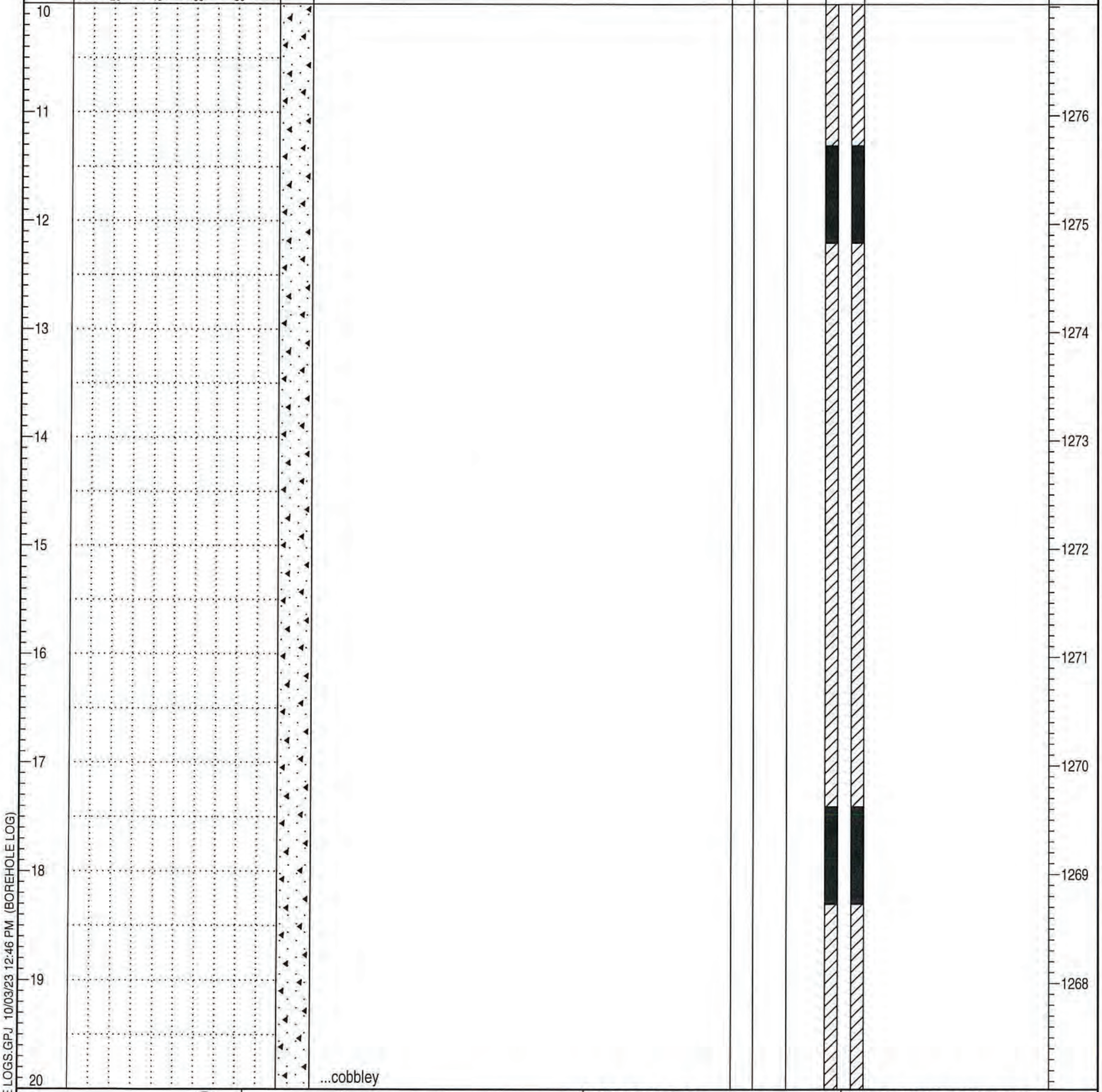
AMEC Earth & Environmental
Medicine Hat, Alberta T1A 8G3

LOGGED BY: RH	COMPLETION DEPTH: 56.40 m
REVIEWED BY: RH	COMPLETION DATE: 1/20/10
Fig. No: 1	Page 1 of 6

CLIENT: Teck Coal Ltd.	PROJECT: Soil and Groundwater Assessment	BOREHOLE NO: **MW10-01**
DRILLER: J.R. Drilling	LOCATION: Line Creek Mine, Sparwood, B.C.	PROJECT NO: BX05973
DRILL/METHOD: Air Rotary	BOREHOLE LOCATION:X - 54656.9090,Y - 27929.7910	ELEVATION: 1287.025 m

SAMPLE TYPE	■ Shelby Tube	⧄ No Recovery	☒ SPT Test (N)	☰ Grab Sample	▥ Split-Pen	◨ Core
BACKFILL TYPE	■ Bentonite	⁛ Pea Gravel	▥ Slough	⁘ Grout	▨ Drill Cuttings	⁘ Sand

Depth (m)	■ STANDARD PEN (N) ■ 20 40 60 80 PLASTIC M.C. LIQUID 20 40 60 80	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	WELL INSTALLATION	OTHER TESTS COMMENTS	ELEVATION (m)



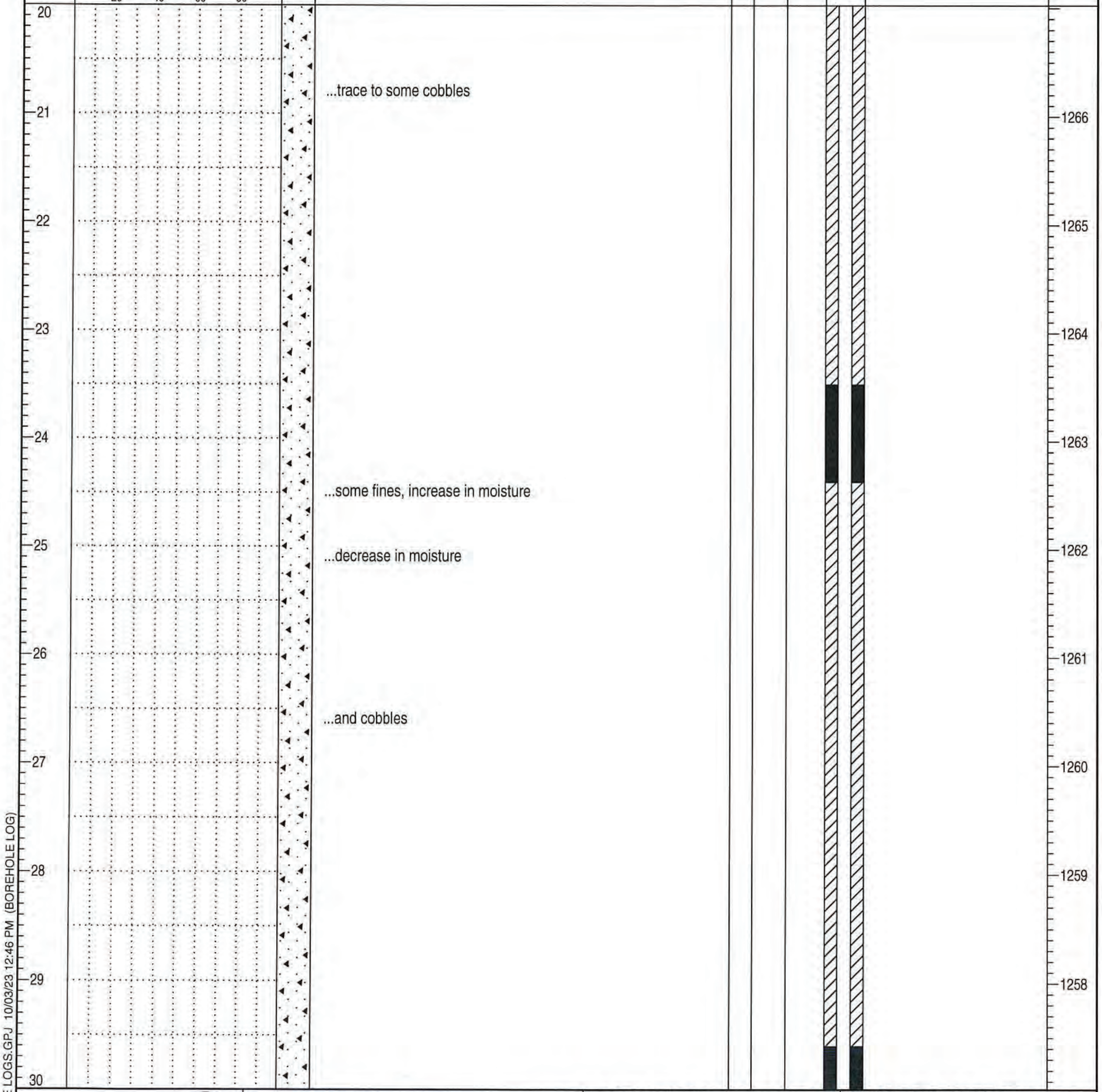
...cobbley

amec	LOGGED BY: RH	COMPLETION DEPTH: 56.40 m
AMEC Earth & Environmental Medicine Hat, Alberta T1A 8G3	REVIEWED BY: RH	COMPLETION DATE: 1/20/10
	Fig. No: 1	Page 2 of 6

CLIENT: Teck Coal Ltd.	PROJECT: Soil and Groundwater Assessment	BOREHOLE NO: **MW10-01**
DRILLER: J.R. Drilling	LOCATION: Line Creek Mine, Sparwood, B.C.	PROJECT NO: BX05973
DRILL/METHOD: Air Rotary	BOREHOLE LOCATION:X - 54656.9090,Y - 27929.7910	ELEVATION: 1287.025 m

SAMPLE TYPE	■ Shelby Tube	◺ No Recovery	☒ SPT Test (N)	☰ Grab Sample	▥ Split-Pen	▮ Core
BACKFILL TYPE	■ Bentonite	⁚ Pea Gravel	▥ Slough	⁘ Grout	▨ Drill Cuttings	⁙ Sand

Depth (m)	■ STANDARD PEN (N) ■ 20 40 60 80 PLASTIC M.C. LIQUID 20 40 60 80	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	WELL INSTALLATION	OTHER TESTS COMMENTS	ELEVATION (m)



...trace to some cobbles

...some fines, increase in moisture

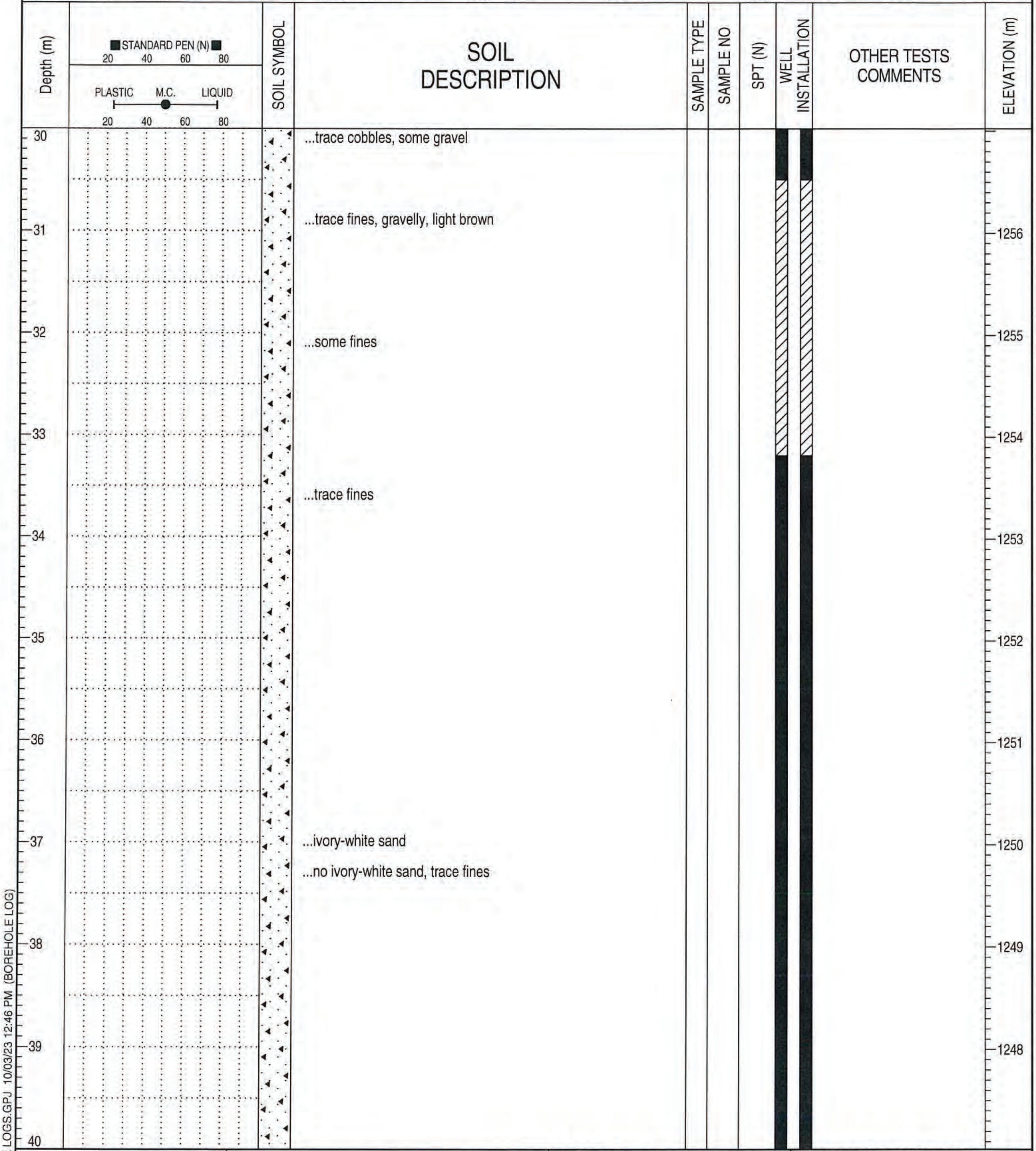
...decrease in moisture

...and cobbles

amec	AMEC Earth & Environmental Medicine Hat, Alberta T1A 8G3	LOGGED BY: RH REVIEWED BY: RH Fig. No: 1
		COMPLETION DEPTH: 56.40 m COMPLETION DATE: 1/20/10 Page 3 of 6

CLIENT: Teck Coal Ltd.	PROJECT: Soil and Groundwater Assessment	BOREHOLE NO: **MW10-01**
DRILLER: J.R. Drilling	LOCATION: Line Creek Mine, Sparwood, B.C.	PROJECT NO: BX05973
DRILL/METHOD: Air Rotary	BOREHOLE LOCATION:X - 54656.9090,Y - 27929.7910	ELEVATION: 1287.025 m

SAMPLE TYPE	■ Shelby Tube	▨ No Recovery	☒ SPT Test (N)	☰ Grab Sample	▥ Split-Pen	▮ Core
BACKFILL TYPE	■ Bentonite	⁚ Pea Gravel	▥ Slough	⁙ Grout	▨ Drill Cuttings	⁙ Sand



...trace cobbles, some gravel

...trace fines, gravelly, light brown

...some fines

...trace fines

...ivory-white sand

...no ivory-white sand, trace fines

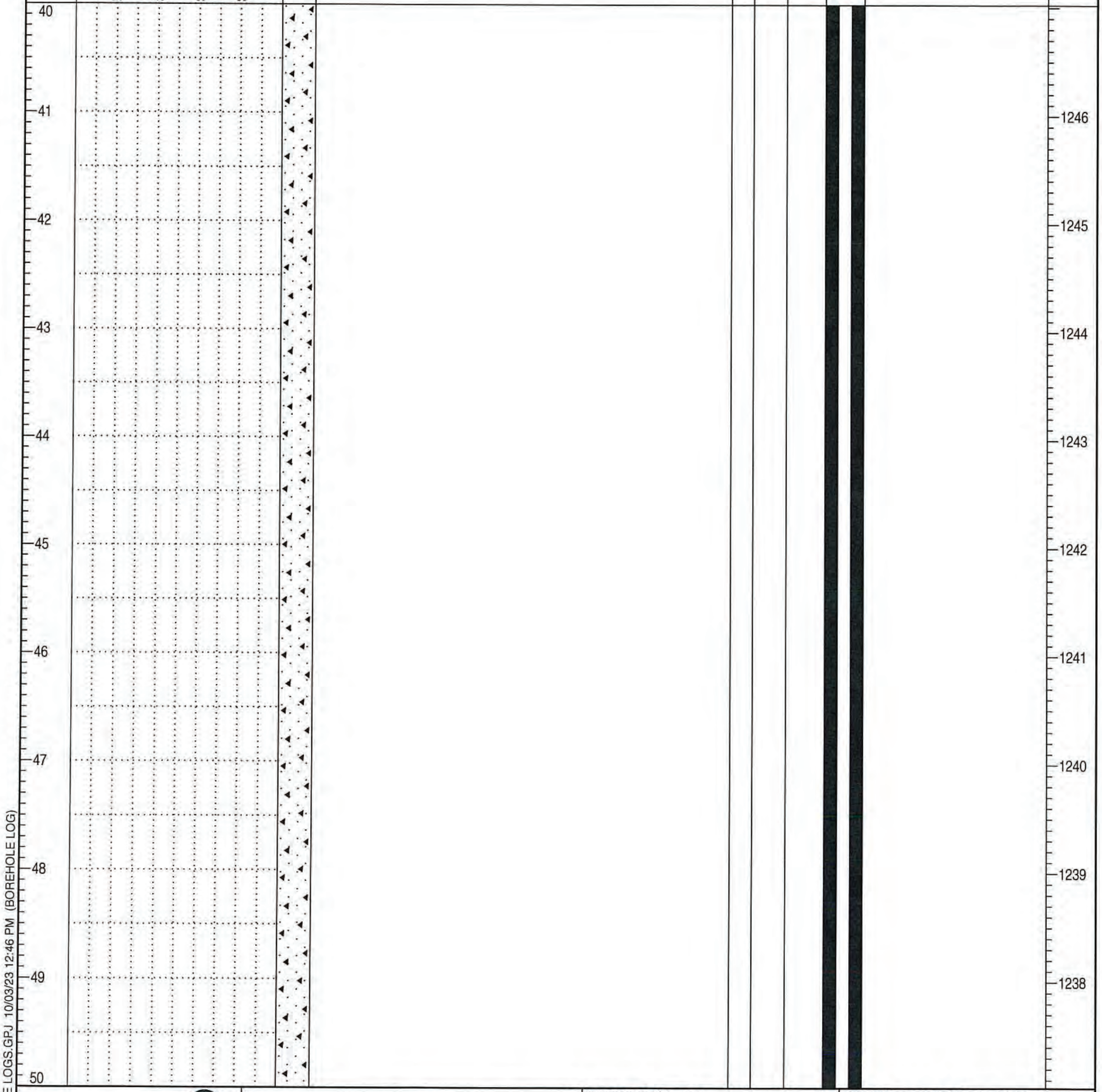
amec	LOGGED BY: RH	COMPLETION DEPTH: 56.40 m
AMEC Earth & Environmental Medicine Hat, Alberta T1A 8G3	REVIEWED BY: RH	COMPLETION DATE: 1/20/10
	Fig. No: 1	Page 4 of 6

LC_PIZP1001

CLIENT: Teck Coal Ltd.	PROJECT: Soil and Groundwater Assessment	BOREHOLE NO: **MW10-01**
DRILLER: J.R. Drilling	LOCATION: Line Creek Mine, Sparwood, B.C.	PROJECT NO: BX05973
DRILL/METHOD: Air Rotary	BOREHOLE LOCATION:X - 54656.9090,Y - 27929.7910	ELEVATION: 1287.025 m

SAMPLE TYPE	■ Shelby Tube	▨ No Recovery	☒ SPT Test (N)	☰ Grab Sample	▥ Split-Pen	◨ Core
BACKFILL TYPE	■ Bentonite	⁚ Pea Gravel	▥ Slough	⁘ Grout	▨ Drill Cuttings	⁘ Sand

Depth (m)	■ STANDARD PEN (N) ■ 20 40 60 80 PLASTIC M.C. LIQUID 20 40 60 80	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	WELL INSTALLATION	OTHER TESTS COMMENTS	ELEVATION (m)



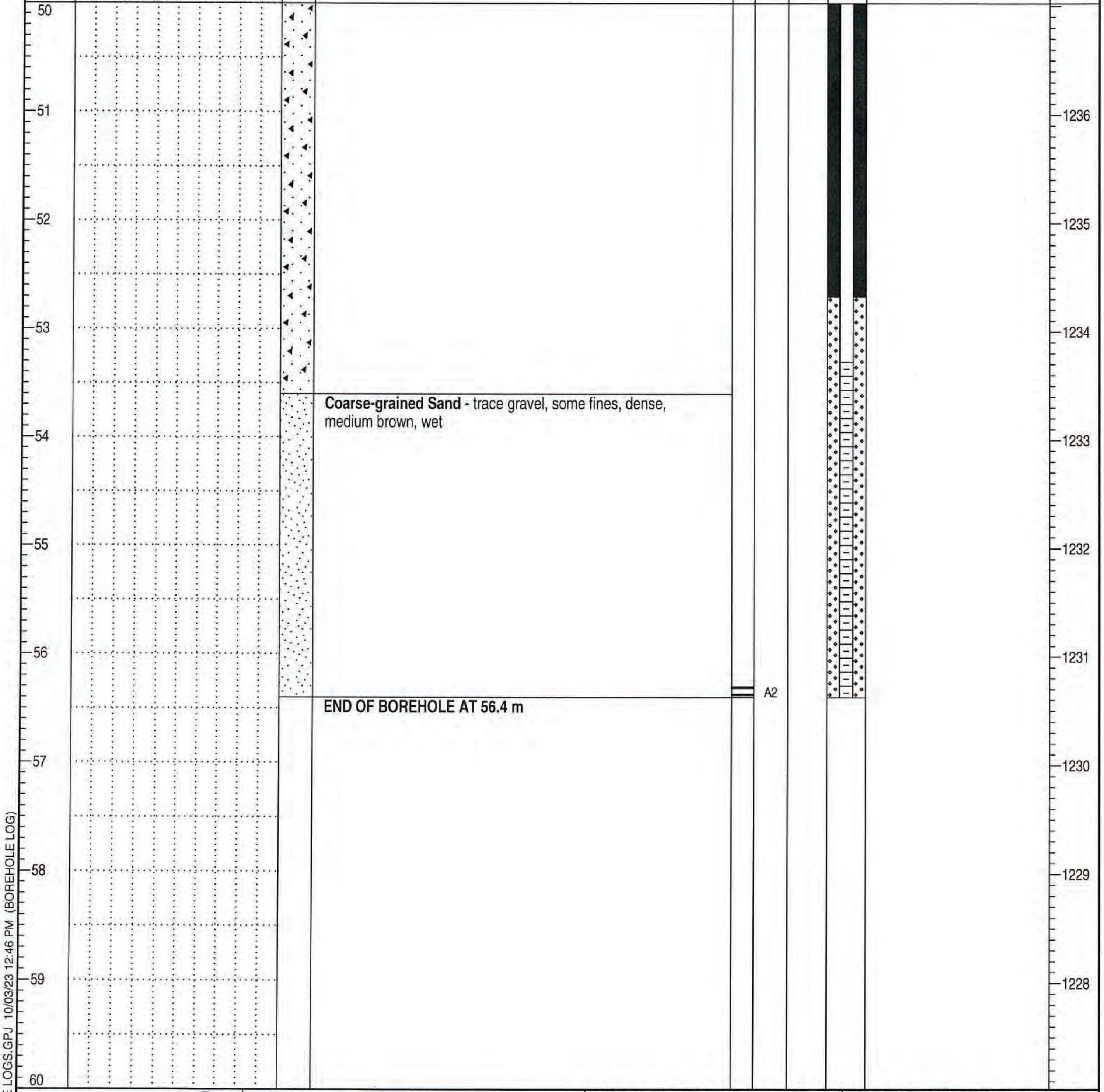
BOREHOLE LOGS.GPJ 10/03/23 12:46 PM (BOREHOLE LOG)

amec	AMEC Earth & Environmental Medicine Hat, Alberta T1A 8G3	LOGGED BY: RH	COMPLETION DEPTH: 56.40 m
		REVIEWED BY: RH	COMPLETION DATE: 1/20/10
		Fig. No: 1	Page 5 of 6

CLIENT: Teck Coal Ltd.	PROJECT: Soil and Groundwater Assessment	BOREHOLE NO: **MW10-01**
DRILLER: J.R. Drilling	LOCATION: Line Creek Mine, Sparwood, B.C.	PROJECT NO: BX05973
DRILL/METHOD: Air Rotary	BOREHOLE LOCATION:X - 54656.9090,Y - 27929.7910	ELEVATION: 1287.025 m

SAMPLE TYPE	■ Shelby Tube	▨ No Recovery	☒ SPT Test (N)	☰ Grab Sample	▥ Split-Pen	▮ Core
BACKFILL TYPE	■ Bentonite	⁚ Pea Gravel	▥ Slough	⁘ Grout	▨ Drill Cuttings	⁘ Sand

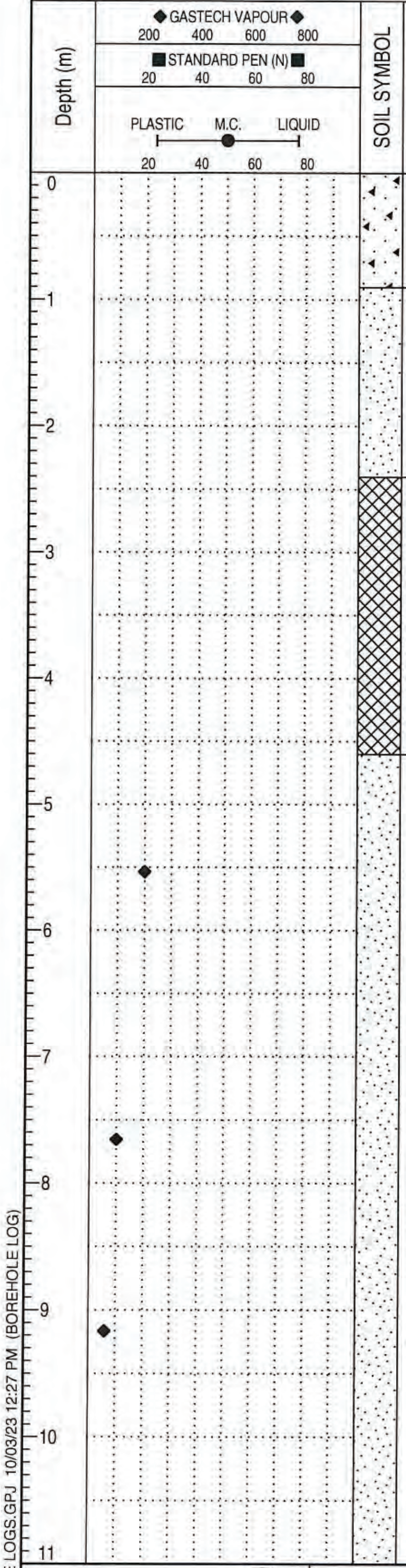
Depth (m)	STANDARD PEN (N) 20 40 60 80 / PLASTIC M.C. LIQUID 20 40 60 80	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	WELL INSTALLATION	OTHER TESTS COMMENTS	ELEVATION (m)
53.6			**Coarse-grained Sand -** trace gravel, some fines, dense, medium brown, wet						
56.3				☰	A2				
56.4			**END OF BOREHOLE AT 56.4 m**						



amec	LOGGED BY: RH	COMPLETION DEPTH: 56.40 m
AMEC Earth & Environmental Medicine Hat, Alberta T1A 8G3	REVIEWED BY: RH	COMPLETION DATE: 1/20/10
	Fig. No: 1	Page 6 of 6

CLIENT: Teck Coal Ltd.	PROJECT: Soil and Groundwater Assessment	BOREHOLE NO: **MW10-02**
DRILLER: J.R. Drilling	LOCATION: Line Creek Mine, Sparwood, B.C.	PROJECT NO: BX05973
DRILL/METHOD: Air Rotary	BOREHOLE LOCATION: X-54273.7949,Y- 27669.2550	ELEVATION: 1272.131 m

SAMPLE TYPE	■ Shelby Tube	▧ No Recovery	☒ SPT Test (N)	☰ Grab Sample	▥ Split-Pen	◧ Core
BACKFILL TYPE	■ Bentonite	⁚ Pea Gravel	▥ Slough	▨ Grout	▧ Drill Cuttings	⁙ Sand



SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)
Sand and Gravel - dense, grey, damp			
Sand - some gravel, trace fines, dense, medium brown, moist			
Silt and Clay - some gravel, firm, dark brown, concrete and wood inclusions, moist to wet (FILL)			
Sand - some gravel, trace fines, dense, medium brown, moist			
...noticable hydrocarbon odour	☰	A1	
...faint hydrocarbon odour, damp	☰	A2	
...moist			
...no hydrocarbon odour	☰	A3	
...faint hydrocarbon odour			

OTHER TESTS COMMENTS

Top of Pipe Elevation - 1272.931 m

10 m Slot Stainless Steel Screen.
200 m Steel Cased Water Well.
Steel casing pulled back to 41.1 m.
Surface seal inserted by pouring bentonite powder into annulus during last 4.5 m of drilling.
Well developed for 30 minutes at 1-2 gallons/minute.
Stick up steel casing protector 1 m above ground surface.

ELEVATION (m)
1272
1271
1270
1269
1268
1267
1266
1265
1264
1263
1262

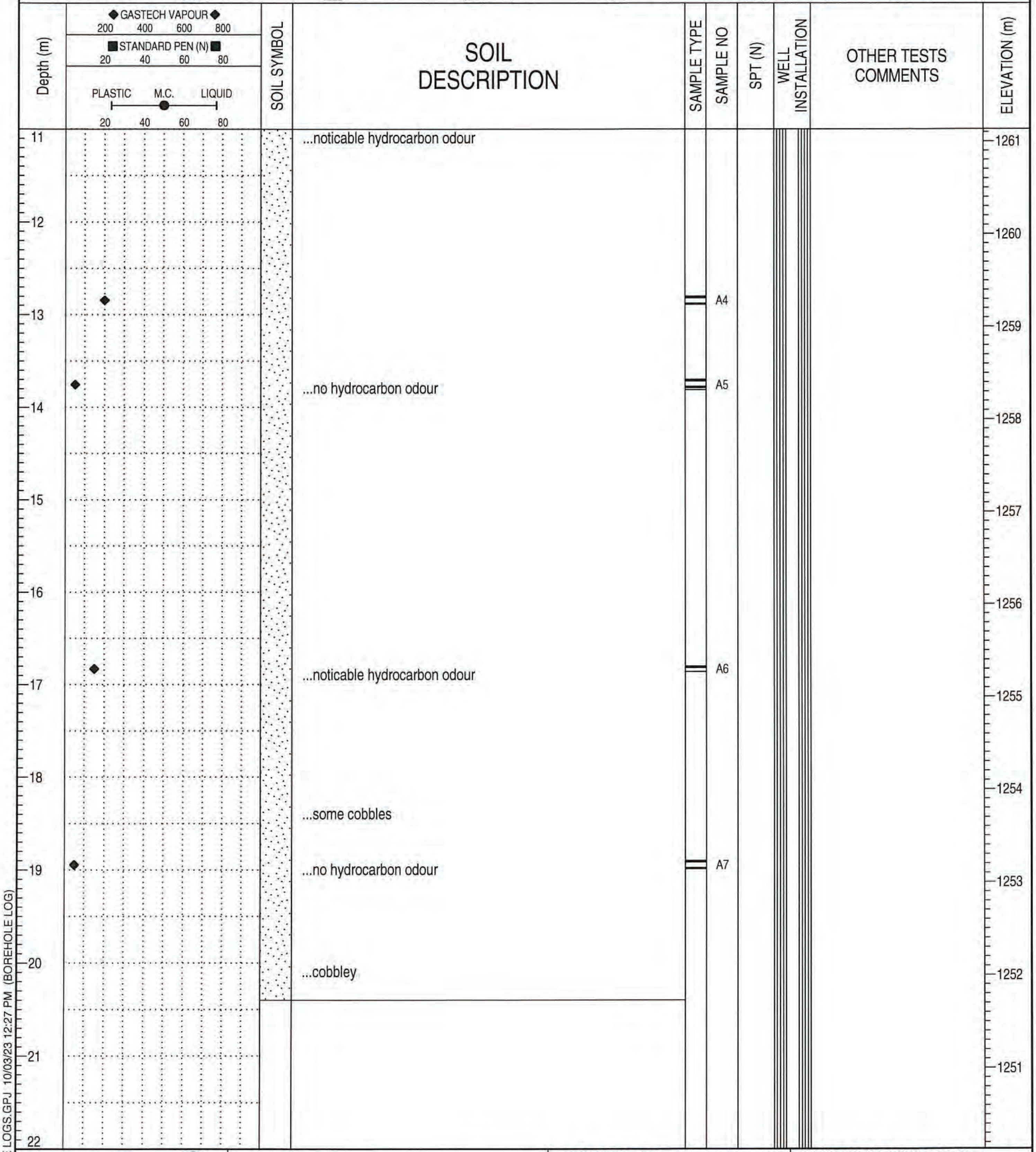
BOREHOLE LOGS.GPJ 10/03/23 12:27 PM (BOREHOLE LOG)

amec	LOGGED BY: RH	COMPLETION DEPTH: 43.60 m
AMEC Earth & Environmental Medicine Hat, Alberta T1A 8G3	REVIEWED BY: RH	COMPLETION DATE: 1/21/10
	Fig. No: 2	Page 1 of 4

LC_PIZP1002

CLIENT: Teck Coal Ltd.	PROJECT: Soil and Groundwater Assessment	BOREHOLE NO: **MW10-02**
DRILLER: J.R. Drilling	LOCATION: Line Creek Mine, Sparwood, B.C.	PROJECT NO: BX05973
DRILL/METHOD: Air Rotary	BOREHOLE LOCATION: X-54273.7949,Y- 27669.2550	ELEVATION: 1272.131 m

SAMPLE TYPE	■ Shelby Tube	▨ No Recovery	☒ SPT Test (N)	☰ Grab Sample	▥ Split-Pen	◧ Core
BACKFILL TYPE	■ Bentonite	⁚ Pea Gravel	▥ Slough	⁘ Grout	▨ Drill Cuttings	⁘ Sand



...noticable hydrocarbon odour

...no hydrocarbon odour

...noticable hydrocarbon odour

...some cobbles

...no hydrocarbon odour

...cobbley

amec

AMEC Earth & Environmental
Medicine Hat, Alberta T1A 8G3

LOGGED BY: RH	COMPLETION DEPTH: 43.60 m
REVIEWED BY: RH	COMPLETION DATE: 1/21/10
Fig. No: 2	

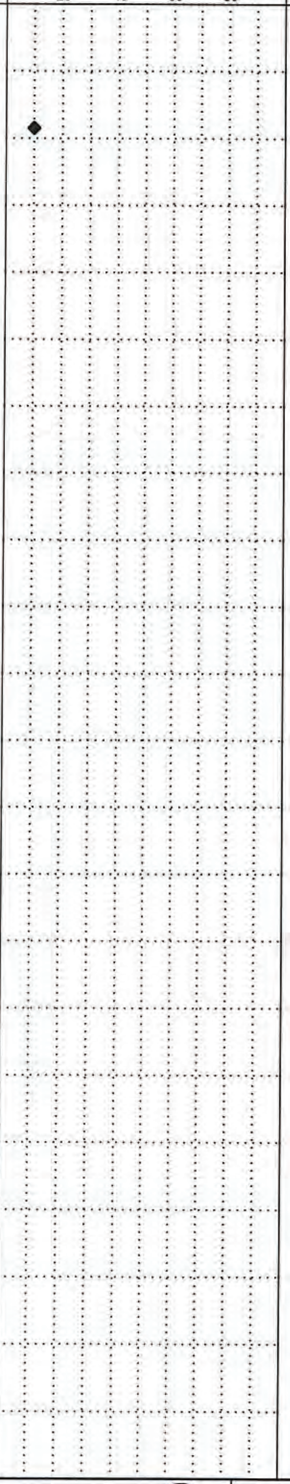
LC_PIZP1002

CLIENT: Teck Coal Ltd.	PROJECT: Soil and Groundwater Assessment	BOREHOLE NO: **MW10-02**
DRILLER: J.R. Drilling	LOCATION: Line Creek Mine, Sparwood, B.C.	PROJECT NO: BX05973
DRILL/METHOD: Air Rotary	BOREHOLE LOCATION: X-54273.7949,Y- 27669.2550	ELEVATION: 1272.131 m

SAMPLE TYPE: ■ Shelby Tube ▨ No Recovery ☒ SPT Test (N) ☰ Grab Sample ▥ Split-Pen ▮ Core

BACKFILL TYPE: ■ Bentonite ⁚ Pea Gravel ▥ Slough ⁖ Grout ▨ Drill Cuttings ⁖ Sand

Depth (m)	◆ GASTECH VAPOUR ◆ 200 400 600 800 ■ STANDARD PEN (N) ■ 20 40 60 80 PLASTIC M.C. LIQUID 20 40 60 80	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	WELL INSTALLATION	OTHER TESTS COMMENTS	ELEVATION (m)
22									1250
23	◆			☰	A8				1249
24									1248
25			...fine-grained sand, some gravel						1247
26			...no hydrocarbon odour ...noticable hydrocarbon odour						1246
27									1245
28									1244
29									1243
30									1242
31									1241
32									1240
33									



AMEC Earth & Environmental Medicine Hat, Alberta T1A 8G3	LOGGED BY: RH	COMPLETION DEPTH: 43.60 m
	REVIEWED BY: RH	COMPLETION DATE: 1/21/10
	Fig. No: 2	Page 3 of 4

LC_PIZP1002

CLIENT: Teck Coal Ltd.	PROJECT: Soil and Groundwater Assessment	BOREHOLE NO: **MW10-02**
DRILLER: J.R. Drilling	LOCATION: Line Creek Mine, Sparwood, B.C.	PROJECT NO: BX05973
DRILL/METHOD: Air Rotary	BOREHOLE LOCATION: X-54273.7949,Y- 27669.2550	ELEVATION: 1272.131 m

SAMPLE TYPE ■ Shelby Tube ▨ No Recovery ☒ SPT Test (N) ☰ Grab Sample ▥ Split-Pen ▮ Core

BACKFILL TYPE ■ Bentonite ⁘ Pea Gravel ▥ Slough ⁘ Grout ▨ Drill Cuttings ⁘ Sand

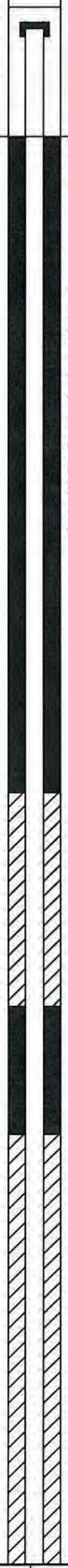
Depth (m)	◆ GASTECH VAPOUR ◆ 200 400 600 800 ■ STANDARD PEN (N) ■ 20 40 60 80 PLASTIC M.C. LIQUID 20 40 60 80	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	WELL INSTALLATION	OTHER TESTS COMMENTS	ELEVATION (m)
33									1239
34									1238
35									1237
36									1236
37									1235
38			...no hydrocarbon odour						1234
39									1233
40									1232
41			**Coarse-grained Sand and Gravel** - (angular gravel), silty, dense, medium brown, wet						1231
42									1230
43									1229
			END OF BOREHOLE AT 43.6 m						
44									

amec	AMEC Earth & Environmental Medicine Hat, Alberta T1A 8G3	LOGGED BY: RH	COMPLETION DEPTH: 43.60 m
		REVIEWED BY: RH	COMPLETION DATE: 1/21/10
		Fig. No: 2	Page 4 of 4

CLIENT: Teck Coal Ltd.	PROJECT: Soil and Groundwater Assessment	BOREHOLE NO: **MW10-03**
DRILLER: J.R. Drilling	LOCATION: Line Creek Mine, Sparwood, B.C.	PROJECT NO: BX05973
DRILL/METHOD: Air Rotary	BOREHOLE LOCATION:X - 54627.1430, Y - 27968.0540	ELEVATION: 1283.388 m

SAMPLE TYPE	■ Shelby Tube	▨ No Recovery	☒ SPT Test (N)	☰ Grab Sample	▥ Split-Pen	◧ Core
BACKFILL TYPE	■ Bentonite	⁚ Pea Gravel	▥ Slough	⁘ Grout	▨ Drill Cuttings	⁘ Sand

Depth (m)	■ STANDARD PEN (N) ■ 20 40 60 80 / PLASTIC M.C. LIQUID 20 40 60 80	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)		OTHER TESTS COMMENTS	ELEVATION (m)
0			**Silt** - trace clay, trace gravel, very firm, low plasticity, medium brown, damp					Top of Pipe Elevation - 1284.188 m	1283
1			**Fine-grained Sand** - trace gravel, dense, medium brown, moist					50 mm PVC, Schedule 40 Monitoring Well, 10 Slot Well Screen with Steel Stick Up Casing Protector 200 mm steel casing pulled out to expose 1.32 m of 50 mm PVC screen. Addition extraction of steel casing was not possible after the pipe broke, leaving 200 mm of casing between 27.0 m and 54.4 m	1282
2			...some gravel ...some coarse-grained sand, light brown						1281
3			**Sand** - some gravel, trace fines, dense, medium brown, moist						1280
4			...gravelly						1279
5									1278
6									1277
7			...some cobbles						1276
8			...faint solvent odour	☰	A1				1275
9									1274
10									

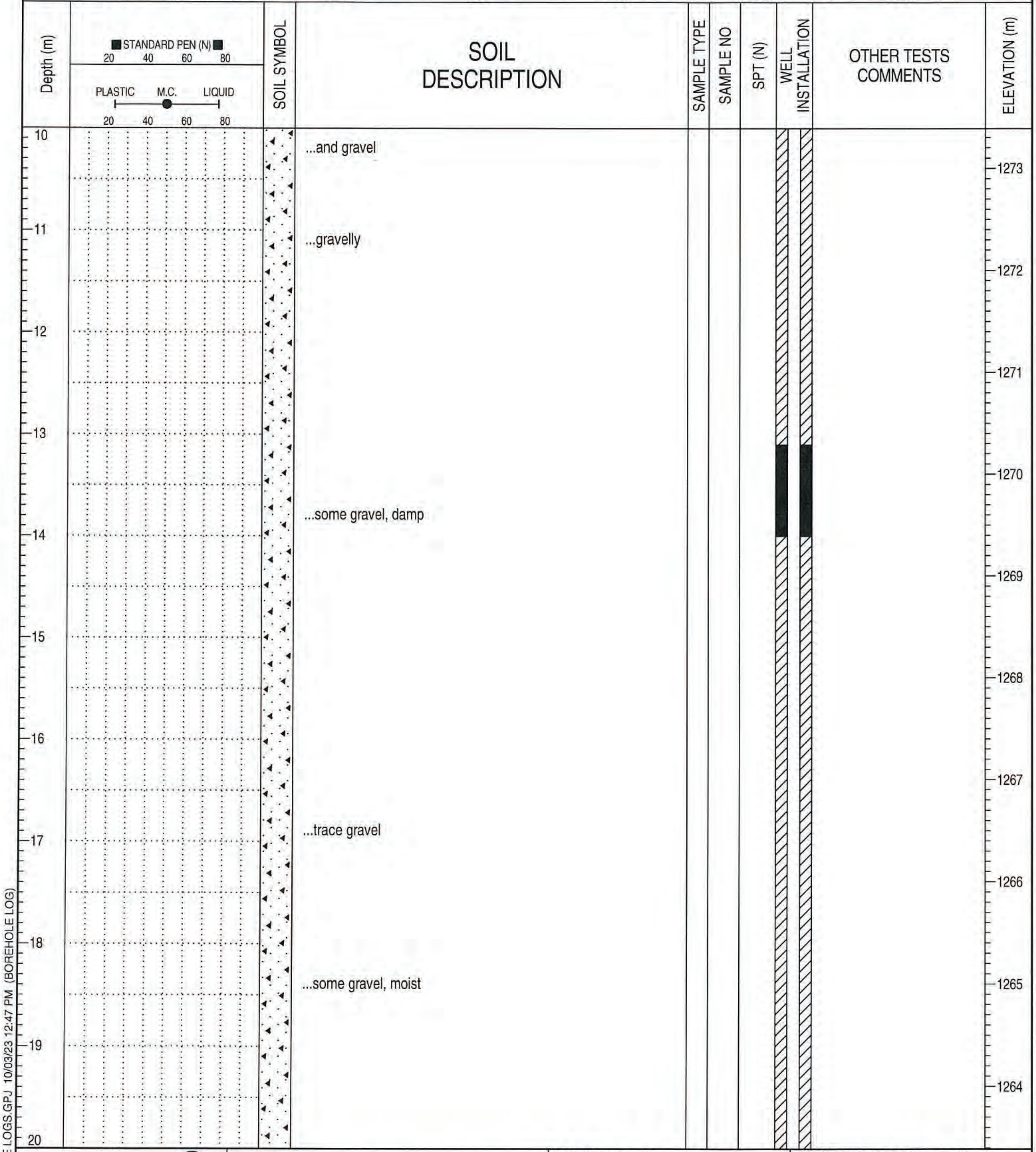


AMEC Earth & Environmental
Medicine Hat, Alberta T1A 8G3

LOGGED BY: RH	COMPLETION DEPTH: 55.80 m
REVIEWED BY: RH	COMPLETION DATE: 1/22/10
Fig. No: 3	Page 1 of 6

CLIENT: Teck Coal Ltd.	PROJECT: Soil and Groundwater Assessment	BOREHOLE NO: **MW10-03**
DRILLER: J.R. Drilling	LOCATION: Line Creek Mine, Sparwood, B.C.	PROJECT NO: BX05973
DRILL/METHOD: Air Rotary	BOREHOLE LOCATION:X - 54627.1430, Y - 27968.0540	ELEVATION: 1283.388 m

SAMPLE TYPE	■ Shelby Tube	▨ No Recovery	☒ SPT Test (N)	☰ Grab Sample	▥ Split-Pen	◨ Core
BACKFILL TYPE	■ Bentonite	⁙ Pea Gravel	▥ Slough	⁙ Grout	▨ Drill Cuttings	⁙ Sand



...and gravel

...gravelly

...some gravel, damp

...trace gravel

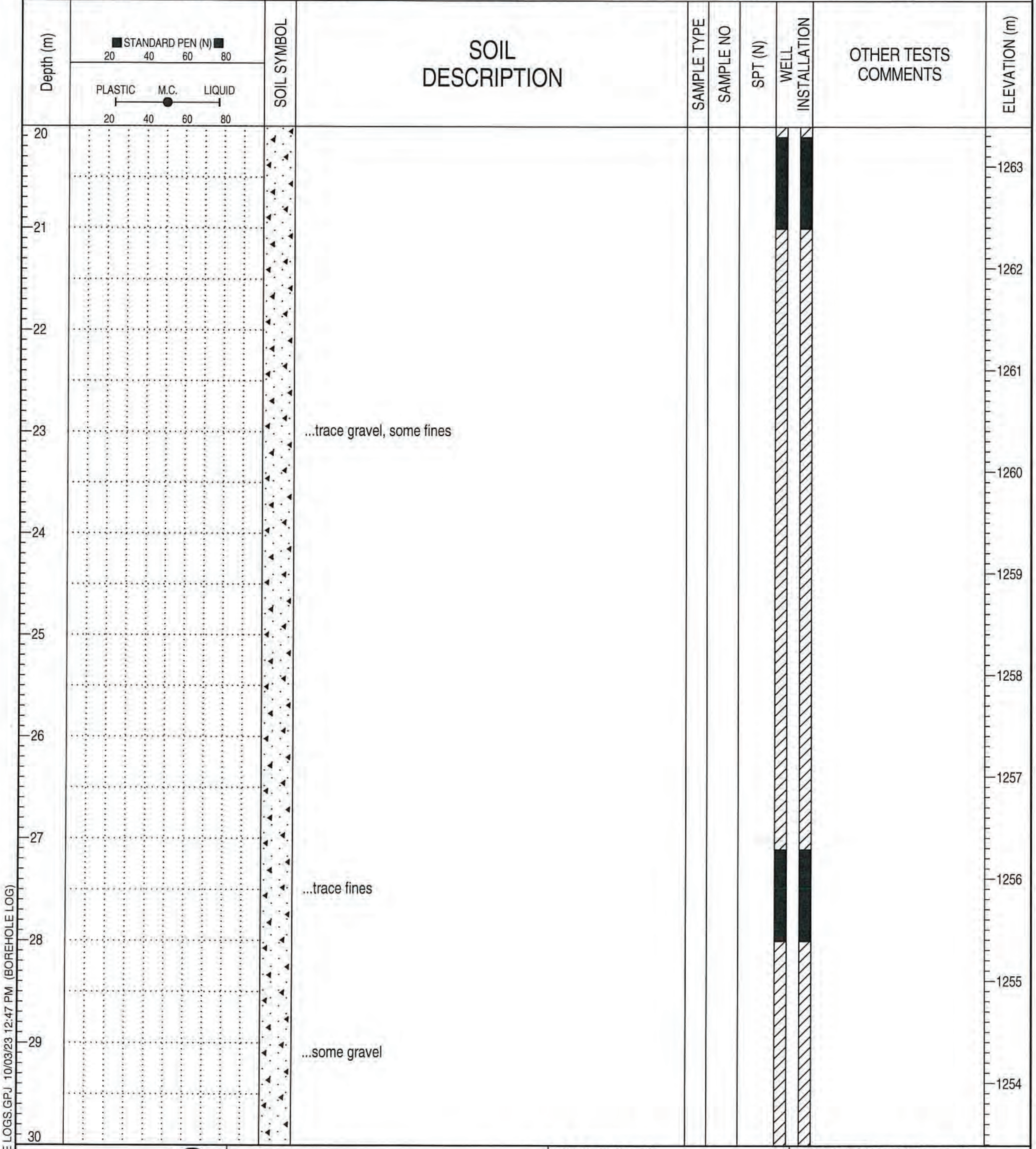
...some gravel, moist

AMEC Earth & Environmental
Medicine Hat, Alberta T1A 8G3

LOGGED BY: RH	COMPLETION DEPTH: 55.80 m
REVIEWED BY: RH	COMPLETION DATE: 1/22/10
Fig. No: 3	

CLIENT: Teck Coal Ltd.	PROJECT: Soil and Groundwater Assessment	BOREHOLE NO: **MW10-03**
DRILLER: J.R. Drilling	LOCATION: Line Creek Mine, Sparwood, B.C.	PROJECT NO: BX05973
DRILL/METHOD: Air Rotary	BOREHOLE LOCATION:X - 54627.1430, Y - 27968.0540	ELEVATION: 1283.388 m

SAMPLE TYPE	■ Shelby Tube	◿ No Recovery	☒ SPT Test (N)	☰ Grab Sample	▥ Split-Pen	▮ Core
BACKFILL TYPE	■ Bentonite	⁚ Pea Gravel	▥ Slough	⁘ Grout	▨ Drill Cuttings	⁘ Sand



...trace gravel, some fines

...trace fines

...some gravel

amec	AMEC Earth & Environmental Medicine Hat, Alberta T1A 8G3	LOGGED BY: RH REVIEWED BY: RH Fig. No: 3

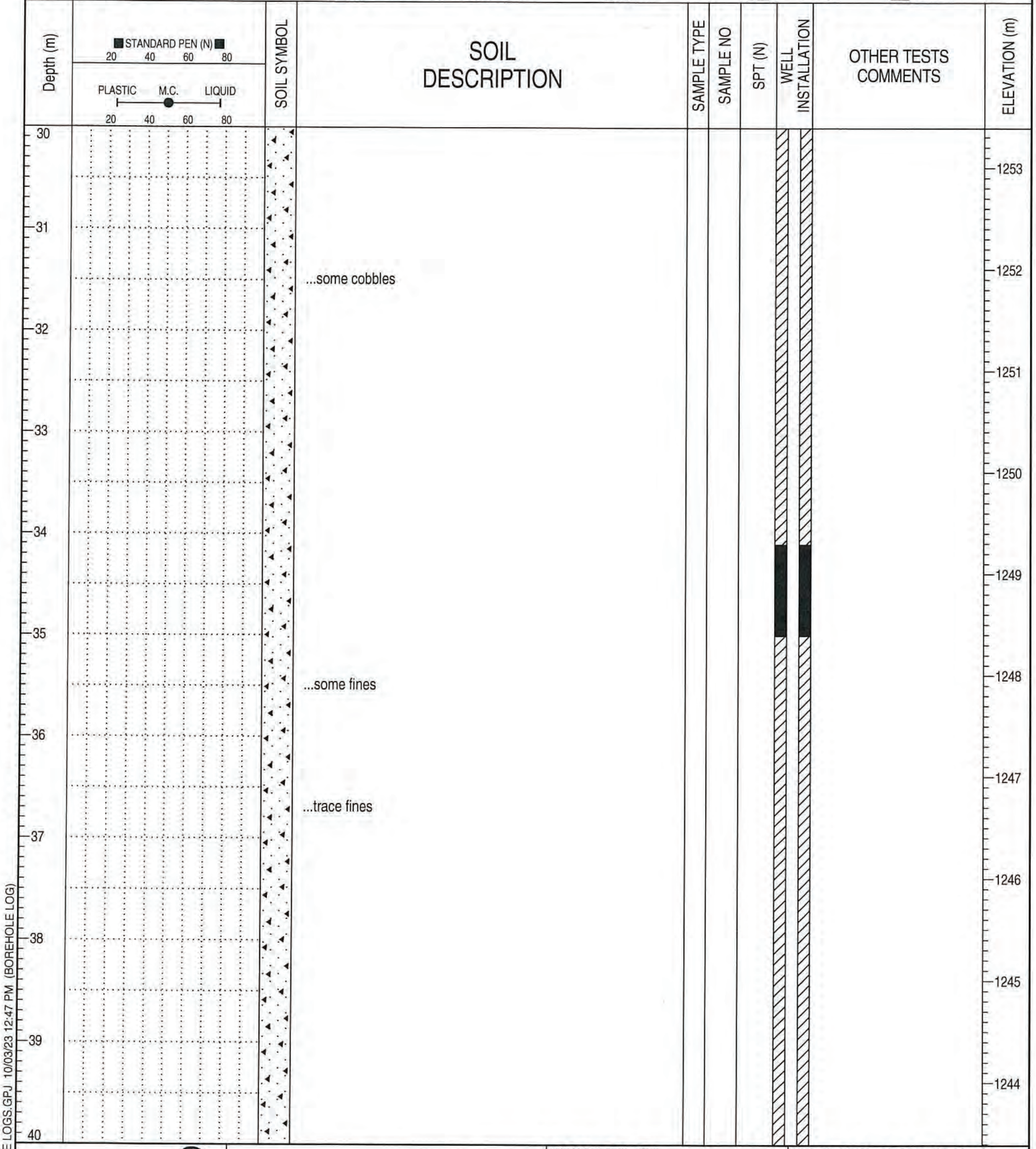
COMPLETION DEPTH: 55.80 m
COMPLETION DATE: 1/22/10

LC_PIZP1003

CLIENT: Teck Coal Ltd.	PROJECT: Soil and Groundwater Assessment	BOREHOLE NO: **MW10-03**
DRILLER: J.R. Drilling	LOCATION: Line Creek Mine, Sparwood, B.C.	PROJECT NO: BX05973
DRILL/METHOD: Air Rotary	BOREHOLE LOCATION:X - 54627.1430, Y - 27968.0540	ELEVATION: 1283.388 m

SAMPLE TYPE ■ Shelby Tube ▨ No Recovery ☒ SPT Test (N) ☰ Grab Sample ▥ Split-Pen ▮ Core

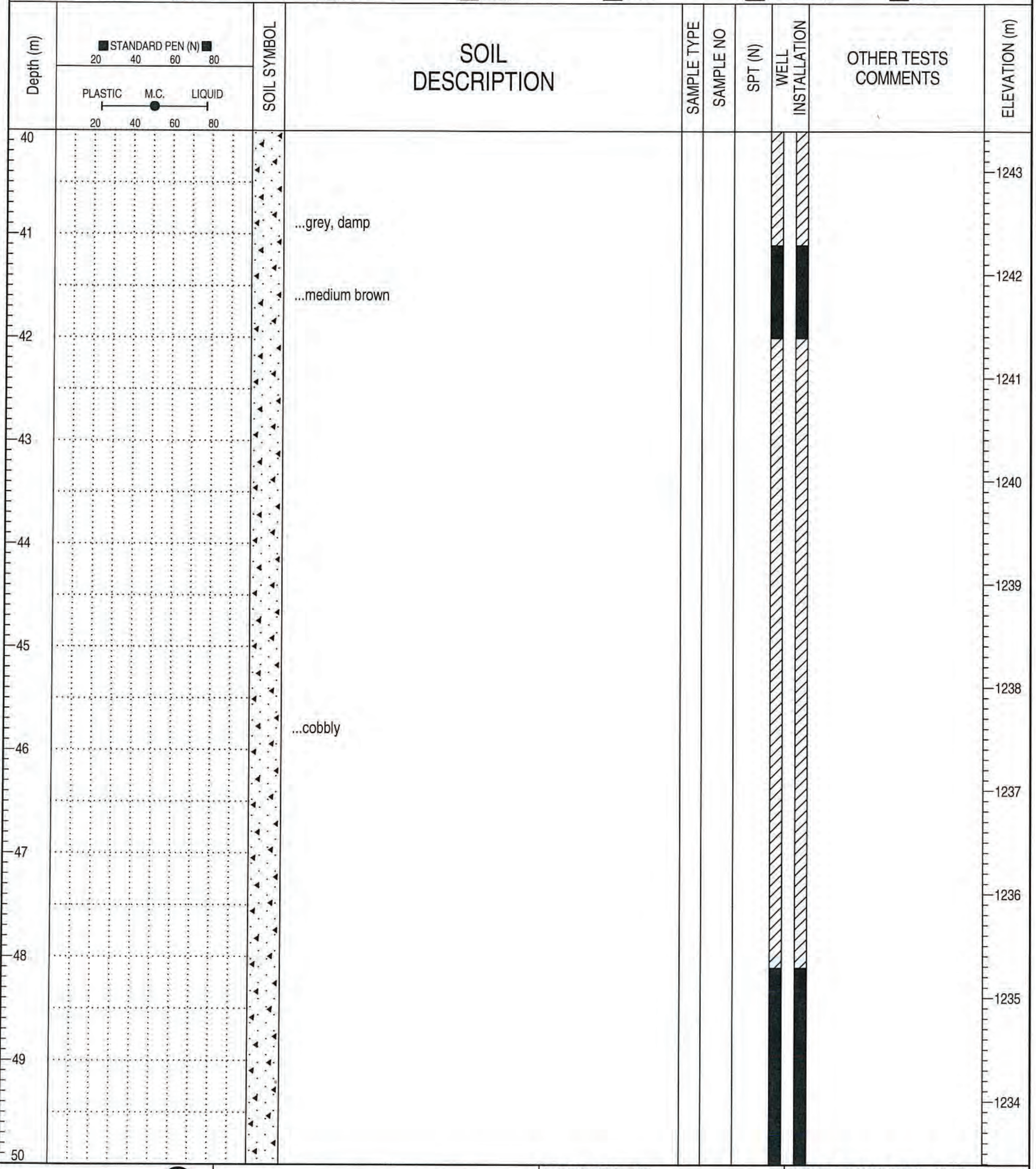
BACKFILL TYPE ■ Bentonite ⁚ Pea Gravel ▥ Slough ⁖ Grout ▨ Drill Cuttings ⁖ Sand



AMEC Earth & Environmental Medicine Hat, Alberta T1A 8G3	LOGGED BY: RH	COMPLETION DEPTH: 55.80 m
	REVIEWED BY: RH	COMPLETION DATE: 1/22/10
	Fig. No: 3	Page 4 of 6

CLIENT: Teck Coal Ltd.	PROJECT: Soil and Groundwater Assessment	BOREHOLE NO: **MW10-03**
DRILLER: J.R. Drilling	LOCATION: Line Creek Mine, Sparwood, B.C.	PROJECT NO: BX05973
DRILL/METHOD: Air Rotary	BOREHOLE LOCATION:X - 54627.1430, Y - 27968.0540	ELEVATION: 1283.388 m

SAMPLE TYPE	■ Shelby Tube	▨ No Recovery	☒ SPT Test (N)	☰ Grab Sample	▥ Split-Pen	▮ Core
BACKFILL TYPE	■ Bentonite	⁚ Pea Gravel	▥ Slough	⁙ Grout	▨ Drill Cuttings	⁙ Sand



...grey, damp

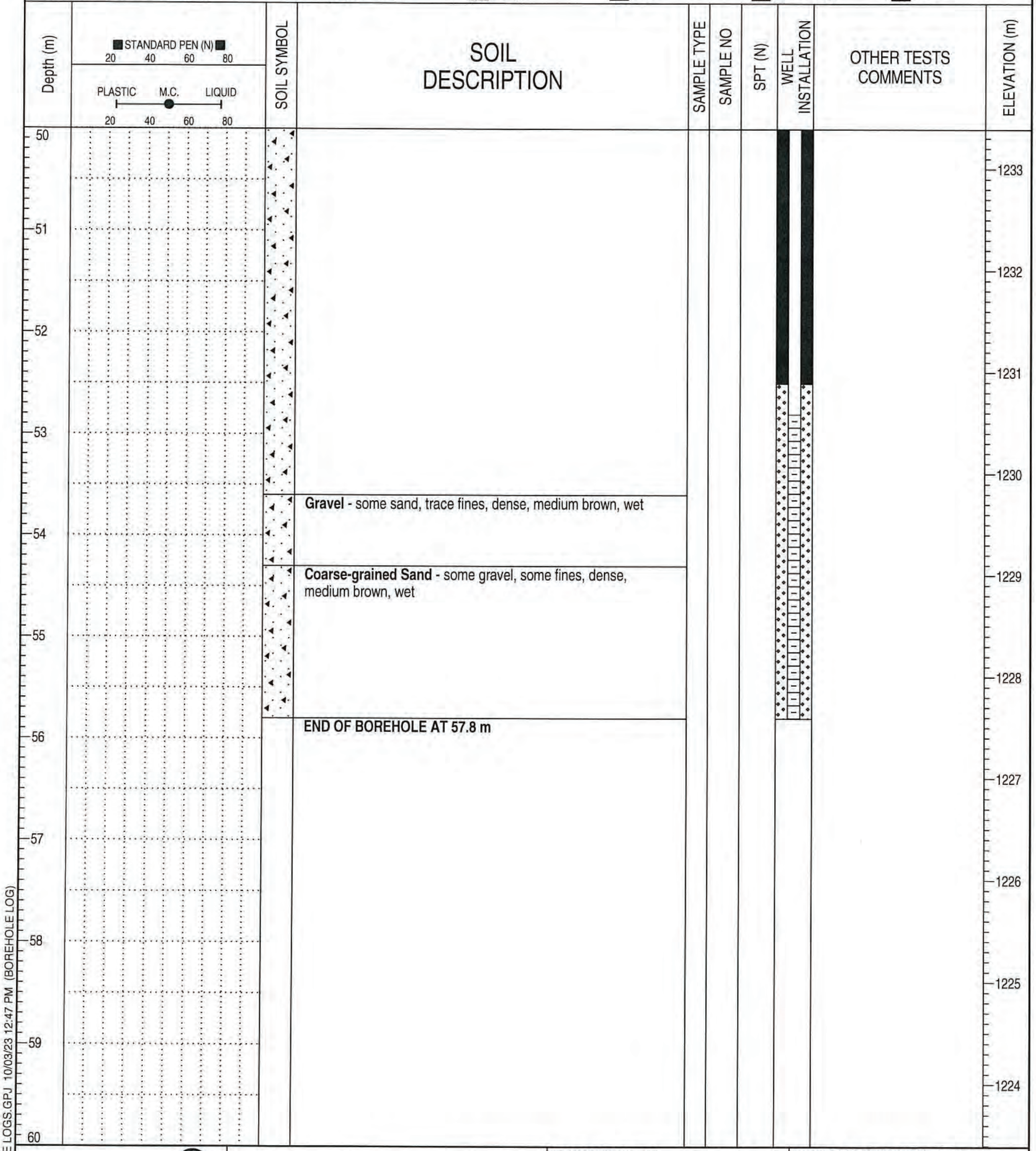
...medium brown

...cobbly

amec	AMEC Earth & Environmental Medicine Hat, Alberta T1A 8G3	LOGGED BY: RH	COMPLETION DEPTH: 55.80 m
		REVIEWED BY: RH	COMPLETION DATE: 1/22/10
		Fig. No: 3	Page 5 of 6

CLIENT: Teck Coal Ltd.	PROJECT: Soil and Groundwater Assessment	BOREHOLE NO: **MW10-03**
DRILLER: J.R. Drilling	LOCATION: Line Creek Mine, Sparwood, B.C.	PROJECT NO: BX05973
DRILL/METHOD: Air Rotary	BOREHOLE LOCATION:X - 54627.1430, Y - 27968.0540	ELEVATION: 1283.388 m

SAMPLE TYPE	■ Shelby Tube	▨ No Recovery	☒ SPT Test (N)	☰ Grab Sample	Ⅲ Split-Pen	▮ Core
BACKFILL TYPE	■ Bentonite	⁘ Pea Gravel	Ⅲ Slough	⁘ Grout	▨ Drill Cuttings	⁘ Sand



Gravel - some sand, trace fines, dense, medium brown, wet

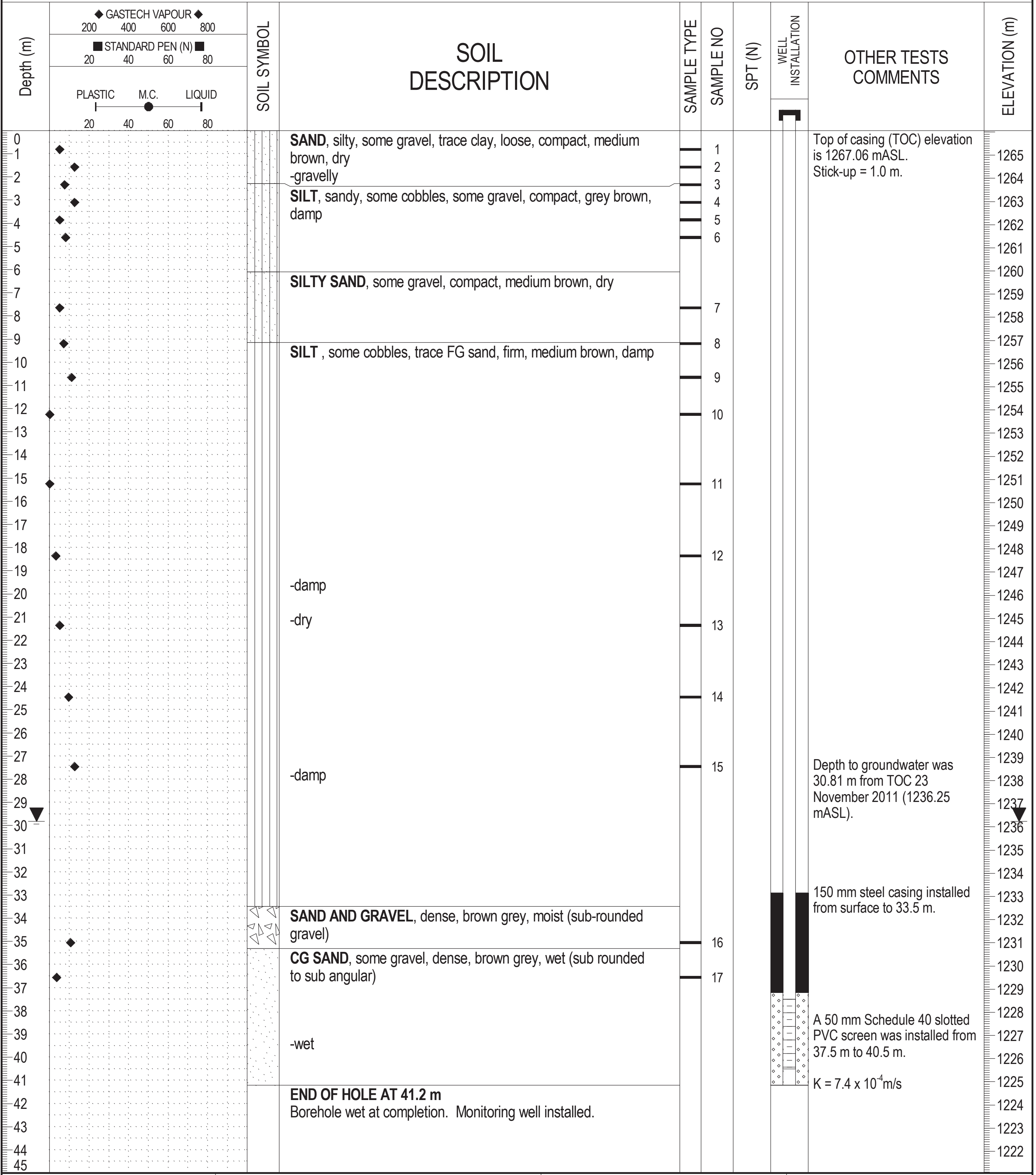
Coarse-grained Sand - some gravel, some fines, dense, medium brown, wet

END OF BOREHOLE AT 57.8 m

AMEC Earth & Environmental Medicine Hat, Alberta T1A 8G3	LOGGED BY: RH	COMPLETION DEPTH: 55.80 m
	REVIEWED BY: RH	COMPLETION DATE: 1/22/10
	Fig. No: 3	Page 6 of 6

CLIENT: Teck Coal Ltd.	PROJECT: GW Assessment - Effluent Ponds	BOREHOLE NO: **MW11(P)-01**
DRILLER: JR Drilling	LOCATION: Teck - LCO	PROJECT NO: BX06169
DRILL/METHOD: DR-12/ Air Rotary	BOREHOLE LOCATION: Refer to site plan	ELEVATION: 1266.06 m

SAMPLE TYPE	■ Shelby Tube	◿ No Recovery	☒ SPT Test (N)	☰ Grab Sample	▥ Split-Pen	◨ Core
BACKFILL TYPE	■ Bentonite	⁖ Pea Gravel	▥ Slough	⁘ Grout	▨ Drill Cuttings	⁙ Sand



SOIL DESCRIPTION

SAND, silty, some gravel, trace clay, loose, compact, medium brown, dry
-gravelly

SILT, sandy, some cobbles, some gravel, compact, grey brown, damp

SILTY SAND, some gravel, compact, medium brown, dry

SILT , some cobbles, trace FG sand, firm, medium brown, damp

-damp

-dry

-damp

SAND AND GRAVEL, dense, brown grey, moist (sub-rounded gravel)

CG SAND, some gravel, dense, brown grey, wet (sub rounded to sub angular)

-wet

END OF HOLE AT 41.2 m
Borehole wet at completion. Monitoring well installed.

OTHER TESTS COMMENTS

Top of casing (TOC) elevation is 1267.06 mASL. Stick-up = 1.0 m.

Depth to groundwater was 30.81 m from TOC 23 November 2011 (1236.25 mASL).

150 mm steel casing installed from surface to 33.5 m.

A 50 mm Schedule 40 slotted PVC screen was installed from 37.5 m to 40.5 m.

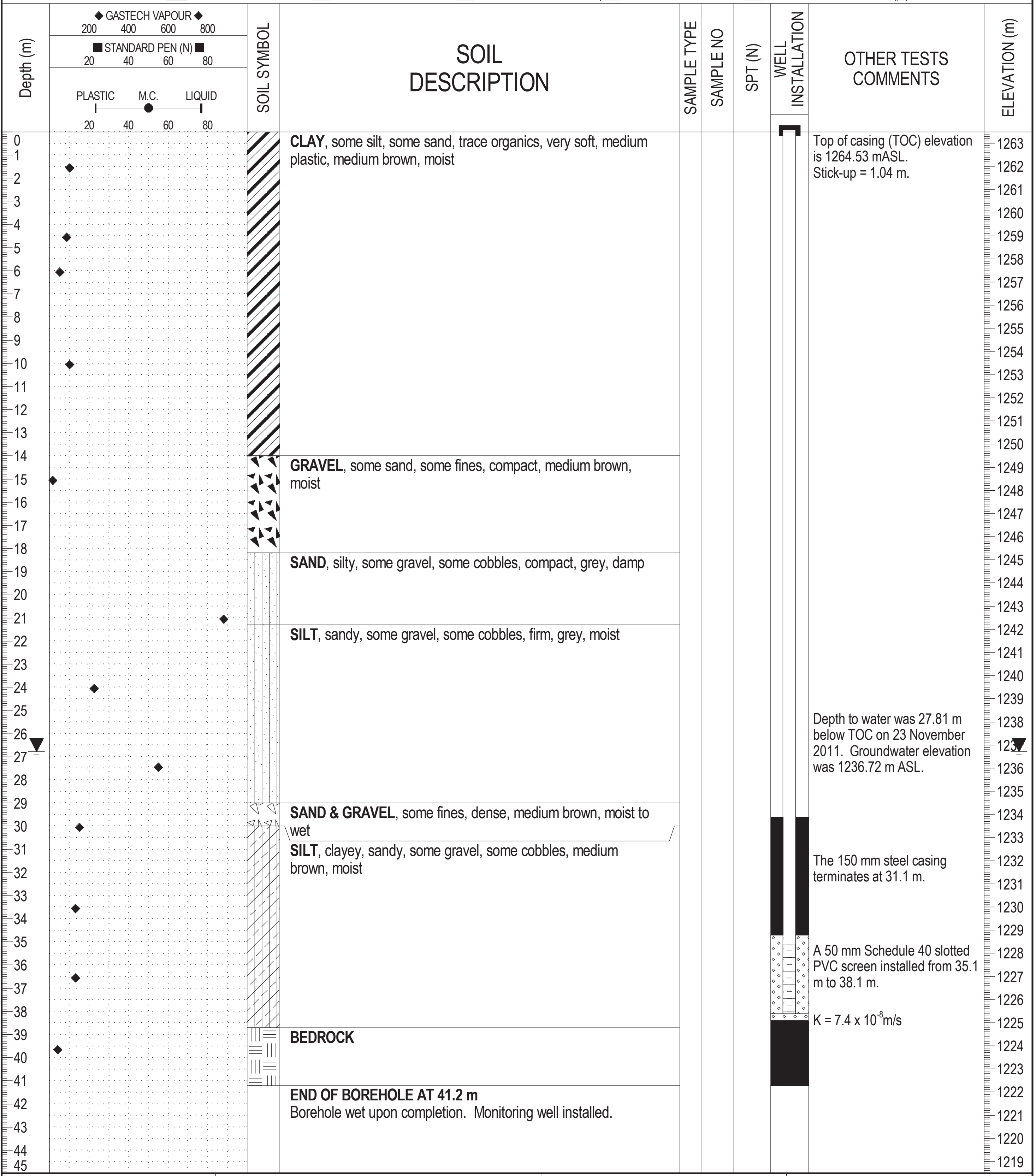
K = 7.4 x 10^{-4}m/s

AMEC Environment & Infrastructure Medicine Hat, Alberta	LOGGED BY: RH	COMPLETION DEPTH: 40.50 m
	REVIEWED BY: LH	COMPLETION DATE: 11/15/11
		Page 1 of 1

LC_PIZP1103

CLIENT: Teck Coal Ltd.	PROJECT: GW Assessment - Effluent Ponds	BOREHOLE NO: **MW11(P)-03**
DRILLER: JR Drilling	LOCATION: Teck - LCO	PROJECT NO: BX06169
DRILL/METHOD: DR-12/Air Rotary	BOREHOLE LOCATION: Refer to site plan	ELEVATION: 1263.49 m

SAMPLE TYPE	■ Shelby Tube	▨ No Recovery	☒ SPT Test (N)	☰ Grab Sample	▥ Split-Pen	◧
BACKFILL TYPE	■ Bentonite	⁚ Pea Gravel	▥ Slough	⁖ Grout	▨ Drill Cuttings	⁘ Sand



SOIL DESCRIPTION

CLAY, some silt, some sand, trace organics, very soft, medium plastic, medium brown, moist

GRAVEL, some sand, some fines, compact, medium brown, moist

SAND, silty, some gravel, some cobbles, compact, grey, damp

SILT, sandy, some gravel, some cobbles, firm, grey, moist

SAND & GRAVEL, some fines, dense, medium brown, moist to wet

SILT, clayey, sandy, some gravel, some cobbles, medium brown, moist

BEDROCK

END OF BOREHOLE AT 41.2 m
Borehole wet upon completion. Monitoring well installed.

OTHER TESTS COMMENTS

Top of casing (TOC) elevation is 1264.53 mASL. Stick-up = 1.04 m.

Depth to water was 27.81 m below TOC on 23 November 2011. Groundwater elevation was 1236.72 m ASL.

The 150 mm steel casing terminates at 31.1 m.

A 50 mm Schedule 40 slotted PVC screen installed from 35.1 m to 38.1 m.

K = 7.4×10^{-8}m/s

amec	AMEC Environment & Infrastructure Medicine Hat, Alberta	LOGGED BY: RH
		REVIEWED BY: LH

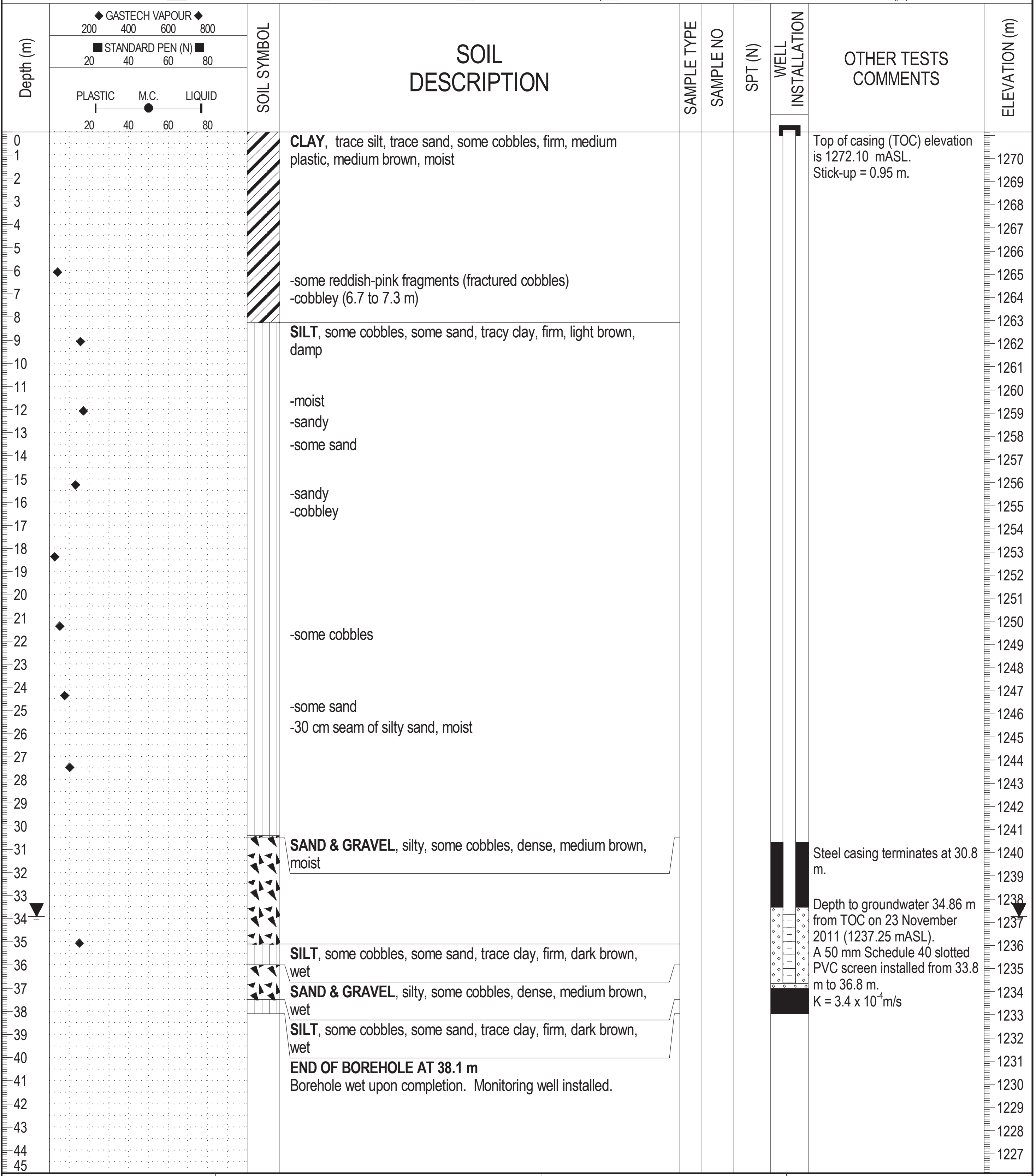
COMPLETION DEPTH: 41.20 m
COMPLETION DATE: 11/18/11

LC_PIZP1104

CLIENT: Teck Coal Ltd.	PROJECT: GW Assessment - Effluent Ponds	BOREHOLE NO: **MW11(P)-04**
DRILLER: JR Drilling	LOCATION: Teck - LCO	PROJECT NO: BX06169
DRILL/METHOD: DR-12/Air Rotary	BOREHOLE LOCATION: Refer to site plan	ELEVATION: 1271.15 m

SAMPLE TYPE ■ Shelby Tube ▨ No Recovery ☒ SPT Test (N) ☰ Grab Sample ▥ Split-Pen ◧

BACKFILL TYPE ■ Bentonite ⁚ Pea Gravel ▥ Slough ▩ Grout ▨ Drill Cuttings ⁛ Sand



SOIL DESCRIPTION

CLAY, trace silt, trace sand, some cobbles, firm, medium plastic, medium brown, moist

-some reddish-pink fragments (fractured cobbles)
-cobbley (6.7 to 7.3 m)

SILT, some cobbles, some sand, tracy clay, firm, light brown, damp

-moist
-sandy
-some sand

-sandy
-cobbley

-some cobbles

-some sand
-30 cm seam of silty sand, moist

SAND & GRAVEL, silty, some cobbles, dense, medium brown, moist

SILT, some cobbles, some sand, trace clay, firm, dark brown, wet

SAND & GRAVEL, silty, some cobbles, dense, medium brown, wet

SILT, some cobbles, some sand, trace clay, firm, dark brown, wet

END OF BOREHOLE AT 38.1 m
Borehole wet upon completion. Monitoring well installed.

OTHER TESTS COMMENTS

Top of casing (TOC) elevation is 1272.10 mASL.
Stick-up = 0.95 m.

Steel casing terminates at 30.8 m.

Depth to groundwater 34.86 m from TOC on 23 November 2011 (1237.25 mASL).
A 50 mm Schedule 40 slotted PVC screen installed from 33.8 m to 36.8 m.
K = 3.4 x 10^{-4}m/s

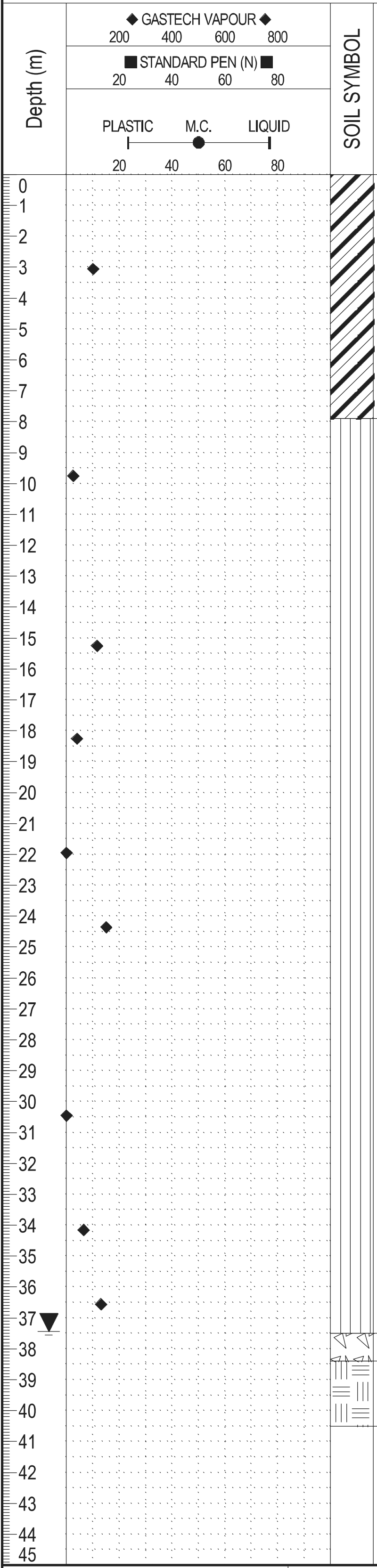
AMEC Environment & Infrastructure Medicine Hat, Alberta	LOGGED BY: RH	COMPLETION DEPTH: 38.10 m
	REVIEWED BY: LH	COMPLETION DATE: 11/21/11
		Page 1 of 1

LC_PIZP1105

CLIENT: Teck Coal Ltd.	PROJECT: GW Assessment - Effluent Ponds	BOREHOLE NO: **MW11(P)-05**
DRILLER: JR Drilling	LOCATION: Teck - LCO	PROJECT NO: BX06169
DRILL/METHOD: DR-12/Air Rotary	BOREHOLE LOCATION: Refer to site plan	ELEVATION: 1272.94 m

SAMPLE TYPE: ■ Shelby Tube ◩ No Recovery ☒ SPT Test (N) ☰ Grab Sample ▥ Split-Pen

BACKFILL TYPE: ■ Bentonite ⁚ Pea Gravel ▥ Slough ▨ Grout ◩ Drill Cuttings ⁙ Sand



SOIL DESCRIPTION

CLAY, trace silt, trace sand, some cobbles, firm, medium plastic, medium brown, moist

-cobbley

SILT, some cobbles, some sand, tracy clay, firm, orange brown, damp
-30 cm seam of silty sand, moist
-cobbley, medium brown

-boulder

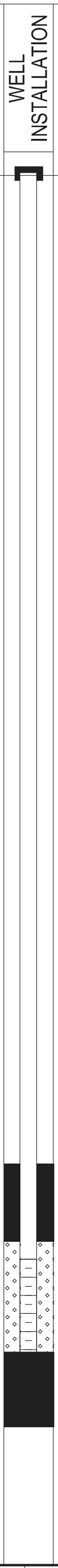
-sandy, light brown

SAND & GRAVEL, some fines, some cobbles, dense, medium brown, damp

BEDROCK

END OF BOREHOLE AT 40.5 m
Borehole wet upon completion. Monitoring well installed.

SAMPLE TYPE | SAMPLE NO | SPT (N)



OTHER TESTS COMMENTS

Top of casing (TOC) elevation is 1273.86 mASL.
Stick-up = 0.92 m.

150 mm steel casing terminates at 32.0 m.

A 50 mm Schedule 40 slotted PVC screen was installed from 35.1 m to 38.1 m.
Depth to groundwater is 38.35 m from TOC on 23 November 2011 (1235.51 mASL).
K - n/a

ELEVATION (m)
1272 1271 1270 1269 1268 1267 1266 1265 1264 1263 1262 1261 1260 1259 1258 1257 1256 1255 1254 1253 1252 1251 1250 1249 1248 1247 1246 1245 1244 1243 1242 1241 1240 1239 1238 1237 123▼ 1235 1234 1233 1232 1231 1230 1229

amec

AMEC Environment & Infrastructure
Medicine Hat, Alberta

LOGGED BY: RH	COMPLETION DEPTH: 40.50 m
REVIEWED BY: LH	COMPLETION DATE: 11/22/11

FINAL

SNC · LAVALIN	Client **Teck Coal Limited**	**Borehole No. : LC_BH_ER4A**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2020 05 20	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1192.955	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1193.924	Date Drilled:	2020 05 08
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5525918.369	Easting: 653205.305	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
☐ Odex

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

Depth in Metres

Soil Description

0 SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subangular to subrounded, some silt, well graded, brown, loose, damp, organics.
At 0.45 m - no organics.

4 At 4.0 m - moist.

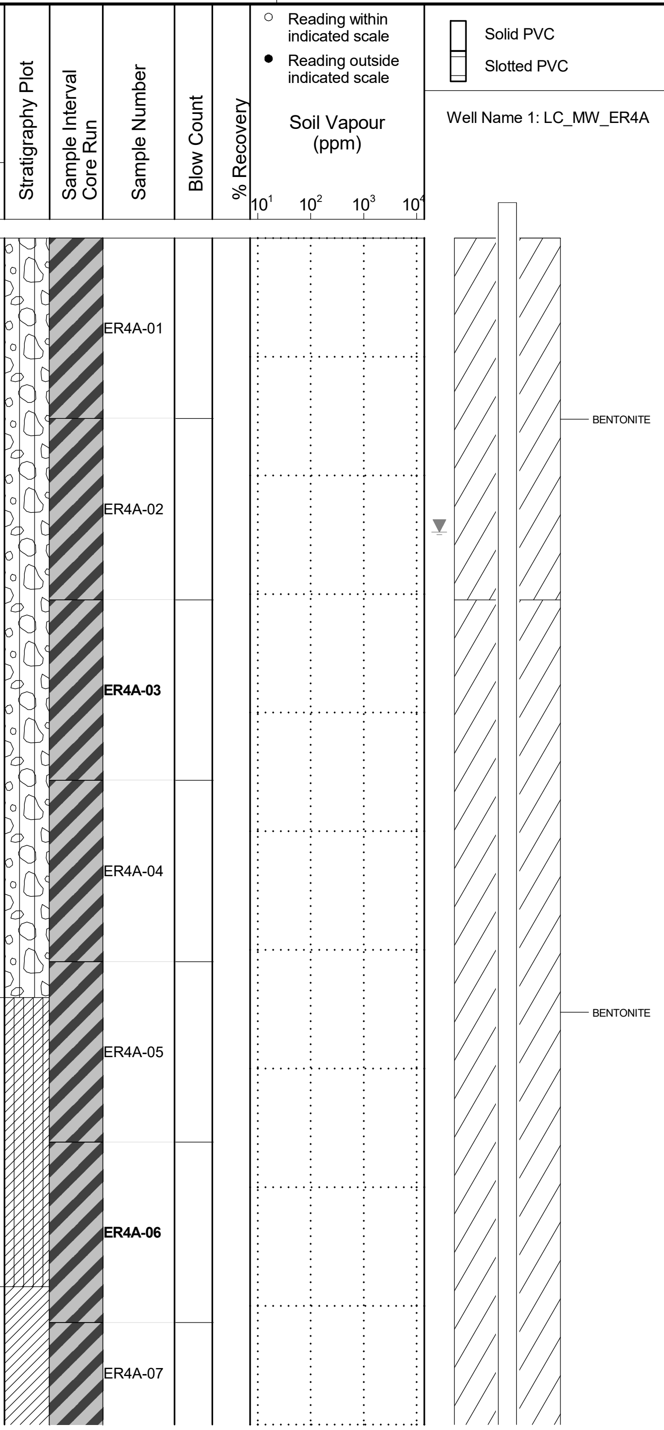
At 4.6 m - wet.

CLAY, some silt, some sand, fine to coarse grained, some gravel, fine to coarse, angular to subangular, well graded, brown, firm, low plastic, wet.

Below 7.6 m - trace sand, trace gravel.

9 CLAY, trace sand, fine to coarse grained, brown, firm, medium plastic, damp.

10



NOTES
Bolded sample denotes sample analyzed.

QA/QC: MB 2020 06 22 Print Date:2020-12-02

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : LC_BH_ER4A**
	Location **Regional Groundwater Monitoring**	PAGE 2 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2020 05 20	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1192.955	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1193.924	Date Drilled:	2020 05 08
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5525918.369	Easting: 653205.305	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
☐ Odex

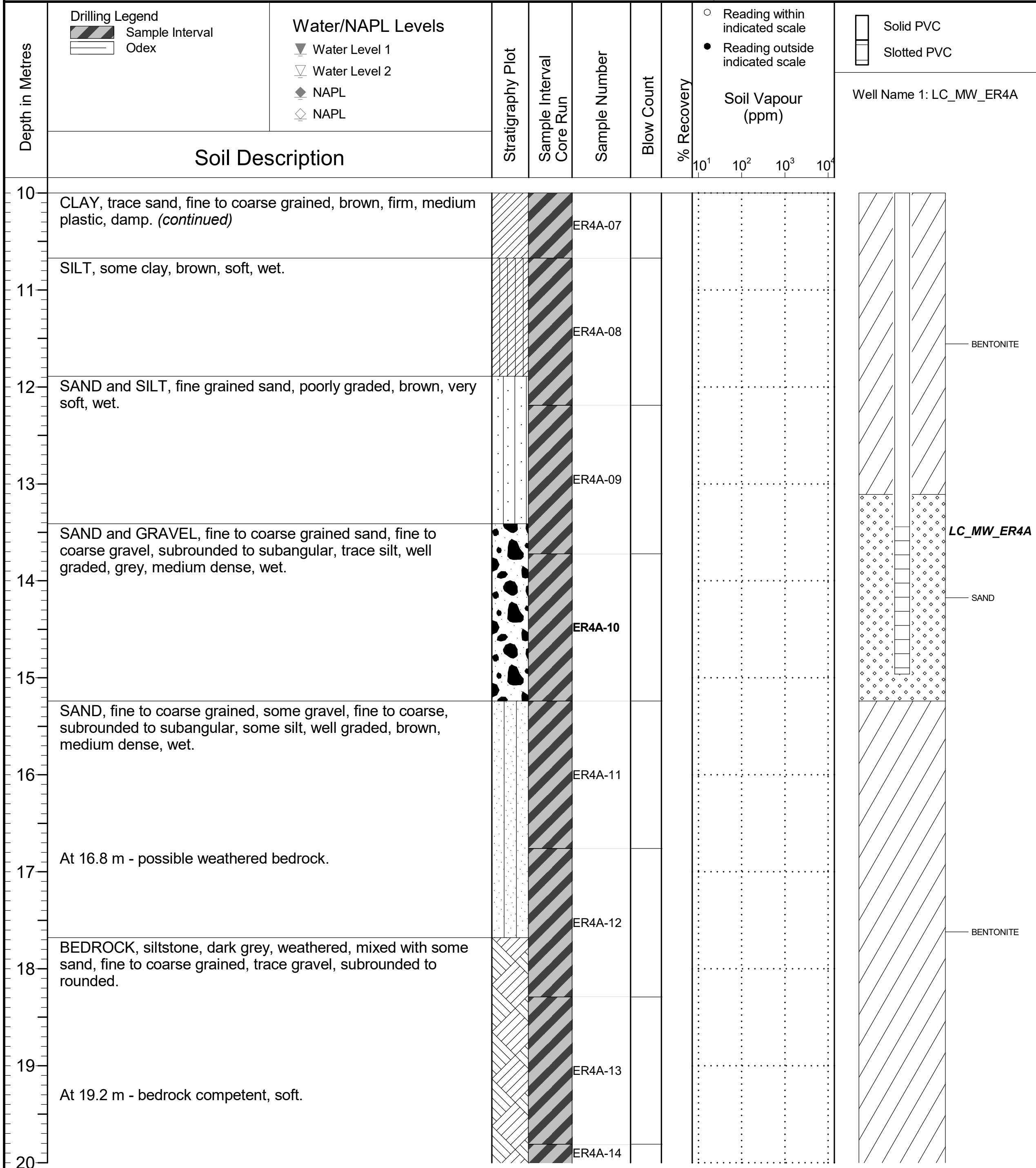
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

☐ Solid PVC
☐ Slotted PVC

Well Name 1: LC_MW_ER4A

Soil Description	Sample Number
CLAY, trace sand, fine to coarse grained, brown, firm, medium plastic, damp. *(continued)*	ER4A-07
SILT, some clay, brown, soft, wet.	ER4A-08
SAND and SILT, fine grained sand, poorly graded, brown, very soft, wet.	ER4A-09
SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded to subangular, trace silt, well graded, grey, medium dense, wet.	**ER4A-10**
SAND, fine to coarse grained, some gravel, fine to coarse, subrounded to subangular, some silt, well graded, brown, medium dense, wet. At 16.8 m - possible weathered bedrock.	ER4A-11 ER4A-12
BEDROCK, siltstone, dark grey, weathered, mixed with some sand, fine to coarse grained, trace gravel, subrounded to rounded. At 19.2 m - bedrock competent, soft.	ER4A-13 ER4A-14



NOTES
Bolded sample denotes sample analyzed.

QA/QC: MB 2020 06 22 Print Date:2020-12-02

FINAL

SNC•LAVALIN	Client **Teck Coal Limited**	**Borehole No. : LC_BH_ER4A**
	Location **Regional Groundwater Monitoring**	PAGE 3 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2020 05 20	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1192.955	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1193.924	Date Drilled:	2020 05 08
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5525918.369	Easting: 653205.305	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ☐ Odex

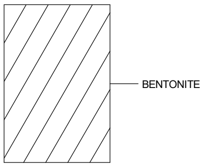
Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- Solid PVC
- Slotted PVC

Well Name 1: LC_MW_ER4A

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm) 10^1 10^2 10^3 10^4
20–21.3	BEDROCK, siltstone, dark grey, weathered, mixed with some sand, fine to coarse grained, trace gravel, subrounded to rounded. *(continued)*	▨	▨	ER4A-14			
21.3	Bottom of hole at 21.3 m.						



Depth scale: 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30

NOTES
Bolded sample denotes sample analyzed.

QA/QC: MB 2020 06 22 Print Date:2020-12-02

FINAL

SNC•LAVALIN	Client **Teck Coal Limited**	**Borehole No. : LC_BH_ER4B**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 1

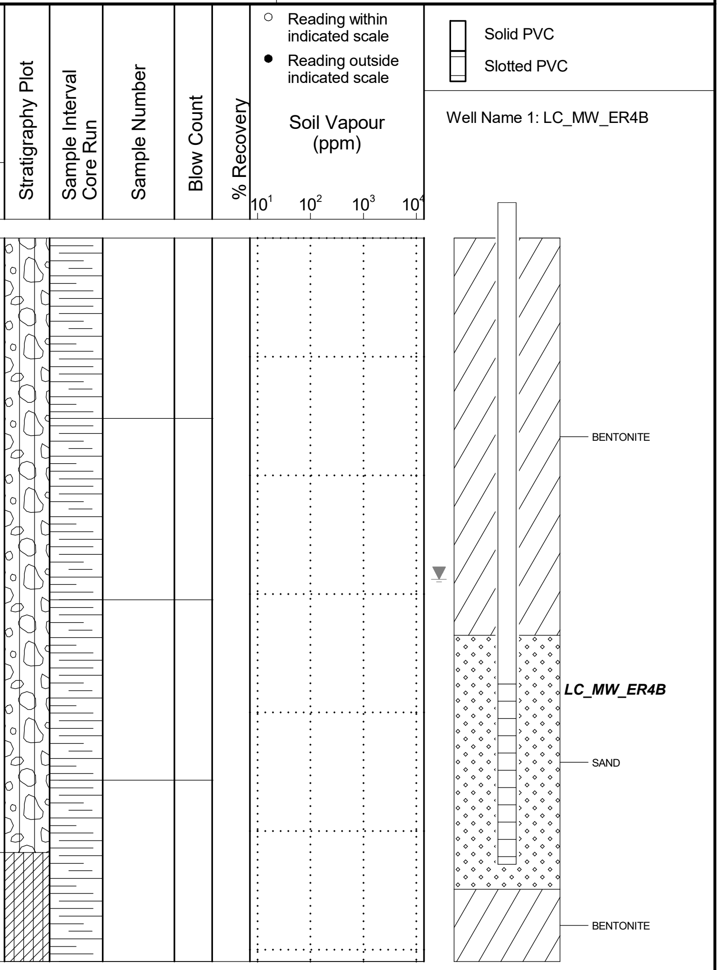
Drilling Contractor	Owen's Drilling	Date Monitored	2020 05 20	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1192.892	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1193.852	Date Drilled:	2020 05 09
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5525917.200	Easting: 653205.946	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▤ Odex

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

Depth in Metres

Soil Description



Depth (m)	Soil Description
0	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subangular to subrounded, some silt, well graded, brown, loose, damp, organics. At 0.45 m - no organics.
4	At 4.0 m - moist.
	At 4.6 m - wet.
5.2	CLAY, some silt, some sand, fine to coarse grained, some gravel, fine to coarse, angular to subangular, well graded, brown, firm, low plastic, wet.
6.1	Bottom of hole at 6.1 m.

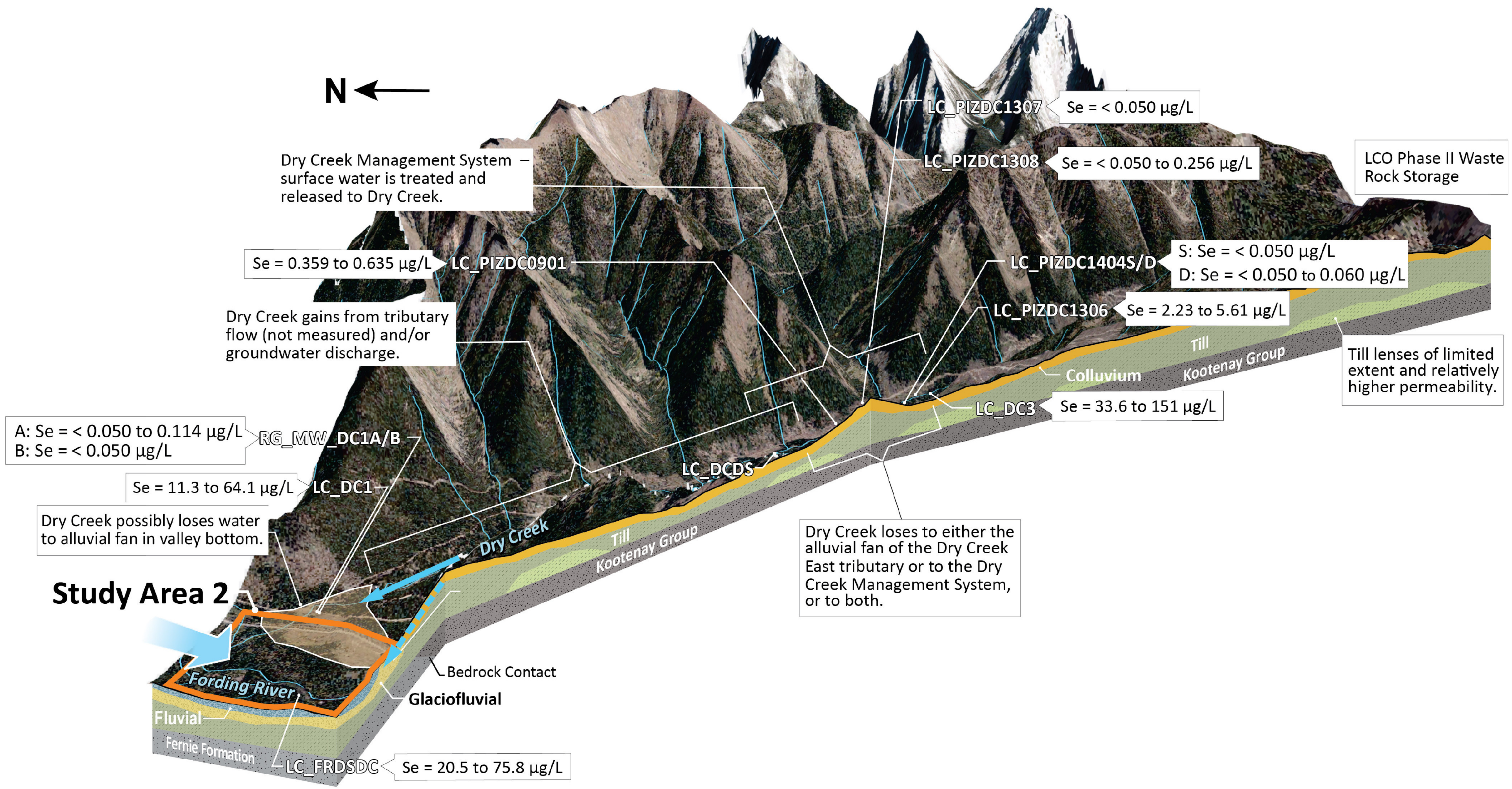
0
1
2
3
4
5
6
7
8
9
10

NOTES

QA/QC: MB 2020 06 22 Print Date:2020-12-02

Appendix II

Block Diagrams



Flow Legend

- Main Stem Down-Valley Groundwater
- Upland or Tributary Groundwater
- Surface Water

NOTES:
1. Original in colour.
2. All concentrations shown are for 2022 minimum and maximum unless otherwise stated.
3. Subsurface geology is not to scale.
4. Vertical exaggeration 2x for topographic profile.

References:
1. Graphics from Brick Tudor Studios, LLC.
2. Bedrock geology derived from Monahan, 2000, BC Government.

Revisions:
0 - CW - 2023-02-15 - DRAFT - MG
1 - CW - 2023-03-27 - FINAL - MG

CLIENT: Teck Coal Limited

PROJECT LOCATION: Elk Valley, BC

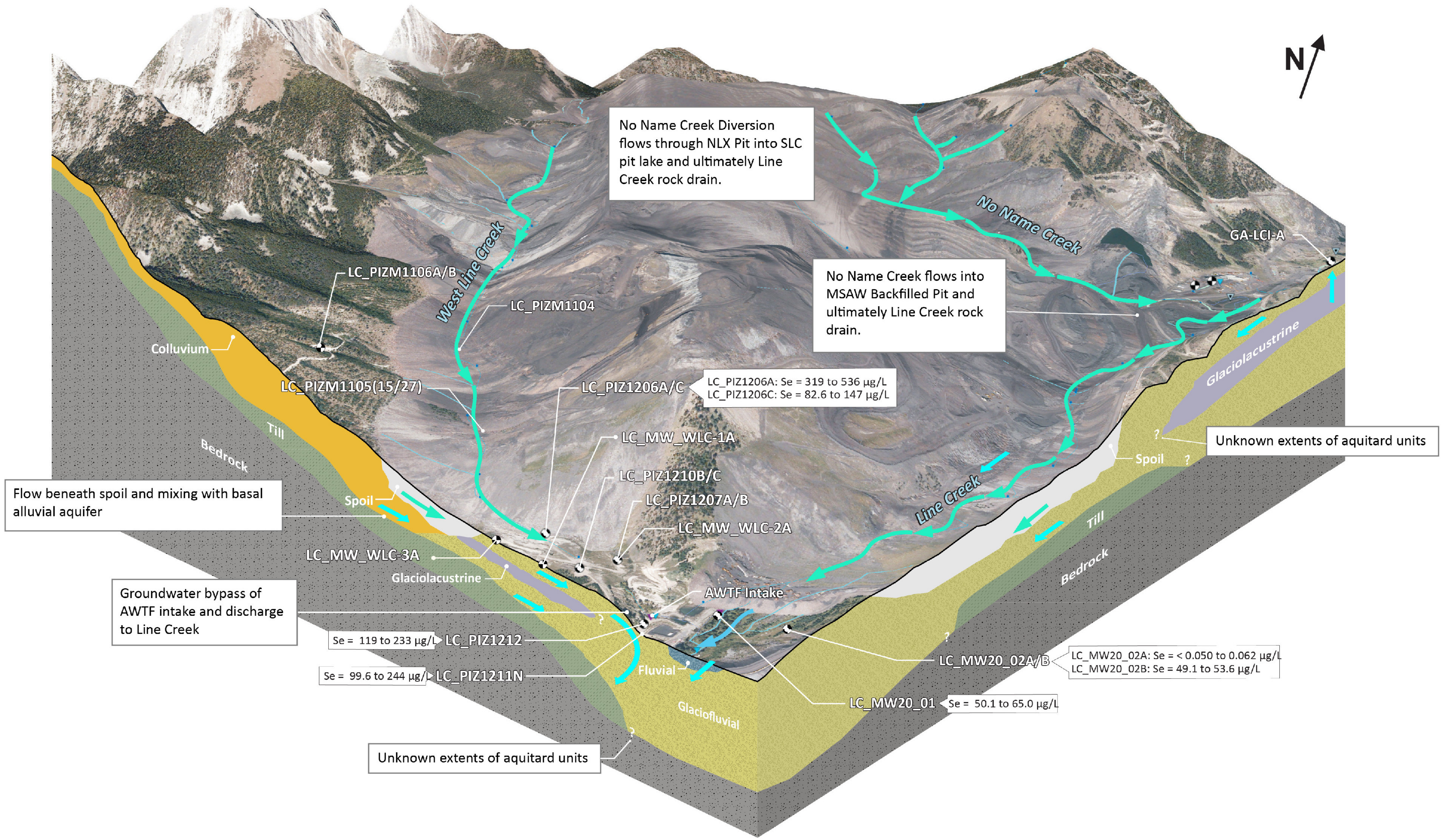
SNC·LAVALIN

Block Diagram Showing 3D Conceptual Hydrogeology and Transport Pathways of Order Constituents at LCO - Dry Creek and Study Area 2

BY: CW	SCALE:	DATE: 2023-03-13	REF No:
CHK'D: MG	Proj Coord Sys:		**DIAGRAM LC-01**

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2021

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-BlockDiagram_LC01.mxd



No Name Creek Diversion flows through NLX Pit into SLC pit lake and ultimately Line Creek rock drain.

No Name Creek flows into MSAW Backfilled Pit and ultimately Line Creek rock drain.

LC_PIZ1206A: Se = 319 to 536 µg/L
LC_PIZ1206C: Se = 82.6 to 147 µg/L

Unknown extents of aquitard units

Flow beneath spoil and mixing with basal alluvial aquifer

Groundwater bypass of AWTF intake and discharge to Line Creek

Se = 119 to 233 µg/L

Se = 99.6 to 244 µg/L

LC_MW20_02A: Se = < 0.050 to 0.062 µg/L
LC_MW20_02B: Se = 49.1 to 53.6 µg/L

Se = 50.1 to 65.0 µg/L

Unknown extents of aquitard units

Flow Legend

Surface Water Flow Pathway

Subsurface (Rock Drain) Flow Pathway

Groundwater Flow Pathway

NOTES:
1. Original in colour.
2. Numerical scale reflects full-size print. Print scaling will distort this scale, however scale bar will remain accurate.
3. All concentrations shown are for 2022 minimum and maximum unless otherwise stated.
4. Sub-surface geology not to scale
5. Vertical exaggeration 2x for topographic profile.
6. Surface water and groundwater concentrations are dissolved selenium.

References:
1. Graphics from Brick Tudor Studios, LLC.
2. Bedrock geology derived from Monahan, 2000, BC Government.

Revisions:
0 - CW - 2023-02-15 - DRAFT - MG
1 - CW - 2023-03-27 - FINAL - MG

CLIENT:
Teck Coal Limited

PROJECT LOCATION:
Elk Valley, BC

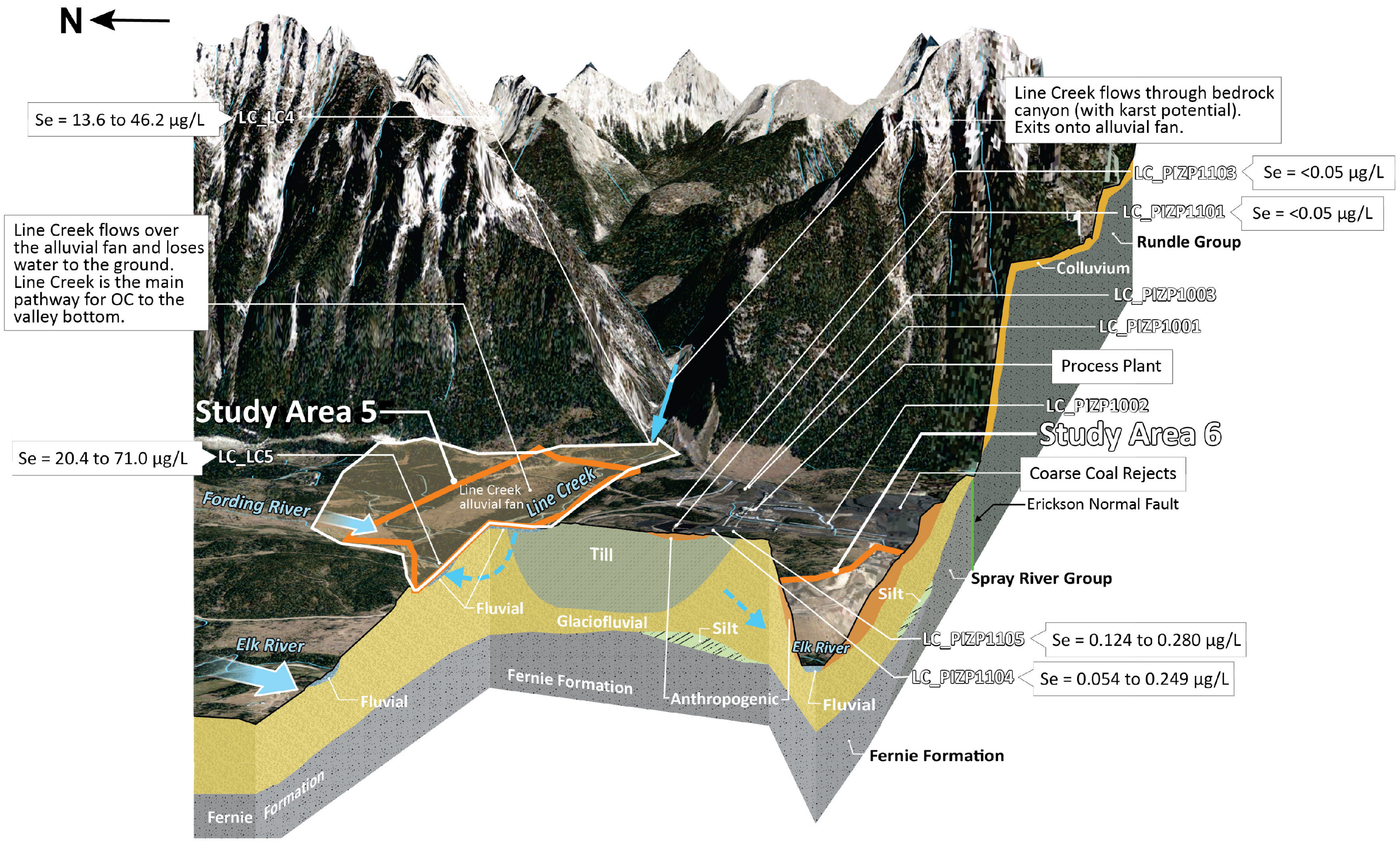
SNC·LAVALIN

Block Diagram Showing 3D Conceptual Hydrogeology and Transport Pathways of Order Constituents at LCO - Centre Line Creek and West Line Creek

BY: CW	SCALE:	DATE: 2023-03-13	REF No:
CHK'D: MG	Proj Coord Sys:		**DIAGRAM LC-02**

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-BlockDiagram_LC02.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2021



Flow Legend

- Main Stem Down-Valley Groundwater
- Upland or Tributary Groundwater
- Surface Water

NOTES:

1. Original in colour.
2. All concentrations shown are for 2022 minimum and maximum unless otherwise stated.
3. Subsurface geology is not to scale.
4. Vertical exaggeration 2x for topographic profile.
5. There are multiple hydrostratigraphic zones targeted by the monitoring wells

References:

1. Graphics from Brick Tudor Studios, LLC.
2. Bedrock geology derived from Monahan, 2000, BC Government.

Revisions:

0 - CW - 2023-02-15 - DRAFT - MG
1 - CW - 2023-03-27 - FINAL - MG

CLIENT:
Teck Coal Limited

PROJECT LOCATION:
Elk Valley, BC

SNC·LAVALIN

Block Diagram Showing 3D Conceptual Hydrogeology and Transport Pathways of Order Constituents at LCO - Line Creek, Process Plant, Elk River, and Study Areas 5/6

BY: CW
SCALE:
DATE: 2023-03-13
REF No: **DIAGRAM LC-03**
CHK'D: MG
Proj Coord Sys:

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-BlockDiagram_LC03.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2021

Appendix III

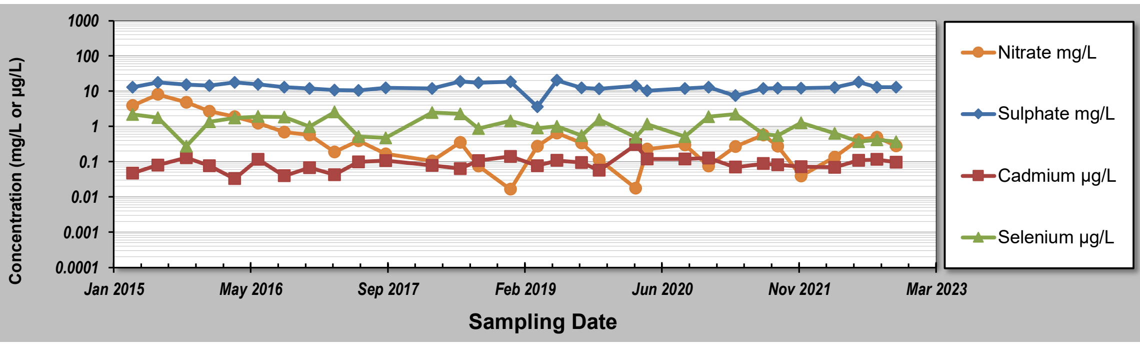
Mann-Kendall Analyses

GSI MANN-KENDALL TOOLKIT

Evaluation Date: 02-Jan-23
Facility Name: Teck Coal Regional Groundwater - LCO
Conducted By: MF

Job ID: 635544
Location LC_PIZDC0901
Reviewed By: MG

Sampling Event	Sampling Date	Nitrate	Sulphate	Cadmium	Selenium				
Parameter units		mg/L	mg/L	µg/L	µg/L				
		LC_PIZDC0901 CONCENTRATION							
1	11-Mar-15	3.9000	12.90	0.0470	2.180				
2	10-Jun-15	8.1000	17.60	0.0791	1.760				
3	22-Sep-15	4.8500	15.10	0.1280	0.275				
4	16-Dec-15	2.6700	14.20	0.0767	1.340				
5	16-Mar-16	1.8700	17.80	0.0327	1.740				
6	10-Jun-16	1.2300	15.70	0.1160	1.900				
7	13-Sep-16	0.6850	12.80	0.0395	1.850				
8	15-Dec-16	0.5750	11.90	0.0680	0.990				
9	16-Mar-17	0.1890	10.70	0.0427	2.560				
10	12-Jun-17	0.3900	10.50	0.0983	0.513				
11	19-Sep-17	0.1660	12.40	0.1070	0.476				
12	7-Mar-18	0.1050	11.80	0.0777	2.460				
13	18-Jun-18	0.3510	18.80	0.0633	2.290				
14	23-Aug-18	0.0751	17.20	0.1060	0.867				
15	18-Dec-18	0.0165	18.30	0.1390	1.430				
16	26-Mar-19	0.2730	3.61	0.0757	0.894				
17	5-Jun-19	0.6440	20.30	0.1080	1.010				
18	3-Sep-19	0.3390	12.30	0.0948	0.550				
19	6-Nov-19	0.1130	11.70	0.0564	1.570				
20	18-Mar-20	0.0175	14.00	0.3010	0.492				
21	30-Apr-20	0.2260	10.30	0.1190	1.150				
22	14-Sep-20	0.2990	11.90	0.1180	0.513				
23	10-Dec-20	0.0744	12.80	0.1270	1.870				
24	18-Mar-21	0.2690	7.40	0.0695	2.210				
25	27-Jun-21	0.5700	11.80	0.0876	0.607				
26	19-Aug-21	0.2750	12.20	0.0806	0.544				
27	12-Nov-21	0.0389	12.10	0.0722	1.270				
28	14-Mar-22	0.1350	12.60	0.0690	0.635				
29	10-Jun-22	0.4170	17.90	0.1100	0.369				
30	15-Aug-22	0.4960	12.80	0.1150	0.419				
31	25-Oct-22	0.2790	12.80	0.0964	0.366				
32									
33									
34									
35									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		1.82	0.26	0.50	0.60				
Mann-Kendall Statistic (S):		-179	-63	83	-142				
Confidence Factor:		99.9%	85.3%	91.8%	99.3%				
Concentration Trend:		Decreasing	Stable	Prob. Increasing	Decreasing				



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

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GSI Environmental Inc., www.gsi-net.com

GSI MANN-KENDALL TOOLKIT

Evaluation Date: 02-Jan-23
Facility Name: Teck Coal Regional Groundwater - LCO
Conducted By: MF

Job ID: 635544
Location LC_PIZDC1306
Reviewed By: MG

Parameter		Nitrate	Sulphate	Cadmium	Selenium				
units		mg/L	mg/L	µg/L	µg/L				
Sampling Event	**Sampling Date**	**LC_PIZDC1306 CONCENTRATION**							
1	9-Jun-15	0.1760	6.53	0.1130	3.240				
2	22-Sep-15	0.0800	6.67	0.1030	2.960				
3	15-Dec-15	0.0906	6.33	0.1210	2.150				
4	16-Mar-16	0.0712	6.03	0.0233	1.540				
5	10-Jun-16	0.1050	6.14	0.1410	2.230				
6	13-Sep-16	0.1100	6.47	0.1240	2.820				
7	12-Jun-17	0.2010	6.93	0.1310	5.600				
8	14-Sep-17	0.1550	6.52	0.1330	3.590				
9	1-Nov-17	0.1350	6.00	0.1250	3.060				
10	25-Jun-18	0.2280	8.02	0.1240	5.180				
11	23-Aug-18	0.1560	6.63	0.3930	4.560				
12	26-Nov-18	0.2650	6.88	0.1570	4.130				
13	25-Mar-19	0.0962	5.97	0.1310	2.100				
14	29-May-19	0.1710	6.85	0.1310	3.050				
15	15-Aug-19	0.1540	6.97	0.1190	4.120				
16	7-Nov-19	0.1140	6.06	0.1400	3.360				
17	27-Feb-20	0.0917	5.59	0.1230	2.350				
18	30-Apr-20	0.2040	4.77	0.1260	2.630				
19	14-Sep-20	0.1880	6.82	0.1660	4.810				
20	2-Dec-20	0.1340	5.88	0.1110	3.860				
21	18-Mar-21	0.1180	5.86	0.1180	2.150				
22	11-Jun-21	0.1830	6.75	0.1420	4.340				
23	17-Sep-21	0.1320	6.46	0.1210	3.670				
24	17-Nov-21	0.1800	6.28	0.1160	2.680				
25	17-Apr-22	0.2650	5.25	0.1180	2.230				
26	16-Aug-22	0.2370	7.58	0.1250	5.610				
27	18-Oct-22	0.1560	6.76	0.1280	5.290				
28									
29									
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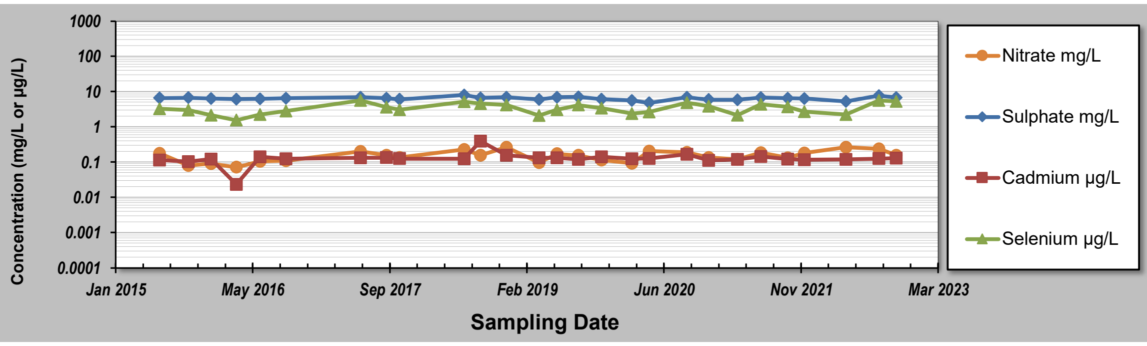
46									
Coefficient of Variation:		0.35	0.10	0.43	0.34				
Mann-Kendall Statistic (S):		103	-29	12	57				
Confidence Factor:		98.4%	71.9%	59.0%	87.7%				
Concentration Trend:		Increasing	Stable	No Trend	No Trend				



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

Evaluation Date: 02-Jan-23
Facility Name: Teck Coal Regional Groundwater - LCO
Conducted By: MF

Job ID: 635544
Location LC_PIZDC1307
Reviewed By: MG

	Parameter	Nitrate							
	units	mg/L							
Sampling Event	**Sampling Date**	**LC_PIZDC1307 CONCENTRATION**							
1	10-Mar-15	0.0073							
2	10-Jun-15	0.0050							
3	22-Sep-15	0.0050							
4	16-Dec-15	0.0050							
5	16-Mar-16	0.0050							
6	10-Jun-16	0.0050							
7	13-Sep-16	0.0050							
8	13-Dec-16	0.0050							
9	16-Mar-17	0.0050							
10	12-Jun-17	0.0050							
11	19-Sep-17	0.0050							
12	1-Nov-17	0.0058							
13	7-Mar-18	0.0050							
14	13-Jun-18	0.0050							
15	29-Aug-18	0.0050							
16	26-Nov-18	0.0050							
17	21-Mar-19	0.0050							
18	29-May-19	0.0104							
19	22-Aug-19	0.0050							
20	30-Oct-19	0.0121							
21	26-Feb-20	0.0050							
22	22-Apr-20	0.0112							
23	9-Sep-20	0.0050							
24	25-Nov-20	0.0050							
25	10-Mar-21	0.0113							
26	19-May-21	0.0050							
27	17-Sep-21	0.0090							
28	18-Nov-21	0.0050							
29	4-Mar-22	0.0050							
30	6-May-22	0.0050							
31	25-Aug-22	0.0082							
32	26-Oct-22	0.0050							
33									
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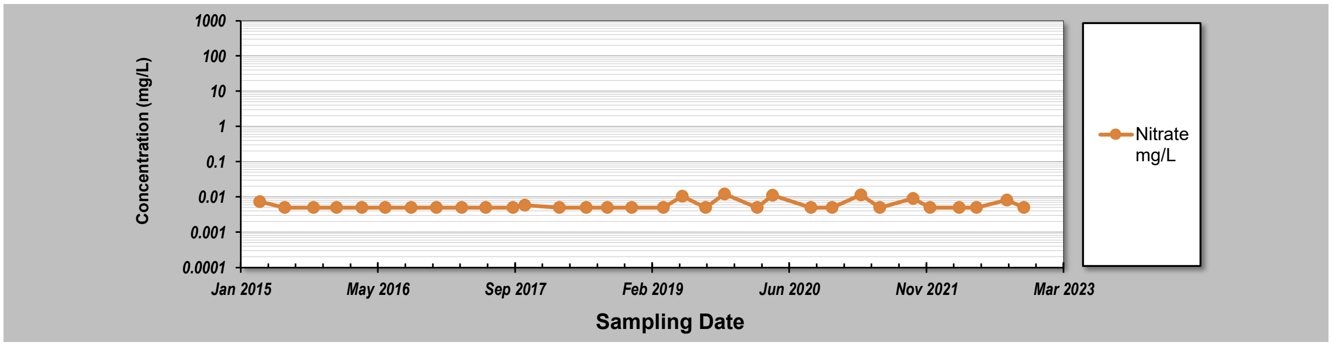
46									
	Coefficient of Variation:	0.36							
	Mann-Kendall Statistic (S):	52							
	Confidence Factor:	79.4%							
	Concentration Trend:	No Trend							



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

Evaluation Date: 02-Jan-23
Facility Name: Teck Coal Regional Groundwater - LCO
Conducted By: MF

Job ID: 635544
Location LC_PIZDC1308
Reviewed By: MG

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	Sampling Date	LC_PIZDC1308 CONCENTRATION							
1	10-Mar-15	0.1120	4.78	0.0001	0.270				
2	10-Jun-15	0.6670	5.38	0.1320	0.686				
3	22-Sep-15	0.3840	4.24	0.1460	0.383				
4	16-Dec-15	0.1070	4.41	0.1250	0.177				
5	16-Mar-16	0.0082	3.23	0.0001	0.050				
6	10-Jun-16	0.2580	5.11	0.1610	0.317				
7	13-Sep-16	0.0326	4.60	0.0950	0.141				
8	13-Dec-16	0.0432	5.09	0.1700	0.050				
9	16-Mar-17	0.0055	2.50	0.0091	0.050				
10	12-Jun-17	0.1590	4.74	0.1330	0.301				
11	19-Sep-17	0.0050	2.06	0.0253	0.050				
12	1-Nov-17	0.0627	2.02	0.0361	0.050				
13	7-Mar-18	0.0052	2.10	0.0001	0.050				
14	13-Jun-18	0.1810	5.53	0.1160	0.160				
15	29-Aug-18	0.0383	5.00	0.1270	0.098				
16	27-Nov-18	0.0050	5.10	0.0211	0.058				
17	21-Mar-19	0.0050	5.13	0.0059	0.072				
18	29-May-19	0.1150	5.74	0.1260	0.266				
19	22-Aug-19	0.1260	5.47	0.0351	0.210				
20	30-Oct-19	0.0156	4.52	0.0469	0.075				
21	26-Feb-20	0.0050	2.90	0.0001	0.050				
22	22-Apr-20	0.0636	5.54	0.0279	0.156				
23	9-Sep-20	0.0417	4.77	0.0533	0.071				
24	25-Nov-20	0.0050	3.04	0.0272	0.050				
25	10-Mar-21	0.0143	1.84	0.0001	0.050				
26	19-May-21	0.1710	5.41	0.1780	0.232				
27	17-Sep-21	0.0656	5.64	0.0854	0.091				
28	18-Nov-21	0.0050	3.39	0.0392	0.068				
29	4-Mar-22	0.0050	1.93	0.0192	0.050				
30	6-May-22	0.1080	5.84	0.1550	0.256				
31	25-Aug-22	0.1080	5.31	0.1350	0.111				
32	26-Oct-22	0.0098	3.80	0.0350	0.051				
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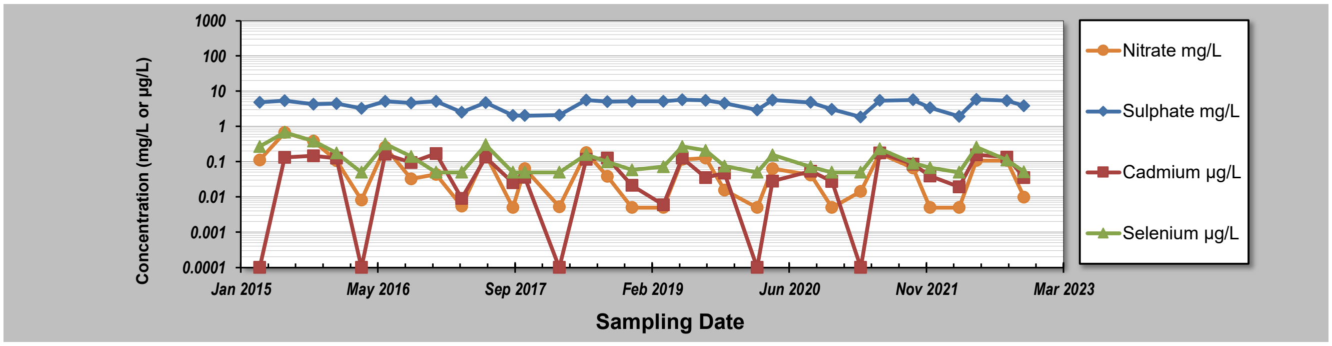
Coefficient of Variation:		1.48	0.31	0.86	0.93				
Mann-Kendall Statistic (S):		-108	36	-18	-87				
Confidence Factor:		95.9%	71.3%	60.8%	91.8%				
Concentration Trend:		Decreasing	No Trend	Stable	Prob. Decreasing				



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
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GSI MANN-KENDALL TOOLKIT

Evaluation Date: 02-Jan-23
Facility Name: Teck Coal Regional Groundwater - LCO
Conducted By: MF

Job ID: 635544
Location LC_PIZDC1404S
Reviewed By: MG

Parameter	Sulphate							
units	mg/L							

Sampling Event	Sampling Date	LC_PIZDC1404S CONCENTRATION							
1	9-Mar-15	6.30							
2	9-Jun-15	5.79							
3	22-Sep-15	5.50							
4	15-Dec-15	5.52							
5	16-Mar-16	5.31							
6	10-Jun-16	5.22							
7	13-Sep-16	5.85							
8	13-Dec-16	5.36							
9	16-Mar-17	5.28							
10	12-Jun-17	4.64							
11	14-Sep-17	4.82							
12	1-Nov-17	4.68							
13	6-Mar-18	4.34							
14	11-Jun-18	0.30							
15	20-Aug-18	5.13							
16	14-Nov-18	4.95							
17	20-Mar-19	4.88							
18	23-May-19	4.80							
19	15-Aug-19	5.08							
20	23-Oct-19	5.57							
21	10-Mar-20	4.55							
22	28-May-20	4.28							
23	9-Sep-20	4.31							
24	2-Dec-20	4.20							
25	17-Mar-21	5.37							
26	24-Jun-21	4.75							
27	26-Aug-21	4.74							
28	10-Nov-21	4.79							
29	8-Mar-22	5.05							
30	11-May-22	5.54							
31	25-Aug-22	4.79							
32	18-Oct-22	4.52							
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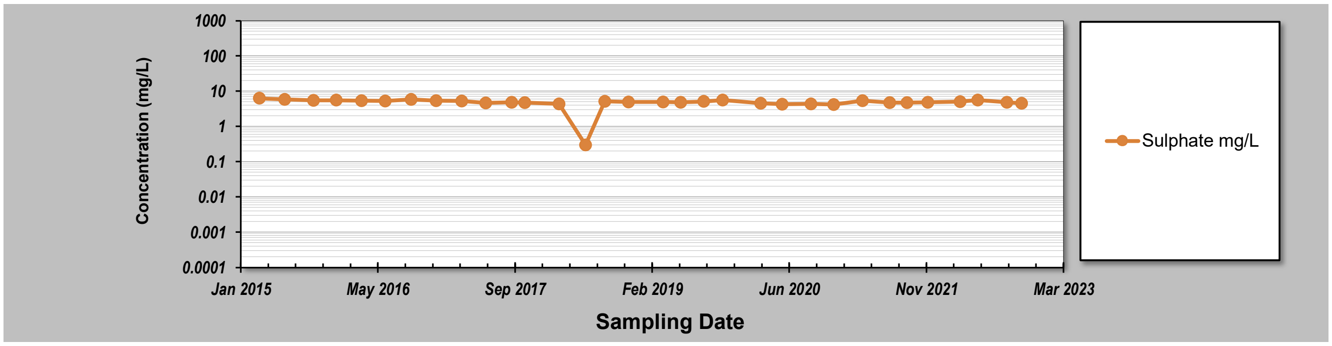
46									
Coefficient of Variation:		0.20							
Mann-Kendall Statistic (S):		-177							
Confidence Factor:		99.8%							
Concentration Trend:		Decreasing							



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

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GSI MANN-KENDALL TOOLKIT

Evaluation Date:	02-Jan-23	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - LCO	**Location**	LC_MW20_01
Conducted By:	MF	**Reviewed By:**	MG

Parameter	Nitrate	Sulphate	Cadmium	Selenium				
units	mg/L	mg/L	µg/L	µg/L				

Sampling Event	Sampling Date	LC_MW20_01 CONCENTRATION							
1	14-Jul-20	15.6000	265.00	0.0340	46.400				
2	28-Sep-20	13.3000	240.00	0.0224	43.800				
3	28-Jan-21	13.4000	248.00	0.0288	57.100				
4	16-Apr-21	16.8000	315.00	0.0304	63.900				
5	26-Aug-21	13.2000	250.00	0.0284	42.300				
6	23-Nov-21	13.0000	275.00	0.0324	52.500				
7	1-Mar-22	13.0000	274.00	0.0351	50.500				
8	2-Jun-22	13.6000	275.00	0.0289	50.600				
9	17-Aug-22	12.9000	277.00	0.0235	56.600				
10	17-Oct-22	12.6000	261.00	0.0247	65.000				
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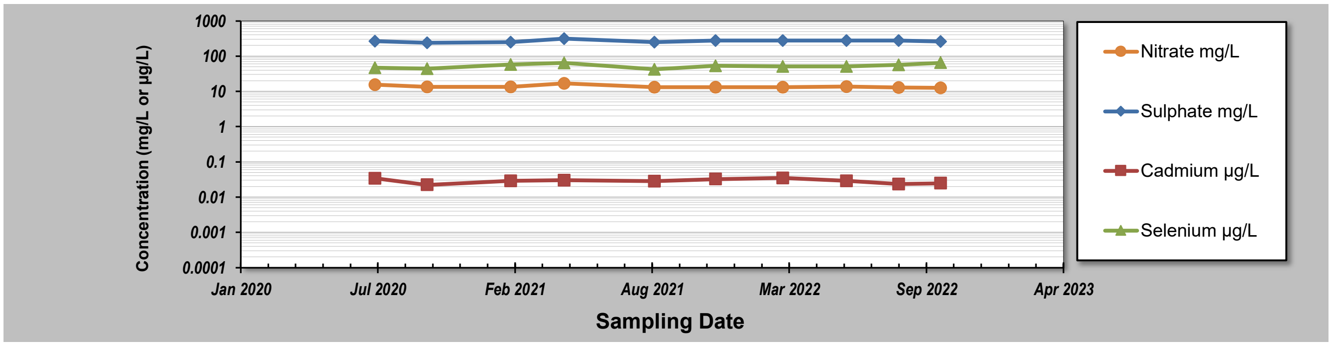
46									
Coefficient of Variation:		0.10	0.08	0.15	0.15				
Mann-Kendall Statistic (S):		-26	14	-5	15				
Confidence Factor:		98.9%	87.3%	63.6%	89.2%				
Concentration Trend:		Decreasing	No Trend	Stable	No Trend				



Notes:
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GSI MANN-KENDALL TOOLKIT

Evaluation Date:	02-Jan-23	Job ID:	635544
Facility Name:	Teck Coal Regional Groundwater - LCO	Location	MW20_02A
Conducted By:	MF	Reviewed By:	MG

Parameter	Sulphate							
units	mg/L							

Sampling Event	Sampling Date	MW20_02A CONCENTRATION							
1	14-Jul-20	207.00							
2	2-Oct-20	230.00							
3	28-Jan-21	210.00							
4	17-Apr-21	241.00							
5	24-Aug-21	258.00							
6	24-Nov-21	259.00							
7	2-Mar-22	248.00							
8	2-Jun-22	258.00							
9	17-Aug-22	274.00							
10	17-Oct-22	264.00							
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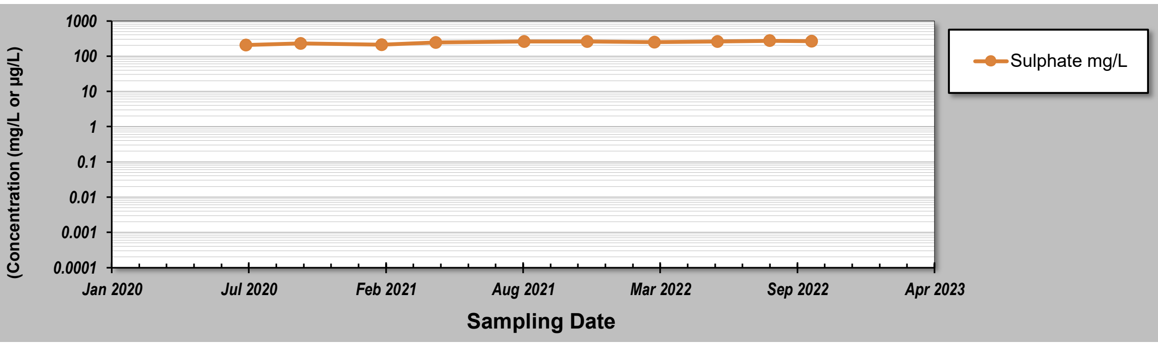
46									
Coefficient of Variation:		0.09							
Mann-Kendall Statistic (S):		34							
Confidence Factor:		100.0%							
Concentration Trend:		Increasing							



Notes:

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GSI MANN-KENDALL TOOLKIT

Evaluation Date: 02-Jan-23
Facility Name: Teck Coal Regional Groundwater - LCO
Conducted By: MF

Job ID: 635544
Location LC_MW20_02B
Reviewed By: MG

Parameter		**Nitrate**	**Sulphate**	**Cadmium**	**Selenium**				
units		mg/L	mg/L	µg/L	µg/L				
Sampling Event	**Sampling Date**	**LC_MW20_02B CONCENTRATION**							
1	14-Jul-20	15.7000	236.00	0.0333	40.900				
2	2-Oct-20	10.6000	202.00	0.0239	40.800				
3	28-Jan-21	12.0000	219.00	0.0294	46.900				
4	17-Apr-21	14.6000	257.00	0.0242	46.400				
5	24-Aug-21	12.3000	226.00	0.0429	39.500				
6	24-Nov-21	9.8000	216.00	0.0309	39.500				
7	2-Mar-22	12.1000	254.00	0.0298	51.800				
8	2-Jun-22	13.9000	257.00	0.0302	53.600				
9	17-Aug-22	12.2000	251.00	0.0243	51.200				
10	17-Oct-22	10.0000	228.00	0.0277	49.100				
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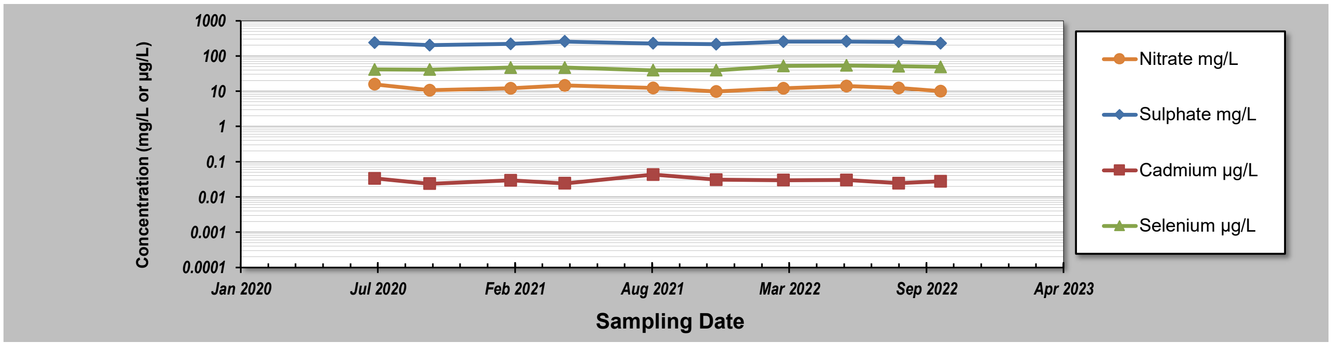
Coefficient of Variation:		0.16	0.08	0.19	0.12				
Mann-Kendall Statistic (S):		-9	10	-3	14				
Confidence Factor:		75.8%	78.4%	56.9%	87.3%				
Concentration Trend:		Stable	No Trend	Stable	No Trend				



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
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GSI MANN-KENDALL TOOLKIT

Evaluation Date: 02-Jan-23
Facility Name: Teck Coal Regional Groundwater - LCO
Conducted By: MF

Job ID: 635544
Location LC_MW20_03
Reviewed By: MG

Parameter		Sulphate	Cadmium						
units		mg/L	µg/L						
Sampling Event	**Sampling Date**	**LC_MW20_03 CONCENTRATION**							
1	16-Jul-20	18.40	0.022						
2	14-Oct-20	19.50	0.015						
3	8-Feb-21	18.40	0.019						
4	17-Apr-21	17.00	0.006						
5	26-Aug-21	18.20	0.013						
6	24-Nov-21	18.10	0.015						
7	2-Mar-22	18.50	0.032						
8	3-Jun-22	17.40	0.012						
9	18-Aug-22	16.60	0.015						
10	19-Oct-22	18.60	0.007						
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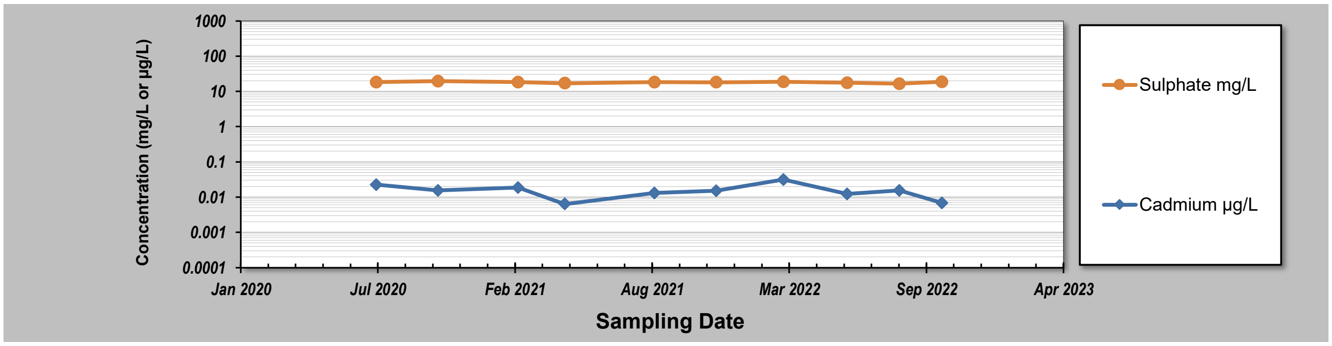
46									
Coefficient of Variation:		0.05	0.47						
Mann-Kendall Statistic (S):		-10	-12						
Confidence Factor:		78.4%	83.2%						
Concentration Trend:		Stable	Stable						



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

Evaluation Date: 02-Jan-23
Facility Name: Teck Coal Regional Groundwater - LCO
Conducted By: MF
Job ID: 635544
Location LC_PIZ1206A
Reviewed By: MG

Sampling Event	Sampling Date	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
		LC_PIZ1206A CONCENTRATION							
1	17-Jun-20	11.8000	826.00	0.0435	376.000				
2	13-Oct-20	10.6000	896.00	0.0430	377.000				
3	28-Jan-21	12.1000	1020.00	0.0530	425.000				
4	15-Apr-21	12.6000	1070.00	0.0540	389.000				
5	25-Aug-21	9.6800	859.00	0.0568	291.000				
6	22-Nov-21	9.7800	827.00	0.0488	315.000				
7	2-Mar-22	11.5000	1040.00	0.0589	361.000				
8	1-Jun-22	12.5000	1180.00	0.0471	385.000				
9	17-Aug-22	9.1700	852.00	0.0438	319.000				
10	2-Nov-22	10.5000	996.00	0.0563	536.000				
11									
12									
13									
14									
15									
16									
17									
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19									
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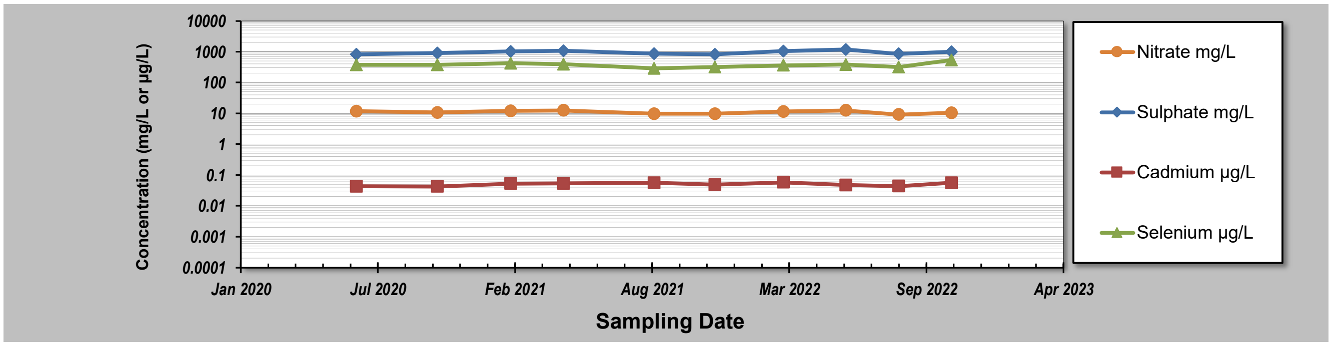
43									
44									
45									
46									
Coefficient of Variation:		0.11	0.13	0.12	0.18				
Mann-Kendall Statistic (S):		-9	9	11	3				
Confidence Factor:		75.8%	75.8%	81.0%	56.9%				
Concentration Trend:		Stable	No Trend	No Trend	No Trend				



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

Evaluation Date: 02-Jan-23
Facility Name: Teck Coal Regional Groundwater - LCO
Conducted By: MF

Job ID: 635544
Location LC_PIZ1206C
Reviewed By: MG

Parameter	Nitrate	Sulphate	Cadmium	Selenium				
units	mg/L	mg/L	µg/L	µg/L				

Sampling Event	Sampling Date	LC_PIZ1206C CONCENTRATION							
1	17-Jun-20	2.0700	350.00	0.1320	56.200				
2	22-Oct-20	2.2600	388.00	0.0634	59.200				
3	29-Jan-21	2.3700	368.00	0.0555	68.900				
4	16-Apr-21	2.6700	417.00	0.0502	72.600				
5	25-Aug-21	3.1700	456.00	0.0355	73.800				
6	23-Nov-21	3.3700	468.00	0.0302	89.600				
7	3-Mar-22	3.5100	468.00	0.0322	82.600				
8	1-Jun-22	3.7400	521.00	0.0315	94.800				
9	26-Sep-22	4.2600	518.00	0.0652	131.000				
10	2-Nov-22	4.3400	521.00	0.0238	147.000				
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12									
13									
14									
15									
16									
17									
18									
19									
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42									
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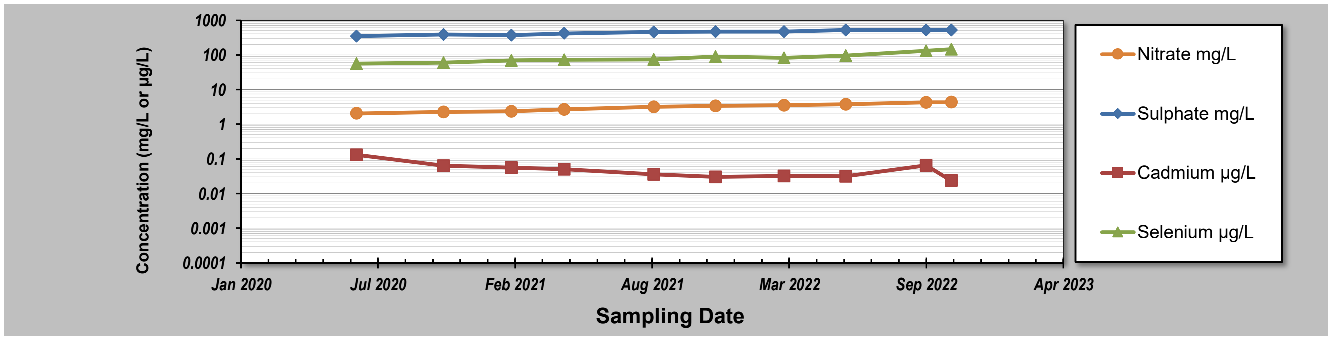
46									
Coefficient of Variation:		0.26	0.14	0.61	0.34				
Mann-Kendall Statistic (S):		45	39	-27	43				
Confidence Factor:		>99.9%	>99.9%	99.2%	>99.9%				
Concentration Trend:		Increasing	Increasing	Decreasing	Increasing				



Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

Evaluation Date: 02-Jan-23
Facility Name: Teck Coal Regional Groundwater - LCO
Conducted By: MF

Job ID: 635544
Location LC_PIZ1211N
Reviewed By: MG

	Parameter	**Nitrate**	**Sulphate**	**Cadmium**	**Selenium**				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	**Sampling Date**	**LC_PIZ1211N CONCENTRATION**							
1	17-Jun-20	8.1300	358.00	0.0397	161.000				
2	28-Sep-20	16.0000	397.00	0.0469	99.700				
3	8-Feb-21	20.2000	480.00	0.0406	127.000				
4	16-Apr-21	16.7000	396.00	0.0471	96.300				
5	24-Aug-21	12.8000	498.00	0.0619	170.000				
6	23-Nov-21	14.8000	427.00	0.0541	120.000				
7	1-Mar-22	19.8000	472.00	0.0557	99.600				
8	2-Jun-22	12.8000	646.00	0.0702	244.000				
9	17-Aug-22	10.6000	518.00	0.0602	184.000				
10	19-Oct-22	20.2000	599.00	0.0540	113.000				
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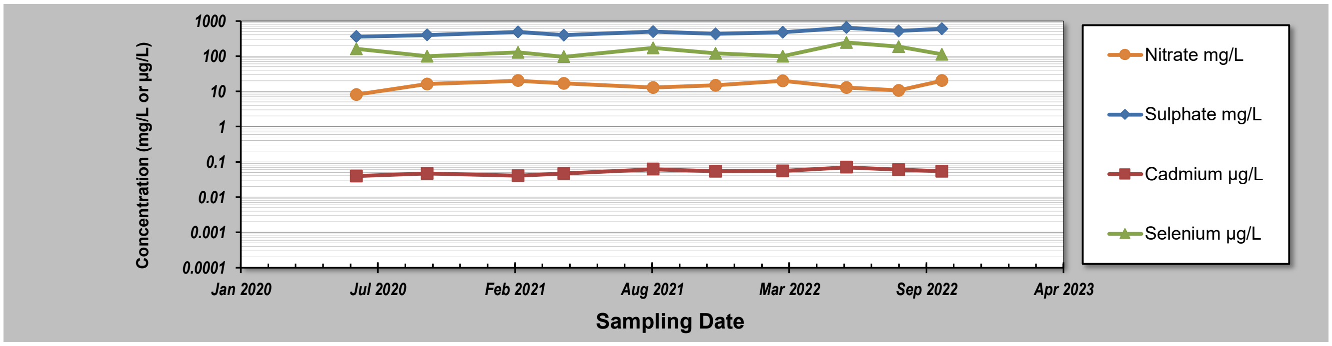
45									
46									
Coefficient of Variation:		**0.27**	**0.19**	**0.18**	**0.34**				
Mann-Kendall Statistic (S):		**3**	**29**	**25**	**5**				
Confidence Factor:		**56.9%**	**99.5%**	**98.6%**	**63.6%**				
Concentration Trend:		No Trend	Increasing	Increasing	No Trend				



Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

Evaluation Date: 02-Jan-23
Facility Name: Teck Coal Regional Groundwater - LCO
Conducted By: MF

Job ID: 635544
Location LC_PIZ1212
Reviewed By: MG

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	Sampling Date	LC_PIZ1212 CONCENTRATION							
1	17-Jun-20	10.0000	474.00	0.0962	211.000				
2	2-Oct-20	15.7000	420.00	0.0986	129.000				
3	29-Jan-21	18.8000	463.00	0.0994	139.000				
4	16-Apr-21	17.6000	442.00	0.0784	119.000				
5	24-Aug-21	14.9000	372.00	0.0856	99.600				
6	23-Nov-21	15.5000	455.00	0.0916	127.000				
7	1-Mar-22	19.5000	511.00	0.0891	119.000				
8	2-Jun-22	12.6000	599.00	0.1160	233.000				
9	17-Aug-22	14.0000	458.00	0.0993	147.000				
10	19-Oct-22	13.6000	434.00	0.0963	131.000				
11									
12									
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15									
16									
17									
18									
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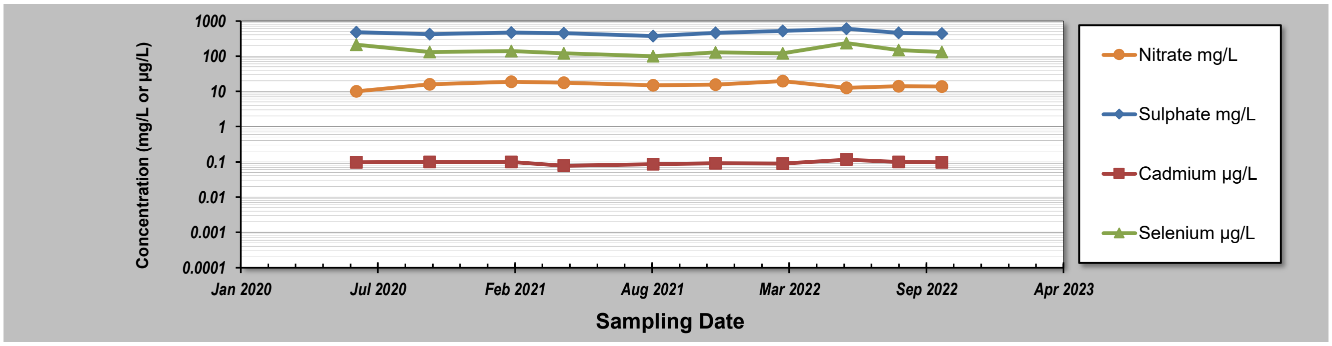
45									
46									
Coefficient of Variation:		0.19	0.13	0.11	0.29				
Mann-Kendall Statistic (S):		-7	3	7	0				
Confidence Factor:		70.0%	56.9%	70.0%	45.6%				
Concentration Trend:		Stable	No Trend	No Trend	Stable				



Notes:

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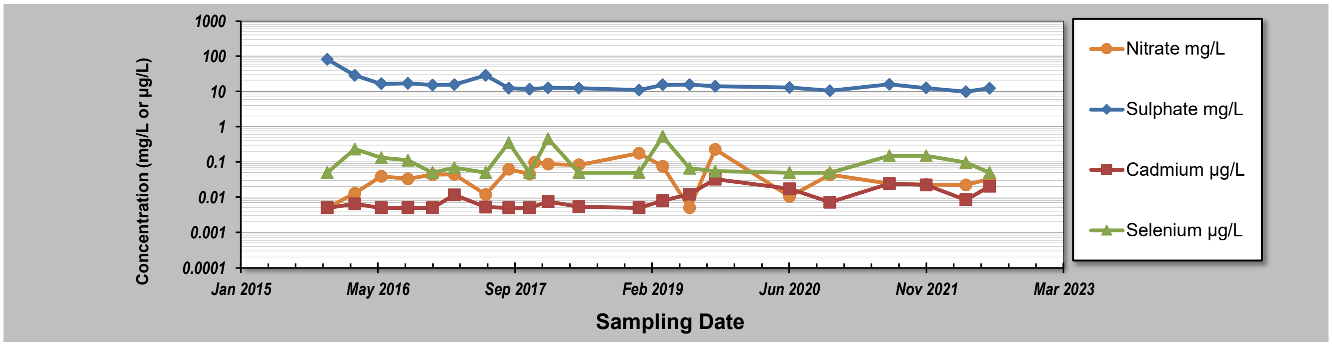
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

Evaluation Date:	02-Jan-23	Job ID:	635544
Facility Name:	Teck Coal Regional Groundwater - LCO	Location	WL-MW-15-02A
Conducted By:	MF	Reviewed By:	MG

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	Sampling Date	WL-MW-15-02A CONCENTRATION							
1	11-Nov-15	0.0050	82.00	0.0050	0.050				
2	20-Feb-16	0.0130	28.50	0.0064	0.231				
3	27-May-16	0.0390	16.40	0.0050	0.132				
4	1-Sep-16	0.0331	16.90	0.0050	0.111				
5	30-Nov-16	0.0431	15.10	0.0050	0.050				
6	17-Feb-17	0.0447	15.70	0.0115	0.069				
7	11-Jun-17	0.0118	28.80	0.0052	0.050				
8	3-Sep-17	0.0616	12.40	0.0050	0.349				
9	19-Nov-17	0.0450	11.60	0.0050	0.050				
10	7-Dec-17	0.0980							
11	25-Jan-18	0.0867	12.60	0.0075	0.454				
12	17-May-18	0.0822	12.30	0.0054	0.050				
13	23-Dec-18	0.1750	10.90	0.0050	0.050				
14	19-Mar-19	0.0755	15.40	0.0080	0.530				
15	25-Jun-19	0.0050	15.60	0.0121	0.066				
16	27-Sep-19	0.2280	14.10	0.0325	0.055				
17	24-Jun-20	0.0104	13.00	0.0172	0.050				
18	18-Nov-20	0.0431	10.40	0.0072	0.050				
19	22-Jun-21	0.0240	16.00	0.0243	0.148				
20	4-Nov-21	0.0225	12.50	0.0221	0.149				
21	28-Mar-22	0.0222	9.81	0.0084	0.097				
22	23-Jun-22	0.0332	12.30	0.0203	0.050				
23									
24									
25									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	1.01	0.85	0.75	1.04				
	Mann-Kendall Statistic (S):	21	-101	109	-8				
	Confidence Factor:	71.1%	99.9%	>99.9%	58.3%				
	Concentration Trend:	No Trend	Decreasing	Increasing	No Trend				



Notes:

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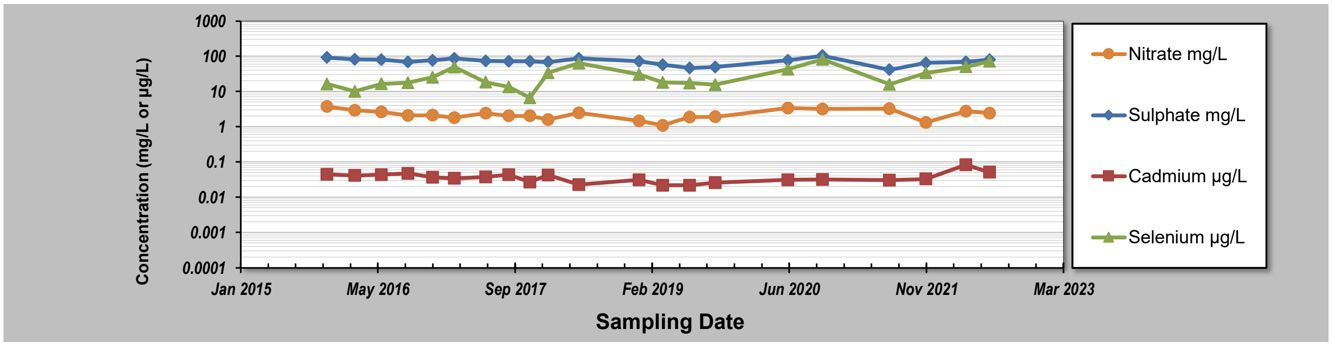
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

Evaluation Date: 02-Jan-23
Facility Name: Teck Coal Regional Groundwater - LCO
Conducted By: MF

Job ID: 635544
Location WL-MW-15-02B
Reviewed By: MG

Sampling Event	Sampling Date	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
		WL-MW-15-02B CONCENTRATION							
1	11-Nov-15	3.7200	91.20	0.0440	16.200				
2	20-Feb-16	2.9200	81.90	0.0412	10.000				
3	27-May-16	2.6100	79.80	0.0436	16.400				
4	1-Sep-16	2.0800	69.40	0.0470	17.600				
5	30-Nov-16	2.1100	76.00	0.0370	25.300				
6	17-Feb-17	1.8000	86.50	0.0341	48.800				
7	11-Jun-17	2.4200	73.10	0.0378	18.200				
8	3-Sep-17	2.0200	71.70	0.0434	13.400				
9	19-Nov-17	2.0200	71.40	0.0269	6.660				
10	25-Jan-18	1.5800	68.10	0.0426	33.900				
11	17-May-18	2.4500	86.10	0.0229	62.900				
12	23-Dec-18	1.4500	71.60	0.0312	30.500				
13	19-Mar-19	1.1000	57.20	0.0219	18.100				
14	25-Jun-19	1.8800	45.90	0.0219	17.200				
15	26-Sep-19	1.9000	49.10	0.0255	15.600				
16	17-Jun-20	3.3700	76.20	0.0308	42.600				
17	21-Oct-20	3.1800	104.00	0.0318	81.600				
18	23-Jun-21	3.2500	41.30	0.0303	16.000				
19	2-Nov-21	1.3200	64.50	0.0327	33.400				
20	28-Mar-22	2.7200	68.30	0.0831	49.700				
21	23-Jun-22	2.4100	78.90	0.0508	71.500				
22									
23									
24									
25									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	0.31	0.21	0.36	0.69				
	Mann-Kendall Statistic (S):	-27	-70	-41	72				
	Confidence Factor:	78.1%	98.2%	88.5%	98.5%				
	Concentration Trend:	Stable	Decreasing	Stable	Increasing				



Notes:
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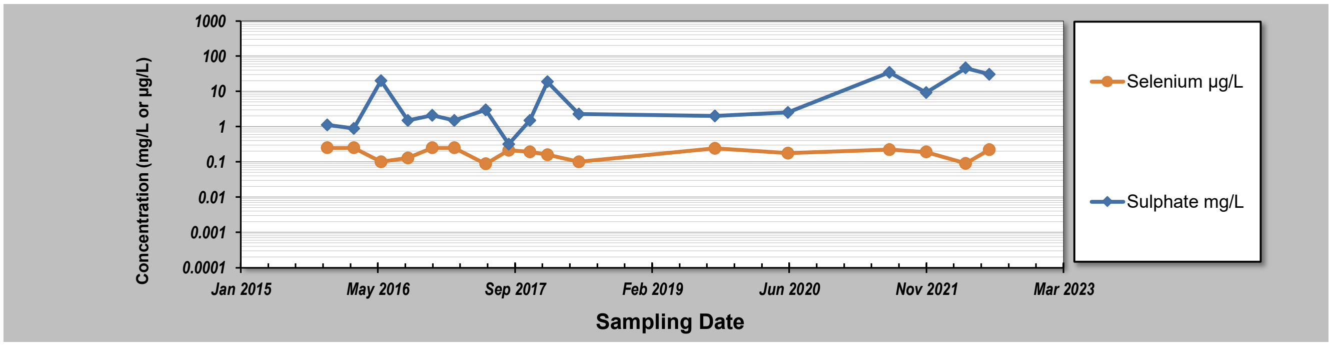
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

Evaluation Date:	02-Jan-23	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - LCO	**Location**	WL-MW-15-04B
Conducted By:	MF	**Reviewed By:**	MG

Sampling Event	Sampling Date	Selenium	Sulphate						
	units	µg/L	mg/L						
		WL-MW-15-04B CONCENTRATION							
1	11-Nov-15	0.250	1.12						
2	16-Feb-16	0.250	0.88						
3	26-May-16	0.101	20.10						
4	1-Sep-16	0.130	1.50						
5	29-Nov-16	0.250	2.10						
6	17-Feb-17	0.250	1.50						
7	11-Jun-17	0.088	2.97						
8	3-Sep-17	0.211	0.32						
9	19-Nov-17	0.192	1.50						
10	7-Dec-17								
11	23-Jan-18	0.158	18.60						
12	17-May-18	0.101	2.27						
13	25-Sep-19	0.243	2.00						
14	18-Jun-20	0.177	2.50						
15	23-Jun-21	0.221	34.20						
16	4-Nov-21	0.190	9.20						
17	28-Mar-22	0.091	45.70						
18	22-Jun-22	0.220	30.70						
19									
20									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	0.33	1.36						
	Mann-Kendall Statistic (S):	-25	67						
	Confidence Factor:	83.6%	99.8%						
	Concentration Trend:	Stable	Increasing						



Notes:

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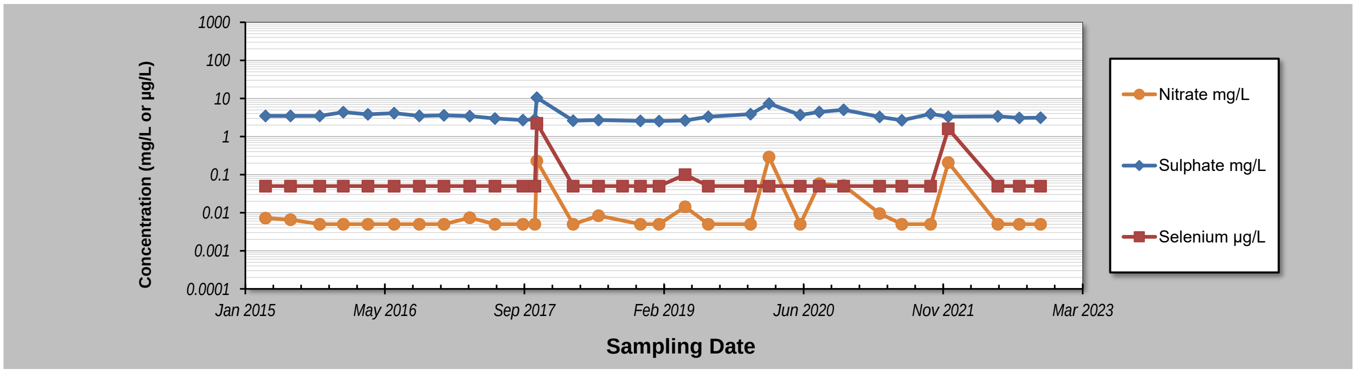
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

Evaluation Date:	**02-Jan-23**	Job ID:	**635544**
Facility Name:	**Teck Coal Regional Groundwater - LCO**	Location	**LC_PIZP1101**
Conducted By:	**MF**	Reviewed By:	**MG**

Parameter	**Nitrate**	**Sulphate**	**Selenium**					
units	mg/L	mg/L	µg/L					

Sampling Event	Sampling Date	LC_PIZP1101 CONCENTRATION							
1	14-Mar-15	0.0072	3.5	0.050					
2	12-Jun-15	0.0066	3.49	0.050					
3	24-Sep-15	0.005	3.49	0.050					
4	18-Dec-15	0.005	4.35	0.050					
5	15-Mar-16	0.005	3.83	0.050					
6	17-Jun-16	0.005	4.14	0.050					
7	15-Sep-16	0.005	3.5	0.050					
8	12-Dec-16	0.005	3.62	0.050					
9	15-Mar-17	0.0074	3.44	0.050					
10	13-Jun-17	0.005	2.97	0.0500					
11	21-Sep-17	0.005	2.7	0.050					
12	3-Nov-17	0.005	2.84	0.050					
13	10-Nov-17	0.229	10.5	2.2400					
14	20-Mar-18	0.005	2.61	0.050					
15	19-Jun-18	0.0083	2.71	0.050					
16	13-Sep-18			0.0500					
17	16-Nov-18	0.005	2.58	0.0500					
18	22-Jan-19	0.005	2.56	0.0500					
19	25-Apr-19	0.0143	2.64	0.1000					
20	17-Jul-19	0.005	3.30	0.050					
21	16-Dec-19	0.005	3.88	0.0500					
22	20-Feb-20	0.289	7.30	0.050					
23	11-Jun-20	0.005	3.68	0.050					
24	18-Aug-20	0.058	4.44	0.050					
25	13-Nov-20	0.0515	5.05	0.050					
26	22-Mar-21	0.0095	3.26	0.050					
27	10-Jun-21	0.005	2.66	0.050					
28	21-Sep-21	0.005	3.91	0.050					
29	23-Nov-21	0.207	3.31	1.6000					
30	11-Mar-22								
31	20-May-22	0.005	3.39	0.050					
32	5-Aug-22	0.005	3.09	0.0500					
33	20-Oct-22	0.005	3.14	0.0500					
34									
35									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		**2.25**	**0.42**	**2.77**					
Mann-Kendall Statistic (S):		**31**	**-49**	**22**					
Confidence Factor:		**69.4%**	**79.1%**	**63.2%**					
Concentration Trend:		No Trend	Stable	No Trend					



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
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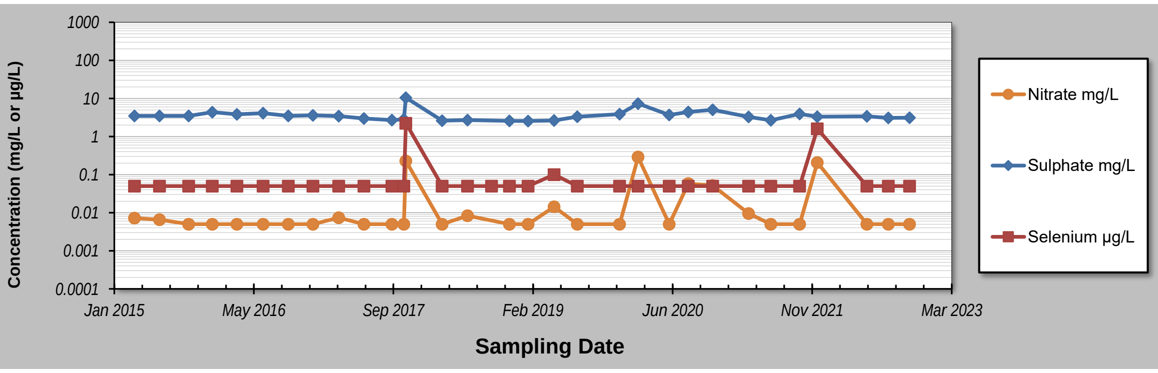
GSI MANN-KENDALL TOOLKIT

Evaluation Date: **02-Jan-23**
Facility Name: **Teck Coal Regional Groundwater - LCO**
Conducted By: **MF**

Job ID: **635544**
Location **LC_PIZP1101**
Reviewed By: **MG**

	Parameter	Nitrate	Sulphate	Selenium					
	units	mg/L	mg/L	µg/L					
Sampling Event	Sampling Date	LC_PIZP1101 CONCENTRATION							
1	14-Mar-15	0.0072	3.5	0.050					
2	12-Jun-15	0.0066	3.49	0.050					
3	24-Sep-15	0.005	3.49	0.050					
4	18-Dec-15	0.005	4.35	0.050					
5	15-Mar-16	0.005	3.83	0.050					
6	17-Jun-16	0.005	4.14	0.050					
7	15-Sep-16	0.005	3.5	0.050					
8	12-Dec-16	0.005	3.62	0.050					
9	15-Mar-17	0.0074	3.44	0.050					
10	13-Jun-17	0.005	2.97	0.0500					
11	21-Sep-17	0.005	2.7	0.050					
12	3-Nov-17	0.005	2.84	0.050					
13	10-Nov-17	0.229	10.5	2.2400					
14	20-Mar-18	0.005	2.61	0.050					
15	19-Jun-18	0.0083	2.71	0.050					
16	13-Sep-18			0.0500					
17	16-Nov-18	0.005	2.58	0.0500					
18	22-Jan-19	0.005	2.56	0.0500					
19	25-Apr-19	0.0143	2.64	0.1000					
20	17-Jul-19	0.005	3.30	0.050					
21	16-Dec-19	0.005	3.88	0.0500					
22	20-Feb-20	0.289	7.30	0.050					
23	11-Jun-20	0.005	3.68	0.050					
24	18-Aug-20	0.058	4.44	0.050					
25	13-Nov-20	0.0515	5.05	0.050					
26	22-Mar-21	0.0095	3.26	0.050					
27	10-Jun-21	0.005	2.66	0.050					
28	21-Sep-21	0.005	3.91	0.050					
29	23-Nov-21	0.207	3.31	1.6000					
30	11-Mar-22								
31	20-May-22	0.005	3.39	0.050					
32	5-Aug-22	0.005	3.09	0.0500					
33	20-Oct-22	0.005	3.14	0.0500					
34									
35									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		2.25	0.42	2.77					
Mann-Kendall Statistic (S):		31	-49	22					
Confidence Factor:		69.4%	79.1%	63.2%					
Concentration Trend:		No Trend	Stable	No Trend					



Notes:

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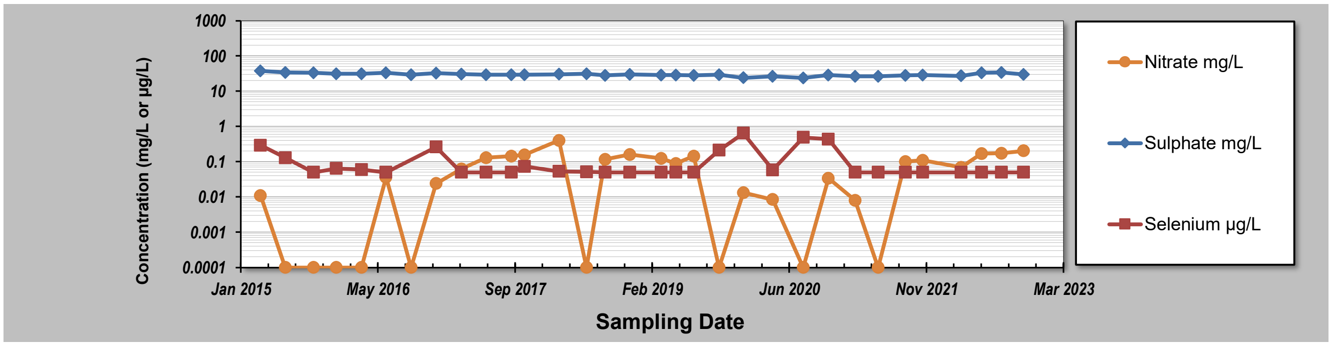
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	02-Jan-23	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - LCO	**Location**	LC_PIZP1103
Conducted By:	MF	**Reviewed By:**	MG

Parameter	Nitrate	Sulphate	Selenium					
units	mg/L	mg/L	µg/L					

Sampling Event	Sampling Date	LC_PIZP1103 CONCENTRATION							
1	13-Mar-15	0.0110	37.50	0.290					
2	12-Jun-15	0.0001	33.50	0.130					
3	23-Sep-15	0.0001	32.90	0.050					
4	14-Dec-15	0.0001	31.20	0.064					
5	15-Mar-16	0.0001	31.10	0.059					
6	13-Jun-16	0.0360	33.00	0.050					
7	12-Sep-16	0.0001	29.20	0.051					
8	12-Dec-16	0.0239	32.20	0.260					
9	15-Mar-17	0.0620	30.50	0.050					
10	13-Jun-17	0.1280	29.30	0.050					
11	13-Sep-17	0.1440	29.40	0.050					
12	31-Oct-17	0.1560	29.00	0.073					
13	6-Mar-18	0.3990	30.10	0.053					
14	14-Jun-18	0.0001	31.00	0.051					
15	21-Aug-18	0.1160	27.80	0.050					
16	19-Nov-18	0.1590	30.00	0.050					
17	13-Mar-19	0.1240	28.80	0.050					
18	6-May-19	0.0878	28.70	0.050					
19	10-Jul-19	0.1440	27.90	0.050					
20	10-Oct-19	0.0001	29.10	0.211					
21	7-Jan-20	0.0131	23.90	0.639					
22	23-Apr-20	0.0084	26.10	0.058					
23	12-Aug-20	0.0001	23.80	0.487					
24	12-Nov-20	0.0340	28.50	0.434					
25	17-Feb-21	0.0080	26.40	0.050					
26	13-May-21	0.0001	26.40	0.050					
27	20-Aug-21	0.0999	28.10	0.050					
28	22-Oct-21	0.1100	28.70	0.050					
29	11-Mar-22	0.0690	27.10	0.050					
30	25-May-22	0.1700	32.90	0.050					
31	5-Aug-22	0.1730	33.80	0.050					
32	24-Oct-22	0.2020	29.70	0.050					
33									
34									
35									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		1.15	0.10	1.25					
Mann-Kendall Statistic (S):		133	-217	-109					
Confidence Factor:		98.5%	>99.9%	96.7%					
Concentration Trend:		Increasing	Decreasing	Decreasing					



Notes:

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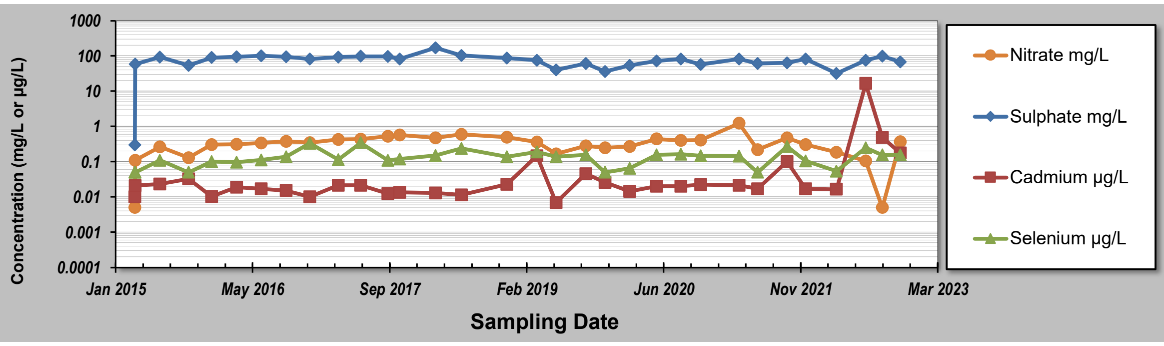
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

Evaluation Date: 02-Jan-23
Facility Name: Teck Coal Regional Groundwater - LCO
Conducted By: MF

Job ID: 635544
Location LC_PIZP1104
Reviewed By: MG

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	Sampling Date	LC_PIZP1104 CONCENTRATION							
1	12-Mar-15	0.0050	0.30	0.0100	0.050				
2	13-Mar-15	0.1090	58.10	0.0210	0.050				
3	11-Jun-15	0.2640	92.40	0.0230	0.109				
4	24-Sep-15	0.1280	54.00	0.0326	0.050				
5	17-Dec-15	0.3030	89.40	0.0102	0.101				
6	17-Mar-16	0.3120	94.10	0.0188	0.096				
7	15-Jun-16	0.3390	99.70	0.0169	0.111				
8	14-Sep-16	0.3770	94.50	0.0151	0.137				
9	9-Dec-16	0.3480	81.40	0.0100	0.330				
10	23-Mar-17	0.4280	91.80	0.0212	0.114				
11	13-Jun-17	0.4310	97.10	0.0212	0.342				
12	20-Sep-17	0.5280	96.40	0.0124	0.109				
13	2-Nov-17	0.5740	80.60	0.0135	0.119				
14	13-Mar-18	0.4720	170.00	0.0130	0.150				
15	15-Jun-18	0.5990	102.00	0.0113	0.235				
16	28-Nov-18	0.4910	85.80	0.0228	0.138				
17	18-Mar-19	0.3570	74.70	0.1460	0.188				
18	27-May-19	0.1650	40.30	0.0069	0.137				
19	12-Sep-19	0.2790	60.50	0.0453	0.155				
20	21-Nov-19	0.2490	36.20	0.0257	0.050				
21	19-Feb-20	0.2660	53.40	0.0143	0.065				
22	27-May-20	0.4390	71.30	0.0199	0.155				
23	24-Aug-20	0.3960	80.90	0.0200	0.161				
24	4-Nov-20	0.4060	57.10	0.0223	0.147				
25	25-Mar-21	1.2300	81.40	0.0212	0.143				
26	31-May-21	0.2170	60.60	0.0169	0.050				
27	16-Sep-21	0.4720	63.60	0.1000	0.266				
28	22-Nov-21	0.3030	80.80	0.0168	0.105				
29	15-Mar-22	0.1830	31.50	0.0164	0.054				
30	30-Jun-22	0.1050	74.90	16.4000	0.249				
31	29-Aug-22	0.0050	98.20	0.4820	0.154				
32	3-Nov-22	0.3650	67.00	0.1750	0.155				
33									
34									
35									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	0.63	0.38	5.20	0.54				
	Mann-Kendall Statistic (S):	35	-71	129	129				
	Confidence Factor:	70.8%	87.1%	98.2%	98.2%				
	Concentration Trend:	No Trend	Stable	Increasing	Increasing				



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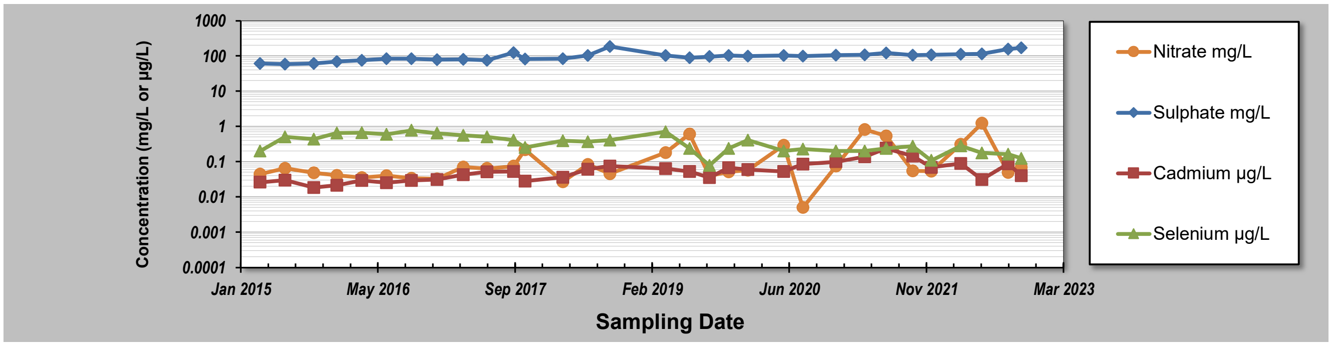
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 02-Jan-23
Facility Name: Teck Coal Regional Groundwater - LCO
Conducted By: MF

Job ID: 635544
Location LC_PIZP1105
Reviewed By: MG

Sampling Event	Sampling Date	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
		LC_PIZP1105 CONCENTRATION							
1	12-Mar-15	0.0440	60.40	0.0260	0.200				
2	11-Jun-15	0.0650	58.60	0.0300	0.502				
3	23-Sep-15	0.0480	60.40	0.0185	0.434				
4	17-Dec-15	0.0410	68.40	0.0215	0.652				
5	17-Mar-16	0.0350	75.30	0.0291	0.657				
6	15-Jun-16	0.0400	82.60	0.0251	0.597				
7	14-Sep-16	0.0340	83.20	0.0291	0.773				
8	16-Dec-16	0.0323	78.50	0.0310	0.640				
9	22-Mar-17	0.0700	80.40	0.0426	0.555				
10	16-Jun-17	0.0640	74.90	0.0511	0.499				
11	21-Sep-17	0.0740	124.00	0.0523	0.406				
12	2-Nov-17	0.2160	81.30	0.0280	0.250				
13	20-Mar-18	0.0270	82.70	0.0358	0.391				
14	19-Jun-18	0.0830	102.00	0.0610	0.370				
15	7-Sep-18	0.0450	184.00	0.0745	0.411				
16	29-Mar-19	0.1810	102.00	0.0633	0.704				
17	25-Jun-19	0.6050	87.90	0.0528	0.237				
18	5-Sep-19	0.0390	95.20	0.0355	0.078				
19	14-Nov-19	0.0510	102.00	0.0670	0.238				
20	23-Jan-20	0.0570	97.90	0.0597	0.411				
21	2-Jun-20	0.2930	102.00	0.0529	0.199				
22	11-Aug-20	0.0050	97.90	0.0842	0.226				
23	10-Dec-20	0.0740	104.00	0.0992	0.199				
24	24-Mar-21	0.8120	106.00	0.1380	0.200				
25	11-Jun-21	0.5350	120.00	0.2400	0.236				
26	16-Sep-21	0.0543	105.00	0.1420	0.272				
27	22-Nov-21	0.0536	106.00	0.0682	0.108				
28	10-Mar-22	0.3130	111.00	0.0888	0.280				
29	26-May-22	1.2300	114.00	0.0311	0.176				
30	30-Aug-22	0.0492	156.00	0.0868	0.162				
31	17-Oct-22	0.0693	168.00	0.0397	0.124				
32									
33									
34									
35									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		1.58	0.29	0.74	0.54				
Mann-Kendall Statistic (S):		132	332	276	-248				
Confidence Factor:		98.8%	>99.9%	>99.9%	>99.9%				
Concentration Trend:		Increasing	Increasing	Increasing	Decreasing				



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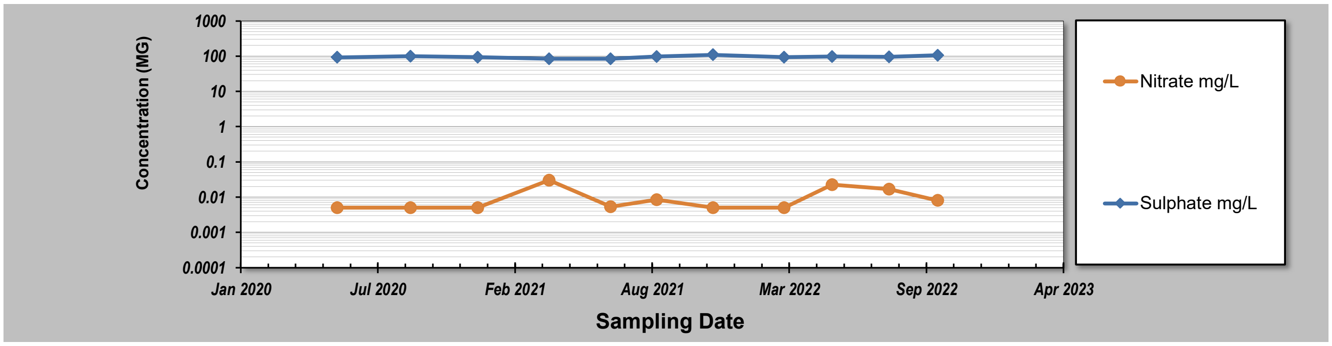
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 02-Jan-23
Facility Name: Teck Coal Regional Groundwater - LCO
Conducted By: MF

Job ID: 635544
Location LC_MW_ER4A
Reviewed By: MG

LC_MW_ER4A CONCENTRATION

Sampling Event	Parameter Sampling Date	Nitrate	Sulphate						
	units	mg/L	mg/L						
1	20-May-20	0.0050	92.20						
2	4-Sep-20	0.0050	98.60						
3	11-Dec-20	0.0050	93.10						
4	25-Mar-21	0.0304	83.90						
5	23-Jun-21	0.0053	84.10						
6	29-Aug-21	0.0084	96.80						
7	19-Nov-21	0.0050	109.00						
8	3-Mar-22	0.0050	92.70						
9	12-May-22	0.0227	97.00						
10	3-Aug-22	0.0167	94.40						
11	13-Oct-22	0.008	105.0						
12									
13									
14									
15									
16									
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		0.83	0.08						
Mann-Kendall Statistic (S):		15	17						
Confidence Factor:		85.9%	89.1%						
Concentration Trend:		No Trend	No Trend						



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GSI MANN-KENDALL TOOLKIT

Evaluation Date: 02-Jan-23
Facility Name: Teck Coal Regional Groundwater - LCO
Conducted By: MF

Job ID: 635544
Location LC_MW_ER4B
Reviewed By: MG

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	**Sampling Date**	**LC_MW_ER4B CONCENTRATION**							
1	20-May-20	3.0700	86.90	0.0129	16.300				
2	4-Sep-20	1.6600	63.20	0.0154	6.050				
3	11-Dec-20	2.6500	83.20	0.0173	17.100				
4	25-Mar-21	3.3400	93.00	0.0141	16.400				
5	23-Jun-21	1.7800	54.80	0.0132	9.350				
6	29-Aug-21	1.7200	65.90	0.0213	7.470				
7	19-Nov-21	2.8100	82.30	0.0176	15.000				
8	3-Mar-22	3.2200	83.60	0.0145	17.300				
9	12-May-22	4.1700	106.00	0.0180	19.800				
10	3-Aug-22	1.3500	49.80	0.0188	7.640				
11	13-Oct-22	2.1900	74.10	0.0301	12.300				
12									
13									
14									
15									
16									
17									
18									
19									
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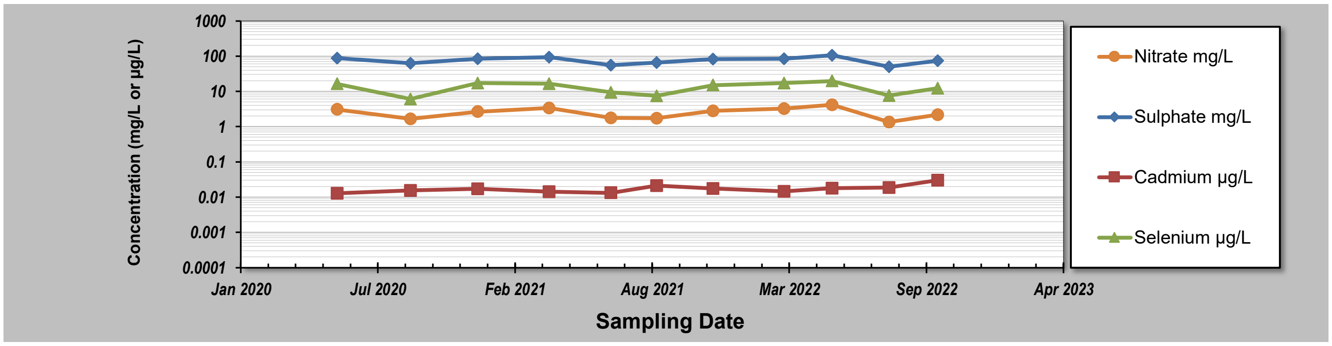
45									
46									
Coefficient of Variation:		0.34	0.22	0.28	0.36				
Mann-Kendall Statistic (S):		1	-3	31	5				
Confidence Factor:		50.0%	56.0%	99.2%	61.9%				
Concentration Trend:		No Trend	Stable	Increasing	No Trend				



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1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

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Appendix VIII

Elkview Operations 2022 SSGMP and RGMP Annual Report

- Figures
- Tables
- Drawings
- Attachments
    I. Borehole Logs
    II. Block Diagrams
    III. Mann-Kendall Analyses

1 Elkview Operations SSGMP and RGMP Report

1.1 Overview

This report presents the results for the 2022 Elkview Operation (EVO) Site-specific Groundwater Monitoring Program (SSGMP) and the 2022 Regional Groundwater Monitoring Program (RGMP) Study Areas 7, 8, 9, 10, and 12. As there is spatial overlap with work completed at Sparwood Area per Permit 107517, the results from the annual sampling program for the Sparwood Area have also been included.

The basis for the SSGMP and RGMP is the conceptual site model (CSM) presented in the approved 2018 SSGMP Update (SNC-Lavalin, 2019a), the 2020 RGMP Update (SNC-Lavalin, 2020; approved on March 20, 2023) and the 2021 SSGMP Update (SNC-Lavalin, 2021a; awaiting approval).

The main surface water courses near EVO are the Elk River, which flows from north to south along the western boundary of EVO, and its tributary, Michel Creek, which flows from the southeast to the northwest along the southern boundary of EVO and discharges to the Elk River at the District of Sparwood (Drawing EV-01). There are several tributary watercourses that flow to the Elk River and Michel Creek (Golder, 2015a), including:

- West flowing creeks that discharge to the Elk River (from north to south): EVO Dry Creek (which flows into Harmer Creek); Harmer Creek (which flows into Grave Creek); Grave Creek; Six Mile Creek; Balmer Creek; Fennelon Creek; Feltham Creek; Lindsay Creek (which discharges to ground in the vicinity of the Elk River); Goddard Creek; Cossarini Creek; and Otto Creek; and
- West and south flowing creeks that discharge into Michel Creek (from north to south): Qualtieri Creek (which is diverted into Aqueduct Creek); Aqueduct Creek; Spring Creek; Bodie Creek; Gate Creek; South Gate Creek; Adit Creek; Thresher Creek; Milligan Creek; South Pit Creek; and Erickson Creek.

Of the above listed creeks, Grave/Harmer/Dry creeks and Erickson Creek are considered major tributary drainages that originate within EVO boundaries and drain water to the north and south, respectively. A portion of the upper Erickson drainage is overlain by the Erickson waste rock spoils, and the upslope area of Dry Creek, which drains into Harmer Creek, has also been covered by the Cedar spoils. Upper Feltham and Lindsay creeks are captured by the Lindsay Interceptor Ditch and flow into Goddard Creek (Drawing EV-01). Qualtieri Creek has also been re-directed to Aqueduct Creek. Bodie, Gate and South Gate creeks flow within the western flank of EVO from rock drains, which daylight prior to discharging into Michel Creek within the valley bottom.

Generally, groundwater in the tributary watersheds is monitored by the EVO SSGMP, while the valley-bottoms of Elk River and Michel Creek are monitored by the RGMP. The EVO permitted area overlaps portions of RGMP Study Areas 8, 9 and 10, and some monitoring locations are included in both the EVO SSGMP and RGMP (Drawing EV-01). Study Area 9 has been further subdivided into Study Areas 9a and 9b. Study Area 9a includes drainage from Baldy Ridge to Study Area 12 in Sparwood, while Study Area 9b includes upgradient sources at Bodie and Gate creeks and down-valley flow.

Table A presents the tributary watersheds assessed as part of the EVO SSGMP and linkages to Study Areas associated with the RGMP. The results and discussion presented in the following sections are organized in accordance with these linkages.

Table A: EVO SSGMP Major Tributary Watersheds and Relevant RGMP Study Areas

Upland EVO SSGMP Tributary Watersheds	Downstream Watershed and RGMP Study Area
Dry Creek, Harmer Creek, Grave Creek	Elk River (Study Area 7)
Balmer Creek, Lindsay Creek, Goddard Creek, Otto Creek, Cossarini Creek	Elk River (Study Area 8)
Aqueduct Creek, Qualtieri Creek, Spring Creek, Baldy Ridge	Michel Creek (Study Area 9a)
Bodie Creek, Gate Creek	Michel Creek (Study Area 9b)
Sparwood Ridge	Elk River (Study Area 12)
Erickson Creek, South Pit Creek	Michel Creek (Study Area 10)

Surficial geology at EVO is characteristic of a post-glacial cordilleran mountain setting. Colluvium covers the upland areas and thicker glaciofluvial and glaciolacustrine deposits are generally located in valley-bottoms (Drawings 6 and 7 of the main report). Anthropogenically derived materials including waste rock and coarse coal rejects (CCR) from mining operations are present in mining pits, waste spoils, valley flanks and valley-bottoms (SNC-Lavalin, 2021a).

The bedrock encountered in boreholes within the EVO area consists primarily of shale and sandstone of the Fernie Formation throughout the Elk River Valley and the western portion of the Michel Creek area and sandstone, siltstone and coal of the Kootenay Group to the east. West of Sparwood and the Bourgeau thrust fault, dolomitic sandstone and siltstone of the Spray River Group are present (Drawing 3 of the main report). The Mist Mountain Formation of the Kootenay Group contains the economic coal seams at EVO and is close to surface along ridge-tops in the eastern part of the Elk Valley and tributary drainages. The Rundle Formation, consisting primarily of limestone, is located east of the Erickson Fault (close to Erickson Creek) and extends northward, including the area of the EVO Dry Creek Sedimentation Pond and extending beyond Harmer and Grave creeks, forming the Erickson Karst Potential Block. This formation was identified in the 2020 RGMP Update (SNC-Lavalin, 2020) to potentially have karst features since it contains limestone and dolomite. Structurally, EVO is underlain by the eastern limb of a broad north-south orientated syncline that includes north-south orientated normal and thrust faults. These faults include the Harmer West Thrust Fault (believed to be the F42 fault identified in Cedar North that intercepted the conveyor tunnel [SNC-Lavalin, 2021a]), the Harmer East Thrust Fault, and the Erickson Fault (Drawing 3 of the main report). As a result, stratigraphic beds of the Kootenay Group dip primarily to the west (Golder, 2015a, 2015b). The bedrock and surficial geology of EVO have been discussed in detail as part of the 2021 SSGMP Update and includes bedrock cross sections for the area (SNC-Lavalin, 2021a).

1.2 Groundwater Monitoring Locations

Tables 1 and 5 in the main report provide a list of monitoring wells associated with each program, as well as the monitoring and/or sampling rationale for each location. Drawing EV-01 shows the locations of monitoring wells relative to key surface water and mine site features. Additional well details are provided in Table EV-01. Manual groundwater level measurements from 2022 and calculated vertical gradients are provided in Table EV-02. Borehole logs are presented in Attachment I, except for the following groundwater supply wells: EV_RCSgw, EV_WH50gw, EV_BRgw, and EV_HW1 (EV_HM1) for which borehole logs are not available. A site plan is provided in Drawing EV-01; quarter four (Q4) groundwater elevations and inferred groundwater flow directions are presented on Drawings EV-02 and -03. Cross sections showing well installation, stratigraphy, and groundwater elevations are presented on Drawings EV-04 to -13. Drawings EV-14 to -21 provide a spatial summary of 2022 Order Constituents (OC) concentrations; Block Diagrams for each of the relevant study areas are provided in Attachment II (Diagrams EV-01 to -04).

1.3 Program Modifications

Program modifications include any significant change to either program going forward compared to what was completed in previous years, such as the addition or removal of wells from monitoring programs or changes in sampling frequency. Deviations from the program terms of reference are detailed in Appendix XII. Table B provides a summary and discussion of modifications of the groundwater sampling program to the SSGMP and RGMP.

Table B: EVO SSGMP and Relevant RGMP Study Areas – Summary of Program Modification

#	Well ID	Program	Q[a]	Modification	Reason
1	EV_MW_BC2 EV_MW_BC3	SSGMP / RGMP	1, 2, 3, 4	Monitoring wells included in monitoring program	Assess groundwater quality from unconsolidated sediment and underlying bedrock upgradient of Michel Creek.
2	EV_MW_MCgwD EV_MW_MCgwS	SSGMP / RGMP	1, 2, 3, 4	Removed from monitoring program	Monitoring wells decommissioned on July 23, 2022.

Notes:

[a] Q denotes Quarter (Q1, Q2, Q3, Q4).

1.4 Summary of Field Activities

Table C summarizes the field activities that took place in 2022.

Table C: Summary of 2022 Field Activities

#	Location	Quarter	Field Activity	Rationale
1	Elkview Operations – multiple locations	Q3	Monitoring wells installed in weathered bedrock and shallow unconsolidated sediment.	Assess possible transport pathways of mine-influenced groundwater within faults and fractures connecting to Cedar North Pit.
2	Elkview Operations – multiple locations	Q2 to Q4	Hydraulic conductivity tests performed at the following locations: EV_OCgw, RG_MW_GCA, EV_GV3gw, EV_GV3gwS, EV_MW22_GV5A/B, EV_BALgw, EV_MW_BC1B, EV_MW22_BCgw_1A/B, EV_MW_MCgwA, EV_MW_MCgwB, EV_MW22_MC2C, EV_MW22_MC3B, EV_MW22_RCSgw_1A/B/C, and EV_ECgw.	Determination of hydraulic conductivity and confirmation of prior hydraulic conductivity testing results due to anomalously low hydraulic conductivity relative to screened formation (i.e., EV_ECgw and EV_OCgw).
3	Study Area 9a – Michel Creek	Q3	EV_MW_MCgwS/D decommissioned.	Screened within an aquitard, which did not yield relevant groundwater data for the RGMP/SSGMP.
4	Elkview Operations – multiple locations	Q2 to Q4	New monitoring wells installed: EV_MW22_GV5A/B, EV_MW22_BCgw_1A/B, EV_MW22_MC2C, EV_MW22_MC3B, EV_MW22_RCSgw_1A/B/C.	Further delineation of the EVO conceptual site model.

1.5 Grave/Harmer Creek Watershed and Elk River Downstream of Grave Creek Confluence (Study Area 7)

A summary of 2022 groundwater monitoring and sampling results for the Grave/Harmer Creek Watershed and Study Area 7 is presented in Table D with references to supporting information (Drawings, Figures, Tables, and Appendices).

Table D: Summary of 2022 Groundwater Monitoring and Sampling Results in the Grave/Harmer Creek Watershed and Study Area 7 Elk River Downstream of Grave Creek Confluence

Hydrogeological Information		Description	Reference
Monitoring Locations	Relevant EVO SSGMP/RGMP Wells (Study Area 7)	**Grave/Harmer Creek Watershed:** EV_GV3gwS, EV_GV3gw, EV_MW_GV4A/B, RG_MW_GCA **Downstream of the Elk River/Grave Creek Confluence:** RG_DW-02-20, RG_MW_WW	Table EV-01 Drawing EV-01
	Relevant Monitoring Wells from Other Programs[a]	**Dry Creek:** EV_MW_DC1, EV_MW_DC2, EV_MW_DC7 **Harmer Reservoir:** EV_MW_HC1, EV_MW_HC2, EV_MW_HC3, EV_MW_HC4, EV_MW_HC5, EV_MW22_GV5A/B	
	Relevant Surface Water Monitoring Stations[b]	EV_DC1, EV_HC1, EV_GV1, EV_SM1	
	Relevant Seep Monitoring Locations[b]	No monitored seeps in these watersheds.	
Physical Hydrogeology	Groundwater Elevation Trends	• Groundwater elevations generally exhibit seasonal trends with the highest levels measured in spring/early summer (June) and the lowest measured in mid-fall (October). Seasonal elevation trends in groundwater at EV_GV3gw, and EV_MW_GV4A/B followed similar patterns to surface water levels measured at Harmer Creek (EV_HC1). Groundwater elevations at EV_GV3gwS showed a gradual elevation rise from fall to spring with the maximum elevation observed during the summer. Groundwater elevations were higher in 2022 with a greater elevation rise, however the pattern was similar, and does not match those of other wells in the Harmer Reservoir area. • At RG_MW_GCA, manual groundwater elevations show a peak elevation in March 2022, followed by a gradual decline in the summer and fall. This well is screened within shale near Grave Creek prior to its discharge at the Elk River. A transducer has not been installed at this location so continuous groundwater elevation data is not available. • Groundwater elevations at RG_MW_WW show a general similar trend to the Elk River (i.e., higher groundwater elevations in the spring/summer, followed by declining elevations), however an additional peak is observed in March/April 2022, which was higher than the peak observed in July 2022. • Groundwater elevation data on the hydrograph were compensated with barometric pressure data collected from a transducer/datalogger deployed in EV_MW_SPR1B. • Manual groundwater levels could not be measured at downgradient well RG_DW-02-20 due to the wellhead configuration. A pressure transducer could not be installed due to the well design and access considerations.	Figure EV-01 Table EV-02 Drawing EV-02
	Hydraulic Gradients and Flow Direction	• Vertical Hydraulic Gradient: – EV_GV3gw and EV_GV3gwS: 0.24 to 0.27 m/m downwards; and – EV_MW_GV4A/B: 0.12 to 0.14 m/m downwards. • A lateral hydraulic gradient could not be calculated due to limited monitoring well network. Upland groundwater flow is inferred to generally follow topography. Downstream of the Grave Creek/Elk River confluence, groundwater flow in the Elk River valley-bottom is inferred to be southward.	
Chemistry	2022 SSGMP/RGMP OC Results	• **Grave/Harmer Creek Watershed:** – All OC concentrations were less than primary screening criteria. • **Elk River Downstream of Grave Creek**: – Concentrations above primary screening criteria: ▪ Dissolved selenium: RG_DW_02-20 and RG_MW_WW (all 2022 sampling events); ▪ No monitoring locations had dissolved selenium concentrations greater than the secondary screening criteria (19 µg/L); and ▪ All other OC concentrations were less than primary screening criteria.	Table E Figures EV-02 to -04 Tables EV-03 to -05 Drawings EV-14 to -17
	Non-Order Mine-Related and Naturally Occurring Constituents[c]	• Concentrations greater than primary screening criteria – Non-Order Mine-related: – Manganese: EV_MW_GV4A (Q2-4). • Concentrations greater than primary screening criteria – Naturally-Occurring Constituents: – **Grave/Harmer Creek Watershed:** ▪ Fluoride: RG_MW_GCA (Q1-4); ▪ Sodium: RG_MW_GCA (Q1-4); ▪ Lithium: EV_GV3gw, EV_MW_GV4A/B, RG_MW_GCA during all sampling events and EV_GV3gwS (Q4); ▪ Boron: RG_MW_GCA (Q4); and – **Elk River Downstream of Grave Creek:** ▪ Lithium: RG_DW-02-20 (Q2-3). • Manganese was only observed to exceed the primary screening criteria in bedrock at EV_MW_GV4A in Q2-Q4; manganese concentrations at EV_MW_GV4B, screened in unconsolidated sediment, had manganese concentrations that were two to three orders of magnitude lower. • The turbidity measurement at RG_MW_GCA remained high in 2022, with a maximum of 1,060 NTU in Q4 2022. • All other non-order constituent concentrations were less than primary screening criteria.	Tables EV-03 to -05 SNC-Lavalin, 2020

Table D (Cont'd): Summary of 2022 Groundwater Monitoring and Sampling Results in the Grave/Harmer Creek Watershed and Study Area 7 Elk River Downstream of Grave Creek Confluence

Hydrogeological Information		Description	Reference
Chemistry (Cont'd)	Mann-Kendall Trend Analysis	• Increasing trends: – Dissolved selenium (EV_GV3gw, EV_MW_GV4A, RG_DW_02-20), – Sulphate (EV_MW_GV4B, RG_DW_02-20), and – Nitrate (EV_MW_GV4A, RG_MW_WW); however, nitrate concentrations remain an order of magnitude lower than the primary screening criteria. • All other parameters were either decreasing, stable or no trend.	Table F Attachment III

Notes:

[a] - Relevant Monitoring Wells from Other Programs are those in the area that are under evaluation for potential inclusion in the SSGMP and/or RGMP.

[b]: Relevant Surface Water Stations and Seep Monitoring Stations represent a sub-set of the surface water and seepage monitoring stations present in EVO and Study Area 7.

[c]: Based on the Background Assessment (BGA) completed for the 2020 RGMP Update, concentrations of lithium, sodium, boron and fluoride are inferred to be unrelated to mining.

A summary of results for OC compared to primary screening criteria is presented in Table E below.

Table E: Summary of OC Compared to Primary Screening Criteria in the Grave/Harmer Creek Watershed and Elk River Downstream of Grave Creek Confluence (Study Area 7)

Parameter[1,2,3]	Nitrate-N (mg/L)				Sulphate (mg/L)				Dissolved Cadmium (µg/L)				Dissolved Selenium (µg/L)			
Well ID	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Grave/Harmer Creek Watershed																
EV_GV3gw	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EV_GV3gwS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EV_MW_GV4A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EV_MW_GV4B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RG_MW_GCA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Elk River Downstream of Grave Creek Confluence																
RG_DW_02-20	-	-	-	-	-	-	-	-	-	-	-	-	15.0	15.8	14.8	10.5
RG_MW_WW	-	-	-	-	-	-	-	-	-	-	-	-	10.3	10.6	11.0	12.2
CSR AW	400				1,280 – 4,290[4]				0.5 – 4[4]				20			
CSR IW	n/a				n/a				5				20			
CSR LW	100				1,000				80				30			
CSR DW	10				500				5				10			

Notes:

[1] Primary screening criteria are *Contaminated Sites Regulation* (CSR), B.C. Reg. 375/96, includes amendments up to B.C. Reg. 179/2021, July 7, 2021, standards for **Aquatic Life (AW),** Drinking Water (DW), Livestock (LW), and *Irrigation (IW)*.

[2] '–' denotes result less than primary screening criteria for given constituents.

[3] Where a duplicate was collected, the higher concentration is provided in table.

[4] Standard varies with hardness.

'NS' denotes no sample.

Mann-Kendall trend analysis was completed for OC where more than seven data points have been measured. A summary of the trend analysis results is provided in Table F.

Table F: Summary of Mann-Kendall Trend Analysis for OC in the Grave/Harmer Creek Watershed and Elk River Downstream of Grave Creek Confluence (Study Area 7)

Parameter[1,2] / Well ID	Nitrate-N	Sulphate	Dissolved Cadmium	Dissolved Selenium
Grave/Harmer Creek Watershed				
EV_GV3gw	Decreasing	No Trend	Stable	Increasing
EV_GV3gwS	No Trend	Stable	Decreasing	No Trend
EV_MW_GV4A	Probably Increasing	Decreasing	-	Probably Increasing
EV_MW_GV4B	No Trend	Increasing	No Trend	No Trend
Downstream of Grave Creek Confluence (Study Area 7)				
RG_DW-02-20	No Trend	Probably Increasing	Stable	*Probably Increasing*
RG_MW_WW	Probably Increasing	Stable	No Trend	*No Trend*

Notes:

[1] Where OC were measured greater than the primary screening criteria in 2022, the trend result is *italics*. Where the OC were measured greater than the secondary screening criteria for dissolved selenium during at least one event in 2022, the result is ***bold and italics***. Where increasing trends are noted, the cell is shaded yellow.

1.5.1 Discussion

Discussion of trends in groundwater quality focuses primarily on dissolved selenium, as it is the principal OC identified to have an increasing trend in the Grave/Harmer Creek watershed and it was the only OC measured above primary screening criteria in Study Area 7 (Table F, Attachment III). However, increasing (and probably increasing) trends were also identified for nitrate-N (EV_MW_GV4A and RG_MW_WW) and sulphate (EV_MW_GV4B and RG_DW_02-20).

1.5.1.1 Grave/Harmer Creek Watershed (Study Area 7)

In 2022, groundwater samples from the Grave Creek/Harmer Creek watershed (EV_GV3gw, EV_GV3gwS, EV_MW_GV4A/B, and RG_MW_GCA) had concentrations of OCs less than the primary screening criteria; trends (where available) and concentrations were also generally consistent with historical data. However, recent data suggest that there are now probably increasing dissolved selenium and nitrate concentrations at EV_MW_GV4A and increasing sulphate concentrations at EV_MW_GV4B (Table F), although concentrations remain below the primary screening criteria.

Clustered well pair EV_MW_GV4A/B was installed along Grave Creek before the confluence with Harmer Creek. In 2022, higher concentrations of dissolved selenium and sulphate were measured in the bedrock well EV_MW_GV4A (4.8 to 7.3 µg/L and 74.4 to 85.4 mg/L, respectively) compared to the shallower unconsolidated sediment well EV_MW_GV4B (3.4 to 4.2 µg/L and 64.3 to 74.7 mg/L, respectively; Figures EV-02 and -03). Selenium to sulphate (as S) ratios [Se:SO_4 (S)] for EV_MW_GV4A plot just outside of the defined range of natural non-contact water for bedrock and also approach the mixing line (Figure EV-05). The Se:SO_4 (S) ratios for EV_MW_GV4B fall outside of the natural (non-contact) water for unconsolidated materials, although they are similar to the ratios observed for EV_MW_GV4A (Figure EV-05). The inferred boundaries defining non-contact water from mine-influenced water are based on 95th percentile of sulphate and dissolved selenium concentrations of background wells. Based on the BGA completed by SNC-Lavalin as part of the RGMP Update (SNC-Lavalin, 2020), this well pair was considered to represent background, but recent increasing concentrations suggest that there may be some influence from Harmer Reservoir/Harmer Creek. Additional data is currently being collected for this well pair, including isotope data which will provide insight on the relative age of groundwaters, recharge areas and flow paths. Once available, the BGA will be updated as part of the 2023 RGMP Update to inform whether these wells should continue to be assessed as part of the background dataset.

Monitoring wells EV_GV3gw and EV_GV3gwS were installed in the unconsolidated sediment along Grave Creek near the confluence with Harmer Creek. In 2022, concentrations of dissolved selenium in the shallow groundwater at EV_GV3gwS ranged from 2.64 to 3.40 µg/L and in deep groundwater at EV_GV3gw ranged from 4.48 to 5.22 µg/L (Figure EV-02; Drawing EV-17). Although concentrations of dissolved selenium at EV_GV3gw exhibit an increasing trend, concentrations have remained below the primary screening criteria.

Surface water concentrations of dissolved selenium, nitrate-N and sulphate, and groundwater elevations at EV_HC1 fluctuate seasonally and are typically lower during freshet which is consistent with the effect of dilution on constituents in a freshet dominated regime. Groundwater elevations also fluctuate seasonally at EV_GV3gwS, EV_GV3gw and EV_MW_GV4A/B in a more muted manner in comparison to EV_HC1 (Figures EV-01 to -04).

Monitoring well RG_MW_GCA was installed in bedrock further downstream along Grave Creek prior to the confluence with the Elk River (Drawing EV-06; Attachment II – Diagram EV-01). Groundwater from this well also contains concentrations of dissolved selenium (0.6 to 1.6 µg/L) which are an order of magnitude lower than in Harmer Creek (EV_HC1), as well as lower than historical concentrations previously measured in Grave Creek (EV_GV1) (Figure EV-02). The Se:SO_4 (S) ratio for RG_MW_GCA falls within the defined range for natural (non-contact) water for bedrock (Figure EV-05). High turbidity was encountered at RG_MW_GCA in 2022 (84.3 to 1,060 NTU), with increasing turbidity observed in each successive quarter. The high turbidity values at this monitoring location may have yielded higher metal concentrations, and therefore the sample analytical results may not be representative of bedrock groundwater quality in this area.

The ratio of Se:SO_4 (S) for groundwater from EV_GV3gwS fall outside of the defined range for natural (non-contact) water for unconsolidated materials (Figure EV-05). Similar to ratios plotted for EV_MW_GV4A/B, the ratios for EV_GV3gw plot outside of the previously defined range for natural non-contact water, suggesting that either some degree of mixing with mine-influenced water or selenium attenuation has occurred. Surface water at EV_HC1 exhibits the chemical signature consistent with mixing of non-contact water and mine-influenced water (shown in Figure EV-05). Although the chemistry is generally similar for EV_GV3gwS/EV_Gv3gw and EV_MW_GV4A/B, the shallower wells generally have lower dissolved selenium and sulphate concentrations.

Mine-influenced constituents are known to be transported by surface water as measured at surface water stations in Dry Creek (EV_DC1) and Harmer Creek (EV_HC1). Both of these tributaries flow into Grave Creek, which has also contained elevated concentrations of OC between 2013 and 2016 (EV_GC1, station deactivated after 2016), relative to groundwater sampled in this watershed (SNC-Lavalin, 2021a). Surface water has not been collected from EV_GC1 since 2016; therefore, a comparison of recent data could not be completed. However, groundwater transport of OC from the Harmer Creek drainage to the Elk River valley-bottom is inferred to be minimal based on concentrations of OC less than the screening criteria measured in both shallow (EV_GV3gwS) and relatively deep groundwater (EV_GV3gw) compared to surface water. Furthermore, at RG_MW_GCA, installed near the confluence of Grave Creek and the Elk River, bedrock was encountered at a depth of 1.5 m, which further suggests that the groundwater component along Grave Creek would be minimal in comparison to surface water. This hypothesis is also supported by flow accretion studies that found that Harmer Creek did not lose flow to groundwater on a catchment scale and localized flow loss was regained before Harmer Creek reaches the Harmer Reservoir (Drawing EV-02; SNC-Lavalin, 2021a).The proportional decrease in OC concentrations in surface water downstream in Harmer Creek was inferred not to be to the result aquifer attenuation, but was consistent with mixing (i.e., dilution) with background waters (Lorax Environmental, 2019; SNC-Lavalin, 2020). Overall, surface water is considered the main transport pathway for OC to groundwater in the Elk River valley-bottom.

Additional monitoring wells were recently installed near the Dry Creek Sedimentation Pond (EV_MW_DC1, EV_MW_DC2, EV_MW_DC7 and EV_PW_DC1) and, near the Harmer Reservoir (EV_MW_HC1 through EV_MW_HC5) (Drawing EV-01). As discussed in the SSGMP Update, Dry Creek is expected to represent the main source of mine-influenced groundwater and surface water to the Grave Creek/Harmer Creek areas (SNC-Lavalin, 2021a). After two years of data has been collected from the Harmer Reservoir wells and Dry Creek wells, which should be sufficient to identify any seasonal or other trends, the results will be reviewed for potential inclusion in the EVO SSGMP. In addition, background wells were installed upstream of the Harmer Creek/Grave Creek confluence near Grave Creek (EV_MW22-GV5A/B) (Drawing EV-01).

1.5.1.2 Elk River Downstream of Grave Creek Confluence (Study Area 7)

In 2022, groundwater samples from the Elk River downstream of the Grave Creek confluence (RG_DW-02-20 and RG_MW_WW) had concentrations of OCs less than the primary screening criteria; except for dissolved selenium in both wells; trends (where available) and concentrations were consistent with historical data.

Both RG_DW-02-20 and RG_MW_WW have been installed in the Elk River valley-bottom downstream of the confluence with Grave Creek (Drawing EV-01). Infiltration of surface water from the Elk River is considered a key influence on groundwater quality in this area. In 2022, sulphate concentrations in Elk River valley-bottom groundwater at RG_DW-02-20 ranged between 60.2 and 89.3 mg/L, while dissolved selenium concentrations ranged from 10.5 and 15.8 µg/L (Figures EV-02 and -03; Drawings EV-15 and -17). Concentrations of dissolved selenium were greater than the applicable primary standards, and the Mann-Kendall trend analysis indicates a probable increasing trend (Attachment III). Concentrations of nitrate-nitrogen (nitrate-N) at RG_DW-02-20 were less than the primary screening criteria (Figure EV-04) and the Mann-Kendall analysis indicates no apparent trend.

Concentrations of sulphate and dissolved selenium in 2022 at RG_MW_WW ranged from 63.0 to 69.7 mg/L and 10.3 to 12.2 µg/L, respectively. The concentrations of OC in both wells were within the range of magnitude of those measured in Elk River surface water at EV_ER4 (upstream from the confluence with Grave Creek; Figures EV-02 to -04) and the Se:SO_4 (S) ratios are similar, indicating mixing with mine-influenced water (Figure EV-05). OC concentrations in the Elk River measured at EV_ER4 fluctuate seasonally and are typically lower during freshet, consistent with the effect of dilution on constituents in a freshet dominated regime. Although OC concentrations at RG_DW02-20 were similar in magnitude to the Elk River, they followed a delayed seasonal trend relative to that observed in surface water, suggesting some lag may be present in groundwater-surface water interactions and/or less dilution occurring in groundwater during freshet. Nitrate-N displays a probable increasing trend, although concentrations remain below applicable thresholds. All other OCs either display a stable trend or no apparent trend.

1.6 Elk River Proximal to EVO (Study Area 8)

A summary of 2022 groundwater monitoring and sampling results for the Elk River Proximal to EVO and Study Area 8 is presented in Table G with references to supporting information (Drawings, Figures, Tables, and Appendices).

Table G: Summary of 2022 Groundwater Monitoring and Sampling Results at the Elk River Proximal to EVO (Study Area 8)

Hydrogeological Information		Description	Reference
Monitoring Locations	Relevant EVO SSGMP/RGMP Wells (Study Area 8)	EV_BALgw, EV_LSgw, EV_GCgw, EV_OCgw, EV_MW_GC1B, RG_DW-03-10 (Sparwood Well 4, PW4)	Table EV-01 Drawing EV-01 SRK, 2022
	Relevant Monitoring Wells from Other Programs[a]	EV_MW22_WBR_1A/B, EV_MW22_WBR_2A/B, EV_MW22_WBR_3A/B, EV_MW22_WBR_4A/B	
	Relevant Surface Water Monitoring Stations[b]	EV_BLM2, EV_GC2, EV_LAGD, EV_LC1, EV_OC1, EV_ER2	
	Relevant Seep Monitoring Locations[b]	EV_SEEP_PLANT1, EV_SEEP_PLANT10, EV_SEEP_PLANT11, EV_SEEP_PLANT23, EV_SEEP_10MILE5, EV_SEEP_10MILE9, EV_SEEP_CFI1, EV_SEEP_CFI3, EV_WLAGC	
Physical Hydrogeology	Groundwater Elevation Trends	• Groundwater elevations exhibit seasonal trends with the highest levels measured in spring/early summer (June) and the lowest measured in mid-fall (October), except at EV_BALgw, where minimal seasonal fluctuations have been observed. • Groundwater elevations at EV_OCgw have followed less of a defined seasonal trend since January 2015. This may be partially related water levels in nearby Lagoon D, inferred to be losing water to ground.	Figure EV-06 Table EV-02 Drawing EV-02
	Hydraulic Gradients and Flow Direction	• No nested well pairs are present in the area to calculate vertical gradients. • Lateral flow is inferred to follow the Elk River. Wells EV_LSgw and EV_MW_GC1B are both screened in the shallow unconfined sand and gravel aquifer. The lateral gradient between these wells was 0.003 to 0.004 m/m to the south in 2022.	
Chemistry	2022 SSGMP/RGMP OC Results	• All OC concentrations were less than primary screening criteria in 2022.	Table H Figures EV-07 to -09 Tables EV-03 to -05 Drawings EV-14 to -17
	Non-Order Mine-Related and Naturally Occurring Constituents[c]	• Concentrations greater than primary screening criteria – Non-Order Mine-related: – Copper: EV_OCgw (Q2); this location only exceeds BCWQG due to being within 10 m of a surface water body. • Concentrations greater than primary screening criteria – Naturally-Occurring Constituents: – Fluoride: EV_OCgw (Q1 to Q4); – Lithium: All wells with the exception of EV_GCgw (above criteria in Q4 only) and RG_DW-03-10 (no concentrations above criteria Q1 to Q4); and – Manganese: EV_LSgw and EV_MW_GC1B (both wells Q1 to Q4). • All other constituents were less than primary screening criteria.	Tables EV-03 to -04 SNC-Lavalin, 2020
	Mann-Kendall Trend Analysis	• Increasing trends: – Sulphate (EV_GCgw, EV_OCgw, EV_MW_GC1B); and – Nitrate (EV_BALgw, EV_GCgw, EV_OCgw, RG_DW-03-10). Concentrations of these OC remain at least an order of magnitude lower than the primary screening criteria. • All other concentrations at EV_LSgw, EV_GCgw, EV_OCgw, EV_BALgw, RG_DW-03-10 and EV_MW_GC1B were either decreasing, stable or no trend.	Table I Attachment III

Notes:

[a] - Relevant Monitoring Wells from Other Programs are those in the area that are under evaluation for potential inclusion in the SSGMP and/or RGMP.

[b]: Relevant Surface Water Stations and Seep Monitoring Stations represent a sub-set of the surface water and seepage monitoring stations present in EVO and Study Area 8.

[c]: Based on the Background Assessment (BGA) completed for the 2020 RGMP Update, all parameters were identified as unrelated to mining.

A summary of results for OC compared to primary screening criteria is presented Table H.

Table H: Summary of OC Compared to Primary Screening Criteria at the Elk River Proximal to EVO (Study Area 8)

Parameter[1,2,3] / Well ID	Nitrate-N (mg/L)				Sulphate (mg/L)				Dissolved Cadmium (µg/L)				Dissolved Selenium (µg/L)			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
EV_BALgw	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EV_LSgw	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EV_GCgw	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EV_OCgw**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EV_MW_GC1B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RG_DW-03-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CSR AW	400				1,280 – 4,290[4]				0.5 – 4[4]				20			
CSR IW	n/a				n/a				5				20			
CSR LW	100				1,000				80				30			
CSR DW	10				500				5				10			
BCWQG (Long-term Average)	3				309 - 429[3]				n/a				2			
BCWQG (Short-term Average)	32.8				n/a				n/a				n/a			

Notes:

[1] Primary screening criteria are CSR standards for **Aquatic Life (AW),** Drinking Water (DW), Livestock (LW), and *Irrigation (IW)* except for wells with a ** which indicates the well is within 10 m of surface water and results are compared to BC Water Quality Guideline (BCWQG) for AW.

[2] '–' denotes result less than primary screening criteria for given constituents.

[3] Where a duplicate was collected, the higher concentration is provided in table.

[4] Standard varies with hardness.

'NS' denotes no sample.

Mann-Kendall trend analysis was completed for OC where more than seven data points have been measured. A summary of the trend analysis results is provided in Table I.

Table I: Summary of Mann-Kendall Trend Analysis for OC at the Elk River Proximal to EVO (Study Area 8)

Parameter[1,2] / Well ID	Nitrate-N	Sulphate	Dissolved Cadmium	Dissolved Selenium
EV_BALgw	Increasing	Decreasing	Stable	Decreasing
EV_LSgw	No Trend	Decreasing	Decreasing	Decreasing
EV_GCgw	Increasing	Increasing	Stable	No Trend
EV_OCgw	Increasing	Probably Increasing	No Trend	Decreasing
RG_DW-03-10	Increasing	Probably Decreasing	No Trend	Stable
EV_MW_GC1B	No Trend	Probably Increasing	Decreasing	No Trend

Notes:

[1] Where OC were measured greater than the primary screening criteria in 2022, the trend result is *italics*. Where the OC were measured greater than the secondary screening criteria for dissolved selenium during at least one event in 2022, the result is ***bold and italics***. Where increasing trends are noted, the cell is shaded yellow.

1.6.1 Discussion

In 2022, groundwater samples from the Elk River proximal to EVO and in Study Area 8 had concentrations of OCs that remained less than the primary screening criteria (Figures EV-07 to -09 and Drawings EV-14 to -17). Concentrations of OCs were generally consistent with historical data. Although the Mann-Kendall trend analysis completed for nitrate-N at EV_OCgw indicated an increasing trend, in 2022 concentrations decreased from Q2 to Q4. In addition, Mann-Kendall analysis indicated increasing trends for nitrate at EV_BALgw, EV_GCgw, ad RG_DW-03-10, however concentrations for all these wells and from EV_OCgw remain approximately one order of magnitude less than the applicable *British Columbia Approved Water Quality Guidelines*[1] (BCWQG) for AW and greater than one order of magnitude less than the primary screening criteria. Mann-Kendall analysis also indicated increasing trends in sulphate at EV_GCgw and probably increasing sulphate concentrations at EV_OCgw and EV_MW_GC1B, although concentrations remained below the primary screening criteria. No other increasing trends were observed in this Study Area.

Dissolved selenium displayed concentrations greater than the BCWQG for AW in the surface waters of the main tributaries in the Elk River watershed (Balmer Creek [EV_BLM2], Lindsay [EV_LC1], Goddard [EV_GC2] and Otto [EV_OC1]). Concentrations of dissolved selenium in groundwater at EV_BALgw, EV_LSgw, EV_GCgw and EV_OCgw have remained less than the screening criteria (less than the laboratory method detection limit at EV_GCgw) and stable or marginally decreasing since 2014 (Figure EV-07). Consistent with previous findings, dissolved selenium concentrations in surface water remain up to two orders of magnitude higher compared to groundwater concentrations in the Elk River drainage (Figure EV-07). The highest dissolved selenium concentrations in surface water were measured at EV_GC2 (Goddard Creek Sedimentation Pond Decant). Dissolved selenium displayed no overall increasing trends at any monitoring well in 2022, which is consistent with historical trends.

Goddard Creek is known to be influenced from seepage through a known fault as it flows from the Cedar North Pit through the conveyor tunnel to the valley-bottom (SNC-Lavalin, 2020). Teck is planning to divert flow from the conveyor tunnel for use as process water starting in the spring of 2023. The Lindsay Interceptor Ditch, which collects flow from the upper Lindsay and Feltham Creek drainages, represents the other source of surface water to Goddard Creek. Four settling ponds (including the Goddard Mid-Pond) help to remove suspended sediment prior to discharge to Goddard Marsh.

At EV_MW_GC1B, located immediately northwest of EV_GC2 (decant of the Goddard Sedimentation Ponds) and northeast of the Goddard Marsh, the Se:SO_4 (S) ratios observed in shallow groundwater show evidence of selenium reduction (Figure EV-10). In Q1, Q3 and Q4 of 2022, reducing conditions were observed at EV_MW_GC1B; the oxidation-reduction potential ranged from -25.1 and 71.1 mV and dissolved oxygen concentrations were low (0.06 to 0.28 mg/L). These values suggest reducing conditions are present in shallow groundwater at this location (SNC-Lavalin, 2021b). The reducing conditions may be related to surface water infiltration from either the Goddard Sedimentation Ponds or the Goddard Marsh, where a reducing environment within the pond sediments is possible. Selenium reduction may also be occurring in CCR, located upgradient to the east and northeast. Note that surface water at both the Goddard Marsh (at Location EV_GCMARSH01A, 2019 data [Ecofish Research Ltd., 2019]) and the Goddard Sedimentation Ponds are both mine-influenced; selenium reduction does not appear to be occurring in surface water at either location (Figure EV-10). However, it is possible that it may be occurring within sediments and within groundwater seepage.

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[1] *British Columbia Approved Water Quality Guidelines, includes Working Water Quality Guidelines for BC* (BCWQG). British Columbia Ministry of Environment & Climate Change Strategy, updated December 2021.

Seep samples collected from location EV_SEEP_PLANT23, located near EV_MW_GC1B and immediately downgradient of the Goddard Sedimentation Ponds, had an average dissolved selenium concentration of 20.2 µg/L and an average sulphate concentration of 445 mg/L in 2022, which are indicative of mine-influenced water. Both of these average concentrations are higher than what was observed in groundwater at EV_MW_GC1B (maximum 2022 dissolved selenium and sulphate concentrations of 5.03 µg/L and 344 mg/L, respectively). Although the sulphate concentrations are of the same order of magnitude to those observed at EV_GC2, the dissolved selenium concentrations are more than an order of magnitude lower. The Se:SO_4 (S) ratios also indicate that EV_SEEP_PLANT23 water has undergone some selenium reduction but not to the same extent as EV_MW_GC1B (Figure EV-10). This result further suggests that groundwater in this area is undergoing selenium reduction, which is not observed in surface water at either the Goddard Sedimentation Ponds (i.e., at EV_GC2) or the Goddard Marsh (i.e., at EV_GCMARSH01A [Ecofish Research Inc., 2019]). There is also the potential that water in the seep is being influenced by mixing of seepage water from nearby and upgradient CCR.

Lagoon D, a tailings storage facility, is located in Study Area 8 and is inferred to be losing water to ground via infiltration (SNC-Lavalin, 2021a). Surface water from the lagoon (surface sample location EV_LAGD) may be influencing the seasonal potentiometric elevations measured at EV_OCgw via seepage, since groundwater elevations at this well have a less defined seasonal trend than other monitoring wells. However, the dissolved selenium concentrations in groundwater at EV_OCgw remain less than the primary screening criteria (and usually below laboratory method detection limits [MDLs]), while they exceed the primary screening criteria at EV_LAGD, and concentrations of sulphate and nitrate are also lower at EV_OCgw than at EV_LAGD. The major ion distribution at EV_LAGD is also distinct from groundwater at EV_OCgw (i.e., lower sodium and higher sulphate, chloride and calcium) (Figures EV-11 and EV-12). These results suggest that groundwater seepage from Lagoon D has not affected groundwater or surface water quality in this area. Monitoring well EV_OCgw is located at the base of the unconfined aquifer immediately over bedrock (screened approximately 10 m below the water table), and shallow groundwater quality and vertical gradients in this area are not known (Drawing EV-07). In addition, the major ion distribution between Otto Creek (EV_OC1) and groundwater from EV_OCgw are distinct from one another (higher calcium, magnesium and chloride in Otto Creek vs. groundwater), indicative that surface water – groundwater interaction between the creek and deeper groundwater (above bedrock) in this area may be limited (Figures EV-11 and -12).

There is some residual uncertainty regarding groundwater flow direction in the vicinity of inactive Lagoons A, B and C. However, the installation of additional monitoring wells in the vicinity of Lagoon D and the inactive lagoons are being considered. The need for inclusion of additional monitoring wells to the RGMP and/or SSGMP will be evaluated once the Lagoon D monitoring well installation program is complete, as part of the next RGMP or SSGMP Update.

Groundwater concentrations at RG_DW-03-10 (Sparwood Municipal Supply Well 4), the municipal well drilled in 2018 to replace Sparwood Well 3 (RG_DW-03-04 in Study Area 12), were less than the primary screening criteria for all OC in 2022 samples (Figures EV-07 to -09). This well is on the opposite (west) side of the Elk River from EVO near Cummings Creek. The Elk River is believed to act as a groundwater divide, which is a natural barrier to groundwater transport from potential sources identified on the western slope of EVO and the Elk River valley-bottom aquifer. However, the Elk River may also recharge the underlying aquifer which can represent a source of OC to groundwater. Conversely, aquifer recharge from Cummings Creek may limit influence from the Elk River at RG_DW-03-10. Continued monitoring of groundwater quality in RG_DW-03-10 is warranted to improve understanding given its importance as a drinking water supply for the District of Sparwood. An increasing trend in nitrate-N was identified at RG_DW-03-10, but concentrations remain an order of magnitude below the primary screening criteria.

1.7 Sparwood Area (Study Areas 9a and 12)

This section has been structured along the following geographical areas with rationale:

- Sparwood Area - Michel Creek and Baldy Ridge (Study Area 9a): Assess recharge to groundwater from infiltration of Michel Creek and the Elk River, as well as an identified potential groundwater flow path from EVO to the Sparwood Area; and
- Sparwood Area – Elk River and Sparwood Ridge (Study Area 12): Assess upland groundwater and surface water on the northern slopes of Sparwood Ridge flowing into Michel Creek valley-bottom sediments, as well as assess surface water-groundwater interactions (specifically with Elk River and Michel Creek), along with groundwater flow paths from upgradient areas. This area receives groundwater flow from Study Area 8 (Elk River Proximal to EVO) and Study Area 9a (Sparwood Area – Michel Creek and Baldy Ridge).

A summary of 2022 groundwater monitoring and sampling results for the Sparwood Area is presented in Table J with references to supporting information (Drawings, Figures, Tables, and Appendices).

Table J: Summary of 2022 Groundwater Monitoring and Sampling Results in the Sparwood Area (Study Areas 9a and 12)

Hydrogeological Information		Description	Reference
Monitoring Locations	Relevant EVO SSGMP/RGMP Wells (Study Areas 9a and 12)	**Sparwood Area– Michel Creek and Baldy Ridge (Study Area 9a):** EV_MW_SPR1A/B/C, EV_MW_MCgwA/B, , EV_MW_AQ1, EV_MW_AQ2, EV_MW_MC4 **Sparwood Area – Elk River and Sparwood Ridge (Study Area 12):** RG_DW-03-04 (Sparwood Well 3), RG_MW-03-04, EV_ER1gwS, EV_ER1gwD, EV_MW_MC3	Table EV-01 Drawing EV-01 SRK, 2022
	Relevant Monitoring Wells from Other Programs[a]	EV_MW22_MC3B	
	Relevant Surface Water Monitoring Stations[b]	EV_ER2, EV_MC2, EV_ER1, EV_SPR2, EV_AQ6	
	Relevant Seep Monitoring Locations[b]	EV_SPR1B (SEEP1B), EV_SEEP_TURCON1	
Physical Hydrogeology	Groundwater Elevation Trends	• **Sparwood Area – Michel Creek and Baldy Ridge:** – Groundwater elevations at most wells exhibit similar seasonal trends with the highest levels measured in spring/early summer and the lowest measured in mid-fall (October), similar to seasonal fluctuations in Michel Creek (EV_MC2). Groundwater elevations at EV_MW_AQ1 are highest in the spring (May). At EV_MW_MC4, the seasonal response is also muted and delayed; the maximum annual elevations usually occur in August. Seasonal groundwater elevation fluctuations at EV_MW_AQ2 are also muted with the highest groundwater elevations typically occurring in April or May and the lowest elevations between November and January (only about 0.2 m of seasonal variation). • **Sparwood Area – Elk River and Sparwood Ridge:** – RG_DW-03-04 is no longer in use for drinking water supply and typically only operated for maintenance/emergency purposes. A pressure transducer cannot be installed, and manual groundwater elevations are not available. However pumping records indicate that this well experienced almost no use since October 2020. Groundwater elevations at EV_ER1gwS/D follow similar seasonal elevation trends as surface water levels measured in Elk River (EMS Station ID 08NK016), and manual measurements at RG_MW-03-04 also appear similar. The cessation of pumping at RG_DW-03-04 does not appear to have greatly affected groundwater elevations at EV_ER1gwS/D. EV_MW_MC3 exhibits higher groundwater elevations in the spring/summer, consistent with a freshet dominated regime and similar to the trend observed in Michel Creek (EV_MC2).	Figures EV-13 to -14 Table EV-02 Drawing EV-02, -03
	Hydraulic Gradients and Flow Direction	• Vertical Hydraulic Gradient: – EV_MW_SPR1A/B, EV_MW_SPR1B/C, EV_MW_MCgwA/B (Study Area 9a): 0.006 to 0.03 m/m upwards; and – EV_ER1gwS/D (Study Area 12): 0.02 m/m downwards. • Lateral Hydraulic Gradient: – In Q4 2022, the lateral hydraulic gradient was approximately 0.009 m/m along Michel Creek in Study Area 9a and 0.007 m/m in Study Area 12. East of the Elk River, groundwater flow along the Michel Creek valley is westward, parallel or sub-parallel to Michel Creek. Locally, groundwater flow is likely governed by the presence of preferential pathways formed by channels of coarse-grained sediments and therefore localized groundwater flow directions may vary. – Upland groundwater and surface water originating on Sparwood Ridge flows downgradient to the Elk River and Michel Creek in the Sparwood Area. Shallow groundwater flow is influenced by bedrock topography where bedrock is shallow.	
Chemistry	2022 SSGMP/RGMP OC Results	• **Sparwood Area – Michel Creek and Baldy Ridge:** – Concentrations greater than primary screening criteria: ▪ Dissolved selenium – EV_MW_AQ1 (Q1). – All concentrations were less than the secondary screening criteria. • **Sparwood Area – Elk River and Sparwood Ridge:** – Concentrations greater than primary screening criteria: ▪ Dissolved selenium – EV_ER1gwS (Q4), RG_MW-03-04 (Q4), and EV_MW_MC3 (Q1, Q2 and Q3); and – All concentrations were less than the secondary screening criteria. • All other OC concentrations were less than the primary screening criteria in 2022.	Table K Figures EV-15 to -20 Tables EV-03 to -05 Drawings EV-18 to -21
	Non-Order Mine-Related and Naturally Occurring Constituents[c]	• Concentrations greater than primary screening criteria – Non-Order Mine-related: None. • Concentrations greater than primary screening criteria – Naturally-Occurring Constituents: – Fluoride: EV_MW_SPR1B (Q1 to Q4); – Lithium: All wells, with concentrations above primary screening criteria, with the exception of RG_DW-03-04 (Q3) and EV_ER1gwS/D (all quarters); – Manganese: EV_MW_SPR1A (Q1 to Q4); and – Molybdenum: EV_MW_SPR1B (Q1 to Q3), EV_MW_MC3 (Q4). • All other constituents had concentrations that were less than the primary screening criteria.	Tables EV-03 to -04 SNC-Lavalin, 2020

Table J (Cont'd): Summary of 2022 Groundwater Monitoring and Sampling Results in the Sparwood Area (Study Areas 9a and 12)

Hydrogeological Information		Description	Reference
Chemistry (Cont'd)	Mann-Kendall Trend Analysis	• Increasing or probably increasing trends: – Nitrate-N (EV_MW_SPR1A, EV_MW_MC3); – Sulphate (EV_MW_MCgwA/B, EV_MW_AQ1, EV_MW_MC3); – Dissolved cadmium (EV_MW_SPR1C, EV_ER1gwS/D, EV_MW_MC3): – Dissolved selenium (EV_MW_SPR1B, EV_MW_MC3). • All other parameters in select wells were either decreasing, stable or no trend. • Insufficient data was available to complete Mann-Kendall trend analysis at RG_MW-03-04.	Table L Attachment III

Notes:

[a] - Relevant Monitoring Wells from Other Programs are those in the area that are under evaluation for potential inclusion in the SSGMP and/or RGMP.
[b] - Relevant Surface Water Stations and Seep Monitoring Stations represent a sub-set of the surface water and seepage monitoring stations present in EVO and Study Areas 9a and 12.
[c]: Based on the Background Assessment (BGA) completed for the 2020 RGMP Update, all parameters were identified as unrelated to mining.

A summary of results for OC compared to primary screening criteria is presented in Table K.

Table K: Summary of OC Compared to Primary Screening Criteria in the Sparwood Area (Study Areas 9a and 12)

Parameter[1,2,3] / Well ID	Nitrate-N (mg/L)				Sulphate (mg/L)				Dissolved Cadmium (µg/L)				Dissolved Selenium (µg/L)			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Sparwood Area - Michel Creek and Baldy Ridge																
EV_MW_SPR1A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EV_MW_SPR1B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EV_MW_SPR1C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EV_MW_MCgwA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EV_MW_MCgwB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EV_MW_AQ1	-	-	-	-	-	-	-	-	-	-	-	-	12.2	-	-	-
EV_MW_AQ2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EV_MW_MC4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Elk River and Sparwood Ridge																
EV_ER1gwS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12.2
EV_ER1gwD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RG_DW-03-04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RG_MW-03-04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.3
EV_MW_MC3	-	-	-	-	-	-	-	-	-	-	-	-	18.6	18.8	18.8	-
CSR AW	400				1,280 – 4,290[4]				0.5 – 4[4]				20			
CSR IW	n/a				n/a				5				20			
CSR LW	100				1,000				80				30			
CSR DW	10				500				5				10			

Notes:

[1] Primary screening criteria are CSR standards for **Aquatic Life (AW),** Drinking Water (DW), Livestock (LW), and *Irrigation (IW).*

[2] '–' denotes result less than primary screening criteria for given constituents.

[3] Where a duplicate was collected, the higher concentration is provided in table.

[4] Standard varies with hardness.

'NS' denotes no sample.

Mann-Kendall trend analysis was completed for OC where more than seven data points have been measured. A summary of the trend analysis results is provided in Table L.

Table L: Summary of Mann-Kendall Trend Analysis for OC of the Sparwood Area (Study Areas 9a and 12)

Parameter[1,2] Well ID	Nitrate-N	Sulphate	Dissolved Cadmium	Dissolved Selenium
Sparwood Area – Michel Creek and Baldy Ridge				
EV_MW_SPR1A	Probably Increasing	Decreasing	Stable	No Trend
EV_MW_SPR1B	Stable	Decreasing	No Trend	Probably Increasing
EV_MW_SPR1C	Stable	Stable	Increasing	Stable
EV_MW_MCgwA	Decreasing	Increasing	Stable	Probably Decreasing
EV_MW_MCgwB	Stable	Increasing	No Trend	No Trend
EV_MW_AQ1	No Trend	Increasing	Stable	*No Trend*
EV_MW_AQ2	No Trend	Stable	Stable	No Trend
EV_MW_MC4	No Trend	Stable	Stable	Stable
Sparwood Area – Elk River and Sparwood Ridge				
EV_ER1gwS	Decreasing	No Trend	Increasing	*Stable*
EV_ER1gwD	Decreasing	Decreasing	Increasing	Decreasing
RG_DW-03-04	Decreasing	Stable	Decreasing	Decreasing
RG_MW-03-04	-	-	-	-
EV_MW_MC3	Increasing	Increasing	Probably Increasing	*Increasing*

Notes:

[1] Where OC were measured greater than the primary screening criteria in 2022, the trend result is *italics*. Where the OC were measured greater than the secondary screening criteria for dissolved selenium during at least one event in 2022, the result is ***bold and italics***. Where increasing trends are noted, the cell is shaded yellow.

[2] "-" denotes insufficient data to complete trend analysis, including where concentrations were consistently less than or within five times the method detection limit (MDL).

1.7.1 Discussion

1.7.1.1 Sparwood Area – Michel Creek and Baldy Ridge (Study Area 9a)

Groundwater at the base of Baldy Ridge is inferred to primarily originate upslope from Baldy Ridge, and then merges with flow near Michel Creek further downgradient. The water levels show a muted seasonal influence at EV_MW_MC4 and EV_MW_AQ1 and little seasonal influence at EV_MW_AQ2 compared to wells installed in the Michel Creek aquifer. This further supports the hypothesis that groundwater flow from Baldy Ridge is the dominant process as opposed to surface water infiltration from Michel Creek or nearby tributaries (Figure EV-13).

In 2022, groundwater samples from the Sparwood Area along Michel Creek (EV_MW_SPR1A/B and EV_MW_MCgwA/B) had concentrations of OC less than the primary screening criteria (Figures EV-15 to -17 and Drawings EV-18 to -21). Concentrations of dissolved selenium were lower than the primary screening criteria in shallow well EV_MW_SPR1C. Prior dissolved selenium concentrations at this well exceeded the primary screening criteria in Q1 of 2019, 2020 and 2021 (sampling was initiated in 2019).

At the nested well EV_MW_SPR1A/B/C, an upward groundwater gradient was present between the shallow and deeper aquifers through the entire year, which suggests groundwater in this area may be recharging surface water, including Spring Creek (i.e., at EV_SPR2; Table EV-02). Dissolved selenium concentrations at EV_MW_SPR1C are generally similar to those observed in surface water at nearby

EV_SPR2, although they may at times more closely resemble surface water concentrations at Michel Creek (EV_MC2) (Figure EV-15). Isotope and general geochemistry data indicated that groundwater sources to Spring Creek are from the relatively shallow fluvial/alluvial aquifer, while contributions from deeper sources originating from the Mist Mountain Formation on Baldy Ridge appear to be relatively insignificant (SNC-Lavalin, 2009).

The Se:SO_4 (S) ratio plot indicates that mine-influenced groundwater is present at monitoring wells EV_MW_AQ1 and EV_MW_SPR1C (Figure EV-21). In addition, groundwater at these two wells have Se:SO_4 (S) ratios that are similar to surface water at Michel Creek (EV_MC2) and Spring Creek (EV_SPR2), which also indicate mine-influence. Dissolved selenium, sulphate and nitrate concentration trends at Michel Creek (EV_MC2) also resemble those at Spring Creek (EV_SPR2) and groundwater at EV_MW_SPR1C. These results suggest that mine-influenced water sourced from Michel Creek may be influencing the groundwater quality at EV_MW_SPR1C, EV_MW_MC3 and surface water at Spring Creek (EV_SPR2).

The presence of a relatively thick and continuous fine-grained unit in this area is interpreted to locally affect groundwater flow, resulting in two distinct aquifers separated by an aquitard in the valley-bottom in the Sparwood Area (Drawings EV-09 and -10). Groundwater at EV_MW_SPR1A/B, screened below EV_MW_SPR1C does not appear to be mine-influenced, which suggest that any surface water influence from Michel Creek or Aqueduct Creek does not extend into the underlying fine-grained unit and deeper confined aquifer. The aquitard extends to EV_MW_MCgwA/B (Drawing EV-09), where there is also little or no mine-influence in either the shallow or deep aquifers. Influence from Michel Creek on the deeper well may be minimal due to the presence of the aquitard and also due to influence of groundwater flow from Baldy Ridge. The fine-grained unit is also inferred to contribute to the following naturally occurring constituents: fluoride, lithium, and manganese and molybdenum.

In 2022, groundwater samples from Baldy Ridge (EV_MW_AQ1, EV_MW_AQ2 and EV_MW_MC4) had concentrations of OCs less than the primary screening criteria, with the exception of dissolved selenium at EV_MW_AQ1 (12.2 µg/L in Q1) (Figures EV-15 to -17 and Drawings EV-18 to -21). Concentrations and trends of OCs were generally consistent with historical data.

The Se:SO_4 (S) ratios in surface water at Aqueduct Creek (EV_AQ6) indicates mine-influence, although the sulphate concentrations are generally lower than observed in groundwater at EV_MW_AQ1 (Figure EV-21). In Q1 2022, the dissolved selenium concentration at EV_MW_AQ1 (12.2 µg/L) exceeded the primary screening criteria for the first time (the well was first sampled in 2019). Concentrations returned below primary screening criteria for the remainder of the year. Dissolved selenium concentrations have exceeded the primary screening criteria on occasion at EV_AQ6, usually in the late fall, winter and spring (i.e., between November and June). Dissolved selenium concentrations at EV_MW_AQ1 are usually lower than surface water at Aqueduct Creek (EV_AQ6), although in Q1, Q2 and Q3 2022 they were similar or higher (Figure EV-15). Sulphate concentrations in groundwater at EV_MW_AQ1 are higher than at Aqueduct Creek (EV_AQ6), and nitrate concentrations are usually higher as well (Figures EV-16 and -17). These results suggest that although there may be some influence from infiltration of surface water from Aqueduct Creek (and Qualtieri Creek, which has been diverted to Aqueduct Creek) to groundwater, there also may be other influences, including upgradient groundwater (e.g., from Baldy Ridge). At EV_MW_AQ1, there is approximately 20 m of gravel sediment over bedrock, with saturated conditions present 4 m above bedrock. The lack of strong seasonal groundwater elevation fluctuations suggest that the valley-bottom aquifer has little influence on groundwater at EV_MW_AQ1, which further supports Baldy Ridge groundwater as the main influence on groundwater quality. The difference in groundwater elevations between surface water at EV_MC2 (about 1140 masl) and EV_MW_AQ1 (approximately 1158 masl) also suggests that the valley-bottom aquifer would not influence groundwater quality at EV_MW_AQ1.

Concentrations of OC in groundwater at wells EV_MW_MC4, EV_MW_AQ2 and seep EV_SEEP_TURCON1 did not contain OC concentrations greater than the primary screening criteria in 2022 or in prior years (Figures EV-15 to -17). Concentrations of dissolved selenium at EV_MW_MC4 and EV_MW_AQ2 are usually below or slightly above laboratory MDLs. The Se:SO_4 (S) ratios for groundwater at both these wells are similar, and indicate that although dissolved selenium concentrations are low, higher sulphate concentrations suggest mine influence (Figure EV-21). The Se:SO_4 (S) ratios for EV_SEEP_TURCON1 are variable, with most 2022 results remaining immediately within the natural non-contact water boundary for bedrock and one sample indicating mine-influenced water. Specifically, the SE:SO_4 (S) ratios for EV_SEEP_TURCON1 range from those observed at EV_MW_MC4 to those observed at EV_MW_SPR1C and EV_MW_AQ1.

1.7.1.2 Sparwood Area – Elk River and Sparwood Ridge (Study Area 12)

In 2022, groundwater samples near the Elk River in Study Area 12 (RG_DW-03-04, RG_MW-03-04, and EV_ER1gwS/D) had concentrations of dissolved selenium, nitrate-N and sulphate that were within similar ranges as observed in previous years. At EV_MW_MC3, concentrations of dissolved selenium, nitrate-N and sulphate were within historical ranges with the exception of sulphate in Q1 which was higher than previously observed, although it was below the primary screening criteria (Figures EV-18 to -20 and Drawings EV-18, -19 and -21).

Seasonal trends in OC concentrations have been observed in surface water in the Elk River and Michel Creek (EV_ER1 and EV_MC2, respectively; Figures EV-18 to -20). Similar seasonal fluctuations have been observed in groundwater at RG_DW-03-04, RG_MW-03-04 and EV_ER1gwS, with lower concentrations measured in the late spring and summer which increase through the fall and winter, consistent with the effect of dilution in a freshet dominated regime. Prior to July 2019, concentrations of OC at deep well EV_ER1gwD also exhibited seasonal fluctuations; however, since then, fluctuations have become more muted and concentrations of OC have generally decreased (with the exception of Q1 in 2021 and 2022, which have higher concentrations either approaching or similar to the Elk River and Michel Creek) (Figures EV-18 to -20). This may be the result of the cessation of sustained pumping at municipal groundwater supply well RG_DW-03-04. Municipal groundwater extraction has now shifted to RG_DW-03-10 (Sparwood Well #4).

The confining layer (identified as clay at RG_DW-03-04 and silt and clay at RG_MW-03-04) is not fully continuous and the confined/semi-confined aquifer unit may interact with the shallow unconfined aquifer as well as infiltrating surface water, as evident in cross sections (Drawings EV-12 and -13). Neither the extent of the confined aquifer, the confining layer, or the groundwater flow direction at the confluence of Michel Creek and Elk River are well constrained. The RG_DW-03-04 capture zone was inferred to extend in a generally north to northeast direction and draw water from both Elk River and Michel Creek (UMA, 2008), where flow is likely governed by coarser-grained materials formed by historical fluvial or glaciofluvial channels. From 2016 to 2020, dissolved selenium and nitrate-N concentrations in the deeper confined aquifer at RG_DW-03-04 appeared to generally reflect Elk River surface water quality, with some influence from Michel Creek. In 2021 and 2022, dissolved selenium and nitrate concentrations were generally lower than in previous years, although influence from the Elk River and Michel Creek is apparent.

The Se:SO_4 (S) ratio plot indicates that groundwater quality in Study Area 12 is mine-influenced (Figure EV-22). Groundwater Se:SO_4 (S) ratios at EV_MW_MC3, RG_MW-03-04 and RG_DW-03-04 plot more closely to that of Michel Creek surface water (i.e., EV_MC2) than the Elk River, indicating that Michel Creek is influencing this water (Elk River surface water tends to have lower sulphate concentrations). Groundwater at EV_ER1gwS/D plot more closely with Elk River water (i.e., EV_ER1), which indicate that the Elk River is a stronger influence.

Surface water concentrations of dissolved selenium at Michel Creek (EV_MC2) generally decreased from 2019 to 2021, although peak concentrations of dissolved selenium increased in August to October 2022 increased and were similar to those observed prior to 2019 (Figure EV-18). Sulphate concentrations remained similar to prior years, and nitrate concentrations remained similar to what was observed from 2019 to 2021 (Figures EV-19 and -20).

Although concentrations of OC have generally decreased in deep well EV_ER1gwD (Figures EV-18 to -20), water levels in the deep aquifer do not appear to have changed in 2022 compared to previous years, and the upward vertical gradient at this location has also remained similar (Table EV-02 and Figure EV-15). Due to the wellhead configuration, instrumentation cannot be installed inside the well casing to collect water level data from RG_DW-03-04 to assess changes after pumping.

Downgradient from Sparwood Ridge, continuous groundwater elevation data in well EV_MW_MC3 indicates a seasonal response (Figure EV-14). The highest groundwater levels are observed in the spring, approximately following the same response as Michel Creek (EV_MC2), which suggests a hydraulic connection between groundwater and Michel Creek surface water.

Similar to observations in 2021, groundwater samples from EV_MW_MC3 in 2022 had concentrations of dissolved selenium greater than the primary screening criteria in Q1 through Q3, although the concentration decreased to below the criteria in Q4 (Figure EV-18 and Drawing EV-21), and concentrations of OCs (nitrate-N, sulphate and dissolved selenium) display statistically significant increasing trends according to Mann-Kendall analysis (Figures EV-18 to -20 and Table L). The 2021 and 2022 OC concentrations were generally similar or higher than what was observed in Michel Creek (EV_MC2).

Prior to Q4 2020, groundwater at EV_MW_MC3 was classified as sodium-bicarbonate type water, consistent with the evolution of water through cation exchange with bedrock and reducing conditions, and indicative that groundwater-surface water interaction had likely occurred (Figure EV-23). In Q4 2020, the major ion distribution in groundwater at this well has shifted to calcium-bicarbonate-sulphate type water. In Q1 2021, the major ion distribution shifted back to sodium-bicarbonate before returning to calcium-bicarbonate-sulphate water in Q2-Q4 of 2021 and Q1-Q3 of 2022. In Q4 of 2022, the water shifted again to a sodium-bicarbonate water. When groundwater at EV_MW_MC3 is of sodium-bicarbonate type, dissolved selenium concentrations remain below the primary screening criteria; however, when the groundwater shifts to calcium-bicarbonate-sulphate water, dissolved selenium concentrations exceed the primary screening criteria. Increases in field-measured dissolved oxygen (DO) and oxidation-reduction potential (ORP) also correspond to calcium-bicarbonate-sulphate water (Table EV-03). The Se:SO_4 (S) ratios for this well are similar to what has been observed within Michel Creek, and indicate mine-influenced water, although the samples collected in Q1 2021 and Q4 2022 lie within or just outside the range for natural non-contact water (Figure EV-22). The shift in water type and corresponding increases in dissolved selenium concentrations indicate that there are two varying sources of groundwater that intercept this well, one of which having a much stronger mine-influenced signature.

Seep EV_SPR1B is located in the general vicinity of EV_MW_MC3 and also had concentrations of dissolved selenium greater than the primary screening criteria in Q2 of 2019, 2020, 2021 and 2022. Dissolved selenium concentrations during these quarters resemble those measured at Michel Creek (EV_MC2) which suggest a possible source. However, the major ion distribution at EV_SPR1B for Q2 of 2019, 2020, 2021 and 2022 indicates that the water is of a calcium-magnesium-sulphate-bicarbonate type water, which is dissimilar to that of EV_MW_MC3 (Figure EV-23). The dissolved selenium concentrations measured at EV_SPR1B are generally dissimilar to concentrations measured at EV_MW_MC3 (with the exception of Q2 2021). In addition, the Se:SO4 ratios observed at EV_SPR1B lie within the natural (non-contact water) for bedrock, with the exception of one sample that shows mine influence (Figure EV-22).Based on these results, this seep has been interpreted to be representative of melt water that has flowed through the historical mine workings on Sparwood Ridge, located to the south of Michel Creek, and is not considered representative of the groundwater in the valley-bottom of the Sparwood Area.

1.8 Michel Creek Downstream of Gate Creek and Bodie Creek (Study Area 9b)

This section has been structured along the following geographical areas with rationale:

- Gate Creek and Bodie Creek: a potential groundwater flow path from EVO mining activities upstream from Bodie and Gate Creek drainages.
- Michel Creek Valley-Bottom: understanding of the major sources of mining-related groundwater further downstream of Bodie and Gate Creek.

A summary of 2022 groundwater monitoring and sampling results for the Michel Creek downstream of Gate and Bodie Creeks and Study Area 9b is presented in Table M with references to supporting information (Drawings, Figures, Tables, and Appendices).

Table M: Summary of 2022 Groundwater Monitoring and Sampling Results for Michel Creek Downstream of Gate Creek and Bodie Creek (Study Area 9b)

Hydrogeological Information		Description	Reference
Monitoring Locations	Relevant EVO SSGMP/RGMP Wells (Study Area 9b)	**Gate and Bodie Creek:** EV_RCSgw, EV_MW_GT1A/B, EV_MW_BC2/3, EV_WH50gw, EV_MW_BC1A/B, EV_BCgw **Michel Creek Valley-Bottom:** EV_BRgw, EV_MW_MC1A/B, EV_MW_MC2A/B, EV_HW1 (EV_HM1)	Table EV-01 Drawing EV-01
	Relevant Monitoring Wells from Other Programs[a]	**Other Wells:** EV_MW22_RCSgw1A/B/C, EV_MW22_BCgw_1A/B, EV_MW22_MC2C.	
	Relevant Surface Water Monitoring Stations[b]	EV_GT1, EV_BC1, EV_MC2	
	Relevant Seep Monitoring Stations[b]	EV_SPR2B, EV_SPR5, EV_SPR14.	
Physical Hydrogeology	Groundwater Elevation Trends	• **Gate and Bodie Creek**: – Groundwater elevations have exhibited seasonal trends generally consistent with surface water station EV_MC2 (approximately 2 km downstream) in Michel Creek, with water levels increasing during freshet and decreasing in the fall and winter. A lag is apparent between the hydrograph peaks at EV_MC2 and in groundwater wells suggesting a hydraulic influence of the creek on the valley-bottom aquifer. – Pumping rates at EV_RCSgw continued to be low in 2022, with a maximum daily rate of 4.2 m^3/day, and typical pumping rates less than 0.2 m^3/day. Pumping rates at EV_WH50gw were unavailable from late February to November 2021 and in 2022. In 2021, rates ranged from 0.1 to 1.1 m^3/day. In 2021, groundwater from EV_WH50gw was pumped year-round at an average rate of 0.45 m^3/day. – Drawdown induced from groundwater pumping at the supply wells is not apparent on the hydrographs for any of the monitoring wells. • **Michel Creek Valley-Bottom**: – Groundwater elevation data at EV_MW_MC1A/B and EV_MW_MC2A/B indicated a seasonal response with highest groundwater levels in the spring, approximately following the surface water level of Michel Creek (EV_MC2, approximately 0.5 km downstream). – At EV_BRgw, pumping rates in 2022 usually ranged between 1 m^3/day to 4 m^3/day, with peak rates of up to 6 m^3/day. Pumping rates in 2022 increased in comparison to 2021, where pumping rates were usually less than 1 m^3/day. – Pumping rates at EV_HW1 in 2022 were the highest year-round for the wells in Study Area 9b with a median pumping rate of 50 m^3/day, and a peak rate of 323 m^3/day in January 2022. Between August and the end of September, pumping rates at EV_HW1 were the lowest, with an average rate of 17 m^3/day, and pumping rates were also lower between November and December. Pumping rates were generally similar in 2021 (the median pump rate was 43 m^3/day). – Wells EV_MW_MC2A/B are located closest to EV_HW1, but no obvious pumping effects (i.e., drawdown) were apparent on groundwater elevations at these wells or at EV_MW_MC1A/B.	Figures EV-24 to -26 Table EV-02 Drawing EV-03
	Hydraulic Gradients and Flow Direction	• Vertical Hydraulic Gradient: – EV_MW_GT1A/B:0.01 m/m downwards and EV_MW_BC1A/B: 0.02 to 0.05 m/m downwards; – EV_MW_BC1A/B: 0.02 to 0.05 m/m downwards; – EV_MW_BC2/3: 1.05 to 1.28 m/m upwards (gradient >1 indicates that EV_MW_BC3, screened in unconsolidated sediment, has perched water not in direct communication with bedrock well EV_MW_BC2, which has artesian conditions – the groundwater elevation is approximately 6 m above the bedrock surface); – EV_MW_MC1A/B: 0.02 to 0.03 m/m downwards; and – EV_MW_MC2A/B: 0.01 m/m downwards (Q1-Q4). • Lateral Hydraulic Gradient: – The lateral hydraulic gradient along Michel Creek was 0.009 m/m in Q4 2022. Groundwater flow is towards the northwest following Michel Creek.	
Chemistry	2022 SSGMP/RGMP OC Results	• **Gate and Bodie Creek** – Concentrations greater than primary screening criteria: ▪ Dissolved Selenium– all wells, except for EV_MW_GT1A (Q1 to Q4) and EV_WH50gw (Q1 to Q3); all concentrations that were greater than the primary screening criteria also exceeded the secondary screening criteria, except at EV_WH50gw (Q4), EV_BCgw (Q1) and EV_MW_BC2 (Q4); ▪ Sulphate – EV_MW_BC1A/B, EV_RCSgw, EV_MW_GT1B, EV_MW_BC3 (Q2 to Q4), and ▪ Nitrate-N – EV_MW_BC1A (Q1 to Q4), EV_MW_BC1B (Q1 and Q2), EV_RCSgw (Q1 to Q4), EV_MW_GT1B (Q2). – Concentrations greater than secondary screening criteria: ▪ Dissolved Selenium – EV_MW_GT1B, EV_MW_BC1A/1B, EV_RCSgw, EV_MW_BC3 (Q1 to Q4), EV_MW_BC2 (Q1 to Q3), EV_BCgw (Q2 to Q4).	Table N Drawings EV-18 to -21 Tables EV-03 to -05 Figures EV-27 to – 29, EV-31 to -33

Table M (Cont'd): Summary of 2022 Groundwater Monitoring and Sampling Results for Michel Creek Downstream of Gate Creek and Bodie Creek (Study Area 9b)

Hydrogeological Information		Description	Reference
Chemistry (Cont'd)	2022 SSGMP/RGMP OC Results (Cont'd)	• **Michel Creek Valley Bottom:** – Concentrations greater than primary screening criteria: ▪ Dissolved Selenium – EV_BRgw, EV_MW_MC2B, EV_HW1 (Q1 to Q4 for all these wells); all concentrations were greater than the secondary screening criteria. – Concentrations greater than secondary screening criteria: ▪ Dissolved Selenium – EV_BRgw, EV_HW1, EV_MW_MC2B (Q1 to Q4). ▪ Concentrations of these OC have been greater than the applicable primary criteria since sampling began in 2019, with the exception of EV_MW_MC1A which has sulphate and nitrate-N concentrations that remain well below the primary screening criteria. • All other OC concentrations were less than the primary screening criteria and secondary screening criteria in 2022.	Table N Drawings EV-18 to -21 Tables EV-03 to -05 Figures EV-27 to – 29, EV-31 to -33
	Non-Order Mine-Related and Naturally Occurring Constituents[c]	• Concentrations greater than primary screening criteria – Non-Order Mine-related: – Iron: EV_MW_MC1B (Q1 to Q4); – Copper: EV_HW1 (Q1 to Q4); – Uranium: EV_MW_BC1B (Q1 to Q3); – Barium: EV_MW_M1A and EV_MW_MC2A (Q1 to Q4), and – Chloride: EV_MW_MC1A (Q3 and Q4) and EV_MW_MC1B (Q1 to Q3). • The source of dissolved copper at EV_HW1 is not clear; however, may be related to copper tubing used in the construction of the sampling port. • Dissolved uranium at EV_MC_BC1B is inferred to be related to surface water infiltration from Bodie Creek. • The source of chloride is not known but it may be related to road salt (the wells are located adjacent to a parking area).	Figure EV-30 Tables EV-04 to -05 SNC-Lavalin, 2020 SNC-Lavalin, 2022a
		• Concentrations greater than primary screening criteria – Naturally-Occurring Constituents: – Lithium: All wells except for EV_WH50gw during Q1 and Q2; and – Manganese: EV_MW_MC1B (Q1 to Q4) and EV_MW_BC2 (Q1 to Q4). • All other constituents were less than the primary screening criteria.	
	Mann-Kendall Trend Analysis	• Increasing or probably increasing trends: – Dissolved selenium: EV_MW_BC1A (probably increasing); – Sulphate: EV_RCSgw (increasing) and EV_MW_MC1A (increasing); and – Nitrate-N: EV_MW_MC1A (increasing). • All other parameters were either decreasing, stable or no trend for all other wells.	Table O Attachment III

Notes:

[a] - Relevant Monitoring Wells from Other Programs are those in the area that are under evaluation for potential inclusion in the SSGMP and/or RGMP.

[b]: Relevant Surface Water Stations and Seep Monitoring Stations represent a sub-set of the surface water and seepage monitoring stations present in EVO and Study Area 9b.

[c]: Based on the Background Assessment (BGA) completed for the 2020 RGMP Update, concentrations of lithium and manganese are inferred to be unrelated to mining.

A summary of results for OC compared to primary screening criteria is presented in Table N.

Table N: Summary of OC Compared to Primary Screening Criteria at Michel Creek Downstream of Gate Creek and Bodie Creek (Study Area 9b)

Parameter[1,2,3] / Well ID	Nitrate-N (mg/L)				Sulphate (mg/L)				Dissolved Cadmium (µg/L)				Dissolved Selenium (µg/L)			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Gate Creek and Bodie Creek																
EV_MW_GT1A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EV_MW_GT1B	-	10.5	-	-	629	868	598	705	-	-	-	-	***142***	***123***	***62.7***	***101***
EV_MW_BC1A	22.8	17.5	11.7	10.6	903	843	766	746	-	-	-	-	***211***	***168***	***112***	***117***
EV_MW_BC1B	22.7	15.2	-	-	995	880	774	849	-	-	-	-	***221***	***172***	***92.1***	***101***
EV_MW_BC2	-	-	-	-	-	-	-	-	-	-	-	-	***37.7***	***36.6***	***21.8***	12.6
EV_MW_BC3	-	-	-	-	-	537	859	639	-	-	-	-	***53.8***	***46.1***	***102***	***98.9***
EV_RCSgw	25.1	27.3	25.5	26.2	1,230	1,220	1,240	1,290	-	-	-	-	***230***	***220***	***208***	***228***
EV_BCgw	-	-	-	-	-	-	-	-	-	-	-	-	13.1	**21.8**	***26.6***	***24.5***
EV_WH50gw	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.1
Michel Creek Valley-Bottom																
EV_BRgw	-	-	-	-	-	-	-	-	-	-	-	-	***36.1***	**25.4**	***57.9***	***49.3***
EV_HW1	-	-	-	-	-	-	-	-	-	-	-	-	***55.4***	***56.9***	***47.1***	***67.1***
EV_MW_MC1A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EV_MW_MC1B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EV_MW_MC2A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EV_MW_MC2B	-	-	-	-	-	-	-	-	-	-	-	-	***54.8***	***56.0***	***59.5***	***58.7***
CSR AW	400				1,280 – 4,290[4]				0.5 – 4[4]				20			
CSR IW	n/a				n/a				5				20			
CSR LW	100				1,000				80				30			
CSR DW	10				500				5				10			

Notes:

[1] Primary screening criteria are CSR standards for **Aquatic Life (AW),** Drinking Water (DW), Livestock (LW), and *Irrigation (IW).*

[2] '–' denotes result less than primary screening criteria for given constituents.

[3] Where a duplicate was collected, the higher concentration is provided in table.

[4] Standard varies with hardness.

'NS' denotes no sample.

Mann-Kendall trend analysis was completed for OC where more than seven data points have been measured. A summary of the trend analysis results is provided in Table O.

Table O: **Summary of Mann-Kendall Trend Analysis for OC at Michel Creek Downstream of Gate Creek and Bodie Creek (Study Area 9b)**

Parameter[1] Well ID	Nitrate-N	Sulphate	Dissolved Cadmium	Dissolved Selenium
Gate Creek and Bodie Creek				
EV_MW_GT1A	No Trend	Decreasing	Stable	No Trend
EV_MW_GT1B	Stable	*Stable*	Stable	***No Trend***
EV_MW_BC1A	*No Trend*	*No Trend*	No Trend	***Probably Increasing***
EV_MW_BC1B	Stable	*Stable*	Stable	***No Trend***
EV_RCSgw	*Decreasing*	*Increasing*	Stable	***No Trend***
EV_BCgw	Decreasing	Decreasing	Decreasing	***Decreasing***
EV_WH50gw	Decreasing	Stable	Stable	*Probably Decreasing*
Michel Creek Valley-Bottom				
EV_BRgw	Decreasing	Decreasing	Decreasing	***Stable***
EV_HW1	Decreasing	Decreasing	Stable	***No Trend***
EV_MW_MC1A	Increasing	Increasing	No Trend	No Trend
EV_MW_MC1B	No Trend	No Trend	Stable	No Trend
EV_MW_MC2A	No Trend	No Trend	Stable	Stable
EV_MW_MC2B	Decreasing	Decreasing	Decreasing	***No Trend***

Notes:

[1] Where OC were measured greater than the primary screening criteria in 2022, the trend result is *italics*. Where the OC were measured greater than the secondary screening criteria for dissolved selenium during at least one event in 2022, the result is ***bold and italics***. Where increasing trends are noted, the cell is shaded yellow.

1.8.1 Discussion

1.8.1.1 Gate Creek and Bodie Creek

In 2022, most of the groundwater samples from Gate Creek and Bodie Creek (EV_RCSgw, EV_MW_GT1B, EV_MW_BC2/3, EV_MW_BC1A/B, and EV_BCgw) had concentrations of dissolved selenium greater than the primary screening criteria in all quarterly samples collected. With the exception of EV_BCgw in Q1 and EV_MW_BC2 in Q4, these selenium concentrations were also greater than the secondary screening criteria of 20 µg/L in each monitoring event. The dissolved selenium concentration at EV_WH50gw was also greater than primary screening criteria in Q4 of 2022 although this concentration did not exceed the secondary criteria.

Sulphate concentrations were greater than the primary screening criteria at EV_RCSgw and EV_MW_BC1A in all quarters, at EV_MW_BC3 in three quarters, at EV_MW_MC1B in Q1 and Q2, and at EV_MW_GT1B in Q2. Concentrations of nitrate-N were greater than the primary screening criteria at EV_MW_BC1A and EV_RCSgw in all quarters. Of the wells in Gate Creek and Bodie Creek, only EV_MW_GT1A did not have any OC concentrations exceed the primary screening criteria in all quarters (Figures EV-27 to -29 and Drawings EV-18 to -21). Concentrations of OCs and trends were generally consistent with historical data.

Source of Order Constituents in Shallow Groundwater at EV_RCSgw

Some of the highest concentrations of sulphate, nitrate-N and dissolved selenium in groundwater in the Gate and Bodie Creek areas have been measured at EV_RCSgw, which has a well depth of 6.1 mbgs. The preliminary flow accretion data from July 2021 indicates that Michel Creek is a gaining reach from South Gate Creek to Bodie Creek, however OC concentrations at Michel Creek (EV_MC2) are lower (note that EV_MC2 is located approximately 2 km downstream to the northwest).

OC concentrations are usually higher at EV_RCSgw than observed in surface water at Gate Creek (EV_GT1) and Bodie Creek (EV_BC1) and have remained relatively consistent. From 2019 to 2021, dissolved selenium and nitrate-N concentrations at Gate Creek (EV_GT1) and Bodie Creek (EV_BC1) were similar to EV_RCSgw, however in 2022 these concentrations generally decreased, while the EV_RCSgw concentration remained consistent (Figures EV-27 to EV-29). The SE:SO_4 (S) ratios for EV_RCSgw indicate spoils influence, however they plot above the ratios for Gate and Bodie Creek, due to the higher sulphate concentrations (Figure EV-34).

Mann-Kendall analysis indicates a decreasing trend for nitrate-N, an increasing trend for sulphate, and no trend for dissolved selenium. The observed decreases in nitrate-N and increases in sulphate at EV_RCSgw are consistent with observations at a well installed in spoils at Fording River Operations (FRO) (specifically, FR_HMW2), which further suggests the upgradient spoil is influencing groundwater in this area (SNC-Lavalin, 2021b). A similar range of OC concentrations has previously been measured in shallow groundwater (i.e., < 6 meters below ground surface [mbgs]) approximately 70 m up-valley as part of Phase 2 of the Sparwood Area Groundwater Supporting Study (SNC-Lavalin, 2019b) (specifically at BH11-02, sampled in November 2017, near the confluence of Gate Creek/South Gate Creek). The lack of seasonality in dissolved selenium and nitrate-N concentrations further suggest that OC concentrations at EV_RCSgw originate from an upgradient shallow groundwater transport pathway (total well depth is 6.1 mbgs) instead of a surface water infiltration pathway. However, mixing with infiltration from a surface water source also influenced by upgradient spoil (such as Bodie or Gate Creeks, where seasonal effects in groundwater elevations and OC concentrations also appear to be muted) may also be occurring.

Monitoring wells EV_MW_BC2 (screened in shallow shale bedrock) and EV_MW_BC3 (screened in gravel immediately above bedrock) have dissolved selenium concentrations greater than the primary screening criteria in all quarters sampled in 2022. In addition, sulphate concentrations exceeded the primary screening criteria at EV_MW_BC3 in Q2-Q4, 2022. Concentrations of dissolved selenium and sulphate were higher within the gravel (EV_MW_BC3) than in shallow bedrock (EV_MW_BC2). Nitrate-N concentrations were higher in Q1-Q2 at EV_MW_BC2 than EV_MW_BC3, and in Q3-Q4, nitrate concentrations decreased in this well and were lower than EV_MW_BC3, where the concentrations slightly increased. Groundwater at EV_MW_BC3 is perched above bedrock, while deeper groundwater at EV_MW_BC2 is under artesian conditions, with the groundwater potentiometric surface approximately 6 m above the bedrock-sediment interface (and 5 m above the potentiometric surface measured at EV_MW_BC3). This results in a gradient greater than 1 m/m upward, which indicates that hydraulic communication between unconsolidated sediment and underlying bedrock may be limited. The hydraulic conductivity at EV_MW_BC3 is 2.0×10^{-7} m/s (screened within clayey gravel), approximately 4.5 x lower than the hydraulic conductivity within bedrock (9×10^{-7} m/s). These wells are located near the location where Gate Creek splits from Bodie Creek along the eastern slope of the Michel Creek Valley, as shown in cross-section EH-EH' (Drawing EV-11). The higher dissolved selenium concentrations in the gravel suggest that the source of OC may be infiltration from Bodie/Gate Creeks, however dissolved selenium concentrations within bedrock, the higher hydraulic conductivity, and the upward gradient, indicate that there is a dissolved selenium pathway within bedrock sourced from a higher elevation (i.e., at the location of EV_MW_BC2/3, surface water is not recharging bedrock).

Concentrations of dissolved copper at EV_RCSgw fell below the applicable primary screening criteria in 2022. Water at this location travels through copper tubing prior to being collected at the sampling port (SNC-Lavalin, 2021b), and the source of the copper is suspected to be the piping. Concentrations of dissolved copper have been measured greater than the primary screening criteria since 2016, with the highest concentration measured May 2018 (575 µg/L). The reduction in the copper concentration may be attributed to improved sampling methods, specifically allowing water to run through the sample port for a longer time, which would clear out stagnant water in the tubing.

Groundwater-Surface Water Interaction near Gate Creek Pond

Downgradient of Gate Creek Pond (EV_GT1) are nested wells EV_MW_GT1A/B. Groundwater elevation data indicated the vertical gradient between well pair EV_MW_GT1A/B was consistently downward, further supporting surface water recharge to the valley-bottom aquifer. Groundwater elevations at EV_MW_GT1A/B also closely follow water levels in Michel Creek (EV_MC2), indicating a potential hydraulic connection (Figure EV-24).

Compared to Michel Creek, it is more difficult to discern from water level data alone if there is an influence from Gate Creek Pond on groundwater at EV_MW_GT1A/B since surface water levels remain relatively consistent and typically do not show a seasonal influence. However, there appears to be a connection between Gate Creek and shallow groundwater at EV_MW_GT1B. Concentrations of dissolved selenium and nitrate-N in shallow groundwater at EV_MW_GT1B (screened between 2.7 and 4.3 mbgs) are very similar to OC concentrations measured at Gate Creek Pond from Q1 to Q4 2022 (Figures EV-27 and EV-29). This is consistent with a review of the distribution of major ions during each quarter in 2022. Specifically, major ions in shallow groundwater at EV_MW_GT1B are similar to surface water at Gate Creek Pond (EV_GT1), although in Q1, sodium and chloride at EV_MW_GT1B more closely resemble Michel Creek, and conversely in Q2, sodium and chloride at EV_GT1 resembled Michel Creek. Deeper groundwater at EV_MW_GT1A is more similar to that of Michel Creek in all four quarters (Figure EV-35). These results indicate that there is hydraulic communication between Gate Creek Pond and the shallow aquifer, but the amount of influence varies as mixing with surface water from Michel Creek also appears to be influencing groundwater quality. Concentrations of dissolved selenium and nitrate-N in deep groundwater at EV_MW_GT1A (screened between 62.2 and 63.7 mbgs) are lower than concentrations measured in Michel Creek, and sulphate concentrations are similar, although sulphate (along with dissolved selenium and nitrate-N) do not show a similar seasonal response (Figures EV-27 to -29). The Se:SO_4 (S) plot indicates that deep groundwater at EV_MW_GT1A plots outside of the zone of natural (non-contact water) for unconsolidated materials (Figure EV-34).

At several quarterly events in 2019 (Q1 and Q2), once in 2020 (Q2) and once in 2021 (Q1), OC concentrations at EV_MW_GT1B resembled those measured in Michel Creek (EV_MC2), whereas all other quarterly results, including 2022 results, more closely resemble concentrations measured in Gate Creek (EV_GT1) (Figures EV-27 to -29). This well is located adjacent to Gate Creek and Michel Creek. These results indicate that groundwater at this well is influenced by both Michel Creek and Gate Creek, although Gate Creek influence usually dominates.

Flow accretion data was collected in the summer and fall of 2021 by SNC-Lavalin. The preliminary flow accretion data indicate that within Study Area 9b, Michel Creek is a gaining reach from South Gate Creek to Bodie Creek, extending close to EV_BCgw (Drawing EV-03). These results suggest that groundwater may be recharging Michel Creek in this area. Since Gate Creek Pond is located near Michel Creek, it also may be receiving groundwater. Vertical groundwater gradients at EV_MW_BC1A/B and EV_MW_GT1A/B are downward (Table EV-02, Figure EV-24); however, these gradients were estimated across the full vertical extent of the aquifer, and there may be more localized gradients near the base of Michel Creek and other surface water bodies. In October 2018, Gate Creek was identified as a losing stream or stable, except for a small upgradient portion where a gaining reach was indicated. South Gate Creek was identified as a losing reach in the valley floor bottom but is a gaining reach further upgradient (Drawing EV-03; Golder, 2019a). These results further indicate active groundwater-surface water interaction in this area, with groundwater both discharging to and receiving infiltration from surface water on the valley flank. Overall, infiltration of surface water to groundwater is considered the primary pathway for OC near Gate Creek Pond.

Groundwater-Surface Water Interaction near Bodie Creek Pond

Adjacent to Bodie Creek are nested wells EV_MW_BC1A/B. Groundwater elevation data indicates that the vertical gradient between well pair EV_MW_BC1A/B was consistently downward, further supporting surface water recharge to the valley-bottom aquifer (Table EV-02; Figure EV-24). Groundwater elevations at EV_MW_BC1A/B, located adjacent to the Bodie Creek Pond, closely follows stage elevations at Michel Creek (at EV_MC2), and any influence from Bodie Creek is not obvious due to relatively stable water level elevations at the pond (Figure EV-24). The concentrations in the nested well pair are also similar to concentrations in Bodie Creek, which suggests hydraulic communication and surface water infiltration during all seasons. In addition, the major ion distribution of groundwater from EV_MW_BC1A/B is similar with Bodie Creek year-round (i.e., calcium-magnesium-sulphate-bicarbonate water) (Figure EV-35). Note that OC concentrations are lower in the deeper aquifer than in the shallow aquifer, and unlike the Gate Creek well nest (EV_MW_GT1A/B), mine influenced- groundwater at EV_MW_BC1A/B extends through the aquifer to just above bedrock (which is located at 65 m in the Gate Creek wells and 26 m at the Bodie Creek wells; Figure EV-34). The 2021 flow accretion study indicated that Bodie Creek upgradient of the Bodie Pond is neither a gaining nor losing stream (Drawing EV-03), although further to the west, Michel Creek is a gaining reach in this area (SNC-Lavalin, 2022c).

The source of dissolved uranium at EV_MW_BC1B is not clear but is potentially mine-influenced as concentrations of uranium have been measured greater than the primary screening criteria at this location in Q1 to Q3 of 2022, ranging from 10.3 to 11.5 µg/L (the primary screening criteria is 10 µg/L) (Figure EV-30). Dissolved uranium concentrations in 2022 at surface water monitoring station EV_BC1 are similar to concentrations measured in groundwater at EV_MW_BC1B, which suggests that the probable sources are infiltrating surface water from Bodie Creek. At EV_MW_GT1B, dissolved uranium concentrations remained below the primary screening criteria and were lower than concentrations measured in surface water at Gate Creek (EV_GT1). Concentrations of dissolved uranium exceeding the primary screening criteria have only been measured in shallow groundwater at EV_MW_BC1B (and EV_MW_GT1B in the past) and do not extend to the nested deep monitoring wells or EV_BCgw; therefore, the extent is inferred to be localized.

Groundwater-Surface Water Interaction at EV_WH50gw and EV_BCgw

Hydrograph data at EV_BCgw shows a strong correlation with Michel Creek, although a similar correlation was observed at EV_MW_GT1A/B and EV_MW_BC1A/B (Figure EV-24) whose OC concentrations suggest that they are influenced from Gate and Bodie Creeks, respectively. Hydrograph data is not available for EV_WH50gw, as the wellhead configuration does not allow for the installation of a transducer.

At EV_WH50gw and EV_BCgw, OC concentrations are very similar to those of Michel Creek (EV_MC2), although concentrations at EV_BCgw tend to be a little higher and concentrations at EV_WH50gw tend to be lower (Figures EV-27 to -29). EV_BCgw is located near the confluence of Bodie Creek and may have higher OC concentrations than EV_WH50gw due to influence from Bodie Creek. These results indicate that groundwater at EV_WH50gw and EV_BCgw are both influenced by Michel Creek, while EV_BCgw may also receive some influence from Bodie Creek.

1.8.1.2 Michel Creek Valley Bottom

In 2022, concentrations of OC in groundwater samples near Michel Creek, downstream of Gate and Bodie Creeks (EV_BRgw, EV_MW_MC1A/B, EV_MW_MC2A/B, and EV_HW1) were generally consistent with historical data (Figures EV-31 to -33 and Drawings EV-18 to -21). Concentrations of OC that exceeded primary screening criteria were limited to dissolved selenium at EV_BRgw, EV_MW_MC2B, and EV_HW1.

Of the nested well pairs EV_MW_MC1A/B and EV_MW_MC2A/B, only the shallow well EV_MW_MC2B (screened in gravel between 4.9 m and 6.4 mbgs) had dissolved selenium concentrations (54.8 to 59.5 µg/L) that were greater than the primary screening criteria. Supply wells EV_HW1 and EV_BRgw (all quarters) also contained dissolved selenium greater than the primary screening criteria. These concentrations were higher compared to concentrations in Michel Creek downstream of the supply wells (EV_MC2; Figure EV-31). These results suggest that there is a potential groundwater pathway of OC in this location, inferred to extend from the upgradient Bodie and Gate Creek areas.

The source of dissolved barium at EV_MW_MC1A and EV_MW_MC2A is uncertain, however barium concentrations above the primary screening criteria were also identified at the Bodie Seep located near Bodie Creek in March 2018 (SNC-Lavalin, 2022a) at concentrations similar to those observed at EV_MW_MC1A. The higher concentrations of barium at Bodie Seep may be associated with increased groundwater residence time within the underground workings of the former Balmer North Mine. EV_MW_MC1A is located closer to the former Balmer North Mine workings than EV_MW_MC2A and had higher barium concentrations. Other wells are also located close to the Balmer North Mine; however, it is uncertain why these are the only two wells were barium concentrations exceeded the primary screening criteria. Elevated concentrations of manganese and iron are indicative of reducing conditions at EV_MW_MC1B, as evidenced by low dissolved oxygen (0.05 to 0.3 mg/L) and ORP values ranging between -99.1 to -111.7 mV.

At EV_MW_MC1A/B, downward hydraulic gradients were present, while at EV_MW_MC2A/B, upward hydraulic gradients were recorded. EV_MW_MC2A/B is located closer to Michel Creek than EV_MW_MC1A/B, which may suggest groundwater discharge to Michel Creek. This observation, along with higher dissolved selenium and nitrate-N concentrations in groundwater, further suggest a potential groundwater pathway of OC in this area.

Selenium and nitrate-N concentrations at EV_BRgw appear to have a strong seasonal influence. The highest concentrations are observed in late summer (i.e., Q3), with selenium concentrations higher than those of Michel Creek, and similar to groundwater concentrations measured at EV_HW1 and EV_MW_MC2B. Concentrations then decline until reaching a minimum the following spring, with concentrations similar or slightly higher than those at Michel Creek. This suggests that EV_BRgw may be more strongly influenced by upgradient groundwater (i.e., from the Bodie and Gate Creek area) in the late summer, with the influence of Michel Creek increasing through the fall, winter and spring. Wells EV_MW_MC2B and EV_HW1 also show a similar seasonal trend, however the concentration variations are much more muted. The trend at EV_BRgw may be stronger since the well is pumped for groundwater supply.

Several discharge points of concern have also been documented along the eastern edge of Sparwood Ridge to Michel Creek in Study Area 9b (SNC-Lavalin, 2021c), including:

- EV_SPR14, representative of discharge from a creek flowing near or through suspected mine workings, underground mine discharge from adit openings from No. 1 Rock Tunnel, and from No. 3 Rock Tunnel, with dissolved selenium concentrations that occasionally exceed the BCWQG for AW, which usually flows overland to Michel Creek;

- EV_SPR2B, representative of underground mine discharge from adit openings flowing from the No. 1 Rock Tunnel overland and discharging to Michel Creek. Nitrite was observed greater than the BCWQG AW guideline in a 2013 sample, and
- EV_SPR5, representative of discharge from No.3 rock tunnel. Concentrations of chromium, ammonia and dissolved copper exceeded the BCWQG AW guideline in one sample, and the discharge flows overland to Michel Creek.

The above listed discharge points are all located downstream of Bodie and Gate creeks but upstream of EV_BRgw and other Michel Creek wells further downgradient. Since 2018, concentrations of OC at the discharge points have generally been less than concentrations measured in Michel Creek, except for sulphate at EV_SPR2B, which has concentrations similar to or higher than Michel Creek, and dissolved selenium at EV_SPR5 in January 2021 and June 2022 (Figures EV-31 to -33). In addition, the nitrate-N concentration at EV_SPR5 in September 2021 was similar to the concentration measured in Michel Creek. Concentrations of dissolved selenium at EV_SPR5 have increased since 2018, although concentrations of other OCs at the three discharge points have remained similar.

In general, the OC concentrations measured at these discharge points are lower than those measured downstream. Based on the available data, these sources of OC to Michel Creek are considered to be minor in comparison to those sourced from Bodie Creek and Gate Creek, due to low OC concentrations and low, previously documented flow rates (SNC-Lavalin, 2021c).

Overall, concentrations of OC in groundwater from Bodie/Gate creeks to EV_MW_SPR1A/B/C in Study Area 9A are higher in shallow wells than those screened deeper in the aquifer. These results suggest that loading of mine-influenced constituents to groundwater in the valley-bottom of Michel Creek in the vicinity of EVO are primarily sourced from infiltration of surface water and upland groundwater flow from Bodie and Gate creeks followed by down-valley groundwater flow and infiltration along Michel Creek.

1.9 Erickson Creek and Michel Creek Downgradient of Erickson Creek (Study Area 10)

This section has been structured along the following geographical areas with rationale:

- Erickson Creek: a potential groundwater flow path from Erickson waste rock spoils and other potential sources in the Erickson Creek drainage, and
- Michel Creek Downgradient of Erickson Creek: understanding of the major sources of mining related groundwater to Michel Creek valley-bottom.

A summary of 2022 groundwater monitoring and sampling results upgradient of Erickson Creek Watershed is presented in Table P with references to supporting information (Drawings, Figures, Tables, and Appendices).

Table P: Summary of 2022 Groundwater Monitoring and Sampling Results at Erickson Creek and Michel Creek Downgradient of Erickson Creek (Study Area 10)

Hydrogeological Information		Description	Reference
Monitoring Locations	Relevant EVO SSGMP/RGMP Wells (Study Area 10)	EV_WF_SW, EV_ECgw, EV_MW_SP1A/B/C	Table EV-01 Drawing EV-01
	Relevant Monitoring Wells from Other Programs[a]	**Upper Erickson Creek:** EV_MW_EC3A/B	
	Relevant Surface Water Monitoring Stations[b]	EV_EC1, EV_MC3, EV_SP1, EV_MG1, EV_TC1	
	Relevant Seep Monitoring Stations[b]	EV_SEEP_ERICKSON2, EV_SEEP_ERICKSON1, EV_SEEP_SOUTHPIT6, EV_SEEP_SOUTHPIT3, EV_SEEP_SOUTHPIT4	
Physical Hydrogeology	Groundwater Elevation Trends	• Groundwater elevations at well EV_ECgw, within the Erickson Creek Watershed, exhibited seasonal trends with the highest groundwater levels measured in the spring/summer and lower levels in the fall/winter. This location displays slow recovery after transducer download events. • Well EV_WF_SW is installed in spoils and groundwater elevations are likely influenced by surface water management in the West Fork Tailings Facility (WFTF). • Groundwater elevations at monitoring wells EV_MC_SP1A/B/C, in the Michel Creek valley-bottom, appear to seasonally fluctuate similar to surface water levels at EV_MC2, which indicates that groundwater elevations may be influenced by Michel Creek.	Figure EV-37 Table EV-02 Drawing EV-02
	Hydraulic Gradients and Flow Direction	• Vertical Hydraulic Gradient: – EV_MW_SP1A/B (deep to intermediate groundwater): 0.01 to 0.02 m/m upwards; and – EV_MW_SP1B/C: 0.06 m/m downwards. • Lateral Hydraulic Gradient: – The lateral hydraulic gradient could not be calculated; however, groundwater flow along Erickson Creek is inferred to be southwards to southwestwards towards Michel Creek, following topography, and northwest along Michel Creek.	
Chemistry	2022 SSGMP/RGMP OC Results	• All OC groundwater concentrations were less than the primary screening criteria in 2022.	Table Q Figures EV-38 to -40 Tables EV-03 to -05 Drawings EV-18 to -21
	Non-Order Mine-Related and Naturally Occurring Constituents[c]	• Concentrations greater than primary screening criteria – Non-Order Mine-related: – Field-measured pH: EV_WF_SW (Q1 and Q4); – Ammonia-N: EV_WF_SW (Q1); – Barium: EV_MW_SP1A (Q4); and – Iron: EV_WF_SW (Q2 and Q3). • Elevated concentrations of ammonia, manganese and iron are indicative of reducing conditions at EV_WF_SW. • The source of barium at EV_MW_SP1A is unknown.	Tables EV-03 to -04 SNC-Lavalin, 2020
		• Concentrations greater than primary screening criteria – Naturally-Occurring Constituents: – Lithium: All wells from three to all four quarters in 2022, except at EV_MW_SP1B which did not have lithium concentrations above primary screening criteria; – Manganese: EV_WF_SW (Q2 and Q3); and – Molybdenum: EV_ECgw (Q2 to Q4, no sample collected in Q1). • All other constituents were less than the primary screening criteria.	
	Mann-Kendall Trend Analysis	• Increasing or probably increasing trends: – Dissolved selenium: EV_WF_SW (increasing) and EV_MW_SP1A (probably increasing); and – Nitrate-N: EV_WF_SW (probably increasing) and EV_ECgw (increasing). • All other Mann-Kendall trend analysis results indicate stable, decreasing or no trend. Concentrations of OCs remain below the primary screening criteria.	Table R Attachment III

Notes:

[a] - Relevant Monitoring Wells from Other Programs are those in the area that are under evaluation for potential inclusion in the SSGMP and/or RGMP.

[b]: Relevant Surface Water Stations and Seep Monitoring Stations represent a sub-set of the surface water and seepage monitoring stations present in EVO and Study Area 10.

[c]: Based on the Background Assessment (BGA) completed for the 2020 RGMP Update, concentrations of lithium, manganese and molybdenum are inferred to be unrelated to mining.

A summary of results for OC compared to primary screening criteria is presented in Table Q below.

Table Q: Summary of OC Compared to Primary Screening Criteria at Erickson Creek and Michel Creek Downgradient of Erickson Creek (Study Area 10)

Parameter[1,2,3] / Well ID	Nitrate-N (mg/L)				Sulphate (mg/L)				Dissolved Cadmium (µg/L)				Dissolved Selenium (µg/L)			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Erickson Creek																
EV_WF_SW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EV_ECgw	NS	-	-	-	NS	-	-	-	NS	-	-	-	NS	-	-	-
Michel Creek Downgradient of Erickson Creek																
EV_MW_SP1A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EV_MW_SP1B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EV_MW_SP1C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CSR AW	400				1,280 – 4,290[4]				0.5 – 4[4]				20			
CSR IW	n/a				n/a				5				20			
CSR LW	100				1,000				80				30			
CSR DW	10				500				5				10			

Notes:

[1] Primary screening criteria are CSR standards for **Aquatic Life (AW),** Drinking Water (DW), Livestock (LW), and *Irrigation (IW)*.

[2] '–' denotes result less than primary screening criteria for given constituents.

[3] Where a duplicate was collected, the higher concentration is provided in table.

[4] Standard varies with hardness.

'NS' denotes no sample.

Mann-Kendall trend analysis were completed where more than seven data points have been measured. A summary of the trend analysis results is provided in Table R.

Table R: Summary of Mann-Kendall Trend Analysis for OC at Erickson Creek and Michel Creek Downgradient of Erickson Creek (Study Area 10)

Parameter[1,2] / Well ID	Nitrate-N	Sulphate	Dissolved Cadmium	Dissolved Selenium
Erickson Creek				
EV_WF_SW	Probably Increasing	No Trend	Decreasing	Increasing
EV_ECgw	Increasing	Probably Decreasing	No Trend	No Trend
Michel Creek Downgradient of Erickson Creek				
EV_MW_SP1A	Decreasing	Decreasing	Stable	Probably Increasing
EV_MW_SP1B	Stable	No Trend	Stable	Stable
EV_MW_SP1C	Stable	Stable	No Trend	Stable

[1] Where OC were measured greater than the primary screening criteria in 2022, the trend result is *italics*. Where the OC were measured greater than the secondary screening criteria for dissolved selenium during at least one event in 2022, the result is ***bold and italics***. Where increasing trends are noted, the cell is shaded yellow.

1.9.1 Discussion

1.9.1.1 Erickson Creek

In 2022, groundwater sample concentrations from Erickson Creek (EV_WF_SW and EV_ECgw) remain less than the primary screening criteria for all OC and are consistent with historical data (Figures EV-38 to -40 and Drawings EV-18 to -21). Increasing trends for nitrate-N were identified at both locations, and an increasing trend in selenium was recorded at EV_WF_SW. However, concentrations remain well below the primary screening criteria.

A portion of the upper Erickson drainage is overlain by waste rock spoils, which starts near the confluence of Erickson Creek and West Fork Creek, which is also overlain by waste rock. Infiltration through the spoils is inferred to cause elevated OC concentrations in shallow groundwater which daylights as Erickson Creek surface flow approximately 2.3 km south of the Erickson Dam. Surface water collected upstream of, or in, the Elkview Operations Saturated Rock Fill Phase 2 (EVO SRF P2) infiltration gallery (RG_ERCKUT) (Drawing EV-01) had OC concentrations greater than primary screening criteria during routine sampling events.

Well EV_WF_SW, screened within spoils, is located downstream of the West Fork Tailings Facility and upstream of the West Fork's discharge at Erickson Creek. OC concentrations in this well have historically been at least two magnitudes lower than the applicable primary screening criteria, with the exception of sulphate, which has concentrations greater than other groundwater samples collected from the Erickson Creek area (ranging from 148 to 395 mg/L in 2022). However, these concentrations are lower than the seep samples (EV_SEEP_ERICKSON1/2) and surface water in Erickson Creek (EV_EC1). The Se:SO_4 (S) plot shows that groundwater at EV_WF_SW has likely been affected by microbial reduction (Figure EV-41).

Along Erickson Creek upgradient of its daylight location, concentrations of OC in shallow groundwater at EV_ECgw are substantially lower than those in the Erickson Creek surface water (EV_EC1). The Se:SO_4 (S) ratio plot shows that groundwater from EV_ECgw falls within the natural non-contact groundwater range (Figure EV-41).

Two deep flowing artesian boreholes (EV_MW-EC1/2) advanced in the valley-bottom show that groundwater quality in deeper Erickson Creek valley sediments is consistent with non-mine contact groundwater (the boreholes were sealed and abandoned after they were drilled) (SNC-Lavalin, 2021a). Monitoring locations EV_MW_EC3A/B were installed in 2021 along Erickson Creek approximately 160 m north of EV_MW_EC1/2, whose analytical groundwater results will be reviewed for potential inclusion in the EVO SSGMP once a minimum of two years of data is available (Drawing EV_01).

Groundwater elevations at EV_ECgw measured manually and with transducers have historically been variable. This well has a low hydraulic conductivity ($1x10^{-8}$ m/s) and can take up to two weeks to recover after sampling, which is recorded by the transducer. As this transducer data is not accurately reflecting the true potentiometric surface of the water-bearing unit, it is typically edited out of the hydrographs. However, in 2022, manual groundwater elevations were lower than usually measured historically. All of the transducer data for 2021 and 2022 has been included in the hydrograph presented in Figure EV-37, which shows that the manual measurements were measuring the water level in the well under drawdown conditions and do not reflect the potentiometric surface of the water-bearing unit (i.e., the manual measurements were precise, since they closely matched the transducer data, but they were not accurately measuring groundwater elevations under natural conditions). This may have also occurred prior to 2022 (e.g., November 2020 also has a low manual measurement in comparison to the edited transducer data), since some manual groundwater measurements do not match well with transducer elevations (the transducer data showing drawdown has been edited out).

Water quality at groundwater seep EV_SEEP_ERICKSON2, located near the southern tip of the EVO permit boundary and near spoils, is consistent with mine-influenced water (Figure EV-41). Water chemistry observed at this seep suggests that groundwater in this upland area is mine-influenced and likely reports to Erickson Creek. Groundwater seepage at EV_SEEP_ERICKSON1, located at a lower elevation, is inferred to be indicative of the shallow groundwater in lower Erickson Creek drainage before the confluence, which has dissolved selenium and nitrate-N concentrations less than the primary screening criteria, but sulphate concentrations near primary screening criteria (Figure EV-38 to -40). Water at EV_SEEP_ERICKSON1 is inferred to have undergone microbial reduction (Figure EV-41).

In a May 2019 flow accretion study, Erickson Creek was consistently gaining downgradient of EV_ECgw to Michel Creek, suggesting an upward hydraulic gradient from groundwater in the valley-bottom (Drawing EV-02; Golder, 2019c). The presence of the underlying aquitards and artesian flow conditions would further limit downward migration of surface water. The April 2019 flow accretion study indicated that dissolved selenium concentrations in Erickson Creek slightly decreased, from 178 µg/L upstream of EV_ECgw to 163 µg/L at Michel Creek (at EV_EC1); no analytical surface water data was available for the May 2019 flow accretion study (Golder, 2019b; 2019c). The decrease in concentrations and increase in flow indicate that no additional inputs of mine-influenced groundwater is discharging to the stream.

Based on available data, the main transport pathway of OC along the Erickson Creek drainage to Michel Creek is inferred to occur through surface water rather than groundwater migration. The Se:SO_4 (S) ratios for Erickson Creek surface water (EV_EC1) appears to be mine-influenced. Elkview Operations Saturated Rock Fill Phase 2 (EVO SRF P2) water treatment facility began treating Erickson Creek on February 15, 2021. Concentrations of dissolved selenium and nitrate-N in Erickson Creek surface water (EV_EC1) become more variable and generally decrease starting in March 2021, coinciding with treatment coming online. On April 9,2022, Teck decided to temporarily halt the treatment of Erickson Creek to perform maintenance on the EVO SRF P2 infrastructure and investigate conditions downstream of the facility discharge. As treatment of Erickson Creek water was not occurring, the concentrations became more consistent and returned to historically observed levels. Teck resumed Erickson Creek treatment on October 4, 2022, and concentrations have decreased.

1.9.1.2 Michel Creek Downstream of Erickson Creek

In 2022, OC concentrations in groundwater samples from Michel Creek downstream of Erickson Creek and in Study Area 10 (EV_MW_SP1A/B/C) remain less than the primary screening criteria (Figures EV-38 to -40 and Drawings EV-18 to -21). Overall, concentrations of OC at the triple clustered wells were generally consistent with historical data. The Se:SO_4 (S) ratio plot suggests that groundwater at EV_MW_SP1B may have some mine-influence as evidenced by an increase in dissolved selenium to 9.04 µg/L in Q4 2022 (Figures EV-38 and EV-41). This well has a higher hydraulic conductivity (1×10^{-3} m/s) in comparison to EV_MW_SP1A (5×10^{-4} m/s) or EV_MW_SP1C (4×10^{-4} m/s) and is screened in sand and gravel beneath silty gravel, which suggests that this sand and gravel unit may represent a preferential pathway of groundwater flow. A similar concentration at this well was observed in Q1 2021, where the selenium concentration increased to 9.82 µg/L.

Waste rock spoils are present in the upper region of the South Pit Creek drainage, from where mine-influenced surface water flows downstream (EV_SP1) into the valley-bottom. Water quality results of the groundwater seep EV_SEEP_SOUTHPIT6, located near EV_SP1, is consistent with mine-influenced water (Figure EV-41).

Seep data from EV_SEEP_SOUTHPIT3, located near the outflow of Thresher Creek to Michel Creek, has elevated dissolved selenium concentrations, although the average concentration in 2022 was less than the primary screening criteria. The Se:SO_4 (S) ratio plot suggests that there is some mine-influence (Figure EV-41). Further downstream near the outflow of Hotel Creek, EV_SEEP_SOUTHPIT4 OC concentrations were low, and the water does not appear to be mine-affected (Figures EV-38 to -41).

Milligan Creek surface water (EV_MG1) is mine-influenced, based on the Se:SO_4 (S) ratio plot. The extent of groundwater-surface water interaction at the Milligan Creek drainage is not well understood. Similar to South Pit, the pond is inferred to be hydraulically connected to the Michel Creek valley-bottom aquifer. It is unknown whether there is potential transport of OC from the pond to groundwater via infiltration.

2 Recommendations

New recommendations, evolving from the EVO SSGMP and RGMP data review and assessment, are presented in Table S. Appendix II of the main report provides recommendations related to EVO from the 2020 Annual Report (SNC-Lavalin, 2021b), the 2021 Annual Report (SNC-Lavalin, 2022b), and the 2021 SSGMP Update Report (SNC-Lavalin, 2021a). Previous recommendations that have been initiated, but not completed, are presented in Table T.

Table S: Summary of New Recommendations - EVO SSGMP and RGMP

Program	Recommendation	Rationale
Site-Specific Groundwater Monitoring Programs		
EVO SSGMP	Decommission RG_MW_GCA. Conduct a field reconnaissance of the area and identify a suitable location to install a replacement well.	Attempted development of the well twice, however turbidity continues to increase with each sampling event.
	Continue to collect quarterly water samples from Sparwood Ridge discharge points: EV_SPR5, EV_SPR2B, EV_SPR6, EV_SPR7, EV_SPR14, and EV_SPR17.	Evaluate influence of Sparwood Ridge on Michel Creek chemistry.
	Collect quarterly water samples at Bodie Seep in Study Area 9b.	Determine influence of Bodie Seep on Michel Creek chemistry. Bodie Seep may represent groundwater conditions within the former Balmer Mine North.
	Conduct hydraulic conductivity testing at EV_MW_BC2 and EV_MW_BC3	The hydraulic conductivities of these two wells were previously estimated by Golder (2019a), however the result for EV_MW_BC3 was anomalously low (2 x 10-7 m/s), considering that it is screened in fine sand to fine gravel.

Table T: Summary of Outstanding Recommendations - EVO SSGMP and RGMP

Program	Recommendation	Year/Report Made	Rationale
Site-Specific Groundwater Monitoring Programs			
EVO SSGMP	Survey surface water station at Goddard Creek (EV_GC2) to a geodetic datum.	2021 SSGMP Update	Improved characterization of groundwater/surface water interaction.
	Results from the groundwater investigation planned for Lagoon D decommissioning should be reviewed.	2021 SSGMP Update	Evaluate whether additional wells (including shallow groundwater near EV_OCgw) are recommended for this area and for inactive Lagoons A-C to evaluate shallow groundwater.
	Review results from investigation activities planned west of Cedar North Pit to Elk River and south to Michel Creek (Permit 107517 Condition 8.2.4).	2021 SSGMP Update	Assess possible transport pathways of mine-influenced groundwater within faults and fractures connecting to Cedar North Pit.
	Continue monitoring chemistry at EV_MW_MC3 and at nearby EV_SPR1B quarterly and review isotope results.	2021 SSGMP Update	Further evaluate selenium sources at base of Sparwood Ridge near Michel Creek.
	Survey surface water station at Gate Creek (EV_GT1) to a geodetic datum.	2021 SSGMP Update	Improved characterization of groundwater and surface water interactions.
	Review contaminant load study related to condition 4C3.4ii in Permit 107517.	2021 SSGMP Update	Evaluate if a load imbalance along Michel Creek exists.
	Sample newly installed monitoring wells in Erickson Creek (EV_MW_EC3A/B) for at least two years. Assess analytical results in 2023 for potential inclusion in the SSGMP.	2021 SSGMP Update	Additional upgradient monitoring points in Erickson Creek area.
	Sampling frequency at EV_BALgw, EV_LSgw, EV_OCgw, EV_GCgw, EV_MW_MC1A, EV_MW_MC2A, EV_MW_AQ1, EV_MW_AQ2, EV_MW_MC4, EV_MW_SPR1A, EV_MW_GT1A, and EV_BCgw should be reduced to semi-annual.	2021 SSGMP Update	Based on low and/or stable OC concentrations.
	Remove monitoring well EV_WF_SW from the SSGMP.	2021 SSGMP Update	The well is screened below 159 m of waste rock and concentrations of OC are less than the primary screening criteria. Groundwater at this well is under reducing conditions, selenium and nitrate concentrations are very low. Although it is in a source area, the well does not provide much information to better understand OC migration to receptors.

Table T (Cont'd): Summary of Outstanding Recommendations - EVO SSGMP and RGMP

Program	Recommendation	Year/Report Made	Rationale
Site-Specific Groundwater Monitoring Programs (Cont'd)			
EVO SSGMP (Cont'd)	Assess analytical results from the Harmer Reservoir wells in 2022 for potential inclusion in the SSGMP. Assess analytical results from the Dry Creek Sedimentation Pond wells in 2023 for potential inclusion in the SSGMP.	2021 SSGMP Update	Improve understanding of groundwater/surface water interactions near Dry Creek Sedimentation Pond and the Harmer Reservoir.
Regional Groundwater Monitoring Program			
Study Area 7	Establish a new surface water monitoring location at Grave Creek near RG_MW_GCA to replace former EV_GV1 location.	2021 Annual Report	Very difficult to access current surface water monitoring point.
Study Area 10	Consider establishing a new station in Michel Creek downgradient of Milligan Creek.	2021 Annual Report	This additional location will help in the understanding of OC inputs to Michel Creek.

3 References

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Golder Associates Ltd., 2015b. Site-Wide Groundwater Monitoring Plan – Teck Coal Limited. Elkview Operations. Prepared for Teck Coal Limited., dated March 2015.

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Golder Associates Ltd. 2019c. May 2019 Erickson Creek Flow Accretion Study for the Elkview Operations Saturated Rock Fill Phase 2 Full Scale Trial Project. Technical Memorandum submitted to Teck Coal Limited. July 31, 2019.

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SNC-Lavalin Inc. 2019b. Sparwood Area Groundwater Supporting Study – Phase 2. Prepared for Teck Coal Limited. February 22, 2019.

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SNC-Lavalin. 2021c. Sparwood Ridge Water Quality Monitoring Report, Sparwood, BC. Prepared for Teck Coal Limited. Dated May 31, 2021.

SNC-Lavalin, 2022a. Former Balmer North and Surrounding Area Desktop Review and Data Gap Assessment. Prepared for Teck Coal Limited. Dated October 17, 2022.

SNC-Lavalin. 2022b. 2021 Annual Report: Elk Valley Regional and Site-Specific Groundwater Monitoring Programs. Prepared for Teck Coal Limited. Dated March 29, 2022.

SNC-Lavalin. 2022c. Michel Creek Flow and Load Accretion Investigation. Prepared for Teck Coal Limited. Dated September 20, 2022.

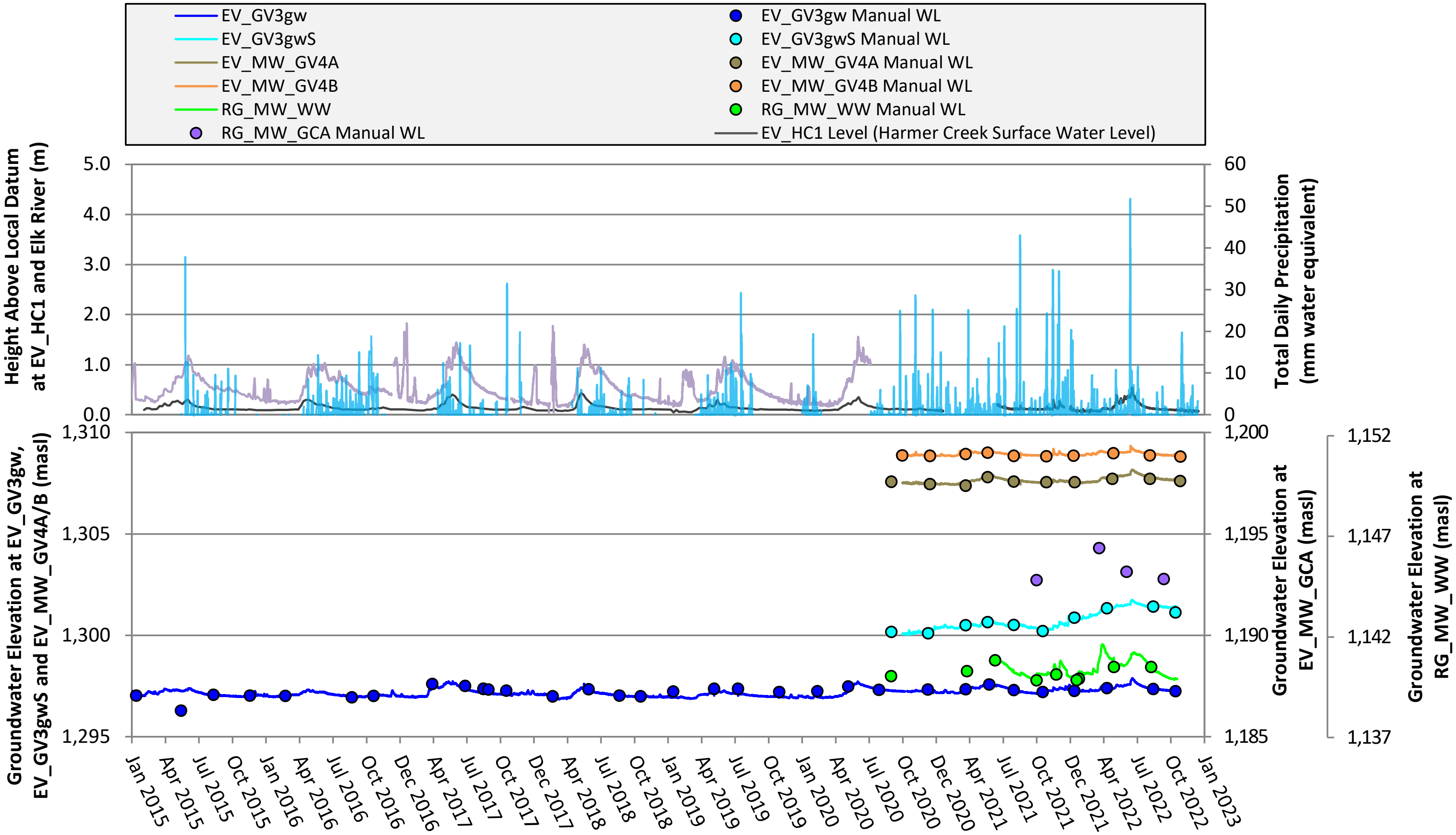
SRK Consulting Inc., 2022. Elk Valley Seep Monitoring: 2021 Annual Report. Report prepared for Teck Coal Limited. Dated March 2022.

UMA Engineering Ltd. 2008. District of Sparwood Source Water Protection Plan Drinking Water Wells. Report prepared for the District of Sparwood. Dated January 9, 2008.

Figures

Figures (Cont'd)

Figure EV-01: Grave/Harmer Creek Watershed and Elk River Downstream of Grave Creek (Study Area 7) - Hydrograph



Notes: Data was removed where suspected datalogger removal occured. EV_HC1 Level is plotted as height above location datum. Continuous water level water has been compensated using barologger at EV_MW_SPR1B.

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635544 / 2023 03 24
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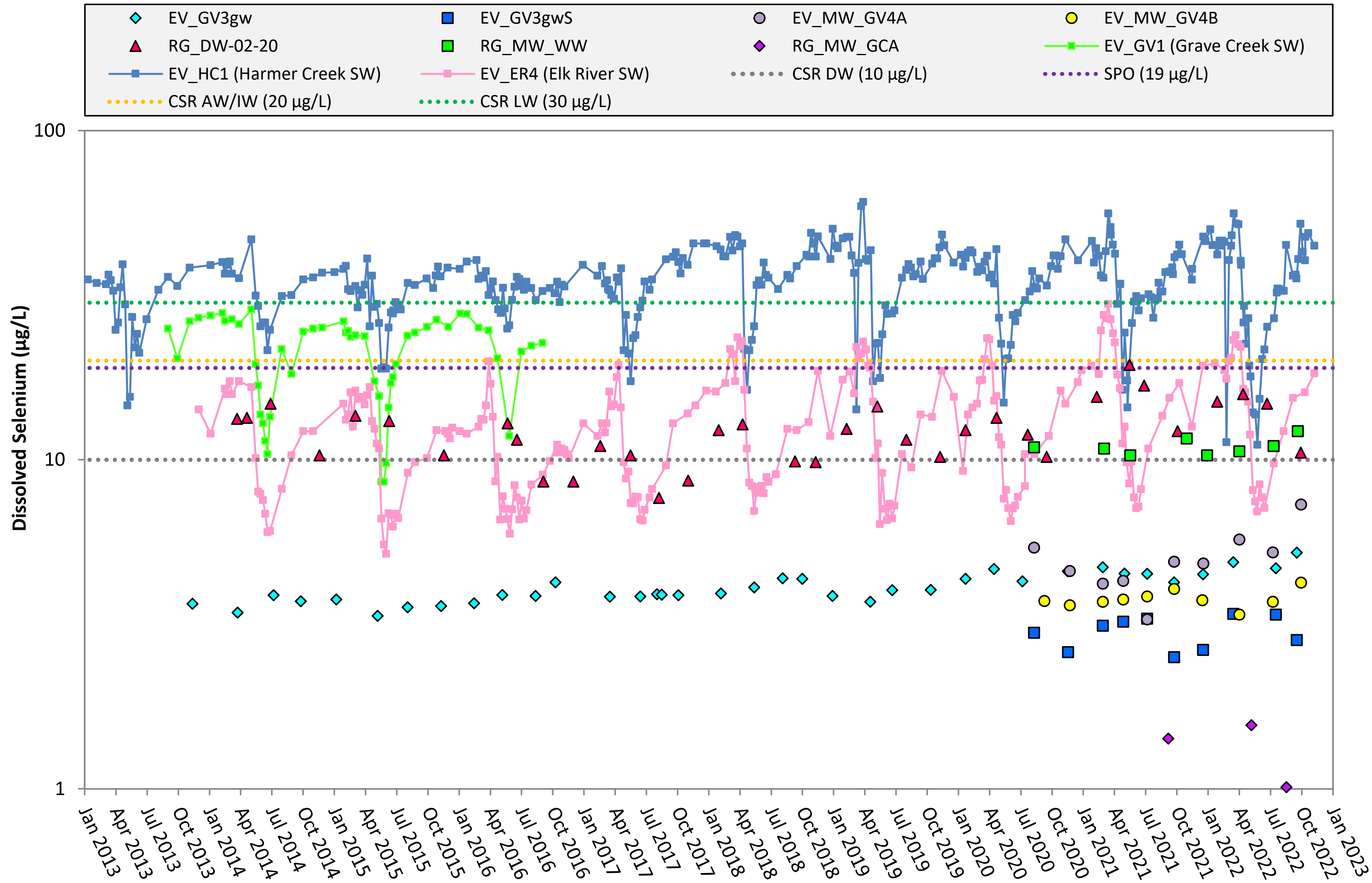
Figure EV-02: Grave/Harmer Creek Watershed and Elk River Downstream of Grave Creek (Study Area 7) - Dissolved Selenium



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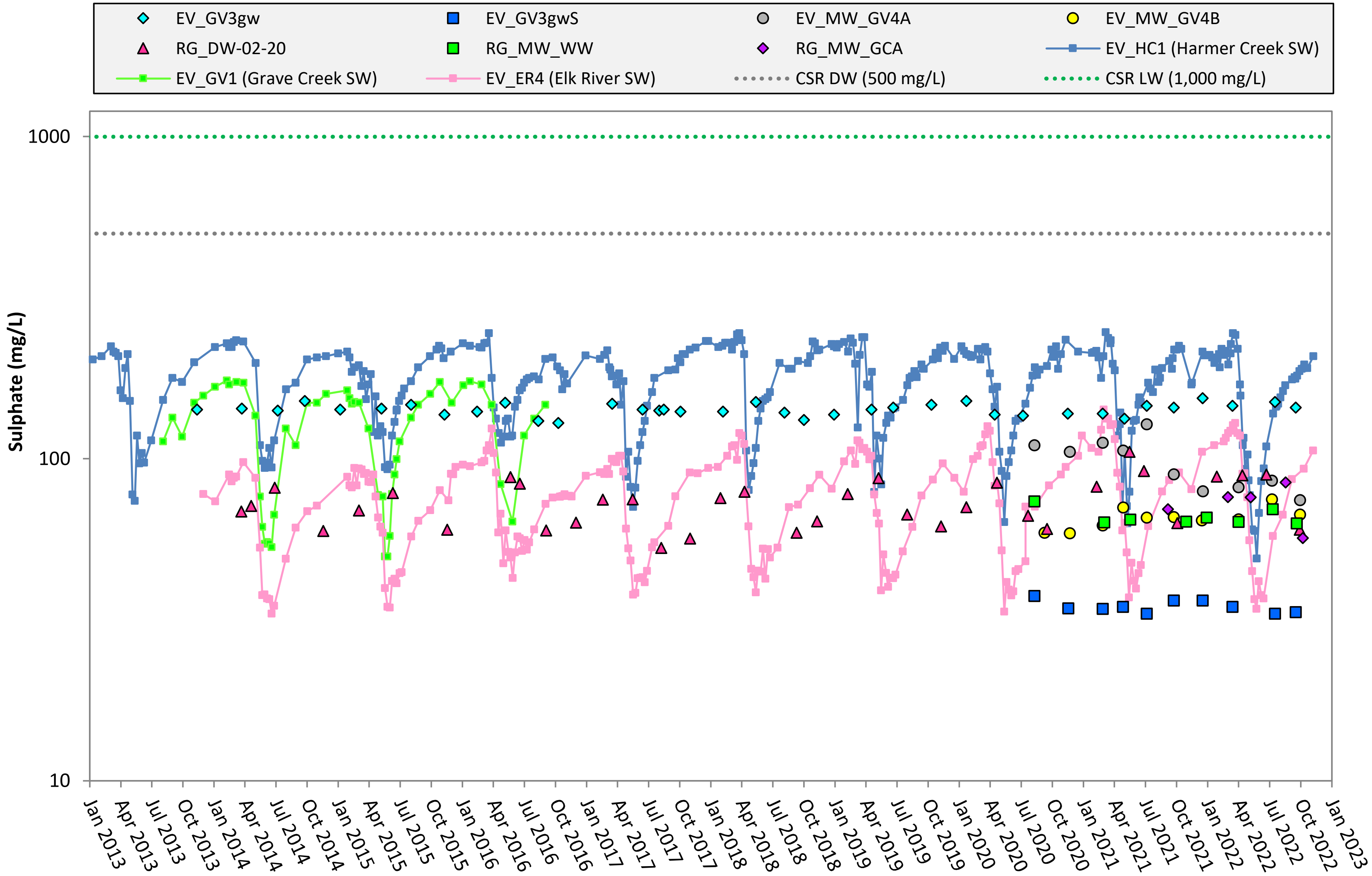
Notes: Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

635544 / 2023 03 24
QAQC: DC 2023 03 24

Figure EV-03: Grave/Harmer Creek Watershed and Elk River Downstream of Grave Creek (Study Area 7) - Sulphate



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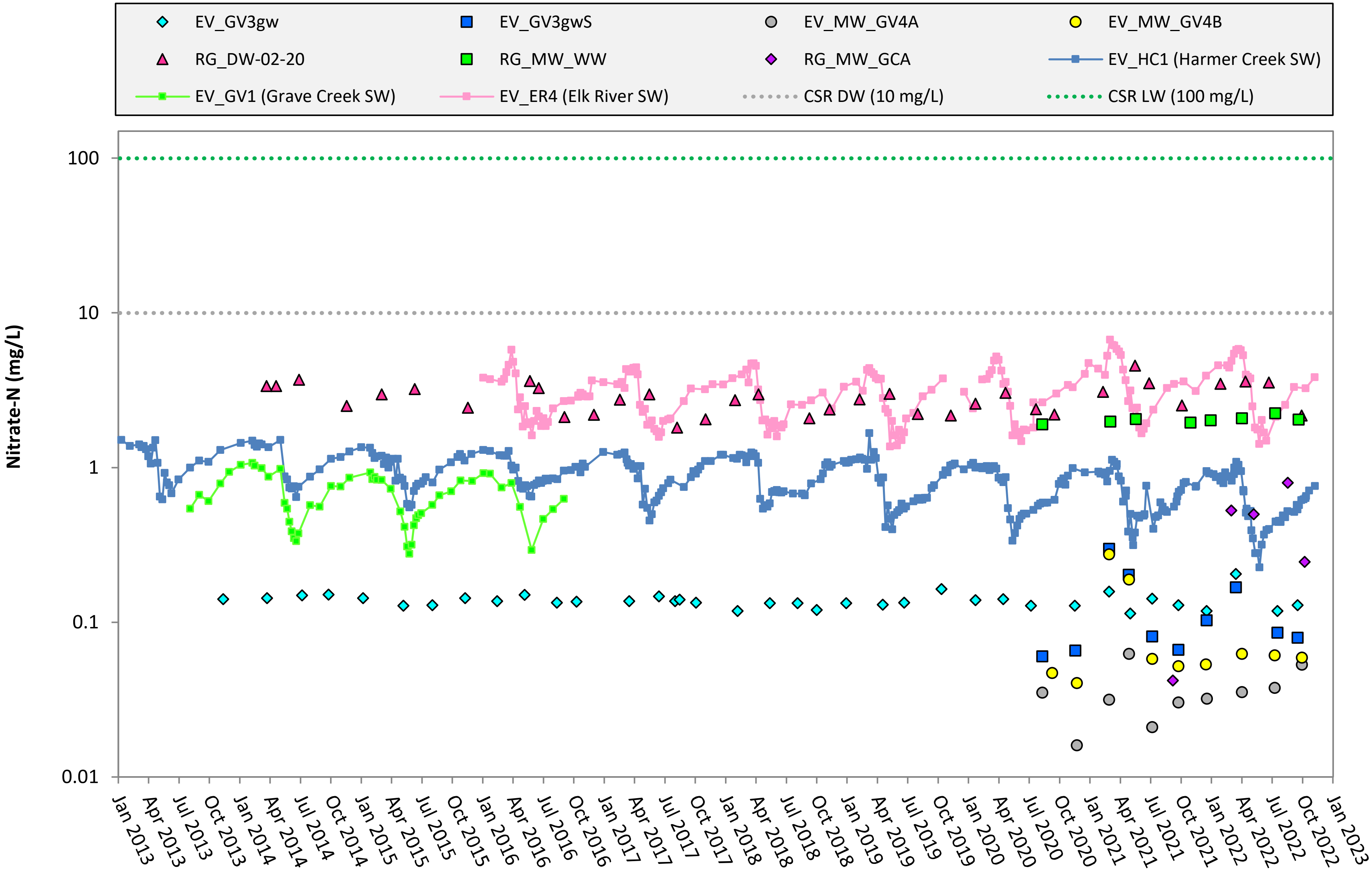
Notes: Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

635544 / 2023 03 24
QAQC: DC 2023 03 24

Figure EV-04: Grave/Harmer Creek Watershed and Elk River Downstream of Grave Creek (Study Area 7) - Nitrate-N



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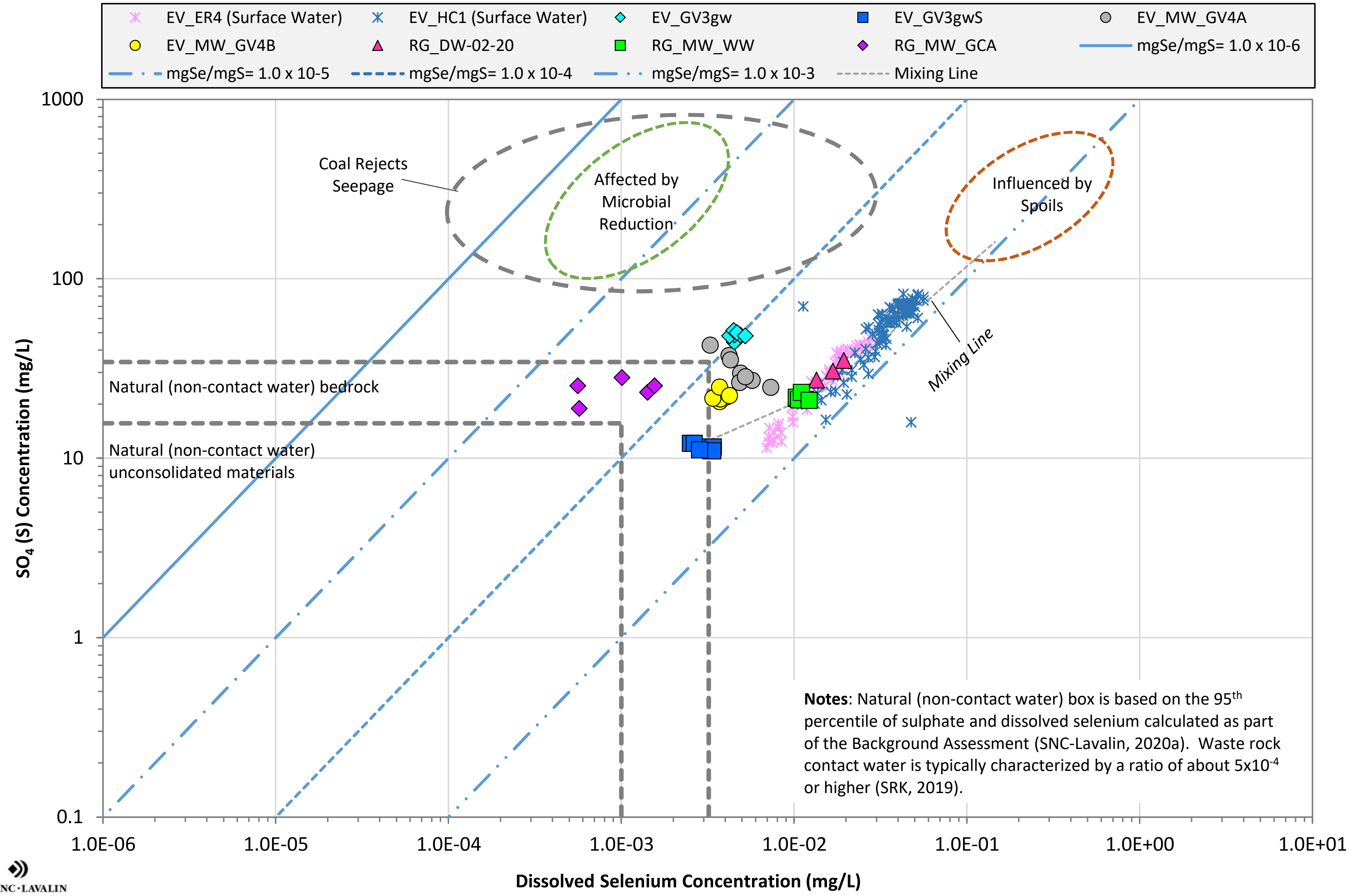
Notes: Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

Figure EV-05: Grave/Harmer Creek Watershed and Elk River Downstream of Grave Creek (Study Area 7) - Se:SO4 (S)



Notes: Natural (non-contact water) box is based on the 95th percentile of sulphate and dissolved selenium calculated as part of the Background Assessment (SNC-Lavalin, 2020a). Waste rock contact water is typically characterized by a ratio of about 5x10^{-4} or higher (SRK, 2019).

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635544 / 2023 03 24
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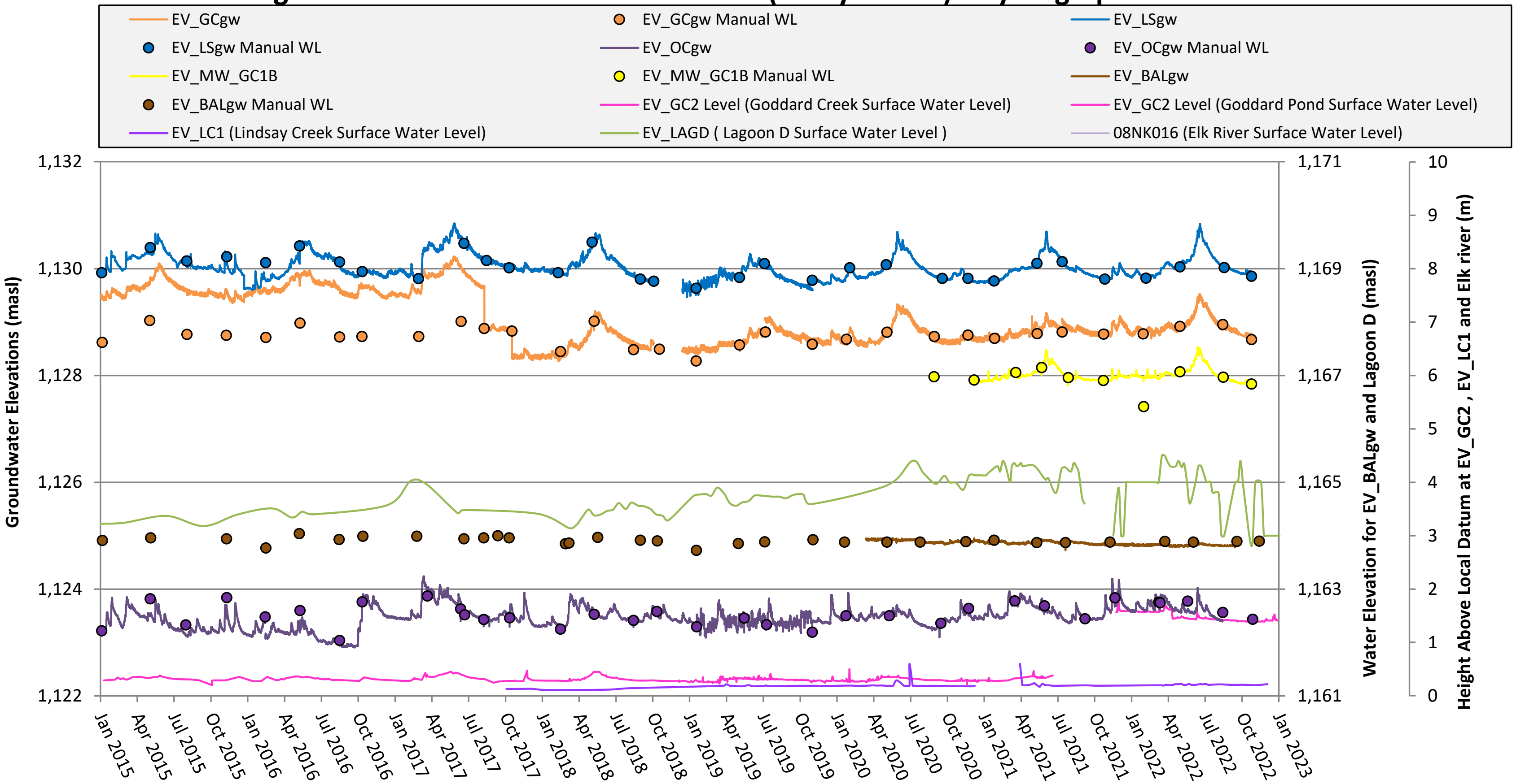
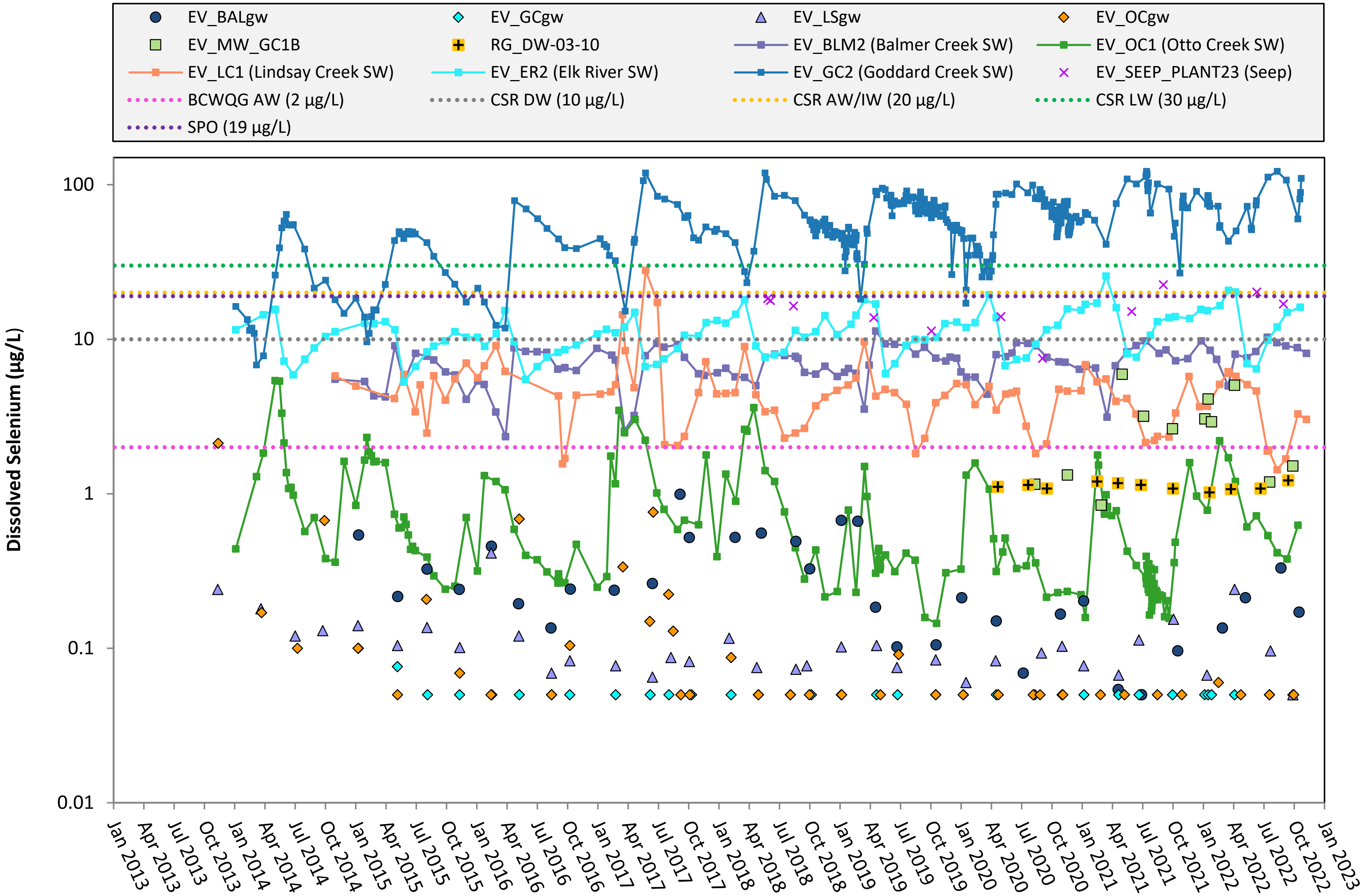
Figure EV-06: Elk River Proximal to EVO (Study Area 8) - Hydrograph



Note: data was removed where suspected datalogger removal occured. Continuous water level data has been compensated using barologger at EV_MW_SPR1B;Goddard surface water station moved in 2021 from creek to pond.

Figure EV-07: Elk River Proximal to EVO (Study Area 8) - Dissolved Selenium



Note: For concentrations measured below the analytical detection limit, the detection limit (0.05 µg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations

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635544 / 2023 03 24
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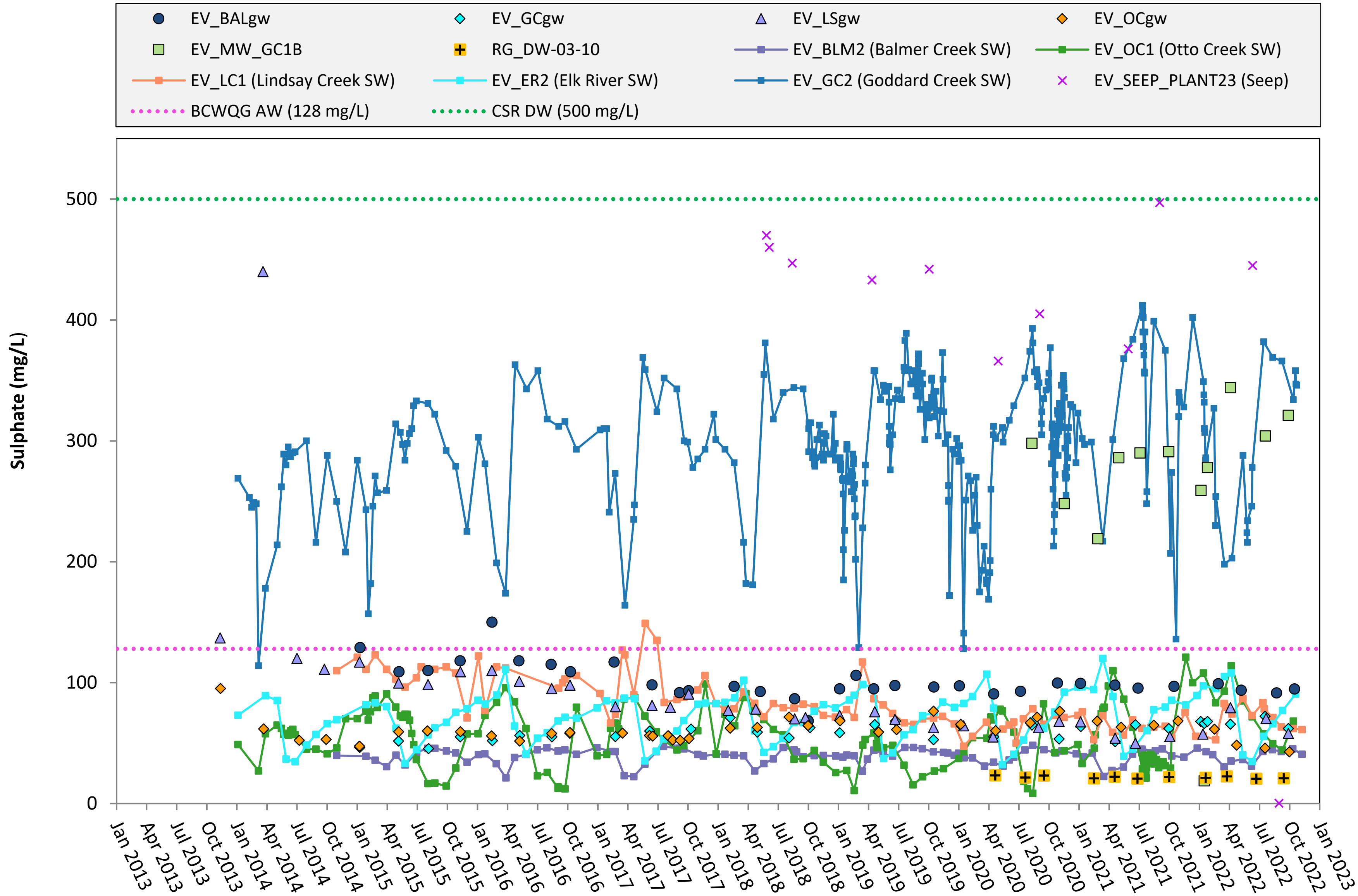
Figure EV-08: Elk River Proximal to EVO (Study Area 8) - Sulphate



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Note: BCWQG AW was applied to EV_OCgw only as the well is within 10 m of the high water mark.

635544 / 2023 03 24
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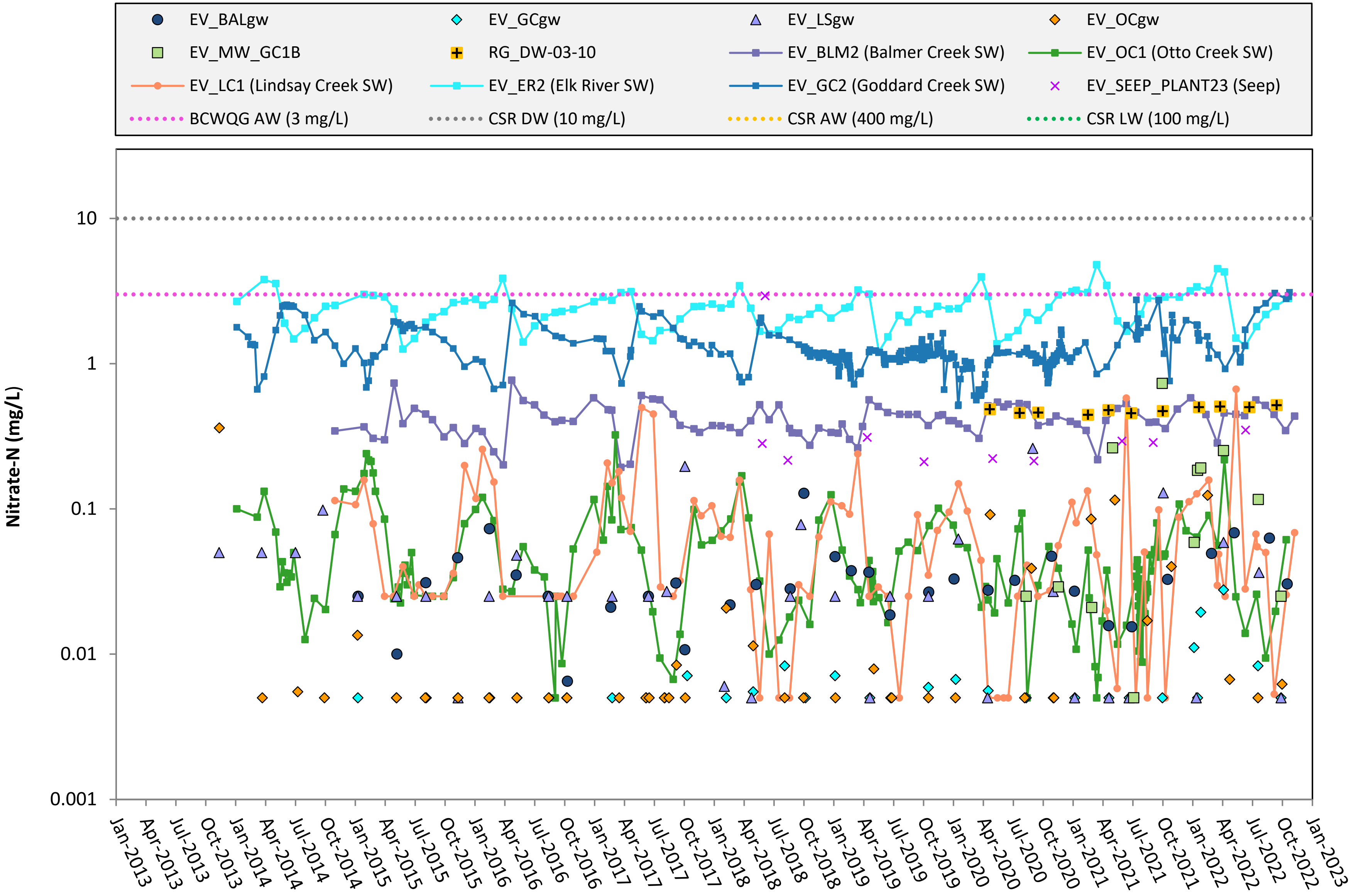
Figure EV-09: Elk River Proximal to EVO (Study Area 8) - Nitrate-N



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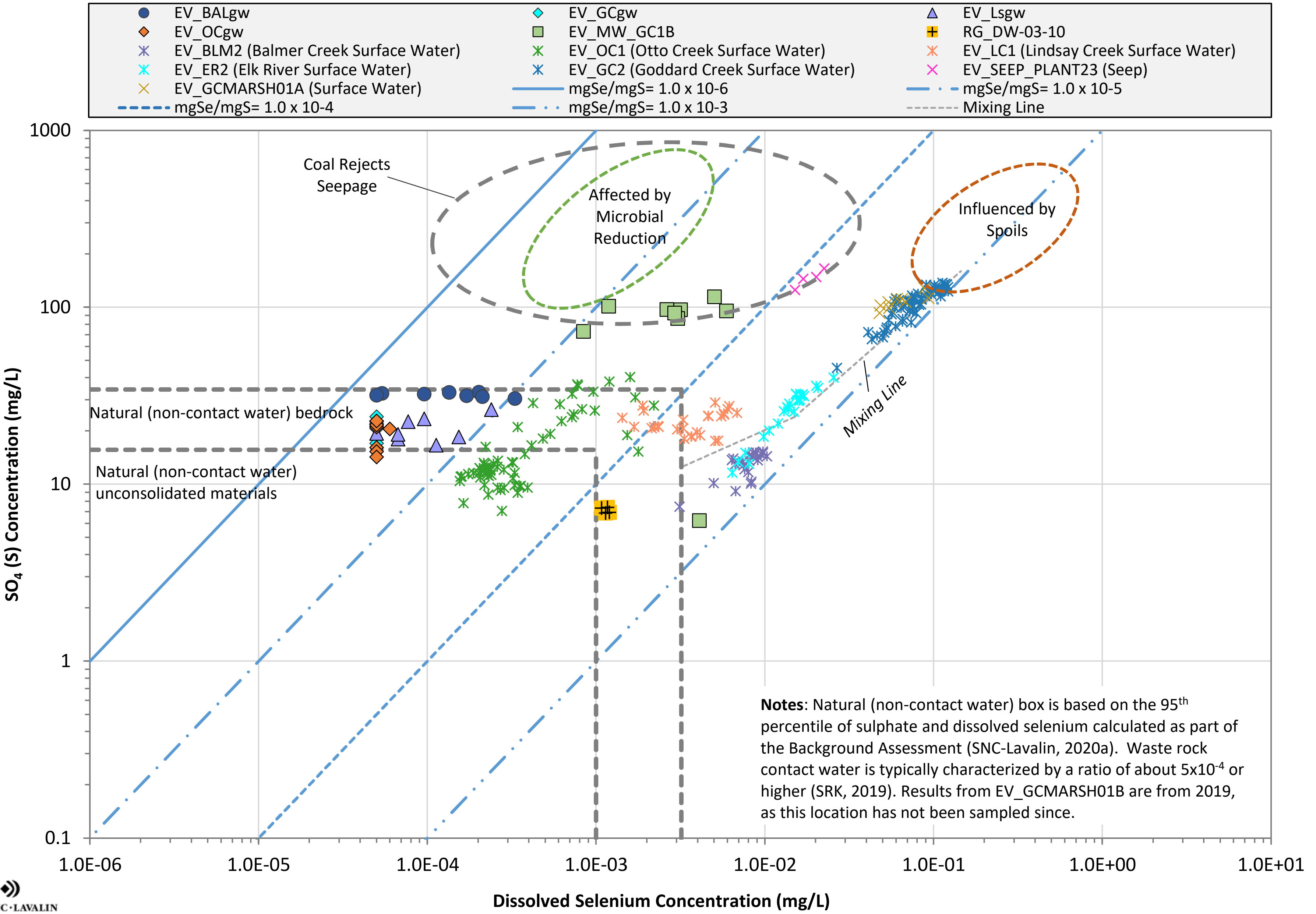
Note: For concentrations measured below the analytical detection limit, the detection limit (0.005 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria. BCWQG AW was applied to EV_OCgw only as the well is within 10 m of the high water mark.

635544 / 2023 03 24
QAQC: DC 2023 03 24

Figure EV-10: Elk River Proximal to EVO (Study Area 8) - Se:SO4 (S)



Notes: Natural (non-contact water) box is based on the 95th percentile of sulphate and dissolved selenium calculated as part of the Background Assessment (SNC-Lavalin, 2020a). Waste rock contact water is typically characterized by a ratio of about 5x10^{-4} or higher (SRK, 2019). Results from EV_GCMARSH01B are from 2019, as this location has not been sampled since.

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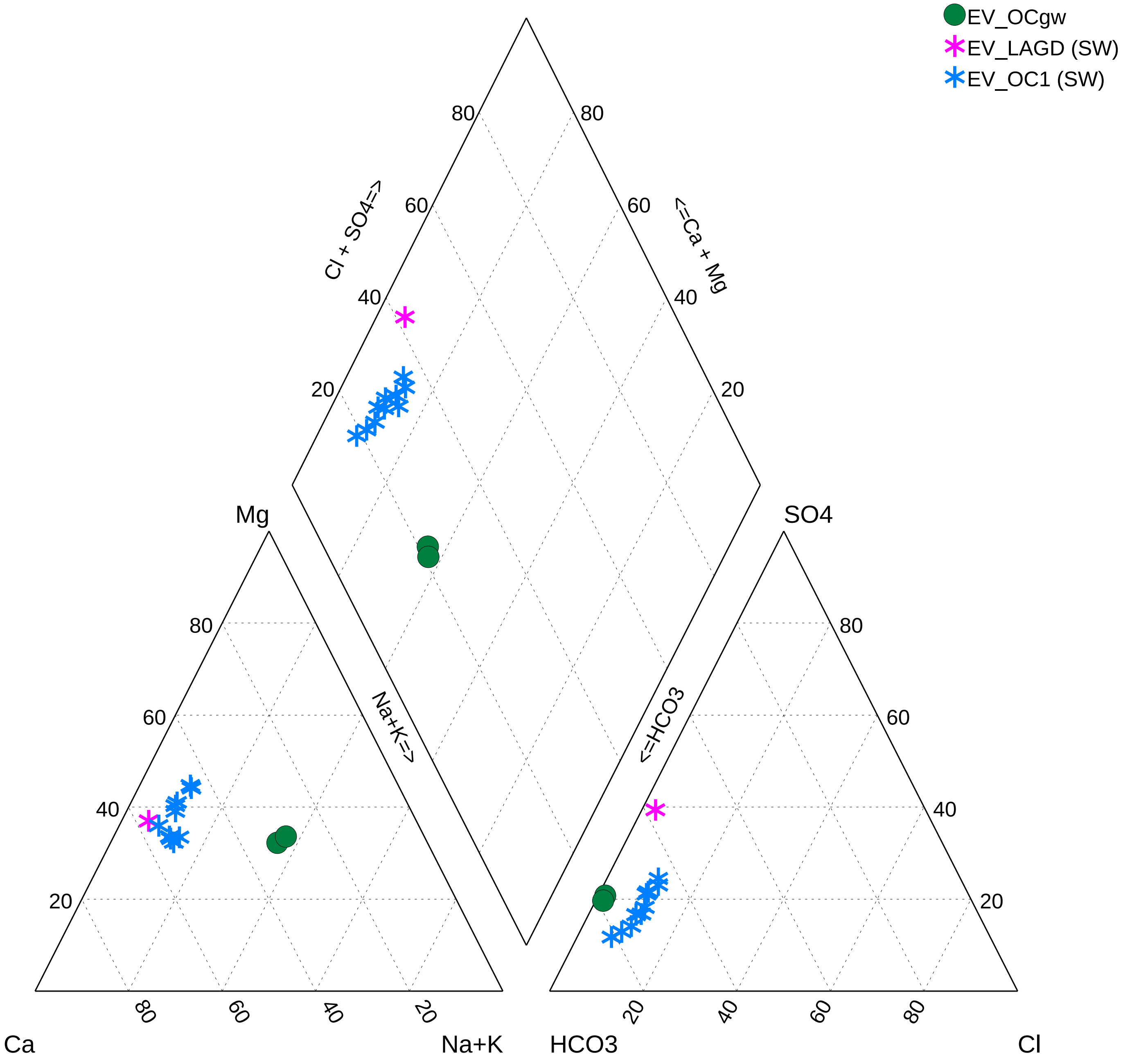
635544 / 2023 03 24
QAQC: DC 2023 03 24



DESCRIPTION: Figure EV-11: Piper Diagram for Elk River Proximal to EVO (Study Area 8)

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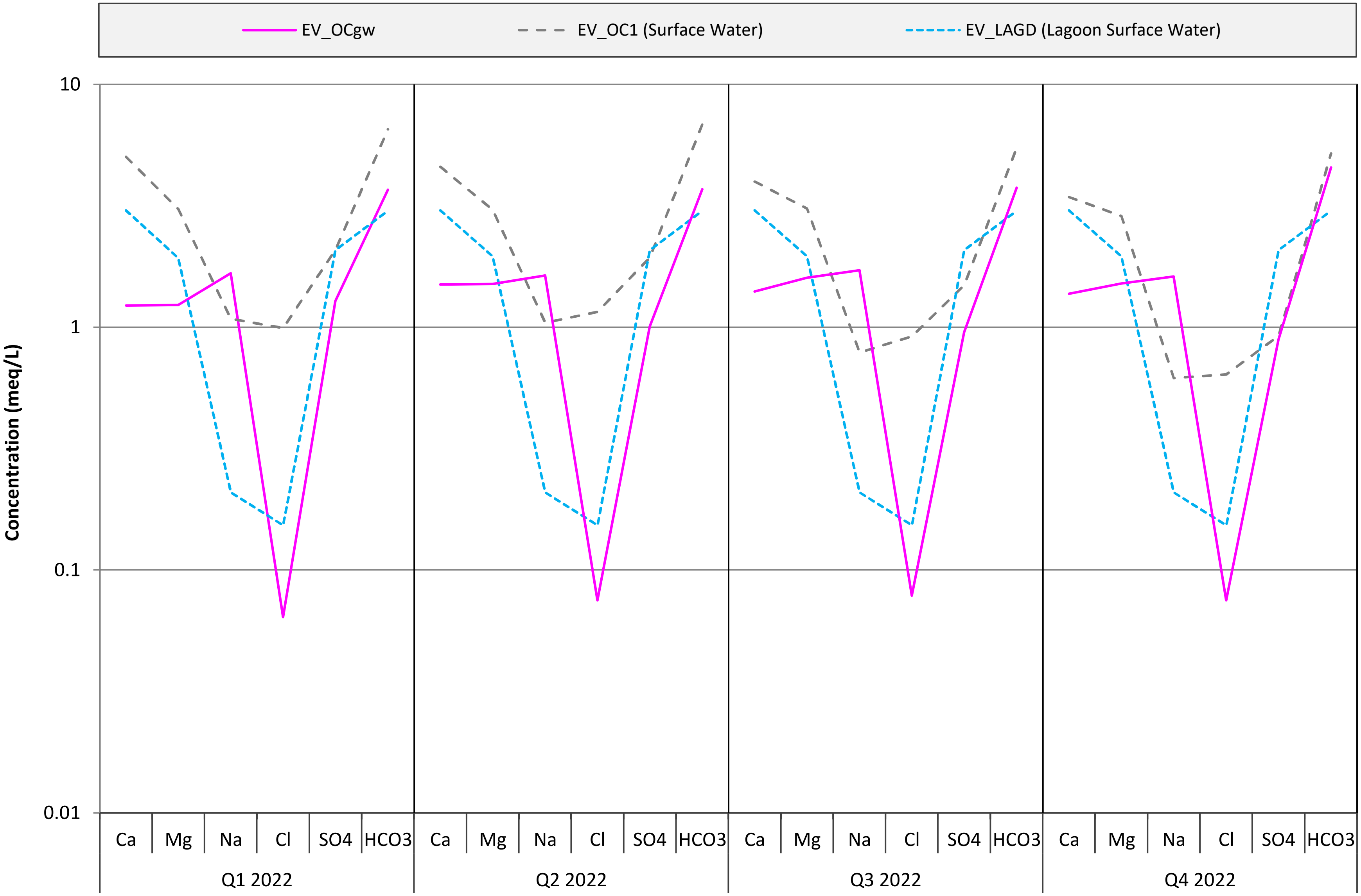
	CLIENT:	Teck Coal Limited	DATE:	2023-02-02

635544 / 2023 03 24
QAQC: DC 2023 03 24

Figure EV-12: Elk River Proximal to EVO (Study Area 8) - Schoeller Plot



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635544 / 2023 03 24
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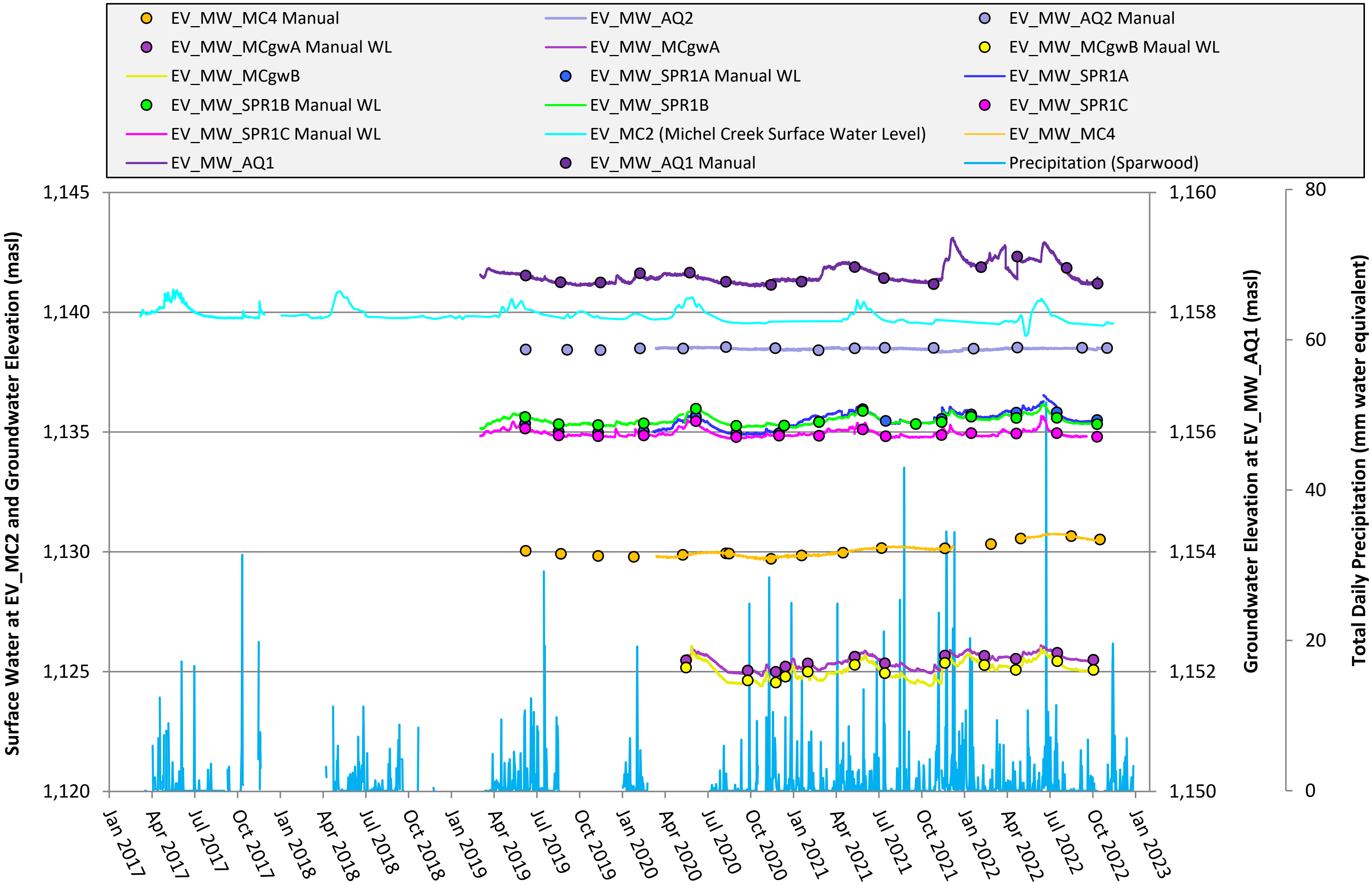
Figure EV-13: Sparwood Area - Michel Creek and Baldy Ridge (Study Area 9a) - Hydrograph



Note: data was removed where suspected datalogger removal occured, dataloggers MCgwD and MCgwS were switched on November 17, 2015. Continuous water level data has been compensated using barologger at EV_MW_SPR1B.

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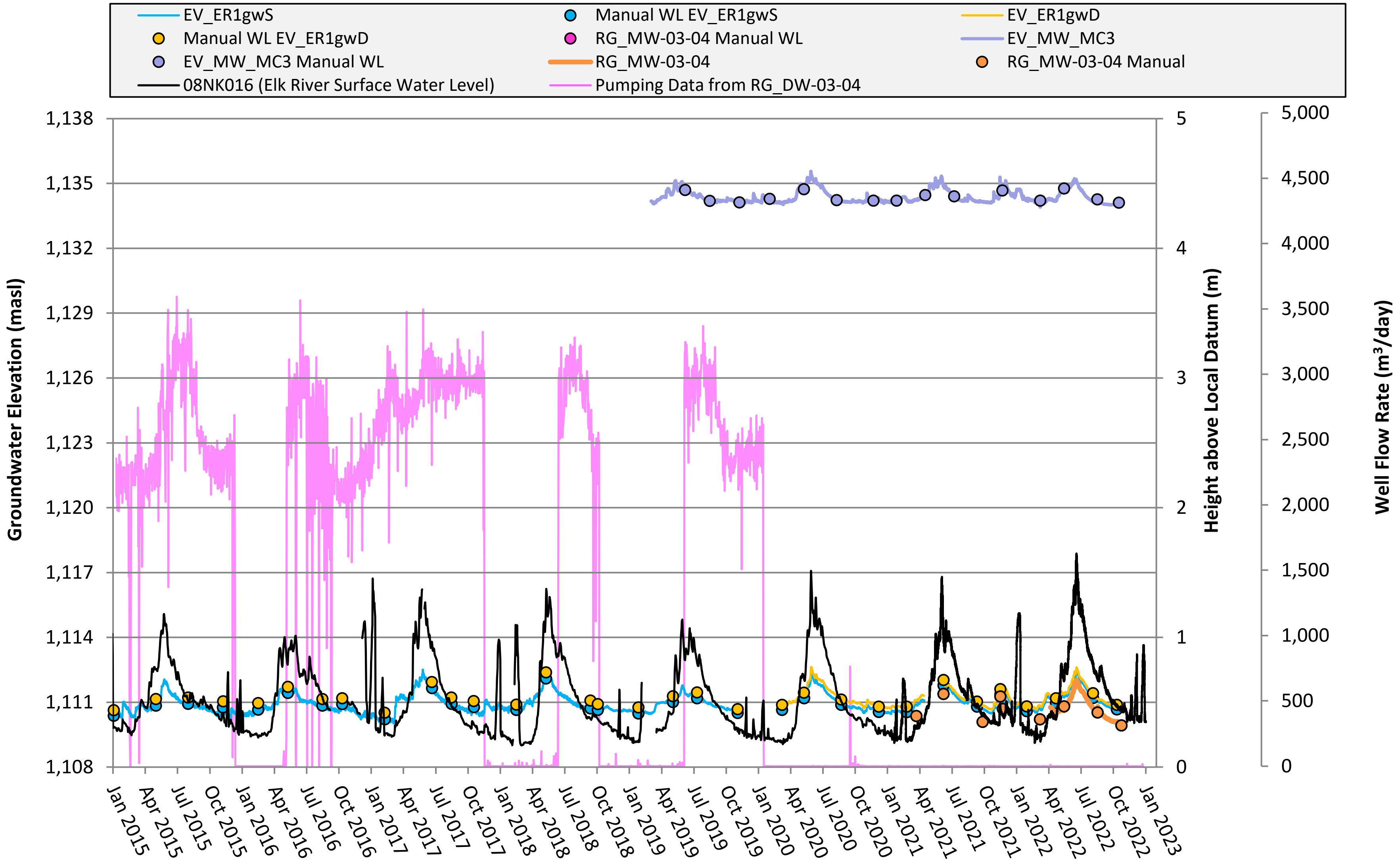
Figure EV-14: Sparwood Area - Elk River and Sparwood Ridge (Study Area 12) - Hydrograph and Pumping Rates



Note: data was removed where suspected datalogger removal occured. Continuous water level data has been compensated using barologger at EM_MW_SPR1B.

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635544 / 2023 03 24
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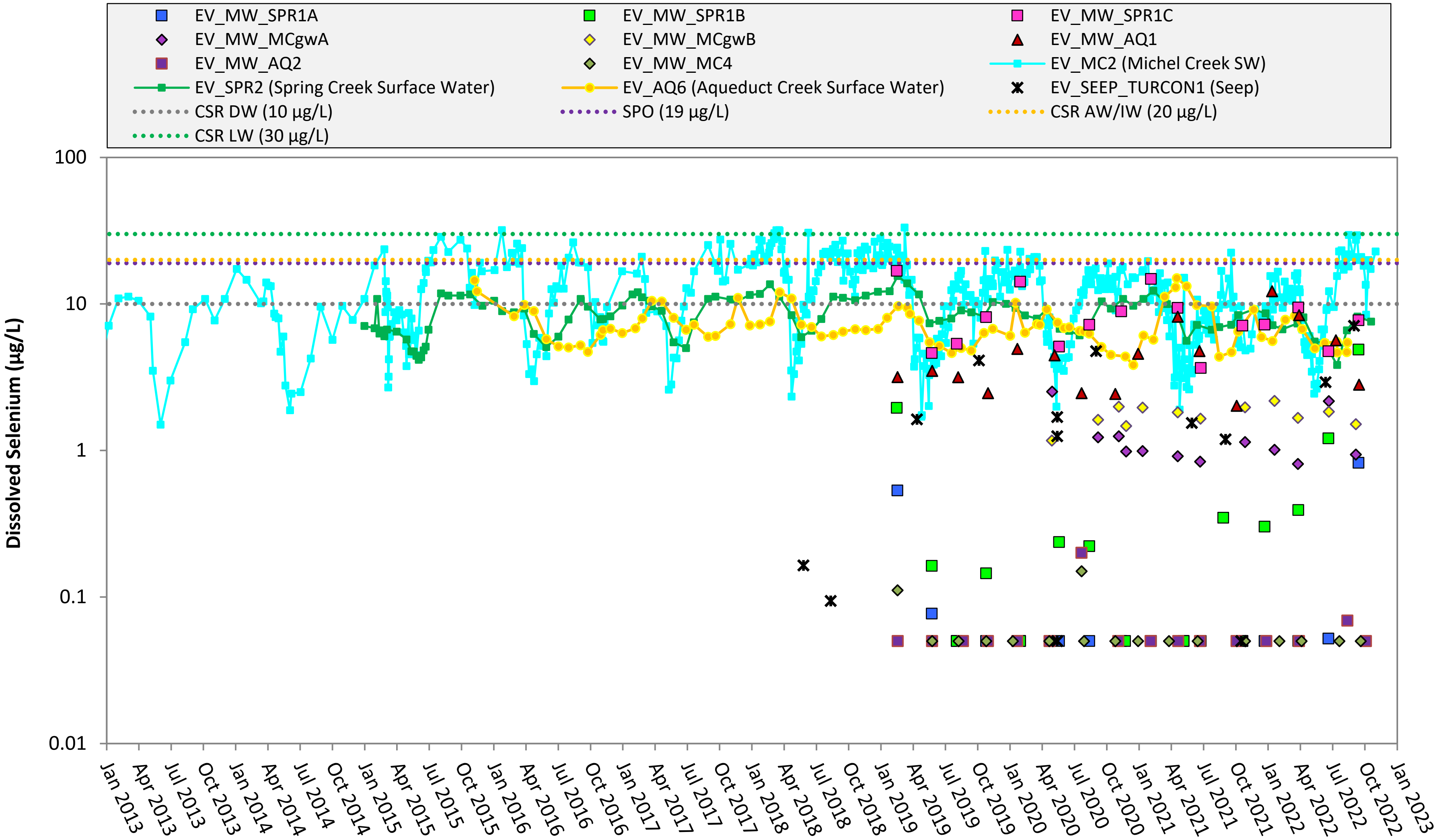
Figure EV-15: Sparwood Area - Michel Creek and Baldy Ridge (Study Area 9a) - Dissolved Selenium



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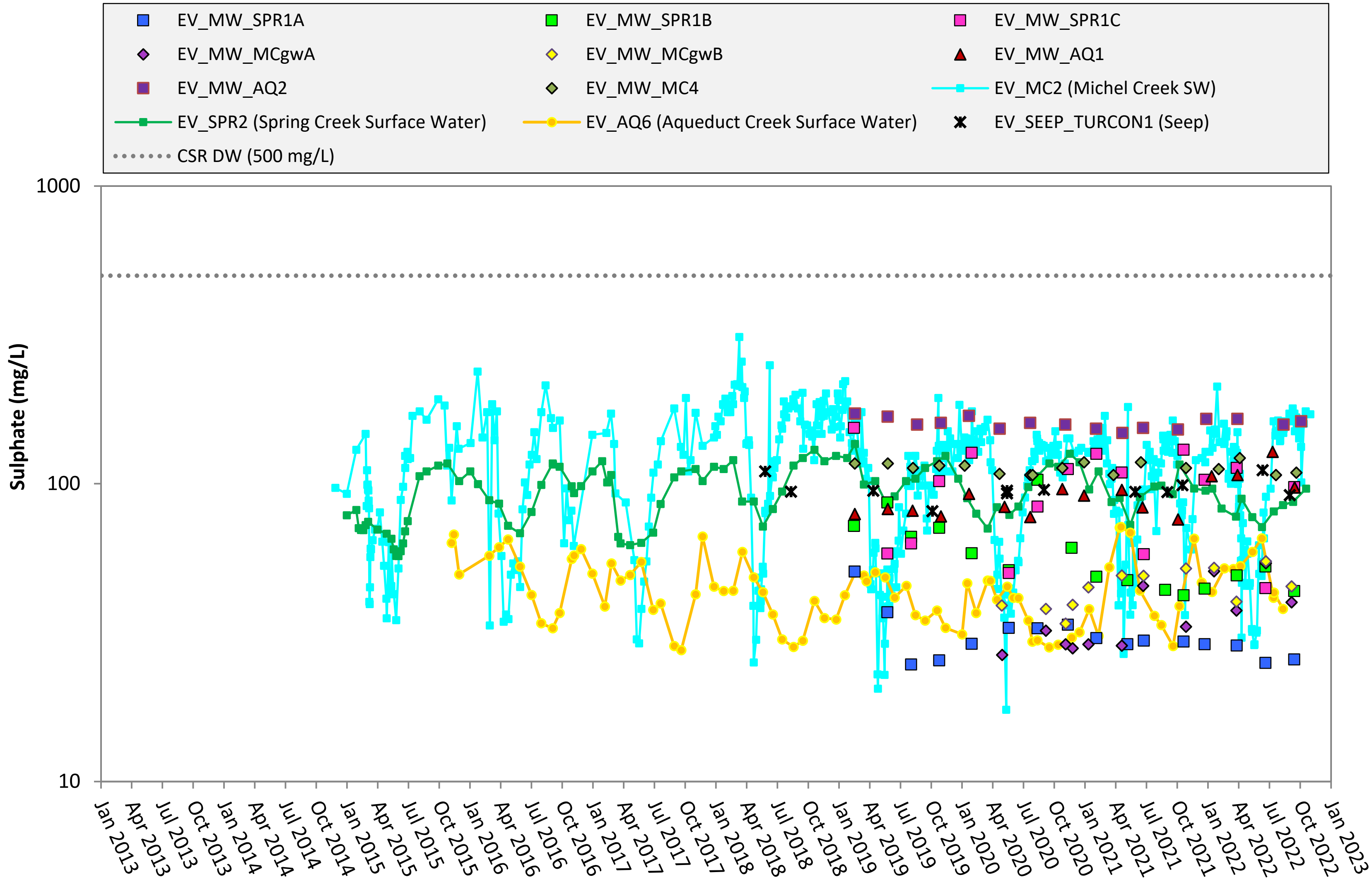
Note: For concentrations measured below the analytical detection limit, the detection limit (0.05 µg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

635544 / 2023 03 24
QAQC: DC 2023 03 24

Figure EV-16: Sparwood Area - Michel Creek and Baldy Ridge (Study Area 9a) - Sulphate



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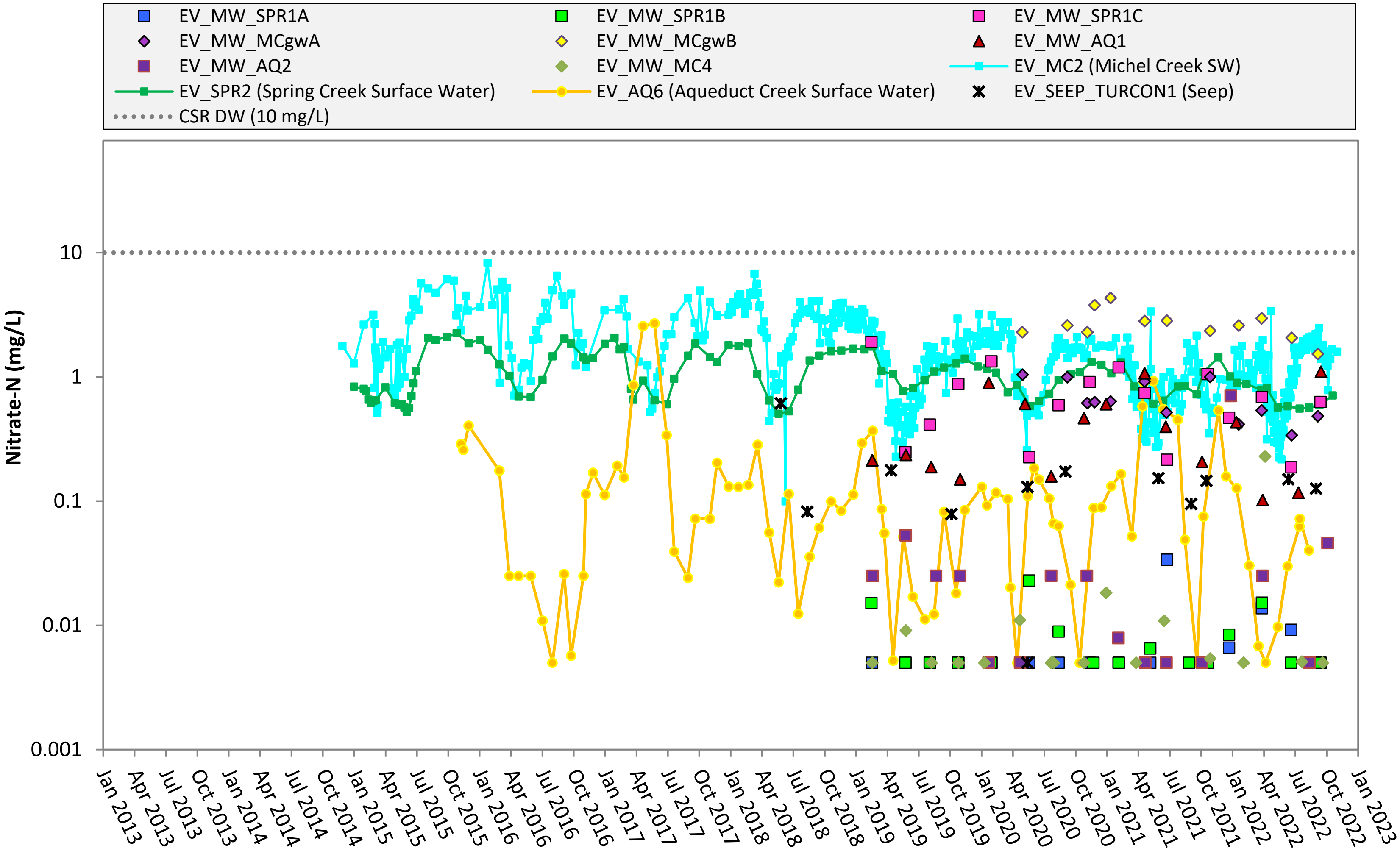
Note: Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

635544 / 2023 03 24
QAQC: DC 2023 03 24

Figure EV-17: Sparwood Area - Michel Creek and Baldy Ridge (Study Area 9a) - Nitrate-N



Note: For concentrations measured below the analytical detection limit, the detection limit (0.005 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

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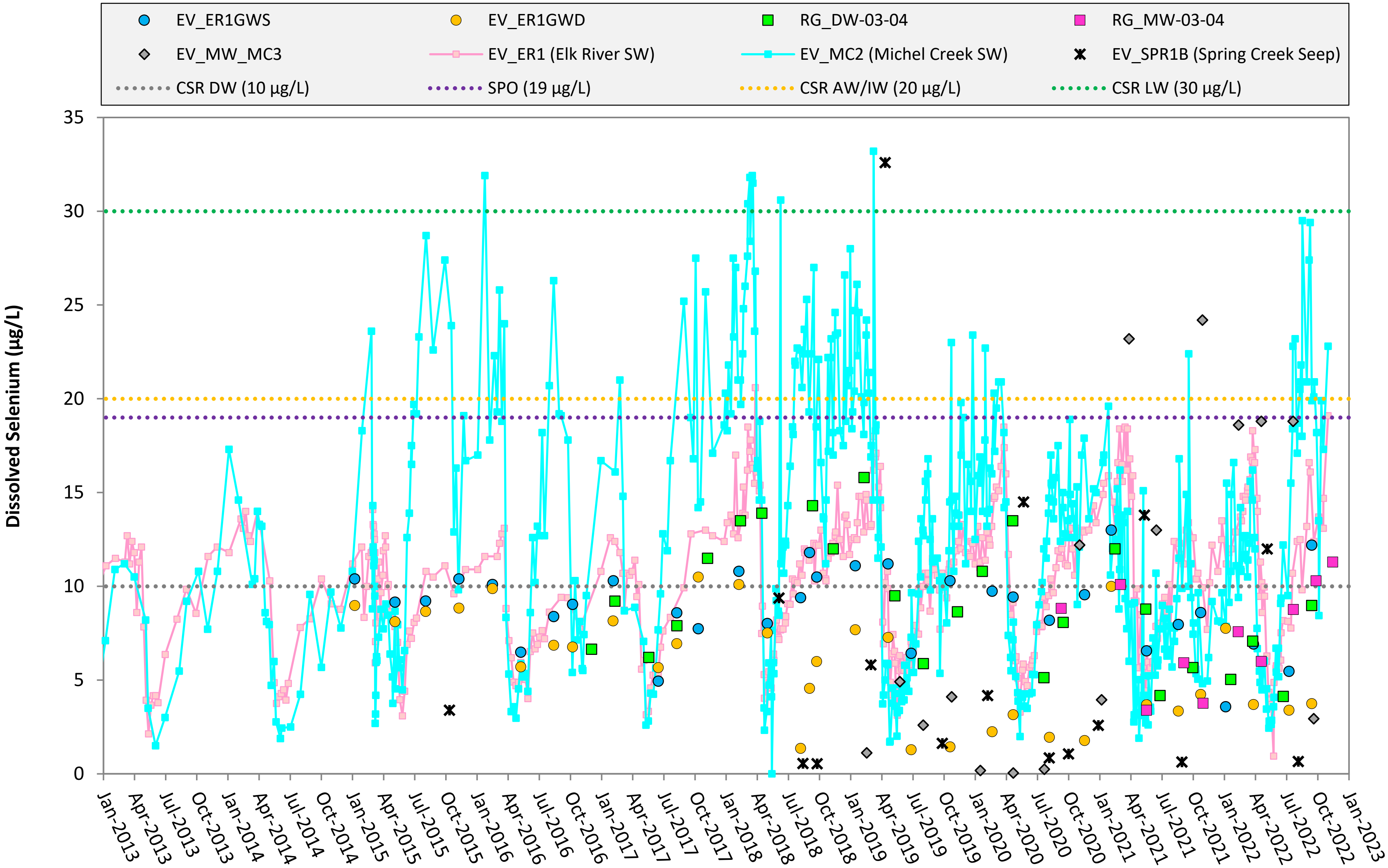
635544 / 2023 03 24
QAQC: DC 2023 03 24

Figure EV-18: Sparwood Area - Elk River and Sparwood Ridge (Study Area 12) - Dissolved Selenium



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635544 / 2023 03 24
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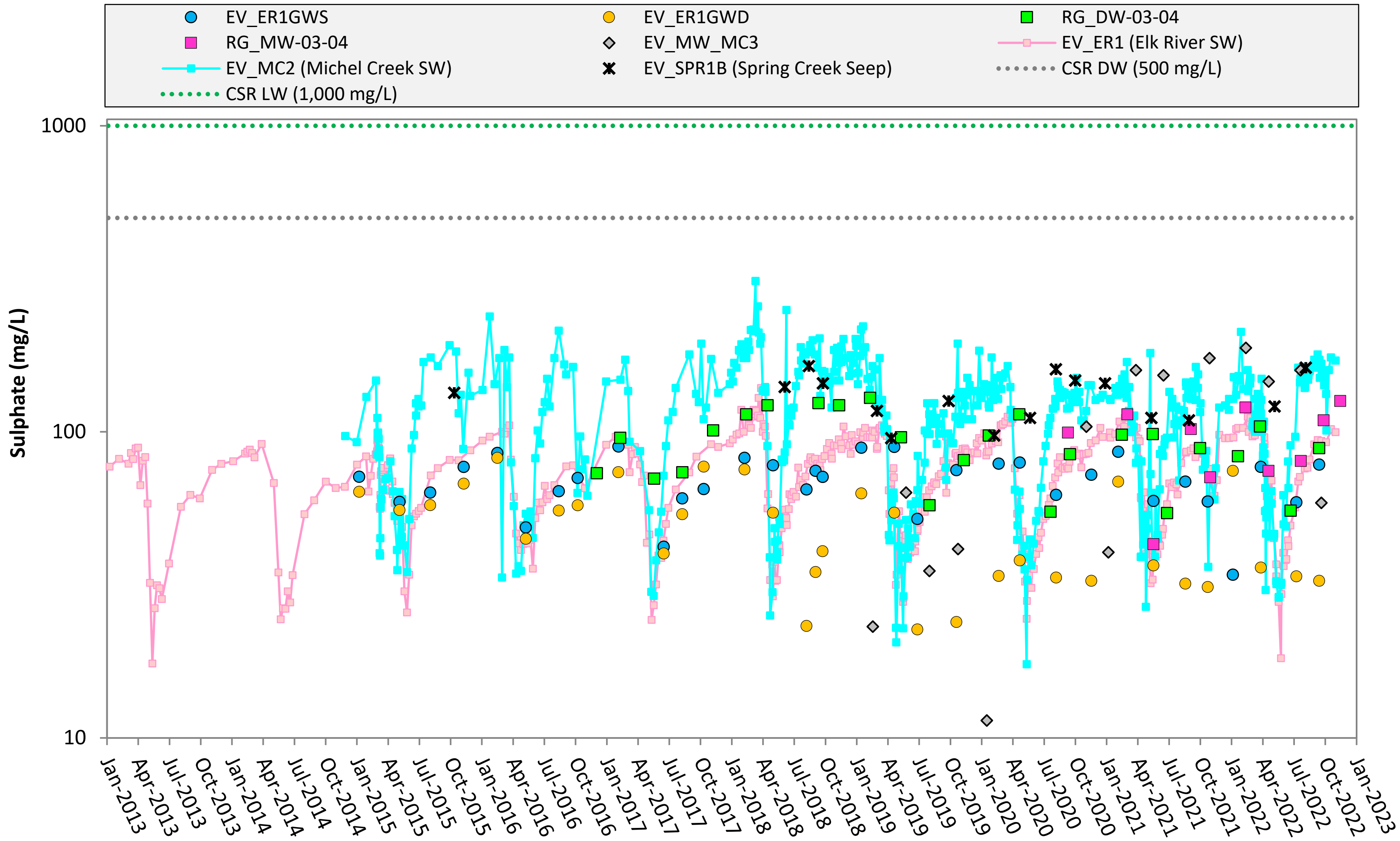
Figure EV-19: Sparwood Area - Elk River and Sparwood Ridge (Study Area 12) - Sulphate



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Note: Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

635544 / 2023 03 24
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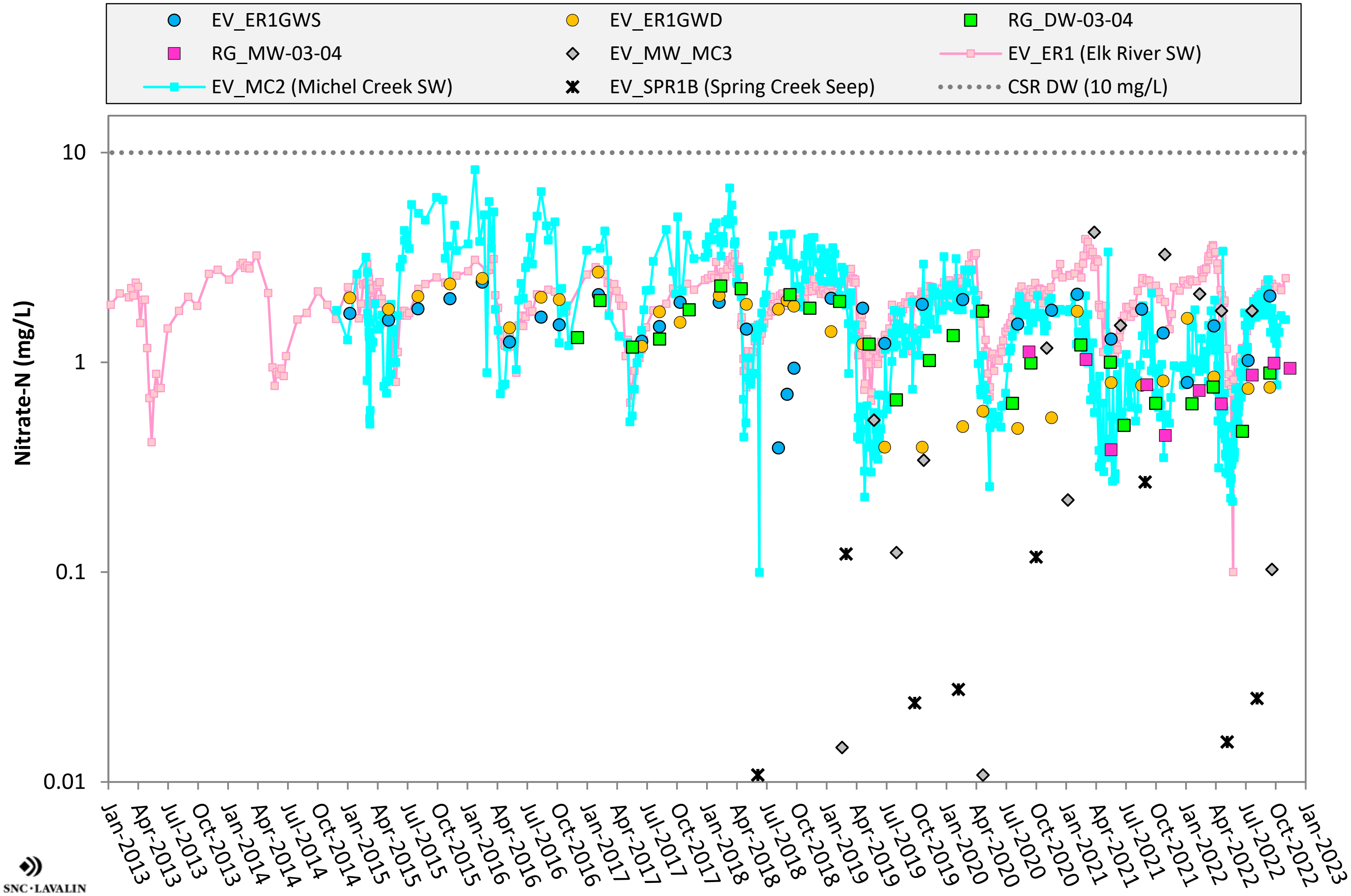
Figure EV-20: Sparwood Area - Elk River and Sparwood Ridge (Study Area 12) - Nitrate-N



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635544 / 2023 03 24
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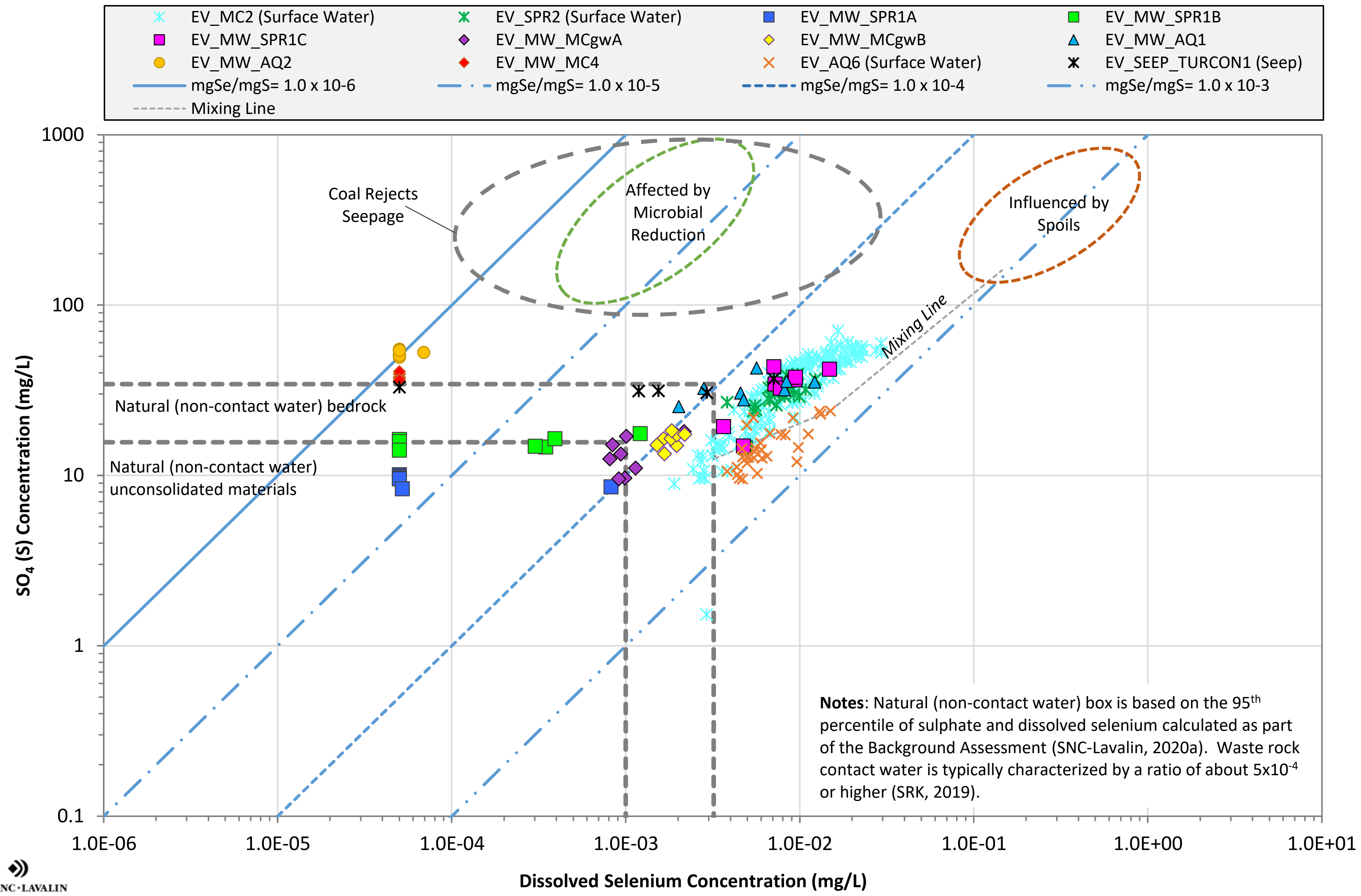
Figure EV-21: Sparwood Area
Michel Creek and Baldy Ridge (Study Area 9a) - Se:SO4 (S)



Notes: Natural (non-contact water) box is based on the 95th percentile of sulphate and dissolved selenium calculated as part of the Background Assessment (SNC-Lavalin, 2020a). Waste rock contact water is typically characterized by a ratio of about 5x10^{-4} or higher (SRK, 2019).

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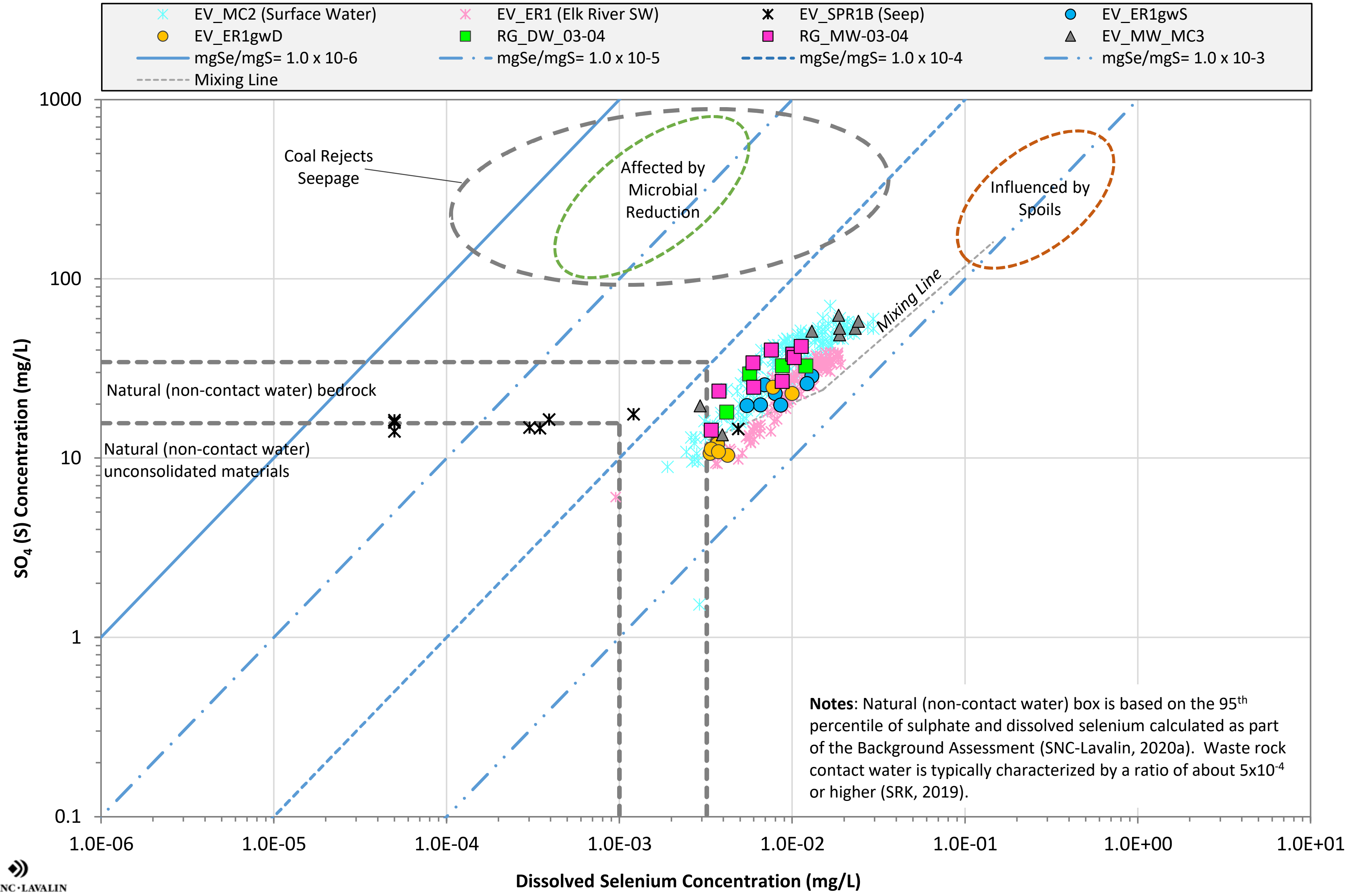
635544 / 2023 03 24
QAQC: DC 2023 03 24

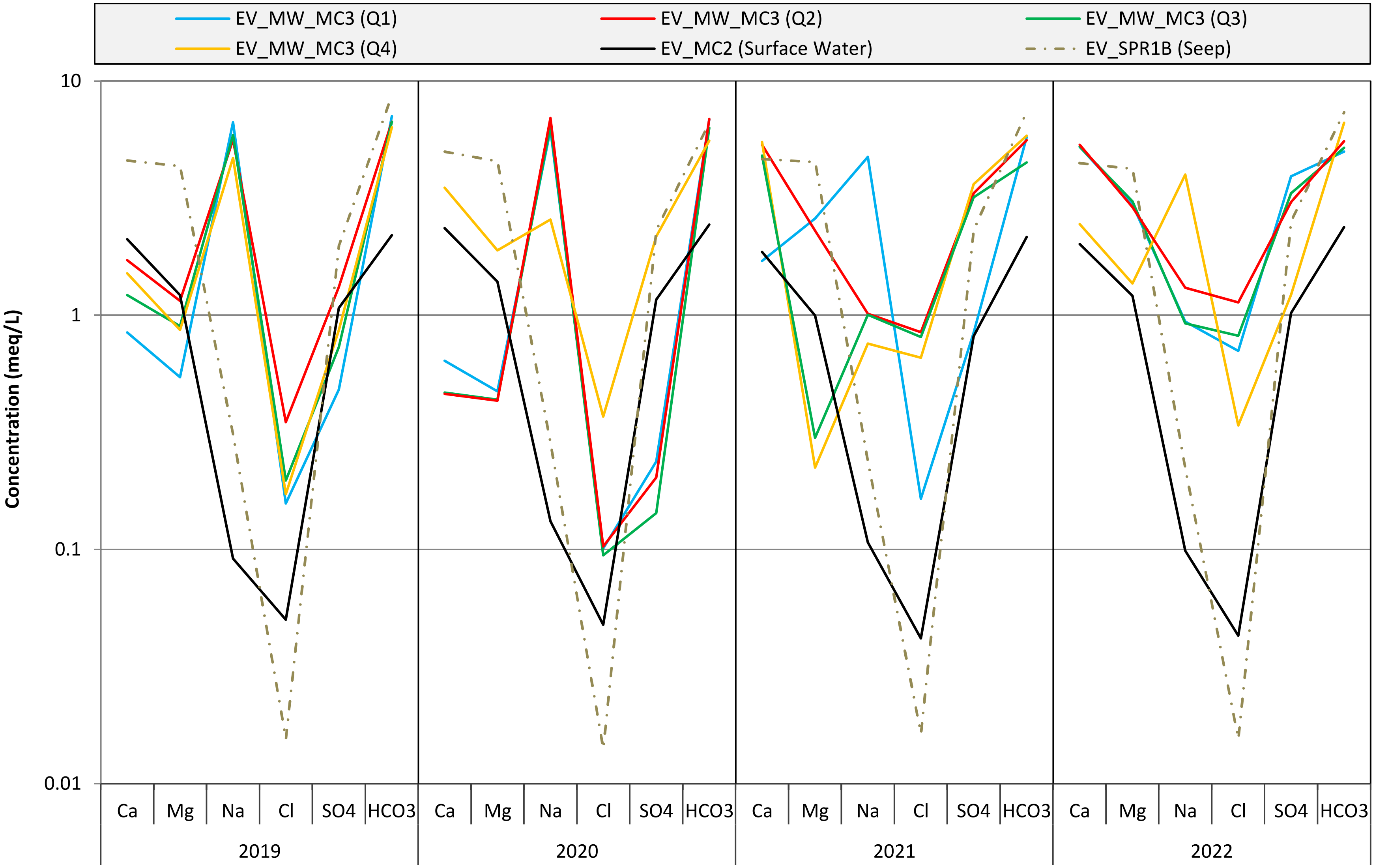
Figure EV-22: Sparwood Area
Elk River and Sparwood Ridge (Study Area 12) - Se:SO4 (S)



Notes: Natural (non-contact water) box is based on the 95th percentile of sulphate and dissolved selenium calculated as part of the Background Assessment (SNC-Lavalin, 2020a). Waste rock contact water is typically characterized by a ratio of about $5x10^{-4}$ or higher (SRK, 2019).

635544 / 2023 03 24
QAQC: DC 2023 03 24

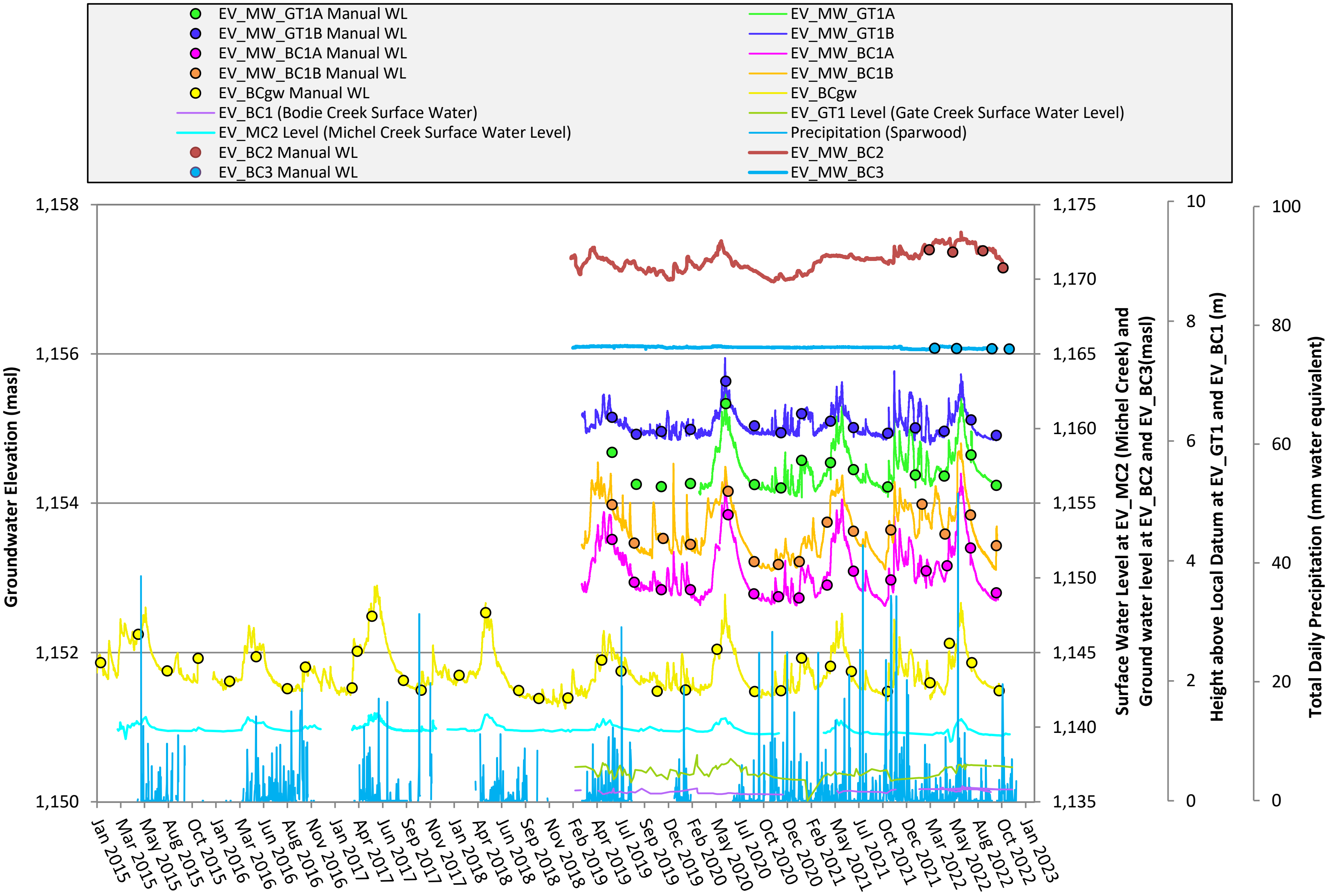
Figure EV-23: Sparwood Area - Sparwood Ridge (Study Area 12) - Schoeller Plot



Note: Analytical data presented for surface water and seeps are from Q2 in each year.

635544 / 2023 03 24
QAQC: DC 2023 03 24

Figure EV-24: Gate Creek and Bodie Creek (Study Area 9b) - Hydrograph



Note: Continuous water level data has been compensated using barologger at EV_MW_SPR1B.

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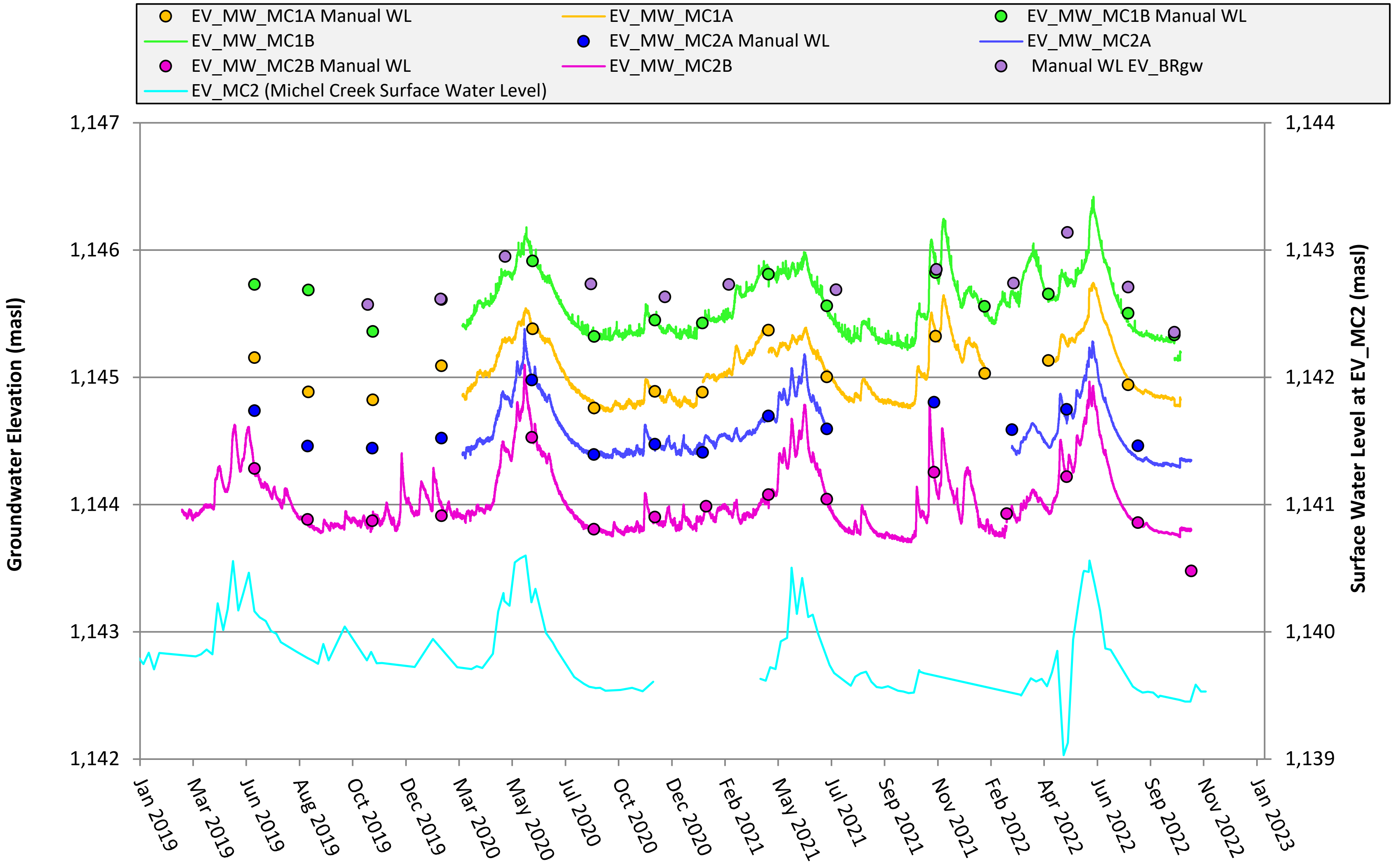
635544 / 2023 03 24
QAQC: DC 2023 03 24

Figure EV-25: Michel Creek Valley Bottom (Study Area 9b) - Hydrograph



Note: Continuous water level data has been compensated using barologger at EV_MW_SPR1B.

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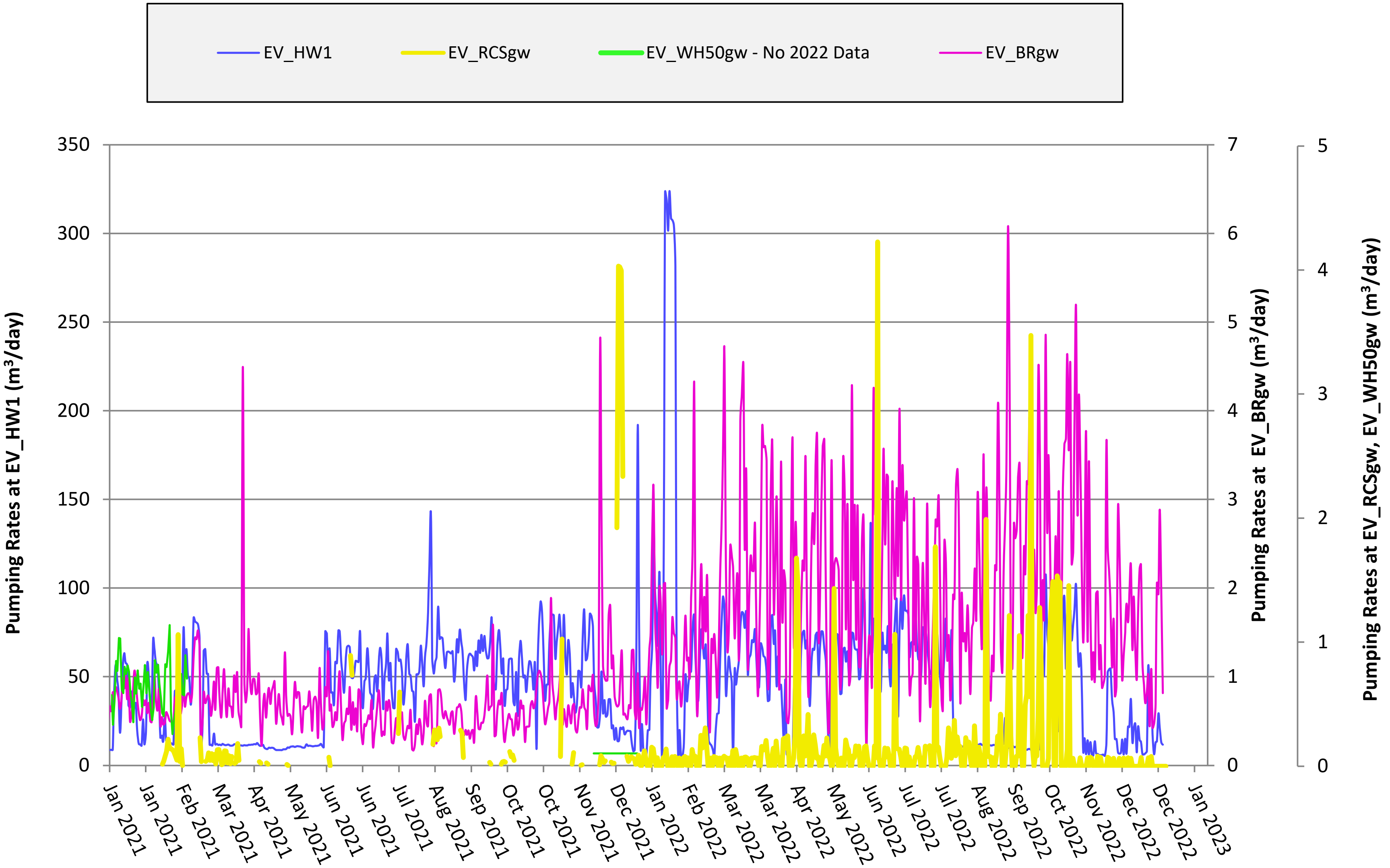
635544 / 2023 03 24
QAQC: DC 2023 03 24

Figure EV-26: Study Area 9b Supply Wells - Pumping Rates



Note: Flow meter at EV_WH50gw malfunctioned between February and November 2021; therefore, erroneous data has been removed from the graph.

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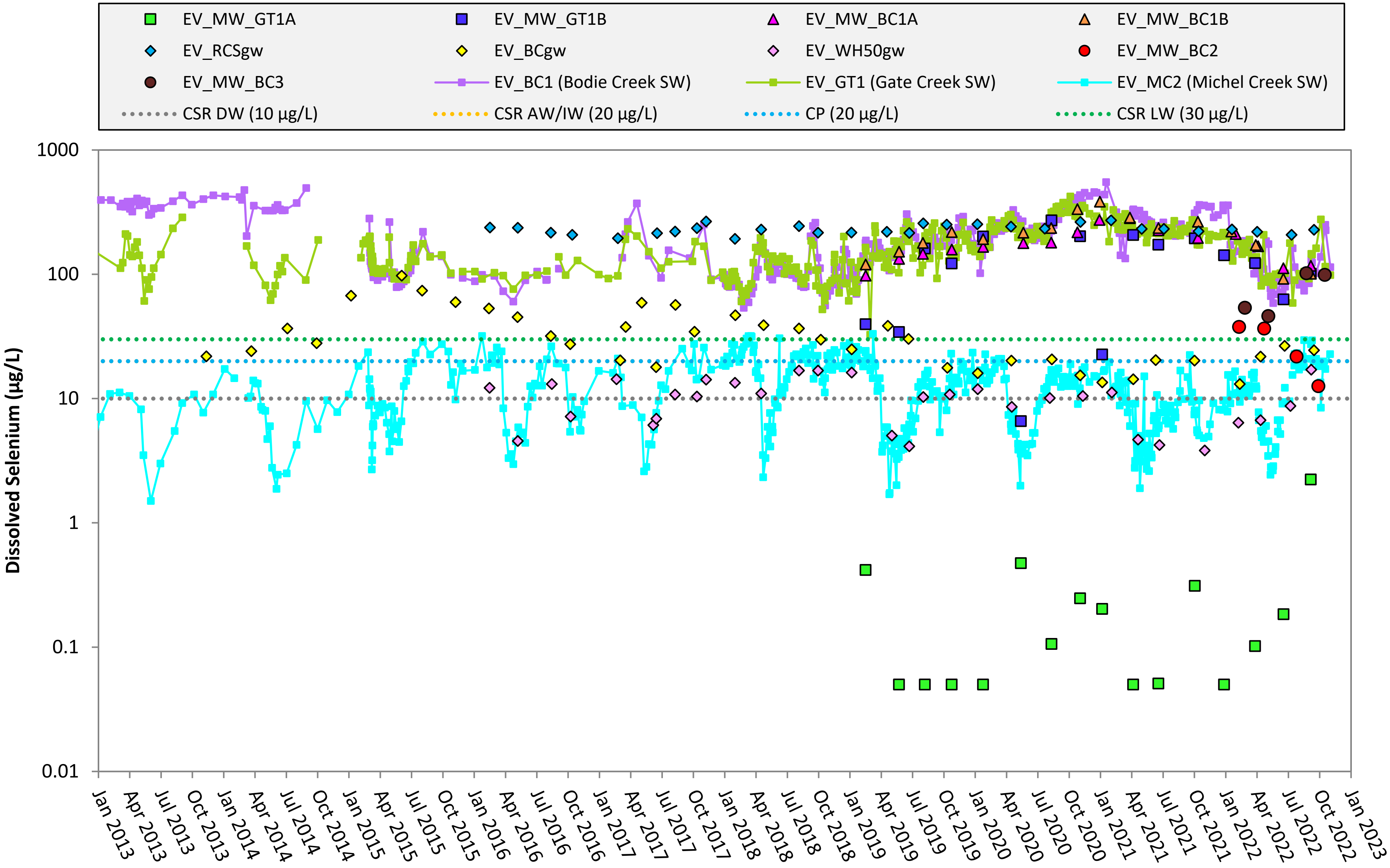
Figure EV-27: Gate Creek and Bodie Creek (Study Area 9b) - Dissolved Selenium



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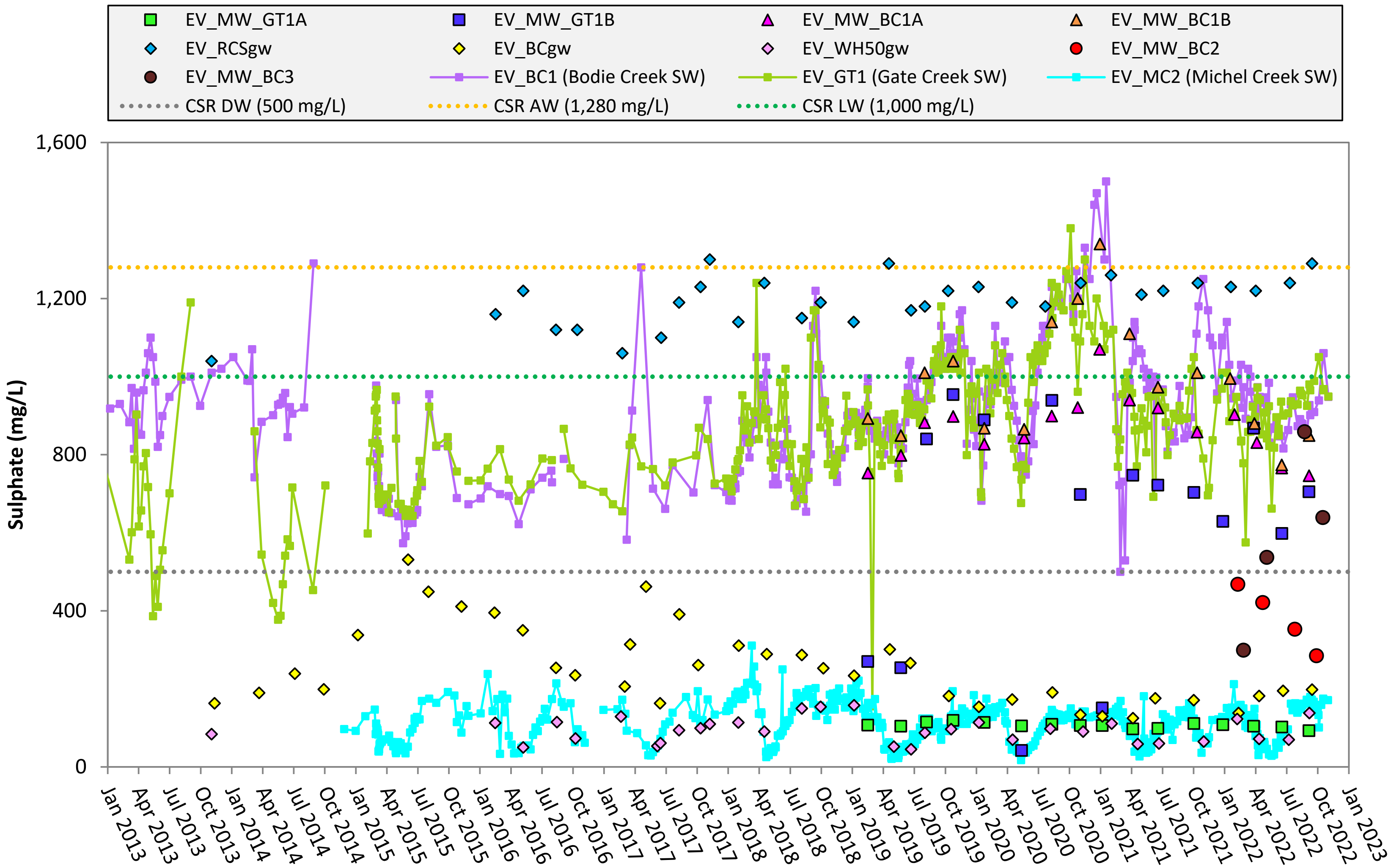
Note: For concentrations measured below the analytical detection limit, the detection limit (0.05 µg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

635544 / 2023 03 24
QAQC: DC 2023 03 24

Figure EV-28: Gate Creek and Bodie Creek (Study Area 9b) - Sulphate



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635544 / 2023 03 24
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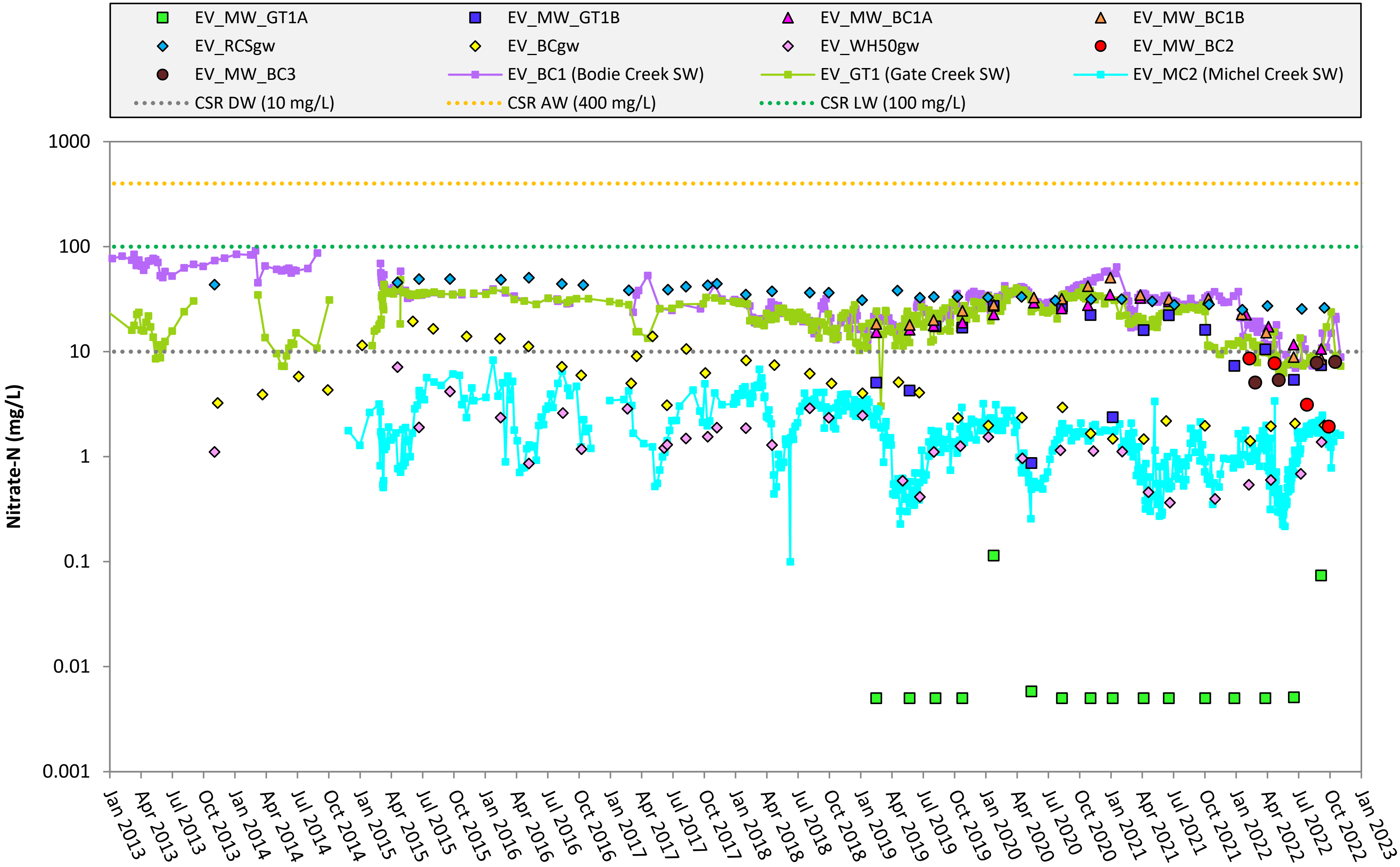
Figure EV-29: Gate Creek and Bodie Creek (Study Area 9b) - Nitrate-N



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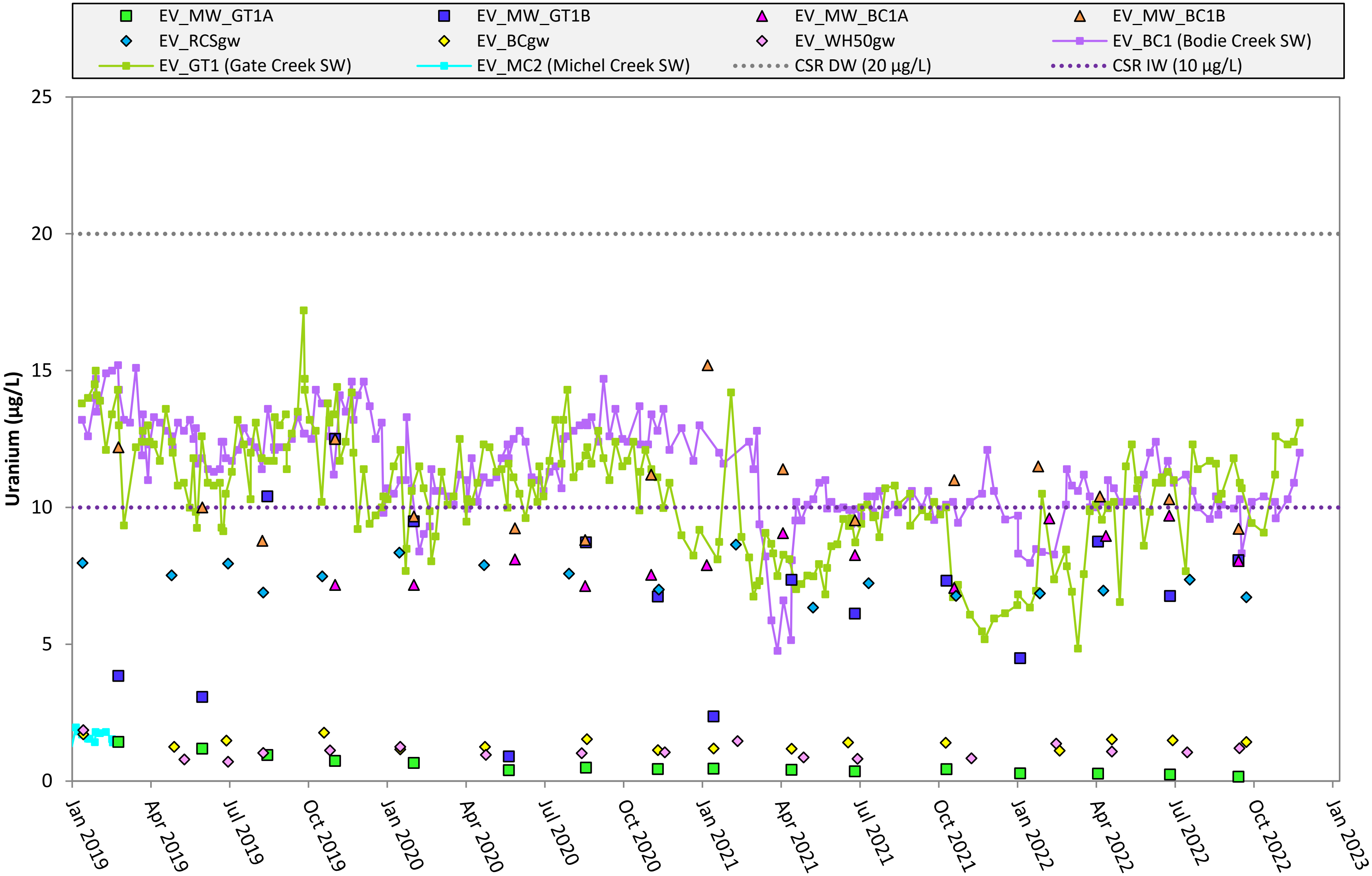
Note: For concentrations measured below the analytical detection limit, the detection limit (0.005 µg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

635544 / 2023 03 24
QAQC: DC 2023 03 24

Figure EV-30: Gate Creek and Bodie Creek (Study Area 9b) - Uranium



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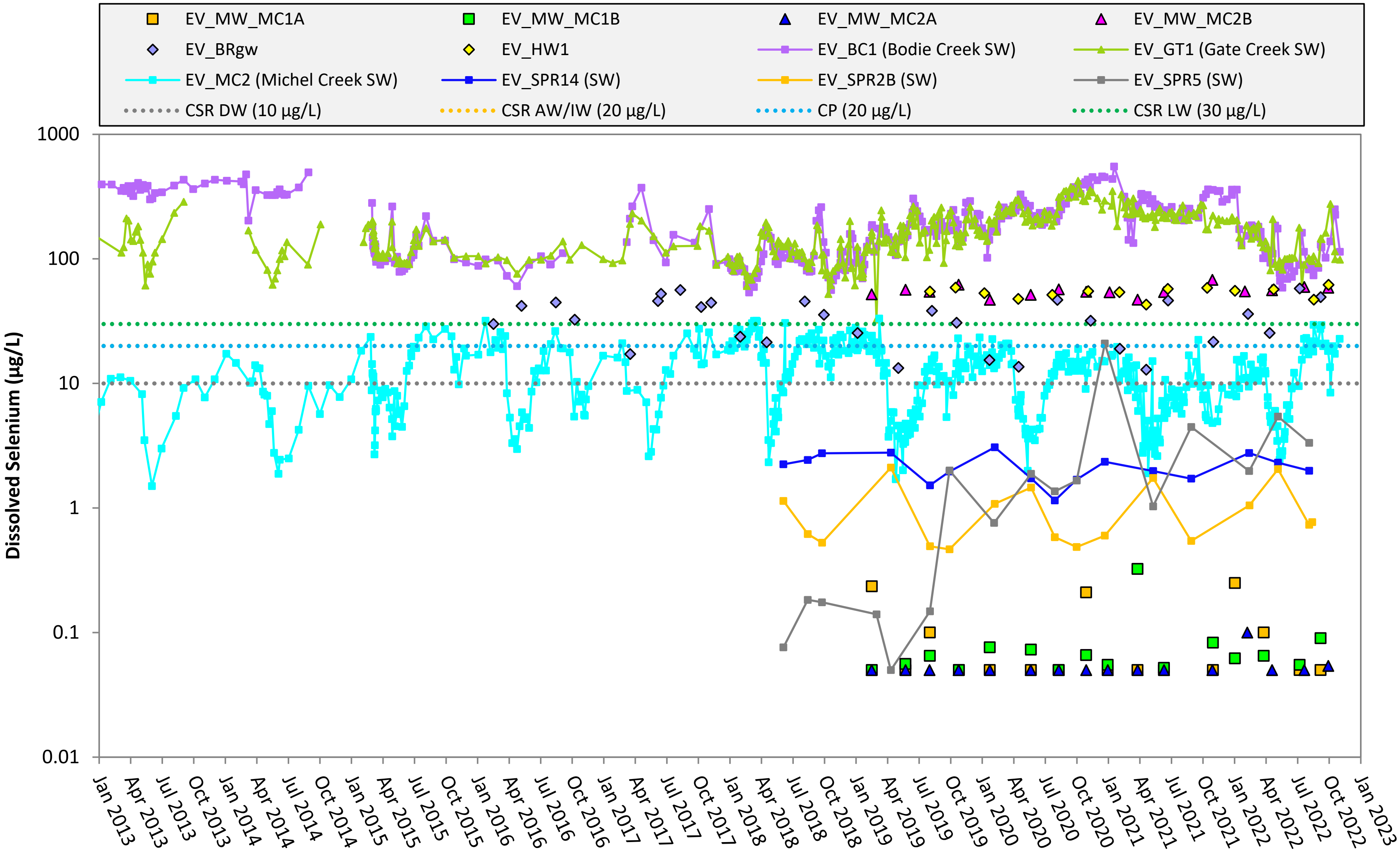
Note: The CSR LW standard for uranium is 200 ug/L, which plots off the scale.

635544 / 2023 03 24
QAQC: DC 2023 03 24

Figure EV-31: Michel Creek Valley Bottom (Study Area 9b) - Dissolved Selenium



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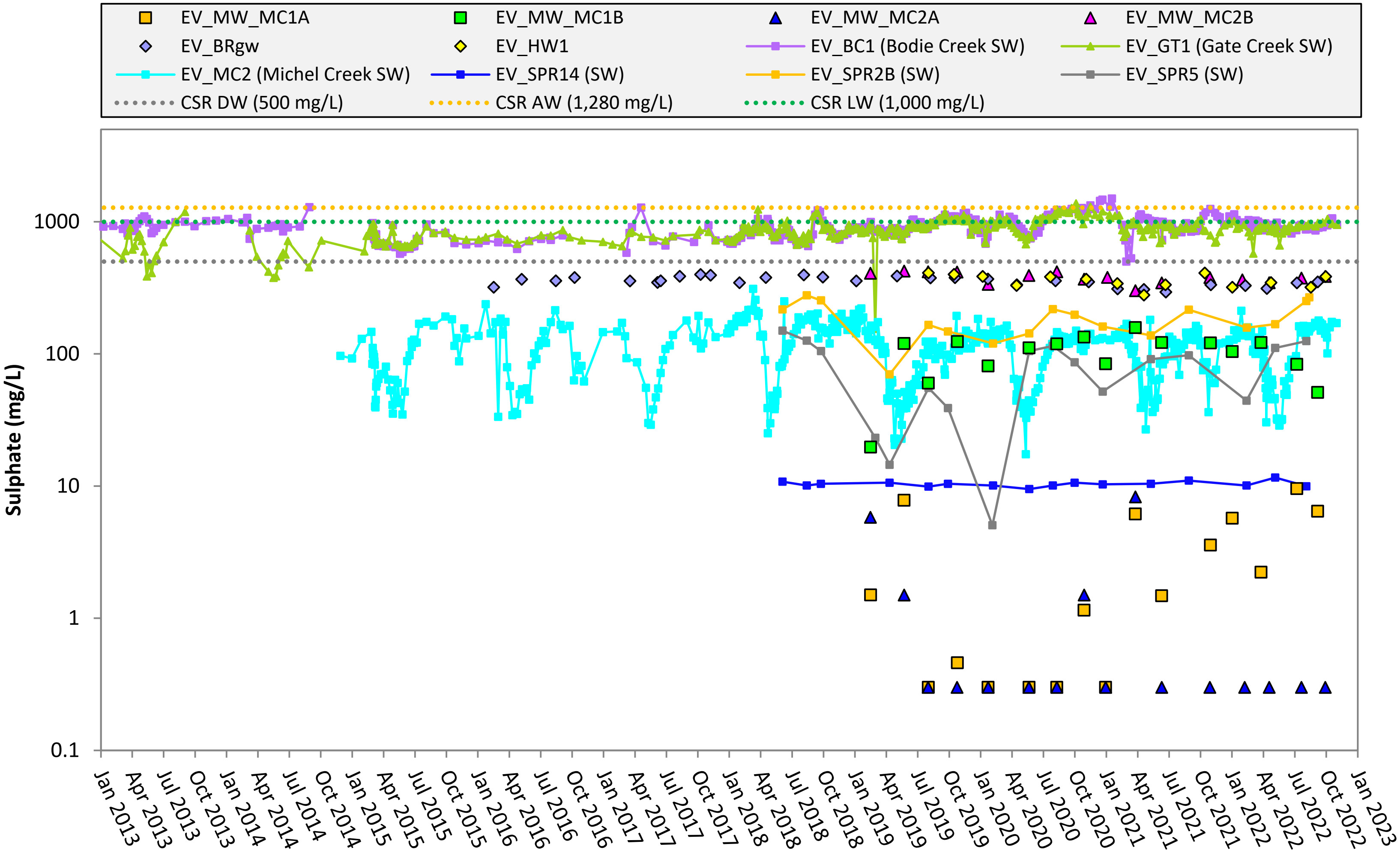
Note: For concentrations measured below the analytical detection limit, the detection limit (0.05 µg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

635544 / 2023 03 24
QAQC: DC 2023 03 24

Figure EV-32: Michel Creek Valley Bottom (Study Area 9b) - Sulphate



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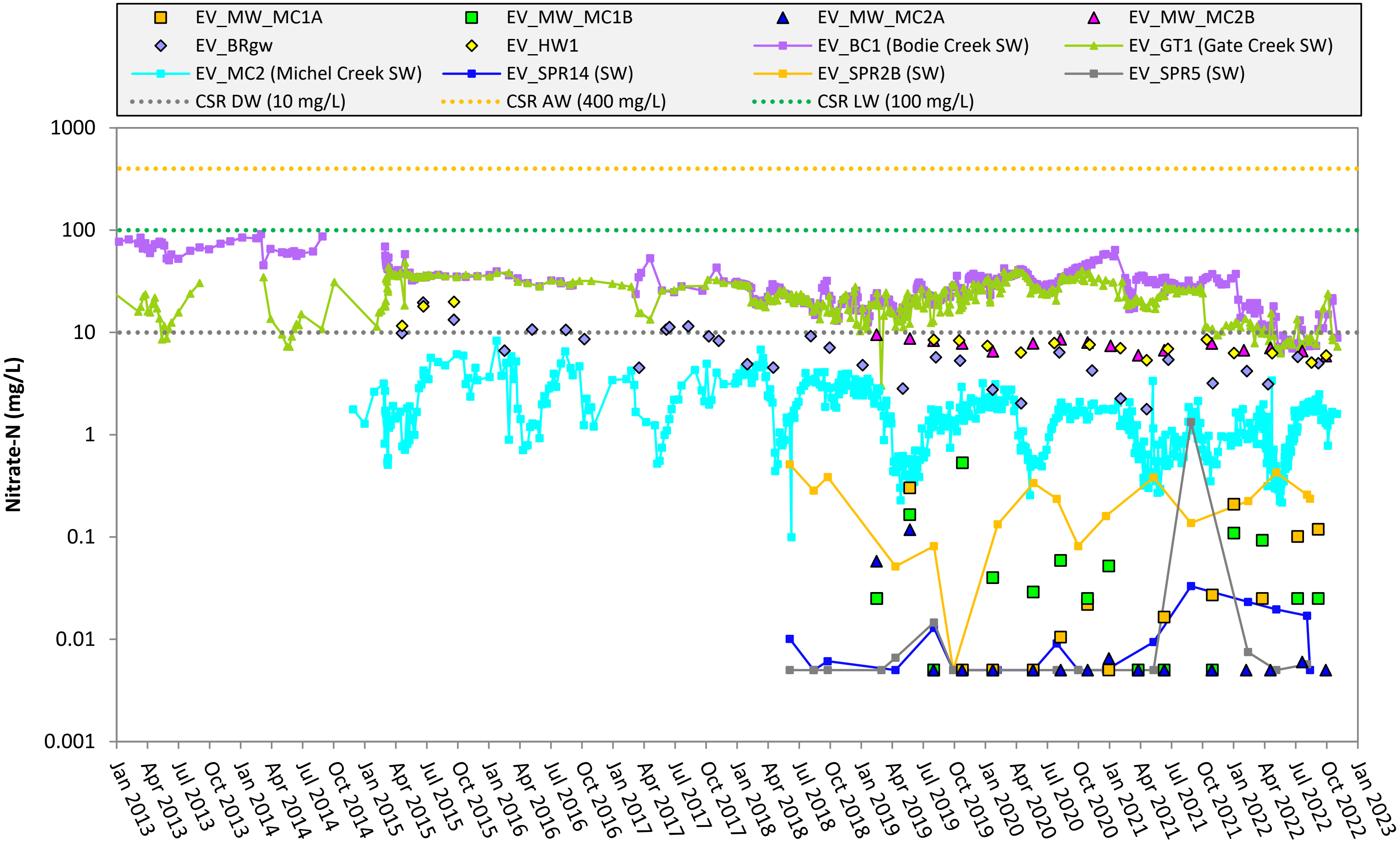
Note: For concentrations measured below the analytical detection limit, the detection limit (0.3 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

635544 / 2023 03 24
QAQC: DC 2023 03 24

Figure EV-33: Michel Creek Valley Bottom (Study Area 9b) - Nitrate-N



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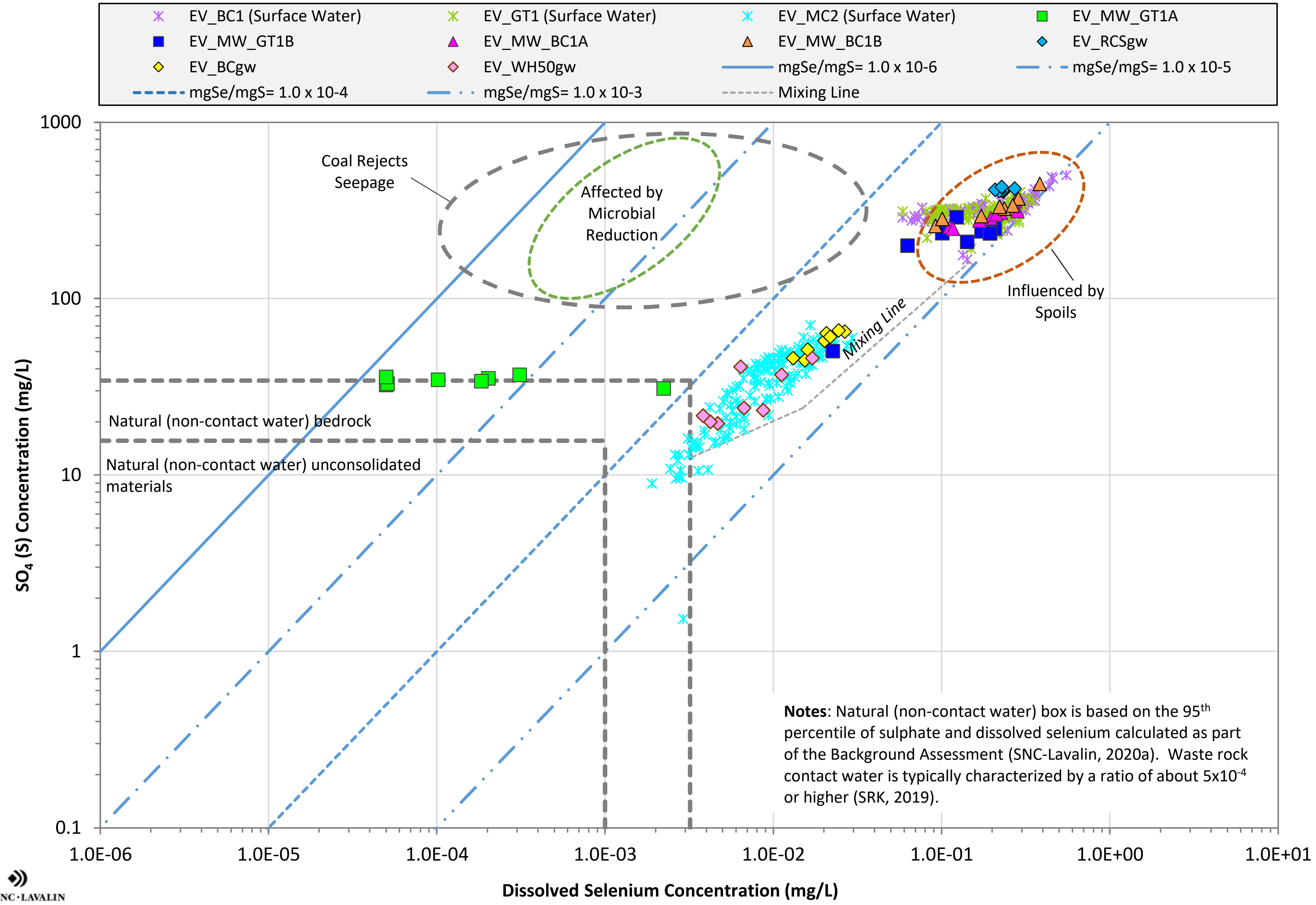
Note: For concentrations measured below the analytical detection limit, the detection limit (0.005 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

635544 / 2023 03 24
QAQC: DC 2023 03 24

Figure EV-34: Gate Creek and Bodie Creek (Study Area 9b) - Se:SO4 (S)



Notes: Natural (non-contact water) box is based on the 95th percentile of sulphate and dissolved selenium calculated as part of the Background Assessment (SNC-Lavalin, 2020a). Waste rock contact water is typically characterized by a ratio of about 5x10^{-4} or higher (SRK, 2019).

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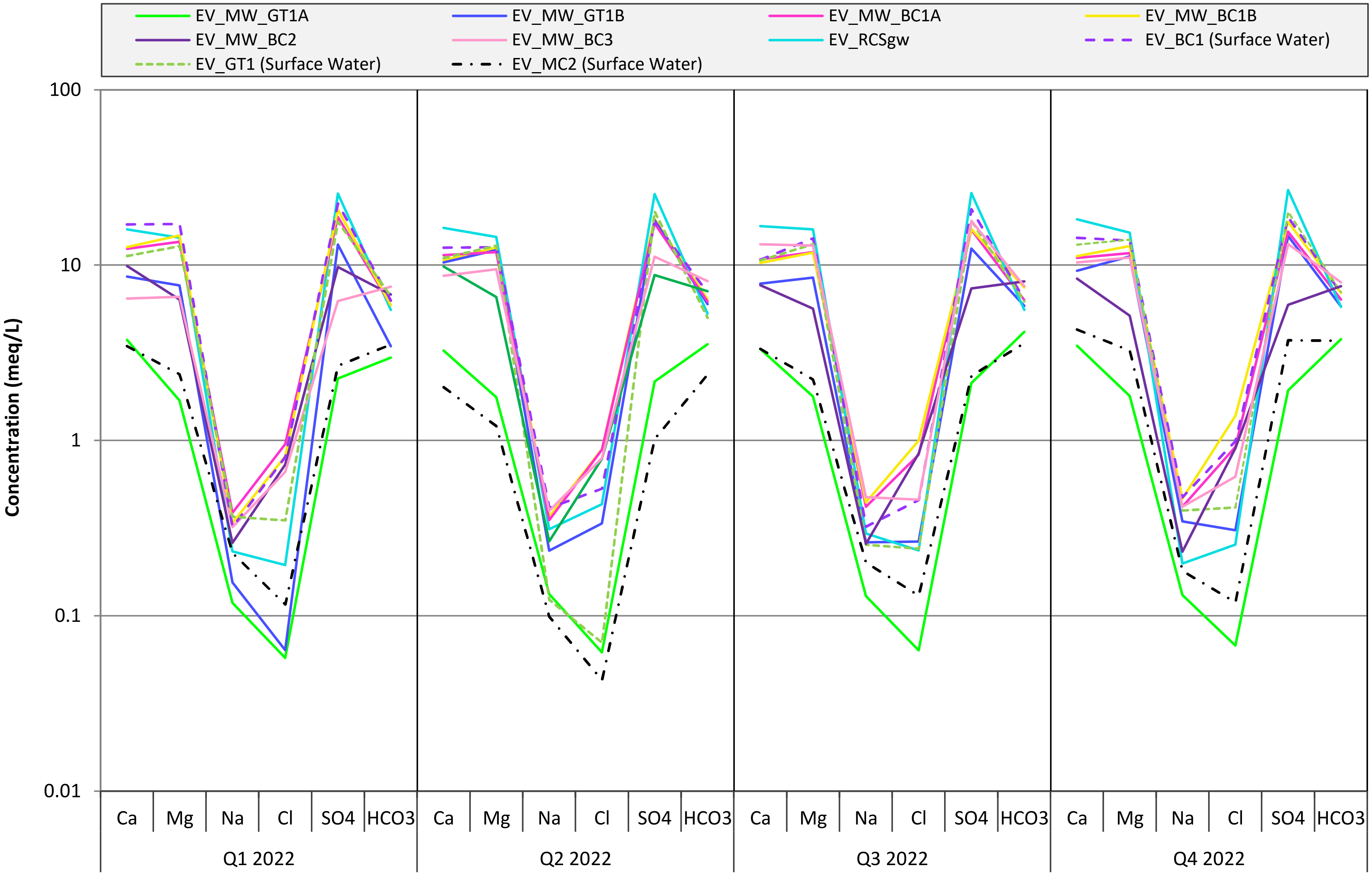
635544 / 2023 03 24
QAQC: DC 2023 03 24

Figure EV-35: Gate Creek and Bodie Creek (Study Area 9b) - Schoeller Plot



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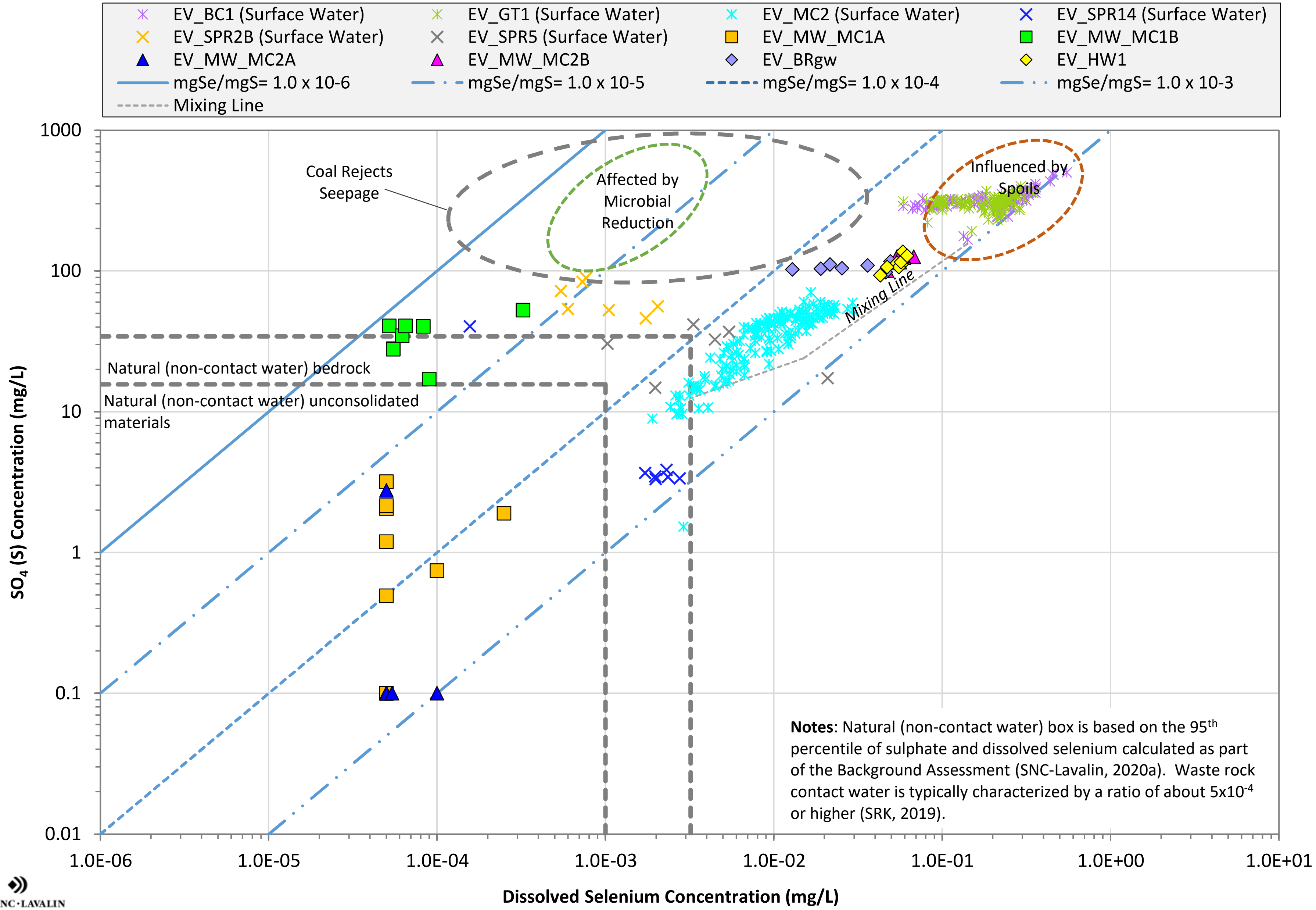
635544 / 2023 03 24
QAQC: DC 2023 03 24

Figure EV-36: Michel Creek Valley Bottom (Study Area 9b) - Se:SO4 (S)



Notes: Natural (non-contact water) box is based on the 95th percentile of sulphate and dissolved selenium calculated as part of the Background Assessment (SNC-Lavalin, 2020a). Waste rock contact water is typically characterized by a ratio of about 5x10^{-4} or higher (SRK, 2019).

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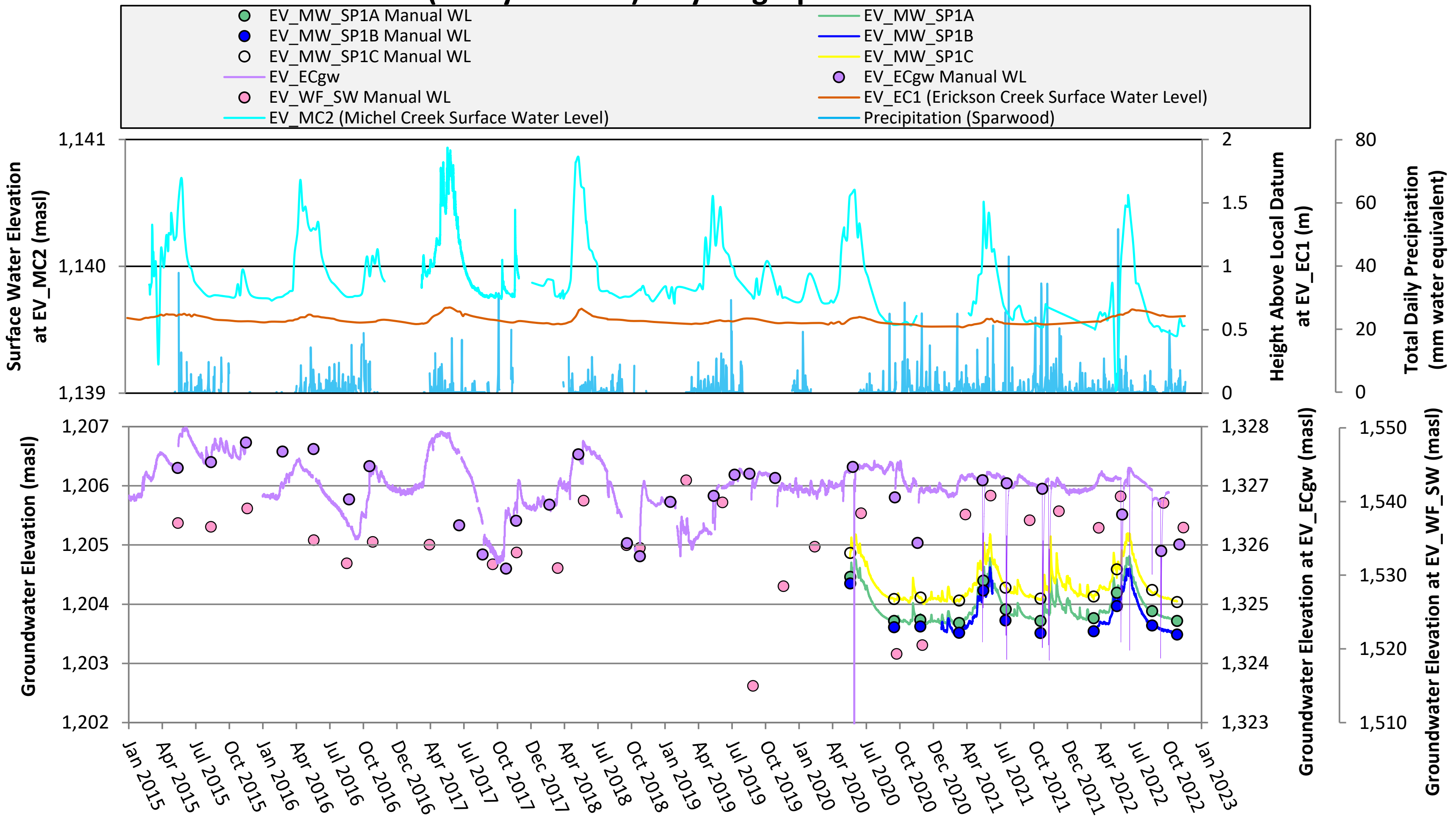
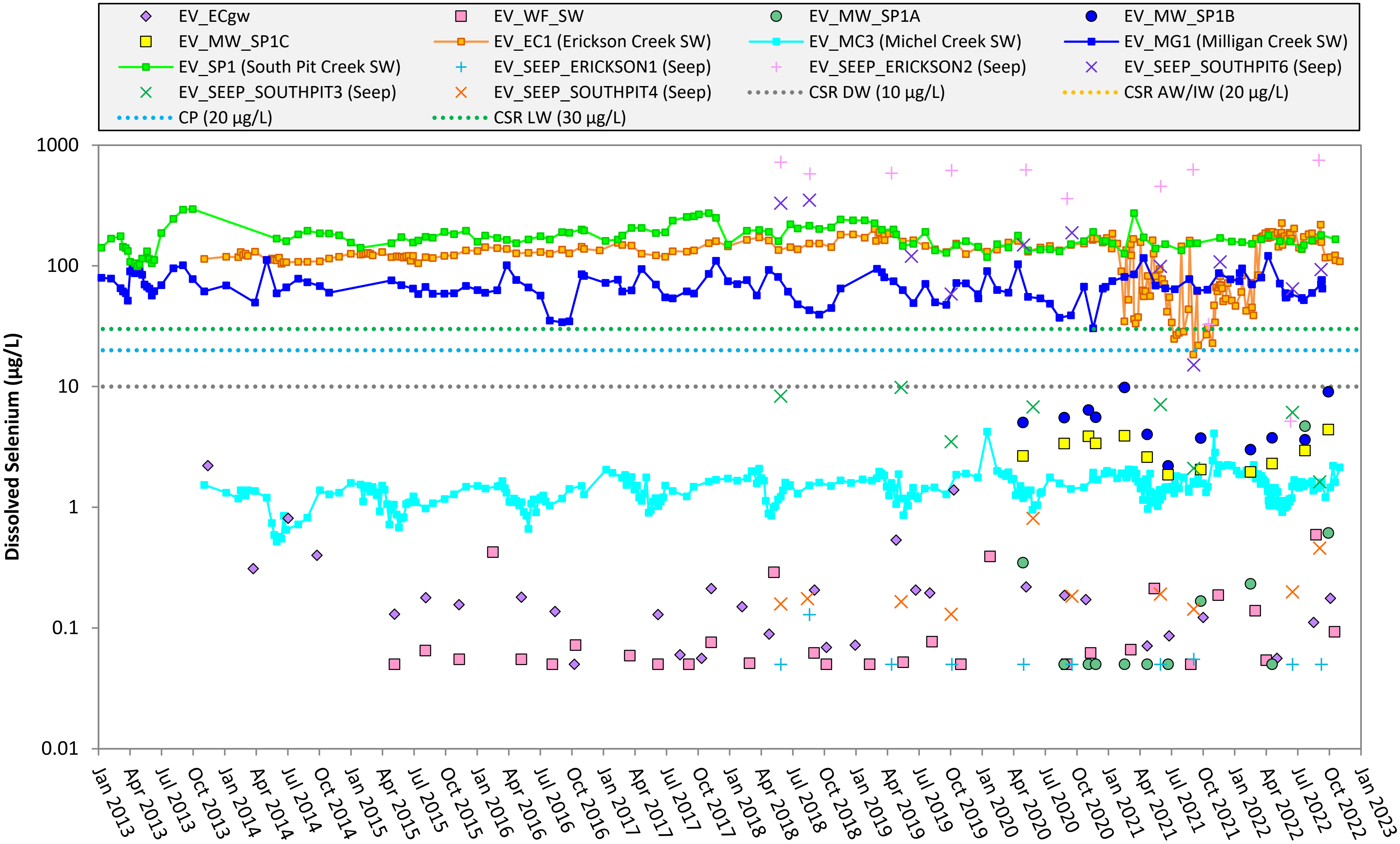
635544 / 2023 03 24
QAQC: DC 2023 03 24

Figure EV-37: Erickson Creek and Michel Creek Downstream of Erickson Creek (Study Area 10) - Hydrograph



Note: Manual water level at EV_MW_SP1C in Q2 2021 was considered anomalous and has been removed from the hydrograph. Data was also removed where suspected datalogger removal occured. EV_EC1 Level data prior to 2016-06-07 was corrected to account for a change in datalogger elevation. Continuous water level data has been compensated using barologger at EM_MW_SPR1B.

Figure EV-38: Erickson Creek and Michel Creek Downgradient of Erickson Creek (Study Area 10) - Dissolved Selenium



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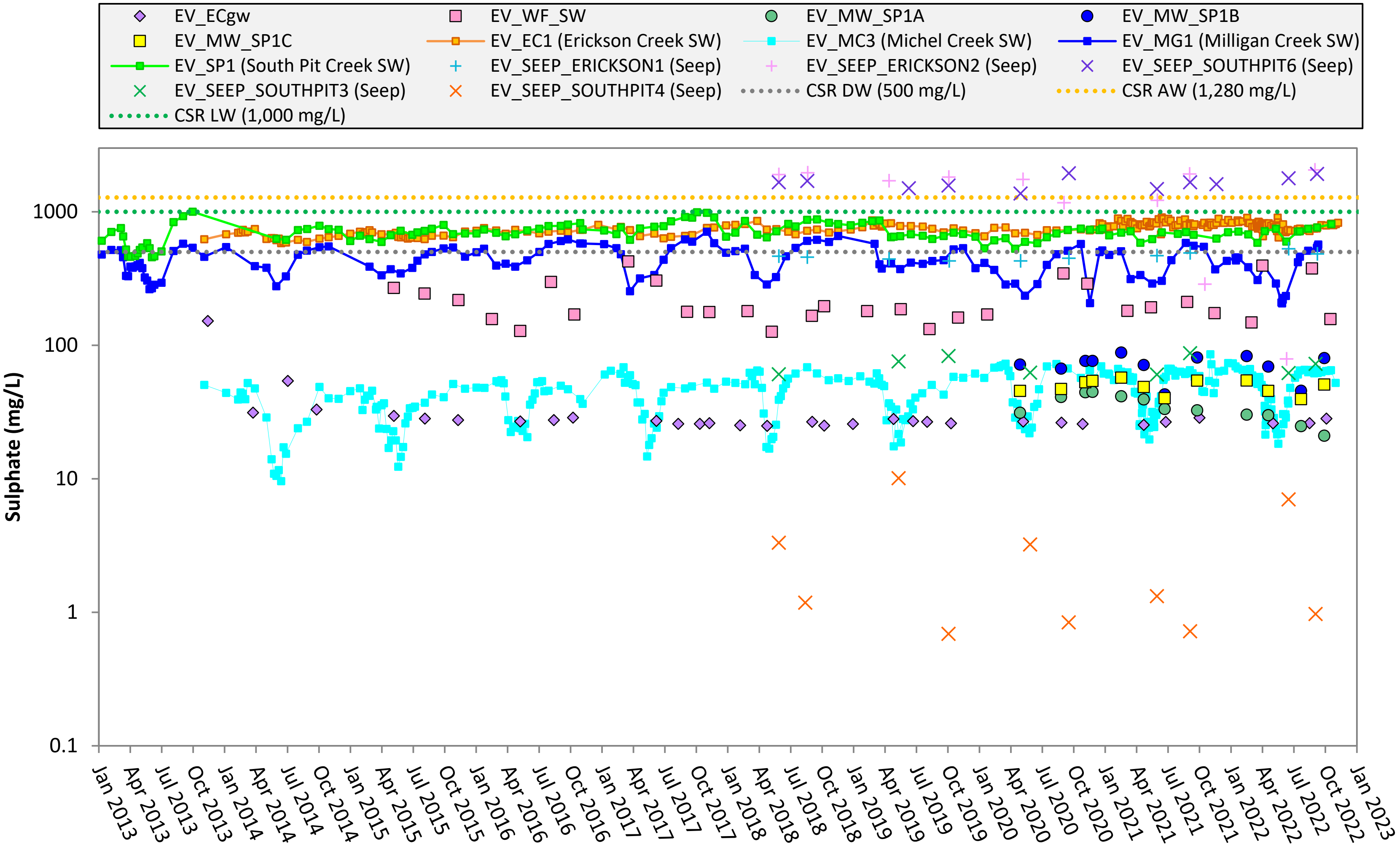
Note: For concentrations measured below the analytical detection limit, the detection limit (0.05 µg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

635544 / 2023 03 24
QAQC: DC 2023 03 24

Figure EV-39: Erickson Creek and Michel Creek Downgradient of Erickson Creek (Study Area 10) - Sulphate



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Note: Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

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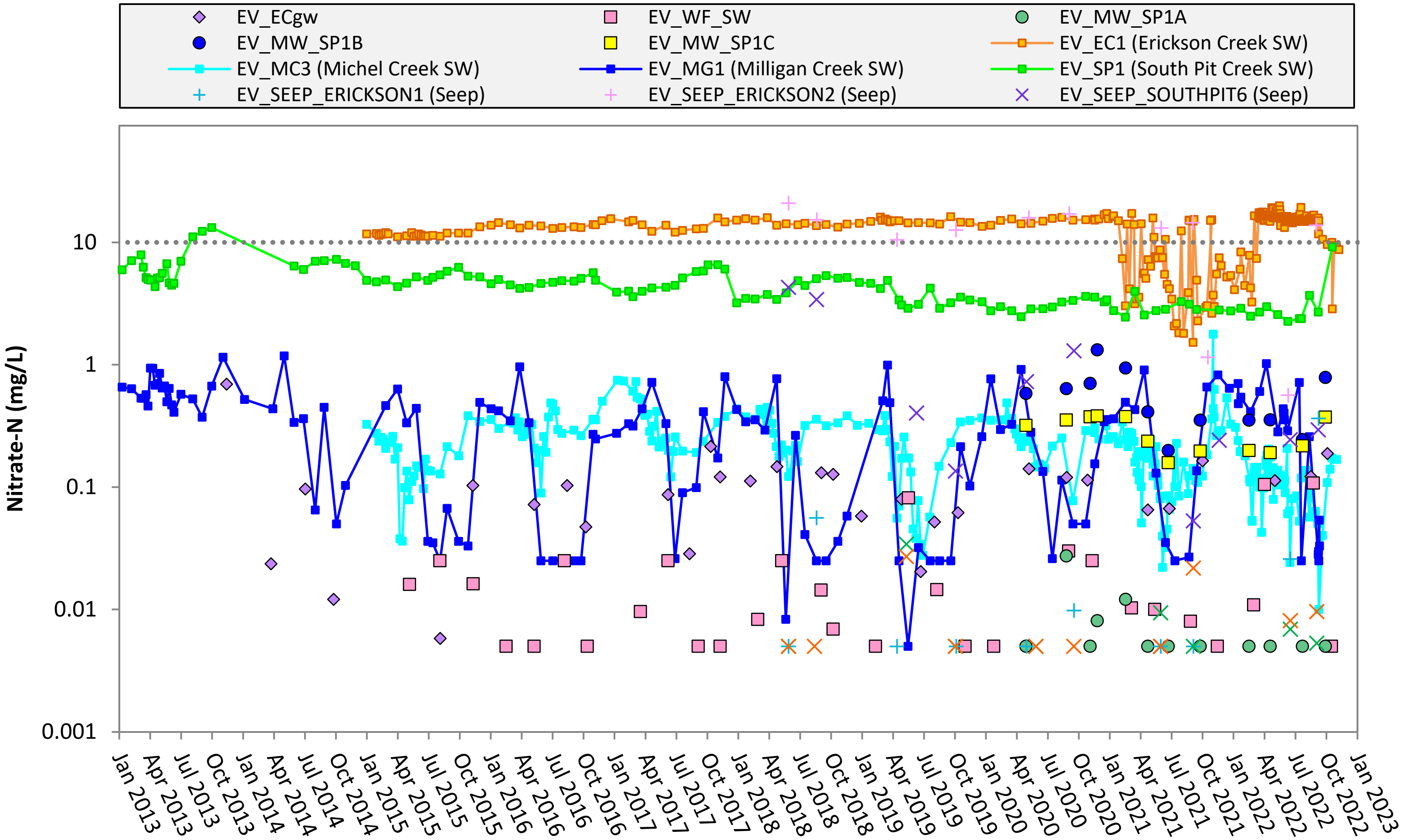
635544 / 2023 03 24
QAQC: DC 2023 03 24

Figure EV-40: Erickson Creek and Michel Creek Downgradient of Erickson Creek (Study Area 10) - Nitrate-N



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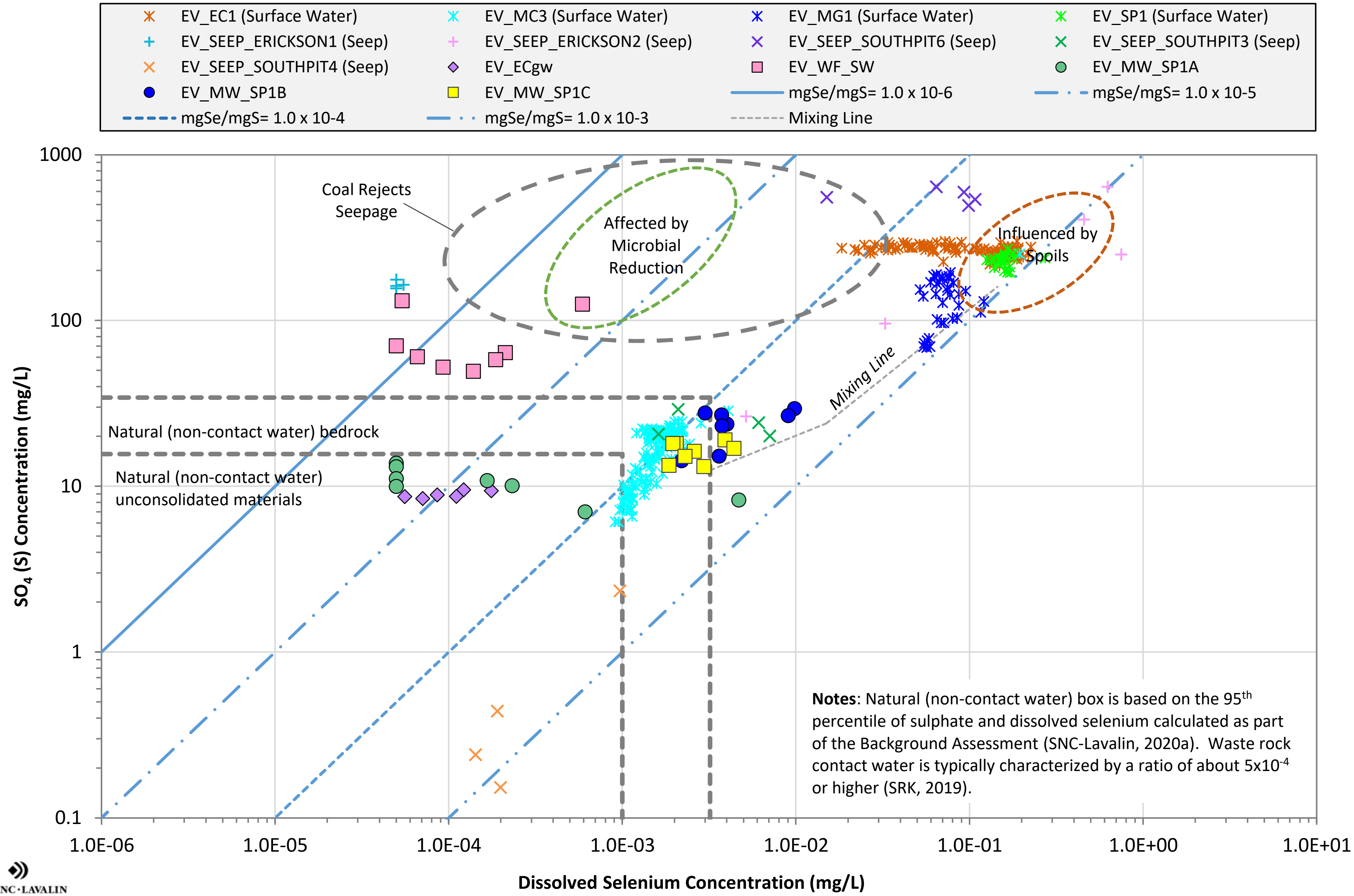
Note: For concentrations measured below the analytical detection limit, the detection limit (0.005 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

Figure EV-41: Erickson Creek and Michel Creek Downgradient of Erickson Creek (Study Area 10) - Se:SO4 (S)



Notes: Natural (non-contact water) box is based on the 95th percentile of sulphate and dissolved selenium calculated as part of the Background Assessment (SNC-Lavalin, 2020a). Waste rock contact water is typically characterized by a ratio of about 5x10^{-4} or higher (SRK, 2019).

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635544 / 2023 03 24
QAQC: DC 2023 03 24

Tables

TABLE EV-01: Summary of Well Installation Details and Hydrogeological Information (EVO)

Area	Well ID	Monitoring Program[a]	Well Type	Monitoring Type[i]	Sampling Frequency		Logs (Y/N)	Coordinates (UTM NAD 83)		Ground Elevation	TOC Elevation	Stick Up Height	Drilled Depth	Well Diameter	Top of Screen Depth	Bottom of Screen Depth	Screened Formation	Depth to Bedrock	Hydraulic Conductivity
					Approved[j]	Recommended[k]		Easting	Northing	masl	masl	m	mbgs	mm	mbgs	mbgs		mbgs	m/s
Grave/Harmer Creek Watershed and Elk River Downstream of Grave Creek Confluence (Study Area 7)	EV_GV3gw[e]	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	656582	5522258	1307.25	1308.19	0.93	25.0	60	22.9	24.4	Silty Gravel	-	8.0E-04
	EV_GV3gwS[f]	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	656580	5522259	1307.28	1308.19	0.91	12.2	50	7.7	9.2	Silty Sand	-	8.1E-06
	EV_MW_GV4A	SSGMP, RGMP[c]	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	656665	5522317	1310.87	1311.77	0.90	16.8	50	14.1	15.7	Sandstone Bedrock	13.4	7.5E-06
	EV_MW_GV4B	SSGMP, RGMP[c]	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	656662	5522318	1310.78	1311.83	1.05	6.8	50	4.3	5.8	Silty Gravel and Silt	-	5.3E-06
	RG_MW_GCA[b,f]	SSGMP, RGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	653613	5523406	1196.67	1197.54	0.87	14.5	50	10.7	13.7	Shale Bedrock	1.5	1.5E-08
	RG_DW-02-20	RGMP	Domestic	S	-	Q1, Q2, Q3, Q4	Y	652327	5522263	-	-	-	18.3	-	-	-	Gravel with Clay	-	-
	RG_MW_WW	RGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	652201	5518080	1151.25	1152.12	0.87	24.4	50	22.5	24.0	Sand with Gravel	-	8.1E-04
Elk River Proximal to EVO (Study Area 8)	EV_BALgw	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q2, Q3	Y	653057	5517321	1174.87	1175.95	1.09	12.7	60	10.5	12.7	Siltstone Bedrock	10.4	2.2E-08
	EV_GCgw	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q2, Q3	Y	653043	5513891	1130.55	1131.12	0.57	15.6	60	12.6	15.6	Silty Clay	-	4.0E-06
	EV_LSgw	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q2, Q3	Y	653272	5514730	1133.23	1134.24	1.01	10.7	60	5.2	6.7	Sand and Gravel	-	1.0E-03
	EV_OCgw	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	652483	5512663	1126.19	1127.07	0.88	15.5	60	11.6	14.6	Sand	14.5	4.2E-07
	EV_MW_GC1B	SSGMP, RGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	653147	5514184	1129.16	1130.02	0.86	4.3	50	2.0	3.7	Sandy Gravel	-	6.6E-05
	RG_DW-03-10	RGMP	Supply	S	-	Q1, Q2, Q3, Q4	Y	652027	5514569	1157.93	1159.50	1.57	73.2	304	64.0	73.2	Sand and Gravel	-	6.6E-05
Sparwood Area - Michel Creek and Baldy Ridge (Study Area 9a)	EV_MW_AQ1	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q2, Q3	Y	654573	5511292	1174.29	1175.31	1.02	22.3	50	16.2	17.7	Gravel, some Sand	19.8	2.2E-04
	EV_MW_AQ2	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q2, Q3	Y	653854	5511872	1151.08	1152.17	1.10	18.6	50	13.4	14.9	Sand and Gravel	15.9	1.7E-05
	EV_MW_MC4	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q2, Q3	Y	653309	5512280	1144.81	1145.81	1.00	26.2	50	23.1	24.7	Silty Sand	25.0	3.2E-04
	EV_MW_SPR1A	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q2, Q3	Y	653947	5511277	1137.66	1138.73	1.07	53.3	50	41.2	42.7	Silty Sand	50.3	2.6E-05
	EV_MW_SPR1B	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	653947	5511277	1137.66	1138.71	1.05	53.3	50	25.3	26.5	Gravel, Sand and Silt	50.3	4.1E-06
	EV_MW_SPR1C[e]	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	653946	5511278	1137.61	1138.65	1.04	5.2	50	3.7	5.2	Sand and Gravel	-	2.4E-04
	EV_MW_MCgwA[e]	RGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	652962	5511969	1126.63	1127.62	0.99	22.9	50	20.7	21.6	Sandy Gravel	21.6	4.1E-05
	EV_MW_MCgwB[e]	RGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	652963	5511970	1126.64	1127.60	0.96	3.8	50	1.6	2.7	Sand and Gravel	-	1.6E-03

Notes:
a: SSGMP denotes EVO Site-Specific Groundwater Monitoring Program; RGMP denotes Regional Groundwater Monitoring Program.
b: Monitoring wells installed in 2021 to support the SSGMP and/or RGMP.
c: Monitoring wells are assessed as part of the Regional Background Monitoring Report as per the 2020 RGMP Update.
d: EV_HW1 is also referred to as EV_HM1 and EV_Harmer Well in other sources.
e: Monitoring wells added to the RGMP Program as per the 2020 RGMP Update.
f: Monitoring wells added to the SSGMP Program as per the 2021 SSGMP Update.
g: Monitoring well EV_RCSgw was formerly referred to as EV_RCgw.
h: AMEC (2011) reported waste rock in the screened interval which is not clear in the borehole log (provided in Attachment I).
i: WL = Water Level. S = Sample.
j: 2018 SSGMP Update Report (approved BC ENV March 2020) and 2020 RGMP Update Report (Approved BC ENV February 2023).
k: 2019, 2020, and 2021 SSGMP Annual Reports; 2021 SSGMP Update Report.
masl denotes metres above sea level.
mbgs denotes metres below ground surface.
TOC denotes top of pipe casing.
"-" denotes data not available.

TABLE EV-01: Summary of Well Installation Details and Hydrogeological Information (EVO)

Area	Well ID	Monitoring Program[a]	Well Type	Monitoring Type[i]	Sampling Frequency		Logs (Y/N)	Coordinates (UTM NAD 83)		Ground Elevation	TOC Elevation	Stick Up Height	Drilled Depth	Well Diameter	Top of Screen Depth	Bottom of Screen Depth	Screened Formation	Depth to Bedrock	Hydraulic Conductivity
					Approved[j]	Recommended[k]		Easting	Northing	masl	masl	m	mbgs	mm	mbgs	mbgs		mbgs	m/s
Sparwood Area - Elk River and Sparwood Ridge (Study Area 12)	EV_ER1gwS	RGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	651374	5510955	1115.25	1115.96	0.71	17.6	60	14.6	17.6	Sand and Gravel	-	7.0E-04
	EV_ER1gwD	RGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	651379	5510952	1115.20	1115.91	0.71	30.8	60	25.8	28.9	Sand/Silty Sand	27.9	9.0E-04
	RG_DW-03-04 (WTN 77913; TH99-2, Sparwood Well 3)	RGMP	Supply	S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	651839	5510619	1113.20	1114.15	0.95	41.5	254	24.2	32.4	Sandy Gravel	-	2.0E-03
	RG_MW-03-04[f]	RGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	651853	5511208	1115.99	1115.86	-0.13	25.5	51	24.1	25.6	Sandy Gravel	-	2.6E-03
	EV_MW_MC3	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	653667	5510983	1138.22	1139.26	1.04	21.0	50	16.2	17.7	Gravel, some Silt	17.7	6.4E-06
Michel Creek Downstream of Gate Creek and Bodie Creek - Gate Creek and Bodie Creek (Study Area 9b)	EV_MW_GT1A[e]	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q2, Q3	Y	655651	5509290	1156.88	1157.90	1.03	64.6	50	62.2	63.7	Gravel, some Sand	64.9	5.9E-04
	EV_MW_GT1B[e]	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	655651	5509290	1156.88	1157.92	1.05	5.1	50	2.7	4.3	Sand and Gravel, Silty Sand	-	6.6E-05
	EV_MW_BC1A	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	655665	5509503	1156.67	1157.56	0.88	27.9	50	22.9	24.4	Sand and gravel, some Silt	25.6	8.4E-04
	EV_MW_BC1B	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	655665	5509503	1156.67	1157.56	0.89	27.9	50	3.4	4.9	Fill, Sand and Gravel	25.6	1.3E-05
	EV_MW_BC2	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	N	655878	5509497	1175.84	1176.91	1.07	16.8	187	13.7	16.8	Shale Bedrock	11.0	9.0E-07
	EV_MW_BC3	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	N	655878	5509498	1175.87	1176.92	1.05	12.2	187	8.5	11.6	Clayey Gravel	11.9	2.0E-07
	EV_RCSgw[g]	SSGMP, RGMP	Supply	S	-	Q1, Q2, Q3, Q4	N	655902	5509299	-	-	-	6.1	-	-	-	Sand and Gravel	-	-
	EV_BCgw	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q2, Q3	Y	655388	5509656	1153.67	1154.64	0.96	23.2	60	17.8	20.8	Gravel	-	1.0E-04
	EV_WH50gw	RGMP	Supply	WL, S	-	Q1, Q2, Q3, Q4	N	655705	5509196	-	-	-	-	-	-	-	-	-	-
Michel Creek Downstream of Gate Creek and Bodie Creek - Michel Creek Valley Bottom (Study Area 9b)	EV_BRgw	RGMP	Supply	WL, S	-	Q1, Q2, Q3, Q4	N	654961	5510221	-	-	-	-	-	-	-	-	-	-
	EV_HW1 (EV_HM1)[d,e]	RGMP	Supply	S	-	Q1, Q2, Q3, Q4	N	654772	5510583	-	-	-	6.1	152	-	-	-	-	-
	EV_MW_MC1A	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q2, Q3	Y	654903	5510593	1148.02	1149.06	1.04	32.0	50	25.0	26.5	Sand and Gravel	30.2	5.7E-04
	EV_MW_MC1B	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	654903	5510593	1148.02	1149.06	1.03	32.0	50	3.4	4.9	Sand and Gravel	30.2	1.4E-04
	EV_MW_MC2A[e]	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q2, Q3	Y	654758	5510530	1147.41	1148.46	1.05	55.8	50	51.7	53.2	Sand and Gravel	54.3	9.8E-04
	EV_MW_MC2B[e]	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	654758	5510529	1147.41	1148.43	1.02	55.8	50	4.9	6.4	Gravel	54.3	2.0E-04
Erickson Creek and Michel Creek Downstream of Erickson Creek (Study Area 10)	EV_WF_SW	SSGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	659208	5513023	1679.25	1678.57	0.68	163	152	151.5	159.4	Waste Rock[h]	-	-
	EV_ECgw	SSGMP/RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	660796	5506385	1327.63	1328.192	0.56	11.0	60	2.6	4.1	Sand/Clay and Sand	-	1.5E-08
	EV_MW_SP1A[e]	RGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	659315	5505644	1207.38	1208.32	0.94	31.1	50	28.6	30.1	Sand	-	5.4E-04
	EV_MW_SP1B[e]	RGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	659316	5505644	1207.36	1208.35	0.99	15.0	50	12.5	14.1	Sand and Gravel	-	1.1E-03
	EV_MW_SP1C[e]	RGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	659316	5505642	1207.37	1208.39	1.02	4.6	50	2.9	4.4	Sand and Gravel	-	4.3E-04

Notes:

a: SSGMP denotes EVO Site-Specific Groundwater Monitoring Program; RGMP denotes Regional Groundwater Monitoring Program.
b: Monitoring wells installed in 2021 to support the SSGMP and/or RGMP.
c: Monitoring wells are assessed as part of the Regional Background Monitoring Report as per the 2020 RGMP Update.
d: EV_HW1 is also referred to as EV_HM1 and EV_Harmer Well in other sources.
e: Monitoring wells added to the RGMP Program as per the 2020 RGMP Update.
f: Monitoring wells added to the SSGMP Program as per the 2021 SSGMP Update.
g: Monitoring well EV_RCSgw was formerly referred to as EV_RCgw.
h: AMEC (2011) reported waste rock in the screened interval which is not clear in the borehole log (provided in Attachment I).
i: WL = Water Level. S = Sample.
j: 2018 SSGMP Update Report (approved BC ENV March 2020) and 2020 RGMP Update Report (Approved BC ENV February 2023).
k: 2019, 2020, and 2021 SSGMP Annual Reports; 2021 SSGMP Update Report.
masl denotes metres above sea level.
mbgs denotes metres below ground surface.
TOC denotes top of pipe casing.
"-" denotes data not available.

TABLE EV-02: Summary of Groundwater Levels and Sampling Information (EVO)

Area	Well ID	Ground Elevation	TOC Elevation	Stick Up Height	Date of Static Water Level Measurement	Depth to Water	Potentiometric Elevation	Well Pairs	Calculated Vertical Gradient		Continuous Water Level Monitoring	Purging / Sampling Methodology
		masl	masl	m	yyyy-mm-dd	mbtoc	masl		m/m	Direction		
Grave/Harmer Creek Watershed and Elk River Downstream of Grave Creek Confluence (Study Area 7)	EV_GV3gw	1307.25	1308.19	0.93	2022-01-11	10.93	1297.25	EV_GV3gw and EV_GV3gwS	-0.238	Downward	Yes	Bladder
					2022-04-10	10.78	1297.41		-0.259	Downward		
					2022-08-14	10.84	1297.34		-0.269	Downward		
					2022-10-14	10.94	1297.25		-0.256	Downward		
	EV_GV3gwS	1307.28	1308.19	0.91	2022-01-11	7.32	1300.87	-	-	-	Yes	Bladder
					2022-04-10	6.85	1301.34					
					2022-08-14	6.76	1301.43					
					2022-10-14	7.06	1301.13					
	EV_MW_GV4A	1310.87	1311.77	0.90	2022-01-12	4.22	1307.55	EV_GV4A and EV_GV4B	-0.135	Downward	Yes	Peristaltic
					2022-04-28	4.06	1307.71		-0.131	Downward		
					2022-08-05	4.06	1307.71		-0.119	Downward		
					2022-10-27	4.16	1307.61		-0.123	Downward		
	EV_MW_GV4B	1310.78	1311.83	1.05	2022-01-09	2.97	1308.86	-	-	-	Yes	Peristaltic
					2022-04-28	2.85	1308.98					
					2022-08-05	2.95	1308.88					
					2022-10-27	3.02	1308.81					
	RG_MW_GCA	1196.67	1197.54	0.87	2022-03-20	3.24	1194.30	-	-	-	Yes	Peristaltic
					2022-06-03	4.41	1193.13					
					2022-09-12	4.71	1192.84					
					2022-11-01	4.86	1192.68					
	RG_DW-02-20	-	-	-	2022-02-02	-	-	-	-	-	-	Tap
					2022-05-09	-	-					
					2022-07-19	-	-					
					2022-10-26	-	-					
	RG_MW_WW	1151.25	1152.12	0.87	2022-01-23	12.20	1139.92	-	-	-	Yes	Bladder
					2022-04-28	11.62	1140.50					
					2022-08-07	11.62	1140.50					
					2022-10-17	12.26	1139.86					
Elk River Proximal to EVO (Study Area 8)	EV_BALgw	1174.87	1175.95	1.09	2022-03-23	12.09	1163.86	-	-	-	Yes	Bladder
					2022-05-31	12.07	1163.88					
					2022-09-14	12.09	1163.86					
					2022-11-13	12.04	1163.91					
	EV_GCgw	1130.55	1131.12	0.57	2022-01-30	2.34	1128.78	-	-	-	Yes	Peristaltic
					2022-05-01	2.20	1128.92					
					2022-08-15	2.17	1128.95					
					2022-10-25	2.45	1128.67					
	EV_LSgw	1133.23	1134.24	1.01	2022-02-06	4.42	1129.82	-	-	-	Yes	Peristaltic
					2022-05-01	4.21	1130.03					
					2022-08-18	4.22	1130.02					
					2022-10-25	4.39	1129.86					
	EV_OCgw	1126.19	1127.07	0.88	2022-03-10	3.32	1123.76	-	-	-	Yes	Peristaltic
					2022-05-20	3.30	1123.77					
					2022-08-15	3.51	1123.57					
					2022-10-28	3.63	1123.44					

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c: water level taken on 2022-10-26 was erroneous, and not used for gradient calculations.
TOC denotes top of casing.
masl denotes meters above sea level.
mbtoc denotes meters below top of casing.
"-" denotes data not available.
"*" TOC elevation estimated based on LiDAR ground surface elevation of 1149.34 and an estimated stick up of 0.5 m.

TABLE EV-02: Summary of Groundwater Levels and Sampling Information (EVO)

Area	Well ID	Ground Elevation	TOC Elevation	Stick Up Height	Date of Static Water Level Measurement	Depth to Water	Potentiometric Elevation	Well Pairs	Calculated Vertical Gradient		Continuous Water Level Monitoring	Purging / Sampling Methodology
		masl	masl	m	yyyy-mm-dd	mbtoc	masl		m/m	Direction		
Elk River Proximal to EVO (Study Area 8)	EV_MW_GC1B	1129.16	1130.02	0.86	2022-01-31	2.60	1127.42	-	-	-	Yes	Peristaltic
					2022-05-01	1.95	1128.07					
					2022-08-16	2.05	1127.97					
					2022-10-25	2.18	1127.84					
	RG_DW-03-10	1157.93	1159.50	1.57	2022-02-14	-	-	-	-	-	-	Tap
					2022-04-20	-	-					
					2022-07-19	-	-					
					2022-10-11	-	-					
Sparwood Area - Michel Creek and Baldy Ridge (Study Area 9a)	EV_MW_AQ1	1174.29	1175.31	1.02	2022-02-06	16.56	1158.75	-	-	-	Yes	Bladder
					2022-04-24	16.38	1158.93					
					2022-08-07	16.57	1158.74					
					2022-10-12	16.83	1158.48					
	EV_MW_AQ2	1151.08	1152.17	1.10	2022-01-21	13.69	1138.48	-	-	-	Yes	Bladder
					2022-04-24	13.65	1138.52					
					2022-09-09	13.66	1138.51					
					2022-11-01	13.67	1138.50					
	EV_MW_MC4	1144.81	1145.81	1.00	2022-02-27	15.49	1130.32	-	-	-	Yes	Bladder
					2022-05-01	15.26	1130.56					
					2022-08-17	15.16	1130.65					
					2022-10-17	15.30	1130.51					
	EV_MW_SPR1A	1137.66	1138.73	1.07	2022-01-16	3.00	1135.73	EV_MW_SPR1A and EV_MW_SPR1B	0.006	Upward	Yes	Peristaltic
					2022-04-22	2.93	1135.81		0.014	Upward		
					2022-07-17	2.91	1135.82		0.014	Upward		
					2022-10-11	3.24	1135.50		0.010	Upward		
	EV_MW_SPR1B	1137.66	1138.71	1.05	2022-01-16	3.07	1135.64	EV_MW_SPR1B and EV_MW_SPR1C	0.032	Upward	Yes	Peristaltic
					2022-04-22	3.13	1135.59		0.030	Upward		
					2022-07-17	3.12	1135.59		0.030	Upward		
					2022-10-11	3.38	1135.33		0.025	Upward		
	EV_MW_SPR1C	1137.61	1138.65	1.04	2022-01-16	3.70	1134.95	-	-	-	Yes	Peristaltic
					2022-04-22	3.72	1134.93					
					2022-07-17	3.70	1134.95					
					2022-10-11	3.85	1134.80					
	EV_MW_MCgwA	1126.63	1127.62	0.99	2022-02-13	1.97	1125.66	EV_MW_MCgwA and EV_MW_MCgwB	0.020	Upward	Yes	Peristaltic
					2022-04-21	2.09	1125.53		0.025	Upward		
					2022-07-18	1.84	1125.78		0.018	Upward		
					2022-10-03	2.13	1125.49		0.022	Upward		
	EV_MW_MCgwB	1126.64	1127.60	0.96	2022-02-13	2.33	1125.27	-	-	-	Yes	Peristaltic
					2022-04-21	2.54	1125.07					
					2022-07-18	2.17	1125.44					
					2022-10-03	2.53	1125.07					

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c: water level taken on 2022-10-26 was erroneous, and not used for gradient calculations.
TOC denotes top of casing.
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mbtoc denotes meters below top of casing.
"-" denotes data not available.
"*" TOC elevation estimated based on LiDAR ground surface elevation of 1149.34 and an estimated stick up of 0.5 m.

TABLE EV-02: Summary of Groundwater Levels and Sampling Information (EVO)

Area	Well ID	Ground Elevation	TOC Elevation	Stick Up Height	Date of Static Water Level Measurement	Depth to Water	Potentiometric Elevation	Well Pairs	Calculated Vertical Gradient		Continuous Water Level Monitoring	Purging / Sampling Methodology
		masl	masl	m	yyyy-mm-dd	mbtoc	masl		m/m	Direction		
Sparwood Area - Elk River (Study Area 12)	EV_ER1gwS	1115.25	1115.96	0.71	2022-01-30	5.42	1110.55	EV_ER1gwS and EV_ER1gwD	-0.039	Downward	Yes	Peristaltic
					2022-04-22	5.00	1110.96		-0.043	Downward		
					2022-08-05	4.76	1111.20		-0.043	Downward		
					2022-10-11	5.30	1110.66		-0.044	Downward		
	EV_ER1gwD	1115.20	1115.91	0.71	2022-01-30	5.10	1110.10	-	-	-	Yes	Peristaltic / Bladder
					2022-04-22	4.73	1110.47					
					2022-07-19	4.49	1110.71					
					2022-10-11	5.03	1110.17					
	RG_DW-03-04	1113.20	1114.15	0.95	2022-02-14	-	-	-	-	-	-	Tap
					2022-04-20	-	-					
					2022-07-19	-	-					
					2022-10-04	-	-					
	RG_MW-03-04	1115.99	1115.86	0.95	2022-03-08	5.64	1110.22	-	-	-	-	Peristaltic
					2022-05-15	4.47	1111.39					
					2022-08-18	5.33	1110.53					
					2022-10-24	5.93	1109.93					
	EV_MW_MC3	1138.22	1139.26	1.04	2022-03-09	5.05	1134.21	-	-	-	Yes	Peristaltic
					2022-05-15	4.49	1134.76					
					2022-08-17	4.99	1134.27					
					2022-10-17	5.14	1134.12					
Michel Creek Downstream of Gate Creek and Bodie Creek - Gate Creek and Bodie Creek (Study Area 9b)	EV_MW_GT1A	1156.88	1157.90	1.03	2022-01-21	3.53	1154.38	EV_MW_GT1A and EV_MW_GT1B	-0.011	Downward	Yes	Peristaltic
					2022-04-22	3.54	1154.36		-0.010	Downward		
					2022-07-15	3.26	1154.65		-0.008	Downward		
					2022-10-03	3.67	1154.24		-0.011	Downward		
	EV_MW_GT1B	1156.88	1157.92	1.05	2022-01-21	2.92	1155.01	-	-	-	Yes	Peristaltic
					2022-04-22	2.96	1154.96					
					2022-07-15	2.81	1155.12					
					2022-10-03	3.02	1154.91					
	EV_MW_BC1A	1156.67	1157.56	0.88	2022-02-24	4.46	1153.10	EV_MW_BC1A and EV_MW_BC1B	-0.046	Downward	Yes	Peristaltic
					2022-05-01	4.39	1153.16		-0.022	Downward		
					2022-07-14	4.15	1153.40		-0.023	Downward		
					2022-10-03	4.75	1152.80		-0.032	Downward		
	EV_MW_BC1B	1156.67	1157.56	0.89	2022-02-11	3.57	1153.99	-	-	-	Yes	Peristaltic
					2022-04-24	3.97	1153.59					
					2022-07-14	3.72	1153.84					
					2022-10-03	4.13	1153.43					
	EV_MW_BC2[b]	1175.84	1176.909	1.07	2022-03-06	4.94	1171.97	EV_MW_BC2 and EV_MW_BC3	1.277	Upward	-	Peristaltic
					2022-05-19	5.10	1171.81		1.240	Upward		
					2022-08-22	5.02	1171.89		1.260	Upward		
					2022-10-25	6.15	1170.76		1.046	Upward		
	EV_MW_BC3[b]	1175.87	1176.92	1.05	2022-03-06	11.59	1165.33	-	-	-	-	Peristaltic / Bladder
					2022-05-31	11.56	1165.36					
					2022-09-20	11.58	1165.34					
					2022-11-13	11.60	1165.33					

Notes:

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TABLE EV-02: Summary of Groundwater Levels and Sampling Information (EVO)

Area	Well ID	Ground Elevation	TOC Elevation	Stick Up Height	Date of Static Water Level Measurement	Depth to Water	Potentiometric Elevation	Well Pairs	Calculated Vertical Gradient		Continuous Water Level Monitoring	Purging / Sampling Methodology
		masl	masl	m	yyyy-mm-dd	mbtoc	masl		m/m	Direction		
Michel Creek Downstream of Gate Creek and Bodie Creek - Gate Creek and Bodie Creek (Study Area 9b)	EV_RCSgw	-	-	-	2022-02-13	-	-	-	-	-	-	Distribution System
					2022-04-28	-	-					
					2022-08-07	-	-					
					2022-10-12	-	-					
	EV_BCgw	1153.67	1154.64	0.96	2022-03-08	3.04	1151.60	-	-	-	Yes	Peristaltic
					2022-05-08	2.51	1152.13					
					2022-07-18	2.77	1151.86					
					2022-10-12	3.15	1151.49					
	EV_WH50gw	-	-	-	2022-03-04	4.62	-	-	-	-	Yes	Peristaltic
					2022-05-08	3.98	-					
					2022-08-04	4.71	-					
					2022-10-04	4.95	-					
Michel Creek Downstream of Gate Creek and Bodie Creek - Michel Creek Valley Bottom (Study Area 9b)	EV_BRgw*	1149.34	1149.84	0.5	2022-03-06	4.10	1145.74	-	-	-	-	Peristaltic
					2022-05-16	3.70	1146.14					
					2022-08-04	4.13	1145.71					
					2022-10-04	4.49	1145.36					
	EV_HW1	-	-	-	2022-01-27	-	-	-	-	-	-	Tap
					2022-05-20	-	-					
					2022-09-14	-	-					
					2022-10-27	-	-					
	EV_MW_MC1A	1148.02	1149.06	1.04	2022-01-27	4.03	1145.03	EV_MW_MC1A and EV_MW_MC1B	-0.024	Downward	Yes	Peristaltic
					2022-04-21	3.93	1145.13		-0.024	Downward		
					2022-08-04	4.12	1144.94		-0.026	Downward		
					2022-10-04	4.27	1144.79		-0.025	Downward		
	EV_MW_MC1B	1148.02	1149.06	1.03	2022-01-27	3.50	1145.56	-	-	-	Yes	Peristaltic
					2022-04-21	3.40	1145.66					
					2022-08-04	3.55	1145.51					
					2022-10-04	3.72	1145.33					
	EV_MW_MC2A[b, c]	1146.99	1147.95	0.96	2022-03-04	3.87	1144.08	EV_MW_MC2A and EV_MW_MC2B	0.013	Upward	Yes	Peristaltic
					2022-05-15	3.71	1144.24		0.010	Upward		
					2022-08-17	4.00	1143.95		0.012	Upward		
					2022-10-26	-	-		-	-		
	EV_MW_MC2B[b]	1146.99	1147.97	0.98	2022-02-25	4.50	1143.47	-	-	-	Yes	Peristaltic
					2022-05-15	4.21	1143.76					
					2022-08-17	4.57	1143.40					
					2022-10-26	5.32	1142.65					

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TOC denotes top of casing.
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TABLE EV-02: Summary of Groundwater Levels and Sampling Information (EVO)

Area	Well ID	Ground Elevation	TOC Elevation	Stick Up Height	Date of Static Water Level Measurement	Depth to Water	Potentiometric Elevation	Well Pairs	Calculated Vertical Gradient		Continuous Water Level Monitoring	Purging / Sampling Methodology
		masl	masl	m	yyyy-mm-dd	mbtoc	masl		m/m	Direction		
Erickson Creek and Michel Creek Downstream of Erickson Creek (Study Area 10)	EV_WF_SW	1679.25	1678.57	0.68	2022-03-27	142.14	1536.43	-	-	-	-	Hydrasleeve
					2022-05-26	137.85	1540.72					
					2022-09-20	138.76	1539.81					
					2022-11-13	142.09	1536.48					
	EV_ECgw[a]	1327.63	1328.19	0.56	-	-	-	-	-	-	Yes	Peristaltic
					2022-05-29	1.68	1326.52					
					2022-09-13	2.29	1325.90					
					2022-11-01	2.18	1326.01					
	EV_MW_SP1A	1207.38	1208.32	0.94	2022-03-13	4.56	1203.76	EV_MW_SP1A and EV_MW_SP1B	0.014	Upward	Yes	Peristaltic
					2022-05-15	4.13	1204.19		0.014	Upward		
					2022-08-19	4.44	1203.88		0.015	Upward		
					2022-10-26	4.61	1203.72		0.014	Upward		
	EV_MW_SP1B	1207.36	1208.35	0.99	2022-03-13	4.81	1203.55	EV_MW_SP1B and EV_MW_SP1C	-0.062	Downward	Yes	Peristaltic
					2022-05-15	4.38	1203.97		-0.064	Downward		
					2022-08-19	4.71	1203.64		-0.063	Downward		
					2022-10-26	4.86	1203.49		-0.058	Downward		
	EV_MW_SP1C	1207.37	1208.39	1.02	2022-03-13	4.26	1204.13	-	-	-	Yes	Peristaltic
					2022-05-15	3.80	1204.59					
					2022-08-19	4.15	1204.24					
					2022-10-26	4.36	1204.03					

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TABLE EV-03: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Organics, Nutrient and Organics in Groundwater (EVO)

			Field Parameters					Physical Parameters						Dissolved Inorganics								Nutrients						Organics	
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Field Temperature C	pH (field) pH	Dissolved Oxygen mg/L	Field Conductivity µS/cm	Field ORP mV	pH pH	Hardness mg/L	Conductivity µS/cm	Total Suspended Solids mg/L	Total Dissolved Solids mg/L	Turbidity ntu	Total Alkalinity mg/L	Bicarbonate mg/L	Carbonate mg/L	Hydroxide mg/L	Bromide mg/L	Chloride mg/L	Fluoride mg/L	Sulphate mg/L	Ammonia Nitrogen mg/L	Nitrate Nitrogen mg/L	Nitrite Nitrogen mg/L	Kjeldahl Nitrogen-N mg/L	Ortho-Phosphate mg/L	Phosphorus, Total mg/L	Total Organic Carbon mg/L	Dissolved Organic Carbon mg/L
BC Standard																													
CSR Aquatic Life (AW)[a]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,500	2-3[e]	1,280-4,290[e]	1.31-18.5[f]	400	0.2-2[g]	n/a	n/a	n/a	n/a	n/a
CSR Irrigation Watering (IW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSR Livestock Watering (LW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	1	1,000	n/a	100	10	n/a	n/a	n/a	n/a	n/a
CSR Drinking Water (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	250	1.5	500	n/a	10	1	n/a	n/a	n/a	n/a	n/a
BC Guideline																													
BCWQG Aquatic Life Long-Term Average (AW)[b]			n/a	6.5-9.0	n/a	n/a	n/a	6.5-9.0	n/a	n/a	n/a[d]	n/a	n/a[d]	n/a	n/a	n/a	n/a	n/a	150	n/a	309-429[f]	0.135-1.77[f]	3	0.04[g]	n/a	n/a	n/a	n/a	n/a
BCWQG Aquatic Life Short-Term Average (AW)[c]			n/a	6.5-9.0	n/a	n/a	n/a	6.5-9.0	n/a	n/a	n/a[d]	n/a	n/a[d]	n/a	n/a	n/a	n/a	n/a	600	1.42-1.87[e]	n/a	0.7-24.5[f]	32.8	0.12[g]	n/a	n/a	n/a	n/a	n/a
Grave/Harmer Creek Watershed and Elk River Downstream of Grave Creek Confluence (^ denotes well part of Study Area 7)																													
EV_GV3gw^	EV_GV3GW_WG_2022_Q1_NP	2022 01 11	3.9	9.55	2.29	625	78.1	7.63	362	608	< 1.0	371	< 0.10	198	242	< 2.0	< 2.0	< 0.050	1.33	0.401	154	< 0.0050	0.118	< 0.0010	0.066	0.0012	< 0.0020	< 0.50	1.82
	EV_GV3GW_WG_2022_Q2_NP	2022 04 10	4.9	7.31	1.94	615	95.0	7.96	328	621	1.9	392	0.16	222	271	< 2.0	< 2.0	< 0.050	1.68	0.484	146	< 0.0050	0.205	0.0011	< 0.050	0.0014	< 0.0020	< 0.50	< 0.50
	EV_GV3GW_WG_2022_Q3_NP	2022 08 14	12.6	7.47	2.04	621	81.8	7.62	339	578	< 1.0	422	< 0.10	212	259	< 2.0	< 2.0	< 0.050	1.55	0.479	150	< 0.0050	0.118	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	0.65
	EV_GV3GW_WG_2022_Q4_NP	2022 10 14	6.4	7.53	2.75	631	68.3	7.97	358	589	1.1	378	< 0.10	218	266	< 2.0	< 2.0	< 0.050	1.60	0.496	144	< 0.0050	0.129	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	1.35
EV_GV3gwS	EV_GV3GWS_WG_2022_Q1_NP	2022 01 11	4.3	9.30	5.82	490.9	140.7	7.65	289	478	< 1.0	248	0.96	234	286	< 2.0	< 2.0	< 0.050	0.43	0.250	36.3	< 0.0050	0.103	< 0.0010	0.147	< 0.0010	0.0024	0.59	0.65
	EV_GV3GWS_WG_2022_Q2_NP	2022 04 10	4.0	7.22	5.68	483.3	148.6	7.93	257	487	< 1.0	252	0.56	253	309	< 2.0	< 2.0	< 0.050	1.29	0.297	34.7	< 0.0050	0.168	< 0.0010	< 0.050	< 0.0010	0.0028	< 0.50	2.55
	EV_GV3GWS_WG_2022_Q3_NP	2022 08 14	18.1	7.27	4.91	523	126.2	7.61	286	481	< 1.0	299	0.20	262	320	< 2.0	< 2.0	< 0.050	0.62	0.284	33.0	< 0.0050	0.0857	< 0.0010	< 0.050	< 0.0010	< 0.0020	0.64	1.86
	EV_GV3GWS_WG_2022_Q4_NP	2022 10 14	9.0	7.29	4.76	533	111.4	7.99	292	495	3.1	285	2.66	267	326	< 2.0	< 2.0	< 0.050	0.56	0.318	33.4	< 0.0050	0.0795	< 0.0010	< 0.050	< 0.0010	0.0058	< 0.50	1.79
EV_MW_GV4A^	EV_MW_GV4A_WG_2022_Q1_NP	2022 01 12	4.3	8.71	3.22	622	76.9	8.06	296	578	154	367	43.1	258	315	< 2.0	< 2.0	< 0.050	1.05	0.647	79.2	0.0068	0.0321	< 0.0010	< 0.050	< 0.0010	0.0697	2.92	3.11
	EV_MW_GV4A_WG_2022_Q2_NP	2022 04 28	4.3	7.35	1.09	653	-61.9	8.14	303	632	211	401	37.8	294	359	< 2.0	< 2.0	< 0.050	1.21	0.731	81.6	0.0284	0.0353	< 0.0010	0.118	< 0.0010	0.210	2.87	2.05
	EV_MW_GV4A_WG_2022_Q3_NP	2022 08 05	6.7	7.36	1.26	639	-51.8	7.52	309	612	53.1	410	8.57	272	331	< 2.0	< 2.0	< 0.050	1.22	0.636	85.4	0.0213	0.0377	< 0.0010	0.114	< 0.0010	0.0494	2.10	2.70
	EV_MW_GV4A_WG_2022_Q4_NP	2022 10 27	4.9	7.15	4.02	628	-21.0	8.01	352	597	24.6	354	6.75	304	371	< 2.0	< 2.0	< 0.050	1.10	0.694	74.4	0.0120	0.0531	< 0.0010	< 0.500	< 0.0010	0.0131	1.22	1.36
EV_MW_GV4B^	EV_MW_GV4B_WG_2022_Q1_NP	2022 01 09	1.7	7.27	5.30	589	192.3	8.17	286	553	< 1.0	348	< 0.10	262	319	< 1.0	< 1.0	< 0.050	0.89	0.604	64.3	< 0.0050	0.0533	< 0.0010	< 0.050	0.0012	0.0026	0.88	0.98
	EV_MW_GV4B_WG_2022_Q2_NP	2022 04 28	3.4	7.41	5.48	575	172.4	8.24	308	555	2.0	339	0.27	266	324	< 2.0	< 2.0	< 0.050	0.94	0.586	64.8	< 0.0050	0.0626	0.0011	< 0.050	< 0.0010	0.0031	0.63	2.19
	EV_MW_GV4B_WG_2022_Q3_NP	2022 08 05	6.6	7.41	5.35	585	153.0	7.57	323	564	1.9	379	0.51	272	332	< 2.0	< 2.0	< 0.050	1.02	0.523	74.7	< 0.0050	0.0612	< 0.0010	< 0.050	< 0.0010	0.0029	< 0.50	1.25
	EV_MW_GV4B_WG_2022_Q4_NP	2022 10 27	5.7	7.16	5.38	585	105.0	7.98	340	558	< 1.0	324	0.27	294	358	< 2.0	< 2.0	< 0.050	0.97	0.596	67.1	< 0.0050	0.0590	< 0.0010	< 0.500	< 0.0010	0.0026	< 0.50	< 0.50
RG_MW_GCA^	RG_MW_GCA_WG_2022_Q1_NP	2022 03 27	7.0	8.76	0.22	1,248	-74.5	8.69	6.02	1,210	12.7	868	84.3	710	797	33.8	< 2.0	< 0.250	10.1	***2.92***	76.0	0.623	0.528	0.0467	0.920	0.0838	0.152	2.10	1.74
	RG_MW_GCA_WG_2022_Q2_NP	2022 06 03	8.2	8.73	3.61	1,263	91.9	8.73	7.06	1,310	112	958	164	640	718	31.0	< 2.0	< 0.250	7.85	***2.26***	75.9	0.555	0.498	0.0486	1.01	0.0176	0.231	2.94	2.36
	RG_MW_GCA_WG_2022_Q3_NP	2022 09 14	10.8	8.62	6.38	1,282	142.3	8.63	7.16	1,280	288	1,100	547	636	733	21.1	< 1.0	< 0.250	7.02	***2.08***	84.4	0.649	0.796	0.0086	1.44	0.0171	0.374	2.72	2.51
	RG_MW_GCA_WG_2022_Q4_NP	2022 11 04	3.5	8.76	4.48	1,245	93.6	8.74	10.1	1,240	95.2	1,330	1,060	655	750	24.0	< 2.0	< 0.250	6.96	***2.81***	56.7	0.526	0.246	0.0078	1.67	0.0038	0.611	9.36	2.55
RG_DW-02-20^	RG_DW-02-20_WP_2022_02_22_NP	2022 02 22	5.9	7.75	9.25	485.5	81.5	8.21	247	485	< 1.0	311	0.91	168	204	< 1.0	< 1.0	< 0.050	2.85	0.142	88.0	< 0.0050	3.48	< 0.0010	0.261	< 0.0010	< 0.0020	< 0.50	< 0.50
	RG_DW-02-20_WP_2022_05_09_NP	2022 05 09	7.4	7.65	9.62	500.0	122.2	7.73	276	484	< 1.0	315	0.50	172	209	< 1.0	< 1.0	< 0.050	3.85	0.179	88.8	< 0.0050	3.60	< 0.0010	< 0.500	0.0011	< 0.0020	< 0.50	< 0.50
	RG_DW-02-20_WP_2022_07_19_NP	2022 07 19	11.9	7.78	8.17	516	140.9	6.85	263	504	< 1.0	338	0.55	214	262	< 1.0	< 1.0	< 0.050	3.25	0.188	89.3	< 0.0050	3.55	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	RG_DW-D_WP_2022_07_19_NP	Duplicate	-	-	-	-	-	6.94	267	507	< 1.0	331	0.53	216	264	< 1.0	< 1.0	< 0.050	3.17	0.188	88.7	< 0.0050	3.54	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	QA/QC RPD%		-	-	-	-	-	1	2	1	*	2	4	1	1	*	*	*	2	0	1	*	0	*	*	*	*	*	*
	RG_DW-02-20_WP_2022_10_26_NP	2022 10 26	10.1	7.66	8.13	437.5	94.5	8.08	225	402	< 1.0	274	0.65	174	212	< 1.0	< 1.0	< 0.050	2.15	0.193	60.2	< 0.0050	2.17	< 0.0010	< 0.500	< 0.0010	< 0.0020	< 0.50	< 0.50

All terms defined within the body of SNC-Lavalin's report.

<	Denotes concentration less than indicated detection limit.
-	Denotes analysis not conducted.
n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL	Denotes reported detection limit.

BLUE	Concentration greater than BCWQG Aquatic Life Long-term Average guideline and/or BCWQG Aquatic Life Short-term Maximum guideline
BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Guideline to protect freshwater aquatic life, long-term average (i.e. "chronic") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[c] Guideline to protect freshwater aquatic life, short-term maximum (i.e. "acute") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[d] Guideline varies with background concentration.

[e] Standard/guideline varies with Hardness.

[f] Standard/guideline varies with pH and Temperature. Temperature assumed 10C CSR, 15C BCWQG.

[g] Standard/guideline varies with Chloride.

[h] Monitoring wells within 10m of high watermark, samples compared to CSR and BCWQG.

TABLE EV-03: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Organics, Nutrient and Organics in Groundwater (EVO)

			Field Parameters					Physical Parameters						Dissolved Inorganics								Nutrients						Organics	
Sample Location	**Sample ID**	**Sample Date (yyyy mm dd)**	**Field Temperature C**	**pH (field) pH**	**Dissolved Oxygen mg/L**	**Field Conductivity µS/cm**	**Field ORP mV**	**pH pH**	**Hardness mg/L**	**Conductivity µS/cm**	**Total Suspended Solids mg/L**	**Total Dissolved Solids mg/L**	**Turbidity ntu**	**Total Alkalinity mg/L**	**Bicarbonate mg/L**	**Carbonate mg/L**	**Hydroxide mg/L**	**Bromide mg/L**	**Chloride mg/L**	**Fluoride mg/L**	**Sulphate mg/L**	**Ammonia Nitrogen mg/L**	**Nitrate Nitrogen mg/L**	**Nitrite Nitrogen mg/L**	**Kjeldahl Nitrogen-N mg/L**	**Ortho-Phosphate mg/L**	**Phosphorus, Total mg/L**	**Total Organic Carbon mg/L**	**Dissolved Organic Carbon mg/L**
BC Standard																													
CSR Aquatic Life (AW)[a]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,500	2-3[e]	1,280-4,290[e]	1.31-18.5[f]	400	0.2-2[g]	n/a	n/a	n/a	n/a	n/a
CSR Irrigation Watering (IW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSR Livestock Watering (LW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	1	1,000	n/a	100	10	n/a	n/a	n/a	n/a	n/a
CSR Drinking Water (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	250	1.5	500	n/a	10	1	n/a	n/a	n/a	n/a	n/a
BC Guideline																													
BCWQG Aquatic Life Long-Term Average (AW)[b]			n/a	6.5-9.0	n/a	n/a	n/a	6.5-9.0	n/a	n/a	n/a[d]	n/a	n/a[d]	n/a	n/a	n/a	n/a	n/a	150	n/a	309-429[f]	0.135-1.77[f]	3	0.04[g]	n/a	n/a	n/a	n/a	n/a
BCWQG Aquatic Life Short-Term Average (AW)[c]			n/a	6.5-9.0	n/a	n/a	n/a	6.5-9.0	n/a	n/a	n/a[d]	n/a	n/a[d]	n/a	n/a	n/a	n/a	n/a	600	1.42-1.87[e]	n/a	0.7-24.5[f]	32.8	0.12[g]	n/a	n/a	n/a	n/a	n/a
Grave/Harmer Creek Watershed and Elk River Downstream of Grave Creek Confluence (^ denotes well part of Study Area 7)																													
RG_MW_WW^	RG_MW_WW_WG_2022_Q1_NP	2022 01 23	3.8	7.65	6.38	470.5	248.4	7.84	245	441	1.2	230	1.98	165	201	< 2.0	< 2.0	< 0.050	2.28	0.142	65.6	0.0056	2.02	< 0.0010	0.258	0.0013	0.0037	< 0.50	2.47
	RG_MW_WW_WG_2022_Q2_NP	2022 04 28	13.5	7.57	6.24	472	57.8	7.89	234	443	10.8	326	13.3	180	220	< 2.0	< 2.0	< 0.050	2.76	0.167	63.6	< 0.0050	2.08	< 0.0010	< 0.050	< 0.0010	0.0112	< 0.50	3.31
	RG_MW_WW_WG_2022_Q3_NP	2022 08 07	12.8	7.52	6.41	483.2	215.6	8.06	253	466	< 1.0	312	0.30	185	226	< 2.0	< 2.0	< 0.050	3.11	0.190	69.7	< 0.0050	2.24	< 0.0010	< 0.500	< 0.0010	< 0.0020	< 0.50	< 0.50
	RG_MW_WW_WG_2022_Q4_NP	2022 10 17	4.6	7.55	4.42	468.5	163.4	7.78	258	453	1.6	295	0.32	184	224	< 2.0	< 2.0	< 0.050	3.15	0.190	63.0	< 0.0050	2.04	< 0.0010	< 0.500	< 0.0010	0.0038	< 0.50	< 0.50
Elk River Proximal to EVO (+ denotes well part of Study Area 8)																													
EV_BALgw	EV_BALGW_WG_2022_Q1_NP	2022 03 25	15.4	7.16	5.29	801	55.8	7.48	390	748	71.8	462	59.8	363	443	< 2.0	< 2.0	< 0.050	2.22	0.260	99.0	0.0083	0.0493	0.0030	0.076	< 0.0010	0.0276	1.16	1.51
	EV_BALGW_WG_2022_Q2_NP	2022 06 03	18.3	7.17	3.54	796	109.5	7.96	353	782	219	503	136	371	453	< 2.0	< 2.0	< 0.050	1.88	0.218	93.7	0.0241	0.0684	0.0017	0.301	0.0010	0.210	2.02	2.25
	EV_BALGW_WG_2022_Q3_NP	2022 09 19	26.4	7.27	5.90	780	45.2	7.77	341	722	164	442	83.1	370	451	< 2.0	< 2.0	< 0.050	1.82	0.247	91.4	0.0342	0.0628	0.0015	0.237	< 0.0010	0.0996	1.44	1.70
	EV_BALGW_WG_2022_Q4_NP	2022 11 13	4.6	6.95	0.69	768	68.5	7.52	367	735	30.3	415	13.1	359	438	< 2.0	< 2.0	< 0.050	1.76	0.226	94.7	0.0642	0.0304	0.0011	0.268	< 0.0010	0.0438	1.29	0.98
EV_GCgw	EV_GCGW_WG_2022_Q1_NP	2022 01 30	4.0	7.64	0.24	463.2	-143.6	7.86	255	451	3.9	244	4.03	181	221	< 2.0	< 2.0	< 0.050	4.49	0.415	67.9	0.0229	0.0111	< 0.0010	< 0.050	< 0.0010	0.0054	< 0.50	1.46
	EV_GCGW_WG_2022-02-10_NP	2022 02 10	6.6	7.62	0.46	438.7	-117.8	7.83	222	448	7.7	241	6.57	179	218	< 2.0	< 2.0	< 0.050	4.57	0.388	66.1	0.0239	< 0.0050	< 0.0010	< 0.050	< 0.0010	0.0068	< 0.50	< 0.50
	EV_GCGW_WG_2022-02-20_NP	2022 02 20	1.1	7.7	0.25	466.6	-73.8	8.08	235	451	10.4	286	7.85	188	229	< 2.0	< 2.0	< 0.050	4.57	0.370	67.9	0.0196	0.0194	< 0.0010	< 0.050	< 0.0010	0.0072	< 0.50	< 0.50
	EV_GCGW_WG_2022_Q2_NP	2022 05 01	6.2	7.43	0.51	441.9	-88.2	8.00	222	434	14.8	330	11.8	171	208	< 2.0	< 2.0	< 0.050	4.68	0.553	65.6	0.0322	0.0277	< 0.0010	0.080	< 0.0010	0.0121	< 0.50	< 0.50
	EV_GCGW_WG_2022-06-23_NP	2022 06 23	13.2	7.50	0.37	349.8	-56.1	8.07	228	429	16.9	298	10.6	175	214	< 2.0	< 2.0	< 0.050	4.81	0.458	67.7	0.0333	0.0060	< 0.0010	0.060	< 0.0010	0.0180	0.62	0.66
	EV_GCGW_WG_2022_Q3_NP	2022 08 15	18.9	7.52	0.22	458.3	-135.9	7.96	238	446	12.8	272	6.67	180	219	< 2.0	< 2.0	< 0.050	5.08	0.479	72.2	0.0217	0.0083	< 0.0010	0.055	0.0011	0.0092	< 0.50	2.76
	EV_GCGW_WG_2022_Q4_NP	2022 10 25	8.5	7.44	0.25	434.8	-114.0	8.14	227	381	7.1	250	5.27	176	215	< 2.0	< 2.0	< 0.050	4.40	0.624	62.0	0.0344	< 0.0050	< 0.0010	0.072	< 0.0010	0.0048	< 0.50	< 0.50
EV_LSgw[+]	EV_LSGW_WG_2022_Q1_NP	2022 02 06	8.7	7.23	0.41	954	-113.6	7.91	529	964	7.3	547	33.0	499	609	< 2.0	< 2.0	< 0.050	7.79	0.279	57.4	0.195	< 0.0050	< 0.0010	0.299	< 0.0010	0.0174	1.85	2.98
	EV_LSGW_WG_2022_Q2_NP	2022 05 01	9.4	7.09	0.40	1,001	-87.7	7.78	567	966	10.4	520	27.7	541	660	< 2.0	< 2.0	< 0.250	7.50	0.255	79.2	0.100	0.0587	< 0.0050	0.176	< 0.0010	0.0289	1.90	1.89
	EV_LSGW_WG_2022_Q3_NP	2022 08 18	14.8	7.12	0.18	1,095	-109.1	8.16	616	1,020	4.1	566	41.8	581	708	< 1.0	< 1.0	< 0.250	7.54	0.264	70.3	0.221	0.0365	< 0.0050	0.292	< 0.0010	0.0221	1.67	2.59
	EV_LSGW_WG_2022_Q4_NP	2022 10 25	10.7	6.98	0.35	1,098	-96.3	8.04	617	998	11.4	576	40.4	694	847	< 2.0	< 2.0	0.073	7.64	0.270	58.0	0.238	< 0.0050	< 0.0010	< 0.500	< 0.0010	0.0211	2.20	2.35
EV_OCgw[+,h]	EV_OCGW_WG_2022_Q1_NP	2022 03 13	5.8	8.00	3.72	454.9	106.1	8.11	123	447	5.2	263	3.83	184	225	< 2.0	< 2.0	< 0.050	2.27	*1.20*	61.5	0.0340	0.124	0.0043	0.136	0.0058	0.0199	0.67	1.35
	EV_MW_MC5GW_WG_2022_Q1_NP	Duplicate	-	-	-	-	-	8.09	128	442	5.5	249	4.38	186	226	< 2.0	< 2.0	< 0.050	2.25	*1.18*	61.2	0.0483	0.118	0.0047	0.070	0.0064	0.0216	< 0.50	0.97
	QA/QC RPD%		-	-	-	-	-	0	4	1	6	5	13	1	0	*	*	*	1	2	0	35	5	*	*	10	8	*	*
	EV_OCGW_WG_2022_Q2_NP	2022 05 20	7.1	7.88	0.46	428.3	-120.3	8.08	150	416	< 1.0	254	1.02	186	226	< 2.0	< 2.0	< 0.050	2.66	*1.11*	48.3	0.0515	0.0067	< 0.0010	0.065	0.0050	0.0099	< 0.50	< 0.50
	EV_MC5GW_WG_2022_Q2_NP	Duplicate	-	-	-	-	-	8.07	151	416	< 1.0	251	1.00	185	225	< 2.0	< 2.0	< 0.050	2.86	*1.14*	50.1	0.0501	0.0248	0.0010	0.052	0.0054	0.0095	0.60	< 0.50
	QA/QC RPD%		-	-	-	-	-	0	1	0	*	1	2	1	0	*	*	*	7	3	4	3	*	*	*	8	*	*	*
	EV_OCGW_WG_2022_Q3_NP	2022 08 15	10.5	7.85	0.54	421.7	-134.5	8.12	150	414	17.1	235	14.8	188	229	< 2.0	< 2.0	< 0.050	2.78	*1.16*	45.8	0.0602	< 0.0050	0.0027	0.102	0.0014	0.0264	< 0.50	< 0.50
	EV_MC5GW_WG_2022_Q3_NP	Duplicate	-	-	-	-	-	8.05	146	422	18.2	242	11.4	193	236	< 2.0	< 2.0	< 0.050	2.99	*1.16*	46.6	0.0576	0.0089	0.0040	0.108	0.0032	0.0251	< 0.50	< 0.50
	QA/QC RPD%		-	-	-	-	-	1	3	2	6	3	26	3	3	*	*	*	7	0	2	4	*	*	*	*	5	*	*
	EV_OCGW_WG_2022_Q4_NP	2022 10 28	7.1	7.79	0.36	421.9	-135.9	8.12	144	408	8.1	234	8.18	228	278	< 2.0	< 2.0	< 0.050	2.66	*1.12*	42.7	0.0584	0.0062	< 0.0010	0.087	0.0011	0.0150	< 0.50	< 0.50
	EV_MC5GW_WG_2022_Q4_NP	Duplicate	-	-	-	-	-	-	146	394	4.6	239	4.82	226	276	< 2.0	< 2.0	< 0.050	2.75	*1.11*	44.4	0.0595	0.0066	< 0.0010	0.064	0.0014	0.0170	< 0.50	< 0.50
	QA/QC RPD%		-	-	-	-	-	40	1	3	*	2	52	1	1	*	*	*	3	1	4	2	*	*	*	*	13	*	*

All terms defined within the body of SNC-Lavalin's report.

< Denotes concentration less than indicated detection limit.

\- Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

* RPDs are not calculated where one or more concentrations are less than five times RDL.

RDL Denotes reported detection limit.

BLUE	Concentration greater than BCWQG Aquatic Life Long-term Average guideline and/or BCWQG Aquatic Life Short-term Maximum guideline
BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Guideline to protect freshwater aquatic life, long-term average (i.e. "chronic") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[c] Guideline to protect freshwater aquatic life, short-term maximum (i.e. "acute") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[d] Guideline varies with background concentration.

[e] Standard/guideline varies with Hardness.

[f] Standard/guideline varies with pH and Temperature. Temperature assumed 10C CSR, 15C BCWQG.

[g] Standard/guideline varies with Chloride.

[h] Monitoring wells within 10m of high watermark, samples compared to CSR and BCWQG.

TABLE EV-03: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Organics, Nutrient and Organics in Groundwater (EVO)

			Field Parameters					Physical Parameters						Dissolved Inorganics								Nutrients						Organics	
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Field Temperature C	pH (field) pH	Dissolved Oxygen mg/L	Field Conductivity µS/cm	Field ORP mV	pH pH	Hardness mg/L	Conductivity µS/cm	Total Suspended Solids mg/L	Total Dissolved Solids mg/L	Turbidity ntu	Total Alkalinity mg/L	Bicarbonate mg/L	Carbonate mg/L	Hydroxide mg/L	Bromide mg/L	Chloride mg/L	Fluoride mg/L	Sulphate mg/L	Ammonia Nitrogen mg/L	Nitrate Nitrogen mg/L	Nitrite Nitrogen mg/L	Kjeldahl Nitrogen-N mg/L	Ortho-Phosphate mg/L	Phosphorus, Total mg/L	Total Organic Carbon mg/L	Dissolved Organic Carbon mg/L
BC Standard																													
CSR Aquatic Life (AW)[a]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,500	2-3[e]	1,280-4,290[e]	1.31-18.5[f]	400	0.2-2[g]	n/a	n/a	n/a	n/a	n/a
CSR Irrigation Watering (IW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSR Livestock Watering (LW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	1	1,000	n/a	100	10	n/a	n/a	n/a	n/a	n/a
CSR Drinking Water (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	250	1.5	500	n/a	10	1	n/a	n/a	n/a	n/a	n/a
BC Guideline																													
BCWQG Aquatic Life Long-Term Average (AW)[b]			n/a	6.5-9.0	n/a	n/a	n/a	6.5-9.0	n/a	n/a	n/a[d]	n/a	n/a[d]	n/a	n/a	n/a	n/a	n/a	150	n/a	309-429[f]	0.135-1.77[f]	3	0.04[g]	n/a	n/a	n/a	n/a	n/a
BCWQG Aquatic Life Short-Term Average (AW)[c]			n/a	6.5-9.0	n/a	n/a	n/a	6.5-9.0	n/a	n/a	n/a[d]	n/a	n/a[d]	n/a	n/a	n/a	n/a	n/a	600	1.42-1.87[e]	n/a	0.7-24.5[f]	32.8	0.12[g]	n/a	n/a	n/a	n/a	n/a
Elk River Proximal to EVO (+ denotes well part of Study Area 8)																													
EV_MW_GC1B[+]	EV_MW_GC1B_WG_2022_Q1_NP	2022 01 31	6.2	7.23	0.16	1,094	-23.5	7.87	636	1,050	< 1.0	758	0.89	337	412	< 1.0	< 1.0	< 0.250	22.1	0.158	259	0.0694	0.0587	< 0.0050	0.093	0.0018	0.0026	0.91	1.08
	EV_MW_GC1B_WG_2022-02-10_NP	2022 02 10	6.2	7.60	6.74	310.6	163.5	7.78	149	301	2.8	142	64.9	151	184	< 2.0	< 2.0	< 0.050	1.51	0.154	18.7	0.0055	0.184	< 0.0010	0.139	0.0019	0.0241	3.24	1.20
	EV_MW_GC1B_WG_2022-02-20_NP	2022 02 20	4.7	7.25	0.22	1,105	40.6	7.96	570	1,070	1.2	754	0.99	342	417	< 2.0	< 2.0	< 0.250	22.5	0.142	278	0.0740	0.191	< 0.0050	0.115	< 0.0010	< 0.0020	0.86	0.98
	EV_MW_GC1B_WG_2022_Q2_NP	2022 05 01	7.2	7.16	0.17	1,193	71.1	7.71	638	1,160	1.0	856	0.82	353	430	< 2.0	< 2.0	< 0.250	24.9	0.187	344	0.0559	0.252	< 0.0050	0.097	0.0015	< 0.0020	1.31	1.40
	EV_MW_GC1B_WG_2022-06-23_NP	2022 06 23	10.5	7.04	0.28	1,194	-30.8	8.20	614	1,110	< 1.0	844	4.35	374	456	< 2.0	< 2.0	< 0.250	26.5	0.203	302	0.102	0.119	< 0.0050	0.121	< 0.0010	0.0032	1.38	2.34
	EV_MW_MC10A_WG_2022-06-23_NP	Duplicate	-	-	-	-	-	8.18	632	1,120	1.6	854	4.62	384	469	< 2.0	< 2.0	< 0.250	24.1	0.197	297	0.0922	< 0.0250	< 0.0050	0.153	0.0041	0.0039	1.41	1.67
	QA/QC RPD%		-	-	-	-	-	0	3	1	*	1	6	3	3	*	*	*	9	3	2	10	*	*	*	*	*	*	*
	EV_MW_GC1B_WG_2022_Q3_NP	2022 08 16	12.4	7.12	0.06	1,160	-25.1	7.63	639	1,120	< 1.0	796	0.75	398	485	< 2.0	< 2.0	< 0.250	23.9	0.210	304	0.0659	0.116	< 0.0050	0.090	0.0012	0.0026	0.88	1.18
	EV_MW_MC10A_WG_2022_Q3_NP	Duplicate	-	-	-	-	-	7.77	665	1,140	< 1.0	803	0.77	371	452	< 2.0	< 2.0	0.166	23.7	0.228	292	0.0676	0.0093	< 0.0010	0.087	0.0010	0.0023	0.73	0.75
	QA/QC RPD%		-	-	-	-	-	2	4	2	*	1	3	7	7	*	*	*	1	8	4	3	*	*	*	*	*	*	*
	EV_MW_GC1B_WG_2022_Q4_NP	2022 10 25	10.5	6.99	0.20	1,173	-12.8	8.08	648	1,080	1.5	761	1.21	374	456	< 2.0	< 2.0	< 0.250	23.2	0.210	321	0.0773	< 0.0250	< 0.0050	0.130	< 0.0010	0.0024	< 0.50	< 0.50
RG_DW-03-10[+]	RG_DW-03-10_WP_2022_02_14_NP	2022 02 14	5.2	7.47	7.70	482.2	189.2	7.99	239	479	< 1.0	276	< 0.10	235	286	< 1.0	< 1.0	< 0.050	11.0	0.182	21.4	< 0.0050	0.502	< 0.0010	0.058	< 0.0010	< 0.0020	< 0.50	< 0.50
	RG_DW-03-10_WP_2022_04_20_NP	2022 04 20	5.3	7.54	7.78	486.4	177.7	7.99	248	480	< 1.0	258	< 0.10	240	293	< 1.0	< 1.0	< 0.050	11.2	0.200	22.5	< 0.0050	0.507	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	RG_DW-03-10_WP_2022_07_19_NP	2022 07 19	8.6	7.44	7.46	489.2	206.8	6.87	272	480	< 1.0	283	< 0.10	302	369	< 1.0	< 1.0	< 0.050	11.4	0.201	20.5	< 0.0050	0.502	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	RG_DW-03-10_WP_2022_10_11_NP	2022 10 11	7.0	7.48	7.76	496.1	429.0	8.15	270	485	< 1.0	254	< 0.10	264	322	< 1.0	< 1.0	< 0.050	11.8	0.194	20.9	< 0.0050	0.518	< 0.0010	< 0.500	< 0.0010	< 0.0020	< 0.50	< 0.50
Sparwood Area - Michel Creek and Baldy Ridge (Study Area 9a)																													
EV_MW_AQ1	EV_MW_AQ1_WG_2022_Q1_NP	2022 02 06	6.7	6.96	6.54	951	196.0	7.75	503	958	2.0	578	1.15	340	414	< 2.0	< 2.0	0.380	65.8	0.216	106	< 0.0050	0.431	< 0.0010	0.104	0.0171	0.0178	1.16	2.55
	EV_MW_AQ1_WG_2022_Q2_NP	2022 04 24	10.9	6.92	6.9	918	203.1	7.60	458	906	< 1.0	553	0.12	314	383	< 2.0	< 2.0	0.488	70.0	0.242	107	< 0.0050	0.102	< 0.0010	0.050	0.0186	0.0184	1.51	4.04
	EV_MW_AQ1_WG_2022_Q3_NP	2022 08 07	19.7	6.89	5.11	977	224.1	8.03	580	933	< 1.0	664	0.27	340	414	< 2.0	< 2.0	0.417	58.4	0.236	128	< 0.0050	0.117	< 0.0010	< 0.050	0.0184	0.0180	1.71	3.87
	EV_MW_AQ1_WG_2022_Q4_NP	2022 10 12	13.1	6.95	6.61	907	126.5	7.19	499	842	< 1.0	500	0.55	368	449	< 2.0	< 2.0	< 0.250	39.7	0.227	97.1	< 0.0050	1.10	< 0.0050	0.071	0.0180	0.0154	0.54	4.52
EV_MW_AQ2	EV_MW_AQ2_WG_2022_Q1_NP	2022 01 21	5.3	6.98	0.33	1,132	22.0	7.61	595	1,070	2.3	675	4.28	402	490	< 2.0	< 2.0	< 0.250	15.1	0.134	165	0.0509	0.702	< 0.0050	0.110	< 0.0010	0.0025	0.69	2.28
	EV_MW_AQ2_WG_2022_Q2_NP	2022 04 24	7.7	6.94	0.33	1,107	-39.2	7.55	571	1,080	2.3	1,030	6.31	511	623	< 2.0	< 2.0	< 0.250	18.4	0.175	165	0.0392	< 0.0250	< 0.0050	0.067	< 0.0010	< 0.0020	0.68	1.71
	EV_MW_BC10A_WG_2022_Q2_NP	Duplicate	-	-	-	-	-	7.55	570	1,080	1.5	687	6.12	517	631	< 2.0	< 2.0	< 0.250	17.2	0.169	155	0.0396	0.0316	< 0.0050	0.083	< 0.0010	0.0021	0.84	0.98
	QA/QC RPD%		-	-	-	-	-	0	0	0	*	40	3	1	1	*	*	*	7	3	6	1	*	*	*	*	*	*	*
	EV_MW_AQ2_WG_2022_Q3_NP	2022 09 09	8.2	6.93	0.26	1,099	7.6	7.97	609	1,050	< 1.0	658	3.17	496	605	< 2.0	< 2.0	< 0.050	18.4	0.180	158	0.0357	< 0.0050	< 0.0010	0.139	< 0.0010	< 0.0020	0.76	0.90
	EV_EC5GW_WG_2022_Q3_NP	Duplicate	-	-	-	-	-	7.57	624	1,050	< 1.0	650	3.09	481	587	< 2.0	< 2.0	< 0.050	18.4	0.174	158	0.0356	< 0.0050	< 0.0010	0.074	< 0.0010	< 0.0020	0.71	0.87
	QA/QC RPD%		-	-	-	-	-	5	2	0	*	1	3	3	3	*	*	*	0	3	0	0	*	*	*	*	*	*	*
	EV_MW_AQ2_WG_2022_Q4_NP	2022 11 01	6.7	7.03	7.70	1,105	115.9	7.67	566	1,060	12.5	695	6.04	455	555	< 2.0	< 2.0	< 0.250	17.8	0.180	162	0.0417	0.0460	< 0.0050	< 0.500	0.0012	0.0042	0.78	0.76
EV_MW_MC4	EV_MW_MC4_WG_2022_Q1_NP	2022 02 27	6.3	7.11	0.88	879	-47.3	7.97	476	849	1.2	558	3.83	367	448	< 2.0	< 2.0	0.157	29.5	0.147	112	< 0.0050	< 0.0050	< 0.0010	0.193	< 0.0010	0.0051	1.30	1.53
	EV_MW_MC4_WG_2022_Q2_NP	2022 05 01	7.7	7.03	0.58	891	-11.6	7.65	467	866	1.5	556	3.64	346	423	< 2.0	< 2.0	< 0.250	30.1	0.162	122	0.0524	0.229	< 0.0050	0.084	< 0.0010	0.0035	1.30	1.45
	EV_MW_MC4_WG_2022_Q3_NP	2022 08 17	16.7	7.07	1.09	876	-26.0	7.53	469	833	1.9	555	2.21	362	442	< 2.0	< 2.0	0.147	27.7	0.199	107	< 0.0050	0.0051	< 0.0010	< 0.050	< 0.0010	0.0026	2.11	2.50
	EV_MW_MC4_WG_2022_Q4_NP	2022 10 17	8.2	7.06	0.53	857	-13.0	7.38	558	817	1.6	515	3.09	370	451	< 2.0	< 2.0	0.152	29.0	0.194	109	0.0062	< 0.0050	< 0.0010	< 0.500	< 0.0010	0.0022	0.76	1.22

All terms defined within the body of SNC-Lavalin's report.

<	Denotes concentration less than indicated detection limit.
-	Denotes analysis not conducted.
n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL	Denotes reported detection limit.

BLUE	Concentration greater than BCWQG Aquatic Life Long-term Average guideline and/or BCWQG Aquatic Life Short-term Maximum guideline
BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Guideline to protect freshwater aquatic life, long-term average (i.e. "chronic") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[c] Guideline to protect freshwater aquatic life, short-term maximum (i.e. "acute") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[d] Guideline varies with background concentration.

[e] Standard/guideline varies with Hardness.

[f] Standard/guideline varies with pH and Temperature. Temperature assumed 10C CSR, 15C BCWQG.

[g] Standard/guideline varies with Chloride.

[h] Monitoring wells within 10m of high watermark, samples compared to CSR and BCWQG.

TABLE EV-03: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Organics, Nutrient and Organics in Groundwater (EVO)

			Field Parameters					Physical Parameters						Dissolved Inorganics								Nutrients						Organics	
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Field Temperature C	pH (field) pH	Dissolved Oxygen mg/L	Field Conductivity µS/cm	Field ORP mV	pH pH	Hardness mg/L	Conductivity µS/cm	Total Suspended Solids mg/L	Total Dissolved Solids mg/L	Turbidity ntu	Total Alkalinity mg/L	Bicarbonate mg/L	Carbonate mg/L	Hydroxide mg/L	Bromide mg/L	Chloride mg/L	Fluoride mg/L	Sulphate mg/L	Ammonia Nitrogen mg/L	Nitrate Nitrogen mg/L	Nitrite Nitrogen mg/L	Kjeldahl Nitrogen-N mg/L	Ortho-Phosphate mg/L	Phosphorus, Total mg/L	Total Organic Carbon mg/L	Dissolved Organic Carbon mg/L
BC Standard																													
CSR Aquatic Life (AW)[a]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,500	2-3[e]	1,280-4,290[e]	1.31-18.5[f]	400	0.2-2[g]	n/a	n/a	n/a	n/a	n/a
CSR Irrigation Watering (IW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSR Livestock Watering (LW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	1	1,000	n/a	100	10	n/a	n/a	n/a	n/a	n/a
CSR Drinking Water (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	250	1.5	500	n/a	10	1	n/a	n/a	n/a	n/a	n/a
BC Guideline																													
BCWQG Aquatic Life Long-Term Average (AW)[b]			n/a	6.5-9.0	n/a	n/a	n/a	6.5-9.0	n/a	n/a	n/a[d]	n/a	n/a[d]	n/a	n/a	n/a	n/a	n/a	150	n/a	309-429[f]	0.135-1.77[f]	3	0.04[g]	n/a	n/a	n/a	n/a	n/a
BCWQG Aquatic Life Short-Term Average (AW)[c]			n/a	6.5-9.0	n/a	n/a	n/a	6.5-9.0	n/a	n/a	n/a[d]	n/a	n/a[d]	n/a	n/a	n/a	n/a	n/a	600	1.42-1.87[e]	n/a	0.7-24.5[f]	32.8	0.12[g]	n/a	n/a	n/a	n/a	n/a
Sparwood Area - Michel Creek and Baldy Ridge (Study Area 9a)																													
EV_MW_SPR1A	EV_MW_SPR1A_WG_2022_Q1_NP	2022 01 16	3.6	7.12	0.20	643	-136.8	7.94	323	608	132	367	25.9	317	386	< 2.0	< 2.0	< 0.050	17.4	0.237	28.9	0.0469	0.0066	< 0.0010	0.103	< 0.0010	0.247	1.20	1.00
	EV_MW_SPR1A_WG_2022_Q2_NP	2022 04 22	6.5	7.25	0.21	633	-172.1	7.99	314	627	5.1	361	4.08	313	382	< 2.0	< 2.0	< 0.050	19.0	0.320	28.6	0.0502	0.0137	< 0.0010	0.094	< 0.0010	0.0075	0.93	1.41
	EV_MW_SPR1A_WG_2022_Q3_NP	2022 07 17	16.0	7.09	0.26	632	-147.3	7.60	338	608	3.8	395	3.53	342	417	< 2.0	< 2.0	< 0.050	19.3	0.281	25.0	0.0546	0.0092	< 0.0010	< 0.050	< 0.0010	0.0066	< 0.50	< 0.50
	EV_MW_SPR1A_WG_2022_Q4_NP	2022 10 11	6.9	7.26	0.21	641	-213.8	7.80	372	602	187	349	3.48	309	377	< 2.0	< 2.0	< 0.050	20.3	0.310	25.7	0.0422	< 0.0050	< 0.0010	0.094	0.0045	0.0580	< 0.50	1.66
EV_MW_SPR1B	EV_MW_SPR1B_WG_2022_Q1_NP	2022 01 16	3.4	7.66	1.00	445.3	-148.1	8.22	133	420	65.3	282	11.8	194	236	< 2.0	< 2.0	< 0.050	0.68	*1.24*	44.4	0.187	0.0084	< 0.0010	0.198	< 0.0010	0.0534	2.56	4.38
	EV_MW_SPR1B_WG_2022_Q2_NP	2022 04 22	10.6	7.93	7.95	441.0	-178.4	8.22	152	466	37.4	290	38.6	210	256	< 2.0	< 2.0	< 0.050	1.21	*1.18*	49.2	0.195	0.0152	< 0.0010	0.251	< 0.0010	0.0347	2.68	2.54
	EV_MW_SPR1B_WG_2022_Q3_NP	2022 07 17	24.2	7.77	0.26	487.1	-200.3	7.96	162	452	2.0	295	3.37	214	262	< 2.0	< 2.0	< 0.050	1.14	*1.25*	52.7	0.171	< 0.0050	< 0.0010	0.180	< 0.0010	0.0066	2.38	2.54
	EV_MW_SPR1B_WG_2022_Q4_NP	2022 10 11	12.7	7.70	0.31	448.7	-237.1	7.94	151	396	13.7	266	4.64	193	236	< 2.0	< 2.0	< 0.050	0.88	*1.28*	43.6	0.160	< 0.0050	< 0.0010	0.236	< 0.0010	0.0090	1.72	3.58
EV_MW_SPR1C**	EV_MW_SPR1C_WG_2022_Q1_NP	2022 01 16	5.4	7.05	2.79	784	212.1	7.87	368	748	< 1.0	451	< 0.10	250	305	< 2.0	< 2.0	0.860	48.5	0.105	103	< 0.0050	0.469	0.0033	0.111	< 0.0010	0.0031	1.12	1.85
	EV_MW_SPR1C_WG_2022_Q2_NP	2022 04 22	4.3	7.14	3.55	937	170.4	7.87	437	940	< 1.0	564	0.13	299	364	< 2.0	< 2.0	0.648	74.7	0.129	113	< 0.0050	0.687	< 0.0010	0.288	0.0030	0.0042	1.12	1.39
	EV_MW_SPR1C_WG_2022_Q3_NP	2022 07 17	8.4	7.30	1.82	555	33.7	7.65	268	540	< 1.0	352	0.12	250	305	< 2.0	< 2.0	0.243	29.8	0.180	44.6	0.0439	0.187	< 0.0010	0.334	< 0.0010	0.0050	1.29	1.60
	EV_MW_SPR1C_WG_2022_Q4_NP	2022 10 11	8.6	7.13	1.82	847	-24.1	7.86	462	787	< 1.0	472	< 0.10	320	390	< 2.0	< 2.0	0.302	43.8	0.162	97.4	< 0.0050	0.627	< 0.0010	0.157	0.0035	0.0033	< 0.50	1.72
EV_MW_MCgwA**	EV_MW_MCGWA_WG_2022_Q1_NP	2022 02 13	6.4	7.15	0.24	787	-98.6	7.42	380	768	< 1.0	485	0.99	340	415	< 2.0	< 2.0	0.141	38.2	0.160	50.8	0.0129	0.415	0.0054	0.108	< 0.0010	0.0036	< 0.50	0.56
	EV_MW_MCGWA_WG_2022_Q2_NP	2022 04 21	7.0	6.88	0.30	781	-84.0	7.63	376	777	1.4	429	2.71	360	439	< 2.0	< 2.0	0.096	35.9	0.178	37.5	0.0068	0.537	0.0050	0.100	< 0.0010	0.0034	1.02	1.84
	EV_MW_MCGWA_WG_2022_Q3_NP	2022 07 18	8.7	7.15	0.30	785	-77.9	7.54	393	750	1.7	477	0.22	382	465	< 2.0	< 2.0	0.135	35.5	0.199	54.1	0.0130	0.339	0.0056	0.154	< 0.0010	0.0033	< 0.50	1.52
	EV_MW_MCgwA_WG_2022_Q4_NP	2022 10 03	8.7	7.01	0.08	767	-72.1	7.90	404	727	1.6	426	1.07	339	413	< 2.0	< 2.0	0.180	35.3	0.222	40.0	0.0061	0.482	0.0063	0.112	< 0.0010	0.0028	< 0.50	< 0.50
EV_MW_MCgwB**	EV_MW_MCGWB_WG_2022_Q1_NP	2022 02 13	5.0	7.10	2.54	740	244.1	7.36	359	717	1.3	404	0.18	326	398	< 2.0	< 2.0	0.074	27.4	0.140	52.2	< 0.0050	2.59	< 0.0010	0.268	0.0041	0.0053	0.70	0.80
	EV_MW_MCGWB_WG_2022_Q2_NP	2022 04 21	5.9	6.85	3.02	751	162.2	7.66	350	743	1.6	423	0.36	337	411	< 2.0	< 2.0	0.060	28.9	0.168	40.2	0.0104	2.96	< 0.0010	0.416	0.0054	0.0060	1.51	0.85
	EV_MW_MCGWB_WG_2022_Q3_NP	2022 07 18	10.1	7.17	2.00	719	89.3	7.49	358	683	1.7	442	6.28	329	402	< 2.0	< 2.0	0.077	25.1	0.198	54.9	0.0064	2.06	< 0.0010	0.203	0.0059	0.0053	0.55	0.59
	EV_MW_MCgwB_WG_2022_Q4_NP	2022 10 03	10.6	7.01	2.16	728	161.9	7.82	370	693	< 1.0	406	< 0.10	319	389	< 2.0	< 2.0	0.086	27.5	0.193	45.2	< 0.0050	1.53	0.0020	0.160	0.0022	0.0042	< 0.50	< 0.50
Sparwood Area - Elk River (Study Area 12)																													
EV_ER1gwS	EV_ER1GWS_WG_2022_Q1_NP	2022 01 30	2.9	7.50	8.55	549	198.6	7.78	253	438	< 1.0	263	0.51	214	260	< 2.0	< 2.0	< 0.050	5.06	0.184	34.1	< 0.0050	0.801	< 0.0010	0.133	< 0.0010	0.0046	< 0.50	< 0.50
	EV_MW_BC10A_WG_2022_Q1_NP	Duplicate	-	-	-	-	-	7.85	298	525	< 1.0	315	< 0.10	204	249	< 2.0	< 2.0	< 0.050	11.3	0.115	74.0	0.0228	1.60	< 0.0010	0.245	0.0032	0.0035	< 0.50	1.89
	QA/QC RPD%		-	-	-	-	-	1	16	18	*	18	*	5	4	*	*	*	76	46	74	*	67	*	*	*	*	*	*
	EV_ER1GWS_WG_2022_Q2_NP	2022 04 22	6.2	7.49	8.10	587	120.6	8.07	268	585	< 1.0	362	0.14	216	264	< 2.0	< 2.0	< 0.050	19.6	0.161	76.8	< 0.0050	1.49	< 0.0010	0.253	0.0024	0.0025	0.51	2.17
	EV_ER1GWS_WG_2022_Q3_NP	2022 08 05	9.5	7.45	6.23	510	153.4	7.67	256	494	< 1.0	324	< 0.10	222	270	< 2.0	< 2.0	< 0.050	12.3	0.147	58.8	< 0.0050	1.02	< 0.0010	0.149	< 0.0010	0.0031	< 0.50	0.87
	EV_ER1GWS_WG_2022_Q4_NP	2022 10 11	10.5	7.55	6.39	499.9	42.8	7.92	265	469	< 1.0	280	0.12	193	235	< 2.0	< 2.0	< 0.050	4.94	0.200	78.1	< 0.0050	2.07	< 0.0010	0.287	0.0033	0.0033	< 0.50	< 0.50
EV_ER1gwD	EV_ER1GWD_WG_2022_Q1_NP	2022 01 30	3.0	7.38	2.54	455.1	168.7	7.89	292	527	< 1.0	371	< 0.10	200	244	< 2.0	< 2.0	< 0.050	11.4	0.117	74.5	0.0166	1.62	< 0.0010	0.248	0.0031	0.0035	< 0.50	< 0.50
	EV_ER1GWD_WG_2022_Q2_NP	2022 04 22	6.3	7.16	2.38	455.9	59.9	8.05	221	459	1.7	245	0.51	210	256	< 2.0	< 2.0	< 0.050	5.62	0.232	36.0	< 0.0050	0.851	< 0.0010	0.235	< 0.0010	0.0024	< 0.50	1.00
	EV_ER1GWD_WG_2022_Q3_NP	2022 08 05	10.6	7.56	4.40	440.7	145.7	7.71	239	426	< 1.0	279	0.38	208	254	< 2.0	< 2.0	< 0.050	5.71	0.205	33.7	< 0.0050	0.750	< 0.0010	0.072	< 0.0010	0.0021	< 0.50	< 0.50
	EV_ER1GWD_WG_2022_Q4_NP	2022 10 11	12.1	7.45	2.44	441.1	7.3	7.87	242	403	2.1	225	0.46	209	255	< 2.0	< 2.0	< 0.050	5.20	0.229	32.6	< 0.0050	0.759	< 0.0010	0.070	< 0.0010	0.0024	< 0.50	< 0.50

All terms defined within the body of SNC-Lavalin's report.

<   Denotes concentration less than indicated detection limit.

-    Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

*   RPDs are not calculated where one or more concentrations are less than five times RDL.

RDL Denotes reported detection limit.

BLUE	Concentration greater than BCWQG Aquatic Life Long-term Average guideline and/or BCWQG Aquatic Life Short-term Maximum guideline
BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Guideline to protect freshwater aquatic life, long-term average (i.e. "chronic") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[c] Guideline to protect freshwater aquatic life, short-term maximum (i.e. "acute") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[d] Guideline varies with background concentration.

[e] Standard/guideline varies with Hardness.

[f] Standard/guideline varies with pH and Temperature. Temperature assumed 10C CSR, 15C BCWQG.

[g] Standard/guideline varies with Chloride.

[h] Monitoring wells within 10m of high watermark, samples compared to CSR and BCWQG.

TABLE EV-03: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Organics, Nutrient and Organics in Groundwater (EVO)

			Field Parameters					Physical Parameters						Dissolved Inorganics								Nutrients						Organics	
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Field Temperature C	pH (field) pH	Dissolved Oxygen mg/L	Field Conductivity µS/cm	Field ORP mV	pH pH	Hardness mg/L	Conductivity µS/cm	Total Suspended Solids mg/L	Total Dissolved Solids mg/L	Turbidity ntu	Total Alkalinity mg/L	Bicarbonate mg/L	Carbonate mg/L	Hydroxide mg/L	Bromide mg/L	Chloride mg/L	Fluoride mg/L	Sulphate mg/L	Ammonia Nitrogen mg/L	Nitrate Nitrogen mg/L	Nitrite Nitrogen mg/L	Kjeldahl Nitrogen-N mg/L	Ortho-Phosphate mg/L	Phosphorus, Total mg/L	Total Organic Carbon mg/L	Dissolved Organic Carbon mg/L
BC Standard																													
CSR Aquatic Life (AW)[a]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,500	2-3[e]	1,280-4,290[e]	1.31-18.5[f]	400	0.2-2[g]	n/a	n/a	n/a	n/a	n/a
CSR Irrigation Watering (IW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSR Livestock Watering (LW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	1	1,000	n/a	100	10	n/a	n/a	n/a	n/a	n/a
CSR Drinking Water (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	250	1.5	500	n/a	10	1	n/a	n/a	n/a	n/a	n/a
BC Guideline																													
BCWQG Aquatic Life Long-Term Average (AW)[b]			n/a	6.5-9.0	n/a	n/a	n/a	6.5-9.0	n/a	n/a	n/a[d]	n/a	n/a[d]	n/a	n/a	n/a	n/a	n/a	150	n/a	309-429[f]	0.135-1.77[f]	3	0.04[g]	n/a	n/a	n/a	n/a	n/a
BCWQG Aquatic Life Short-Term Average (AW)[c]			n/a	6.5-9.0	n/a	n/a	n/a	6.5-9.0	n/a	n/a	n/a[d]	n/a	n/a[d]	n/a	n/a	n/a	n/a	n/a	600	1.42-1.87[e]	n/a	0.7-24.5[f]	32.8	0.12[g]	n/a	n/a	n/a	n/a	n/a
Sparwood Area - Elk River (Study Area 12)																													
RG_DW-03-04	RG_DW-03-04_WP_2022_02_14_NP	2022 02 14	7.8	7.68	8.35	498.7	124.5	8.03	236	483	< 1.0	311	< 0.10	176	215	< 1.0	< 1.0	< 0.050	9.81	0.146	83.2	< 0.0050	0.634	< 0.0010	0.077	< 0.0010	0.0033	0.59	0.58
	RG_DW-03-04_WP_2022_04_20_NP	2022 04 20	7.1	7.72	8.70	555	161.9	8.00	270	551	< 1.0	331	< 0.10	188	229	< 1.0	< 1.0	< 0.050	13.6	0.148	104	< 0.0050	0.762	0.0011	0.112	0.0018	0.0024	< 0.50	< 0.50
	RG_DW-03-04_WP_2022_07_19_NP	2022 07 19	5.6	7.74	8.60	433.0	168.7	6.82	224	419	< 1.0	272	< 0.10	205	250	< 1.0	< 1.0	< 0.050	10.7	0.154	55.2	< 0.0050	0.469	< 0.0010	< 0.050	< 0.0010	0.0030	< 0.50	< 0.50
	RG_DW-03-04_WP_2022_10_11_NP	2022 10 11	5.5	7.68	6.02	526	156.1	8.18	270	507	< 1.0	280	< 0.10	181	221	< 1.0	< 1.0	< 0.050	10.0	0.140	88.4	< 0.0050	0.888	< 0.0010	< 0.500	0.0023	0.0021	< 0.50	< 0.50
RG_MW-03-04	RG_MW-03-04_WG_2022_Q1_NP	2022 03 08	3.6	7.62	9.01	577	146.5	7.89	294	557	2.4	368	1.59	192	234	< 2.0	< 2.0	< 0.050	8.02	0.103	120	< 0.0050	0.734	< 0.0010	0.101	0.0042	0.0052	0.84	0.90
	RG_MW-03-04_WG_2022_Q2_NP	2022 05 15	6.3	7.57	7.59	484.0	171.3	7.93	243	468	< 1.0	274	0.59	174	213	< 2.0	< 2.0	< 0.050	8.03	0.122	74.5	< 0.0050	0.633	< 0.0010	0.073	< 0.0010	0.0045	1.37	2.40
	RG_MW-03-04_WG_2022_Q3_NP	2022 08 18	10.9	7.56	4.11	515	133.6	8.27	260	505	< 1.0	288	0.35	192	234	< 1.0	< 1.0	< 0.050	9.48	0.125	80.3	< 0.0050	0.869	< 0.0010	< 0.500	0.0043	0.0081	< 0.50	1.88
	RG_MW-03-04_WG_2022_Q4_NP	2022 10 24	6.9	7.33	3.82	606	146.3	7.77	327	578	< 1.0	336	0.11	260	317	< 2.0	< 2.0	< 0.050	10.9	0.137	109	< 0.0050	0.991	< 0.0010	< 0.500	0.0010	0.0040	-	< 0.50
	RG_MW-03-04_WG_2022-12-12_NP	2022 12 12	7.4	7.51	6.27	640	119.1	7.89	345	616	9.2	404	0.18	215	262	< 1.0	< 1.0	< 0.050	9.82	0.130	126	< 0.0050	0.936	< 0.0010	0.098	0.0012	0.0046	< 0.50	< 0.50
EV_MW_MC3	EV_MW_MC3_WG_2022_Q1_NP	2022 03 09	3.2	7.27	4.39	831	93.2	8.12	411	811	1.6	540	0.31	250	305	< 2.0	< 2.0	0.198	25.0	0.154	188	< 0.0050	2.12	0.0180	0.269	< 0.0010	0.0047	< 0.50	0.73
	EV_MW_MC3_WG_2022_Q2_NP	2022 05 15	8.7	7.09	3.20	908	165.5	7.86	412	866	< 1.0	547	0.21	277	338	< 2.0	< 2.0	0.153	40.2	0.232	146	0.0109	1.76	0.0140	0.372	< 0.0010	0.0046	0.89	1.28
	EV_MW_MC3_WG_2022_Q3_NP	2022 08 17	17.0	7.12	2.94	841	101.9	7.64	415	801	2.2	560	0.31	259	316	< 2.0	< 2.0	0.180	29.0	0.183	159	< 0.0050	1.76	0.0040	0.126	0.0012	0.0043	0.65	2.67
	EV_MW_MC3_WG_2022_Q4_NP	2022 10 17	9.6	7.54	0.27	697	47.4	7.83	191	654	< 1.0	392	0.61	332	405	< 2.0	< 2.0	0.105	12.0	0.805	58.6	0.0486	0.103	0.0830	< 0.500	0.0016	0.0068	< 0.50	0.87
Michel Creek Downstream of Gate Creek and Bodie Creek - Gate Creek and Bodie Creek (+ denotes well part of Study Area 9b)																													
EV_MW_GT1A^{+}	EV_MW_GT1A_WG_2022_Q1_NP	2022 01 21	5.0	7.59	0.34	531	-119.7	8.09	272	500	< 1.0	328	0.94	148	181	< 2.0	< 2.0	< 0.050	2.04	0.121	108	0.0864	< 0.0050	< 0.0010	0.201	0.0045	0.0106	0.57	0.65
	EV_MW_GT1A_WG_2022_Q2_NP	2022 04 22	5.9	7.43	0.46	511	-131.4	8.12	251	514	< 1.0	312	1.05	177	216	< 2.0	< 2.0	< 0.050	2.19	0.157	104	0.0807	< 0.0050	< 0.0010	0.115	0.0032	0.0092	0.67	1.31
	EV_MW_GT1A_WG_2022_Q3_NP	2022 07 15	11.7	7.77	0.09	508	-130.4	7.07	255	484	< 1.0	340	0.81	208	254	< 2.0	< 2.0	< 0.050	2.25	0.175	102	0.0979	0.0051	< 0.0010	0.127	0.0069	0.0090	< 0.50	< 0.50
	EV_MW_GT1A_WG_2022_Q4_NP	2022 10 03	9.6	7.64	0.14	501	-177.1	8.16	263	480	< 1.0	308	0.44	189	231	< 2.0	< 2.0	< 0.050	2.40	0.162	92.7	0.103	0.0738	< 0.0010	0.143	0.0046	0.0092	< 0.50	< 0.50
EV_MW_GT1B^{+}	EV_MW_GT1B_WG_2022_Q1_NP	2022 01 21	1.3	7.83	10.47	1,461	250.9	8.10	812	1,350	< 1.0	1,100	0.24	172	210	< 2.0	< 2.0	< 0.250	2.26	0.139	629	0.0050	7.32	< 0.0050	0.363	0.0096	0.0098	1.37	2.35
	EV_MW_GT1B_WG_2022_Q2_NP	2022 04 22	4.3	7.77	8.67	1,859	111.7	8.11	1,130	1,810	3.1	1,490	1.65	299	365	< 2.0	< 2.0	< 0.250	11.9	0.239	868	< 0.0050	10.5	< 0.0050	0.092	0.0096	0.0118	1.47	1.35
	EV_MW_GT1B_WG_2022_Q3_NP	2022 07 15	13.3	7.62	5.27	1,401	134.7	7.52	816	1,330	1.5	1,100	0.32	292	357	< 2.0	< 2.0	0.225	9.38	0.192	598	< 0.0050	5.38	< 0.0010	< 0.050	0.0112	0.0112	< 0.50	< 0.50
	EV_MW_GT1B_WG_2022_Q4_NP	2022 10 03	12.3	7.41	4.53	1,624	175.6	8.05	1,020	1,540	< 1.0	1,280	0.25	291	354	< 2.0	< 2.0	0.302	10.9	0.227	705	< 0.0050	7.42	< 0.0050	0.716	0.0068	0.0082	< 0.50	< 0.50
EV_MW_BC1A^{+}	EV_MW_BC1A_WG_2022_Q1_NP	2022 02 24	4.7	7.19	4.30	2,053	112.0	8.08	1,300	1,970	3.9	1,760	2.90	296	360	< 2.0	< 2.0	< 0.250	33.7	0.201	903	< 0.0050	22.5	0.0073	< 0.050	0.0217	0.0245	< 0.50	1.16
	EV_MW_MC10A_WG_2022_Q1_NP	Duplicate	-	-	-	-	-	8.08	1,250	1,980	3.4	1,350	2.39	295	360	< 2.0	< 2.0	< 0.250	33.9	0.200	901	< 0.0050	22.8	< 0.0050	< 0.050	0.0230	0.0235	< 0.50	< 0.50
	QA/QC RPD%		-	-	-	-	-	0	4	1	*	26	19	0	0	*	*	*	1	0	0	*	1	*	*	6	4	*	*
	EV_MW_BC1A_WG_2022_Q2_NP	2022 05 01	7.8	7.12	3.75	1,948	117.9	7.73	1,160	1,880	5.7	1,570	3.83	310	378	< 2.0	< 2.0	0.324	31.3	0.204	831	< 0.0050	17.3	< 0.0050	< 0.050	0.0220	0.0246	0.86	1.29
	EV_MW_MC10A_WG_2022_Q2_NP	Duplicate	-	-	-	-	-	7.74	1,190	1,880	4.8	1,660	3.48	309	377	< 2.0	< 2.0	0.298	31.4	0.221	843	< 0.0050	17.5	< 0.0050	< 0.050	0.0218	0.0235	0.71	2.03
	QA/QC RPD%		-	-	-	-	-	0	3	0	*	6	10	0	0	*	*	8	0	8	1	*	1	*	*	1	5	*	*
	EV_MW_BC1A_WG_2022_Q3_NP	2022 07 14	10.5	7.05	5.64	1,850	120.1	7.83	1,130	1,770	2.2	1,560	1.55	315	385	< 2.0	< 2.0	0.251	29.3	0.277	766	< 0.0050	11.7	< 0.0050	< 0.050	0.0243	0.0260	< 0.50	19.8
	EV_MW_BC1A_WG_2022_Q4_NP	2022 10 03	9.6	7.05	1.29	1,817	105.7	7.77	1,130	1,710	5.1	1,440	3.28	318	388	< 2.0	< 2.0	0.497	32.5	0.244	746	< 0.0050	10.6	< 0.0050	1.22	0.0207	0.0245	< 0.50	< 0.50
EV_MW_BC1B^{+}	EV_MW_BC1B_WG_2022_Q1_NP	2022 02 11	4.4	7.22	8.21	2,163	184.2	7.68	1,370	2,030	1.2	1,730	0.89	295	360	< 2.0	< 2.0	< 0.250	28.8	0.356	995	< 0.0050	22.7	< 0.0050	0.187	0.0210	0.0390	0.77	0.99
	EV_MW_BC1B_WG_2022_Q2_NP	2022 04 24	7.8	7.24	7.60	2,011	172.8	7.75	1,160	1,920	2.2	1,600	0.17	319	389	< 2.0	< 2.0	0.310	31.6	0.276	880	< 0.0050	15.2	< 0.0050	< 0.050	0.0343	0.0334	0.94	1.18
	EV_MW_BC1B_WG_2022_Q3_NP	2022 07 14	15.0	7.01	6.81	1,884	173.9	7.76	1,100	1,810	1.7	1,560	< 0.10	373	455	< 2.0	< 2.0	< 0.250	35.3	0.287	774	< 0.0050	8.89	< 0.0050	< 0.050	0.0380	0.0354	< 0.50	< 0.50
	EV_MW_BC1B_WG_2022_Q4_NP	2022 10 03	13.3	6.87	6.97	1,918	192.9	7.66	1,200	1,820	1.8	1,500	0.32	347	423	< 2.0	< 2.0	0.855	48.8	0.330	849	< 0.0050	8.51	< 0.0050	< 0.050	0.0324	0.0300	< 0.50	1.73

All terms defined within the body of SNC-Lavalin's report.

<	Denotes concentration less than indicated detection limit.
-	Denotes analysis not conducted.
n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL	Denotes reported detection limit.

BLUE	Concentration greater than BCWQG Aquatic Life Long-term Average guideline and/or BCWQG Aquatic Life Short-term Maximum guideline
BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

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[a] Standard to protect freshwater aquatic life.

[b] Guideline to protect freshwater aquatic life, long-term average (i.e. "chronic") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[c] Guideline to protect freshwater aquatic life, short-term maximum (i.e. "acute") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[d] Guideline varies with background concentration.

[e] Standard/guideline varies with Hardness.

[f] Standard/guideline varies with pH and Temperature. Temperature assumed 10C CSR, 15C BCWQG.

[g] Standard/guideline varies with Chloride.

[h] Monitoring wells within 10m of high watermark, samples compared to CSR and BCWQG.

TABLE EV-03: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Organics, Nutrient and Organics in Groundwater (EVO)

			Field Parameters					Physical Parameters						Dissolved Inorganics								Nutrients						Organics	
Sample Location	**Sample ID**	**Sample Date**	**Field Temperature**	**pH (field)**	**Dissolved Oxygen**	**Field Conductivity**	**Field ORP**	**pH**	**Hardness**	**Conductivity**	**Total Suspended Solids**	**Total Dissolved Solids**	**Turbidity**	**Total Alkalinity**	**Bicarbonate**	**Carbonate**	**Hydroxide**	**Bromide**	**Chloride**	**Fluoride**	**Sulphate**	**Ammonia Nitrogen**	**Nitrate Nitrogen**	**Nitrite Nitrogen**	**Kjeldahl Nitrogen-N**	**Ortho-Phosphate**	**Phosphorus, Total**	**Total Organic Carbon**	**Dissolved Organic Carbon**
		(yyyy mm dd)	**C**	**pH**	**mg/L**	**µS/cm**	**mV**	**pH**	**mg/L**	**µS/cm**	**mg/L**	**mg/L**	**ntu**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**
BC Standard																													
CSR Aquatic Life (AW)[a]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,500	2-3[e]	1,280-4,290[e]	1.31-18.5[f]	400	0.2-2[g]	n/a	n/a	n/a	n/a	n/a
CSR Irrigation Watering (IW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSR Livestock Watering (LW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	1	1,000	n/a	100	10	n/a	n/a	n/a	n/a	n/a
CSR Drinking Water (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	250	1.5	500	n/a	10	1	n/a	n/a	n/a	n/a	n/a
BC Guideline																													
BCWQG Aquatic Life Long-Term Average (AW)[b]			n/a	6.5-9.0	n/a	n/a	n/a	6.5-9.0	n/a	n/a	n/a[d]	n/a	n/a[d]	n/a	n/a	n/a	n/a	n/a	150	n/a	309-429[f]	0.135-1.77[f]	3	0.04[g]	n/a	n/a	n/a	n/a	n/a
BCWQG Aquatic Life Short-Term Average (AW)[c]			n/a	6.5-9.0	n/a	n/a	n/a	6.5-9.0	n/a	n/a	n/a[d]	n/a	n/a[d]	n/a	n/a	n/a	n/a	n/a	600	1.42-1.87[e]	n/a	0.7-24.5[f]	32.8	0.12[g]	n/a	n/a	n/a	n/a	n/a
Michel Creek Downstream of Gate Creek and Bodie Creek - Gate Creek and Bodie Creek (+ denotes well part of Study Area 9b)																													
EV_MW_BC2	EV_MW_BC2_WG_2022_Q1_NP	2022 03 06	5.1	7.02	0.51	1,430	47.5	7.84	812	1,380	10.0	1,030	8.20	340	414	< 1.0	< 1.0	< 0.250	25.8	0.127	468	< 0.0050	8.60	0.0451	0.349	0.0026	0.0244	0.80	2.08
	EV_MW_BC2_WG_2022_Q2_NP	2022 05 19	8.0	7.08	0.47	1,410	65.6	7.63	820	1,340	62.0	1,030	8.99	354	432	< 2.0	< 2.0	< 0.250	27.8	0.112	421	0.0074	7.74	0.0695	< 0.050	0.0027	0.0418	0.76	0.92
	EV_MW_BC2_WG_2022_Q3_NP	2022 08 22	18.8	7.05	0.39	1,282	122.5	7.85	667	1,250	14.8	958	6.51	404	493	< 2.0	< 2.0	< 0.250	29.8	0.148	353	< 0.0050	3.12	0.0439	0.284	0.0012	0.0195	0.88	3.24
	EV_MW_BC2_WG_2022_Q4_NP	2022 10 25	5.3	6.98	0.44	1,173	128.4	7.91	677	1,060	5.3	787	2.44	380	463	< 2.0	< 2.0	< 0.250	32.0	0.145	285	< 0.0050	1.93	0.0470	< 0.500	< 0.0010	0.0049	< 0.50	< 0.50
EV_MW_BC3	EV_MW_BC3_WG_2022_Q1_NP	2022 03 23	8.5	7.16	9.21	1,210	188.4	7.47	652	1,170	8.3	838	6.60	377	460	< 2.0	< 2.0	< 0.250	23.4	0.246	299	< 0.0050	5.08	< 0.0050	0.515	0.0381	0.0481	1.03	1.83
	EV_MW_BC3_WG_2022_Q2_NP	2022 05 31	9.1	7.16	9.12	1,504	218.7	7.73	908	1,380	4.7	1,130	1.59	405	494	< 2.0	< 2.0	< 0.250	28.0	0.294	537	< 0.0050	5.36	0.0053	0.330	0.0412	0.0438	< 0.50	2.88
	EV_MW_BC3_WG_2022_Q3_NP	2022 09 20	13.0	6.97	8.01	1,968	151.2	7.69	1,300	1,840	46.6	1,540	29.3	378	462	< 2.0	< 2.0	0.344	16.3	0.318	859	< 0.0050	7.83	< 0.0050	0.554	0.0410	0.0651	0.90	1.10
	EV_MW_BC3_WG_2022_Q4_NP	2022 11 13	6.9	7.16	9.43	1,692	166.8	7.63	1,070	1,570	3.5	1,280	1.02	398	486	< 2.0	< 2.0	< 0.250	22.0	0.297	633	< 0.0050	7.99	< 0.0050	0.239	0.0438	0.0415	0.87	0.66
	EV_EC5GW_WG_2022_Q4_NP	Duplicate	-	-	-	-	-	7.67	1,070	1,570	3.7	1,360	1.05	390	475	< 2.0	< 2.0	0.252	22.4	0.322	639	< 0.0050	7.69	< 0.0050	0.286	0.0429	0.0395	1.11	0.84
	QA/QC RPD%		-	-	-	-	-	1	0	0	*	6	3	2	2	*	*	*	2	8	1	*	4	*	*	2	5	*	*
EV_RCSgw[+]	EV_RCSGW_WG_2022_Q1_NP	2022 02 13	11.6	7.03	7.29	2,371	90.4	7.26	1,520	2,250	1.9	2,110	0.21	278	339	< 2.0	< 2.0	< 0.250	6.90	0.132	1,230	0.0208	25.1	0.0060	0.356	0.0032	0.0047	0.92	0.99
	EV_RCSGW_WG_2022_Q2_NP	2022 04 28	8.3	7.18	8.05	2,421	149.3	8.01	1,540	2,310	3.1	2,020	0.14	264	322	< 2.0	< 2.0	< 0.250	15.3	0.183	1,220	< 0.0050	27.3	0.0559	< 0.050	0.0038	0.0052	1.45	1.29
	EV_RCSGW_WG_2022_Q3_NP	2022 08 07	9.3	7.08	7.81	2,405	162.4	8.02	1,630	2,280	1.5	2,080	0.19	277	338	< 2.0	< 2.0	< 0.250	8.36	0.180	1,240	< 0.0050	25.5	< 0.0050	1.62	< 0.0010	0.0045	1.36	1.13
	EV_RCSGW_WG_2022_Q4_NP	2022 10 12	8.6	7.00	6.84	2,491	131.1	7.15	1,680	2,200	2.2	1,980	0.34	288	352	< 2.0	< 2.0	< 0.250	9.03	0.174	1,290	< 0.0050	26.2	0.0054	3.84	0.0056	0.0063	0.70	0.76
EV_BCgw[+]	EV_BCGW_WG_2022_Q1_NP	2022 03 08	4.4	7.47	3.51	587	140.5	7.86	316	573	1.0	386	0.22	182	222	< 2.0	< 2.0	< 0.050	3.43	0.130	138	< 0.0050	1.41	< 0.0010	0.236	0.0046	0.0039	< 0.50	0.84
	EV_BCGW_WG_2022_Q2_NP	2022 05 08	6.2	7.35	4.12	716	148.8	8.07	350	697	1.4	479	0.37	194	237	< 2.0	< 2.0	< 0.050	5.17	0.122	182	< 0.0050	1.95	< 0.0010	0.244	0.0035	0.0048	0.53	0.60
	EV_BCGW_WG_2022_Q3_NP	2022 07 18	7.5	7.45	3.32	695	113.2	7.74	378	689	1.8	523	0.23	197	240	< 2.0	< 2.0	0.052	5.31	0.158	195	< 0.0050	2.07	0.0010	0.194	0.0016	0.0038	< 0.50	< 0.50
	EV_BCGW_WG_2022_Q4_NP	2022 10 12	7.3	7.50	2.60	719	105.7	7.76	383	671	1.2	437	0.62	199	243	< 2.0	< 2.0	< 0.050	4.65	0.153	198	< 0.0050	1.99	< 0.0010	0.261	0.0036	0.0045	< 0.50	0.61
EV_WH50gw[+]	EV_WH50GW_WG_2022_Q1_NP	2022 03 04	3.5	7.69	10.33	536	103.9	8.02	282	490	2.7	334	3.22	176	215	< 2.0	< 2.0	< 0.050	2.39	0.093	123	0.0167	0.539	< 0.0010	0.117	< 0.0010	0.0155	< 0.50	0.89
	EV_EC5GW_WG_2022_Q1_NP	Duplicate	-	-	-	-	-	8.08	273	498	6.3	334	10.6	175	214	< 2.0	< 2.0	< 0.050	2.43	0.095	123	< 0.0050	0.540	< 0.0010	0.064	< 0.0010	0.0180	0.63	1.57
	QA/QC RPD%		-	-	-	-	-	1	3	2	*	0	107	1	0	*	*	*	2	*	0	*	0	*	*	*	15	*	*
	EV_WH50GW_WG_2022_Q2_NP	2022 05 08	3.0	7.60	8.71	438.0	115.4	8.19	207	423	< 1.0	279	1.10	157	191	< 2.0	< 2.0	< 0.050	2.22	0.105	71.9	0.0073	0.599	< 0.0010	0.159	0.0042	0.0079	1.57	2.27
	EV_WH50GW_WG_2022_Q3_NP	2022 08 04	8.6	7.87	4.81	419.8	111.7	8.19	247	405	1.4	273	1.38	157	191	< 2.0	< 2.0	< 0.050	1.21	0.119	69.7	< 0.0050	0.687	< 0.0010	< 0.050	0.0046	0.0088	< 0.50	< 0.50
	EV_MW_BC10A_WG_2022_Q3_NP	Duplicate	-	-	-	-	-	8.25	232	404	< 1.0	280	1.59	155	189	< 2.0	< 2.0	< 0.050	1.20	0.126	69.2	0.0058	0.683	< 0.0010	0.240	0.0058	0.0071	< 0.50	< 0.50
	QA/QC RPD%		-	-	-	-	-	1	6	0	*	3	14	1	1	*	*	*	1	6	1	*	1	*	*	*	*	*	*
	EV_WH50GW_WG_2022_Q4_NP	2022 10 04	11.4	7.85	1.99	585	39.5	8.11	298	550	3.4	380	11.9	179	218	< 2.0	< 2.0	< 0.050	2.28	0.135	138	0.0101	1.38	< 0.0010	0.160	< 0.0010	0.0147	0.54	0.82
	EV_MW_BC10A_WG_2022_Q4_NP	Duplicate	-	-	-	-	-	8.06	302	550	3.8	382	11.5	316	385	< 2.0	< 2.0	< 0.050	2.27	0.133	137	0.0191	1.38	< 0.0010	0.163	0.0020	0.0162	0.54	2.44
	QA/QC RPD%		-	-	-	-	-	1	1	0	*	1	3	55	55	*	*	*	0	1	1	*	0	*	*	*	10	*	*
Michel Creek Downstream of Gate Creek and Bodie Creek - Michel Creek Valley Bottom (+ denotes well part of Study Area 9b)																													
EV_BRgw[+]	EV_BRGW_WG_2022_Q1_NP	2022 03 06	7.0	7.01	1.58	1,060	73.4	7.83	582	1,080	< 1.0	764	0.36	268	327	< 1.0	< 1.0	0.324	18.4	0.104	329	< 0.0050	4.20	< 0.0050	0.261	< 0.0010	0.0032	< 0.50	1.98
	EV_BRGW_WG_2022_Q2_NP	2022 05 08	7.0	7.08	1.46	1,061	89.5	8.13	547	1,020	1.3	773	0.54	264	322	< 2.0	< 2.0	< 0.250	18.4	0.105	313	< 0.0050	3.12	< 0.0050	0.349	0.0014	0.0030	< 0.50	1.23
	EV_BRGW_WG_2022_Q3_NP	2022 08 04	8.5	7.24	2.55	1,108	78.7	8.02	673	1,060	< 1.0	810	0.16	247	301	< 2.0	< 2.0	< 0.250	18.7	0.113	345	< 0.0050	5.78	< 0.0050	0.266	0.0018	0.0022	< 0.50	< 0.50
	EV_BRGW_WG_2022_Q4_NP	2022 10 04	8.7	7.01	1.69	1,107	102.0	7.72	610	1,040	4.2	794	1.82	271	330	< 2.0	< 2.0	< 0.250	18.2	0.125	351	< 0.0050	5.00	< 0.0050	< 0.050	< 0.0010	0.0026	< 0.50	0.88

All terms defined within the body of SNC-Lavalin's report.

<   Denotes concentration less than indicated detection limit.

-    Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

*   RPDs are not calculated where one or more concentrations are less than five times RDL.

RDL Denotes reported detection limit.

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BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Guideline to protect freshwater aquatic life, long-term average (i.e. "chronic") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[c] Guideline to protect freshwater aquatic life, short-term maximum (i.e. "acute") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[d] Guideline varies with background concentration.

[e] Standard/guideline varies with Hardness.

[f] Standard/guideline varies with pH and Temperature. Temperature assumed 10C CSR, 15C BCWQG.

[g] Standard/guideline varies with Chloride.

[h] Monitoring wells within 10m of high watermark, samples compared to CSR and BCWQG.

TABLE EV-03: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Organics, Nutrient and Organics in Groundwater (EVO)

			Field Parameters					Physical Parameters						Dissolved Inorganics								Nutrients						Organics	
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Field Temperature	pH (field)	Dissolved Oxygen	Field Conductivity	Field ORP	pH	Hardness	Conductivity	Total Suspended Solids	Total Dissolved Solids	Turbidity	Total Alkalinity	Bicarbonate	Carbonate	Hydroxide	Bromide	Chloride	Fluoride	Sulphate	Ammonia Nitrogen	Nitrate Nitrogen	Nitrite Nitrogen	Kjeldahl Nitrogen-N	Ortho-Phosphate	Phosphorus, Total	Total Organic Carbon	Dissolved Organic Carbon
			C	pH	mg/L	µS/cm	mV	pH	mg/L	µS/cm	mg/L	mg/L	ntu	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
BC Standard																													
CSR Aquatic Life (AW)[a]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,500	2-3[e]	1,280-4,290[e]	1.31-18.5[f]	400	0.2-2[g]	n/a	n/a	n/a	n/a	n/a
CSR Irrigation Watering (IW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSR Livestock Watering (LW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	1	1,000	n/a	100	10	n/a	n/a	n/a	n/a	n/a
CSR Drinking Water (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	250	1.5	500	n/a	10	1	n/a	n/a	n/a	n/a	n/a
BC Guideline																													
BCWQG Aquatic Life Long-Term Average (AW)[b]			n/a	6.5-9.0	n/a	n/a	n/a	6.5-9.0	n/a	n/a	n/a[d]	n/a	n/a[d]	n/a	n/a	n/a	n/a	n/a	150	n/a	309-429[f]	0.135-1.77[f]	3	0.04[g]	n/a	n/a	n/a	n/a	n/a
BCWQG Aquatic Life Short-Term Average (AW)[c]			n/a	6.5-9.0	n/a	n/a	n/a	6.5-9.0	n/a	n/a	n/a[d]	n/a	n/a[d]	n/a	n/a	n/a	n/a	n/a	600	1.42-1.87[e]	n/a	0.7-24.5[f]	32.8	0.12[g]	n/a	n/a	n/a	n/a	n/a
Michel Creek Downstream of Gate Creek and Bodie Creek - Michel Creek Valley Bottom (+ denotes well part of Study Area 9b)																													
EV_HW1+	EV_HW1_WG_2022_Q1_NP	2022 01 27	5.8	7.35	7.10	1,182	226.4	7.95	646	1,120	< 1.0	744	< 0.10	259	316	< 2.0	< 2.0	0.342	35.7	< 0.100	320	0.0216	6.29	< 0.0050	< 0.050	0.0025	0.0032	< 0.50	< 0.50
	EV_HW1_WG_2022_Q2_NP	2022 05 20	7.4	7.32	7.94	1,197	227.7	7.74	678	1,130	1.7	845	< 0.10	259	315	< 2.0	< 2.0	0.261	41.0	0.126	347	< 0.0050	6.28	0.0059	0.289	0.0040	0.0043	0.51	0.54
	EV_HW1_WG_2022_Q3_NP	2022 09 14	14.9	6.99	3.15	1,186	188.1	7.51	617	1,160	< 1.0	861	0.15	303	370	< 2.0	< 2.0	0.271	46.8	0.146	320	< 0.0050	5.08	< 0.0050	0.374	< 0.0010	0.0027	< 0.50	< 0.50
	EV_HW1_WG_2022_Q4_NP	2022 10 27	12.6	7.07	4.05	1,191	205.1	7.93	690	1,110	< 1.0	828	< 0.10	268	327	< 2.0	< 2.0	< 0.250	30.0	0.146	385	< 0.0050	5.95	< 0.0050	0.312	< 0.0010	0.0027	< 0.50	< 0.50
	EV_HW1_WG_2022-12-19_NP	2022 12 19	7.3	7.24	4.79	1,172	234.3	7.58	592	1,140	2.6	867	< 0.10	244	298	< 1.0	< 1.0	0.251	27.1	0.148	377	0.0078	5.38	< 0.0050	1.02	< 0.0010	0.0024	< 0.50	< 0.50
EV_MW_MC1A	EV_MW_MC1A_WG_2022_Q1_NP	2022 01 27	5.4	7.23	0.24	910	-70.2	7.95	415	870	1.4	464	10.6	366	447	< 2.0	< 2.0	0.454	67.4	0.191	5.71	1.47	0.209	< 0.0050	1.58	0.0015	0.0120	1.34	1.46
	EV_MW_MC1A_WG_2022_Q2_NP	2022 04 21	7.6	6.94	0.32	932	-73.1	7.69	396	906	1.1	500	10.2	357	435	< 2.0	< 2.0	0.651	100	0.291	2.23	1.38	< 0.0250	< 0.0050	1.51	0.0015	0.0123	2.00	3.18
	EV_MW_MC1A_WG_2022_Q3_NP	2022 08 04	9.8	7.19	0.22	978	-58.1	8.08	477	928	2.4	599	9.25	351	428	< 2.0	< 2.0	0.816	*108*	0.335	9.56	1.44	0.101	< 0.0050	1.39	< 0.0010	0.0117	0.92	0.94
	EV_MW_MC1A_WG_2022_Q4_NP	2022 10 04	8.3	6.96	0.12	978	-55.0	7.81	442	897	1.6	546	4.02	381	465	< 2.0	< 2.0	1.02	*107*	0.354	6.45	1.46	0.119	< 0.0050	1.30	< 0.0010	0.0104	1.31	1.56
EV_MW_MC1B	EV_MW_MC1B_WG_2022_Q1_NP	2022 01 27	6.1	7.07	0.22	1,338	-99.1	7.68	636	1,240	29.6	701	128	399	486	< 2.0	< 2.0	1.44	*141*	0.129	104	0.273	0.109	< 0.0050	0.392	< 0.0010	0.0282	2.86	2.84
	EV_MW_MC1B_WG_2022_Q2_NP	2022 04 21	6.6	6.64	0.31	1,425	-109.4	7.34	621	1,350	24.9	790	157	377	460	< 2.0	< 2.0	1.15	*172*	0.154	122	0.230	0.0929	< 0.0050	0.338	< 0.0010	0.0103	2.37	4.41
	EV_MW_MC1B_WG_2022_Q3_NP	2022 08 04	10.8	7.06	0.05	1,141	-105.4	7.72	582	1,060	27.2	669	171	362	441	< 2.0	< 2.0	0.804	*107*	0.206	83.4	0.260	< 0.0250	< 0.0050	0.324	< 0.0010	0.0151	2.45	2.44
	EV_MW_MC1B_WG_2022_Q4_NP	2022 10 04	10.3	6.89	0.07	1,004	-111.7	7.55	455	906	23.3	562	164	362	441	< 2.0	< 2.0	0.807	85.4	0.252	51.1	0.278	< 0.0250	< 0.0050	0.281	< 0.0010	0.0119	2.55	4.06
EV_MW_MC2A+	EV_MW_MC2A_WG_2022_Q1_NP	2022 03 04	5.1	7.23	0.33	952	-105.6	7.89	403	871	2.1	476	13.6	407	496	< 2.0	< 2.0	< 0.050	89.7	0.226	< 0.30	0.843	< 0.0050	< 0.0010	0.859	< 0.0010	0.0107	< 0.50	< 0.50
	EV_MW_MC2A_WG_2022_Q2_NP	2022 05 15	8.2	7.16	0.27	952	-102.5	7.85	399	914	9.2	507	19.8	399	487	< 2.0	< 2.0	< 0.050	85.6	0.257	< 0.30	0.826	< 0.0050	< 0.0010	0.954	< 0.0010	0.0212	< 0.50	< 0.50
	EV_EC5GW_WG_2022_Q2_NP	Duplicate	-	-	-	-	-	7.81	411	920	4.1	492	24.7	416	508	< 2.0	< 2.0	< 0.050	87.2	0.264	< 0.30	0.832	< 0.0050	< 0.0010	0.976	< 0.0010	0.0198	< 0.50	< 0.50
	QA/QC RPD%		-	-	-	-	-	1	3	1	*	3	22	4	4	*	*	*	2	3	*	1	*	*	2	*	7	*	*
	EV_MW_MC2A_WG_2022_Q3_NP	2022 08 17	9.2	7.19	0.11	944	-101.0	7.65	436	909	4.6	510	18.3	430	524	< 2.0	< 2.0	0.054	86.0	0.291	< 0.30	0.903	0.0060	< 0.0010	0.945	< 0.0010	0.0159	< 0.50	< 0.50
	EV_MW_MC2A_WG_2022_Q4_NP	2022 10 26	6.7	7.04	0.28	935	-98.4	7.88	419	866	4.6	476	28.3	406	495	< 2.0	< 2.0	0.053	80.4	0.267	< 0.30	0.869	< 0.0050	< 0.0010	0.681	< 0.0010	0.0081	< 0.50	1.71
EV_MW_MC2B+	EV_MW_MC2B_WG_2022_Q1_NP	2022 02 25	0.3	7.11	2.35	1,225	153.3	7.67	632	1,120	< 1.0	830	< 0.10	255	311	< 2.0	< 2.0	0.274	37.5	0.116	364	0.0066	6.71	< 0.0050	0.240	0.0022	0.0029	2.78	2.04
	EV_MW_MC2B_WG_2022_Q2_NP	2022 05 15	8.1	7.21	2.33	1,200	180.9	7.80	628	1,150	1.4	825	0.12	260	318	< 2.0	< 2.0	< 0.250	37.0	0.125	346	< 0.0050	7.06	< 0.0050	0.227	< 0.0010	0.0040	0.76	1.99
	EV_MW_MC2B_WG_2022_Q3_NP	2022 08 17	9.7	7.05	1.68	1,199	113.5	7.58	674	1,150	< 1.0	877	< 0.10	266	325	< 2.0	< 2.0	0.332	38.6	0.161	375	< 0.0050	6.58	< 0.0050	0.170	0.0033	0.0031	0.58	1.58
	EV_MW_MC2B_WG_2022_Q4_NP	2022 10 26	7.5	6.90	2.09	1,198	89.7	7.61	720	1,130	< 1.0	869	0.12	281	342	< 2.0	< 2.0	0.264	30.2	0.147	386	< 0.0050	5.89	< 0.0050	< 0.500	< 0.0010	0.0024	< 0.50	1.98
Erickson Creek and Michel Creek Downstream of Erickson Creek (~ denotes well part of Study Area 10)																													
EV_WF_SW[h]	EV_WF_SW_WG_2022_Q1_NP	2022 03 27	8.2	9.08	8.03	387.7	-12.3	8.77	185	398	17.5	268	10.5	64.1	64.3	6.8	< 2.0	< 0.050	2.85	0.095	148	0.147	0.0109	< 0.0010	0.362	< 0.0010	0.0203	4.36	4.87
	EV_WF_SW_WG_2022_Q2_NP	2022 05 26	9.4	7.53	1.67	1,224	-124.0	7.75	570	1,150	26.1	812	86.2	319	389	< 2.0	< 2.0	< 0.250	3.23	0.253	395	0.0237	0.105	< 0.0050	1.24	< 0.0010	0.0111	1.76	1.50
	EV_WF_SW_WG_2022_Q3_NP	2022 09 20	9.2	7.73	3.19	648	-199.2	7.79	534	1,070	31.0	813	71.8	311	380	< 2.0	< 2.0	< 0.250	2.76	0.263	376	0.0529	0.108	< 0.0050	0.169	< 0.0010	0.0092	1.40	0.57
	EV_WF_SW_WG_2022_Q4_NP	2022 11 13	6.5	9.06	2.70	447.8	-47.5	8.62	222	425	16.2	260	8.53	69.1	76.0	4.1	< 2.0	< 0.050	3.01	0.106	157	0.131	< 0.0050	< 0.0010	0.264	< 0.0010	0.0088	2.82	3.11
EV_ECgw~	EV_ECGW_WG_2022_Q2_NP	2022 05 29	6.4	7.61	1.00	409.4	183.2	8.29	162	404	17.1	235	17.0	202	247	< 1.0	< 1.0	< 0.050	0.56	0.742	26.0	0.0462	0.113	0.0043	0.075	0.0148	0.0384	0.67	2.34
	EV_ECGW_WG_2022_Q3_NP	2022 09 13	13.1	7.66	0.78	407.7	142.8	8.12	164	394	50.4	267	41.6	218	265	< 2.0	< 2.0	< 0.050	0.73	0.849	26.1	0.0955	0.122	0.0292	0.279	0.0102	0.0880	< 0.50	< 0.50
	EV_ECGW_WG_2022_Q4_NP	2022 11 03	6.3	7.76	1.44	412.3	161.8	8.09	164	408	41.1	224	42.6	208	253	< 2.0	< 2.0	< 0.050	0.78	0.839	28.2	0.0802	0.188	0.0138	0.243	0.0080	0.0528	2.18	0.94

All terms defined within the body of SNC-Lavalin's report.

<	Denotes concentration less than indicated detection limit.
-	Denotes analysis not conducted.
n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL	Denotes reported detection limit.

BLUE	Concentration greater than BCWQG Aquatic Life Long-term Average guideline and/or BCWQG Aquatic Life Short-term Maximum guideline
BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Guideline to protect freshwater aquatic life, long-term average (i.e. "chronic") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[c] Guideline to protect freshwater aquatic life, short-term maximum (i.e. "acute") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[d] Guideline varies with background concentration.

[e] Standard/guideline varies with Hardness.

[f] Standard/guideline varies with pH and Temperature. Temperature assumed 10C CSR, 15C BCWQG.

[g] Standard/guideline varies with Chloride.

[h] Monitoring wells within 10m of high watermark, samples compared to CSR and BCWQG.

TABLE EV-03: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Organics, Nutrient and Organics in Groundwater (EVO)

			Field Parameters					Physical Parameters						Dissolved Inorganics								Nutrients						Organics	
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Field Temperature C	pH (field) pH	Dissolved Oxygen mg/L	Field Conductivity µS/cm	Field ORP mV	pH pH	Hardness mg/L	Conductivity µS/cm	Total Suspended Solids mg/L	Total Dissolved Solids mg/L	Turbidity ntu	Total Alkalinity mg/L	Bicarbonate mg/L	Carbonate mg/L	Hydroxide mg/L	Bromide mg/L	Chloride mg/L	Fluoride mg/L	Sulphate mg/L	Ammonia Nitrogen mg/L	Nitrate Nitrogen mg/L	Nitrite Nitrogen mg/L	Kjeldahl Nitrogen-N mg/L	Ortho-Phosphate mg/L	Phosphorus, Total mg/L	Total Organic Carbon mg/L	Dissolved Organic Carbon mg/L
BC Standard																													
CSR Aquatic Life (AW)[a]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,500	2-3[e]	1,280-4,290[e]	1.31-18.5[f]	400	0.2-2[g]	n/a	n/a	n/a	n/a	n/a
CSR Irrigation Watering (IW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSR Livestock Watering (LW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	1	1,000	n/a	100	10	n/a	n/a	n/a	n/a	n/a
CSR Drinking Water (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	250	1.5	500	n/a	10	1	n/a	n/a	n/a	n/a	n/a
BC Guideline																													
BCWQG Aquatic Life Long-Term Average (AW)[b]			n/a	6.5-9.0	n/a	n/a	n/a	6.5-9.0	n/a	n/a	n/a[d]	n/a	n/a[d]	n/a	n/a	n/a	n/a	n/a	150	n/a	309-429[f]	0.135-1.77[f]	3	0.04[g]	n/a	n/a	n/a	n/a	n/a
BCWQG Aquatic Life Short-Term Average (AW)[c]			n/a	6.5-9.0	n/a	n/a	n/a	6.5-9.0	n/a	n/a	n/a[d]	n/a	n/a[d]	n/a	n/a	n/a	n/a	n/a	600	1.42-1.87[e]	n/a	0.7-24.5[f]	32.8	0.12[g]	n/a	n/a	n/a	n/a	n/a
Erickson Creek and Michel Creek Downstream of Erickson Creek (~ denotes well part of Study Area 10)																													
EV_MW_SP1A~	EV_MW_SP1A_WG_2022_Q1_NP	2022 03 13	4.5	7.40	0.19	563	-163.1	7.98	282	542	1.0	301	4.11	283	345	< 2.0	< 2.0	< 0.050	4.27	0.313	30.2	0.712	< 0.0050	< 0.0010	0.628	< 0.0010	0.0096	0.87	1.51
	EV_MW_SP1A_WG_2022_Q2_NP	2022 05 15	5.4	7.26	0.30	535	-116.8	8.02	263	514	< 1.0	284	4.97	254	310	< 2.0	< 2.0	< 0.050	4.68	0.278	29.9	0.490	< 0.0050	< 0.0010	0.565	< 0.0010	0.0097	< 0.50	1.84
	EV_MW_SP1A_WG_2022_Q3_NP	2022 08 19	9.9	7.45	0.13	546	-165.7	7.59	301	506	1.4	298	3.90	289	352	< 1.0	< 1.0	< 0.050	4.63	0.341	24.8	0.638	< 0.0050	< 0.0010	0.648	< 0.0010	0.0108	0.54	1.37
	EV_MW_SP1A_WG_2022_Q4_NP	2022 10 26	5.9	7.34	0.18	573	-156.8	7.96	297	546	< 1.0	320	3.09	327	399	< 2.0	< 2.0	< 0.050	4.19	0.359	21.0	0.738	< 0.0050	< 0.0010	0.728	< 0.0010	0.0086	< 0.50	0.62
EV_MW_SP1B~	EV_MW_SP1B_WG_2022_Q1_NP	2022 03 13	4.2	7.66	7.51	461.8	-63.3	7.98	190	451	< 1.0	254	0.24	167	204	< 2.0	< 2.0	< 0.050	4.50	0.107	82.9	< 0.0050	0.352	< 0.0010	0.064	0.0013	0.0025	< 0.50	0.93
	EV_MW_SP1B_WG_2022_Q2_NP	2022 05 15	4.3	7.36	6.99	465.5	184.4	8.11	222	445	< 1.0	267	0.27	164	200	< 2.0	< 2.0	< 0.050	6.39	0.101	69.2	< 0.0050	0.354	< 0.0010	0.054	< 0.0010	0.0028	< 0.50	0.72
	EV_MW_SP1B_WG_2022_Q3_NP	2022 08 19	10.9	7.64	4.98	400.5	-49.5	7.87	204	369	< 1.0	220	0.12	176	214	< 1.0	< 1.0	< 0.050	6.73	0.133	45.6	< 0.0050	0.244	< 0.0010	0.130	< 0.0010	< 0.0020	< 0.50	0.82
	EV_MW_SP1B_WG_2022_Q4_NP	2022 10 26	6.3	7.46	4.81	474.0	65.7	7.99	247	453	< 1.0	281	0.27	189	230	< 2.0	< 2.0	< 0.050	3.79	0.129	80.1	< 0.0050	0.787	< 0.0010	< 0.500	< 0.0010	< 0.0020	< 0.50	0.63
EV_MW_SP1C~	EV_MW_SP1C_WG_2022_Q1_NP	2022 03 13	3.7	7.46	5.78	468.0	163.2	7.95	193	438	< 1.0	232	0.41	190	232	< 2.0	< 2.0	< 0.050	7.48	0.110	54.4	< 0.0050	0.199	< 0.0010	< 0.050	0.0012	0.0034	0.65	1.78
	EV_MW_SP1C_WG_2022_Q2_NP	2022 05 15	5.1	7.50	5.45	465.9	189.0	8.07	220	445	420	272	14.4	180	219	< 2.0	< 2.0	< 0.050	13.8	0.124	45.5	< 0.0050	0.191	< 0.0010	< 0.050	< 0.0010	0.215	1.62	0.58
	EV_MW_SP1C_WG_2022_Q3_NP	2022 08 19	10.2	7.51	5.08	417.1	89.9	7.67	214	387	< 1.0	224	0.16	192	234	< 1.0	< 1.0	< 0.050	6.80	0.138	39.5	0.0140	0.217	< 0.0010	0.168	< 0.0010	0.0028	0.51	2.30
	EV_MW_SP1C_WG_2022_Q4_NP	2022 10 26	6.0	7.39	4.74	446.2	80.9	7.92	232	429	1.4	262	0.38	218	265	< 2.0	< 2.0	< 0.050	5.88	0.131	50.8	< 0.0050	0.373	< 0.0010	0.524	< 0.0010	0.0106	< 0.50	1.45
Blanks																													
Field Blanks																													
EV_ER1gwS	EV_MW_BC10B_WG_2022_Q1_NP	2022 01 30	-	-	-	-	-	5.32	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
EV_MW_BC1A	EV_MW_MC10B_WG_2022_Q1_NP	2022 02 24	-	-	-	-	-	5.68	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
EV_WH50gw	EV_EC6GW_WG_2022_Q1_NP	2022 03 04	-	-	-	-	-	5.93	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
EV_OCgw	EV_MW_MC6GW_WG_2022_Q1_NP	2022 03 13	-	-	-	-	-	5.14	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0097	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
EV_MW_AQ2	EV_MW_BC10B_WG_2022_Q2_NP	2022 04 24	-	-	-	-	-	5.50	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
EV_MW_BC1A	EV_MW_MC10B_WG_2022_Q2_NP	2022 05 01	-	-	-	-	-	5.75	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
EV_MW_MC2A	EV_EC6GW_WG_2022_Q2_NP	2022 05 15	-	-	-	-	-	5.18	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
EV_OCgw	EV_MC6GW_WG_2022_Q2_NP	2022 05 20	-	-	-	-	-	5.44	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
EV_WH50gw	EV_MW_BC10B_WG_2022_Q3_NP	2022 08 04	-	-	-	-	-	5.21	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
EV_OCgw	EV_MC6GW_WG_2022_Q3_NP	2022 08 15	-	-	-	-	-	5.17	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
EV_MW_GC1B	EV_MW_MC10B_WG_2022_Q3_NP	2022 08 16	-	-	-	-	-	5.23	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	0.0101	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
EV_MW_AQ2	EV_EC6GW_WG_2022_Q3_NP	2022 09 09	-	-	-	-	-	5.53	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
EV_WH50gw	EV_MW_BC10B_WG_2022_Q4_NP	2022 10 04	-	-	-	-	-	5.27	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
EV_OCgw	EV_MC6GW_WG_2022_Q4_NP	2022 10 28	-	-	-	-	-	5.41	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
EV_MW_BC3	EV_EC6GW_WG_2022_Q4_NP	2022 11 13	-	-	-	-	-	5.71	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50

All terms defined within the body of SNC-Lavalin's report.

<	Denotes concentration less than indicated detection limit.
-	Denotes analysis not conducted.
n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL	Denotes reported detection limit.

BLUE	Concentration greater than BCWQG Aquatic Life Long-term Average guideline and/or BCWQG Aquatic Life Short-term Maximum guideline
BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Guideline to protect freshwater aquatic life, long-term average (i.e. "chronic") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[c] Guideline to protect freshwater aquatic life, short-term maximum (i.e. "acute") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[d] Guideline varies with background concentration.

[e] Standard/guideline varies with Hardness.

[f] Standard/guideline varies with pH and Temperature. Temperature assumed 10C CSR, 15C BCWQG.

[g] Standard/guideline varies with Chloride.

[h] Monitoring wells within 10m of high watermark, samples compared to CSR and BCWQG.

TABLE EV-03: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Organics, Nutrient and Organics in Groundwater (EVO)

			Field Parameters					Physical Parameters						Dissolved Inorganics								Nutrients						Organics	
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Field Temperature	pH (field)	Dissolved Oxygen	Field Conductivity	Field ORP	pH	Hardness	Conductivity	Total Suspended Solids	Total Dissolved Solids	Turbidity	Total Alkalinity	Bicarbonate	Carbonate	Hydroxide	Bromide	Chloride	Fluoride	Sulphate	Ammonia Nitrogen	Nitrate Nitrogen	Nitrite Nitrogen	Kjeldahl Nitrogen-N	Ortho-Phosphate	Phosphorus, Total	Total Organic Carbon	Dissolved Organic Carbon
			C	pH	mg/L	µS/cm	mV	pH	mg/L	µS/cm	mg/L	mg/L	ntu	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
BC Standard																													
CSR Aquatic Life (AW)[a]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,500	2-3[e]	1,280-4,290[e]	1.31-18.5[f]	400	0.2-2[g]	n/a	n/a	n/a	n/a	n/a
CSR Irrigation Watering (IW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSR Livestock Watering (LW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	1	1,000	n/a	100	10	n/a	n/a	n/a	n/a	n/a
CSR Drinking Water (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	250	1.5	500	n/a	10	1	n/a	n/a	n/a	n/a	n/a
BC Guideline																													
BCWQG Aquatic Life Long-Term Average (AW)[b]			n/a	6.5-9.0	n/a	n/a	n/a	6.5-9.0	n/a	n/a	n/a[d]	n/a	n/a[d]	n/a	n/a	n/a	n/a	n/a	150	n/a	309-429[f]	0.135-1.77[f]	3	0.04[g]	n/a	n/a	n/a	n/a	n/a
BCWQG Aquatic Life Short-Term Average (AW)[c]			n/a	6.5-9.0	n/a	n/a	n/a	6.5-9.0	n/a	n/a	n/a[d]	n/a	n/a[d]	n/a	n/a	n/a	n/a	n/a	600	1.42-1.87[e]	n/a	0.7-24.5[f]	32.8	0.12[g]	n/a	n/a	n/a	n/a	n/a
Blanks																													
Trip Blanks																													
	EV_MW_BC10C_WG_2022_Q1_NP	2022 01 30	-	-	-	-	-	5.34	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0131	< 0.0050	< 0.0010	0.094	< 0.0010	< 0.0020	< 0.50	< 0.50
	EV_MW_MC10C_WG_2022_Q1_NP	2022 02 24	-	-	-	-	-	5.44	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0307	< 0.0050	< 0.0010	0.071	< 0.0010	< 0.0020	< 0.50	< 0.50
	EV_EC7GW_WG_2022_Q1_NP	2022 03 04	-	-	-	-	-	5.19	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0222	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	EV_MW_MC7GW_WG_2022_Q1_NP	2022 03 13	-	-	-	-	-	5.03	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0124	< 0.0050	< 0.0010	0.124	< 0.0010	< 0.0020	< 0.50	< 0.50
	EV_MW_BC10C_WG_2022_Q2_NP	2022 04 24	-	-	-	-	-	5.58	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0248	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	EV_MW_MC10C_WG_2022_Q2_NP	2022 05 01	-	-	-	-	-	5.51	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	EV_EC7GW_WG_2022_Q2_NP	2022 05 15	-	-	-	-	-	5.33	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0541	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	EV_MC7GW_WG_2022_Q2_NP	2022 05 20	-	-	-	-	-	5.30	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0228	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	EV_MW_BC10C_WG_2022_Q3_NP	2022 08 04	-	-	-	-	-	5.14	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0248	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	EV_MC7GW_WG_2022_Q3_NP	2022 08 15	-	-	-	-	-	5.38	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0059	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	EV_MW_MC10C_WG_2022_Q3_NP	2022 08 16	-	-	-	-	-	5.22	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0239	< 0.0050	< 0.0010	0.062	< 0.0010	< 0.0020	< 0.50	< 0.50
	EV_EC7GW_WG_2022_Q3_NP	2022 09 09	-	-	-	-	-	5.33	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0154	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	EV_MW_BC10C_WG_2022_Q4_NP	2022 10 04	-	-	-	-	-	5.29	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0182	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	EV_MC7GW_WG_2022_Q4_NP	2022 10 28	-	-	-	-	-	5.28	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	EV_EC7GW_WG_2022_Q4_NP	2022 11 13	-	-	-	-	-	5.43	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 2.0	< 2.0	< 2.0	< 2.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0788	< 0.0050	< 0.0010	0.085	< 0.0010	< 0.0020	< 0.50	< 0.50

All terms defined within the body of SNC-Lavalin's report.

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n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL	Denotes reported detection limit.

BLUE	Concentration greater than BCWQG Aquatic Life Long-term Average guideline and/or BCWQG Aquatic Life Short-term Maximum guideline
BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Guideline to protect freshwater aquatic life, long-term average (i.e. "chronic") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[c] Guideline to protect freshwater aquatic life, short-term maximum (i.e. "acute") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[d] Guideline varies with background concentration.

[e] Standard/guideline varies with Hardness.

[f] Standard/guideline varies with pH and Temperature. Temperature assumed 10C CSR, 15C BCWQG.

[g] Standard/guideline varies with Chloride.

[h] Monitoring wells within 10m of high watermark, samples compared to CSR and BCWQG.

TABLE EV-04: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Metals in Groundwater (EVO)

				Dissolved Metals																														
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Hardness mg/L	Aluminum µg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Bismuth µg/L	Boron µg/L	Cadmium µg/L	Calcium mg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Lithium µg/L	Magnesium mg/L	Manganese µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Potassium mg/L	Selenium µg/L	Silver µg/L	Sodium mg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Uranium µg/L	Vanadium µg/L	Zinc[j] µg/L
BC Standard																																		
CSR Aquatic Life (AW)[a]			n/a	n/a	90	50	10,000	1.5	n/a	12,000	0.5-4[e]	n/a	10[f]	40	20-90[e]	n/a	40-160[e]	n/a	n/a	n/a	0.25	10,000	250-1,500[e]	n/a	20	0.5-15[e]	n/a	n/a	3	n/a	1,000	85	n/a	75-2,400[e]
CSR Irrigation Watering (IW)			n/a	5,000	n/a	100	n/a	100	n/a	500	5	n/a	5[f]	50	200	5,000	200	2,500	n/a	200	1	10	200	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	10	100	1,000-5,000[d]
CSR Livestock Watering (LW)			n/a	5,000	n/a	25	n/a	100	n/a	5,000	80	1,000	50[f]	1,000	300	n/a	100	5,000	n/a	n/a	2	50	1,000	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	200	100	2,000
CSR Drinking Water (DW)			n/a	9,500	6	10	1,000	8	n/a	5,000	5	n/a	50[f]	20[g]	1,500	6,500	10	8	n/a	1,500	1	250	80	n/a	10	20	200	2,500	n/a	2,500	n/a	20	20	3,000
Health-based Value (HBV)[g]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,200	n/a	n/a	n/a	2,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BC Guideline																																		
BCWQG Aquatic Life Long-Term Average (AW)[b]			n/a	6.84-50[d]	9	5	1,000	0.13	n/a	1,200	0.246-0.457[e]	n/a	1 (Cr(+6))[f]	4	0.3-4.3[h]	n/a	7.46-19.6[e]	n/a	n/a	1,146-2,600[e]	0.02[i]	7,600	112-150[e]	n/a	2	1.5[e]	n/a	n/a	0.8	n/a	n/a	8.5	n/a	32.3-187.5[e]
BCWQG Aquatic Life Short-Term Average (AW)[c]			n/a	23.03-100[d]	n/a	n/a	n/a	n/a	n/a	n/a	0.728-2.8[e]	n/a	n/a	110	1.5-26.4[h]	350	106-417[e]	n/a	n/a	1,895-3,390[e]	n/a	46,000	n/a	n/a	n/a	3[e]	n/a	n/a	n/a	n/a	n/a	n/a	n/a	57.8-340.5[e]
Grave/Harmer Creek Watershed and Elk River Downstream of Grave Creek Confluence (^ denotes well part of Study Area 7)																																		
EV_GV3gw^	EV_GV3GW_WG_2022_Q1_NP	2022 01 11	362	< 1.0	< 0.10	< 0.10	17.3	< 0.020	< 0.050	12	0.0066	90.2	0.28	< 0.10	0.65	< 10	< 0.050	15.8	33.2	< 0.10	< 0.0050	0.964	0.54	0.984	4.48	< 0.010	3.08	613	< 0.010	< 0.10	< 0.30	1.72	< 0.50	2.7
	EV_GV3GW_WG_2022_Q2_NP	2022 04 10	328	1.3	< 0.10	< 0.10	19.1	< 0.020	< 0.050	13	< 0.0050	81.2	0.26	< 0.10	0.66	< 10	0.079	16.2	30.4	0.21	< 0.0050	0.989	< 0.50	1.05	4.88	< 0.010	3.16	563	< 0.010	0.11	< 0.30	1.64	< 0.50	< 1.0
	EV_GV3GW_WG_2022_Q3_NP	2022 08 14	339	1.3	< 0.10	< 0.10	22.1	< 0.020	< 0.050	13	0.0076	81.0	0.22	< 0.10	3.74	< 10	0.081	15.9	33.3	< 0.10	< 0.0050	0.951	< 0.50	0.995	4.68	< 0.010	3.32	578	< 0.010	< 0.10	< 0.30	1.72	< 0.50	1.8
	EV_GV3GW_WG_2022_Q4_NP	2022 10 14	358	< 1.0	< 0.10	< 0.10	18.1	< 0.020	< 0.050	13	0.0118	86.9	0.26	< 0.10	< 0.20	< 10	< 0.050	16.6	34.2	< 0.10	< 0.0050	1.34	< 0.50	1.05	5.22	< 0.010	3.35	584	< 0.010	< 0.10	< 0.30	1.65	< 0.50	< 1.0
EV_GV3gwS	EV_GV3GWS_WG_2022_Q1_NP	2022 01 11	289	1.3	< 0.10	< 0.10	68.9	< 0.020	< 0.050	< 10	0.0066	77.6	0.18	< 0.10	< 0.20	< 10	< 0.050	6.9	23.2	0.10	< 0.0050	0.995	< 0.50	0.956	2.64	< 0.010	1.96	202	< 0.010	< 0.10	< 0.30	1.29	< 0.50	< 1.0
	EV_GV3GWS_WG_2022_Q2_NP	2022 04 10	257	1.3	< 0.10	< 0.10	69.0	< 0.020	< 0.050	< 10	< 0.0050	68.2	0.21	< 0.10	0.38	< 10	< 0.050	6.9	21.1	0.35	< 0.0050	0.973	< 0.50	0.951	3.40	< 0.010	2.00	185	< 0.010	< 0.10	< 0.30	1.21	< 0.50	< 1.0
	EV_GV3GWS_WG_2022_Q3_NP	2022 08 14	286	< 1.0	< 0.10	< 0.10	79.5	< 0.020	< 0.050	12	0.0066	73.9	0.19	< 0.10	0.33	< 10	< 0.050	7.6	24.6	< 0.10	< 0.0050	1.10	< 0.50	1.06	3.38	< 0.010	2.32	205	< 0.010	< 0.10	< 0.30	1.34	< 0.50	< 1.0
	EV_GV3GWS_WG_2022_Q4_NP	2022 10 14	292	< 1.0	< 0.10	0.11	85.6	< 0.020	< 0.050	13	< 0.0050	76.9	0.19	< 0.10	0.31	< 10	< 0.050	8.4	24.2	< 0.10	< 0.0050	1.10	< 0.50	1.18	2.83	< 0.010	2.32	201	< 0.010	< 0.10	< 0.30	1.20	< 0.50	< 1.0
EV_MW_GV4A^	EV_MW_GV4A_WG_2022_Q1_NP	2022 01 12	296	< 1.0	0.26	0.35	52.9	< 0.020	< 0.050	18	0.0066	72.9	0.15	< 0.10	< 0.20	< 10	< 0.050	10.5	27.8	26.2	< 0.0050	3.65	0.52	1.28	4.84	< 0.010	24.9	342	0.013	< 0.10	< 0.30	5.65	< 0.50	2.0
	EV_MW_GV4A_WG_2022_Q2_NP	2022 04 28	303	1.4	0.32	1.89	40.2	< 0.020	< 0.050	18	0.0117	72.7	< 0.10	0.63	0.97	229	< 0.050	11.2	29.6	*307*	< 0.0050	2.95	1.52	1.60	5.72	< 0.010	21.6	401	0.011	< 0.10	< 0.30	5.04	0.55	3.4
	EV_MW_GV4A_WG_2022_Q3_NP	2022 08 05	309	1.1	0.23	1.28	41.2	< 0.020	< 0.050	20	0.0108	73.3	< 0.10	0.57	< 0.20	313	< 0.050	10.6	30.5	*330*	< 0.0050	2.82	1.11	1.54	5.23	< 0.010	22.4	349	0.018	< 0.10	< 0.30	3.71	< 0.50	< 1.0
	EV_MW_GV4A_WG_2022_Q4_NP	2022 10 27	352	< 1.0	0.16	1.06	46.2	< 0.020	< 0.050	14	0.0115	83.5	< 0.10	0.43	< 0.20	192	< 0.050	10.1	34.9	*202*	< 0.0050	2.22	1.16	1.44	7.31	< 0.010	11.4	346	0.020	< 0.10	< 0.30	2.74	0.53	< 1.0
EV_MW_GV4B^	EV_MW_GV4B_WG_2022_Q1_NP	2022 01 09	286	< 1.0	< 0.10	< 0.10	60.1	< 0.020	< 0.050	< 10	0.0063	68.5	< 0.10	< 0.10	< 0.20	< 10	< 0.050	9.3	27.9	0.13	< 0.0050	1.56	< 0.50	1.06	3.74	< 0.010	2.68	279	< 0.010	< 0.10	< 0.30	1.31	< 0.50	< 1.0
	EV_MW_GV4B_WG_2022_Q2_NP	2022 04 28	308	< 1.0	< 0.10	< 0.10	69.9	< 0.020	< 0.050	< 10	0.0062	72.9	< 0.10	< 0.10	4.86	< 10	0.050	9.1	30.7	< 0.10	< 0.0050	1.51	< 0.50	1.10	3.38	< 0.010	2.73	290	< 0.010	< 0.10	< 0.30	1.31	< 0.50	< 1.0
	EV_MW_GV4B_WG_2022_Q3_NP	2022 08 05	323	< 1.0	< 0.10	< 0.10	68.6	< 0.020	< 0.050	11	0.0111	75.5	< 0.10	< 0.10	< 0.20	< 10	< 0.050	9.3	32.7	< 0.10	< 0.0050	1.70	< 0.50	1.18	3.70	< 0.010	2.96	278	< 0.010	< 0.10	< 0.30	1.41	< 0.50	< 1.0
	EV_MW_GV4B_WG_2022_Q4_NP	2022 10 27	340	< 1.0	< 0.10	< 0.10	68.3	< 0.020	< 0.050	12	0.0149	82.0	< 0.10	< 0.10	1.20	< 10	< 0.050	9.9	32.8	0.22	< 0.0050	1.79	< 0.50	1.14	4.23	< 0.010	2.90	295	< 0.010	< 0.10	< 0.30	1.41	< 0.50	1.7
RG_MW_GCA^	RG_MW_GCA_WG_2022_Q1_NP	2022 03 27	6.02	16.1	0.29	3.67	43.6	< 0.020	< 0.050	*770*	< 0.0050	1.78	< 0.10	< 0.10	< 0.20	< 10	< 0.050	710	0.383	3.39	< 0.0050	9.63	< 0.50	1.25	0.561	< 0.010	287	167	< 0.010	< 0.10	< 0.30	1.36	0.76	< 1.0
	RG_MW_GCA_WG_2022_Q2_NP	2022 06 03	7.06	7.2	0.93	3.91	47.8	< 0.040	< 0.100	*782*	< 0.0100	2.13	< 0.20	< 0.20	0.55	< 20	< 0.100	786	0.424	2.80	< 0.0050	9.04	< 1.00	1.24	1.56	< 0.020	320	194	< 0.020	< 0.20	< 0.60	1.21	< 1.00	< 2.0
	RG_MW_GCA_WG_2022_Q3_NP	2022 09 14	7.16	20.2	0.56	3.05	58.8	< 0.020	< 0.050	*805*	0.0086	2.20	< 0.10	< 0.10	0.56	11	< 0.050	890	0.405	3.07	< 0.0050	*13.5*	0.62	1.28	1.01	< 0.010	292	210	0.026	< 0.10	< 0.30	1.38	1.14	< 1.0
	RG_MW_GCA_WG_2022_Q4_NP	2022 11 04	10.1	3,140	0.59	3.10	66.6	0.116	< 0.050	*828*	0.0121	2.54	3.70	0.21	0.56	889	0.243	800	0.903	7.28	< 0.0050	5.71	1.14	2.21	0.572	< 0.010	296	168	0.055	0.14	148	0.716	6.81	< 1.0
RG_DW-02-20^	RG_DW-02-20_WP_2022_02_22_NP	2022 02 22	247	< 1.0	< 0.10	< 0.10	87.8	< 0.020	< 0.050	< 10	0.0077	64.8	0.22	< 0.10	1.44	< 10	< 0.050	7.8	20.6	0.78	-	1.11	< 0.50	0.592	15.0	< 0.010	2.55	240	< 0.010	< 0.10	< 0.30	1.14	< 0.50	5.6
	RG_DW-02-20_WP_2022_05_09_NP	2022 05 09	276	< 1.0	< 0.10	< 0.10	101	< 0.020	< 0.050	< 10	0.0050	70.9	0.23	< 0.10	1.01	< 10	< 0.050	8.2	24.0	0.42	-	1.14	< 0.50	0.671	15.8	< 0.010	2.86	271	< 0.010	< 0.10	< 0.30	1.14	< 0.50	2.6
	RG_DW-02-20_WP_2022_07_19_NP	2022 07 19	263	< 1.0	< 0.10	< 0.10	102	< 0.020	< 0.050	< 10	0.0073	69.0	0.19	< 0.10	3.38	< 10	0.106	8.2	22.1	0.90	-	1.02	< 0.50	0.648	14.8	< 0.010	2.79	251	< 0.010	< 0.10	< 0.30	1.10	< 0.50	8.8
	RG_DW-D_WP_2022_07_19_NP	Duplicate	267	< 1.0	< 0.10	< 0.10	103	< 0.020	< 0.050	< 10	0.0070	70.4	0.19	< 0.10	3.61	35	0.115	8.3	22.2	0.84	-	1.01	< 0.50	0.642	14.8	< 0.010	2.71	253	< 0.010	< 0.10	< 0.30	1.08	< 0.50	8.6
	QA/QC RPD%		2	*	*	*	1	*	*	*	*	2	*	*	7	*	*	1	0	7	-	1	*	1	0	*	3	1	*	*	*	2	*	2
	RG_DW-02-20_WP_2022_10_26_NP	2022 10 26	225	2.3	< 0.10	< 0.10	84.7	< 0.020	< 0.050	< 10	0.0052	57.2	0.16	< 0.10	2.05	< 10	0.051	6.8	20.0	0.51	-	1.06	< 0.50	0.616	10.5	< 0.010	2.33	215	< 0.010	< 0.10	< 0.30	0.907	< 0.50	4.7

All terms defined within the body of SNC-Lavalin's report.

<	Denotes concentration less than indicated detection limit.
-	Denotes analysis not conducted.
n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL	Denotes reported detection limit.

BLUE	Concentration greater than BCWQG Aquatic Life Long-term Average guideline and/or BCWQG Aquatic Life Short-term Maximum guideline
BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Guideline to protect freshwater aquatic life, long-term average (i.e. "chronic") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[c] Guideline to protect freshwater aquatic life, short-term maximum (i.e. "acute") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[d] Standard/guideline varies with pH.

[e] Standard/guideline varies with Hardness.

[f] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.

[g] Interim BC MoE Regional Background Estimate (Protocol 9 Determining Background Groundwater Quality).

[h] Guideline is temperature, pH, DOC and hardness dependent.

[i] Total Mercury guideline is based on the % of MethylMercury present. WQG = 0.0001 / (MeHg/total Hg), where MeHg is mass (or concentration) of methyl mercury and THg. Guideline shown assumes MeHg<0.5% of Total Hg.

[j] There is no Zinc standard specified for H > 400; therefore, the standard for H=300-<400 is applied as a conservative comparison.

[k] Ramboll calculated health-based values for these two parameters based on toxicity values (tolerable daily intakes; TDI) and drinking water allocation factors (DW AFs), documented in Appendix IV.

[l] Monitoring wells within 10m of high watermark, samples compared to CSR and BCWQG.

TABLE EV-04: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Metals in Groundwater (EVO)

				Dissolved Metals																														
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Hardness mg/L	Aluminum μg/L	Antimony μg/L	Arsenic μg/L	Barium μg/L	Beryllium μg/L	Bismuth μg/L	Boron μg/L	Cadmium μg/L	Calcium mg/L	Chromium μg/L	Cobalt μg/L	Copper μg/L	Iron μg/L	Lead μg/L	Lithium μg/L	Magnesium mg/L	Manganese μg/L	Mercury μg/L	Molybdenum μg/L	Nickel μg/L	Potassium mg/L	Selenium μg/L	Silver μg/L	Sodium mg/L	Strontium μg/L	Thallium μg/L	Tin μg/L	Titanium μg/L	Uranium μg/L	Vanadium μg/L	Zinc[j] μg/L
BC Standard																																		
CSR Aquatic Life (AW)[a]			n/a	n/a	90	50	10,000	1.5	n/a	12,000	0.5-4[e]	n/a	10[f]	40	20-90[e]	n/a	40-160[e]	n/a	n/a	n/a	0.25	10,000	250-1,500[e]	n/a	20	0.5-15[e]	n/a	n/a	3	n/a	1,000	85	n/a	75-2,400[e]
CSR Irrigation Watering (IW)			n/a	5,000	n/a	100	n/a	100	n/a	500	5	n/a	5[f]	50	200	5,000	200	2,500	n/a	200	1	10	200	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	10	100	1,000-5,000[d]
CSR Livestock Watering (LW)			n/a	5,000	n/a	25	n/a	100	n/a	5,000	80	1,000	50[f]	1,000	300	n/a	100	5,000	n/a	n/a	2	50	1,000	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	200	100	2,000
CSR Drinking Water (DW)			n/a	9,500	6	10	1,000	8	n/a	5,000	5	n/a	50[f]	20[g]	1,500	6,500	10	8	n/a	1,500	1	250	80	n/a	10	20	200	2,500	n/a	2,500	n/a	20	20	3,000
Health-based Value (HBV)[g]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,200	n/a	n/a	n/a	2,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BC Guideline																																		
BCWQG Aquatic Life Long-Term Average (AW)[b]			n/a	6.84-50[d]	9	5	1,000	0.13	n/a	1,200	0.246-0.457[e]	n/a	1 (Cr(+6))[f]	4	0.3-4.3[h]	n/a	7.46-19.6[e]	n/a	n/a	1,146-2,600[e]	0.02[i]	7,600	112-150[e]	n/a	2	1.5[e]	n/a	n/a	0.8	n/a	n/a	8.5	n/a	32.3-187.5[e]
BCWQG Aquatic Life Short-Term Average (AW)[c]			n/a	23.03-100[d]	n/a	n/a	n/a	n/a	n/a	n/a	0.728-2.8[e]	n/a	n/a	110	1.5-26.4[h]	350	106-417[e]	n/a	n/a	1,895-3,390[e]	n/a	46,000	n/a	n/a	n/a	3[e]	n/a	n/a	n/a	n/a	n/a	n/a	n/a	57.8-340.5[e]
Grave/Harmer Creek Watershed and Elk River Downstream of Grave Creek Confluence (^ denotes well part of Study Area 7)																																		
RG_MW_WW^	RG_MW_WW_WG_2022_Q1_NP	2022 01 23	245	1.0	< 0.10	0.10	125	< 0.020	< 0.050	< 10	0.0093	67.7	0.18	< 0.10	0.26	< 10	< 0.050	4.9	18.5	0.20	< 0.0050	1.40	< 0.50	0.655	10.3	< 0.010	2.47	223	< 0.010	< 0.10	< 0.30	0.818	< 0.50	1.0
	RG_MW_WW_WG_2022_Q2_NP	2022 04 28	234	3.1	< 0.10	< 0.10	130	< 0.020	< 0.050	< 10	0.0131	64.0	0.20	< 0.10	0.53	< 10	0.084	5.1	18.1	0.48	< 0.0050	1.42	< 0.50	0.658	10.6	< 0.010	2.52	212	< 0.010	< 0.10	< 0.30	0.904	< 0.50	1.2
	RG_MW_WW_WG_2022_Q3_NP	2022 08 07	253	3.0	< 0.10	< 0.10	138	< 0.020	< 0.050	< 10	0.0113	68.2	0.20	< 0.10	1.75	20	0.086	5.1	20.1	0.25	< 0.0050	1.50	< 0.50	0.635	11.0	< 0.010	2.42	232	< 0.010	0.13	< 0.30	1.04	< 0.50	1.8
	RG_MW_WW_WG_2022_Q4_NP	2022 10 17	258	< 1.0	< 0.10	< 0.10	138	< 0.020	< 0.050	< 10	0.0112	71.2	0.20	< 0.10	0.68	< 10	< 0.050	4.6	19.4	0.41	< 0.0050	3.04	< 0.50	0.682	12.2	< 0.010	2.73	323	0.014	< 0.10	< 0.30	1.03	< 0.50	< 1.0
Elk River Proximal to EVO (+ denotes well part of Study Area 8)																																		
EV_BALgw	EV_BALGW_WG_2022_Q1_NP	2022 03 25	390	2.0	< 0.10	0.11	34.0	< 0.020	< 0.050	194	0.0085	99.1	< 0.10	< 0.10	0.76	13	< 0.050	126	34.5	20.8	< 0.0050	8.10	2.17	2.83	0.135	< 0.010	36.4	2,380	< 0.010	< 0.10	< 0.30	0.122	0.67	4.3
	EV_BALGW_WG_2022_Q2_NP	2022 06 03	353	1.4	< 0.10	0.16	33.3	< 0.020	< 0.050	176	0.0163	92.6	< 0.10	0.16	0.24	15	< 0.050	121	29.5	15.1	< 0.0050	0.995	1.25	2.56	0.212	< 0.010	34.0	2,400	< 0.010	0.13	< 0.30	0.139	< 0.50	2.8
	EV_BALGW_WG_2022_Q3_NP	2022 09 19	341	1.7	< 0.10	0.23	37.5	< 0.020	< 0.050	168	< 0.0050	86.4	0.22	0.20	< 0.20	127	< 0.050	123	30.5	49.7	< 0.0050	2.08	4.93	2.76	0.330	< 0.010	35.6	2,290	< 0.010	< 0.10	< 0.30	0.105	< 0.50	2.7
	EV_BALGW_WG_2022_Q4_NP	2022 11 13	367	1.5	< 0.10	0.18	42.3	< 0.020	< 0.050	172	0.0236	92.3	< 0.10	0.21	2.35	37	< 0.050	124	33.2	23.3	< 0.0050	4.96	3.08	2.86	0.171	< 0.010	37.8	2,400	< 0.010	< 0.10	< 0.30	0.137	< 0.50	8.5
EV_GCgw	EV_GCGW_WG_2022_Q1_NP	2022 01 30	255	< 1.0	< 0.10	2.42	65.6	< 0.020	< 0.050	12	< 0.0050	68.6	< 0.10	0.18	< 0.20	270	< 0.050	7.8	20.4	90.0	< 0.0050	2.48	< 0.50	0.759	< 0.050	< 0.010	4.42	290	0.016	< 0.10	< 0.30	1.12	< 0.50	1.1
	EV_GCGW_WG_2022-02-10_NP	2022 02 10	222	< 1.0	< 0.10	2.30	59.3	< 0.020	< 0.050	13	< 0.0050	60.8	< 0.10	0.19	0.55	237	< 0.050	7.4	17.1	82.6	< 0.0050	2.64	0.65	0.692	< 0.050	< 0.010	3.92	255	0.017	< 0.10	< 0.30	1.13	< 0.50	2.0
	EV_GCGW_WG_2022-02-20_NP	2022 02 20	235	< 1.0	< 0.10	2.36	64.6	< 0.020	< 0.050	14	< 0.0050	64.1	< 0.10	0.19	< 0.20	288	< 0.050	8.0	18.2	81.6	< 0.0050	2.56	< 0.50	0.718	< 0.050	< 0.010	4.10	275	0.018	< 0.10	< 0.30	1.12	< 0.50	1.4
	EV_GCGW_WG_2022_Q2_NP	2022 05 01	222	1.3	< 0.10	3.41	75.0	< 0.020	< 0.050	14	< 0.0050	61.5	< 0.10	0.18	< 0.20	487	< 0.050	7.9	16.7	67.8	< 0.0050	2.57	0.53	0.774	< 0.050	< 0.010	3.57	266	0.019	< 0.10	< 0.30	1.09	< 0.50	1.8
	EV_GCGW_WG_2022-06-23_NP	2022 06 23	228	1.6	< 0.10	2.49	72.2	< 0.020	< 0.050	12	< 0.0050	61.8	< 0.10	0.17	0.61	314	< 0.050	7.2	17.8	82.7	< 0.0050	2.37	0.70	0.698	< 0.050	< 0.010	4.03	254	0.018	< 0.10	< 0.30	1.07	< 0.50	2.5
	EV_GCGW_WG_2022_Q3_NP	2022 08 15	238	< 1.0	< 0.10	2.39	65.8	< 0.020	< 0.050	14	< 0.0050	63.6	< 0.10	0.19	< 0.20	271	< 0.050	8.0	19.3	88.7	< 0.0050	2.50	0.68	0.737	< 0.050	< 0.010	4.26	272	0.022	< 0.10	< 0.30	1.14	< 0.50	1.6
	EV_GCGW_WG_2022_Q4_NP	2022 10 25	227	1.3	< 0.10	3.11	66.8	< 0.020	< 0.050	14	< 0.0050	62.6	< 0.10	0.16	< 0.20	421	< 0.050	8.1	17.1	67.4	< 0.0050	4.15	0.54	0.748	< 0.050	< 0.010	3.64	269	0.017	< 0.10	< 0.30	1.04	< 0.50	1.2
EV_LSgw[+]	EV_LSGW_WG_2022_Q1_NP	2022 02 06	529	1.6	< 0.10	1.58	238	< 0.020	< 0.050	41	< 0.0050	104	< 0.10	1.52	< 0.20	2,630	< 0.050	61.8	65.4	*1,090*	< 0.0050	2.50	4.05	3.97	0.067	< 0.020	8.94	452	0.041	< 0.10	< 0.30	1.48	< 0.50	1.7
	EV_LSGW_WG_2022_Q2_NP	2022 05 01	567	2.8	< 0.10	1.54	209	< 0.020	< 0.050	40	< 0.0050	112	< 0.10	1.10	0.40	2,200	< 0.050	60.9	69.7	*860*	< 0.0050	1.97	3.46	3.90	0.240	< 0.010	8.57	475	0.041	< 0.10	< 0.30	2.18	< 0.50	2.7
	EV_LSGW_WG_2022_Q3_NP	2022 08 18	616	1.3	< 0.10	2.10	256	< 0.020	< 0.050	48	< 0.0050	118	< 0.10	1.66	< 0.20	3,300	< 0.050	67.6	78.0	*1,210*	< 0.0050	2.51	4.64	4.30	0.096	< 0.010	9.14	535	0.049	< 0.10	< 0.30	1.45	< 0.50	1.8
	EV_LSGW_WG_2022_Q4_NP	2022 10 25	617	1.3	< 0.10	2.19	246	< 0.020	< 0.050	50	< 0.0050	128	< 0.10	1.57	0.74	3,480	< 0.050	67.4	72.3	*1,130*	< 0.0050	2.43	4.44	4.11	< 0.050	< 0.010	8.20	550	0.049	< 0.10	< 0.30	1.43	< 0.50	2.9
EV_OCgw[+,l]	EV_OCGW_WG_2022_Q1_NP	2022 03 13	123	1.5	< 0.10	0.77	48.9	< 0.020	< 0.050	112	< 0.0550	24.6	< 0.10	< 0.10	< 0.20	< 10	< 0.050	22.3	15.0	39.4	< 0.00050	*13.3*	< 0.50	1.41	0.060	< 0.010	38.3	375	0.014	< 0.10	< 0.30	1.21	< 0.50	1.0
	EV_MW_MC5GW_WG_2022_Q1_NP	Duplicate	128	1.9	< 0.10	0.86	49.7	< 0.020	< 0.050	116	< 0.0100	25.4	< 0.10	< 0.10	< 0.20	< 10	< 0.050	22.9	15.8	41.1	< 0.00050	*13.6*	< 0.50	1.46	0.060	< 0.020	40.4	380	0.022	< 0.10	< 0.30	1.21	< 0.50	1.4
	QA/QC RPD%		4	*	*	11	2	*	*	4	*	3	*	*	*	*	*	3	5	4	*	2	*	3	*	*	5	1	*	*	*	0	*	*
	EV_OCGW_WG_2022_Q2_NP	2022 05 20	150	1.7	< 0.10	1.83	54.0	< 0.020	< 0.050	132	< 0.0050	30.0	< 0.10	0.26	< 0.20	123	< 0.050	26.5	18.3	76.0	< 0.0050	*13.3*	0.65	1.49	< 0.050	< 0.010	37.5	411	< 0.010	< 0.10	< 0.30	1.12	< 0.50	< 1.0
	EV_MC5GW_WG_2022_Q2_NP	Duplicate	151	2.0	< 0.10	1.83	54.6	< 0.020	< 0.050	132	< 0.0050	29.5	< 0.10	0.26	0.43	123	< 0.050	26.5	18.7	77.0	< 0.0050	*13.1*	1.00	1.53	< 0.050	< 0.010	38.1	413	< 0.010	< 0.10	< 0.30	1.11	< 0.50	< 1.0
	QA/QC RPD%		1	*	*	0	1	*	*	0	*	2	*	*	*	0	*	0	2	1	*	2	*	3	*	*	2	0	*	*	*	1	*	*
	EV_OCGW_WG_2022_Q3_NP	2022 08 15	150	1.5	< 0.10	1.86	57.8	< 0.020	< 0.050	142	0.0217	28.1	< 0.10	< 0.10	< 0.20	205	< 0.050	26.6	19.4	70.7	< 0.0050	*13.0*	< 0.50	1.53	< 0.050	< 0.010	39.4	405	< 0.010	< 0.10	< 0.30	1.09	< 0.50	< 1.0
	EV_MC5GW_WG_2022_Q3_NP	Duplicate	146	2.6	< 0.10	1.85	57.4	< 0.020	< 0.050	138	0.0125	27.5	< 0.10	0.10	< 0.20	201	< 0.050	26.4	18.9	69.9	< 0.0050	*12.9*	< 0.50	1.50	< 0.050	< 0.010	38.2	397	< 0.010	< 0.10	< 0.30	1.07	< 0.50	1.0
	QA/QC RPD%		3	*	*	1	1	*	*	3	*	2	*	*	*	2	*	1	3	1	*	1	*	2	*	*	3	2	*	*	*	2	*	*
	EV_OCGW_WG_2022_Q4_NP	2022 10 28	144	< 1.0	< 0.10	2.21	56.6	< 0.020	< 0.050	134	< 0.0050	27.5	< 0.10	< 0.10	< 0.20	171	< 0.050	27.0	18.4	66.2	< 0.00050	*13.4*	< 0.50	1.50	< 0.050	< 0.010	37.2	400	< 0.010	< 0.10	< 0.30	0.998	< 0.50	< 1.0
	EV_MC5GW_WG_2022_Q4_NP	Duplicate	146	< 1.0	< 0.10	2.20	56.4	< 0.020	< 0.050	136	0.0060	27.5	< 0.10	< 0.10	< 0.20	174	< 0.050	27.1	18.8	66.9	< 0.00050	*14.2*	< 0.50	1.52	< 0.050	< 0.010	38.0	401	< 0.010	< 0.10	< 0.30	0.974	< 0.50	< 1.0
	QA/QC RPD%		1	*	*	0	0	*	*	1	*	0	*	*	*	2	*	0	2	1	*	6	*	1	*	*	2	0	*	*	*	2	*	*

All terms defined within the body of SNC-Lavalin's report.

<   Denotes concentration less than indicated detection limit.

\-   Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

*   RPDs are not calculated where one or more concentrations are less than five times RDL.

RDL Denotes reported detection limit.

BLUE	Concentration greater than BCWQG Aquatic Life Long-term Average guideline and/or BCWQG Aquatic Life Short-term Maximum guideline
BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Guideline to protect freshwater aquatic life, long-term average (i.e. "chronic") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[c] Guideline to protect freshwater aquatic life, short-term maximum (i.e. "acute") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[d] Standard/guideline varies with pH.

[e] Standard/guideline varies with Hardness.

[f] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.

[g] Interim BC MoE Regional Background Estimate (Protocol 9 Determining Background Groundwater Quality).

[h] Guideline is temperature, pH, DOC and hardness dependent.

[i] Total Mercury guideline is based on the % of MethylMercury present. WQG = 0.0001 / (MeHg/total Hg), where MeHg is mass (or concentration) of methyl mercury and THg. Guideline shown assumes MeHg<0.5% of Total Hg.

[j] There is no Zinc standard specified for H > 400; therefore, the standard for H=300-<400 is applied as a conservative comparison.

[k] Ramboll calculated health-based values for these two parameters based on toxicity values (tolerable daily intakes; TDI) and drinking water allocation factors (DW AFs), documented in Appendix IV.

[l] Monitoring wells within 10m of high watermark, samples compared to CSR and BCWQG.

TABLE EV-04: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Metals in Groundwater (EVO)

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Hardness mg/L	Aluminum µg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Bismuth µg/L	Boron µg/L	Cadmium µg/L	Calcium mg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Lithium µg/L	Magnesium mg/L	Manganese µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Potassium mg/L	Selenium µg/L	Silver µg/L	Sodium mg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Uranium µg/L	Vanadium µg/L	Zinc[j] µg/L
				Dissolved Metals																														
BC Standard																																		
CSR Aquatic Life (AW)[a]			n/a	n/a	90	50	10,000	1.5	n/a	12,000	0.5-4[e]	n/a	10[f]	40	20-90[e]	n/a	40-160[e]	n/a	n/a	n/a	0.25	10,000	250-1,500[e]	n/a	20	0.5-15[e]	n/a	n/a	3	n/a	1,000	85	n/a	75-2,400[e]
CSR Irrigation Watering (IW)			n/a	5,000	n/a	100	n/a	100	n/a	500	5	n/a	5[f]	50	200	5,000	200	2,500	n/a	200	1	10	200	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	10	100	1,000-5,000[d]
CSR Livestock Watering (LW)			n/a	5,000	n/a	25	n/a	100	n/a	5,000	80	1,000	50[f]	1,000	300	n/a	100	5,000	n/a	n/a	2	50	1,000	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	200	100	2,000
CSR Drinking Water (DW)			n/a	9,500	6	10	1,000	8	n/a	5,000	5	n/a	50[f]	20[g]	1,500	6,500	10	8	n/a	1,500	1	250	80	n/a	10	20	200	2,500	n/a	2,500	n/a	20	20	3,000
Health-based Value (HBV)[g]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,200	n/a	n/a	n/a	2,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BC Guideline																																		
BCWQG Aquatic Life Long-Term Average (AW)[b]			n/a	6.84-50[d]	9	5	1,000	0.13	n/a	1,200	0.246-0.457[e]	n/a	1 (Cr(+6))[f]	4	0.3-4.3[h]	n/a	7.46-19.6[e]	n/a	n/a	1,146-2,600[e]	0.02[i]	7,600	112-150[e]	n/a	2	1.5[e]	n/a	n/a	0.8	n/a	n/a	8.5	n/a	32.3-187.5[e]
BCWQG Aquatic Life Short-Term Average (AW)[c]			n/a	23.03-100[d]	n/a	n/a	n/a	n/a	n/a	n/a	0.728-2.8[e]	n/a	n/a	110	1.5-26.4[h]	350	106-417[e]	n/a	n/a	1,895-3,390[e]	n/a	46,000	n/a	n/a	n/a	3[e]	n/a	n/a	n/a	n/a	n/a	n/a	n/a	57.8-340.5[e]
Elk River Proximal to EVO (+ denotes well part of Study Area 8)																																		
EV_MW_GC1B^{+}	EV_MW_GC1B_WG_2022_Q1_NP	2022 01 31	636	< 1.0	< 0.10	0.13	91.7	< 0.020	< 0.050	52	0.0978	133	< 0.10	0.47	< 0.20	86	< 0.050	39.5	73.8	*827*	< 0.0050	2.07	3.62	2.31	3.05	< 0.010	19.6	924	0.054	< 0.10	< 0.30	1.52	< 0.50	2.2
	EV_MW_GC1B_WG_2022-02-10_NP	2022 02 10	149	70.4	0.16	0.12	29.3	< 0.020	< 0.050	17	0.0552	37.1	0.12	0.17	1.24	22	< 0.050	9.3	13.8	12.5	< 0.0050	1.50	1.26	1.00	4.10	< 0.010	2.42	224	0.024	< 0.10	2.31	0.589	< 0.50	2.1
	EV_MW_GC1B_WG_2022-02-20_NP	2022 02 20	570	< 1.0	< 0.10	0.11	87.1	< 0.020	< 0.050	59	0.0987	122	< 0.10	0.48	< 0.20	48	< 0.050	41.3	64.5	*710*	< 0.0050	1.95	3.52	2.12	2.92	< 0.010	17.4	821	0.054	< 0.10	< 0.30	1.44	< 0.50	1.7
	EV_MW_GC1B_WG_2022_Q2_NP	2022 05 01	638	1.8	< 0.10	< 0.10	99.7	< 0.020	< 0.050	56	0.0989	134	< 0.10	0.51	< 0.20	12	< 0.050	46.0	73.6	*753*	< 0.0050	3.31	3.81	2.28	5.03	< 0.010	18.2	977	0.060	< 0.10	< 0.30	1.90	< 0.50	2.2
	EV_MW_GC1B_WG_2022-06-23_NP	2022 06 23	614	< 1.0	< 0.10	0.26	79.3	< 0.020	< 0.050	61	0.0656	125	< 0.10	0.58	< 0.20	400	< 0.050	45.8	73.3	*574*	< 0.0050	1.98	3.16	2.33	0.952	< 0.010	19.2	990	0.043	< 0.10	< 0.30	1.75	< 0.50	1.3
	EV_MW_MC10A_WG_2022-06-23_NP	Duplicate	632	1.1	< 0.10	0.28	82.6	< 0.020	< 0.050	67	0.0628	133	< 0.10	0.58	< 0.20	394	< 0.050	48.9	72.8	*585*	< 0.0050	2.15	3.14	2.33	0.982	< 0.010	19.4	1,060	0.047	< 0.10	< 0.30	1.83	< 0.50	1.6
	QA/QC RPD%		3	*	*	*	4	*	*	9	4	6	*	0	*	2	*	7	1	2	*	8	1	0	3	*	1	7	*	*	*	4	*	*
	EV_MW_GC1B_WG_2022_Q3_NP	2022 08 16	639	< 1.0	0.11	0.20	94.2	< 0.020	< 0.050	52	0.0773	131	< 0.10	0.54	0.22	156	< 0.050	47.7	75.7	*680*	< 0.0050	2.15	4.06	2.53	1.19	< 0.010	19.5	973	0.061	< 0.10	< 0.30	1.90	< 0.50	1.8
	EV_MW_MC10A_WG_2022_Q3_NP	Duplicate	665	< 1.0	0.12	0.21	97.8	< 0.020	< 0.050	57	0.0840	138	< 0.10	0.58	< 0.20	166	< 0.050	49.1	77.9	*699*	< 0.0050	2.31	4.10	2.58	1.24	< 0.010	19.8	1,030	0.064	< 0.10	< 0.30	2.00	< 0.50	1.6
	QA/QC RPD%		4	*	*	*	4	*	*	9	8	5	*	7	*	6	*	3	3	3	*	7	1	2	4	*	2	6	5	*	*	5	*	*
	EV_MW_GC1B_WG_2022_Q4_NP	2022 10 25	648	< 1.0	0.12	0.18	101	< 0.020	< 0.050	59	0.0754	142	< 0.10	0.52	1.94	158	< 0.050	44.3	71.4	*744*	< 0.0050	2.45	3.79	2.43	1.51	< 0.010	18.4	995	0.066	< 0.10	< 0.30	1.70	< 0.50	4.3
RG_DW-03-10^{+}	RG_DW-03-10_WP_2022_02_14_NP	2022 02 14	239	< 1.0	< 0.10	< 0.10	135	< 0.020	< 0.050	< 10	< 0.0050	64.0	0.60	< 0.10	2.97	< 10	0.067	6.5	19.2	< 0.10	-	1.40	< 0.50	0.776	1.02	< 0.010	5.07	174	< 0.010	< 0.10	< 0.30	1.29	< 0.50	6.6
	RG_DW-03-10_WP_2022_04_20_NP	2022 04 20	248	< 1.0	< 0.10	< 0.10	150	< 0.020	< 0.050	< 10	< 0.0050	65.9	0.68	< 0.10	2.38	< 10	0.076	7.0	20.4	< 0.10	-	1.45	< 0.50	0.780	1.07	< 0.010	5.53	189	< 0.010	< 0.10	< 0.30	1.39	< 0.50	10.6
	RG_DW-03-10_WP_2022_07_19_NP	2022 07 19	272	1.1	< 0.10	< 0.10	145	< 0.020	< 0.050	< 10	0.0063	73.2	0.63	< 0.10	4.67	< 10	0.152	6.9	21.6	< 0.10	-	1.48	< 0.50	0.825	1.08	< 0.010	6.04	204	< 0.010	< 0.10	< 0.30	1.43	< 0.50	25.2
	RG_DW-03-10_WP_2022_10_11_NP	2022 10 11	270	4.6	< 0.10	< 0.10	152	< 0.020	< 0.050	10	< 0.0050	71.8	0.68	< 0.10	2.82	< 10	0.095	7.9	22.1	0.12	-	1.49	< 0.50	0.819	1.22	< 0.010	5.50	200	< 0.010	< 0.10	< 0.30	1.35	< 0.50	17.3
Sparwood Area - Michel Creek and Baldy Ridge (Study Area 9a)																																		
EV_MW_AQ1	EV_MW_AQ1_WG_2022_Q1_NP	2022 02 06	503	< 1.0	< 0.10	0.12	206	< 0.020	< 0.050	20	0.0518	122	< 0.10	< 0.10	0.56	< 10	< 0.050	19.8	48.2	0.40	< 0.0050	0.330	0.53	1.70	12.2	< 0.010	6.18	377	< 0.010	< 0.10	< 0.30	0.481	< 0.50	4.7
	EV_MW_AQ1_WG_2022_Q2_NP	2022 04 24	458	2.1	< 0.10	0.15	183	< 0.020	< 0.050	16	0.0500	113	< 0.10	< 0.10	1.37	< 10	< 0.050	15.8	42.8	0.22	< 0.0050	0.385	1.10	1.61	8.38	< 0.010	7.36	329	< 0.010	< 0.10	< 0.30	0.446	< 0.50	11.0
	EV_MW_AQ1_WG_2022_Q3_NP	2022 08 07	580	1.2	< 0.10	0.18	210	< 0.020	< 0.050	24	0.0712	138	< 0.10	< 0.10	2.61	< 10	0.128	16.9	57.2	0.19	< 0.0050	0.432	1.13	1.74	5.65	< 0.010	9.20	400	< 0.010	< 0.10	< 0.30	0.737	< 0.50	35.2
	EV_MW_AQ1_WG_2022_Q4_NP	2022 10 12	499	< 1.0	< 0.10	0.10	161	< 0.020	< 0.050	20	0.0358	123	< 0.10	< 0.10	1.13	< 10	< 0.050	18.8	46.6	0.17	< 0.0050	0.327	0.62	1.53	2.81	< 0.010	5.36	353	< 0.010	< 0.10	< 0.30	0.477	< 0.50	10.7
EV_MW_AQ2	EV_MW_AQ2_WG_2022_Q1_NP	2022 01 21	595	< 1.0	< 0.10	0.12	19.1	< 0.020	< 0.050	92	< 0.0050	150	< 0.10	0.10	< 0.20	480	< 0.050	54.5	53.5	77.1	< 0.0050	0.204	0.61	1.90	< 0.050	< 0.010	17.9	1,130	< 0.010	< 0.10	< 0.30	0.112	< 0.50	1.0
	EV_MW_AQ2_WG_2022_Q2_NP	2022 04 24	571	2.2	< 0.10	0.11	18.6	< 0.020	< 0.050	100	< 0.0050	139	< 0.10	0.10	0.22	461	< 0.050	52.8	54.4	72.2	< 0.0050	0.175	0.82	1.93	< 0.050	< 0.010	18.8	1,060	< 0.010	< 0.10	< 0.30	0.126	< 0.50	2.3
	EV_MW_BC10A_WG_2022_Q2_NP	Duplicate	570	1.8	< 0.10	0.11	19.0	< 0.020	< 0.050	102	< 0.0050	139	< 0.10	0.10	0.49	429	< 0.050	55.0	54.1	73.1	< 0.0050	0.172	1.01	1.93	< 0.050	< 0.010	18.7	1,080	< 0.010	< 0.10	< 0.30	0.125	< 0.50	2.6
	QA/QC RPD%		0	*	*	*	2	*	*	2	*	0	*	*	*	7	*	4	1	1	*	*	*	0	*	*	1	2	*	*	*	1	*	*
	EV_MW_AQ2_WG_2022_Q3_NP	2022 09 09	609	< 1.0	< 0.10	0.17	19.8	< 0.020	< 0.050	96	< 0.0050	145	< 0.10	0.18	< 0.20	280	< 0.050	60.7	59.9	69.7	< 0.0050	0.223	1.44	2.05	0.069	< 0.010	20.2	1,130	< 0.010	< 0.10	< 0.30	0.130	< 0.50	1.0
	EV_EC5GW_WG_2022_Q3_NP	Duplicate	624	< 1.0	< 0.10	0.18	20.9	< 0.020	< 0.050	94	< 0.0050	148	< 0.10	0.19	0.22	290	< 0.050	62.5	61.7	73.2	< 0.0050	0.189	1.51	2.13	0.062	< 0.010	20.8	1,140	< 0.010	< 0.10	< 0.30	0.134	< 0.50	1.5
	QA/QC RPD%		2	*	*	*	5	*	*	2	*	2	*	*	*	4	*	3	3	5	*	*	*	4	*	*	3	1	*	*	*	3	*	*
	EV_MW_AQ2_WG_2022_Q4_NP	2022 11 01	566	< 1.0	< 0.10	0.16	23.4	< 0.020	< 0.050	91	< 0.0050	137	< 0.10	0.16	0.26	298	< 0.050	52.6	54.4	70.6	< 0.0050	1.53	1.22	2.09	< 0.050	< 0.010	19.5	1,070	< 0.010	< 0.10	< 0.30	0.124	< 0.50	1.5
EV_MW_MC4	EV_MW_MC4_WG_2022_Q1_NP	2022 02 27	476	< 1.0	< 0.10	0.46	121	< 0.020	< 0.050	38	< 0.0050	128	< 0.10	0.46	< 0.20	330	< 0.050	19.5	38.1	72.2	< 0.0050	3.51	2.79	2.40	< 0.050	< 0.010	7.79	572	0.022	< 0.10	< 0.30	1.01	< 0.50	4.2
	EV_MW_MC4_WG_2022_Q2_NP	2022 05 01	467	1.7	< 0.10	0.41	130	< 0.020	< 0.050	39	< 0.0050	128	< 0.10	0.47	< 0.20	363	< 0.050	20.5	35.8	68.8	< 0.0050	3.78	2.61	2.47	< 0.050	< 0.010	7.31	567	0.024	< 0.10	< 0.30	1.14	< 0.50	4.3
	EV_MW_MC4_WG_2022_Q3_NP	2022 08 17	469	< 1.0	< 0.10	0.31	133	< 0.020	< 0.050	41	< 0.0050	125	< 0.10	0.51	< 0.20	238	< 0.050	19.6	38.2	72.6	< 0.0050	4.58	3.00	2.83	< 0.050	< 0.010	7.80	514	0.022	< 0.10	< 0.30	1.18	< 0.50	3.9
	EV_MW_MC4_WG_2022_Q4_NP	2022 10 17	558	< 1.0	0.10	0.49	124	< 0.020	< 0.050	46	0.0052	156	< 0.10	0.48	0.22	358	< 0.050	23.2	41.0	70.6	< 0.0050	4.63	2.78	2.49	< 0.050	< 0.010	7.60	648	0.026	< 0.10	< 0.30	1.12	< 0.50	4.5

All terms defined within the body of SNC-Lavalin's report.

<	Denotes concentration less than indicated detection limit.
-	Denotes analysis not conducted.
n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL	Denotes reported detection limit.

BLUE	Concentration greater than BCWQG Aquatic Life Long-term Average guideline and/or BCWQG Aquatic Life Short-term Maximum guideline
BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Guideline to protect freshwater aquatic life, long-term average (i.e. "chronic") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[c] Guideline to protect freshwater aquatic life, short-term maximum (i.e. "acute") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[d] Standard/guideline varies with pH.

[e] Standard/guideline varies with Hardness.

[f] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.

[g] Interim BC MoE Regional Background Estimate (Protocol 9 Determining Background Groundwater Quality).

[h] Guideline is temperature, pH, DOC and hardness dependent.

[i] Total Mercury guideline is based on the % of MethylMercury present. WQG = 0.0001 / (MeHg/total Hg), where MeHg is mass (or concentration) of methyl mercury and THg. Guideline shown assumes MeHg<0.5% of Total Hg.

[j] There is no Zinc standard specified for H > 400; therefore, the standard for H=300-<400 is applied as a conservative comparison.

[k] Ramboll calculated health-based values for these two parameters based on toxicity values (tolerable daily intakes; TDI) and drinking water allocation factors (DW AFs), documented in Appendix IV.

[l] Monitoring wells within 10m of high watermark, samples compared to CSR and BCWQG.

TABLE EV-04: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Metals in Groundwater (EVO)

				Dissolved Metals																														
Sample Location	**Sample ID**	**Sample Date (yyyy mm dd)**	**Hardness mg/L**	**Aluminum µg/L**	**Antimony µg/L**	**Arsenic µg/L**	**Barium µg/L**	**Beryllium µg/L**	**Bismuth µg/L**	**Boron µg/L**	**Cadmium µg/L**	**Calcium mg/L**	**Chromium µg/L**	**Cobalt µg/L**	**Copper µg/L**	**Iron µg/L**	**Lead µg/L**	**Lithium µg/L**	**Magnesium mg/L**	**Manganese µg/L**	**Mercury µg/L**	**Molybdenum µg/L**	**Nickel µg/L**	**Potassium mg/L**	**Selenium µg/L**	**Silver µg/L**	**Sodium mg/L**	**Strontium µg/L**	**Thallium µg/L**	**Tin µg/L**	**Titanium µg/L**	**Uranium µg/L**	**Vanadium µg/L**	**Zinc[j] µg/L**
BC Standard																																		
CSR Aquatic Life (AW)[a]			n/a	n/a	90	50	10,000	1.5	n/a	12,000	0.5-4[e]	n/a	10[f]	40	20-90[e]	n/a	40-160[e]	n/a	n/a	n/a	0.25	10,000	250-1,500[e]	n/a	20	0.5-15[e]	n/a	n/a	3	n/a	1,000	85	n/a	75-2,400[e]
CSR Irrigation Watering (IW)			n/a	5,000	n/a	100	n/a	100	n/a	500	5	n/a	5[f]	50	200	5,000	200	2,500	n/a	200	1	10	200	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	10	100	1,000-5,000[d]
CSR Livestock Watering (LW)			n/a	5,000	n/a	25	n/a	100	n/a	5,000	80	1,000	50[f]	1,000	300	n/a	100	5,000	n/a	n/a	2	50	1,000	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	200	100	2,000
CSR Drinking Water (DW)			n/a	9,500	6	10	1,000	8	n/a	5,000	5	n/a	50[f]	20[g]	1,500	6,500	10	8	n/a	1,500	1	250	80	n/a	10	20	200	2,500	n/a	2,500	n/a	20	20	3,000
Health-based Value (HBV)[g]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,200	n/a	n/a	n/a	2,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BC Guideline																																		
BCWQG Aquatic Life Long-Term Average (AW)[b]			n/a	6.84-50[d]	9	5	1,000	0.13	n/a	1,200	0.246-0.457[e]	n/a	1 (Cr(+6))[f]	4	0.3-4.3[h]	n/a	7.46-19.6[e]	n/a	n/a	1,146-2,600[e]	0.02[i]	7,600	112-150[e]	n/a	2	1.5[e]	n/a	n/a	0.8	n/a	n/a	8.5	n/a	32.3-187.5[e]
BCWQG Aquatic Life Short-Term Average (AW)[c]			n/a	23.03-100[d]	n/a	n/a	n/a	n/a	n/a	n/a	0.728-2.8[e]	n/a	n/a	110	1.5-26.4[h]	350	106-417[e]	n/a	n/a	1,895-3,390[e]	n/a	46,000	n/a	n/a	n/a	3[e]	n/a	n/a	n/a	n/a	n/a	n/a	n/a	57.8-340.5[e]
Sparwood Area - Michel Creek and Baldy Ridge (Study Area 9a)																																		
EV_MW_SPR1A	EV_MW_SPR1A_WG_2022_Q1_NP	2022 01 16	323	1.1	< 0.10	0.99	322	< 0.020	< 0.050	23	< 0.0050	82.2	< 0.10	0.40	0.34	355	< 0.050	15.6	28.6	*255*	< 0.0050	1.43	1.42	1.43	< 0.050	< 0.010	3.95	301	< 0.010	< 0.10	< 0.30	0.641	< 0.50	< 1.0
	EV_MW_SPR1A_WG_2022_Q2_NP	2022 04 22	314	1.7	< 0.10	0.98	366	< 0.020	< 0.050	23	< 0.0050	77.2	< 0.10	0.39	0.71	270	< 0.050	14.2	29.5	*240*	< 0.0050	1.55	1.30	1.32	< 0.050	< 0.010	4.09	300	< 0.010	< 0.10	< 0.30	0.493	< 0.50	1.8
	EV_MW_SPR1A_WG_2022_Q3_NP	2022 07 17	338	< 1.0	< 0.10	1.02	363	< 0.020	< 0.050	23	< 0.0050	82.7	< 0.10	0.42	< 0.20	158	< 0.050	15.0	31.9	*268*	< 0.0050	1.38	1.19	1.43	0.052	< 0.010	4.32	300	< 0.010	< 0.10	< 0.30	0.564	< 0.50	2.0
	EV_MW_SPR1A_WG_2022_Q4_NP	2022 10 11	372	< 1.0	< 0.10	0.97	398	< 0.020	< 0.050	25	< 0.0050	95.5	< 0.10	0.39	< 0.20	335	< 0.050	14.4	32.5	*253*	< 0.0050	1.58	1.04	1.39	0.824	< 0.010	4.41	322	< 0.010	< 0.10	< 0.30	0.530	< 0.50	< 1.0
EV_MW_SPR1B	EV_MW_SPR1B_WG_2022_Q1_NP	2022 01 16	133	1.7	< 0.10	0.60	39.8	< 0.020	< 0.050	146	< 0.0100	33.1	< 0.10	< 0.10	< 0.20	145	0.065	10.9	12.3	93.7	< 0.0050	*25.8*	< 0.50	1.11	0.302	< 0.010	43.0	785	< 0.010	< 0.10	< 0.30	1.29	< 0.50	< 1.0
	EV_MW_SPR1B_WG_2022_Q2_NP	2022 04 22	152	1.7	< 0.10	1.22	47.9	< 0.020	< 0.050	128	< 0.0050	36.5	< 0.10	< 0.10	< 0.20	548	< 0.050	10.5	14.9	125	< 0.0050	*19.3*	< 0.50	1.19	0.392	< 0.010	40.8	848	< 0.010	0.11	< 0.30	1.14	< 0.50	< 1.0
	EV_MW_SPR1B_WG_2022_Q3_NP	2022 07 17	162	1.0	< 0.10	0.85	48.5	< 0.020	< 0.050	150	0.0052	38.3	< 0.10	< 0.10	< 0.20	43	< 0.050	11.6	16.0	115	< 0.0050	*20.4*	< 0.50	1.27	1.21	< 0.010	48.5	932	< 0.010	< 0.10	< 0.30	1.47	< 0.50	1.4
	EV_MW_SPR1B_WG_2022_Q4_NP	2022 10 11	151	6.5	< 0.10	0.32	39.8	< 0.020	< 0.050	166	< 0.0050	38.6	< 0.10	< 0.10	< 0.20	128	< 0.050	11.2	13.2	125	< 0.0050	5.82	< 0.50	1.18	4.88	< 0.010	44.9	930	< 0.010	0.31	< 0.30	1.40	< 0.50	< 1.0
EV_MW_SPR1C**	EV_MW_SPR1C_WG_2022_Q1_NP	2022 01 16	368	1.8	0.10	< 0.10	167	< 0.020	< 0.050	17	0.0710	99.4	< 0.10	< 0.10	0.32	< 10	< 0.050	19.3	29.0	< 0.10	< 0.0050	0.600	< 0.50	1.40	7.22	< 0.010	12.9	218	< 0.010	< 0.10	< 0.30	1.02	< 0.50	1.6
	EV_MW_SPR1C_WG_2022_Q2_NP	2022 04 22	437	< 1.0	0.10	< 0.10	198	< 0.020	< 0.050	13	0.0864	114	0.18	< 0.10	0.35	< 10	< 0.050	18.0	37.0	< 0.10	< 0.0050	0.562	< 0.50	1.42	9.44	< 0.010	15.2	275	< 0.010	< 0.10	< 0.30	1.23	< 0.50	< 1.0
	EV_MW_SPR1C_WG_2022_Q3_NP	2022 07 17	268	< 1.0	0.11	< 0.10	112	< 0.020	< 0.050	15	0.0544	71.4	0.16	< 0.10	0.29	< 10	< 0.050	13.6	21.8	0.25	< 0.0050	0.811	< 0.50	1.20	4.75	< 0.010	9.21	154	< 0.010	< 0.10	< 0.30	0.890	< 0.50	< 1.0
	EV_MW_SPR1C_WG_2022_Q4_NP	2022 10 11	462	< 1.0	0.13	0.10	187	< 0.020	< 0.050	23	0.0962	128	0.10	< 0.10	0.26	< 10	< 0.050	21.2	34.5	0.16	< 0.0050	0.763	< 0.50	1.54	7.73	< 0.010	11.0	272	< 0.010	< 0.10	< 0.30	1.57	< 0.50	< 1.0
EV_MW_MCgwA**	EV_MW_MCGWA_WG_2022_Q1_NP	2022 02 13	380	< 1.0	< 0.10	0.13	347	< 0.020	< 0.050	37	0.0166	98.0	< 0.10	0.17	< 0.20	98	< 0.050	21.3	32.9	32.7	< 0.0050	2.78	1.58	2.26	1.01	< 0.010	14.4	399	< 0.010	< 0.10	< 0.30	0.636	< 0.50	1.2
	EV_MW_MCGWA_WG_2022_Q2_NP	2022 04 21	376	< 1.0	< 0.10	0.11	329	< 0.020	< 0.050	34	0.0153	95.3	< 0.10	0.19	< 0.20	99	< 0.050	20.5	33.5	30.8	< 0.0050	2.59	1.65	2.22	0.810	< 0.020	15.0	388	0.012	< 0.10	< 0.30	0.555	< 0.50	1.6
	EV_MW_MCGWA_WG_2022_Q3_NP	2022 07 18	393	< 1.0	< 0.10	0.14	313	< 0.020	< 0.050	39	0.0161	100	< 0.10	0.18	< 0.20	89	< 0.050	20.2	34.8	32.7	< 0.0050	2.37	1.83	2.29	2.17	< 0.010	15.6	389	< 0.010	< 0.10	< 0.30	0.599	< 0.50	1.5
	EV_MW_MCgwA_WG_2022_Q4_NP	2022 10 03	404	1.4	< 0.10	0.15	307	< 0.020	< 0.050	38	0.0190	103	< 0.10	0.18	0.65	88	< 0.050	20.1	35.7	25.2	< 0.0050	2.59	1.91	2.27	0.937	< 0.010	14.9	420	0.020	< 0.10	< 0.30	0.536	< 0.50	1.6
EV_MW_MCgwB**	EV_MW_MCGWB_WG_2022_Q1_NP	2022 02 13	359	< 1.0	< 0.10	0.12	208	< 0.020	< 0.050	50	0.0708	94.8	0.13	< 0.10	0.44	< 10	< 0.050	14.8	29.8	0.35	< 0.0050	2.99	1.67	2.45	2.18	< 0.010	14.2	282	0.013	< 0.10	< 0.30	0.756	< 0.50	1.0
	EV_MW_MCGWB_WG_2022_Q2_NP	2022 04 21	350	< 1.0	< 0.10	0.12	205	< 0.020	< 0.050	43	0.0669	92.7	0.11	< 0.10	1.52	< 10	0.059	13.8	28.8	< 0.10	< 0.0050	2.99	1.42	2.37	1.67	< 0.010	13.7	282	0.013	0.36	< 0.30	0.699	< 0.50	2.2
	EV_MW_MCGWB_WG_2022_Q3_NP	2022 07 18	358	< 1.0	< 0.10	0.10	197	< 0.020	< 0.050	51	0.0695	95.1	0.16	< 0.10	0.58	< 10	< 0.050	14.1	29.2	< 0.10	< 0.0050	3.12	1.66	2.74	1.84	< 0.010	14.1	274	< 0.010	< 0.10	< 0.30	0.755	< 0.50	1.4
	EV_MW_MCgwB_WG_2022_Q4_NP	2022 10 03	370	< 1.0	< 0.10	0.16	199	< 0.020	< 0.050	48	0.0998	99.2	0.11	< 0.10	1.04	< 10	< 0.050	14.7	29.7	0.20	< 0.0050	3.27	1.49	2.42	1.51	< 0.010	12.4	311	0.016	< 0.10	< 0.30	0.665	< 0.50	2.6
Sparwood Area - Elk River (Study Area 12)																																		
EV_ER1gwS	EV_ER1GWS_WG_2022_Q1_NP	2022 01 30	253	6.1	< 0.10	0.10	82.1	< 0.020	< 0.050	< 10	< 0.0050	65.0	0.44	< 0.10	0.80	< 10	< 0.050	7.4	22.0	0.14	< 0.0050	1.45	< 0.50	0.764	3.58	< 0.010	3.35	205	< 0.010	< 0.10	< 0.30	1.28	< 0.50	3.6
	EV_MW_BC10A_WG_2022_Q1_NP	Duplicate	298	1.2	< 0.10	0.10	126	< 0.020	< 0.050	< 10	0.0133	79.0	0.28	< 0.10	< 0.20	< 10	< 0.050	7.6	24.5	< 0.10	< 0.0050	0.890	< 0.50	0.896	7.62	< 0.010	8.83	212	< 0.010	< 0.10	< 0.30	0.989	< 0.50	< 1.0
	QA/QC RPD%		16	*	*	*	42	*	*	*	*	19	*	*	*	*	*	3	11	*	*	48	*	16	72	*	90	3	*	*	*	26	*	*
	EV_ER1GWS_WG_2022_Q2_NP	2022 04 22	268	1.4	< 0.10	0.11	132	< 0.020	< 0.050	10	0.0166	72.0	0.26	< 0.10	0.77	< 10	< 0.050	7.8	21.5	< 0.10	< 0.0050	0.851	< 0.50	0.915	6.93	< 0.010	10.4	196	< 0.010	< 0.10	< 0.30	0.952	< 0.50	1.0
	EV_ER1GWS_WG_2022_Q3_NP	2022 08 05	256	< 1.0	< 0.10	0.13	125	< 0.020	< 0.050	12	0.0159	68.9	0.24	< 0.10	< 0.20	< 10	< 0.050	7.2	20.4	< 0.10	< 0.0050	0.864	< 0.50	0.921	5.47	< 0.010	8.97	170	< 0.010	< 0.10	< 0.30	0.877	< 0.50	< 1.0
	EV_ER1GWS_WG_2022_Q4_NP	2022 10 11	265	< 1.0	< 0.10	0.11	117	< 0.020	< 0.050	10	0.0147	71.7	0.25	< 0.10	< 0.20	< 10	< 0.050	7.9	20.9	< 0.10	< 0.0050	1.24	< 0.50	0.868	12.2	< 0.010	4.31	181	< 0.010	< 0.10	< 0.30	1.16	< 0.50	< 1.0
EV_ER1gwD	EV_ER1GWD_WG_2022_Q1_NP	2022 01 30	292	1.1	< 0.10	0.10	121	< 0.020	< 0.050	< 10	0.0134	77.7	0.27	< 0.10	0.22	< 10	< 0.050	7.5	23.9	< 0.10	< 0.0050	0.911	< 0.50	0.842	7.76	< 0.010	8.54	210	< 0.010	< 0.10	< 0.30	0.959	< 0.50	1.5
	EV_ER1GWD_WG_2022_Q2_NP	2022 04 22	221	4.8	0.10	< 0.10	77.6	< 0.020	< 0.050	< 10	0.0056	56.2	0.46	< 0.10	0.58	< 10	< 0.050	6.8	19.7	< 0.10	< 0.0050	1.47	< 0.50	0.682	3.70	< 0.010	3.14	184	< 0.010	0.12	< 0.30	1.25	< 0.50	2.8
	EV_ER1GWD_WG_2022_Q3_NP	2022 08 05	239	5.5	< 0.10	< 0.10	83.4	< 0.020	< 0.050	11	0.0051	61.2	0.52	< 0.10	0.25	< 10	< 0.050	7.5	20.9	< 0.10	< 0.0050	1.46	< 0.50	0.665	3.40	< 0.010	3.25	191	< 0.010	< 0.10	< 0.30	1.40	< 0.50	< 1.0
	EV_ER1GWD_WG_2022_Q4_NP	2022 10 11	242	5.0	< 0.10	< 0.10	76.1	< 0.020	< 0.050	13	0.0058	64.4	0.46	< 0.10	1.72	< 10	< 0.050	7.2	19.6	0.10	< 0.0050	3.75	0.58	0.657	3.75	< 0.010	2.84	190	< 0.010	< 0.10	< 0.30	1.41	< 0.50	2.4

All terms defined within the body of SNC-Lavalin's report.

<	Denotes concentration less than indicated detection limit.
-	Denotes analysis not conducted.
n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL	Denotes reported detection limit.

BLUE	Concentration greater than BCWQG Aquatic Life Long-term Average guideline and/or BCWQG Aquatic Life Short-term Maximum guideline
BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Guideline to protect freshwater aquatic life, long-term average (i.e. "chronic") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[c] Guideline to protect freshwater aquatic life, short-term maximum (i.e. "acute") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[d] Standard/guideline varies with pH.

[e] Standard/guideline varies with Hardness.

[f] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.

[g] Interim BC MoE Regional Background Estimate (Protocol 9 Determining Background Groundwater Quality).

[h] Guideline is temperature, pH, DOC and hardness dependent.

[i] Total Mercury guideline is based on the % of MethylMercury present. WQG = 0.0001 / (MeHg/total Hg), where MeHg is mass (or concentration) of methyl mercury and THg. Guideline shown assumes MeHg<0.5% of Total Hg.

[j] There is no Zinc standard specified for H > 400; therefore, the standard for H=300-<400 is applied as a conservative comparison.

[k] Ramboll calculated health-based values for these two parameters based on toxicity values (tolerable daily intakes; TDI) and drinking water allocation factors (DW AFs), documented in Appendix IV.

[l] Monitoring wells within 10m of high watermark, samples compared to CSR and BCWQG.

TABLE EV-04: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Metals in Groundwater (EVO)

				Dissolved Metals																														
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Hardness mg/L	Aluminum µg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Bismuth µg/L	Boron µg/L	Cadmium µg/L	Calcium mg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Lithium µg/L	Magnesium mg/L	Manganese µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Potassium mg/L	Selenium µg/L	Silver µg/L	Sodium mg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Uranium µg/L	Vanadium µg/L	Zinc[j] µg/L
BC Standard																																		
CSR Aquatic Life (AW)[a]			n/a	n/a	90	50	10,000	1.5	n/a	12,000	0.5-4[e]	n/a	10[f]	40	20-90[e]	n/a	40-160[e]	n/a	n/a	n/a	0.25	10,000	250-1,500[e]	n/a	20	0.5-15[e]	n/a	n/a	3	n/a	1,000	85	n/a	75-2,400[e]
CSR Irrigation Watering (IW)			n/a	5,000	n/a	100	n/a	100	n/a	500	5	n/a	5[f]	50	200	5,000	200	2,500	n/a	200	1	10	200	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	10	100	1,000-5,000[d]
CSR Livestock Watering (LW)			n/a	5,000	n/a	25	n/a	100	n/a	5,000	80	1,000	50[f]	1,000	300	n/a	100	5,000	n/a	n/a	2	50	1,000	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	200	100	2,000
CSR Drinking Water (DW)			n/a	9,500	6	10	1,000	8	n/a	5,000	5	n/a	50[f]	20[g]	1,500	6,500	10	8	n/a	1,500	1	250	80	n/a	10	20	200	2,500	n/a	2,500	n/a	20	20	3,000
Health-based Value (HBV)[g]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,200	n/a	n/a	n/a	2,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BC Guideline																																		
BCWQG Aquatic Life Long-Term Average (AW)[b]			n/a	6.84-50[d]	9	5	1,000	0.13	n/a	1,200	0.246-0.457[e]	n/a	1 (Cr(+6))[f]	4	0.3-4.3[h]	n/a	7.46-19.6[e]	n/a	n/a	1,146-2,600[e]	0.02[i]	7,600	112-150[e]	n/a	2	1.5[e]	n/a	n/a	0.8	n/a	n/a	8.5	n/a	32.3-187.5[e]
BCWQG Aquatic Life Short-Term Average (AW)[c]			n/a	23.03-100[d]	n/a	n/a	n/a	n/a	n/a	n/a	0.728-2.8[e]	n/a	n/a	110	1.5-26.4[h]	350	106-417[e]	n/a	n/a	1,895-3,390[e]	n/a	46,000	n/a	n/a	n/a	3[e]	n/a	n/a	n/a	n/a	n/a	n/a	n/a	57.8-340.5[e]
Sparwood Area - Elk River (Study Area 12)																																		
RG_DW-03-04	RG_DW-03-04_WP_2022_02_14_NP	2022 02 14	236	1.2	< 0.10	< 0.10	136	< 0.020	< 0.050	10	0.0131	61.6	< 0.10	< 0.10	0.41	< 10	< 0.050	8.4	20.1	< 0.10	-	1.09	< 0.50	0.957	5.04	< 0.010	7.62	144	< 0.010	< 0.10	< 0.30	0.865	< 0.50	2.1
	RG_DW-03-04_WP_2022_04_20_NP	2022 04 20	270	1.0	0.10	0.12	160	< 0.020	< 0.050	< 10	0.0133	68.7	0.16	< 0.10	0.50	< 10	< 0.050	8.6	24.0	< 0.10	-	1.02	0.62	0.964	7.08	< 0.010	8.43	166	< 0.010	< 0.10	< 0.30	1.04	< 0.50	4.2
	RG_DW-03-04_WP_2022_07_19_NP	2022 07 19	224	1.3	0.10	0.10	107	< 0.020	< 0.050	< 10	0.0124	58.6	0.14	< 0.10	1.62	< 10	0.088	7.0	18.9	< 0.10	-	1.10	5.09	0.825	4.13	< 0.010	7.63	138	< 0.010	< 0.10	< 0.30	0.787	< 0.50	8.0
	RG_DW-03-04_WP_2022_10_11_NP	2022 10 11	270	2.3	< 0.10	< 0.10	142	< 0.020	< 0.050	12	0.0099	69.4	0.14	< 0.10	1.82	< 10	0.062	9.2	23.4	0.12	-	1.02	1.61	0.877	8.98	< 0.010	7.81	161	< 0.010	< 0.10	< 0.30	0.931	< 0.50	5.3
RG_MW-03-04	RG_MW-03-04_WG_2022_Q1_NP	2022 03 08	294	1.4	< 0.10	0.14	145	< 0.020	< 0.050	< 10	0.0135	75.9	< 0.10	< 0.10	0.64	< 10	< 0.050	8.8	25.5	0.27	< 0.0050	0.980	< 0.50	0.847	7.58	< 0.010	6.13	176	< 0.010	< 0.10	< 0.30	1.26	< 0.50	1.2
	RG_MW-03-04_WG_2022_Q2_NP	2022 05 15	243	1.9	0.11	0.13	117	< 0.020	< 0.050	11	0.0099	62.2	0.14	< 0.10	0.43	< 10	< 0.050	9.2	21.3	< 0.10	< 0.0050	1.00	< 0.50	0.820	6.00	< 0.010	6.18	155	< 0.010	0.11	< 0.30	0.962	< 0.50	< 1.0
	RG_MW-03-04_WG_2022_Q3_NP	2022 08 18	260	2.3	0.12	0.15	129	< 0.020	< 0.050	13	0.0157	65.3	0.15	< 0.10	0.50	< 10	< 0.050	9.7	23.6	0.15	< 0.0050	0.927	< 0.50	0.978	8.77	< 0.010	6.29	170	< 0.010	< 0.10	< 0.30	1.02	< 0.50	< 1.0
	RG_MW-03-04_WG_2022_Q4_NP	2022 10 24	327	1.6	0.14	0.17	170	< 0.020	< 0.050	15	0.0178	83.1	0.12	< 0.10	0.93	< 10	< 0.050	10.9	29.0	< 0.10	< 0.0050	0.936	< 0.50	1.16	10.3	< 0.010	6.76	198	< 0.010	< 0.10	< 0.30	1.24	< 0.50	1.3
	RG_MW-03-04_WG_2022-12-12_NP	2022 12 12	345	< 1.0	0.12	0.16	166	< 0.020	< 0.050	11	0.0151	85.6	< 0.10	< 0.10	0.39	< 10	< 0.050	10.3	31.8	0.10	< 0.0050	0.951	< 0.50	1.09	11.3	< 0.010	6.68	218	< 0.010	< 0.10	< 0.30	1.14	< 0.50	< 1.0
EV_MW_MC3	EV_MW_MC3_WG_2022_Q1_NP	2022 03 09	411	< 1.0	0.11	0.13	103	< 0.020	< 0.050	19	0.0560	105	< 0.10	< 0.10	0.57	< 10	< 0.050	30.8	36.1	3.14	< 0.0050	1.58	< 0.50	1.48	18.6	< 0.010	21.6	261	< 0.010	< 0.10	< 0.30	1.15	< 0.50	1.4
	EV_MW_MC3_WG_2022_Q2_NP	2022 05 15	412	10.6	0.10	0.14	123	< 0.020	< 0.050	23	0.0514	107	0.11	< 0.10	1.03	14	< 0.050	36.2	35.1	6.81	< 0.0050	2.63	0.54	1.56	18.8	< 0.010	30.1	251	< 0.010	0.14	< 0.30	1.29	< 0.50	2.1
	EV_MW_MC3_WG_2022_Q3_NP	2022 08 17	415	< 1.0	0.11	0.18	120	< 0.020	< 0.050	23	0.0561	105	< 0.10	< 0.10	0.24	< 10	< 0.050	34.0	37.2	2.06	< 0.0050	1.05	< 0.50	1.60	18.8	< 0.010	21.2	241	< 0.010	< 0.10	< 0.30	1.11	< 0.50	< 1.0
	EV_MW_MC3_WG_2022_Q4_NP	2022 10 17	191	< 1.0	0.12	0.56	106	< 0.020	< 0.050	65	0.0683	49.1	< 0.10	< 0.10	0.50	< 10	< 0.050	82.3	16.6	53.7	< 0.0050	*14.0*	< 0.50	1.46	2.94	< 0.010	91.6	133	< 0.010	< 0.10	< 0.30	0.947	< 0.50	1.6
Michel Creek Downstream of Gate Creek and Bodie Creek - Gate Creek and Bodie Creek (+ denotes well part of Study Area 9b)																																		
EV_MW_GT1A[+]	EV_MW_GT1A_WG_2022_Q1_NP	2022 01 21	272	1.1	< 0.10	0.15	70.5	< 0.020	< 0.050	12	< 0.0050	75.0	< 0.10	< 0.10	< 0.20	115	< 0.050	9.9	20.5	75.9	< 0.0050	1.03	< 0.50	0.740	< 0.050	< 0.010	2.72	135	< 0.010	< 0.10	< 0.30	0.279	< 0.50	< 1.0
	EV_MW_GT1A_WG_2022_Q2_NP	2022 04 22	251	1.8	< 0.10	0.17	68.6	< 0.020	< 0.050	11	< 0.0050	65.1	< 0.10	< 0.10	< 0.20	97	< 0.050	9.2	21.4	74.5	< 0.0050	1.14	< 0.50	0.757	0.102	< 0.010	3.05	130	< 0.010	< 0.10	< 0.30	0.268	< 0.50	< 1.0
	EV_MW_GT1A_WG_2022_Q3_NP	2022 07 15	255	1.6	< 0.10	0.12	74.8	< 0.020	< 0.050	12	< 0.0050	66.5	< 0.10	< 0.10	< 0.20	104	< 0.050	10.9	21.6	75.2	< 0.0050	0.689	< 0.50	0.826	0.184	< 0.010	2.97	135	< 0.010	< 0.10	< 0.30	0.234	< 0.50	< 1.0
	EV_MW_GT1A_WG_2022_Q4_NP	2022 10 03	263	< 1.0	< 0.10	< 0.10	91.6	< 0.020	< 0.050	13	< 0.0050	69.4	< 0.10	< 0.10	< 0.20	73	< 0.050	10.3	21.8	65.4	< 0.0050	0.643	< 0.50	0.790	2.23	< 0.010	3.01	144	< 0.010	0.16	< 0.30	0.159	< 0.50	1.0
EV_MW_GT1B[+]	EV_MW_GT1B_WG_2022_Q1_NP	2022 01 21	812	1.3	0.47	0.23	51.3	< 0.020	< 0.050	13	0.0759	172	< 0.10	< 0.10	0.43	< 10	< 0.050	35.6	93.0	< 0.10	< 0.0050	4.57	7.69	2.14	***142***	< 0.010	3.56	400	< 0.010	< 0.10	< 0.30	4.49	< 0.50	3.0
	EV_MW_GT1B_WG_2022_Q2_NP	2022 04 22	1,130	2.4	0.76	0.28	71.3	< 0.020	< 0.050	25	0.0947	207	< 0.10	< 0.10	0.80	< 10	< 0.050	72.2	148	0.11	< 0.0050	*10.3*	12.0	4.10	***123***	< 0.010	5.40	576	< 0.010	< 0.10	< 0.30	8.75	< 0.50	3.8
	EV_MW_GT1B_WG_2022_Q3_NP	2022 07 15	816	1.9	0.72	0.30	88.6	< 0.020	< 0.050	28	0.117	157	0.12	< 0.10	3.83	< 10	< 0.050	64.1	103	0.11	< 0.0050	6.88	9.48	3.32	***62.7***	< 0.010	6.03	467	0.013	0.10	< 0.30	6.76	< 0.50	4.6
	EV_MW_GT1B_WG_2022_Q4_NP	2022 10 03	1,020	1.1	0.88	0.32	65.1	< 0.020	< 0.050	34	0.141	186	< 0.10	< 0.10	0.53	< 10	< 0.050	103	136	< 0.10	< 0.0050	9.50	13.5	4.08	***101***	< 0.010	7.93	528	0.020	< 0.10	< 0.30	8.07	< 0.50	5.0
EV_MW_BC1A[+]	EV_MW_BC1A_WG_2022_Q1_NP	2022 02 24	1,300	< 1.0	0.78	0.19	50.4	< 0.020	< 0.050	51	0.193	248	0.11	0.15	0.22	< 10	< 0.050	159	165	1.22	< 0.0050	5.90	1.44	5.86	***211***	< 0.010	8.89	1,020	0.023	< 0.10	< 0.30	9.60	< 0.50	4.2
	EV_MW_MC10A_WG_2022_Q1_NP	Duplicate	1,250	< 1.0	0.75	0.21	49.3	< 0.020	< 0.050	49	0.198	238	0.14	0.15	0.26	< 10	< 0.050	145	160	1.22	< 0.0050	5.83	1.45	5.70	***210***	< 0.010	8.62	1,000	0.021	< 0.10	< 0.30	9.53	< 0.50	4.2
	QA/QC RPD%		4	*	4	*	2	*	*	*	3	4	*	*	*	*	*	9	3	0	*	1	*	3	0	*	3	2	*	*	*	1	*	*
	EV_MW_BC1A_WG_2022_Q2_NP	2022 05 01	1,160	1.4	0.71	0.19	47.0	< 0.020	< 0.050	47	0.175	228	0.12	0.10	< 0.20	< 10	< 0.050	135	144	2.46	< 0.0050	5.85	1.33	5.12	***168***	< 0.010	8.08	1,050	0.018	< 0.10	< 0.30	8.82	< 0.50	4.1
	EV_MW_MC10A_WG_2022_Q2_NP	Duplicate	1,190	1.5	0.71	0.18	47.1	< 0.020	< 0.050	48	0.169	233	< 0.10	0.10	0.24	< 10	< 0.050	139	148	2.68	< 0.0050	5.76	1.43	5.37	***163***	< 0.010	8.54	1,030	0.018	0.12	< 0.30	8.96	< 0.50	4.1
	QA/QC RPD%		3	*	0	*	0	*	*	*	3	2	*	*	*	*	*	3	3	9	*	2	*	5	3	*	6	2	*	*	*	2	*	*
	EV_MW_BC1A_WG_2022_Q3_NP	2022 07 14	1,130	< 1.0	0.84	0.24	49.8	< 0.020	< 0.050	52	0.191	216	0.15	0.16	0.76	< 10	< 0.050	133	144	1.12	< 0.0050	6.56	1.64	5.78	***112***	< 0.010	9.63	1,000	0.017	< 0.10	< 0.30	9.70	< 0.50	4.0
	EV_MW_BC1A_WG_2022_Q4_NP	2022 10 03	1,130	< 1.0	0.82	0.26	49.2	< 0.020	< 0.050	58	0.165	220	< 0.10	0.16	1.46	< 10	< 0.050	141	142	4.39	< 0.0050	7.19	1.62	5.65	***117***	< 0.010	9.64	1,040	0.018	< 0.10	< 0.30	8.04	< 0.50	5.9
EV_MW_BC1B[+]	EV_MW_BC1B_WG_2022_Q1_NP	2022 02 11	1,370	< 2.0	1.12	0.20	29.5	< 0.040	< 0.100	45	0.223	254	< 0.20	< 0.20	0.68	< 20	< 0.100	140	179	0.40	< 0.0050	9.67	4.64	5.90	***221***	< 0.020	7.77	1,140	< 0.020	< 0.20	< 0.60	*11.5*	< 1.00	5.3
	EV_MW_BC1B_WG_2022_Q2_NP	2022 04 24	1,160	1.5	1.17	0.25	27.3	< 0.020	< 0.050	54	0.205	213	0.10	< 0.10	0.71	< 10	< 0.050	128	153	< 0.10	< 0.0050	9.03	3.47	5.47	***172***	< 0.010	8.45	947	0.017	< 0.10	< 0.30	*10.4*	< 0.50	5.5
	EV_MW_BC1B_WG_2022_Q3_NP	2022 07 14	1,100	< 1.0	1.39	0.28	40.3	< 0.020	< 0.050	68	0.256	206	0.12	< 0.10	0.87	< 10	< 0.050	141	143	0.11	< 0.0050	8.95	5.59	6.18	***92.1***	< 0.010	10.2	941	0.019	< 0.10	< 0.30	*10.3*	< 0.50	5.2
	EV_MW_BC1B_WG_2022_Q4_NP	2022 10 03	1,200	< 1.0	1.57	0.31	34.9	< 0.020	< 0.050	65	0.249	225	0.14	< 0.10	0.76	< 10	< 0.050	147	156	0.12	< 0.0050	8.69	3.70	6.66	***101***	< 0.010	10.7	1,030	0.031	< 0.10	< 0.30	9.22	< 0.50	6.3

All terms defined within the body of SNC-Lavalin's report.

<	Denotes concentration less than indicated detection limit.
-	Denotes analysis not conducted.
n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
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BLUE	Concentration greater than BCWQG Aquatic Life Long-term Average guideline and/or BCWQG Aquatic Life Short-term Maximum guideline
BOLD	Concentration greater than CSR Aquatic Life (AW) standard
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[a] Standard to protect freshwater aquatic life.

[b] Guideline to protect freshwater aquatic life, long-term average (i.e. "chronic") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[c] Guideline to protect freshwater aquatic life, short-term maximum (i.e. "acute") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[d] Standard/guideline varies with pH.

[e] Standard/guideline varies with Hardness.

[f] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.

[g] Interim BC MoE Regional Background Estimate (Protocol 9 Determining Background Groundwater Quality).

[h] Guideline is temperature, pH, DOC and hardness dependent.

[i] Total Mercury guideline is based on the % of MethylMercury present. WQG = 0.0001 / (MeHg/total Hg), where MeHg is mass (or concentration) of methyl mercury and THg. Guideline shown assumes MeHg<0.5% of Total Hg.

[j] There is no Zinc standard specified for H > 400; therefore, the standard for H=300-<400 is applied as a conservative comparison.

[k] Ramboll calculated health-based values for these two parameters based on toxicity values (tolerable daily intakes; TDI) and drinking water allocation factors (DW AFs), documented in Appendix IV.

[l] Monitoring wells within 10m of high watermark, samples compared to CSR and BCWQG.

TABLE EV-04: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Metals in Groundwater (EVO)

				Dissolved Metals																														
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Hardness mg/L	Aluminum µg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Bismuth µg/L	Boron µg/L	Cadmium µg/L	Calcium mg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Lithium µg/L	Magnesium mg/L	Manganese µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Potassium mg/L	Selenium µg/L	Silver µg/L	Sodium mg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Uranium µg/L	Vanadium µg/L	Zinc[j] µg/L
BC Standard																																		
CSR Aquatic Life (AW)[a]			n/a	n/a	90	50	10,000	1.5	n/a	12,000	0.5-4[e]	n/a	10[f]	40	20-90[e]	n/a	40-160[e]	n/a	n/a	n/a	0.25	10,000	250-1,500[e]	n/a	20	0.5-15[e]	n/a	n/a	3	n/a	1,000	85	n/a	75-2,400[e]
CSR Irrigation Watering (IW)			n/a	5,000	n/a	100	n/a	100	n/a	500	5	n/a	5[f]	50	200	5,000	200	2,500	n/a	200	1	10	200	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	10	100	1,000-5,000[d]
CSR Livestock Watering (LW)			n/a	5,000	n/a	25	n/a	100	n/a	5,000	80	1,000	50[f]	1,000	300	n/a	100	5,000	n/a	n/a	2	50	1,000	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	200	100	2,000
CSR Drinking Water (DW)			n/a	9,500	6	10	1,000	8	n/a	5,000	5	n/a	50[f]	20[g]	1,500	6,500	10	8	n/a	1,500	1	250	80	n/a	10	20	200	2,500	n/a	2,500	n/a	20	20	3,000
Health-based Value (HBV)[g]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,200	n/a	n/a	n/a	2,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BC Guideline																																		
BCWQG Aquatic Life Long-Term Average (AW)[b]			n/a	6.84-50[d]	9	5	1,000	0.13	n/a	1,200	0.246-0.457[e]	n/a	1 (Cr(+6))[f]	4	0.3-4.3[h]	n/a	7.46-19.6[e]	n/a	n/a	1,146-2,600[e]	0.02[i]	7,600	112-150[e]	n/a	2	1.5[e]	n/a	n/a	0.8	n/a	n/a	8.5	n/a	32.3-187.5[e]
BCWQG Aquatic Life Short-Term Average (AW)[c]			n/a	23.03-100[d]	n/a	n/a	n/a	n/a	n/a	n/a	0.728-2.8[e]	n/a	n/a	110	1.5-26.4[h]	350	106-417[e]	n/a	n/a	1,895-3,390[e]	n/a	46,000	n/a	n/a	n/a	3[e]	n/a	n/a	n/a	n/a	n/a	n/a	n/a	57.8-340.5[e]
Michel Creek Downstream of Gate Creek and Bodie Creek - Gate Creek and Bodie Creek (+ denotes well part of Study Area 9b)																																		
EV_MW_BC2	EV_MW_BC2_WG_2022_Q1_NP	2022 03 06	812	1.2	0.48	0.17	41.7	< 0.020	< 0.050	34	0.134	198	< 0.10	1.99	0.56	< 10	< 0.050	73.8	77.2	*414*	< 0.0050	0.992	3.74	2.44	***37.7***	< 0.010	5.99	767	< 0.010	< 0.10	< 0.30	3.76	< 0.50	5.9
	EV_MW_BC2_WG_2022_Q2_NP	2022 05 19	820	5.3	0.50	0.17	49.8	< 0.020	< 0.050	36	0.124	197	< 0.10	1.83	1.19	< 10	< 0.050	81.1	79.8	*386*	< 0.0050	1.11	3.70	2.36	***36.6***	< 0.010	6.12	781	< 0.010	0.33	< 0.30	3.70	< 0.50	6.5
	EV_MW_BC2_WG_2022_Q3_NP	2022 08 22	667	< 1.0	0.44	0.18	34.3	< 0.020	< 0.050	34	0.103	154	< 0.10	1.51	0.49	< 10	< 0.050	71.7	68.5	*354*	< 0.0050	1.11	3.00	2.14	***21.8***	< 0.010	5.92	582	0.012	< 0.10	< 0.30	3.89	< 0.50	4.4
	EV_MW_BC2_WG_2022_Q4_NP	2022 10 25	677	1.6	0.45	0.20	33.2	< 0.020	< 0.050	35	0.0915	168	< 0.10	1.29	1.20	< 10	< 0.050	72.6	62.5	*315*	< 0.0050	0.969	2.62	2.11	12.6	< 0.010	5.34	622	0.014	< 0.10	< 0.30	3.63	< 0.50	5.8
EV_MW_BC3	EV_MW_BC3_WG_2022_Q1_NP	2022 03 23	652	4.3	0.77	0.26	51.2	< 0.020	< 0.050	60	0.275	129	0.10	< 0.10	0.97	< 10	< 0.050	115	80.0	9.34	< 0.0050	9.54	4.64	4.56	***53.8***	< 0.010	7.36	939	< 0.010	0.19	< 0.30	5.63	0.60	10.2
	EV_MW_BC3_WG_2022_Q2_NP	2022 05 31	908	< 1.0	0.91	0.27	80.7	< 0.020	< 0.050	68	0.378	174	< 0.10	< 0.10	0.42	< 10	< 0.050	133	115	4.48	< 0.0050	6.97	5.92	5.60	***46.1***	< 0.010	9.12	1,120	< 0.010	< 0.10	< 0.30	8.19	< 0.50	12.0
	EV_MW_BC3_WG_2022_Q3_NP	2022 09 20	1,300	2.8	1.31	0.36	120	< 0.020	< 0.050	64	0.604	263	0.11	0.35	1.55	17	< 0.050	140	157	104	< 0.0050	*10.4*	10.9	7.20	***102***	< 0.010	10.9	1,430	0.020	< 0.10	< 0.30	9.92	< 0.50	19.9
	EV_MW_BC3_WG_2022_Q4_NP	2022 11 13	1,070	< 1.0	1.18	0.27	91.7	< 0.020	< 0.050	66	0.437	207	< 0.10	< 0.10	0.78	< 10	< 0.050	145	134	16.4	< 0.0050	8.21	7.20	6.05	***92.4***	< 0.010	9.64	1,150	0.015	< 0.10	< 0.30	8.21	< 0.50	13.3
	EV_EC5GW_WG_2022_Q4_NP	Duplicate	1,070	1.0	1.17	0.26	92.7	< 0.020	< 0.050	66	0.443	207	< 0.10	< 0.10	0.83	< 10	< 0.050	145	135	14.9	< 0.0050	8.99	7.28	6.11	***98.9***	< 0.010	9.74	1,140	0.016	< 0.10	< 0.30	7.43	< 0.50	12.2
	QA/QC RPD%		0	*	1	*	1	*	*	0	1	0	*	*	*	*	*	0	1	10	*	9	1	1	7	*	1	1	*	*	*	10	*	9
EV_RCSgw[+]	EV_RCSGW_WG_2022_Q1_NP	2022 02 13	1,520	< 2.0	0.20	< 0.20	35.8	< 0.040	< 0.100	22	0.205	320	< 0.20	< 0.20	9.16	< 20	0.160	58.0	174	1.37	< 0.0050	1.51	< 1.00	3.41	***230***	< 0.020	5.34	402	< 0.020	< 0.20	< 0.60	6.86	< 1.00	7.9
	EV_RCSGW_WG_2022_Q2_NP	2022 04 28	1,540	2.2	0.21	< 0.20	35.1	< 0.040	< 0.100	< 20	0.204	327	< 0.20	< 0.20	22.8	< 20	0.136	59.3	176	0.76	< 0.0050	1.57	1.34	3.21	***220***	< 0.020	7.16	433	< 0.020	< 0.20	< 0.60	6.96	< 1.00	11.8
	EV_RCSGW_WG_2022_Q3_NP	2022 08 07	1,630	< 1.0	0.20	0.13	38.7	< 0.020	< 0.050	16	0.240	334	0.14	< 0.10	29.6	19	0.197	55.9	194	3.24	< 0.0050	1.67	1.54	3.44	***208***	< 0.010	6.76	409	0.011	< 0.10	< 0.30	7.36	< 0.50	15.2
	EV_RCSGW_WG_2022_Q4_NP	2022 10 12	1,680	< 2.0	0.21	< 0.20	35.0	< 0.040	< 0.100	< 20	0.240	366	< 0.20	< 0.20	17.2	< 20	0.232	61.3	186	0.72	< 0.0050	1.58	1.74	3.33	***228***	< 0.020	4.57	444	< 0.020	< 0.20	< 0.60	6.72	< 1.00	10.2
EV_BCgw[+]	EV_BCGW_WG_2022_Q1_NP	2022 03 08	316	< 1.0	0.12	0.12	35.4	< 0.020	< 0.050	12	0.0252	76.4	0.14	< 0.10	0.68	< 10	< 0.050	17.7	30.5	0.39	< 0.0050	1.12	< 0.50	1.02	13.1	< 0.010	4.24	151	0.010	< 0.10	< 0.30	1.11	< 0.50	7.3
	EV_BCGW_WG_2022_Q2_NP	2022 05 08	350	1.3	0.11	0.11	41.5	< 0.020	< 0.050	14	0.0304	84.3	0.13	< 0.10	1.15	< 10	< 0.050	19.4	33.8	0.18	< 0.0050	1.10	< 0.50	1.18	***21.8***	< 0.010	4.62	182	< 0.010	< 0.10	< 0.30	1.52	< 0.50	2.4
	EV_BCGW_WG_2022_Q3_NP	2022 07 18	378	< 1.0	0.11	0.14	43.2	< 0.020	< 0.050	15	0.0327	87.3	0.18	< 0.10	0.87	< 10	< 0.050	20.5	39.0	< 0.10	< 0.0050	1.03	< 0.50	1.17	***26.6***	< 0.010	4.76	177	< 0.010	< 0.10	< 0.30	1.49	< 0.50	1.5
	EV_BCGW_WG_2022_Q4_NP	2022 10 12	383	1.1	0.11	0.12	39.5	< 0.020	< 0.050	14	0.0262	90.6	0.13	< 0.10	0.34	< 10	< 0.050	21.5	38.1	< 0.10	< 0.0050	0.991	< 0.50	1.08	***24.5***	< 0.010	4.29	176	< 0.010	< 0.10	< 0.30	1.43	< 0.50	< 1.0
EV_WH50gw[+]	EV_WH50GW_WG_2022_Q1_NP	2022 03 04	282	1.6	< 0.10	0.11	97.4	< 0.020	< 0.050	< 10	0.0191	70.9	< 0.10	< 0.10	0.22	17	< 0.050	8.0	25.4	2.14	< 0.0050	1.12	< 0.50	0.725	6.40	< 0.010	3.97	163	< 0.010	< 0.10	< 0.30	1.37	< 0.50	< 1.0
	EV_EC5GW_WG_2022_Q1_NP	Duplicate	273	< 1.0	< 0.10	< 0.10	91.9	< 0.020	< 0.050	< 10	0.0216	70.5	0.11	< 0.10	0.23	16	< 0.050	8.0	23.6	2.16	< 0.0050	1.13	< 0.50	0.669	5.86	< 0.010	3.76	161	< 0.010	< 0.10	< 0.30	1.35	< 0.50	< 1.0
	QA/QC RPD%		3	*	*	*	6	*	*	*	*	1	*	*	*	*	*	0	7	1	*	1	*	8	9	*	5	1	*	*	*	1	*	*
	EV_WH50GW_WG_2022_Q2_NP	2022 05 08	207	3.9	0.13	0.11	82.7	< 0.020	< 0.050	< 10	0.0253	51.6	< 0.10	< 0.10	0.53	20	< 0.050	7.4	19.0	2.01	< 0.0050	1.13	< 0.50	0.735	6.70	< 0.010	3.84	137	< 0.010	< 0.10	< 0.30	1.08	< 0.50	< 1.0
	EV_WH50GW_WG_2022_Q3_NP	2022 08 04	247	< 1.0	0.19	0.11	99.4	< 0.020	< 0.050	15	0.0145	61.3	< 0.10	< 0.10	0.75	12	< 0.050	9.0	22.8	2.61	< 0.0050	1.39	< 0.50	0.924	8.72	< 0.010	3.33	159	< 0.010	< 0.10	< 0.30	1.05	< 0.50	< 1.0
	EV_MW_BC10A_WG_2022_Q3_NP	Duplicate	232	< 1.0	0.17	0.11	92.8	< 0.020	< 0.050	13	0.0144	56.5	< 0.10	< 0.10	0.72	11	< 0.050	8.1	22.1	2.53	< 0.0050	1.21	< 0.50	0.900	8.15	< 0.010	3.24	139	< 0.010	< 0.10	< 0.30	0.939	< 0.50	< 1.0
	QA/QC RPD%		6	*	*	*	7	*	*	*	*	8	*	*	*	*	*	11	3	3	*	14	*	3	7	*	3	13	*	*	*	11	*	*
	EV_WH50GW_WG_2022_Q4_NP	2022 10 04	298	< 1.0	0.25	< 0.10	121	< 0.020	< 0.050	15	0.0100	76.2	< 0.10	< 0.10	1.59	< 10	< 0.050	12.4	26.2	10.9	< 0.0050	1.12	< 0.50	1.14	17.1	< 0.010	3.66	197	< 0.010	< 0.10	< 0.30	1.19	< 0.50	< 1.0
	EV_MW_BC10A_WG_2022_Q4_NP	Duplicate	302	1.2	0.25	< 0.10	129	< 0.020	< 0.050	15	0.0100	76.0	< 0.10	< 0.10	1.95	12	< 0.050	12.4	27.2	11.4	< 0.0050	1.10	< 0.50	1.24	17.6	< 0.010	3.86	199	< 0.010	< 0.10	< 0.30	1.20	< 0.50	< 1.0
	QA/QC RPD%		1	*	*	*	6	*	*	*	*	0	*	*	20	*	*	0	4	4	*	2	*	8	3	*	5	1	*	*	*	1	*	*
Michel Creek Downstream of Gate Creek and Bodie Creek - Michel Creek Valley Bottom (+ denotes well part of Study Area 9b)																																		
EV_BRgw[+]	EV_BRGW_WG_2022_Q1_NP	2022 03 06	582	1.8	0.10	< 0.10	59.2	< 0.020	< 0.050	35	0.0409	149	< 0.10	< 0.10	0.77	38	0.081	46.7	51.0	1.86	< 0.0050	0.657	1.62	2.04	***36.1***	< 0.010	7.80	308	< 0.010	< 0.10	< 0.30	1.62	< 0.50	3.5
	EV_BRGW_WG_2022_Q2_NP	2022 05 08	547	1.6	< 0.10	< 0.10	55.5	< 0.020	< 0.050	33	0.0378	142	0.11	< 0.10	0.40	26	< 0.050	41.5	46.8	1.58	< 0.0050	0.679	1.68	1.94	***25.4***	< 0.010	7.45	290	< 0.010	< 0.10	< 0.30	1.60	< 0.50	10.4
	EV_BRGW_WG_2022_Q3_NP	2022 08 04	673	< 1.0	0.11	0.10	62.7	< 0.020	< 0.050	35	0.0425	168	0.15	< 0.10	< 0.20	24	< 0.050	47.1	61.5	1.87	< 0.0050	0.731	1.28	1.93	***57.9***	< 0.010	8.70	334	< 0.010	< 0.10	< 0.30	1.81	< 0.50	2.2
	EV_BRGW_WG_2022_Q4_NP	2022 10 04	610	1.1	0.12	< 0.10	59.7	< 0.020	< 0.050	38	0.0487	159	0.14	< 0.10	1.26	< 10	< 0.050	45.3	51.8	0.50	< 0.0050	0.741	1.35	2.08	***49.3***	< 0.010	8.28	314	< 0.010	< 0.10	< 0.30	1.54	< 0.50	2.4

All terms defined within the body of SNC-Lavalin's report.

<	Denotes concentration less than indicated detection limit.
-	Denotes analysis not conducted.
n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL	Denotes reported detection limit.

BLUE	Concentration greater than BCWQG Aquatic Life Long-term Average guideline and/or BCWQG Aquatic Life Short-term Maximum guideline
BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Guideline to protect freshwater aquatic life, long-term average (i.e. "chronic") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[c] Guideline to protect freshwater aquatic life, short-term maximum (i.e. "acute") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[d] Standard/guideline varies with pH.

[e] Standard/guideline varies with Hardness.

[f] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.

[g] Interim BC MoE Regional Background Estimate (Protocol 9 Determining Background Groundwater Quality).

[h] Guideline is temperature, pH, DOC and hardness dependent.

[i] Total Mercury guideline is based on the % of MethylMercury present. WQG = 0.0001 / (MeHg/total Hg), where MeHg is mass (or concentration) of methyl mercury and THg. Guideline shown assumes MeHg<0.5% of Total Hg.

[j] There is no Zinc standard specified for H > 400; therefore, the standard for H=300-<400 is applied as a conservative comparison.

[k] Ramboll calculated health-based values for these two parameters based on toxicity values (tolerable daily intakes; TDI) and drinking water allocation factors (DW AFs), documented in Appendix IV.

[l] Monitoring wells within 10m of high watermark, samples compared to CSR and BCWQG.

TABLE EV-04: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Metals in Groundwater (EVO)

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Hardness mg/L	Dissolved Metals																														
				Aluminum µg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Bismuth µg/L	Boron µg/L	Cadmium µg/L	Calcium mg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Lithium µg/L	Magnesium mg/L	Manganese µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Potassium mg/L	Selenium µg/L	Silver µg/L	Sodium mg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Uranium µg/L	Vanadium µg/L	Zinc[j] µg/L
BC Standard																																		
CSR Aquatic Life (AW)[a]			n/a	n/a	90	50	10,000	1.5	n/a	12,000	0.5-4[e]	n/a	10[f]	40	20-90[e]	n/a	40-160[e]	n/a	n/a	n/a	0.25	10,000	250-1,500[e]	n/a	20	0.5-15[e]	n/a	n/a	3	n/a	1,000	85	n/a	75-2,400[e]
CSR Irrigation Watering (IW)			n/a	5,000	n/a	100	n/a	100	n/a	500	5	n/a	5[f]	50	200	5,000	200	2,500	n/a	200	1	10	200	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	10	100	1,000-5,000[d]
CSR Livestock Watering (LW)			n/a	5,000	n/a	25	n/a	100	n/a	5,000	80	1,000	50[f]	1,000	300	n/a	100	5,000	n/a	n/a	2	50	1,000	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	200	100	2,000
CSR Drinking Water (DW)			n/a	9,500	6	10	1,000	8	n/a	5,000	5	n/a	50[f]	20[g]	1,500	6,500	10	8	n/a	1,500	1	250	80	n/a	10	20	200	2,500	n/a	2,500	n/a	20	20	3,000
Health-based Value (HBV)[g]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,200	n/a	n/a	n/a	2,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BC Guideline																																		
BCWQG Aquatic Life Long-Term Average (AW)[b]			n/a	6.84-50[d]	9	5	1,000	0.13	n/a	1,200	0.246-0.457[e]	n/a	1 (Cr(+6))[f]	4	0.3-4.3[h]	n/a	7.46-19.6[e]	n/a	n/a	1,146-2,600[e]	0.02[i]	7,600	112-150[e]	n/a	2	1.5[e]	n/a	n/a	0.8	n/a	n/a	8.5	n/a	32.3-187.5[e]
BCWQG Aquatic Life Short-Term Average (AW)[c]			n/a	23.03-100[d]	n/a	n/a	n/a	n/a	n/a	n/a	0.728-2.8[e]	n/a	n/a	110	1.5-26.4[h]	350	106-417[e]	n/a	n/a	1,895-3,390[e]	n/a	46,000	n/a	n/a	n/a	3[e]	n/a	n/a	n/a	n/a	n/a	n/a	n/a	57.8-340.5[e]
Michel Creek Downstream of Gate Creek and Bodie Creek - Michel Creek Valley Bottom (+ denotes well part of Study Area 9b)																																		
EV_HW1^{+}	EV_HW1_WG_2022_Q1_NP	2022 01 27	646	< 1.0	0.12	< 0.10	54.7	< 0.020	< 0.050	25	0.0701	154	0.12	< 0.10	***413***	< 10	< 0.050	57.9	63.5	0.34	< 0.0050	0.708	0.81	2.29	***55.4***	< 0.010	12.9	361	0.018	< 0.10	< 0.30	1.61	< 0.50	14.2
	EV_HW1_WG_2022_Q2_NP	2022 05 20	678	< 1.0	0.11	< 0.10	55.0	< 0.020	< 0.050	27	0.0739	162	0.16	< 0.10	***334***	< 10	< 0.050	65.1	66.4	0.18	< 0.0050	0.752	1.18	2.29	***56.9***	< 0.010	13.3	368	0.016	< 0.10	< 0.30	1.77	< 0.50	9.2
	EV_HW1_WG_2022_Q3_NP	2022 09 14	617	< 1.0	0.15	< 0.10	91.4	< 0.020	< 0.050	35	0.141	149	< 0.10	< 0.10	***582***	< 10	0.093	74.2	59.4	1.93	< 0.0050	0.696	1.40	2.36	***47.1***	< 0.010	16.1	430	0.016	< 0.10	< 0.30	1.48	< 0.50	18.3
	EV_HW1_WG_2022_Q4_NP	2022 10 27	690	< 1.0	0.14	< 0.10	59.2	< 0.020	< 0.050	28	0.0814	161	0.11	< 0.10	***332***	< 10	< 0.050	58.1	70.0	0.39	< 0.0050	0.688	0.90	2.18	***61.9***	< 0.010	12.0	364	0.018	< 0.10	< 0.30	1.75	< 0.50	7.8
	EV_HW1_WG_2022-12-19_NP	2022 12 19	592	< 1.0	0.12	< 0.10	55.1	< 0.020	< 0.050	24	0.0818	141	< 0.10	< 0.10	***404***	< 10	< 0.050	54.4	58.2	4.28	< 0.0050	6.22	0.86	2.12	***67.1***	< 0.010	11.4	352	0.022	< 0.10	< 0.30	1.74	< 0.50	11.2
EV_MW_MC1A	EV_MW_MC1A_WG_2022_Q1_NP	2022 01 27	415	< 5.0	< 0.50	< 0.50	10,000	< 0.100	< 0.250	61	< 0.0250	106	< 0.50	< 0.50	1.32	880	< 0.250	102	36.5	99.2	< 0.0050	< 0.250	< 2.50	4.54	< 0.250	< 0.050	21.4	1,840	< 0.050	< 0.50	< 1.50	0.167	< 2.50	< 5.0
	EV_MW_MC1A_WG_2022_Q2_NP	2022 04 21	396	< 2.0	< 0.20	0.38	9,100	< 0.040	< 0.100	56	< 0.0100	103	< 0.20	< 0.20	< 0.40	777	< 0.100	95.3	33.7	91.2	< 0.0050	0.114	< 1.00	4.24	< 0.100	< 0.020	19.7	1,800	< 0.020	< 0.20	< 0.60	0.148	< 1.00	3.4
	EV_MW_MC1A_WG_2022_Q3_NP	2022 08 04	477	1.3	< 0.10	0.49	**10,700**	< 0.020	< 0.050	65	< 0.0050	119	< 0.10	< 0.10	0.76	883	< 0.050	108	43.6	102	< 0.0050	0.160	< 0.50	4.78	< 0.050	< 0.010	23.7	2,040	< 0.010	< 0.10	< 0.30	0.205	< 0.50	5.5
	EV_MW_MC1A_WG_2022_Q4_NP	2022 10 04	442	< 1.0	< 0.10	0.36	**10,900**	< 0.020	< 0.050	62	< 0.0050	119	< 0.10	< 0.10	0.91	727	< 0.050	98.4	35.3	93.4	< 0.0050	0.156	< 0.50	4.78	< 0.050	< 0.010	21.6	1,950	< 0.010	< 0.10	< 0.30	0.165	< 0.50	5.0
EV_MW_MC1B	EV_MW_MC1B_WG_2022_Q1_NP	2022 01 27	636	< 1.0	< 0.10	5.67	694	< 0.020	< 0.050	48	< 0.0050	170	< 0.10	0.14	< 0.20	*14,500*	< 0.050	114	51.4	*748*	< 0.0050	2.13	0.54	3.71	0.062	< 0.010	24.5	876	< 0.010	< 0.10	< 0.30	0.555	< 0.50	< 1.0
	EV_MW_MC1B_WG_2022_Q2_NP	2022 04 21	621	3.3	< 0.10	4.52	553	< 0.020	< 0.050	33	< 0.0050	159	< 0.10	0.66	< 0.20	*13,000*	< 0.050	73.2	54.4	*1,050*	< 0.0050	1.31	1.03	2.68	0.065	< 0.010	29.3	643	< 0.010	0.10	< 0.30	0.516	< 0.50	1.8
	EV_MW_MC1B_WG_2022_Q3_NP	2022 08 04	582	< 1.0	< 0.10	6.16	594	< 0.020	< 0.050	53	< 0.0050	147	< 0.10	0.22	< 0.20	*14,100*	< 0.050	85.4	52.3	*779*	< 0.0050	2.11	0.64	3.30	0.055	< 0.010	26.9	678	< 0.010	< 0.10	< 0.30	0.517	< 0.50	< 1.0
	EV_MW_MC1B_WG_2022_Q4_NP	2022 10 04	455	< 1.0	< 0.10	6.34	497	< 0.020	< 0.050	66	< 0.0050	124	< 0.10	0.11	< 0.20	*10,200*	< 0.050	93.6	35.3	*539*	< 0.0050	2.37	< 0.50	3.72	0.090	< 0.010	19.0	643	< 0.010	< 0.10	< 0.30	0.414	< 0.50	< 1.0
EV_MW_MC2A^{+}	EV_MW_MC2A_WG_2022_Q1_NP	2022 03 04	403	< 2.0	< 0.20	0.70	5,510	< 0.040	< 0.100	64	< 0.0100	107	< 0.20	< 0.20	< 0.40	1,470	< 0.100	232	33.1	50.0	< 0.0050	0.112	< 1.00	3.43	< 0.100	< 0.020	37.3	1,470	< 0.020	< 0.20	< 0.60	< 0.020	< 1.00	3.7
	EV_MW_MC2A_WG_2022_Q2_NP	2022 05 15	399	1.6	< 0.10	1.28	5,460	< 0.020	< 0.050	66	< 0.0050	104	< 0.10	< 0.10	< 0.20	1,680	< 0.050	244	33.8	54.7	< 0.0050	0.130	< 0.50	3.73	< 0.050	< 0.010	39.5	1,550	< 0.010	< 0.10	< 0.30	0.013	< 0.50	3.1
	EV_EC5GW_WG_2022_Q2_NP	Duplicate	411	3.0	< 0.20	1.35	5,660	< 0.040	< 0.100	69	< 0.0100	107	< 0.20	< 0.20	< 0.40	1,760	< 0.100	249	35.0	55.8	< 0.0050	0.194	< 1.00	3.80	< 0.100	< 0.020	40.6	1,580	< 0.020	< 0.20	< 0.60	< 0.020	< 1.00	7.7
	QA/QC RPD%		3	*	*	5	4	*	*	4	*	3	*	*	*	5	*	2	3	2	*	*	*	2	*	*	3	2	*	*	*	*	*	*
	EV_MW_MC2A_WG_2022_Q3_NP	2022 08 17	436	< 1.0	< 0.10	1.02	5,560	< 0.020	< 0.050	68	< 0.0050	112	< 0.10	< 0.10	0.55	1,790	< 0.050	254	38.1	59.0	< 0.0050	0.142	< 0.50	4.00	< 0.050	< 0.010	42.7	1,610	< 0.010	< 0.10	< 0.30	0.013	< 0.50	4.8
	EV_MW_MC2A_WG_2022_Q4_NP	2022 10 26	419	< 1.0	< 0.10	1.30	5,720	< 0.020	< 0.050	73	< 0.0050	106	< 0.10	< 0.10	< 0.20	1,630	< 0.050	240	37.4	55.7	< 0.0050	0.156	< 0.50	3.76	0.054	< 0.010	41.3	1,420	< 0.010	< 0.10	< 0.30	0.017	< 0.50	4.0
EV_MW_MC2B^{+}	EV_MW_MC2B_WG_2022_Q1_NP	2022 02 25	632	< 1.0	< 0.10	< 0.10	50.8	< 0.020	< 0.050	24	0.0865	155	0.17	< 0.10	0.23	< 10	< 0.050	53.3	59.5	< 0.10	< 0.0050	0.641	< 0.50	2.02	***54.8***	< 0.010	11.5	332	< 0.010	< 0.10	< 0.30	1.63	< 0.50	1.3
	EV_MW_MC2B_WG_2022_Q2_NP	2022 05 15	628	1.2	0.11	0.11	54.1	< 0.020	< 0.050	25	0.0980	147	0.13	< 0.10	0.26	< 10	< 0.050	57.2	63.3	< 0.10	< 0.0050	0.657	0.92	2.22	***56.0***	< 0.010	12.0	341	< 0.010	< 0.10	< 0.30	1.77	< 0.50	1.4
	EV_MW_MC2B_WG_2022_Q3_NP	2022 08 17	674	< 1.0	0.11	0.12	59.1	< 0.020	< 0.050	27	0.116	157	0.16	< 0.10	< 0.20	< 10	< 0.050	58.2	68.5	< 0.10	< 0.0050	0.643	0.56	2.42	***59.5***	< 0.010	13.6	351	0.010	< 0.10	< 0.30	1.76	< 0.50	1.2
	EV_MW_MC2B_WG_2022_Q4_NP	2022 10 26	720	< 1.0	< 0.10	0.12	65.2	< 0.020	< 0.050	27	0.104	167	0.16	< 0.10	0.26	< 10	< 0.050	60.1	73.5	< 0.10	< 0.0050	0.675	0.50	2.38	***58.7***	< 0.010	13.0	352	0.011	< 0.10	< 0.30	1.62	< 0.50	1.1
Erickson Creek and Michel Creek Downstream of Erickson Creek (~ denotes well part of Study Area 10)																																		
EV_WF_SW[l]	EV_WF_SW_WG_2022_Q1_NP	2022 03 27	185	2.0	< 0.10	0.11	1.75	< 0.020	< 0.050	< 10	0.0052	10.3	< 0.10	< 0.10	0.24	< 10	< 0.050	12.9	38.6	178	< 0.0050	1.19	< 0.50	3.02	0.139	< 0.010	4.08	6.35	< 0.010	< 0.10	< 0.30	0.019	< 0.50	< 1.0
	EV_WF_SW_WG_2022_Q2_NP	2022 05 26	570	1.7	< 0.10	0.34	12.6	< 0.020	< 0.050	10	< 0.0050	106	0.16	2.69	< 0.20	*6,940*	< 0.050	20.4	74.2	*384*	< 0.0050	1.16	4.09	2.75	0.054	< 0.010	4.04	118	< 0.010	< 0.10	< 0.30	2.60	< 0.50	1.3
	EV_WF_SW_WG_2022_Q3_NP	2022 09 20	534	< 1.0	< 0.10	0.33	12.0	< 0.020	< 0.050	10	< 0.0050	95.3	< 0.10	2.02	< 0.20	5,950	< 0.050	19.3	72.0	*381*	< 0.0050	1.27	3.12	2.99	0.591	< 0.010	4.03	103	< 0.010	< 0.10	< 0.30	2.04	< 0.50	< 1.0
	EV_WF_SW_WG_2022_Q4_NP	2022 11 13	222	< 1.0	< 0.10	0.11	1.22	< 0.020	< 0.050	< 10	< 0.0050	11.6	< 0.10	< 0.10	0.21	130	< 0.050	11.4	46.8	175	< 0.0050	1.38	< 0.50	2.85	0.093	< 0.010	3.95	7.06	< 0.010	< 0.10	< 0.30	0.028	< 0.50	< 1.0
EV_ECgw$^{\sim}$	EV_ECGW_WG_2022_Q2_NP	2022 05 29	162	1.6	< 0.10	0.37	49.3	< 0.020	< 0.050	107	0.0239	36.6	< 0.10	< 0.10	0.85	< 10	< 0.050	12.6	17.2	60.4	< 0.0050	*14.2*	2.25	0.977	0.056	< 0.010	31.3	407	0.034	< 0.10	< 0.30	1.59	< 0.50	2.3
	EV_ECGW_WG_2022_Q3_NP	2022 09 13	164	1.4	< 0.10	0.35	48.5	< 0.020	< 0.050	125	0.0166	36.3	< 0.10	0.10	1.67	< 10	< 0.050	14.7	17.7	72.5	< 0.0050	*15.4*	1.45	1.30	0.111	< 0.010	35.8	430	0.041	< 0.10	< 0.30	1.54	< 0.50	2.4
	EV_ECGW_WG_2022_Q4_NP	2022 11 01	164	18.7	< 0.10	0.46	54.4	< 0.020	< 0.050	118	0.0396	35.6	< 0.10	0.10	2.28	< 10	< 0.050	13.4	18.3	46.8	< 0.0050	*14.4*	1.23	1.10	0.176	< 0.010	30.3	424	0.034	< 0.10	0.31	1.57	< 0.50	10.0

All terms defined within the body of SNC-Lavalin's report.

<	Denotes concentration less than indicated detection limit.
-	Denotes analysis not conducted.
n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL	Denotes reported detection limit.

BLUE	Concentration greater than BCWQG Aquatic Life Long-term Average guideline and/or BCWQG Aquatic Life Short-term Maximum guideline
BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Guideline to protect freshwater aquatic life, long-term average (i.e. "chronic") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[c] Guideline to protect freshwater aquatic life, short-term maximum (i.e. "acute") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[d] Standard/guideline varies with pH.

[e] Standard/guideline varies with Hardness.

[f] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.

[g] Interim BC MoE Regional Background Estimate (Protocol 9 Determining Background Groundwater Quality).

[h] Guideline is temperature, pH, DOC and hardness dependent.

[i] Total Mercury guideline is based on the % of MethylMercury present. WQG = 0.0001 / (MeHg/total Hg), where MeHg is mass (or concentration) of methyl mercury and THg. Guideline shown assumes MeHg<0.5% of Total Hg.

[j] There is no Zinc standard specified for H > 400; therefore, the standard for H=300-<400 is applied as a conservative comparison.

[k] Ramboll calculated health-based values for these two parameters based on toxicity values (tolerable daily intakes; TDI) and drinking water allocation factors (DW AFs), documented in Appendix IV.

[l] Monitoring wells within 10m of high watermark, samples compared to CSR and BCWQG.

TABLE EV-04: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Metals in Groundwater (EVO)

				Dissolved Metals																														
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Hardness mg/L	Aluminum µg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Bismuth µg/L	Boron µg/L	Cadmium µg/L	Calcium mg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Lithium µg/L	Magnesium mg/L	Manganese µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Potassium mg/L	Selenium µg/L	Silver µg/L	Sodium mg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Uranium µg/L	Vanadium µg/L	Zinc[j] µg/L
BC Standard																																		
CSR Aquatic Life (AW)[a]			n/a	n/a	90	50	10,000	1.5	n/a	12,000	0.5-4[e]	n/a	10[f]	40	20-90[e]	n/a	40-160[e]	n/a	n/a	n/a	0.25	10,000	250-1,500[e]	n/a	20	0.5-15[e]	n/a	n/a	3	n/a	1,000	85	n/a	75-2,400[e]
CSR Irrigation Watering (IW)			n/a	5,000	n/a	100	n/a	100	n/a	500	5	n/a	5[f]	50	200	5,000	200	2,500	n/a	200	1	10	200	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	10	100	1,000-5,000[d]
CSR Livestock Watering (LW)			n/a	5,000	n/a	25	n/a	100	n/a	5,000	80	1,000	50[f]	1,000	300	n/a	100	5,000	n/a	n/a	2	50	1,000	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	200	100	2,000
CSR Drinking Water (DW)			n/a	9,500	6	10	1,000	8	n/a	5,000	5	n/a	50[f]	20[g]	1,500	6,500	10	8	n/a	1,500	1	250	80	n/a	10	20	200	2,500	n/a	2,500	n/a	20	20	3,000
Health-based Value (HBV)[g]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,200	n/a	n/a	n/a	2,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BC Guideline																																		
BCWQG Aquatic Life Long-Term Average (AW)[b]			n/a	6.84-50[d]	9	5	1,000	0.13	n/a	1,200	0.246-0.457[e]	n/a	1 (Cr(+6))[f]	4	0.3-4.3[h]	n/a	7.46-19.6[e]	n/a	n/a	1,146-2,600[e]	0.02[i]	7,600	112-150[e]	n/a	2	1.5[e]	n/a	n/a	0.8	n/a	n/a	8.5	n/a	32.3-187.5[e]
BCWQG Aquatic Life Short-Term Average (AW)[c]			n/a	23.03-100[d]	n/a	n/a	n/a	n/a	n/a	n/a	0.728-2.8[e]	n/a	n/a	110	1.5-26.4[h]	350	106-417[e]	n/a	n/a	1,895-3,390[e]	n/a	46,000	n/a	n/a	n/a	3[e]	n/a	n/a	n/a	n/a	n/a	n/a	n/a	57.8-340.5[e]
Erickson Creek and Michel Creek Downstream of Erickson Creek (~ denotes well part of Study Area 10)																																		
EV_MW_SP1A~	EV_MW_SP1A_WG_2022_Q1_NP	2022 03 13	282	< 1.0	< 0.10	< 0.10	649	< 0.020	< 0.050	26	< 0.0050	74.2	< 0.10	< 0.10	< 0.20	325	< 0.050	92.2	23.4	54.0	< 0.0050	0.316	< 0.50	3.14	0.232	< 0.010	8.47	274	< 0.010	< 0.10	< 0.30	0.089	< 0.50	< 1.0
	EV_MW_SP1A_WG_2022_Q2_NP	2022 05 15	263	1.3	< 0.10	< 0.10	632	< 0.020	< 0.050	23	< 0.0050	68.3	< 0.10	< 0.10	< 0.20	407	< 0.050	74.8	22.4	51.9	< 0.0050	0.464	< 0.50	2.66	< 0.050	< 0.010	8.14	259	< 0.010	< 0.10	< 0.30	0.148	< 0.50	< 1.0
	EV_MW_SP1A_WG_2022_Q3_NP	2022 08 19	301	< 1.0	< 0.10	< 0.10	880	< 0.020	< 0.050	27	< 0.0050	74.9	< 0.10	< 0.10	< 0.20	276	< 0.050	95.3	27.6	61.3	< 0.0050	0.317	< 0.50	3.32	4.70	< 0.010	9.54	284	< 0.010	< 0.10	< 0.30	0.091	< 0.50	1.5
	EV_MW_SP1A_WG_2022_Q4_NP	2022 10 26	297	1.1	< 0.10	< 0.10	1,040	< 0.020	< 0.050	31	< 0.0050	73.8	< 0.10	< 0.10	< 0.20	266	< 0.050	100	27.3	59.1	< 0.0050	0.221	< 0.50	3.47	0.612	< 0.010	9.25	283	< 0.010	< 0.10	< 0.30	0.046	< 0.50	1.1
EV_MW_SP1B~	EV_MW_SP1B_WG_2022_Q1_NP	2022 03 13	190	< 1.0	0.12	0.10	132	< 0.020	< 0.050	< 10	0.0057	51.5	0.13	< 0.10	< 0.20	< 10	< 0.050	5.8	15.0	0.26	< 0.0050	0.792	< 0.50	0.612	3.00	< 0.010	4.94	138	< 0.010	< 0.10	< 0.30	0.711	< 0.50	< 1.0
	EV_MW_SP1B_WG_2022_Q2_NP	2022 05 15	222	4.1	< 0.10	< 0.10	142	< 0.020	< 0.050	< 10	0.0096	58.3	0.17	< 0.10	0.37	21	0.053	6.4	18.5	0.77	< 0.0050	0.750	< 0.50	0.658	3.76	< 0.010	5.49	145	< 0.010	0.12	< 0.30	0.779	< 0.50	8.6
	EV_MW_SP1B_WG_2022_Q3_NP	2022 08 19	204	< 1.0	< 0.10	0.10	133	< 0.020	< 0.050	< 10	0.0083	52.8	0.20	< 0.10	5.34	12	< 0.050	6.6	17.5	0.26	< 0.0050	0.906	< 0.50	0.654	3.62	< 0.010	6.36	123	< 0.010	0.19	< 0.30	0.653	< 0.50	2.5
	EV_MW_SP1B_WG_2022_Q4_NP	2022 10 26	247	< 1.0	< 0.10	0.10	156	< 0.020	< 0.050	10	0.0074	63.6	0.13	< 0.10	< 0.20	< 10	< 0.050	7.7	21.4	< 0.10	< 0.0050	0.778	< 0.50	0.774	9.04	< 0.010	6.37	144	< 0.010	< 0.10	< 0.30	0.748	< 0.50	< 1.0
EV_MW_SP1C~	EV_MW_SP1C_WG_2022_Q1_NP	2022 03 13	193	6.0	< 0.10	< 0.10	143	< 0.020	< 0.050	< 10	0.0252	52.4	0.16	< 0.10	0.25	< 10	0.053	7.8	15.0	1.05	< 0.0050	1.01	< 0.50	0.741	1.96	< 0.010	6.84	144	0.012	< 0.10	< 0.30	0.719	< 0.50	< 1.0
	EV_MW_SP1C_WG_2022_Q2_NP	2022 05 15	220	1.3	< 0.10	< 0.10	161	< 0.020	< 0.050	< 10	0.0305	60.0	0.13	< 0.10	0.25	< 10	< 0.050	9.3	17.1	< 0.10	< 0.0050	0.829	< 0.50	0.810	2.30	< 0.010	9.11	152	< 0.010	< 0.10	< 0.30	0.680	< 0.50	< 1.0
	EV_MW_SP1C_WG_2022_Q3_NP	2022 08 19	214	< 1.0	< 0.10	< 0.10	145	< 0.020	< 0.050	< 10	0.0323	57.5	0.15	< 0.10	0.22	< 10	< 0.050	9.2	17.2	< 0.10	< 0.0050	0.855	< 0.50	0.851	2.95	< 0.010	7.65	136	< 0.010	< 0.10	< 0.30	0.635	< 0.50	< 1.0
	EV_MW_SP1C_WG_2022_Q4_NP	2022 10 26	232	< 1.0	< 0.10	< 0.10	159	< 0.020	< 0.050	< 10	0.0309	61.9	< 0.10	< 0.10	0.26	< 10	< 0.050	9.1	18.8	< 0.10	< 0.0050	0.890	< 0.50	0.816	4.40	< 0.010	7.15	142	< 0.010	< 0.10	< 0.30	0.676	< 0.50	< 1.0
Blanks																																		
Field Blanks																																		
EV_ER1gwS	EV_MW_BC10B_WG_2022_Q1_NP	2022 01 30	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
EV_MW_BC1A	EV_MW_MC10B_WG_2022_Q1_NP	2022 02 24	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
EV_WH50gw	EV_EC6GW_WG_2022_Q1_NP	2022 03 04	< 0.50	< 1.0	< 0.10	< 0.10	0.38	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	0.79	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	0.265	0.21	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
EV_OCgw	EV_MW_MC6GW_WG_2022_Q1_NP	2022 03 13	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.00050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
EV_MW_AQ2	EV_MW_BC10B_WG_2022_Q2_NP	2022 04 24	< 0.50	1.6	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	0.31	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
EV_MW_BC1A	EV_MW_MC10B_WG_2022_Q2_NP	2022 05 01	< 0.50	1.1	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	0.61	19	0.171	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	0.13	< 0.30	< 0.010	< 0.50	< 1.0
EV_MW_MC2A	EV_EC6GW_WG_2022_Q2_NP	2022 05 15	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
EV_OCgw	EV_MC6GW_WG_2022_Q2_NP	2022 05 20	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
EV_WH50gw	EV_MW_BC10B_WG_2022_Q3_NP	2022 08 04	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
EV_OCgw	EV_MC6GW_WG_2022_Q3_NP	2022 08 15	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
EV_MW_GC1B	EV_MW_MC10B_WG_2022_Q3_NP	2022 08 16	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	1.7
EV_MW_AQ2	EV_EC6GW_WG_2022_Q3_NP	2022 09 09	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
EV_WH50gw	EV_MW_BC10B_WG_2022_Q4_NP	2022 10 04	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
EV_OCgw	EV_MC6GW_WG_2022_Q4_NP	2022 10 28	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.00050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
EV_MW_BC3	EV_EC6GW_WG_2022_Q4_NP	2022 11 13	< 0.50	< 1.0	< 0.10	< 0.10	0.29	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	0.69	< 10	< 0.050	< 1.0	0.0064	0.14	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	0.187	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0

All terms defined within the body of SNC-Lavalin's report.

<	Denotes concentration less than indicated detection limit.
-	Denotes analysis not conducted.
n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL	Denotes reported detection limit.

BLUE	Concentration greater than BCWQG Aquatic Life Long-term Average guideline and/or BCWQG Aquatic Life Short-term Maximum guideline
BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Guideline to protect freshwater aquatic life, long-term average (i.e. "chronic") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[c] Guideline to protect freshwater aquatic life, short-term maximum (i.e. "acute") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[d] Standard/guideline varies with pH.

[e] Standard/guideline varies with Hardness.

[f] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.

[g] Interim BC MoE Regional Background Estimate (Protocol 9 Determining Background Groundwater Quality).

[h] Guideline is temperature, pH, DOC and hardness dependent.

[i] Total Mercury guideline is based on the % of MethylMercury present. WQG = 0.0001 / (MeHg/total Hg), where MeHg is mass (or concentration) of methyl mercury and THg. Guideline shown assumes MeHg<0.5% of Total Hg.

[j] There is no Zinc standard specified for H > 400; therefore, the standard for H=300-<400 is applied as a conservative comparison.

[k] Ramboll calculated health-based values for these two parameters based on toxicity values (tolerable daily intakes; TDI) and drinking water allocation factors (DW AFs), documented in Appendix IV.

[l] Monitoring wells within 10m of high watermark, samples compared to CSR and BCWQG.

TABLE EV-04: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Metals in Groundwater (EVO)

				Dissolved Metals																														
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Hardness mg/L	Aluminum µg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Bismuth µg/L	Boron µg/L	Cadmium µg/L	Calcium mg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Lithium µg/L	Magnesium mg/L	Manganese µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Potassium mg/L	Selenium µg/L	Silver µg/L	Sodium mg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Uranium µg/L	Vanadium µg/L	Zinc[j] µg/L
BC Standard																																		
CSR Aquatic Life (AW)[a]			n/a	n/a	90	50	10,000	1.5	n/a	12,000	0.5-4[e]	n/a	10[f]	40	20-90[e]	n/a	40-160[e]	n/a	n/a	n/a	0.25	10,000	250-1,500[e]	n/a	20	0.5-15[e]	n/a	n/a	3	n/a	1,000	85	n/a	75-2,400[e]
CSR Irrigation Watering (IW)			n/a	5,000	n/a	100	n/a	100	n/a	500	5	n/a	5[f]	50	200	5,000	200	2,500	n/a	200	1	10	200	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	10	100	1,000-5,000[d]
CSR Livestock Watering (LW)			n/a	5,000	n/a	25	n/a	100	n/a	5,000	80	1,000	50[f]	1,000	300	n/a	100	5,000	n/a	n/a	2	50	1,000	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	200	100	2,000
CSR Drinking Water (DW)			n/a	9,500	6	10	1,000	8	n/a	5,000	5	n/a	50[f]	20[g]	1,500	6,500	10	8	n/a	1,500	1	250	80	n/a	10	20	200	2,500	n/a	2,500	n/a	20	20	3,000
Health-based Value (HBV)[g]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,200	n/a	n/a	n/a	2,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BC Guideline																																		
BCWQG Aquatic Life Long-Term Average (AW)[b]			n/a	6.84-50[d]	9	5	1,000	0.13	n/a	1,200	0.246-0.457[e]	n/a	1 (Cr(+6))[f]	4	0.3-4.3[h]	n/a	7.46-19.6[e]	n/a	n/a	1,146-2,600[e]	0.02[i]	7,600	112-150[e]	n/a	2	1.5[e]	n/a	n/a	0.8	n/a	n/a	8.5	n/a	32.3-187.5[e]
BCWQG Aquatic Life Short-Term Average (AW)[c]			n/a	23.03-100[d]	n/a	n/a	n/a	n/a	n/a	n/a	0.728-2.8[e]	n/a	n/a	110	1.5-26.4[h]	350	106-417[e]	n/a	n/a	1,895-3,390[e]	n/a	46,000	n/a	n/a	n/a	3[e]	n/a	n/a	n/a	n/a	n/a	n/a	n/a	57.8-340.5[e]
Blanks																																		
Trip Blanks																																		
	EV_MW_BC10C_WG_2022_Q1_NP	2022 01 30	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
	EV_MW_MC10C_WG_2022_Q1_NP	2022 02 24	< 0.50	3.4	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
	EV_EC7GW_WG_2022_Q1_NP	2022 03 04	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	2.2
	EV_MW_MC7GW_WG_2022_Q1_NP	2022 03 13	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.00050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
	EV_MW_BC10C_WG_2022_Q2_NP	2022 04 24	< 0.50	1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	0.071	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
	EV_MW_MC10C_WG_2022_Q2_NP	2022 05 01	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
	EV_EC7GW_WG_2022_Q2_NP	2022 05 15	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
	EV_MC7GW_WG_2022_Q2_NP	2022 05 20	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	0.144	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
	EV_MW_BC10C_WG_2022_Q3_NP	2022 08 04	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	0.056	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
	EV_MC7GW_WG_2022_Q3_NP	2022 08 15	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
	EV_MW_MC10C_WG_2022_Q3_NP	2022 08 16	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
	EV_EC7GW_WG_2022_Q3_NP	2022 09 09	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
	EV_MW_BC10C_WG_2022_Q4_NP	2022 10 04	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
	EV_MC7GW_WG_2022_Q4_NP	2022 10 28	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.00050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
	EV_EC7GW_WG_2022_Q4_NP	2022 11 13	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0

All terms defined within the body of SNC-Lavalin's report.

<	Denotes concentration less than indicated detection limit.
-	Denotes analysis not conducted.
n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL	Denotes reported detection limit.

BLUE	Concentration greater than BCWQG Aquatic Life Long-term Average guideline and/or BCWQG Aquatic Life Short-term Maximum guideline
BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Guideline to protect freshwater aquatic life, long-term average (i.e. "chronic") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[c] Guideline to protect freshwater aquatic life, short-term maximum (i.e. "acute") (in absence of both total and dissolved metals concentrations, all guidelines have been applied to the available concentrations).

[d] Standard/guideline varies with pH.

[e] Standard/guideline varies with Hardness.

[f] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.

[g] Interim BC MoE Regional Background Estimate (Protocol 9 Determining Background Groundwater Quality).

[h] Guideline is temperature, pH, DOC and hardness dependent.

[i] Total Mercury guideline is based on the % of MethylMercury present. WQG = 0.0001 / (MeHg/total Hg), where MeHg is mass (or concentration) of methyl mercury and THg. Guideline shown assumes MeHg<0.5% of Total Hg.

[j] There is no Zinc standard specified for H > 400; therefore, the standard for H=300-<400 is applied as a conservative comparison.

[k] Ramboll calculated health-based values for these two parameters based on toxicity values (tolerable daily intakes; TDI) and drinking water allocation factors (DW AFs), documented in Appendix IV.

[l] Monitoring wells within 10m of high watermark, samples compared to CSR and BCWQG.

TABLE EV-05: Summary of Analytical Results Compared to Secondary Screening Criteria for Selenium (EVO)

Sample Location	Sample ID	Sample Date (yyyy mm dd)	SPO/Compliance Point	Selenium µg/L
Groundwater Quality Benchmarks				
SPO			Elk River [EV_ER1 (0200393)]	19
Compliance Point			Michel Creek [EV_MC2 (E300091)]	20
Grave/Harmer Creek Watershed and Elk River Downstream of Grave Creek Confluence (^ denotes well part of Study Area 7)				
RG_DW-02-20^	RG_DW-02-20_WP_2022_02_22_NP	2022 02 22	Elk River [EV_ER1 (0200393)]	15.0
	RG_DW-02-20_WP_2022_05_09_NP	2022 05 09	Elk River [EV_ER1 (0200393)]	15.8
	RG_DW-02-20_WP_2022_07_19_NP	2022 07 19	Elk River [EV_ER1 (0200393)]	14.8
	RG_DW-D_WP_2022_07_19_NP	Duplicate	Elk River [EV_ER1 (0200393)]	14.8
	QA/QC RPD%			0
	RG_DW-02-20_WP_2022_10_26_NP	2022 10 26	Elk River [EV_ER1 (0200393)]	10.5
RG_MW_WW^	RG_MW_WW_WG_2022_Q1_NP	2022 01 23	Elk River [EV_ER1 (0200393)]	10.3
	RG_MW_WW_WG_2022_Q2_NP	2022 04 28	Elk River [EV_ER1 (0200393)]	10.6
	RG_MW_WW_WG_2022_Q3_NP	2022 08 07	Elk River [EV_ER1 (0200393)]	11.0
	RG_MW_WW_WG_2022_Q4_NP	2022 10 17	Elk River [EV_ER1 (0200393)]	12.2
Sparwood Area - Michel Creek and Baldy Ridge (Study Area 9a)				
EV_MW_AQ1	EV_MW_AQ1_WG_2022_Q1_NP	2022 02 06	Elk River [EV_ER1 (0200393)]	12.2
Sparwood Area - Elk River and Sparwood Ridge (Study Area 12)				
EV_ER1gwS	EV_ER1GWS_WG_2022_Q4_NP	2022 10 11	Elk River [EV_ER1 (0200393)]	12.2
RG_MW-03-04	RG_MW-03-04_WG_2022_Q4_NP	2022 10 24	Elk River [EV_ER1 (0200393)]	10.3
	RG_MW-03-04_WG_2022-12-12_NP	2022 12 12	Elk River [EV_ER1 (0200393)]	11.3
EV_MW_MC3	EV_MW_MC3_WG_2022_Q1_NP	2022 03 09	Elk River [EV_ER1 (0200393)]	18.6
	EV_MW_MC3_WG_2022_Q2_NP	2022 05 15	Elk River [EV_ER1 (0200393)]	18.8
	EV_MW_MC3_WG_2022_Q3_NP	2022 08 17	Elk River [EV_ER1 (0200393)]	18.8
Michel Creek Downstream of Gate Creek and Bodie Creek - Gate Creek and Bodie Creek (+ denotes well part of Study Area 9b)				
EV_MW_GT1B^{+}	EV_MW_GT1B_WG_2022_Q1_NP	2022 01 21	Michel Creek [EV_MC2 (E300091)]	142
	EV_MW_GT1B_WG_2022_Q2_NP	2022 04 22	Michel Creek [EV_MC2 (E300091)]	123
	EV_MW_GT1B_WG_2022_Q3_NP	2022 07 15	Michel Creek [EV_MC2 (E300091)]	62.7
	EV_MW_GT1B_WG_2022_Q4_NP	2022 10 03	Michel Creek [EV_MC2 (E300091)]	101
EV_MW_BC1A^{+}	EV_MW_BC1A_WG_2022_Q1_NP	2022 02 24	Michel Creek [EV_MC2 (E300091)]	211
	EV_MW_MC10A_WG_2022_Q1_NP	Duplicate	Michel Creek [EV_MC2 (E300091)]	210
	QA/QC RPD%			0
	EV_MW_BC1A_WG_2022_Q2_NP	2022 05 01	Michel Creek [EV_MC2 (E300091)]	168
	EV_MW_MC10A_WG_2022_Q2_NP	Duplicate	Michel Creek [EV_MC2 (E300091)]	163
	QA/QC RPD%			3
	EV_MW_BC1A_WG_2022_Q3_NP	2022 07 14	Michel Creek [EV_MC2 (E300091)]	112
	EV_MW_BC1A_WG_2022_Q4_NP	2022 10 03	Michel Creek [EV_MC2 (E300091)]	117
EV_MW_BC1B^{+}	EV_MW_BC1B_WG_2022_Q1_NP	2022 02 11	Michel Creek [EV_MC2 (E300091)]	221
	EV_MW_BC1B_WG_2022_Q2_NP	2022 04 24	Michel Creek [EV_MC2 (E300091)]	172
	EV_MW_BC1B_WG_2022_Q3_NP	2022 07 14	Michel Creek [EV_MC2 (E300091)]	92.1
	EV_MW_BC1B_WG_2022_Q4_NP	2022 10 03	Michel Creek [EV_MC2 (E300091)]	101
EV_MW_BC2	EV_MW_BC2_WG_2022_Q1_NP	2022 03 06	Michel Creek [EV_MC2 (E300091)]	37.7
	EV_MW_BC2_WG_2022_Q2_NP	2022 05 19	Michel Creek [EV_MC2 (E300091)]	36.6
	EV_MW_BC2_WG_2022_Q3_NP	2022 08 22	Michel Creek [EV_MC2 (E300091)]	21.8
	EV_MW_BC2_WG_2022_Q4_NP	2022 10 25	Michel Creek [EV_MC2 (E300091)]	12.6
EV_MW_BC3	EV_MW_BC3_WG_2022_Q1_NP	2022 03 23	Michel Creek [EV_MC2 (E300091)]	53.8
	EV_MW_BC3_WG_2022_Q2_NP	2022 05 31	Michel Creek [EV_MC2 (E300091)]	46.1
	EV_MW_BC3_WG_2022_Q3_NP	2022 09 20	Michel Creek [EV_MC2 (E300091)]	102
	EV_MW_BC3_WG_2022_Q4_NP	2022 11 13	Michel Creek [EV_MC2 (E300091)]	92.4
	EV_EC5GW_WG_2022_Q4_NP	Duplicate	Michel Creek [EV_MC2 (E300091)]	98.9
	QA/QC RPD%			7
EV_RCSgw^{+}	EV_RCSGW_WG_2022_Q1_NP	2022 02 13	Michel Creek [EV_MC2 (E300091)]	230
	EV_RCSGW_WG_2022_Q2_NP	2022 04 28	Michel Creek [EV_MC2 (E300091)]	220
	EV_RCSGW_WG_2022_Q3_NP	2022 08 07	Michel Creek [EV_MC2 (E300091)]	208
	EV_RCSGW_WG_2022_Q4_NP	2022 10 12	Michel Creek [EV_MC2 (E300091)]	228
EV_BCgw^{+}	EV_BCGW_WG_2022_Q1_NP	2022 03 08	Michel Creek [EV_MC2 (E300091)]	13.1
	EV_BCGW_WG_2022_Q2_NP	2022 05 08	Michel Creek [EV_MC2 (E300091)]	21.8
	EV_BCGW_WG_2022_Q3_NP	2022 07 18	Michel Creek [EV_MC2 (E300091)]	26.6
	EV_BCGW_WG_2022_Q4_NP	2022 10 12	Michel Creek [EV_MC2 (E300091)]	24.5
EV_WH50gw^{+}	EV_WH50GW_WG_2022_Q4_NP	2022 10 04	Michel Creek [EV_MC2 (E300091)]	17.1
	EV_MW_BC10A_WG_2022_Q4_NP	Duplicate	Michel Creek [EV_MC2 (E300091)]	17.6
	QA/QC RPD%			3

All terms defined within the body of SNC-Lavalin's report.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

* RPDs are not calculated where one or more concentrations are less than five times RDL.

RDL Denotes reported detection limit.

SHADED	Concentration greater than SPO by Area/Compliance Point by Area

TABLE EV-05: Summary of Analytical Results Compared to Secondary Screening Criteria for Selenium (EVO)

Sample Location	Sample ID	Sample Date (yyyy mm dd)	SPO/Compliance Point	Selenium µg/L
Groundwater Quality Benchmarks				
SPO			Elk River [EV_ER1 (0200393)]	19
Compliance Point			Michel Creek [EV_MC2 (E300091)]	20
Michel Creek Downstream of Gate Creek and Bodie Creek - Michel Creek Valley Bottom (+ denotes well part of Study Area 9b)				
EV_BRgw^{+}	EV_BRGW_WG_2022_Q1_NP	2022 03 06	Michel Creek [EV_MC2 (E300091)]	36.1
	EV_BRGW_WG_2022_Q2_NP	2022 05 08	Michel Creek [EV_MC2 (E300091)]	25.4
	EV_BRGW_WG_2022_Q3_NP	2022 08 04	Michel Creek [EV_MC2 (E300091)]	57.9
	EV_BRGW_WG_2022_Q4_NP	2022 10 04	Michel Creek [EV_MC2 (E300091)]	49.3
EV_HW1^{+}	EV_HW1_WG_2022_Q1_NP	2022 01 27	Michel Creek [EV_MC2 (E300091)]	55.4
	EV_HW1_WG_2022_Q2_NP	2022 05 20	Michel Creek [EV_MC2 (E300091)]	56.9
	EV_HW1_WG_2022_Q3_NP	2022 09 14	Michel Creek [EV_MC2 (E300091)]	47.1
	EV_HW1_WG_2022_Q4_NP	2022 10 27	Michel Creek [EV_MC2 (E300091)]	61.9
	EV_HW1_WG_2022-12-19_NP	2022 12 19	Michel Creek [EV_MC2 (E300091)]	67.1
EV_MW_MC2B^{+}	EV_MW_MC2B_WG_2022_Q1_NP	2022 02 25	Michel Creek [EV_MC2 (E300091)]	54.8
	EV_MW_MC2B_WG_2022_Q2_NP	2022 05 15	Michel Creek [EV_MC2 (E300091)]	56.0
	EV_MW_MC2B_WG_2022_Q3_NP	2022 08 17	Michel Creek [EV_MC2 (E300091)]	59.5
	EV_MW_MC2B_WG_2022_Q4_NP	2022 10 26	Michel Creek [EV_MC2 (E300091)]	58.7

All terms defined within the body of SNC-Lavalin's report.

n/a Denotes no applicable standard/guideline.

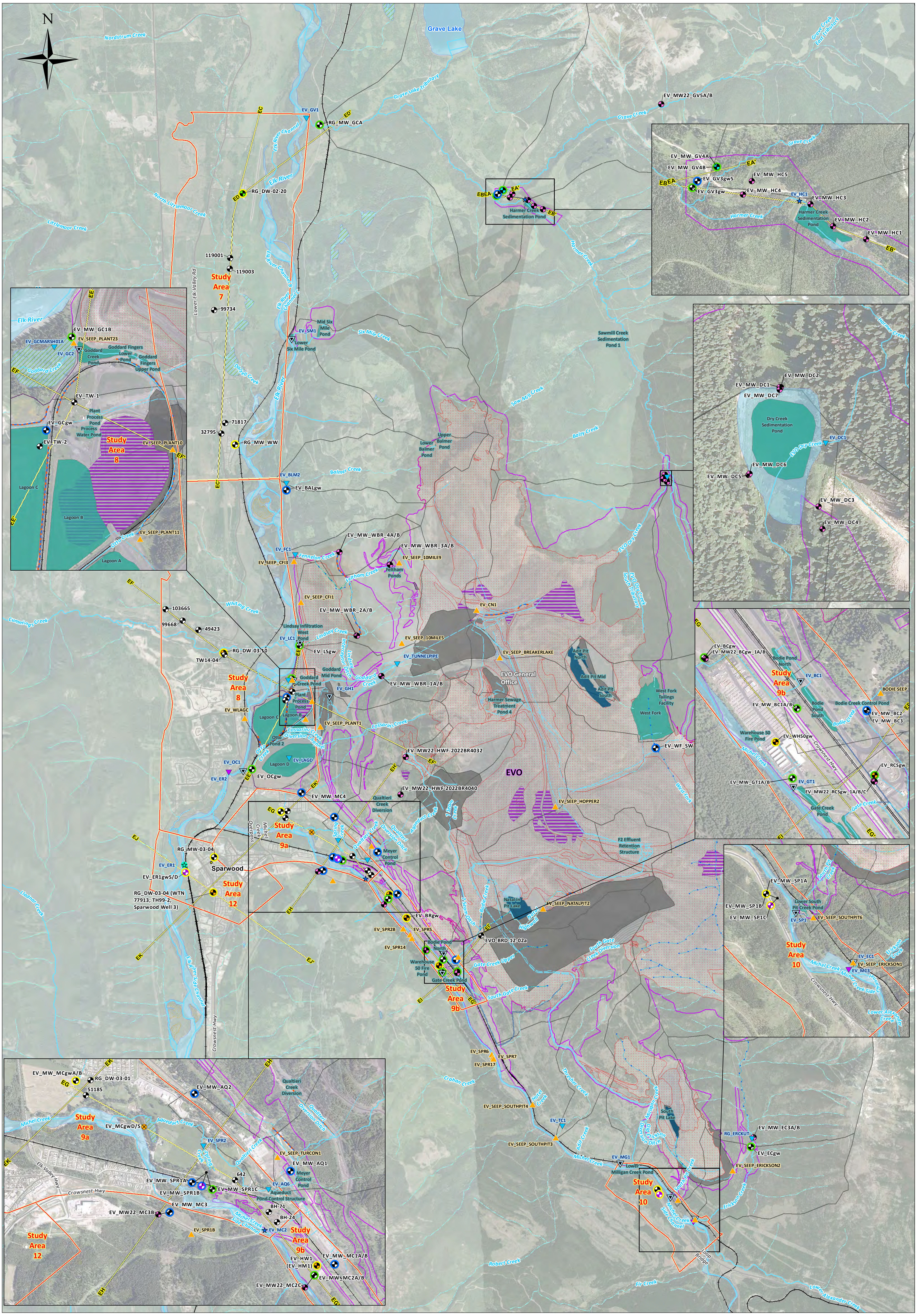
QA/QC RPD Denotes quality assurance/quality control relative percent difference

* RPDs are not calculated where one or more concentrations are less than five times RDL.

RDL Denotes reported detection limit.

▨ SHADED	Concentration greater than SPO by Area/Compliance Point by Area

Drawings



Legend

Groundwater Stations

- ⊕ Monitoring Well
- ⊕ Background Monitoring Well
- ⊕ Domestic Well
- ⊕ Supply Well
- ⊕ Well included in the RGMP
- ⊕ Well included in the SSGMP
- ⊕ Well included in both the RGMP and the SSGMP
- ⊕ Monitoring wells to be considered for inclusion
- ⊗ Decommissioned Well
- ◑ Barologgers associated the SSGMP/RGMP

Surface Water Stations

- ★ Compliance Point
- ☆ Order Station
- ▼ Receiving Environment
- ▽ Authorized Discharge
- ▼ Monitoring
- ▲ Seep

Site Features

- Highway/Arterial
- Secondary Road
- Rails
- Geological Cross Section
- Study Areas
- Tailings/Settling/Sediment Pond
- Waste Water Pond
- End-Pit Lake
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds
- Mine Permitted Areas

Water Features

- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Rock Drain
- Water Pipeline
- Bypass/Diversion Channel
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:22000 Scale)

Notes:
1. Original in colour at paper size ANSI C (17x22 in).
2. Numerical scale reflects full-size print. Print scaling will distort this scale; however, scale bar will remain accurate.
3. Intended for illustration purposes. Accuracy has not been verified for construction or navigation.
4 .Locations of overlapping wells have been adjusted for clarity.
5. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Information provided by Teck Coal Limited.
2.Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Revisions:
0 - CW - 2023-03-07 - DRAFT - DC
1 - CW - 2023-03-22 - FINAL - DC

0 0.5 1 2 3 km

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

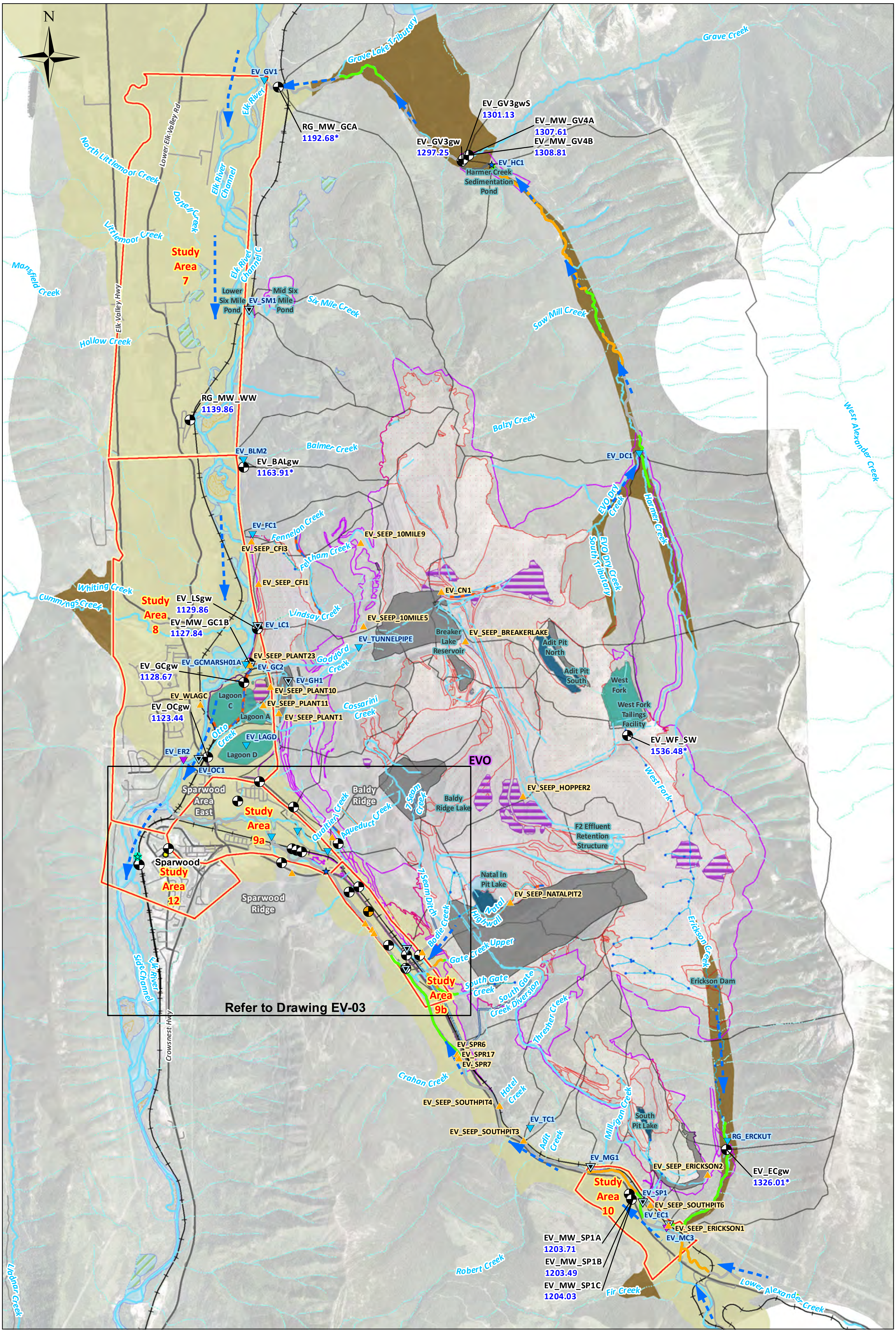
SNC·LAVALIN

Elkview Operations - Sample Location Plan

CHK'D: DC
BY: CW
DATE: 2023-03-22
SCALE: 1:30,000
COORD SYS: NAD 1983 UTM Zone 11N
Ref Num:
REV: 0
DRAWING EV-01

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-LocPlan_EVO.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



Legend

Groundwater Stations
- Monitoring Well
- Supply Well

Surface Water Stations
- ★ Compliance Point
- ☆ Order Station
- ▼ Receiving Environment
- ▽ Authorized Discharge
- ▼ Monitoring
- ▲ Seep

Flow Status
- Gaining
- Losing
- No Change
- Not Available/ Insufficient Information

Site Features
- Highway/Arterial
- Secondary Road
- Rails

- Approximate GW flow direction
- Study Areas
- Tailings/Settling/ Sediment Pond
- Waste Water Pond
- End-Pit Lake
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds

- Mine Permitted Areas
- Interpreted Tributary Valley-bottom Extent
- Interpreted Main Valley-bottom Extent

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface

- Ditch
- Rock Drain
- Water Pipeline
- Bypass/Diversion Channel
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:60000 Scale)

1143.80 Water level (masl) measured in October 2022

1538.70* Water level (masl) measured in November 2022

Notes:
1. Original in colour.
2. Numerical scale reflects full-size print. Print scaling will distort this scale, however scale bar will remain accurate.
3. Intended for illustration purposes, accuracy has not been verified for construction or navigation purposes.
4. Stations used to assess flow status are not shown on the map. Readers are referred to report references.
5. Flow accretion studies completion dates:
· Grave Creek: May and October 2020
· Harmer Creek: October 2018
· Erickson Creek: May 2019
· Michel Creek, Alexander Creek: July 2021
· Gate, South Gate, Bodie Creek: October 2018
6. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Information provided by Teck Coal Limited.

0 0.5 1 2 km

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

SNC·LAVALIN

Groundwater Elevations from Q4 2022 and Inferred Groundwater Flow Direction - Elkview Operations (Study Areas 7, 8 and 10)

CHK'D: DC
BY: CW
DATE: 2023-03-14 SCALE: 1:60,000
COORD SYS: NAD 1983 UTM Zone 11N
Ref Num: **DRAWING EV-02**

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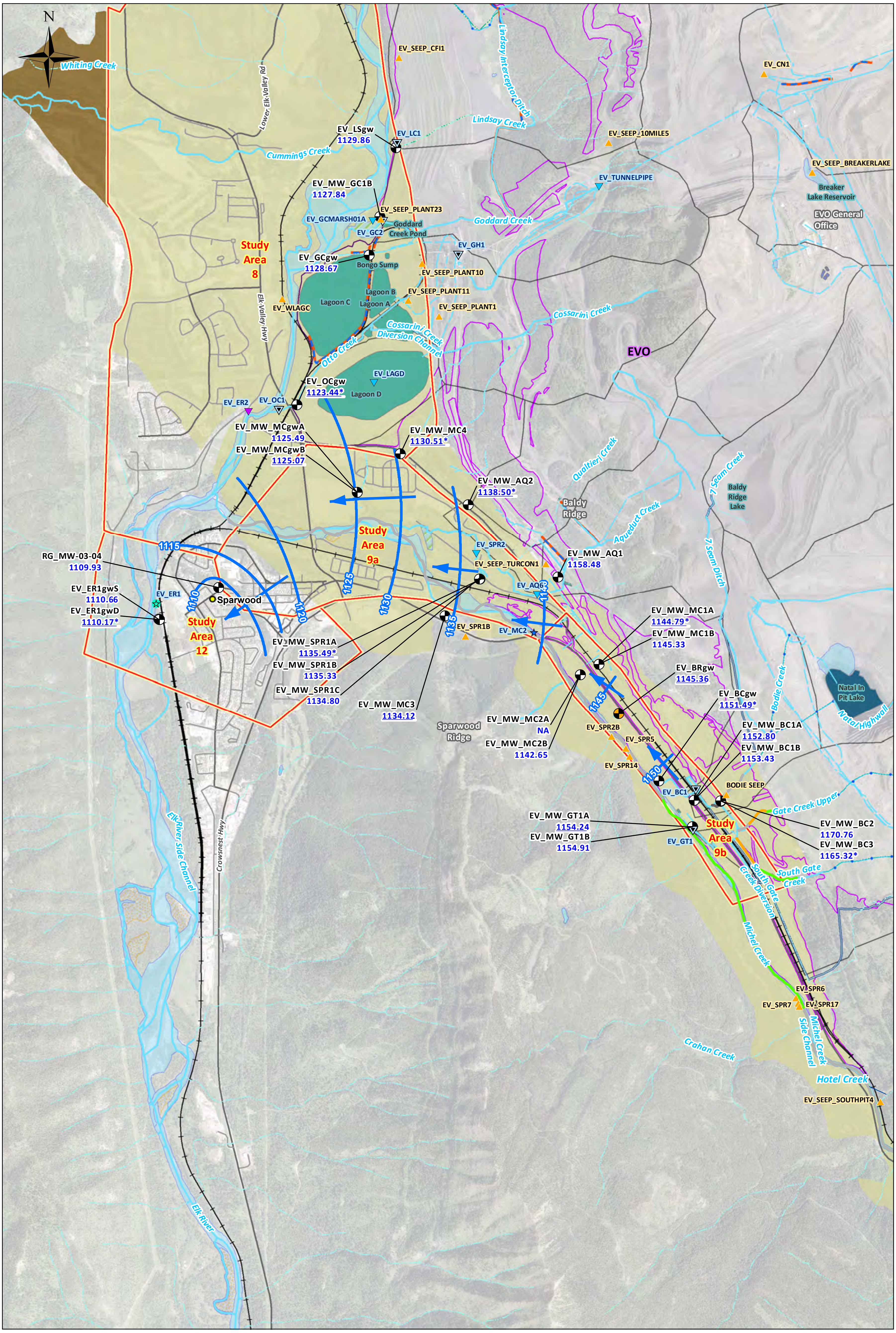
Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



Legend

Groundwater Stations
- Monitoring Well
- Supply Well

Surface Water Stations
- ★ Compliance Point
- ☆ Order Station
- ▼ Receiving Environment
- ▽ Authorized Discharge
- ▼ Monitoring
- ▲ Seep

Flow Status
- Gaining
- Losing
- No Change
- Not Available/ Insufficient Information

Site Features
- Highway/Arterial
- Secondary Road
- Rails
- Interpreted GW contours (masl)
- Interpreted GW flow direction
- Study Areas
- Tailings/Settling/ Sediment Pond
- Waste Water Pond
- End-Pit Lake
- Watersheds
- Mine Permitted Areas
- Interpreted Tributary Valley-bottom Extent
- Interpreted Main Valley-bottom Extent

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Rock Drain
- Water Pipeline
- Bypass/Diversion Channel
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:30000 Scale)

1143.80	Water level (masl) measured in October 2022
1538.70*	Water level (masl) measured in November 2022
<u>1143.80</u>	Water level (masl) used for contouring

Notes:
1. Original in colour.
2. Numerical scale reflects full-size print. Print scaling will distort this scale, however scale bar will remain accurate.
3. Intended for illustration purposes, accuracy has not been verified for construction or navigation purposes.
4. Stations used to assess flow status are not shown on the map. Readers are referred to report references.
5. Flow accretion studies completion dates:
· Michel Creek, Alexander Creek: July 2021
· Gate, South Gate, and Bodie Creek: October 2018
6. NA - Not Available
7. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Information provided by Teck Coal Limited.

0 125 250 500 750 1,000 Meters

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

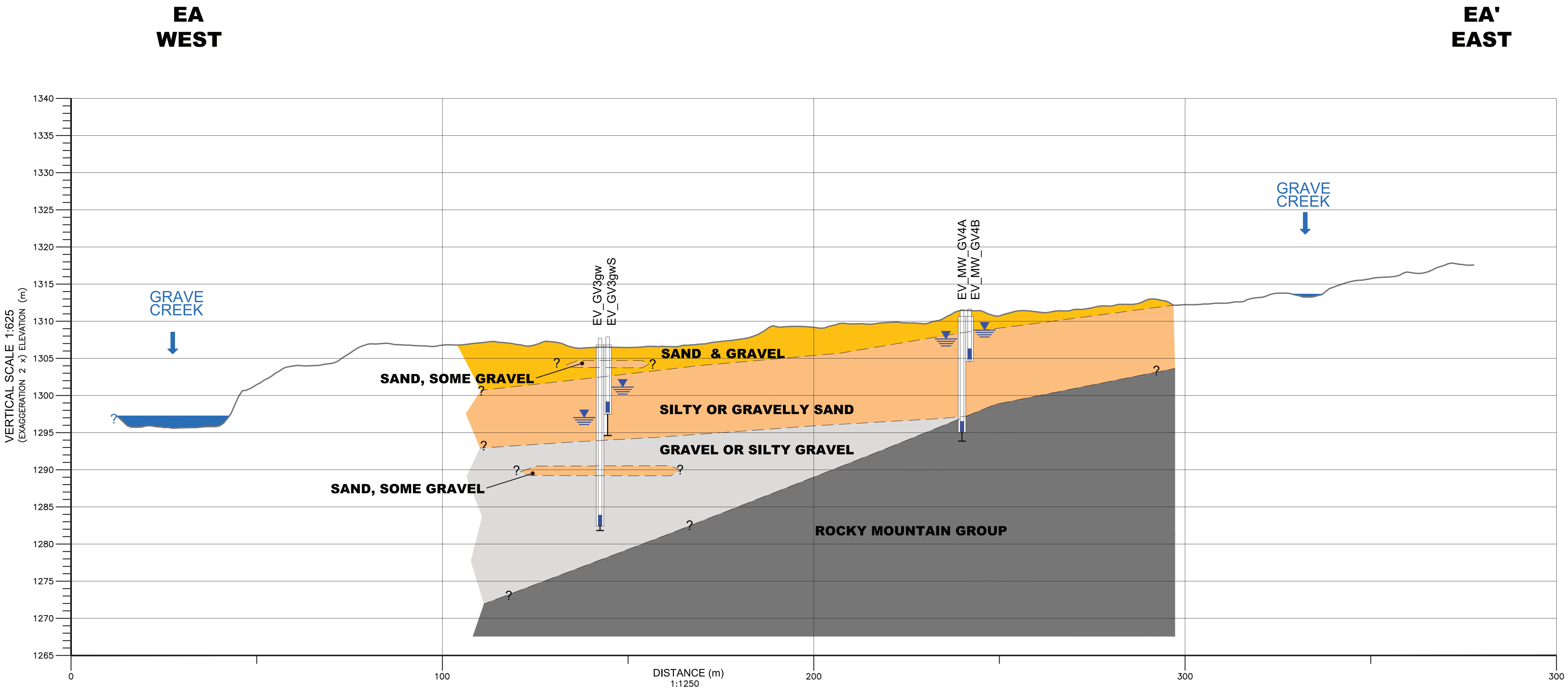
SNC·LAVALIN

Groundwater Elevations from Q4 2022 and Inferred Groundwater Flow Direction - Elkview Operations (Study Areas 9a, 9b and 12)

CHK'D: DC
BY: CW
DATE: 2023-03-22 SCALE: 1:30,000
COORD SYS: NAD 1983 UTM Zone 11N
Ref Num:
DRAWING EV-03

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-GWElev_EVO_SA9-10-12.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



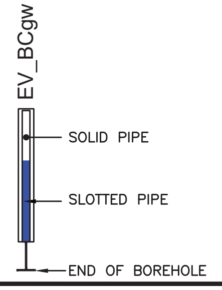
LEGEND

🟧	**SAND & GRAVEL**
🟧	**SAND**
⬜	**GRAVEL**
⬛	**BEDROCK**

— — — — INFERRED STRATIGRAPHIC BOUNDARY

GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)

BOREHOLE LEGEND



NOTES

1. THE CROSS SECTION DEPICTED IS BASED ON INTERPRETATION OF LIMITED GEOLOGICAL DATA. ACTUAL GEOLOGICAL CONDITIONS MAY BE DIFFERENT FROM THOSE INTERPRETED.
2. INFORMATION PRESENTED IS WITHIN 25m OF SECTION LINE UNLESS INDICATED OTHERWISE ON DRAWING.
3. ORIGINAL DRAWING IN COLOUR.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–22	ISSUED TO CLIENT	AJK	AAZ
0	2022–03–14	ISSUED TO CLIENT	AJK	KC

CLIENT NAME:
TECK COAL LIMITED
–

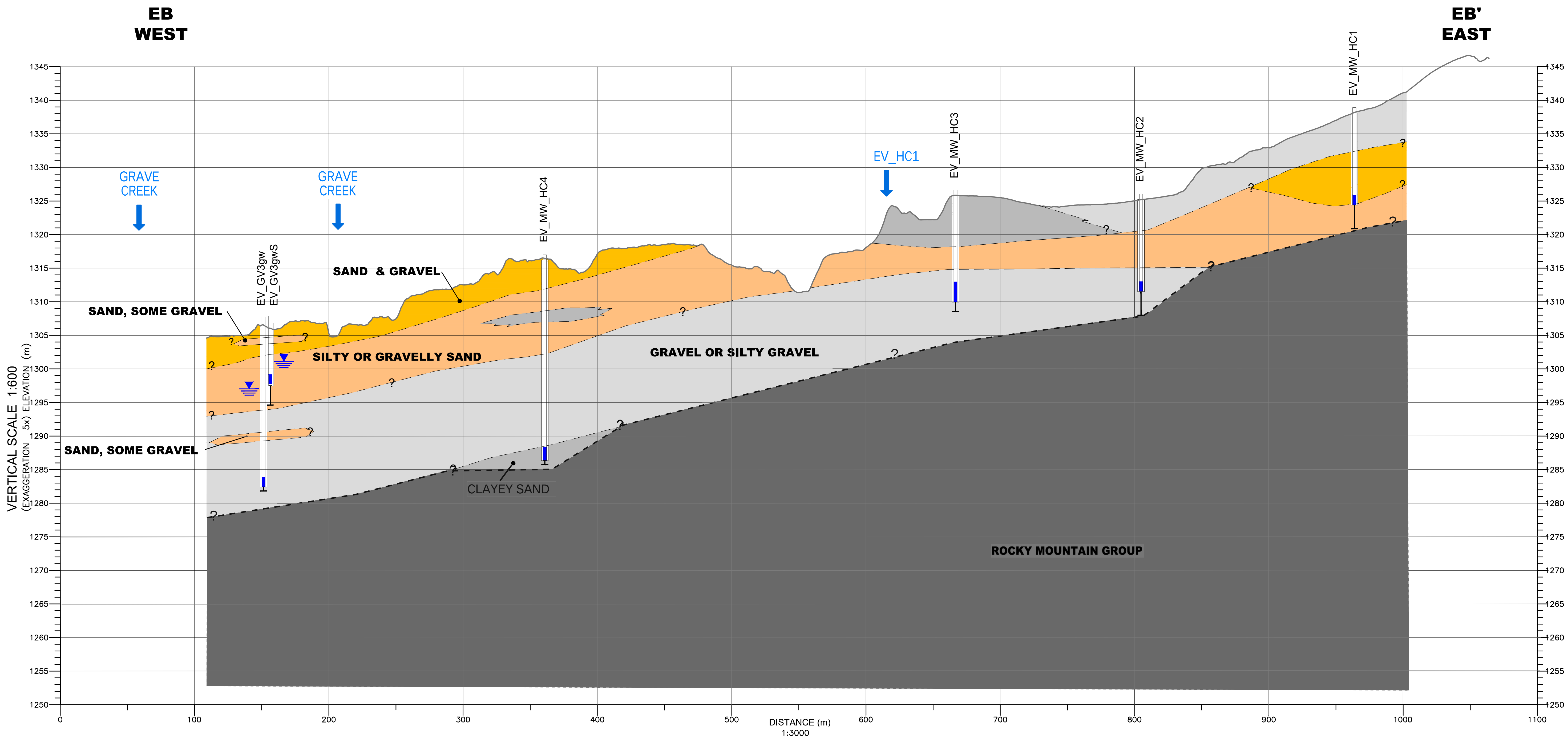
PROJECT LOCATION:
ELKVIEW OPERATONS
ELK VALLEY, BC

SNC·LAVALIN

TITLE:
ELKVIEW OPERATIONS
INFERRED GEOLOGICAL CROSS SECTION EA-EA'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2022–02–14	DWG No: REV.: **1**
CHK'D: KC	PLOT: 20230322.0913	CADFILE: 635544–X2R20	**DRAWING EV-04**

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R20.DWG



LEGEND

🟨 **SAND & GRAVEL**

🟧 **SAND**

⬜ **GRAVEL**

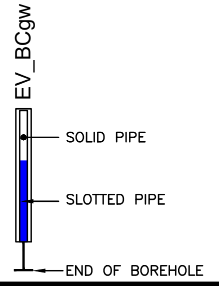
▩ **CLAYEY SAND**

⬛ **BEDROCK**

— — — — INFERRED STRATIGRAPHIC BOUNDARY

GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)

BOREHOLE LEGEND



NOTES

1. THE CROSS SECTION DEPICTED IS BASED ON INTERPRETATION OF LIMITED GEOLOGICAL DATA. ACTUAL GEOLOGICAL CONDITIONS MAY BE DIFFERENT FROM THOSE INTERPRETED.
2. INFORMATION PRESENTED IS WITHIN 25m OF SECTION LINE UNLESS INDICATED OTHERWISE ON DRAWING.
3. ORIGINAL DRAWING IN COLOUR.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–22	ISSUED TO CLIENT	AJK	AAZ
0	2022–03–14	ISSUED TO CLIENT	AJK	KC

CLIENT NAME:
TECK COAL LIMITED
–

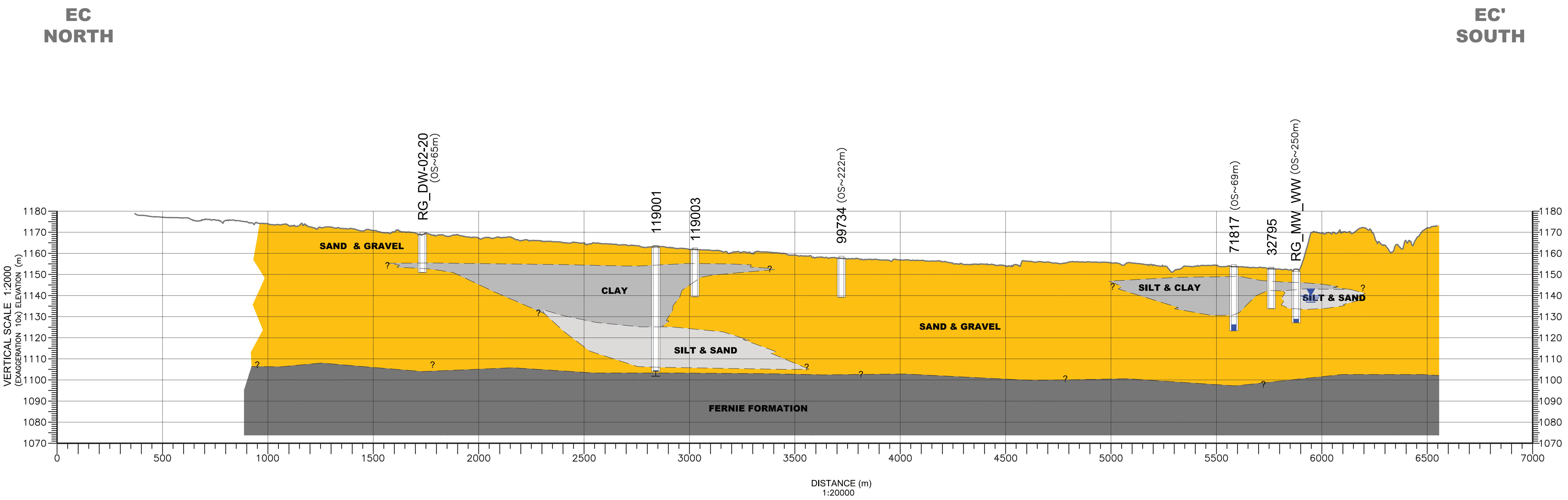
PROJECT LOCATION:
ELKVIEW OPERATONS
ELK VALLEY, BC

SNC·LAVALIN

TITLE:
ELKVIEW OPERATIONS
INFERRED GEOLOGICAL CROSS SECTION EB-EB'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2022–02–14	DWG No: REV.: **1**
CHK'D: KC	PLOT: 20230322.0914	CADFILE: 635544–X2R20	**DRAWING EV-05**

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R20.DWG



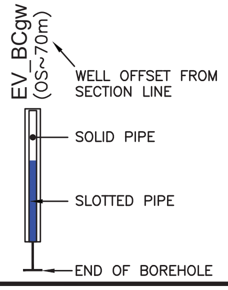
LEGEND

- 🟨 **FILL**
- 🟥 **COLLUVIUM**
- 🟧 **SAND & GRAVEL**
- 🟧 **SAND**
- ⬜ **SILT**
- ⬜ **CLAY**
- ⬛ **BEDROCK**

— — — — INFERRED STRATIGRAPHIC BOUNDARY

GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)

BOREHOLE LEGEND



NOTES

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3. ORIGINAL DRAWING IN COLOUR.
4. GROUND SURFACE ELEVATION OF WELLS WAS OBTAINED FROM LIDAR.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–22	ISSUED TO CLIENT	AJK	AAZ
0	2022–03–14	ISSUED TO CLIENT	AJK	KC

CLIENT NAME:
TECK COAL LIMITED
–

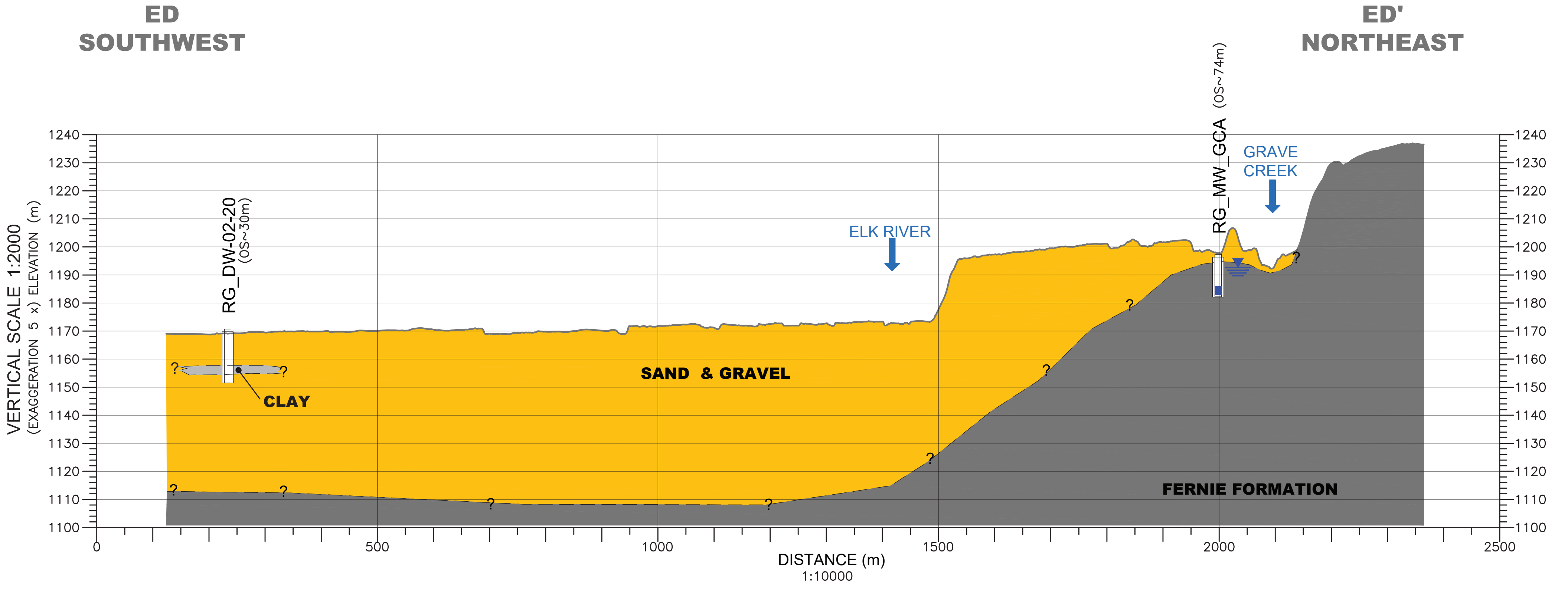
PROJECT LOCATION:
ELKVIEW OPERATONS
ELK VALLEY, BC

SNC·LAVALIN

TITLE:
ELKVIEW OPERATIONS
INFERRED GEOLOGICAL CROSS SECTION EC-EC'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2022–02–14	DWG No: REV.: **1**
CHK'D: KC	PLOT: 20230322.0932	CADFILE: 635544–X2R20	**DRAWING EV-06**

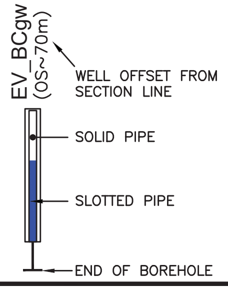
PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R20.DWG



LEGEND

🟨	**SAND & GRAVEL**	— — — —	INFERRED STRATIGRAPHIC BOUNDARY
▒	**CLAY**	≚	GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)
▓	**BEDROCK**		

BOREHOLE LEGEND



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3. ORIGINAL DRAWING IN COLOUR.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–22	ISSUED TO CLIENT	AJK	AAZ
0	2022–03–14	ISSUED TO CLIENT	AJK	KC

CLIENT NAME:
TECK COAL LIMITED
–

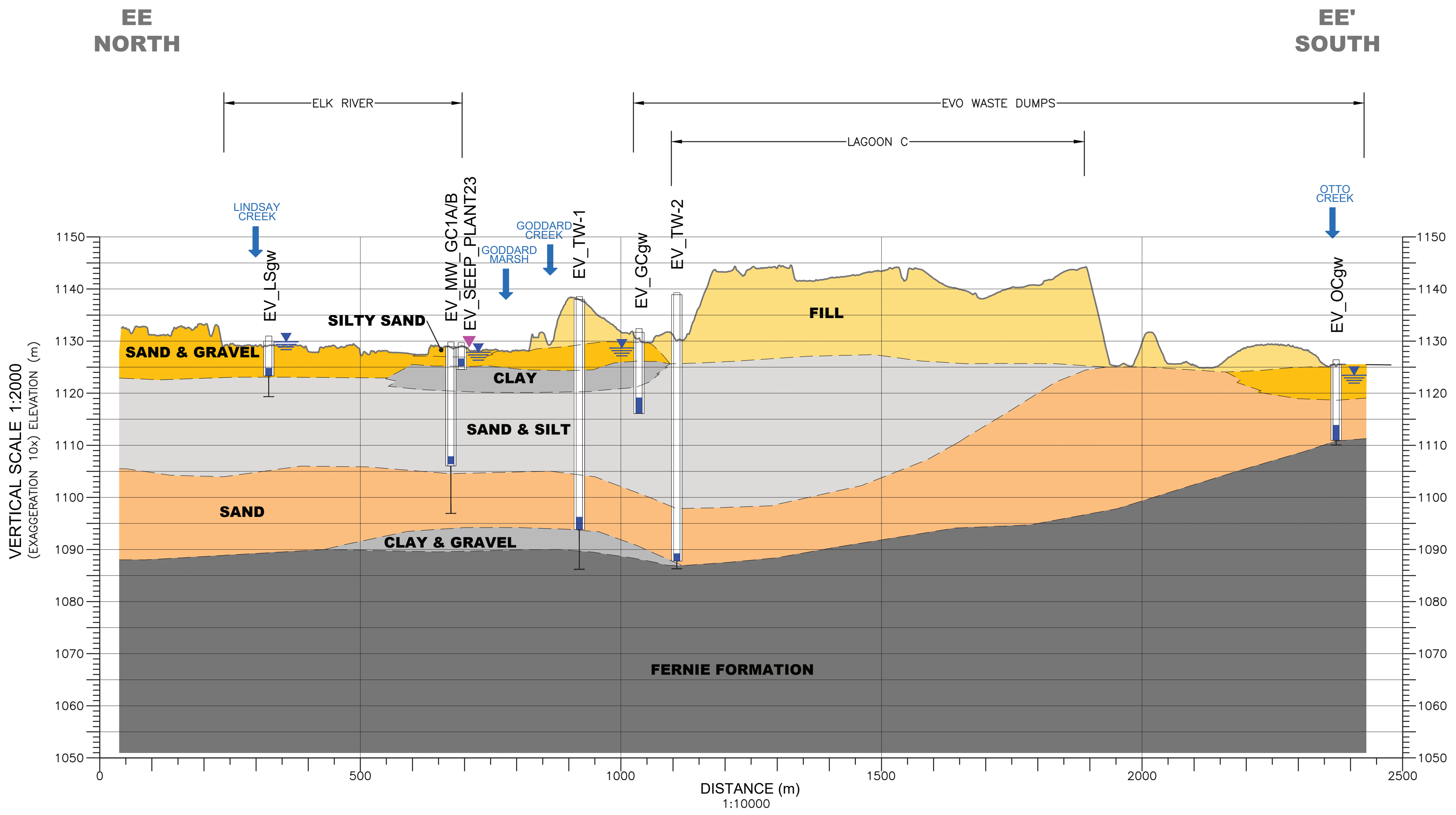
PROJECT LOCATION:
ELKVIEW OPERATONS
ELK VALLEY, BC

SNC·LAVALIN

TITLE:
ELKVIEW OPERATIONS
INFERRED GEOLOGICAL CROSS SECTION ED-ED'

DWN BY: AJK
SCALE: AS SHOWN
DATE: 2022–02–14
DWG No: **DRAWING EV-07**
REV.: **1**
CHK'D: KC
PLOT: 20230322.0933
CADFILE: 635544–X2R20

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R20.DWG



LEGEND

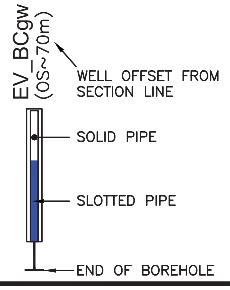
▨	**FILL**
▨	**SAND & GRAVEL**
▨	**SAND**
▨	**SILT**
▨	**CLAY**
▨	**BEDROCK**

— — — — INFERRED STRATIGRAPHIC BOUNDARY

▼ SEEP LOCATION

▽ GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)

BOREHOLE LEGEND



NOTES

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2. INFORMATION PRESENTED IS WITHIN 25m OF SECTION LINE UNLESS INDICATED OTHERWISE ON DRAWING.
3. ORIGINAL DRAWING IN COLOUR.
4. GROUND SURFACE ELEVATION OF WELLS WAS OBTAINED FROM LIDAR. GROUNDWATER ELEVATIONS SHOWN ON SECTIONS WERE CALCULATED USING LIDAR GROUND SURFACE ELEVATIONS.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–22	ISSUED TO CLIENT	AJK	AAZ
0	2022–03–14	ISSUED TO CLIENT	AJK	KC

CLIENT NAME:
TECK COAL LIMITED
–

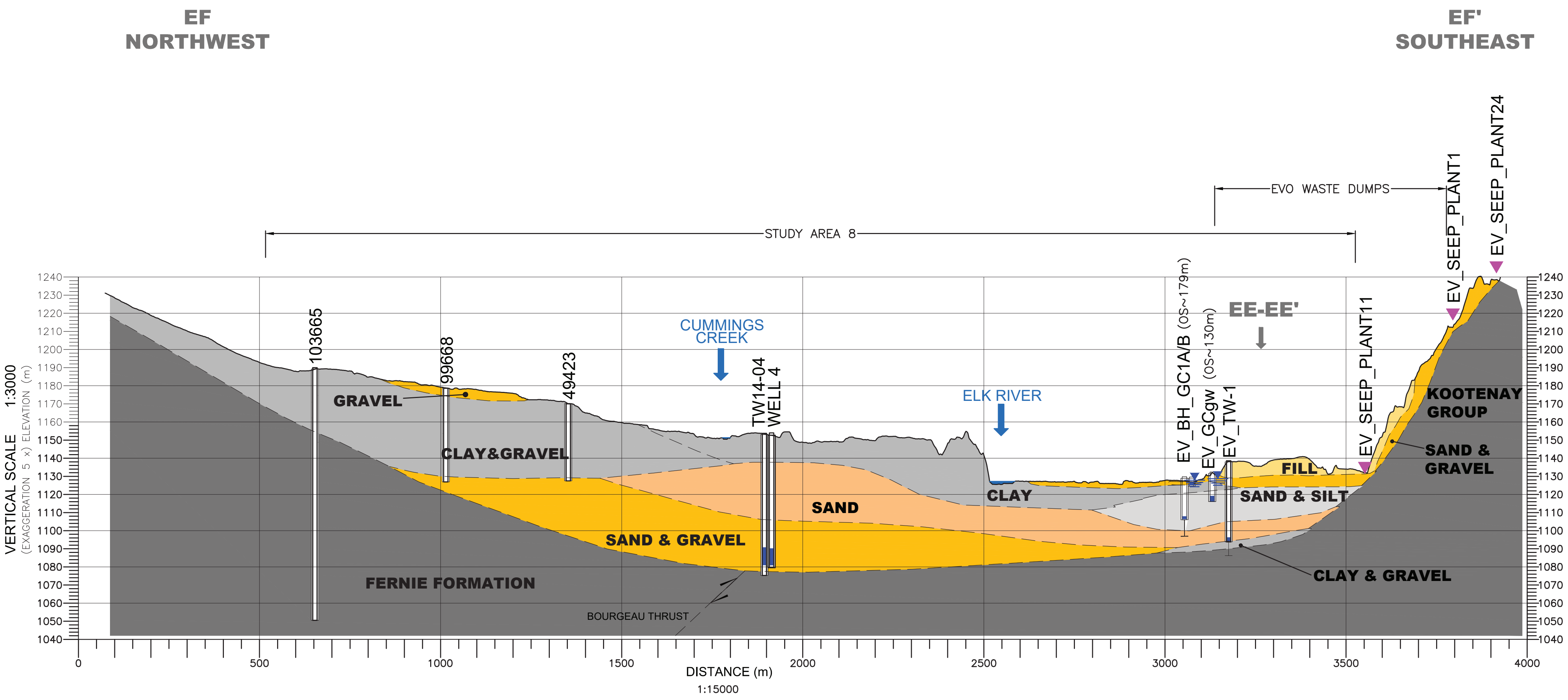
PROJECT LOCATION:
ELKVIEW OPERATONS
ELK VALLEY, BC

SNC·LAVALIN

TITLE:
ELKVIEW OPERATIONS
INFERRED GEOLOGICAL CROSS SECTION EE-EE'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2022–02–14	DWG No: REV.: 1
CHK'D: KC	PLOT: 20230322.0934	CADFILE: 635544–X2R20	DRAWING EV-08

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R20.DWG



LEGEND

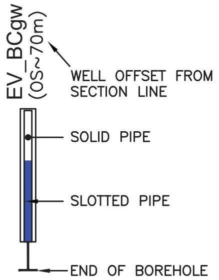
🟨	**FILL**
🟥	**COLLUVIUM**
🟧	**SAND & GRAVEL**
🟧	**SAND**
⬜	**SILT**
⬜	**CLAY**
⬛	**BEDROCK**

— — — — INFERRED STRATIGRAPHIC BOUNDARY

▼ SEEP LOCATION

≡ GROUNDWATER ELEVATION (2021 Q4 MANUAL WATER LEVEL MEASUREMENT)

BOREHOLE LEGEND



NOTES

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2. INFORMATION PRESENTED IS WITHIN 25m OF SECTION LINE UNLESS INDICATED OTHERWISE ON DRAWING.
3. ORIGINAL DRAWING IN COLOUR.
4. GROUND SURFACE ELEVATION OF WELLS WAS OBTAINED FROM LIDAR. GROUNDWATER ELEVATIONS SHOWN ON SECTIONS WERE CALCULATED USING LIDAR GROUND SURFACE ELEVATIONS.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–22	ISSUED TO CLIENT	AJK	AAZ
0	2022–03–14	ISSUED TO CLIENT	AJK	KC

CLIENT NAME:
TECK COAL LIMITED
–

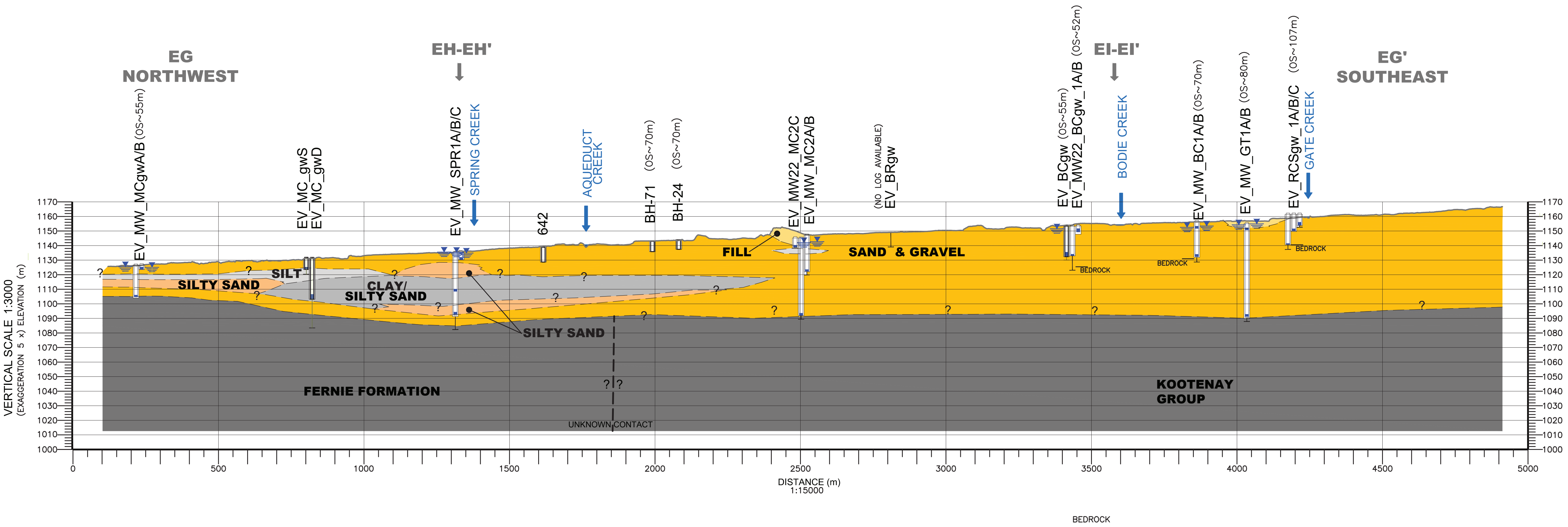
PROJECT LOCATION:
ELKVIEW OPERATONS
ELK VALLEY, BC

SNC·LAVALIN

TITLE:
ELKVIEW OPERATIONS
INFERRED GEOLOGICAL CROSS SECTION EF-EF'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2022–02–14	DWG No: REV.: **1**
CHK'D: KC	PLOT: 20230322.0934	CADFILE: 635544–X2R20	**DRAWING EV-09**

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R20.DWG



LEGEND

🟨 **FILL**

🟥 **COLLUVIUM**

🟧 **SAND & GRAVEL**

🟧 **SAND**

⬜ **SILT**

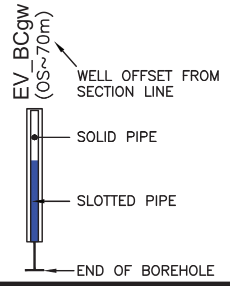
⬜ **CLAY**

⬛ **BEDROCK**

– – – – INFERRED STRATIGRAPHIC BOUNDARY

▽ GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)

BOREHOLE LEGEND



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3. ORIGINAL DRAWING IN COLOUR.
4. GROUND SURFACE ELEVATION OF WELLS WAS OBTAINED FROM LIDAR. GROUNDWATER ELEVATIONS SHOWN ON SECTIONS WERE CALCULATED USING LIDAR GROUND SURFACE ELEVATIONS.

REFERENCE DRAWINGS

–	–	–
DWG. NO.	DATE	DESCRIPTION

REVISIONS

1	2023–03–22	ISSUED TO CLIENT	AJK	AAZ
0	2022–03–14	ISSUED TO CLIENT	AJK	KC
REV.	DATE	DESCRIPTION	BY	CHK

CLIENT NAME:
TECK COAL LIMITED
–

PROJECT LOCATION:
ELKVIEW OPERATONS
ELK VALLEY, BC

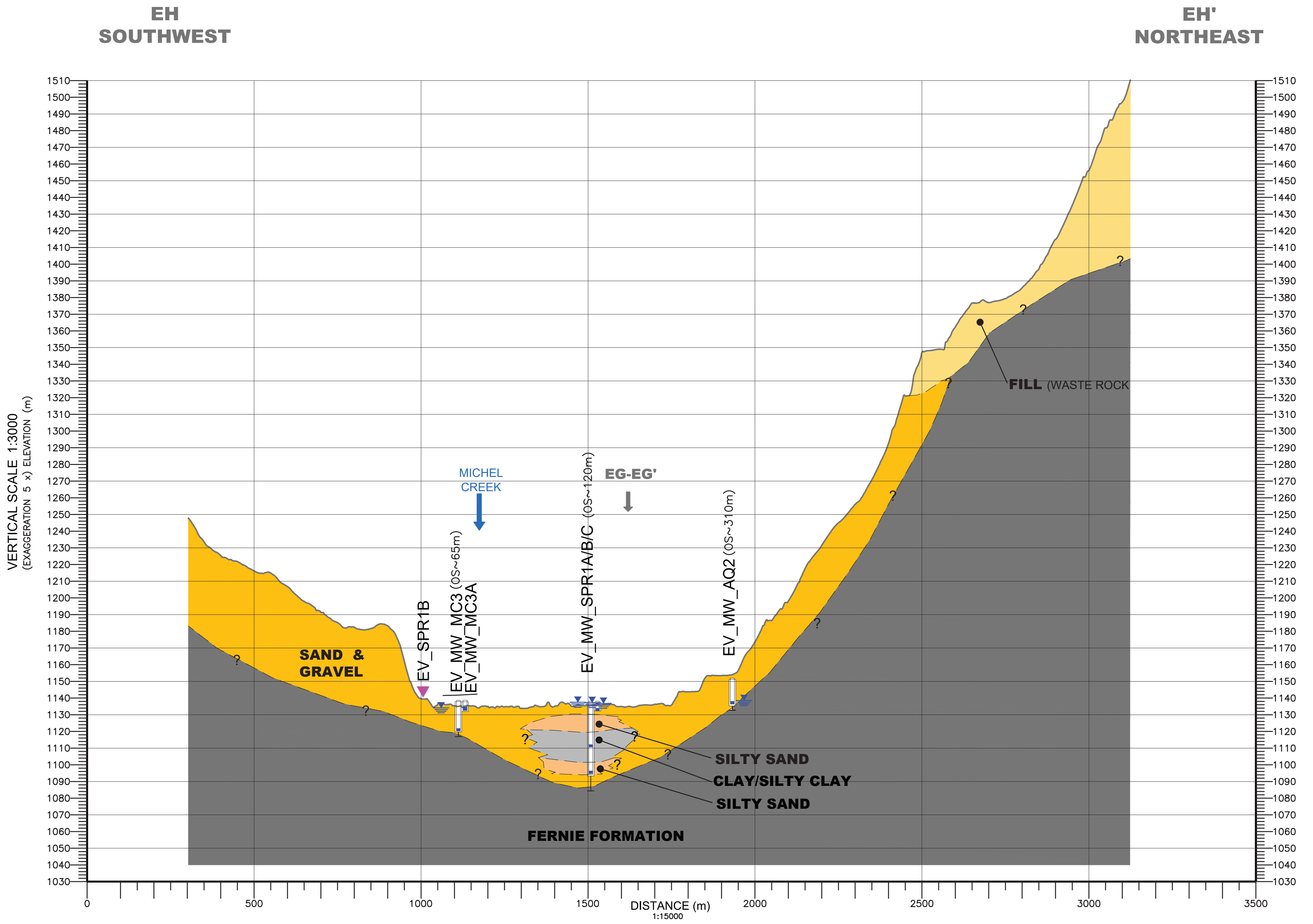
SNC·LAVALIN

TITLE:

ELKVIEW OPERATIONS
INFERRED GEOLOGICAL CROSS SECTION EG-EG'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2022–02–14	DWG No: REV.: **1**
CHK'D: KC	PLOT: 20230322.0935	CADFILE: 635544–X2R20	**DRAWING EV-10**

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R20.DWG



LEGEND

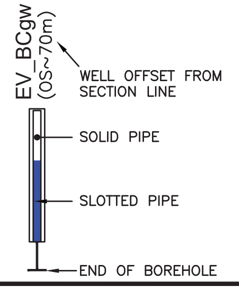
- FILL
- COLLUVIUM
- SAND & GRAVEL
- SAND
- SILT
- CLAY
- BEDROCK

— — — — INFERRED STRATIGRAPHIC BOUNDARY

▼ SEEP LOCATION

▼ GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)

BOREHOLE LEGEND



NOTES

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3. ORIGINAL DRAWING IN COLOUR.
4. GROUND SURFACE ELEVATION OF WELLS WAS OBTAINED FROM LIDAR. GROUNDWATER ELEVATIONS SHOWN ON SECTIONS WERE CALCULATED USING LIDAR GROUND SURFACE ELEVATIONS.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–22	ISSUED TO CLIENT	AJK	AAZ
0	2022–03–14	ISSUED TO CLIENT	AJK	KC

CLIENT NAME:
TECK COAL LIMITED
–

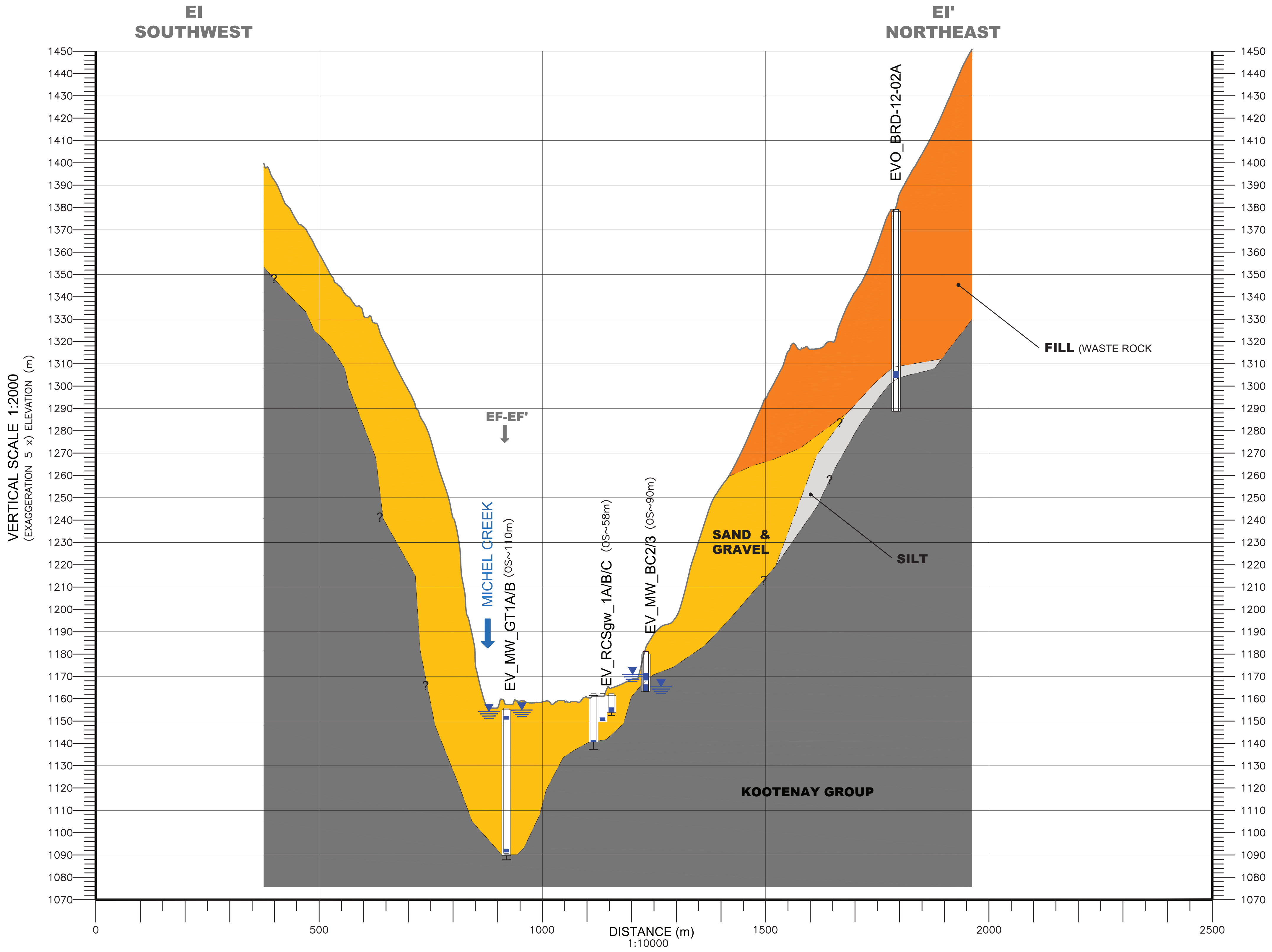
PROJECT LOCATION:
ELKVIEW OPERATONS
ELK VALLEY, BC

SNC·LAVALIN

TITLE:
ELKVIEW OPERATIONS
INFERRED GEOLOGICAL CROSS SECTION EH-EH'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2022–02–14	DWG No: REV.: **1**
CHK'D: KC	PLOT: 20230322.0935	CADFILE: 635544–X2R20	**DRAWING EV-11**

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R20.DWG



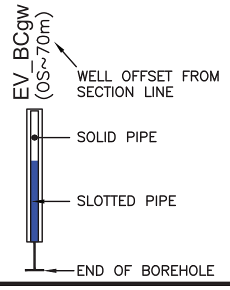
LEGEND

🟧 **FILL (WASTE ROCK)**
🟨 **SAND & GRAVEL**
⬜ **SILT**
⬛ **BEDROCK**

— — — — INFERRED STRATIGRAPHIC BOUNDARY

▼ GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)

BOREHOLE LEGEND



NOTES

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2. INFORMATION PRESENTED IS WITHIN 25m OF SECTION LINE UNLESS INDICATED OTHERWISE ON DRAWING.
3. ORIGINAL DRAWING IN COLOUR.
4. GROUND ELEVATION FOR SECTIONS WAS OBTAINED FROM LIDAR. GROUNDWATER ELEVATIONS WERE CALCULATED USING LIDAR GROUND SURFACE ELEVATIONS.
5. DEPTH TO GROUNDWATER AT EVO_BRD-12-02A WAS MEASURED ON 2012/09/27.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–22	ISSUED TO CLIENT	AJK	AAZ
0	2022–03–14	ISSUED TO CLIENT	AJK	KC

CLIENT NAME:
TECK COAL LIMITED
–

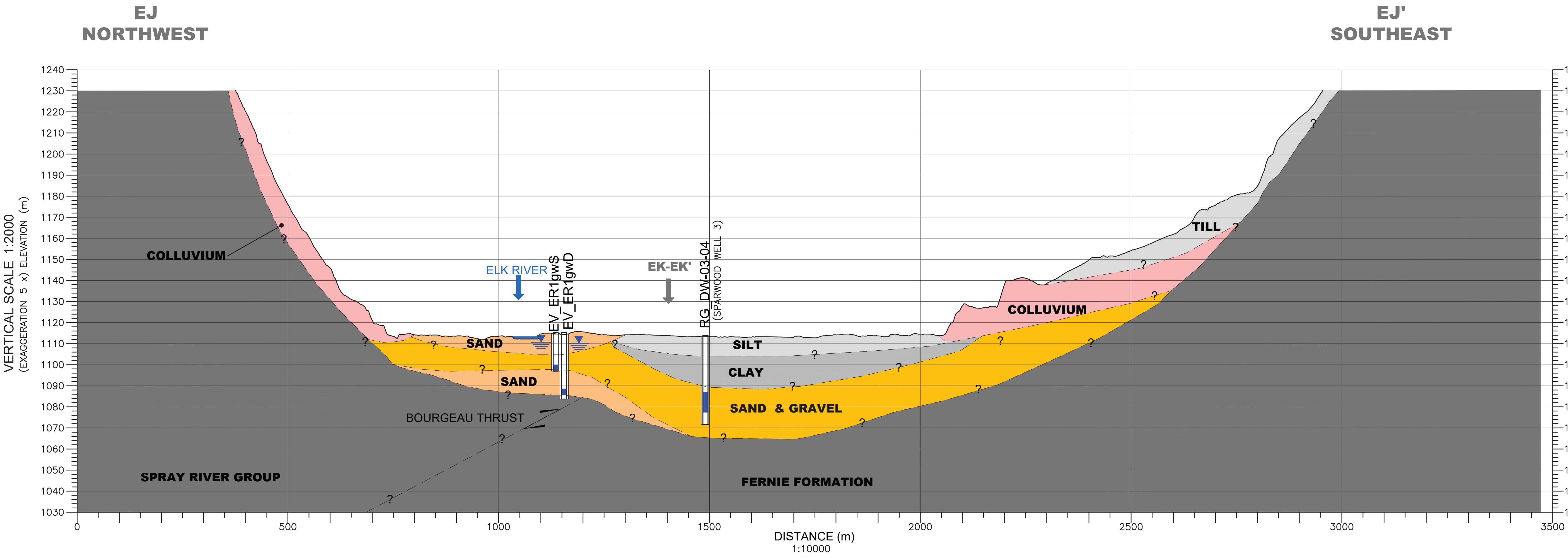
PROJECT LOCATION:
ELKVIEW OPERATONS
ELK VALLEY, BC

SNC·LAVALIN

TITLE:
ELKVIEW OPERATIONS
INFERRED GEOLOGICAL CROSS SECTION EI-EI'

DWN BY: AJK
SCALE: AS SHOWN
DATE: 2022–02–14
DWG No:
REV.: 1
CHK'D: KC
PLOT: 20230322.0936
CADFILE: 635544–X2R20
DRAWING EV-12

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R20.DWG



LEGEND

▨ FILL

▨ COLLUVIUM

▨ SAND & GRAVEL

▨ SAND

▨ SILT

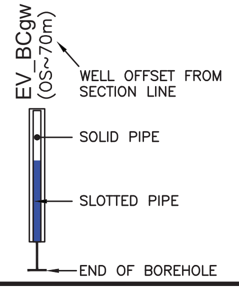
▨ CLAY

▨ BEDROCK

— — — — INFERRED STRATIGRAPHIC BOUNDARY

▽ GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)

BOREHOLE LEGEND



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3. ORIGINAL DRAWING IN COLOUR.
4. GROUND SURFACE ELEVATION OF WELLS WAS OBTAINED FROM LIDAR.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–22	ISSUED TO CLIENT	AJK	AAZ
0	2022–03–14	ISSUED TO CLIENT	AJK	KC

CLIENT NAME:
TECK COAL LIMITED
–

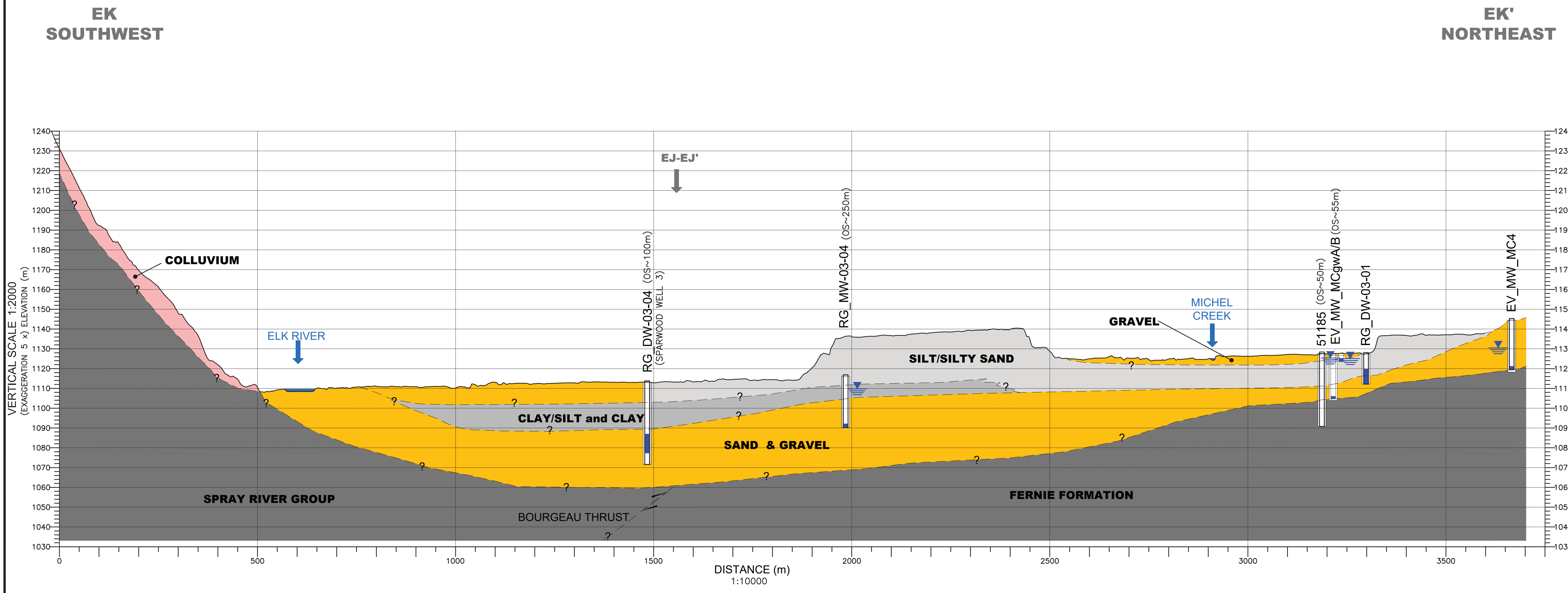
PROJECT LOCATION:
ELKVIEW OPERATONS
ELK VALLEY, BC

SNC·LAVALIN

TITLE:
ELKVIEW OPERATIONS
INFERRED GEOLOGICAL CROSS SECTION EJ-EJ'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2022–02–14	DWG No: REV.: 1
CHK'D: KC	PLOT: 20230322.0936	CADFILE: 635544–X2R20	**DRAWING EV-13**

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R20.DWG



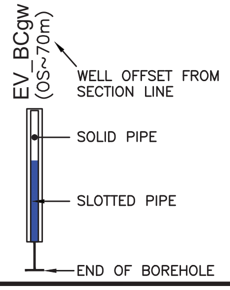
LEGEND

🟨	**FILL**
🟥	**COLLUVIUM**
🟧	**SAND & GRAVEL**
🟧	**SAND**
⬜	**SILT/SILTY SAND**
⬜	**CLAY/SILT and CLAY**
⬛	**BEDROCK**

— — — — INFERRED STRATIGRAPHIC BOUNDARY

▼ GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)

BOREHOLE LEGEND



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3. ORIGINAL DRAWING IN COLOUR.
4. GROUND SURFACE ELEVATION OF WELLS WAS OBTAINED FROM LIDAR.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
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REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–22	ISSUED TO CLIENT	AJK	AAZ
0	2022–03–14	ISSUED TO CLIENT	AJK	KC

CLIENT NAME:
TECK COAL LIMITED
–

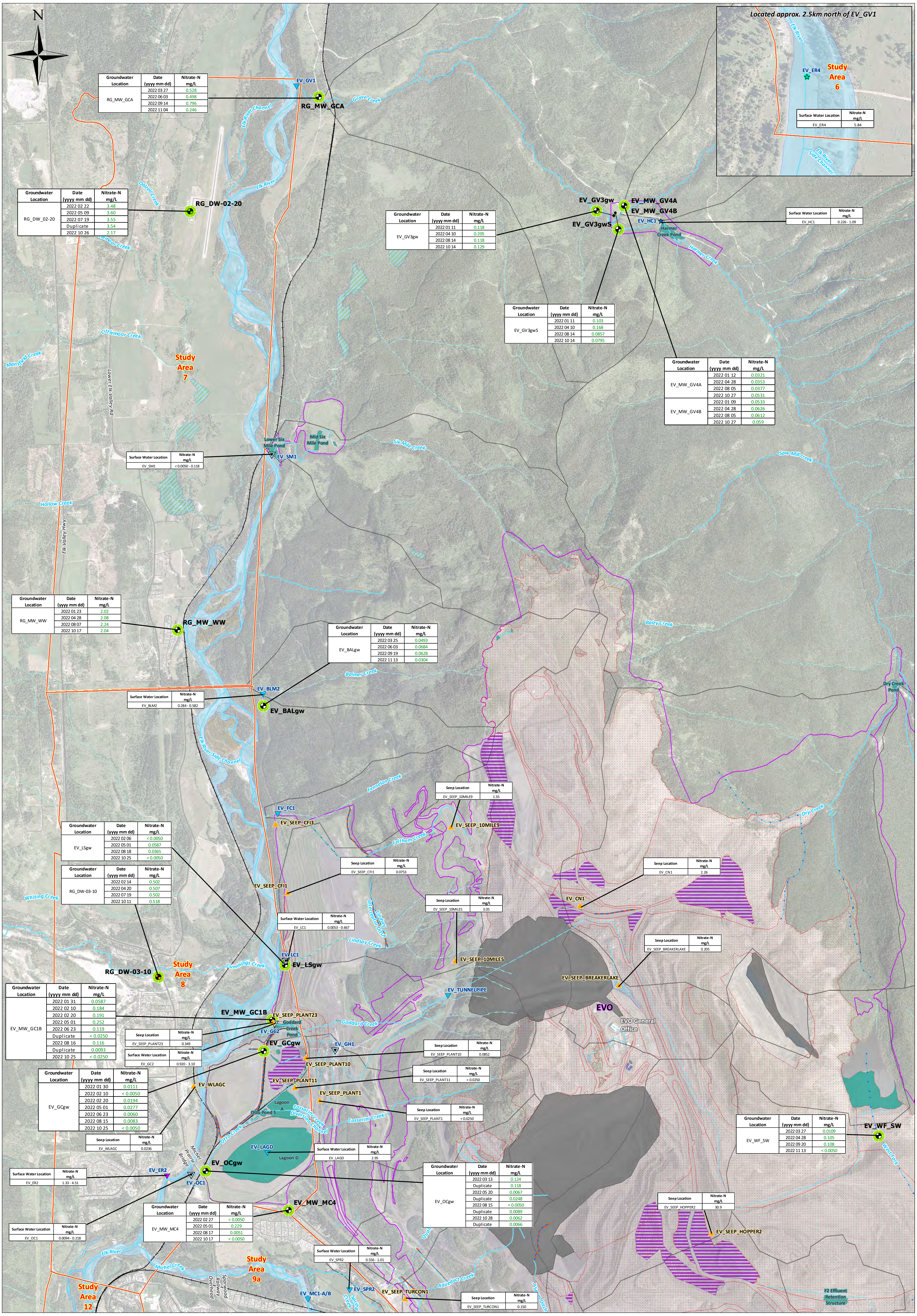
PROJECT LOCATION:
ELKVIEW OPERATONS
ELK VALLEY, BC

SNC·LAVALIN

TITLE:
ELKVIEW OPERATIONS
INFERRED GEOLOGICAL CROSS SECTION EK-EK'

DWN BY: AJK
SCALE: AS SHOWN
DATE: 2022–02–14
DWG No:
REV.: 1
CHK'D: KC
PLOT: 20230322.0936
CADFILE: 635544–X2R20
DRAWING EV-14

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R20.DWG



Surface Water Location	Nitrate-N mg/L
EV_ER4	5.84

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
RG_MW_GCA	2022 03 27	0.528
	2022 06 03	0.498
	2022 09 14	0.796
	2022 11 04	0.246

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
RG_DW_02-20	2022 02 22	3.48
	2022 05 09	3.60
	2022 07 19	3.55
	Duplicate	3.54
	2022 10 26	2.17

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_GV3gw	2022 01 11	0.118
	2022 04 10	0.205
	2022 08 14	0.118
	2022 10 14	0.129

Surface Water Location	Nitrate-N mg/L
EV_HC1	0.226 - 1.09

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_GV3gwS	2022 01 11	0.103
	2022 04 10	0.168
	2022 08 14	0.0857
	2022 10 14	0.0795

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_MW_GV4A	2022 01 12	0.0321
	2022 04 28	0.0353
	2022 08 05	0.0377
	2022 10 27	0.0531
EV_MW_GV4B	2022 01 09	0.0533
	2022 04 28	0.0626
	2022 08 05	0.0612
	2022 10 27	0.059

Surface Water Location	Nitrate-N mg/L
EV_SM1	< 0.0050 - 0.118

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
RG_MW_WW	2022 01 23	2.02
	2022 04 28	2.08
	2022 08 07	2.24
	2022 10 17	2.04

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_BALgw	2022 03 25	0.0493
	2022 06 03	0.0684
	2022 09 19	0.0628
	2022 11 13	0.0304

Surface Water Location	Nitrate-N mg/L
EV_BLM2	0.284 - 0.582

Seep Location	Nitrate-N mg/L
EV_SEEP_10MILE9	1.35

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_LSgw	2022 02 06	< 0.0050
	2022 05 01	0.0587
	2022 08 18	0.0365
	2022 10 25	< 0.0050

Seep Location	Nitrate-N mg/L
EV_SEEP_CFI1	0.0753

Seep Location	Nitrate-N mg/L
EV_CN1	2.26

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
RG_DW-03-10	2022 02 14	0.502
	2022 04 20	0.507
	2022 07 19	0.502
	2022 10 11	0.518

Seep Location	Nitrate-N mg/L
EV_SEEP_10MILE5	3.05

Surface Water Location	Nitrate-N mg/L
EV_LC1	0.0053 - 0.667

Seep Location	Nitrate-N mg/L
EV_SEEP_BREAKERLAKE	0.205

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_MW_GC1B	2022 01 31	0.0587
	2022 02 10	0.184
	2022 02 20	0.191
	2022 05 01	0.252
	2022 06 23	0.119
	Duplicate	< 0.0250
	2022 08 16	0.116
	Duplicate	0.0093
	2022 10 25	< 0.0250

Seep Location	Nitrate-N mg/L
EV_SEEP_PLANT23	0.349

Surface Water Location	Nitrate-N mg/L
EV_GC2	0.920 - 3.10

Seep Location	Nitrate-N mg/L
EV_SEEP_PLANT10	0.0852

Seep Location	Nitrate-N mg/L
EV_SEEP_PLANT11	< 0.0250

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_GCgw	2022 01 30	0.0111
	2022 02 10	< 0.0050
	2022 02 20	0.0194
	2022 05 01	0.0277
	2022 06 23	0.0060
	2022 08 15	0.0083
	2022 10 25	< 0.0050

Seep Location	Nitrate-N mg/L
EV_SEEP_PLANT1	< 0.0250

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_WF_SW	2022 03 27	0.0109
	2022 04 28	0.105
	2022 09 20	0.108
	2022 11 13	< 0.0050

Seep Location	Nitrate-N mg/L
EV_WLAGC	0.0236

Surface Water Location	Nitrate-N mg/L
EV_LAGD	2.95

Surface Water Location	Nitrate-N mg/L
EV_ER2	1.33 - 4.51

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_OCgw	2022 03 13	0.124
	Duplicate	0.118
	2022 05 20	0.0067
	Duplicate	0.0248
	2022 08 15	< 0.0050
	Duplicate	0.0089
	2022 10 28	0.0062
	Duplicate	0.0066

Seep Location	Nitrate-N mg/L
EV_SEEP_HOPPER2	30.9

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_MW_MC4	2022 02 27	< 0.0050
	2022 05 01	0.229
	2022 08 17	0.0051
	2022 10 17	< 0.0050

Surface Water Location	Nitrate-N mg/L
EV_OC1	0.0094 - 0.218

Surface Water Location	Nitrate-N mg/L
EV_SPR2	0.556 - 1.01

Seep Location	Nitrate-N mg/L
EV_SEEP_TURCON1	0.150

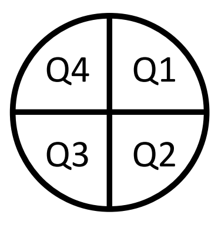
Legend

Groundwater Stations[4]
- ◐ Monitoring Well
- ◐ Domestic
- ◐ Supply

Surface Water Stations
- ★ Compliance Point
- ▼ Receiving Environment
- ▽ Authorized Discharge
- ▼ Monitoring
- ▲ Seep

Site Features
- Highway/Arterial
- Secondary Road
- Rails
- Study Areas
- Tailings/Settling/Sediment Pond
- Waste Water Pond
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds
- Mine Permitted Areas

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Culvert
- Ditch
- Rock Drain
- Water Pipeline
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:18000 Scale)



symbol locations have been adjusted relative to well locations for visibility

Green below the applicable screening criteria

Blue above the applicable screening criteria

Grey no sample collected

Primary Screening Criteria	Nitrate-N mg/L
CSR Aquatic Life	400
CSR Irrigation Watering	n/a
CSR Livestock Watering	100
CSR Drinking Water	10

Notes:
1. Original in colour at paper size ANSI C (17x22 in).
2. Numerical scale reflects full-size print. Print scaling will distort this scale; however, scale bar will remain accurate.
3. Intended for illustration purposes. Accuracy has not been verified for construction or navigation.
4. Locations of overlapping wells have been adjusted for clarity.
5. Nitrate-N = Nitrate Nitrogen
6. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Data provided by Teck Coal Limited

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

SNC·LAVALIN

Elkview Operations (Study Areas 7 and 8) Spatial Distribution of Nitrate Nitrogen in Groundwater

CHK'D: DC
BY: CW
DATE: 2023-01-30 SCALE: 1:18,000
COORD SYS: NAD 1983 UTM Zone 11N
REF NUM:
REV: 0
DRAWING EV-15

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-SpatialDist_N_EVO_SA7_8.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022

Surface Water Location	Sulphate mg/L
EV_ER4	129

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
RG_MW_GCA	2022 03 27	76.0
	2022 06 03	75.9
	2022 09 14	84.4
	2022 11 04	56.7

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
RG_DW_02-20	2022 02 22	88.0
	2022 05 09	88.8
	2022 07 19	89.3
	Duplicate	88.7
	2022 10 26	60.2

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_GV3gw	2022 01 11	154
	2022 04 10	146
	2022 08 14	150
	2022 10 14	144

Surface Water Location	Sulphate mg/L
EV_HC1	49.0 - 245

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_GV3gwS	2022 01 11	36.3
	2022 04 10	34.7
	2022 08 14	33.0
	2022 10 14	33.4

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_MW_GV4A	2022 01 12	79.2
	2022 04 28	81.6
	2022 08 05	85.4
	2022 10 27	74.4
EV_MW_GV4B	2022 01 09	64.3
	2022 04 28	64.8
	2022 08 05	74.7
	2022 10 27	67.1

Surface Water Location	Sulphate mg/L
EV_SM1	41.7 - 77.4

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
RG_MW_WW	2022 01 23	65.6
	2022 04 28	63.6
	2022 08 07	69.7
	2022 10 17	63.0

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_BALgw	2022 03 25	99.0
	2022 06 03	93.7
	2022 09 19	91.4
	2022 11 13	94.7

Surface Water Location	Sulphate mg/L
EV_BLM2	30.4 - 45.9

Seep Location	Sulphate mg/L
EV_SEEP_10MILE9	210

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_LSgw	2022 02 06	57.4
	2022 05 01	79.2
	2022 08 18	70.3
	2022 10 25	58.0

Seep Location	Sulphate mg/L
EV_SEEP_CFI1	0.33

Seep Location	Sulphate mg/L
EV_CN1	431

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
RG_DW-03-10	2022 02 14	21.4
	2022 04 20	22.5
	2022 07 19	20.5
	2022 10 11	20.9

Seep Location	Sulphate mg/L
EV_SEEP_10MILE5	411

Surface Water Location	Sulphate mg/L
EV_LC1	52.7 - 86.9

Seep Location	Sulphate mg/L
EV_SEEP_BREAKERLAKE	294

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_MW_GC1B	2022 01 31	259
	2022 02 10	18.7
	2022 02 20	278
	2022 05 01	344
	2022 06 23	302
	Duplicate	297
	2022 08 16	304
	Duplicate	292
	2022 10 25	321

Seep Location	Sulphate mg/L
EV_SEEP_PLANT23	445

Surface Water Location	Sulphate mg/L
EV_GC2	198 - 402

Seep Location	Sulphate mg/L
EV_SEEP_PLANT10	859

Seep Location	Sulphate mg/L
EV_SEEP_PLANT11	190

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_GCgw	2022 01 30	67.9
	2022 02 10	66.1
	2022 02 20	67.9
	2022 05 01	65.6
	2022 06 23	67.7
	2022 08 15	72.2
	2022 10 25	62.0

Seep Location	Sulphate mg/L
EV_SEEP_PLANT1	107

Seep Location	Sulphate mg/L
EV_WLAGC	40.2

Surface Water Location	Sulphate mg/L
EV_LAGD	99.9

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_WF_SW	2022 03 27	148
	2022 04 28	395
	2022 09 20	376
	2022 11 13	157

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_OCgw	2022 03 13	61.5
	Duplicate	61.2
	2022 05 20	48.3
	Duplicate	50.1
	2022 08 15	45.8
	Duplicate	46.6
	2022 10 28	42.7
	Duplicate	44.4

Surface Water Location	Sulphate mg/L
EV_ER2	34.8 - 108

Seep Location	Sulphate mg/L
EV_SEEP_HOPPER2	2,560

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_MW_MC4	2022 02 27	112
	2022 05 01	122
	2022 08 17	107
	2022 10 17	109

Surface Water Location	Sulphate mg/L
EV_OC1	44.3 - 114

Surface Water Location	Sulphate mg/L
EV_SPR2	71.5 - 96.3

Seep Location	Sulphate mg/L
EV_SEEP_TURCON1	111

Legend

Groundwater Stations
- ◐ Monitoring Well
- ● Domestic
- ● Supply

Surface Water Stations
- ★ Compliance Point
- ▼ Receiving Environment
- ▽ Authorized Discharge
- ▼ Monitoring
- ▲ Seep

Site Features
- Highway/Arterial
- Secondary Road
- Rails
- Study Areas
- Tailings/Settling/Sediment Pond
- Waste Water Pond
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds
- Mine Permitted Areas

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Culvert
- Ditch
- Rock Drain
- Water Pipeline
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:18000 Scale)

Q4	Q1
Q3	Q2

symbol locations have been adjusted relative to well locations for visibility

Green below the applicable screening criteria

Blue above the applicable screening criteria

Grey no sample collected

Primary Screening Criteria	Sulphate mg/L
CSR Aquatic Life	1,280-4,290
CSR Irrigation Watering	*n/a*
CSR Livestock Watering	1,000
CSR Drinking Water	500

Notes:
1. Original in colour at paper size ANSI C (17x22 in).
2. Numerical scale reflects full-size print. Print scaling will distort this scale; however, scale bar will remain accurate.
3. Intended for illustration purposes. Accuracy has not been verified for construction or navigation.
4. Locations of overlapping wells have been adjusted for clarity.
5. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Data provided by Teck Coal Limited

0 0.25 0.5 1 1.5 km

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

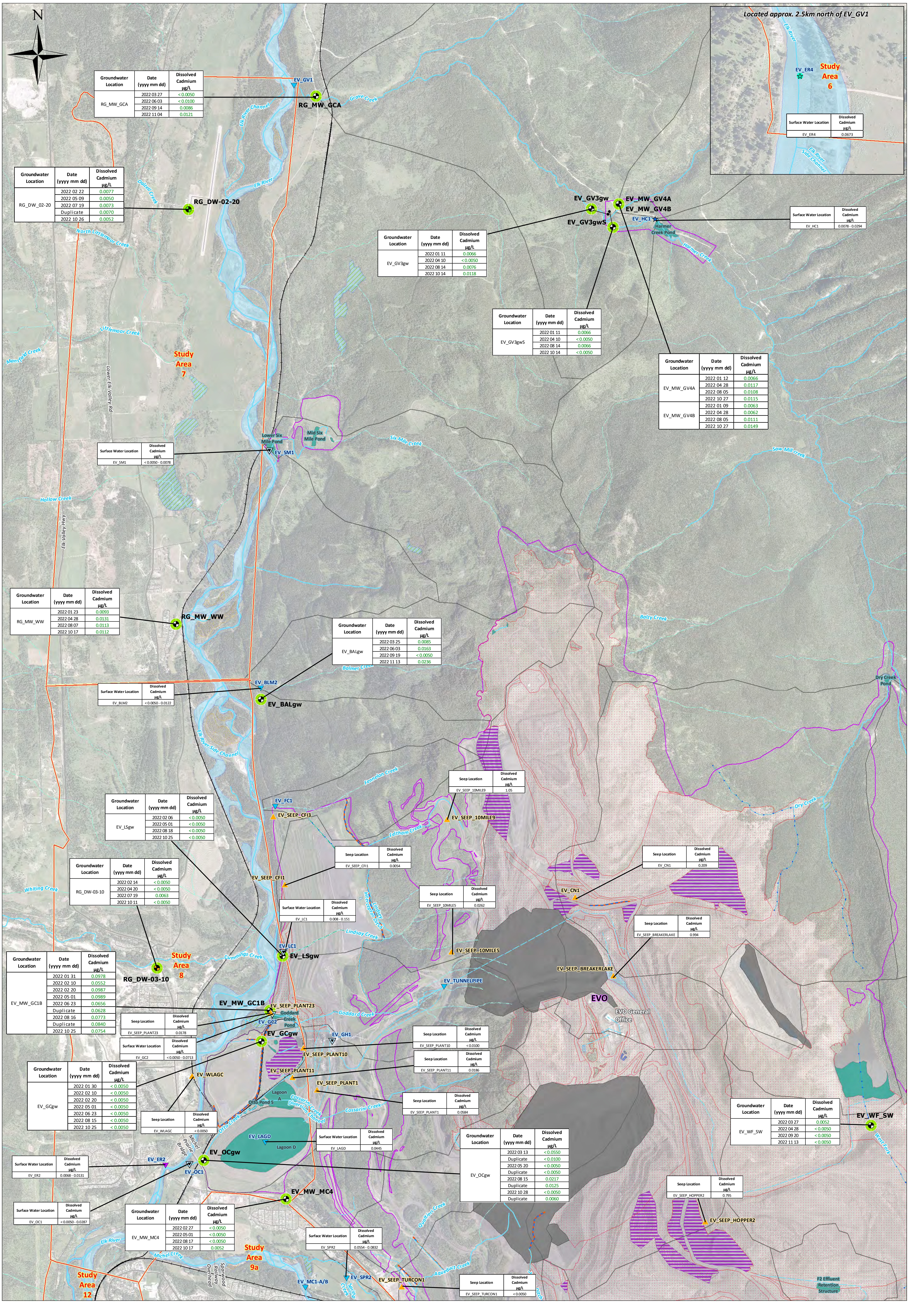
SNC·LAVALIN

Elkview Operations (Study Areas 7 and 8) Spatial Distribution of Sulphate in Groundwater

CHK'D: DC
BY: CW
DATE: 2023-01-30
SCALE: 1:18,000
COORD SYS: NAD 1983 UTM Zone 11N
REF NUM:
REV: 0
DRAWING EV-16

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-SpatialDist_SO4_EVO_SA7_8.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



Surface Water Location	Dissolved Cadmium µg/L
EV_ER4	0.0673

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
RG_MW_GCA	2022 03 27	< 0.0050
	2022 06 03	< 0.0100
	2022 09 14	0.0086
	2022 11 04	0.0121

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
RG_DW_02-20	2022 02 22	0.0077
	2022 05 09	0.0050
	2022 07 19	0.0073
	Duplicate	0.0070
	2022 10 26	0.0052

Surface Water Location	Dissolved Cadmium µg/L
EV_HC1	0.0078 - 0.0294

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_GV3gw	2022 01 11	0.0066
	2022 04 10	< 0.0050
	2022 08 14	0.0076
	2022 10 14	0.0118

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_GV3gwS	2022 01 11	0.0066
	2022 04 10	< 0.0050
	2022 08 14	0.0066
	2022 10 14	< 0.0050

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_MW_GV4A	2022 01 12	0.0066
	2022 04 28	0.0117
	2022 08 05	0.0108
	2022 10 27	0.0115
EV_MW_GV4B	2022 01 09	0.0063
	2022 04 28	0.0062
	2022 08 05	0.0111
	2022 10 27	0.0149

Surface Water Location	Dissolved Cadmium µg/L
EV_SM1	< 0.0050 - 0.0078

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
RG_MW_WW	2022 01 23	0.0093
	2022 04 28	0.0131
	2022 08 07	0.0113
	2022 10 17	0.0112

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_BALgw	2022 03 25	0.0085
	2022 06 03	0.0163
	2022 09 19	< 0.0050
	2022 11 13	0.0236

Surface Water Location	Dissolved Cadmium µg/L
EV_BLM2	< 0.0050 - 0.0122

Seep Location	Dissolved Cadmium µg/L
EV_SEEP_10MILE9	1.05

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_LSgw	2022 02 06	< 0.0050
	2022 05 01	< 0.0050
	2022 08 18	< 0.0050
	2022 10 25	< 0.0050

Seep Location	Dissolved Cadmium µg/L
EV_SEEP_CFI1	0.0054

Seep Location	Dissolved Cadmium µg/L
EV_CN1	0.209

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
RG_DW-03-10	2022 02 14	< 0.0050
	2022 04 20	< 0.0050
	2022 07 19	0.0063
	2022 10 11	< 0.0050

Surface Water Location	Dissolved Cadmium µg/L
EV_LC1	0.008 - 0.151

Seep Location	Dissolved Cadmium µg/L
EV_SEEP_10MILE5	0.0262

Seep Location	Dissolved Cadmium µg/L
EV_SEEP_BREAKERLAKE	0.994

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_MW_GC1B	2022 01 31	0.0978
	2022 02 10	0.0552
	2022 02 20	0.0987
	2022 05 01	0.0989
	2022 06 23	0.0656
	Duplicate	0.0628
	2022 08 16	0.0773
	Duplicate	0.0840
	2022 10 25	0.0754

Seep Location	Dissolved Cadmium µg/L
EV_SEEP_PLANT23	0.0178

Surface Water Location	Dissolved Cadmium µg/L
EV_GC2	< 0.0050 - 0.0713

Seep Location	Dissolved Cadmium µg/L
EV_SEEP_PLANT10	< 0.0100

Seep Location	Dissolved Cadmium µg/L
EV_SEEP_PLANT11	0.0186

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_GCgw	2022 01 30	< 0.0050
	2022 02 10	< 0.0050
	2022 02 20	< 0.0050
	2022 05 01	< 0.0050
	2022 06 23	< 0.0050
	2022 08 15	< 0.0050
	2022 10 25	< 0.0050

Seep Location	Dissolved Cadmium µg/L
EV_SEEP_PLANT1	0.0584

Seep Location	Dissolved Cadmium µg/L
EV_WLAGC	< 0.0050

Surface Water Location	Dissolved Cadmium µg/L
EV_LAGD	0.0445

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_WF_SW	2022 03 27	0.0052
	2022 04 28	< 0.0050
	2022 09 20	< 0.0050
	2022 11 13	< 0.0050

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_OCgw	2022 03 13	< 0.0550
	Duplicate	< 0.0100
	2022 05 20	< 0.0050
	Duplicate	< 0.0050
	2022 08 15	0.0217
	Duplicate	0.0125
	2022 10 28	< 0.0050
	Duplicate	0.0060

Surface Water Location	Dissolved Cadmium µg/L
EV_ER2	0.0068 - 0.0131

Seep Location	Dissolved Cadmium µg/L
EV_SEEP_HOPPER2	0.795

Surface Water Location	Dissolved Cadmium µg/L
EV_OC1	< 0.0050 - 0.0287

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_MW_MC4	2022 02 27	< 0.0050
	2022 05 01	< 0.0050
	2022 08 17	< 0.0050
	2022 10 17	0.0052

Surface Water Location	Dissolved Cadmium µg/L
EV_SPR2	0.0554 - 0.0832

Seep Location	Dissolved Cadmium µg/L
EV_SEEP_TURCON1	< 0.0050

Legend

Groundwater Stations
- ◕ Monitoring Well
- ◕ Domestic
- ◕ Supply

Surface Water Stations
- ★ Compliance Point
- ▼ Receiving Environment
- ▼ Authorized Discharge
- ▼ Monitoring
- ▲ Seep

Site Features
- Highway/Arterial
- Secondary Road
- Rails
- Study Areas
- Tailings/Settling/Sediment Pond
- Waste Water Pond
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds
- Mine Permitted Areas

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Culvert
- Ditch
- Rock Drain
- Water Pipeline
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:18000 Scale)

Q4	Q1
Q3	Q2

symbol locations have been adjusted relative to well locations for visibility

Green below the applicable screening criteria

Blue above the applicable screening criteria

Grey no sample collected

^ Dissolved phase of the parameter is shown in the spatial plot.

Primary Screening Criteria	Cadmium^ µg/L
CSR Aquatic Life	**0.5-4**
CSR Irrigation Watering	*5*
CSR Livestock Watering	80
CSR Drinking Water	5

Notes:
1. Original in colour at paper size ANSI C (17x22 in).
2. Numerical scale reflects full-size print. Print scaling will distort this scale; however, scale bar will remain accurate.
3. Intended for illustration purposes. Accuracy has not been verified for construction or navigation.
4. Locations of overlapping wells have been adjusted for clarity.
5. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Data provided by Teck Coal Limited

0 162.5 325 650 975 1,300 1,625 Meters

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

SNC·LAVALIN

Elkview Operations (Study Areas 7 and 8) Spatial Distribution of Dissolved Cadmium in Groundwater

CHK'D: DC
DATE: 2023-01-30 SCALE: 1:18,000
REF NUM: REV: 0
BY: CW
COORD SYS: NAD 1983 UTM Zone 11N
DRAWING EV-17

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-SpatialDist_Cd_EVO_SA7_8.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022

Seep Location	Dissolved Selenium µg/L
EV_ER4	23.9

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
RG_MW_GCA	2022 03 27	0.561
	2022 06 03	1.56
	2022 09 14	1.01
	2022 11 04	0.572

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
RG_DW_02-20	2022 02 22	15.0
	2022 05 09	15.8
	2022 07 19	14.8
	Duplicate	14.8
	2022 10 26	10.5

Surface Water Location	Dissolved Selenium µg/L
EV_HC1	11.1 - 56.0

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_GV3gw	2022 01 11	4.48
	2022 04 10	4.88
	2022 08 14	4.68
	2022 10 14	5.22

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_GV3gwS	2022 01 11	2.64
	2022 04 10	3.40
	2022 08 14	3.38
	2022 10 14	2.83

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_MW_GV4A	2022 01 12	4.84
	2022 04 28	5.72
	2022 08 05	5.23
	2022 10 27	7.31
EV_MW_GV4B	2022 01 09	3.74
	2022 04 28	3.38
	2022 08 05	3.70
	2022 10 27	4.23

Surface Water Location	Dissolved Selenium µg/L
EV_SM1	2.04 - 3.48

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
RG_MW_WW	2022 01 23	10.3
	2022 04 28	10.6
	2022 08 07	11.0
	2022 10 17	12.2

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_BALgw	2022 03 25	0.135
	2022 06 03	0.212
	2022 09 19	0.330
	2022 11 13	0.171

Surface Water Location	Dissolved Selenium µg/L
EV_BLM2	4.99 - 10.3

Seep Location	Dissolved Selenium µg/L
EV_SEEP_10MILE9	113

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_LSgw	2022 02 06	0.067
	2022 05 01	0.240
	2022 08 18	0.096
	2022 10 25	< 0.050

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
RG_DW-03-10	2022 02 14	1.02
	2022 04 20	1.07
	2022 07 19	1.08
	2022 10 11	1.22

Seep Location	Dissolved Selenium µg/L
EV_SEEP_CFI1	0.093

Seep Location	Dissolved Selenium µg/L
EV_CN1	237

Surface Water Location	Dissolved Selenium µg/L
EV_LC1	1.43 - 6.16

Seep Location	Dissolved Selenium µg/L
EV_SEEP_10MILE5	59.4

Seep Location	Dissolved Selenium µg/L
EV_SEEP_BREAKERLAKE	33.8

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_MW_GC1B	2022 01 31	3.05
	2022 02 10	4.10
	2022 02 20	2.92
	2022 05 01	5.03
	2022 06 23	0.952
	Duplicate	0.982
	2022 08 16	1.19
	Duplicate	1.24
	2022 10 25	1.51

Seep Location	Dissolved Selenium µg/L
EV_SEEP_PLANT23	20.2

Surface Water Location	Dissolved Selenium µg/L
EV_GC2	43.1 - 122

Seep Location	Dissolved Selenium µg/L
EV_SEEP_PLANT10	< 0.100

Seep Location	Dissolved Selenium µg/L
EV_SEEP_PLANT11	1.18

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_GCgw	2022 01 30	< 0.050
	2022 02 10	< 0.050
	2022 02 20	< 0.050
	2022 05 01	< 0.050
	2022 06 23	< 0.050
	2022 08 15	< 0.050
	2022 10 25	< 0.050

Seep Location	Dissolved Selenium µg/L
EV_SEEP_PLANT1	1.94

Seep Location	Dissolved Selenium µg/L
EV_WLAGC	0.152

Surface Water Location	Dissolved Selenium µg/L
EV_LAGD	21.9

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_WF_SW	2022 03 27	0.139
	2022 04 28	0.054
	2022 09 20	0.591
	2022 11 13	0.093

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_OCgw	2022 03 13	0.060
	Duplicate	0.060
	2022 05 20	< 0.050
	Duplicate	< 0.050
	2022 08 15	< 0.050
	Duplicate	< 0.050
	2022 10 28	< 0.050
	Duplicate	< 0.050

Surface Water Location	Dissolved Selenium µg/L
EV_ER2	6.42 - 20.7

Seep Location	Dissolved Selenium µg/L
EV_SEEP_HOPPER2	638

Surface Water Location	Dissolved Selenium µg/L
EV_OC1	0.378 - 2.2

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_MW_MC4	2022 02 27	< 0.050
	2022 05 01	< 0.050
	2022 08 17	< 0.050
	2022 10 17	< 0.050

Surface Water Location	Dissolved Selenium µg/L
EV_SPR2	3.83 - 8.61

Seep Location	Dissolved Selenium µg/L
EV_SEEP_TURCON1	7.09

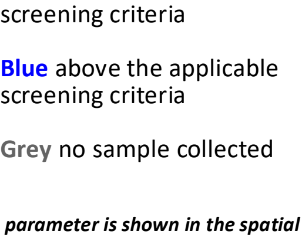
Legend

Groundwater Stations
- ◕ Monitoring Well
- ● Domestic
- ● Supply

Surface Water Stations
- ★ Compliance Point
- ▼ Receiving Environment
- ▽ Authorized Discharge
- ▼ Monitoring
- ▲ Seep

Site Features
- Highway/Arterial
- Secondary Road
- Rails
- Study Areas
- Tailings/Settling/Sediment Pond
- Waste Water Pond
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds
- Mine Permitted Areas

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Culvert
- Ditch
- Rock Drain
- Water Pipeline
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:18000 Scale)



symbol locations have been adjusted relative to well locations for visibility

Green below the applicable screening criteria

Blue above the applicable screening criteria

Grey no sample collected

^ Dissolved phase of the parameter is shown in the spatial plot.

Primary Screening Criteria	Selenium^ µg/L
CSR Aquatic Life	20
CSR Irrigation Watering	20
CSR Livestock Watering	30
CSR Drinking Water	10

Notes:
1. Original in colour at paper size ANSI C (17x22 in).
2. Numerical scale reflects full-size print. Print scaling will distort this scale; however, scale bar will remain accurate.
3. Intended for illustration purposes. Accuracy has not been verified for construction or navigation.
4. Locations of overlapping wells have been adjusted for clarity.
5. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Data provided by Teck Coal Limited

0 0.25 0.5 1 1.5 km

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

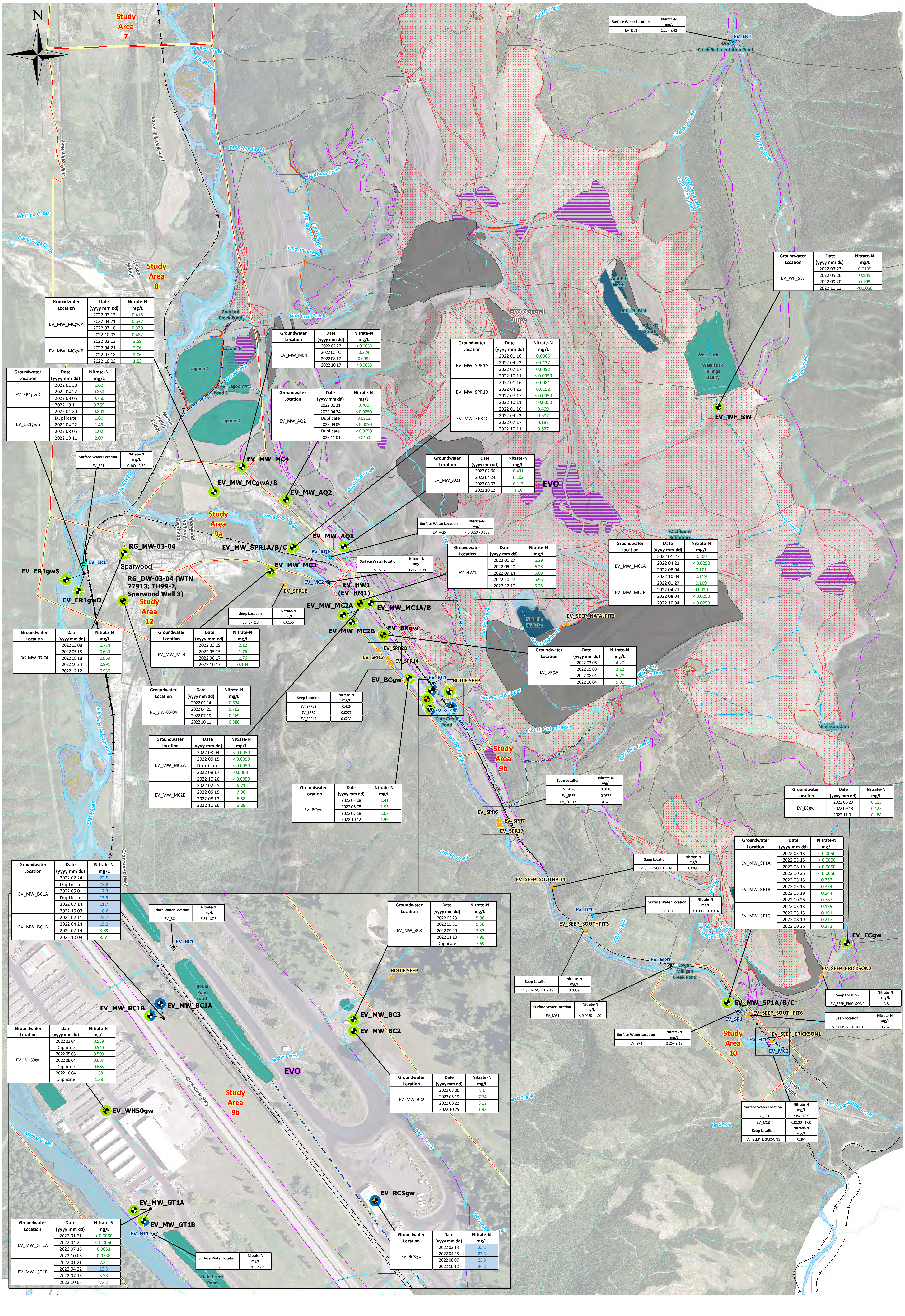
SNC·LAVALIN

Elkview Operations (Study Areas 7 and 8) Spatial Distribution of Dissolved Selenium in Groundwater

CHK'D: DC	DATE: 2023-01-30	SCALE: 1:18,000	REF NUM: REV: 0
BY: CW	COORD SYS: NAD 1983 UTM Zone 11N		DRAWING EV-18

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-SpatialDist_Se_EVO_SA7_8.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



Surface Water Location	Nitrate-N mg/L
EV_DC1	1.22 - 3.42

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_WF_SW	2022 03 27	0.0109
	2022 05 26	0.105
	2022 09 20	0.108
	2022 11 13	<0.0050

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_MW_MCgwA	2022 02 13	0.415
	2022 04 21	0.537
	2022 07 18	0.339
	2022 10 03	0.482
EV_MW_MCgwB	2022 02 13	2.59
	2022 04 21	2.96
	2022 07 18	2.06
	2022 10 03	1.53

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_ER1gwD	2022 01 30	1.62
	2022 04 22	0.851
	2022 08 05	0.750
	2022 10 11	0.759
EV_ER1gwS	2022 01 30	0.801
	Duplicate	1.60
	2022 04 22	1.49
	2022 08 05	1.02
	2022 10 11	2.07

Surface Water Location	Nitrate-N mg/L
EV_ER1	0.100 - 3.62

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_MW_MC4	2022 02 27	< 0.0050
	2022 05 01	0.229
	2022 08 17	0.0051
	2022 10 17	< 0.0050

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_MW_AQ2	2022 01 21	0.702
	2022 04 24	< 0.0250
	Duplicate	0.0316
	2022 09 09	< 0.0050
	Duplicate	< 0.0050
	2022 11 01	0.0460

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_MW_SPR1A	2022 01 16	0.0066
	2022 04 22	0.0137
	2022 07 17	0.0092
	2022 10 11	< 0.0050
EV_MW_SPR1B	2022 01 16	0.0084
	2022 04 22	0.0152
	2022 07 17	< 0.0050
	2022 10 11	< 0.0050
EV_MW_SPR1C	2022 01 16	0.469
	2022 04 22	0.687
	2022 07 17	0.187
	2022 10 11	0.627

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_MW_AQ1	2022 02 06	0.431
	2022 04 24	0.102
	2022 08 07	0.117
	2022 10 12	1.10

Surface Water Location	Nitrate-N mg/L
EV_AQ6	< 0.0050 - 0.158

Surface Water Location	Nitrate-N mg/L
EV_MC2	0.217 - 3.39

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_HW1	2022 01 27	6.29
	2022 05 20	6.28
	2022 09 14	5.08
	2022 10 27	5.95
	2022 12 19	5.38

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_MW_MC1A	2022 01 27	0.209
	2022 04 21	< 0.0250
	2022 08 04	0.101
	2022 10 04	0.119
EV_MW_MC1B	2022 01 27	0.109
	2022 04 21	0.0929
	2022 08 04	< 0.0250
	2022 10 04	< 0.0250

Seep Location	Nitrate-N mg/L
EV_SPR1B	0.0155

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
RG_MW-03-04	2022 03 08	0.734
	2022 05 15	0.633
	2022 08 18	0.869
	2022 10 24	0.991
	2022 12 12	0.936

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_MW_MC3	2022 03 09	2.12
	2022 05 15	1.76
	2022 08 17	1.76
	2022 10 17	0.103

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
RG_DW-03-04	2022 02 14	0.634
	2022 04 20	0.762
	2022 07 19	0.469
	2022 10 11	0.888

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_MW_MC2A	2022 03 04	< 0.0050
	2022 05 15	< 0.0050
	Duplicate	< 0.0050
	2022 08 17	0.0060
	2022 10 26	< 0.0050
EV_MW_MC2B	2022 02 25	6.71
	2022 05 15	7.06
	2022 08 17	6.58
	2022 10 26	5.89

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_BRgw	2022 03 06	4.20
	2022 05 08	3.12
	2022 08 04	5.78
	2022 10 04	5.00

Seep Location	Nitrate-N mg/L
EV_SPR2B	0.426
EV_SPR5	0.0075
EV_SPR14	0.0232

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_BCgw	2022 03 08	1.41
	2022 05 08	1.95
	2022 07 18	2.07
	2022 10 12	1.99

Seep Location	Nitrate-N mg/L
EV_SPR6	0.0118
EV_SPR7	0.0672
EV_SPR17	0.574

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_ECgw	2022 05 29	0.113
	2022 09 13	0.122
	2022 11 01	0.188

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_MW_SP1A	2022 03 13	< 0.0050
	2022 05 15	< 0.0050
	2022 08 19	< 0.0050
	2022 10 26	< 0.0050
EV_MW_SP1B	2022 03 13	0.352
	2022 05 15	0.354
	2022 08 19	0.244
	2022 10 26	0.787
EV_MW_SP1C	2022 03 13	0.199
	2022 05 15	0.191
	2022 08 19	0.217
	2022 10 26	0.373

Seep Location	Nitrate-N mg/L
EV_SEEP_SOUTHPIT4	0.0096

Surface Water Location	Nitrate-N mg/L
EV_TC1	< 0.0050 - 0.0374

Seep Location	Nitrate-N mg/L
EV_SEEP_SOUTHPIT3	0.0069

Surface Water Location	Nitrate-N mg/L
EV_MG1	< 0.0250 - 1.02

Seep Location	Nitrate-N mg/L
EV_SEEP_ERICKSON2	13.8

Seep Location	Nitrate-N mg/L
EV_SEEP_SOUTHPIT6	0.294

Surface Water Location	Nitrate-N mg/L
EV_SP1	2.26 - 9.18

Surface Water Location	Nitrate-N mg/L
EV_EC1	2.86 - 19.9
EV_MC3	0.0100 - 17.0
Seep Location	**Nitrate-N mg/L**
EV_SEEP_ERICKSON1	0.364

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_MW_BC1A	2022 02 24	22.5
	Duplicate	22.8
	2022 05 01	17.3
	Duplicate	17.5
	2022 07 14	11.7
	2022 10 03	10.6
EV_MW_BC1B	2022 02 11	22.7
	2022 04 24	15.2
	2022 07 14	8.89
	2022 10 03	8.51

Surface Water Location	Nitrate-N mg/L
EV_BC1	6.34 - 37.3

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_MW_BC3	2022 03 23	5.08
	2022 05 31	5.36
	2022 09 20	7.83
	2022 11 13	7.99
	Duplicate	7.69

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_WH50gw	2022 03 04	0.539
	Duplicate	0.540
	2022 05 08	0.599
	2022 08 04	0.687
	Duplicate	0.683
	2022 10 04	1.38
	Duplicate	1.38

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_MW_BC2	2022 03 06	8.6
	2022 05 19	7.74
	2022 08 22	3.12
	2022 10 25	1.93

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_MW_GT1A	2022 01 21	< 0.0050
	2022 04 22	< 0.0050
	2022 07 15	0.0051
	2022 10 03	0.0738
EV_MW_GT1B	2022 01 21	7.32
	2022 04 22	10.5
	2022 07 15	5.38
	2022 10 03	7.42

Surface Water Location	Nitrate-N mg/L
EV_GT1	6.26 - 23.9

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
EV_RCSgw	2022 02 13	25.1
	2022 04 28	27.3
	2022 08 07	25.5
	2022 10 12	26.2

Legend

Groundwater Stations
- ◐ Monitoring Well
- ◐ Supply

Surface Water Stations
- ★ Compliance Point
- ☆ Order Station
- ▼ Receiving Environment
- ▽ Authorized Discharge
- ▼ Monitoring
- ▲ Seep

Site Features
- Highway/Arterial
- Secondary Road
- Rails
- Study Areas
- Tailings/Settling/Sediment Pond
- Waste Water Pond
- End-Pit Lake
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds
- Mine Permitted Areas

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Rock Drain
- Water Pipeline
- Bypass/Diversion Channel
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:22000 Scale)

symbol locations have been adjusted relative to well locations for visibility

Green below the applicable screening criteria

Blue above the applicable screening criteria

Grey no sample collected

Primary Screening Criteria	Nitrate-N mg/L
CSR Aquatic Life	400
CSR Irrigation Watering	*n/a*
CSR Livestock Watering	100
CSR Drinking Water	10

Notes:
1. Original in colour at paper size ANSI C (17x22 in).
2. Numerical scale reflects full-size print. Print scaling will distort this scale; however, scale bar will remain accurate.
3. Intended for illustration purposes. Accuracy has not been verified for construction or navigation.
4. Locations of overlapping wells have been adjusted for clarity.
5. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Data provided by Teck Coal Limited

0 0.25 0.5 1 1.5 2 km

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

SNC·LAVALIN

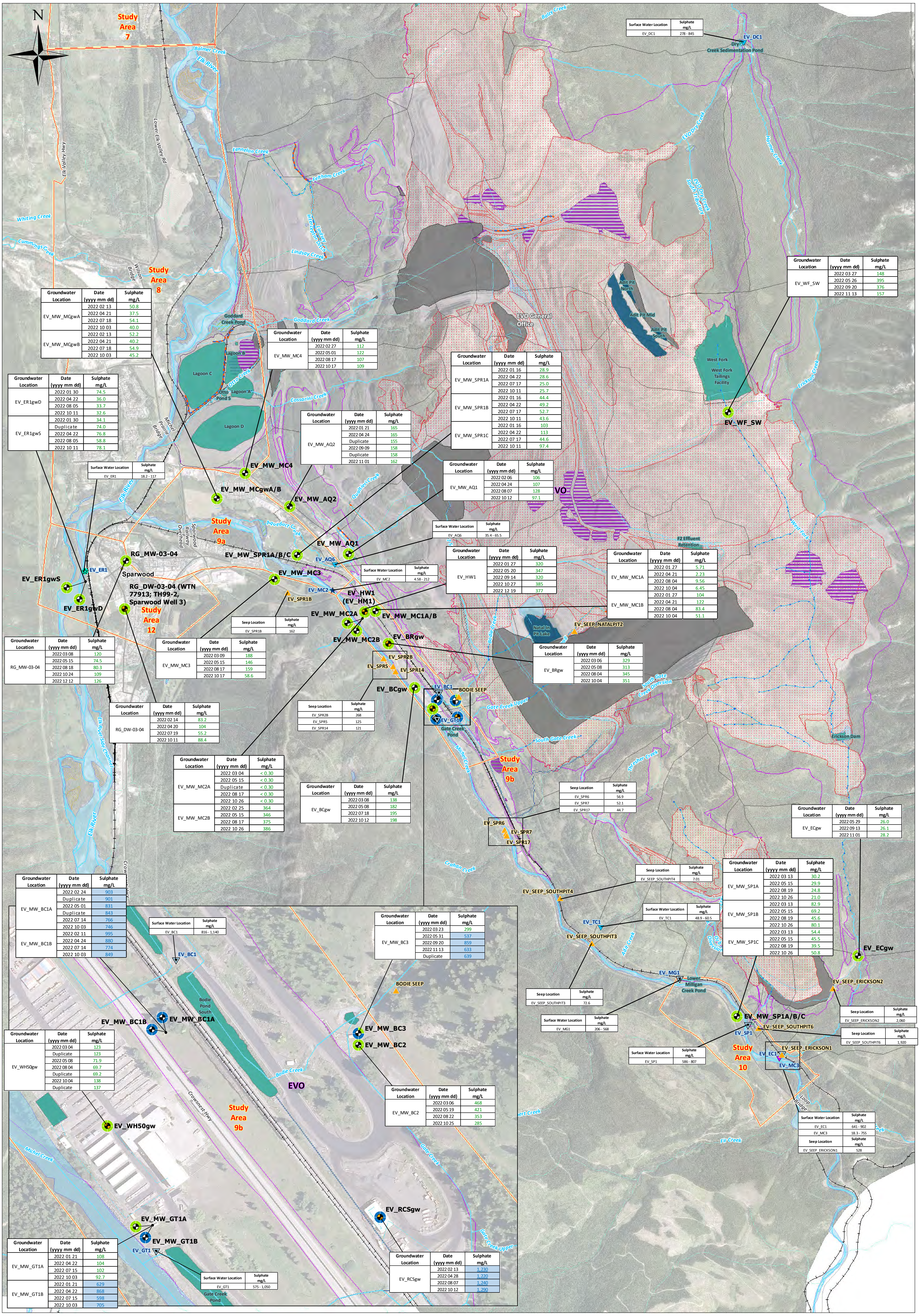
Elkview Operations (Study Areas 9a and 9b, 10 and 12) Spatial Distribution of Nitrate Nitrogen in Groundwater

CHK'D: DC
DATE: 2023-02-14 SCALE: 1:22,000
REF NUM:
REV: 0
BY: CW
COORD SYS: NAD 1983 UTM Zone 11N

DRAWING EV-19

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-SpatialDist_N_EVO_SA9-10-12.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



Surface Water Location	Sulphate mg/L
EV_DC1	278 - 845

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_WF_SW	2022 03 27	148
	2022 05 26	395
	2022 09 20	376
	2022 11 13	157

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_MW_MCgwA	2022 02 13	50.8
	2022 04 21	37.5
	2022 07 18	54.1
	2022 10 03	40.0
EV_MW_MCgwB	2022 02 13	52.2
	2022 04 21	40.2
	2022 07 18	54.9
	2022 10 03	45.2

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_MW_MC4	2022 02 27	112
	2022 05 01	122
	2022 08 17	107
	2022 10 17	109

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_MW_SPR1A	2022 01 16	28.9
	2022 04 22	28.6
	2022 07 17	25.0
	2022 10 11	25.7
EV_MW_SPR1B	2022 01 16	44.4
	2022 04 22	49.2
	2022 07 17	52.7
	2022 10 11	43.6
EV_MW_SPR1C	2022 01 16	103
	2022 04 22	113
	2022 07 17	44.6
	2022 10 11	97.4

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_ER1gwD	2022 01 30	74.5
	2022 04 22	36.0
	2022 08 05	33.7
	2022 10 11	32.6
EV_ER1gwS	2022 01 30	34.1
	Duplicate	74.0
	2022 04 22	76.8
	2022 08 05	58.8
	2022 10 11	78.1

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_MW_AQ2	2022 01 21	165
	2022 04 24	165
	Duplicate	155
	2022 09 09	158
	Duplicate	158
	2022 11 01	162

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_MW_AQ1	2022 02 06	106
	2022 04 24	107
	2022 08 07	128
	2022 10 12	97.1

Surface Water Location	Sulphate mg/L
EV_ER1	18.2 - 117

Surface Water Location	Sulphate mg/L
EV_AQ6	35.4 - 65.5

Surface Water Location	Sulphate mg/L
EV_MC2	4.58 - 212

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_HW1	2022 01 27	320
	2022 05 20	347
	2022 09 14	320
	2022 10 27	385
	2022 12 19	377

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_MW_MC1A	2022 01 27	5.71
	2022 04 21	2.23
	2022 08 04	9.56
	2022 10 04	6.45
EV_MW_MC1B	2022 01 27	104
	2022 04 21	122
	2022 08 04	83.4
	2022 10 04	51.1

Seep Location	Sulphate mg/L
EV_SPR1B	162

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
RG_MW-03-04	2022 03 08	120
	2022 05 15	74.5
	2022 08 18	80.3
	2022 10 24	109
	2022 12 12	126

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_MW_MC3	2022 03 09	188
	2022 05 15	146
	2022 08 17	159
	2022 10 17	58.6

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_BRgw	2022 03 06	329
	2022 05 08	313
	2022 08 04	345
	2022 10 04	351

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
RG_DW-03-04	2022 02 14	83.2
	2022 04 20	104
	2022 07 19	55.2
	2022 10 11	88.4

Seep Location	Sulphate mg/L
EV_SPR2B	268
EV_SPR5	125
EV_SPR14	121

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_MW_MC2A	2022 03 04	< 0.30
	2022 05 15	< 0.30
	Duplicate	< 0.30
	2022 08 17	< 0.30
	2022 10 26	< 0.30
EV_MW_MC2B	2022 02 25	364
	2022 05 15	346
	2022 08 17	375
	2022 10 26	386

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_BCgw	2022 03 08	138
	2022 05 08	182
	2022 07 18	195
	2022 10 12	198

Seep Location	Sulphate mg/L
EV_SPR6	56.9
EV_SPR7	52.1
EV_SPR17	44.7

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_ECgw	2022 05 29	26.0
	2022 09 13	26.1
	2022 11 01	28.2

Seep Location	Sulphate mg/L
EV_SEEP_SOUTHPIT4	7.01

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_MW_SP1A	2022 03 13	30.2
	2022 05 15	29.9
	2022 08 19	24.8
	2022 10 26	21.0
EV_MW_SP1B	2022 03 13	82.9
	2022 05 15	69.2
	2022 08 19	45.6
	2022 10 26	80.1
EV_MW_SP1C	2022 03 13	54.4
	2022 05 15	45.5
	2022 08 19	39.5
	2022 10 26	50.8

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_MW_BC1A	2022 02 24	903
	Duplicate	901
	2022 05 01	831
	Duplicate	843
	2022 07 14	766
	2022 10 03	746
EV_MW_BC1B	2022 02 11	995
	2022 04 24	880
	2022 07 14	774
	2022 10 03	849

Surface Water Location	Sulphate mg/L
EV_BC1	816 - 1,140

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_MW_BC3	2022 03 23	299
	2022 05 31	537
	2022 09 20	859
	2022 11 13	633
	Duplicate	639

Surface Water Location	Sulphate mg/L
EV_TC1	48.9 - 60.5

Seep Location	Sulphate mg/L
EV_SEEP_SOUTHPIT3	72.6

Surface Water Location	Sulphate mg/L
EV_MG1	206 - 568

Seep Location	Sulphate mg/L
EV_SEEP_ERICKSON2	2,060

Seep Location	Sulphate mg/L
EV_SEEP_SOUTHPIT6	1,920

Surface Water Location	Sulphate mg/L
EV_SP1	586 - 807

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_WH50gw	2022 03 04	123
	Duplicate	123
	2022 05 08	71.9
	2022 08 04	69.7
	Duplicate	69.2
	2022 10 04	138
	Duplicate	137

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_MW_BC2	2022 03 06	468
	2022 05 19	421
	2022 08 22	353
	2022 10 25	285

Surface Water Location	Sulphate mg/L
EV_EC1	641 - 902
EV_MC3	18.3 - 755
Seep Location	**Sulphate mg/L**
EV_SEEP_ERICKSON1	528

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_MW_GT1A	2022 01 21	108
	2022 04 22	104
	2022 07 15	102
	2022 10 03	92.7
EV_MW_GT1B	2022 01 21	629
	2022 04 22	868
	2022 07 15	598
	2022 10 03	705

Surface Water Location	Sulphate mg/L
EV_GT1	575 - 1,050

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
EV_RCSgw	2022 02 13	1,230
	2022 04 28	1,220
	2022 08 07	1,240
	2022 10 12	1,290

Legend

Groundwater Stations
- Monitoring Well
- Supply

Surface Water Stations
- ★ Compliance Point
- Order Station
- ▼ Receiving Environment
- Authorized Discharge
- ▼ Monitoring
- ▲ Seep

Site Features
- Highway/Arterial
- Secondary Road
- Rails
- Study Areas
- Tailings/Settling/Sediment Pond
- Waste Water Pond
- End-Pit Lake
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds
- Mine Permitted Areas

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Rock Drain
- Water Pipeline
- Bypass/Diversion Channel
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:22000 Scale)

Q4 Q1
Q3 Q2

symbol locations have been adjusted relative to well locations for visibility

Green below the applicable screening criteria

Blue above the applicable screening criteria

Grey no sample collected

Primary Screening Criteria	Sulphate mg/L
CSR Aquatic Life	1,280-4,290
CSR Irrigation Watering	*n/a*
CSR Livestock Watering	1,000
CSR Drinking Water	500

Notes:
1. Original in colour at paper size ANSI C (17x22 in).
2. Numerical scale reflects full-size print. Print scaling will distort this scale; however, scale bar will remain accurate.
3. Intended for illustration purposes. Accuracy has not been verified for construction or navigation.
4. Locations of overlapping wells have been adjusted for clarity.
5. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Data provided by Teck Coal Limited

0 0.25 0.5 1 1.5 2 km

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

SNC·LAVALIN

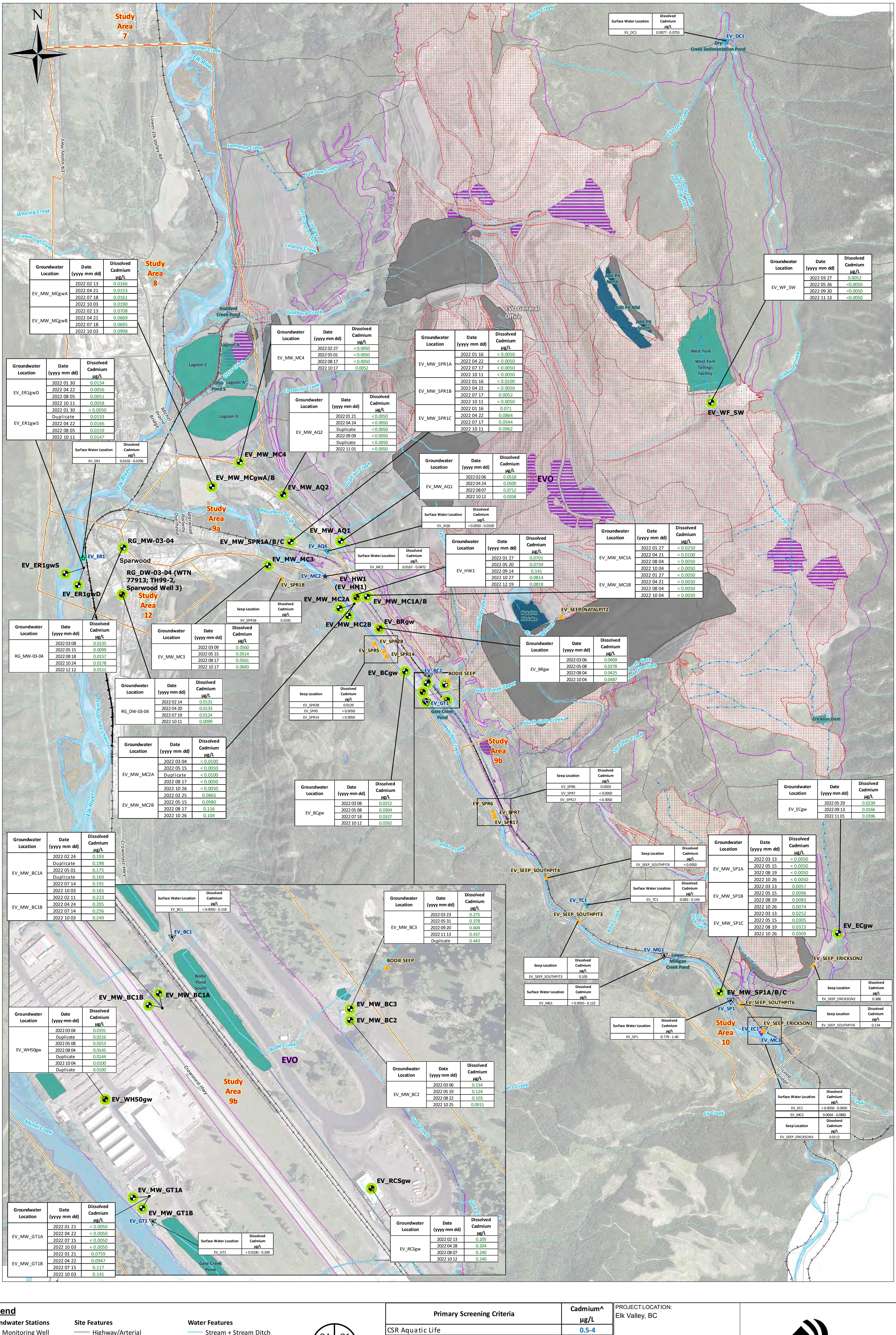
Elkview Operations (Study Areas 9a and 9b, 10 and 12) Spatial Distribution of Sulphate in Groundwater

CHK'D: DC
DATE: 2023-02-14
SCALE: 1:22,000
REF NUM:
REV: 0
BY: CW
COORD SYS: NAD 1983 UTM Zone 11N

DRAWING EV-20

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-SpatialDist_SO4_EVO_SA9-10-12.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



Surface Water Location	Dissolved Cadmium µg/L
EV_DC1	0.0077 - 0.0755

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_MW_MCgwA	2022 02 13	0.0166
	2022 04 21	0.0153
	2022 07 18	0.0161
	2022 10 03	0.0190
EV_MW_MCgwB	2022 02 13	0.0708
	2022 04 21	0.0669
	2022 07 18	0.0695
	2022 10 03	0.0998

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_WF_SW	2022 03 27	0.0052
	2022 05 26	<0.0050
	2022 09 20	<0.0050
	2022 11 13	<0.0050

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_MW_MC4	2022 02 27	< 0.0050
	2022 05 01	< 0.0050
	2022 08 17	< 0.0050
	2022 10 17	0.0052

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_MW_SPR1A	2022 01 16	< 0.0050
	2022 04 22	< 0.0050
	2022 07 17	< 0.0050
	2022 10 11	< 0.0050
EV_MW_SPR1B	2022 01 16	< 0.0100
	2022 04 22	< 0.0050
	2022 07 17	0.0052
	2022 10 11	< 0.0050
EV_MW_SPR1C	2022 01 16	0.071
	2022 04 22	0.0864
	2022 07 17	0.0544
	2022 10 11	0.0962

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_ER1gwD	2022 01 30	0.0134
	2022 04 22	0.0056
	2022 08 05	0.0051
	2022 10 11	0.0058
EV_ER1gwS	2022 01 30	< 0.0050
	Duplicate	0.0133
	2022 04 22	0.0166
	2022 08 05	0.0159
	2022 10 11	0.0147

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_MW_AQ2	2022 01 21	< 0.0050
	2022 04 24	< 0.0050
	Duplicate	< 0.0050
	2022 09 09	< 0.0050
	Duplicate	< 0.0050
	2022 11 01	< 0.0050

Surface Water Location	Dissolved Cadmium µg/L
EV_ER1	0.0102 - 0.0296

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_MW_AQ1	2022 02 06	0.0518
	2022 04 24	0.0500
	2022 08 07	0.0712
	2022 10 12	0.0358

Surface Water Location	Dissolved Cadmium µg/L
EV_AQ6	< 0.0050 - 0.0109

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_MW_MC1A	2022 01 27	< 0.0250
	2022 04 21	< 0.0100
	2022 08 04	< 0.0050
	2022 10 04	< 0.0050
EV_MW_MC1B	2022 01 27	< 0.0050
	2022 04 21	< 0.0050
	2022 08 04	< 0.0050
	2022 10 04	< 0.0050

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_HW1	2022 01 27	0.0701
	2022 05 20	0.0739
	2022 09 14	0.141
	2022 10 27	0.0814
	2022 12 19	0.0818

Surface Water Location	Dissolved Cadmium µg/L
EV_MC2	0.0167 - 0.0472

Seep Location	Dissolved Cadmium µg/L
EV_SPR1B	0.0181

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
RG_MW-03-04	2022 03 08	0.0135
	2022 05 15	0.0099
	2022 08 18	0.0157
	2022 10 24	0.0178
	2022 12 12	0.0151

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_MW_MC3	2022 03 09	0.0560
	2022 05 15	0.0514
	2022 08 17	0.0561
	2022 10 17	0.0683

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_BRgw	2022 03 06	0.0409
	2022 05 08	0.0378
	2022 08 04	0.0425
	2022 10 04	0.0487

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
RG_DW-03-04	2022 02 14	0.0131
	2022 04 20	0.0133
	2022 07 19	0.0124
	2022 10 11	0.0099

Seep Location	Dissolved Cadmium µg/L
EV_SPR2B	0.0129
EV_SPR5	< 0.0050
EV_SPR14	< 0.0050

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_MW_MC2A	2022 03 04	< 0.0100
	2022 05 15	< 0.0050
	Duplicate	< 0.0100
	2022 08 17	< 0.0050
	2022 10 26	< 0.0050
EV_MW_MC2B	2022 02 25	0.0865
	2022 05 15	0.0980
	2022 08 17	0.116
	2022 10 26	0.104

Seep Location	Dissolved Cadmium µg/L
EV_SPR6	0.0203
EV_SPR7	< 0.0050
EV_SPR17	< 0.0050

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_ECgw	2022 05 29	0.0239
	2022 09 13	0.0166
	2022 11 01	0.0396

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_BCgw	2022 03 08	0.0252
	2022 05 08	0.0304
	2022 07 18	0.0327
	2022 10 12	0.0262

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_MW_BC1A	2022 02 24	0.193
	Duplicate	0.198
	2022 05 01	0.175
	Duplicate	0.169
	2022 07 14	0.191
	2022 10 03	0.165
EV_MW_BC1B	2022 02 11	0.223
	2022 04 24	0.205
	2022 07 14	0.256
	2022 10 03	0.249

Seep Location	Dissolved Cadmium µg/L
EV_SEEP_SOUTHPIT4	< 0.0050

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_MW_SP1A	2022 03 13	< 0.0050
	2022 05 15	< 0.0050
	2022 08 19	< 0.0050
	2022 10 26	< 0.0050
EV_MW_SP1B	2022 03 13	0.0057
	2022 05 15	0.0096
	2022 08 19	0.0083
	2022 10 26	0.0074
EV_MW_SP1C	2022 03 13	0.0252
	2022 05 15	0.0305
	2022 08 19	0.0323
	2022 10 26	0.0309

Surface Water Location	Dissolved Cadmium µg/L
EV_BC1	< 0.0050 - 0.118

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_MW_BC3	2022 03 23	0.275
	2022 05 31	0.378
	2022 09 20	0.604
	2022 11 13	0.437
	Duplicate	0.443

Surface Water Location	Dissolved Cadmium µg/L
EV_TC1	0.083 - 0.144

Seep Location	Dissolved Cadmium µg/L
EV_SEEP_SOUTHPIT3	0.105

Surface Water Location	Dissolved Cadmium µg/L
EV_MG1	< 0.0050 - 0.123

Seep Location	Dissolved Cadmium µg/L
EV_SEEP_ERICKSON2	0.388

Seep Location	Dissolved Cadmium µg/L
EV_SEEP_SOUTHPIT6	0.134

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_WH50gw	2022 03 04	0.0191
	Duplicate	0.0216
	2022 05 08	0.0253
	2022 08 04	0.0145
	Duplicate	0.0144
	2022 10 04	0.0100
	Duplicate	0.0100

Surface Water Location	Dissolved Cadmium µg/L
EV_SP1	0.779 - 1.40

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_MW_BC2	2022 03 06	0.134
	2022 05 19	0.124
	2022 08 22	0.103
	2022 10 25	0.0915

Surface Water Location	Dissolved Cadmium µg/L
EV_EC1	< 0.0050 - 0.0435
EV_MC3	0.0064 - 0.0882

Seep Location	Dissolved Cadmium µg/L
EV_SEEP_ERICKSON1	0.0112

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_MW_GT1A	2022 01 21	< 0.0050
	2022 04 22	< 0.0050
	2022 07 15	< 0.0050
	2022 10 03	< 0.0050
EV_MW_GT1B	2022 01 21	0.0759
	2022 04 22	0.0947
	2022 07 15	0.117
	2022 10 03	0.141

Surface Water Location	Dissolved Cadmium µg/L
EV_GT1	< 0.0100 - 0.200

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
EV_RCSgw	2022 02 13	0.205
	2022 04 28	0.204
	2022 08 07	0.240
	2022 10 12	0.240

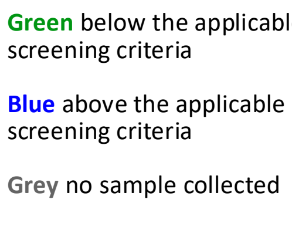
Legend

Groundwater Stations
- Monitoring Well
- Supply

Surface Water Stations
- ★ Compliance Point
- ☆ Order Station
- ▼ Receiving Environment
- ▽ Authorized Discharge
- ▼ Monitoring
- ▲ Seep

Site Features
- Highway/Arterial
- Secondary Road
- Rails
- Study Areas
- Tailings/Settling/Sediment Pond
- Waste Water Pond
- End-Pit Lake
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds
- Mine Permitted Areas

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Rock Drain
- Water Pipeline
- Bypass/Diversion Channel
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:22000 Scale)



symbol locations have been adjusted relative to well locations for visibility

Green below the applicable screening criteria

Blue above the applicable screening criteria

Grey no sample collected

^ Dissolved phase of the parameter is shown in the spatial plot.

Primary Screening Criteria	Cadmium^ µg/L
CSR Aquatic Life	0.5-4
CSR Irrigation Watering	5
CSR Livestock Watering	80
CSR Drinking Water	5

Notes:
1. Original in colour at paper size ANSI C (17x22 in).
2. Numerical scale reflects full-size print. Print scaling will distort this scale; however, scale bar will remain accurate.
3. Intended for illustration purposes. Accuracy has not been verified for construction or navigation.
4. Locations of overlapping wells have been adjusted for clarity.
5. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Data provided by Teck Coal Limited

0 0.25 0.5 1 1.5 2 km

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

SNC·LAVALIN

Elkview Operations (Study Areas 9a and 9b, 10 and 12) Spatial Distribution of Dissolved Cadmium in Groundwater

CHK'D: DC	DATE: 2023-02-14	SCALE: 1:22,000	REF NUM:	REV: 0
BY: CW	COORD SYS: NAD 1983 UTM Zone 11N		DRAWING EV-21	

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-SpatialDist_Cd_EVO_SA9-10-12.mxd

Surface Water Location	Dissolved Selenium µg/L
EV_DC1	78.0 - 273

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_MW_MCgwA	2022 02 13	1.01
	2022 04 21	0.810
	2022 07 18	2.17
	2022 10 03	0.937
EV_MW_MCgwB	2022 02 13	2.18
	2022 04 21	1.67
	2022 07 18	1.84
	2022 10 03	1.51

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_WF_SW	2022 03 27	0.139
	2022 04 28	0.054
	2022 09 20	0.591
	2022 11 13	0.093

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_MW_MC4	2022 02 27	< 0.050
	2022 05 01	< 0.050
	2022 08 17	< 0.050
	2022 10 17	< 0.050

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_MW_SPR1A	2022 01 16	< 0.050
	2022 04 22	< 0.050
	2022 07 17	0.052
	2022 10 11	0.824
EV_MW_SPR1B	2022 01 16	0.302
	2022 04 22	0.392
	2022 07 17	1.21
	2022 10 11	4.88
EV_MW_SPR1C	2022 01 16	7.22
	2022 04 22	9.44
	2022 07 17	4.75
	2022 10 11	7.73

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_ER1gwD	2022 01 30	7.76
	2022 04 22	3.70
	2022 08 05	3.40
	2022 10 11	3.75
EV_ER1gwS	2022 01 30	3.58
	Duplicate	7.62
	2022 04 22	6.93
	2022 08 05	5.47
	2022 10 11	12.2

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_MW_AQ2	2022 01 21	< 0.050
	2022 04 24	< 0.050
	Duplicate	< 0.050
	2022 09 09	0.069
	Duplicate	0.062
	2022 11 01	< 0.050

Surface Water Location	Dissolved Selenium µg/L
EV_ER1	0.953 - 19.1

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_MW_AQ1	2022 02 06	12.2
	2022 04 24	8.38
	2022 08 07	5.65
	2022 10 12	2.81

Surface Water Location	Dissolved Selenium µg/L
EV_AQ6	4.66 - 8.26

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_HW1	2022 01 27	55.4
	2022 05 20	56.9
	2022 09 14	47.1
	2022 10 27	61.9
	2022 12 19	67.1

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_MW_MC1A	2022 01 27	< 0.250
	2022 04 21	< 0.100
	2022 08 04	< 0.050
	2022 10 04	< 0.050
EV_MW_MC1B	2022 01 27	0.062
	2022 04 21	0.065
	2022 08 04	0.055
	2022 10 04	0.090

Surface Water Location	Dissolved Selenium µg/L
EV_MC2	2.44 - 29.5

Seep Location	Dissolved Selenium µg/L
EV_SPR1B	12.0

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
RG_MW-03-04	2022 03 08	7.58
	2022 05 15	6.00
	2022 08 18	8.77
	2022 10 24	10.3
	2022 12 12	11.3

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_MW_MC3	2022 03 09	18.6
	2022 05 15	18.8
	2022 08 17	18.8
	2022 10 17	2.94

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_BRgw	2022 03 06	36.1
	2022 05 08	25.4
	2022 08 04	57.9
	2022 10 04	49.3

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
RG_DW-03-04	2022 02 14	5.04
	2022 04 20	7.08
	2022 07 19	4.13
	2022 10 11	8.98

Seep Location	Dissolved Selenium µg/L
EV_SPR2B	2.05
EV_SPR5	5.42
EV_SPR14	2.76

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_MW_MC2A	2022 03 04	< 0.100
	2022 05 15	< 0.050
	Duplicate	< 0.100
	2022 08 17	< 0.050
	2022 10 26	0.054
EV_MW_MC2B	2022 02 25	54.8
	2022 05 15	56.0
	2022 08 17	59.5
	2022 10 26	58.7

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_BCgw	2022 03 08	13.1
	2022 05 08	21.8
	2022 07 18	26.6
	2022 10 12	24.5

Seep Location	Dissolved Selenium µg/L
EV_SPR6	2.54
EV_SPR7	3.68
EV_SPR17	0.867

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_ECgw	2022 05 29	0.056
	2022 09 13	0.111
	2022 11 01	0.176

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_MW_SP1A	2022 03 13	0.232
	2022 05 15	< 0.050
	2022 08 19	4.70
	2022 10 26	0.612
EV_MW_SP1B	2022 03 13	3.00
	2022 05 15	3.76
	2022 08 19	3.62
	2022 10 26	9.04
EV_MW_SP1C	2022 03 13	1.96
	2022 05 15	2.30
	2022 08 19	2.95
	2022 10 26	4.40

Seep Location	Dissolved Selenium µg/L
EV_SEEP_SOUTHPIT4	0.458

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_MW_BC1A	2022 02 24	211
	Duplicate	210
	2022 05 01	168
	Duplicate	163
	2022 07 14	112
	2022 10 03	117
EV_MW_BC1B	2022 02 11	221
	2022 04 24	172
	2022 07 14	92.1
	2022 10 03	101

Surface Water Location	Dissolved Selenium µg/L
EV_BC1	58.6 - 359

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_MW_BC3	2022 03 23	53.8
	2022 05 31	46.1
	2022 09 20	102
	2022 11 13	92.4
	Duplicate	98.9

Surface Water Location	Dissolved Selenium µg/L
EV_TC1	6.83 - 10.5

Seep Location	Dissolved Selenium µg/L
EV_SEEP_SOUTHPIT3	6.10

Surface Water Location	Dissolved Selenium µg/L
EV_MG1	52.0 - 121

Seep Location	Dissolved Selenium µg/L
EV_SEEP_ERICKSON2	750

Seep Location	Dissolved Selenium µg/L
EV_SEEP_SOUTHPIT6	93.0

Surface Water Location	Dissolved Selenium µg/L
EV_SP1	138 - 180

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_WH50gw	2022 03 04	6.40
	Duplicate	5.86
	2022 05 08	6.70
	2022 08 04	8.72
	Duplicate	8.15
	2022 10 04	17.1
	Duplicate	17.6

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_MW_BC2	2022 03 06	37.7
	2022 05 19	36.6
	2022 08 22	21.8
	2022 10 25	12.6

Surface Water Location	Dissolved Selenium µg/L
EV_EC1	38.9 - 226
EV_MC3	0.912 - 195
Seep Location	**Dissolved Selenium µg/L**
EV_SEEP_ERICKSON1	< 0.050

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_RCSgw	2022 02 13	230
	2022 04 28	220
	2022 08 07	208
	2022 10 12	228

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
EV_MW_GT1A	2022 01 21	< 0.050
	2022 04 22	0.102
	2022 07 15	0.184
	2022 10 03	2.23
EV_MW_GT1B	2022 01 21	142
	2022 04 22	123
	2022 07 15	62.7
	2022 10 03	101

Surface Water Location	Dissolved Selenium µg/L
EV_GT1	58.8 - 276

Legend

Groundwater Stations
- ◐ Monitoring Well
- ◐ Supply

Surface Water Stations
- ★ Compliance Point
- ☆ Order Station
- ▼ Receiving Environment
- ▽ Authorized Discharge
- ▼ Monitoring
- ▲ Seep

Site Features
- Highway/Arterial
- Secondary Road
- Rails
- Study Areas
- Tailings/Settling/Sediment Pond
- Waste Water Pond
- End-Pit Lake
- Pit
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- Bypass/Diversion Channel
- Island
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:22000 Scale)

Q4 Q1
Q3 Q2

symbol locations have been adjusted relative to well locations for visibility

Green below the applicable screening criteria

Blue above the applicable screening criteria

Grey no sample collected

^ Dissolved phase of the parameter is shown in the spatial plot.

Primary Screening Criteria	Selenium^ µg/L
CSR Aquatic Life	20
CSR Irrigation Watering	20
CSR Livestock Watering	30
CSR Drinking Water	10

Notes:
1. Original in colour at paper size ANSI C (17x22 in).
2. Numerical scale reflects full-size print. Print scaling will distort this scale; however, scale bar will remain accurate.
3. Intended for illustration purposes. Accuracy has not been verified for construction or navigation.
4. Locations of overlapping wells have been adjusted for clarity.
5. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Data provided by Teck Coal Limited

0 0.25 0.5 1 1.5 2 km

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

SNC·LAVALIN

Elkview Operations (Study Areas 9a and 9b, 10 and 12) Spatial Distribution of Dissolved Selenium in Groundwater

CHK'D: DC
BY: CW
DATE: 2023-02-14
SCALE: 1:22,000
COORD SYS: NAD 1983 UTM Zone 11N
REF NUM:
REV: 0
DRAWING EV-22

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-SpatialDist_Se_EVO_SA9-10-12.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022

Attachment I

Borehole Logs

DATA ENTRY: IPG

PROJECT No.: 12.1349.0013

RECORD OF BOREHOLE: EV_GV3gw

SHEET 1 OF 3

LOCATION: See Location Plan

N: 5522255 E: 656580

BORING DATE: October 23, 2013

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES | BORING METHOD | SOIL PROFILE | SAMPLES (NUMBER, TYPE, BLOWS/0.3m) | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20, 40, 60, 80) | SHEAR STRENGTH Cu, kPa: nat V. + Q- ● rem V. ⊕ U- ○ (20, 40, 60, 80) | HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6}, 10^{-5}, 10^{-4}, 10^{-3}) | WATER CONTENT PERCENT Wp ⊢ ○W ⊣ Wl (10, 20, 30, 40) | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION

Boring method: Sonic 127 mm (ID) Casing 152.4 mm (OD)
JR Drilling

DESCRIPTION	ELEV.	DEPTH (m)
Ground Surface	400.51	
SANDY GRAVEL, fine-grained, sub-angular to angular, moderately graded, dry, very loose		0.00
SAND, some gravel, fine to coarse-grained, sub-rounded to sub-angular, moderately graded, dry, very loose	398.98	1.52
SANDY GRAVEL, fine-grained, sub-angular to angular, moderately graded, dry, very loose	397.61	2.90
SAND, some gravel, localized thin zones of gravel, fine to coarse-grained, sub-rounded to sub-angular, moderately graded, moist, very loose	395.94	4.57

Stick-up =0.91 m

Bentonite Chips

15 Nov 2013 ▽

Depth scale: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: RT
CHECKED: CD

BOREHOLE - EXPANDED ADD. LAB TESTING 12.1349.0013 BH LOGS.GPJ CALGARY.GDT 4/8/14

DATA ENTRY: IPG

PROJECT No.: 12.1349.0013

RECORD OF BOREHOLE: EV_GV3gw

SHEET 2 OF 3

LOCATION: See Location Plan

N: 5522255 E: 656580

BORING DATE: October 23, 2013

DATUM: UTM Zone 11
(Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES – NUMBER	SAMPLES – TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa (nat V. + Q- ● rem V. ⊕ U- O) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}); WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10	Sonic 127 mm (ID) Casing 152.4 mm (OD) JR Drilling	SAND, some gravel, localized thin zones of gravel, fine to coarse-grained, sub-rounded to sub-angular, moderately graded, moist, very loose *(continued)*								
11										
12										
13		SILTY GRAVEL, fine-grained, sub-rounded to sub-angular, poorly graded, wet, very loose	387.55 12.95							
14		GRAVEL, fine-grained, sub-rounded to sub-angular, well graded, moist, very loose	385.88 14.63							
15										Bentonite Chips
16		SAND, some gravel, fine to coarse-grained, sub-rounded to sub-angular, moderately graded, moist, very loose	384.35 16.15							
17		GRAVEL, some silt, fine-grained, sub-rounded to sub-angular, poorly graded, moist, very loose	382.98 17.63							
18										
19		SILTY GRAVEL, fine-grained, sub-rounded to sub-angular, poorly graded, wet, very loose	381.46 19.05							
20										

CONTINUED NEXT PAGE

BOREHOLE - EXPANDED ADD. LAB TESTING 12.1349.0013 BH LOGS.GPJ CALGARY.GDT 4/8/14

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: RT
CHECKED: CD

PROJECT No.: 12.1349.0013

RECORD OF BOREHOLE: EV_GV3gw

SHEET 3 OF 3

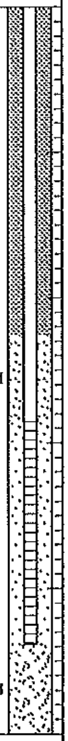
LOCATION: See Location Plan

N: 5522255 E: 656580

BORING DATE: October 23, 2013

DATUM: UTM Zone 11
(Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - O) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) WATER CONTENT PERCENT (Wp ⊢—O W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
20	Sonic 127 mm (ID) Casing 152.4 mm (OD) JR Drilling	SILTY GRAVEL, fine-grained, sub-rounded to sub-angular, poorly graded, wet, very loose *(continued)*									
21		SILTY GRAVEL, fine and coarse-grained, sub-angular to angular, poorly graded, wet, very loose		379.63 20.88							Bentonite Chips
22											Silica Sand
23											Slotted Section
24											Silica Sand
25		End of BOREHOLE. NOTES: Standpipe installed to 24.4 m upon well completion. Groundwater level measured at 9.9 mbgs on November 15, 2013.		375.51 25.00							
26											
27											
28											
29											
30											



DEPTH SCALE
1 : 50

Golder Associates

LOGGED: RT
CHECKED: CD

FINAL

SNC·LAVALIN

Client **Teck Coal Limited**		**Borehole No. : EV_BH_GV3gwS**
Location **Regional Groundwater Monitoring**		PAGE 1 OF 2

Drilling Contractor	Owen's Drilling	Date Monitored	2020 08 31	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1307.011	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1307.883	Date Drilled:	2020 08 10
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5522259.297	Easting: 656580.106	Log Typed By:	AS

Drilling Legend
- ▨ Sample Interval
- ☰ Odex

Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

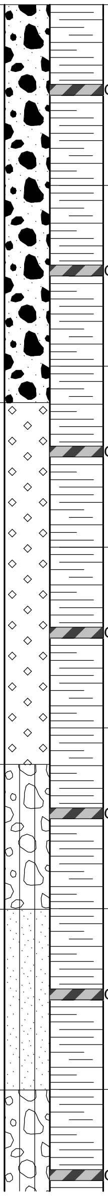
- ○ Reading within indicated scale
- ● Reading outside indicated scale

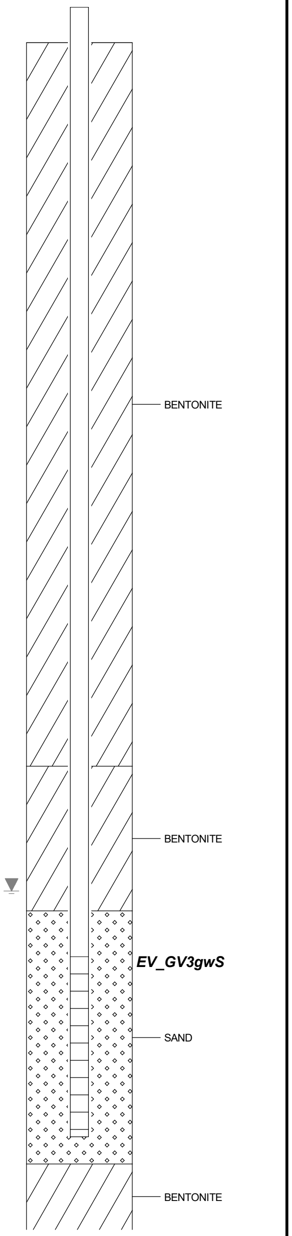
Soil Vapour (ppm): 10^1 10^2 10^3 10^4

- Solid PVC
- Slotted PVC

Well Name 1: EV_GV3gwS

Depth in Metres	Soil Description	Sample Number
0	SANDY GRAVEL, fine to coarse gravel, subangular, fine to coarse grained sand, containing cobbles, well graded, grey, loose, dry. At 0.3 m - organics.	GV3GWS-01
2	At 2.1 m - damp, brown.	GV3GWS-02
3	GRAVELLY SAND, fine to coarse grained sand, fine to coarse gravel, subangular to subrounded, well graded, brown, loose, moist.	GV3GWS-03
5	Below 4.9 m - gravel, fine, some silt.	GV3GWS-04
6	At 5.9 m - wet.	
	SILTY GRAVEL, fine to coarse, subangular to angular, some sand, fine to coarse, brown, medium dense, damp.	GV3GWS-05
	SILTY SAND, fine to coarse grained, some gravel, fine, subangular to angualar, well graded, brown, medium dense, wet.	GV3GWS-06
9	SILTY GRAVEL, fine to coarse, angular to subangular, some sand, fine to coarse, brown, medium dense, wet.	GV3GWS-07
10		





NOTES
Bolded sample denotes sample analyzed.
* Denotes blind field duplicate.

QA/QC: LLH 2020 10 19 Print Date:2020-12-02

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_GV3gwS**
	Location **Regional Groundwater Monitoring**	PAGE 2 OF 2

Drilling Contractor	Owen's Drilling	Date Monitored	2020 08 31	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1307.011	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1307.883	Date Drilled:	2020 08 10
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5522259.297	Easting: 656580.106	Log Typed By:	AS

Depth in Metres

Drilling Legend
▨ Sample Interval
☰ Odex

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

Soil Description

Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery

○ Reading within indicated scale
● Reading outside indicated scale

Soil Vapour (ppm)

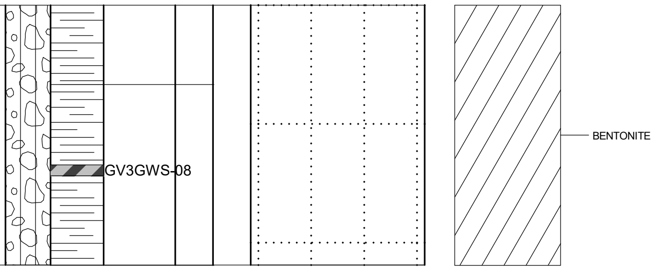
10^1 10^2 10^3 10^4

Solid PVC
Slotted PVC

Well Name 1: EV_GV3gwS

10

SILTY GRAVEL, fine to coarse, angular to subangular, some sand, fine to coarse, brown, medium dense, wet. *(continued)*



11

12

Bottom of hole at 12.2 m.

13

14

15

16

17

18

19

20

NOTES
Bolded sample denotes sample analyzed.
* Denotes blind field duplicate.

QA/QC: LLH 2020 10 19 Print Date:2020-12-02

FINAL

SNC • LAVALIN

Client
Teck Coal Limited

Location
Regional Groundwater Monitoring

Borehole No. : EV_BH_GV4A

PAGE 1 OF 2

Drilling Contractor	Owen's Drilling	Date Monitored	2020 08 31	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1310.661	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1311.532	Date Drilled:	2020 08 09
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5522317.465	Easting: 656664.666	Log Typed By:	AS

Drilling Legend
▨ Sample Interval
☰ Odex

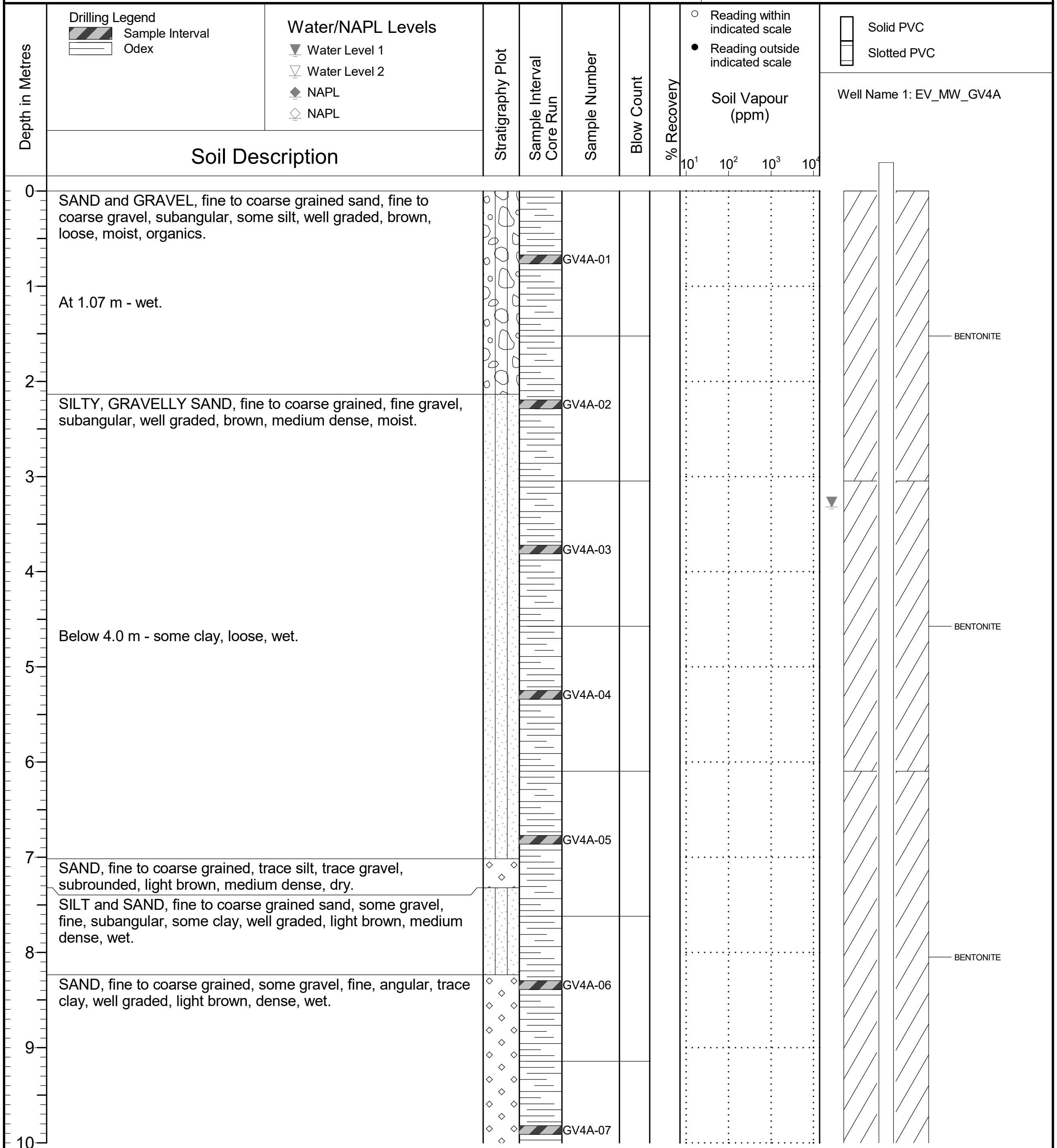
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

▯ Solid PVC
▯ Slotted PVC

Well Name 1: EV_MW_GV4A

Depth in Metres	Soil Description
0	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subangular, some silt, well graded, brown, loose, moist, organics.
1	At 1.07 m - wet.
2	SILTY, GRAVELLY SAND, fine to coarse grained, fine gravel, subangular, well graded, brown, medium dense, moist.
4	Below 4.0 m - some clay, loose, wet.
7	SAND, fine to coarse grained, trace silt, trace gravel, subrounded, light brown, medium dense, dry.
	SILT and SAND, fine to coarse grained sand, some gravel, fine, subangular, some clay, well graded, light brown, medium dense, wet.
8	SAND, fine to coarse grained, some gravel, fine, angular, trace clay, well graded, light brown, dense, wet.
10	



NOTES
Bolded sample denotes sample analyzed.
* Denotes blind field duplicate.

FINAL

SNC·LAVALIN

Client
Teck Coal Limited

Location
Regional Groundwater Monitoring

Borehole No. : EV_BH_GV4A

PAGE 2 OF 2

Drilling Contractor	Owen's Drilling	Date Monitored	2020 08 31	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1310.661	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1311.532	Date Drilled:	2020 08 09
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5522317.465	Easting: 656664.666	Log Typed By:	AS

Drilling Legend
▨ Sample Interval
☰ Odex

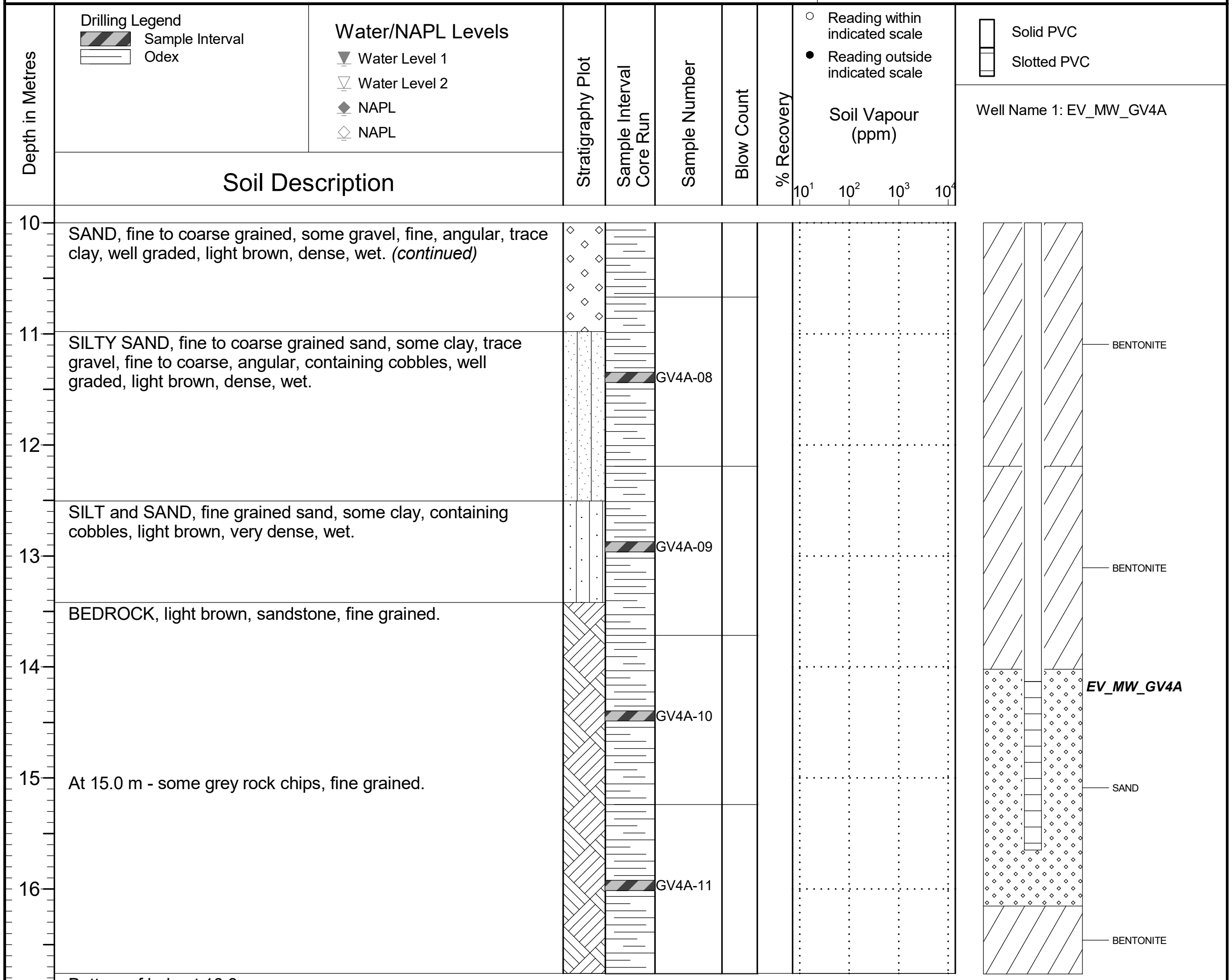
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: EV_MW_GV4A

Depth in Metres	Soil Description
10	SAND, fine to coarse grained, some gravel, fine, angular, trace clay, well graded, light brown, dense, wet. *(continued)*
11	SILTY SAND, fine to coarse grained sand, some clay, trace gravel, fine to coarse, angular, containing cobbles, well graded, light brown, dense, wet.
	SILT and SAND, fine grained sand, some clay, containing cobbles, light brown, very dense, wet.
	BEDROCK, light brown, sandstone, fine grained.
15	At 15.0 m - some grey rock chips, fine grained.
	Bottom of hole at 16.8 m.



17
18
19
20

NOTES
Bolded sample denotes sample analyzed.
* Denotes blind field duplicate.

QA/QC: LLH 2020 10 19 Print Date:2020-12-02

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_GV4B**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 1

Drilling Contractor	Owen's Drilling	Date Monitored	2020 09 30	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1310.636	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1311.661	Date Drilled:	2020 08 10
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5522318.467	Easting: 656662.164	Log Typed By:	AS

Drilling Legend
- ▨ Sample Interval
- ☰ Odex

Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

Depth in Metres

Soil Description

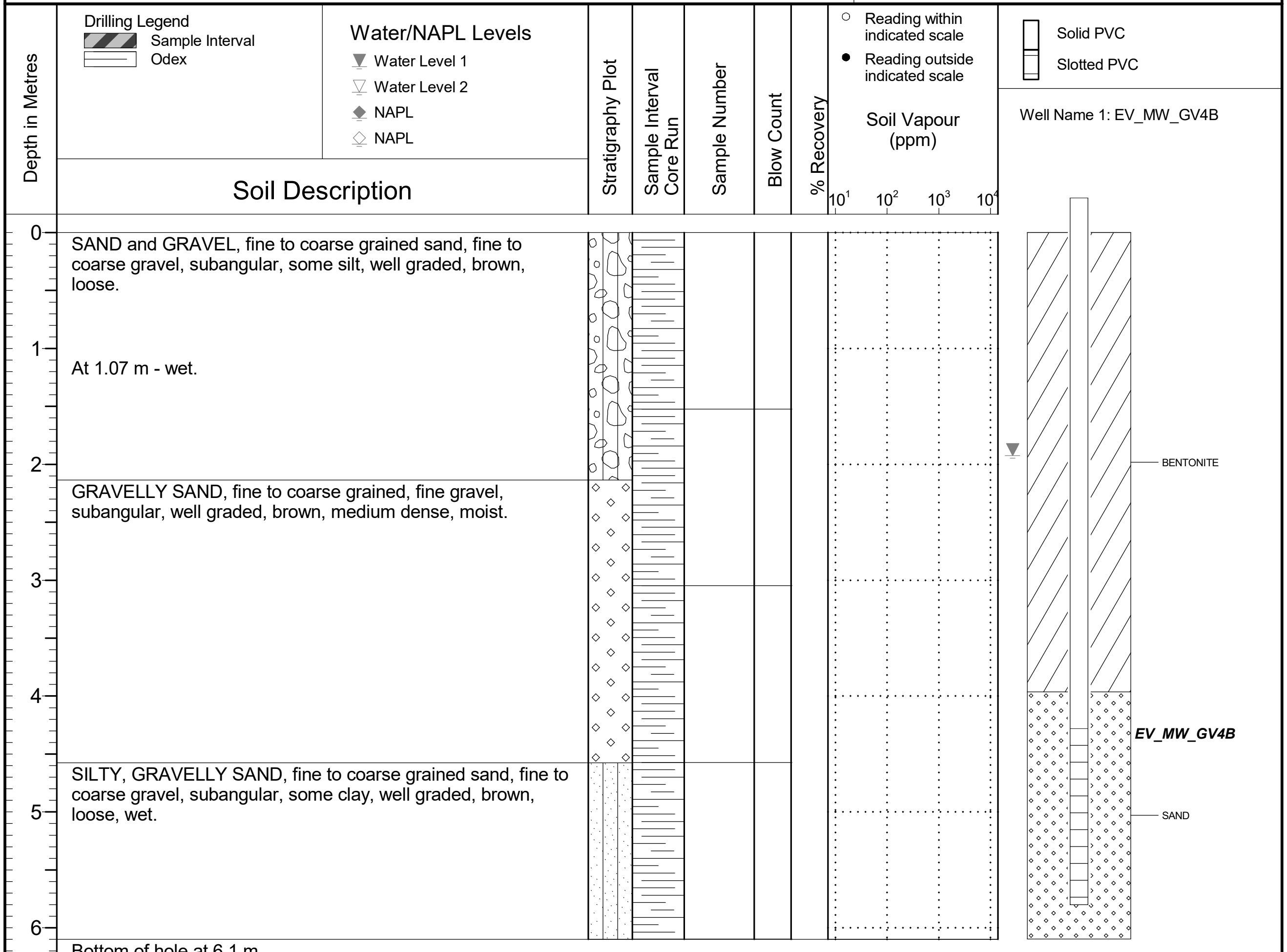
SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subangular, some silt, well graded, brown, loose.

At 1.07 m - wet.

GRAVELLY SAND, fine to coarse grained, fine gravel, subangular, well graded, brown, medium dense, moist.

SILTY, GRAVELLY SAND, fine to coarse grained sand, fine to coarse gravel, subangular, some clay, well graded, brown, loose, wet.

Bottom of hole at 6.1 m.



7
8
9
10

NOTES

QA/QC: LLH 2020 10 19 Print Date:2020-12-02

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : RG_BH_GCA**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 2

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	n/a	Project Number:	683032
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	TBD	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	TBD	Date Drilled:	2021 09 07
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: n/a	Easting: n/a	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ⋈ Vibrasonic

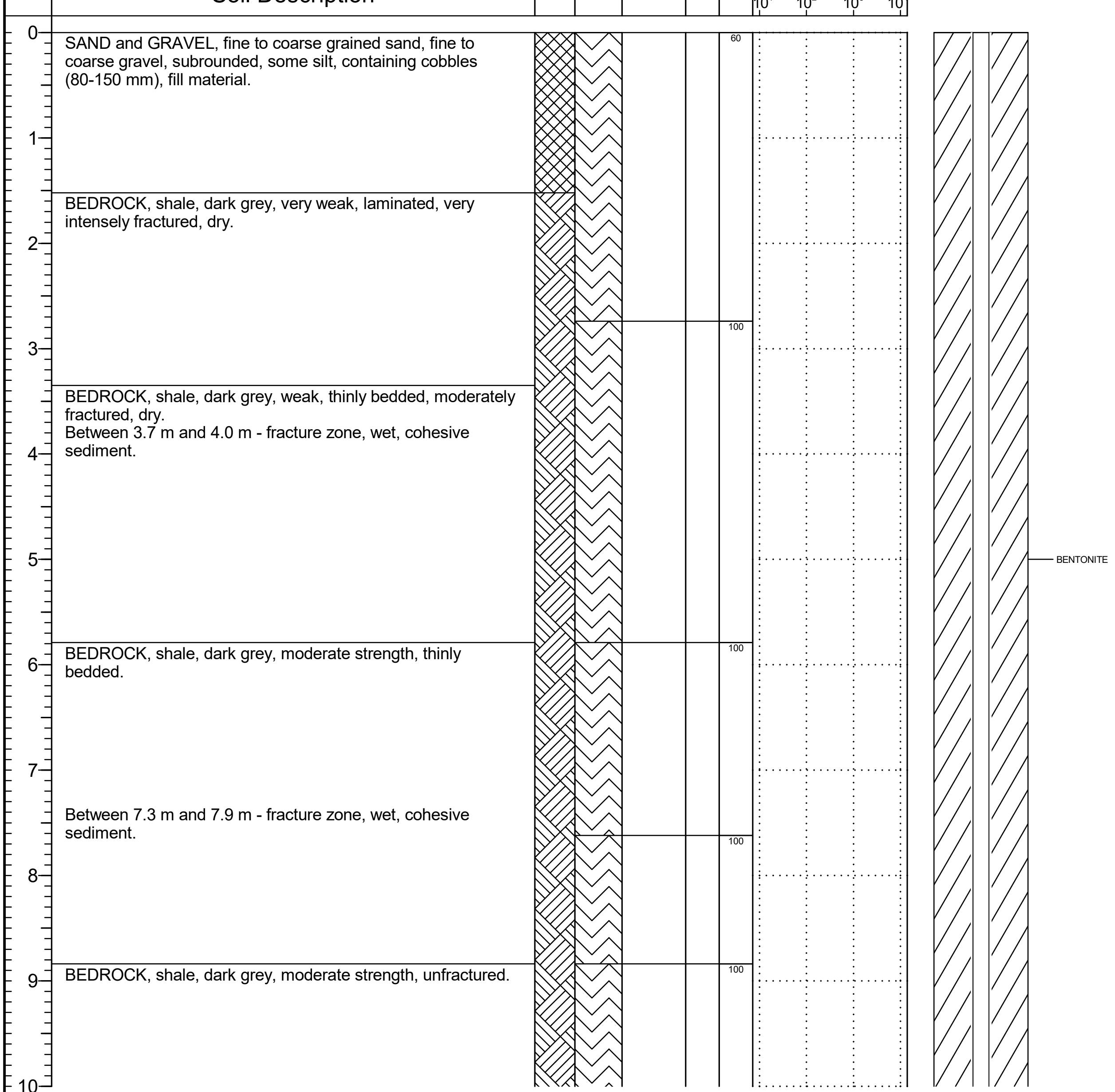
Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- Solid PVC
- Slotted PVC

Well Name 1: RG_MW_GCA

Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm)



SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded, some silt, containing cobbles (80-150 mm), fill material.

BEDROCK, shale, dark grey, very weak, laminated, very intensely fractured, dry.

BEDROCK, shale, dark grey, weak, thinly bedded, moderately fractured, dry.
Between 3.7 m and 4.0 m - fracture zone, wet, cohesive sediment.

BEDROCK, shale, dark grey, moderate strength, thinly bedded.

Between 7.3 m and 7.9 m - fracture zone, wet, cohesive sediment.

BEDROCK, shale, dark grey, moderate strength, unfractured.

NOTES

QA/QC: SD 2021 09 22 Print Date:2021-10-26

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : RG_BH_GCA**
	Location **Regional Groundwater Monitoring**	PAGE 2 OF 2

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	n/a	Project Number:	683032
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	TBD	Borehole Logged By:	AH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	TBD	Date Drilled:	2021 09 07
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: n/a	Easting: n/a	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ⋀ Vibrasonic

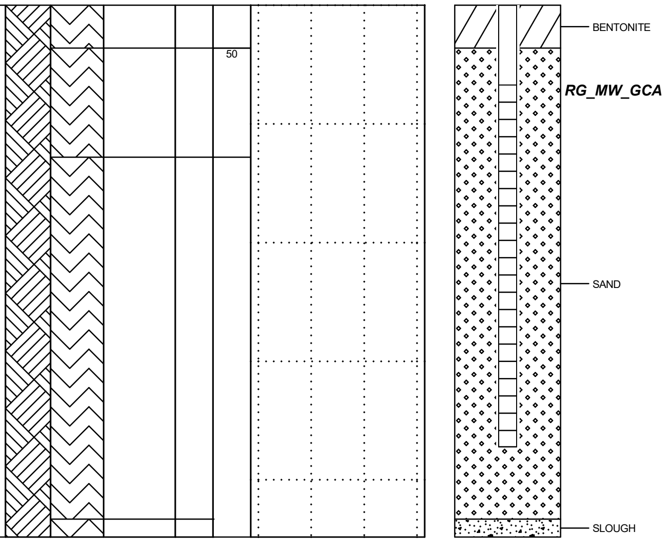
Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- Solid PVC
- Slotted PVC

Well Name 1: RG_MW_GCA

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm) 10^1 10^2 10^3 10^4
10	BEDROCK, shale, dark grey, moderate strength, unfractured. *(continued)*					50	
11	Between 11.3 m and 13.1 m - moderately healed fractures with white mineralization (calcite).						
13	Between 13.1 m and 14.5 m - clean fractures, no secondary mineralization.						
14.5	Bottom of hole at 14.5 m.						



Depth in Metres: 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20

NOTES

QA/QC: SD 2021 09 22 Print Date:2021-10-26

BRITISH COLUMBIA

Report 1 - Detailed Well Record

RG_DW-02-20

Well Tag Number: 101942

Owner: ELK VALLEY FLYING CLUB

Address:

Area:

WELL LOCATION:
KOOTENAY Land District
District Lot: 4144 Plan: Lot:
Township: Section: Range:
Indian Reserve: Meridian: Block:
Quarter:
Island:
BCGS Number (NAD 27): 082G086231 Well: 4

Class of Well: Water supply
Subclass of Well: Domestic
Orientation of Well: Vertical
Status of Well: New
Well Use: Private Domestic
Observation Well Number:
Observation Well Status:
Construction Method:
Diameter: inches
Casing drive shoe: Y
Well Depth: 60 feet
Elevation: feet (ASL)
Final Casing Stick Up: inches
Well Cap Type:
Bedrock Depth: feet
Lithology Info Flag: N
File Info Flag: N
Sieve Info Flag: N
Screen Info Flag: N

Site Info Details:
Other Info Flag:
Other Info Details:

Construction Date: 2002-04-02 00:00:00

Driller: J. R. Drilling
Well Identification Plate Number:
Plate Attached By:
Where Plate Attached:

PRODUCTION DATA AT TIME OF DRILLING:
Well Yield: 60 (Driller's Estimate) U.S. Gallons per Minute
Development Method: Air lifting
Pump Test Info Flag: N
Artesian Flow:
Artesian Pressure (ft):
Static Level: 7 feet

WATER QUALITY:
Character:
Colour:
Odour:
Well Disinfected: N
EMS ID:
Water Chemistry Info Flag: N
Field Chemistry Info Flag:
Site Info (SEAM):

Water Utility:
Water Supply System Name:
Water Supply System Well Name:

SURFACE SEAL:
Flag: N
Material:
Method:
Depth (ft):
Thickness (in):
Liner from To: feet

WELL CLOSURE INFORMATION:
Reason For Closure:
Method of Closure:
Closure Sealant Material:
Closure Backfill Material:
Details of Closure:

Screen from	to feet	Type	Slot Size

Casing from	to feet	Diameter	Material	Drive Shoe
0	60	6	Steel	Y

GENERAL REMARKS:
MEASUREMENTS: TOP OF CASING. PITLESS UNIT: WELDED. SHOE: BARBER. WATER QUALITY AND QUANTITY NOT GUARANTEED BY CONTRACTOR.

LITHOLOGY INFORMATION:

From	0	to	47	Ft.	gravel
From	47	to	52	Ft.	clay
From	52	to	60	Ft.	gravel

- Return to Main
- Return to Search Options
- Return to Search Criteria

	Client **Teck Coal Limited**	**Borehole No. : RG_BH_WW**
SNC • LAVALIN	Location **Regional Groundwater Monitoring**	PAGE 1 OF 3

Drilling Contractor	SNC-Lavalin	Date Monitored	n/a	Project Number:	631283
Drilling Method	Hydrovac/Odex	Ground Surface Elev. (m)	n/a	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	n/a	Date Drilled:	2020 09 19
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: n/a	Easting: n/a	Log Typed By:	AS

Drilling Legend
- ▨ Sample Interval
- ⧅ Vac. Extraction
- ☰ Odex

Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- Solid PVC
- Slotted PVC

Well Name 1: RG_MW_WW

Depth in Metres

Soil Description

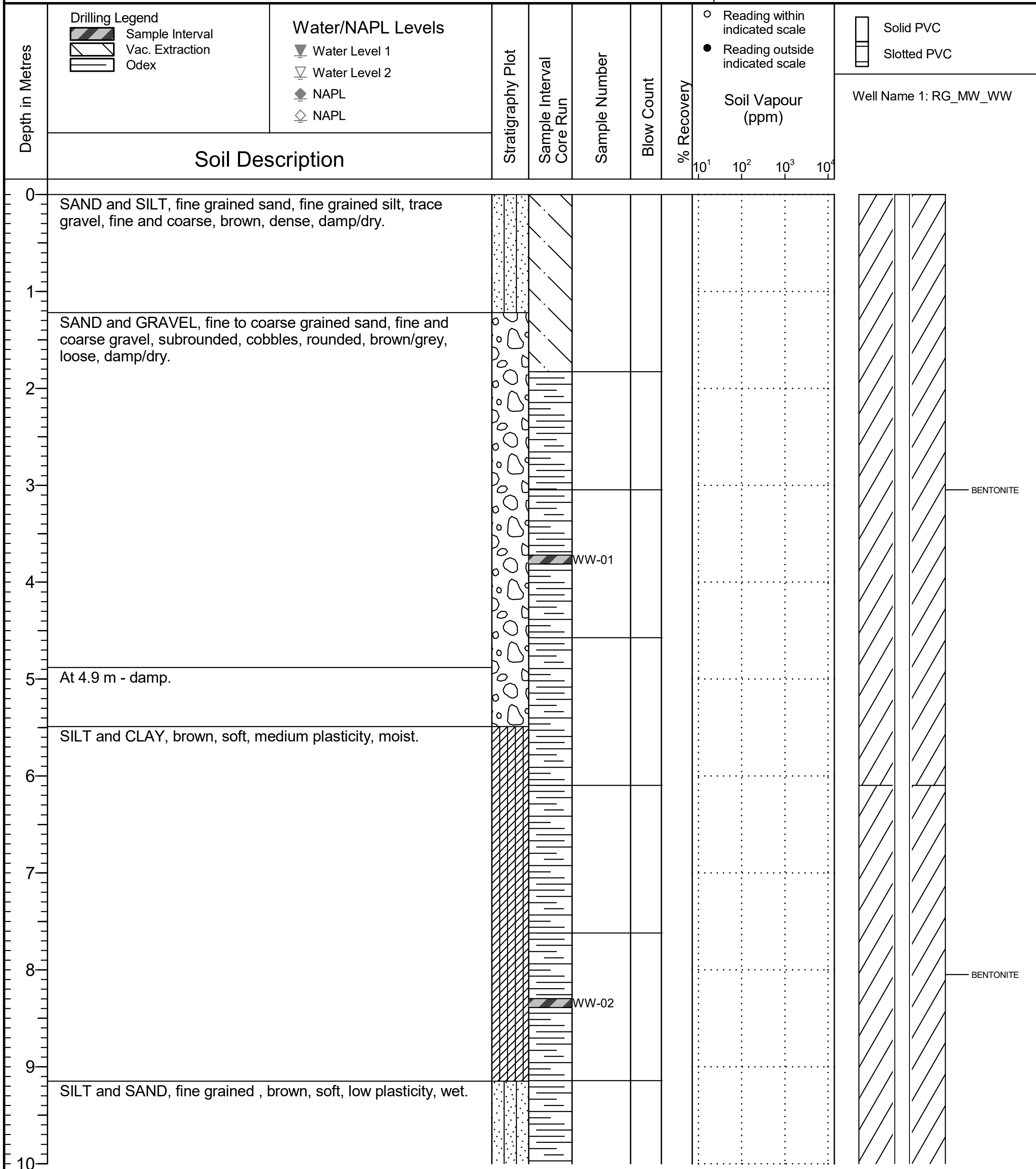
SAND and SILT, fine grained sand, fine grained silt, trace gravel, fine and coarse, brown, dense, damp/dry.

SAND and GRAVEL, fine to coarse grained sand, fine and coarse gravel, subrounded, cobbles, rounded, brown/grey, loose, damp/dry.

At 4.9 m - damp.

SILT and CLAY, brown, soft, medium plasticity, moist.

SILT and SAND, fine grained , brown, soft, low plasticity, wet.



NOTES
Bolded sample denotes sample analyzed. * Denotes blind field duplicate.

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : RG_BH_WW**
	Location **Regional Groundwater Monitoring**	PAGE 2 OF 3

Drilling Contractor	SNC-Lavalin	Date Monitored	n/a	Project Number:	631283
Drilling Method	Hydrovac/Odex	Ground Surface Elev. (m)	n/a	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	n/a	Date Drilled:	2020 09 19
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: n/a	Easting: n/a	Log Typed By:	AS

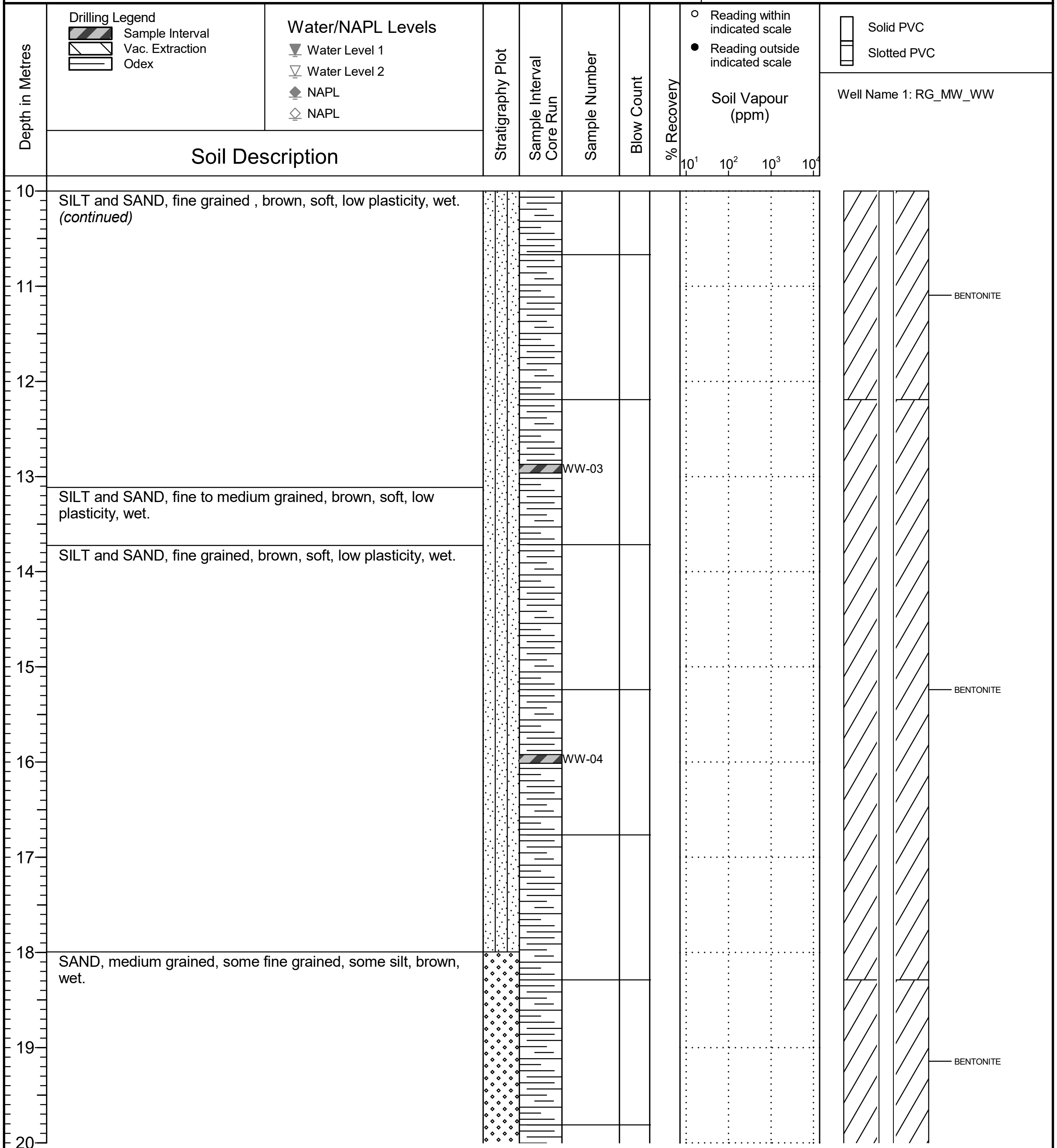
Drilling Legend
- ▨ Sample Interval
- ⧅ Vac. Extraction
- ☰ Odex

Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- ▯ Solid PVC
- ⊟ Slotted PVC

Well Name 1: RG_MW_WW



Soil Description

10 — SILT and SAND, fine grained , brown, soft, low plasticity, wet. *(continued)*

SILT and SAND, fine to medium grained, brown, soft, low plasticity, wet.

SILT and SAND, fine grained, brown, soft, low plasticity, wet.

18 — SAND, medium grained, some fine grained, some silt, brown, wet.

NOTES
Bolded sample denotes sample analyzed. * Denotes blind field duplicate.

SNC·LAVALIN

Client **Teck Coal Limited**		**Borehole No. : RG_BH_WW**
Location **Regional Groundwater Monitoring**		PAGE 3 OF 3

Drilling Contractor	SNC-Lavalin	Date Monitored	n/a	Project Number:	631283
Drilling Method	Hydrovac/Odex	Ground Surface Elev. (m)	n/a	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	n/a	Date Drilled:	2020 09 19
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: n/a	Easting: n/a	Log Typed By:	AS

Drilling Legend
- ▨ Sample Interval
- ⊠ Vac. Extraction
- ☰ Odex

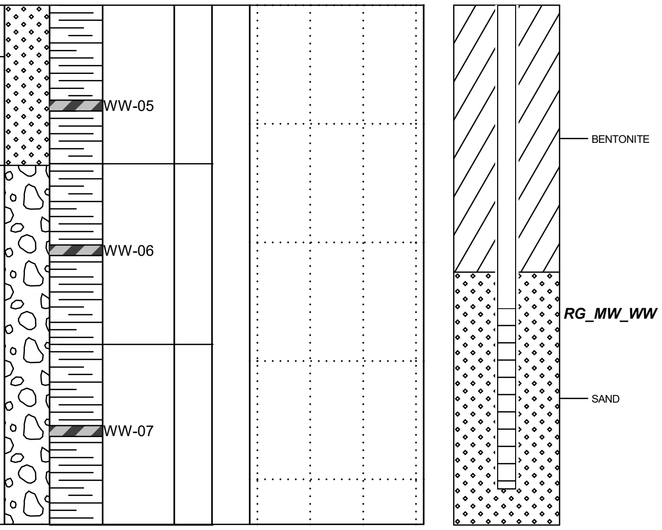
Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- Solid PVC
- Slotted PVC

Well Name 1: RG_MW_WW

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm) 10^1 10^2 10^3 10^4
20	SAND, medium grained, some fine grained, some silt, brown, wet. *(continued)*						
20.4	At 20.4 m - some coarse grained sand, trace gravel.			WW-05			
21.4	SAND and GRAVEL, fine to coarse grained sand, fine and coarse gravel, subrounded to subangular, some silt, well graded, brown, medium dense, wet.			WW-06 WW-07			
24.4	Bottom of hole at 24.4 m.						



NOTES
Bolded sample denotes sample analyzed. * Denotes blind field duplicate.

DATA ENTRY: AM

PROJECT No.: 12.1349.0013

RECORD OF BOREHOLE: EV_BALgw

SHEET 1 OF 2

LOCATION: See Location Plan

BORING DATE: October 27, 2014

DATUM: UTM Zone 11
(Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	ELEV. DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80 / SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○ 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3} / WATER CONTENT PERCENT Wp ⊢ ○W ⊣ Wl 10 20 30 40	FIELD EC AND ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		Ground Surface								Stick-up =1.0 m
0	Sonic 127 mm (ID) Casing 152.4 mm (OD) JR Drilling	SAND, medium to coarse-grained, some gravel, bolders and cobbles, sub-angular to sub-rounded, well graded, brown / grey, dry	0.00							
4.30		SAND and GRAVEL, sub-rounded to rounded, well graded, brown, dry	4.30							Bentonite Chips
10		*CONTINUED NEXT PAGE*								

BOREHOLE - EXPANDED ADD. LAB TESTING 12.1349.0013 BH LOGS.GPJ CALGARY.GDT 12/30/14

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: RT
CHECKED:

DATA ENTRY: AM

PROJECT No.: 12.1349.0013

RECORD OF BOREHOLE: EV_BALgw

SHEET 2 OF 2

LOCATION: See Location Plan

BORING DATE: October 27, 2014

DATUM: UTM Zone 11
(Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○ (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}); WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10 20 30 40)	FIELD EC AND ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10	Sonic 127 mm (ID) Casing 152.4 mm (OD) JR Drilling	CLAY, some sand and fine gravel, sub-angular to sub-rounded, poorly graded, dark grey, moist		10.10							Bentonite Chips
		SILTSTONE, fine-grained, grey / brown --- Fractured with water from 10.7 to 11.3 m		10.40							
11		--- Competent from 11.3 m									28 Oct 2014 ∇ Slotted Section
12											
		End of BOREHOLE.		12.74							
13											
14											
15											
16											
17											
18											
19											
20											

NOTES:
Standpipe installed to 12.7 m upon well completion.
Groundwater level measured at 11.1 mbgs on October 28, 2014.

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: RT

CHECKED:

DATA ENTRY: IPG

PROJECT No.: 12.1349.0013

RECORD OF BOREHOLE: EV_GCgw

SHEET 1 OF 2

LOCATION: See Location Plan

N: 5513879 E: 653059

BORING DATE: October 25, 2013

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}); WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		Ground Surface	344.42							Stick-up ≈0.72 m
0	Sonic 127 mm (ID) Casing 152.4 mm (OD) JR Drilling	SAND, fine to medium-grained, sub-rounded to sub-angular, well graded, dark black carbonaceous, dry, very loose	0.00							
1.52		SANDY GRAVEL, trace silt, fine-grained, sub-rounded to sub-angular, poorly graded, moist, very loose	342.90 1.52							14 Nov 2013 ▽
3.81		CLAY, some gravel, fine-grained, sub-rounded to sub-angular, poorly graded, moist, firm	340.61 3.81							Bentonite Chips
8.23		SILTY CLAY, well graded, wet, very soft	336.19 8.23							
10		CONTINUED NEXT PAGE								

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: RT
CHECKED: CD

DATA ENTRY: IPG

PROJECT No.: 12.1349.0013

RECORD OF BOREHOLE: EV_GCgw

SHEET 2 OF 2

LOCATION: See Location Plan

N: 5513879 E: 653059

BORING DATE: October 25, 2013

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80 / SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○ 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3} / WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10	Sonic 127 mm (ID) Casing 152.4 mm (OD) JR Drilling	SILTY CLAY, well graded, wet, very soft *(continued)*	▨								Bentonite Chips
11											
12											Silica Sand
13											
14											Slotted Section
15				328.02 15.60							
		End of BOREHOLE. NOTES: Standpipe installed to 15.6 m upon well completion. Groundwater level measured at 2.0 mbgs on November 14, 2013.									
16											
17											
18											
19											
20											

BOREHOLE - EXPANDED ADD. LAB TESTING 12.1349.0013 BH LOGS.GPJ CALGARY.GDT 4/8/14

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: RT

CHECKED: CO

PROJECT No.: 12.1349.0013

RECORD OF BOREHOLE: EV_LSgw

SHEET 1 OF 2

LOCATION: See Location Plan
N: 5514731 E: 653274

BORING DATE: October 24, 2013

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - O) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp ⊢ —O^W— ⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		Ground Surface		345.03							Stick-up =0.93 m
0	Sonic 127 mm (ID) Casing 152.4 mm (OD) JR Drilling	FILL - Sand sized particles, medium to coarse-grained, sub-rounded to sub-angular, well graded, dark black carbonaceous, moist, very loose		0.00							
1											
		SANDY GRAVEL, some silt, fine-grained, sub-rounded to sub-angular, poorly graded, moist, very loose		343.51 1.52							
2											Bentonite Chips
3											14 Nov 2013 ∇
		GRAVELY SAND, coarse-grained with fine-grained gravel, sub-rounded to sub-angular, poorly graded, moist, very loose		341.22 3.81							
4											
5											Silica Sand
6											Slotted Section
		SANDY SILT, fine to medium-grained, wet, mud		338.16 6.86							
7											
8											Silica Sand
9											
10											

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: RT
CHECKED: CD

DATA ENTRY: IPG

PROJECT No.: 12.1349.0013

RECORD OF BOREHOLE: EV_LSgw

SHEET 2 OF 2

LOCATION: See Location Plan

N: 5514731 E: 653274

BORING DATE: October 24, 2013

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - O (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}); WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10	JR Drilling	SANDY SILT, fine to medium-grained, wet, mud *(continued)*	▨	334.36 10.67							Silica Sand
		End of BOREHOLE. NOTES: Standpipe installed to 6.7 m upon well completion. Groundwater level measured at 3.4 mbgs on November 14, 2013.									
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: RT

CHECKED: CD

BOREHOLE - EXPANDED ADD. LAB TESTING 12.1349.0013 BH LOGS.GPJ CALGARY.GDT 4/8/14

PROJECT No.: 12.1349.0013

RECORD OF BOREHOLE: EV_OCgw

SHEET 1 OF 2

LOCATION: See Location Plan

N: 5512671 E: 652460

BORING DATE: November 7, 2013

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80 SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○ 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3} WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		Ground Surface		342.60							Stick-up =0.89 m
0	Sonic 127 mm (ID) Casing 152.4 mm (OD) JR Drilling	SANDY GRAVEL, fine-grained with occasional coarse grains, rounded to sub-rounded, moderately graded, dry, very loose		0.00							
		SAND and GRAVEL, coarse sand and fine gravel, rounded to sub-rounded, angular, poorly graded, moist, very loose — Hole is being drilled on the edge of a waste rock pile — Moisture at 2.1 m		341.07 1.52							15 Nov 2013 ∇
		GRAVEL, trace sand, fine to coarse-grained, sub-rounded to rounded, poorly graded, moist, loose		338.94 3.66							Bentonite Chips
		SAND, fine to medium-grained with occasional coarse grains, some gravel, fine to coarse-grained, sub-angular to sub-rounded, dry to moist, loose,		335.89 6.71							
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: RT

CHECKED: CD

DATA ENTRY: IPG

PROJECT No.: 12.1349.0013

RECORD OF BOREHOLE: EV_OCgw

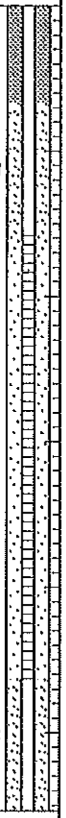
SHEET 2 OF 2

LOCATION: See Location Plan
N: 5512671 E: 652480

BORING DATE: November 7, 2013

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20, 40, 60, 80) SHEAR STRENGTH Cu, kPa (20, 40, 60, 80) nat V. + rem V. ⊕ Q - ● U - ○	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6}, 10^{-5}, 10^{-4}, 10^{-3}) WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10, 20, 30, 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10	Sonic 127 mm (ID) Casing 152.4 mm (OD) JR Drilling	SAND, fine to medium-grained with occasional coarse grains, some gravel, fine to coarse-grained, sub-angular to sub-rounded, dry to moist, loose, *(continued)*									Bentonite Chips
11											Silica Sand
12											
		SAND, fine to medium-grained with occasional coarse grains, some fine-grained gravel, sub-angular to sub-rounded, moist, loose to compact		329.79 12.80							
13											Slotted Section
14											
		BEDROCK		328.12 14.46							
15											Silica Sand Tail Pipe
		End of BOREHOLE. NOTES: Standpipe installed to 14.6 m upon well completion. Groundwater level measured at 2.1 mbgs on November 15, 2013.		327.06 15.54							
16											
17											
18											
19											
20											



BOREHOLE - EXPANDED ADD. LAB TESTING 12.1349.0013 BH LOGS.GPJ CALGARY.GDT 4/8/14

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: RT
CHECKED: CD

FINAL

SNC · LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_GC1B**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 1

Drilling Contractor	Owen's Drilling	Date Monitored	2020 09 01	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1128.870	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1129.706	Date Drilled:	2020 08 13
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5514183.858	Easting: 653147.008	Log Typed By:	AS

Drilling Legend
▨ Sample Interval
☰ Odex

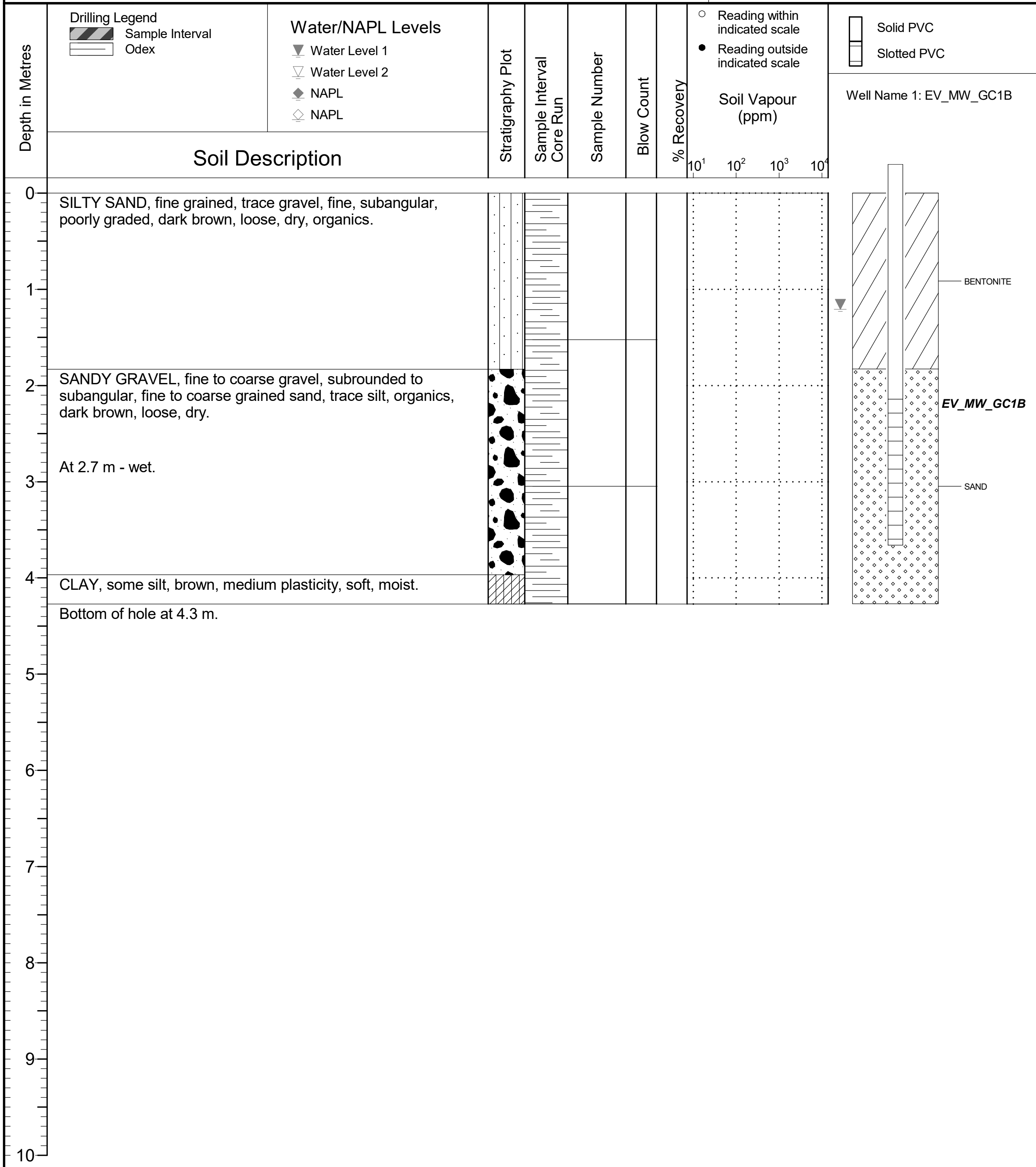
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

▯ Solid PVC
▯ Slotted PVC

Well Name 1: EV_MW_GC1B

Depth in Metres	Soil Description
0	SILTY SAND, fine grained, trace gravel, fine, subangular, poorly graded, dark brown, loose, dry, organics.
1.8	SANDY GRAVEL, fine to coarse gravel, subrounded to subangular, fine to coarse grained sand, trace silt, organics, dark brown, loose, dry. At 2.7 m - wet.
4.0	CLAY, some silt, brown, medium plasticity, soft, moist.
4.3	Bottom of hole at 4.3 m.

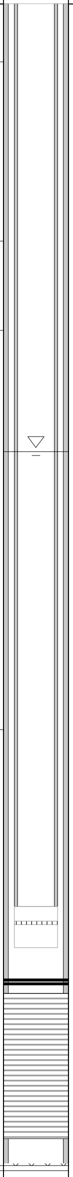


NOTES

McElhanney Consulting	District of Sparwood	BOREHOLE: Well 4
INSTALLED BY: Waterline Resources Inc.	Sparwood Water Supply Well	PROJECT #: 2283-17-002
DRILL TYPE: Dual Rotary	EAST: 652027 NORTH: 5514569	ELEVATION: 1152.72 (masl)

FILL TYPE: ▦ Backfill ■ Bentonite ▨ Grout ☐ Open Hole ▨ Cement ▒ Sand ☒ Slough ◫ Unknown

SAMPLE TYPE: ■ Shelby Tube ▨ No Recovery ☒ Split Spoon ⊟ Disturbed ◫ Dynamic Cone ▨ Core ☐ Grab Sample



Depth (m)	SOIL DESCRIPTION	WELL INSTALLATION
	Fill, sand and gravel some silt,, dry	Stickup = 1.28 m
5	3.66 mbgl Clay, med to dk brown, plastic, soft, moist	Bentonite surface seal from 0 to 6 m
10		
15	14.94 mbgl Silty Sand, some gravel	
20	20.57 mbgl Silty Gravelly Sand, moist, well graded, stiff	
25		
30		NPGWL= 27.94 mbgl Pump discharge (203 mm ID) Production casing (304.8mm ID) from 0 to 62.3m
35		
40		
45	45.72 mbgl Sand and Gravel, wet	
50		
55	45% gravel, 55% sand, trace fines	
60		Intake Pump
65	65% gravel, 35% sand no fines	K-Packer at 61.4 mbgl Riser pipe (ID=254 mm) from 61.4 to 62.3 mbgl K-Packer 100 slot stainless steel screen from 62.3 to 71.5 mbgl (diameter: 254 mm
70	45% gravel, 55% sand	Sump from 71.5 to 73.0 mbgl
75	END OF HOLE AT 73.15 m Water Level Date 2018-09-09	
80		
85		
90		

TYPE: Water Supply Well	COMPLETION DEPTH: 73.0 (m)
LOGGED BY: DvE	COMPLETION DATE: Sept 7, 2018
CHECKED BY: SN	Date printed: 27-Nov-2018

SNC • LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_AQ1**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1173.956	Borehole Logged By:	RAS
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1174.862	Date Drilled:	2019 01 11
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5511292.053	Easting: 654572.618	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ▼ Air Rotary

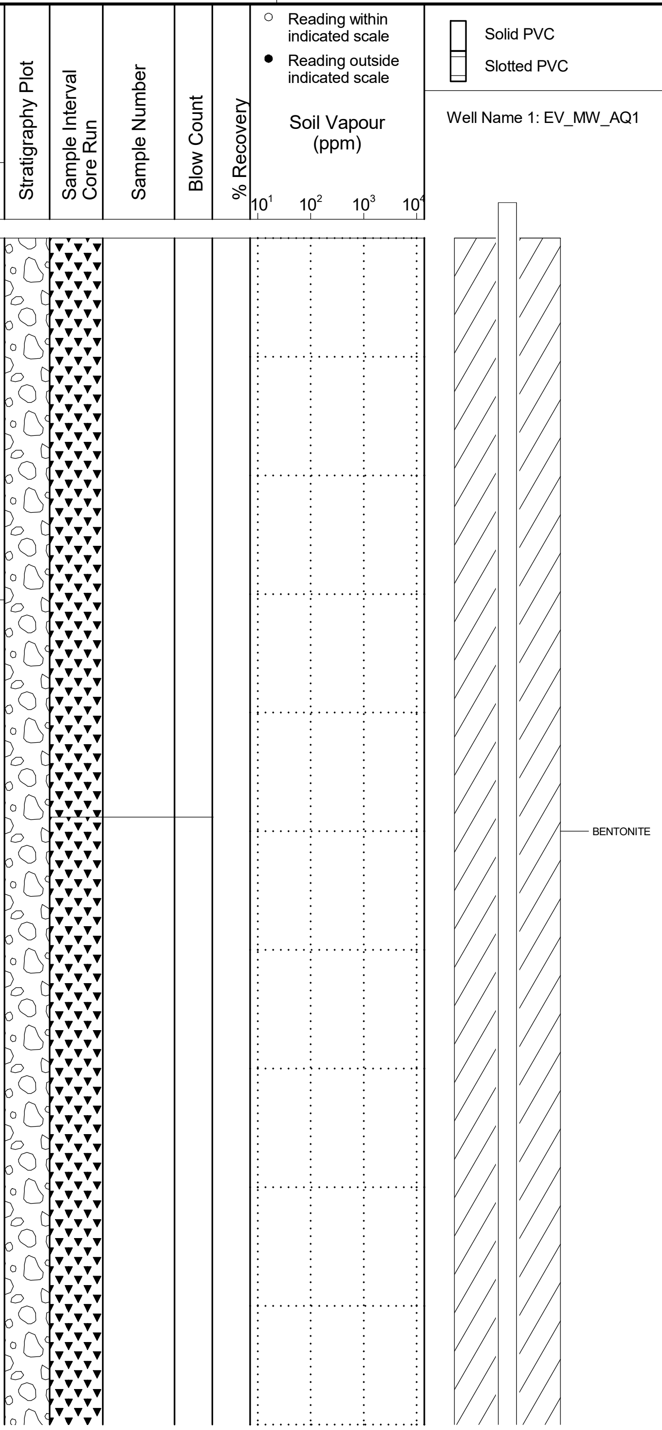
Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- ☐ Solid PVC
- ☐ Slotted PVC

Well Name 1: EV_MW_AQ1

Depth in Metres	Soil Description
0	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, trace silt, subangular, well graded, dark brown, dense, damp.
3	GRAVEL, fine to coarse, some fine to coarse grained sand, trace silt, subangular to angular, well graded, dark brown, dense, damp.
8	From 7.9 m to 12.5 m - brown



NOTES

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_AQ1**
	Location **Regional Groundwater Monitoring**	PAGE 2 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1173.956	Borehole Logged By:	RAS
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1174.862	Date Drilled:	2019 01 11
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5511292.053	Easting: 654572.618	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼▼▼ Air Rotary

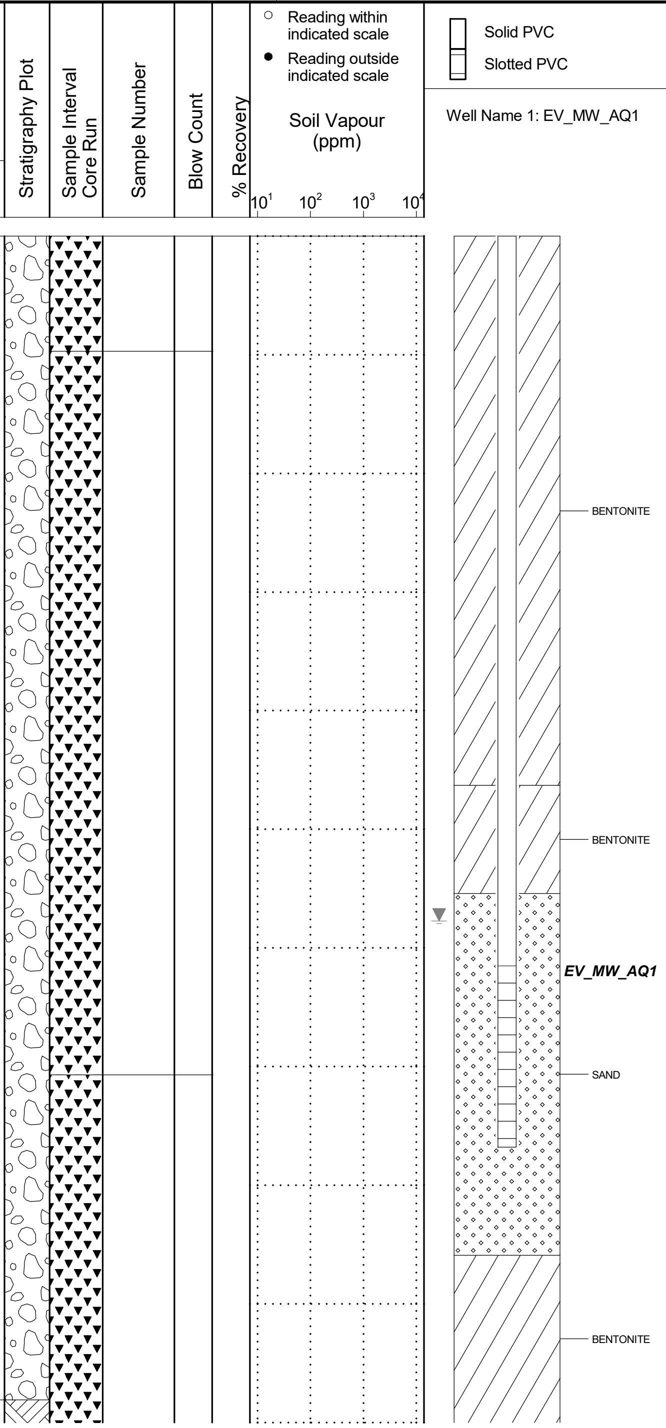
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

▯ Solid PVC
▤ Slotted PVC

Well Name 1: EV_MW_AQ1

Depth in Metres	Soil Description
10	GRAVEL, fine to coarse, some fine to coarse grained sand, trace silt, subangular to angular, well graded, dark brown, dense, damp. *(continued)*
12.5	At 12.5 m - moist
16.5	At 16.5 m - light brown
16.8	At 16.8 m - wet
18.9	At 18.9 m - loose, potentially silt or clay
20	BEDROCK, dry.



NOTES

SNC•LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_AQ1**
	Location **Regional Groundwater Monitoring**	PAGE 3 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1173.956	Borehole Logged By:	RAS
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1174.862	Date Drilled:	2019 01 11
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5511292.053	Easting: 654572.618	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼▼▼ Air Rotary

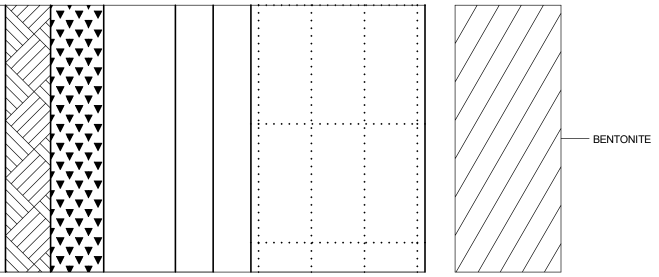
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

▯ Solid PVC
▯ Slotted PVC

Well Name 1: EV_MW_AQ1

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm) 10^1 10^2 10^3 10^4
20	BEDROCK, dry. *(continued)*						
22.3	Bottom of hole at 22.3 m.						



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QA/QC: BH 2019 04 10 Print Date:2019-09-26

SNC•LAVALIN

Client
Teck Coal Limited

Location
Regional Groundwater Monitoring

Borehole No. : EV_BH_AQ2

PAGE 1 OF 2

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 08	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1150.689	Borehole Logged By:	RG/AMH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1151.673	Date Drilled:	2019 01 23
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5511871.860	Easting: 653854.171	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ▼ Air Rotary

Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- ▯ Solid PVC
- ▯ Slotted PVC

Well Name 1: EV_MW_AQ2

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm)

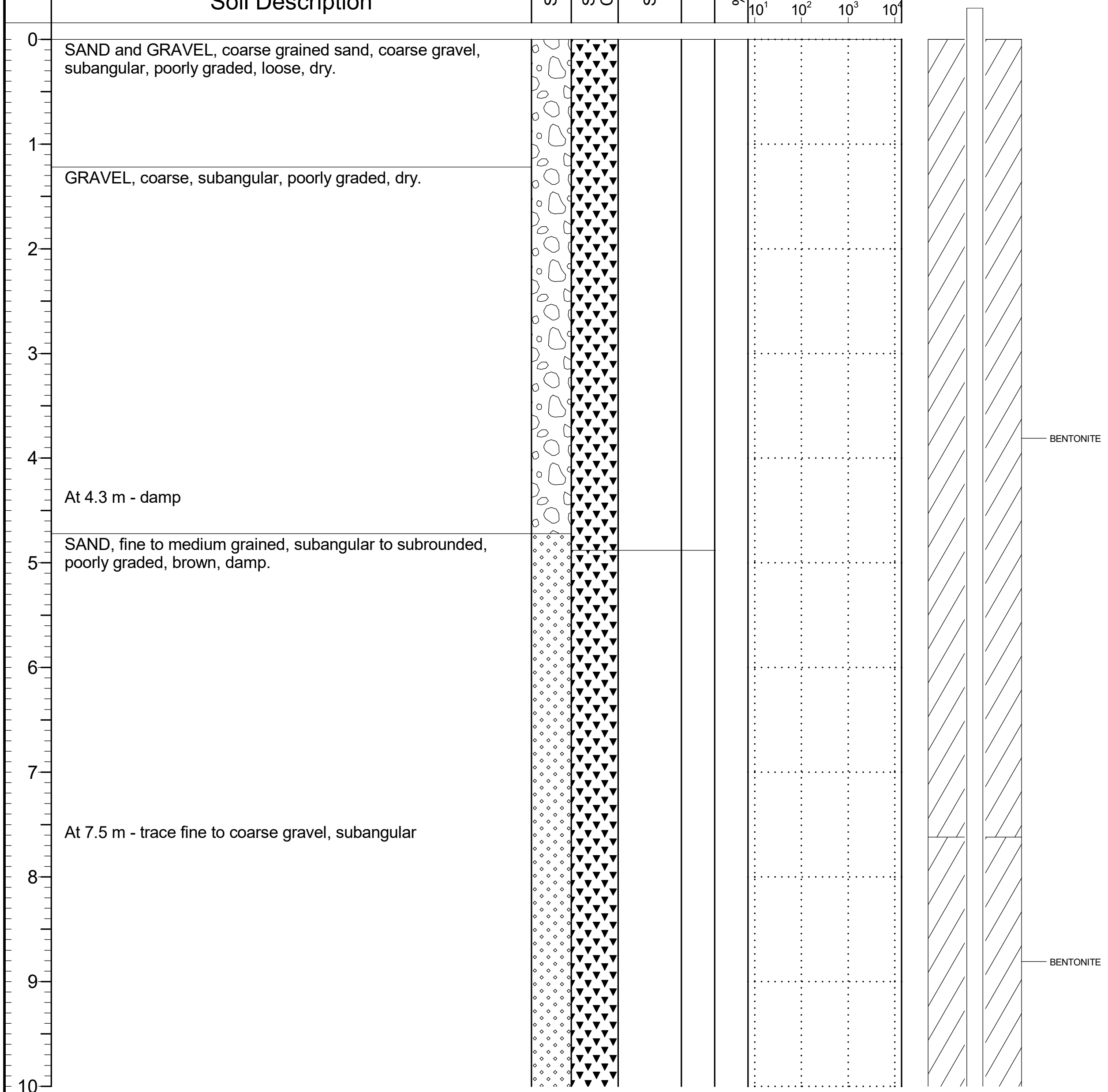
SAND and GRAVEL, coarse grained sand, coarse gravel, subangular, poorly graded, loose, dry.

GRAVEL, coarse, subangular, poorly graded, dry.

At 4.3 m - damp

SAND, fine to medium grained, subangular to subrounded, poorly graded, brown, damp.

At 7.5 m - trace fine to coarse gravel, subangular



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QA/QC: BH 2019 04 10 Print Date:2019-09-26

Client **Teck Coal Limited**	**Borehole No. : EV_BH_AQ2**	
Location **Regional Groundwater Monitoring**	PAGE 2 OF 2	

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 08	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1150.689	Borehole Logged By:	RG/AMH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1151.673	Date Drilled:	2019 01 23
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5511871.860	Easting: 653854.171	Log Typed By:	VL

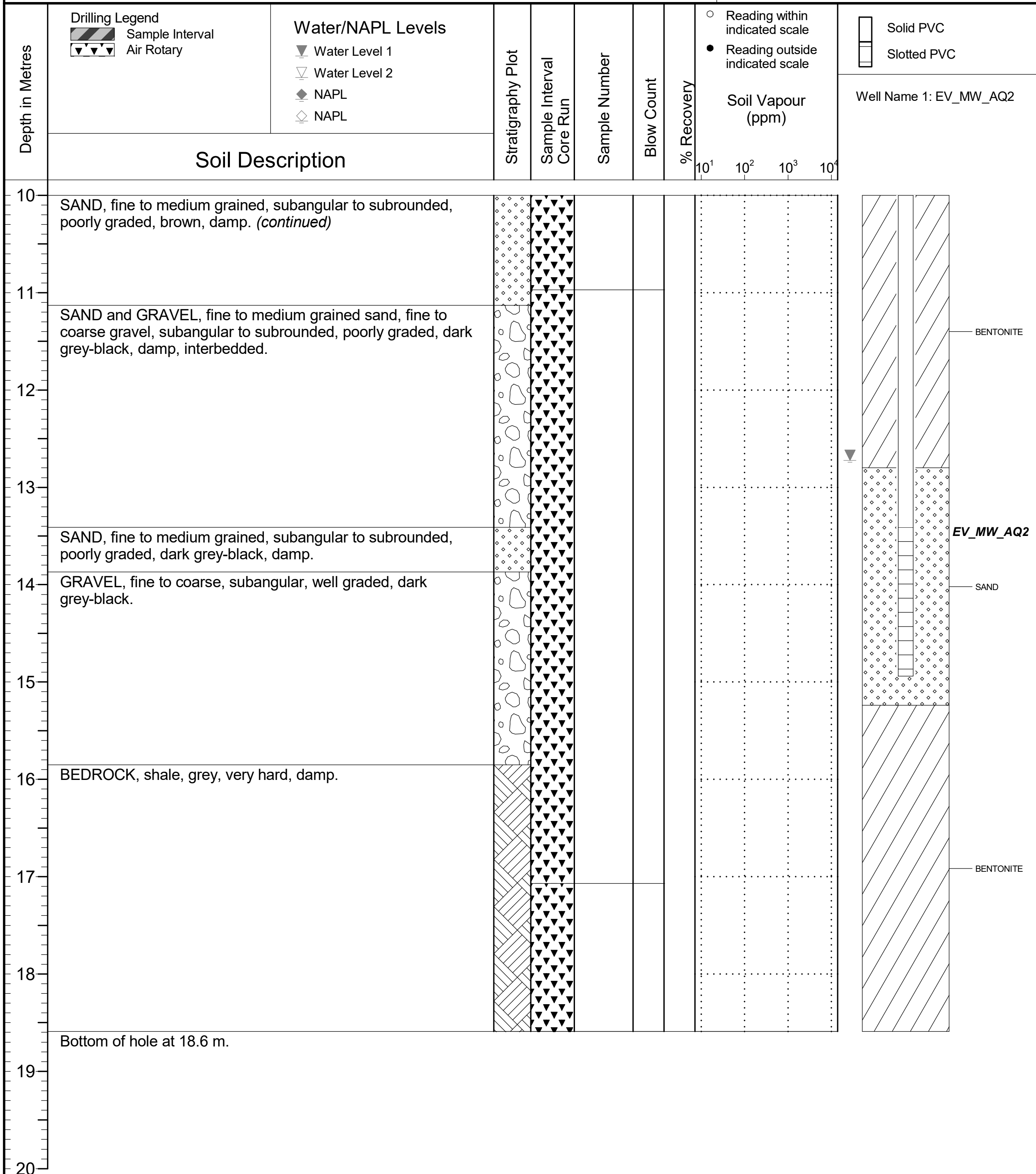
Drilling Legend
- ▨ Sample Interval
- ▼▼▼ Air Rotary

Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- ▯ Solid PVC
- ▤ Slotted PVC

Well Name 1: EV_MW_AQ2



SAND, fine to medium grained, subangular to subrounded, poorly graded, brown, damp. *(continued)*

SAND and GRAVEL, fine to medium grained sand, fine to coarse gravel, subangular to subrounded, poorly graded, dark grey-black, damp, interbedded.

SAND, fine to medium grained, subangular to subrounded, poorly graded, dark grey-black, damp.

GRAVEL, fine to coarse, subangular, well graded, dark grey-black.

BEDROCK, shale, grey, very hard, damp.

Bottom of hole at 18.6 m.

NOTES

SNC·LAVALIN

Client
Teck Coal Limited

Location
Regional Groundwater Monitoring

Borehole No. : EV_BH_MC4

PAGE 1 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1144.345	Borehole Logged By:	RAS
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1145.308	Date Drilled:	2019 01 09
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5512279.753	Easting: 653309.224	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ▼ Air Rotary

Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- ▯ Solid PVC
- ▤ Slotted PVC

Well Name 1: EV_MW_MC4

Depth in Metres

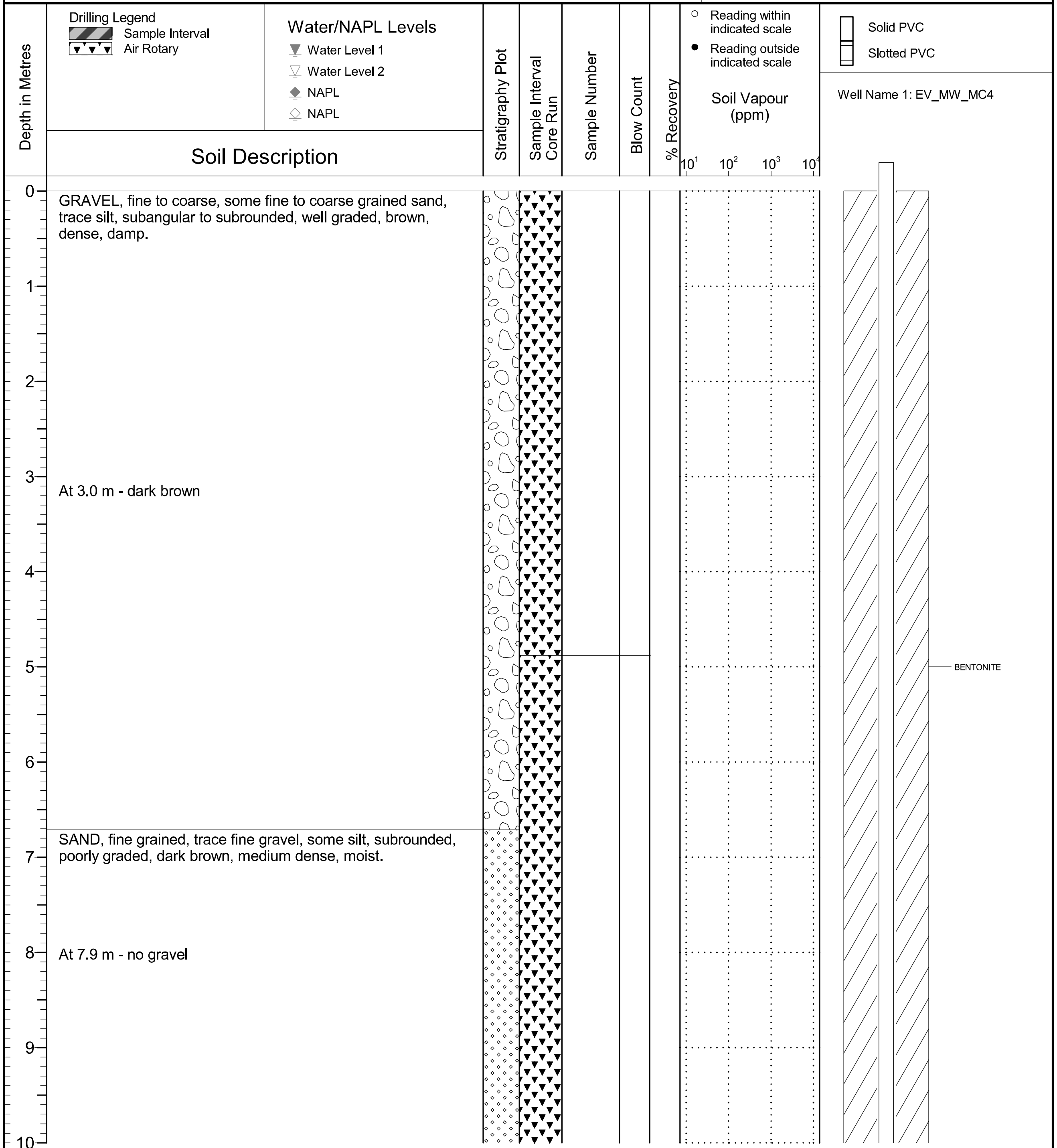
Soil Description

GRAVEL, fine to coarse, some fine to coarse grained sand, trace silt, subangular to subrounded, well graded, brown, dense, damp.

At 3.0 m - dark brown

SAND, fine grained, trace fine gravel, some silt, subrounded, poorly graded, dark brown, medium dense, moist.

At 7.9 m - no gravel



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SNC·LAVALIN

Client **Teck Coal Limited**	**Borehole No. : EV_BH_MC4**
Location **Regional Groundwater Monitoring**	

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1144.345	Borehole Logged By:	RAS
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1145.308	Date Drilled:	2019 01 09
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5512279.753	Easting: 653309.224	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼ Air Rotary

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

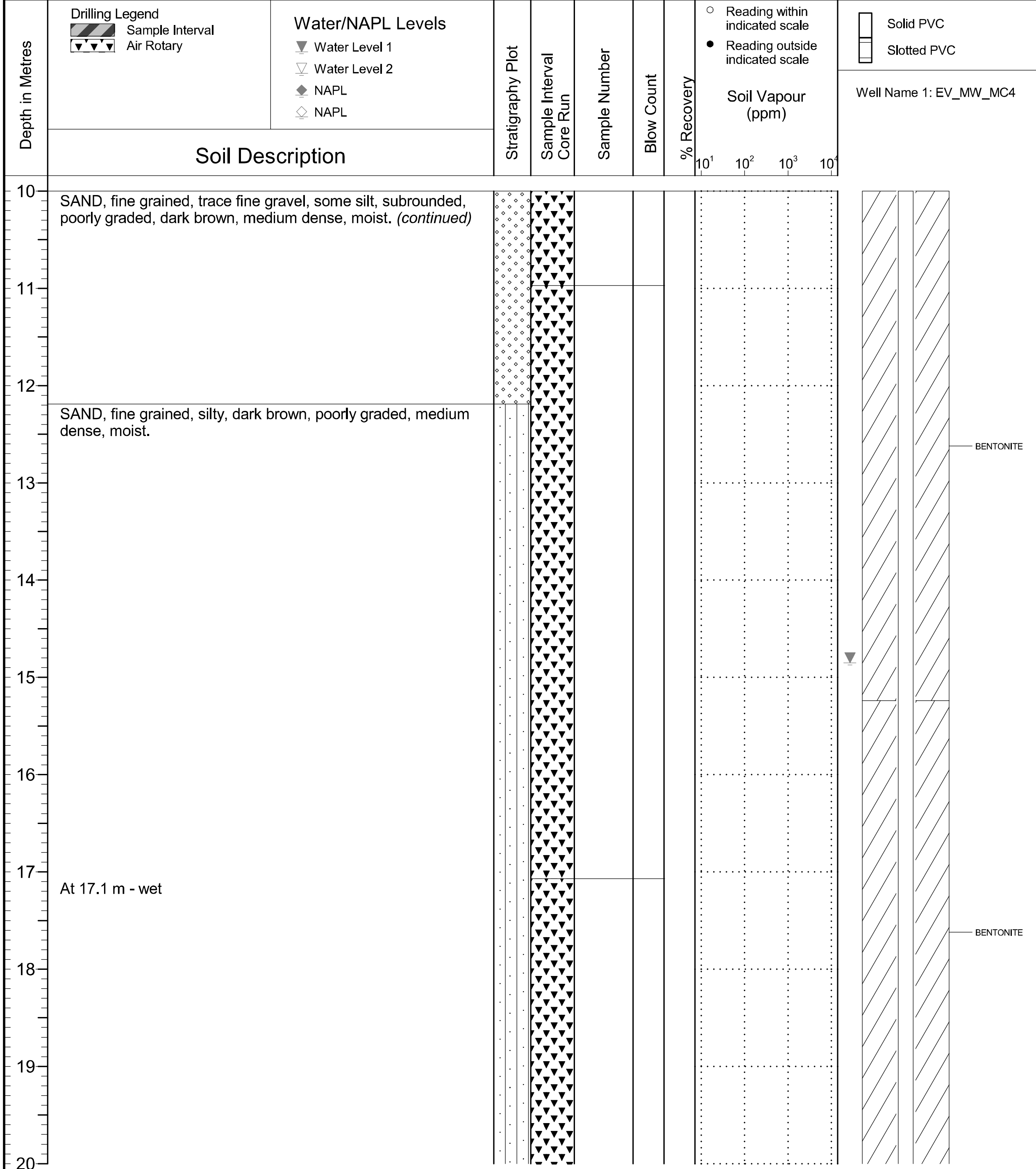
Well Name 1: EV_MW_MC4

Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm)

10 — SAND, fine grained, trace fine gravel, some silt, subrounded, poorly graded, dark brown, medium dense, moist. *(continued)*

12.2 — SAND, fine grained, silty, dark brown, poorly graded, medium dense, moist.

At 17.1 m - wet



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QA/QC: BH 2019 04 10 Print Date:2019-09-26

SNC·LAVALIN

Client **Teck Coal Limited**		**Borehole No. : EV_BH_MC4**
Location **Regional Groundwater Monitoring**		PAGE 3 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1144.345	Borehole Logged By:	RAS
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1145.308	Date Drilled:	2019 01 09
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5512279.753	Easting: 653309.224	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼ Air Rotary

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

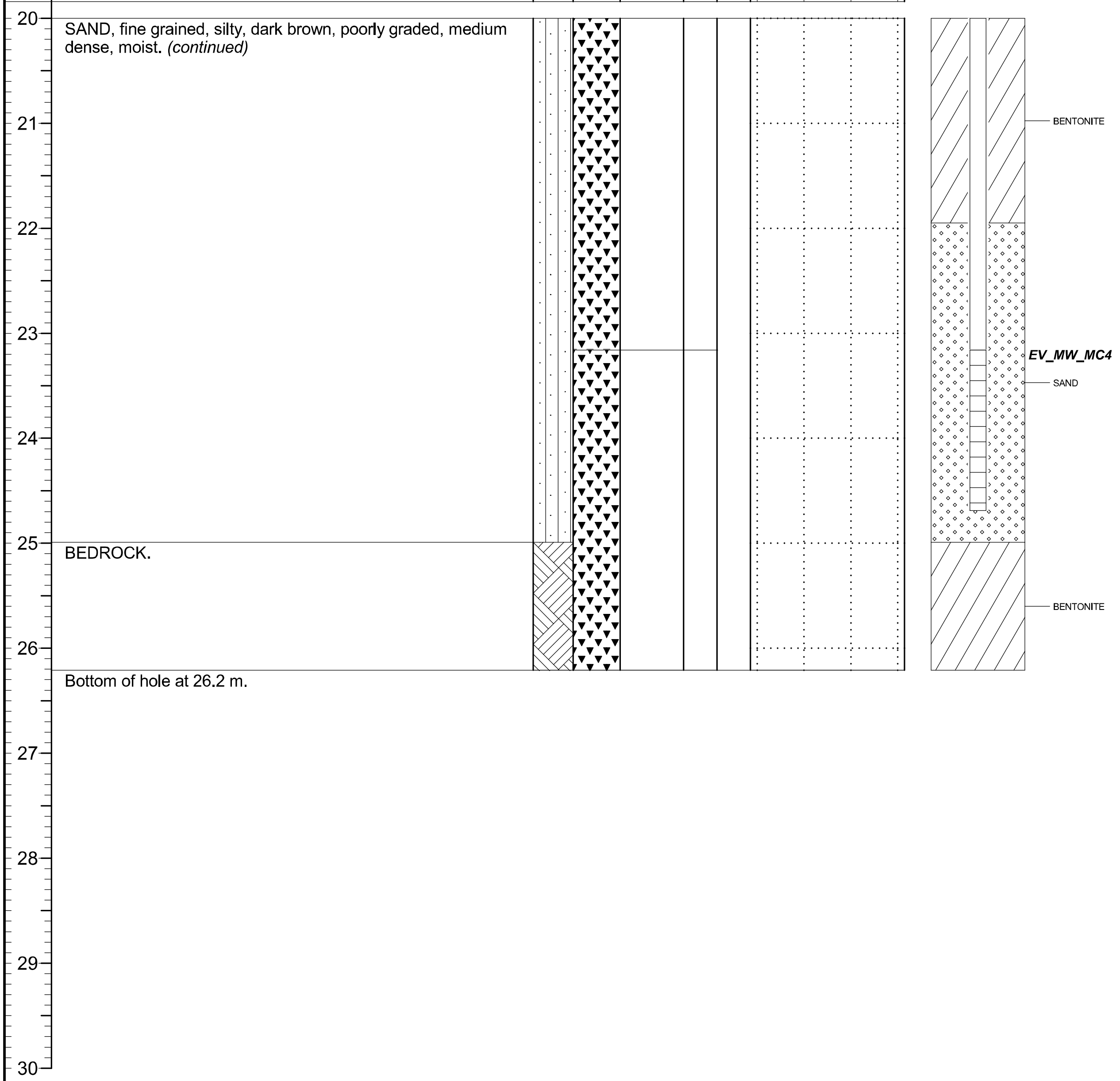
○ Reading within indicated scale
● Reading outside indicated scale

Soil Vapour (ppm)

▯ Solid PVC
▭ Slotted PVC

Well Name 1: EV_MW_MC4

Depth in Metres	Soil Description
20	SAND, fine grained, silty, dark brown, poorly graded, medium dense, moist. *(continued)*
25	BEDROCK.
26.2	Bottom of hole at 26.2 m.



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QA/QC: BH 2019 04 10 Print Date:2019-09-26

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Client
Teck Coal Limited

Location
Regional Groundwater Monitoring

Borehole No. : EV_BH_SPR1

PAGE 1 OF 6

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 08	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1137.376	Borehole Logged By:	AMH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1138.248 1138.247	Date Drilled:	2019 01 21
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5511277.374	Easting: 653946.968	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼ Air Rotary

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: EV_MW_SPR1-A
Well Name 2: EV_MW_SPR1-B

Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm)

COBBLES, rounded, up to 20 cm, grey.

SAND, fine grained, some fine to coarse gravel, rounded to subrounded, poorly graded, brown, loose, dry.

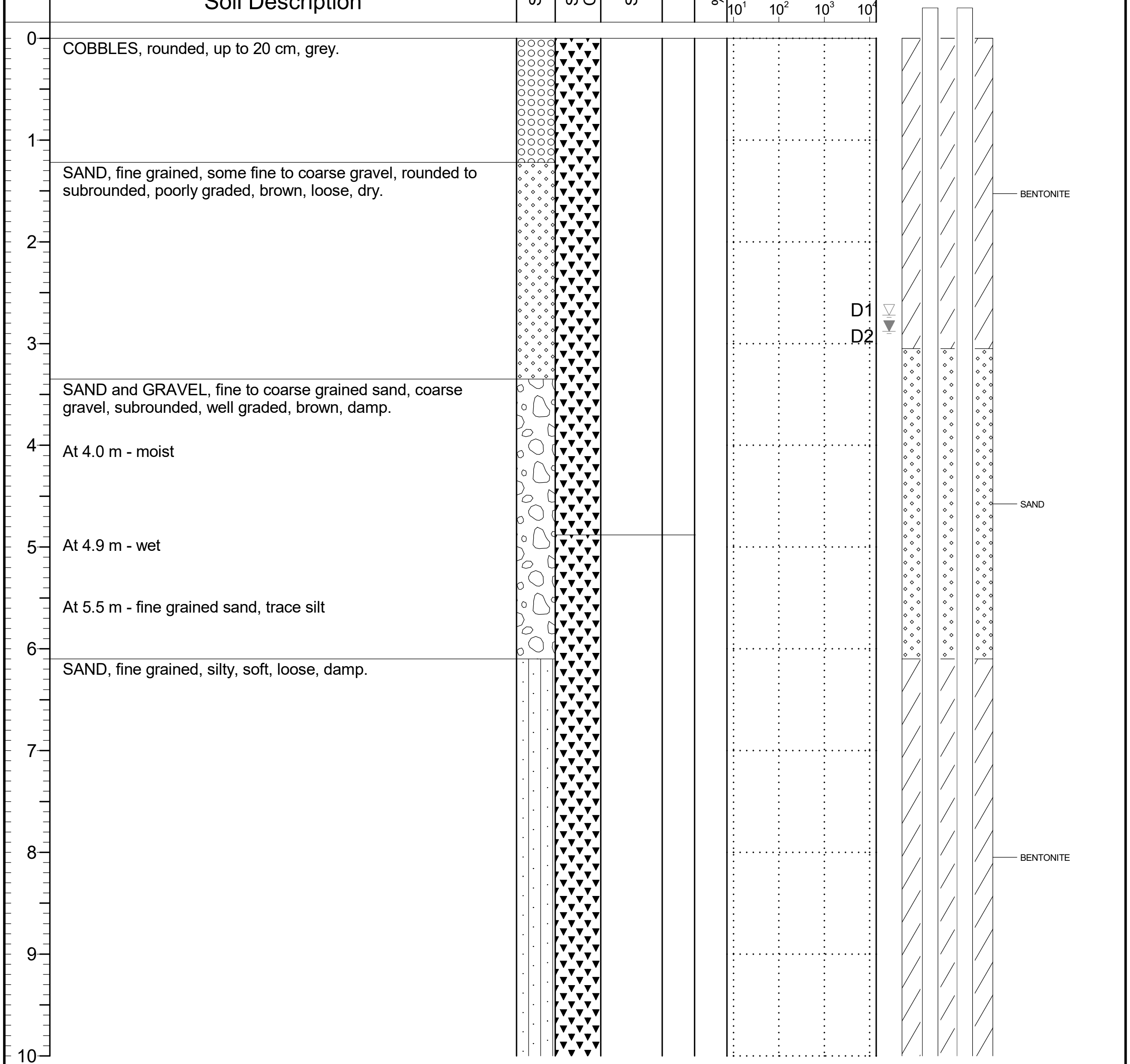
SAND and GRAVEL, fine to coarse grained sand, coarse gravel, subrounded, well graded, brown, damp.

At 4.0 m - moist

At 4.9 m - wet

At 5.5 m - fine grained sand, trace silt

SAND, fine grained, silty, soft, loose, damp.



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QA/QC: BH 2019 04 10 Print Date:2019-09-26

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Client
Teck Coal Limited

Location
Regional Groundwater Monitoring

Borehole No. : EV_BH_SPR1

PAGE 2 OF 6

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 08	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1137.376	Borehole Logged By:	AMH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1138.248 1138.247	Date Drilled:	2019 01 21
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5511277.374	Easting: 653946.968	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼▼▼ Air Rotary

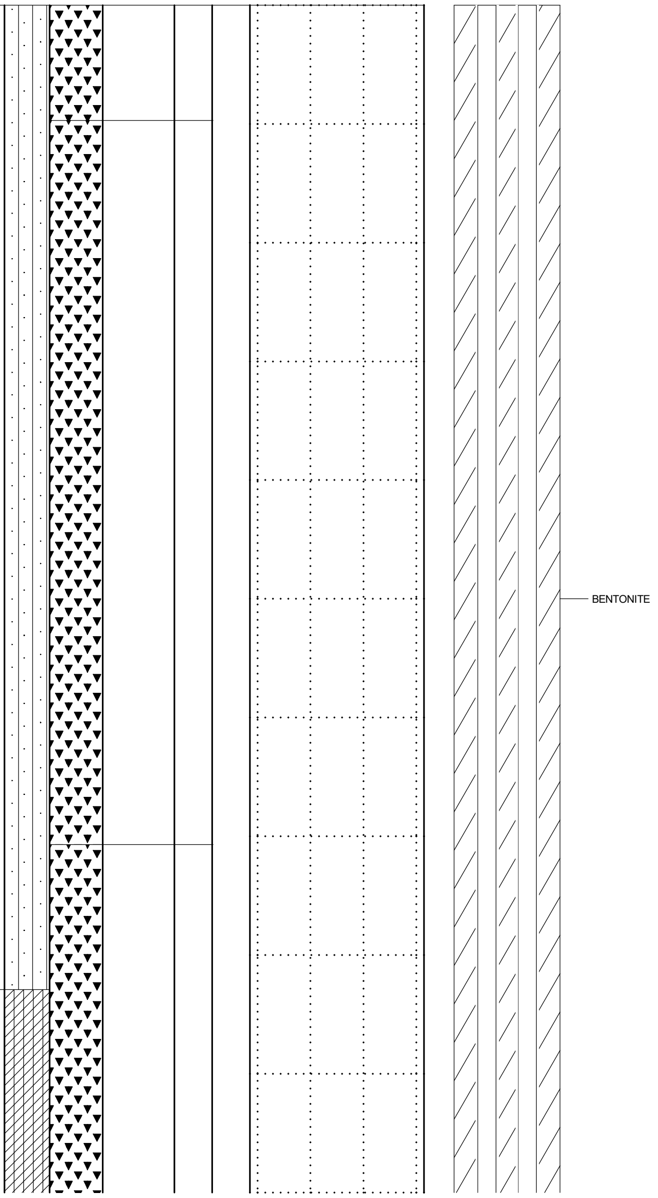
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

▯ Solid PVC
▤ Slotted PVC

Well Name 1: EV_MW_SPR1-A
Well Name 2: EV_MW_SPR1-B

Depth in Metres	Soil Description
10	SAND, fine grained, silty, soft, loose, damp. *(continued)*
18.3	CLAY, silty, brown, intermediate plasticity, moisture level at plastic limit.



Depth scale: 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20

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QA/QC: BH 2019 04 10 Print Date:2019-09-26

SNC·LAVALIN

Client
Teck Coal Limited

Location
Regional Groundwater Monitoring

Borehole No. : EV_BH_SPR1

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 08	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1137.376	Borehole Logged By:	AMH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1138.248 1138.247	Date Drilled:	2019 01 21
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5511277.374	Easting: 653946.968	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼ Air Rotary

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

▯ Solid PVC
▤ Slotted PVC

Well Name 1: EV_MW_SPR1-A
Well Name 2: EV_MW_SPR1-B

Depth in Metres	Soil Description
20	CLAY, silty, brown, intermediate plasticity, moisture level at plastic limit. *(continued)*
	At 20.7 m - moisture level below plastic limit
25.3	GRAVEL, fine, subrounded, poorly graded, damp to wet.
26.5	SAND and SILT, fine grained sand, poorly graded, moist.
	At 28.7 m - damp
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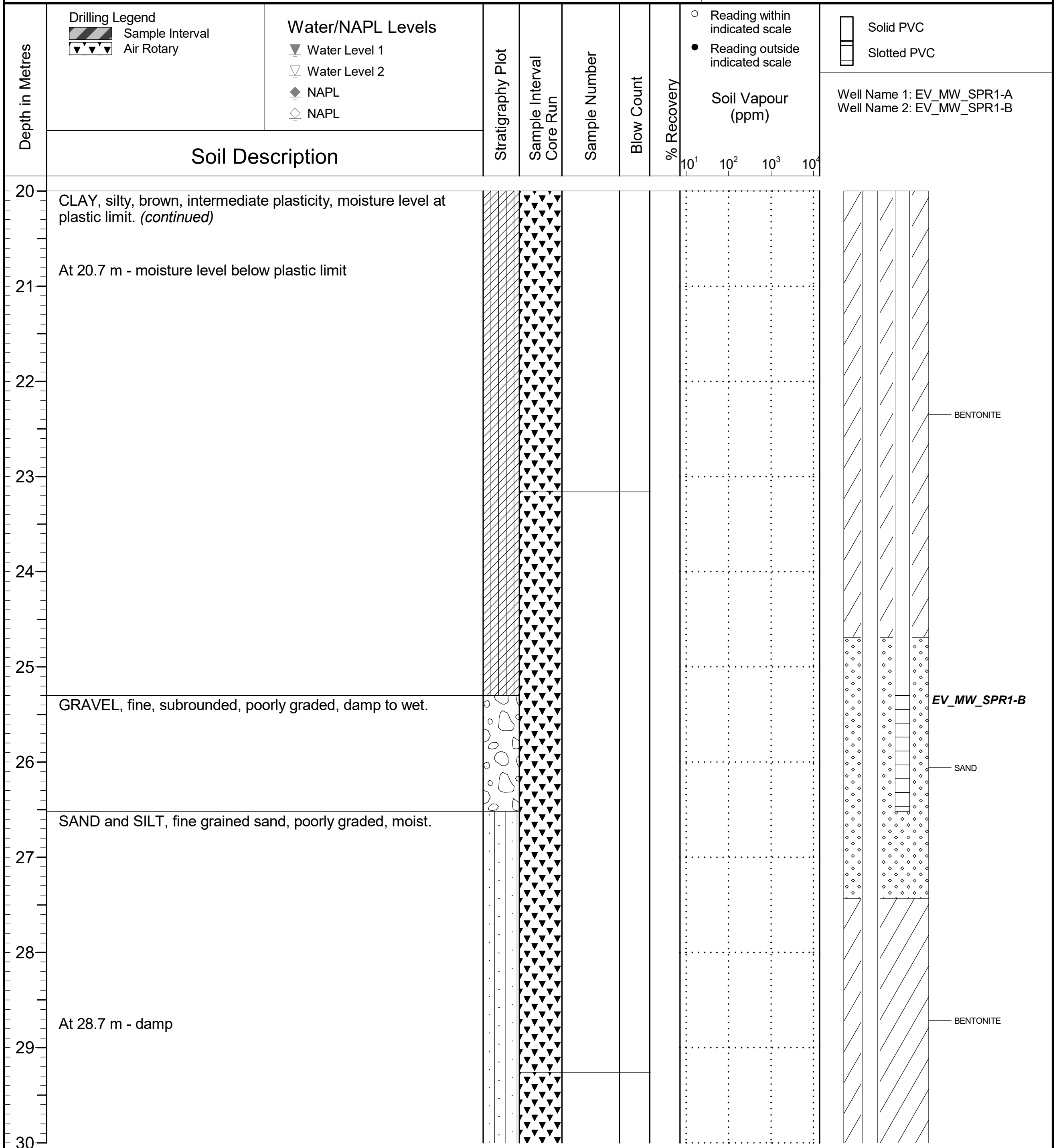

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SNC·LAVALIN

Client
Teck Coal Limited

Location
Regional Groundwater Monitoring

Borehole No. : EV_BH_SPR1

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 08	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1137.376	Borehole Logged By:	AMH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1138.248 1138.247	Date Drilled:	2019 01 21
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5511277.374	Easting: 653946.968	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼▼▼ Air Rotary

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

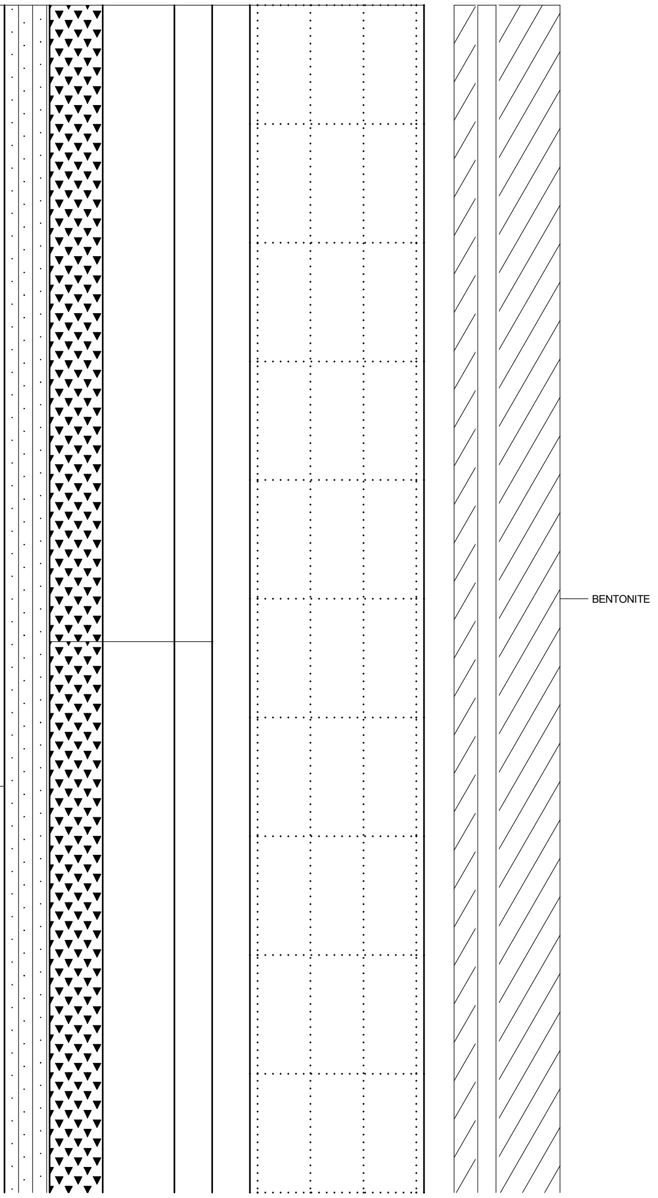
Soil Vapour (ppm)
10^1 10^2 10^3 10^4

▯ Solid PVC
▤ Slotted PVC

Well Name 1: EV_MW_SPR1-A
Well Name 2: EV_MW_SPR1-B

Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery

Depth in Metres	Soil Description
30	SAND and SILT, fine grained sand, poorly graded, moist. *(continued)*
34.7	At 34.7 m - dense
36.6	SAND, fine grained, silty, poorly graded, loose, wet.
39.0	At 39.0 m - some silt to silty



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NOTES

SNC·LAVALIN

Client
Teck Coal Limited

Location
Regional Groundwater Monitoring

Borehole No. : EV_BH_SPR1

PAGE 5 OF 6

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 08	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1137.376	Borehole Logged By:	AMH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1138.248 1138.247	Date Drilled:	2019 01 21
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5511277.374	Easting: 653946.968	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼ Air Rotary

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

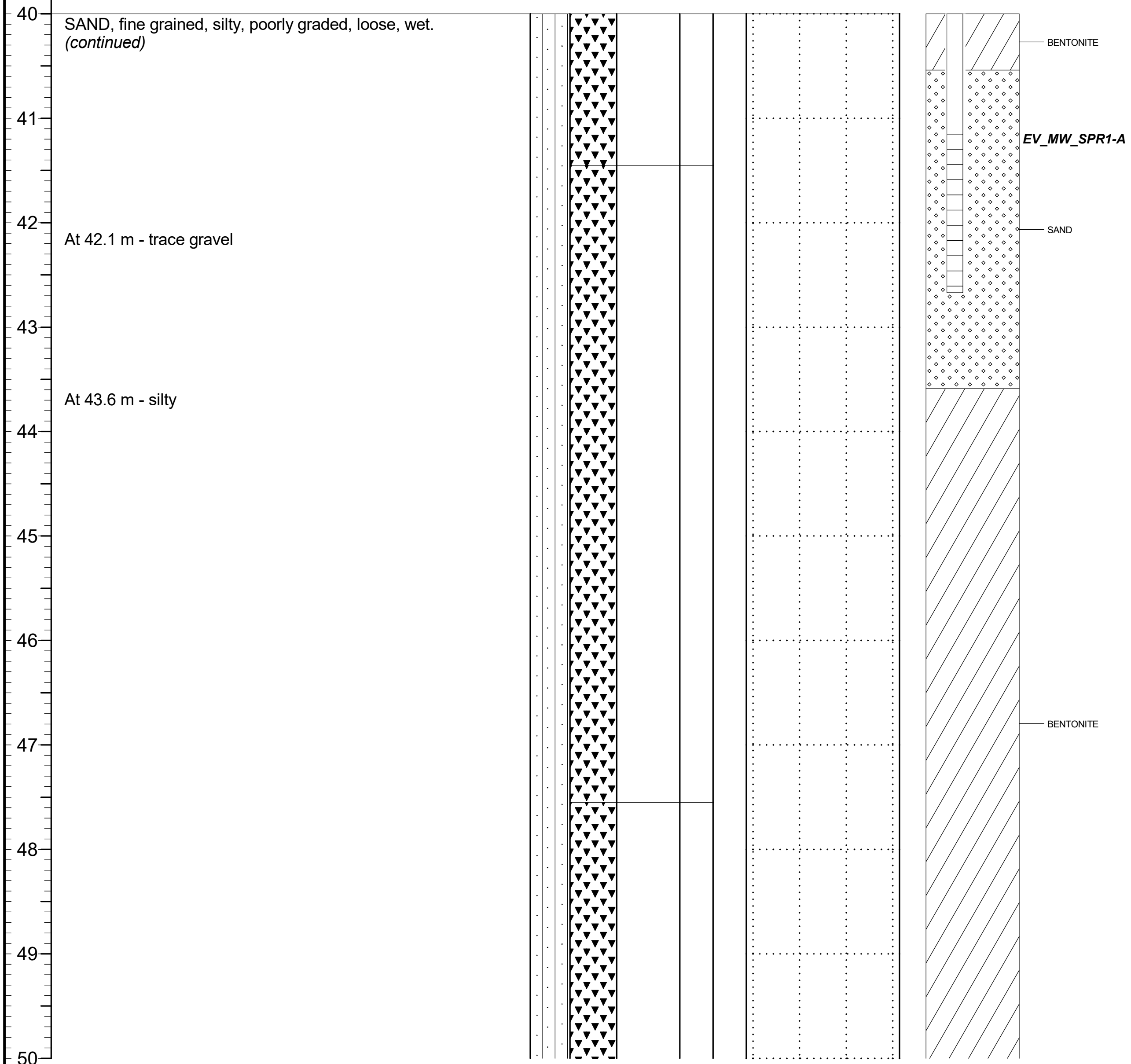
○ Reading within indicated scale
● Reading outside indicated scale

Soil Vapour (ppm)

▯ Solid PVC
▤ Slotted PVC

Well Name 1: EV_MW_SPR1-A
Well Name 2: EV_MW_SPR1-B

Depth in Metres	Soil Description
40	SAND, fine grained, silty, poorly graded, loose, wet. *(continued)*
42	At 42.1 m - trace gravel
43	At 43.6 m - silty



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QA/QC: BH 2019 04 10 Print Date:2019-09-26

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_SPR1**
	Location **Regional Groundwater Monitoring**	PAGE 6 OF 6

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 08	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1137.376	Borehole Logged By:	AMH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1138.248 1138.247	Date Drilled:	2019 01 21
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5511277.374	Easting: 653946.968	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼ Air Rotary

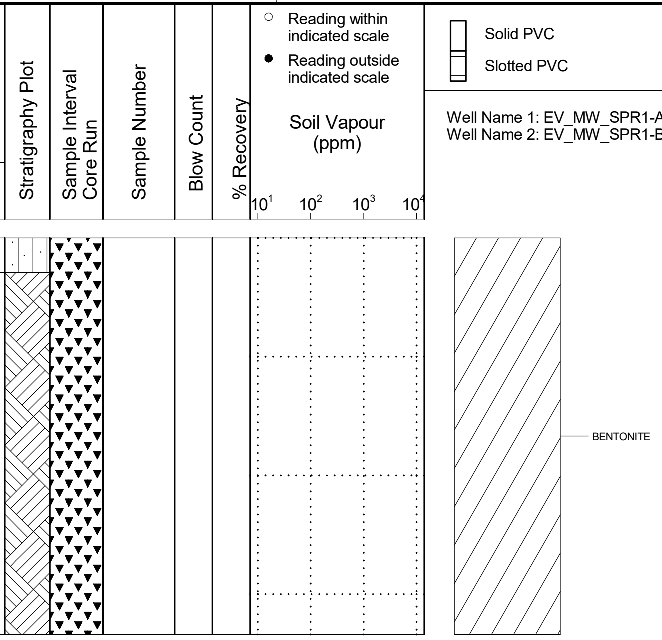
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

☐ Solid PVC
☐ Slotted PVC

Well Name 1: EV_MW_SPR1-A
Well Name 2: EV_MW_SPR1-B

Depth in Metres	Soil Description
50	SAND, fine grained, silty, poorly graded, loose, wet. *(continued)*
	BEDROCK, shale, angular, black.
53.3	Bottom of hole at 53.3 m.



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NOTES

SNC • LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_SPR-C**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 1

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 06	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1137.270	Borehole Logged By:	AMH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1138.188	Date Drilled:	2019 01 21
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5511278.052	Easting: 653945.619	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼ Air Rotary

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: EV_MW_SPR1-C

Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm)

COBBLES, rounded, up to 20 cm, grey.

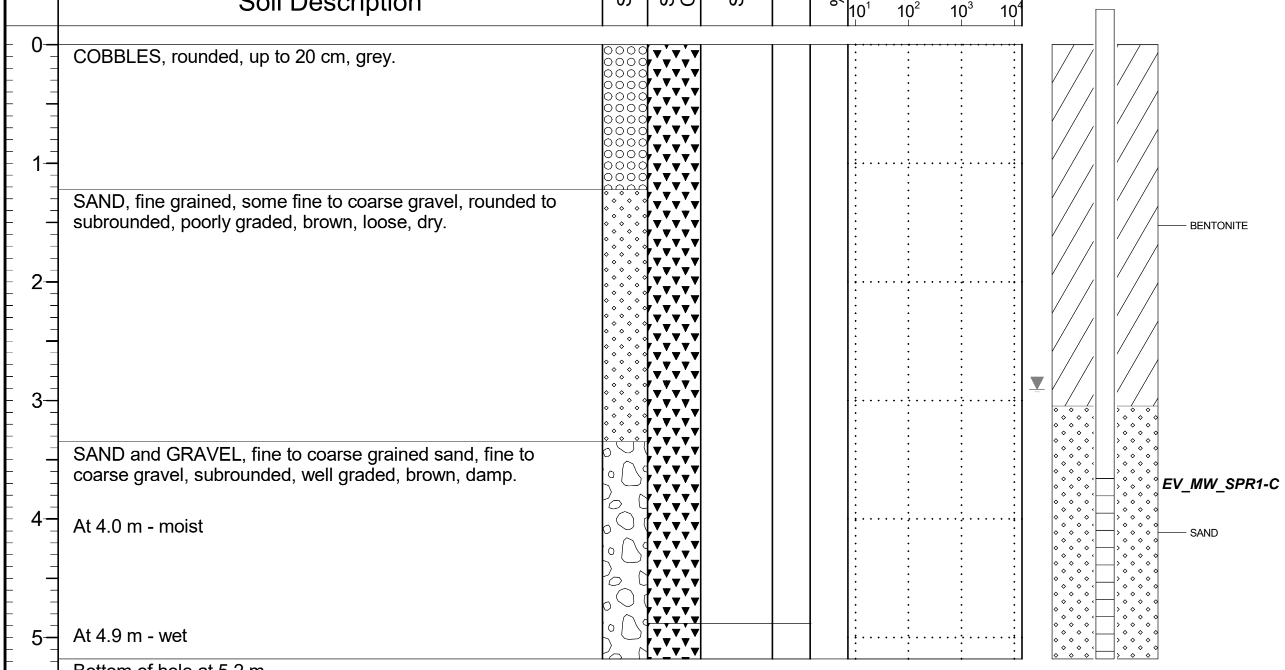
SAND, fine grained, some fine to coarse gravel, rounded to subrounded, poorly graded, brown, loose, dry.

SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded, well graded, brown, damp.

At 4.0 m - moist

At 4.9 m - wet

Bottom of hole at 5.2 m.



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NOTES

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_MCgwA**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2020 05 19	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1126.629	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1127.623	Date Drilled:	2020 05 07
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5511969.374	Easting: 652962.530	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ▭ Odex

Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

Depth in Metres

Soil Description

SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subangular, some silt, well graded, grey, loose, moist, organics.
At 0.45 m - no organics.

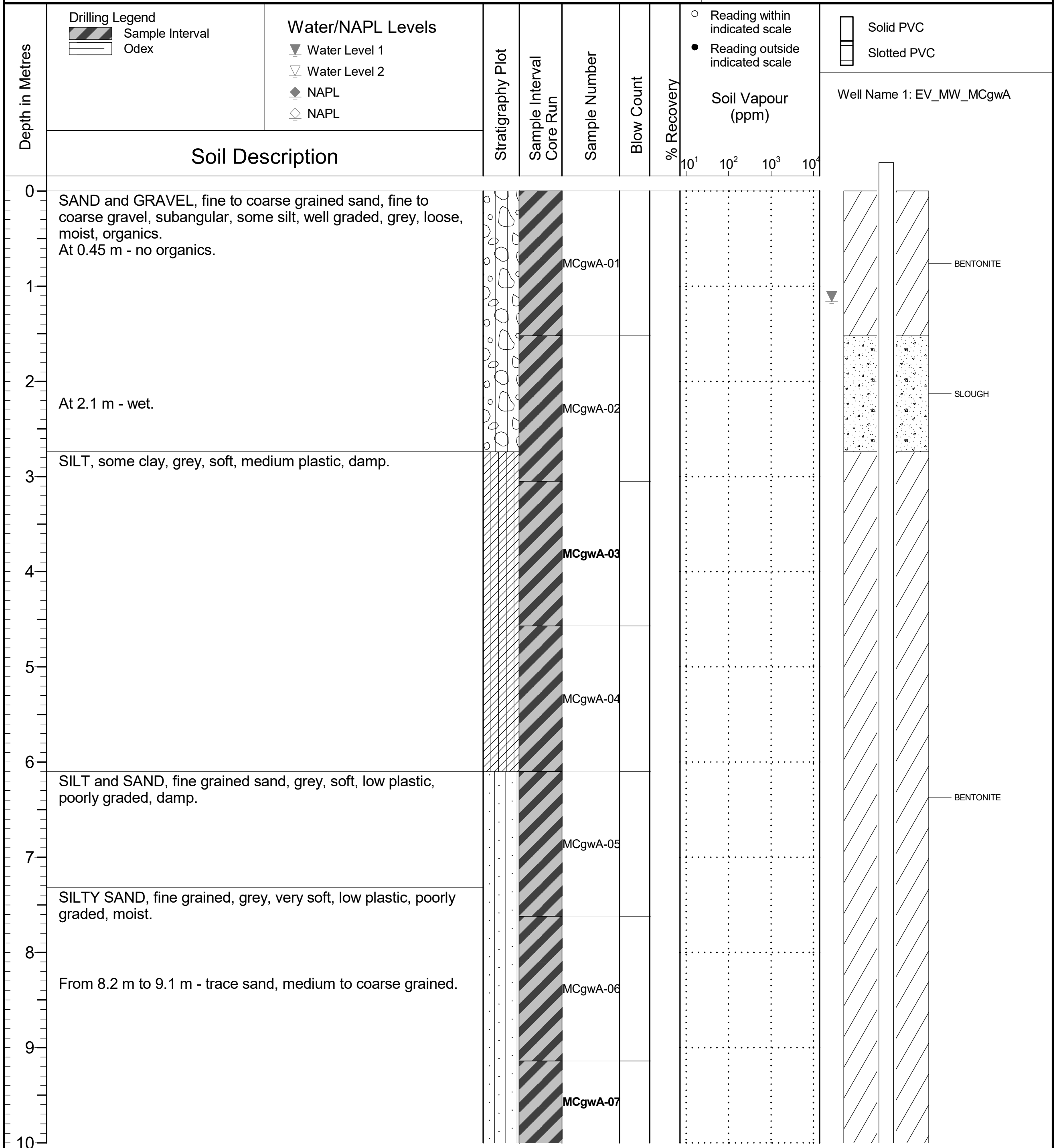
At 2.1 m - wet.

SILT, some clay, grey, soft, medium plastic, damp.

SILT and SAND, fine grained sand, grey, soft, low plastic, poorly graded, damp.

SILTY SAND, fine grained, grey, very soft, low plastic, poorly graded, moist.

From 8.2 m to 9.1 m - trace sand, medium to coarse grained.



NOTES
Bolded sample denotes sample analyzed.

QA/QC: MB 2020 06 22 Print Date:2020-12-02

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_MCgwA**
	Location **Regional Groundwater Monitoring**	PAGE 2 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2020 05 19	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1126.629	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1127.623	Date Drilled:	2020 05 07
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5511969.374	Easting: 652962.530	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▭ Odex

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

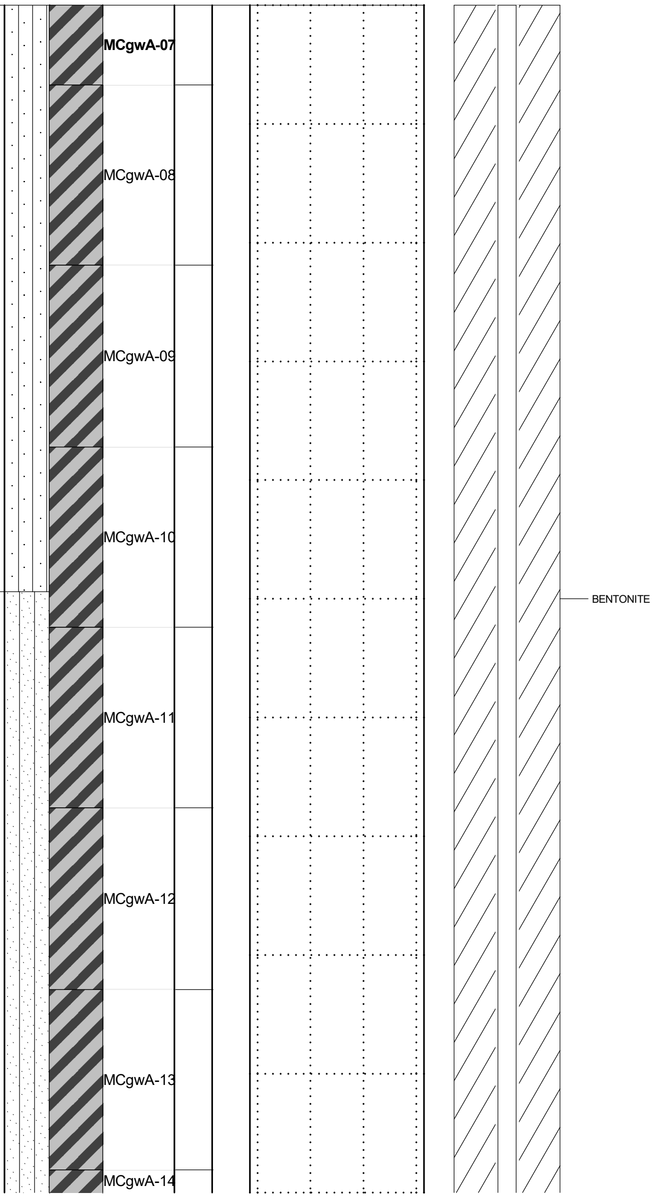
○ Reading within indicated scale
● Reading outside indicated scale

Soil Vapour (ppm) 10^1 10^2 10^3 10^4

▯ Solid PVC
▤ Slotted PVC

Well Name 1: EV_MW_MCgwA

Depth in Metres	Soil Description	Sample Number
10	SILTY SAND, fine grained, grey, very soft, low plastic, poorly graded, moist. *(continued)*	**MCgwA-07**
11	At 11.0 m - increase in moisture.	MCgwA-08
12		
13		MCgwA-09
14		MCgwA-10
15	SAND, fine to medium grained, some silt, grey, poorly graded, loose, wet, heaving.	
16		MCgwA-11
17		MCgwA-12
18		
19		MCgwA-13
20		MCgwA-14



NOTES
Bolded sample denotes sample analyzed.

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_MCgwA**
	Location **Regional Groundwater Monitoring**	PAGE 3 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2020 05 19	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1126.629	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1127.623	Date Drilled:	2020 05 07
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5511969.374	Easting: 652962.530	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▭ Odex

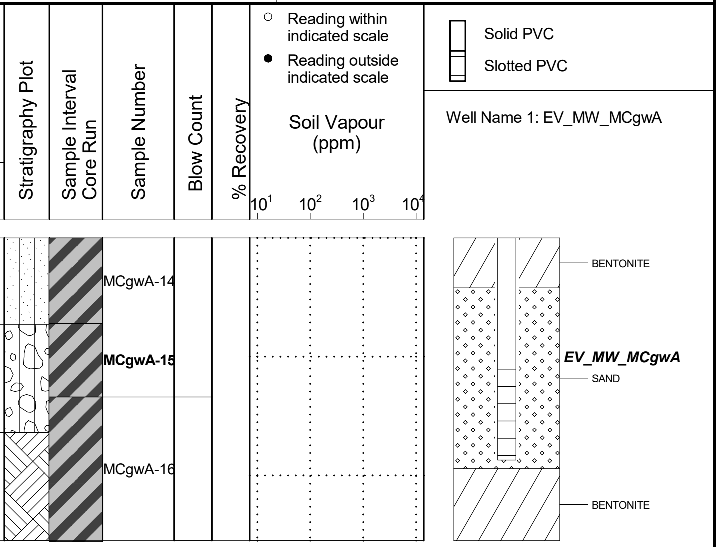
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: EV_MW_MCgwA

Depth in Metres	Soil Description
20	SAND, fine to medium grained, some silt, grey, poorly graded, loose, wet, heaving. *(continued)*
21	SANDY GRAVEL, fine to coarse gravel, subrounded to subangular, fine to coarse grained sand, some silt, well graded, grey, medium dense, wet.
22	BEDROCK, dark grey, siltstone, dry, very soft.
	Bottom of hole at 22.6 m.
23	
24	
25	
26	
27	
28	
29	
30	



NOTES
Bolded sample denotes sample analyzed.

QA/QC: MB 2020 06 22 Print Date:2020-12-02

FINAL

SNC·LAVALIN

Client
Teck Coal Limited

Location
Regional Groundwater Monitoring

Borehole No. : EV_BH_MCgwB

PAGE 1 OF 1

Drilling Contractor	Owen's Drilling	Date Monitored	2020 05 19	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1126.643	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1127.601	Date Drilled:	2020 05 07
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5511969.539	Easting: 652963.190	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
☐ Odex

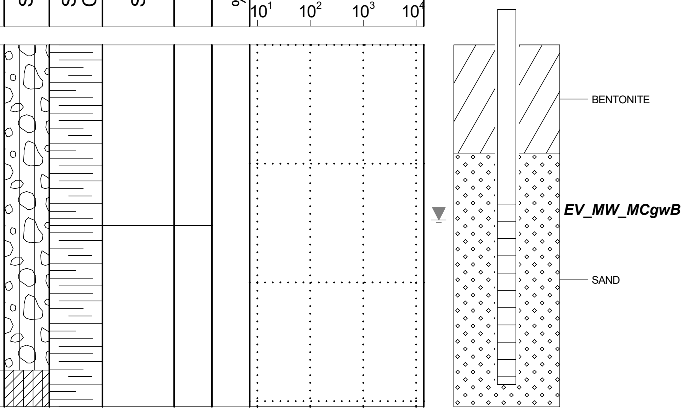
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

☐ Solid PVC
☐ Slotted PVC

Well Name 1: EV_MW_MCgwB

Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm)



SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subangular, some silt, well graded, grey, loose, moist, organics.
At 0.45 m - no organics.

At 2.1 m - wet.

SILT, some clay, grey, soft, medium plastic, damp.

Bottom of hole at 3.1 m.

0 1 2 3 4 5 6 7 8 9 10

NOTES

QA/QC: MB 2020 06 22 Print Date:2020-12-02

DATA ENTRY: IPG

PROJECT No.: 12.1349.0013

RECORD OF BOREHOLE: EV_ER1gwS

SHEET 1 OF 2

LOCATION: See Location Plan

N: 5510955 E: 651374

BORING DATE: October 30, 2013

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○ (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}); WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		Ground Surface		339.85							Stick-up =0.96 m
0	Sonic 127 mm (ID) Casing 152.4 mm (OD) JR Drilling	SAND, medium and coarse-grained with some fine grains, rounded to sub-rounded, moderately graded, dry, very loose	▨	0.00							16 Nov 2013 ∇ Bentonite Chips
7		SAND, medium to coarse-grained, some fine-grained gravel, sub-rounded, sub-angular, moderately sorted, dry, very loose	▨	333.15 6.71							
9		SAND, medium to coarse-grained, some fine-grained gravel, sub-rounded, sub-angular and angular, moderately sorted, wet, very loose	▨	331.32 8.53							
10		*CONTINUED NEXT PAGE*									

BOREHOLE - EXPANDED ADD. LAB TESTING 12.1349.0013 BH LOGS.GPJ CALGARY.GDT 4/8/14

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: RT

CHECKED: CD

DATA ENTRY: IPG

PROJECT No.: 12.1349.0013

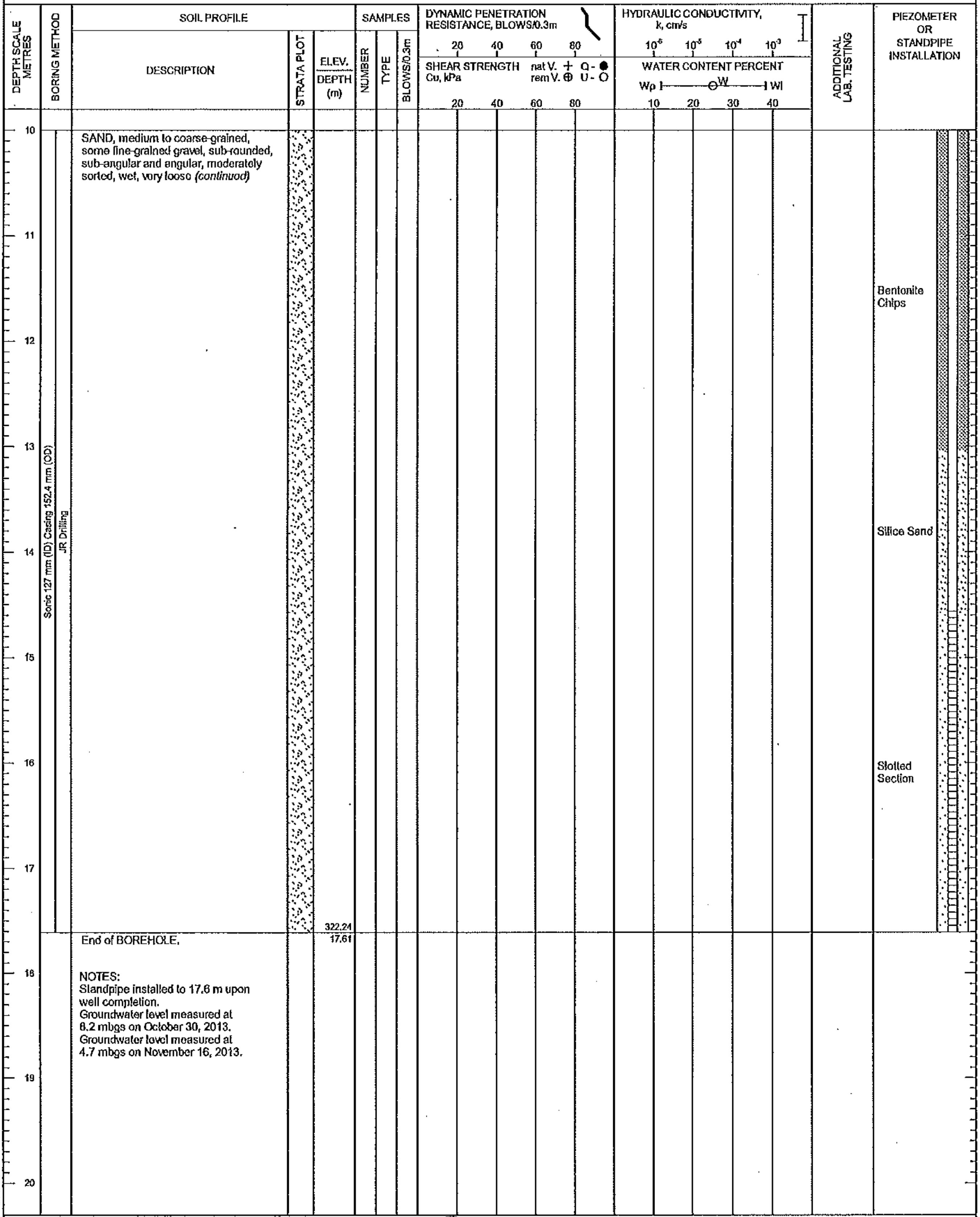
RECORD OF BOREHOLE: EV_ER1gwS

SHEET 2 OF 2

LOCATION: See Location Plan
N: 5510955 E: 651374

BORING DATE: October 30, 2013

DATUM: UTM Zone 11 (Nad 83)



SAND, medium to coarse-grained, some fine-grained gravel, sub-rounded, sub-angular and angular, moderately sorted, wet, very loose *(continued)*

End of BOREHOLE.

NOTES:
Standpipe installed to 17.6 m upon well completion.
Groundwater level measured at 8.2 mbgs on October 30, 2013.
Groundwater level measured at 4.7 mbgs on November 16, 2013.

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: RT
CHECKED: CD

BOREHOLE - EXPANDED ADD. LAB TESTING 12.1349.0013 BH LOGS.GPJ CALGARY.GDT 4/8/14

DATA ENTRY: IPG

PROJECT No.: 12.1349.0013

RECORD OF BOREHOLE: EV_ER1gwD

SHEET 1 OF 4

LOCATION: See Location Plan

N: 5510952 E: 651379

BORING DATE: 29 and 31 October, 2013

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) WATER CONTENT PERCENT (Wp ├──○W──┤ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		Ground Surface		339.85							Stick-up =0.71 m
0	Sonic 127 mm (ID) Casing 152.4 mm (OD) JR Drilling	SILTY SAND, fine-grained with occasional medium grains, rounded to sub-rounded, moderately graded, minor organics (roots), dry, very loose		0.00							
1											
		SAND, medium and coarse-grained, and fine-grained with some coarse-grained GRAVEL, poorly sorted, sub-rounded, sub-angular and angular clasts, dry, very loose		338.33 1.52							
2											
3											
4											16 Nov 2013 ∇
5											Bentonite Chips
6											
7											
8											
9											
				329.95 9.91							
10											

CONTINUED NEXT PAGE

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: RT

CHECKED: CD

PROJECT No.: 12.1349.0013

LOCATION: See Location Plan

N: 5510952 E: 651379

RECORD OF BOREHOLE: EV_ER1gwD

BORING DATE: 29 and 31 October, 2013

SHEET 2 OF 4

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa nat V. + Q- ● rem V. ⊕ U- O (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}); WATER CONTENT PERCENT Wp ⊢—O^W—⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10	Sonic 127 mm (ID) Casing 152.4 mm (OD) JR Drilling	SANDY GRAVEL, fine-grained with some coarse grains, sub-rounded to sub-angular, poorly sorted, wet, very loose *(continued)*									
11											
12											
13											
14											
15											Bentonite Chips
16											
17		SAND, medium to coarse-grained, some fine-grained gravel, angular to sub-angular, moderately sorted, wet, very loose		322.94 16.92							
18											
19											
20											

CONTINUED NEXT PAGE

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: RT

CHECKED: CD

DATA ENTRY: IPG

PROJECT No.: 12.1349.0013

RECORD OF BOREHOLE: EV_ER1gwD

SHEET 3 OF 4

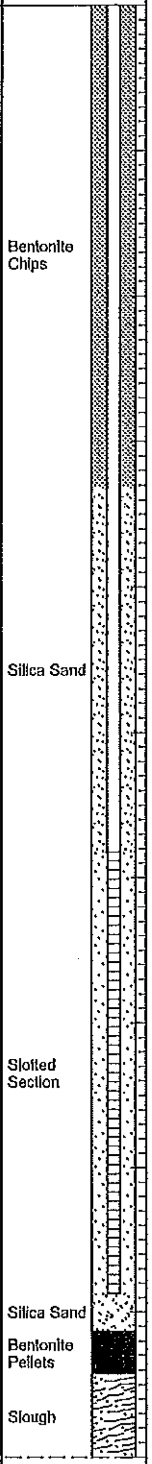
LOCATION: See Location Plan

N: 5510952 E: 651379

BORING DATE: 29 and 31 October, 2013

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○ (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m				
20	Sonic 127 mm (ID) Casing 152.4 mm (OD) JR Drilling	SAND, medium to coarse-grained, some fine-grained gravel, angular to sub-angular, moderately sorted, wet, very loose *(continued)*									
21											Bentonite Chips
22											
23											
24											Silica Sand
25											
26											
27											Slotted Section
28		SILTY SAND, fine to medium-grained, occasional angular gravel, rounded to sub-rounded, moderately graded, dry, very loose (BEDROCK)		311.96 27.89							
29											Silica Sand Bentonite Pellets Slough
30		*CONTINUED NEXT PAGE*									



BOREHOLE - EXPANDED ADD. LAB TESTING 12.1349.0013 BH LOGS.GPJ CALGARY.GDT 4/8/14

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: RT
CHECKED: CD

DATA ENTRY: IPG

PROJECT No.: 12.1349.0013

RECORD OF BOREHOLE: EV_ER1gwD

SHEET 4 OF 4

LOCATION: See Location Plan

N: 5510952 E: 651379

BORING DATE: 29 and 31 October, 2013

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80 SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○ 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3} WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m				
30	JR Drilling	SILTY SAND, fine to medium-grained, occasional angular gravel, rounded to sub-rounded, moderately graded, dry, very loose (BEDROCK) *(continued)*	▨	309.07 30.78							Slough ▨
		End of BOREHOLE.									
31											
		NOTES: Standpipe installed to 28.9 m upon well completion. Groundwater level measured at 4.6 mbgs on November 16, 2013.									
32											
33											
34											
35											
36											
37											
38											
39											
40											

DEPTH SCALE

1 : 50

Golder Associates

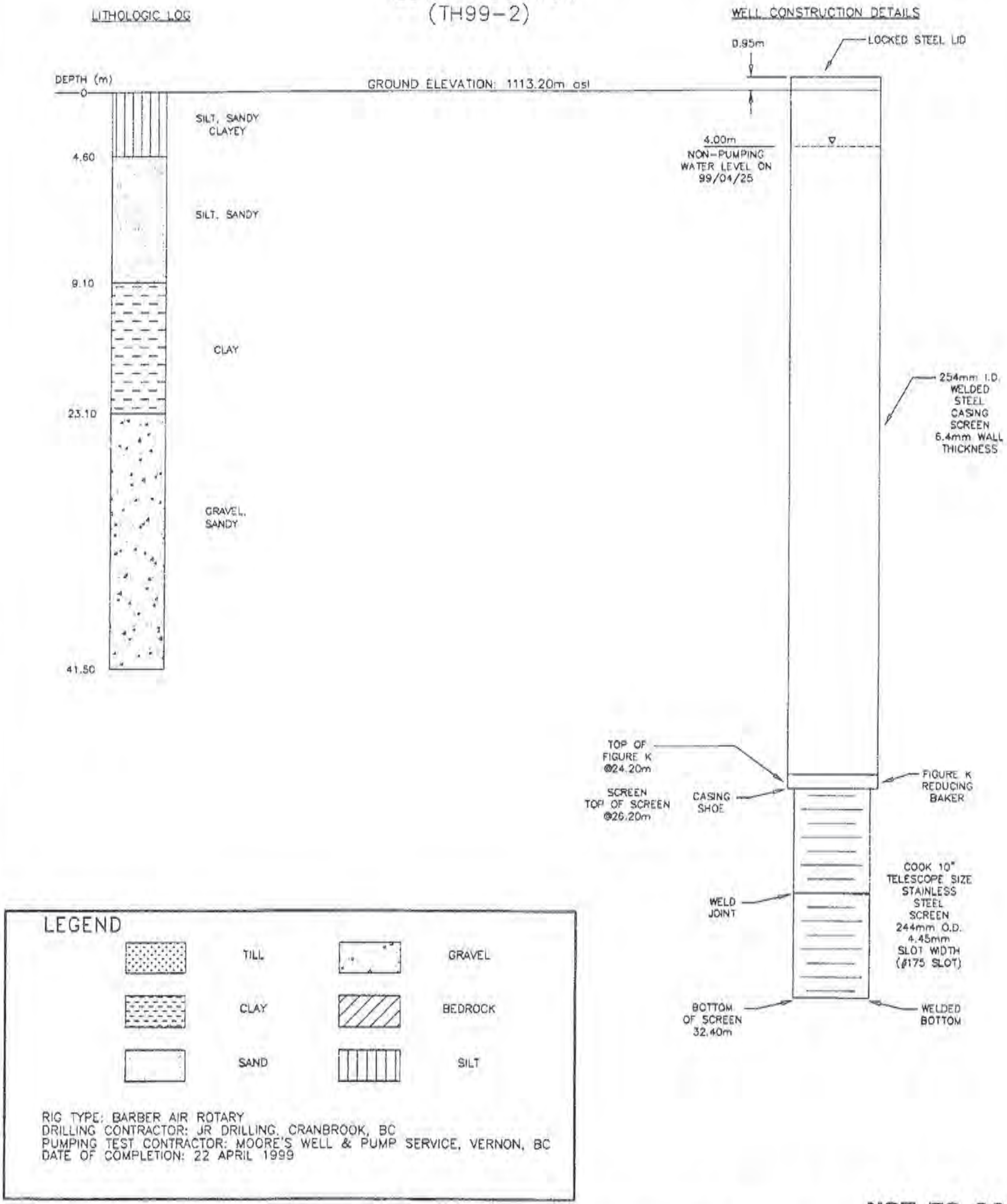
LOGGED: RT

CHECKED: CD

BOREHOLE - EXPANDED ADD. LAB TESTING 12.1349.0013 BH LOGS.GPJ CALGARY.GDT 4/8/14

RG_DW-03-04 (Sparwood Well 3; TH99-2; WTN 77913)

TEST PRODUCTION
(TH99-2)



RIG TYPE: BARBER AIR ROTARY
DRILLING CONTRACTOR: JR DRILLING, CRANBROOK, BC
PUMPING TEST CONTRACTOR: MOORE'S WELL & PUMP SERVICE, VERNON, BC
DATE OF COMPLETION: 22 APRIL 1999

NOT TO SCALE

uma	HYDROGEOLOGICAL EVALUATION OF A NEW TEST WELL DISTRICT OF SPARWOOD, BC	FIG. 3

JOB# 0764-206-00-02

RG_DW-03-04 (Sparwood Well 3;
TH99-2, WTN 77913)

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 77913

Owner: DISTRICT OF SPARWOOD

Address: 425 PINE AVENUE

Area: SPARWOOD

WELL LOCATION:
KOOTENAY Land District
District Lot: Plan: 14652 Lot: 3
Township: Section: Range:
Indian Reserve: Meridian: Block:
Quarter:
Island:
BCGS Number (NAD 83): 082G076231 Well: 4

Class of Well: Water supply
Subclass of Well: Domestic
Orientation of Well:
Status of Well: New
Licence General Status: UNLICENSED
Well Use: Water Supply System
Observation Well Number:
Observation Well Status:
Construction Method:
Diameter: 10 inches
Casing drive shoe:
Well Depth: 106 feet
Elevation: 0 feet (ASL)
Final Casing Stick Up: inches
Well Cap Type:
Bedrock Depth: feet
Lithology Info Flag: N
File Info Flag: N
Sieve Info Flag: N
Screen Info Flag: Y

Site Info Details:
Other Info Flag:
Other Info Details:

Construction Date: 1999-03-23 00:00:00

Driller: J. R. Drilling
Well Identification Plate Number: 16686
Plate Attached By: SONNY SAAD
Where Plate Attached: SOUTH WALL OF PUMP BUILDING

PRODUCTION DATA AT TIME OF DRILLING:
Well Yield: 666 (Driller's Estimate) U.S. Gallons per Minute
Development Method:
Pump Test Info Flag: N
Artesian Flow:
Artesian Pressure (ft):
Static Level: 11 feet

WATER QUALITY:
Character:
Colour:
Odour:
Well Disinfected: N
EMS ID:
Water Chemistry Info Flag:
Field Chemistry Info Flag:
Site Info (SEAM):

Water Utility:
Water Supply System Name: DISTRICT OF SPARWOOD WATER SYSTEM
Water Supply System Well Name: DISTRICT OF SPARWOOD WELL #3

SURFACE SEAL:
Flag: N
Material:
Method:
Depth (ft):
Thickness (in):

WELL CLOSURE INFORMATION:
Reason For Closure:
Method of Closure:
Closure Sealant Material:
Closure Backfill Material:

	Details of Closure:

Screen from	to feet	Type	Slot Size
86	106		17
0	0		0
0	0		0

Casing from	to feet	Diameter	Material	Drive Shoe
null	null	0	null	null

GENERAL REMARKS:
10" WELL TH99-2

LITHOLOGY INFORMATION:

From 0 to 13 Ft. GRAVEL

From 13 to 15 Ft. GRAVEL & SAND

From 15 to 30 Ft. SILT & CLAY

From 30 to 76 Ft. CLAY

From 76 to 78 Ft. GRAVEL & CLAY

From 78 to 136 Ft. GRAVEL

- Return to Main
- Return to Search Options
- Return to Search Criteria

FINAL

SNC•LAVALIN	Client **Teck Coal Limited**	**Borehole No. : RG_BH-03-04**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2020 10 01	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1115.992	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1115.863	Date Drilled:	2020 09 21
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5511207.762	Easting: 651852.976	Log Typed By:	AS

Drilling Legend
- ▨ Sample Interval
- ☰ Odex

Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- Solid PVC
- Slotted PVC

Well Name 1: RG_MW-03-04

Depth in Metres

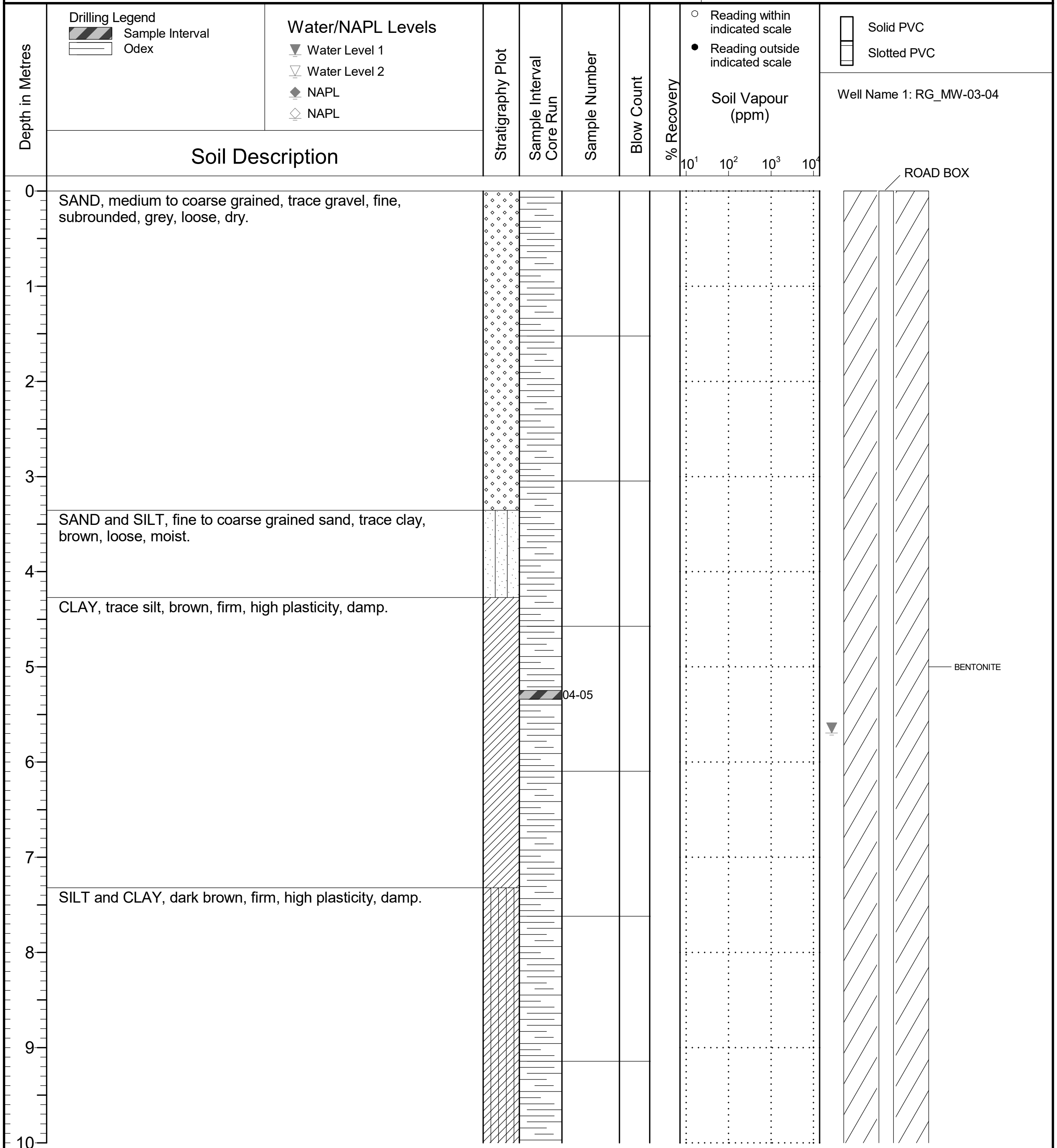
Soil Description

SAND, medium to coarse grained, trace gravel, fine, subrounded, grey, loose, dry.

SAND and SILT, fine to coarse grained sand, trace clay, brown, loose, moist.

CLAY, trace silt, brown, firm, high plasticity, damp.

SILT and CLAY, dark brown, firm, high plasticity, damp.



NOTES
Bolded sample denotes sample analyzed.

QA/QC: LLH 2020 10 19 Print Date:2020-12-02

FINAL

SNC•LAVALIN	Client **Teck Coal Limited**	**Borehole No. : RG_BH-03-04**
	Location **Regional Groundwater Monitoring**	PAGE 2 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2020 10 01	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1115.992	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1115.863	Date Drilled:	2020 09 21
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5511207.762	Easting: 651852.976	Log Typed By:	AS

Drilling Legend
▨ Sample Interval
☰ Odex

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

Depth in Metres

Soil Description

10

SILT and CLAY, dark brown, firm, high plasticity, damp. *(continued)*

11

SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded, trace silt, well graded, brown, medium dense, wet.

12

13

GRAVELLY SAND, fine to coarse grained sand, fine to coarse gravel, subangular to subrounded, some silt, well graded, brown, medium dense, wet.

14

Between 14.6 and 14.9 m - clay.

15

SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded to subangular, some silt, well graded, brown, medium dense, wet.

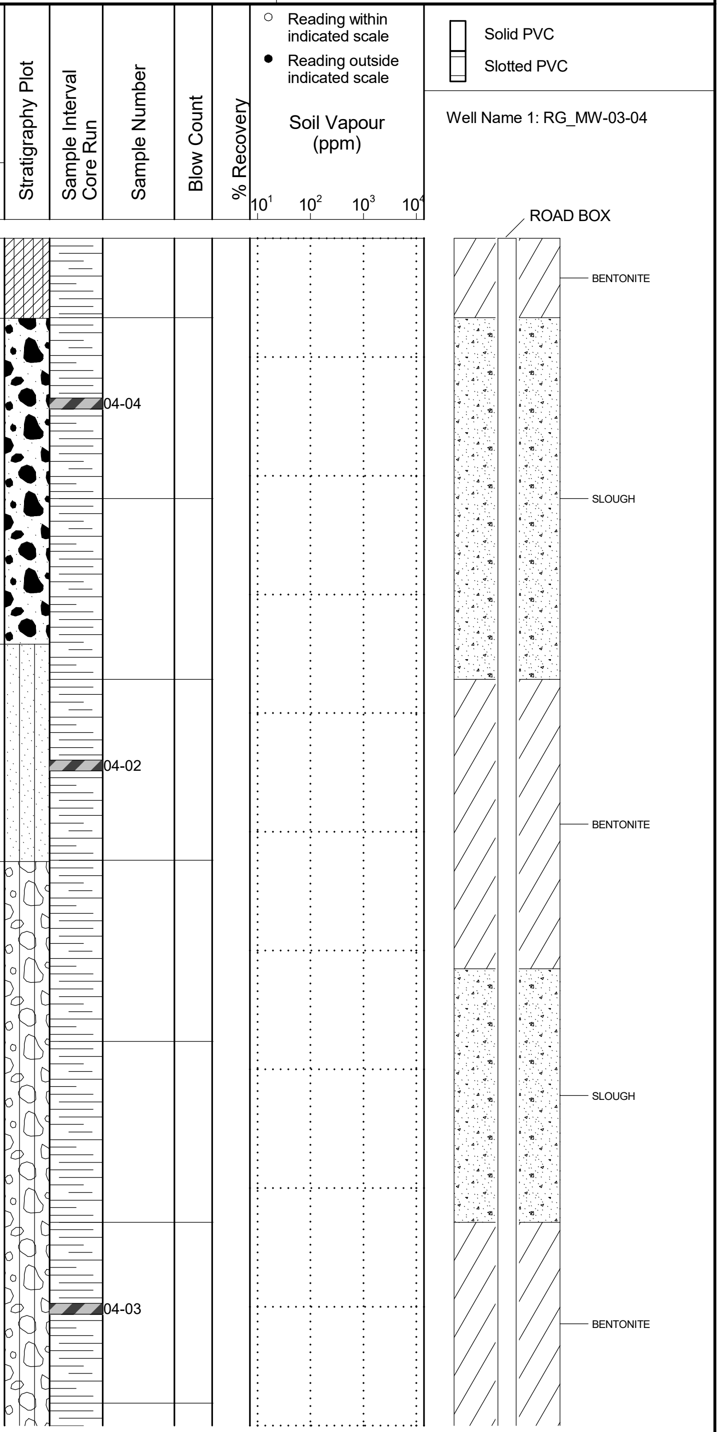
16

17

18

19

20



NOTES
Bolded sample denotes sample analyzed.

QA/QC: LLH 2020 10 19 Print Date:2020-12-02

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : RG_BH-03-04**
	Location **Regional Groundwater Monitoring**	PAGE 3 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2020 10 01	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1115.992	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1115.863	Date Drilled:	2020 09 21
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5511207.762	Easting: 651852.976	Log Typed By:	AS

Drilling Legend
- ▨ Sample Interval
- ☰ Odex

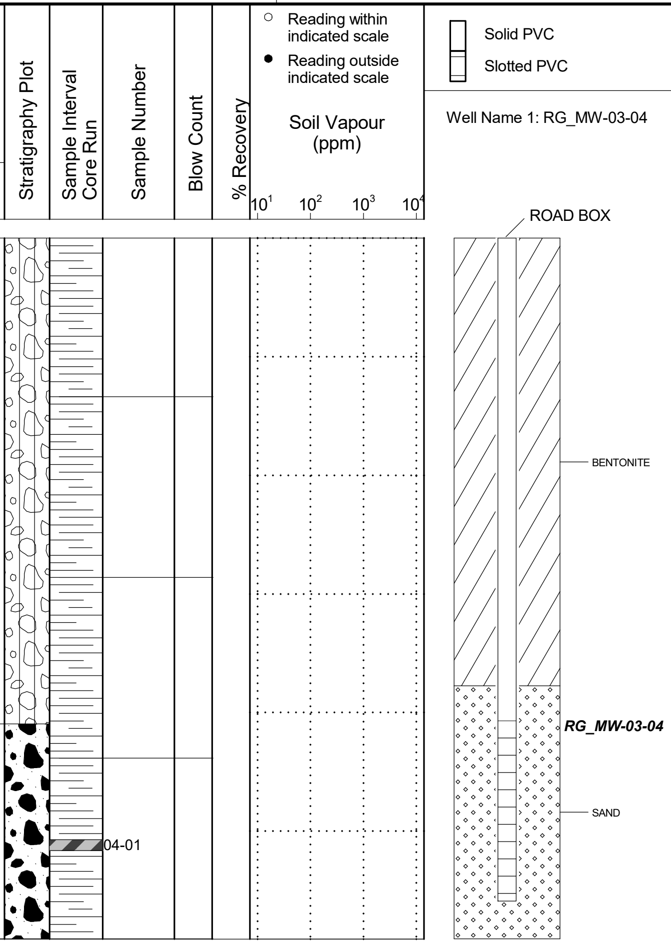
Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- Solid PVC
- Slotted PVC

Well Name 1: RG_MW-03-04

Depth in Metres	Soil Description
20	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded to subangular, some silt, well graded, brown, medium dense, wet. *(continued)*
24	SANDY GRAVEL, fine to coarse gravel, subrounded to subangular, medium to coarse grained sand, trace silt, well graded, containing cobbles, brown, medium dense.
26	Bottom of hole at 25.9 m.



Depth in Metres: 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30

NOTES
Bolded sample denotes sample analyzed.

QA/QC: LLH 2020 10 19 Print Date:2020-12-02

SNC • LAVALIN

Client **Teck Coal Limited**		**Borehole No. : EV_BH_MC3**
Location **Regional Groundwater Monitoring**		PAGE 1 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 08	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1137.925	Borehole Logged By:	RAS
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1138.815	Date Drilled:	2019 01 23
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5510983.197	Easting: 653666.891	Log Typed By:	VL

Drilling Legend

▨ Sample Interval

▼ Air Rotary

Water/NAPL Levels

▼ Water Level 1

▽ Water Level 2

◆ NAPL

◇ NAPL

○ Reading within indicated scale

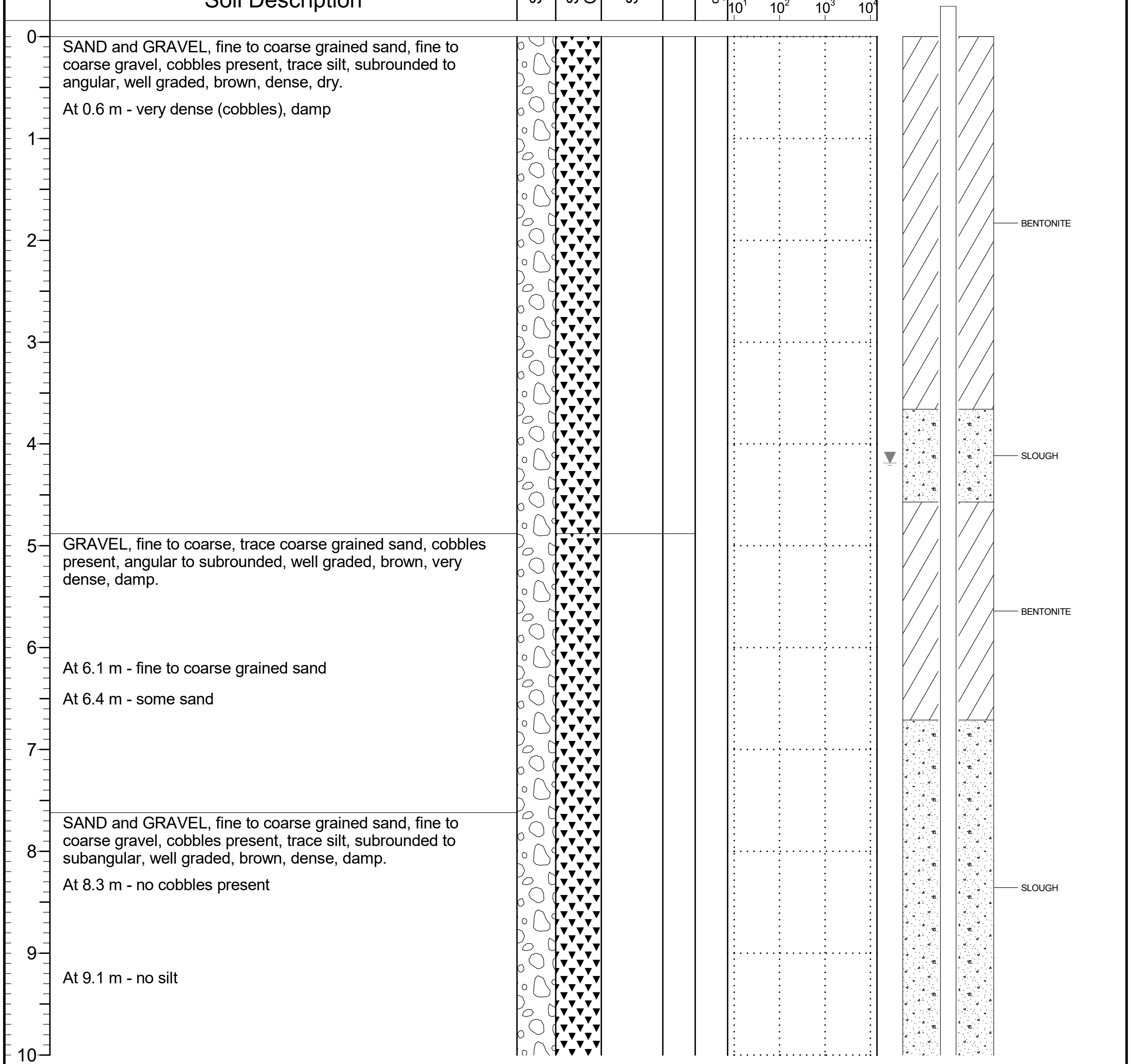
● Reading outside indicated scale

Solid PVC

Slotted PVC

Well Name 1: EV_MW_MC3

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm)



SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, cobbles present, trace silt, subrounded to angular, well graded, brown, dense, dry.

At 0.6 m - very dense (cobbles), damp

GRAVEL, fine to coarse, trace coarse grained sand, cobbles present, angular to subrounded, well graded, brown, very dense, damp.

At 6.1 m - fine to coarse grained sand

At 6.4 m - some sand

SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, cobbles present, trace silt, subrounded to subangular, well graded, brown, dense, damp.

At 8.3 m - no cobbles present

At 9.1 m - no silt

NOTES

QA/QC: BH 2019 04 10 Print Date:2019-09-26

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_MC3**
	Location **Regional Groundwater Monitoring**	PAGE 2 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 08	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1137.925	Borehole Logged By:	RAS
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1138.815	Date Drilled:	2019 01 23
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5510983.197	Easting: 653666.891	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼ Air Rotary

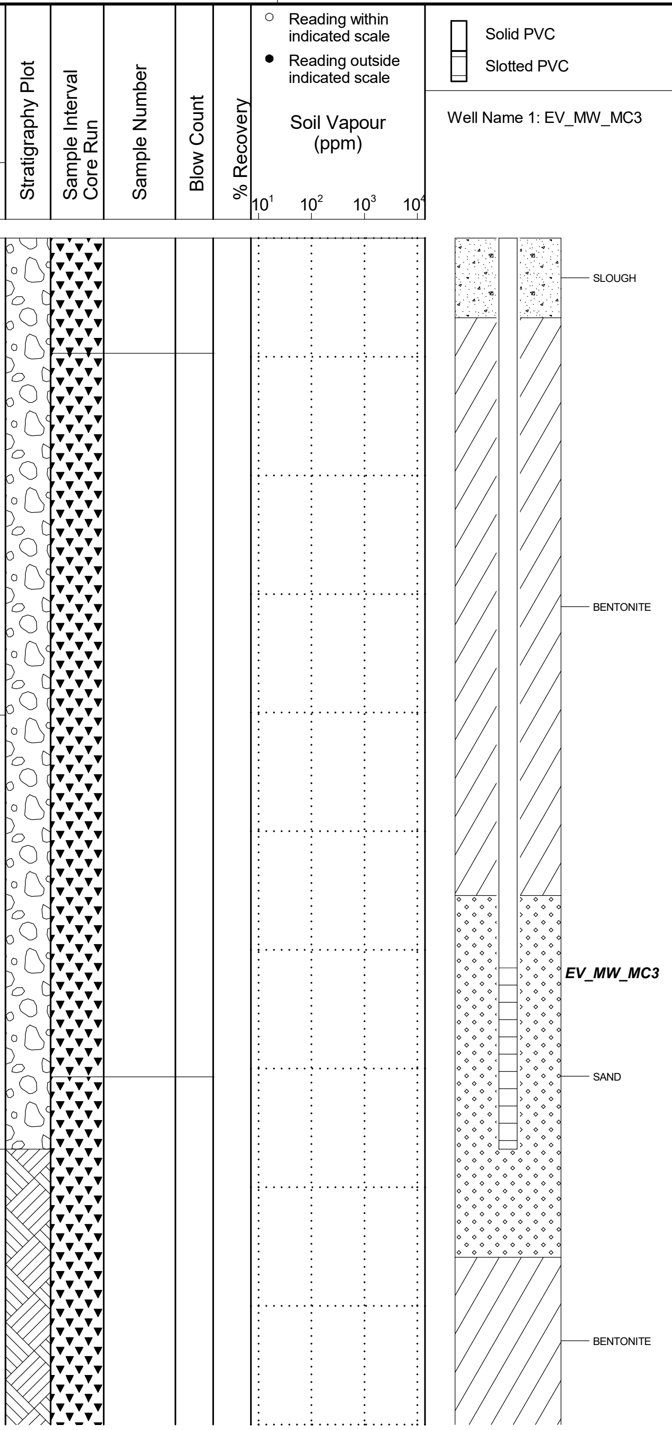
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

▯ Solid PVC
▤ Slotted PVC

Well Name 1: EV_MW_MC3

Depth in Metres	Soil Description
10	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, cobbles present, trace silt, subrounded to subangular, well graded, brown, dense, damp. *(continued)* At 10.1 m - some silt, moist
11	
12	
13	
14	GRAVEL, fine to coarse, some silt, trace fine to coarse grained sand, angular to subrounded, well graded, brown, dense, moist.
15	
16	At 16.5 m - wet
17	
18	BEDROCK, hard.
19	
20	



NOTES

SNC·LAVALIN

Client **Teck Coal Limited**		**Borehole No. : EV_BH_MC3**
Location **Regional Groundwater Monitoring**		PAGE 3 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 08	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1137.925	Borehole Logged By:	RAS
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1138.815	Date Drilled:	2019 01 23
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5510983.197	Easting: 653666.891	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼ Air Rotary

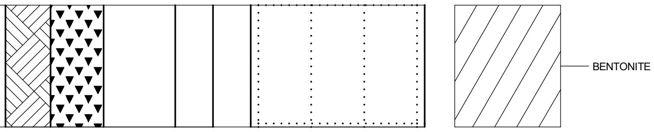
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

☐ Solid PVC
☐ Slotted PVC

Well Name 1: EV_MW_MC3

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm) 10^1 10^2 10^3 10^4
20	BEDROCK, hard. *(continued)*						
21	Bottom of hole at 21.0 m.						
22							
23							
24							
25							
26							
27							
28							
29							
30							



NOTES

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_GT1**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 7

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1156.515	Borehole Logged By:	AMH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1157.442 1157.457	Date Drilled:	2019 01 17
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5509290.376	Easting: 655651.100	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ▼▼▼ Air Rotary

Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- Solid PVC
- Slotted PVC

Well Name 1: EV_MW_GT1-A
Well Name 2: EV_MW_GT1-B

Depth in Metres

Soil Description

FILL, coal and shale boulders, angular, black, dry.

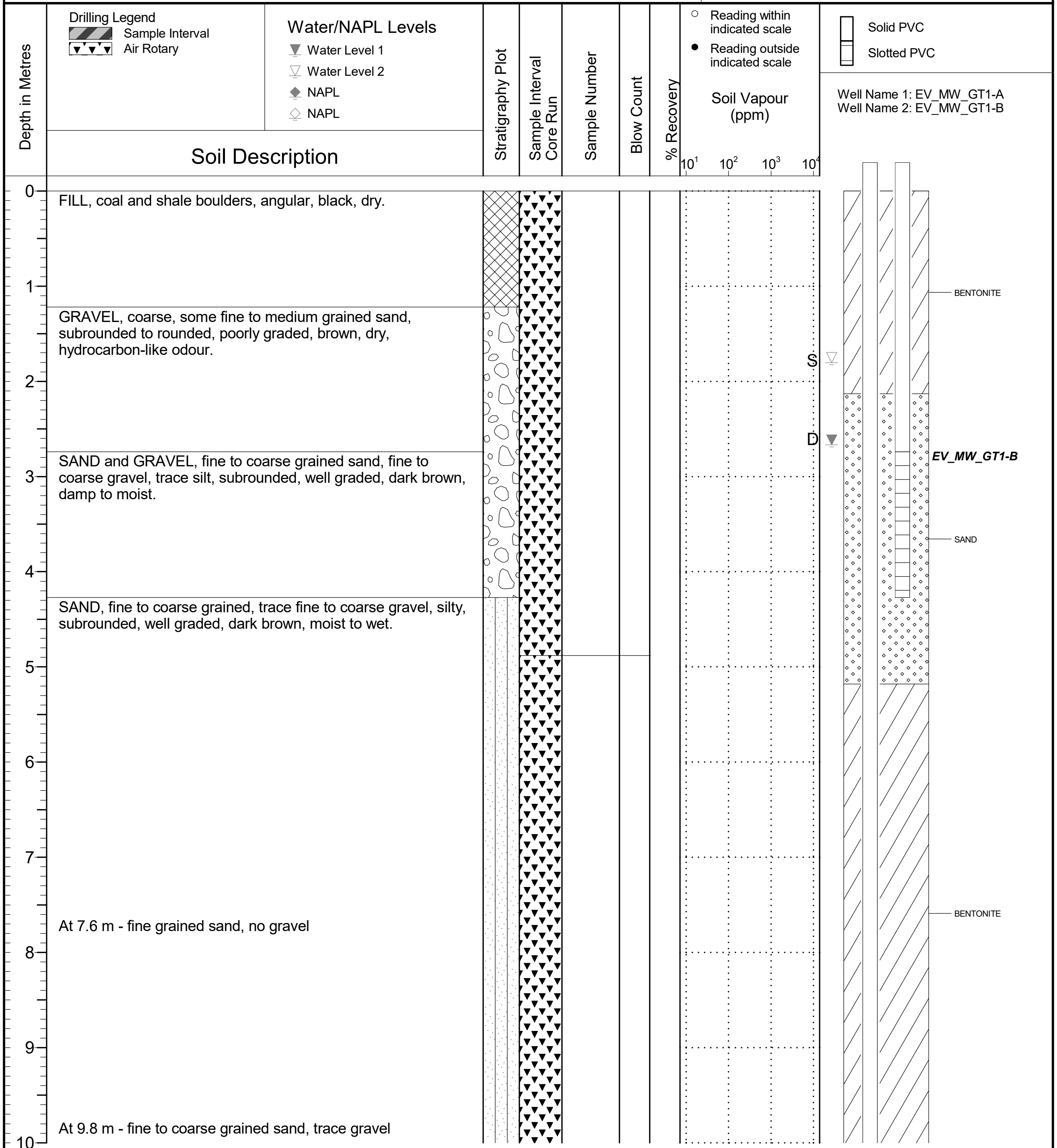
GRAVEL, coarse, some fine to medium grained sand, subrounded to rounded, poorly graded, brown, dry, hydrocarbon-like odour.

SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, trace silt, subrounded, well graded, dark brown, damp to moist.

SAND, fine to coarse grained, trace fine to coarse gravel, silty, subrounded, well graded, dark brown, moist to wet.

At 7.6 m - fine grained sand, no gravel

At 9.8 m - fine to coarse grained sand, trace gravel



NOTES
Tar was being stored in area at time of drilling.

QA/QC: BH 2019 04 10 Print Date:2019-09-26

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_GT1**
	Location **Regional Groundwater Monitoring**	PAGE 2 OF 7

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1156.515	Borehole Logged By:	AMH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1157.442 1157.457	Date Drilled:	2019 01 17
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5509290.376	Easting: 655651.100	Log Typed By:	VL

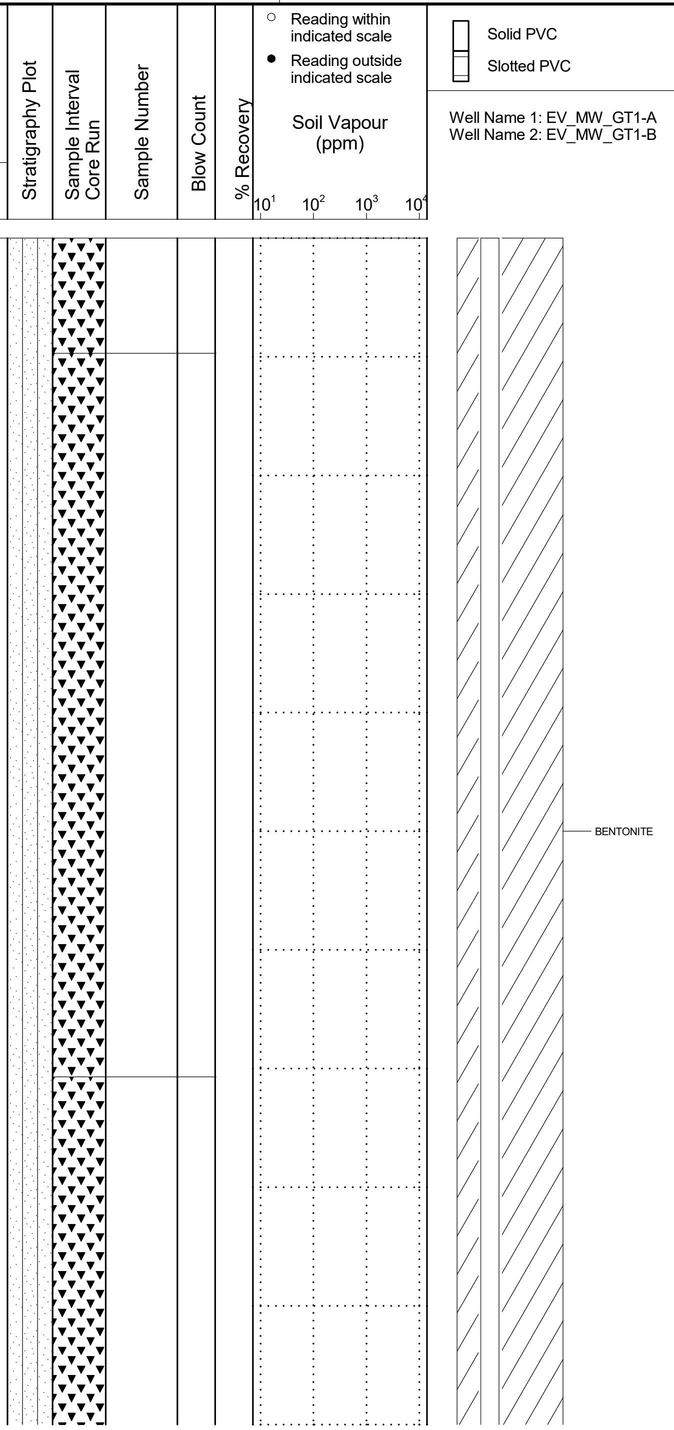
Drilling Legend
▨ Sample Interval
▼ Air Rotary

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

Depth in Metres

Soil Description

Depth in Metres	Soil Description
10	SAND, fine to coarse grained, trace fine to coarse gravel, silty, subrounded, well graded, dark brown, moist to wet. *(continued)*
19.5	At 19.5 m - fine grained sand and silt, wet
20	



Well Name 1: EV_MW_GT1-A
Well Name 2: EV_MW_GT1-B

NOTES
Tar was being stored in area at time of drilling.

Client **Teck Coal Limited**	**Borehole No. : EV_BH_GT1**
Location **Regional Groundwater Monitoring**	PAGE 3 OF 7

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1156.515	Borehole Logged By:	AMH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1157.442 1157.457	Date Drilled:	2019 01 17
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5509290.376	Easting: 655651.100	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼▼▼ Air Rotary

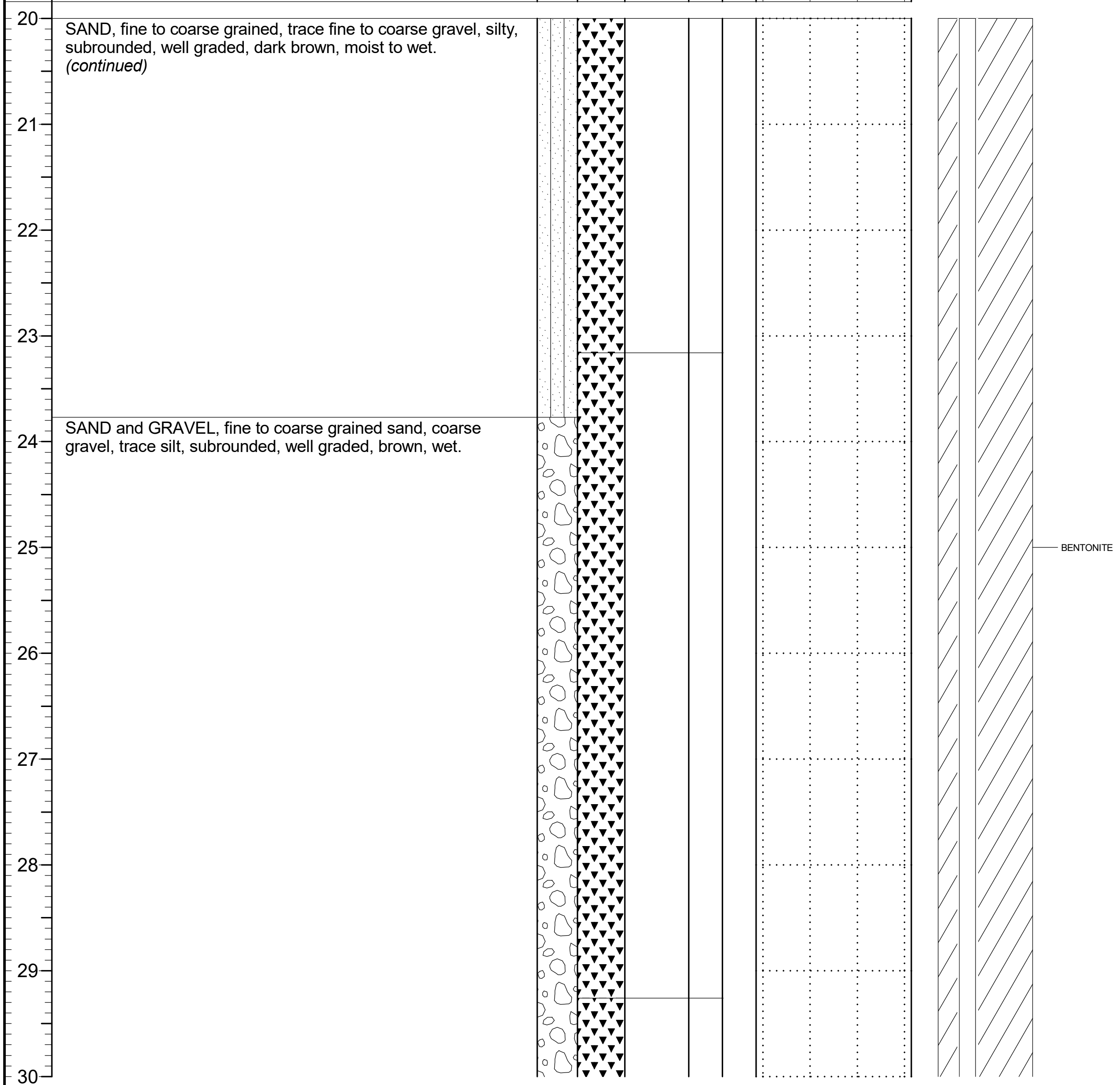
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

▯ Solid PVC
▯ Slotted PVC

Well Name 1: EV_MW_GT1-A
Well Name 2: EV_MW_GT1-B

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm) 10^1 10^2 10^3 10^4



SAND, fine to coarse grained, trace fine to coarse gravel, silty, subrounded, well graded, dark brown, moist to wet. *(continued)*

SAND and GRAVEL, fine to coarse grained sand, coarse gravel, trace silt, subrounded, well graded, brown, wet.

NOTES
Tar was being stored in area at time of drilling.

SNC·LAVALIN

Client
Teck Coal Limited

Location
Regional Groundwater Monitoring

Borehole No. : EV_BH_GT1

PAGE 4 OF 7

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1156.515	Borehole Logged By:	AMH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1157.442 1157.457	Date Drilled:	2019 01 17
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5509290.376	Easting: 655651.100	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼ Air Rotary

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

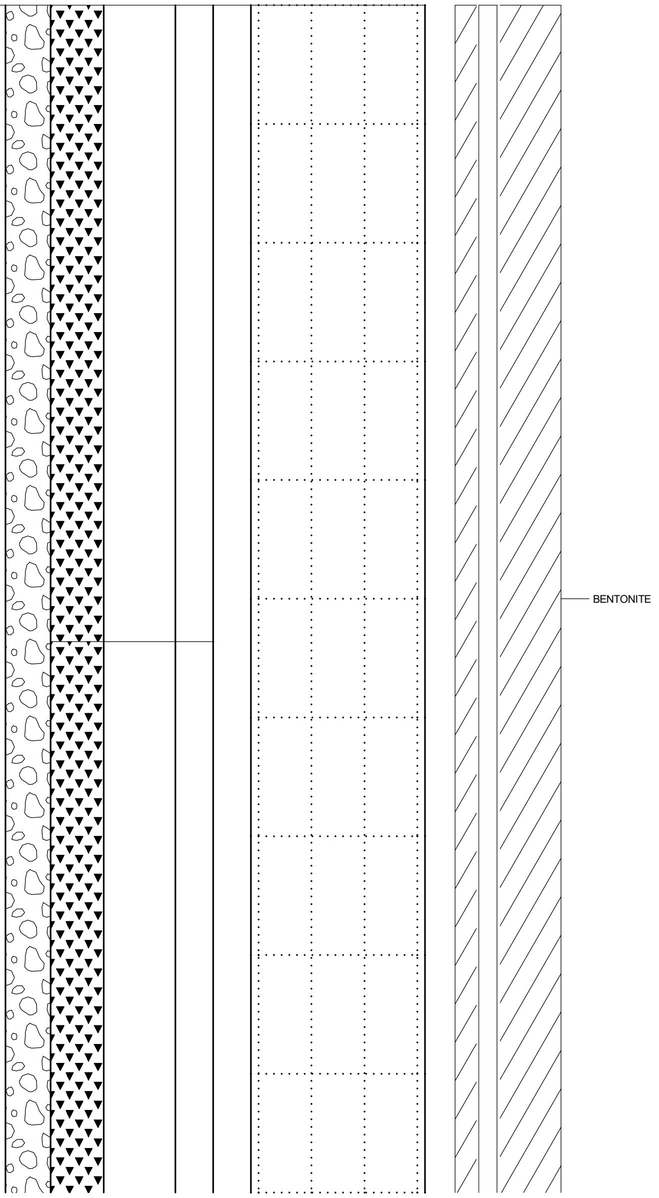
☐ Solid PVC
☐ Slotted PVC

Well Name 1: EV_MW_GT1-A
Well Name 2: EV_MW_GT1-B

Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) 10^1 10^2 10^3 10^4

30 — SAND and GRAVEL, fine to coarse grained sand, coarse gravel, trace silt, subrounded, well graded, brown, wet. *(continued)*
At 30.5 m - medium to coarse grained sand, no silt, subrounded to rounded

At 37.2 m - fine grained sand, some silt



Depth scale: 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40

NOTES
Tar was being stored in area at time of drilling.

SNC·LAVALIN

Client **Teck Coal Limited**	**Borehole No. : EV_BH_GT1**	
Location **Regional Groundwater Monitoring**	PAGE 5 OF 7	

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1156.515	Borehole Logged By:	AMH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1157.442 1157.457	Date Drilled:	2019 01 17
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5509290.376	Easting: 655651.100	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼ Air Rotary

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: EV_MW_GT1-A
Well Name 2: EV_MW_GT1-B

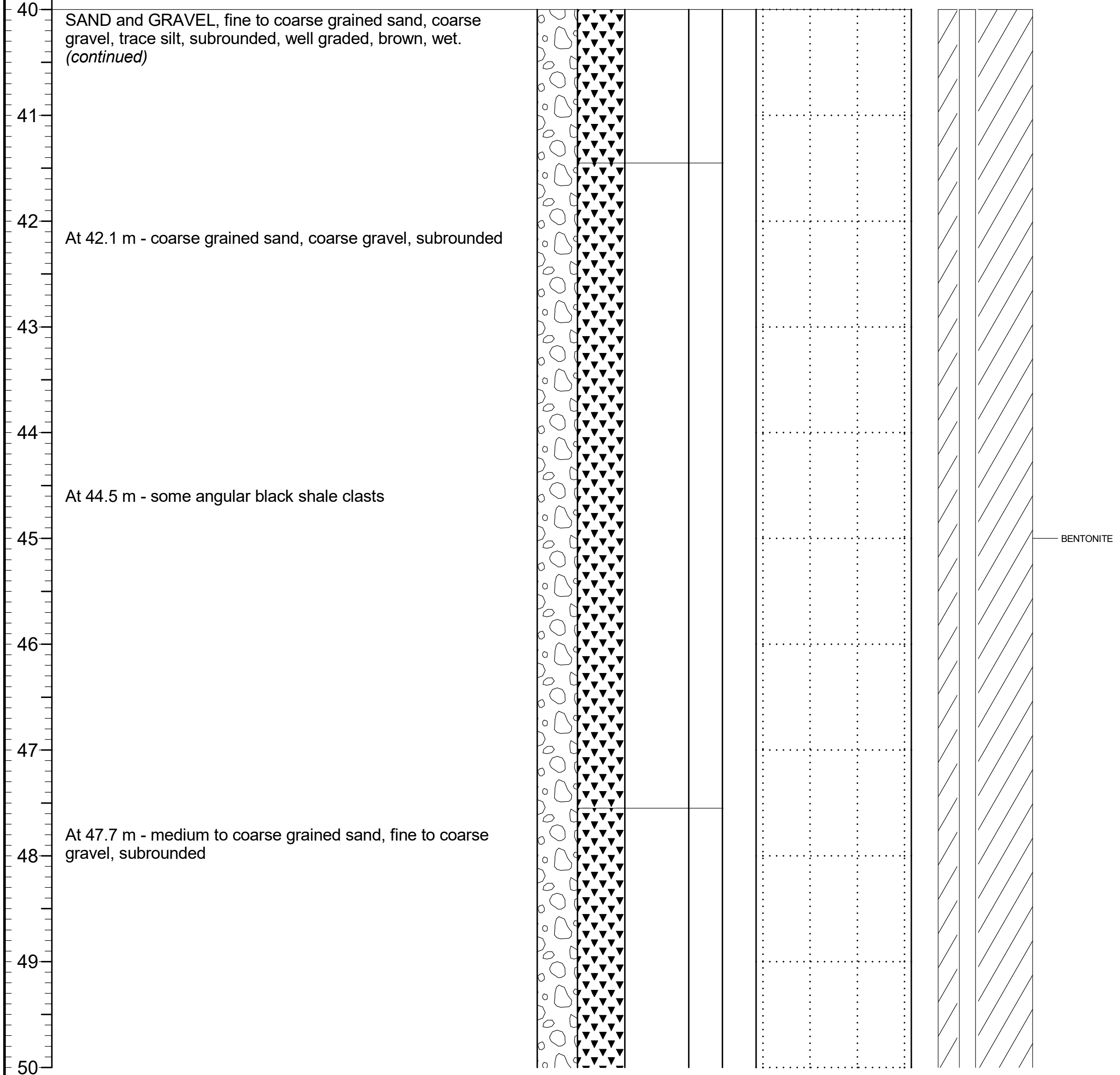
Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) 10^1 10^2 10^3 10^4

40 SAND and GRAVEL, fine to coarse grained sand, coarse gravel, trace silt, subrounded, well graded, brown, wet. *(continued)*

42 At 42.1 m - coarse grained sand, coarse gravel, subrounded

44 At 44.5 m - some angular black shale clasts

47 At 47.7 m - medium to coarse grained sand, fine to coarse gravel, subrounded



NOTES
Tar was being stored in area at time of drilling.

QA/QC: BH 2019 04 10 Print Date:2019-09-26

SNC•LAVALIN

Client **Teck Coal Limited**		**Borehole No. : EV_BH_GT1**
Location **Regional Groundwater Monitoring**		PAGE 6 OF 7

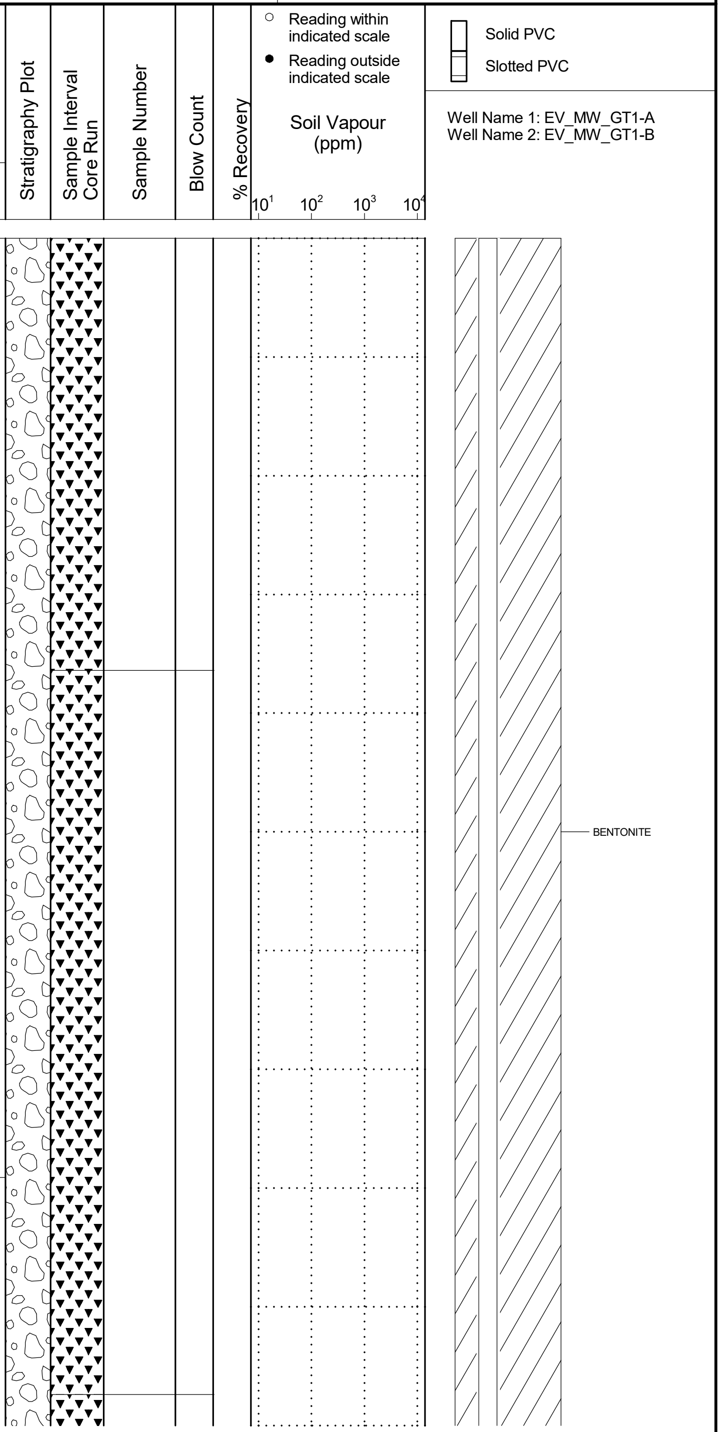
Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1156.515	Borehole Logged By:	AMH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1157.442 1157.457	Date Drilled:	2019 01 17
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5509290.376	Easting: 655651.100	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼ Air Rotary

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

Depth in Metres

Soil Description



Well Name 1: EV_MW_GT1-A
Well Name 2: EV_MW_GT1-B

50 SAND and GRAVEL, fine to coarse grained sand, coarse gravel, trace silt, subrounded, well graded, brown, wet. *(continued)*

51

52

53

54

55

56

57

58 GRAVEL, coarse, some coarse grained sand, poorly graded, grey.

59

60

NOTES
Tar was being stored in area at time of drilling.

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_GT1**
	Location **Regional Groundwater Monitoring**	PAGE 7 OF 7

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1156.515	Borehole Logged By:	AMH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1157.442 1157.457	Date Drilled:	2019 01 17
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5509290.376	Easting: 655651.100	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼ Air Rotary

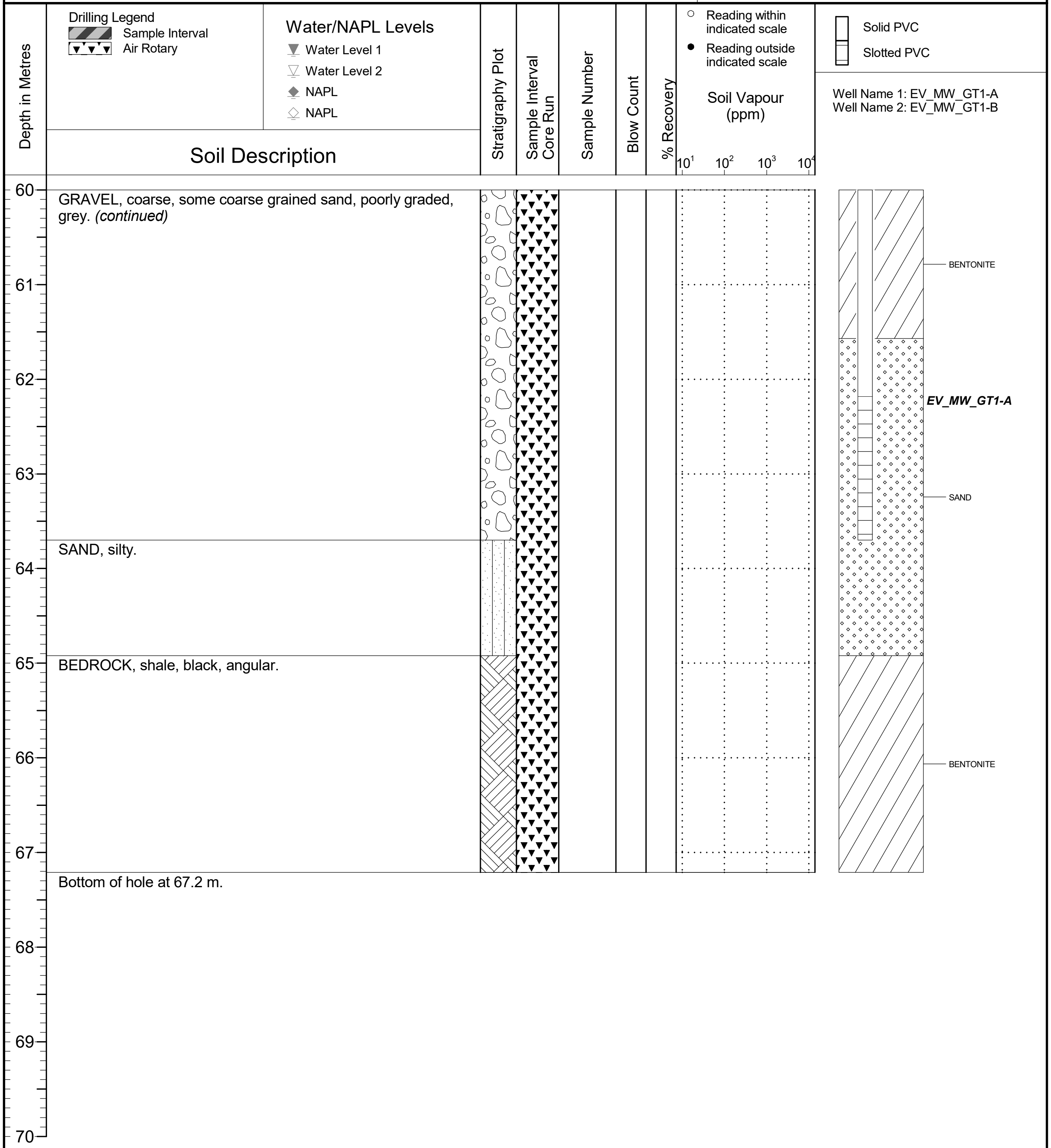
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: EV_MW_GT1-A
Well Name 2: EV_MW_GT1-B

Depth in Metres	Soil Description
60	GRAVEL, coarse, some coarse grained sand, poorly graded, grey. *(continued)*
63.7	SAND, silty.
65	BEDROCK, shale, black, angular.
67.2	Bottom of hole at 67.2 m.



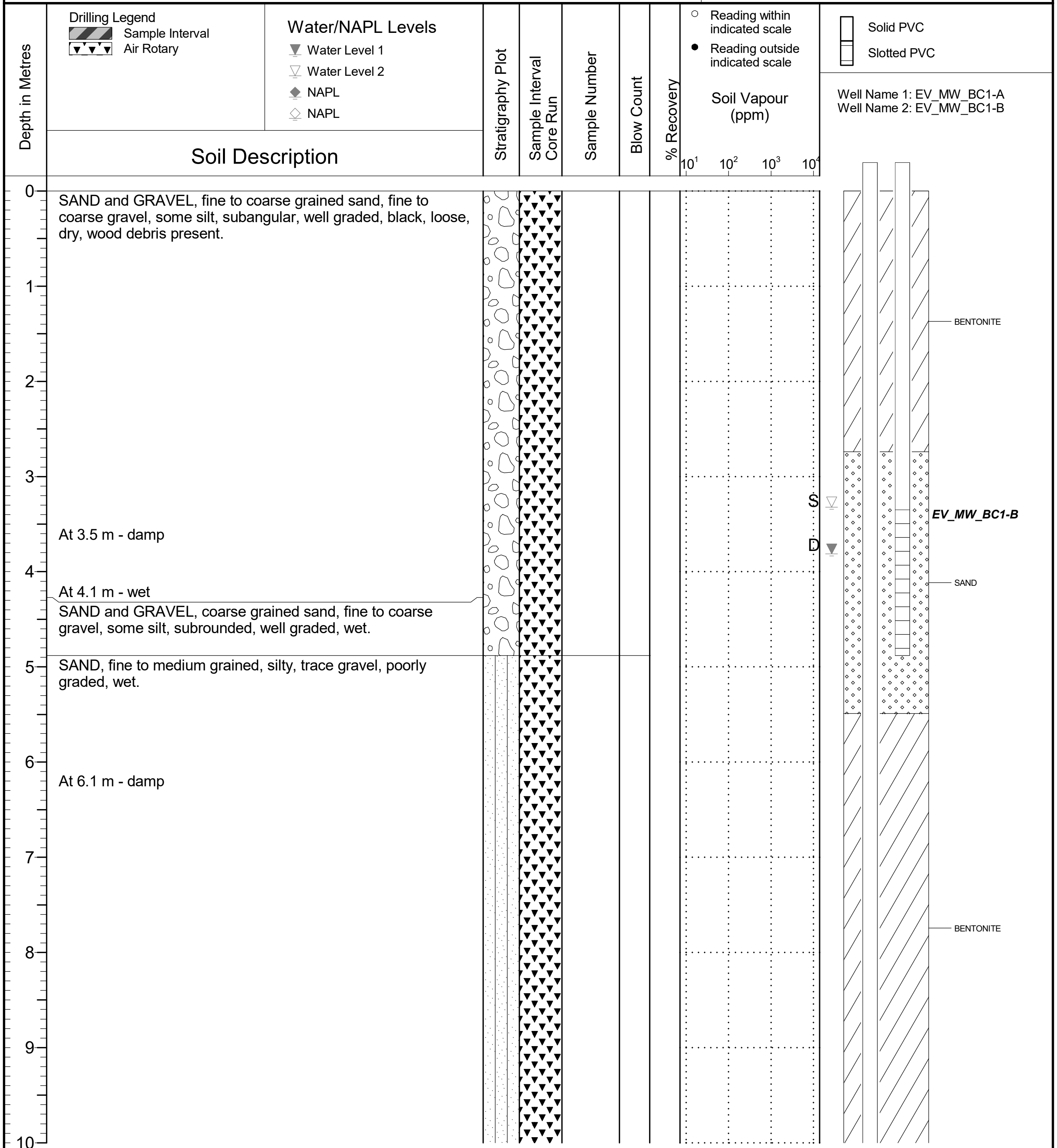
NOTES
Tar was being stored in area at time of drilling.

QA/QC: BH 2019 04 10 Print Date:2019-09-26

SNC·LAVALIN

Client **Teck Coal Limited**		**Borehole No. : EV_BH_BC1**
Location **Regional Groundwater Monitoring**		PAGE 1 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1156.271	Borehole Logged By:	AMH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1157.085 1157.090	Date Drilled:	2019 01 15
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5509503.141	Easting: 655664.927	Log Typed By:	VL



SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, some silt, subangular, well graded, black, loose, dry, wood debris present.

At 3.5 m - damp

At 4.1 m - wet

SAND and GRAVEL, coarse grained sand, fine to coarse gravel, some silt, subrounded, well graded, wet.

SAND, fine to medium grained, silty, trace gravel, poorly graded, wet.

At 6.1 m - damp

NOTES

QA/QC: BH 2019 04 10 Print Date:2019-09-26

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_BC1**
	Location **Regional Groundwater Monitoring**	PAGE 2 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1156.271	Borehole Logged By:	AMH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1157.085 1157.090	Date Drilled:	2019 01 15
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5509503.141	Easting: 655664.927	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼ Air Rotary

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

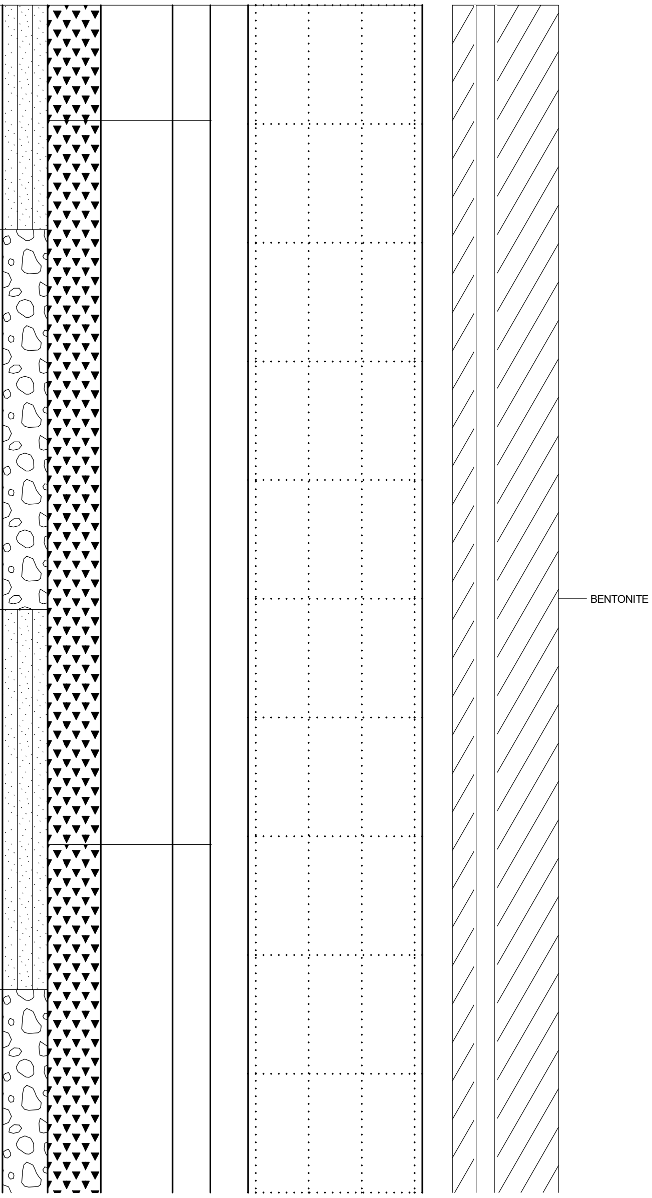
○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: EV_MW_BC1-A
Well Name 2: EV_MW_BC1-B

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm) 10^1 10^2 10^3 10^4
10	SAND, fine to medium grained, silty, trace gravel, poorly graded, wet. *(continued)*						
11.9	GRAVEL, fine to coarse, subangular, some silt, well graded, loose, wet.						
15.1	SAND, fine to medium grained, silty, trace gravel, poorly graded, damp.						
18.3	SAND and GRAVEL, fine to medium grained sand, fine to coarse gravel, some silt, subrounded to rounded, well graded, orange-brown, wet.						

Depth scale: 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20



NOTES

QA/QC: BH 2019 04 10 Print Date:2019-09-26

SNC • LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_BC1**
	Location **Regional Groundwater Monitoring**	PAGE 3 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1156.271	Borehole Logged By:	AMH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1157.085 1157.090	Date Drilled:	2019 01 15
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5509503.141	Easting: 655664.927	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ▼▼▼ Air Rotary

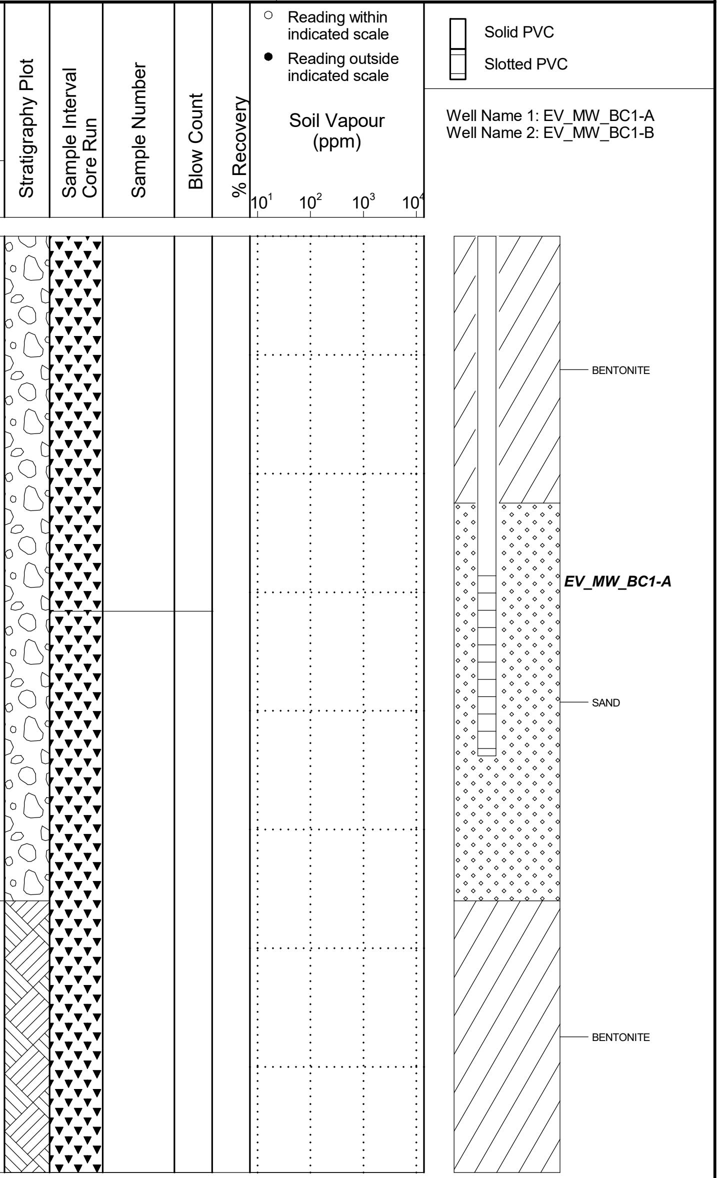
Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- ▯ Solid PVC
- ▤ Slotted PVC

Well Name 1: EV_MW_BC1-A
Well Name 2: EV_MW_BC1-B

Depth in Metres	Soil Description
20	SAND and GRAVEL, fine to medium grained sand, fine to coarse gravel, some silt, subrounded to rounded, well graded, orange-brown, wet. *(continued)*
21.8	At 21.8 m - dark brown
25.6	BEDROCK.
27.9	Bottom of hole at 27.9 m.



NOTES

QA/QC: BH 2019 04 10 Print Date:2019-09-26

EV_RCSgw

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PROJECT No.: 12.1349.0013

RECORD OF BOREHOLE: EV_BCgw

SHEET 1 OF 3

LOCATION: See Location Plan

N: 5509659 E: 655381

BORING DATE: October 22, 2013

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80; SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - O 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3}; WATER CONTENT PERCENT Wp ⊢—OW—⊣ Wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		Ground Surface		353.26							Stick-up =0.86 m
0	Sonic 127 mm (ID) Casing 152.4 mm (OD) JR Drilling	SANDY GRAVEL, fine-grained with occasional coarse grains, rounded to sub-rounded, moderately graded, dry, very loose		0.00							
1				351.74 1.52							
2		GRAVEL, trace sand, fine-grained with occasional coarse grains, rounded to sub-rounded, poorly graded, very loose — Moist at 2.1 m									12 Nov 2013 ∇
3											
4											
5											Bentonite Chips
6		Silty SANDY GRAVEL, fine-grained with occasional coarse grains, sub-rounded to sub-angular, poorly graded, wet, very loose		347.17 6.10							
7											
8											
9				343.51 9.75							
10											

CONTINUED NEXT PAGE

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: RT

CHECKED: CD

DATA ENTRY: JPG

PROJECT No.: 12.1349.0013

RECORD OF BOREHOLE: EV_BCgw

SHEET 2 OF 3

LOCATION: See Location Plan

N: 5509659 E: 655381

BORING DATE: October 22, 2013

DATUM: UTM Zone 11
(Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○ (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}); WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10	Sonic 127 mm (ID) Casing 152.4 mm (OD) JR Drilling	GRAVEL, some sand, trace silt, fine-grained, sub-angular to angular, poorly graded, wet, very loose *(continued)*									
11											
12											
13											Bentonite Chips
14											
15		— Occasional coarse grains from 15.2 m									
16											
17											Silica Sand
18											
19											Slotted Section
20		*CONTINUED NEXT PAGE*									

BOREHOLE - EXPANDED ADD. LAB TESTING 12.1349.0013 BH LOGS.GPJ CALGARY.GDT 4/8/14

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: RT
CHECKED: CD

PROJECT No.: 12.1349.0013

RECORD OF BOREHOLE: EV_BCgw

SHEET 3 OF 3

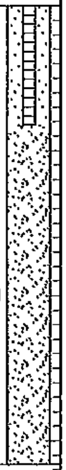
LOCATION: See Location Plan

N: 5509659 E: 655381

BORING DATE: October 22, 2013

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20, 40, 60, 80); SHEAR STRENGTH Cu, kPa nat V. + Q- ● rem V. ⊕ U- ○ (20, 40, 60, 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6}, 10^{-5}, 10^{-4}, 10^{-3}); WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10, 20, 30, 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
20	Sonic 127 mm (ID) Casing 152.4 mm (OD) JR Drilling	GRAVEL, some sand, trace silt, fine-grained, sub-angular to angular, poorly graded, wet, very loose *(continued)*								Slotted Section
21										
22			331.17							Silica Sand
		Sandy SILTY GRAVEL, fine-grained, sub-angular to angular, poorly graded, wet, very loose	22.10							
23			330.10 [illegible]							
		End of BOREHOLE. NOTES: Standpipe installed to 20.7 m upon well completion. Groundwater level measured at 2.4 mbgs on October 23, 2013. Groundwater level measured at 2.2 mbgs on November 12, 2013.								
24										
25										
26										
27										
28										
29										
30										



DEPTH SCALE
1 : 50

Golder Associates

LOGGED: RT
CHECKED: CD

BRITISH COLUMBIA

Groundwater Wells and Aquifers

Well Summary EV_BCgw

Well Tag Number: 123143
Well Identification Plate Number: 61736
Owner Name: Teck Coal Limited Elkview Operations
Intended Water Use: Commercial and Industrial
Artesian Condition: No

Well Status: New
Well Class: Water Supply
Well Subclass: Not Applicable
Aquifer Number:
Technical Report: N/A

Observation Well Number:
Observation Well Status:
Environmental Monitoring System (EMS) ID:
Alternative specs submitted: No

Licensing Information

Licensed Status: Unlicensed

Licence Number:

Location Information

Street Address:
Town/City:

Legal Description:

Lot	
Plan	
District Lot	
Block	
Section	
Township	
Range	
Land District	
Property Identification Description (PID)	012953377

Description of Well Location: NE of Bus Shop, Elkview Operations

MapBox | Government of British Columbia, DataBC, GeoBC

Geographic Coordinates - North American Datum of 1983 (NAD 83)

Latitude: 49.7243
UTM Easting: 655051
Zone: 11

Longitude: -114.8487
UTM Northing: 5510199
Coordinate Acquisition Code: (10 m accuracy) ICF cadastre and good location sketch

Well Activity

Activity	Work Start Date	Work End Date	Drilling Company	Date Entered
Construction report	1995-08-31	1995-08-31		July 13th 2021 at 3:08 PM

Well Work Dates

Start Date of Construction	End Date of Construction	Start Date of Alteration	End Date of Alteration	Start Date of Decommission	End Date of Decommission

Well Completion Data

Total Depth Drilled:
Finished Well Depth: 35 ft bgl
Final Casing Stick Up:
Depth to Bedrock:
Ground elevation:

Estimated Well Yield:
Well Cap:
Well Disinfected Status:
Drilling Method:
Method of determining elevation:

Static Water Level (BTOC):
Artesian Flow:
Artesian Pressure (head):
Artesian Pressure (PSI):
Orientation of Well:

Lithology

From (ft bgl)	To (ft bgl)	Raw Data	Description	Moisture	Colour	Hardness	Observations	Water Bearing Flow Estimate (USGPM)
There are no records to show								

Casing Details

From (ft bgl)	To (ft bgl)	Casing Type	Casing Material	Diameter (in)	Wall Thickness (in)	Drive Shoe
				6		

Surface Seal and Backfill Details

Surface Seal Material:
Surface Seal Installation Method:
Surface Seal Thickness:
Surface Seal Depth:

Backfill Material Above Surface Seal:
Backfill Depth:

Liner Details

Liner Material:
Liner Diameter:
Liner from:

Liner Thickness:
Liner to:

Liner perforations

From (ft bgl)	To (ft bgl)
There are no records to show	

Screen Details

Intake Method:
Type:
Material:
Opening:
Bottom:

Installed Screens

From (ft bgl)	To (ft bgl)	Diameter (in)	Assembly Type	Slot Size
There are no records to show				

Well Development

Developed by:

Development Total Duration:

Well Yield

Estimation Method:
Static Water Level Before Test:
Hydrofracturing Performed: No

Estimation Rate:
Drawdown:
Increase in Yield Due to Hydrofracturing:

Estimation Duration:

Well Decommission Information

Reason for Decommission:
Sealant Material:
Decommission Details:

Method of Decommission:
Backfill Material:

Comments

Drilling date is unknown, but it is before August 31, 1995; Well record x-ref'd and associated with GW license application; specific well use = Camps & Public Facilities (toilets, showers, sinks), Vehicle and Equipment (washing equipment); alternate coordinates = 49.72441, 114.8491

Documents

- WTN 123143 __ Map.pdf

Disclaimer

EV_WH50gw

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Well Summary EV_WH50gw

Well Tag Number: 123144
Well Identification Plate Number: 17834
Owner Name: Teck Coal Limited - Elkview Operations
Intended Water Use: Commercial and Industrial
Artesian Condition: No

Well Status: New
Well Class: Water Supply
Well Subclass: Not Applicable

Aquifer Number:
Technical Report: N/A

Observation Well Number:
Observation Well Status:
Environmental Monitoring System (EMS) ID:

Alternative specs submitted: No

Licensing Information

Licensed Status: Unlicensed

Licence Number:

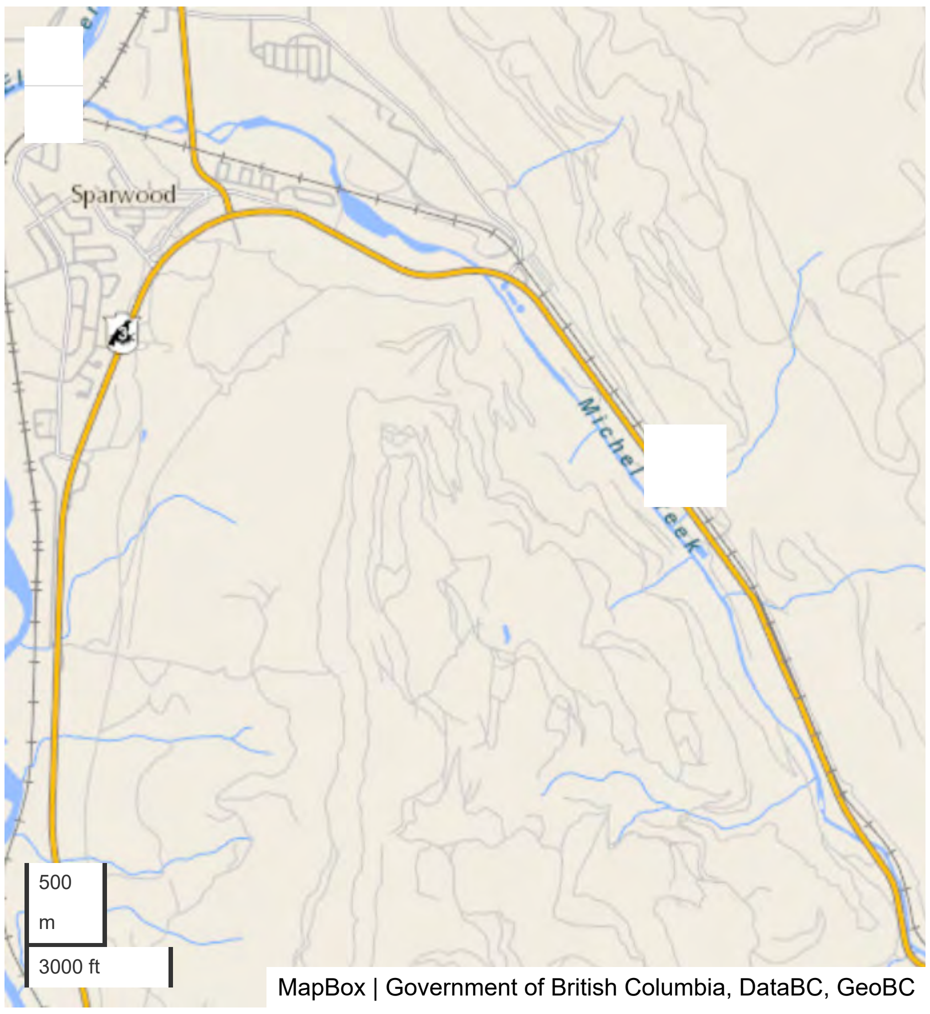
Location Information

Street Address: Teck Elkview Operations - Highway 3
Town/City: Sparwood

Legal Description:

Lot	
Plan	
District Lot	
Block	
Section	
Township	
Range	
Land District	
Property Identification Description (PID)	009115960

Description of Well Location: NW of Warehouse 50 / Recruiting office



MapBox | Government of British Columbia, DataBC, GeoBC

Geographic Coordinates - North American Datum of 1983 (NAD 83)
Latitude: 49.71697
Longitude: -114.8414
UTM Easting: 655601
UTM Northing: 5509399
Zone: 11
Coordinate Acquisition Code: (10 m accuracy) ICF cadastre and good location sketch

Well Activity

Activity	Work Start Date	Work End Date	Drilling Company	Date Entered
Construction report	1995-08-31	1995-08-31		July 13th 2021 at 4:03 PM

Well Work Dates

Start Date of Construction	End Date of Construction	Start Date of Alteration	End Date of Alteration	Start Date of Decommission	End Date of Decommission

Well Completion Data

Total Depth Drilled:
Finished Well Depth: 33 ft bgl
Final Casing Stick Up:
Depth to Bedrock:
Ground elevation:

Estimated Well Yield:
Well Cap:
Well Disinfected Status:
Drilling Method:
Method of determining elevation:

Static Water Level (BTOC):
Artesian Flow:
Artesian Pressure (head):
Artesian Pressure (PSI):
Orientation of Well:

Lithology

From (ft bgl)	To (ft bgl)	Raw Data	Description	Moisture	Colour	Hardness	Observations	Water Bearing Flow Estimate (USGPM)
There are no records to show								

Casing Details

From (ft bgl)	To (ft bgl)	Casing Type	Casing Material	Diameter (in)	Wall Thickness (in)	Drive Shoe
				6		

Surface Seal and Backfill Details

Surface Seal Material:
Surface Seal Installation Method:
Surface Seal Thickness:
Surface Seal Depth:

Backfill Material Above Surface Seal:
Backfill Depth:

Liner Details

Liner Material:
Liner Diameter:
Liner from:

Liner Thickness:
Liner to:

Liner perforations

From (ft bgl)	To (ft bgl)
There are no records to show	

Screen Details

Intake Method:
Type:
Material:
Opening:
Bottom:

Installed Screens

From (ft bgl)	To (ft bgl)	Diameter (in)	Assembly Type	Slot Size
There are no records to show				

Well Development

Developed by:

Development Total Duration:

Well Yield

Estimation Method:
Static Water Level Before Test:
Hydrofracturing Performed: No

Estimation Rate: 1320 USgpm
Drawdown:
Increase in Yield Due to Hydrofracturing:

Estimation Duration:

Well Decommission Information

Reason for Decommission:
Sealant Material:
Decommission Details:

Method of Decommission:
Backfill Material:

Comments

Drilling date is unknown, but it is before August 31, 1995; Well record x-ref'd and associated with GW license application; specific water use = camps & public facilities (showers, sinks, and toilets) and backup fire suppression

Documents

- WTN 123144 _ Map.pdf

Disclaimer

EV_BRgw

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EV_HW1 (EV_HM1)

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Groundwater Wells and Aquifers

Well Summary EV_HW1

Well Tag Number: 123237
Well Identification Plate Number: 61737
Owner Name: Teck Coal Limited - Elkview Operations (EVO) - 6069789 CANADA INC., INC.NO. A58865
Intended Water Use: Commercial and Industrial
Artesian Condition: No

Well Status: New
Well Class: Water Supply
Well Subclass: Not Applicable

Aquifer Number:
Technical Report: N/A

Observation Well Number:
Observation Well Status:
Environmental Monitoring System (EMS) ID:

Alternative specs submitted: No

Licensing Information

Licensed Status: Unlicensed

Licence Number:

Location Information

Street Address:
Town/City:

Legal Description:

Lot	
Plan	
District Lot	4589
Block	
Section	
Township	
Range	
Land District	26
Property Identification Description (PID)	012953377

Description of Well Location: SE From Gatehouse

MapBox | Government of British Columbia, DataBC, GeoBC

Geographic Coordinates - North American Datum of 1983 (NAD 83)
Latitude: 49.7273
Longitude: -114.8522
UTM Easting: 654790
UTM Northing: 5510525
Zone: 11
Coordinate Acquisition Code: (10 m accuracy) ICF cadastre and good location sketch

Well Activity

Activity	Work Start Date	Work End Date	Drilling Company	Date Entered
Construction report	1995-08-31	1995-08-31		July 22nd 2021 at 3:27 PM

Well Work Dates

Start Date of Construction	End Date of Construction	Start Date of Alteration	End Date of Alteration	Start Date of Decommission	End Date of Decommission

Well Completion Data

Total Depth Drilled:
Finished Well Depth: 20.4 ft bgl
Final Casing Stick Up:
Depth to Bedrock:
Ground elevation:

Estimated Well Yield:
Well Cap:
Well Disinfected Status:
Drilling Method:
Method of determining elevation:

Static Water Level (BTOC):
Artesian Flow:
Artesian Pressure (head):
Artesian Pressure (PSI):
Orientation of Well: VERTICAL

Lithology

From (ft bgl)	To (ft bgl)	Raw Data	Description	Moisture	Colour	Hardness	Observations	Water Bearing Flow Estimate (USGPM)
There are no records to show								

Casing Details

From (ft bgl)	To (ft bgl)	Casing Type	Casing Material	Diameter (in)	Wall Thickness (in)	Drive Shoe
				10		

Surface Seal and Backfill Details

Surface Seal Material:
Surface Seal Installation Method:
Surface Seal Thickness:
Surface Seal Depth:

Backfill Material Above Surface Seal:
Backfill Depth:

Liner Details

Liner Material:
Liner Diameter:
Liner from:

Liner Thickness:
Liner to:

Liner perforations

From (ft bgl)	To (ft bgl)
There are no records to show	

Screen Details

Intake Method:
Type:
Material:
Opening:
Bottom:

Installed Screens

From (ft bgl)	To (ft bgl)	Diameter (in)	Assembly Type	Slot Size
There are no records to show				

Well Development

Developed by:

Development Total Duration:

Well Yield

Estimation Method:
Static Water Level Before Test:
Hydrofracturing Performed: No

Estimation Rate:
Drawdown:
Increase in Yield Due to Hydrofracturing:

Estimation Duration:

Well Decommission Information

Reason for Decommission:
Sealant Material:
Decommission Details:

Method of Decommission:
Backfill Material:

Comments

Well record x-ref'd and associated with GW license application; well name = Harmer Well; The date when the well was drilled is unknown. The water use extends before August 31, 1995.

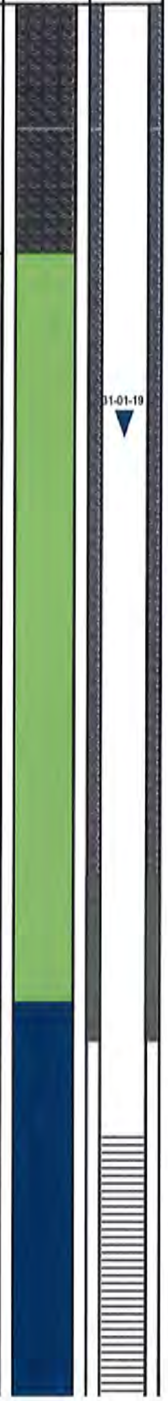
Documents

- WTN 123237_Map.pdf

WELL ID: EV_MW_BC2

Depth (mGL)	Lithological Description
0	
1	0-3.0mGL: **FILL (GW) GRAVEL**, fine sand - fine gravels, angular - sub-rounded, dark grey - black, moist
2	
3	3.0-11.9mGL: **(GW) GRAVEL**, fine sand - fine gravels , sub-angular - sub-rounded, dark brown, moist
4	GRAVEL, as above but dry and brown-grey
5	GRAVEL, as above but angular - sub-rounded
6	GRAVEL, as above but sub-angular - sub-rounded, and moist, very rare clay
7	
8	GRAVEL, as above but sandier, with white precipitate or silty texture (cemented horizon?), dry
9	
10	GRAVEL, as above but more moist again
11	Water indications from driller around 11.3-11.6mGL
12	11.9-16.8mGL: **BEDROCK**- brown and grey shale (Kootenay Fm)
13	
14	Driller felt what might have been a fracture zone around 14.3 mGL
15	
16	

Lithology | Well

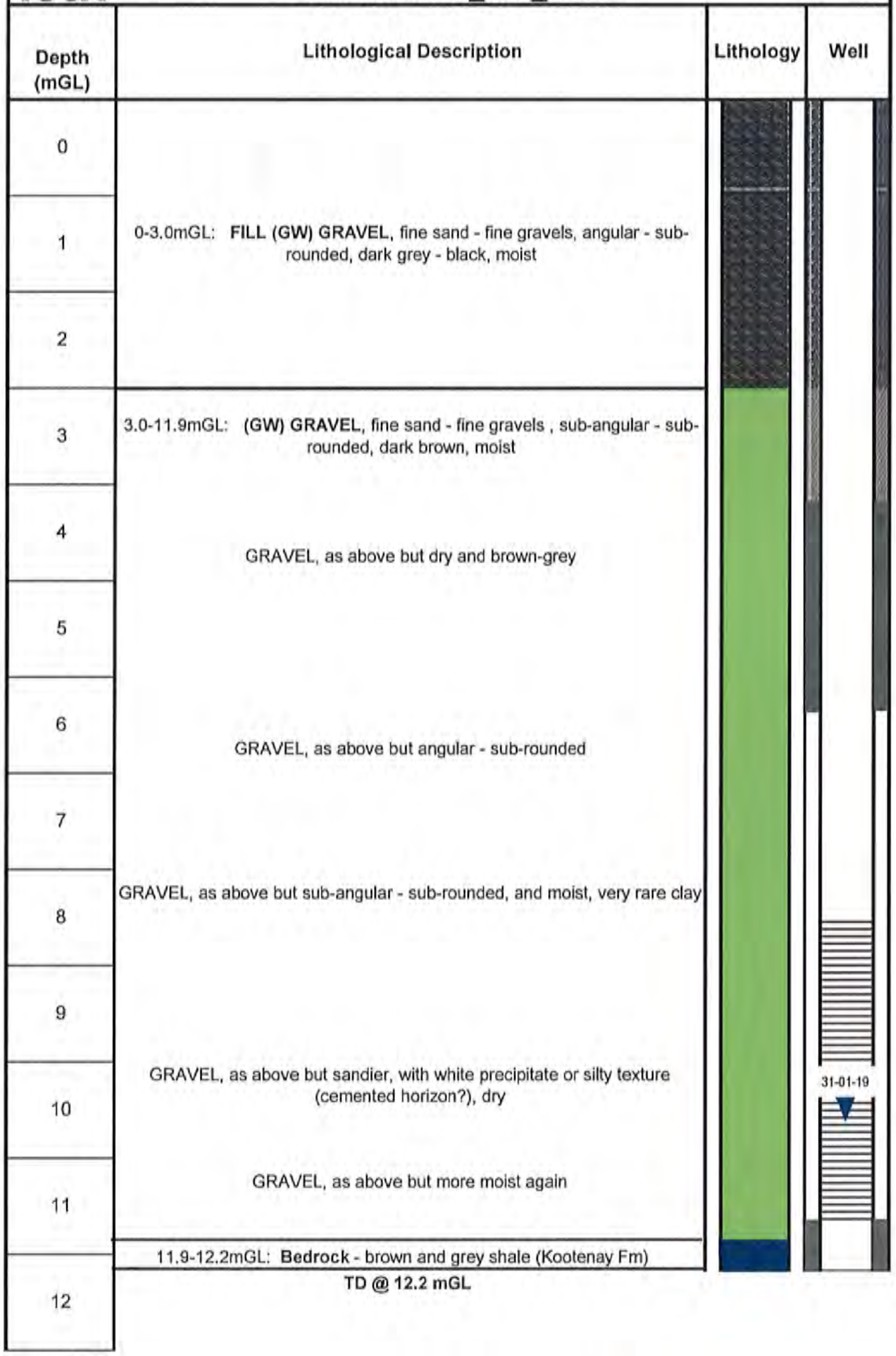


TD @ 16.8 mGL

Legend	
Fill/Spoil	⬛
Clay	🟫
Silty-Clay	🟧
Clayey Silt	🟧
Clayey Sand	🟧
Sand	🟨
Clayey Gravel	🟩
Sand & Gravel	🟩
Gravel	🟩
Bedrock	🟦

Teck

WELL ID: EV_MW_BC3



0-3.0mGL: **FILL (GW) GRAVEL**, fine sand - fine gravels, angular - sub-rounded, dark grey - black, moist

3.0-11.9mGL: **(GW) GRAVEL**, fine sand - fine gravels , sub-angular - sub-rounded, dark brown, moist

GRAVEL, as above but dry and brown-grey

GRAVEL, as above but angular - sub-rounded

GRAVEL, as above but sub-angular - sub-rounded, and moist, very rare clay

GRAVEL, as above but sandier, with white precipitate or silty texture (cemented horizon?), dry

GRAVEL, as above but more moist again

11.9-12.2mGL: **Bedrock** - brown and grey shale (Kootenay Fm)

TD @ 12.2 mGL

Legend	
Fill/Spoil	▨
Clay	🟩
Silty-Clay	🟨
Clayey Silt	🟧
Clayey Sand	🟧
Sand	🟨
Clayey Gravel	🟩
Sand & Gravel	🟩
Gravel	🟩
Bedrock	🟦

SNC•LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_MC1**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 4

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1147.631	Borehole Logged By:	AMH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1148.587 1148.585	Date Drilled:	2019 01 20
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5510593.103	Easting: 654902.674	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼ Air Rotary

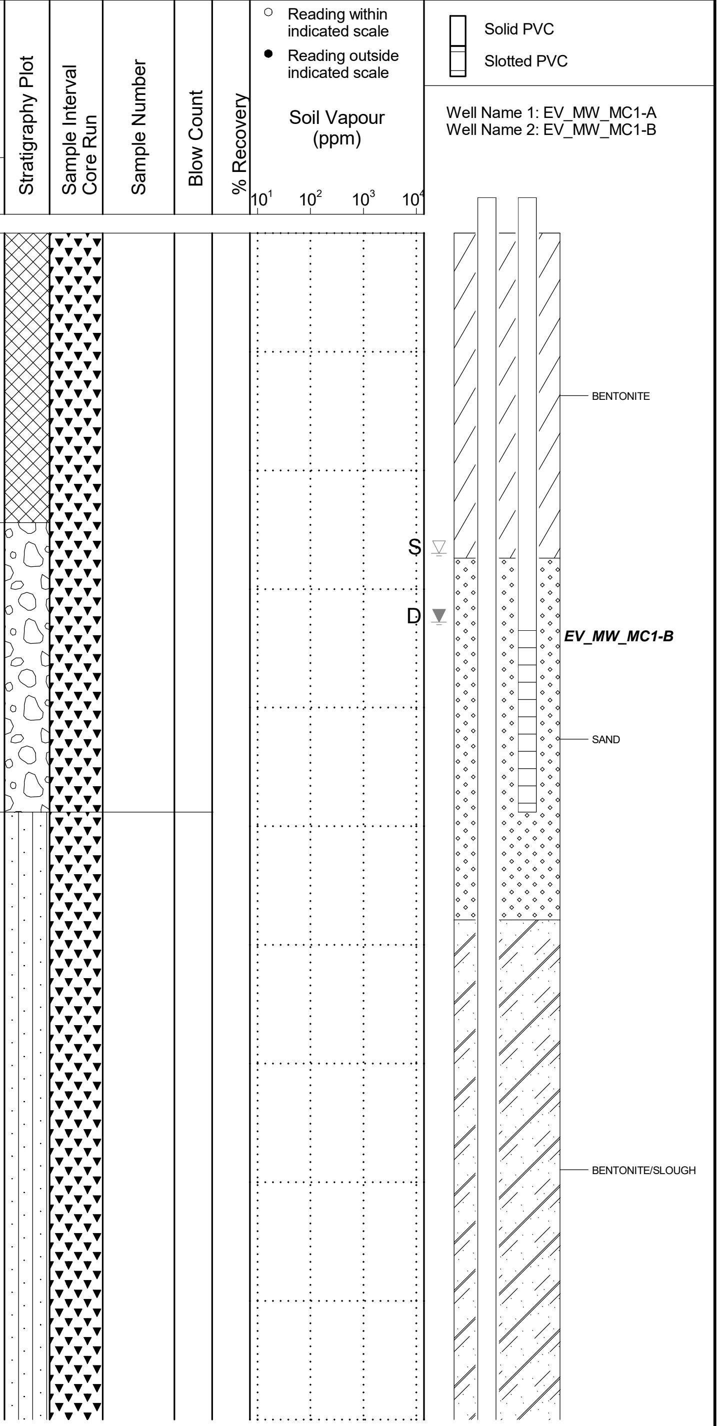
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: EV_MW_MC1-A
Well Name 2: EV_MW_MC1-B

Depth in Metres	Soil Description
0	FILL, coal and shale boulders, loose, dry.
	SAND and GRAVEL, fine to medium grained sand, coarse gravel, rounded, poorly graded, black to dark brown, dry, some coal.
	At 3.7 m - some silt, brown, damp
5	SAND, fine grained, silty, poorly graded, brown, wet.
	At 7.6 m - some silt to silty



NOTES

SNC·LAVALIN

	Client **Teck Coal Limited**	**Borehole No. : EV_BH_MC1**
	Location **Regional Groundwater Monitoring**	PAGE 2 OF 4

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1147.631	Borehole Logged By:	AMH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1148.587 1148.585	Date Drilled:	2019 01 20
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5510593.103	Easting: 654902.674	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼ Air Rotary

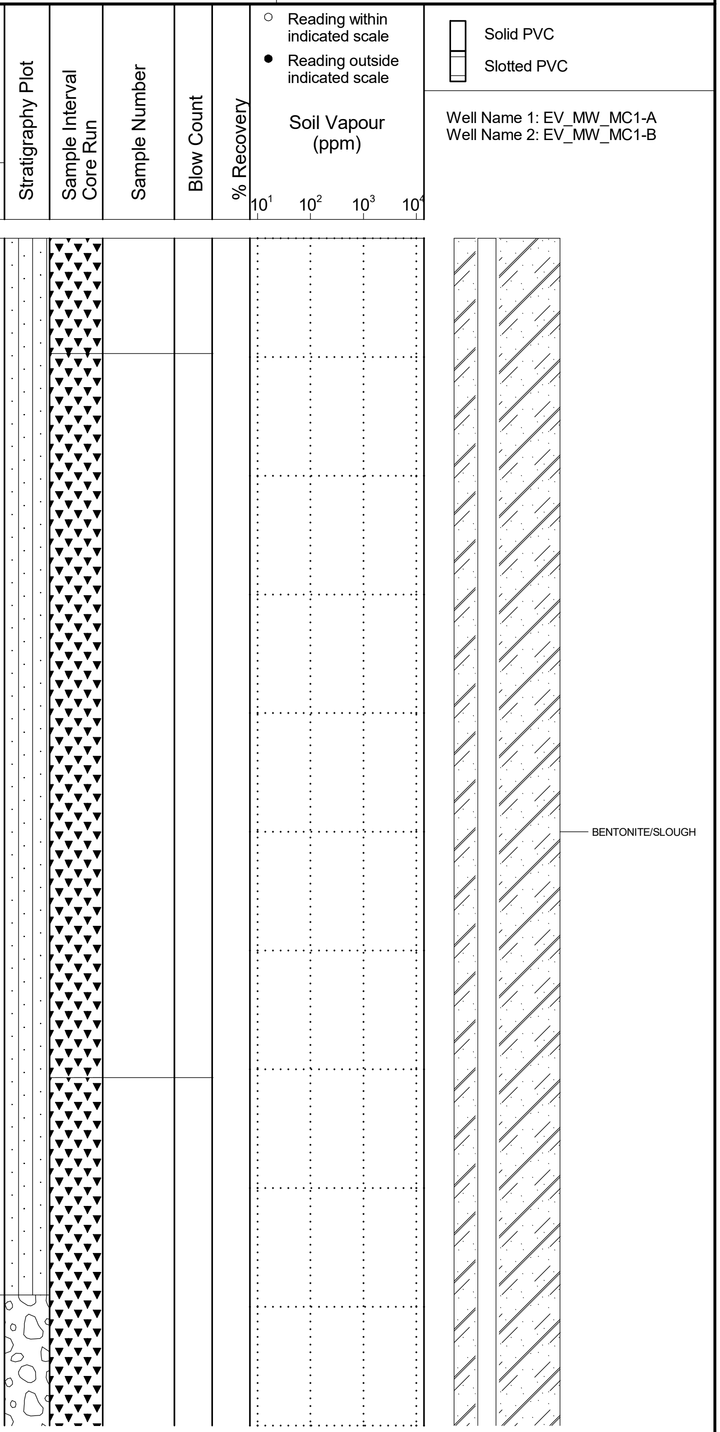
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

▯ Solid PVC
▯ Slotted PVC

Well Name 1: EV_MW_MC1-A
Well Name 2: EV_MW_MC1-B

Depth in Metres	Soil Description
10	SAND, fine grained, silty, poorly graded, brown, wet. *(continued)*
16	At 15.8 m - some medium to coarse grained sand
19	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded to rounded, well graded, brown, wet.



NOTES

QA/QC: BH 2019 04 10 Print Date:2019-09-26

SNC·LAVALIN

	Client **Teck Coal Limited**	**Borehole No. : EV_BH_MC1**
	Location **Regional Groundwater Monitoring**	PAGE 3 OF 4

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1147.631	Borehole Logged By:	AMH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1148.587 1148.585	Date Drilled:	2019 01 20
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5510593.103	Easting: 654902.674	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼ Air Rotary

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: EV_MW_MC1-A
Well Name 2: EV_MW_MC1-B

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm) 10^1 10^2 10^3 10^4

20
SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded to rounded, well graded, brown, wet. *(continued)*

21
From 21.4 m to 22.6 m - gravelly

22
At 22.6 m - subangular to subrounded

23

24

25

26

SAND, fine grained, poorly graded, silty.

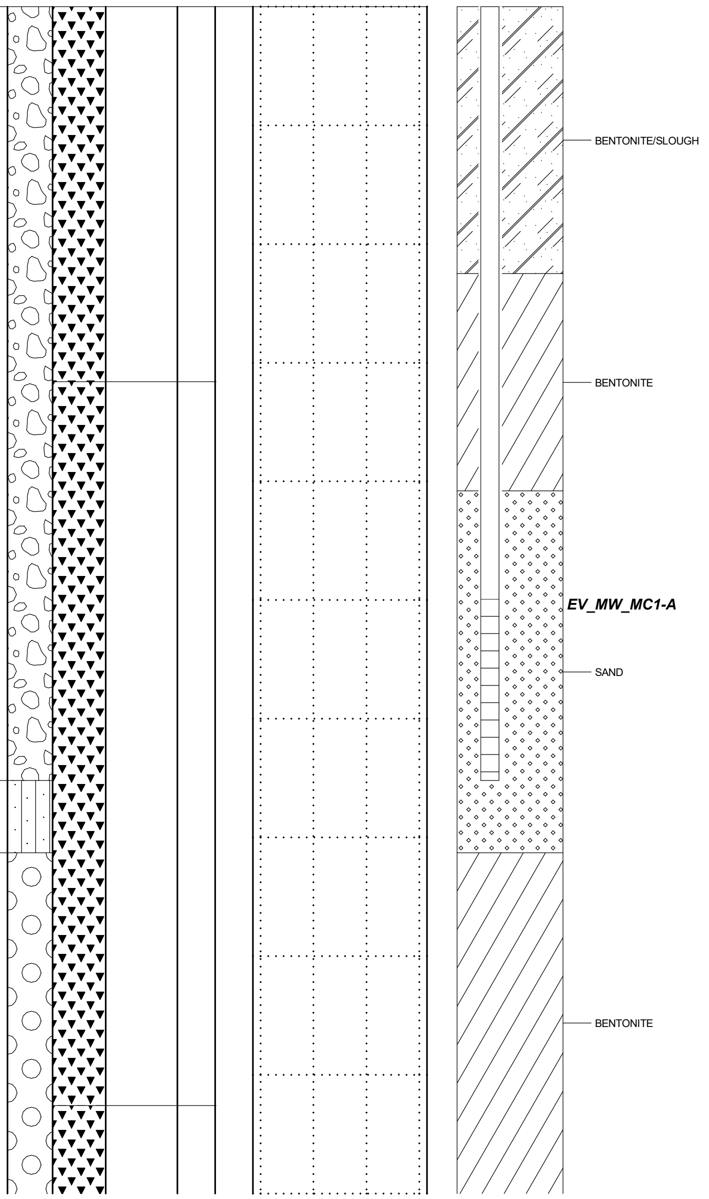
27

BOULDERS, shale, angular, some gravel, rounded to subrounded.

28

29

30



NOTES

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1147.631	Borehole Logged By:	AMH
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1148.587 1148.585	Date Drilled:	2019 01 20
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5510593.103	Easting: 654902.674	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼ Air Rotary

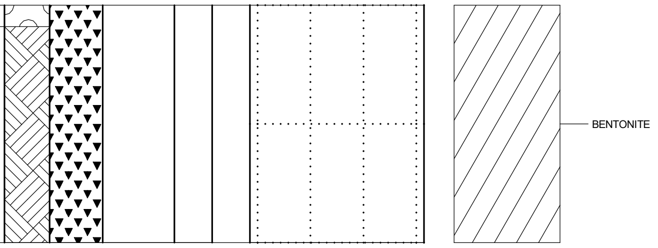
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: EV_MW_MC1-A
Well Name 2: EV_MW_MC1-B

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm) 10^1 10^2 10^3 10^4
30							
	BEDROCK, shale, angular, black.						
31							
32	Bottom of hole at 32.0 m.						
33							
34							
35							
36							
37							
38							
39							
40							



NOTES

SNC·LAVALIN

Client **Teck Coal Limited**		**Borehole No. : EV_BH_MC2**
Location **Regional Groundwater Monitoring**		PAGE 1 OF 6

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1146.989	Borehole Logged By:	RAS
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1147.950 1147.969	Date Drilled:	2019 01 14
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5510529.408	Easting: 654758.366	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ▼▼▼ Air Rotary

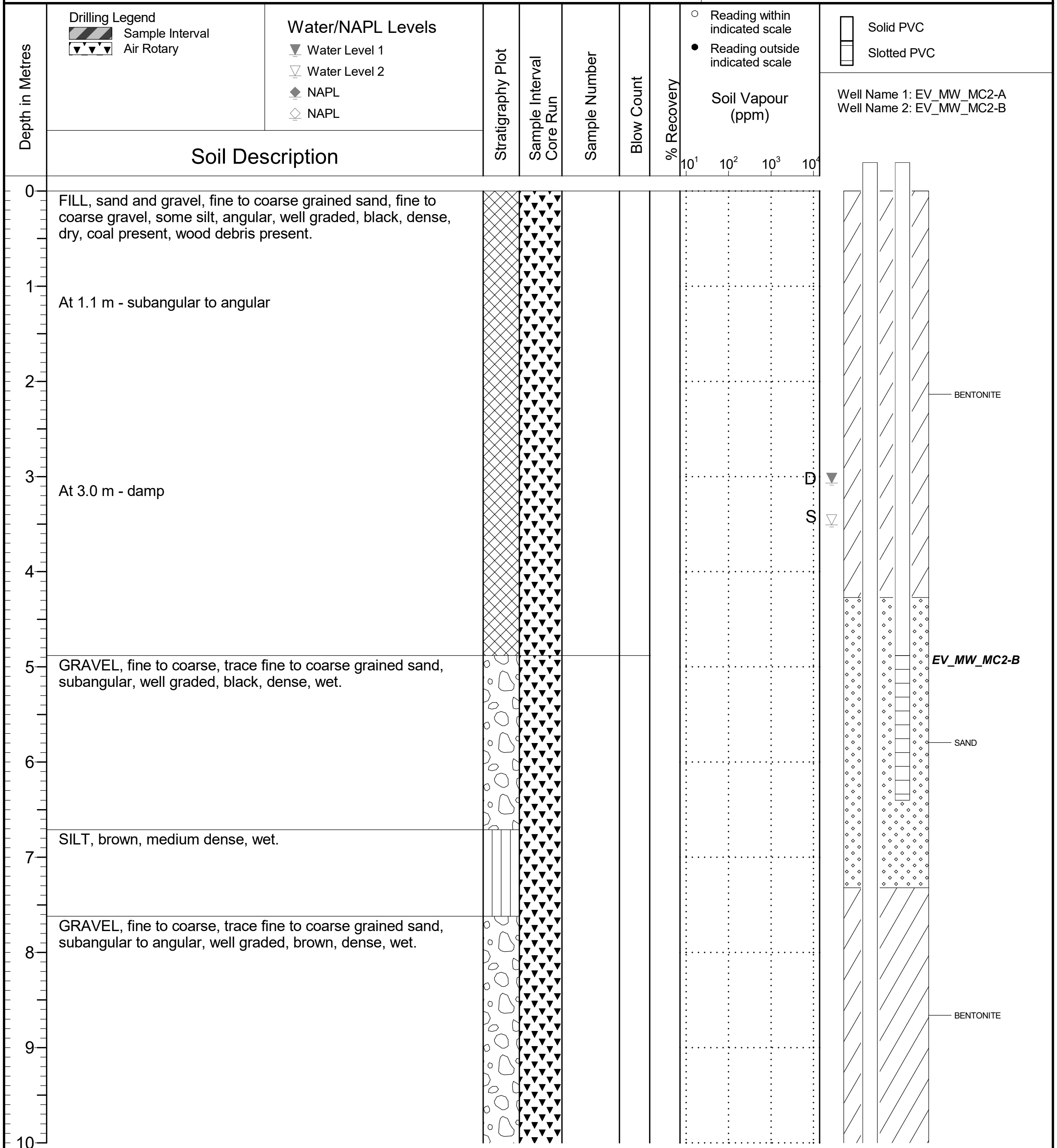
Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- ☐ Solid PVC
- ☐ Slotted PVC

Well Name 1: EV_MW_MC2-A
Well Name 2: EV_MW_MC2-B

Depth in Metres	Soil Description
0	FILL, sand and gravel, fine to coarse grained sand, fine to coarse gravel, some silt, angular, well graded, black, dense, dry, coal present, wood debris present.
1.1	At 1.1 m - subangular to angular
3.0	At 3.0 m - damp
4.9	GRAVEL, fine to coarse, trace fine to coarse grained sand, subangular, well graded, black, dense, wet.
6.7	SILT, brown, medium dense, wet.
7.6	GRAVEL, fine to coarse, trace fine to coarse grained sand, subangular to angular, well graded, brown, dense, wet.



NOTES

SNC·LAVALIN

Client **Teck Coal Limited**	**Borehole No. : EV_BH_MC2**	
Location **Regional Groundwater Monitoring**	PAGE 2 OF 6	

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1146.989	Borehole Logged By:	RAS
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1147.950 1147.969	Date Drilled:	2019 01 14
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5510529.408	Easting: 654758.366	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ▼ Air Rotary

Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

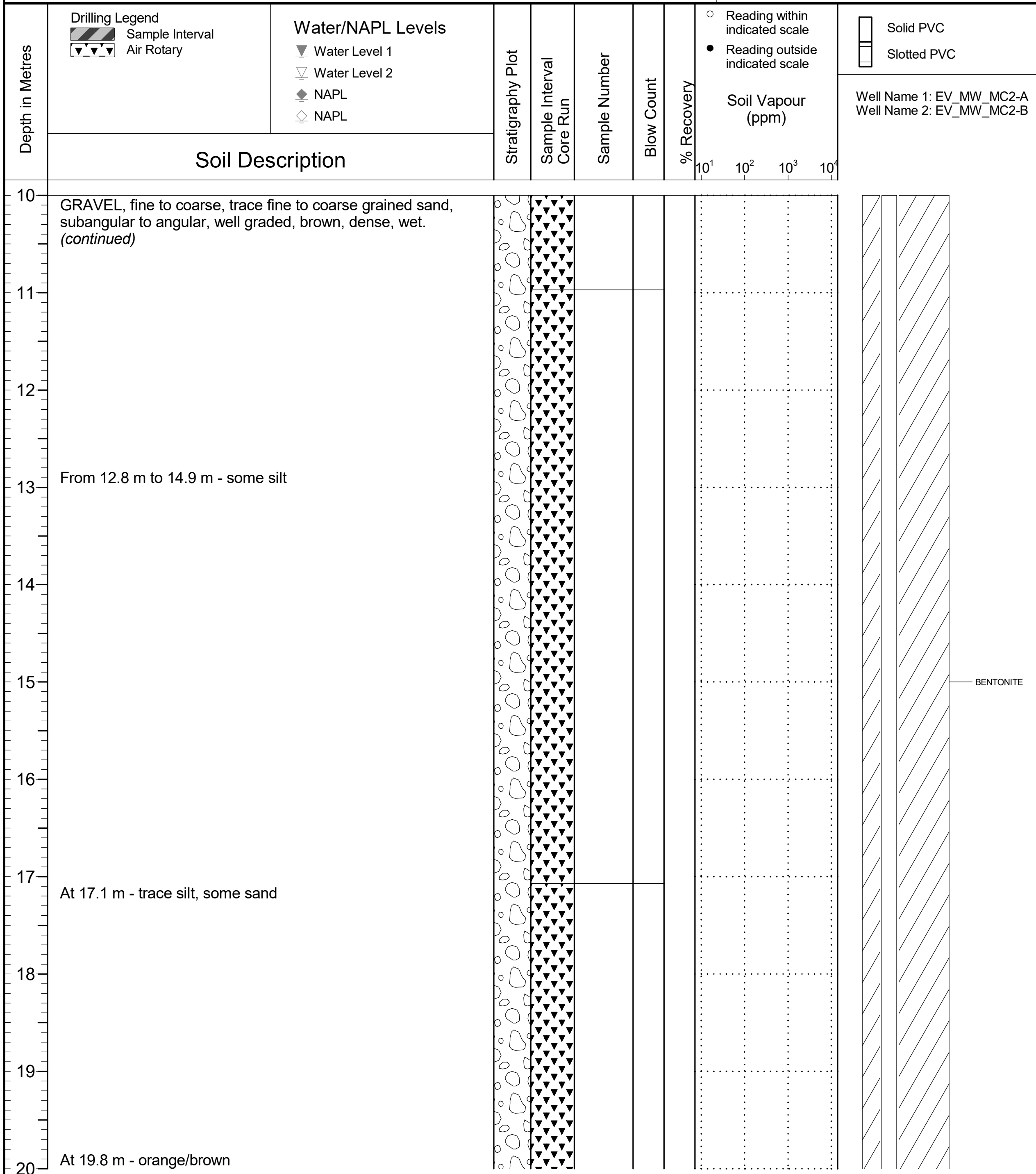
- ○ Reading within indicated scale
- ● Reading outside indicated scale

Soil Vapour (ppm)

- ▯ Solid PVC
- ▯ Slotted PVC

Well Name 1: EV_MW_MC2-A
Well Name 2: EV_MW_MC2-B

Depth in Metres	Soil Description
10	GRAVEL, fine to coarse, trace fine to coarse grained sand, subangular to angular, well graded, brown, dense, wet. *(continued)*
12.8	From 12.8 m to 14.9 m - some silt
17.1	At 17.1 m - trace silt, some sand
19.8	At 19.8 m - orange/brown



NOTES

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1146.989	Borehole Logged By:	RAS
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1147.950 1147.969	Date Drilled:	2019 01 14
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5510529.408	Easting: 654758.366	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼ Air Rotary

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

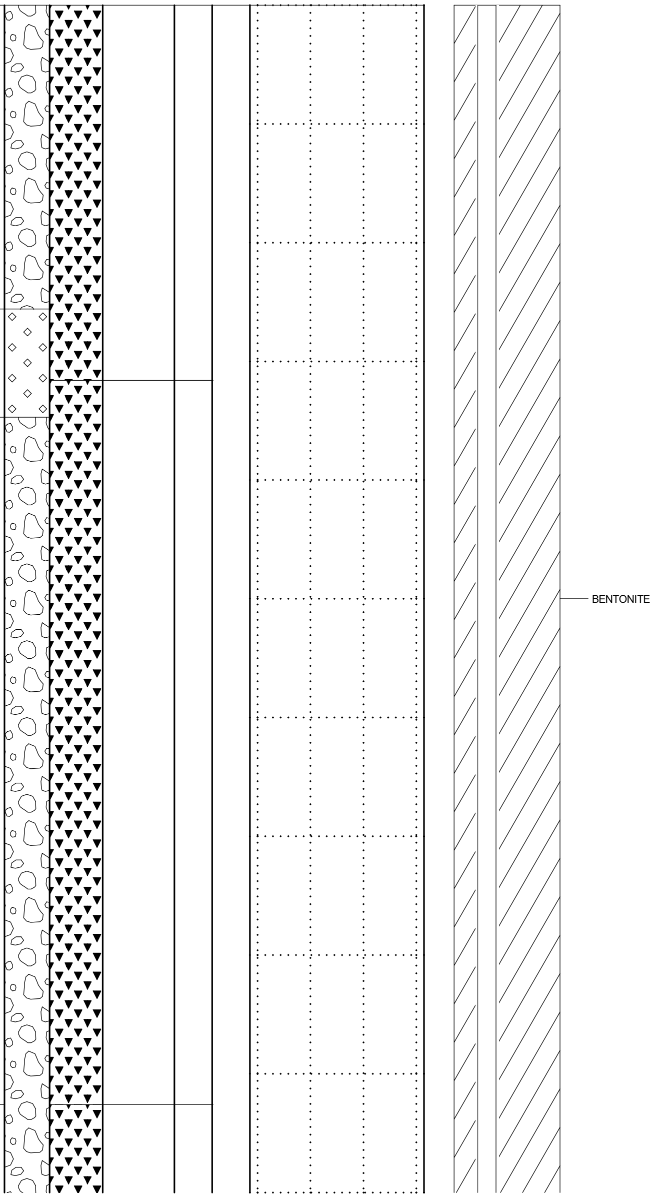
○ Reading within indicated scale
● Reading outside indicated scale

Soil Vapour (ppm)

▯ Solid PVC
▯ Slotted PVC

Well Name 1: EV_MW_MC2-A
Well Name 2: EV_MW_MC2-B

Depth in Metres	Soil Description
20	GRAVEL, fine to coarse, trace fine to coarse grained sand, subangular to angular, well graded, brown, dense, wet. *(continued)*
	At 21.6 m - very dense
	At 22.3 m - dense
	SAND, fine to coarse grained, some fine to coarse gravel, trace silt, subrounded to angular, well graded, orange/brown, dense, wet.
	GRAVEL, fine to coarse, some fine to coarse grained sand, trace silt, subrounded to angular, well graded, light brown, dense, wet.
	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, trace silt, subrounded to angular, well graded, brown, loose.
30	



NOTES

SNC·LAVALIN

Client **Teck Coal Limited**	**Borehole No. : EV_BH_MC2**
Location **Regional Groundwater Monitoring**	PAGE 4 OF 6

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1146.989	Borehole Logged By:	RAS
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1147.950 1147.969	Date Drilled:	2019 01 14
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5510529.408	Easting: 654758.366	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ▼ Air Rotary

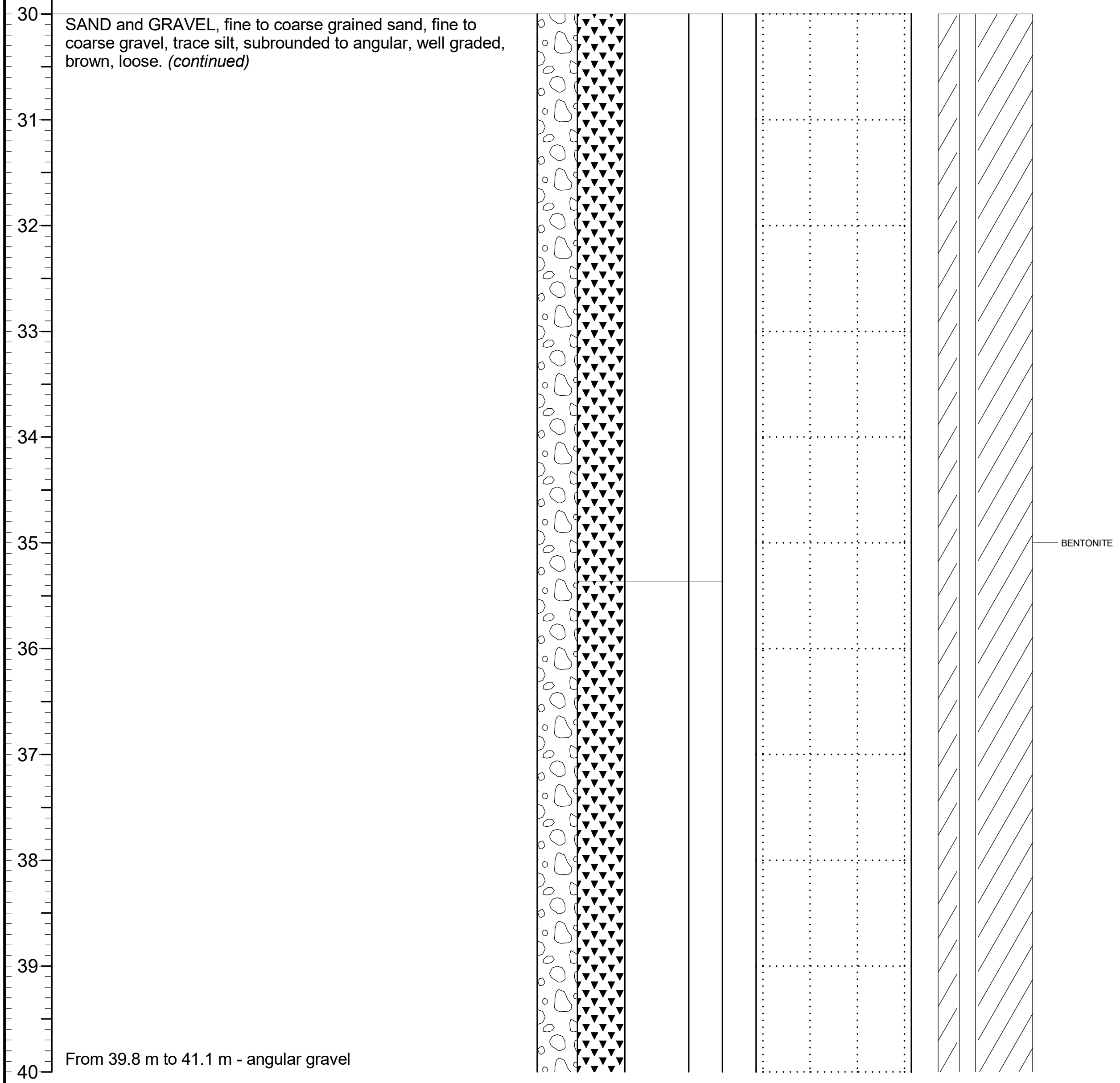
Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- ☐ Solid PVC
- ☐ Slotted PVC

Well Name 1: EV_MW_MC2-A
Well Name 2: EV_MW_MC2-B

Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm)



SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, trace silt, subrounded to angular, well graded, brown, loose. *(continued)*

From 39.8 m to 41.1 m - angular gravel

NOTES

SNC · LAVALIN

Client
Teck Coal Limited

Location
Regional Groundwater Monitoring

Borehole No. : EV_BH_MC2

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1146.989	Borehole Logged By:	RAS
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1147.950 1147.969	Date Drilled:	2019 01 14
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5510529.408	Easting: 654758.366	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼ Air Rotary

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

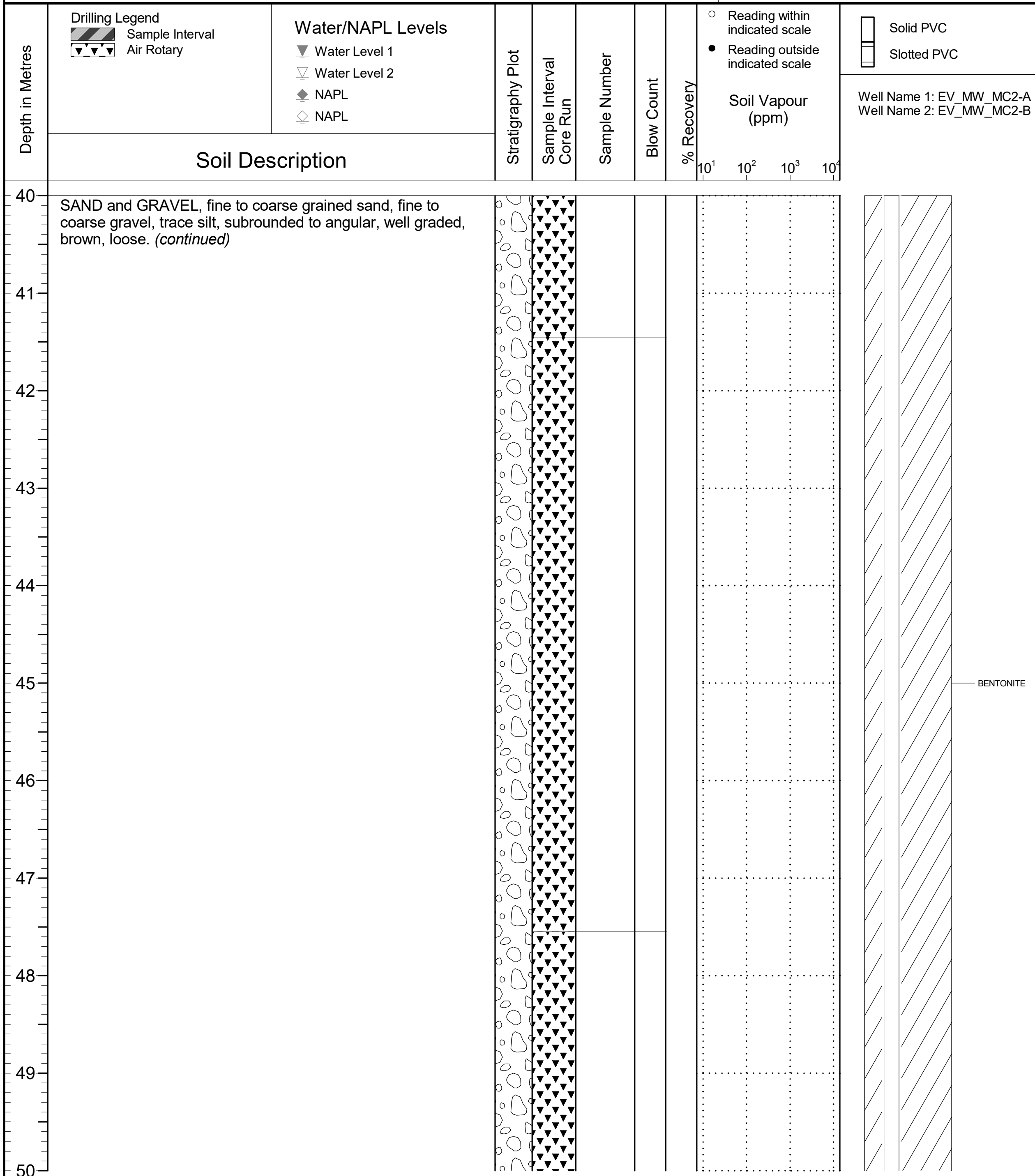
○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: EV_MW_MC2-A
Well Name 2: EV_MW_MC2-B

Soil Description

SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, trace silt, subrounded to angular, well graded, brown, loose. *(continued)*



NOTES

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_MC2**
	Location **Regional Groundwater Monitoring**	PAGE 6 OF 6

Drilling Contractor	Owen's Drilling	Date Monitored	2019 03 07	Project Number:	660613
Drilling Method	Dual Rotary	Ground Surface Elev. (m)	1146.989	Borehole Logged By:	RAS
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	1147.950 1147.969	Date Drilled:	2019 01 14
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5510529.408	Easting: 654758.366	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
▼▼▼ Air Rotary

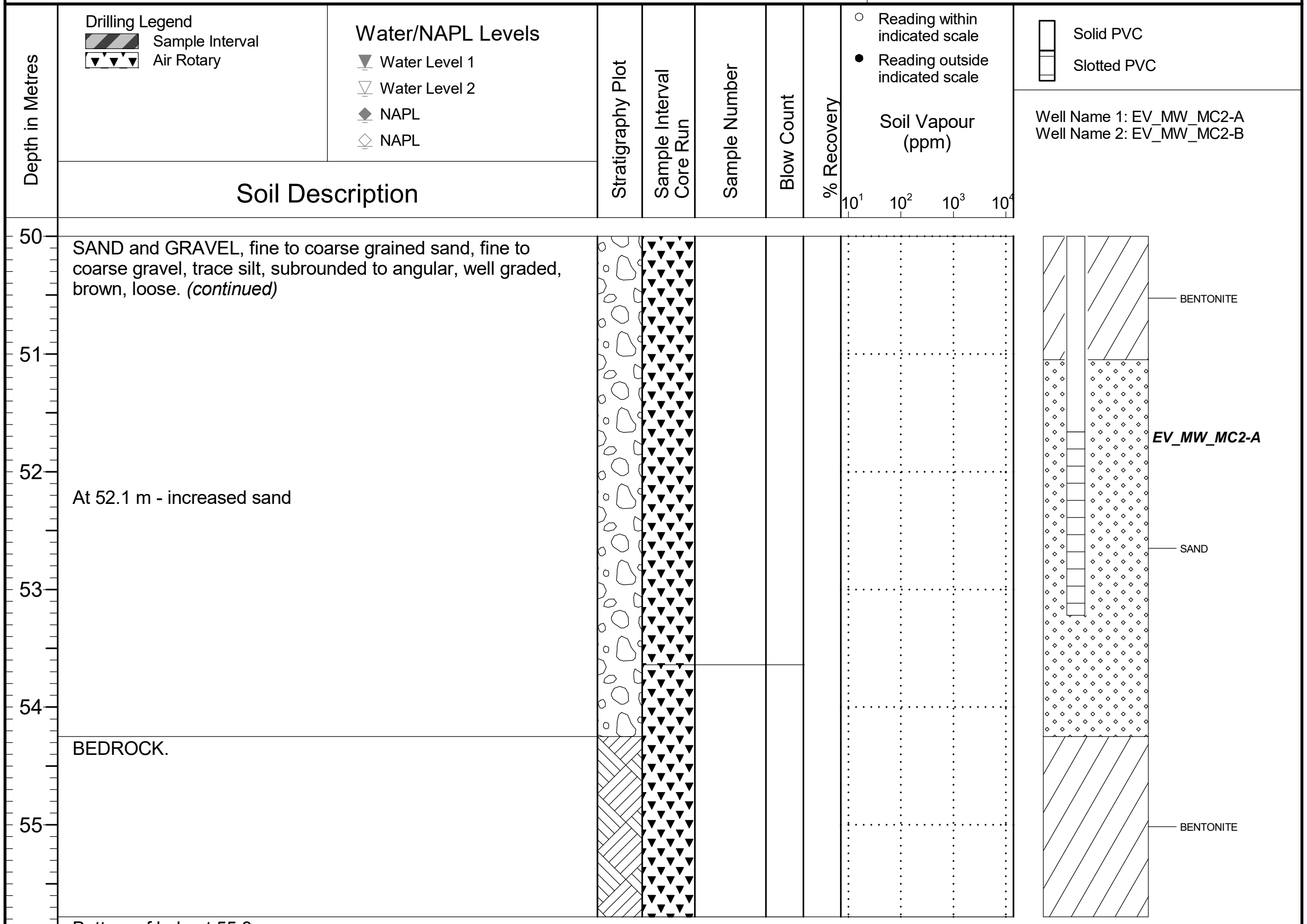
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

▯ Solid PVC
▤ Slotted PVC

Well Name 1: EV_MW_MC2-A
Well Name 2: EV_MW_MC2-B

Depth in Metres	Soil Description
50	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, trace silt, subrounded to angular, well graded, brown, loose. *(continued)*
52	At 52.1 m - increased sand
54	BEDROCK.
56	Bottom of hole at 55.8 m.



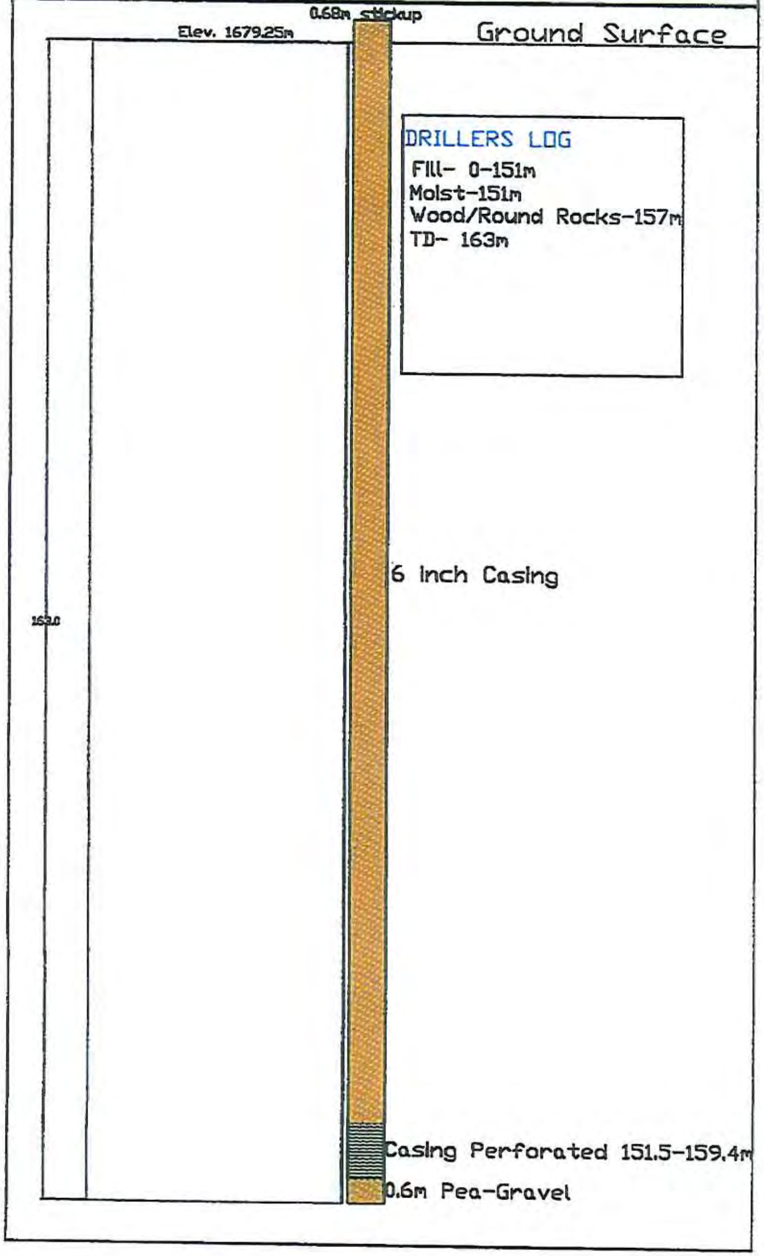
NOTES

EV_WF_SW

WF Tailings Migration Well (South WF-2)AS-BUILT

Northing: 49869
Easting: 20380
Elev.: 1679.25
Total Depth: Drilling 163.0m or 535ft

Piezo Depths: N/A
Contractor: J.R. Drillinf Ltd. (Cranbrook)
E.V.C.C. Tech: D. Gfrerer
Start/Finish: April 11-16, 2005- 6" casing installed



DRILLERS LOG
Fill- 0-151m
Moist-151m
Wood/Round Rocks-157m
TD- 163m

PROJECT No.: 12.1349.0013

RECORD OF BOREHOLE: EV_ECgw

SHEET 1 OF 2

LOCATION: See Location Plan

N: 5506384 E: 660795

BORING DATE: October 27, 2013

DATUM: UTM Zone 11
(Nad 83)

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20 40 60 80

SHEAR STRENGTH Cu, kPa: nat V. + Q - ● rem V. ⊕ U - ○ 20 40 60 80

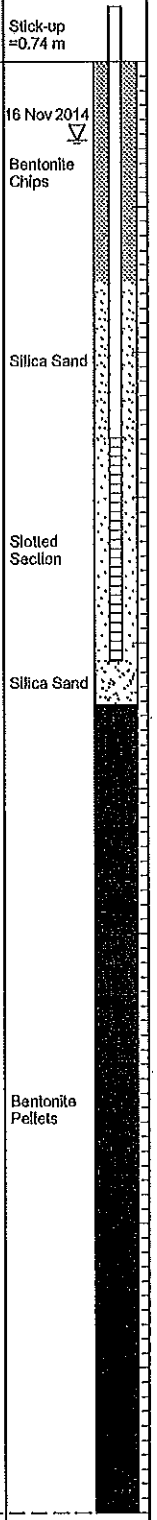
HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-6} 10^{-5} 10^{-4} 10^{-3}

WATER CONTENT PERCENT: Wp ⊢——○W——⊣ Wl 10 20 30 40

ADDITIONAL LAB. TESTING

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	ELEV. DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m
		Ground Surface	406.30			
0	Sonic 127 mm (ID) Casing 152.4 mm (OD) JR Drilling	GRAVELLY SAND, medium and coarse-grained sand with occasional fine gravel grains, rounded to sub-rounded, moderately graded, dry, very loose	0.00			
1.52		SAND, trace gravel, medium-grained, rounded to sub-rounded, moderately graded, dry, very loose	404.77 1.52			
3.81		CLAY and SAND, medium-grained with occasional coarse grains, rounded to sub-rounded, moderately graded, moist, firm	402.49 3.81			
5.18		SANDY CLAY, medium-grained with occasional coarse grains, rounded to sub-rounded, moderately graded, moist, firm	401.12 5.18			
6.86		CLAY, some sand, medium-grained, rounded to sub-rounded, moderately graded, moist, semi-firm	399.44 6.86			
10		*CONTINUED NEXT PAGE*				

PIEZOMETER OR STANDPIPE INSTALLATION



DEPTH SCALE
1 : 50

Golder Associates

LOGGED: RT
CHECKED: CD

PROJECT No.: 12.1349.0013

RECORD OF BOREHOLE: EV_ECgw

SHEET 2 OF 2

LOCATION: See Location Plan

N: 5506304 E: 660795

BORING DATE: October 27, 2013

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80 SHEAR STRENGTH Cu, kPa nat V. + Q- ● rem V. ⊕ U- ○ 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3} WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10	JR Drilling	CLAY, some sand, medium-grained, rounded to sub-rounded, moderately graded, moist, semi-firm *(continued)*		395.33							Bentonite Pellets
11		End of BOREHOLE. NOTES: Standpipe installed to 4.1 m upon well completion. Groundwater level measured at 1.8 mbgs on November 12, 2013.		10.97							
12											
13											
14											
15											
16											
17											
18											
19											
20											

DEPTH SCALE
1 : 50

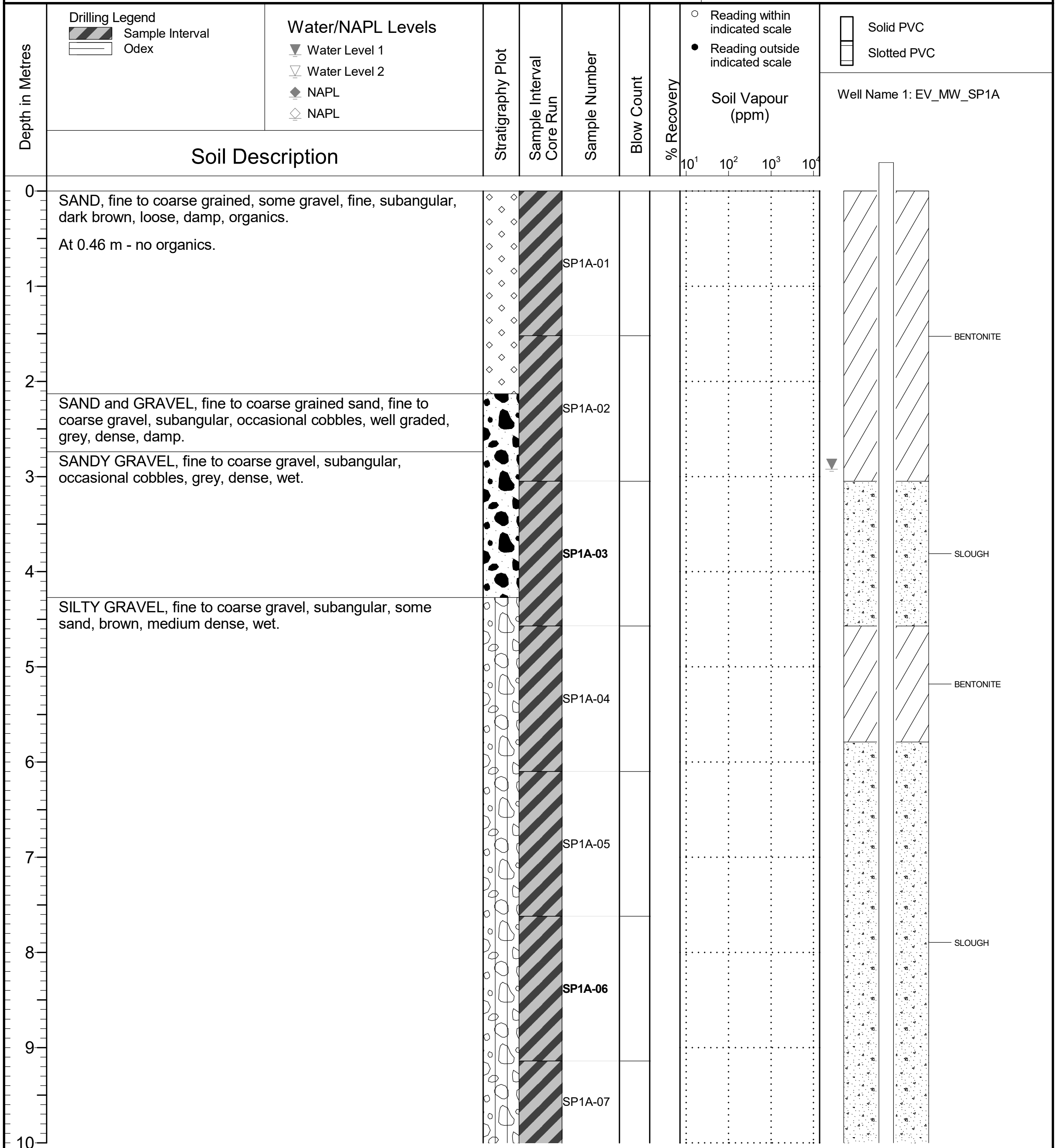
Golder Associates

LOGGED: RT
CHECKED: CD

FINAL

SNC • LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_SP1A**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 4

Drilling Contractor	Owen's Drilling	Date Monitored	2020 05 19	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1207.382	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1208.323	Date Drilled:	2020 05 05
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5505643.910	Easting: 659314.782	Log Typed By:	VL



SAND, fine to coarse grained, some gravel, fine, subangular, dark brown, loose, damp, organics.

At 0.46 m - no organics.

SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subangular, occasional cobbles, well graded, grey, dense, damp.

SANDY GRAVEL, fine to coarse gravel, subangular, occasional cobbles, grey, dense, wet.

SILTY GRAVEL, fine to coarse gravel, subangular, some sand, brown, medium dense, wet.

NOTES
Bolded sample denotes sample analyzed.

FINAL

SNC • LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_SP1A**
	Location **Regional Groundwater Monitoring**	PAGE 2 OF 4

Drilling Contractor	Owen's Drilling	Date Monitored	2020 05 19	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1207.382	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1208.323	Date Drilled:	2020 05 05
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5505643.910	Easting: 659314.782	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ☐ Odex

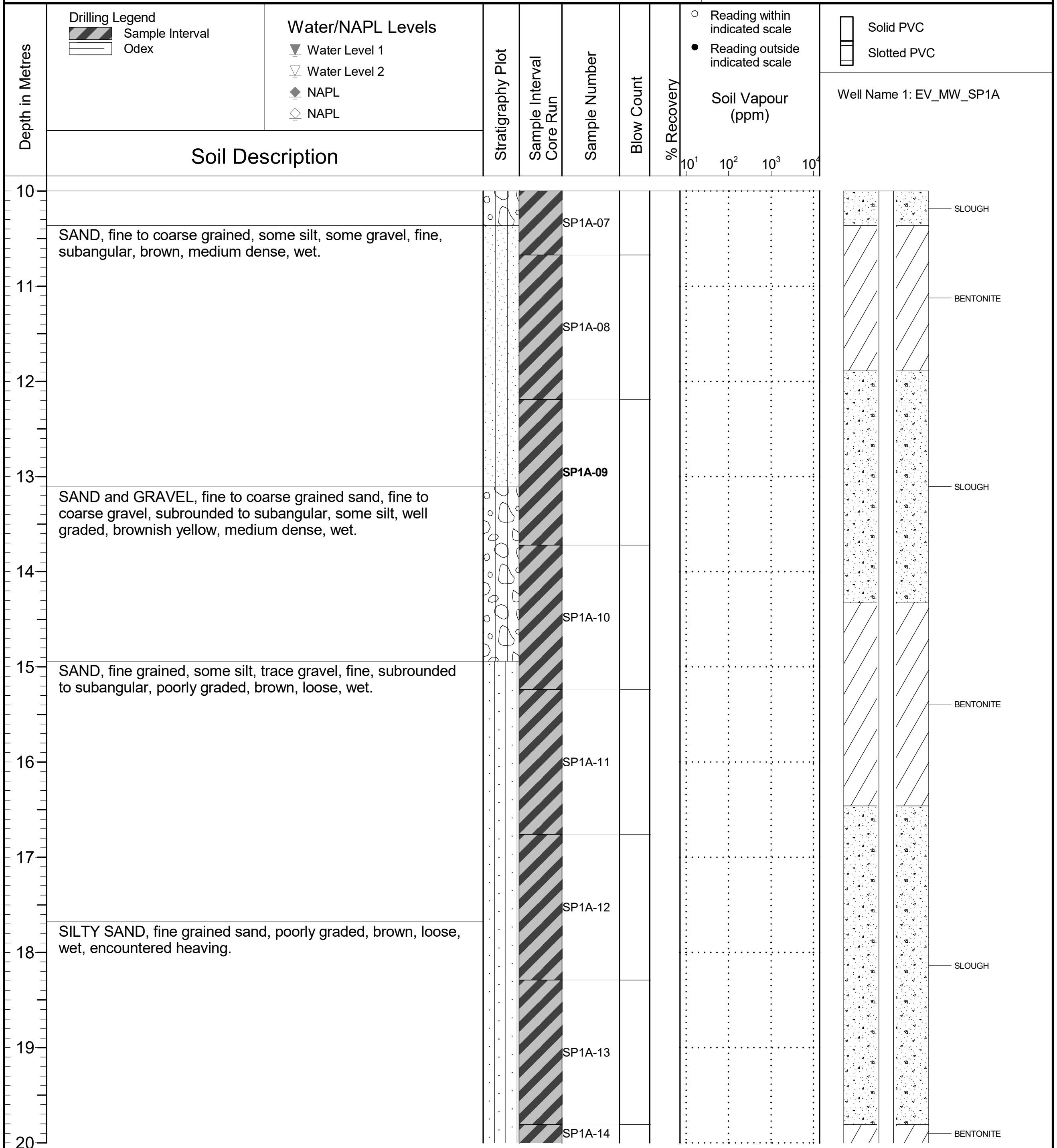
Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- Solid PVC
- Slotted PVC

Well Name 1: EV_MW_SP1A

Depth in Metres	Soil Description
10.4	SAND, fine to coarse grained, some silt, some gravel, fine, subangular, brown, medium dense, wet.
13.1	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded to subangular, some silt, well graded, brownish yellow, medium dense, wet.
14.9	SAND, fine grained, some silt, trace gravel, fine, subrounded to subangular, poorly graded, brown, loose, wet.
17.7	SILTY SAND, fine grained sand, poorly graded, brown, loose, wet, encountered heaving.



NOTES
Bolded sample denotes sample analyzed.

QA/QC: MB 2020 06 22 Print Date:2020-12-02

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_SP1A**
	Location **Regional Groundwater Monitoring**	PAGE 3 OF 4

Drilling Contractor	Owen's Drilling	Date Monitored	2020 05 19	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1207.382	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1208.323	Date Drilled:	2020 05 05
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5505643.910	Easting: 659314.782	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
☐ Odex

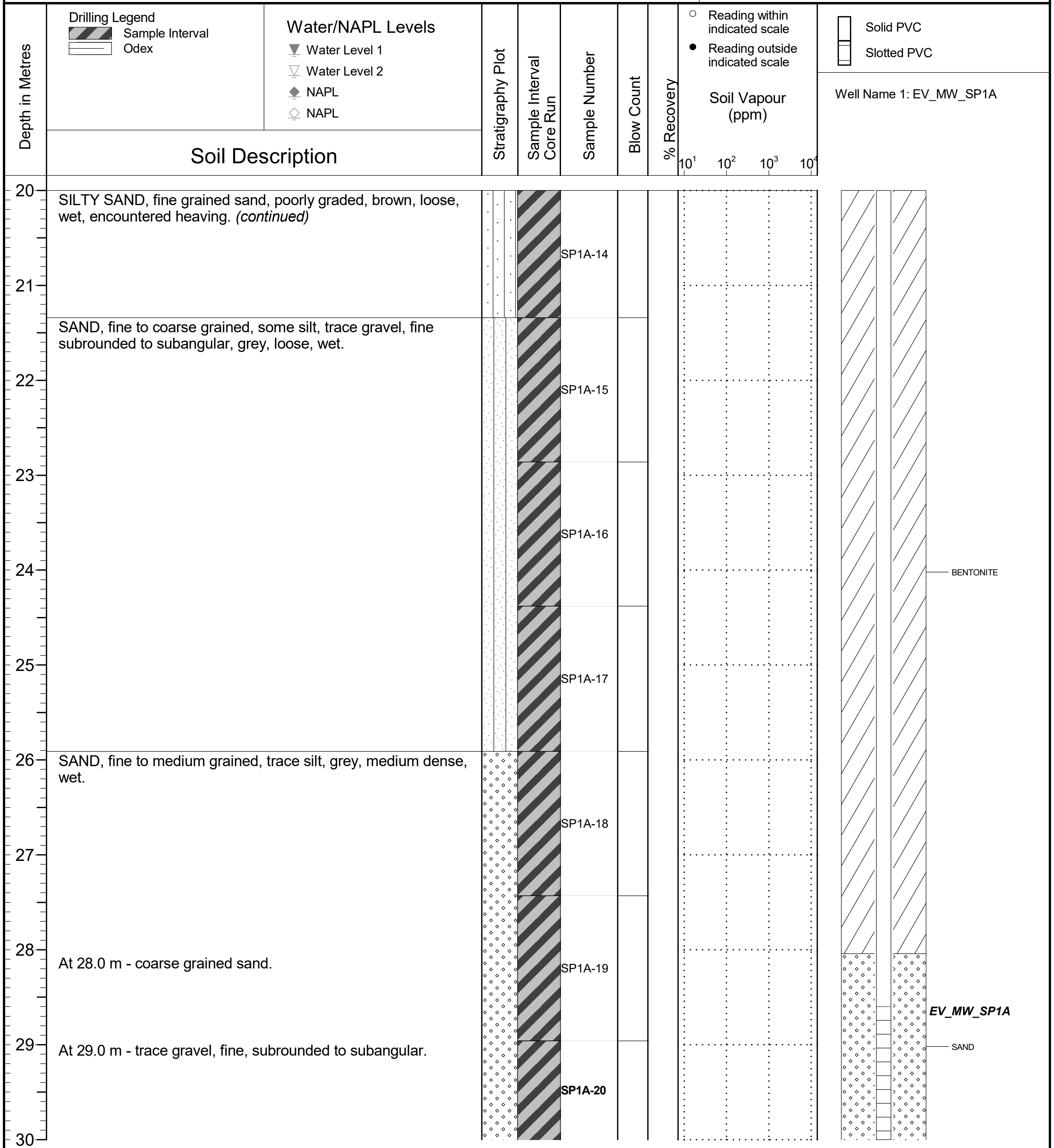
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: EV_MW_SP1A

Depth in Metres	Soil Description
20	SILTY SAND, fine grained sand, poorly graded, brown, loose, wet, encountered heaving. *(continued)*
	SAND, fine to coarse grained, some silt, trace gravel, fine subrounded to subangular, grey, loose, wet.
26	SAND, fine to medium grained, trace silt, grey, medium dense, wet.
28	At 28.0 m - coarse grained sand.
29	At 29.0 m - trace gravel, fine, subrounded to subangular.



NOTES
Bolded sample denotes sample analyzed.

QA/QC: MB 2020 06 22 Print Date:2020-12-02

FINAL

SNC • LAVALIN

Client **Teck Coal Limited**	**Borehole No. : EV_BH_SP1A**
Location **Regional Groundwater Monitoring**	PAGE 4 OF 4

Drilling Contractor	Owen's Drilling	Date Monitored	2020 05 19	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1207.382	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1208.323	Date Drilled:	2020 05 05
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5505643.910	Easting: 659314.782	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
☐ Odex

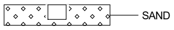
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: EV_MW_SP1A

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm) 10^1 10^2 10^3 10^4
30			▨	**SP1A-20**			
	Bottom of hole at 30.2 m.						
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							



NOTES
Bolded sample denotes sample analyzed.

QA/QC: MB 2020 06 22 Print Date:2020-12-02

FINAL

SNC • LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_SP1B**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 2

Drilling Contractor	Owen's Drilling	Date Monitored	2020 05 19	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1207.358	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1208.347	Date Drilled:	2020 05 06
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5505643.717	Easting: 659316.582	Log Typed By:	VL

Drilling Legend
- ▨ Sample Interval
- ☰ Odex

Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

Depth in Metres

Soil Description

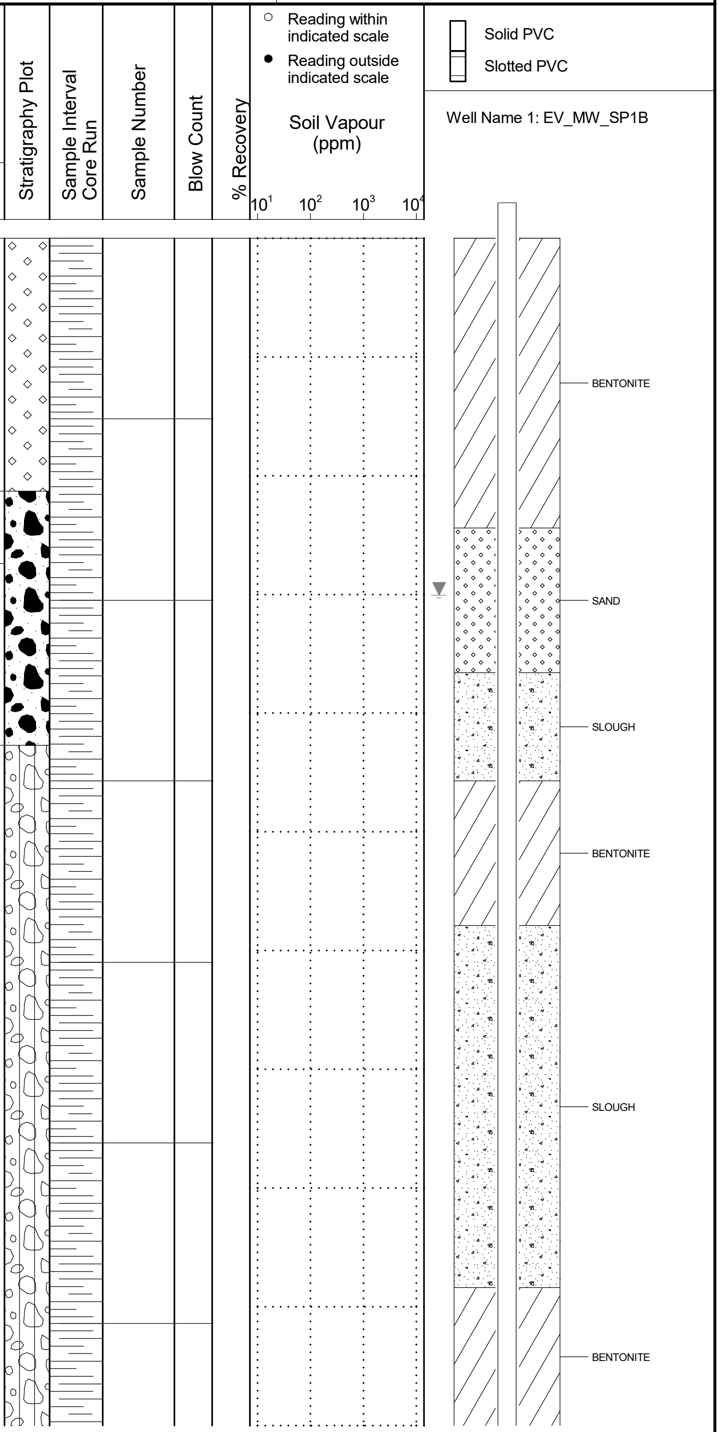
SAND, fine to coarse grained, some gravel, fine, subangular, dark brown, loose, damp, organics.

At 0.46 m - no organics.

SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subangular, occasional cobbles, well graded, grey, dense, damp.

SANDY GRAVEL, fine to coarse gravel, subangular, occasional cobbles, grey, dense, wet.

SILTY GRAVEL, fine to coarse, subangular, some sand, brown, medium dense, wet.



0
1
2
3
4
5
6
7
8
9
10

NOTES

QA/QC: MB 2020 06 22 Print Date:2020-12-02

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_SP1B**
	Location **Regional Groundwater Monitoring**	PAGE 2 OF 2

Drilling Contractor	Owen's Drilling	Date Monitored	2020 05 19	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1207.358	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1208.347	Date Drilled:	2020 05 06
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5505643.717	Easting: 659316.582	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
☰ Odex

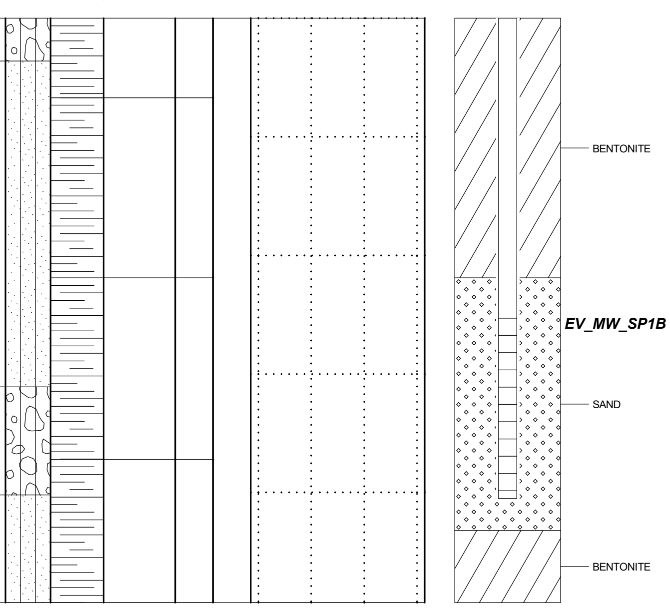
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: EV_MW_SP1B

Depth in Metres	Soil Description
10.0–10.35	
10.35–13.1	SAND, fine to coarse grained, some silt, some gravel, fine, subangular to subrounded, brown, medium dense, wet.
13.1–14.0	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded to subangular, some silt, well graded, brownish yellow, medium dense, wet.
14.0–14.9	SAND, fine to coarse grained, some silt, trace gravel, fine, subrounded to subangular, poorly graded, brown, medium dense, wet.
14.9	Bottom of hole at 14.9 m.



NOTES

QA/QC: MB 2020 06 22 Print Date:2020-12-02

FINAL

SNC·LAVALIN

Client **Teck Coal Limited**		**Borehole No. : EV_BH_SP1C**
Location **Regional Groundwater Monitoring**		PAGE 1 OF 1

Drilling Contractor	Owen's Drilling	Date Monitored	2020 05 19	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1207.366	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1208.391	Date Drilled:	2020 05 05
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5505642.125	Easting: 659315.597	Log Typed By:	VL

Drilling Legend
▨ Sample Interval
☰ Odex

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: EV_MW_SP1C

Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm)

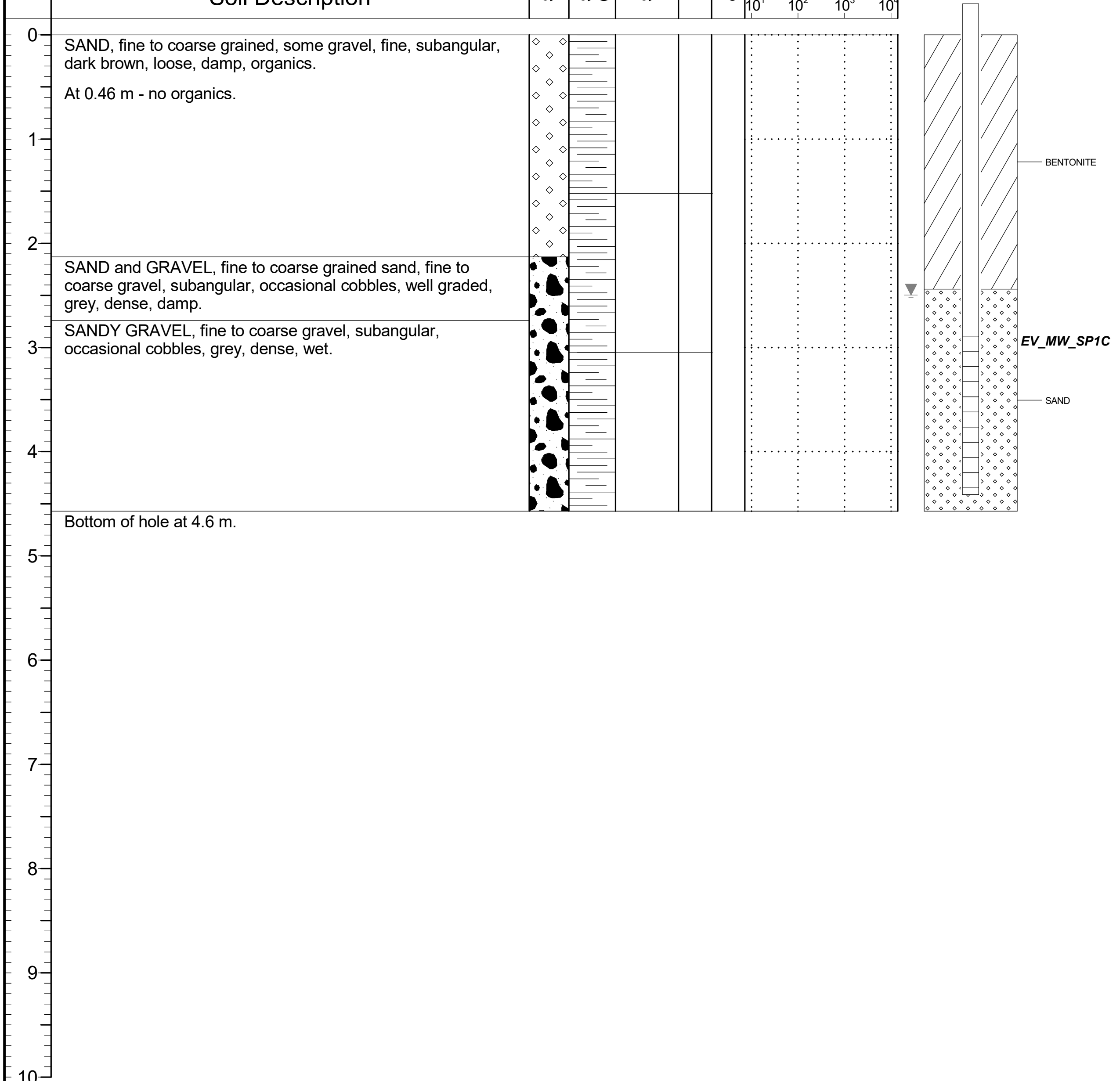
SAND, fine to coarse grained, some gravel, fine, subangular, dark brown, loose, damp, organics.

At 0.46 m - no organics.

SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subangular, occasional cobbles, well graded, grey, dense, damp.

SANDY GRAVEL, fine to coarse gravel, subangular, occasional cobbles, grey, dense, wet.

Bottom of hole at 4.6 m.



NOTES

QA/QC: MB 2020 06 22 Print Date:2020-12-02

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_EC3A**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 6

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	2021 09 30	Project Number:	683032
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	1331	Borehole Logged By:	TG
Borehole Dia. (m)	0.18	Top of Casing Elev. (m)	1332	Date Drilled:	2021 09 16
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5506540	Easting: 660840	Log Typed By:	VL

Drilling Legend
▨ Sample Interval

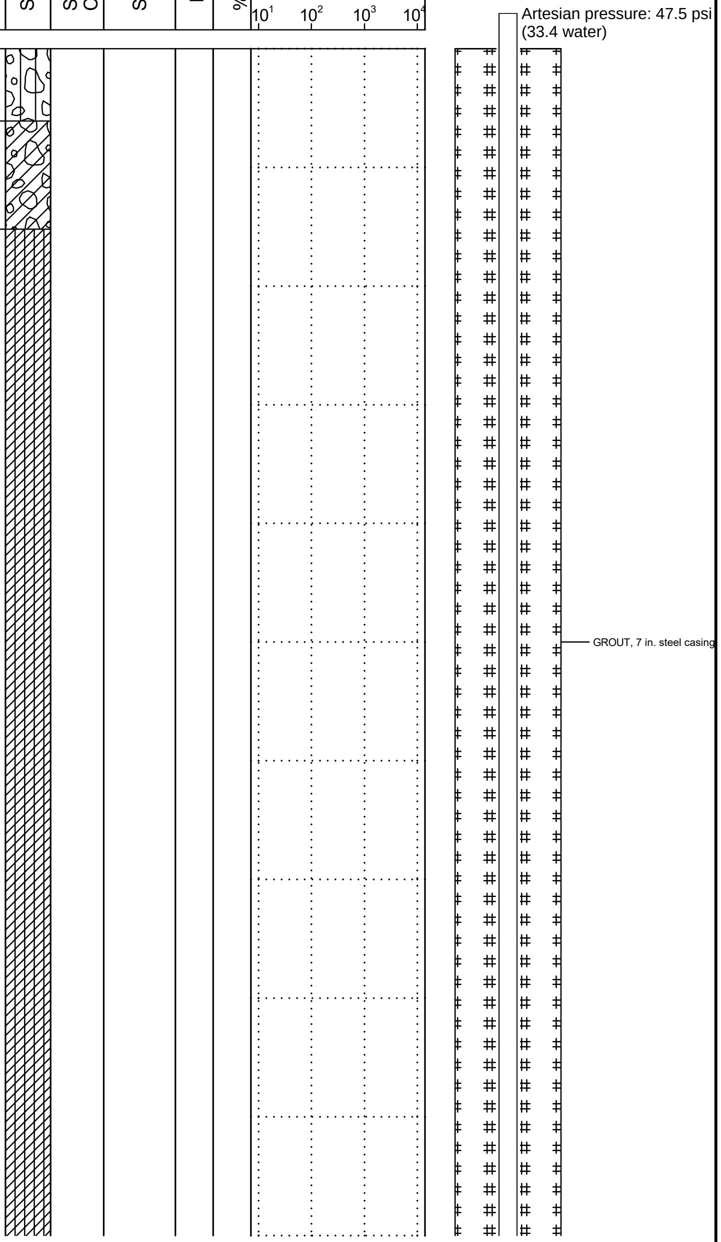
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

☐ Solid PVC
☐ Slotted PVC

Well Name 1: EV_MW_EC3A

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm)
0	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subangular, some silt, containing cobbles, dark brown, roots and organics to 0.15 m.						
	CLAYEY GRAVEL, subrounded to subangular gravel, some silt, some sand, containing cobbles, orange-brown. At 0.9 m - grey.						
1							
	SILT and CLAY, high plasticity, grey.						
2							
3							
4							
5	Below 5.2 m - laminations of silty sand and clean fine to medium grained sand comprising 5 to 10% within dominant silt and clay.						
6							
7							
8							
9							
10							



NOTES
Borehole diameter 0.18 m to 21.3 m, 0.15 m to EOH.
Collar location preliminary (not surveyed).

QA/QC: TG 2021 10 26 Print Date:2021-10-26

FINAL

SNC·LAVALIN

Client
Teck Coal Limited

Location
Regional Groundwater Monitoring

Borehole No. : EV_BH_EC3A

PAGE 2 OF 6

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	2021 09 30	Project Number:	683032
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	1331	Borehole Logged By:	TG
Borehole Dia. (m)	0.18	Top of Casing Elev. (m)	1332	Date Drilled:	2021 09 16
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5506540	Easting: 660840	Log Typed By:	VL

Drilling Legend
▨ Sample Interval

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

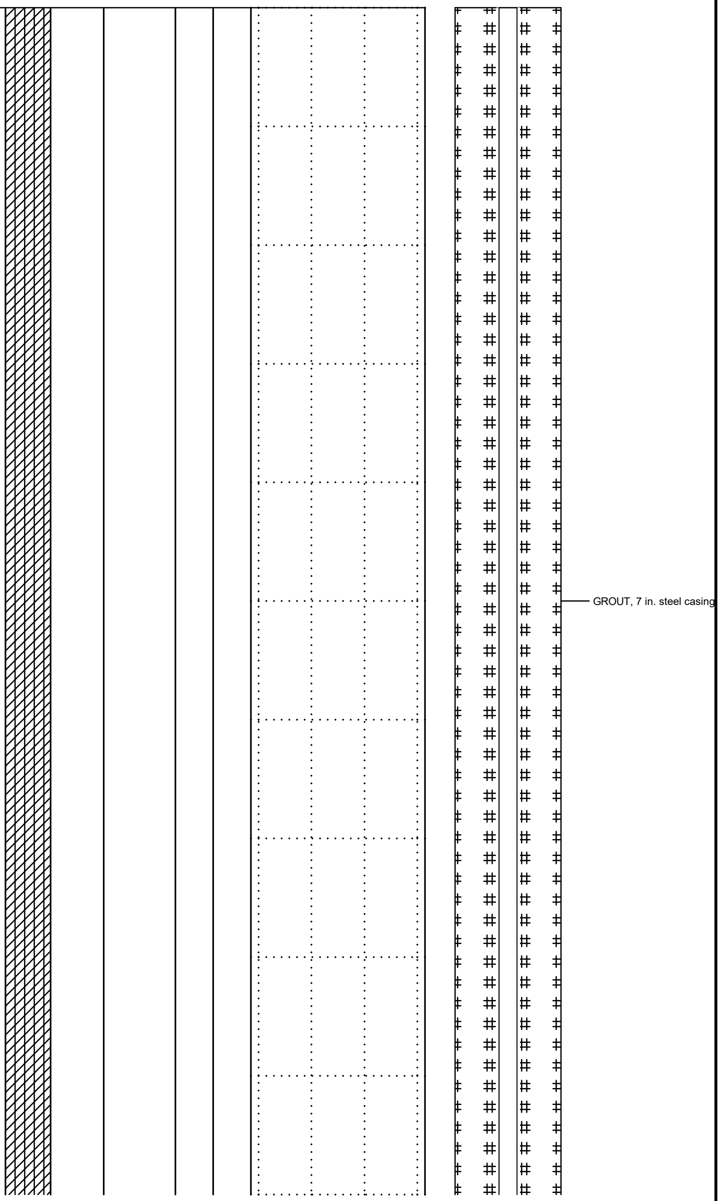
○ Reading within indicated scale
● Reading outside indicated scale

Soil Vapour (ppm)

☐ Solid PVC
☐ Slotted PVC

Well Name 1: EV_MW_EC3A

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery
10	SILT and CLAY, high plasticity, grey. *(continued)*					
11						
12						
13						
14						
15	Between 14.9 m and 16.0 m - sandy, fine grained sand, moderate plasticity.					
16						
17	At 17.4 m - 0.15 m lense of sand and silt, fine grained sand, some clay, low plasticity.					
18	At 18.3 m - frequency of sand laminations reduced to 1%.					
19						
20						



NOTES
Borehole diameter 0.18 m to 21.3 m, 0.15 m to EOH.
Collar location preliminary (not surveyed).

QA/QC: TG 2021 10 26 Print Date:2021-10-26

FINAL

SNC•LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_EC3A**
	Location **Regional Groundwater Monitoring**	PAGE 3 OF 6

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	2021 09 30	Project Number:	683032
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	1331	Borehole Logged By:	TG
Borehole Dia. (m)	0.18	Top of Casing Elev. (m)	1332	Date Drilled:	2021 09 16
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5506540	Easting: 660840	Log Typed By:	VL

Drilling Legend
▨ Sample Interval

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Soil Vapour (ppm)

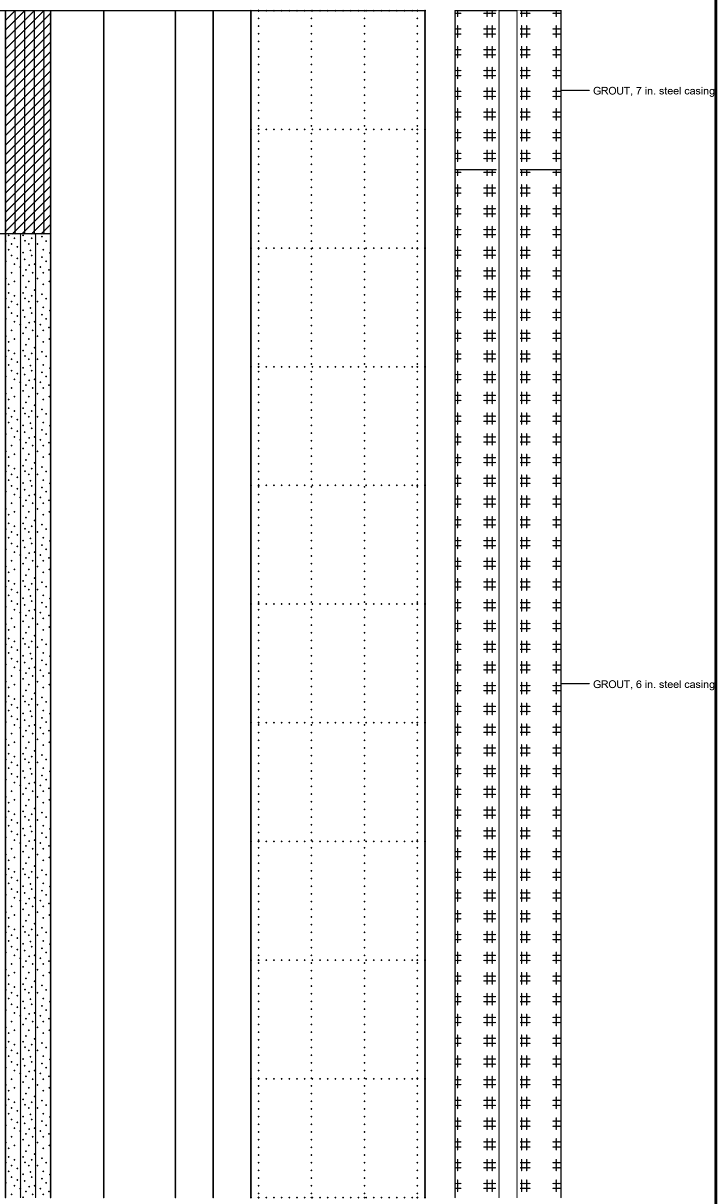
▯ Solid PVC
▤ Slotted PVC

Well Name 1: EV_MW_EC3A

Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery

20 — SILT and CLAY, high plasticity, grey. *(continued)*

22 — SILT and SAND, fine grained sand, some medium grained sand, trace to some clay, grey, slightly cohesive.



NOTES
Borehole diameter 0.18 m to 21.3 m, 0.15 m to EOH.
Collar location preliminary (not surveyed).

FINAL

SNC-LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_EC3A**
	Location **Regional Groundwater Monitoring**	PAGE 4 OF 6

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	2021 09 30	Project Number:	683032
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	1331	Borehole Logged By:	TG
Borehole Dia. (m)	0.18	Top of Casing Elev. (m)	1332	Date Drilled:	2021 09 16
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5506540	Easting: 660840	Log Typed By:	VL

Drilling Legend
▨ Sample Interval

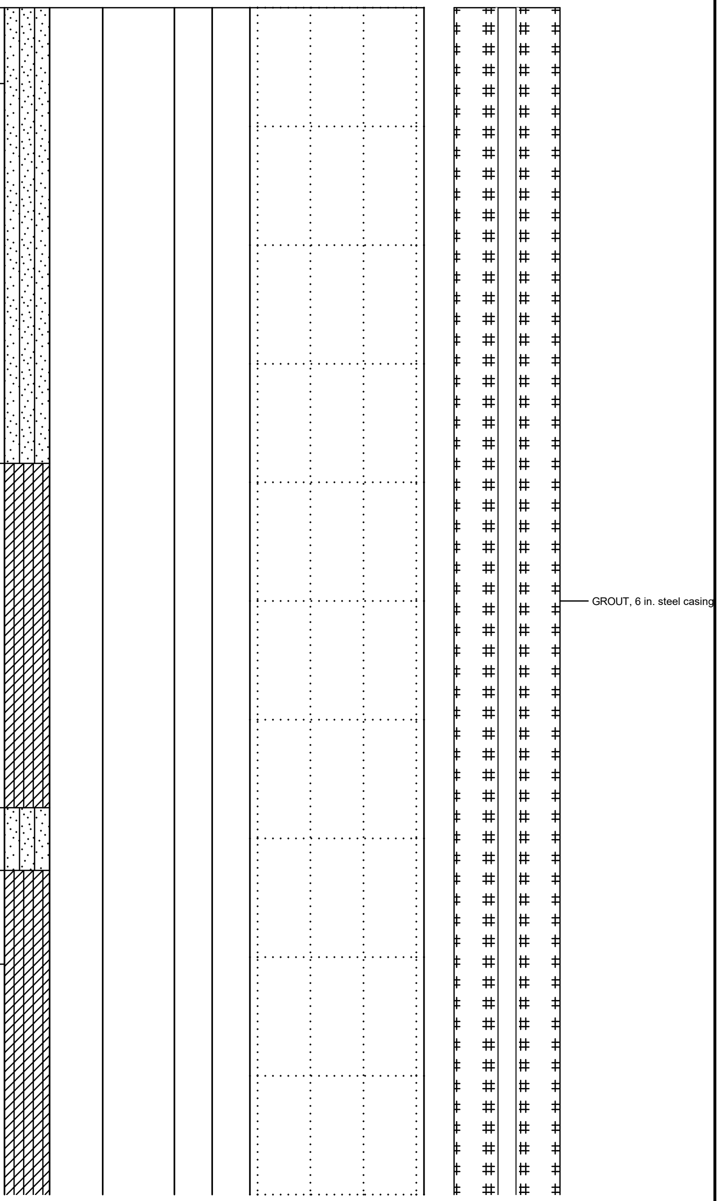
Water/NAPL Levels
Water Level 1
Water Level 2
NAPL
NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: EV_MW_EC3A

Depth in Metres	Soil Description
30	SILT and SAND, fine grained sand, some medium grained sand, trace to some clay, grey, slightly cohesive. *(continued)*
	SAND, fine to medium grained, some silt to silty, no plasticity, laminations of silt and clay up to one inch thick comprised 5 to 10% within dominant sands.
32	At 32.0 m - 0.20 m lense of clayey sand, fine to medium grained sand, some silt, trace coarse grained sand, trace fine gravel, low plasticity. Below 32.2 m - no gravel.
33	Below 33.3 m - increasing silt.
34	SILT and CLAY, trace gravel, fine, subangular to angular, trace sand, medium to coarse grained, containing cobbles, dark brown to grey, dense, low to moderate plasticity.
35	At 35.1 m - 0.20 m lense of fine to medium grained sand, trace coarse grained sand, some silt, grey, no plasticity.
36	Below 36.2 m - no sand, no gravel.
36.7	SAND, fine to coarse grained, some silt to silty, light brown.
37.3	SILT and CLAY, some gravel, fine to coarse, subangular, trace sand, coarse, compact, light brown, moderate plasticity.
38	SILT and CLAY, some sand, fine to coarse grained, trace gravel, fine, subangular, dark brown, very dense, low plasticity, till-like. At 38.4 m - 0.25 m lense of fine to coarse grained sand, trace fine gravel, trace to some silt, dark brown, dense.
39.6	Below 39.6 m - some gravel, trace sand, fine to coarse grained, containing cobbles.
40	



NOTES
Borehole diameter 0.18 m to 21.3 m, 0.15 m to EOH.
Collar location preliminary (not surveyed).

QA/QC: TG 2021 10 26 Print Date:2021-10-26

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_EC3A**
	Location **Regional Groundwater Monitoring**	PAGE 5 OF 6

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	2021 09 30	Project Number:	683032
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	1331	Borehole Logged By:	TG
Borehole Dia. (m)	0.18	Top of Casing Elev. (m)	1332	Date Drilled:	2021 09 16
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5506540	Easting: 660840	Log Typed By:	VL

Depth in Metres

Drilling Legend
▨ Sample Interval

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

Soil Description

Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery

○ Reading within indicated scale
● Reading outside indicated scale

Soil Vapour (ppm)

10^1 10^2 10^3 10^4

Solid PVC
Slotted PVC

Well Name 1: EV_MW_EC3A

40

SILT and CLAY, some sand, fine to coarse grained, trace gravel, fine, subangular, dark brown, very dense, low plasticity, till-like. *(continued)*

41

42

SAND and GRAVEL, subrounded to subangular gravel, some silt, dark brown, loose.

CLAYEY, SANDY GRAVEL, fine to coarse gravel, subrounded to subangular, loose, low plasticity.

SILT and CLAY, trace sand, fine to coarse grained, trace gravel, fine, subrounded to subangular, dark grey, very dense, low plasticity, slow drilling.

43

44

At 41.1 m - sandy, gravelly for 0.03 m.

Between 44.8 m and 45.1 m - containing cobbles.

45

46

Below 46.3 m - increased coarse fractions, some sand, fine to coarse grained, some gravel, fine to coarse, containing cobbles.

47

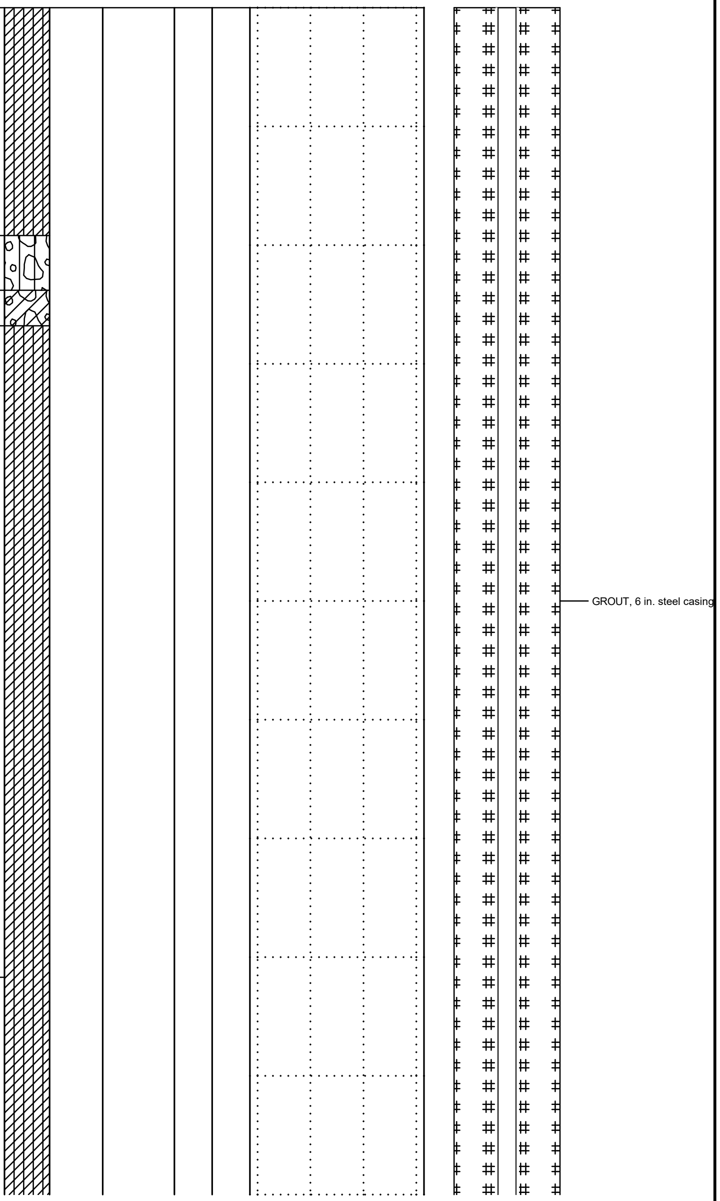
48

SILT and CLAY, dark brown, dense, low plasticity, faster drilling than previous material.

Below 48.8 m - moderate plasticity.

49

50



NOTES
Borehole diameter 0.18 m to 21.3 m, 0.15 m to EOH.
Collar location preliminary (not surveyed).

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : EV_BH_EC3A**
	Location **Regional Groundwater Monitoring**	PAGE 6 OF 6

Drilling Contractor	Mud Bay Drilling Co. Ltd.	Date Monitored	2021 09 30	Project Number:	683032
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	1331	Borehole Logged By:	TG
Borehole Dia. (m)	0.18	Top of Casing Elev. (m)	1332	Date Drilled:	2021 09 16
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5506540	Easting: 660840	Log Typed By:	VL

Drilling Legend
▨ Sample Interval

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm)

○ Reading within indicated scale
● Reading outside indicated scale

10^1 10^2 10^3 10^4

☐ Solid PVC
☐ Slotted PVC

Well Name 1: EV_MW_EC3A

50

SILT and CLAY, dark brown, dense, low plasticity, faster drilling than previous material. *(continued)*
Below 50.3 m - low plasticity.

51

Below 51.2 m - trace sand, fine to coarse, trace gravel, fine to coarse, subrounded to subangular.

52

GRAVELLY SILT and CLAY, fine to coarse gravel, subangular, some sand, fine to coarse grained, dark brown, dense.

SAND, fine grained, some silt, brown and dark grey laminations, no plasticity.

53

SILTY SAND and GRAVEL, subangular gravel, some clay, containing cobbles, grey, reducing fine fraction downwards.

54

Below 54.0 m - gravel, fine to coarse, subangular, sandy, fine to coarse grained sand, some silt.
Below 54.3 m - gravel, fine to coarse, subrounded to subangular, some sand, coarse grained, trace silt, trace sand, fine to medium grained, containing cobbles, fine fraction may be washed out.

55

At 54.9 m - Artesian flow encountered after sonic core barrel pulled. Shut-in gauge pressure of 37.5 psi measured at collar before installing well. Flow of 1.1 L/s measured in cased hole, and increased after one 10 ft run of casing was removed (highest flow rates not measured and on the order of 10 L/s). Produced water included silt and sand (fine to medium grained).

56

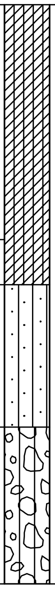
Bottom of hole at 54.9 m.

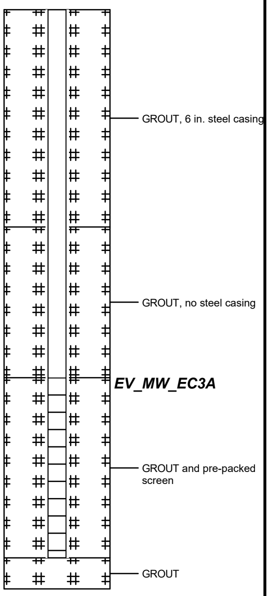
57

58

59

60





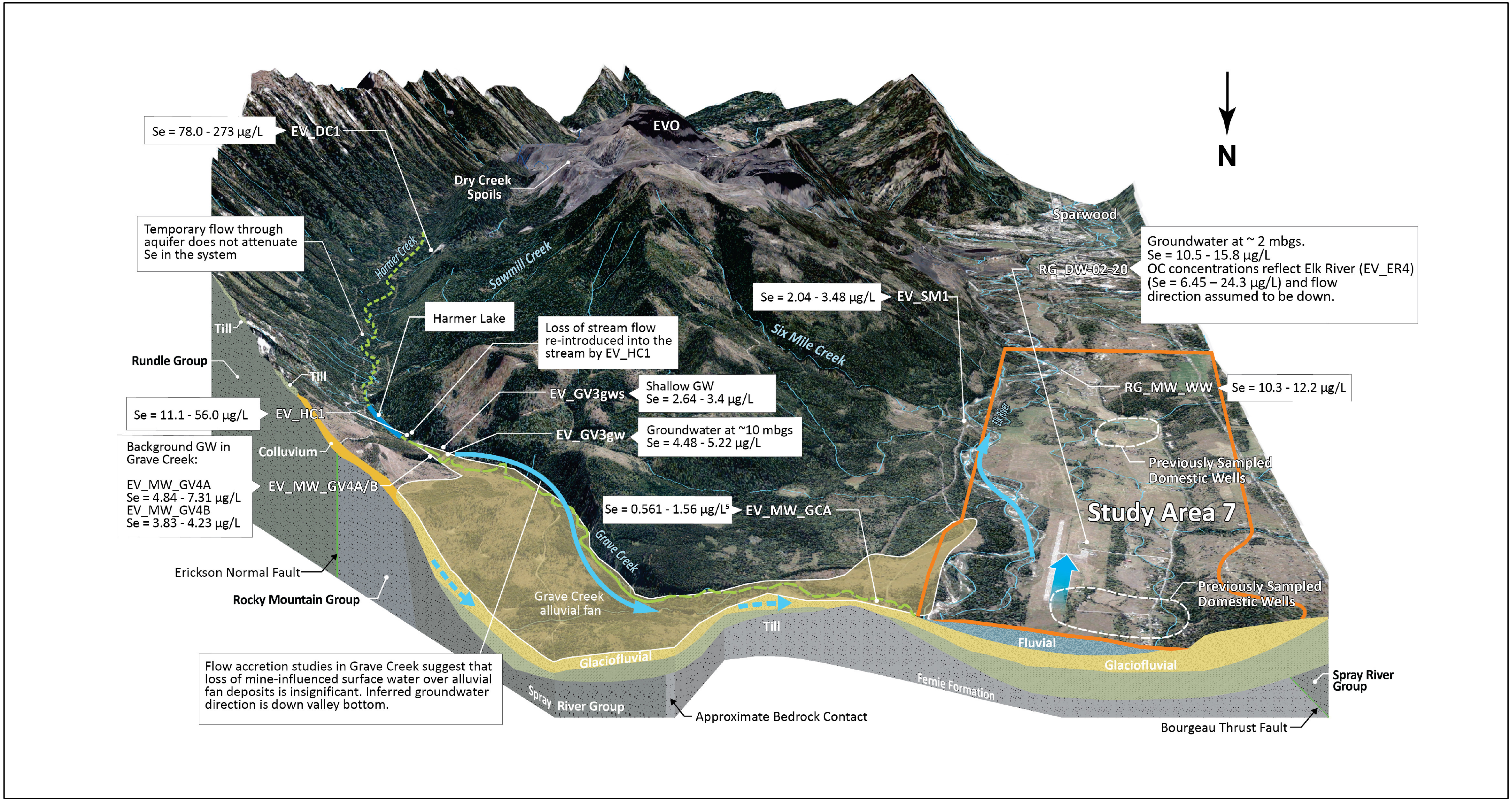
NOTES
Borehole diameter 0.18 m to 21.3 m, 0.15 m to EOH.
Collar location preliminary (not surveyed).

QA/QC: TG 2021 10 26 Print Date:2021-10-26

Attachment II

Block Diagrams

Diagram EV-01	Block Diagram Showing 3D Conceptual Hydrogeology and Transport Pathways of Order Constituents at EVO - Grave Creek/Harmer Creek and Study Area 7
Diagram EV-02	Block Diagram Showing 3D Conceptual Hydrogeology and Transport Pathways of Order Constituents at EVO - Elk River Proximal to EVO and Study Area 8
Diagram EV-03	Block Diagram Showing 3D Conceptual Hydrogeology and Transport Pathways of Order Constituents at EVO - Michel Creek and Elk River Distal to EVO, Study Areas 9a, 9b and 12
Diagram EV-04	Block Diagram Showing 3D Conceptual Hydrogeology and Transport Pathways of Order Constituents at EVO - Erickson Creek and Study Area 10



Se = 78.0 - 273 µg/L

Temporary flow through aquifer does not attenuate Se in the system

Loss of stream flow re-introduced into the stream by EV_HC1

Se = 11.1 - 56.0 µg/L

Background GW in Grave Creek:

EV_MW_GV4A
Se = 4.84 - 7.31 µg/L
EV_MW_GV4B
Se = 3.83 - 4.23 µg/L

Shallow GW
Se = 2.64 - 3.4 µg/L

Groundwater at ~10 mbgs
Se = 4.48 - 5.22 µg/L

Se = 0.561 - 1.56 µg/L^5

Se = 2.04 - 3.48 µg/L

Groundwater at ~ 2 mbgs.
Se = 10.5 - 15.8 µg/L
OC concentrations reflect Elk River (EV_ER4) (Se = 6.45 – 24.3 µg/L) and flow direction assumed to be down.

Se = 10.3 - 12.2 µg/L

Flow accretion studies in Grave Creek suggest that loss of mine-influenced surface water over alluvial fan deposits is insignificant. Inferred groundwater direction is down valley bottom.

Flow Legend

Main Stem Down-Valley Groundwater
Upland or Tributary Groundwater
Surface Water
Gaining Reach
Stable Reach
Losing or Stable Reach

REFERENCES:

1. Graphics from Brick Tudor Studios, LLC.
2. Geology derived from Monahan, 2000, BC Government.
3. Lorax Environmental, 2019, EVO Dry Creek and Harmer Creek Local Flow and Water Quality Investigation
4. SNC-Lavalin, 2020, Grave Creek and Line Creek Flow Accretion Studies, Summer and Fall 2020

NOTES:

1. Original in colour.
2. All concentrations shown are for 2022 minimum and maximum unless otherwise stated.
3. Subsurface geology is not to scale.
4. Vertical exaggeration 2x for topographic profile.
5. Only one sampling event at EV_MW_GCA.
6. mbgs denotes meters below ground surface.
7. OC denotes Order Constituents.

CLIENT:
Teck Coal Limited

PROJECT LOCATION:
Elk Valley, BC

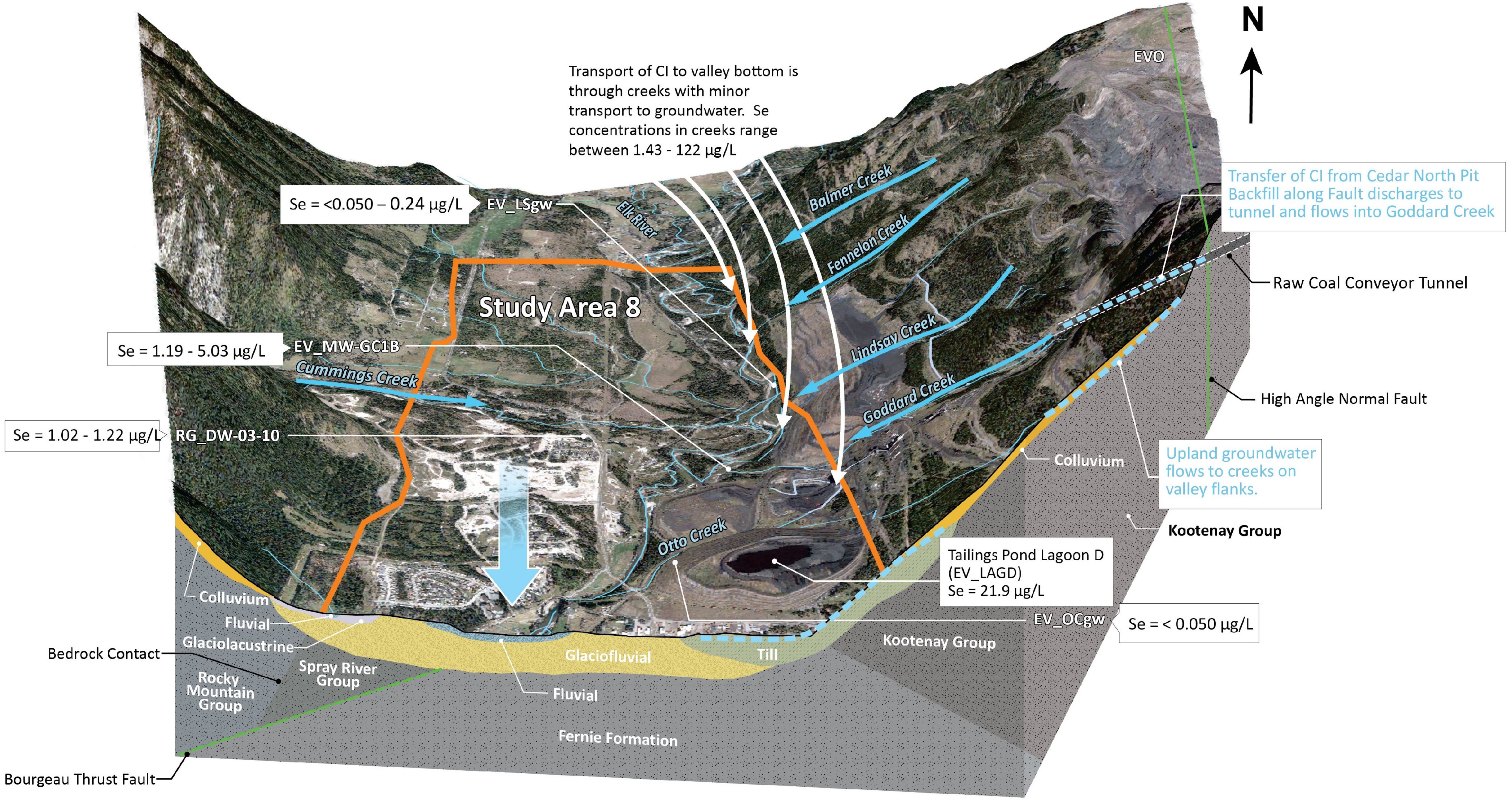
SNC·LAVALIN

Block Diagram Showing 3D Conceptual Hydrogeology and Transport Pathways of Order Constituents at EVO - Grave Creek/Harmer Creek and Study Area 7

BY: CW
SCALE:
DATE: 2023-02-01
REF No:
DIAGRAM EV-01
CHK'D: DC
Proj Coord Sys:

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-BlockDiagram_EV01.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



Flow Legend

Main Stem Down-Valley Groundwater

Upland or Tributary Groundwater

Surface Water

REFERENCES:

1. Graphics from Brick Tudor Studios, LLC.
2. Geology derived from Monahan, 2000, BC Government.

NOTES:

1. Original in colour.
2. All concentrations shown are for 2022 minimum and maximum unless otherwise stated.
3. Subsurface geology is not to scale.
4. Vertical exaggeration 2x for topographic profile.
5. Bourgeau thrust fault strikes N-S and dips to the west.
6. Bedrock contact between the Rocky Mtn. Supergroup and the Spray River Group strikes N-S and dips to the west.
7. Bedrock contact between the Fernie Formation and the Kootenay Group strikes N-S and is inferred to dip to the east.

CLIENT:
Teck Coal Limited

PROJECT LOCATION:
Elk Valley, BC

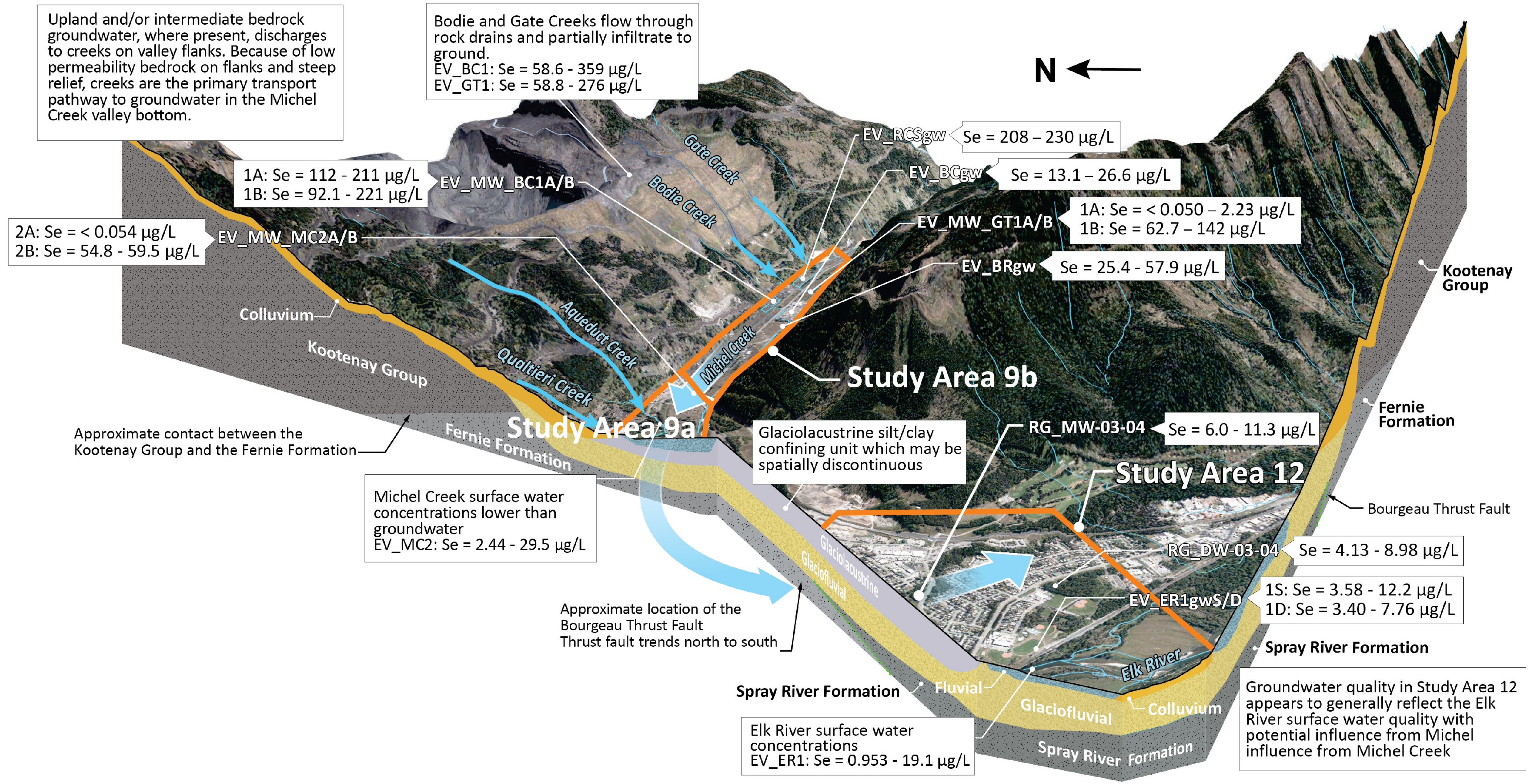
SNC·LAVALIN

Block Diagram Showing 3D Conceptual Hydrogeology and Transport Pathways of Order Constituents at EVO - Elk River Proximal to EVO and Study Area 8

BY: CW
SCALE:
DATE: 2023-02-01
REF No:
CHK'D: DC
Proj Coord Sys:
DIAGRAM EV-02

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-BlockDiagram_EV02.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



Upland and/or intermediate bedrock groundwater, where present, discharges to creeks on valley flanks. Because of low permeability bedrock on flanks and steep relief, creeks are the primary transport pathway to groundwater in the Michel Creek valley bottom.

Bodie and Gate Creeks flow through rock drains and partially infiltrate to ground.
EV_BC1: Se = 58.6 - 359 µg/L
EV_GT1: Se = 58.8 - 276 µg/L

Approximate contact between the Kootenay Group and the Fernie Formation

Glaciolacustrine silt/clay confining unit which may be spatially discontinuous

Michel Creek surface water concentrations lower than groundwater
EV_MC2: Se = 2.44 - 29.5 µg/L

Approximate location of the Bourgeau Thrust Fault
Thrust fault trends north to south

Elk River surface water concentrations
EV_ER1: Se = 0.953 - 19.1 µg/L

Groundwater quality in Study Area 12 appears to generally reflect the Elk River surface water quality with potential influence from Michel influence from Michel Creek

Flow Legend

➡	Main Stem Down-Valley Groundwater
- - ➡	Upland or Tributary Groundwater
➡	Surface Water

REFERENCES:

1. Graphics from Brick Tudor Studios, LLC.
2. Geology derived from Monahan, 2000, BC Government.

NOTES:
1. Original in colour.
2. All concentrations shown are for 2022 minimum and maximum unless otherwise stated.
3. Subsurface geology is not to scale.
4. Vertical exaggeration 2x for topographic profile.

CLIENT:
Teck Coal Limited

PROJECT LOCATION:
Elk Valley, BC

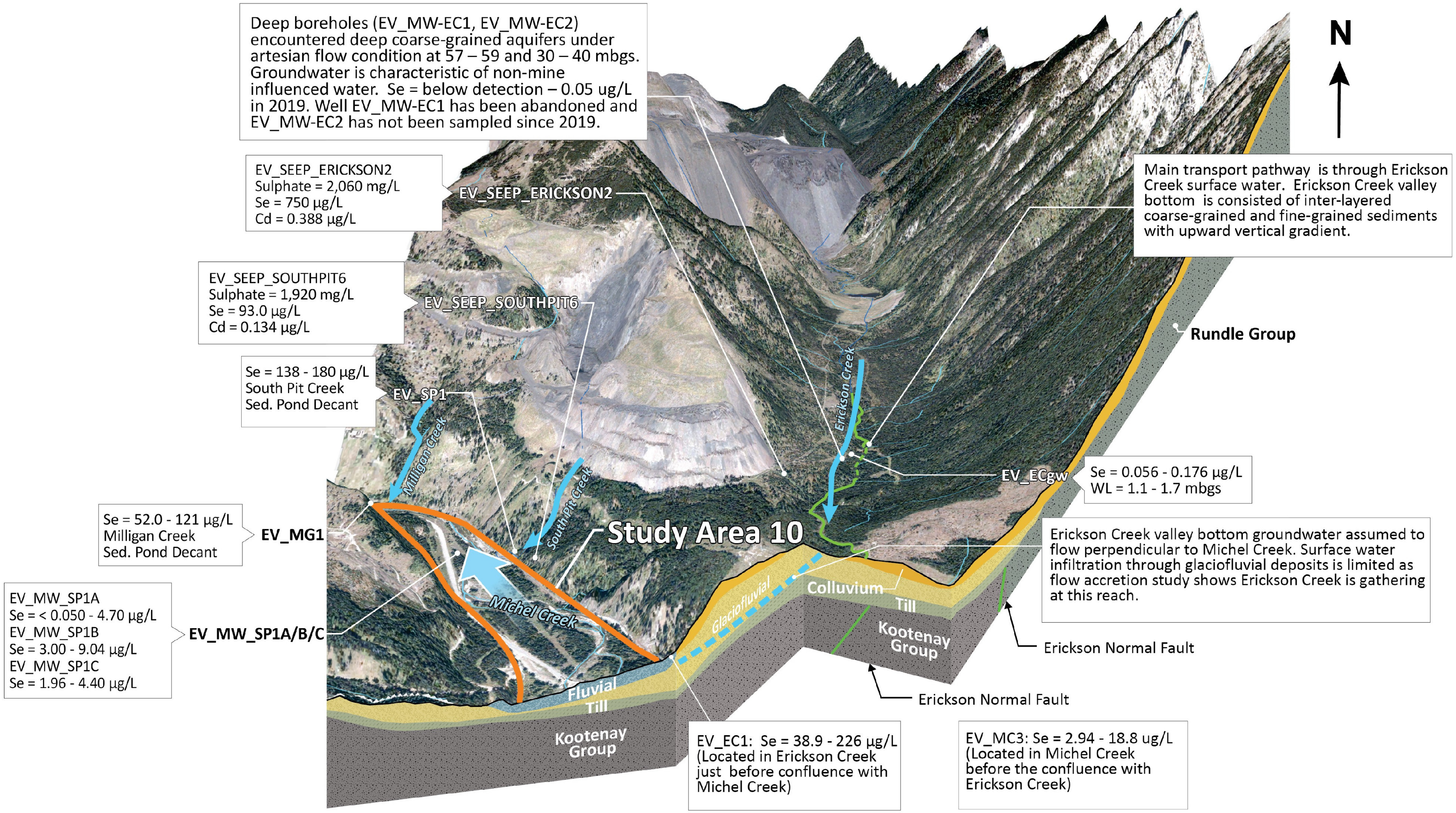
SNC·LAVALIN

Block Diagram Showing 3D Conceptual Hydrogeology and Transport Pathways of Order Constituents at EVO - Michel Creek and Elk River Distal to EVO, Study Areas 9a, 9b and 12

BY: CW
SCALE:
DATE: 2023-02-01
REF No:
CHK'D: DC
Proj Coord Sys: NAD 1983 UTM Zone 10N
DIAGRAM EV-03

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-BlockDiagram_EV03.mxd



Deep boreholes (EV_MW-EC1, EV_MW-EC2) encountered deep coarse-grained aquifers under artesian flow condition at 57 – 59 and 30 – 40 mbgs. Groundwater is characteristic of non-mine influenced water. Se = below detection – 0.05 ug/L in 2019. Well EV_MW-EC1 has been abandoned and EV_MW-EC2 has not been sampled since 2019.

EV_SEEP_ERICKSON2
Sulphate = 2,060 mg/L
Se = 750 µg/L
Cd = 0.388 µg/L

EV_SEEP_SOUTHPIT6
Sulphate = 1,920 mg/L
Se = 93.0 µg/L
Cd = 0.134 µg/L

Se = 138 - 180 µg/L
South Pit Creek
Sed. Pond Decant

Se = 52.0 - 121 µg/L
Milligan Creek
Sed. Pond Decant

EV_MW_SP1A
Se = < 0.050 - 4.70 µg/L
EV_MW_SP1B
Se = 3.00 - 9.04 µg/L
EV_MW_SP1C
Se = 1.96 - 4.40 µg/L

Main transport pathway is through Erickson Creek surface water. Erickson Creek valley bottom is consisted of inter-layered coarse-grained and fine-grained sediments with upward vertical gradient.

Se = 0.056 - 0.176 µg/L
WL = 1.1 - 1.7 mbgs

Erickson Creek valley bottom groundwater assumed to flow perpendicular to Michel Creek. Surface water infiltration through glaciofluvial deposits is limited as flow accretion study shows Erickson Creek is gathering at this reach.

EV_EC1: Se = 38.9 - 226 µg/L (Located in Erickson Creek just before confluence with Michel Creek)

EV_MC3: Se = 2.94 - 18.8 ug/L (Located in Michel Creek before the confluence with Erickson Creek)

Flow Legend

Main Stem Down-Valley Groundwater	Normal Fault
Upland or Tributary Groundwater	Erickson Creek Gaining Reach
Surface Water	Erickson Creek Losing Reach

REFERENCES:

1. Graphics from Brick Tudor Studios, LLC.
2. Geology derived from Monahan, 2000, BC Government.

NOTES:
1. Original in colour.
2. All concentrations shown are for 2022 minimum and maximum unless otherwise stated.
3. Subsurface geology is not to scale.
4. Vertical exaggeration 2x for topographic profile.
5. mbgs denotes metres below ground surface.

CLIENT:
Teck Coal Limited

PROJECT LOCATION:
Elk Valley, BC

SNC·LAVALIN

Block Diagram Showing 3D Conceptual Hydrogeology and Transport Pathways of Order Constituents at EVO - Erickson Creek and Study Area 10

BY: CW
SCALE:
DATE: 2023-02-01
REF No: **DIAGRAM EV-04**
CHK'D: DC
Proj Coord Sys:

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-BlockDiagram_EV04.mxd

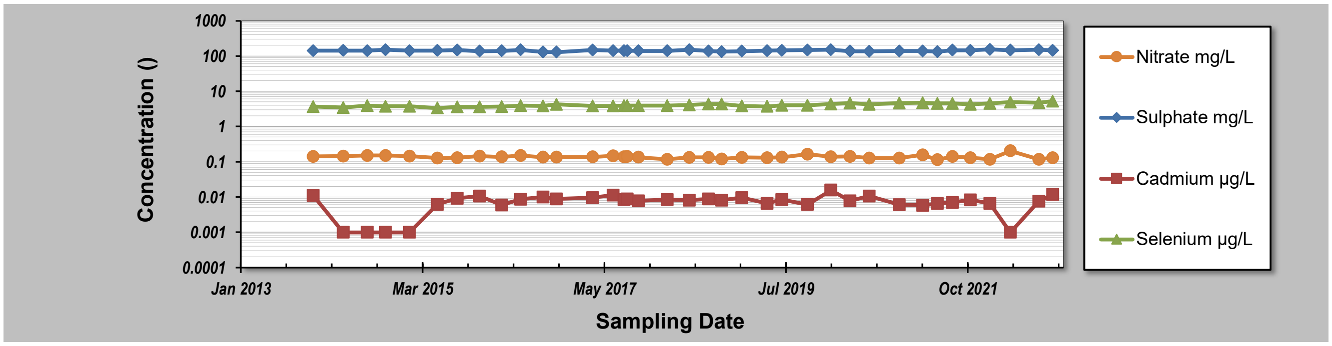
Attachment III

Mann-Kendall Analyses

GSI MANN-KENDALL TOOLKIT

Evaluation Date: 28-Dec-22
Facility Name: Teck Coal Regional Groundwater - EVO
Conducted By: MF
Job ID: 635544
Location EV_GV3gw
Reviewed By:

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	**Sampling Date**	**EV_GV3GW CONCENTRATION**							
1	15-Nov-13	0.141	142	0.011	3.65				
2	28-Mar-14	0.143	143	0.00	3.43				
3	12-Jul-14	0.149	141	0.00	3.87				
4	30-Sep-14	0.151	151	0.00	3.71				
5	13-Jan-15	0.143	142	0.001	3.76				
6	15-May-15	0.128	143	0.0062	3.35				
7	11-Aug-15	0.129	147	0.0091	3.56				
8	18-Nov-15	0.143	137	0.0106	3.59				
9	23-Feb-16	0.137	140	0.0059	3.66				
10	16-May-16	0.150	149	0.0086	3.88				
11	22-Aug-16	0.134	131	0.0099	3.85				
12	20-Oct-16	0.136	129	0.0088	4.24				
13	29-Mar-17	0.137	148	0.0096	3.83				
14	27-Jun-17	0.147	142	0.0112	3.84				
15	15-Aug-17	0.137	141	0.0085	3.90				
16	29-Aug-17	0.140	142	0.0088	3.89				
17	17-Oct-17	0.134	140	0.0078	3.87				
18	20-Feb-18	0.118	140	0.0084	3.92				
19	29-May-18	0.133	150	0.0081	4.09				
20	21-Aug-18	0.133	139	0.0088	4.36				
21	18-Oct-18	0.120	132	0.0081	4.34				
22	15-Jan-19	0.133	137	0.0095	3.85				
23	6-May-19	0.130	142	0.0066	3.70				
24	10-Jul-19	0.134	144	0.0085	4.01				
25	31-Oct-19	0.164	147	0.006	4.02				
26	11-Feb-20	0.139	151	0.0156	4.34				
27	5-May-20	0.141	137	0.0077	4.65				
28	28-Jul-20	0.128	136	0.011	4.27				
29	8-Dec-20	0.128	138	0.0060	4.58				
30	21-Mar-21	0.158	138	0.0058	4.71				
31	24-May-21	0.114	133	0.007	4.51				
32	30-Jul-21	0.142	146	0.0070	4.50				
33	17-Oct-21	0.129	144	0.0082	4.24				
34	11-Jan-22	0.118	154	0.0066	4.48				
35	10-Apr-22	0.205	146	0.0010	4.88				
36	14-Aug-22	0.118	150	0.0076	4.68				
37	14-Oct-22	0.129	144	0.0118	5.22				
38									
39									
40									
	Coefficient of Variation:	**0.12**	**0.04**	**0.43**	**0.11**				
	Mann-Kendall Statistic (S):	**-172**	**24**	**-25**	**458**				
	Confidence Factor:	**98.8%**	**61.7%**	**62.2%**	**>99.9%**				
	Concentration Trend:	**Decreasing**	**No Trend**	**Stable**	**Increasing**				



Notes:

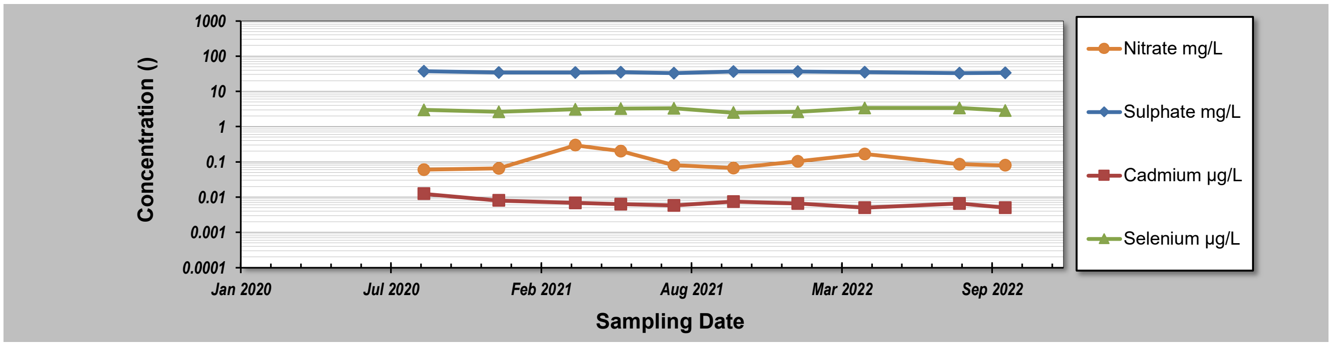
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

Evaluation Date: 28-Dec-22
Facility Name: Teck Coal Regional Groundwater - EVO
Conducted By: MF

Job ID: 635544
Location EV_Gv3gws
Reviewed By:

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	Sampling Date	EV_GV3GWS CONCENTRATION							
1	31-Aug-20	0.0601	37.5	0.0125	2.98				
2	9-Dec-20	0.0656	34.3	0.008	2.6				
3	21-Mar-21	0.298	34.2	0.0068	3.13				
4	20-May-21	0.203	34.7	0.0063	3.22				
5	30-Jul-21	0.0809	33.0	0.0058	3.29				
6	17-Oct-21	0.0663	36.3	0.0074	2.51				
7	11-Jan-22	0.103	36.3	0.0066	2.64				
8	10-Apr-22	0.168	34.7	0.005	3.4				
9	14-Aug-22	0.0857	33.0	0.0066	3.38				
10	14-Oct-22	0.0795	33.4	0.005	2.83				
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	0.65	0.04	0.31	0.11				
	Mann-Kendall Statistic (S):	5	-12	-27	11				
	Confidence Factor:	63.6%	83.2%	99.2%	81.0%				
	Concentration Trend:	No Trend	Stable	Decreasing	No Trend				



Notes:

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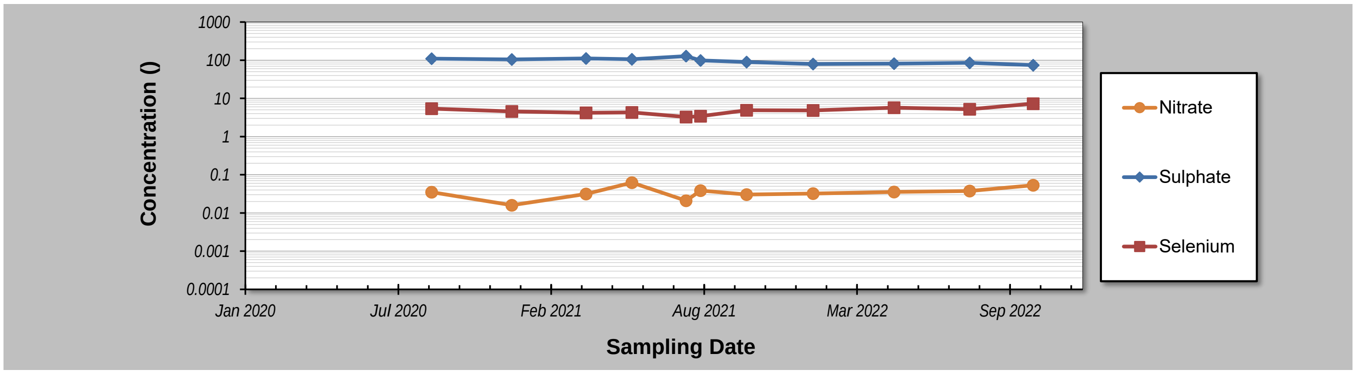
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

Evaluation Date: **28-Dec-22**
Facility Name: **Teck Coal Regional Groundwater - EVO**
Conducted By: **MF**

Job ID: **635544**
Location **EV_MW_GV4A**
Reviewed By:

	Parameter	**Nitrate**	**Sulphate**	**Selenium**					
	units	mg/L	mg/L	µg/L					
Sampling Event	Sampling Date	EV_MW_GV4A CONCENTRATION							
1	31-Aug-20	0.0351	110	5.40					
2	14-Dec-20	0.0160	105	4.59					
3	21-Mar-21	0.0316	112	4.20					
4	20-May-21	0.0624	106	4.28					
5	30-Jul-21	0.0210	128	3.27					
6	18-Aug-21	0.0384	99.1	3.42					
7	17-Oct-21	0.0303	89.4	4.90					
8	12-Jan-22	0.0321	79.2	4.84					
9	28-Apr-22	0.0353	81.6	5.72					
10	5-Aug-22	0.0377	85.4	5.23					
11	27-Oct-22	0.0531	74.4	7.31					
12									
13									
14									
15									
16									
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	**0.36**	**0.17**	**0.23**					
	Mann-Kendall Statistic (S):	**19**	**-35**	**19**					
	Confidence Factor:	**91.8%**	**99.7%**	**91.8%**					
	Concentration Trend:	Prob. Increasing	Decreasing	Prob. Increasing					



Notes:

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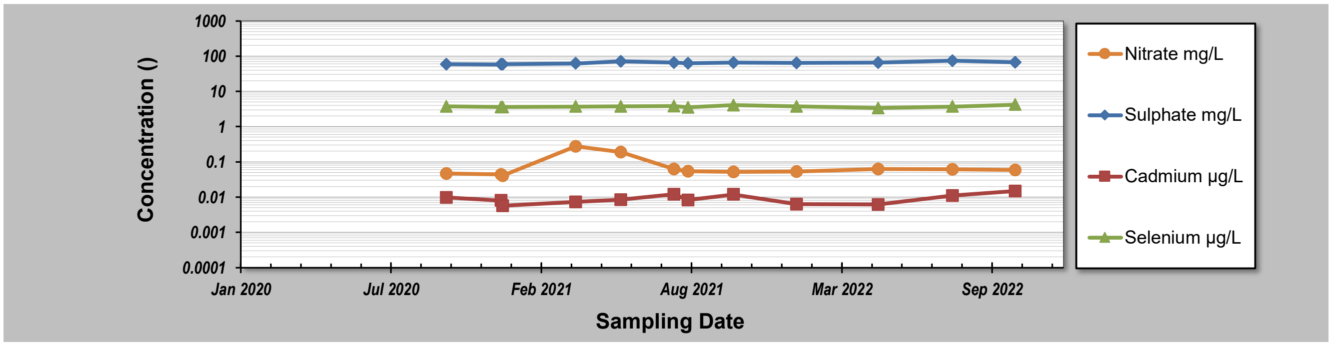
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 28-Dec-22
Facility Name: Teck Coal Regional Groundwater - EVO
Conducted By: MF

Job ID: 635544
Location EV_MW_GV4B
Reviewed By:

Parameter	Nitrate	Sulphate	Cadmium	Selenium				
units	mg/L	mg/L	µg/L	µg/L				

Sampling Event	Sampling Date	EV_MW_GV4B CONCENTRATION							
1	30-Sep-20	0.047	58.9	0.0097	3.72				
2	12-Dec-20	0.0435	58.4	0.008	3.61				
3	14-Dec-20	0.0404	58.7	0.0057	3.61				
4	21-Mar-21	0.275	62	0.0073	3.7				
5	20-May-21	0.189	70.5	0.0085	3.76				
6	30-Jul-21	0.0629	65.6	0.0121	3.84				
7	18-Aug-21	0.0536	62.4	0.0082	3.54				
8	17-Oct-21	0.0521	65.9	0.0119	4.05				
9	9-Jan-22	0.0533	64.3	0.0063	3.74				
10	28-Apr-22	0.0626	64.8	0.0062	3.38				
11	5-Aug-22	0.0612	74.7	0.0111	3.7				
12	27-Oct-22	0.059	67.1	0.0149	4.23				
13									
14									
15									
16									
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		0.87	0.08	0.31	0.06				
Mann-Kendall Statistic (S):		8	38	12	12				
Confidence Factor:		68.1%	99.6%	77.0%	77.0%				
Concentration Trend:		No Trend	Increasing	No Trend	No Trend				



Notes:

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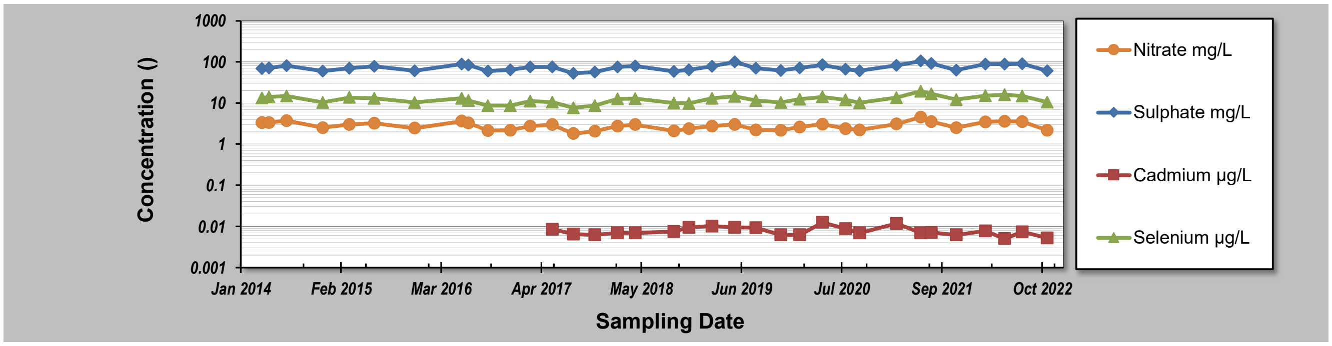
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 28-Dec-22
Facility Name: Teck Coal Regional Groundwater - EVO
Conducted By: MF

Job ID: 635544
Location RG_DW_02-20
Reviewed By:

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	Sampling Date	RG_DW_02-20 CONCENTRATION							
1	26-Mar-14	3.36	68.6		13.3				
2	24-Apr-14	3.36	71.3		13.9				
3	3-Jul-14	3.69	81.2		14.8				
4	24-Nov-14	2.50	59.6		10.3				
5	10-Mar-15	2.98	69.4		13.6				
6	18-Jun-15	3.21	78.2		13.1				
7	26-Nov-15	2.44	60.2		10.3				
8	1-Jun-16	3.62	87.6		12.9				
9	28-Jun-16	3.26	83.6		11.5				
10	14-Sep-16	2.12	59.9		8.58				
11	12-Dec-16	2.19	63.5		8.63				
12	1-Mar-17	2.75	74.6		11				
13	29-May-17	2.97	74.9	0.009	10.5				
14	21-Aug-17	1.81	52.8	0.007	7.65				
15	15-Nov-17	2.05	56.5	0.0062	8.64				
16	13-Feb-18	2.74	75.6	0.007	12.5				
17	25-Apr-18	2.97	78.9	0.0069	12.8				
18	26-Sep-18	2.08	58.9	0.0075	9.87				
19	26-Nov-18	2.37	63.9	0.0094	9.83				
20	25-Feb-19	2.76	77.6	0.0101	13.1				
21	27-May-19	2.99	100	0.0094	14.5				
22	20-Aug-19	2.22	69.5	0.0092	11.5				
23	28-Nov-19	2.18	61.6	0.0062	10.3				
24	11-Feb-20	2.59	70.7	0.0062	12.3				
25	12-May-20	3.05	84.3	0.0125	14.1				
26	12-Aug-20	2.38	66.5	0.0088	11.9				
27	7-Oct-20	2.2	60.5	0.0069	10.2				
28	3-Mar-21	3.08	81.8	0.0117	13.5				
29	8-Jun-21	4.55	105	0.007	19.4				
30	21-Jul-21	3.51	91.6	0.0071	16.8				
31	28-Oct-21	2.52	63.1	0.0062	12.2				
32	22-Feb-22	3.48	88	0.0077	15.0				
33	9-May-22	3.6	88.8	0.005	15.8				
34	19-Jul-22	3.55	89.3	0.0073	14.8				
35	26-Oct-22	2.17	60.2	0.0052	10.5				
36									
37									
38									
39									
40									
Coefficient of Variation:		0.22	0.18	0.25	0.21				
Mann-Kendall Statistic (S):		3	114	-28	96				
Confidence Factor:		51.1%	94.6%	76.0%	91.1%				
Concentration Trend:		No Trend	Prob. Increasing	Stable	Prob. Increasing				



Notes:

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DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of the information contained herein, and no such party shall be liable for any direct, indirect, consequential, incidental or other damages resulting from the use of this product or the information contained herein. Information in this publication is subject to change without notice. GSI Environmental Inc., disclaims any responsibility or obligation to update the information contained herein.*

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GSI MANN-KENDALL TOOLKIT

Evaluation Date:	28-Dec-22	Job ID:	635544
Facility Name:	Teck Coal Regional Groundwater - EVO	Location	RG_MW_WW
Conducted By:	MF	Reviewed By:	

Sampling Event	Sampling Date	Nitrate	Sulphate	Cadmium	Selenium				
	Parameter units	mg/L	mg/L	µg/L	µg/L				
		RG_MW_WW CONCENTRATION							
1	31-Aug-20	1.9	73.7	0.0173	10.9				
2	25-Mar-21	1.98	63.4	0.0089	10.8				
3	10-Jun-21	2.06	64.7	0.0094	10.3				
4	23-Nov-21	1.95	63.8	0.0097	11.6				
5	23-Jan-22	2.02	65.6	0.0093	10.3				
6	28-Apr-22	2.08	63.6	0.0131	10.6				
7	17-Oct-22	2.04	63	0.0112	12.2				
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
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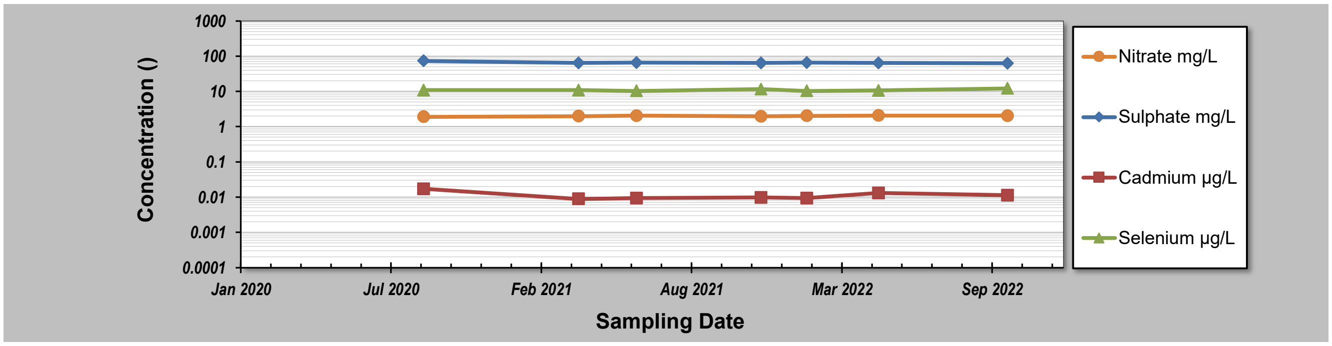
42									
43									
44									
45									
46									
Coefficient of Variation:		0.03	0.06	0.27	0.06				
Mann-Kendall Statistic (S):		11	-9	3	2				
Confidence Factor:		93.2%	88.1%	61.4%	55.7%				
Concentration Trend:		Prob. Increasing	Stable	No Trend	No Trend				



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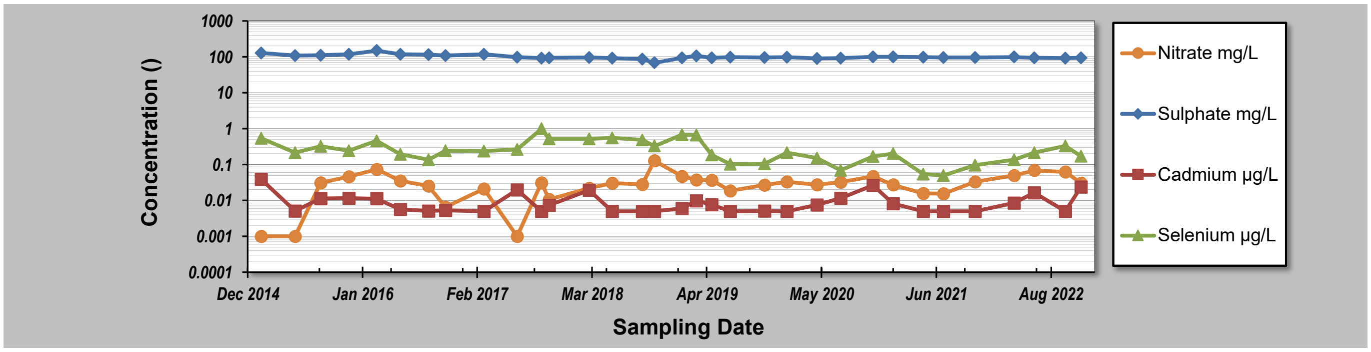
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	28-Dec-22	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - EVO	**Location**	EV_BALgw
Conducted By:	MF	**Reviewed By:**	

	Parameter	**Nitrate**	**Sulphate**	**Cadmium**	**Selenium**				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	**Sampling Date**	**EV_BALGW CONCENTRATION**							
1	16-Jan-15	0.001	129	0.039	0.54				
2	15-May-15	0.001	109	0.0051	0.216				
3	12-Aug-15	0.031	110	0.0114	0.325				
4	18-Nov-15	0.046	118	0.0115	0.24				
5	23-Feb-16	0.073	150	0.011	0.457				
6	16-May-16	0.035	118	0.0056	0.194				
7	22-Aug-16	0.025	115	0.005	0.135				
8	20-Oct-16	0.0065	109	0.0053	0.24				
9	3-Mar-17	0.021	117	0.0050	0.237				
10	27-Jun-17	0.001	98.1	0.020	0.262				
11	19-Sep-17	0.0308	91.6	0.005	0.992				
12	17-Oct-17	0.011	93.3	0.007	0.520				
13	5-Mar-18	0.0218	96.9	0.019	0.521				
14	24-May-18	0.0301	93	0.0050	0.555				
15	6-Sep-18	0.0281	86.6	0.0050	0.491				
16	18-Oct-18	0.1280	68.4	0.005	0.326				
17	22-Jan-19	0.0469	94.8	0.0060	0.672				
18	13-Mar-19	0.0375	106.0	0.010	0.663				
19	6-May-19	0.0366	94.8	0.0077	0.18				
20	10-Jul-19	0.0186	97.6	0.0050	0.102				
21	6-Nov-19	0.0267	96.4	0.0051	0.105				
22	23-Jan-20	0.0329	97.3	0.0050	0.212				
23	7-May-20	0.0275	90.6	0.008	0.150				
24	28-Jul-20	0.0322	92.8	0.012	0.07				
25	18-Nov-20	0.0471	99.6	0.026	0.166				
26	27-Jan-21	0.0271	99	0.0082	0.202				
27	12-May-21	0.0157	97.9	0.0050	0.054				
28	22-Jul-21	0.0154	95.4	0.005	0.05				
29	9-Nov-21	0.0327	96.9	0.0050	0.096				
30	25-Mar-22	0.0493	99	0.0085	0.135				
31	3-Jun-22	0.0684	93.7	0.0163	0.212				
32	19-Sep-22	0.0628	91.4	0.0050	0.33				
33	13-Nov-22	0.0304	94.7	0.0236	0.171				
34									
35									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		0.74	0.14	0.79	0.73				
Mann-Kendall Statistic (S):		113	-194	-36	-160				
Confidence Factor:		95.9%	99.9%	70.5%	99.4%				
Concentration Trend:		Increasing	Decreasing	Stable	Decreasing				



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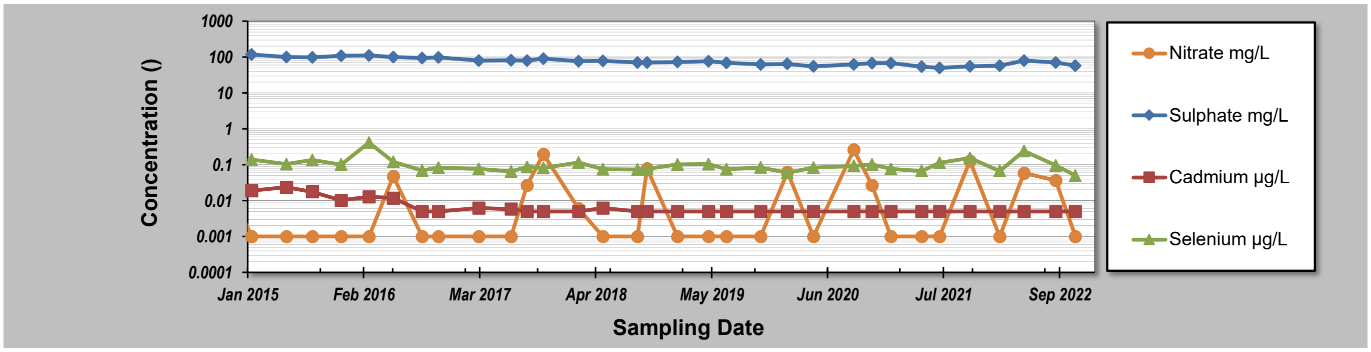
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	28-Dec-22	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - EVO	**Location**	EV_LSGW
Conducted By:	MF	**Reviewed By:**	

Sampling Event	Sampling Date	Nitrate	Sulphate	Cadmium	Selenium				
Parameter		Nitrate	Sulphate	Cadmium	Selenium				
units		mg/L	mg/L	µg/L	µg/L				
		EV_LSGW CONCENTRATION							
1	14-Nov-13	0.05	137	0.018	0.24				
2	25-Mar-14	0.05	440	0.030	0.18				
3	7-Jul-14	0.05	120	0.021	0.12				
4	29-Sep-14	0.098	111	0.022	0.13				
5	14-Jan-15	0.001	117	0.019	0.14				
6	14-May-15	0.001	100	0.0236	0.10				
7	12-Aug-15	0.001	98	0.018	0.136				
8	19-Nov-15	0.001	109	0.01	0.101				
9	23-Feb-16	0.001	110	0.0128	0.413				
10	17-May-16	0.048	101	0.0118	0.12				
11	24-Aug-16	0.001	95	0.005	0.069				
12	19-Oct-16	0.001	97.9	0.005	0.083				
13	7-Mar-17	0.001	80.1	0.006	0.077				
14	27-Jun-17	0.001	81.1	0.0058	0.065				
15	22-Aug-17	0.027	80	0.005	0.087				
16	17-Oct-17	0.196	91	0.005	0.082				
17	15-Feb-18	0.006	77.1	0.005	0.116				
18	10-May-18	0.001	78.1	0.006	0.075				
19	6-Sep-18	0.001	70	0.005	0.073				
20	9-Oct-18	0.078	71	0.005	0.077				
21	22-Jan-19	0.001	72.8	0.005	0.10				
22	9-May-19	0.001	76	0.005	0.104				
23	10-Jul-19	0.001	69.5	0.005	0.075				
24	5-Nov-19	0.001	63	0.005	0.084				
25	5-Feb-20	0.062	64.3	0.005	0.060				
26	5-May-20	0.001	55	0.005	0.083				
27	21-Sep-20	0.261	62.7	0.005	0.093				
28	23-Nov-20	0.027	68	0.005	0.103				
29	27-Jan-21	0.001	67.6	0.005	0.077				
30	13-May-21	0.001	54	0.005	0.07				
31	14-Jul-21	0.001	49.8	0.005	0.113				
32	27-Oct-21	0.129	55.4	0.005	0.154				
33	6-Feb-22	0.001	57.4	0.005	0.067				
34	1-May-22	0.0587	79.2	0.005	0.24				
35	18-Aug-22	0.0365	70.3	0.005	0.096				
36	25-Oct-22	0.001	58	0.005	0.05				
37									
38									
39									
40									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		1.75	0.70	0.77	0.60				
Mann-Kendall Statistic (S):		-14	-485	-334	-183				
Confidence Factor:		57.0%	>99.9%	>99.9%	99.4%				
Concentration Trend:		No Trend	Decreasing	Decreasing	Decreasing				



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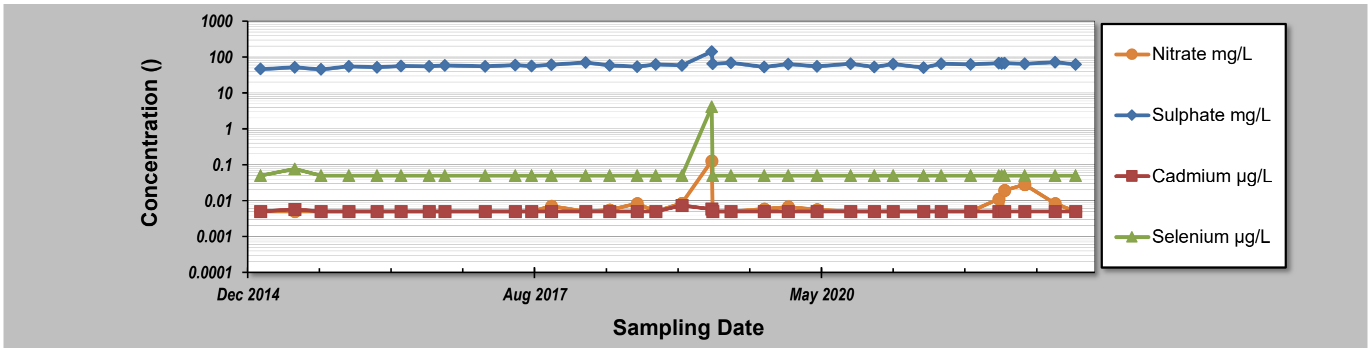
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 28-Dec-22
Facility Name: Teck Coal Regional Groundwater - EVO
Conducted By: MF

Job ID: 635544
Location EV_GCgw
Reviewed By:

Sampling Event	Sampling Date	Nitrate (mg/L)	Sulphate (mg/L)	Cadmium (µg/L)	Selenium (µg/L)				
		EV_GCGW CONCENTRATION							
1	15-Jan-15	0.005	46.3	0.005	0.05				
2	13-May-15	0.005	51.7	0.0057	0.076				
3	13-Aug-15	0.005	45.4	0.005	0.05				
4	18-Nov-15	0.005	55.1	0.005	0.05				
5	24-Feb-16	0.005	52	0.005	0.05				
6	18-May-16	0.005	56	0.005	0.05				
7	24-Aug-16	0.005	55.1	0.005	0.05				
8	18-Oct-16	0.005	58.1	0.005	0.05				
9	7-Mar-17	0.005	55	0.005	0.05				
10	20-Jun-17	0.005	60	0.005	0.05				
11	16-Aug-17	0.005	55.9	0.005	0.05				
12	24-Oct-17	0.007	61.6	0.005	0.05				
13	21-Feb-18	0.005	71.0	0.005	0.05				
14	15-May-18	0.006	59	0.005	0.05				
15	20-Aug-18	0.008	54.2	0.005	0.05				
16	23-Oct-18	0.005	62.8	0.005	0.05				
17	22-Jan-19	0.0085	58.6	0.007	0.05				
18	6-May-19	0.129	142.0	0.006	4.1				
19	9-May-19	0.005	65.3	0.005	0.05				
20	12-Jul-19	0.005	69.1	0.005	0.05				
21	5-Nov-19	0.006	52.8	0.005	0.05				
22	28-Jan-20	0.007	64.2	0.005	0.05				
23	7-May-20	0.006	55.1	0.005	0.05				
24	1-Sep-20	0.005	64.9	0.005	0.05				
25	23-Nov-20	0.005	53	0.005	0.05				
26	28-Jan-21	0.005	63.7	0.005	0.05				
27	13-May-21	0.005	51.1	0.005	0.05				
28	14-Jul-21	0.005	65.2	0.005	0.05				
29	24-Oct-21	0.005	62.0	0.005	0.05				
30	30-Jan-22	0.0111	67.9	0.005	0.05				
31	10-Feb-22	0.005	66	0.005	0.05				
32	20-Feb-22	0.0194	67.9	0.005	0.05				
33	1-May-22	0.0277	65.6	0.005	0.05				
34	15-Aug-22	0.0083	72.2	0.005	0.05				
35	25-Oct-22	0.0050	62.0	0.005	0.05				
36									
37									
38									
39									
40									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		2.07	0.25	0.09	4.11				
Mann-Kendall Statistic (S):		129	264	-33	-31				
Confidence Factor:		96.6%	>99.9%	67.4%	66.4%				
Concentration Trend:		Increasing	Increasing	Stable	No Trend				



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
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3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

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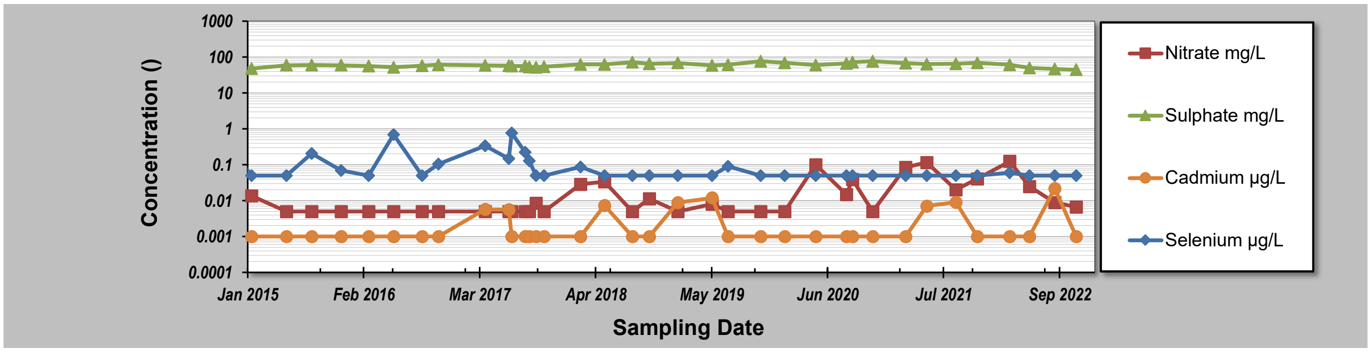
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	28-Dec-22	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - EVO	**Location**	EV_OCGW
Conducted By:	MF	**Reviewed By:**	

Sampling Event	Sampling Date	Nitrate	Sulphate	Cadmium	Selenium				
	Parameter / **units**	mg/L	mg/L	µg/L	µg/L				
		EV_OCGW CONCENTRATION							
1	15-Nov-13	0.361	95.1	0.029	2.12				
2	27-Mar-14	0.005	61.7	0.001	0.17				
3	14-Jul-14	0.0055	52.3	0.001	0.05				
4	4-Oct-14	0.005	53	0.001	0.67				
5	14-Jan-15	0.0135	47.5	0.001	0.05				
6	14-May-15	0.005	59.3	0.001	0.05				
7	10-Aug-15	0.005	60.1	0.001	0.207				
8	19-Nov-15	0.005	59.3	0.001	0.069				
9	22-Feb-16	0.005	56	0.001	0.05				
10	18-May-16	0.005	51.7	0.001	0.685				
11	24-Aug-16	0.005	57.9	0.001	0.05				
12	19-Oct-16	0.005	60.6	0.001	0.104				
13	29-Mar-17	0.005	58.2	0.0057	0.336				
14	19-Jun-17	0.005	57.4	0.0056	0.149				
15	29-Jun-17	0.005	56.7	0.001	0.76				
16	15-Aug-17	0.005	56.1	0.001	0.223				
17	29-Aug-17	0.005	52.5	0.001	0.129				
18	21-Sep-17	0.0084	52.3	0.001	0.05				
19	18-Oct-17	0.005	53.7	0.001	0.05				
20	21-Feb-18	0.0284	62.3	0.001	0.087				
21	15-May-18	0.0336	62.9	0.0073	0.05				
22	20-Aug-18	0.005	71.5	0.001	0.05				
23	17-Oct-18	0.0114	65.1	0.001	0.05				
24	23-Jan-19	0.005	68.4	0.0088	0.05				
25	21-May-19	0.0079	59	0.0119	0.05				
26	15-Jul-19	0.005	61.3	0.001	0.091				
27	5-Nov-19	0.005	76.5	0.001	0.05				
28	27-Jan-20	0.005	69.2	0.001	0.05				
29	13-May-20	0.0995	60.4	0.001	0.05				
30	27-Aug-20	0.0147	66.7	0.001	0.05				
31	17-Sep-20	0.039	71.4	0.001	0.05				
32	25-Nov-20	0.005	76.4	0.001	0.05				
33	19-Mar-21	0.0851	68.2	0.001	0.05				
34	31-May-21	0.115	63.1	0.0071	0.05				
35	8-Sep-21	0.02	64.8	0.009	0.05				
36	21-Nov-21	0.0401	68.6	0.001	0.05				
37	13-Mar-22	0.124	61.5	0.001	0.06				
38	20-May-22	0.0248	50.1	0.001	0.05				
39	15-Aug-22	0.0089	46.6	0.0217	0.05				
40	28-Oct-22	0.0066	44.4	0.001	0.05				
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	2.15	0.15	1.71	2.03				
	Mann-Kendall Statistic (S):	232	138	53	-254				
	Confidence Factor:	99.7%	94.5%	72.7%	99.9%				
	Concentration Trend:	Increasing	Prob. Increasing	No Trend	Decreasing				



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

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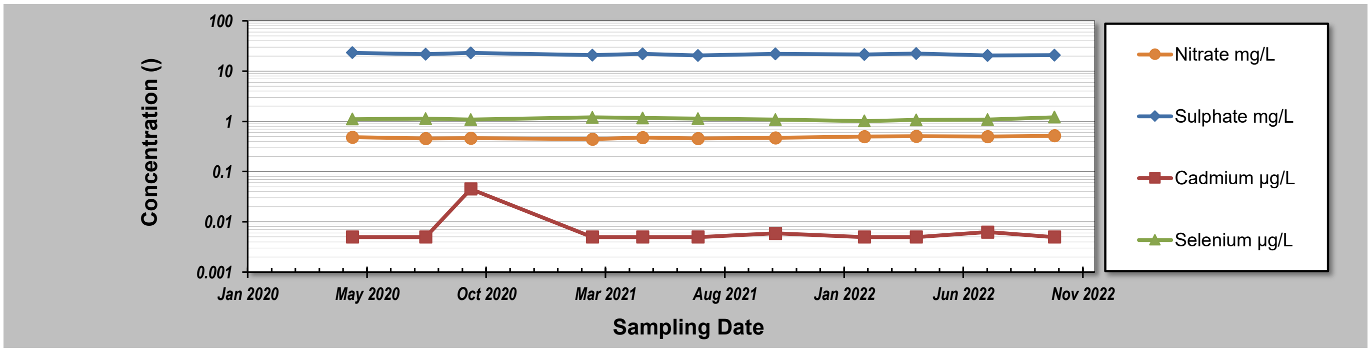
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 28-Dec-22
Facility Name: Teck Coal Regional Groundwater - EVO
Conducted By: MF

Job ID: 635544
Location RG_DW-03-10
Reviewed By:

Sampling Event	Sampling Date	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
		RG_DW-03-10 CONCENTRATION							
1	11-May-20	0.486	23.3	0.005	1.11				
2	11-Aug-20	0.458	21.6	0.005	1.14				
3	7-Oct-20	0.461	23.2	0.0452	1.08				
4	9-Mar-21	0.445	20.8	0.005	1.20				
5	11-May-21	0.479	22.2	0.005	1.17				
6	20-Jul-21	0.456	20.6	0.005	1.14				
7	25-Oct-21	0.472	22.0	0.0059	1.08				
8	14-Feb-22	0.502	21.4	0.005	1.02				
9	20-Apr-22	0.507	22.5	0.005	1.07				
10	19-Jul-22	0.502	20.5	0.0063	1.08				
11	11-Oct-22	0.518	20.9	0.005	1.22				
12									
13									
14									
15									
16									
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	0.05	0.05	1.36	0.05				
	Mann-Kendall Statistic (S):	28	-21	3	-7				
	Confidence Factor:	98.4%	94.0%	56.0%	67.6%				
	Concentration Trend:	Increasing	Prob. Decreasing	No Trend	Stable				



Notes:

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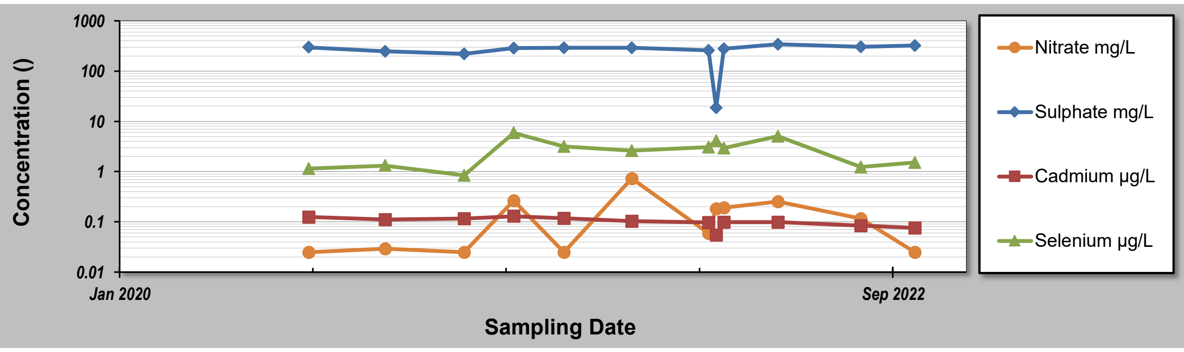
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 28-Dec-22
Facility Name: Teck Coal Regional Groundwater - EVO
Conducted By: MF

Job ID: 635544
Location EV_MW_GC1B
Reviewed By:

Parameter	Nitrate	Sulphate	Cadmium	Selenium				
units	mg/L	mg/L	µg/L	µg/L				

Sampling Event	Sampling Date	EV_MW_GC1B CONCENTRATION							
1	1-Sep-20	0.025	298	0.125	1.15				
2	9-Dec-20	0.029	248	0.111	1.32				
3	21-Mar-21	0.025	219	0.116	0.843				
4	24-May-21	0.263	286	0.130	5.92				
5	28-Jul-21	0.025	290	0.118	3.17				
6	24-Oct-21	0.731	291	0.103	2.63				
7	31-Jan-22	0.0587	259	0.0978	3.05				
8	10-Feb-22	0.184	18.7	0.0552	4.10				
9	20-Feb-22	0.191	278	0.0987	2.92				
10	1-May-22	0.252	344	0.0989	5.03				
11	16-Aug-22	0.116	304	0.084	1.24				
12	25-Oct-22	0.025	321	0.0754	1.51				
13									
14									
15									
16									
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		1.26	0.32	0.21	0.60				
Mann-Kendall Statistic (S):		12	20	-40	10				
Confidence Factor:		77.0%	90.2%	99.7%	72.7%				
Concentration Trend:		No Trend	Prob. Increasing	Decreasing	No Trend				



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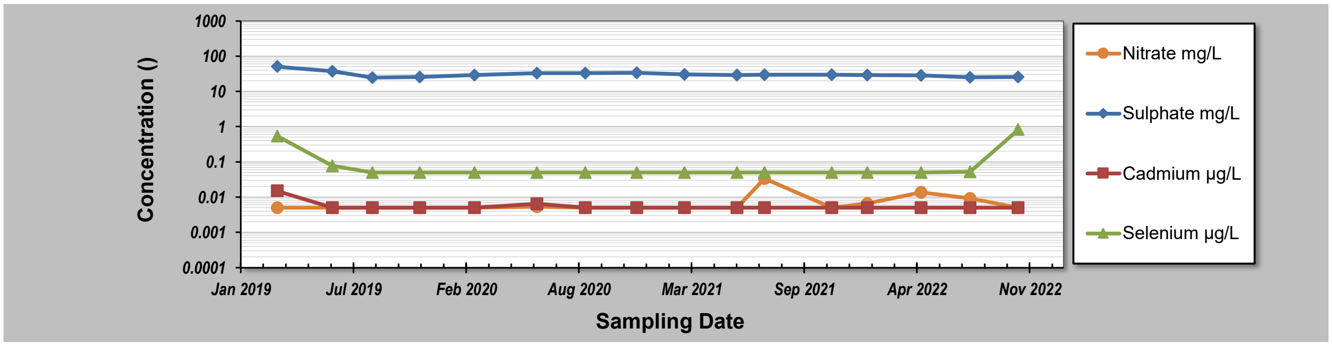
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 28-Dec-22
Facility Name: Teck Coal Regional Groundwater - EVO
Conducted By: MF

Job ID: 635544
Location EV_MW_SPR1A
Reviewed By:

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	Sampling Date	EV_MW_SPR1A CONCENTRATION							
1	6-Mar-19	0.005	50.7	0.0151	0.533				
2	12-Jun-19	0.005	37	0.005	0.077				
3	22-Aug-19	0.005	24.7	0.005	0.05				
4	14-Nov-19	0.005	25.5	0.005	0.05				
5	19-Feb-20	0.005	29	0.005	0.05				
6	9-Jun-20	0.005	32.8	0.0064	0.05				
7	3-Sep-20	0.005	32.7	0.005	0.05				
8	3-Dec-20	0.005	33.6	0.005	0.05				
9	26-Feb-21	0.005	30.3	0.005	0.05				
10	30-May-21	0.005	28.8	0.005	0.05				
11	18-Jul-21	0.0337	29.7	0.005	0.05				
12	14-Nov-21	0.005	29.5	0.005	0.05				
13	16-Jan-22	0.0066	28.9	0.005	0.05				
14	22-Apr-22	0.0137	28.6	0.005	0.05				
15	17-Jul-22	0.0092	25	0.005	0.052				
16	11-Oct-22	0.005	25.7	0.005	0.824				
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		0.95	0.20	0.44	1.69				
Mann-Kendall Statistic (S):		35	-48	-21	0				
Confidence Factor:		93.6%	98.4%	81.3%	48.2%				
Concentration Trend:		Prob. Increasing	Decreasing	Stable	No Trend				



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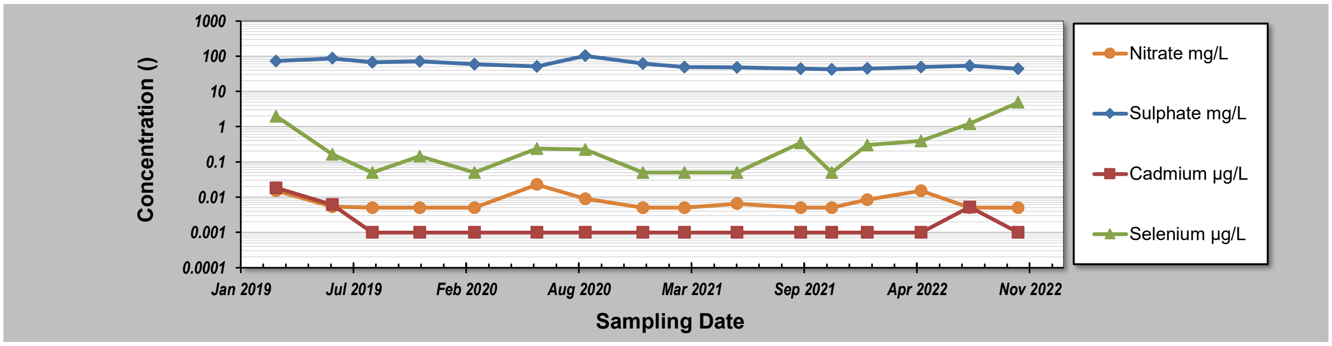
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	28-Dec-22	Job ID:	635544
Facility Name:	Teck Coal Regional Groundwater - EVO	Location	EV_MW_SPR1B
Conducted By:	MF	Reviewed By:	

Sampling Event	Sampling Date	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
		EV_MW_SPR1B CONCENTRATION							
1	4-Mar-19	0.0151	72.1	0.0184	1.95				
2	12-Jun-19	0.0053	86.5	0.0061	0.163				
3	22-Aug-19	0.005	66.3	0.001	0.05				
4	14-Nov-19	0.005	71.1	0.001	0.145				
5	19-Feb-20	0.005	58.4	0.001	0.050				
6	9-Jun-20	0.0229	51.2	0.001	0.237				
7	3-Sep-20	0.0089	103	0.001	0.222				
8	14-Dec-20	0.005	60.9	0.001	0.05				
9	26-Feb-21	0.005	48.7	0.001	0.05				
10	30-May-21	0.0065	47.4	0.001	0.05				
11	20-Sep-21	0.005	44	0.001	0.347				
12	14-Nov-21	0.005	42.2	0.001	0.05				
13	16-Jan-22	0.0084	44.4	0.001	0.302				
14	22-Apr-22	0.0152	49.2	0.001	0.392				
15	17-Jul-22	0.005	52.7	0.0052	1.21				
16	11-Oct-22	0.005	43.6	0.001	4.88				
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	0.66	0.29	1.68	1.96				
	Mann-Kendall Statistic (S):	-12	-70	-18	31				
	Confidence Factor:	68.7%	99.9%	77.5%	91.0%				
	Concentration Trend:	Stable	Decreasing	No Trend	Prob. Increasing				



Notes:

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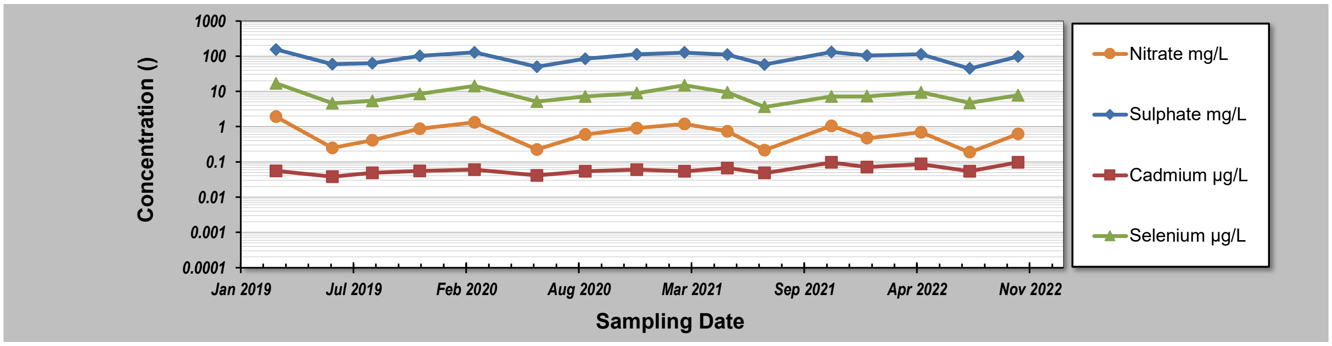
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 28-Dec-22
Facility Name: Teck Coal Regional Groundwater - EVO
Conducted By: MF

Job ID: 635544
Location EV_MW_SP1RC
Reviewed By:

Parameter		Nitrate	Sulphate	Cadmium	Selenium				
units		mg/L	mg/L	µg/L	µg/L				
Sampling Event	**Sampling Date**	**EV_MW_SP1RC CONCENTRATION**							
1	4-Mar-19	1.91	154	0.0554	16.8				
2	12-Jun-19	0.247	58.3	0.0382	4.62				
3	22-Aug-19	0.412	63	0.0487	5.34				
4	14-Nov-19	0.876	102	0.0553	8.39				
5	19-Feb-20	1.33	127	0.0601	14.2				
6	9-Jun-20	0.225	50.1	0.0409	5.11				
7	3-Sep-20	0.591	83.8	0.0539	7.2				
8	3-Dec-20	0.907	112	0.0596	8.89				
9	26-Feb-21	1.19	126	0.0538	14.8				
10	13-May-21	0.741	109	0.0662	9.39				
11	18-Jul-21	0.215	58	0.0482	3.65				
12	14-Nov-21	1.05	130	0.0966	7.1				
13	16-Jan-22	0.469	103	0.0710	7.22				
14	22-Apr-22	0.687	113	0.0864	9.44				
15	17-Jul-22	0.187	44.6	0.0544	4.75				
16	11-Oct-22	0.627	97.4	0.0962	7.73				
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		0.65	0.34	0.29	0.46				
Mann-Kendall Statistic (S):		-22	-6	50	-4				
Confidence Factor:		82.5%	58.8%	98.7%	55.3%				
Concentration Trend:		Stable	Stable	Increasing	Stable				



Notes:

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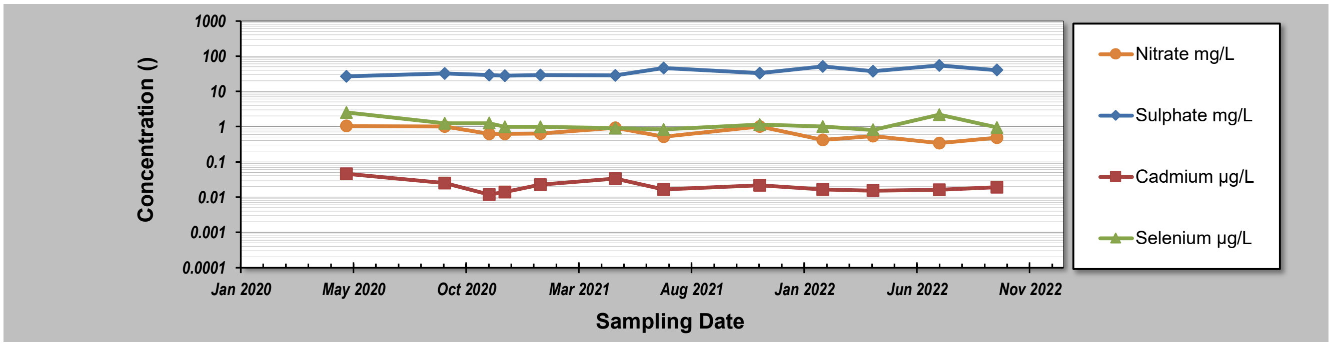
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

Evaluation Date:	28-Dec-22	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - EVO	**Location**	EV_MW_MCgwA
Conducted By:	MF	**Reviewed By:**	

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	**Sampling Date**	**EV_MW_MCGWA CONCENTRATION**							
1	20-May-20	1.04	26.6	0.0457	2.52				
2	28-Sep-20	0.996	32.1	0.025	1.23				
3	26-Nov-20	0.616	28.9	0.0118	1.25				
4	17-Dec-20	0.627	28	0.0139	0.984				
5	2-Feb-21	0.635	28.9	0.0226	0.99				
6	13-May-21	0.918	28.6	0.0333	0.913				
7	16-Jul-21	0.517	45.4	0.0165	0.84				
8	21-Nov-21	1	33.1	0.0215	1.14				
9	13-Feb-22	0.415	50.8	0.0166	1.01				
10	21-Apr-22	0.537	37.5	0.0153	0.81				
11	18-Jul-22	0.339	54.1	0.0161	2.17				
12	3-Oct-22	0.482	40	0.019	0.937				
13									
14									
15									
16									
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	0.36	0.26	0.45	0.44				
	Mann-Kendall Statistic (S):	-34	39	-14	-22				
	Confidence Factor:	99.0%	99.7%	81.0%	92.4%				
	Concentration Trend:	Decreasing	Increasing	Stable	Prob. Decreasing				



Notes:

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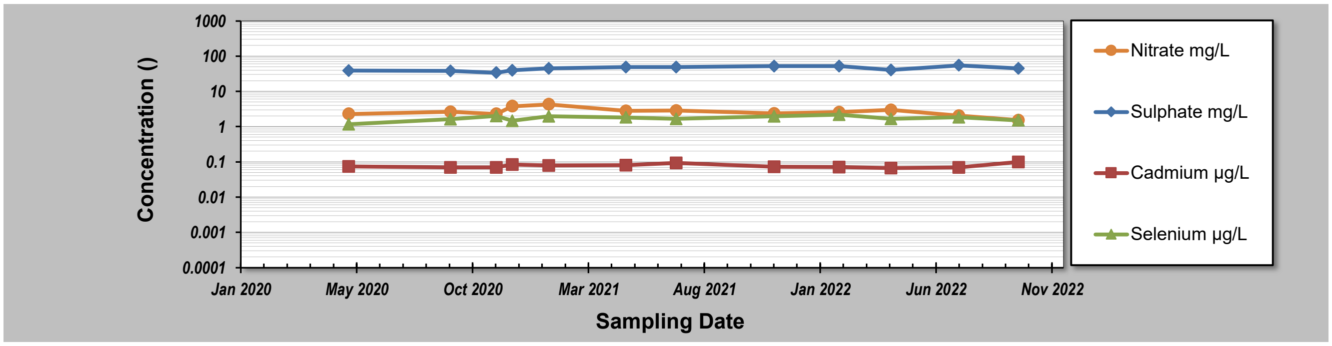
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 28-Dec-22
Facility Name: Teck Coal Regional Groundwater - EVO
Conducted By: MF

Job ID: 635544
Location EV_MW_MCgwB
Reviewed By:

Parameter	Nitrate	Sulphate	Cadmium	Selenium				
units	mg/L	mg/L	µg/L	µg/L				

Sampling Event	Sampling Date	EV_MW_MCGWB CONCENTRATION							
1	19-May-20	2.29	39	0.0737	1.17				
2	28-Sep-20	2.60	38	0.0688	1.62				
3	26-Nov-20	2.29	33.9	0.0692	1.99				
4	17-Dec-20	3.78	39.2	0.0845	1.47				
5	2-Feb-21	4.32	44.9	0.0791	1.96				
6	13-May-21	2.82	49.2	0.0808	1.82				
7	17-Jul-21	2.84	49.1	0.0926	1.65				
8	21-Nov-21	2.35	51.9	0.0718	1.97				
9	13-Feb-22	2.59	52.2	0.0708	2.18				
10	21-Apr-22	2.96	40.2	0.0669	1.67				
11	18-Jul-22	2.06	54.9	0.0695	1.84				
12	3-Oct-22	1.53	45.2	0.0998	1.51				
13									
14									
15									
16									
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		0.28	0.15	0.14	0.16				
Mann-Kendall Statistic (S):		-11	38	4	12				
Confidence Factor:		74.9%	99.6%	58.0%	77.0%				
Concentration Trend:		Stable	Increasing	No Trend	No Trend				



Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
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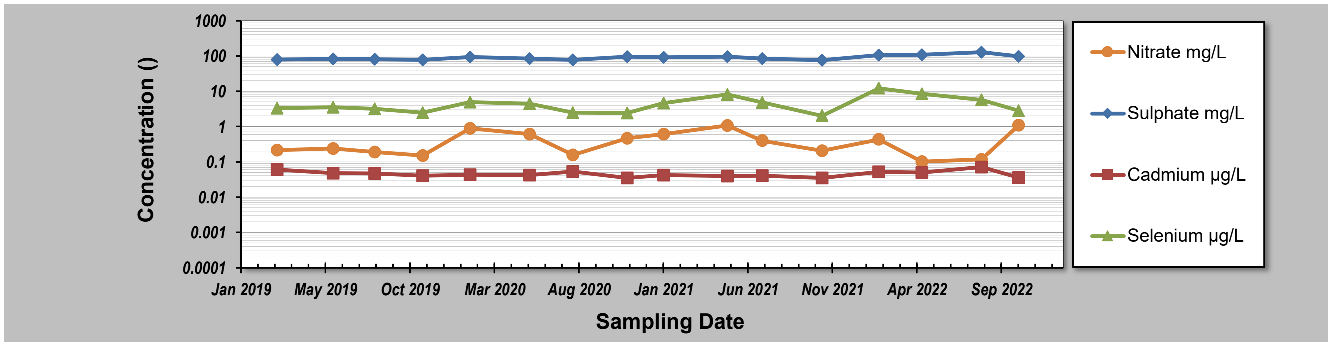
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 28-Dec-22
Facility Name: Teck Coal Regional Groundwater - EVO
Conducted By: MF
Job ID: 635544
Location EV_MW_AQ1
Reviewed By:

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	**Sampling Date**	**EV_MW_AQ1 CONCENTRATION**							
1	6-Mar-19	0.214	79.1	0.06	3.29				
2	13-Jun-19	0.236	82.4	0.048	3.52				
3	26-Aug-19	0.188	81.2	0.047	3.16				
4	19-Nov-19	0.15	77.7	0.04	2.46				
5	11-Feb-20	0.894	92.5	0.043	4.93				
6	27-May-20	0.606	83.6	0.042	4.46				
7	12-Aug-20	0.158	77.3	0.053	2.46				
8	16-Nov-20	0.466	96	0.035	2.43				
9	20-Jan-21	0.603	91.3	0.042	4.57				
10	13-May-21	1.07	95.4	0.039	8.17				
11	14-Jul-21	0.397	83.3	0.04	4.77				
12	28-Oct-21	0.207	75.9	0.035	2.02				
13	6-Feb-22	0.431	106	0.052	12.2				
14	24-Apr-22	0.102	107	0.05	8.38				
15	7-Aug-22	0.117	128	0.071	5.65				
16	12-Oct-22	1.1	97.1	0.036	2.81				
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	**0.77**	**0.15**	**0.21**	**0.59**				
	Mann-Kendall Statistic (S):	**2**	**54**	**-21**	**25**				
	Confidence Factor:	**51.8%**	**99.2%**	**81.3%**	**85.7%**				
	Concentration Trend:	No Trend	Increasing	Stable	No Trend				



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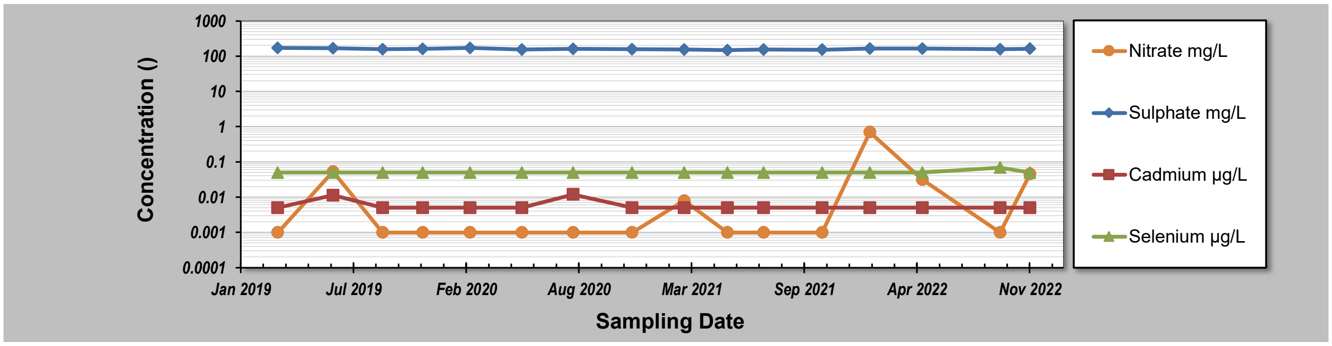
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	28-Dec-22	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - EVO	**Location**	EV_MW_AQ2
Conducted By:	MF	**Reviewed By:**	

Sampling Event	Sampling Date	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
		EV_MW_AQ2 CONCENTRATION							
1	7-Mar-19	0.001	172	0.005	0.05				
2	13-Jun-19	0.053	168	0.0113	0.05				
3	9-Sep-19	0.001	158	0.005	0.05				
4	19-Nov-19	0.001	160	0.005	0.05				
5	11-Feb-20	0.001	169	0.005	0.05				
6	13-May-20	0.001	153	0.005	0.05				
7	12-Aug-20	0.001	160	0.0119	0.05				
8	25-Nov-20	0.001	158	0.005	0.05				
9	25-Feb-21	0.008	153	0.005	0.05				
10	13-May-21	0.001	148	0.005	0.05				
11	16-Jul-21	0.001	154	0.005	0.05				
12	28-Oct-21	0.001	152	0.005	0.05				
13	21-Jan-22	0.702	165	0.005	0.05				
14	24-Apr-22	0.0316	165	0.005	0.05				
15	9-Sep-22	0.001	158	0.005	0.069				
16	1-Nov-22	0.046	162	0.005	0.05				
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	3.27	0.04	0.39	0.09				
	Mann-Kendall Statistic (S):	23	-26	-15	13				
	Confidence Factor:	83.6%	86.7%	73.3%	70.3%				
	Concentration Trend:	No Trend	Stable	Stable	No Trend				



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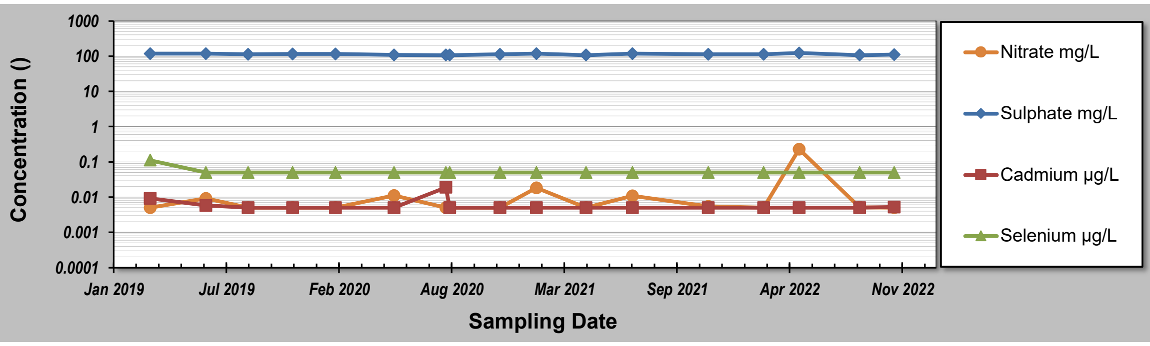
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	28-Dec-22	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - EVO	**Location**	EV_MW_MC4
Conducted By:	MF	**Reviewed By:**	

Sampling Event	Sampling Date	Nitrate	Sulphate	Cadmium	Selenium				
	Parameter units	mg/L	mg/L	µg/L	µg/L				
		EV_MW_MC4 CONCENTRATION							
1	6-Mar-19	0.005	117	0.0091	0.111				
2	13-Jun-19	0.0091	117	0.0058	0.05				
3	27-Aug-19	0.005	113	0.005	0.05				
4	14-Nov-19	0.005	115	0.005	0.05				
5	29-Jan-20	0.005	115	0.005	0.05				
6	12-May-20	0.011	108	0.005	0.05				
7	12-Aug-20	0.005	107	0.0189	0.05				
8	19-Aug-20	0.005	107	0.005	0.05				
9	16-Nov-20	0.005	113	0.005	0.05				
10	20-Jan-21	0.0183	118	0.005	0.05				
11	18-Apr-21	0.005	107	0.005	0.05				
12	9-Jul-21	0.0109	118	0.005	0.05				
13	21-Nov-21	0.0054	113	0.005	0.05				
14	27-Feb-22	0.005	112	0.005	0.05				
15	1-May-22	0.229	122	0.005	0.05				
16	17-Aug-22	0.0051	107	0.005	0.05				
17	17-Oct-22	0.005	109	0.0052	0.05				
18									
19									
20									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		2.71	0.04	0.56	0.28				
Mann-Kendall Statistic (S):		19	-22	-20	-16				
Confidence Factor:		76.8%	80.4%	78.0%	72.9%				
Concentration Trend:		No Trend	Stable	Stable	Stable				



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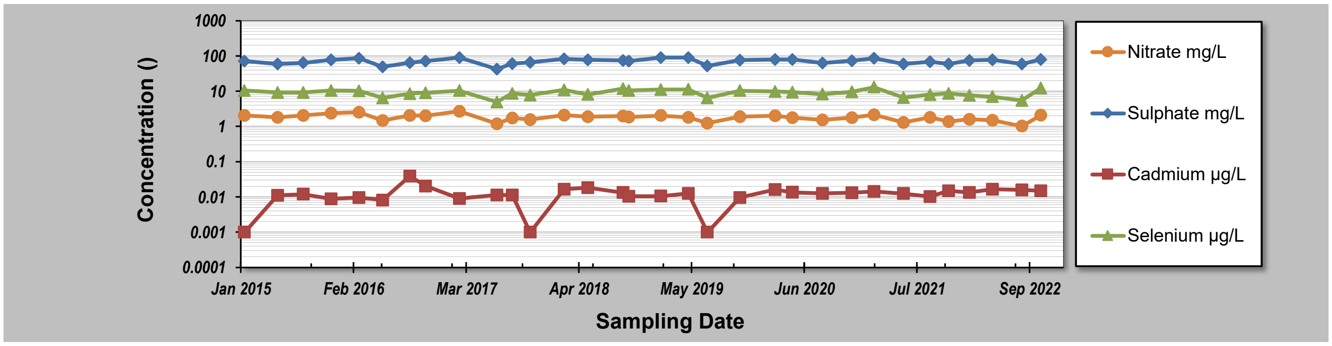
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 28-Dec-22
Facility Name: Teck Coal Regional Groundwater - EVO
Conducted By: MF

Job ID: 635544
Location EV_ER1gwS
Reviewed By:

Sampling Event	Sampling Date	Nitrate (mg/L)	Sulphate (mg/L)	Cadmium (µg/L)	Selenium (µg/L)				
		EV_ER1GWS CONCENTRATION							
1	13-Jan-15	2.03	71.3	0.001	10.4				
2	12-May-15	1.79	59.2	0.0111	9.16				
3	11-Aug-15	2.06	63.3	0.0119	9.22				
4	17-Nov-15	2.36	76.8	0.0088	10.4				
5	24-Feb-16	2.51	85.2	0.0096	10.1				
6	18-May-16	1.46	48.8	0.0081	6.49				
7	23-Aug-16	2.04	63.9	0.0387	8.44				
8	18-Oct-16	1.99	70.6	0.0202	9.04				
9	15-Feb-17	2.69	89.5	0.0090	10.3				
10	28-Jun-17	1.19	42.1	0.0113	4.95				
11	22-Aug-17	1.74	60.6	0.0114	8.59				
12	24-Oct-17	1.55	65	0.001	7.74				
13	21-Feb-18	2.08	82.2	0.0163	10.8				
14	16-May-18	1.89	77.7	0.0184	8.02				
15	18-Sep-18	1.97	74.5	0.0132	11.8				
16	9-Oct-18	1.85	71.2	0.0103	10.5				
17	31-Jan-19	2.02	88.7	0.0105	11.1				
18	8-May-19	1.81	89.2	0.0126	11.2				
19	15-Jul-19	1.23	51.9	0.0010	6.43				
20	7-Nov-19	1.89	76.1	0.0096	10.3				
21	11-Mar-20	2.00	78.9	0.0160	9.74				
22	12-May-20	1.76	79.3	0.0135	9.43				
23	27-Aug-20	1.52	62.2	0.0125	8.19				
24	9-Dec-20	1.77	72.4	0.0131	9.56				
25	26-Feb-21	2.11	86	0.0143	13				
26	10-Jun-21	1.29	59.4	0.0124	6.56				
27	12-Sep-21	1.79	68.7	0.0102	7.97				
28	17-Nov-21	1.38	59.2	0.0148	8.6				
29	30-Jan-22	1.60	74.0	0.0133	7.62				
30	22-Apr-22	1.49	76.8	0.0166	6.93				
31	5-Aug-22	1.02	58.8	0.0159	5.47				
32	11-Oct-22	2.07	78.1	0.0147	12.2				
33									
34									
35									
Coefficient of Variation:		0.21	0.17	0.52	0.21				
Mann-Kendall Statistic (S):		-146	28	138	-50				
Confidence Factor:		99.1%	66.8%	98.7%	78.5%				
Concentration Trend:		Decreasing	No Trend	Increasing	Stable				



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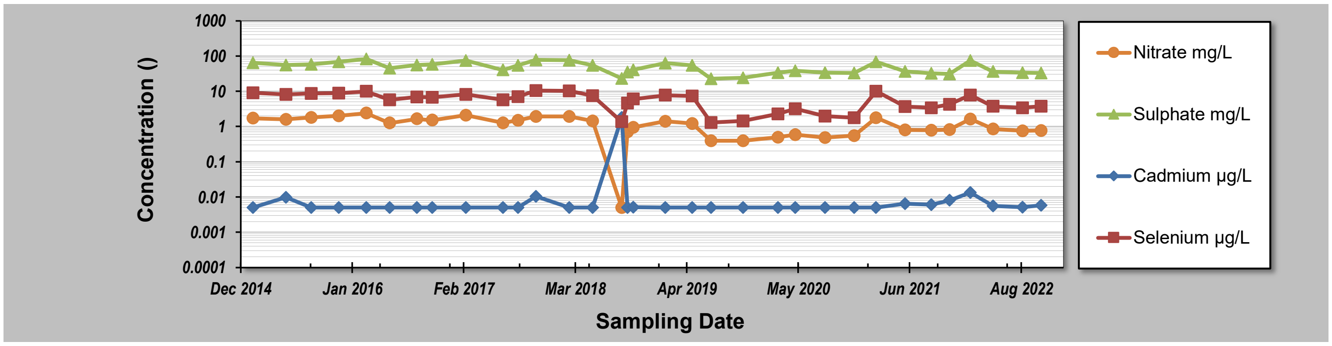
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 28-Dec-22
Facility Name: Teck Coal Regional Groundwater - EVO
Conducted By: MF

Job ID: 635544
Location EV_ER1gwD
Reviewed By:

Sampling Event	Sampling Date	Nitrate mg/L	Sulphate mg/L	Cadmium µg/L	Selenium µg/L				
		EV_ER1GWD CONCENTRATION							
1	13-Jan-15	1.71	63.7	0.005	8.98				
2	12-May-15	1.59	55.5	0.01	8.12				
3	11-Aug-15	1.8	57.6	0.005	8.66				
4	17-Nov-15	2.01	67.7	0.005	8.84				
5	24-Feb-16	2.41	82.2	0.005	9.88				
6	18-May-16	1.25	44.7	0.005	5.71				
7	23-Aug-16	1.64	55.3	0.005	6.86				
8	18-Oct-16	1.51	57.5	0.005	6.77				
9	15-Feb-17	2.10	73.8	0.005	8.16				
10	28-Jun-17	1.26	40.0	0.005	5.67				
11	22-Aug-17	1.48	53.8	0.005	6.95				
12	24-Oct-17	1.93	76.9	0.010	10.50				
13	21-Feb-18	1.93	75.3	0.005	10.10				
14	16-May-18	1.44	54.4	0.005	7.52				
15	28-Aug-18	0.005	23.2	1.79	1.36				
16	18-Sep-18	0.704	34.8	0.005	4.56				
17	9-Oct-18	0.937	40.7	0.005	5.99				
18	31-Jan-19	1.4	62.9	0.005	7.69				
19	8-May-19	1.22	54.4	0.005	7.28				
20	15-Jul-19	0.394	22.6	0.005	1.29				
21	7-Nov-19	0.394	23.9	0.005	1.44				
22	11-Mar-20	0.494	33.8	0.005	2.25				
23	12-May-20	0.585	38.0	0.005	3.16				
24	27-Aug-20	0.484	33.4	0.005	1.95				
25	9-Dec-20	0.544	32.6	0.005	1.78				
26	26-Feb-21	1.75	68.7	0.005	10				
27	10-Jun-21	0.8	36.6	0.006	3.69				
28	12-Sep-21	0.777	31.9	0.006	3.35				
29	17-Nov-21	0.816	31.1	0.008	4.24				
30	30-Jan-22	1.62	74.5	0.013	7.76				
31	22-Apr-22	0.851	36.0	0.006	3.70				
32	5-Aug-22	0.75	33.7	0.005	3.40				
33	11-Oct-22	0.759	32.6	0.006	3.75				
34									
	Coefficient of Variation:	0.50	0.36	5.19	0.50				
	Mann-Kendall Statistic (S):	-204	-202	120	-178				
	Confidence Factor:	99.9%	99.9%	96.8%	99.7%				
	Concentration Trend:	Decreasing	Decreasing	Increasing	Decreasing				



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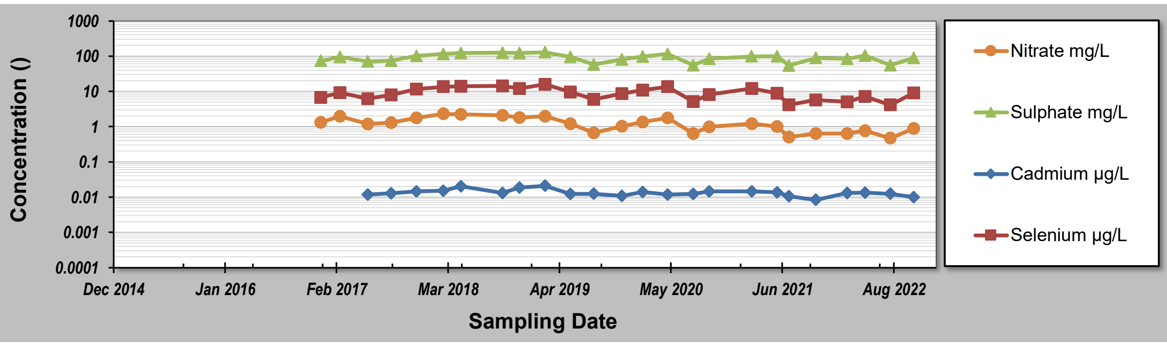
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	28-Dec-22	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - EVO	**Location**	RG_DW-03-04
Conducted By:	MF	**Reviewed By:**	

	Parameter	**Nitrate**	**Sulphate**	**Cadmium**	**Selenium**				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	**Sampling Date**	**RG_DW-03-04 CONCENTRATION**							
1	13-Dec-16	1.31	73.2		6.7				
2	20-Feb-17	1.97	95.5		9.2				
3	31-May-17	1.18	70	0.0118	6.2				
4	22-Aug-17	1.29	74	0.0129	7.9				
5	21-Nov-17	1.78	101	0.0146	11.5				
6	26-Feb-18	2.31	114	0.0152	13.5				
7	30-Apr-18	2.24	122	0.0204	14				
8	27-Sep-18	2.10	124	0.0131	14.3				
9	27-Nov-18	1.81	122	0.0187	12				
10	26-Feb-19	1.95	129	0.0209	15.8				
11	28-May-19	1.22	95.9	0.0123	9.5				
12	20-Aug-19	0.66	57.5	0.0124	5.88				
13	29-Nov-19	1.02	81	0.0108	8.64				
14	11-Feb-20	1.34	97.2	0.0138	10.8				
15	11-May-20	1.75	114	0.0117	13.5				
16	11-Aug-20	0.64	54.8	0.0122	5.13				
17	7-Oct-20	0.992	84.5	0.0145	8.08				
18	9-Mar-21	1.21	97.8	0.0145	12				
19	8-Jun-21	1	98.3	0.0136	8.79				
20	20-Jul-21	0.5	54.2	0.0107	4.18				
21	25-Oct-21	0.637	88	0.0084	5.67				
22	14-Feb-22	0.634	83.2	0.0131	5.04				
23	20-Apr-22	0.762	104	0.0133	7.08				
24	19-Jul-22	0.469	55.2	0.0124	4.13				
25	11-Oct-22	0.888	88.4	0.0099	8.98				
26									
Coefficient of Variation:		**0.45**	**0.25**	**0.22**	**0.38**				
Mann-Kendall Statistic (S):		**-163**	**-29**	**-68**	**-78**				
Confidence Factor:		**>99.9%**	**74.2%**	**96.2%**	**96.4%**				
Concentration Trend:		**Decreasing**	**Stable**	**Decreasing**	**Decreasing**				



Notes:

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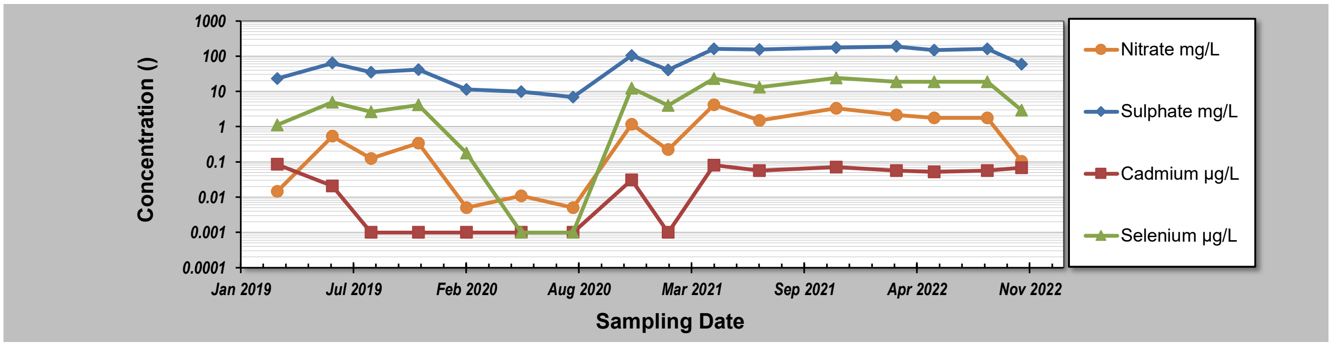
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 28-Dec-22
Facility Name: Teck Coal Regional Groundwater - EVO
Conducted By: MF

Job ID: 635544
Location EV_MW_MC3
Reviewed By:

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	Sampling Date	EV_MW_MC3 CONCENTRATION							
1	6-Mar-19	0.0146	23.1	0.0847	1.12				
2	12-Jun-19	0.531	63.3	0.0205	4.92				
3	20-Aug-19	0.124	35.1	0.001	2.60				
4	12-Nov-19	0.342	41.4	0.001	4.11				
5	5-Feb-20	0.005	11.4	0.001	0.179				
6	12-May-20	0.0108	9.8	0.001	0.001				
7	12-Aug-20	0.005	6.9	0.001	0.001				
8	24-Nov-20	1.17	104	0.0309	12.2				
9	28-Jan-21	0.221	40.4	0.001	3.95				
10	19-Apr-21	4.17	159	0.0798	23.2				
11	9-Jul-21	1.5	153	0.0565	13				
12	22-Nov-21	3.27	174	0.0706	24.2				
13	9-Mar-22	2.12	188	0.056	18.6				
14	15-May-22	1.76	146	0.0514	18.8				
15	17-Aug-22	1.76	159	0.0561	18.8				
16	17-Oct-22	0.103	58.6	0.0683	2.94				
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		1.20	0.78	0.89	0.96				
Mann-Kendall Statistic (S):		40	49	33	46				
Confidence Factor:		96.1%	98.6%	92.4%	97.9%				
Concentration Trend:		Increasing	Increasing	Prob. Increasing	Increasing				



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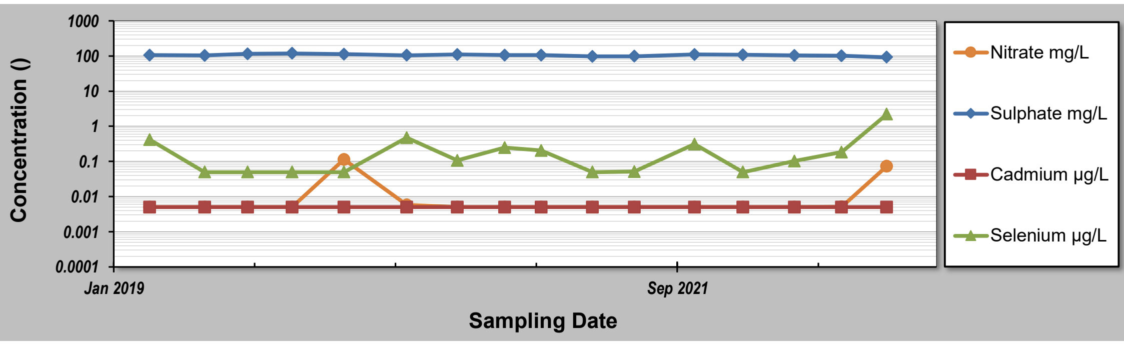
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 28-Dec-22
Facility Name: Teck Coal Regional Groundwater - EVO
Conducted By: MF

Job ID: 635544
Location EV_MW_GT1A
Reviewed By:

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	Sampling Date	EV_MW_GT1A CONCENTRATION							
1	5-Mar-19	0.005	107	0.005	0.418				
2	11-Jun-19	0.005	104	0.005	0.05				
3	26-Aug-19	0.005	115	0.005	0.05				
4	13-Nov-19	0.005	119	0.005	0.05				
5	13-Feb-20	0.114	114	0.005	0.05				
6	3-Jun-20	0.0058	105	0.005	0.474				
7	1-Sep-20	0.005	110	0.005	0.106				
8	24-Nov-20	0.005	106	0.005	0.247				
9	28-Jan-21	0.005	106	0.005	0.203				
10	29-Apr-21	0.005	97.3	0.005	0.05				
11	12-Jul-21	0.005	98.6	0.005	0.051				
12	27-Oct-21	0.005	111	0.005	0.311				
13	21-Jan-22	0.005	108	0.005	0.05				
14	22-Apr-22	0.005	104	0.005	0.102				
15	15-Jul-22	0.0051	102	0.005	0.184				
16	3-Oct-22	0.0738	92.7	0.005	2.23				
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		1.93	0.06	0.00	1.85				
Mann-Kendall Statistic (S):		14	-48	0	23				
Confidence Factor:		71.8%	98.4%	48.2%	83.6%				
Concentration Trend:		No Trend	Decreasing	Stable	No Trend				



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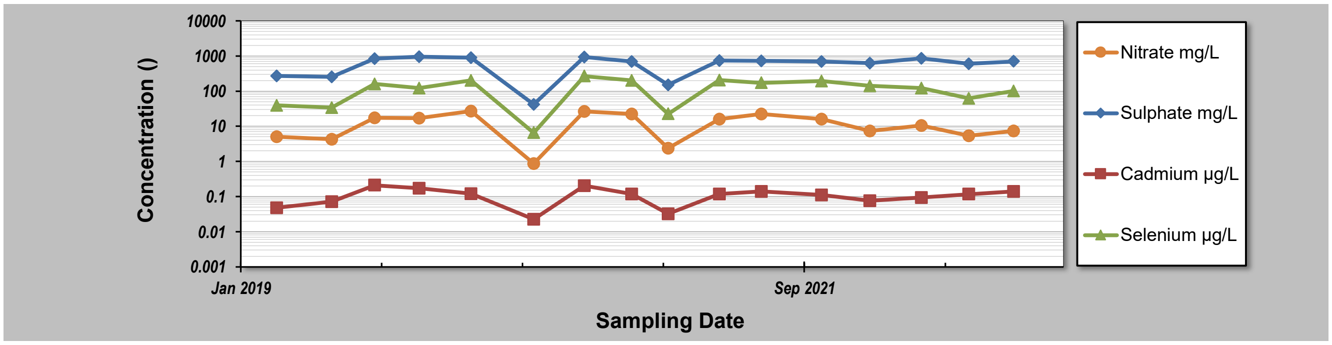
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 28-Dec-22
Facility Name: Teck Coal Regional Groundwater - EVO
Conducted By: MF

Job ID: 635544
Location EV_MW_GT1B
Reviewed By:

Sampling Event	Sampling Date	Nitrate	Sulphate	Cadmium	Selenium				
	Parameter units	mg/L	mg/L	µg/L	µg/L				
		EV_MW_GT1B CONCENTRATION							
1	5-Mar-19	5.07	270	0.0481	39.6				
2	11-Jun-19	4.26	254	0.0709	34.3				
3	26-Aug-19	17.4	840	0.212	161				
4	13-Nov-19	16.9	954	0.173	122				
5	13-Feb-20	27.2	889	0.121	201				
6	3-Jun-20	0.87	42.2	0.0226	6.58				
7	1-Sep-20	26.7	939	0.205	271				
8	24-Nov-20	22.3	698	0.118	202				
9	28-Jan-21	2.37	151	0.0325	22.6				
10	29-Apr-21	16	747	0.118	207				
11	12-Jul-21	22.2	722	0.14	173				
12	27-Oct-21	16.1	703	0.111	194				
13	21-Jan-22	7.32	629	0.0759	142				
14	22-Apr-22	10.5	868	0.0947	123				
15	15-Jul-22	5.38	598	0.117	62.7				
16	3-Oct-22	7.42	705	0.141	101				
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		0.67	0.46	0.49	0.61				
Mann-Kendall Statistic (S):		-12	-4	-1	2				
Confidence Factor:		68.7%	55.3%	50.0%	51.8%				
Concentration Trend:		Stable	Stable	Stable	No Trend				



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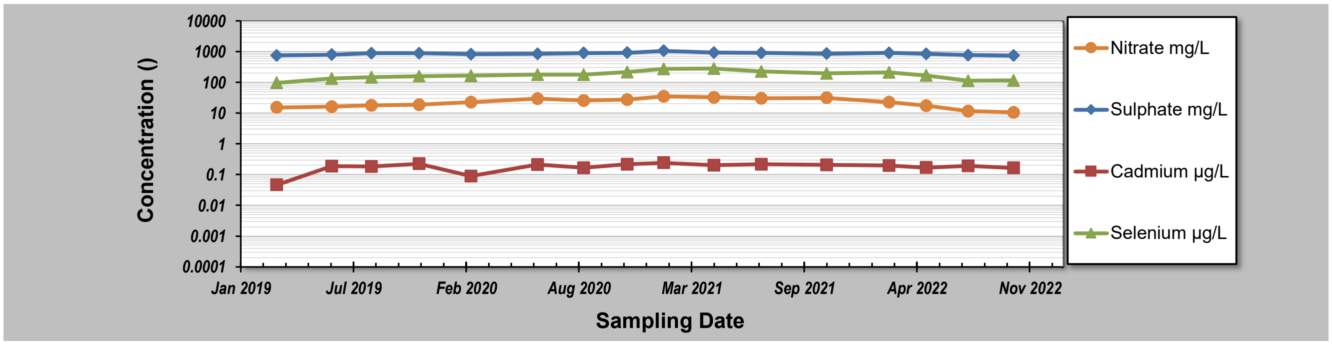
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 28-Dec-22
Facility Name: Teck Coal Regional Groundwater - EVO
Conducted By: MF

Job ID: 635544
Location EV_MW_BC1A
Reviewed By:

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	Sampling Date	EV_MW_BC1A CONCENTRATION							
1	5-Mar-19	15.3	753	0.0463	97.5				
2	11-Jun-19	16.2	798	0.188	133				
3	20-Aug-19	17.8	882	0.183	146				
4	13-Nov-19	18.9	898	0.225	158				
5	13-Feb-20	22.7	827	0.09	166				
6	10-Jun-20	29.3	843	0.211	178				
7	31-Aug-20	25.8	899	0.168	180				
8	16-Nov-20	27.7	921	0.219	218				
9	20-Jan-21	35	1070	0.243	274				
10	19-Apr-21	32.5	940	0.2	283				
11	12-Jul-21	30.2	920	0.219	226				
12	5-Nov-21	31.4	858	0.208	196				
13	24-Feb-22	22.8	903	0.198	211				
14	1-May-22	17.5	843	0.169	168				
15	14-Jul-22	11.7	766	0.191	112				
16	3-Oct-22	10.6	746	0.165	117				
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		0.34	0.09	0.28	0.30				
Mann-Kendall Statistic (S):		12	7	1	32				
Confidence Factor:		68.7%	60.5%	50.0%	91.7%				
Concentration Trend:		No Trend	No Trend	No Trend	Prob. Increasing				



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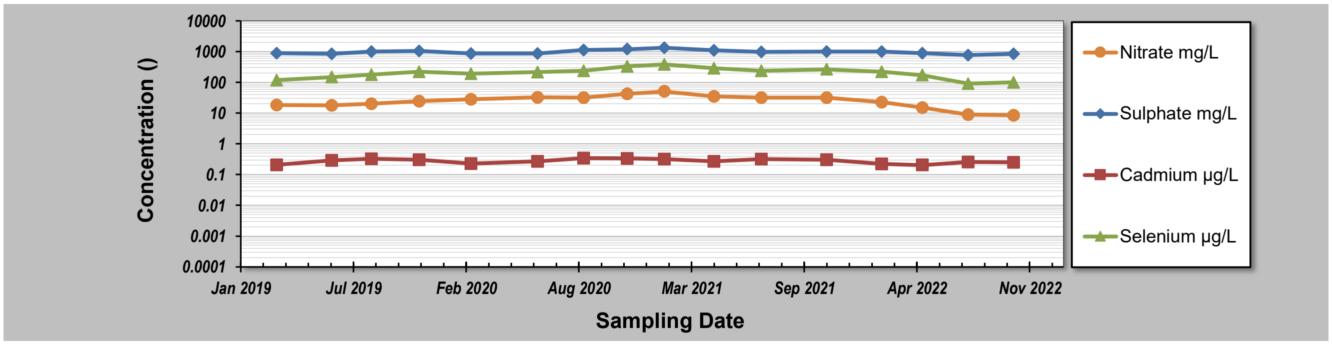
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	28-Dec-22	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - EVO	**Location**	EV_MW_BC1B
Conducted By:	MF	**Reviewed By:**	

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	**Sampling Date**	**EV_MW_BC1B CONCENTRATION**							
1	5-Mar-19	18.4	893	0.207	120				
2	11-Jun-19	17.9	847	0.292	149				
3	20-Aug-19	20	1010	0.329	179				
4	13-Nov-19	24.5	1040	0.301	219				
5	13-Feb-20	27.9	868	0.227	192				
6	10-Jun-20	32.8	865	0.272	216				
7	31-Aug-20	31.9	1140	0.344	236				
8	16-Nov-20	42.1	1200	0.336	335				
9	21-Jan-21	50.8	1340	0.321	384				
10	19-Apr-21	34.7	1110	0.267	286				
11	12-Jul-21	31.6	973	0.321	236				
12	5-Nov-21	32	1010	0.307	265				
13	11-Feb-22	22.7	995	0.223	221				
14	24-Apr-22	15.2	880	0.205	172				
15	14-Jul-22	8.89	774	0.256	92.1				
16	3-Oct-22	8.51	849	0.249	101				
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	**0.44**	**0.15**	**0.17**	**0.38**				
	Mann-Kendall Statistic (S):	**-8**	**-13**	**-23**	**9**				
	Confidence Factor:	**62.2%**	**70.3%**	**83.6%**	**63.9%**				
	Concentration Trend:	**Stable**	**Stable**	**Stable**	**No Trend**				



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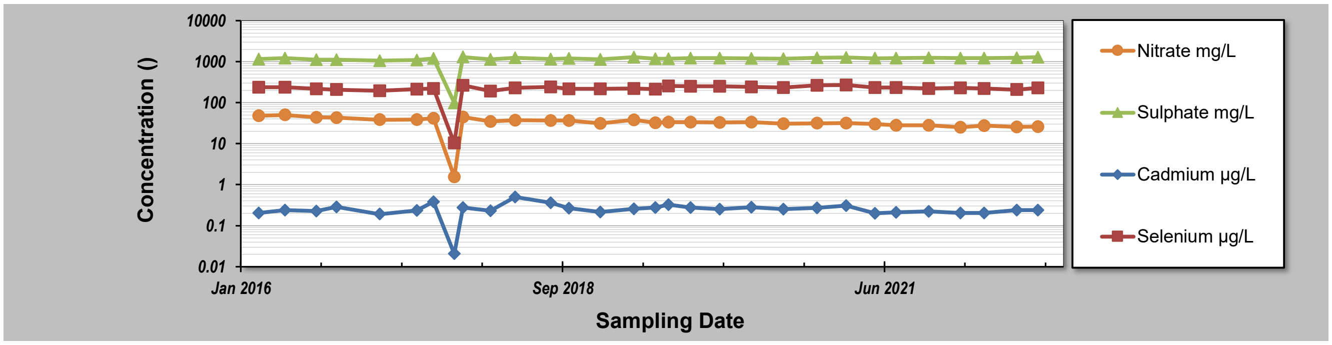
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 28-Dec-22
Facility Name: Teck Coal Regional Groundwater - EVO
Conducted By: MF

Job ID: 635544
Location EV_RCSgw
Reviewed By:

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	Sampling Date	EV_RCSGW CONCENTRATION							
1	25-Feb-16	48.4	1160	0.205	238				
2	17-May-16	50.6	1220	0.238	237				
3	22-Aug-16	44.2	1120	0.226	216				
4	24-Oct-16	43.1	1120	0.284	208				
5	7-Mar-17	38.4	1060	0.191	195				
6	30-Jun-17	38.9	1100	0.233	214				
7	22-Aug-17	41.6	1190	0.384	221				
8	25-Oct-17	1.6	99.4	0.0206	10.4				
9	21-Nov-17	44.4	1300	0.274	266				
10	14-Feb-18	35	1140	0.230	193				
11	2-May-18	37.6	1240	0.501	229				
12	21-Aug-18	36.5	1150	0.360	244				
13	16-Oct-18	36.5	1190	0.265	216				
14	22-Jan-19	31	1140	0.214	217				
15	6-May-19	38.2	1290	0.257	220				
16	11-Jul-19	32.6	1170	0.277	215				
17	21-Aug-19	33.3	1180	0.325	257				
18	29-Oct-19	33.3	1220	0.278	251				
19	27-Jan-20	32.8	1230	0.254	253				
20	5-May-20	33.3	1190	0.283	242				
21	12-Aug-20	30.7	1180	0.253	233				
22	25-Nov-20	31.5	1240	0.270	264				
23	23-Feb-21	31.7	1260	0.306	272				
24	24-May-21	30.1	1210	0.199	232				
25	28-Jul-21	28	1220	0.212	232				
26	7-Nov-21	28.2	1240	0.224	222				
27	13-Feb-22	25.1	1230	0.205	230				
28	28-Apr-22	27.3	1220	0.204	220				
29	7-Aug-22	25.5	1240	0.240	208				
30	12-Oct-22	26.2	1290	0.240	228				
31									
32									
33									
34									
35									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	0.27	0.18	0.31	0.20				
	Mann-Kendall Statistic (S):	-313	189	-31	59				
	Confidence Factor:	>99.9%	>99.9%	70.2%	84.8%				
	Concentration Trend:	Decreasing	Increasing	Stable	No Trend				



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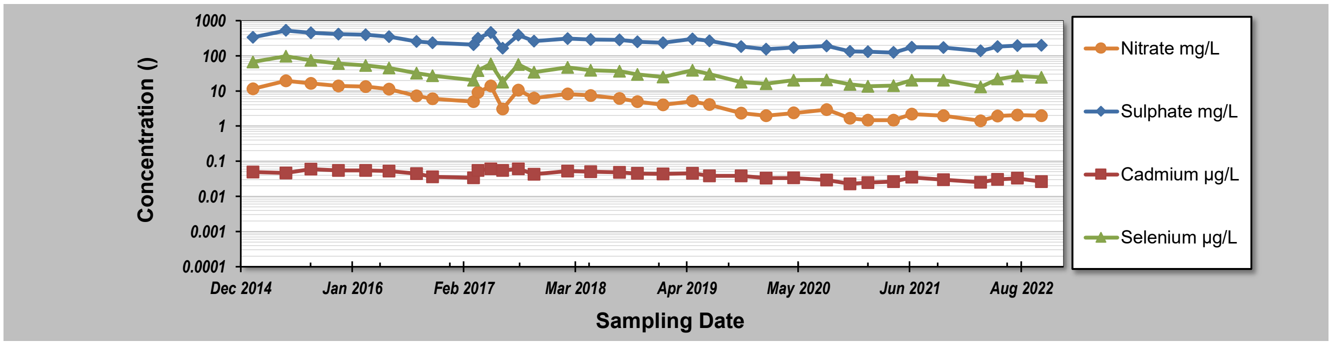
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 28-Dec-22
Facility Name: Teck Coal Regional Groundwater - EVO
Conducted By: MF

Job ID: 635544
Location EV_BCgw
Reviewed By:

Parameter	Nitrate	Sulphate	Cadmium	Selenium				
units	mg/L	mg/L	µg/L	µg/L				

Sampling Event	Sampling Date	EV_BCGW CONCENTRATION							
1	13-Jan-15	11.5	338	0.049	67.3				
2	11-May-15	19.4	531	0.0463	97.6				
3	10-Aug-15	16.5	449	0.0599	73.8				
4	16-Nov-15	14	411	0.0548	59.7				
5	22-Feb-16	13.3	395	0.0544	53.2				
6	16-May-16	11.2	350	0.0529	45.3				
7	22-Aug-16	7.19	254	0.044	31.9				
8	18-Oct-16	5.96	235	0.0361	27.4				
9	14-Mar-17	5	206	0.0335	20.3				
10	30-Mar-17	9.04	314	0.0551	37.7				
11	16-May-17	14	462	0.0609	59				
12	27-Jun-17	3.09	163	0.0549	17.9				
13	23-Aug-17	10.6	391	0.0603	56.8				
14	18-Oct-17	6.27	261	0.0426	34.5				
15	15-Feb-18	8.25	311	0.0521	46.9				
16	9-May-18	7.46	289	0.0504	39				
17	21-Aug-18	6.17	287	0.048	36.7				
18	24-Oct-18	4.98	253	0.0448	29.8				
19	23-Jan-19	4.02	234	0.0431	24.9				
20	9-May-19	5.12	301	0.0453	38.5				
21	9-Jul-19	4.07	266	0.0382	30.2				
22	31-Oct-19	2.34	182	0.0385	17.7				
23	28-Jan-20	1.98	154	0.033	16				
24	6-May-20	2.36	173	0.0334	20.2				
25	2-Sep-20	2.95	191	0.0291	20.7				
26	24-Nov-20	1.66	134	0.0228	15.4				
27	28-Jan-21	1.48	130	0.0247	13.5				
28	29-Apr-21	1.47	125	0.0261	14.3				
29	4-Jul-21	2.19	176	0.0348	20.4				
30	26-Oct-21	1.97	171	0.03	20.2				
31	8-Mar-22	1.41	138	0.0252	13.1				
32	8-May-22	1.95	182	0.0304	21.8				
33	18-Jul-22	2.07	195	0.0327	26.6				
34	12-Oct-22	1.99	198	0.0262	24.5				
35									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		0.78	0.41	0.28	0.58				
Mann-Kendall Statistic (S):		-414	-322	-329	-318				
Confidence Factor:		>99.9%	>99.9%	>99.9%	>99.9%				
Concentration Trend:		Decreasing	Decreasing	Decreasing	Decreasing				



Notes:

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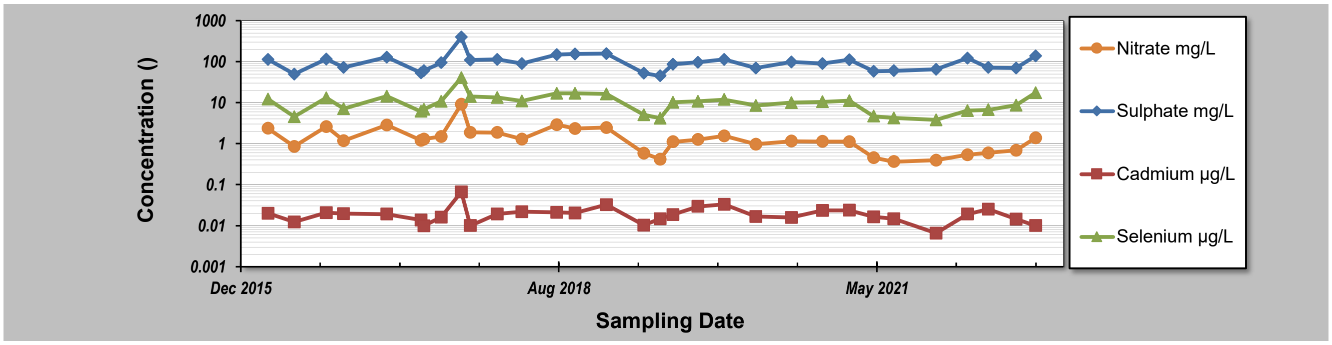
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	28-Dec-22	Job ID:	635544
Facility Name:	Teck Coal Regional Groundwater - EVO	Location	EV_WH50gw
Conducted By:	MF	Reviewed By:	

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	Sampling Date	EV_WH50GW CONCENTRATION							
1	24-Feb-16	2.36	113	0.0201	12.2				
2	17-May-16	0.86	50	0.0122	4.56				
3	25-Aug-16	2.6	115	0.0208	13.1				
4	19-Oct-16	1.18	73	0.0196	7.2				
5	3-Mar-17	2.86	129	0.0191	14.3				
6	19-Jun-17	1.21	54	0.0138	6.12				
7	28-Jun-17	1.3	61	0.0099	6.89				
8	22-Aug-17	1.49	94	0.016	10.8				
9	25-Oct-17	9.18	399	0.0671	41.1				
10	21-Nov-17	1.89	110	0.01	14.2				
11	14-Feb-18	1.87	114	0.0193	13.4				
12	2-May-18	1.29	91	0.0218	11				
13	21-Aug-18	2.89	150	0.021	16.8				
14	16-Oct-18	2.35	154	0.0202	16.8				
15	23-Jan-19	2.46	158	0.0327	16.2				
16	21-May-19	0.59	52	0.0102	5.04				
17	11-Jul-19	0.414	45	0.0146	4.13				
18	21-Aug-19	1.11	88	0.0186	10.3				
19	7-Nov-19	1.26	97	0.0294	10.8				
20	28-Jan-20	1.54	114	0.0333	11.9				
21	7-May-20	0.963	70	0.0167	8.59				
22	27-Aug-20	1.15	98	0.0158	10.1				
23	2-Dec-20	1.13	90.6	0.0233	10.5				
24	25-Feb-21	1.12	111	0.0237	11.2				
25	13-May-21	0.458	59	0.0163	4.68				
26	15-Jul-21	0.365	60	0.0147	4.23				
27	25-Nov-21	0.396	65	0.0066	3.83				
28	4-Mar-22	0.539	123	0.0191	6.4				
29	8-May-22	0.599	72	0.0253	6.7				
30	4-Aug-22	0.687	70	0.0145	8.7				
31	4-Oct-22	1.38	138	0.01	17.6				
32									
33									
34									
35									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		1.00	0.61	0.55	0.63				
Mann-Kendall Statistic (S):		-183	-20	-19	-79				
Confidence Factor:		99.9%	62.6%	61.9%	90.7%				
Concentration Trend:		Decreasing	Stable	Stable	Prob. Decreasing				



Notes:

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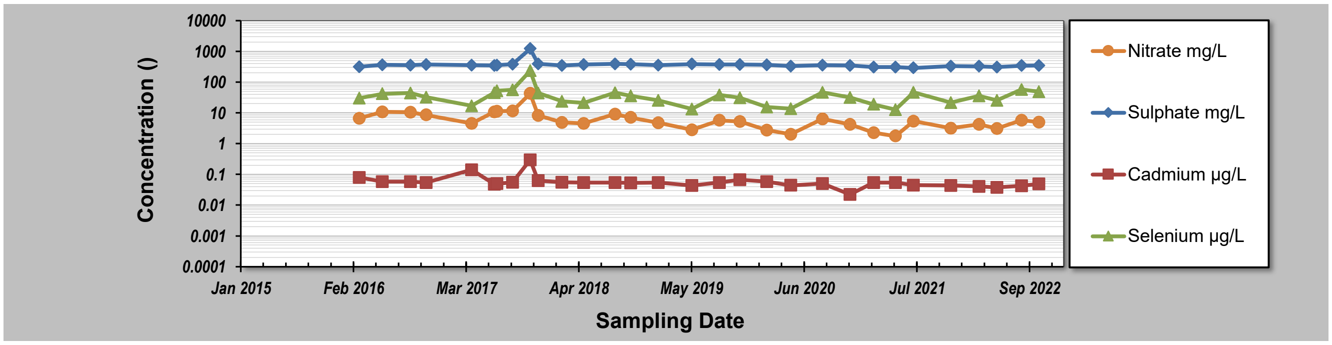
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	28-Dec-22	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - EVO	**Location**	EV_BRgw
Conducted By:	MF	**Reviewed By:**	

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	Sampling Date	EV_BRGW CONCENTRATION							
1	25-Feb-16	6.64	320	0.0788	30				
2	17-May-16	10.7	367	0.0579	41.9				
3	25-Aug-16	10.6	358	0.0581	44.7				
4	19-Oct-16	8.6	379	0.0539	32.5				
5	30-Mar-17	4.53	357	0.141	17.2				
6	19-Jun-17	10.7	348	0.0483	45.9				
7	28-Jun-17	11.3	358	0.0497	52.4				
8	23-Aug-17	11.5	387	0.0555	56.2				
9	25-Oct-17	42.9	1230	0.299	235				
10	21-Nov-17	8.31	395	0.0628	44.5				
11	14-Feb-18	4.9	346	0.055	23.7				
12	2-May-18	4.54	379	0.054	21.4				
13	21-Aug-18	9.2	396	0.0539	45.5				
14	16-Oct-18	7.1	382	0.0525	35.6				
15	22-Jan-19	4.8	357	0.0537	25.4				
16	21-May-19	2.83	389	0.0438	13.3				
17	27-Aug-19	5.72	376	0.0537	38.3				
18	7-Nov-19	5.31	378	0.0669	30.7				
19	11-Feb-20	2.76	369	0.0586	15.4				
20	6-May-20	2.03	334	0.0441	13.6				
21	27-Aug-20	6.38	358	0.0506	46.8				
22	2-Dec-20	4.24	351	0.0223	31.9				
23	25-Feb-21	2.26	311	0.0538	19.0				
24	13-May-21	1.78	308	0.0542	12.9				
25	16-Jul-21	5.42	294	0.0448	46.3				
26	25-Nov-21	3.19	334	0.0433	21.6				
27	6-Mar-22	4.2	329	0.0409	36.1				
28	8-May-22	3.12	313	0.0378	25.4				
29	4-Aug-22	5.78	345	0.0425	57.9				
30	4-Oct-22	5	351	0.0487	49.3				
31									
32									
33									
34									
35									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		1.02	0.42	0.77	0.97				
Mann-Kendall Statistic (S):		-188	-144	-209	-32				
Confidence Factor:		>99.9%	99.5%	>99.9%	70.8%				
Concentration Trend:		Decreasing	Decreasing	Decreasing	Stable				



Notes:

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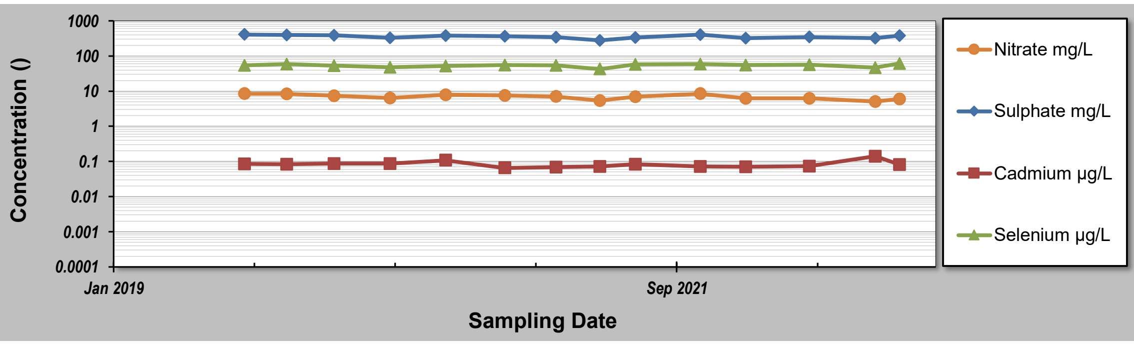
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	28-Dec-22	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - EVO	**Location**	EV_HW1
Conducted By:	MF	**Reviewed By:**	

Parameter	**Nitrate**	**Sulphate**	**Cadmium**	**Selenium**				
units	mg/L	mg/L	µg/L	µg/L				

Sampling Event	**Sampling Date**	**EV_HW1 CONCENTRATION**							
1	21-Aug-19	8.47	411	0.0846	54.7				
2	4-Nov-19	8.35	400	0.0831	58.8				
3	27-Jan-20	7	386	0.0873	53				
4	5-May-20	6.37	330	0.0859	47.7				
5	12-Aug-20	7.88	383	0.108	51.5				
6	25-Nov-20	7.61	368	0.0657	55				
7	24-Feb-21	7.02	341	0.069	54				
8	13-May-21	5.35	279	0.0722	42.9				
9	15-Jul-21	6.92	334	0.0824	57.4				
10	7-Nov-21	8.53	410	0.0715	58.5				
11	27-Jan-22	6.29	320	0.0701	55.4				
12	20-May-22	6.28	347	0.0739	56.9				
13	14-Sep-22	5.08	320	0.141	47.1				
14	27-Oct-22	5.95	385	0.0814	61.9				
15									
16									
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		**0.16**	**0.11**	**0.23**	**0.10**				
Mann-Kendall Statistic (S):		**-51**	**-32**	**-9**	**15**				
Confidence Factor:		**99.8%**	**95.5%**	**66.6%**	**77.5%**				
Concentration Trend:		Decreasing	Decreasing	Stable	No Trend				



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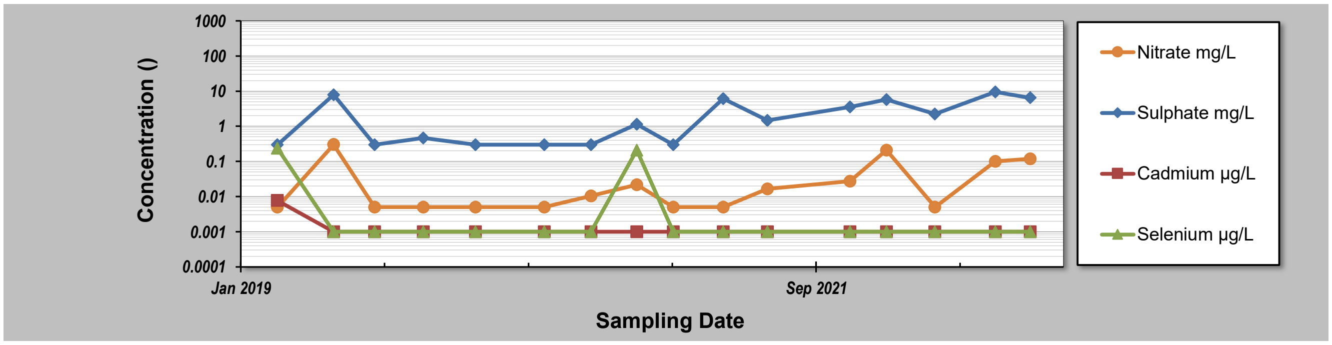
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	28-Dec-22	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - EVO	**Location**	EV_MW_MC1-A
Conducted By:	MF	**Reviewed By:**	

Sampling Event	Sampling Date	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
		EV_MW_MC1-A CONCENTRATION							
1	5-Mar-19	0.005	0.3	0.0077	0.235				
2	11-Jun-19	0.302	7.8	0.001	0.001				
3	21-Aug-19	0.005	0.3	0.001	0.001				
4	14-Nov-19	0.005	0.46	0.001	0.001				
5	12-Feb-20	0.005	0.3	0.001	0.001				
6	11-Jun-20	0.005	0.3	0.001	0.001				
7	31-Aug-20	0.0105	0.3	0.001	0.001				
8	19-Nov-20	0.0219	1.15	0.001	0.21				
9	21-Jan-21	0.005	0.3	0.001	0.001				
10	18-Apr-21	0.005	6.15	0.001	0.001				
11	4-Jul-21	0.0165	1.48	0.001	0.001				
12	24-Nov-21	0.0271	3.58	0.001	0.001				
13	27-Jan-22	0.209	5.71	0.001	0.001				
14	21-Apr-22	0.005	2.23	0.001	0.001				
15	4-Aug-22	0.101	9.56	0.001	0.001				
16	4-Oct-22	0.119	6.45	0.001	0.001				
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		1.66	1.10	1.18	2.64				
Mann-Kendall Statistic (S):		40	55	-15	-17				
Confidence Factor:		96.1%	99.3%	73.3%	76.1%				
Concentration Trend:		Increasing	Increasing	No Trend	No Trend				



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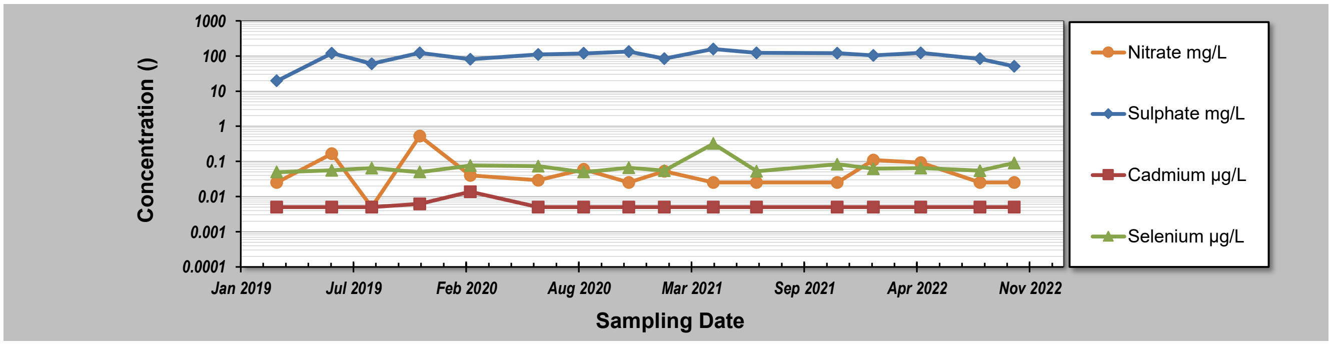
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 28-Dec-22
Facility Name: Teck Coal Regional Groundwater - EVO
Conducted By: MF
Job ID: 635544
Location EV_MW_MC1B
Reviewed By:

Sampling Event	Sampling Date	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
		EV_MW_MC1B CONCENTRATION							
1	5-Mar-19	0.025	19.7	0.005	0.05				
2	11-Jun-19	0.165	120	0.005	0.056				
3	21-Aug-19	0.005	60.1	0.005	0.065				
4	14-Nov-19	0.531	124	0.0062	0.05				
5	12-Feb-20	0.040	81.1	0.0138	0.076				
6	11-Jun-20	0.029	111	0.005	0.073				
7	31-Aug-20	0.059	119	0.005	0.05				
8	19-Nov-20	0.025	134	0.005	0.066				
9	21-Jan-21	0.052	84.2	0.005	0.055				
10	18-Apr-21	0.025	158	0.005	0.324				
11	4-Jul-21	0.025	122	0.005	0.052				
12	24-Nov-21	0.025	121	0.005	0.083				
13	27-Jan-22	0.109	104	0.005	0.062				
14	21-Apr-22	0.093	122	0.005	0.065				
15	4-Aug-22	0.025	83.4	0.005	0.055				
16	4-Oct-22	0.025	51.1	0.005	0.09				
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	1.62	0.35	0.39	0.83				
	Mann-Kendall Statistic (S):	-13	9	-15	29				
	Confidence Factor:	70.3%	63.9%	73.3%	89.5%				
	Concentration Trend:	No Trend	No Trend	Stable	No Trend				



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GSI MANN-KENDALL TOOLKIT

Evaluation Date:	28-Dec-22	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - EVO	**Location**	EV_MW_MC2A
Conducted By:	MF	**Reviewed By:**	

	Parameter	**Nitrate**	**Sulphate**	**Cadmium**	**Selenium**				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	**Sampling Date**	**EV_MW_MC2A CONCENTRATION**							
1	4-Mar-19	0.058	5.8	0.005	0.05				
2	11-Jun-19	0.118	0.3	0.005	0.05				
3	20-Aug-19	0.005	0.3	0.005	0.05				
4	13-Nov-19	0.005	0.3	0.005	0.05				
5	12-Feb-20	0.005	0.3	0.0286	0.05				
6	10-Jun-20	0.005	0.3	0.005	0.05				
7	31-Aug-20	0.005	0.3	0.005	0.05				
8	19-Nov-20	0.005	0.3	0.005	0.05				
9	21-Jan-21	0.0065	0.3	0.005	0.05				
10	18-Apr-21	0.005	8.28	0.005	0.05				
11	4-Jul-21	0.005	0.3	0.005	0.05				
12	22-Nov-21	0.005	0.3	0.005	0.05				
13	4-Mar-22	0.005	0.3	0.005	0.05				
14	15-May-22	0.005	0.3	0.005	0.05				
15	17-Aug-22	0.006	0.3	0.005	0.05				
16									
17									
18									
19									
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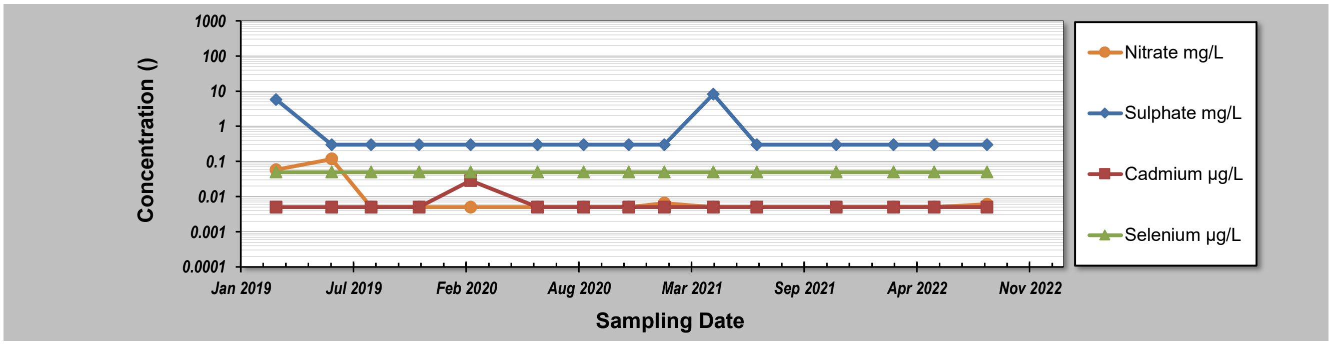
44									
45									
46									
	Coefficient of Variation:	1.93	2.02	0.93	0.00				
	Mann-Kendall Statistic (S):	-14	-9	-6	0				
	Confidence Factor:	73.7%	65.1%	59.6%	48.0%				
	Concentration Trend:	No Trend	No Trend	Stable	Stable				



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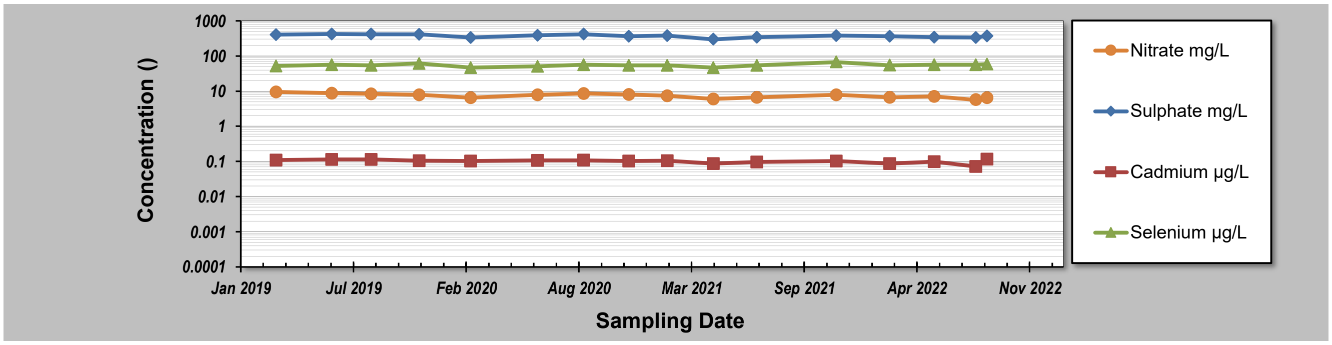
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

Evaluation Date:	28-Dec-22	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - EVO	**Location**	EV_MW_MC2B
Conducted By:	MF	**Reviewed By:**	

Parameter	**Nitrate**	**Sulphate**	**Cadmium**	**Selenium**				
units	mg/L	mg/L	µg/L	µg/L				

Sampling Event	**Sampling Date**	**EV_MW_MC2B CONCENTRATION**							
1	4-Mar-19	9.53	408	0.11	51.9				
2	11-Jun-19	8.74	424	0.114	56.5				
3	20-Aug-19	8.33	419	0.114	54.4				
4	13-Nov-19	7.8	417	0.105	62				
5	12-Feb-20	6.55	336	0.103	46.9				
6	10-Jun-20	7.84	393	0.107	51.4				
7	31-Aug-20	8.58	419	0.108	56.9				
8	19-Nov-20	7.99	368	0.103	54.4				
9	26-Jan-21	7.41	380	0.105	53.9				
10	18-Apr-21	6	301	0.088	47.1				
11	4-Jul-21	6.71	345	0.096	54.2				
12	22-Nov-21	7.82	379	0.102	67.8				
13	25-Feb-22	6.71	364	0.087	54.8				
14	15-May-22	7.06	346	0.098	56				
15	28-Jul-22	5.74	339	0.072	56.3				
16	17-Aug-22	6.58	375	0.116	59.5				
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		**0.14**	**0.10**	**0.11**	**0.09**				
Mann-Kendall Statistic (S):		**-67**	**-55**	**-57**	**29**				
Confidence Factor:		**99.9%**	**99.3%**	**99.5%**	**89.5%**				
Concentration Trend:		Decreasing	Decreasing	Decreasing	No Trend				



Notes:

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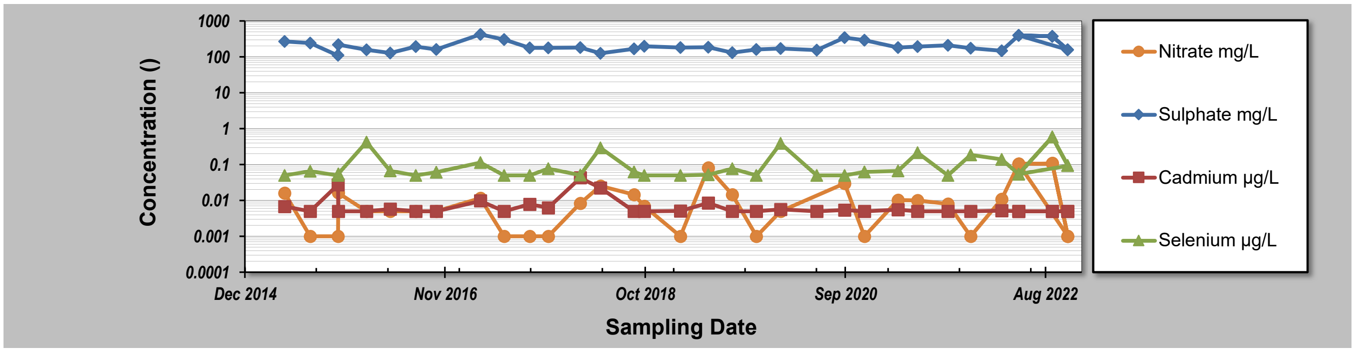
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	28-Dec-22	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - EVO	**Location**	EV_WF_SW
Conducted By:	MS	**Reviewed By:**	

Parameter	**Nitrate**	**Sulphate**	**Cadmium**	**Selenium**				
units	mg/L	mg/L	µg/L	µg/L				

Sampling Event	Sampling Date	EV_WF_SW CONCENTRATION							
1	14-May-15	0.0160	269	0.007	0.050				
2	12-Aug-15	0.0010	244	0.005	0.065				
3	17-Nov-15	0.0010	110	0.027	0.050				
4	19-Nov-15	0.0162	218	0.005	0.055				
5	25-Feb-16	0.0050	157	0.005	0.425				
6	18-May-16	0.0050	128	0.006	0.066				
7	16-Aug-16	0.0050	195	0.005	0.050				
8	26-Oct-16	0.0050	161	0.005	0.061				
9	30-Mar-17	0.0115	424	0.010	0.113				
10	20-Jun-17	0.0010	305	0.005	0.050				
11	18-Sep-17	0.0010	178	0.008	0.050				
12	22-Nov-17	0.0010	177	0.006	0.076				
13	14-Mar-18	0.0083	180	0.043	0.051				
14	24-May-18	0.0250	126	0.022	0.289				
15	18-Sep-18	0.0144	166	0.005	0.062				
16	24-Oct-18	0.0069	196	0.005	0.050				
17	27-Feb-19	0.0010	180	0.005	0.050				
18	5-Jun-19	0.0817	186	0.008	0.052				
19	28-Aug-19	0.0145	132	0.005	0.077				
20	20-Nov-19	0.0010	161	0.005	0.050				
21	13-Feb-20	0.0050	170	0.006	0.391				
22	18-Jun-20		155	0.005	0.050				
23	23-Sep-20	0.0300	345	0.005	0.050				
24	2-Dec-20	0.0010	289	0.005	0.062				
25	29-Mar-21	0.0103	181	0.006	0.066				
26	6-Jun-21	0.0100	192	0.005	0.212				
27	20-Sep-21	0.0080	211	0.005	0.050				
28	9-Dec-21	0.0010	174	0.005	0.187				
29	27-Mar-22	0.0109	148	0.005	0.139				
30	26-May-22	0.1050	395	0.005	0.054				
31	20-Sep-22	0.1080	376	0.005	0.591				
32	13-Nov-22	0.0010	157	0.005	0.093				
33	26-May-22	0.1050	395	0.005	0.054				
34	20-Sep-22	0.1080	376	0.005	0.591				
35	13-Nov-22	0.0010	157	0.005	0.093				
36									
37									
38									
39									
40									
Coefficient of Variation:		1.63	0.41	1.00	1.16				
Mann-Kendall Statistic (S):		100	60	-137	129				
Confidence Factor:		92.8%	79.8%	97.4%	96.6%				
Concentration Trend:		Prob. Increasing	No Trend	Decreasing	Increasing				



Notes:

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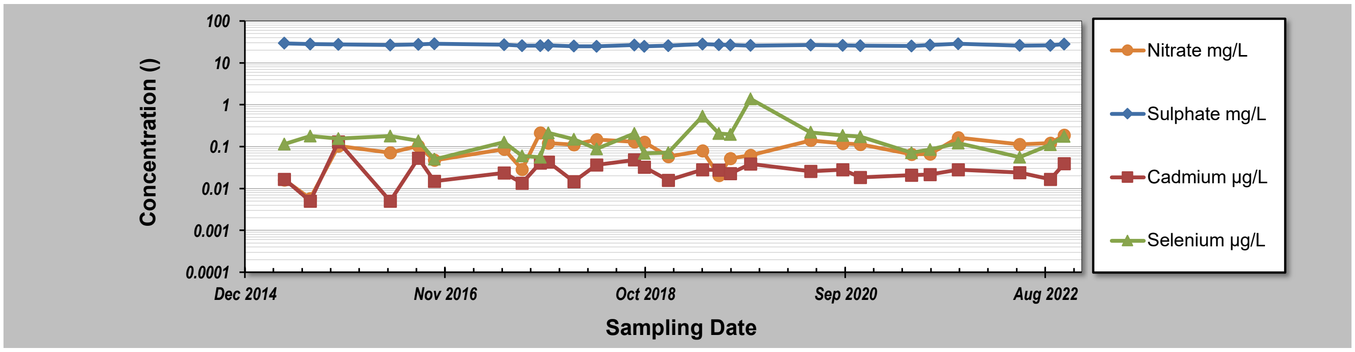
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 28-Dec-22
Facility Name: Teck Coal Regional Groundwater - EVO
Conducted By: MS

Job ID: 635544
Location EV_ECgw
Reviewed By:

	Parameter units	Nitrate mg/L	Sulphate mg/L	Cadmium µg/L	Selenium µg/L				
Sampling Event	Sampling Date	EV_ECGW CONCENTRATION							
1	14-May-15	0.0160	29.60	0.017	0.115				
2	13-Aug-15	0.0058	28.20	0.005	0.178				
3	18-Nov-15	0.1030	27.50	0.131	0.156				
4	18-May-16	0.0720	26.90	0.005	0.180				
5	24-Aug-16	0.1030	27.50	0.053	0.137				
6	19-Oct-16	0.0473	28.70	0.015	0.050				
7	20-Jun-17	0.0868	27.10	0.023	0.129				
8	23-Aug-17	0.0285	25.80	0.013	0.060				
9	25-Oct-17	0.2150	25.80	0.040	0.056				
10	22-Nov-17	0.1210	26.10	0.043	0.212				
11	20-Feb-18	0.1120	25.10	0.015	0.150				
12	10-May-18	0.1470	24.90	0.037	0.089				
13	19-Sep-18	0.1310	26.70	0.048	0.206				
14	24-Oct-18	0.1270	25.00	0.033	0.069				
15	16-Jan-19	0.0579	25.70	0.016	0.072				
16	15-May-19	0.0796	28.00	0.028	0.534				
17	11-Jul-19	0.0204	27.00	0.028	0.206				
18	21-Aug-19	0.0519	26.70	0.023	0.195				
19	30-Oct-19	0.0618	26.00	0.038	1.390				
20	28-May-20	0.1410	26.80	0.026	0.219				
21	17-Sep-20	0.1200	26.30	0.028	0.186				
22	18-Nov-20	0.1140	25.70	0.018	0.172				
23	16-May-21	0.0651	25.30	0.021	0.071				
24	19-Jul-21	0.0667	26.60	0.022	0.086				
25	26-Oct-21	0.1640	28.60	0.028	0.122				
26	29-May-22	0.1130	26.00	0.024	0.056				
27	13-Sep-22	0.1220	26.10	0.017	0.111				
28	1-Nov-22	0.1880	28.20	0.040	0.176				
29									
30									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		0.54	0.05	0.78	1.31				
Mann-Kendall Statistic (S):		103	-73	7	8				
Confidence Factor:		97.8%	92.2%	54.7%	55.4%				
Concentration Trend:		Increasing	Prob. Decreasing	No Trend	No Trend				



Notes:

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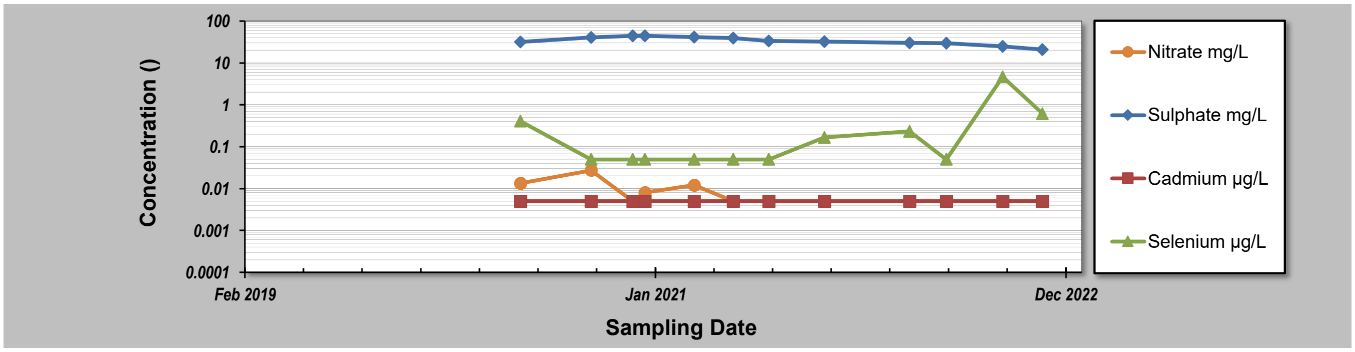
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 28-Dec-22
Facility Name: Teck Coal Regional Groundwater - EVO
Conducted By: MS
Job ID: 635544
Location EV_MW_SP1A
Reviewed By:

Sampling Event	Sampling Date	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
		EV_MW_SP1A CONCENTRATION							
1	19-May-20	0.014	32.0	0.005	0.406				
2	16-Sep-20	0.027	41.0	0.005	0.050				
3	26-Nov-20	0.005	44.4	0.005	0.050				
4	17-Dec-20	0.008	44.8	0.005	0.050				
5	11-Mar-21	0.012	41.4	0.005	0.050				
6	16-May-21	0.005	39.3	0.005	0.050				
7	16-Jul-21	0.005	33.3	0.005	0.050				
8	19-Oct-21	0.005	32.5	0.005	0.167				
9	13-Mar-22	0.005	30.2	0.005	0.232				
10	15-May-22	0.005	29.9	0.005	0.050				
11	19-Aug-22	0.005	24.8	0.005	4.700				
12	26-Oct-22	0.005	21.0	0.005	0.612				
13									
14									
15									
16									
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	0.79	0.22	0.00	2.45				
	Mann-Kendall Statistic (S):	-30	-44	0	21				
	Confidence Factor:	97.8%	99.9%	47.3%	91.3%				
	Concentration Trend:	Decreasing	Decreasing	Stable	Prob. Increasing				



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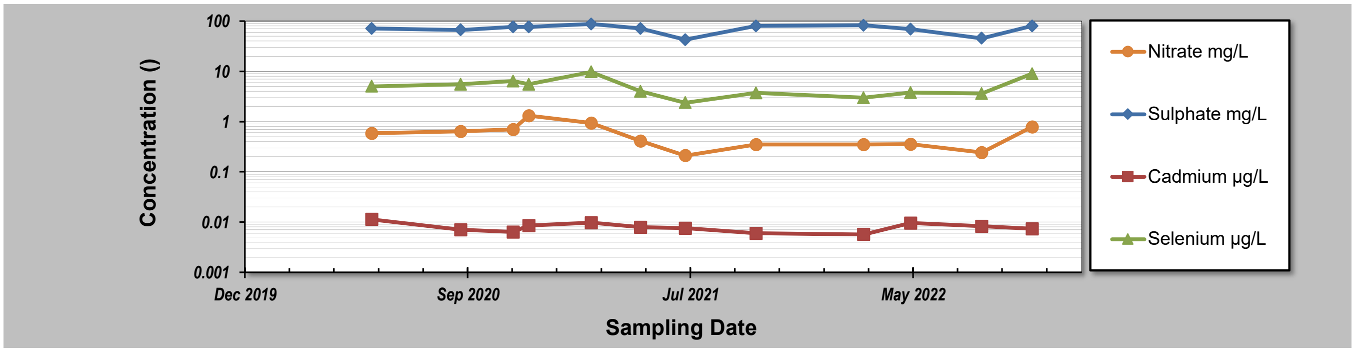
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 28-Dec-22
Facility Name: Teck Coal Regional Groundwater - EVO
Conducted By: MS
Job ID: 635544
Location EV_MW_SP1B
Reviewed By:

Sampling Event	Sampling Date	EV_MW_SP1B CONCENTRATION							
	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
1	19-May-20	0.5830	71.6	0.0114	5.040				
2	16-Sep-20	0.6380	66.8	0.0070	5.520				
3	26-Nov-20	0.7030	76.3	0.0064	6.390				
4	17-Dec-20	1.3200	76.3	0.0085	5.560				
5	11-Mar-21	0.9390	88.1	0.0098	9.820				
6	16-May-21	0.4120	71.2	0.0079	4.010				
7	16-Jul-21	0.2120	42.8	0.0076	2.390				
8	19-Oct-21	0.3520	80.8	0.0060	3.740				
9	13-Mar-22	0.3520	82.9	0.0057	3.000				
10	15-May-22	0.3540	69.2	0.0096	3.760				
11	19-Aug-22	0.2440	45.6	0.0083	3.620				
12	26-Oct-22	0.7870	80.1	0.0074	9.040				
13									
14									
15									
16									
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	0.57	0.20	0.21	0.45				
	Mann-Kendall Statistic (S):	-17	1	-14	-14				
	Confidence Factor:	86.0%	50.0%	81.0%	81.0%				
	Concentration Trend:	Stable	No Trend	Stable	Stable				



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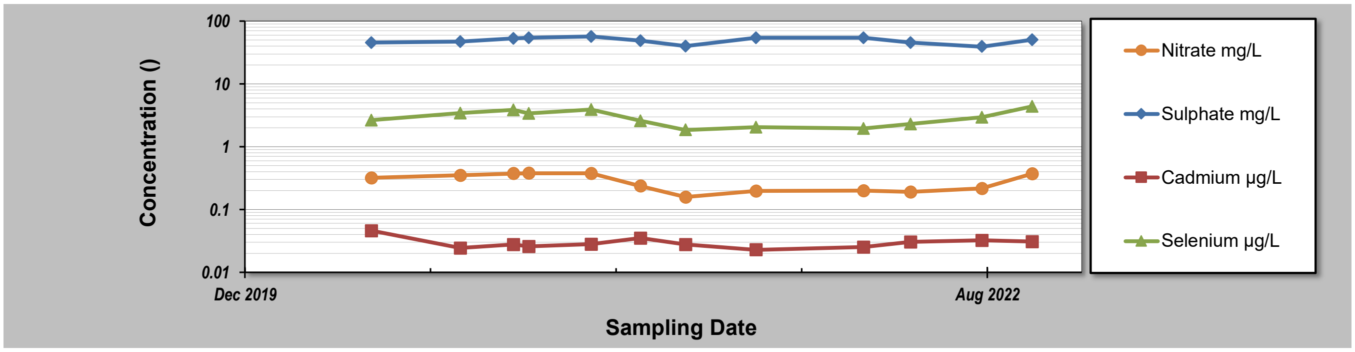
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	28-Dec-22	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - EVO	**Location**	EV_MW_SP1C
Conducted By:	MS	**Reviewed By:**	

	Parameter	**Nitrate**	**Sulphate**	**Cadmium**	**Selenium**				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	**Sampling Date**	**EV_MW_SP1C CONCENTRATION**							
1	19-May-20	0.319	45.5	0.05	2.66				
2	16-Sep-20	0.353	47.1	0.02	3.45				
3	26-Nov-20	0.375	52.8	0.03	3.87				
4	17-Dec-20	0.381	54.1	0.03	3.38				
5	11-Mar-21	0.376	57.2	0.03	3.91				
6	16-May-21	0.237	48.7	0.04	2.60				
7	16-Jul-21	0.158	40.1	0.03	1.86				
8	19-Oct-21	0.197	54.3	0.02	2.05				
9	13-Mar-22	0.199	54.4	0.03	1.96				
10	15-May-22	0.191	45.5	0.03	2.30				
11	19-Aug-22	0.217	39.5	0.03	2.95				
12	26-Oct-22	0.373	50.8	0.03	4.40				
13									
14									
15									
16									
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		0.31	0.12	0.21	0.29				
Mann-Kendall Statistic (S):		-16	-1	8	-6				
Confidence Factor:		84.5%	50.0%	68.1%	63.1%				
Concentration Trend:		Stable	Stable	No Trend	Stable				



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Nelson, British Columbia, Canada V1L 4C6
t. 250.354.1664
www.snclavalin.com

Appendix IX

Coal Mountain mine 2022 SSGMP and RGMP Annual Report

- Figures
- Tables
- Drawings
- Attachments
    - I. Borehole Logs
    - II. Block Diagrams
    - III. Mann-Kendall Analyses
    - IV. Michel Creek Flow and Load Accretion Investigation Report
    - V. Hydraulic Conductivity Testing Results

1 Coal Mountain mine SSGMP and RGMP Report

1.1 Overview

Coal Mountain mine (CMm) is currently in care and maintenance. It was previously called Coal Mountain Operations (CMO) until mining operations ceased in 2019. Groundwater monitoring was completed in accordance with the approved 2020 Regional Groundwater Monitoring Program (RGMP) Update (SNC-Lavalin, 2020), and the approved 2018 Site-specific Groundwater Monitoring Program (SSGMP) Update (SRK Consulting, 2018). The 2021 SSGMP Update has been submitted to the BC Ministry of Environment & Climate Change Strategy (ENV) for approval.

The site location for CMm and corresponding RGMP Study Area 11 are provided on Drawing CM-01. CMm is located between two surface water drainages: Michel Creek and its tributary, Corbin Creek. Michel Creek flows northward along the western boundary of CMm and Corbin Creek flows northwest along the eastern edge of CMm, through a rock drain beneath CMm East spoils (Drawing CM-01). Corbin Creek enters Michel Creek northwest of CMm, south of the rail loop. Both Michel and Corbin creeks drain mountainous, alpine areas located west and east of CMm, respectively. Andy Good Creek is another key tributary of Michel Creek near CMm. Andy Good Creek flows west and drains an alpine area located north of CMm, where no mining activity has occurred, then enters Michel Creek northwest of the rail loop.

Results and discussion are organized based on the Corbin Creek and Michel Creek watersheds. A summary of wells classified by drainage area, well installation details, and hydrogeological information for each well are provided in Table CM-01. Manual groundwater level measurements from 2022 and calculated vertical gradients are provided in Table CM-02. The 2022 fourth quarter (Q4) groundwater elevations are shown on Drawing CM-02. The 2022 water levels are presented in relation to geology in three cross sections (Drawings CM-03 to -05) and Block Diagrams (Attachment II; Diagram CM-01 and -02). Drawings CM-06 to -09 provide a spatial summary of 2022 Order Constituent (OC) concentrations (nitrate, sulphate, cadmium, and selenium). Figures CM-01 to CM-25 present precipitation, water level, and chemistry data for discussion purposes.

Surficial deposits at CMm represent the combined influence of glacial activity and subsequent erosional and fluvial mechanisms, followed by anthropogenic activities. Generally, there is a layer of till overlying the bedrock interface, and coarser fluvial or colluvial sediments overlying the till (George et al., 1986). Surficial geology at CMm is shown on Drawing 7 of the main report, and sediment descriptions encountered at monitoring wells are included with the borehole logs (Attachment I).

Subcropping bedrock at CMm consists of the upper portion of the Jurassic-aged Fernie Formation (Fm) and the lower portion of the Jura-Cretaceous-aged Kootenay Group (Drawing 4 of the main report). The Fernie Fm at CMm consists of a thick sequence of marine sediments. The lower portion of the formation, the Grey Beds, is a shale and siltstone sequence. The upper portion, or Passage Beds, is a medium thick sequence of dark grey siltstone and fine-grained sandstone. At CMm, the Fernie Fm is found subcropping along the eastern and western flanks of CMm.

The Kootenay Group has three subdivisions which are, in ascending order, the Morrissey Fm, the coal-bearing Mist Mountain Fm, and the Elk Fm. The upper portion of the Mist Mountain Fm and the entire Elk Fm have been removed by erosion and are no longer present at CMm. The Morrisey Fm at CMm consists of the lower Weary Ridge Member and the upper Moose Mountain Member. The Weary Ridge Member is a crossbedded, fine-grained sandstone with shale and siltstone interbeds. The Moose Mountain Member is a light grey medium-grained resistant sandstone. Interbeds are generally absent, except for the top few metres, where coal stringers and dark grey shale interbeds can be found (Teck, 2013). The Kootenay Group (Morrisey Fm and Mist Mountain Fm) is exposed in the central portion of CMm, which was thrust to the highest elevations of Coal Mountain.

There is a prominent thrust fault (Big Rip Fault) trending north-south through the middle of the CMm disturbance area and there are numerous associated minor faults associated with this fault (Drawing 4 of the main report; O'Neill, 2016). Relative movement of hanging walls, along the thrust faults, has been toward the east with dip separation in the order of tens to hundreds of metres. The main synclinal axis generally plunges northwards at a moderate angle, but local reversals are present (Teck, 2013). Numerous cross sections showing the general structure and incline of bedrock formations are shown in GSC (1996). The bedrock and surficial geology of CMm have been discussed in detail as part of the 2021 SSGMP Update, which includes bedrock cross sections for the area (SNC-Lavalin, 2021a).

1.2 Groundwater Monitoring Locations

The approved CMm SSGMP Update (SRK Consulting, 2018) and approved 2020 RGMP Update (SNC-Lavalin, 2020) specify the monitoring methods, frequencies, locations, and analysis requirements for CMm. These requirements were formulated based on the groundwater conceptual site model (CSM), which was informed by previous studies. Descriptions of the physical setting, hydrology, geology, mine-related features, physical hydrogeology, and chemical hydrogeology inform the CSM, which is presented in the approved 2018 SSGMP Update (SRK Consulting, 2018) and the 2021 SSGMP Update (SNC-Lavalin, 2021a).

There are 19 groundwater monitoring wells at CMm that support both the SSGMP and RGMP (Drawing CM-01; Table CM-01). Eight monitoring wells are installed in unconsolidated valley deposits and eleven are installed in bedrock units. Eight monitoring wells are located within the Corbin Creek watershed. Eleven monitoring wells are within the Michel Creek watershed, of which five are downgradient of the confluence with Corbin Creek.

1.3 Program Modifications

Data was collected in accordance with the approved 2018 SSGMP Update (SRK Consulting, 2018) and approved 2020 RGMP Update (SNC-Lavalin, 2020). Table A summarizes modifications from the SSGMP and RGMP programs.

Table A: CMm SSGMP and Study Area 11 Program Modifications

#	ID	Q[a]	Modification	Reason
1	CM_CCPD	Q1 – Q4	CM_CCPD was replaced with surface water station CM_CCOFF.	Following completion of the Corbin Dam Spillway Upgrade Project in 2021, samples have been collected at CM_CCOFF rather than CM_CCPD to capture representative samples required by Permit 4750 for the decant discharge of the Corbin Sedimentation Ponds. Throughout 2022 a permit amendment approval process was underway to change the permitted monitoring location for Corbin Pond to CM_CCOFF, which was approved on January 27, 2023.

Notes:

[a] Q denotes Quarter (Q1, Q2, Q3, Q4).

1.4 Summary of Field Activities

Table B summarizes the field activities that took place in 2022, in addition to the quarterly SSGMP and RGMP monitoring and sampling.

Table B: CMm SSGMP and Study Area 11 Summary of Field Activities

#	Location	Q[a]	Field Activity	Rationale
1	CM_MW5-SH/DP 2022 Q1	2022 Q1	Groundwater sampling and monitoring.	Additional samples were collected to fulfill monitoring requirements associated with the Corbin Dam Spillway project.
2	Michel Creek, Corbin Creek, and Andy Good Creek	2022 Q4	Completed a flow and load accretion study on Michel Creek, lower Corbin Creek, and lower Andy Good Creek (Attachment IV).	Recommendation in the 2021 SSGMP Annual Report.
3	CM_MW4-DP, CM_MW6-SH, CM_MW7-SH/DP	2022 Q4	Completed hydraulic conductivity testing in monitoring wells (Attachment V).	Recommendation in the 2021 SSGMP Annual Report.
4	CM_MW6-SH/DP, CM_MW7-SH/DP, CM_MW8, CM_MW9, CM_MW10	2022 Q4	Pressure transducers were installed in monitoring wells to understand groundwater surface water interaction and groundwater recharge.	Recommendation in the 2021 SSGMP Annual Report.
5	CM_MW7-SH/DP, CM_MW8	2022 Q4	Groundwater sampling and monitoring.	Additional samples were collected in support of the 34 Pit Hydrogeological Study.
6	Andy Good Creek, upgradient of confluence with Corbin Creek	2023 Q1	Drill and install a nested monitoring well along Andy Good Creek, upgradient of the confluence with Corbin Creek.	Improving hydrogeologic characterization near CMm. This was not a recommendation from the 2021 SSGMP Update, 2020 RGMP Update, or 2021 Annual Report.
7	Corbin town site	2023 Q1	Drill and install a nested monitoring well near the Corbin town site.	Improving hydrogeologic characterization near CMm. This was not a recommendation from the 2021 SSGMP Update, 2020 RGMP Update, or 2021 Annual Report.

Notes:

[a] Q denotes Quarter (Q1, Q2, Q3, Q4).

1.5 Corbin Creek Watershed

A summary of 2022 groundwater monitoring and sampling results for the Corbin Creek watershed is presented in Table C with references to supporting information (Drawings, Figures, Tables, and Appendices). In addition to quarterly SSGMP and RGMP sampling and monitoring, additional samples were collected from CM_MW5-SH/DP to fulfill monitoring requirements associated with the Corbin Dam Spillway project. It should be noted the results from Corbin Dam Spillway Project samples stayed within 5% of historical values (which was a requirement of monitoring for Corbin Dam Spillway Project Water Quality Monitoring Plan). Analytical chemistry data for the additional samples is provided in Tables CM-06 and -07.

Table C: Summary of 2022 Groundwater Monitoring and Sampling Results for Corbin Creek Watershed

Hydrogeological Information		Description	Reference
Corbin Pond			
Monitoring Location	Relevant CMm SSGMP/RGMP Wells	CM_MW6-SH/DP	Table CM-01 Drawing CM-01 SNC-Lavalin, 2021a SRK, 2021
	Relevant Monitoring Wells from Other Programs[a]	n/a	
	Relevant Surface Water Monitoring Stations[b]	CM_CCHW, CM_PC2, CM_CCPD, CM_CCOFF	
	Relevant Seep Monitoring Locations[b]	CM_CCDS	
Physical Hydrogeology	Groundwater Elevation Trends	• Seasonal variability at CM_MW6-SH and CM_MW6-DP followed a similar pattern in 2022 as previous years, and as the Corbin Pond surface water outflow, with the highest levels measured during the spring (Q2). The lowest groundwater levels are presumed to have occurred during the winter (Q1). Groundwater surface elevations at both wells were similar to historical data from 2017 onwards.	Figure CM-01 Table CM-02 Drawing CM-02 and -05
	Hydraulic Gradients and Flow Direction	• Vertical Hydraulic Gradient: – The vertical hydraulic gradient between CM_MW6-SH/DP was 0.06 to 0.1 m/m upwards in 2022, similar to previous measurements. • Lateral Hydraulic Gradient: – The lateral hydraulic gradient in the lower Corbin Creek valley (Corbin Pond area) is steeper than in the Michel Creek valley with an estimated gradient of 0.03 m/m as measured between CM_MW5-SH and CM_MW6-SH.	Table CM-02 Drawings CM-02 and -05
Chemistry	2022 SSGMP/RGMP Order Constituents Results	• Groundwater concentrations of OC were less than the primary screening criteria at both monitoring wells.	Table D Figures CM-03 to -05 Tables CM-03 and -04 Drawings CM-06 to -09
	Non-Order Mine-Related and Naturally Occurring Constituents[c]	• Mine-related: n/a	Tables CM-03 and -04
		• Naturally occurring: – Fluoride: CM_MW6-SH (Q2 to Q4). – Sodium: CM_MW6-DP (Q2 to Q4). – Lithium: CM_MW6-SH (Q2 to Q4), CM_MW6-DP (Q2 to Q4). – Manganese: CM_MW6-SH (Q2 to Q4). • All other non-order mine-related and naturally occurring constituents were less than the primary screening criteria.	
	Mann-Kendall Trend Analysis	• All Mann-Kendall trend analysis results indicated decreasing or no trend.	Table E Attachment III
Lower Corbin Creek Valley			
Monitoring Location	Relevant CMm SSGMP/RGMP Wells	CM_MW4-SH/DP, CM_MW5-SH/DP, CM_MW9, CM_MW10	Table CM-01 Drawing CM-01 SNC-Lavalin, 2021a SRK, 2021
	Relevant Monitoring Wells from Other Programs[a]	n/a	
	Relevant Surface Water Monitoring Stations[b]	CM_ND2, CM_SPD, CM_CC1	
	Relevant Seep Monitoring Locations[b]	CM_PLANT-SEEP1, CM_NS1, CM_MM-SEEP3	

Table C (Cont'd): Summary of 2022 Groundwater Monitoring and Sampling Results for Corbin Creek Watershed

Hydrogeological Information		Description	Reference
Physical Hydrogeology	Groundwater Elevation Trends	• Groundwater level at CM_MW5-SH and CM_MW5-DP followed a similar pattern as the surface water (CM_CC1). Annual high-water levels occurred during the spring (April to June) generally corresponding with freshet, and annual lows during the winter (December to February). The annual range of groundwater levels was within 2.5 m for both wells in 2022, which is similar to previous years.	Figure CM-07 Table CM-02 Drawing CM-02
	Hydraulic Gradients and Flow Direction	• Vertical Hydraulic Gradient: – The vertical hydraulic gradient between CM_MW5-SH/DP was 0.04 to 0.05 m/m downward in 2022, consistent with previous measurements. Both CM_MW4-SH and CM_MW4-DP were observed to be under flowing artesian conditions in 2022, which has indicated an upward gradient from bedrock deposits to the water table at this location. • Lateral Hydraulic Gradient: – The lateral hydraulic gradient in the lower Corbin Creek valley had an estimated lateral hydraulic gradient of 0.03 m/m, as measured between CM_MW5-SH and CM_MW9.	Table CM-02 Drawings CM-02, -04, and -05
Chemistry	2022 SSGMP/RGMP Order Constituents Results	• Concentrations greater than primary screening criteria: – Dissolved selenium: CM_MW5-SH (Q1). – Sulphate: CM_MW5-SH (Q4). • All other OC were less than the primary screening criteria.	Table D Figures CM-09 to -11 Tables CM-03 to -05 Drawings CM-06 to -09
	Non-Order Mine-Related and Naturally Occurring Constituents[c]	• Mine-related: n/a.	Tables CM-03 and -04
		• Naturally occurring: – Chloride: CM_MW4-SH (Q2 to Q4) and CM_MW4-DP (Q2 to Q4). – Fluoride: CM_MW10 (Q2 to Q4). – Sodium: CM_MW4-SH (Q2 to Q4) and CM_MW4-DP (Q2 to Q4). – Barium: CM_MW5-DP (Q1 to Q4). – Lithium: CM_MW4-SH (Q2 to Q4), CM_MW4-DP (Q2 to Q4), MW5-SH (Q1 to Q4), CM_MW5-DP (Q1 to Q4), and CM_MW10 (Q1 to Q4). • Lithium was the only concentration greater than primary screening criteria identified in an overburden monitoring well (CM_MW5-SH). • All other non-order mine-related and naturally occurring constituents were less than the primary screening criteria.	
	Mann-Kendall Trend Analysis	• Trend analysis indicated the concentration of dissolved selenium at CM_MW5-SH has been increasing over the seven-year period of record. Concentrations of all other OC have been non-trending, stable, or decreasing in all wells in the Lower Corbin Creek Valley.	Table E Attachment III

Notes:

[a] – Other relevant monitoring wells are those in the area that are under evaluation for potential inclusion in the SSGMP and/or RGMP.

[b] – Other relevant surface water stations and seep monitoring locations are as determined in the 2021 SSGMP Update (SNC-Lavalin, 2021a), and represent a sub-set of the surface water and seepage monitoring locations present at CMm and within Study Area 11.

[c] – Non-order mine-related and naturally occurring constituents based on the Background Assessment (BGA) completed for the 2020 RGMP Update (SNC-Lavalin, 2020).

A summary of results for OC compared to primary screening criteria for Corbin Creek Watershed is presented in Table D below.

Table D: Summary of OC Compared to Primary Screening Criteria in the Corbin Creek Watershed

Parameter[1,2,3] / Well ID	Nitrate-N (mg/L)				Sulphate (mg/L)				Dissolved Cadmium (µg/L)				Dissolved Selenium (µg/L)			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Corbin Pond																
CM_MW6-SH	'NS'	-	-	-	'NS'	-	-	-	'NS'	-	-	-	'NS'	-	-	-
CM_MW6-DP	'NS'	-	-	-	'NS'	-	-	-	'NS'	-	-	-	'NS'	-	-	-
Lower Corbin Creek Valley																
CM_MW5-SH	-	-	-	-	-	-	-	792	-	-	-	-	11.9	-	-	-
CM_MW5-DP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CM_MW4-SH	'NS'	-	-	-	'NS'	-	-	-	'NS'	-	-	-	'NS'	-	-	-
CM_MW4-DP	'NS'	-	-	-	'NS'	-	-	-	'NS'	-	-	-	'NS'	-	-	-
CM_MW10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CSR AW	400				1,280 – 4,290[4]				0.5 – 4[4]				20			
CSR IW	n/a				n/a				5				20			
CSR LW	100				1,000				80				30			
CSR DW	10				500				5				10			

Notes:

[1] Primary screening criteria are CSR standards for **Aquatic Life (AW),** Drinking Water (DW), Livestock (LW), and *Irrigation (IW)*.

[2] '–' denotes result less than primary screening criteria for given constituents.

[3] Where a duplicate was collected, the higher concentration is provided in table. If more than one sample collected in a quarter, the higher of the two samples is provided in table.

[4] Standard varies with hardness.

'NS' denotes no sample.

Mann-Kendall trend analyses were completed for data from the Corbin Creek watershed with seven or more sampling events and a summary of the results are presented in Table E (Attachment III).

Table E: Summary of Mann-Kendall Trend Analysis for OC in the Corbin Creek Watershed

Parameter[1] Well ID	Nitrate-N	Sulphate	Dissolved Cadmium	Dissolved Selenium
Corbin Pond				
CM_MW6-SH	-	Decreasing	-	No Trend
CM_MW6-DP	No Trend	No Trend	-	No Trend
Lower Corbin Creek Valley				
CM_MW5-SH	Decreasing	***Stable***	Decreasing	***Increasing***
CM_MW5-DP	No Trend	Decreasing	-	No Trend
CM_MW4-SH	No Trend	No Trend	-	-
CM_MW4-DP	No Trend	-	-	-
CM_MW10	-	Decreasing	-	-

[1] Where OC were greater than the primary screening criteria in 2022, the trend result is ***italics***. Where the OC were greater than the secondary screening criteria for selenium during at least one event in 2022, the result is ***shaded and italics***. Where increasing trends are noted, the cell is shaded yellow.

'–' denotes Mann-Kendall trend analysis was not completed as concentrations were consistently less than or marginally greater than the detection limit.

1.5.1 Discussion

In 2022, concentrations in groundwater samples from the Corbin Creek watershed (CM_MW5-SH/DP, CM_MW4-SH/DP, CM_MW6-SH/DP, and CM_MW10) were less than the primary screening criteria for all OC, with the exception of sulphate, and dissolved selenium at CM_MW5-SH, where an increasing trend has been identified for dissolved selenium. Although an increasing trend was identified at CM_MW5-SH, only one sample (Q1) was greater than the primary screening criteria, which is fewer than in previous years. Trends (where available) and concentrations were consistent with historical data at all wells in the Corbin Creek watershed.

Dissolved selenium to sulphate ratio plots for the Corbin Creek watershed are provided as Figures CM-06 and CM-12. These plots indicated groundwater samples from all monitoring wells in the Corbin Creek watershed plotted within the natural non-contact water zone, except for CM_MW5-SH, which plots in the zone indicative of some mine influence possibly from spoils and Coarse Coal Reject (CCR) seepage. CM_MW6-DP is completed in bedrock and based on water quality and observed upward gradients, is inferred to reflect background water chemistry (Appendix VII). Seep CM_MM-SEEP3 may be affected by microbial reduction and/or CCR seepage.

In addition to CM_MW5-SH, surface water from Corbin Creek (CM_CC1), North Ditch (CM_ND2), and pond discharges (CM_CCOFF and CM_SPD) also indicated mine influence. Concentrations of OC in groundwater at CM_MW5-SH are generally lower than Corbin Creek surface water and exhibit temporal seasonal trends, suggesting the potential sources of OC at CM_MW5-SH are infiltration into the groundwater from Corbin Creek (Figures CM-09 to -11). CM_MW5-SH may also be influenced by the CCR, based on the selenium to sulphate ratio plot (Figure 12).

Surface water in Corbin Creek, seeps, and groundwater from CM_MW5-SH are calcium-magnesium sulphate type waters, whereas other groundwater samples from the Corbin Creek watershed appear to follow a natural transition with depth to sodium-potassium bicarbonate and sodium-chloride type waters in bedrock (Figure CM-08). CM_MW6-SH is completed in unconsolidated sand but groundwater chemistry is inferred to be more indicative of bedrock type groundwater. This may be the result of an upwards vertical gradient in this location from bedrock deposits to valley fill (Table CM-02).

All non-order constituent exceedances identified in Tables CM-03 and -04 were observed in non-mine influenced monitoring wells suggesting they may be naturally occurring. Specifically, chloride and sodium are believed to be naturally occurring in the predominantly marine shales of the Fernie Formation. Also, lithium concentrations were greater than the CSR DW standard in all wells in the Corbin Creek watershed. The Background Assessment (BGA) completed by SNC-Lavalin (2020) also indicated that chloride and sodium, fluoride, dissolved barium, lithium, and manganese are not considered mine-related constituents in groundwater in the Elk Valley. Hydraulic conductivity testing was completed at CM_MW4-DP, CM_MW6-SH and CM_MW6-DP (Attachment V). The calculated hydraulic conductivity values were higher than expected for siltstone at CM_MW4-DP and CM_MW6-DP. Characterization of bedrock hydraulic conductivity is ongoing at CMm.

In addition to quarterly SSGMP and RGMP sampling and monitoring, additional samples were collected from CM_MW5-SH/DP in Q1 2022 to fulfill monitoring requirements associated with the Corbin Dam Spillway project. Results were within 5% of historical values, so as indicated in the Corbin Dam Spillway Water Quality Monitoring Plan, quarterly sampling frequency was resumed following completion of the monitoring plan for the project. Analytical chemistry data for the additional samples is provided in Tables CM-06 and -07.

1.6 Study Area 11 and Michel Creek Watershed

A summary of 2022 groundwater monitoring and sampling results for the Study Area 11 and Michel Creek watershed is presented in Table F with references to supporting information (Drawings, Figures, Tables, and Appendices). In addition to quarterly SSGMP and RGMP sampling and monitoring, additional samples were collected from CM_MW7-SH/DP and CM_MW8 in Q4 2022 to support the Pit 34 Study. Analytical chemistry data for the additional samples is provided in Tables CM-08 and -09.

Table F: Summary of 2022 Groundwater Monitoring and Sampling Results for Study Area 11 and Michel Creek Watershed

Hydrogeological Information		Description	Reference
CMm Footprint Area – Michel Creek Drainage			
Monitoring Location	Relevant CMm SSGMP/RGMP Wells	CM_MW7-SH/DP, CM_MW8	Tables CM-01 Drawing CM-01 SNC-Lavalin, 2021a SRK, 2021
	Relevant Monitoring Wells from Other Programs[a]	n/a	
	Relevant Surface Water Monitoring Stations[b]	n/a	
	Relevant Seep Monitoring Locations[b]	CM_37PIT-SEEP-E	
Physical Hydrogeology	Groundwater Elevation Trends	• Groundwater elevations at these wells in 2022 were similar to the range of measurements over the six-year period of record and illustrated seasonality with several metres of fluctuation (about 6 m range for CM_MW7-SH/DP and 10 m for CM_MW8) between spring freshet and winter low water levels. • Groundwater levels in CM_MW7-SH and CM_MW7-DP were generally similar to each other.	Figure CM-14 Table CM-02 Drawings CM-02 and -03
	Hydraulic Gradients and Flow Direction	• Vertical Hydraulic Gradient: – Vertical gradients at CM_MW7-SH/DP were upward, with gradients ranging from 0.001 to 0.004 m/m. The largest gradient occurred during Q2. • Lateral Hydraulic Gradient: – Lateral hydraulic gradient could not be calculated (CM_MW7-SH/DP and CM_MW8 inferred to be located cross-gradient); however, groundwater flow is inferred to follow topography	Table CM-02 Drawings CM-02 and -03
Chemistry	2022 SSGMP/RGMP Order Constituents Results	• Concentrations greater than primary screening criteria: – Sulphate: CM_MW7-DP (Q1 to Q4). • All other OC were less than the primary screening criteria.	Table G Figures CM-16 to -18 Tables CM-03 and -04 Drawings CM-06 to -09
	Non-Order Mine-Related and Naturally Occurring Constituents[c]	• Mine-related: n/a • Naturally occurring: – Lithium: CM_MW7-DP (Q1 to Q4) and CM_MW8 (Q2 to Q4). – Manganese: CM_MW7-SH (Q2) and CM_MW7-DP (Q1 and Q2). – Strontium: CM_MW8 (Q2 to Q4). • All other non-order mine-related and naturally occurring constituents were less than the primary screening criteria.	Tables CM-03 and -04
	Mann-Kendall Trend Analysis	• Trend analyses indicated the concentration of dissolved selenium at CM_MW7-SH and CM_MW8 have been probably increasing over the seven-year period of record. Concentrations of all other OC have been non-trending, stable, or decreasing in all wells in the CMm mine footprint area.	Table H Attachment III
Michel Creek Watershed Above Corbin Creek Confluence			
Monitoring Location	Relevant CMm SSGMP/RGMP Wells	CM_MW2-SH, CM_MW3-SH/DP	Table CM-01 Drawing CM-01 SNC-Lavalin, 2021a SRK, 2021
	Relevant Monitoring Wells from Other Programs[a]	n/a	
	Relevant Surface Water Monitoring Stations[b]	CM_MC1, CM_MC4, CM_WD	
	Relevant Seep Monitoring Locations[b]	CM_WD4, CM_WD18	
Physical Hydrogeology	Groundwater Elevation Trends	• Groundwater elevations in the Michel Creek valley bottom above the confluence with Corbin Creek were measured at CM_MW3-SH/DP (CM_MW3-DP completed in Fernie Fm) and CM_MW2-SH. • Groundwater elevations at these wells were within the range of measurements over the seven-year period of record.	Figure CM-13 Table CM-02 Drawings CM-02 and -03
	Hydraulic Gradients and Flow Direction	• Vertical Hydraulic Gradient: – Vertical gradients at CM_MW3-SH/DP were upward, with a gradient ranging from of 0.01 to 0.04 m/m. • Lateral Hydraulic Gradient: – The lateral hydraulic gradient in the Michel Creek valley is more gradual than in the Corbin Creek valley with an estimated gradient of 0.01 m/m, as measured between CM_MW3-SH and CM_MW2-SH.	Figure CM-13 Table CM-02 Drawing CM-02

Table F (Cont'd): Summary of 2022 Groundwater Monitoring and Sampling Results for Study Area 11 and Michel Creek Watershed

Hydrogeological Information		Description	Reference
Chemistry	2022 SSGMP/RGMP Order Constituents Results	• All OC were less than the primary screening criteria.	Table G Figures CM-16 to -18 Tables CM-03 and -04 Drawings CM-06 to -09
	Non-Order Mine-Related and Naturally Occurring Constituents[c]	• Mine-related: n/a • Naturally occurring constituents: – Boron: CM_MW3-DP (Q1 to Q4). – Chloride: CM_MW3-DP (Q1 to Q4). – Lithium: CM_MW2-SH (Q1 to Q4), CM_MW3-SH (Q3), and CM_MW3-DP (Q1 to Q4). – Molybdenum: CM_MW3-DP (Q2). – Sodium: CM_MW3-DP (Q1 to Q4). • Chloride, dissolved sodium, dissolved boron, and dissolved molybdenum concentrations exceeded primary screening criteria in bedrock monitoring well CM_MW3-DP (siltstone interpreted to be Fernie Formation). Dissolved lithium was identified in both bedrock wells and shallow overburden monitoring wells CM_MW2-SH and CM_MW3-SH. • All other non-order mine-related and naturally occurring constituents were less than the primary screening criteria.	Tables CM-03 and -04
	Mann-Kendall Trend Analysis	• Trend analysis indicates the concentration of dissolved selenium, sulphate, and nitrate at CM_MW3-SH, and the concentration of nitrate at CM_MW3-DP, have been increasing over the seven-year period of record. Concentrations of all other OC have been non-trending or stable in all wells in the Upper Corbin Creek Valley.	Table H Attachment III
Michel Creek Watershed Below Corbin Creek Confluence (Study Area 11)			
Monitoring Location	Relevant CMm SSGMP/RGMP Wells (Study Area 11)	CM_MW1-OB/SH/DP, CM_MW_AG1A/B	Table CM-01 Drawing CM-01 SNC-Lavalin, 2021a SRK, 2021
	Relevant Monitoring Wells from Other Programs[a]	n/a	
	Relevant Surface Water Monitoring Stations[b]	CM_MC4, CM_CC1, CM_LOIP, CM_MC2, CM_AG2	
	Relevant Seep Monitoring Locations[b]	n/a	
Physical Hydrogeology	Groundwater Elevation Trends	• Groundwater elevations in the Michel Creek valley bottom below Corbin Creek (Study Area 11 of RGMP) were measured at well nest CM_MW1-OB/SH/DP and well cluster CM_MW_AG1A/B. • The groundwater elevations followed the previously characterized trend of seasonal variability and were similar to groundwater levels over the period of record.	Figure CM-20 Table CM-02 Drawing CM-02
	Hydraulic Gradients and Flow Direction	• Vertical Hydraulic Gradient: – The vertical hydraulic gradient measured between the deep bedrock (CM_MW1-DP, siltstone interpreted to be Fernie Fm) and intermediate bedrock (CM_MW1-SH, siltstone interpreted to be Fernie Fm) wells ranged from 0.00 to 0.07 m/m (upward) in 2022, which was similar to previous measurements. – The vertical hydraulic gradient between the intermediate bedrock (CM_MW1-SH) and shallow gravel well (CM_MW1-OB) ranged from 0.001 to 0.06 m/m (downward) in 2022. – The vertical hydraulic gradient between CM_MW_AG1A and CM_MW_AG1B was 0.1 m/m (upward) in 2022. • Lateral Hydraulic Gradient: – The horizontal hydraulic gradient in Study Area 11 is 0.02 m/m as measured between CM_MW_AG1B and CM_MW1-OB.	Table CM-02 Drawings CM-02 and -03

Table F (Cont'd): Summary of 2022 Groundwater Monitoring and Sampling Results for Study Area 11 and Michel Creek Watershed

Hydrogeological Information		Description	Reference
Chemistry	2022 SSGMP/RGMP Order Constituents Results	• Groundwater concentrations of OC were less than the primary screening criteria at all monitoring wells.	Table G Figures CM-22 to -24 Tables CM-03 and -04 Drawings CM-06 to -09
	Non-Order Mine-Related and Naturally Occurring Constituents[c]	• Mine-related: n/a	Tables CM-03 and -04
		• Naturally occurring constituents: – Chloride: CM_MW1-SH (Q1 to Q4), CM_MW1-DP (Q1 to Q4). – Barium: CM_MW1-DP (Q1 to Q4), and CM_MW_AG1A (Q1 to Q4). – Fluoride: CM_MW1-SH (Q1, Q3 and Q4). – Iron: CM_MW_AG1A (Q1 to Q4). – Lithium: CM_MW1-OB (Q1 to Q4), CM_MW1-SH (Q1 to Q4), CM_MW1-DP (Q1 to Q4), and CM_MW_AG1A (Q1 to Q4). – Molybdenum: CM_MW1-SH (Q1 to Q4). – Sodium: CM_MW1-SH (Q1 to Q4), CM_MW1-DP (Q1 to Q4). • Dissolved iron was the only exceedance not identified in bedrock monitoring wells. • All other non-order mine-related and naturally occurring constituents were less than the primary screening criteria.	
	Mann-Kendall Trend Analysis	• Concentrations of all OC have been non-trending, stable or decreasing.	Table H Attachment III

Notes:

[a] – Other relevant monitoring wells are those in the area that are under evaluation for potential inclusion in the SSGMP and/or RGMP.

[b] – Other relevant surface water stations and seep monitoring locations are as determined in the 2021 SSGMP Update (SNC-Lavalin, 2021a), and represent a sub-set of the surface water and seepage monitoring locations present at CMm and within Study Area 11.

[c] – Non-order mine-related and naturally occurring constituents based on the Background Assessment (BGA) completed for the 2020 RGMP Update (SNC-Lavalin, 2020).

A summary of results for OC compared to primary screening criteria for the Michel Creek Watershed and Study Area 11 is presented in Table G below.

Table G: Summary of OC Compared to Primary Screening Criteria in Study Area 11 and the Michel Creek Watershed

Parameter[1,2, 3] / Well ID	Nitrate-N (mg/L)				Sulphate (mg/L)				Dissolved Cadmium (µg/L)				Dissolved Selenium (µg/L)			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
CMm Footprint																
CM_MW7-SH	'NS'	-	-	-	'NS'	-	-	-	'NS'	-	-	-	'NS'	-	-	-
CM_MW7-DP	-	-	-	-	1120	1220	1110	995	-	-	-	-	-	-	-	-
CM_MW8	'NS'	-	-	-	'NS'	-	-	-	'NS'	-	-	-	'NS'	-	-	-
Michel Creek Watershed Above Corbin Creek Confluence																
CM_MW3-SH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CM_MW3-DP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CM_MW2-SH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Michel Creek Watershed Below Corbin Creek Confluence																
CM_MW1-OB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CM_MW1-SH[4]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CM_MW1-DP[4]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CM_MW_AG1A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CM_MW_AG1B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CSR AW	400				1,280 – 4,290[5]				0.5 – 4[5]				20			
CSR IW	n/a				n/a				5				20			
CSR LW	100				1,000				80				30			
CSR DW	10				500				5				10			

Notes:

[1] Primary screening criteria applied are CSR standards for **Aquatic Life (AW)**, Drinking Water (DW), Livestock (LW) and *Irrigation (IW)*.

[2] '–' denotes result less than the primary screening criteria for given constituents.

[3] Where a duplicate was collected, the higher concentration is provided in table. If more than one sample collected in a quarter, the higher of the two samples is provided in table.

[4] CM_MW1-SH and CM_MW1-DP are sampled semi-annually, as per the 2020 RGMP Update.

[5] Standard varies with hardness.

'NS' denotes no sample.

Mann-Kendall trend analyses were completed for data from wells with seven or more sampling events in the Michel Creek Watershed and in Study Area 11 (Table H; Attachment III).

Table H: Summary of Mann-Kendall Trend Analysis for OC in Study Area 11 and the Michel Creek Watershed

Parameter[1,2] / Well ID	Nitrate-N	Sulphate	Dissolved Cadmium	Dissolved Selenium
CMm Footprint				
CM_MW8	No Trend	Stable	Decreasing	Prob. Increasing
CM_MW7-DP	Decreasing	***No Trend***	Decreasing	Decreasing
CM_MW7-SH	Decreasing	Decreasing	Decreasing	Prob. Increasing
Michel Creek Watershed above Corbin Creek Confluence				
CM_MW3-DP	-	No Trend	-	-
CM_MW3-SH	Increasing	Increasing	Stable	Increasing
CM_MW2-SH	No Trend	No Trend	No Trend	No Trend
Michel Creek Watershed below Corbin Creek Confluence				
CM_MW1-DP	No Trend	Decreasing	-	No Trend
CM_MW1-OB	Decreasing	No Trend	No Trend	Stable
CM_MW1-SH	No Trend	Decreasing	Prob. Decreasing	No Trend
CM_MW_AG1A	No Trend	Decreasing	-	-
CM_MW_AG1B	Stable	No Trend	Stable	No Trend

Notes:

[1] Where OC were greater than the primary screening criteria in 2022, the trend result is ***italics***. Where the OC were greater than the secondary screening criteria for selenium during at least one event in 2022, the result is ***shaded and italics***. Where increasing trends are noted, the cell is shaded yellow.

'–' denotes Mann-Kendall trend analysis was not completed as concentrations were consistently less than or marginally greater than the detection limit.

1.6.1 Discussion

The groundwater results for the Michel Creek watershed are grouped into two areas for discussion: Michel Creek watershed above the confluence with Corbin Creek, including the CMm footprint area, and Michel Creek watershed below the confluence with Corbin Creek (Study Area 11 of RGMP).

Michel Creek Watershed Above the Confluence with Corbin Creek, and CMm Footprint Area

In 2022, groundwater samples from the Michel Creek Watershed above the confluence with Corbin Creek (CM_MW2-SH, CM_MW3-SH/DP, CM_MW7-SH/DP, CM_MW8) were less than primary screening criteria for all OC, with the exception of sulphate at CM_MW7-DP. Trends (where available) and concentrations were consistent with historical data, with the exception of dissolved selenium at CM_MW7-SH and CM_MW8, where a probably increasing trend was observed for the first time since monitoring was initiated. However, although probably increasing trends were identified, the dissolved selenium concentrations were below the CSR criteria (Table CM-04, Figure CM-22). Ongoing monitoring will confirm whether the trend is meaningful, in terms of identifying actual changes to groundwater quality or if the trend is an artifact of natural fluctuations within low level concentrations.

On the selenium to sulphate ratio plot (Figure CM-19), all surface water samples from Michel Creek above Corbin Creek and groundwater samples from monitoring wells CM_MW3-SH and CM_MW3-DP plot within the natural non-contact water zone. Based on spatial location and magnitude of concentrations, monitoring wells CM_MW3-SH and CM_MW3-DP are considered background monitoring wells for shallow overburden and bedrock, respectively (Appendix VII). Surface water in the West Ditch (CM_WD), which monitors water quality on the western side of CMm, and seep CM_WD18 appear to be influenced by mining activity.

Monitoring well CM_MW7-DP, which is installed in deeper bedrock (sandstone, inferred to be Kootenay Group) and CM_MW2-SH, which is installed in gravel, may both be mine influenced (Figure CM-19). CM_MW7-DP appeared to be affected by microbial reduction (Figure CM-19). CM_MW7-DP had primary screening exceedances (sulphate concentrations, as shown in Table G; Drawing CM-07). Both bedrock monitoring wells CM_MW7-SH and the much deeper well CM_MW8 have indicated microbial reduction effects, based on the selenium to sulphate ratio plots (Figure CM-19). Sulphate concentrations, particularly those exceeding primary screening criteria, have been previously reported at CM_MW-7 DP. Previous recommendations have proposed data gap assessments to characterize bedrock groundwater flow pathways, particularly those flow paths between the upgradient CMm Pit and spoils downslope towards Michel Creek. Further recommendations to address this gap in characterization are provided herein (Table I).

Concentrations of OC in surface water from CM_WD (West Ditch) were generally greater than concentrations in most monitoring wells and Michel Creek, except for bedrock monitoring well CM_MW7-DP and seeps CM_WD4 and CM_WD18 (Figures CM-16 to -18), which suggests the potential source of OC to shallow groundwater is from the spoils on the western side of CMm. Drawing CM-03 (cross section) illustrates the topographical relationship and groundwater flow potential of CM_MW7-SH/DP, CM_MW2-SH, West Ditch (CM_WD), seep (CM_WD18), and west spoils.

Statistical analysis of groundwater parameter results suggested an increasing trend in nitrate, sulphate, and selenium at CM_MW3-SH; however, OC concentrations remained at least one order of magnitude below primary screening standards (Tables CM-03 and -04). The Se:SO4 plot also suggested CM_MW3-SH is non-mine influenced (Figure CM-19). A review of time-series data on Figures CM-16 to CM-18 showed quarterly nitrate, sulphate, and selenium concentrations (with seasonal variations) in this monitoring well have tracked concentrations in Michel Creek near this location (CM_MC1). A hydraulic connection is therefore suggested between shallow groundwater at CM_MW3-SH and surface water. Sulphate, nitrate, and selenium concentrations have changed seasonally at CM_MC1, which may have influenced trend results. Although sulphate, nitrate, and selenium concentrations are expected to fluctuate seasonally, Figures CM-16 to -18 show no visually-apparent increases in dissolved selenium, sulphate, or nitrate concentrations at background monitoring well CM_MW3-SH. Based on these observations, and the topographical location, monitoring wells CM_MW3-SH/DP are still considered representative of background groundwater quality. However, these wells will be re-assessed in future BGAs, as part of the RGMP update framework.

Most water samples in the Michel Creek watershed above the Corbin Creek confluence are calcium-magnesium type waters with an apparent transition with depth to sodium-potassium type water in background bedrock monitoring well CM_MW3-DP (Figure CM-15). Deep bedrock monitoring wells in the mine area (CM_MW7-SH, CM_MW7-DP, and CM_MW8) are installed in sandstone that is inferred to be Kootenay Group, while background bedrock monitoring well CM_MW3-DP is installed in siltstone that is inferred to be Fernie Formation, which might produce the difference in water type.

All non-order exceedances identified on Tables CM-03 and -04 were mostly observed in non-mine influenced monitoring wells suggesting they are likely naturally occurring. Specifically, chloride and sodium are believed to be naturally occurring in the predominantly marine shales of the Fernie Formation. Also, lithium concentrations were greater than the CSR DW standard in all samples at all monitoring wells (except CM_MW3-SH in Q1, Q2, and Q4 and CM_MW7-SH in all samples) in the Michel Creek watershed above the confluence of Corbin Creek. The BGA completed by SNC-Lavalin (2020) indicated that dissolved barium, dissolved boron, dissolved molybdenum, and dissolved lithium are not considered mine-related parameters in groundwater and are naturally occurring in the Elk Valley groundwater system.

Hydraulic conductivity testing was completed at CM_MW7-SH and CM_MW7-DP. The calculated hydraulic conductivity values were higher than expected for sandstone (Attachment V). Characterization of bedrock hydraulic conductivity is ongoing at CMm.

Michel Creek Watershed below Confluence with Corbin Creek

In 2022, concentrations in groundwater samples from the Michel Creek watershed below the confluence with Corbin Creek (CM_MW1-OB/SH/DP, CM_MW_AG1A/B) remain less than primary screening criteria for all OC. Trends (where available) and concentrations were consistent with historical data.

A selenium sulphate ratio and plot for the Michel Creek watershed below the confluence with Corbin Creek is provided as Figure CM-25. Figure CM-25 illustrates all surface water samples from Andy Good Creek and groundwater samples from monitoring wells CM_MW1-SH, CM_MW1-DP, CM_MW_AG1A, and CM_MW_AG1B plot as natural non-contact water. Surface water in Michel Creek at CM_MC2 and shallow overburden monitoring well CM_MW1-OB appeared to have been influenced by mining activity, and potentially microbial reduction.

Concentrations of OC in Michel Creek surface water from CM_MC2 were generally greater than concentrations in all monitoring wells except for monitoring well CM_MW1-OB, where the sulphate concentration was greater than CM_MC2 in Q2. CM_MC2 and CM_MW1-OB also have similar water types (Figure CM-21), suggesting a hydraulic connection between shallow groundwater at CM_MW1-OB and surface water. Concentrations of OC in Corbin Creek surface water from CM_CC1 were greater than concentrations in all monitoring wells in the Michel Creek watershed below the confluence with Corbin Creek (Figures CM-22 to -24). This suggests that the potential source of OC has been from surface water (lower Corbin Creek) infiltrating into shallow groundwater. Comparing OC concentrations in Corbin Creek surface water (CM_CC1) to Michel Creek above (CM_MC4) and below (CM_MC2) the confluence with Corbin Creek suggests Corbin Creek is the primary source of OC in Study Area 11 (Figures CM-22 to -24 and Diagram CM-01 in Attachment II; CM-1). OC concentrations were greater in Corbin Creek (CM_CC1) than downstream in Michel Creek (CM_MC2), and much greater than OC concentrations in Michel Creek above Corbin Creek (CM_MC4). Drawing CM-04 (cross section) and Drawing CM-02 illustrates the groundwater flow relationship between Corbin Creek, CM_MW1-OB, and Michel Creek.

Most water samples in the Michel Creek watershed below the Corbin Creek confluence are calcium-magnesium type waters with an apparent transition with depth to sodium-potassium type water in bedrock (Fernie Formation) monitoring wells CM_MW1-SH and CM_MW1-DP (Figure CM-15 and -21). Michel Creek surface water below the Corbin Creek confluence (CM_MC2) is both calcium-magnesium sulphate bicarbonate and calcium-magnesium sulphate types, while monitoring well CM_MW1-OB is calcium-magnesium sulphate bicarbonate type water, which suggests that there has been mixing of Michel Creek surface water with shallow groundwater at this location. All other shallow groundwater and surface water in Andy Good Creek is calcium--magnesium bicarbonate type, indicating that there is mixing of surface water with shallow groundwater in the Michel Creek watershed, below the confluence with Corbin Creek.

Most non-order exceedances identified on Tables CM-03 and -04 were observed in non-mine influenced monitoring wells suggesting they are naturally occurring. Specifically, sodium is believed to be naturally occurring in the predominantly marine shales of the Fernie Formation. Also, lithium concentrations were greater than the CSR DW standard in all monitoring wells in the Michel Creek watershed below the confluence of Corbin Creek, except for CM_MW_AG1B.

2 Recommendations

New recommendations, evolving from the CMm 2022 SSGMP and the RGMP data review and assessment, are presented in Table I. Appendix II of the main report outlines recommendations related to CMm from the 2020 Annual Report (SNC-Lavalin, 2021b), the 2021 Annual Report (SNC-Lavalin, 2022), and the 2021 SSGMP Update Report (SNC-Lavalin, 2021a). Previous recommendations that have been initiated but not completed are provided in Table J.

Table I: Summary of New Recommendations – CMm SSGMP and RGMP

Program	Recommendation	Rationale
Site-Specific Groundwater Monitoring Program		
CMm SSGMP	Record depth to pressure transducer sensor at CM_MW4-SH/DP. Alternatively, obtain a manual measurement of the water levels above ground using an extension on the PVC riser during each sampling event at CM_MW4-SH/DP.	The specific elevation of the pressure transducer sensor is required to reconcile pressure readings into potentiometric surface elevations. Alternatively, a manually-obtained elevation of water levels above the casing, paired with a pressure sensor reading with the same time stamp, can also be used for reconciliation.
CMm SSGMP	A review of bedrock groundwater flow pathways, particularly those flow paths between upgradient 34 Pit and spoils downslope towards Michel Creek, should be undertaken. The review should consider the 34 Pit Hydrogeological Study and evaluate CM_MW7-SH/DP to confirm the well completion details are appropriate to inform the SSGMP. The review should consider appropriate geographic locations for potential future investigations (such as along West Ditch Road). The review of available bedrock geology and hydrostratigraphy should also consider potential hydrostatic pressures, in order to reduce the possibility of encountering flowing artesian conditions.	Further development of CSM to improve characterization of hydrogeology at CMm and augment understanding of uppermost weathered and deeper bedrock groundwater flow pathways.
CMm SSGMP	Newly-completed monitoring wells drilled in 2023, near Corbin and the Andy Good and Michel creeks confluence, should be evaluated for inclusion within the SSGMP.	Further development of CSM to improve characterization of hydrogeology at CMm.

Table J: Summary of Outstanding Recommendations – CMm SSGMP and RGMP

Program	Recommendation	Rationale
Site-Specific Groundwater Monitoring Program		
CMm SSGMP	Complete hydraulic conductivity testing at CM_MW4-SH and CM_MW8.	Recommendation in the 2021 SSGMP Annual Report. Hydraulic conductivity testing has not yet been conducted at CM_MW4-SH (due to irretrievable artesian well control plug) or CM_MW8 (due to unsuccessful attempt in 2022, due to downhole logistics associated with water and well depth).
	Establish continuous surface water level monitoring at CM_MC2.	Recommendation in the 2021 SSGMP Annual Report.
Regional Groundwater Monitoring Program		
Study Area 11	Assess the adequacy of the monitoring network, pending recommendations from the flow and load accretion study of Michel Creek, lower Corbin Creek, and lower Andy Good Creek. Complete hydraulic conductivity testing at monitoring wells, installed in January 2023, located near the confluence of Andy Good and Michel creeks.	A flow and load accretion study on lower Andy Good Creek was completed (Attachment IV). Once the network has been deemed adequate (or any identified deficiencies are resolved), hydraulic conductivity testing of monitoring wells be undertaken.

3 References

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George, H.W., Gorman, W.A., VanDine, D. F. 1986. Late Quaternary Geology and Geomorphology of the Elk Valley, Southeastern British Columbia. Canadian Journal of Earth Sciences, pp. 741-751.

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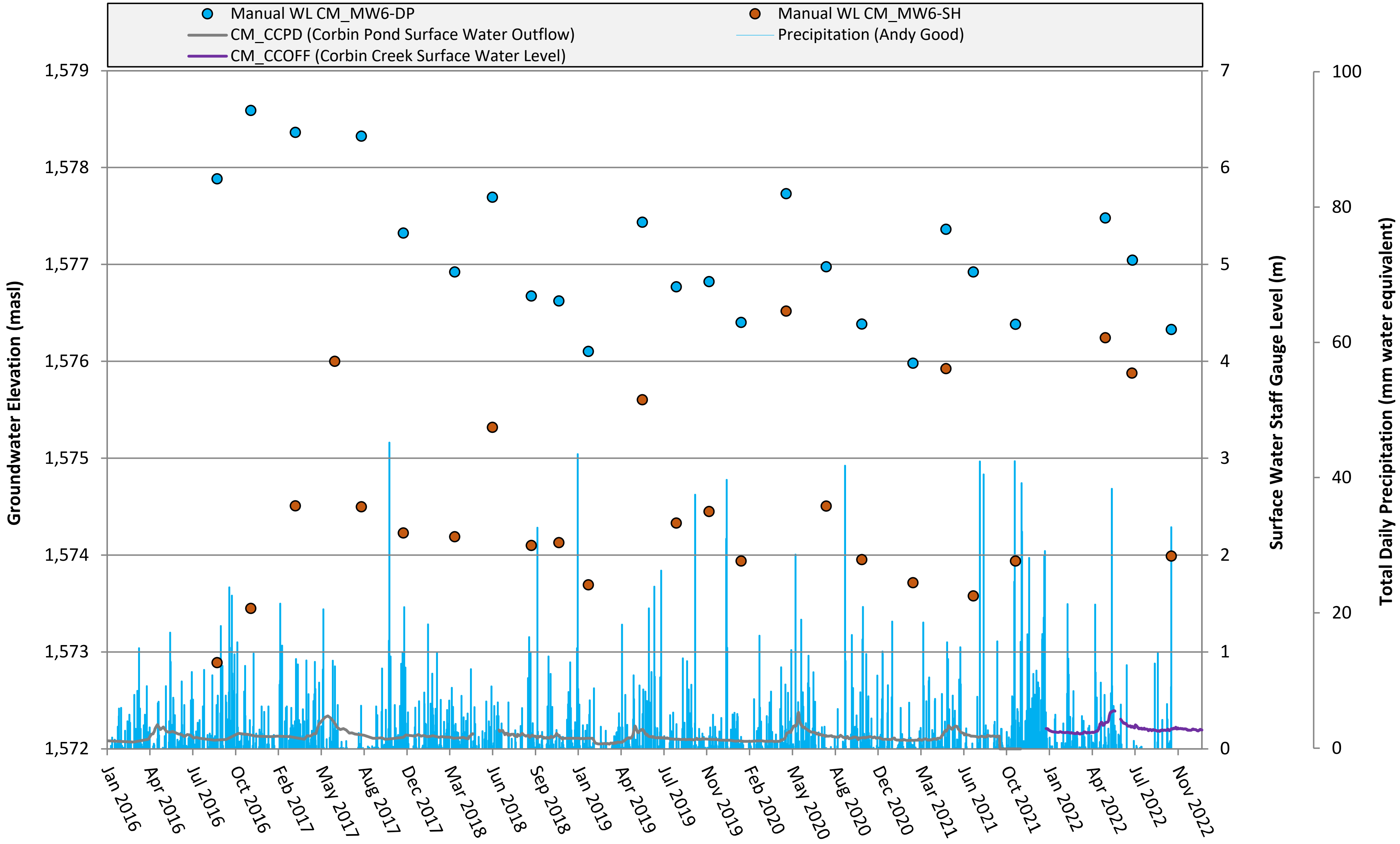
SRK Consulting. 2021. *Elk Valley Seep Monitoring: 2021 Annual Report*. Report prepared for Teck Coal Limited. Dated December 2021.

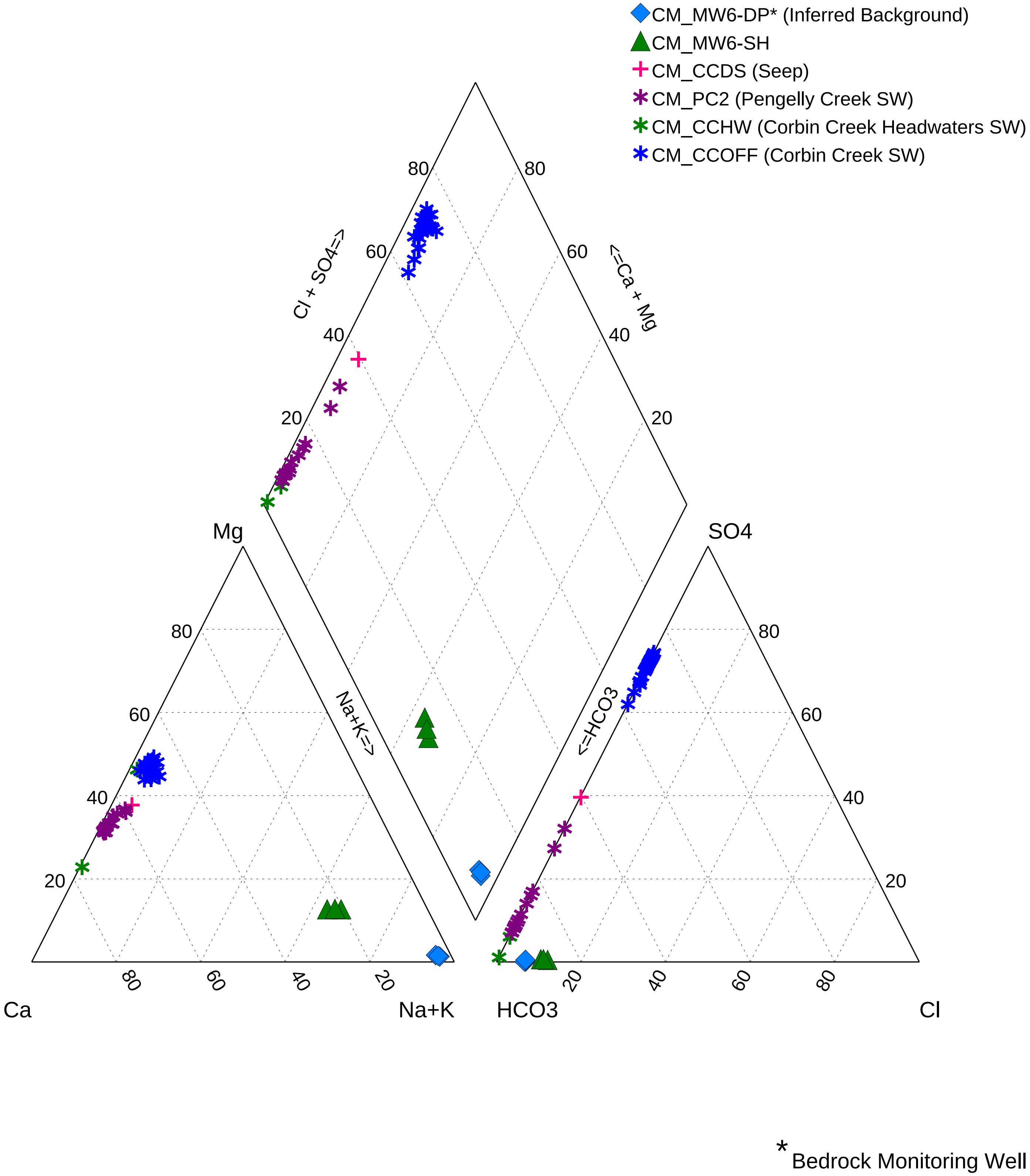
Teck Coal Ltd. 2013. *2013 Life of Mine Plan*: Coal Mountain Operations. July 16, 2013.

Figures

Figure CM-01: Corbin Pond - Hydrograph

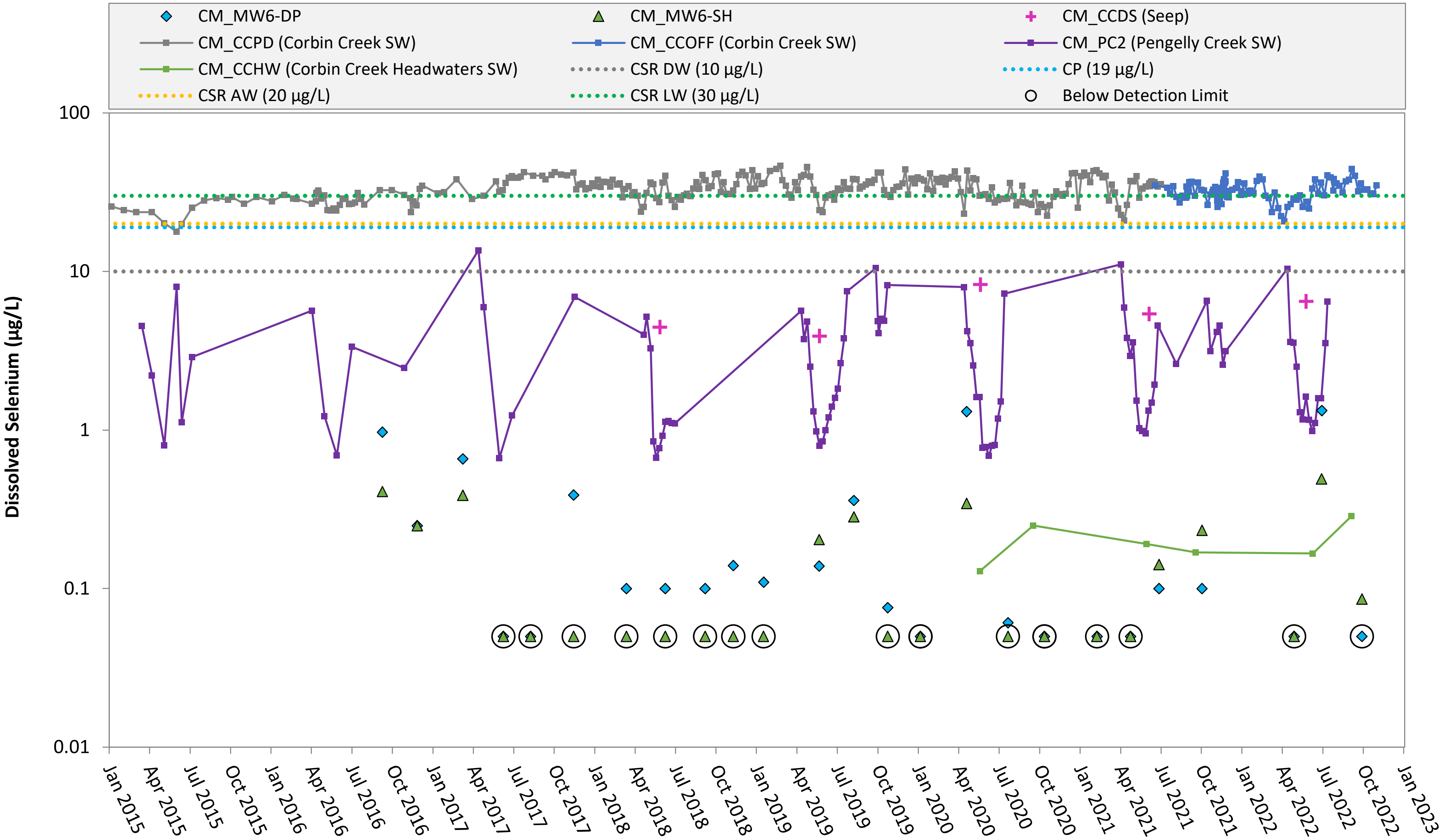


Notes: Precipitation data presented for Environment Canada Sparwood station November 2016 to April 2017. Surface water level is no longer recorded at CM_CCPD following the Corbin Dam Spillway upgrade project in 2021.



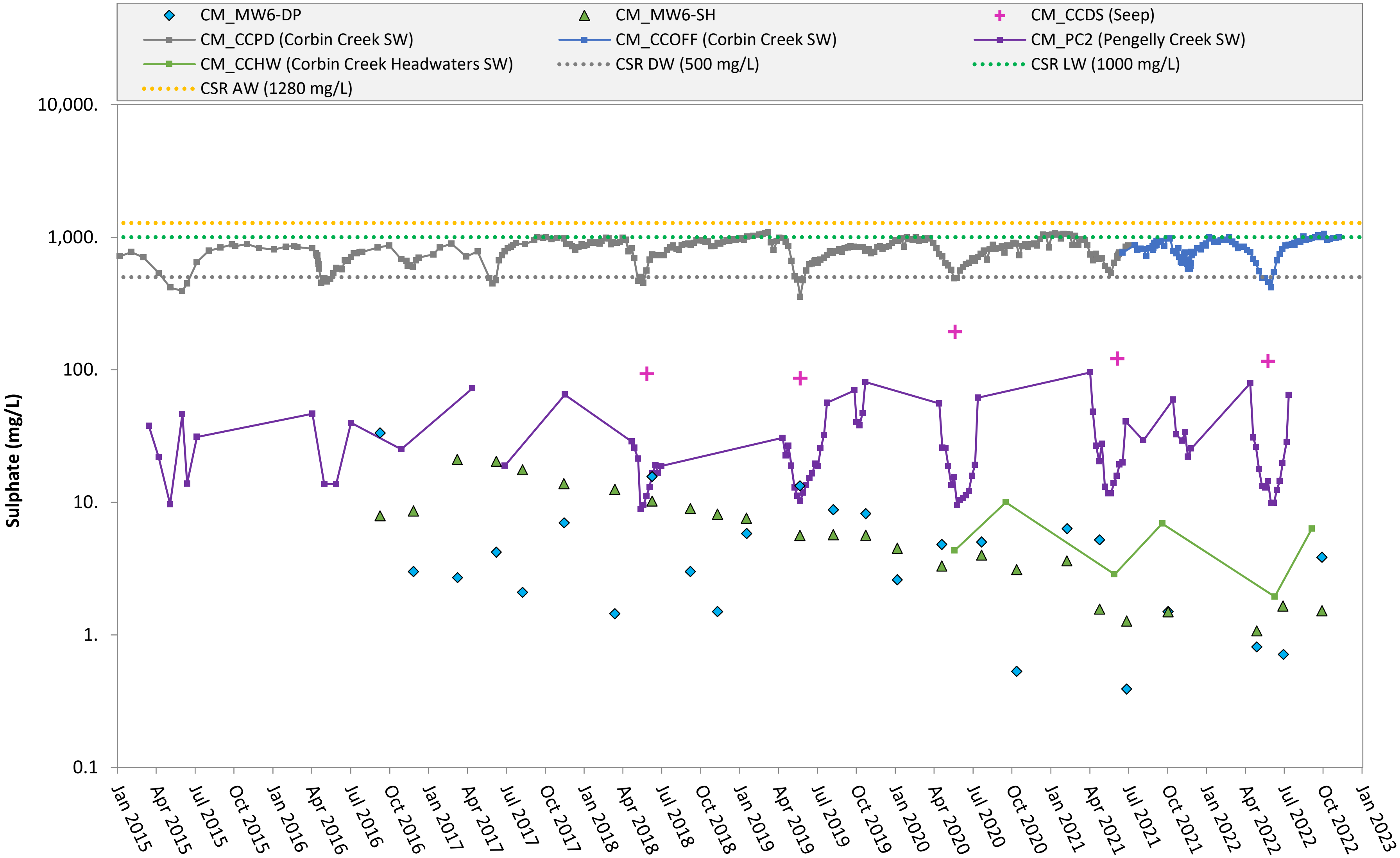
DESCRIPTION: Figure CM-02: Corbin Pond - Piper Diagram		
SNC·LAVALIN PEOPLE. DRIVE. RESULTS.	PROJECT: 2022 RGMP SSGMP Annual Report	PROJECT NO: 635544
	CLIENT: Teck Coal Limited	DATE: 2023-03-15

Figure CM-03: Corbin Pond - Dissolved Selenium



Notes: For concentrations measured below the method detection limit, the method detection limit (0.05 µg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria. CM_CCOFF was sampled in place of CM_CCPD following the Corbin Dam Spillway upgrade project.

Figure CM-04: Corbin Pond - Sulphate



Notes: Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria. CM_CCOFF was sampled in place of CM_CCPD following the Corbin Dam Spillway upgrade project.

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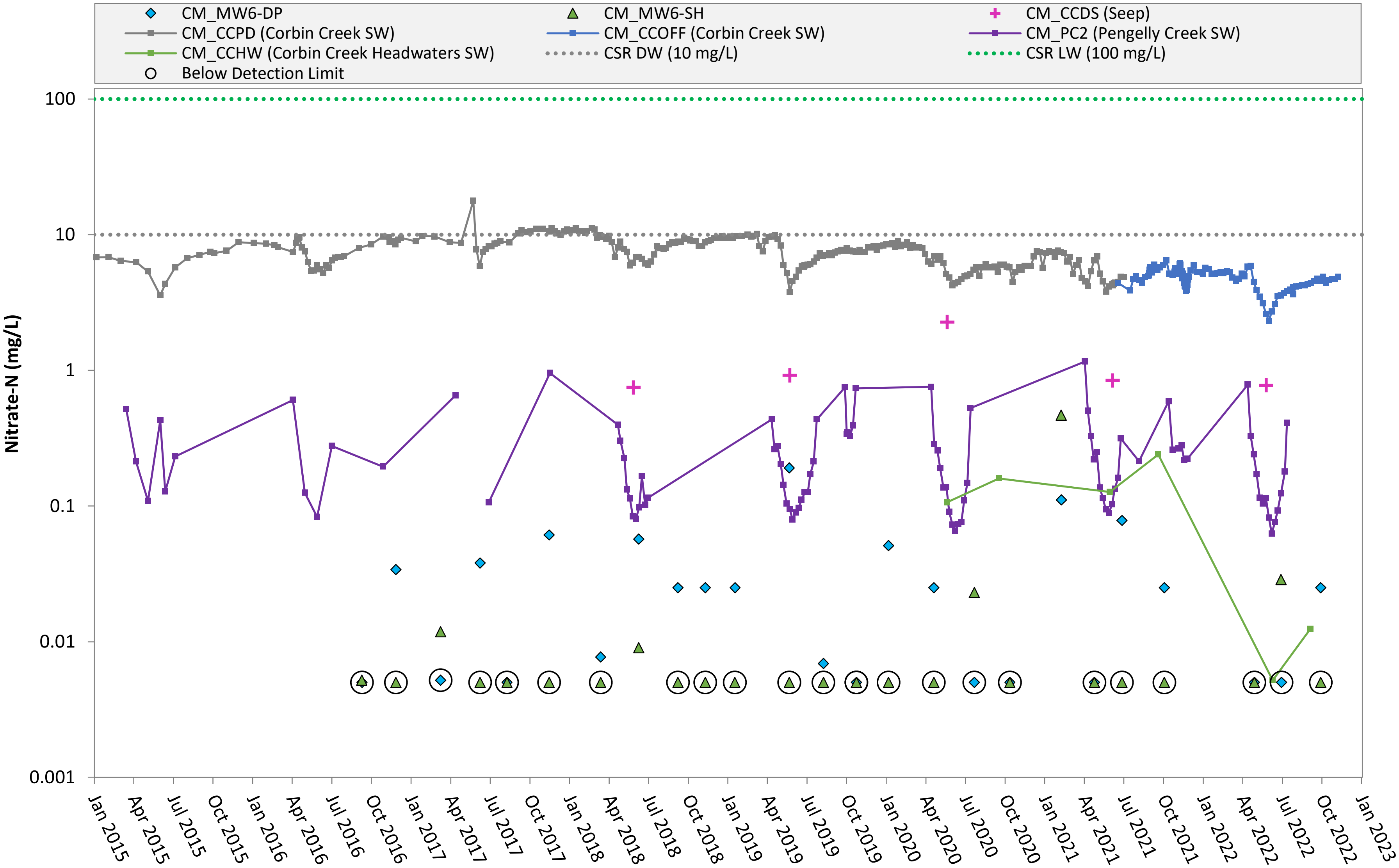
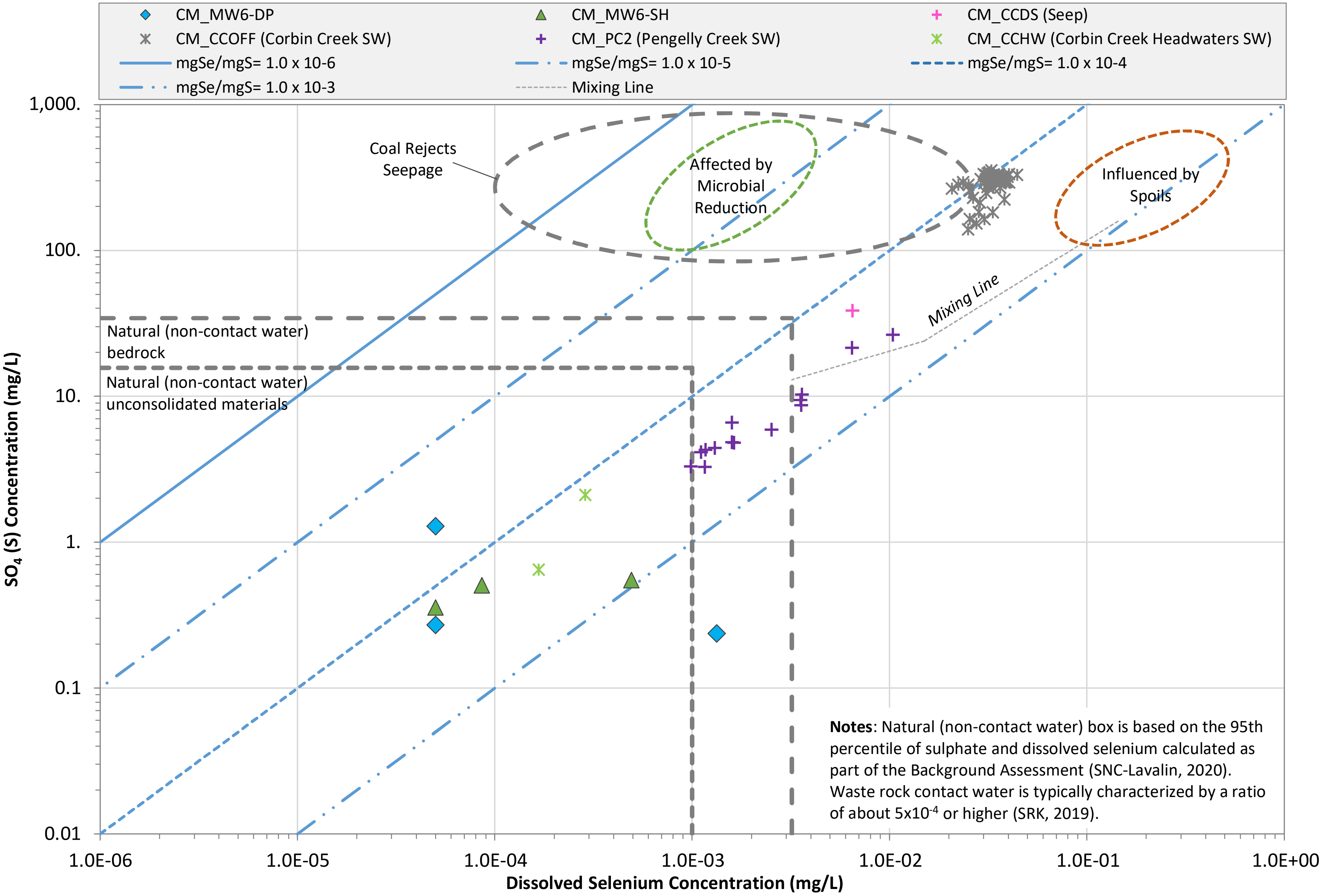
Figure CM-05: Corbin Pond - Nitrate-N



Notes: For concentrations measured below the method detection limit, the method detection limit (0.005 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria. CM_CCOFF was sampled in place of CM_CCPD following the Corbin Dam Spillway upgrade project.

Figure CM-06: Corbin Pond - Se:SO_4 (S)



Notes: Natural (non-contact water) box is based on the 95th percentile of sulphate and dissolved selenium calculated as part of the Background Assessment (SNC-Lavalin, 2020). Waste rock contact water is typically characterized by a ratio of about 5x10^{-4} or higher (SRK, 2019).

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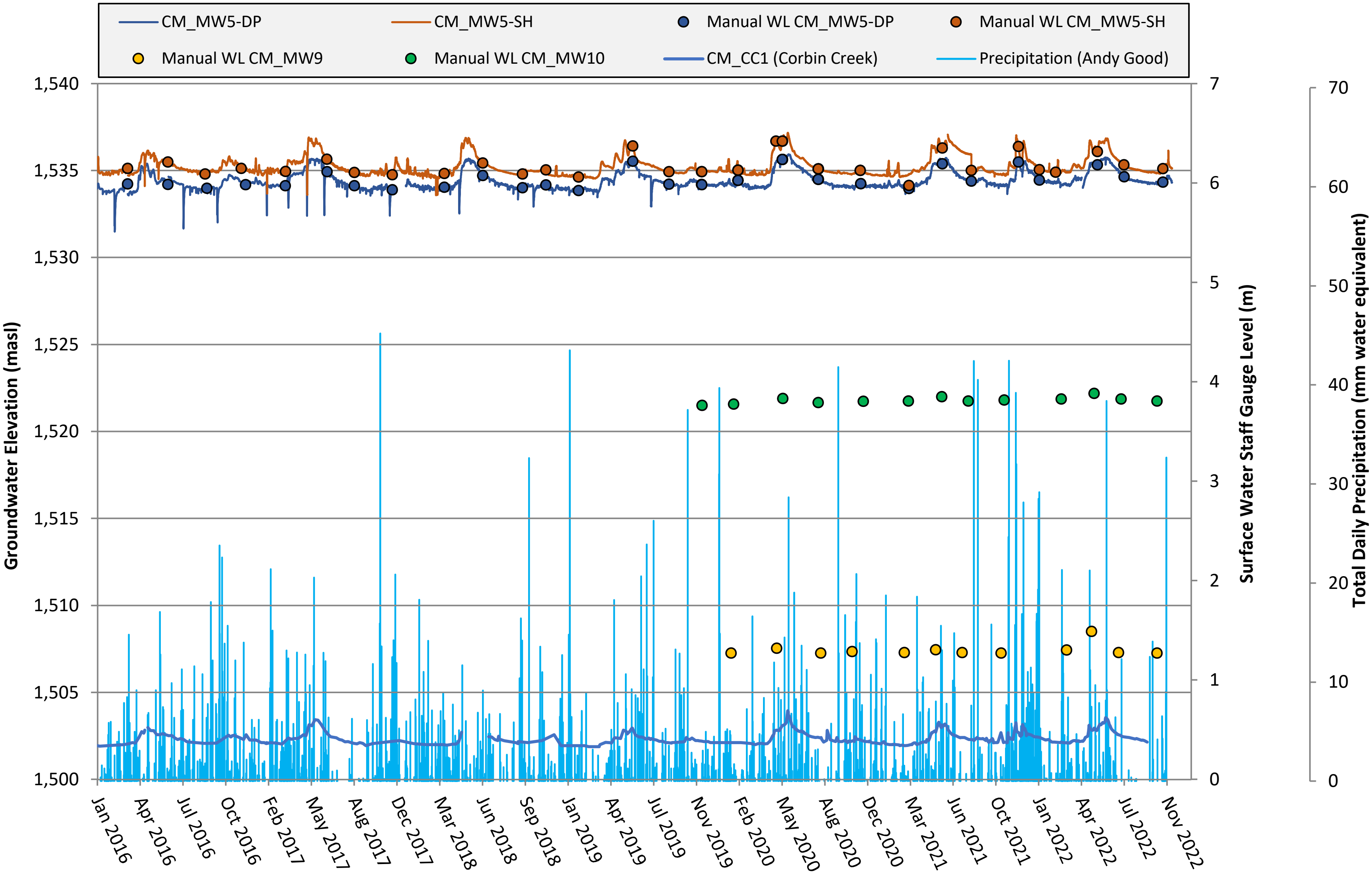
Figure CM-07: Lower Corbin Creek Valley - Hydrograph



Notes: Precipitation data presented for Environment Canada Sparwood station November 2016 to April 2017. Continuous water level data was compensated using barologger installed at CM_BARO (CM_MW5). Select data points were removed where values were not considered to be representative of actual conditions.

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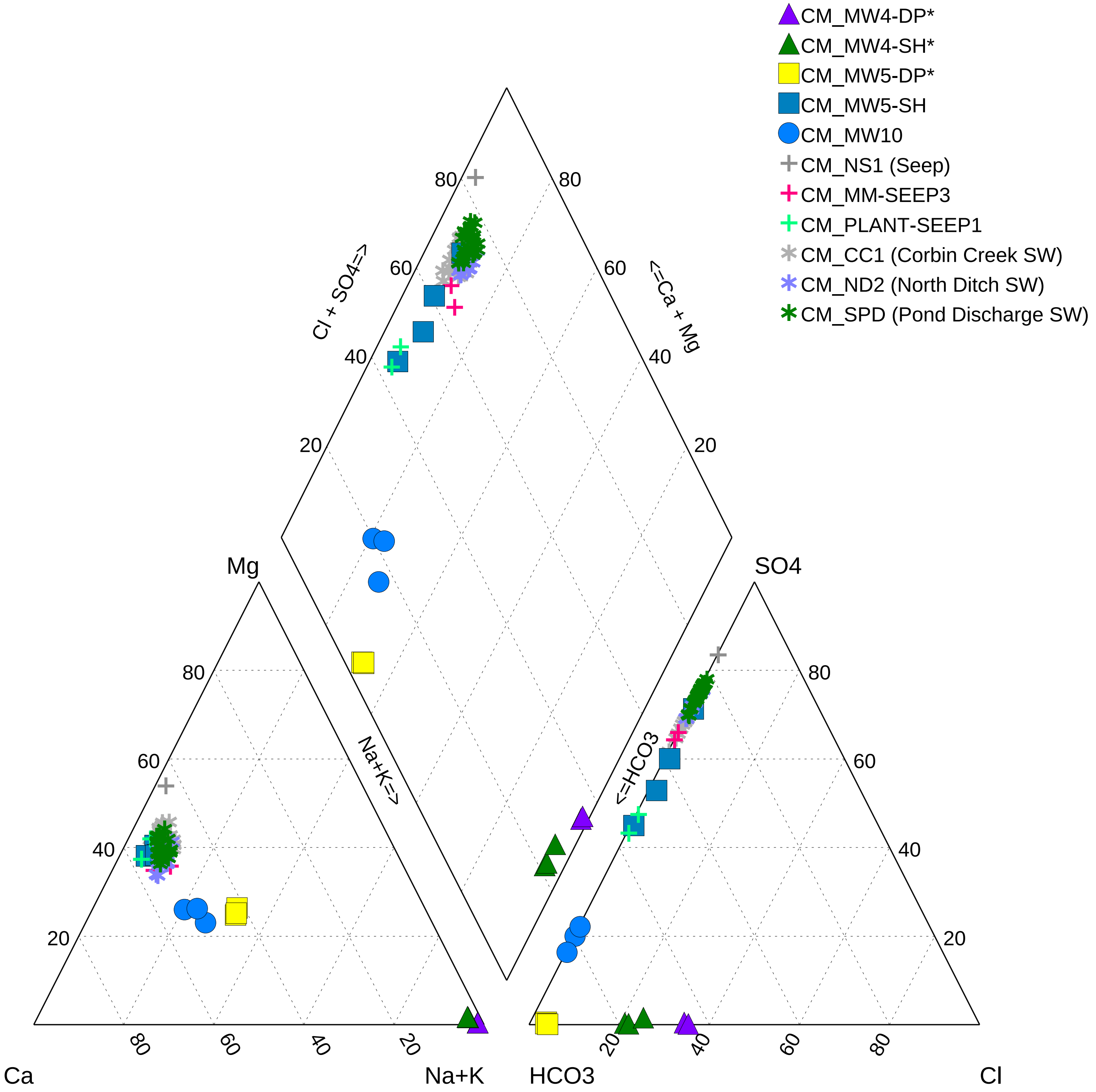
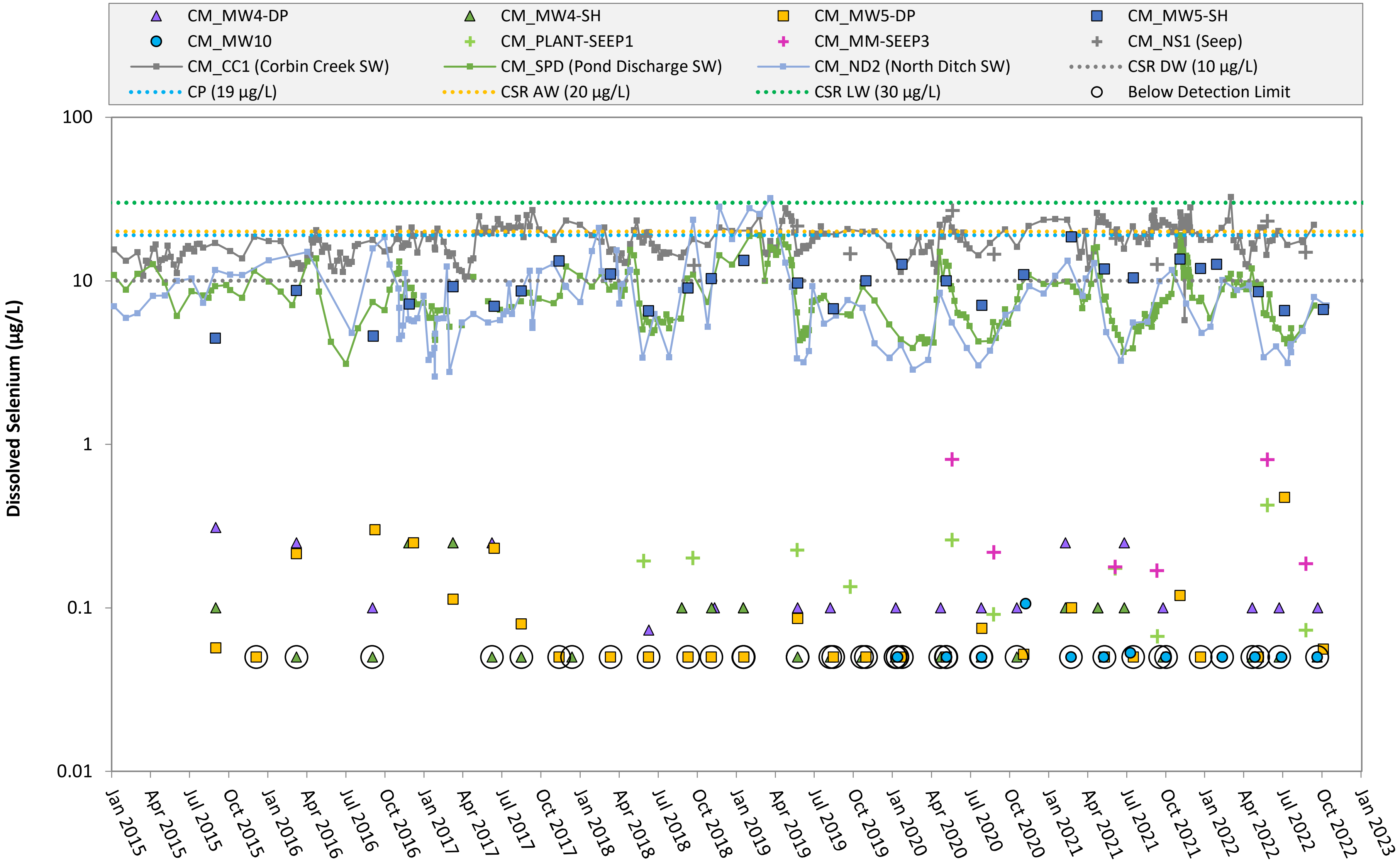


* Bedrock Monitoring Well

DESCRIPTION: Figure CM-08: Lower Corbin Creek - Piper Diagram		
SNC·LAVALIN PEOPLE. DRIVE. RESULTS.	PROJECT: 2022 RGMP SSGMP Annual Report	PROJECT NO: 635544
	CLIENT: Teck Coal Limited	DATE: 2023-03-15

Figure CM-09: Lower Corbin Creek Valley - Dissolved Selenium



Notes: For concentrations measured below the method detection limit, the method detection limit (0.05 µg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

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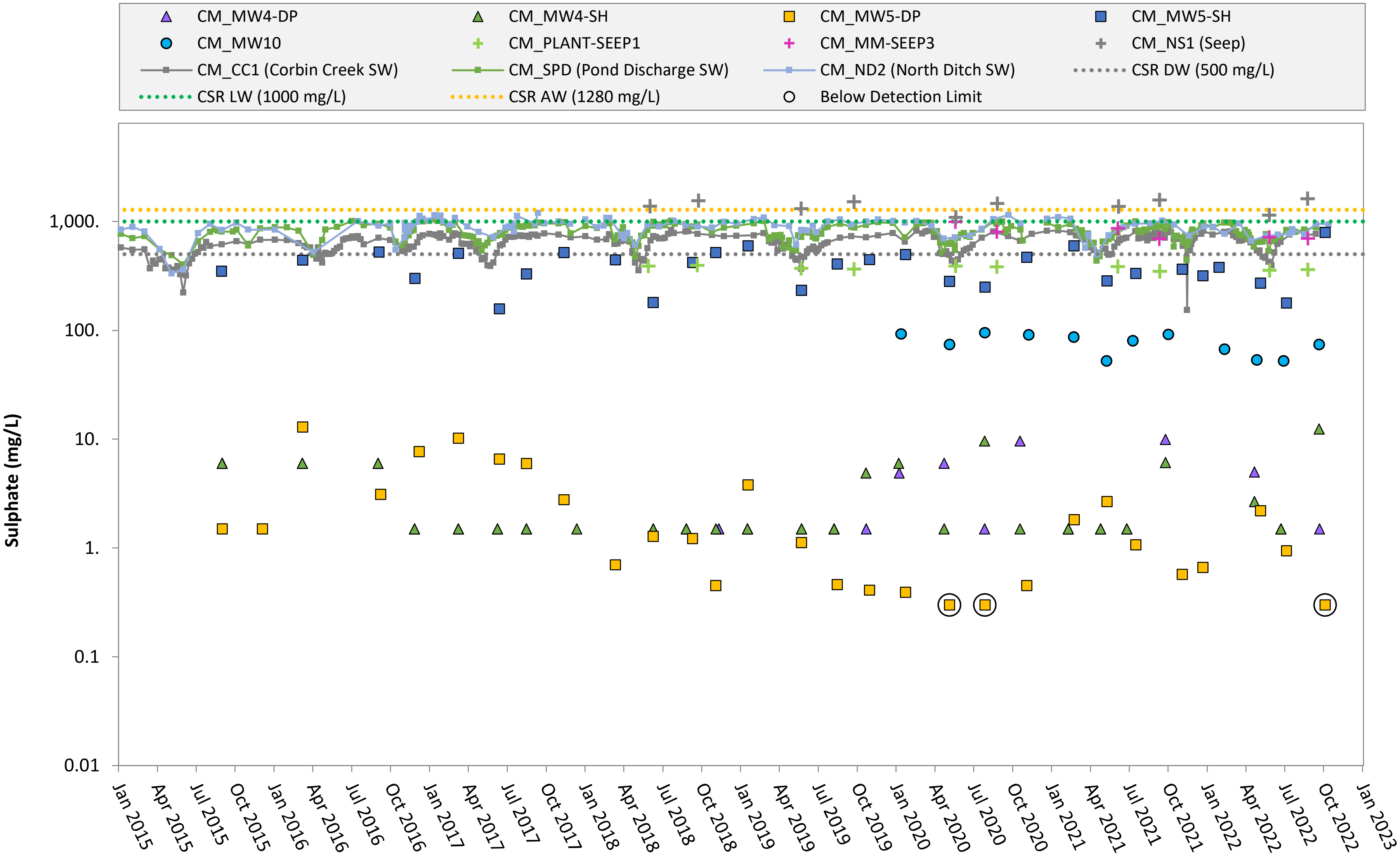
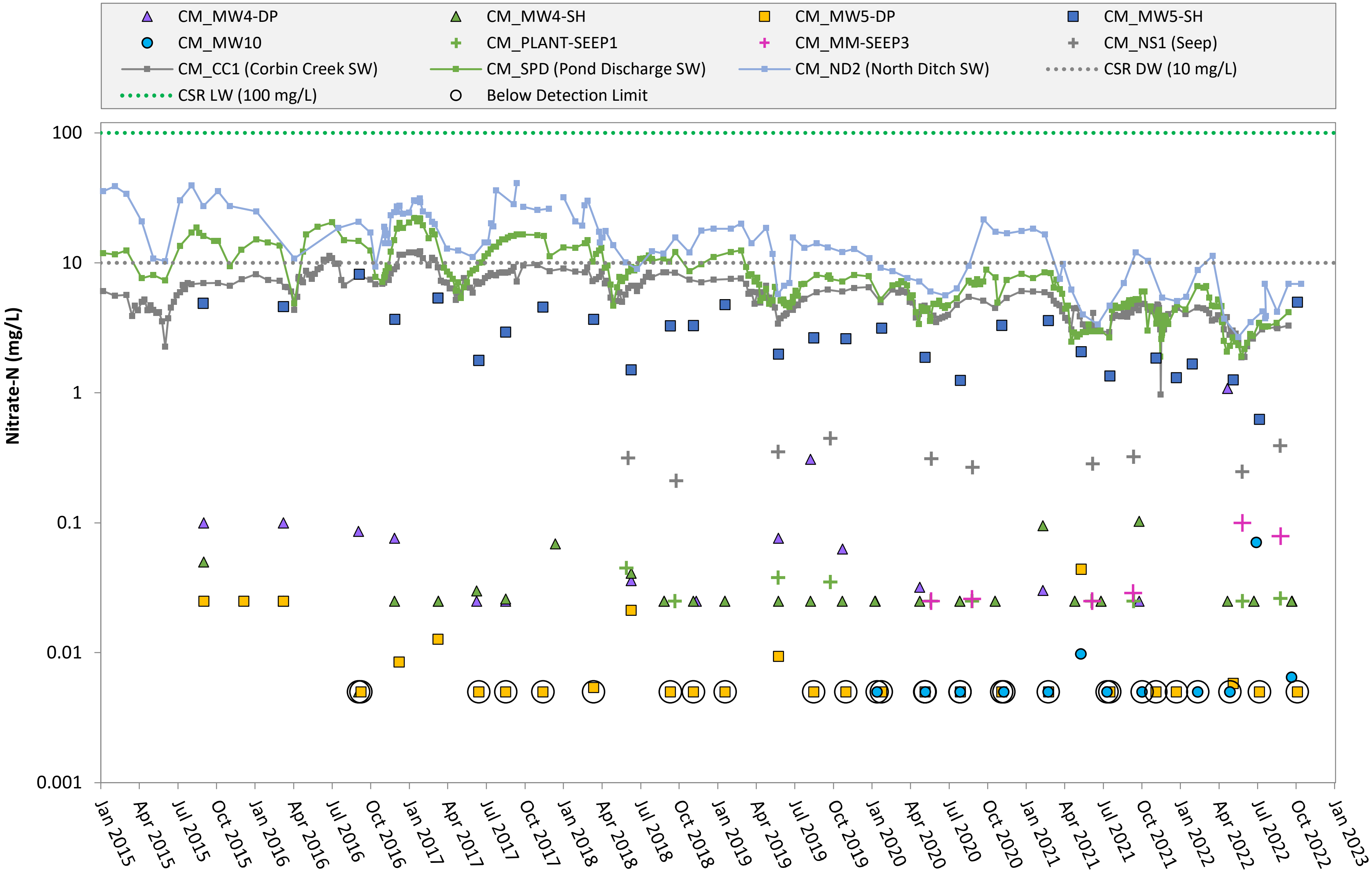
635544 / 2023 02 03
QAQC MB

Figure CM-10: Lower Corbin Creek Valley - Sulphate



Note: For concentrations measured below the method detection limit, the method detection limit (0.3 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

Figure CM-11: Lower Corbin Creek Valley - Nitrate-N



Note: For concentrations measured below the method detection limit, the method detection limit (0.005 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

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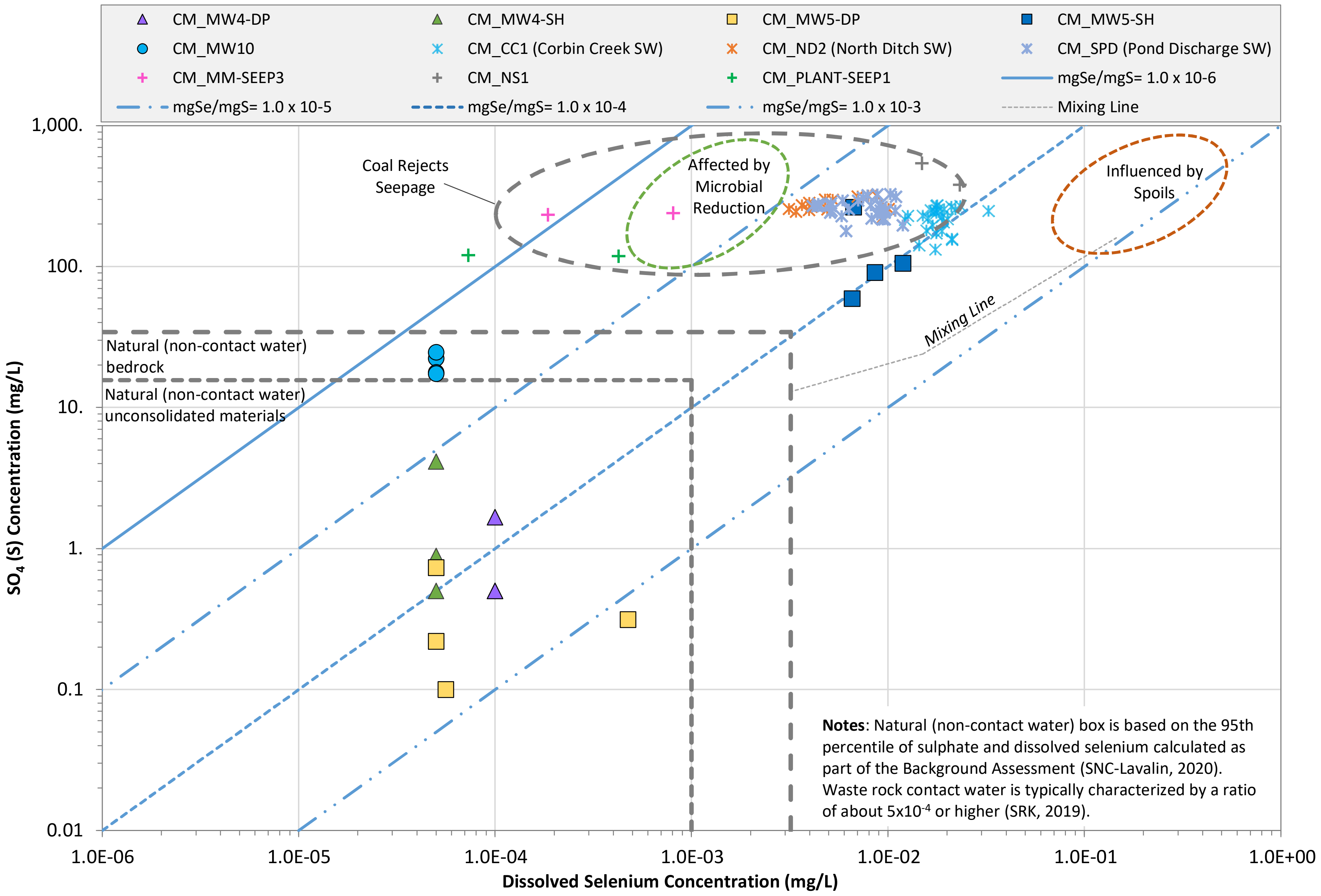
635544 / 2023 02 03
QAQC MB

Figure CM-12: Lower Corbin Creek Valley - Se:SO_4 (S)



Notes: Natural (non-contact water) box is based on the 95th percentile of sulphate and dissolved selenium calculated as part of the Background Assessment (SNC-Lavalin, 2020). Waste rock contact water is typically characterized by a ratio of about $5x10^{-4}$ or higher (SRK, 2019).

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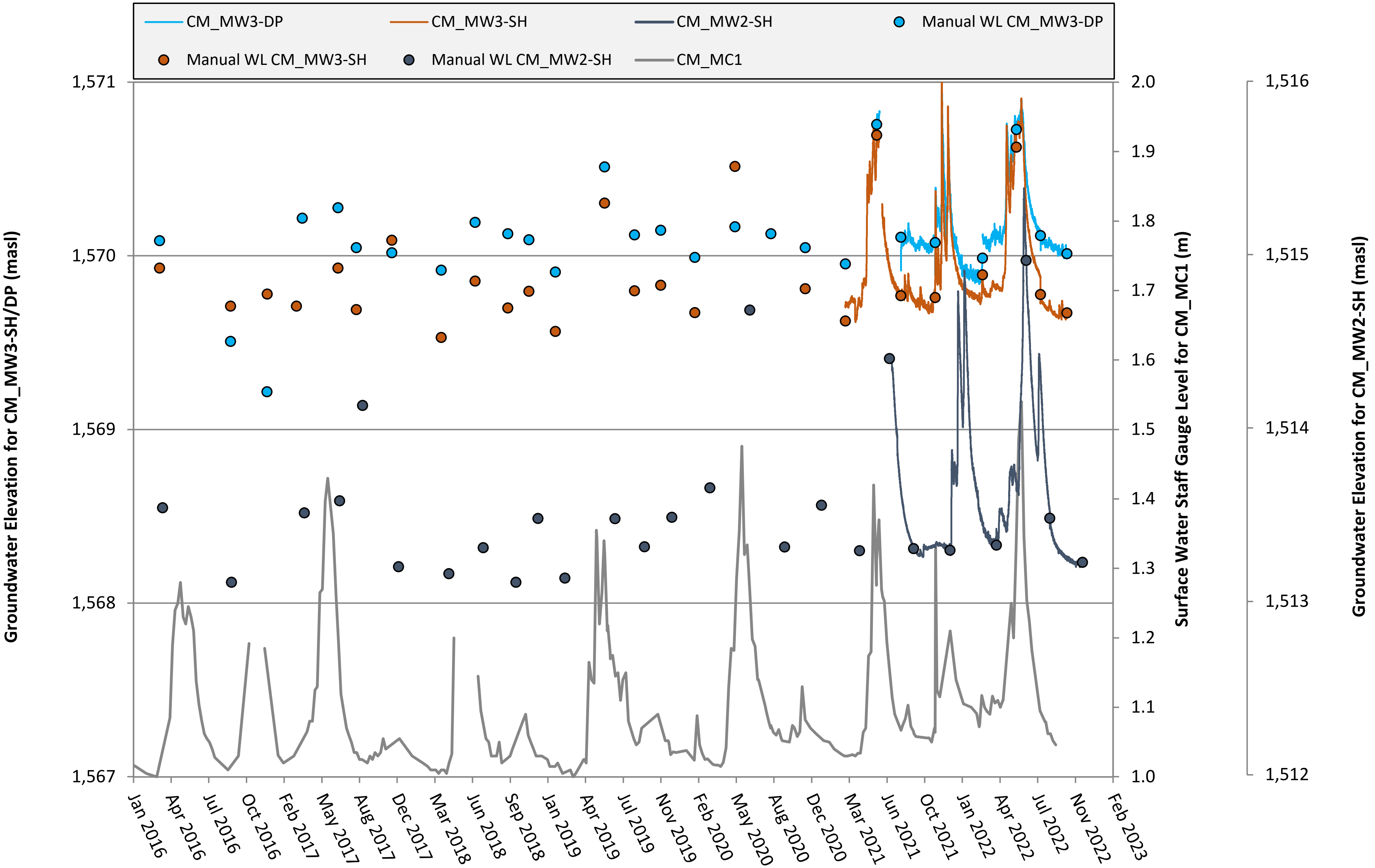
Figure CM-13: Michel Creek Watershed above Confluence with Corbin Creek - Hydrograph



Note: Continuous water level data was compensated using barologger installed at CM_BARO (CM_MW5). Select data points were removed where values were not considered to be representative of actual conditions.

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694450 / 2023 02 03
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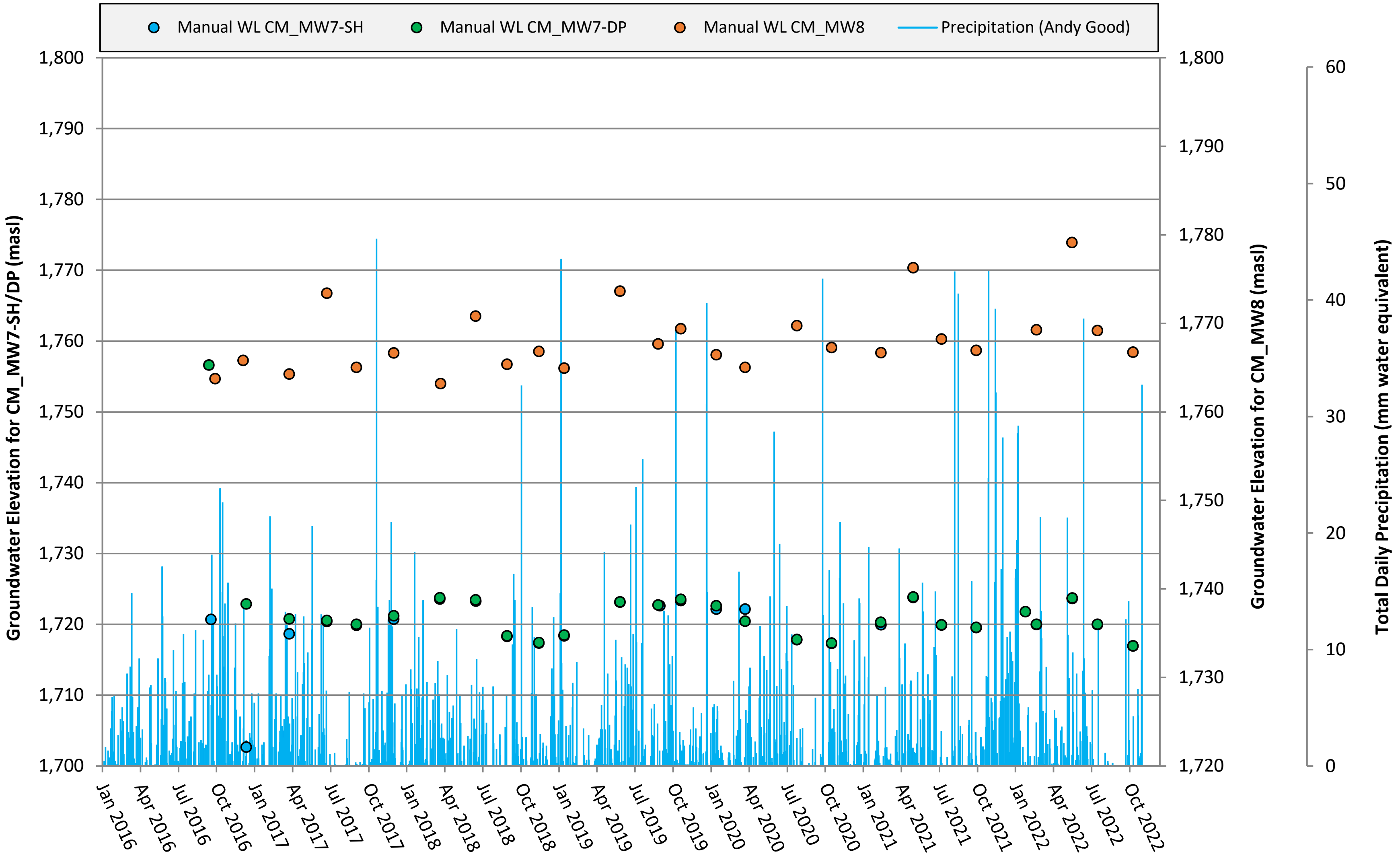
Figure CM-14: Coal Mountain Mine Footprint above Michel Creek - Hydrograph



Notes: Precipitation data presented for Environment Canada Sparwood station November 2016 to April 2017.
Dataloggers were installed in CM_MW7-SH, CM_MW7-DP, and CM_MW8 in Q4 2022.

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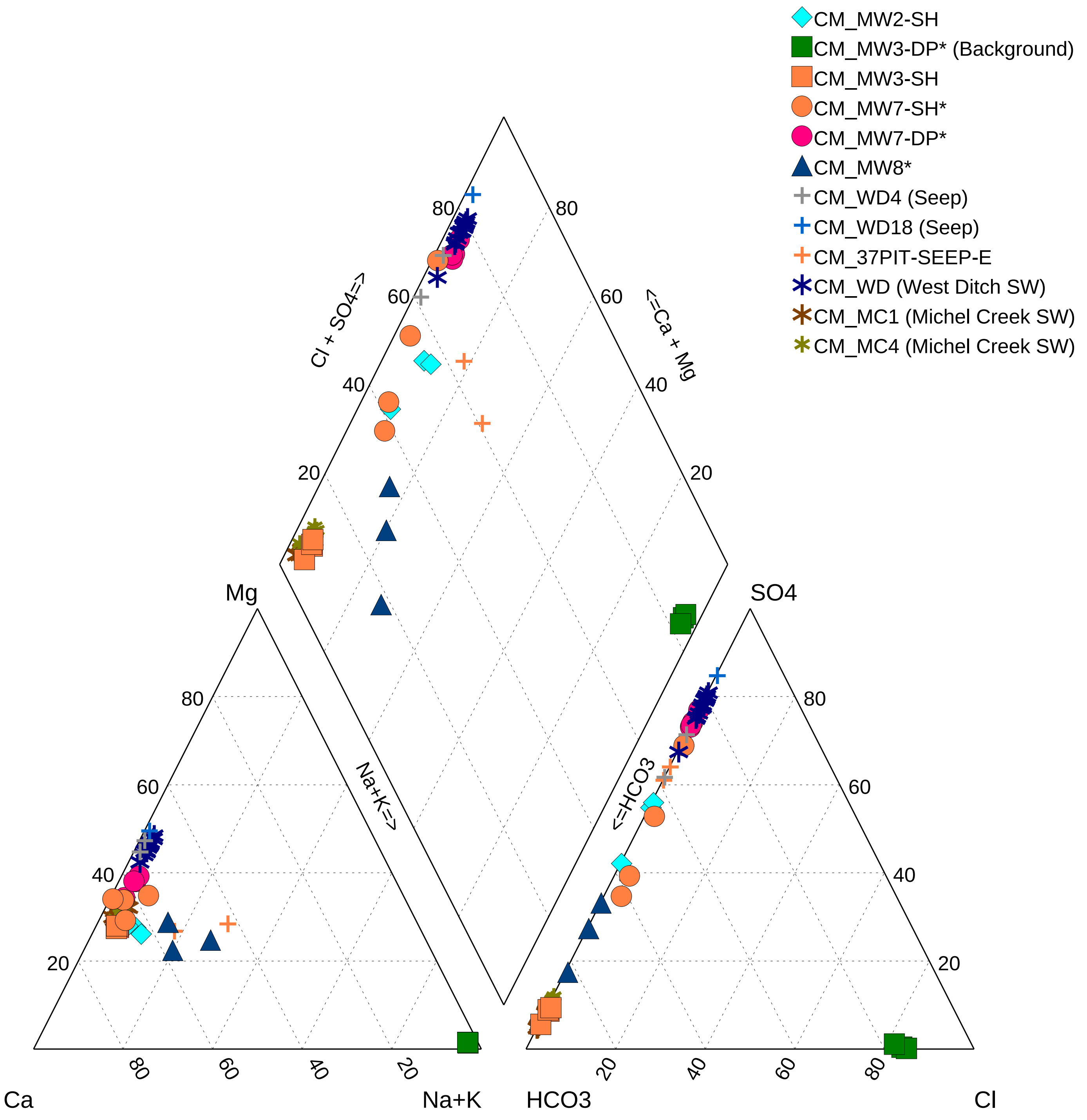
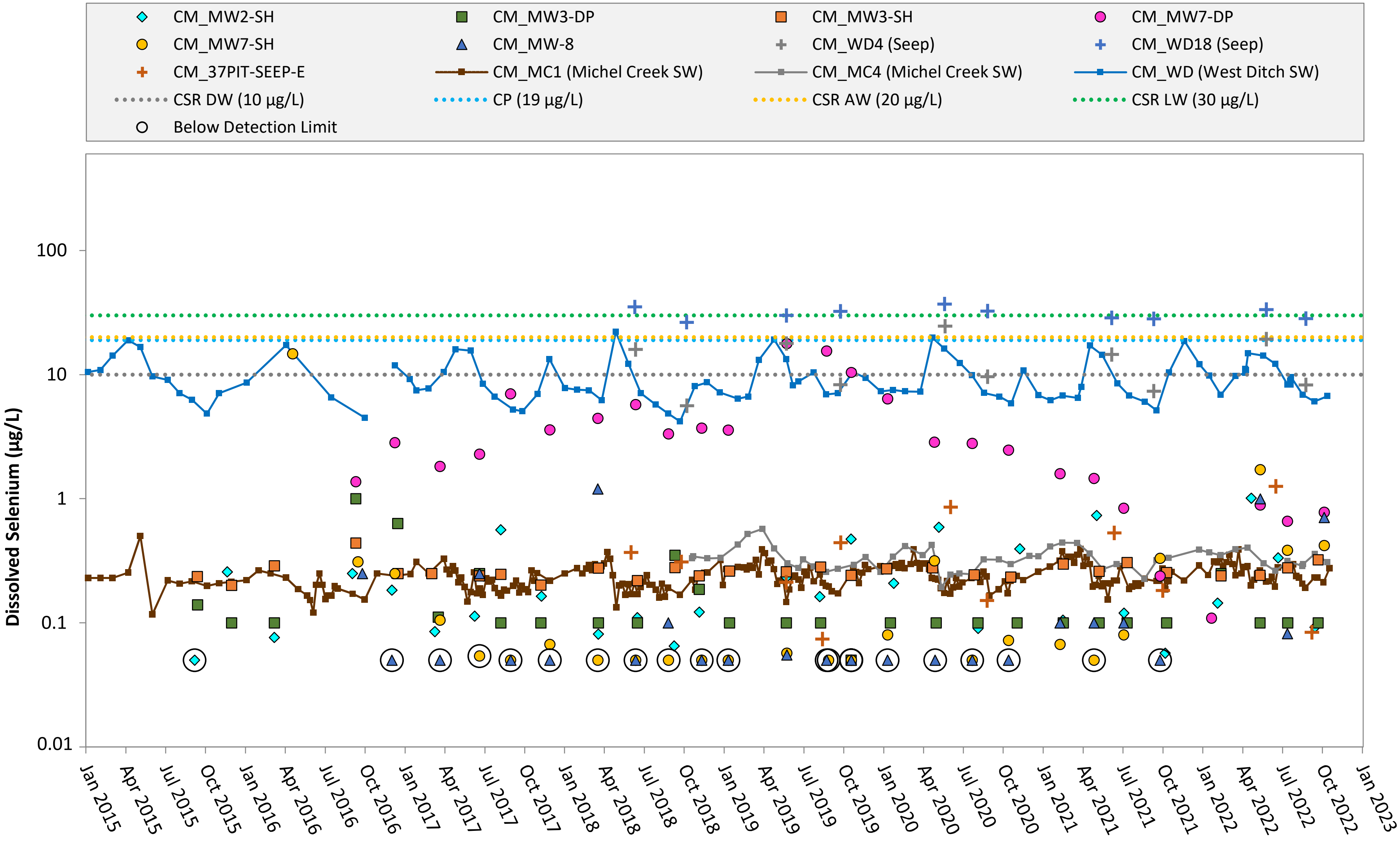


* Bedrock Monitoring Well

DESCRIPTION: Figure CM-15: Michel Creek above Confluence with Corbin Creek - Piper Diagram		
SNC·LAVALIN PEOPLE. DRIVE. RESULTS.	PROJECT: 2022 RGMP SSGMP Annual Report	PROJECT NO: 635544
	CLIENT: Teck Coal Limited	DATE: 2022-03-22

Figure CM-16: Michel Creek Watershed above Confluence with Corbin Creek - Dissolved Selenium



Notes: For concentrations measured below the method detection limit, the method detection limit (0.05 µg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria. CM_WD4 and CM_WD18 drain into Corbin Creek, and are included here for comparison purposes for GW which may be reporting to Michel Creek.

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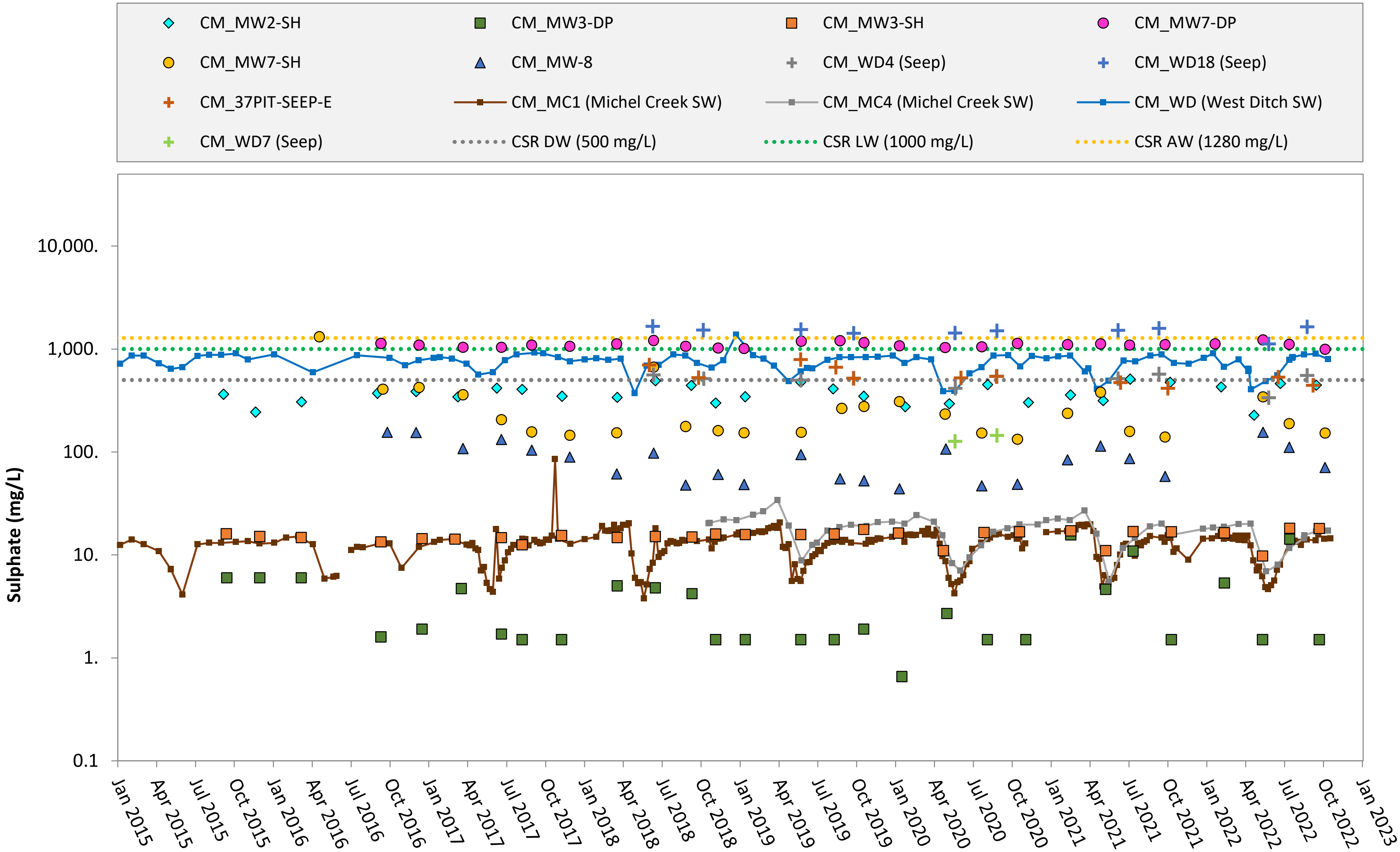
635544 / 2023 03 22
QAQC MB

Figure CM-17: Michel Creek Watershed above Confluence with Corbin Creek - Sulphate



Note: Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria. CM_WD4 and CM_WD18 drain into Corbin Creek, and are included here for comparison purposes for GW which may be reporting to Michel Creek.

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635544 / 2023 03 22
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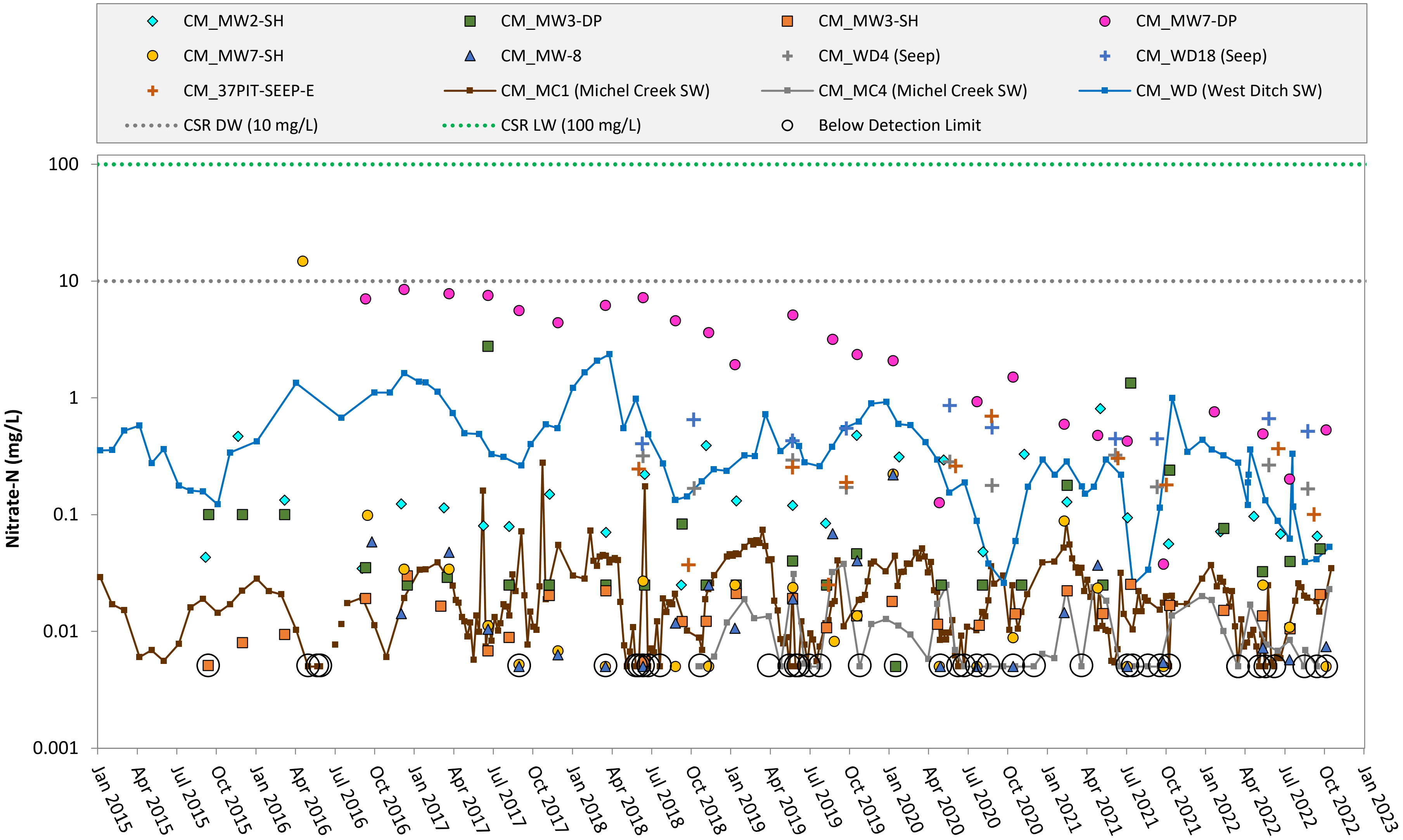
Figure CM-18: Michel Creek Watershed above Confluence with Corbin Creek - Nitrate-N



Note: For concentrations measured below the method detection limit, the method detection limit (0.005 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria. CM_WD4 and CM_WD18 drain into Corbin Creek, and are included here for comparison purposes for GW which may be reporting to Michel Creek.

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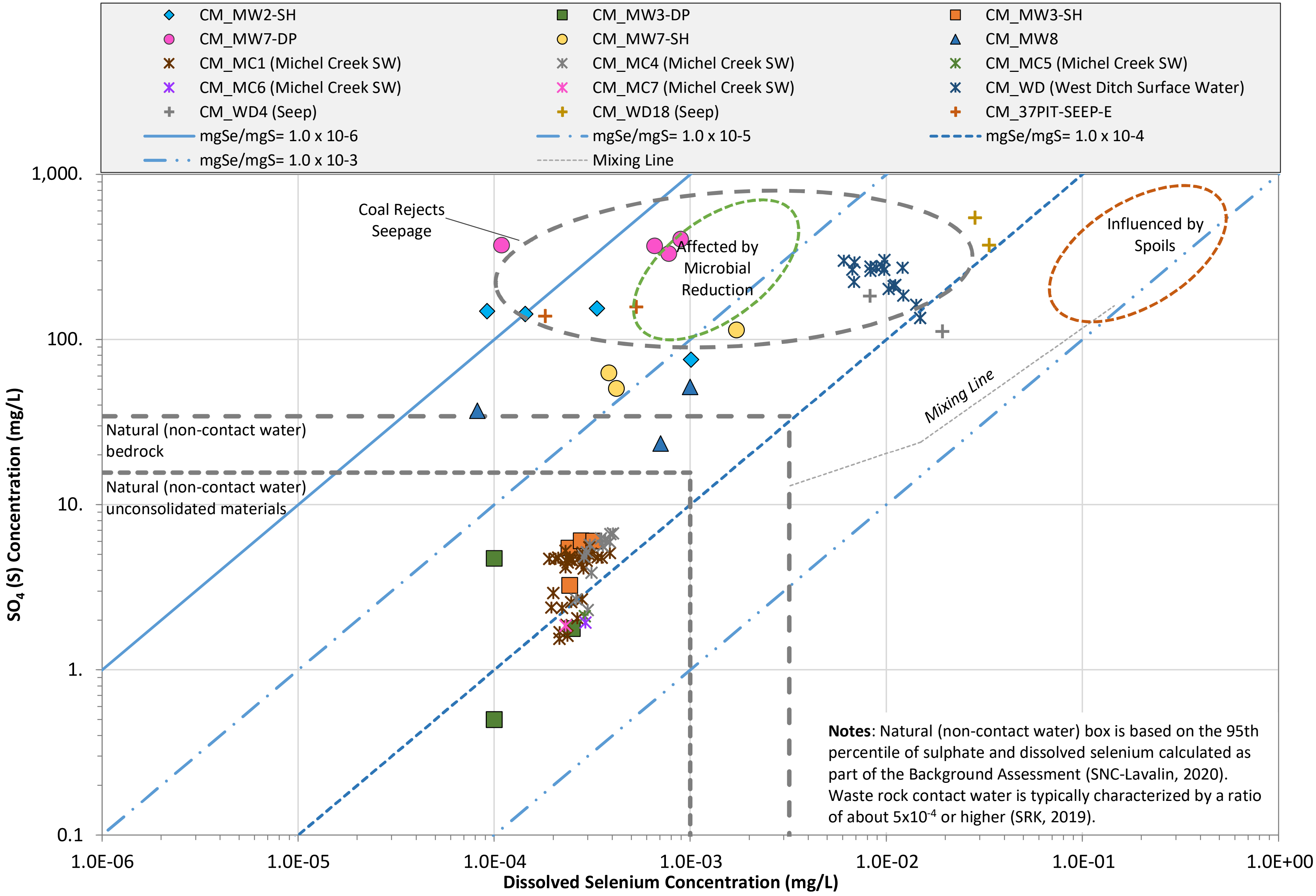
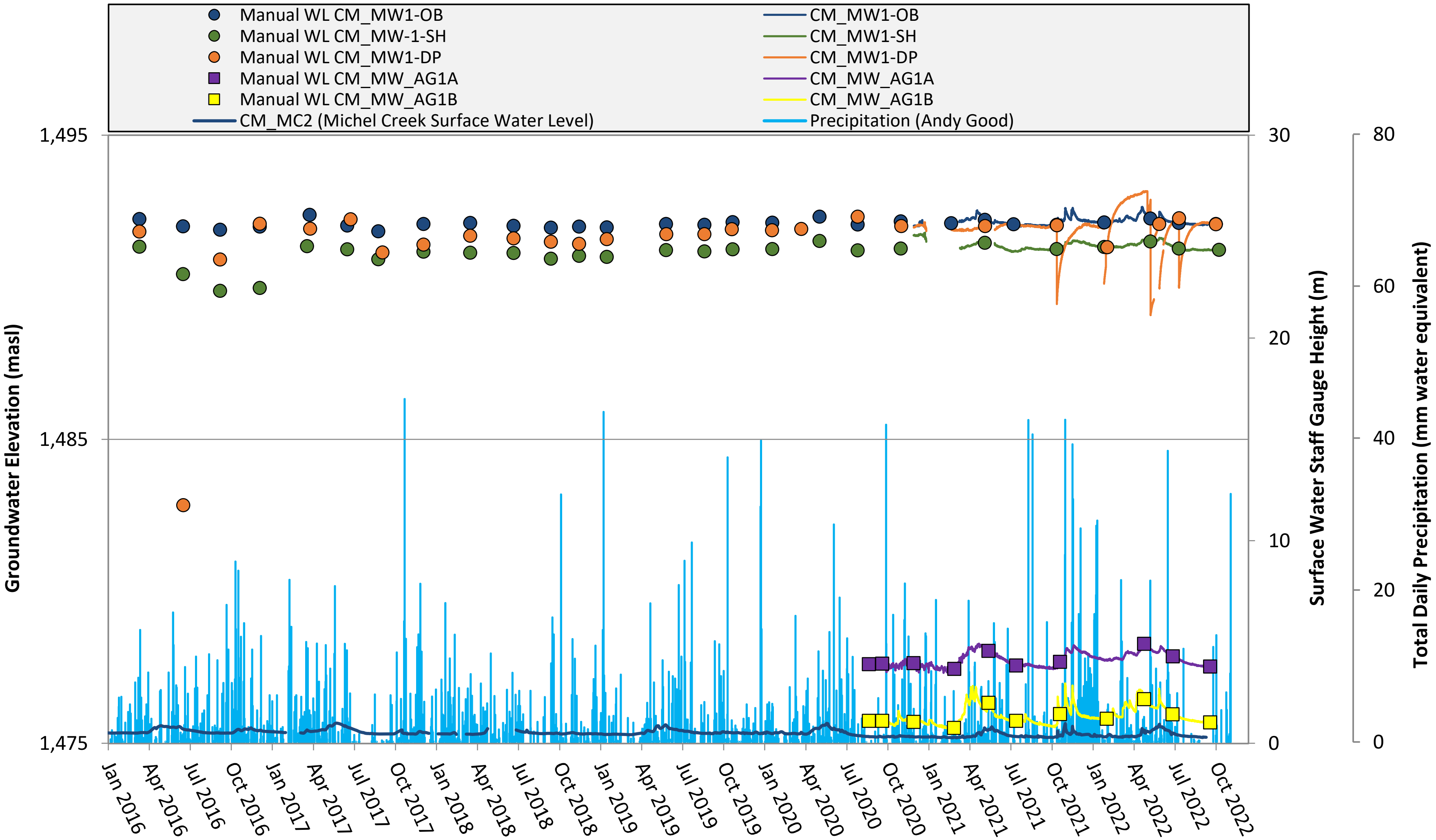
Figure CM-19: Michel Creek Watershed above Confluence with Corbin Creek - Se:SO$_4$ (S)



Notes: Natural (non-contact water) box is based on the 95th percentile of sulphate and dissolved selenium calculated as part of the Background Assessment (SNC-Lavalin, 2020). Waste rock contact water is typically characterized by a ratio of about 5x10^{-4} or higher (SRK, 2019).

Figure CM-20: Michel Creek Watershed below Confluence with Corbin Creek



Note: Precipitation data presented for Environment Canada Sparwood station November 2016 to April 2017. Continuous water level data was compensated using barologger installed at CM_BARO (CM_MW5). Select data points were removed where values were not considered to be representative of actual conditions.

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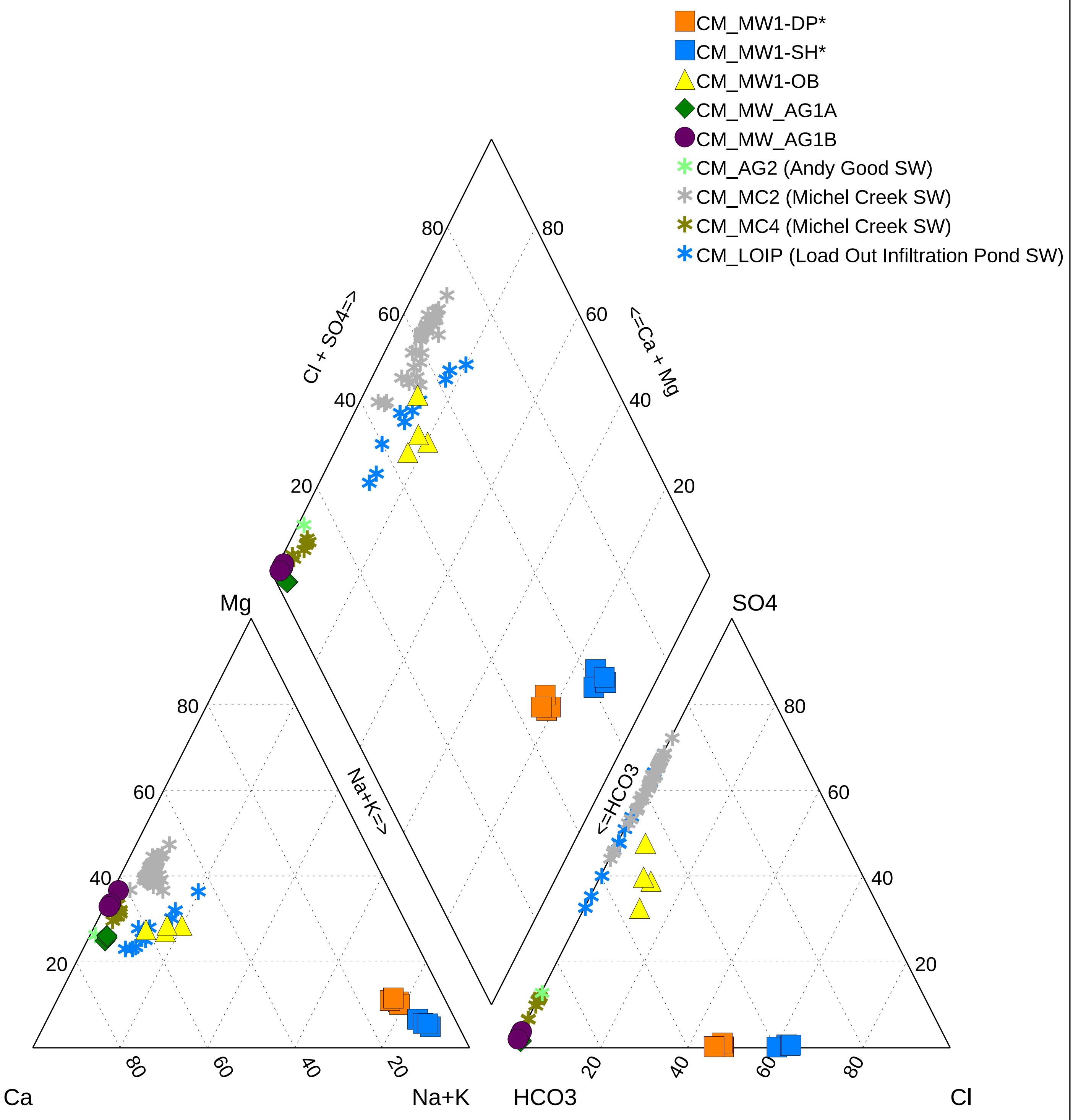
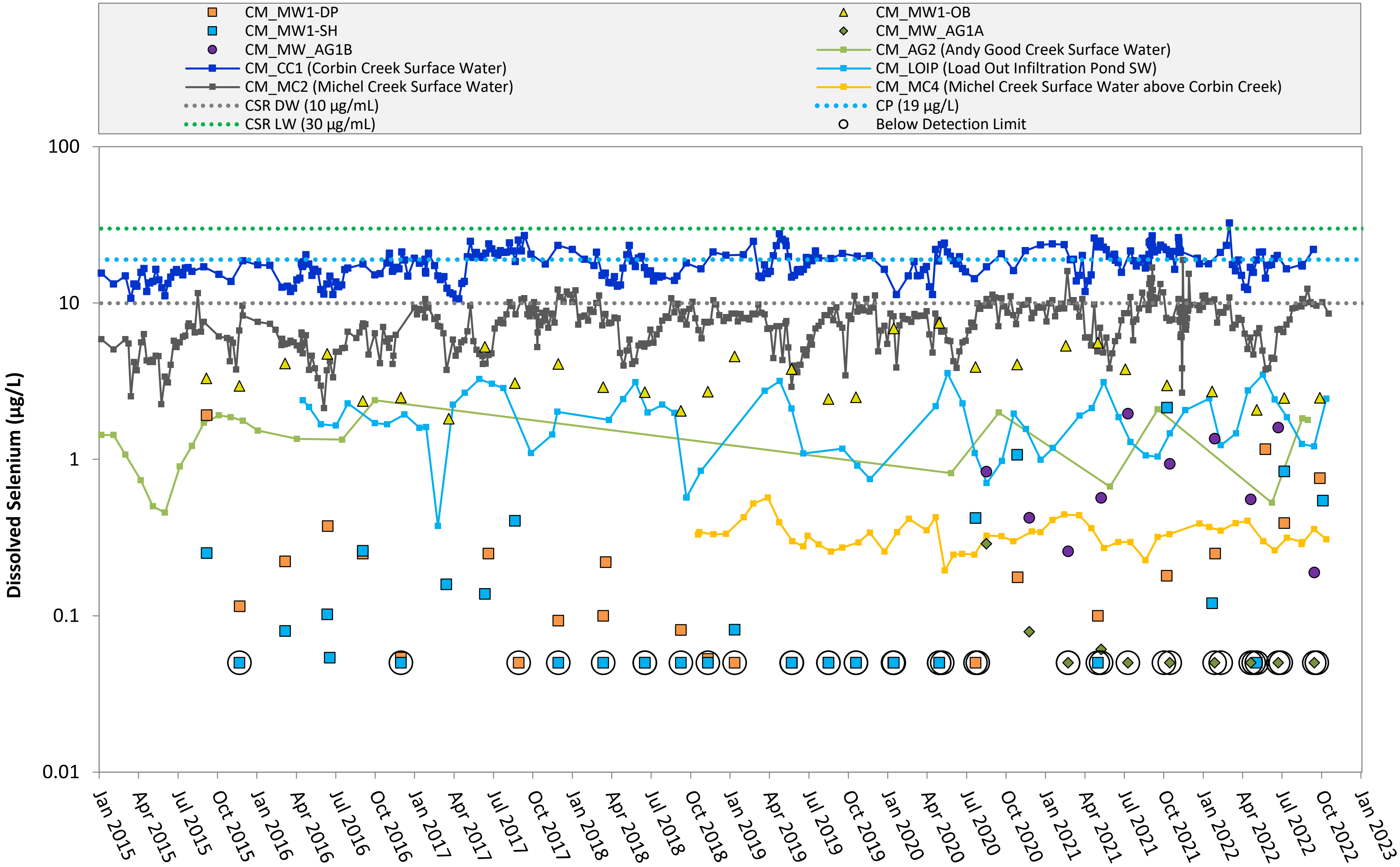


* Bedrock Monitoring Well

DESCRIPTION: Figure CM-21: Michel Creek below Confluence with Corbin Creek - Piper Diagram

SNC·LAVALIN PEOPLE. DRIVE. RESULTS.	PROJECT: 2022 RGMP SSGMP Annual Report	PROJECT NO: 635544
	CLIENT: Teck Coal Limited	DATE: 2022-03-15

Figure CM-22: Michel Creek Watershed below Confluence with Corbin Creek - Dissolved Selenium Concentrations



Notes: For concentrations measured below the method detection limit, the method detection limit (0.05 µg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

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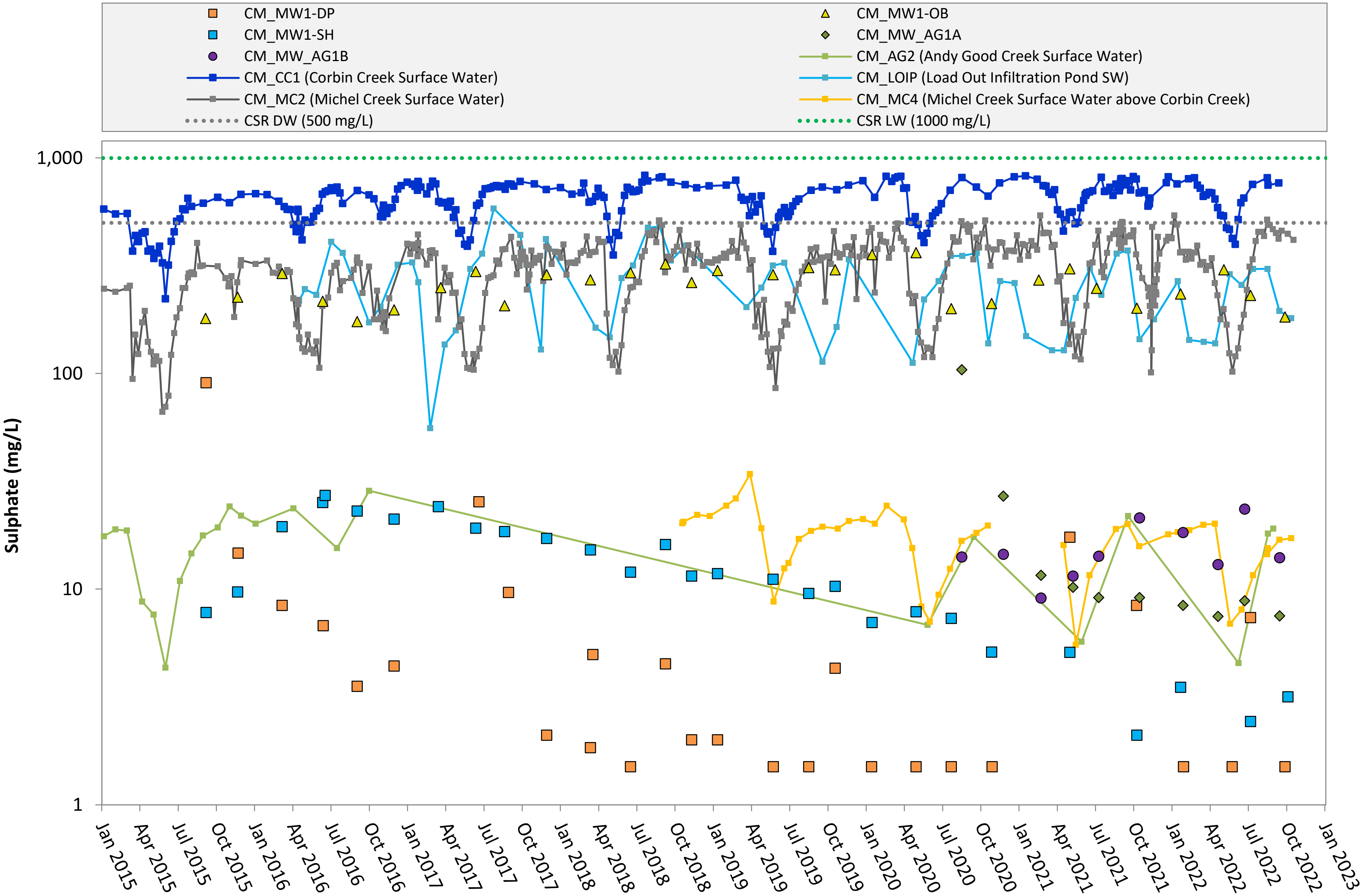
Figure CM-23: Michel Creek Watershed below Confluence with Corbin Creek - Sulphate Concentrations



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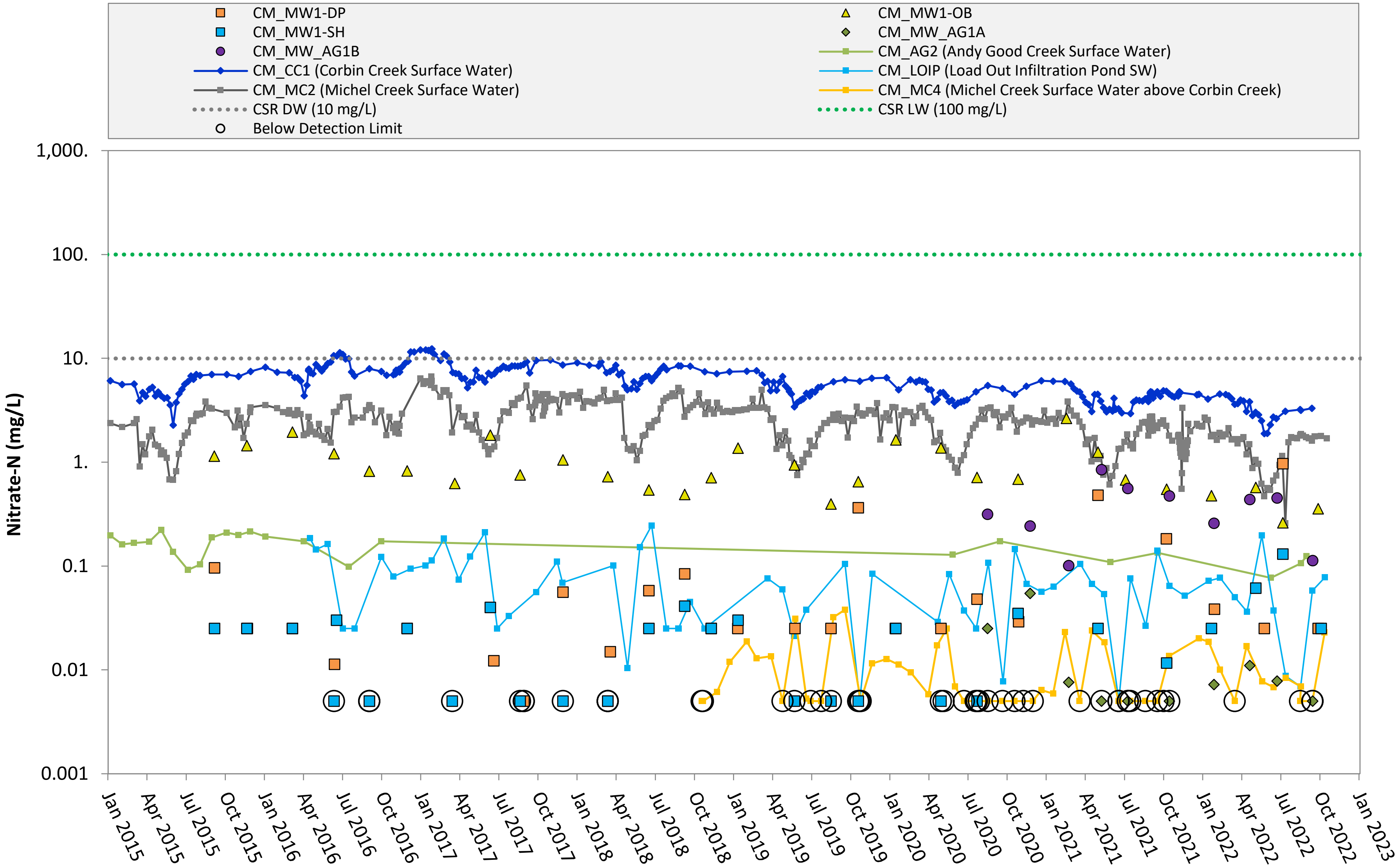
635544 / 2023 02 03
QAQC MB

Figure CM-24: Michel Creek Watershed below Confluence with Corbin Creek - Nitrate-N Concentrations



Note: For concentrations measured below the method detection limit, the method detection limit (0.005 mg/L) was utilized for plotting purposes. Logarithmic scale has been applied on distribution of concentrations relative to applicable screening criteria.

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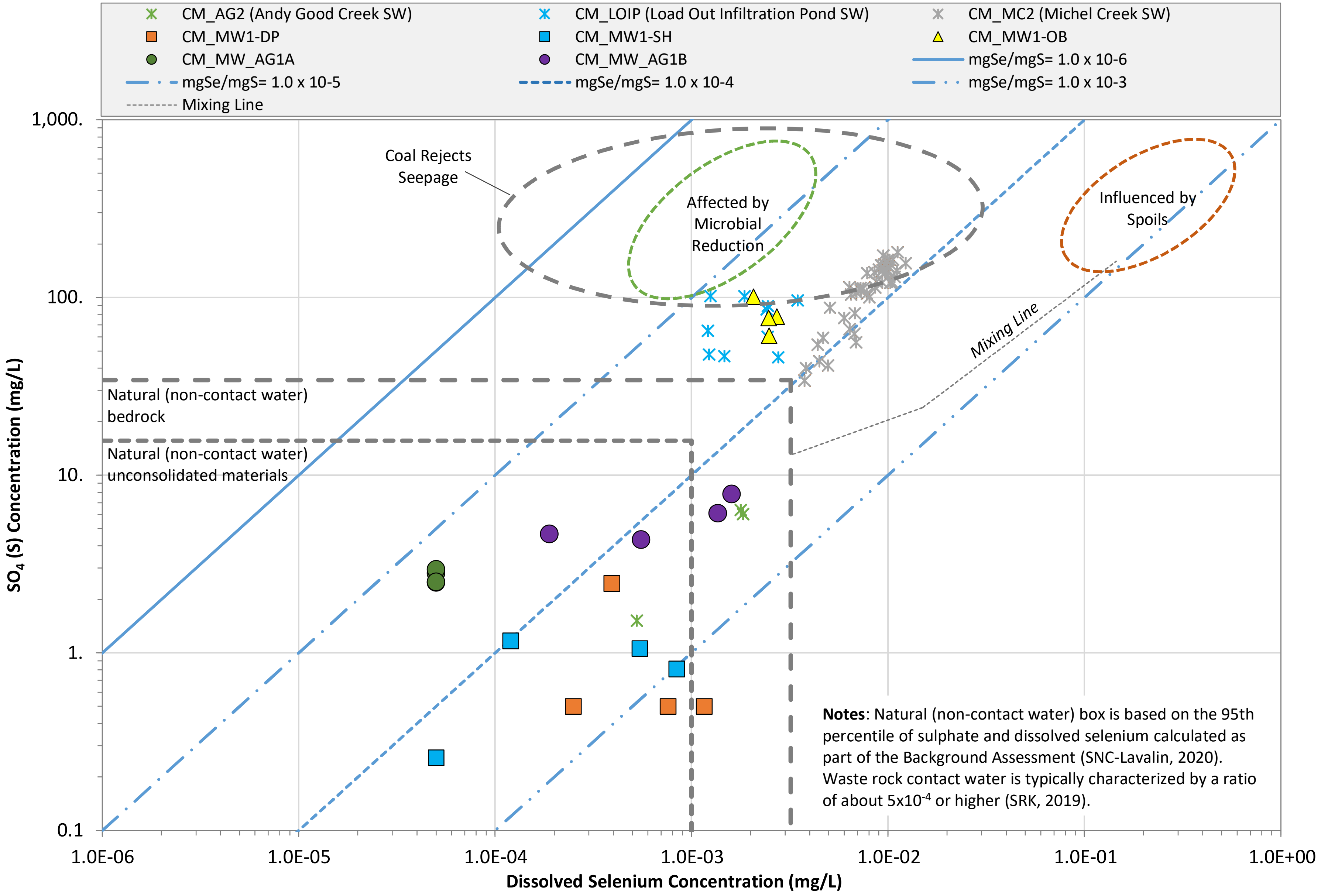
Figure CM-25: Michel Creek Watershed below Confluence with Corbin Creek - Se:SO$_4$ (S)



Notes: Natural (non-contact water) box is based on the 95th percentile of sulphate and dissolved selenium calculated as part of the Background Assessment (SNC-Lavalin, 2020). Waste rock contact water is typically characterized by a ratio of about 5x10^{-4} or higher (SRK, 2019).

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Tables

TABLE CM-01: Summary of Well Installation Details and Hydrogeological Information (CMm)

Area	Well ID	Monitoring Program[a]	Well Type	Monitoring Type[d]	Sampling Frequency		Logs (Y/N)	Coordinates (UTM NAD 83)		Ground Elevation	TOC Elevation	Stick Up Height	Drilled Depth	Well Diameter	Top of Screen Depth	Bottom of Screen Depth	Screened Formation	Depth to Bedrock	Hydraulic Conductivity
					Approved[g]	Recommended[i]		Easting	Northing	masl	masl	m	mbgs	mm	mbgs	mbgs		mbgs	m/s
Corbin Creek Valley	CM_MW4-SH	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q2, Q4	Y	668566	5487348	1512.40	1513.32[c]	0.92	28.5	51	16.0	19.0	Siltstone Bedrock	3.2	-
	CM_MW4-DP[j]	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q2, Q4	Y	668566	5487348	1512.40	1513.32[c]	0.92	28.5	51	25.1	28.2	Siltstone Bedrock	3.2	2.0E-05
	CM_MW5-SH	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	669476	5487365	1541.00	1541.88	0.98	25.9	51	7.1	10.1	Gravel	18.0	1.5E-04
	CM_MW5-DP	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q2, Q4	Y	669476	5487365	1541.00	1541.90	1.00	25.9	51	22.8	25.9	Siltstone Bedrock	18.0	2.5E-06
	CM_MW6-SH[h,j]	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q2, Q4	Y	670118	5486464	1580.39	1581.30	0.91	41.7	51	17.7	20.7	Sand	21.8	2.4E-08
	CM_MW6-DP[b,h,j]	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q2, Q4	Y	670118	5486464	1580.39	1581.28	0.89	41.7	51	38.7	41.7	Siltstone Bedrock	21.8	9.7E-05
	CM_MW9	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4 (WL only)	Y	668563	5487346	1510.30	1510.27	0.88	3.7	51	1.5	2.4	Sand/Silt	2.4	-
	CM_MW10	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	668582	5487630	1535.27	1536.20	0.93	23.9	51	21.0	22.6	Weathered bedrock	20.7	1.2E-07
Michel Creek Valley	CM_MW1-OB[h]	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	667959	5487524	1494.60	1495.41	0.80	37.3	51	2.9	4.5	Gravel	18.0	1.2E-04
	CM_MW1-SH[h]	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	667959	5487524	1494.60	1495.42	0.82	37.3	51	20.4	23.5	Siltstone Bedrock	18.0	2.0E-07
	CM_MW1-DP[h]	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	667959	5487524	1494.60	1495.39	0.79	37.3	51	34.3	37.4	Siltstone Bedrock	18.0	6.0E-06
	CM_MW2-SH	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	668327	5486758	1515.56	1516.45	0.89	4.9	51	2.9	4.4	Gravel	-	8.2E-05
	CM_MW7-SH[j]	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q2, Q4	Y	668833	5485920	1755.77	1756.55	0.80	78.3	51	47.5	50.6	Sandstone Bedrock	31.7	3.2E-05
	CM_MW7-DP[j]	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	668833	5485920	1755.77	1756.56	0.79	78.3	51	64.8	67.5	Sandstone Bedrock	31.7	4.4E-04
	CM_MW8	SSGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q2, Q4	Y	668878	5484957	1847.31	1848.00	0.69	104.0	51	98.0	104.0	Sandstone Bedrock	2.1	5.0E-09
	CM_MW3-SH[b,h]	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	668236	5482853	1572.15	1572.65	0.50	27.4	51	3.6	6.7	Clay and Gravel	6.7	3.9E-04
	CM_MW3-DP[b,h]	SSGMP, RGMP	Monitoring	WL, S	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Y	668236	5482854	1572.15	1572.67	0.52	27.4	51	13.3	16.3	Siltstone Bedrock	6.7	1.0E-07
	CM_MW_AG1A[d,e,h]	SSGMP, RGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	667334	5488250	1478.07	1479.02	0.95	18.3	50	16.2	18.1	Silty gravel sand	-	6.1E-04
	CM_MW_AG1B[d,e,h]	SSGMP, RGMP	Monitoring	WL, S	-	Q1, Q2, Q3, Q4	Y	667329	5488244	1477.99	1478.93	0.93	27.5	50	1.5	3.0	Sand	-	1.5E-05

Notes:

a: SSGMP denotes CMm Site-Specific Groundwater Monitoring Program; RGMP denotes Regional Groundwater Monitoring Program.
b: Monitoring wells are assessed as part of the Regional Background Assessment as per the 2020 RGMP Update.
c: Measurement reference point is top of steel casing for all measurements at this monitoring well.
d: Monitoring wells added to the RGMP Program as per the 2020 RGMP Update.
e: Monitoring wells added to the SSGMP Program as per the 2021 SSGMP Update.
f: WL = Water Level. S = Sample.
g: 2018 SSGMP Update Report (approved BC ENV March 2020).
h: Location resurveyed in 2022.
i: 2019, 2020, and 2021 SSGMP Annual Reports; 2021 SSGMP Update Report
j: Hydraulic conductivity testing completed in 2022.
masl denotes metres above sea level.
mbgs denotes metres below ground surface.
TOC denotes top of pipe casing.
"-" denotes data not available.

TABLE CM-02: Summary of Groundwater Levels and Sampling Information (CMm)

Area	Well ID	Ground Elevation	TOC Elevation (masl)		Stick Up Height	Date of Static Water Level Measurement	Depth to Water	Potentiometric Elevation	Well Pairs	Calculated Vertical Gradient		Continuous Water Level Monitoring	Purging / Sampling Methodology
		masl	PVC	Steel Casing	m	yyyy-mm-dd	mbtoc	masl		m/m	Direction		
Corbin Creek Valley	CM_MW4-SH	1512.40	-	1513.32	0.92	2022-05-12	Artesian	>1513.32	CM_MW4-SH and CM_MW4-DP	-	-	Yes[b]	Discharge Spigot
						2022-07-14	Artesian	>1513.32		-	-		
						2022-10-12	Artesian	>1513.32		-	-		
	CM_MW4-DP	1512.40	-	1513.32	0.92	2022-05-12	Artesian	>1513.32	-	-	-	Yes[b]	Discharge Spigot
						2022-07-14	Artesian	>1513.32					
						2022-10-13	Artesian	>1513.32					
	CM_MW5-SH	1541.00	1541.88	1542.00	0.88	2022-01-10	6.83	1535.05	CM_MW5-SH and CM_MW5-DP	-0.039	Downward	Yes	Bladder Pump
						2022-05-26	5.80	1536.09		-0.049	Downward		
						2022-07-27	6.56	1535.33		-0.044	Downward		
						2022-10-26	6.78	1535.10		-0.049	Downward		
	CM_MW5-DP	1541.00	1541.90	1542.00	0.90	2022-01-10	7.46	1534.44	-	-	-	Yes	Bladder Pump
						2022-05-26	6.58	1535.32					
						2022-07-27	7.27	1534.63					
						2022-10-26	7.58	1534.32					
	CM_MW6-SH[a]	1580.39	1581.30	-	0.91	2022-05-19	5.06	1576.24	CM_MW6-SH and CM_MW6-DP	0.059	Upward	Yes[c]	Bladder Pump
						2022-07-20	5.42	1575.88		0.055	Upward		
						2022-10-20	7.31	1573.99		0.111	Upward		
	CM_MW6-DP[a]	1580.39	1581.28	-	0.89	2022-05-19	3.80	1577.48	-	-	-	Yes[c]	Bladder Pump
						2022-07-21	4.24	1577.04					
						2022-10-20	4.96	1576.33					
	CM_MW9	1510.30	1510.27	-	0.88	2022-03-15	2.83	1507.44	-	-	-	Yes[c]	-
						2022-05-12	1.77	1508.50					
						2022-07-14	2.98	1507.29					
						2022-10-12	3.02	1507.25					
	CM_MW10	1535.27	1536.20	-	0.93	2022-03-03	13.41	1522.79	-	-	-	Yes[c]	Bladder Pump
						2022-05-18	13.09	1523.11					
						2022-07-20	13.40	1522.80					
						2022-10-12	13.53	1522.67					

Notes:

TOC denotes top of pipe casing.

mbgs denotes metres below ground surface.

masl denotes metres above sea level.

mbtoc denotes meters below top of casing.

"-" denotes data not available.

a: Location resurveyed in 2022.

b: Datalogger is installed, however quarterly depth to water and/or depth to logger measurements not recorded.

c: Datalogger was installed in 2022 Q4.

TABLE CM-02: Summary of Groundwater Levels and Sampling Information (CMm)

Area	Well ID	Ground Elevation	TOC Elevation (masl)		Stick Up Height	Date of Static Water Level Measurement	Depth to Water	Potentiometric Elevation	Well Pairs	Calculated Vertical Gradient		Continuous Water Level Monitoring	Purging / Sampling Methodology
		masl	PVC	Steel Casing	m	yyyy-mm-dd	mbtoc	masl		m/m	Direction		
Michel Creek Valley	CM_MW1-OB[a]	1494.60	1495.41	-	0.80	2022-02-10	4.07	1491.34	CM_MW1-OB and CM_MW1-SH	-0.001	Downward	Yes	Bladder Pump
						2022-05-25	3.32	1492.09		-0.032	Downward		
						2022-07-28	3.12	1492.29		-0.055	Downward		
						2022-10-19	3.32	1492.09		-0.047	Downward		
	CM_MW1-SH[a]	1494.60	1495.42	-	0.82	2022-02-10	4.10	1491.33	CM_MW1-SH and CM_MW1-DP	0.000	Downward	Yes	Bladder Pump
						2022-05-25	3.91	1491.51		0.041	Upward		
						2022-07-28	4.14	1491.28		0.072	Upward		
						2022-10-26	4.19	1491.23		0.061	Upward		
	CM_MW1-DP[a]	1494.60	1495.39	-	0.79	2022-02-17	4.07	1491.32	-	-	-	Yes	Hydrasleeve (Q1), Peristaltic (Q2, Q3, Q4)
						2022-06-14	3.32	1492.08					
						2022-07-28	3.12	1492.27					
						2022-10-19	3.32	1492.07					
	CM_MW2-SH	1515.56	1516.45	1516.46	0.89	2022-02-23	3.12	1513.33	-	-	-	Yes	Bladder Pump
						2022-05-12	1.48	1514.97					
						2022-07-13	2.97	1513.48					
						2022-10-06	3.22	1513.23					
	CM_MW7-SH	1755.77	1756.55	1756.63	0.78	2022-03-08	36.59	1719.97	CM_MW7-SH and CM_MW7-DP	0.001	Upward	Yes[c]	Hydrasleeve
						2022-06-02	32.92	1723.63		0.004	Upward		
						2022-08-03	36.59	1719.97		0.001	Upward		
						2022-10-27	39.61	1716.95		0.001	Upward		
	CM_MW7-DP	1755.77	1756.56	1756.63	0.79	2022-02-09	34.76	1721.80	-	-	-	Yes[c]	Hydrasleeve
						2022-03-08	36.57	1719.99					
						2022-06-02	32.85	1723.71					
						2022-08-03	36.57	1719.99					
						2022-10-27	39.59	1716.97					
	CM_MW8	1847.31	1848.00	1847.99	0.69	2022-03-08	78.72	1769.28	-	-	-	Yes[c]	Hydrasleeve
						2022-06-02	68.88	1779.12					
						2022-08-03	78.72	1769.28					
						2022-10-27	81.26	1766.74					
	CM_MW3-SH[a]	1572.15	1572.65	-	0.50	2022-03-03	2.76	1569.89	CM_MW3-SH and CM_MW3-DP	0.010	Upward	Yes	Bladder Pump
						2022-06-01	2.03	1570.63		0.011	Upward		
						2022-08-04	2.87	1569.78		0.035	Upward		
						2022-10-13	2.98	1569.67		0.035	Upward		
	CM_MW3-DP[a]	1572.15	1572.67	-	0.52	2022-03-03	2.68	1569.99	-	-	-	Yes	Bladder Pump
						2022-06-01	1.94	1570.73					
						2022-08-04	2.55	1570.12					
						2022-10-13	2.66	1570.01					
	CM_MW_AG1A[a]	1478.07	1479.02	-	0.95	2022-02-16	Frozen	-	CM_MW_AG1A and CM_MW_AG1B	-	-	Yes	Peristaltic
						2022-05-11	0.74	1478.28		0.123	Upward		
						2022-07-14	1.16	1477.86		0.131	Upward		
						2022-10-06	1.49	1477.53		0.127	Upward		
	CM_MW_AG1B[a]	1477.99	1478.93	-	0.93	2022-02-16	3.11	1475.82	-	-	-	Yes	Peristaltic
						2022-05-11	2.47	1476.45					
						2022-07-14	2.97	1475.96					
						2022-10-06	3.23	1475.70					

Notes:
TOC denotes top of pipe casing.
mbgs denotes metres below ground surface.
masl denotes metres above sea level.
mbtoc denotes meters below top of casing.
"-" denotes data not available.
a: Location resurveyed in 2022.
b: Datalogger is installed, however quarterly depth to water and/or depth to logger measurements not recorded.
c: Datalogger was installed in 2022 Q4.

TABLE CM-03: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Inorganics, Nutrients and Organics in Groundwater (CMm)

			Field Parameters					Physical Parameters						Dissolved Inorganics								Nutrients						Organics	
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Field Temperature C	pH (field) pH	Dissolved Oxygen mg/L	Field Conductivity µS/cm	Field ORP mV	pH pH	Hardness mg/L	Conductivity µS/cm	Total Suspended Solids mg/L	Total Dissolved Solids mg/L	Turbidity ntu	Total Alkalinity mg/L	Bicarbonate mg/L	Carbonate mg/L	Hydroxide mg/L	Bromide mg/L	Chloride mg/L	Fluoride mg/L	Sulphate mg/L	Ammonia Nitrogen mg/L	Nitrate Nitrogen mg/L	Nitrite Nitrogen mg/L	Kjeldahl Nitrogen-N mg/L	Ortho-Phosphate mg/L	Phosphorus, Total mg/L	Total Organic Carbon mg/L	Dissolved Organic Carbon mg/L
BC Standard																													
CSR Aquatic Life (AW)[a]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,500	2-3[b]	1,280-4,290[b]	1.31-18.5[c]	400	0.2-2[d]	n/a	n/a	n/a	n/a	n/a
CSR Irrigation Watering (IW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSR Livestock Watering (LW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	1	1,000	n/a	100	10	n/a	n/a	n/a	n/a	n/a
CSR Drinking Water (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	250	1.5	500	n/a	10	1	n/a	n/a	n/a	n/a	n/a
Corbin Creek Valley Watershed (+ denotes Study Area 11)																													
CM_MW4-SH	CM_MW4-SH_WG_2022-05-12_N	2022 05 12	5.8	8.05	2.48	1,332	73.3	8.47	32.0	1,300	4.0	765	14.2	574	672	14.2	< 1.0	0.342	*109*	0.300	2.66	0.395	< 0.0250	< 0.0050	0.489	0.0084	0.0290	0.68	< 0.50
	CM_MW4-SH_WG_2022-07-01_N	2022 07 14	18.8	8.47	5.01	753	71.0	8.09	32.9	1,300	2.1	800	1.21	596	727	< 1.0	< 1.0	0.498	*121*	0.422	< 1.50	0.453	< 0.0250	< 0.0050	0.437	0.0016	0.0167	< 0.50	< 0.50
	CM_MW4-SH_WG_2022-10-01_N	2022 10 12	8.0	7.95	5.21	1,457	31.6	8.26	37.0	1,370	1.1	770	2.61	602	734	< 1.0	< 1.0	0.565	*144*	0.413	12.4	0.464	< 0.0250	< 0.0050	0.495	0.0093	0.0126	< 0.50	< 0.50
CM_MW4-DP	CM_MW4-DP_WG_2022-05-12_N	2022 05 12	5.8	8.16	3.22	2,016	226.6	8.54	18.3	1,960	2.3	1,050	2.79	702	815	20.6	< 1.0	0.927	*261*	0.337	4.99	0.393	1.08	< 0.0050	0.469	0.0097	0.0180	< 0.50	< 0.50
	CM_MW4-DP_WG_2022-07-01_N	2022 07 14	11	8.12	2.96	1,138	10.6	8.30	18.4	1,980	2.7	1,350	10.2	728	860	13.9	< 1.0	1.08	*282*	0.486	< 1.50	0.476	< 0.0250	< 0.0050	0.489	0.0080	0.0149	< 0.50	< 0.50
	CM_MW4-DP_WG_2022-10-01_N	2022 10 13	8.7	8.16	3.19	2,083	23.7	8.52	17.8	1,930	3.3	1,100	4.51	729	855	16.6	< 1.0	1.04	*278*	0.465	< 1.50	0.457	< 0.0250	< 0.0050	0.450	0.0045	0.0171	< 0.50	< 0.50
CM_MW5-SH	CM_MW5-SH_WG_2022-01-06_N	2022 01 10	5.0	7.34	5.65	955	227.1	7.60	466	935	< 1.0	645	< 0.10	246	300	< 1.0	< 1.0	< 0.050	2.18	0.146	317	< 0.0050	1.31	< 0.0010	0.134	0.0029	0.0040	0.84	1.31
	CM_MW5-SH_WG_2022-05-26_N	2022 05 26	5.1	7.32	6.73	902	107.0	8.13	472	868	5.1	623	< 0.10	239	292	< 2.0	< 2.0	< 0.050	7.29	0.162	272	< 0.0050	1.26	< 0.0010	0.218	0.0015	0.0042	< 0.50	0.96
	CM_MW5-SH_WG_2022-07-01_N	2022 07 27	12.0	7.38	3.97	706	92.0	8.05	347	690	< 1.0	489	0.17	216	263	< 1.0	< 1.0	< 0.050	2.40	0.194	178	< 0.0050	0.626	< 0.0010	< 0.050	< 0.0010	0.0050	< 0.50	3.83
	CM_MW5-SH_WG_2022-10-01_N	2022 10 26	6.6	6.98	4.13	1,769	130.4	7.98	1,050	1,700	< 1.0	1,400	0.12	314	383	< 1.0	< 1.0	< 0.250	7.54	0.170	792	0.0052	5.00	< 0.0050	0.231	0.0017	0.0044	< 0.50	< 0.50
CM_MW5-DP	CM_MW5-DP_WG_2022-01-06_N	2022 01 10	3.81	7.30	0.46	759	-111.1	7.73	274	743	12.7	436	18.9	448	546	< 1.0	< 1.0	0.051	11.4	0.250	0.66	0.621	< 0.0050	< 0.0010	0.653	< 0.0010	0.0048	0.87	0.84
	CM_MW5-DP_WG_2022-05-26_N	2022 05 26	11.7	7.48	0.93	744	-102.2	8.21	292	703	4.2	418	8.22	416	508	< 2.0	< 2.0	< 0.050	11.1	0.264	2.20	0.601	0.0058	< 0.0010	0.542	< 0.0010	0.0039	< 0.50	1.82
	CM_MW5-DP_WG_2022-07-01_N	2022 07 27	12.3	7.57	0.13	735	-131.8	8.06	281	690	4.3	441	15.7	412	502	< 1.0	< 1.0	< 0.050	11.1	0.284	0.94	0.597	< 0.0050	< 0.0010	0.634	< 0.0010	0.0072	< 0.50	< 0.50
	CM_MW5-DP_WG_2022-10-01_N	2022 10 26	5.3	7.41	0.82	755.2	-121.3	8.05	283	726	4.4	417	19.8	413	503	< 1.0	< 1.0	< 0.050	12.8	0.300	< 0.30	0.690	< 0.0050	< 0.0010	0.727	< 0.0010	0.0051	< 0.50	< 0.50
CM_MW6-SH	CM_MW6-SH_WG_2022-05-19_N	2022 05 19	3.3	8.04	0.68	437.9	-133.5	8.40	83.0	417	< 1.0	265	1.24	194	226	5.2	< 1.0	0.094	18.6	*1.34*	1.07	0.0152	< 0.0050	< 0.0010	< 0.050	< 0.0010	0.0062	1.16	3.29
	CM_MW6-SH_WG_2022-07-01_N	2022 07 20	17.9	7.99	0.46	435.4	-157.0	8.20	77.2	363	< 1.0	250	1.53	219	265	< 1.0	< 1.0	0.095	18.2	*1.44*	1.65	0.0253	0.0287	< 0.0010	0.104	0.0010	0.0066	1.73	3.62
	CM_MW6-SH_WG_2022-10-01_N	2022 10 20	8.1	7.88	4.31	433.6	-107.5	8.14	77.6	413	4.6	213	7.05	205	250	< 1.0	< 1.0	0.126	18.5	*1.50*	1.52	0.0269	0.0050	< 0.0010	0.078	< 0.0010	0.0112	1.90	2.13
CM_MW6-DP	CM_MW6-DP_WG_2022-05-19_N	2022 05 19	3.5	8.37	0.07	1,345	-198.4	8.61	34.3	1,270	4.4	803	4.19	702	808	24.2	< 1.0	0.104	36.5	0.405	0.81	0.344	< 0.0050	< 0.0010	0.396	0.0173	0.0218	0.84	1.05
	CM_NNP_WG_2022-05-19_N	Duplicate	-	-	-	-	-	8.60	34.8	1,240	4.0	756	2.98	692	798	22.8	< 1.0	< 0.250	39.0	0.414	7.97	0.352	0.423	0.0074	0.391	0.0076	0.0272	0.66	2.24
	QA/QC RPD%		-	-	-	-	-	0	1	2	*	6	34	1	1	6	*	*	7	2	*	2	*	*	1	78	22	*	*
	CM_MW6-DP_WG_2022-07-01_N	2022 07 21	17.5	8.26	0.29	1,326	-214.3	7.99	31.9	1,260	5.7	780	6.07	710	866	< 1.0	< 1.0	0.132	35.7	0.447	0.71	0.523	< 0.0050	< 0.0010	0.647	0.0152	0.0531	< 0.50	1.11
	CM_MW6-DP_WG_2022-10-01_N	2022 10 20	11.6	8.18	0.63	1,312	-28.2	8.48	32.6	1,240	7.7	725	0.11	703	822	17.8	< 1.0	< 0.250	35.2	0.383	3.85	0.533	< 0.0250	< 0.0050	0.573	0.0028	0.0344	< 0.50	1.28
CM_MW10	CM_MW10_WG_2022-02-01_N	2022 03 03	2.2	7.58	1.58	611.3	-86.9	7.90	264	574	2.0	349	18.3	270	330	< 1.0	< 1.0	< 0.050	0.57	0.980	67.1	0.0225	< 0.0050	< 0.0010	0.065	< 0.0010	0.0079	0.56	1.26
	CM_MW10_WG_2022-05-18_N	2022 05 18	8.5	7.56	0.78	586.0	-64.0	8.10	252	551	5.1	346	12.2	274	335	< 1.0	< 1.0	< 0.050	0.65	*1.05*	53.2	0.0127	< 0.0050	< 0.0010	< 0.050	< 0.0010	0.0102	3.45	2.87
	CM_MW10_WG_2022-07-01_N	2022 07 20	15.5	7.61	0.55	560.4	-134.4	7.75	224	530	2.7	337	10.8	285	348	< 1.0	< 1.0	< 0.050	0.58	*1.09*	52.2	0.0202	0.0709	< 0.0010	0.132	< 0.0010	0.0154	0.64	1.94
	CM_MW10_WG_2022-10-01_N	2022 10 12	5.5	7.37	0.80	567.7	-59.9	7.77	247	564	1.6	302	10.8	262	320	< 1.0	< 1.0	< 0.050	0.60	*1.06*	74.1	0.0108	0.0065	< 0.0010	0.065	< 0.0010	0.0077	< 0.50	< 0.50
Michel Creek Valley Watershed (+ denotes Study Area 11)																													
CM_MW1-OB+	CM_MW1-OB_WG_2022-02-01_N	2022 02 10	4.33	7.01	5.30	1,085	209.3	7.88	473	1,040	1.2	694	0.48	300	366	< 1.0	< 1.0	< 0.250	54.0	0.322	234	< 0.0050	0.476	< 0.0050	0.073	< 0.0010	0.0032	< 0.50	2.91
	CM_MW1-OB_WG_2022-05-25_N	2022 05 25	3.7	7.14	1.27	1,119	151.6	7.39	560	1,070	2.2	742	0.68	296	361	< 1.0	< 1.0	< 0.250	30.3	< 0.100	303	< 0.0050	0.570	0.0090	< 0.050	0.0016	0.0034	0.50	0.62
	CM_NNP2_WG_2022-05-25_N	Duplicate	-	-	-	-	-	7.45	532	1,070	1.2	769	0.51	296	361	< 1.0	< 1.0	< 0.250	34.3	< 0.100	304	< 0.0050	0.195	0.0055	< 0.050	0.0014	0.0033	< 0.50	1.94
	QA/QC RPD%		-	-	-	-	-	1	5	0	*	4	29	0	0	*	*	*	12	*	0	*	98	48	*	*	*	*	*
	CM_MW1-OB_WG_2022-07-01_N	2022 07 28	11.1	7.08	4.01	990	146.0	7.89	444	963	1.2	641	0.23	295	360	< 1.0	< 1.0	< 0.250	42.7	0.111	230	< 0.0050	0.260	< 0.0050	< 0.050	0.0016	0.0034	< 0.50	0.95
	CM_MW1-OB_WG_2022-10-01_N	2022 10 19	8.6	7.03	5.11	961	165.6	7.77	447	908	1.3	566	0.39	313	382	< 1.0	< 1.0	< 0.250	52.7	0.111	183	0.0059	0.356	< 0.0050	< 0.050	< 0.0010	0.0025	< 0.50	1.19

All terms defined within the body of SNC-Lavalin's report.

<   Denotes concentration less than indicated detection limit.

-    Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

*   RPDs are not calculated where one or more concentrations are less than five times RDL.

RDL Denotes reported detection limit.

BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH and Temperature. Temperature assumed 10C.

[d] Standard varies with Chloride.

TABLE CM-03: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Inorganics, Nutrients and Organics in Groundwater (CMm)

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Field Parameters					Physical Parameters						Dissolved Inorganics								Nutrients						Organics	
			Field Temperature C	pH (field) pH	Dissolved Oxygen mg/L	Field Conductivity µS/cm	Field ORP mV	pH pH	Hardness mg/L	Conductivity µS/cm	Total Suspended Solids mg/L	Total Dissolved Solids mg/L	Turbidity ntu	Total Alkalinity mg/L	Bicarbonate mg/L	Carbonate mg/L	Hydroxide mg/L	Bromide mg/L	Chloride mg/L	Fluoride mg/L	Sulphate mg/L	Ammonia Nitrogen mg/L	Nitrate Nitrogen mg/L	Nitrite Nitrogen mg/L	Kjeldahl Nitrogen-N mg/L	Ortho-Phosphate mg/L	Phosphorus, Total mg/L	Total Organic Carbon mg/L	Dissolved Organic Carbon mg/L
BC Standard																													
CSR Aquatic Life (AW)[a]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,500	2-3[b]	1,280-4,290[b]	1.31-18.5[c]	400	0.2-2[d]	n/a	n/a	n/a	n/a	n/a
CSR Irrigation Watering (IW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSR Livestock Watering (LW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	1	1,000	n/a	100	10	n/a	n/a	n/a	n/a	n/a
CSR Drinking Water (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	250	1.5	500	n/a	10	1	n/a	n/a	n/a	n/a	n/a
Michel Creek Valley Watershed (+ denotes Study Area 11)																													
CM_MW1-SH+	CM_MW1-SH_WG_2022-02-01_N	2022 02 10	4.2	8.28	0.23	1,156	-184.0	8.38	83.3	1,120	6.0	626	7.86	210	250	3.0	< 1.0	0.874	*250*	*1.23*	3.51	0.0345	< 0.0250	< 0.0050	0.060	< 0.0010	0.0171	0.50	2.07
	CM_MW1-SH_WG_2022-05-25_N	2022 05 25	7.9	8.29	2.22	1,148	-179.7	8.27	79.5	1,120	< 1.0	614	0.91	216	263	< 1.0	< 1.0	0.856	*242*	0.968	0.77	0.0247	0.0613	0.0058	0.065	0.0086	0.0103	0.55	2.78
	CM_MW1-SH_WG_2022-07-01_N	2022 07 28	12.0	8.33	0.12	1,164	-204.2	8.42	61.9	1,120	4.6	603	0.76	214	245	7.6	< 1.0	0.918	*263*	*1.09*	2.43	0.0296	0.130	< 0.0050	< 0.050	0.0106	0.0140	< 0.50	< 0.50
	CM_MW1-SH_WG_2022-10-01_N	2022 10 26	3.9	8.34	1.25	1,136	-170.4	8.39	65.4	1,120	< 1.0	584	0.67	205	240	4.8	< 1.0	1.08	*255*	*1.03*	3.17	0.0279	< 0.0250	< 0.0050	< 0.050	0.0064	0.0098	< 0.50	0.73
CM_MW1-DP+	CM_MW1-DP_WG_2022-02-01_N	2022 02 17	4.9	7.83	1.00	1,380	14.4	8.24	138	1,270	22.7	673	21.2	358	436	< 1.0	< 1.0	0.766	*228*	0.172	< 1.50	0.566	0.0383	< 0.0050	0.629	0.0255	0.0385	1.19	1.12
	CM_NNP_WG_2022-02-01_N	Duplicate	-	-	-	-	-	8.22	138	1,250	11.0	690	13.3	361	440	< 1.0	< 1.0	0.729	*225*	0.189	< 1.50	0.503	< 0.0250	< 0.0050	0.582	0.0224	0.0276	1.39	1.10
	QA/QC RPD%		-	-	-	-	-	0	0	2	69	2	46	1	1	*	*	5	1	9	*	12	*	*	8	13	33	*	*
	CM_MW1-DP_WG_2022-06-14_N	2022 06 14	4.76	8.01	0.32	1,351	-138.4	8.21	137	1,360	12.0	746	11.9	360	439	< 1.0	< 1.0	0.954	*242*	0.176	< 1.50	0.530	< 0.0250	< 0.0050	0.705	0.0134	0.0416	1.43	2.25
	CM_MW1-DP_WG_2022-07-01_N	2022 07 28	10.6	7.81	0.11	1,261	-170.5	8.18	150	1,250	4.8	692	5.35	344	420	< 1.0	< 1.0	0.707	*229*	0.228	7.38	0.463	0.965	< 0.0050	0.556	0.0025	0.0324	1.83	2.03
	CM_MW1-DP_WG_2022-10-01_N	2022 10 19	7.6	7.80	0.31	1,308	-163.2	8.19	148	1,220	4.3	664	4.80	360	439	< 1.0	< 1.0	0.899	*222*	0.196	< 1.50	0.565	< 0.0250	< 0.0050	0.625	0.0110	0.0243	1.44	1.54
	CM_NNP2_WG_2022-10-01_N	Duplicate	-	-	-	-	-	8.10	153	1,160	4.3	670	4.82	396	483	< 1.0	< 1.0	0.785	*223*	0.203	< 1.50	0.638	< 0.0250	< 0.0050	0.663	0.0120	0.0254	1.33	1.69
	QA/QC RPD%		-	-	-	-	-	1	3	5	*	1	0	10	10	*	*	14	0	4	*	12	*	*	6	9	4	*	*
CM_MW2-SH	CM_MW2-SH_WG_2022-02-01_N	2022 02 23	2.5	6.92	5.04	1,309	171.3	7.46	673	1,240	< 1.0	979	0.37	355	433	< 1.0	< 1.0	< 0.250	2.74	< 0.100	428	0.0093	0.0716	< 0.0050	< 0.050	0.0011	0.0029	< 0.50	< 0.50
	CM_MW2-SH_WG_2022-05-12_N	2022 05 12	7.4	7.00	4.23	944	195.0	7.74	511	926	< 1.0	624	0.26	316	385	< 1.0	< 1.0	< 0.250	0.99	< 0.100	227	< 0.0050	0.0966	< 0.0050	< 0.050	< 0.0010	0.0030	0.73	0.97
	CM_MW2-SH_WG_2022-07-01_N	2022 07 13	5.7	6.87	2.82	1,313	133.2	7.48	685	1,270	2.2	982	0.39	347	423	< 1.0	< 1.0	< 0.250	3.74	0.114	463	< 0.0050	0.0680	< 0.0050	< 0.050	< 0.0010	0.0022	< 0.50	< 0.50
	CM_NNP_WG_2022-07-01_N	Duplicate	-	-	-	-	-	7.56	719	1,240	2.2	987	0.18	344	420	< 1.0	< 1.0	< 0.250	3.26	0.113	462	< 0.0050	0.0554	< 0.0050	< 0.050	0.0014	0.0021	< 0.50	< 0.50
	QA/QC RPD%		-	-	-	-	-	1	5	2	*	1	*	1	1	*	*	*	14	1	0	*	20	*	*	*	*	*	*
	CM_MW2-SH_WG_2022-10-01_N	2022 10 06	8.4	6.89	2.94	1,323	119.1	7.56	732	1,250	1.0	909	0.18	352	430	< 1.0	< 1.0	< 0.250	2.81	0.109	445	< 0.0050	0.0653	< 0.0050	< 0.050	0.0011	0.0020	< 0.50	< 0.50
CM_MW7-SH	CM_MW7-SH_WG_2022-06-02_N	2022 06 02	11.5	7.29	2.05	1,198	-110.9	7.43	591	1,020	70.3	742	40.5	296	361	< 1.0	< 1.0	< 0.250	11.0	0.196	343	0.107	< 0.0250	< 0.0050	0.192	< 0.0010	0.0223	3.12	1.78
	CM_MW7-SH_WG_2022-07-01_N	2022 08 03	10.6	7.18	2.60	955	121.9	7.93	435	702	75.7	589	29.8	279	340	< 1.0	< 1.0	0.076	12.4	0.241	189	0.102	0.0108	< 0.0010	0.182	< 0.0010	0.0233	2.88	1.91
	CM_MW7-SH_WG_2022-10-01_N	2022 10 27	6.0	7.47	4.70	411.02	-48.4	7.79	389	737	45.8	521	48.4	272	332	< 1.0	< 1.0	< 0.050	12.8	0.240	152	0.0548	< 0.0050	< 0.0010	0.205	< 0.0010	0.0158	6.60	6.32
CM_MW7-DP	CM_MW7-DP_WG_2022-02-01_N	2022 02 09	5.5	6.95	1.94	2,246	24.5	7.46	1,400	2,180	34.5	1,990	16.2	396	483	< 1.0	< 1.0	< 0.250	1.74	0.164	1,120	0.0251	0.758	< 0.0050	0.094	< 0.0010	0.0259	0.56	< 0.50
	CM_MW7-DP_WG_2022-06-02_N	2022 06 02	9.6	7.01	2.80	2,264	-30.4	7.38	1,360	2,100	21.8	1,870	6.01	396	483	< 1.0	< 1.0	< 0.250	1.55	0.116	1,220	0.0096	0.490	< 0.0050	0.130	< 0.0010	0.0144	1.13	< 0.50
	CM_MW7-DP_WG_2022-07-01_N	2022 08 03	11.8	7.05	2.90	2,091	47.1	7.84	1,450	2,080	65.1	2,000	25.4	337	412	< 1.0	< 1.0	< 0.250	1.43	0.104	1,110	< 0.0050	0.202	< 0.0050	0.142	< 0.0010	0.0245	2.37	< 0.50
	CM_MW7-DP_WG_2022-10-01_N	2022 10 27	4.6	7.38	8.13	2,173	84.4	7.84	1,220	1,900	60.2	1,830	27.8	372	453	< 1.0	< 1.0	< 0.250	1.89	0.115	995	< 0.0050	0.530	0.0430	0.086	< 0.0010	0.0098	1.98	< 0.50
CM_MW_AG1A	CM_MW_AG1A_WG_2022-02-01_N	2022 02 16	3.5	7.00	2.29	910	-106.7	7.95	459	805	16.6	418	84.2	507	619	< 2.0	< 2.0	0.057	3.32	0.082	8.40	0.0335	0.0072	< 0.0010	0.078	< 0.0010	0.0084	1.93	2.15
	CM_MW_AG1A_WG_2022-05-11_N	2022 05 11	7.0	7.11	1.14	889	-101.2	7.76	491	837	18.4	523	101	483	590	< 2.0	< 2.0	< 0.050	3.77	0.079	7.48	0.0284	0.0110	< 0.0010	0.145	< 0.0010	0.0079	2.10	3.10
	CM_MW_AG1A_WG_2022-07-01_N	2022 07 14	10.1	7.14	0.57	880	-130.3	7.14	470	837	18.0	515	98.0	520	634	< 1.0	< 1.0	0.087	3.97	0.112	8.84	0.0269	0.0078	< 0.0010	0.106	< 0.0010	0.0092	1.92	2.31
	CM_MW_AG1A_WG_2022-10-01_N	2022 10 06	7.8	7.06	0.68	879	-123.9	7.56	500	818	15.2	477	98.6	530	647	< 1.0	< 1.0	0.068	3.78	0.100	7.52	0.0299	< 0.0050	< 0.0010	0.086	< 0.0010	0.0059	1.82	2.16
CM_MW_AG1B	CM_MW_AG1B_WG_2022-02-01_N	2022 02 16	2.8	6.83	6.35	1,065	86.4	7.74	588	947	2.9	490	1.83	609	743	< 2.0	< 2.0	< 0.250	0.58	< 0.100	18.3	< 0.0050	0.258	< 0.0050	< 0.050	0.0032	0.0070	1.06	1.12
	CM_MW_AG1B_WG_2022-05-11_N	2022 05 11	4.6	7.05	10.64	723.6	204.5	7.73	417	703	1.1	418	0.14	406	495	< 2.0	< 2.0	< 0.050	0.22	0.068	13.0	< 0.0050	0.436	< 0.0010	0.186	0.0030	0.0042	0.65	0.74
	CM_MW_AG1B_WG_2022-07-01_N	2022 07 14	11.8	6.88	4.24	1,059	100.6	7.44	616	1,000	1.3	601	0.39	616	751	< 1.0	< 1.0	< 0.050	0.34	0.087	23.5	< 0.0050	0.451	< 0.0010	0.167	0.0061	0.0048	1.05	1.37
	CM_MW_AG1B_WG_2022-10-01_N	2022 10 06	10.6	6.76	4.92	1,097	126	7.63	680	1,040	1.6	592	0.34	709	865	< 1.0	< 1.0	< 0.250	0.73	< 0.100	14.0	< 0.0050	0.113	< 0.0050	< 0.050	0.0020	0.0042	0.99	1.13
	CM_NNP_WG_2022-10-01_N	Duplicate	-	-	-	-	-	7.68	678	1,030	1.8	610	0.41	706	861	< 1.0	< 1.0	< 0.250	0.68	< 0.100	17.3	< 0.0050	0.0715	< 0.0050	< 0.050	0.0035	0.0049	0.86	1.03
	QA/QC RPD%		-	-	-	-	-	1	0	1	*	3	*	0	0	*	*	*	7	*	21	*	45	*	*	*	*	*	*
CM_MW8	CM_MW8_WG_2022-06-02_N	2022 06 02	8.5	7.27	1.9	848	-100.3	7.74	375	792	6.8	514	12.6	317	386	< 1.0	< 1.0	< 0.050	0.59	0.238	155	1.01	0.0072	< 0.0010	1.15	< 0.0010	0.0134	< 0.50	< 0.50
	CM_MW8_WG_2022-07-01_N	2022 08 03	10.9	7.58	5.99	755	-105.6	8.03	335	685	50.0	458	40.8	297	363	< 1.0	< 1.0	< 0.050	0.89	0.261	111	0.938	0.0057	< 0.0010	1.03	< 0.0010	0.0384	0.90	0.70
	CM_NNP2_WG_2022-07-01_N	Duplicate	-	-	-	-	-	8.03	351	656	58.1	438	43.3	280	341	< 1.0	< 1.0	< 0.050	1.32	0.263	112	0.929	0.0071	< 0.0010	1.06	< 0.0010	0.0634	0.98	0.56
	QA/QC RPD%		-	-	-	-	-	0	5	4	15	4	6	6	6	*	*	*	39	1	1	1	*	*	3	*	49	*	*
	CM_MW8_WG_2022-10-01_N	2022 10 27	2.9	7.29	5.77	733.8	-72.3	8.09	283	655	46.6	416	34.4	335	409	< 1.0	< 1.0	< 0.050	1.70	0.264	70.4	0.862	0.0074	0.0063	0.879	< 0.0010	0.0159	1.17	1.16

All terms defined within the body of SNC-Lavalin's report.

< Denotes concentration less than indicated detection limit.

\- Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

* RPDs are not calculated where one or more concentrations are less than five times RDL.

RDL Denotes reported detection limit.

BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH and Temperature. Temperature assumed 10C.

[d] Standard varies with Chloride.

TABLE CM-03: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Inorganics, Nutrients and Organics in Groundwater (CMm)

			Field Parameters					Physical Parameters						Dissolved Inorganics								Nutrients						Organics	
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Field Temperature C	pH (field) pH	Dissolved Oxygen mg/L	Field Conductivity µS/cm	Field ORP mV	pH pH	Hardness mg/L	Conductivity µS/cm	Total Suspended Solids mg/L	Total Dissolved Solids mg/L	Turbidity ntu	Total Alkalinity mg/L	Bicarbonate mg/L	Carbonate mg/L	Hydroxide mg/L	Bromide mg/L	Chloride mg/L	Fluoride mg/L	Sulphate mg/L	Ammonia Nitrogen mg/L	Nitrate Nitrogen mg/L	Nitrite Nitrogen mg/L	Kjeldahl Nitrogen-N mg/L	Ortho-Phosphate mg/L	Phosphorus, Total mg/L	Total Organic Carbon mg/L	Dissolved Organic Carbon mg/L
BC Standard																													
CSR Aquatic Life (AW)[a]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,500	2-3[b]	1,280-4,290[b]	1.31-18.5[c]	400	0.2-2[d]	n/a	n/a	n/a	n/a	n/a
CSR Irrigation Watering (IW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSR Livestock Watering (LW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	1	1,000	n/a	100	10	n/a	n/a	n/a	n/a	n/a
CSR Drinking Water (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	250	1.5	500	n/a	10	1	n/a	n/a	n/a	n/a	n/a
Michel Creek Valley Watershed (+ denotes Study Area 11)																													
CM_MW3-SH	CM_MW3-SH_WG_2022-02-01_N	2022 03 03	2.66	7.30	7.69	341	207.4	7.84	175	333	< 1.0	172	0.11	173	211	< 1.0	< 1.0	< 0.050	1.19	0.080	16.4	0.0068	0.0151	< 0.0010	< 0.050	0.0019	0.0031	< 0.50	< 0.50
	CM_NNP2_WG_2022-02-01_N	Duplicate	-	-	-	-	-	7.88	180	336	< 1.0	179	0.15	174	212	< 1.0	< 1.0	< 0.050	1.16	0.080	16.3	< 0.0050	0.0164	< 0.0010	< 0.050	0.0018	0.0035	< 0.50	< 0.50
	QA/QC RPD%		-	-	-	-	-	1	3	1	*	4	*	1	0	*	*	*	3	*	1	*	*	*	*	*	*	*	*
	CM_MW3-SH_WG_2022-06-01_N	2022 06 01	7.4	7.65	7.18	351.6	169.2	8.28	168	351	< 1.0	212	0.47	171	206	1.1	< 1.0	< 0.050	0.60	0.078	9.76	< 0.0050	0.0136	< 0.0010	< 0.050	< 0.0010	0.0032	1.01	1.34
	CM_NNP2_WG_2022-06-01_N	Duplicate	-	-	-	-	-	8.29	172	351	< 1.0	218	0.10	195	234	2.0	< 1.0	< 0.050	0.88	0.082	10.5	< 0.0050	0.0274	0.0013	0.052	< 0.0010	0.0036	0.99	1.05
	QA/QC RPD%		-	-	-	-	-	0	2	0	*	3	*	13	13	*	*	*	38	*	7	*	*	*	*	*	*	*	*
	CM_MW3-SH_WG_2022-07-01_N	2022 08 04	4.4	7.48	7.68	344.1	110.3	8.01	180	326	< 1.0	195	0.18	185	226	< 1.0	< 1.0	< 0.050	0.79	0.103	18.2	< 0.0050	0.0105	< 0.0010	< 0.050	< 0.0010	0.0038	< 0.50	< 0.50
	CM_MW3-SH_WG_2022-10-01_N	2022 10 13	4.6	7.40	6.72	341.3	43.9	7.97	185	320	< 1.0	185	0.16	172	210	< 1.0	< 1.0	< 0.050	1.22	0.116	18.1	< 0.0050	0.0207	< 0.0010	< 0.050	< 0.0010	0.0030	< 0.50	< 0.50
CM_MW3-DP	CM_MW3-DP_WG_2022-02-01_N	2022 03 03	2.01	8.25	0.98	2,987	208.3	8.29	53.0	2,790	9.3	1,440	4.39	207	253	< 1.0	< 1.0	2.64	*807*	0.371	5.34	0.668	0.0762	< 0.0050	0.715	0.0072	0.0342	0.53	1.52
	CM_MW3-DP_WG_2022-06-01_N	2022 06 01	12.7	7.98	0.41	3,122	-124.8	8.27	49.7	3,040	5.2	1,420	0.43	202	247	< 1.0	< 1.0	2.87	*847*	0.406	< 1.50	0.635	0.0324	0.0097	0.753	0.0093	0.0246	0.53	0.58
	CM_MW3-DP_WG_2022-07-01_N	2022 08 04	7.6	8.24	0.72	2,934	-173.1	8.37	52.8	2,690	2.8	1,500	0.56	235	277	4.7	< 1.0	2.82	*790*	0.457	14.2	0.682	0.0397	< 0.0050	0.624	0.0015	0.0160	< 0.50	< 0.50
	CM_MW3-DP_WG_2022-10-01_N	2022 10 13	10.6	8.28	0.63	2,881	-152.0	8.18	50.2	2,680	3.1	1,340	0.86	208	254	< 1.0	< 1.0	2.77	*806*	0.440	< 1.50	0.671	0.0508	< 0.0050	0.682	0.0031	0.0130	< 0.50	0.98
Blanks																													
Field Blanks																													
CM_MW1-DP	CM_NNT_WG_2022-02-01_N	2022 02 17	-	-	-	-	-	5.61	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
CM_MW6-DP	CM_NNT_WG_2022-05-19_N	2022 05 19	-	-	-	-	-	5.43	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
CM_MW2-SH	CM_NNT_WG_2022-07-01_N	2022 07 13	-	-	-	-	-	5.78	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	0.073	< 0.0010	< 0.0020	< 0.50	< 0.50
CM_MW_AG1B	CM_NNT_WG_2022-10-01_N	2022 10 06	-	-	-	-	-	5.85	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
CM_MW1-DP	CM_NNT2_WG_2022-10-01_N	2022 10 19	-	-	-	-	-	5.24	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
Trip Blanks																													
	CM_TRP_WS_2022-02-01_N	2022 03 03	-	-	-	-	-	5.62	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	0.0225	< 0.0050	< 0.0010	0.135	< 0.0010	< 0.0020	< 0.50	< 0.50
	CM_TRP_WG_2022-06-14_N	2022 06 14	-	-	-	-	-	5.63	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	CM_TRP_WG_2022-07-01_N	2022 08 03	-	-	-	-	-	5.37	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	CM_TRP_WG_2022-10-01_N	2022 10 06	-	-	-	-	-	5.29	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	CM_TRP2_WG_2022-10-01_N	2022 10 26	-	-	-	-	-	5.09	< 0.50	< 2.0	< 1.0	< 10	< 0.10	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	0.053	< 0.0010	< 0.0020	< 0.50	< 0.50

All terms defined within the body of SNC-Lavalin's report.

< Denotes concentration less than indicated detection limit.

- Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

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* RPDs are not calculated where one or more concentrations are less than five times RDL.

RDL Denotes reported detection limit.

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH and Temperature. Temperature assumed 10C.

[d] Standard varies with Chloride.

BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

TABLE CM-04: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Metals in Groundwater (CMm)

			Dissolved Metals																														
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Hardness mg/L	Aluminum µg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Bismuth µg/L	Boron µg/L	Cadmium µg/L	Calcium mg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Lithium µg/L	Magnesium mg/L	Manganese µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Potassium mg/L	Selenium µg/L	Silver µg/L	Sodium mg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Uranium µg/L	Vanadium µg/L	Zinc[f] µg/L
BC Standard																																		
CSR Aquatic Life (AW)[a]			n/a	n/a	90	50	10,000	1.5	n/a	12,000	0.5-4[b]	n/a	10[d]	40	20-90[b]	n/a	40-160[b]	n/a	n/a	n/a	0.25	10,000	250-1,500[b]	n/a	20	0.5-15[b]	n/a	n/a	3	n/a	1,000	85	n/a	75-2,400[b]
CSR Irrigation Watering (IW)			n/a	5,000	n/a	100	n/a	100	n/a	500	5	n/a	5[d]	50	200	5,000	200	2,500	n/a	200	1	10	200	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	10	100	1,000-5,000[c]
CSR Livestock Watering (LW)			n/a	5,000	n/a	25	n/a	100	n/a	5,000	80	1,000	50[d]	1,000	300	n/a	100	5,000	n/a	n/a	2	50	1,000	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	200	100	2,000
CSR Drinking Water (DW)			n/a	9,500	6	10	1,000	8	n/a	5,000	5	n/a	50[d]	20[e]	1,500	6,500	10	8	n/a	1,500	1	250	80	n/a	10	20	200	2,500	n/a	2,500	n/a	20	20	3,000
Health-based Value (HBV)[g]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,200	n/a	n/a	n/a	2,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Corbin Creek Valley Watershed (+ denotes Study Area 11)																																		
CM_MW4-SH	CM_MW4-SH_WG_2022-05-12_N	2022 05 12	32.0	< 1.0	< 0.10	< 0.10	348	< 0.020	< 0.050	371	< 0.0050	8.01	< 0.10	< 0.10	< 0.20	62	< 0.050	403	2.91	3.89	< 0.0050	0.848	< 0.50	1.04	< 0.050	< 0.010	309	887	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
	CM_MW4-SH_WG_2022-07-01_N	2022 07 14	32.9	1.1	< 0.10	< 0.10	327	< 0.020	< 0.050	334	< 0.0050	8.21	< 0.10	< 0.10	< 0.20	53	< 0.050	434	3.01	4.17	< 0.0050	0.984	< 0.50	1.12	< 0.050	< 0.010	334	908	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
	CM_MW4-SH_WG_2022-10-01_N	2022 10 12	37.0	< 1.0	< 0.10	< 0.10	367	< 0.020	< 0.050	364	< 0.0050	9.06	< 0.10	< 0.10	< 0.20	56	< 0.050	484	3.50	4.58	< 0.0050	0.884	< 0.50	1.13	< 0.050	< 0.010	354	993	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
CM_MW4-DP	CM_MW4-DP_WG_2022-05-12_N	2022 05 12	18.3	2.5	< 0.20	< 0.20	325	< 0.040	< 0.100	407	< 0.0100	5.32	< 0.20	< 0.20	< 0.40	32	< 0.100	752	1.23	2.86	< 0.0050	2.96	< 1.00	0.993	< 0.100	< 0.020	488	688	< 0.020	< 0.20	< 0.60	< 0.020	< 1.00	< 2.0
	CM_MW4-DP_WG_2022-07-01_N	2022 07 14	18.4	2.6	< 0.20	< 0.20	307	< 0.040	< 0.100	375	< 0.0100	5.27	< 0.20	< 0.20	< 0.40	42	< 0.100	744	1.27	3.11	< 0.0050	1.03	< 1.00	1.06	< 0.100	< 0.020	515	689	< 0.020	< 0.20	< 0.60	< 0.020	< 1.00	< 2.0
	CM_MW4-DP_WG_2022-10-01_N	2022 10 13	17.8	3.3	< 0.20	< 0.20	278	< 0.040	< 0.100	374	< 0.0100	5.02	< 0.20	< 0.20	< 0.40	30	< 0.100	639	1.29	2.70	< 0.0050	1.09	< 1.00	0.943	< 0.100	< 0.020	432	622	< 0.020	< 0.20	0.89	< 0.020	< 1.00	< 2.0
CM_MW5-SH	CM_MW5-SH_WG_2022-01-06_N	2022 01 10	466	< 1.0	0.26	0.18	55.1	< 0.020	< 0.050	32	0.0293	107	0.29	< 0.10	1.18	< 10	< 0.050	19.6	48.3	0.14	< 0.0050	1.83	1.36	1.72	11.9	< 0.010	14.7	374	0.036	< 0.10	< 0.30	2.77	< 0.50	3.2
	CM_MW5-SH_WG_2022-05-26_N	2022 05 26	472	< 1.0	0.26	0.19	58.2	< 0.020	< 0.050	35	0.0314	110	0.27	< 0.10	0.94	< 10	0.067	19.7	48.0	0.13	< 0.0050	2.58	1.04	1.80	8.58	< 0.010	18.7	344	0.040	< 0.10	< 0.30	2.65	< 0.50	6.6
	CM_MW5-SH_WG_2022-07-01_N	2022 07 27	347	1.1	0.34	0.17	43.9	< 0.020	< 0.050	41	0.0238	82.7	0.30	< 0.10	3.20	< 10	0.087	19.1	34.2	0.18	< 0.0050	2.16	1.53	1.61	6.56	< 0.010	9.29	277	0.034	< 0.10	< 0.30	2.39	< 0.50	13.4
	CM_MW5-SH_WG_2022-10-01_N	2022 10 26	1,050	< 1.0	0.44	0.21	106	< 0.020	< 0.050	79	0.0780	246	0.21	< 0.10	1.21	< 10	< 0.050	40.6	106	0.17	< 0.0050	1.99	5.58	3.14	6.67	< 0.010	40.2	904	0.076	< 0.10	< 0.30	5.96	< 0.50	6.0
CM_MW5-DP	CM_MW5-DP_WG_2022-01-06_N	2022 01 10	274	1.2	< 0.10	< 0.10	1,070	< 0.020	< 0.050	112	0.0084	69.3	< 0.10	< 0.10	0.33	1,020	< 0.050	66.1	24.4	35.5	< 0.0050	0.634	< 0.50	3.12	< 0.050	< 0.010	61.4	1,930	< 0.010	< 0.10	< 0.30	0.053	< 0.50	2.0
	CM_MW5-DP_WG_2022-05-26_N	2022 05 26	292	1.0	< 0.10	< 0.10	1,040	< 0.020	< 0.050	117	< 0.0050	74.0	< 0.10	< 0.10	< 0.20	585	< 0.050	65.6	26.0	59.3	< 0.0050	1.42	1.05	3.45	< 0.050	< 0.010	62.5	1,950	< 0.010	< 0.10	< 0.30	0.099	< 0.50	17.6
	CM_MW5-DP_WG_2022-07-01_N	2022 07 27	281	< 1.0	< 0.10	< 0.10	1,020	< 0.020	< 0.050	125	< 0.0050	69.0	< 0.10	< 0.10	< 0.20	1,160	< 0.050	58.9	26.5	52.9	< 0.0050	0.930	1.05	3.28	0.475	< 0.010	59.0	1,810	< 0.010	< 0.10	< 0.30	0.087	< 0.50	2.8
	CM_MW5-DP_WG_2022-10-01_N	2022 10 26	283	< 1.0	< 0.10	0.10	1,240	< 0.020	< 0.050	118	< 0.0050	71.0	< 0.10	< 0.10	0.91	1,420	< 0.050	56.4	25.6	35.9	< 0.0050	1.02	< 0.50	3.14	0.056	< 0.010	60.5	1,990	< 0.010	< 0.10	< 0.30	0.044	< 0.50	3.3
CM_MW6-SH	CM_MW6-SH_WG_2022-05-19_N	2022 05 19	83.0	1.6	< 0.10	0.70	135	< 0.020	< 0.050	42	< 0.0050	21.7	< 0.10	0.14	< 0.20	233	< 0.050	39.2	7.00	*240*	< 0.0050	5.92	< 0.50	0.297	< 0.050	< 0.010	66.5	220	< 0.010	< 0.10	< 0.30	0.471	< 0.50	< 1.0
	CM_MW6-SH_WG_2022-07-01_N	2022 07 20	77.2	2.8	< 0.10	0.72	134	< 0.020	< 0.050	39	< 0.0050	19.1	< 0.10	0.20	< 0.20	85	< 0.050	42.0	7.16	*250*	< 0.0050	5.54	< 0.50	0.314	0.492	< 0.010	71.6	207	< 0.010	< 0.10	< 0.30	0.456	< 0.50	< 1.0
	CM_MW6-SH_WG_2022-10-01_N	2022 10 20	77.6	4.3	0.15	0.71	132	< 0.020	< 0.050	40	< 0.0050	19.6	< 0.10	0.84	0.20	120	< 0.050	39.2	6.96	*241*	< 0.0050	5.53	3.94	0.293	0.086	< 0.010	67.3	210	< 0.010	0.13	< 0.30	0.445	< 0.50	1.7
CM_MW6-DP	CM_MW6-DP_WG_2022-05-19_N	2022 05 19	34.3	6.7	< 0.10	0.51	325	< 0.020	< 0.050	309	< 0.0050	9.41	< 0.10	< 0.10	< 0.20	233	< 0.050	375	2.63	48.4	< 0.0050	2.64	0.87	1.77	< 0.050	< 0.010	285	1,030	< 0.010	< 0.10	< 0.30	0.682	< 0.50	< 1.0
	CM_NNP_WG_2022-05-19_N	Duplicate	34.8	7.4	< 0.10	0.52	354	< 0.020	< 0.050	299	< 0.0050	9.44	< 0.10	< 0.10	< 0.20	241	< 0.050	379	2.74	50.7	< 0.0050	3.50	0.87	1.81	0.098	< 0.010	300	1,050	< 0.010	< 0.10	< 0.30	0.664	< 0.50	1.1
	QA/QC RPD%		1	10	*	2	9	*	*	3	*	0	*	*	*	3	*	1	4	5	*	28	*	2	*	*	5	2	*	*	*	3	*	*
	CM_MW6-DP_WG_2022-07-01_N	2022 07 21	31.9	4.6	< 0.10	0.87	328	< 0.020	< 0.050	290	< 0.0050	8.71	< 0.10	< 0.10	< 0.20	77	< 0.050	514	2.47	78.9	< 0.0050	1.96	0.57	1.99	1.33	< 0.010	343	1,040	< 0.010	< 0.10	< 0.30	0.334	< 0.50	< 1.0
	CM_MW6-DP_WG_2022-10-01_N	2022 10 20	32.6	7.6	< 0.10	0.73	325	< 0.020	< 0.050	286	< 0.0050	8.79	< 0.10	0.14	0.57	12	< 0.050	469	2.58	70.9	< 0.0050	1.54	2.12	1.89	< 0.050	< 0.010	317	1,020	< 0.010	< 0.10	< 0.30	0.334	< 0.50	3.3
CM_MW10	CM_MW10_WG_2022-02-01_N	2022 03 03	264	1.6	< 0.10	2.14	176	< 0.020	< 0.050	27	0.0132	71.3	< 0.10	0.46	0.38	1,110	< 0.050	12.8	21.0	64.3	< 0.0050	4.86	1.16	0.768	< 0.050	< 0.010	30.9	262	< 0.010	< 0.10	< 0.30	0.881	< 0.50	13.2
	CM_MW10_WG_2022-05-18_N	2022 05 18	252	1.2	< 0.10	1.69	162	< 0.020	< 0.050	28	< 0.0100	69.2	< 0.10	0.38	0.20	464	< 0.050	15.6	19.2	52.9	< 0.0050	6.55	0.52	0.733	< 0.050	< 0.010	41.6	260	< 0.010	< 0.10	< 0.30	2.65	< 0.50	4.8
	CM_MW10_WG_2022-07-01_N	2022 07 20	224	< 1.0	< 0.10	1.87	210	< 0.020	< 0.050	26	< 0.0050	59.4	< 0.10	0.40	0.22	698	< 0.050	16.8	18.3	52.9	< 0.0050	5.56	1.12	0.764	< 0.050	< 0.010	34.6	274	< 0.010	< 0.10	< 0.30	1.93	< 0.50	3.4
	CM_MW10_WG_2022-10-01_N	2022 10 12	247	1.4	< 0.10	1.38	247	< 0.020	< 0.050	28	< 0.0050	65.3	< 0.10	0.37	< 0.20	530	< 0.050	13.0	20.5	51.6	< 0.0050	5.11	1.65	0.763	< 0.050	< 0.010	34.0	283	< 0.010	0.12	< 0.30	1.54	< 0.50	4.0
Michel Creek Valley Watershed (+ denotes Study Area 11)																																		
CM_MW1-OB+	CM_MW1-OB_WG_2022-02-01_N	2022 02 10	473	2.1	0.20	0.12	60.6	< 0.020	< 0.050	31	0.0874	122	0.40	< 0.10	29.2	< 10	0.598	17.3	40.9	0.70	< 0.0050	0.246	1.71	1.61	2.72	< 0.010	53.1	346	0.017	< 0.10	< 0.30	1.20	< 0.50	78.4
	CM_MW1-OB_WG_2022-05-25_N	2022 05 25	560	1.2	0.21	< 0.10	47.0	< 0.020	< 0.050	26	0.127	154	0.64	< 0.10	9.18	< 10	0.218	12.2	42.7	16.2	< 0.0050	0.618	1.71	1.23	2.07	< 0.010	34.9	279	0.021	< 0.10	< 0.30	1.07	< 0.50	52.3
	CM_NNP2_WG_2022-05-25_N	Duplicate	532	3.0	0.18	0.11	43.0	< 0.020	< 0.050	27	0.132	145	0.60	< 0.10	8.79	< 10	0.195	12.8	41.4	15.6	< 0.0050	0.716	1.67	1.31	2.54	< 0.010	37.9	287	0.017	< 0.10	< 0.30	0.976	< 0.50	49.5
	QA/QC RPD%		5	*	*	*	9	*	*	*	4	6	6	*	4	*	*	5	3	4	*	15	*	6	20	*	8	3	*	*	*	9	*	6
	CM_MW1-OB_WG_2022-07-01_N	2022 07 28	444	2.2	0.24	0.14	27.2	< 0.020	< 0.050	43	0.0649	120	1.43	< 0.10	23.4	< 10	0.223	16.2	35.2	0.78	< 0.0050	0.329	1.39	1.60	2.47	< 0.010	40.6	337	0.016	< 0.10	< 0.30	1.10	< 0.50	98.8
	CM_MW1-OB_WG_2022-10-01_N	2022 10 19	447	1.8	0.17	0.16	77.9	< 0.020	< 0.050	37	0.0630	118	1.77	< 0.10	5.12	< 10	0.145	16.4	37.1	8.04	< 0.0050	0.535	1.19	1.47	2.48	< 0.010	39.9	282	0.015	< 0.10	< 0.30	0.951	< 0.50	59.3

All terms defined within the body of SNC-Lavalin's report.

<	Denotes concentration less than indicated detection limit.
-	Denotes analysis not conducted.
n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL	Denotes reported detection limit.

BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH.

[d] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.

[e] Interim BC MoE Regional Background Estimate (Protocol 9 Determining Background Groundwater Quality).

[f] There is no Zinc standard specified for H > 400; therefore, the standard for H=300-<400 is applied as a conservative comparison.

[g] Ramboll calculated health-based values for these two parameters based on toxicity values (tolerable daily intakes; TDI) and drinking water allocation factors (DW AFs), documented in Appendix IV.

TABLE CM-04: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Metals in Groundwater (CMm)

				Dissolved Metals																														
Sample Location	**Sample ID**	**Sample Date (yyyy mm dd)**	**Hardness mg/L**	**Aluminum µg/L**	**Antimony µg/L**	**Arsenic µg/L**	**Barium µg/L**	**Beryllium µg/L**	**Bismuth µg/L**	**Boron µg/L**	**Cadmium µg/L**	**Calcium mg/L**	**Chromium µg/L**	**Cobalt µg/L**	**Copper µg/L**	**Iron µg/L**	**Lead µg/L**	**Lithium µg/L**	**Magnesium mg/L**	**Manganese µg/L**	**Mercury µg/L**	**Molybdenum µg/L**	**Nickel µg/L**	**Potassium mg/L**	**Selenium µg/L**	**Silver µg/L**	**Sodium mg/L**	**Strontium µg/L**	**Thallium µg/L**	**Tin µg/L**	**Titanium µg/L**	**Uranium µg/L**	**Vanadium µg/L**	**Zinc[f] µg/L**
BC Standard																																		
CSR Aquatic Life (AW)[a]			n/a	n/a	90	50	10,000	1.5	n/a	12,000	0.5-4[b]	n/a	10[d]	40	20-90[b]	n/a	40-160[b]	n/a	n/a	n/a	0.25	10,000	250-1,500[b]	n/a	20	0.5-15[b]	n/a	n/a	3	n/a	1,000	85	n/a	75-2,400[b]
CSR Irrigation Watering (IW)			n/a	5,000	n/a	100	n/a	100	n/a	500	5	n/a	5[d]	50	200	5,000	200	2,500	n/a	200	1	10	200	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	10	100	1,000-5,000[c]
CSR Livestock Watering (LW)			n/a	5,000	n/a	25	n/a	100	n/a	5,000	80	1,000	50[d]	1,000	300	n/a	100	5,000	n/a	n/a	2	50	1,000	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	200	100	2,000
CSR Drinking Water (DW)			n/a	9,500	6	10	1,000	8	n/a	5,000	5	n/a	50[d]	20[e]	1,500	6,500	10	8	n/a	1,500	1	250	80	n/a	10	20	200	2,500	n/a	2,500	n/a	20	20	3,000
Health-based Value (HBV)[g]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,200	n/a	n/a	n/a	2,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Michel Creek Valley Watershed (+ denotes Study Area 11)																																		
CM_MW1-SH+	CM_MW1-SH_WG_2022-02-01_N	2022 02 10	83.3	4.2	< 0.10	1.82	643	< 0.020	< 0.050	55	< 0.0200	18.8	< 0.10	< 0.10	< 0.20	91	< 0.050	23.6	8.84	97.3	< 0.0050	*66.4*	0.62	0.788	0.120	< 0.010	214	275	< 0.010	< 0.10	< 0.30	0.520	< 0.50	< 1.0
	CM_MW1-SH_WG_2022-05-25_N	2022 05 25	79.5	4.3	< 0.10	1.64	824	< 0.020	< 0.050	56	< 0.0150	18.4	< 0.10	< 0.10	< 0.20	88	< 0.050	25.6	8.14	86.2	< 0.0050	*70.0*	< 0.50	0.833	< 0.050	< 0.010	234	277	< 0.010	< 0.10	< 0.30	0.464	< 0.50	< 1.0
	CM_MW1-SH_WG_2022-07-01_N	2022 07 28	61.9	5.8	< 0.10	1.78	730	< 0.020	< 0.050	58	0.0155	14.2	< 0.10	< 0.10	< 0.20	80	< 0.050	26.1	6.42	56.5	< 0.0050	*66.1*	< 0.50	0.743	0.839	< 0.010	221	205	< 0.010	< 0.10	< 0.30	0.545	< 0.50	< 1.0
	CM_MW1-SH_WG_2022-10-01_N	2022 10 26	65.4	4.5	< 0.10	1.84	900	< 0.020	< 0.050	46	0.0097	14.4	< 0.10	< 0.10	< 0.20	104	< 0.050	20.0	7.16	63.6	< 0.0050	*58.2*	< 0.50	0.727	0.544	< 0.010	214	218	< 0.010	< 0.10	< 0.30	0.384	< 0.50	1.2
CM_MW1-DP+	CM_MW1-DP_WG_2022-02-01_N	2022 02 17	138	< 5.0	< 0.50	0.97	**11,200**	< 0.100	< 0.250	263	< 0.0250	28.0	< 0.50	< 0.50	< 1.00	< 50	< 0.250	725	16.6	90.6	< 0.0050	4.13	< 2.50	4.82	< 0.250	< 0.050	228	2,410	< 0.050	< 0.50	< 1.50	0.296	< 2.50	6.9
	CM_NNP_WG_2022-02-01_N	Duplicate	138	< 5.0	< 0.50	1.15	**10,600**	< 0.100	< 0.250	252	< 0.0250	27.9	< 0.50	< 0.50	< 1.00	< 50	< 0.250	655	16.7	93.0	< 0.0050	3.97	< 2.50	4.72	< 0.250	< 0.050	220	2,260	< 0.050	< 0.50	< 1.50	0.344	< 2.50	6.8
	QA/QC RPD%		0	*	*	17	6	*	*	4	*	0	*	*	*	*	*	10	1	3	*	4	*	2	*	*	4	6	*	*	*	15	*	1
	CM_MW1-DP_WG_2022-06-14_N	2022 06 14	137	1.9	< 0.10	1.80	**10,400**	< 0.020	< 0.050	189	< 0.0050	28.6	< 0.10	0.41	< 0.20	936	< 0.050	682	15.9	93.5	< 0.0050	5.32	0.55	4.89	1.16	< 0.010	233	2,150	< 0.010	< 0.10	< 0.30	0.306	< 0.50	4.5
	CM_MW1-DP_WG_2022-07-01_N	2022 07 28	150	4.4	0.19	1.81	**10,800**	< 0.020	< 0.050	263	< 0.0050	32.2	0.13	0.19	< 0.20	497	< 0.050	678	16.9	102	< 0.0050	4.74	0.52	4.97	0.392	< 0.010	219	2,300	< 0.010	0.12	< 0.30	0.449	< 0.50	7.4
	CM_MW1-DP_WG_2022-10-01_N	2022 10 19	148	2.8	0.13	1.42	8,500	< 0.020	< 0.050	239	< 0.0050	29.7	0.13	0.14	< 0.20	545	< 0.050	826	17.9	84.8	< 0.0050	3.59	< 0.50	5.12	0.758	< 0.010	222	1,630	< 0.010	< 0.10	< 0.30	0.307	< 0.50	6.3
	CM_NNP2_WG_2022-10-01_N	Duplicate	153	3.5	0.11	1.41	8,440	< 0.020	< 0.050	253	< 0.0050	30.8	0.12	0.14	0.32	496	< 0.050	833	18.4	84.1	< 0.0050	3.49	< 0.50	5.18	0.281	< 0.010	220	1,590	< 0.010	0.11	< 0.30	0.302	< 0.50	6.3
	QA/QC RPD%		3	*	*	1	1	*	*	6	*	4	*	*	*	9	*	1	3	1	*	3	*	1	92	*	1	2	*	*	*	2	*	0
CM_MW2-SH	CM_MW2-SH_WG_2022-02-01_N	2022 02 23	673	< 1.0	< 0.10	< 0.10	99.5	< 0.020	< 0.050	34	0.133	188	0.19	< 0.10	3.73	< 10	< 0.050	23.8	49.5	< 0.10	< 0.0050	0.122	0.62	1.42	0.144	0.043	30.2	570	< 0.010	< 0.10	< 0.30	0.196	< 0.50	22.0
	CM_MW2-SH_WG_2022-05-12_N	2022 05 12	511	1.6	< 0.10	< 0.10	69.8	< 0.020	< 0.050	34	0.101	143	0.26	< 0.10	3.40	< 10	0.213	21.3	37.4	< 0.10	< 0.0050	0.352	0.55	1.27	1.01	< 0.010	17.2	411	< 0.010	< 0.10	< 0.30	0.172	< 0.50	13.2
	CM_MW2-SH_WG_2022-07-01_N	2022 07 13	685	< 1.0	< 0.10	< 0.10	102	< 0.020	< 0.050	37	0.154	191	0.24	< 0.10	1.30	< 10	< 0.050	21.7	50.6	< 0.10	< 0.0050	0.198	0.64	1.56	0.334	< 0.010	24.8	572	0.011	< 0.10	< 0.30	0.217	< 0.50	4.6
	CM_NNP_WG_2022-07-01_N	Duplicate	719	< 1.0	< 0.10	0.10	103	< 0.020	< 0.050	39	0.150	201	0.26	< 0.10	1.31	< 10	< 0.050	22.8	52.8	< 0.10	< 0.0050	0.241	0.72	1.63	0.261	< 0.010	26.1	612	< 0.010	< 0.10	< 0.30	0.227	< 0.50	4.2
	QA/QC RPD%		5	*	*	*	1	*	*	*	3	5	*	*	1	*	*	5	4	*	*	*	*	4	25	*	5	7	*	*	*	5	*	*
	CM_MW2-SH_WG_2022-10-01_N	2022 10 06	732	1.0	< 0.10	< 0.10	116	< 0.020	< 0.050	47	0.167	207	0.21	< 0.10	1.23	< 10	< 0.050	27.4	52.2	< 0.10	< 0.0050	0.140	0.63	1.92	0.092	< 0.010	40.5	601	0.011	< 0.10	< 0.30	0.203	< 0.50	4.6
CM_MW7-SH	CM_MW7-SH_WG_2022-06-02_N	2022 06 02	591	< 1.0	< 0.10	1.38	29.7	< 0.020	< 0.050	18	< 0.0050	154	< 0.10	0.51	< 0.20	2,890	< 0.050	5.8	50.2	*211*	< 0.0050	1.26	< 0.50	1.72	1.72	< 0.010	8.10	488	< 0.010	< 0.10	< 0.30	0.493	< 0.50	< 1.0
	CM_MW7-SH_WG_2022-07-01_N	2022 08 03	435	1.2	< 0.10	1.00	19.7	< 0.020	< 0.050	20	< 0.0050	120	< 0.10	0.12	< 0.20	951	< 0.050	6.6	32.8	126	< 0.0050	0.168	< 0.50	1.39	0.384	< 0.010	11.8	476	< 0.010	0.10	< 0.30	0.496	< 0.50	< 1.0
	CM_MW7-SH_WG_2022-10-01_N	2022 10 27	389	< 1.0	0.56	1.08	30.1	< 0.020	< 0.050	20	< 0.0050	96.7	0.11	0.31	< 0.20	1,250	< 0.050	6.9	35.9	138	< 0.0050	0.982	3.09	1.74	0.419	< 0.010	15.2	455	< 0.010	0.21	< 0.30	0.492	< 0.50	< 1.0
CM_MW7-DP	CM_MW7-DP_WG_2022-02-01_N	2022 02 09	1,400	< 2.0	< 0.20	< 0.20	12.2	< 0.040	< 0.100	54	< 0.0100	338	< 0.20	1.11	< 0.40	651	< 0.100	53.6	134	*494*	< 0.0050	0.119	12.5	2.56	0.109	< 0.020	24.0	847	< 0.020	< 0.20	< 0.60	4.45	< 1.00	8.3
	CM_MW7-DP_WG_2022-06-02_N	2022 06 02	1,360	< 1.0	0.24	0.17	12.7	< 0.020	< 0.050	47	0.0224	324	0.11	1.12	< 0.20	204	< 0.050	48.7	134	*502*	< 0.0050	0.172	11.6	2.50	0.891	< 0.010	24.3	836	< 0.010	0.11	< 0.30	4.26	< 0.50	11.8
	CM_MW7-DP_WG_2022-07-01_N	2022 08 03	1,450	< 2.0	< 0.20	< 0.20	10.6	< 0.040	< 0.100	44	0.0172	374	< 0.20	< 0.20	< 0.40	< 20	< 0.100	56.4	125	58.1	< 0.0050	0.391	9.44	2.26	0.657	< 0.020	20.9	806	< 0.020	< 0.20	< 0.60	4.24	< 1.00	6.2
	CM_MW7-DP_WG_2022-10-01_N	2022 10 27	1,220	< 2.0	< 0.20	< 0.20	13.6	< 0.040	< 0.100	54	0.0489	289	< 0.20	< 0.20	< 0.40	< 20	< 0.100	48.1	121	75.3	< 0.0050	0.113	8.44	2.42	0.776	< 0.020	21.7	760	< 0.020	< 0.20	< 0.60	3.58	< 1.00	14.9
CM_MW_AG1A	CM_MW_AG1A_WG_2022-02-01_N	2022 02 16	459	< 1.0	< 0.10	1.58	1,650	< 0.020	< 0.050	28	< 0.0050	136	< 0.10	0.13	0.63	*6,490*	< 0.050	23.1	29.0	142	< 0.0050	1.10	< 0.50	1.04	< 0.050	< 0.010	8.51	794	< 0.010	< 0.10	< 0.30	0.727	< 0.50	1.4
	CM_MW_AG1A_WG_2022-05-11_N	2022 05 11	491	< 1.0	< 0.10	1.24	1,830	< 0.020	< 0.050	27	< 0.0050	143	< 0.10	< 0.10	< 0.20	*7,400*	< 0.050	22.6	32.5	121	< 0.0050	1.03	< 0.50	1.09	< 0.050	< 0.010	8.56	749	< 0.010	< 0.10	< 0.30	0.529	< 0.50	< 1.0
	CM_MW_AG1A_WG_2022-07-01_N	2022 07 14	470	< 1.0	< 0.10	1.36	1,840	< 0.020	< 0.050	30	< 0.0050	138	< 0.10	< 0.10	< 0.20	*7,370*	< 0.050	26.7	30.6	123	< 0.0050	1.23	< 0.50	1.12	< 0.050	< 0.010	8.98	802	< 0.010	< 0.10	< 0.30	0.620	< 0.50	1.2
	CM_MW_AG1A_WG_2022-10-01_N	2022 10 06	500	< 1.0	< 0.10	1.39	2,140	< 0.020	< 0.050	32	< 0.0050	146	< 0.10	0.10	0.48	*7,220*	< 0.050	24.6	33.0	135	< 0.0050	1.10	< 0.50	1.12	< 0.050	< 0.010	9.07	818	< 0.010	< 0.10	< 0.30	0.600	< 0.50	1.9
CM_MW_AG1B	CM_MW_AG1B_WG_2022-02-01_N	2022 02 16	588	< 1.0	< 0.10	0.22	212	< 0.020	< 0.050	19	0.0511	156	0.36	< 0.10	0.39	< 10	< 0.050	2.6	48.1	0.26	< 0.0050	0.152	0.63	0.868	1.36	< 0.010	2.53	311	0.022	< 0.10	< 0.30	0.575	< 0.50	1.8
	CM_MW_AG1B_WG_2022-05-11_N	2022 05 11	417	< 1.0	< 0.10	0.20	135	< 0.020	< 0.050	17	0.0388	105	0.32	< 0.10	0.26	< 10	< 0.050	1.8	37.6	< 0.10	< 0.0050	0.227	< 0.50	0.920	0.554	< 0.020	2.18	230	0.058	< 0.10	< 0.30	0.451	< 0.50	< 1.0
	CM_MW_AG1B_WG_2022-07-01_N	2022 07 14	616	< 1.0	< 0.10	0.31	245	< 0.020	< 0.050	30	0.0582	163	0.39	< 0.10	0.25	< 10	< 0.050	4.9	50.7	0.38	< 0.0050	0.190	0.73	1.22	1.60	< 0.010	2.57	369	0.042	< 0.10	< 0.30	0.685	< 0.50	1.4
	CM_MW_AG1B_WG_2022-10-01_N	2022 10 06	680	1.6	< 0.10	0.34	301	< 0.020	< 0.050	30	0.0692	182	0.37	< 0.10	1.89	< 10	< 0.050	3.7	54.9	0.39	< 0.0050	0.216	0.82	1.29	0.189	< 0.010	2.66	386	0.036	< 0.10	< 0.30	0.713	< 0.50	1.9
	CM_NNP_WG_2022-10-01_N	Duplicate	678	< 1.0	< 0.10	0.33	292	< 0.020	< 0.050	30	0.0627	181	0.33	< 0.10	0.26	< 10	< 0.050	3.6	55.0	0.32	< 0.0050	0.182	0.90	1.33	0.218	< 0.010	2.74	385	0.036	< 0.10	< 0.30	0.700	0.50	< 1.0
	QA/QC RPD%		0	*	*	*	3	*	*	*	10	1	*	*	*	*	*	*	0	*	*	*	*	3	*	*	3	0	*	*	*	2	*	*
CM_MW8	CM_MW8_WG_2022-06-02_N	2022 06 02	375	1.4	< 0.10	0.10	55.8	< 0.020	< 0.050	229	< 0.0050	98.9	< 0.10	< 0.10	< 0.20	940	< 0.050	44.8	31.1	56.2	< 0.0050	2.52	< 0.50	2.63	0.999	< 0.010	30.5	5,850	< 0.010	< 0.10	< 0.30	0.062	< 0.50	< 1.0
	CM_MW8_WG_2022-07-01_N	2022 08 03	335	1.3	< 0.10	0.22	76.5	< 0.020	< 0.050	261	< 0.0050	96.7	< 0.10	0.10	< 0.20	725	< 0.050	66.7	22.8	121	< 0.0050	0.378	< 0.50	2.41	0.082	< 0.010	36.9	6,110	< 0.010	< 0.10	< 0.30	0.296	< 0.50	< 1.0
	CM_NNP2_WG_2022-07-01_N	Duplicate	351	1.2	< 0.10	0.18	72.2	< 0.020	< 0.050	260	< 0.0050	101	< 0.10	< 0.10	< 0.20	948	< 0.050	64.1	24.0	107	< 0.0050	0.469	< 0.50	2.39	0.076	< 0.010	33.9	6,150	< 0.010	< 0.10	< 0.30	0.257	< 0.50	< 1.0
	QA/QC RPD%		5	*	*	*	6	*	*	0	*	4	*	*	*	27	*	4	5	12	*	21	*	1	*	*	8	1	*	*	*	14	*	*
	CM_MW8_WG_2022-10-01_N	2022 10 27	283	2.0	0.12	0.32	98.4	< 0.020	< 0.050	273	< 0.0050	74.9	0.27	< 0.10	< 0.20	1,030	< 0.050	63.3	23.4	139	< 0.0050	0.278	< 0.50	2.95	0.706	< 0.010	46.8	6,130	< 0.010	< 0.10	< 0.30	0.325	< 0.50	< 1.0

All terms defined within the body of SNC-Lavalin's report.

<	Denotes concentration less than indicated detection limit.
-	Denotes analysis not conducted.
n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL	Denotes reported detection limit.

BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH.

[d] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.

[e] Interim BC MoE Regional Background Estimate (Protocol 9 Determining Background Groundwater Quality).

[f] There is no Zinc standard specified for H > 400; therefore, the standard for H=300-<400 is applied as a conservative comparison.

[g] Ramboll calculated health-based values for these two parameters based on toxicity values (tolerable daily intakes; TDI) and drinking water allocation factors (DW AFs), documented in Appendix IV.

SNC·LAVALIN

TABLE CM-04: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Metals in Groundwater (CMm)

				Dissolved Metals																														
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Hardness mg/L	Aluminum µg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Bismuth µg/L	Boron µg/L	Cadmium µg/L	Calcium mg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Lithium µg/L	Magnesium mg/L	Manganese µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Potassium mg/L	Selenium µg/L	Silver µg/L	Sodium mg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Uranium µg/L	Vanadium µg/L	Zinc[f] µg/L
BC Standard																																		
CSR Aquatic Life (AW)[a]			n/a	n/a	90	50	10,000	1.5	n/a	12,000	0.5-4[b]	n/a	10[d]	40	20-90[b]	n/a	40-160[b]	n/a	n/a	n/a	0.25	10,000	250-1,500[b]	n/a	20	0.5-15[b]	n/a	n/a	3	n/a	1,000	85	n/a	75-2,400[b]
CSR Irrigation Watering (IW)			n/a	5,000	n/a	100	n/a	100	n/a	500	5	n/a	5[d]	50	200	5,000	200	2,500	n/a	200	1	10	200	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	10	100	1,000-5,000[c]
CSR Livestock Watering (LW)			n/a	5,000	n/a	25	n/a	100	n/a	5,000	80	1,000	50[d]	1,000	300	n/a	100	5,000	n/a	n/a	2	50	1,000	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	200	100	2,000
CSR Drinking Water (DW)			n/a	9,500	6	10	1,000	8	n/a	5,000	5	n/a	50[d]	20[e]	1,500	6,500	10	8	n/a	1,500	1	250	80	n/a	10	20	200	2,500	n/a	2,500	n/a	20	20	3,000
Health-based Value (HBV)[g]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,200	n/a	n/a	n/a	2,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Michel Creek Valley Watershed (+ denotes Study Area 11)																																		
CM_MW3-SH	CM_MW3-SH_WG_2022-02-01_N	2022 03 03	175	1.6	< 0.10	0.11	82.8	< 0.020	< 0.050	20	0.0076	49.7	0.26	< 0.10	0.43	< 10	< 0.050	7.3	12.4	4.36	< 0.0050	0.796	< 0.50	0.684	0.240	< 0.010	4.06	274	< 0.010	< 0.10	< 0.30	0.188	< 0.50	3.1
	CM_NNP2_WG_2022-02-01_N	Duplicate	180	1.9	< 0.10	< 0.10	85.0	< 0.020	< 0.050	20	0.0129	51.5	0.24	< 0.10	0.38	< 10	< 0.050	7.4	12.5	4.60	< 0.0050	0.758	0.56	0.685	0.305	< 0.010	4.12	270	< 0.010	< 0.10	< 0.30	0.189	< 0.50	2.8
	QA/QC RPD%		3	*	*	*	3	*	*	*	*	4	*	*	*	*	*	1	1	5	*	5	*	0	*	*	1	1	*	*	*	1	*	*
	CM_MW3-SH_WG_2022-06-01_N	2022 06 01	168	1.4	< 0.10	0.11	86.1	< 0.020	< 0.050	19	0.0211	47.6	0.29	< 0.10	3.30	< 10	0.190	6.8	12.0	0.42	< 0.0050	0.944	0.70	0.654	0.242	< 0.010	3.68	280	< 0.010	< 0.10	< 0.30	0.190	< 0.50	11.8
	CM_NNP2_WG_2022-06-01_N	Duplicate	172	1.6	< 0.10	0.11	87.0	< 0.020	< 0.050	20	0.0093	48.5	0.29	< 0.10	1.50	< 10	0.107	8.0	12.4	0.33	< 0.0050	0.987	0.84	0.673	0.243	< 0.010	4.01	284	< 0.010	< 0.10	< 0.30	0.190	< 0.50	4.4
	QA/QC RPD%		2	*	*	*	1	*	*	*	*	2	*	*	75	*	*	16	3	*	*	4	*	3	*	*	9	1	*	*	*	0	*	*
	CM_MW3-SH_WG_2022-07-01_N	2022 08 04	180	1.2	< 0.10	0.12	86.4	< 0.020	< 0.050	25	0.0070	51.4	0.23	< 0.10	0.76	< 10	< 0.050	8.4	12.6	0.48	< 0.0050	0.981	< 0.50	0.702	0.277	< 0.010	3.83	279	< 0.010	< 0.10	< 0.30	0.211	< 0.50	3.4
	CM_MW3-SH_WG_2022-10-01_N	2022 10 13	185	1.8	< 0.10	0.14	90.7	< 0.020	< 0.050	28	0.0066	52.5	0.22	< 0.10	1.15	< 10	0.054	7.4	13.2	9.99	< 0.0050	0.856	< 0.50	0.719	0.322	< 0.010	3.71	280	< 0.010	< 0.10	< 0.30	0.200	< 0.50	8.7
CM_MW3-DP	CM_MW3-DP_WG_2022-02-01_N	2022 03 03	53.0	10.6	< 0.50	0.78	918	< 0.100	< 0.250	*542*	< 0.0250	12.7	< 0.50	< 0.50	< 1.00	< 50	< 0.250	1,380	5.16	32.1	< 0.0050	1.75	< 2.50	2.52	< 0.250	< 0.050	616	1,160	< 0.050	< 0.50	< 1.50	0.324	< 2.50	< 5.0
	CM_MW3-DP_WG_2022-06-01_N	2022 06 01	49.7	6.4	< 0.20	2.26	810	< 0.040	< 0.100	*509*	< 0.0100	12.3	< 0.20	< 0.20	0.47	68	< 0.100	1,370	4.62	63.8	< 0.0050	*10.8*	1.21	2.56	< 0.100	< 0.020	615	1,270	< 0.020	< 0.20	< 0.60	1.18	< 1.00	4.0
	CM_MW3-DP_WG_2022-07-01_N	2022 08 04	52.8	7.1	< 0.20	0.69	834	< 0.040	< 0.100	*544*	< 0.0100	12.8	< 0.20	< 0.20	< 0.40	53	< 0.100	1,760	5.06	34.6	< 0.0050	2.44	< 1.00	2.42	< 0.100	< 0.020	622	1,180	< 0.020	< 0.20	< 0.60	0.368	< 1.00	2.1
	CM_MW3-DP_WG_2022-10-01_N	2022 10 13	50.2	6.3	< 0.20	0.66	778	< 0.040	< 0.100	*561*	< 0.0100	12.0	< 0.20	< 0.20	< 0.40	24	< 0.100	1,290	4.92	28.1	< 0.0050	2.31	< 1.00	2.20	< 0.100	< 0.020	507	1,090	< 0.020	< 0.20	< 0.60	0.336	< 1.00	< 2.0
Blanks																																		
Field Blanks																																		
CM_MW1-DP	CM_NNT_WG_2022-02-01_N	2022 02 17	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
CM_MW6-DP	CM_NNT_WG_2022-05-19_N	2022 05 19	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
CM_MW2-SH	CM_NNT_WG_2022-07-01_N	2022 07 13	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
CM_MW_AG1B	CM_NNT_WG_2022-10-01_N	2022 10 06	< 0.50	< 1.0	< 0.10	< 0.10	0.22	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	0.95	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	0.175	< 0.20	< 0.010	0.11	< 0.30	< 0.010	< 0.50	< 1.0
CM_MW1-DP	CM_NNT2_WG_2022-10-01_N	2022 10 19	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
Trip Blanks																																		
	CM_TRP_WS_2022-02-01_N	2022 03 03	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	3.98	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
	CM_TRP_WG_2022-06-14_N	2022 06 14	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
	CM_TRP_WG_2022-07-01_N	2022 08 03	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
	CM_TRP_WG_2022-10-01_N	2022 10 06	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0
	CM_TRP2_WG_2022-10-01_N	2022 10 26	< 0.50	< 1.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.20	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.010	< 0.050	< 0.20	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 1.0

All terms defined within the body of SNC-Lavalin's report.

<	Denotes concentration less than indicated detection limit.
-	Denotes analysis not conducted.
n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL	Denotes reported detection limit.

BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH.

[d] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.

[e] Interim BC MoE Regional Background Estimate (Protocol 9 Determining Background Groundwater Quality).

[f] There is no Zinc standard specified for H > 400; therefore, the standard for H=300-<400 is applied as a conservative comparison.

[g] Ramboll calculated health-based values for these two parameters based on toxicity values (tolerable daily intakes; TDI) and drinking water allocation factors (DW AFs), documented in Appendix IV.

TABLE CM-05: Summary of Analytical Results Compared to Secondary Screening Criteria for Selenium (CMm)

Sample Location	Sample ID	Sample Date (yyyy mm dd)	SPO/Compliance Point	Selenium µg/L
Groundwater Quality Benchmarks				
SPO				n/a
Compliance Point			Michel Creek [CM_MC2 (E258937)]	19
Corbin Creek Valley Watershed (+ denotes Study Area 11)				
CM_MW5-SH	CM_MW5-SH_WG_2022-01-06_N	2022 01 10	CM_MC2 (E258937)	11.9

All terms defined within the body of SNC-Lavalin's report.
n/a Denotes no applicable standard/guideline.

SHADED	Concentration greater than SPO by Area/Compliance Point by Area

TABLE CM-06: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Inorganics, Nutrients and Organics in Groundwater (CMm) - Corbin Dam Spillway

			Field Parameters					Physical Parameters							Dissolved Inorganics								Nutrients						Organics	
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Field Temperature	pH (field)	Dissolved Oxygen	Field Conductivity	Field ORP	pH	Hardness	Conductivity	Total Suspended Solids	Total Dissolved Solids	Turbidity	Oxidation Reduction Potential	Total Alkalinity	Bicarbonate	Carbonate	Hydroxide	Bromide	Chloride	Fluoride	Sulphate	Ammonia Nitrogen	Nitrate Nitrogen	Nitrite Nitrogen	Kjeldahl Nitrogen-N	Ortho-Phosphate	Phosphorus, Total	Total Organic Carbon	Dissolved Organic Carbon
			C	pH	mg/L	µS/cm	mV	pH	mg/L	µS/cm	mg/L	mg/L	ntu	mV	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
BC Standard																														
CSR Aquatic Life (AW)[a]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,500	3[b]	4,290[b]	11.3-18.5[c]	400	0.4-2[d]	n/a	n/a	n/a	n/a	n/a
CSR Irrigation Watering (IW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSR Livestock Watering (LW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	1	1,000	n/a	100	10	n/a	n/a	n/a	n/a	n/a
CSR Drinking Water (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	250	1.5	500	n/a	10	1	n/a	n/a	n/a	n/a	n/a
CM_MW5-DP[e]	CM_MW5-DP_WG_2021-10-11_N	2021 09 09	11.5	7.72	0.90	763	-100	7.99	280	746	1.7	431	18.9	498	423	516	< 1.0	< 1.0	< 0.050	12.4	0.288	1.13	0.575	0.0330	< 0.0010	0.082	< 0.0010	0.0041	0.60	2.78
	CM_MW5-DP_WG_2021-09-27_N	2021 09 27	9.09	6.94	0.72	765	-109	7.53	289	708	2.6	412	16.4	453	427	521	< 1.0	< 1.0	< 0.050	11.4	0.279	0.79	0.637	< 0.0050	< 0.0010	0.670	< 0.0010	< 0.0020	0.64	0.94
	CM_MW5-DP_WG_2021-10-07_N	2021 10 07	8.05	7.42	1.26	764	-105	7.71	294	725	2.4	416	15.1	464	436	532	< 1.0	< 1.0	< 0.050	11.6	0.271	1.03	0.652	< 0.0050	< 0.0010	0.680	< 0.0010	0.0024	< 0.50	0.64
	CM_MW5-DP_WG_2021-11-22_N	2021 11 22	6.7	6.90	0.90	751	-109	7.84	296	747	3.5	419	15.9	449	448	546	< 1.0	< 1.0	< 0.050	11.9	0.314	0.57	0.620	0.0050	< 0.0010	0.659	< 0.0010	< 0.0020	< 0.50	< 0.50
	CM_MW5-DP_WG_2021-12-16_N	2021 12 16	4.3	7.46	0.45	750	-100	8.09	300	725	5.0	402	14.3	276	420	512	< 1.0	< 1.0	< 0.050	11.5	0.256	0.57	0.621	< 0.0050	< 0.0010	0.593	< 0.0010	0.0055	0.66	0.62
	CM_MW5-DP_WG_2022-01-06_N	2022 01 10	3.81	7.30	0.46	759	-111.1	7.73	274	743	12.7	436	18.9	460	448	546	< 1.0	< 1.0	0.051	11.4	0.250	0.66	0.621	< 0.0050	< 0.0010	0.653	< 0.0010	0.0048	0.87	0.84
CM_MW5-SH[e]	CM_MW5-SH_WG_2021-10-11_N	2021 09 09	-	7.44	2.68	1,061	71.3	7.83	573	1,050	< 1.0	761	0.71	480	251	307	< 1.0	< 1.0	< 0.050	4.96	0.176	353	0.0054	1.48	< 0.0010	0.642	0.0055	0.0054	0.70	0.82
	CM_MW5-SH_WG_2021-09-27_N	2021 09 27	8.0	7.27	2.27	1,435	134.5	7.35	556	1,000	< 1.0	754	< 0.10	466	264	321	< 1.0	< 1.0	< 0.250	3.90	0.119	329	< 0.0050	2.19	0.0164	0.118	0.0043	0.0050	0.82	0.83
	CM_MW5-SH_WG_2021-10-07_N	2021 10 07	7.99	7.47	2.40	1,080	122	7.50	597	1,060	< 1.0	760	0.16	460	270	329	< 1.0	< 1.0	< 0.250	3.82	0.172	368	< 0.0050	1.66	< 0.0050	0.152	0.0048	0.0039	< 0.50	0.61
	CM_MW5-SH_WG_2021-11-22_N	2021 11 22	7.35	6.67	3.54	1,100	156	7.68	625	1,080	1.1	807	0.11	459	288	351	< 1.0	< 1.0	< 0.250	10.2	0.196	364	< 0.0050	1.86	< 0.0050	0.212	0.0053	0.0031	0.56	0.62
	CM_MW5-SH_WG_2021-12-16_N	2021 12 16	5.56	6.81	5.03	866	147	8.09	463	867	1.6	611	0.15	424	238	290	< 1.0	< 1.0	< 0.050	4.43	0.144	253	0.0091	1.24	< 0.0010	0.184	0.0015	0.0037	0.76	0.78
	CM_MW5-SH_WG_2022-01-06_N	2022 01 10	5.0	7.34	5.65	955	227.1	7.60	466	935	< 1.0	645	< 0.10	423	246	300	< 1.0	< 1.0	< 0.050	2.18	0.146	317	< 0.0050	1.31	< 0.0010	0.134	0.0029	0.0040	0.84	1.31

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- Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

* RPDs are not calculated where one or more concentrations are less than five times RDL.

RDL Denotes reported detection limit.

BOLD	Concentration greater than CSR Aquatic Life (AW) FR standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH and Temperature. Temperature assumed 10C.

[d] Standard varies with Chloride.

[e] In addition to quarterly SSGMP and RGMP sampling and monitoring, additional samples were collected from CM_MW5-SH/DP to fulfill monitoring requirements associated with the Corbin Dam Spillway project. It should be noted the results from Corbin Dam Spillway Project samples stayed within 5% of historical values (which was a requirement of monitoring for Corbin Dam Spillway Project Water Quality Monitoring Plan.

TABLE CM-07: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Metals in Groundwater (CMm) - Corbin Dam Spillway

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Hardness mg/L	Dissolved Metals																														
				Aluminum µg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Bismuth µg/L	Boron µg/L	Cadmium µg/L	Calcium mg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Lithium µg/L	Magnesium mg/L	Manganese µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Potassium mg/L	Selenium µg/L	Silver µg/L	Sodium mg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Uranium µg/L	Vanadium µg/L	Zinc[f] µg/L
BC Standard																																		
CSR Aquatic Life (AW)[a]			n/a	n/a	90	50	10,000	1.5	n/a	12,000	4[b]	n/a	10[d]	40	90[b]	n/a	110-160[b]	n/a	n/a	n/a	0.25	10,000	1,500[b]	n/a	20	15[b]	n/a	n/a	3	n/a	1,000	85	n/a	1,650-2,400[b]
CSR Irrigation Watering (IW)			n/a	5,000	n/a	100	n/a	100	n/a	500	5	n/a	5[d]	50	200	5,000	200	2,500	n/a	200	1	10	200	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	10	100	2,000-5,000[c]
CSR Livestock Watering (LW)			n/a	5,000	n/a	25	n/a	100	n/a	5,000	80	1,000	50[d]	1,000	300	n/a	100	5,000	n/a	n/a	2	50	1,000	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	200	100	2,000
CSR Drinking Water (DW)			n/a	9,500	6	10	1,000	8	n/a	5,000	5	n/a	50[d]	20[e]	1,500	6,500	10	8	n/a	1,500	1	250	80	n/a	10	20	200	2,500	n/a	2,500	n/a	20	20	3,000
Health-based Value (HBV)[g]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,200	n/a	n/a	n/a	2,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CM_MW5-DP[h]	CM_MW5-DP_WG_2021-10-11_N	2021 09 09	280	< 1.0	< 0.10	< 0.10	1,170	< 0.020	< 0.050	113	< 0.0050	71.2	< 0.10	< 0.10	< 0.20	1,020	< 0.050	65.7	24.9	32.9	< 0.0050	0.722	< 0.50	3.23	< 0.050	< 0.010	59.6	1,890	< 0.010	< 0.10	< 0.30	0.062	< 0.50	1.6
	CM_MW5-DP_WG_2021-09-27_N	2021 09 27	289	< 1.0	< 0.10	< 0.10	1,090	< 0.020	< 0.050	113	< 0.0050	75.1	< 0.10	< 0.10	< 0.20	1,130	< 0.050	68.8	24.6	37.4	< 0.0050	0.752	< 0.50	3.14	0.097	< 0.010	61.6	1,860	< 0.010	< 0.10	< 0.30	0.066	< 0.50	1.4
	CM_MW5-DP_WG_2021-10-07_N	2021 10 07	294	1.2	< 0.10	< 0.10	1,180	< 0.020	< 0.050	118	< 0.0050	74.6	< 0.10	< 0.10	0.40	1,210	< 0.050	67.7	26.1	44.0	< 0.0050	0.852	0.56	3.42	< 0.050	< 0.010	66.2	1,950	< 0.010	< 0.10	< 0.30	0.077	< 0.50	5.1
	CM_MW5-DP_WG_2021-11-22_N	2021 11 22	296	< 1.0	< 0.10	< 0.10	1,060	< 0.020	< 0.050	127	< 0.0050	77.3	< 0.10	< 0.10	< 0.20	1,200	< 0.050	67.9	25.0	41.2	< 0.0050	0.610	< 0.50	3.24	0.119	< 0.010	64.3	1,880	< 0.010	< 0.10	< 0.30	0.059	< 0.50	2.2
	CM_MW5-DP_WG_2021-12-16_N	2021 12 16	300	< 1.0	< 0.10	< 0.10	1,210	< 0.020	< 0.050	115	< 0.0050	78.0	0.10	< 0.10	< 0.20	1,130	< 0.050	67.2	25.5	38.2	< 0.0050	0.605	0.53	3.41	0.109	< 0.010	65.2	1,930	< 0.010	< 0.10	< 0.30	0.069	< 0.50	6.7
	CM_MW5-DP_WG_2022-01-06_N	2022 01 10	274	1.2	< 0.10	< 0.10	1,070	< 0.020	< 0.050	112	0.0084	69.3	< 0.10	< 0.10	0.33	1,020	< 0.050	66.1	24.4	35.5	< 0.0050	0.634	< 0.50	3.12	< 0.050	< 0.010	61.4	1,930	< 0.010	< 0.10	< 0.30	0.053	< 0.50	2.0
CM_MW5-SH[h]	CM_MW5-SH_WG_2021-10-11_N	2021 09 09	573	< 1.0	0.30	0.19	68.4	< 0.020	< 0.050	49	0.0333	135	0.29	< 0.10	0.91	< 10	0.050	27.4	57.2	< 0.10	< 0.0050	1.72	1.53	2.11	9.17	< 0.010	15.3	422	0.044	< 0.10	< 0.30	3.08	< 0.50	2.4
	CM_MW5-SH_WG_2021-09-27_N	2021 09 27	556	1.2	0.30	0.19	67.9	< 0.020	< 0.050	46	0.0365	129	0.26	< 0.10	1.35	< 10	0.173	25.0	56.9	< 0.10	< 0.0050	1.76	1.29	2.12	9.05	< 0.010	16.9	412	0.051	< 0.10	< 0.30	2.97	< 0.50	7.3
	CM_MW5-SH_WG_2021-10-07_N	2021 10 07	597	< 1.0	0.29	0.24	76.9	< 0.020	< 0.050	46	0.0374	138	0.27	< 0.10	0.49	< 10	< 0.050	27.0	61.2	< 0.10	< 0.0050	1.75	1.45	2.27	10.6	< 0.010	19.2	447	0.048	< 0.10	< 0.30	3.15	< 0.50	2.1
	CM_MW5-SH_WG_2021-11-22_N	2021 11 22	625	< 1.0	0.25	0.25	78.0	< 0.020	< 0.050	44	0.0392	146	0.25	< 0.10	1.34	< 10	< 0.050	25.0	63.2	< 0.10	< 0.0050	1.32	1.29	2.10	13.6	< 0.010	17.6	448	0.047	< 0.10	< 0.30	2.76	< 0.50	5.0
	CM_MW5-SH_WG_2021-12-16_N	2021 12 16	463	< 1.0	0.28	0.21	61.0	< 0.020	< 0.050	35	0.0323	112	0.24	< 0.10	0.46	< 10	< 0.050	19.9	44.6	< 0.10	< 0.0050	1.76	1.26	1.86	13.0	< 0.010	14.4	357	0.043	< 0.10	< 0.30	2.67	< 0.50	1.5
	CM_MW5-SH_WG_2022-01-06_N	2022 01 10	466	< 1.0	0.26	0.18	55.1	< 0.020	< 0.050	32	0.0293	107	0.29	< 0.10	1.18	< 10	< 0.050	19.6	48.3	0.14	< 0.0050	1.83	1.36	1.72	11.9	< 0.010	14.7	374	0.036	< 0.10	< 0.30	2.77	< 0.50	3.2

All terms defined within the body of SNC-Lavalin's report.

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n/a	Denotes no applicable standard/guideline.
QA/QC RPD	Denotes quality assurance/quality control relative percent difference
*	RPDs are not calculated where one or more concentrations are less than five times RDL.
RDL	Denotes reported detection limit.

BOLD	Concentration greater than CSR Aquatic Life (AW) FR standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH.

[d] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.

[e] Interim BC MoE Regional Background Estimate (Protocol 9 Determining Background Groundwater Quality).

[f] There is no Zinc standard specified for H > 400; therefore, the standard for H=300-<400 is applied as a conservative comparison.

[g] Ramboll calculated health-based values for these two parameters based on toxicity values (tolerable daily intakes; TDI) and drinking water allocation factors (DW AFs), documented in Appendix IV.

[h] In addition to quarterly SSGMP and RGMP sampling and monitoring, additional samples were collected from CM_MW5-SH/DP to fulfill monitoring requirements associated with the Corbin Dam Spillway project. It should be noted the results from Corbin Dam Spillway Project samples stayed within 5% of historical values (which was a requirement of monitoring for Corbin Dam Spillway Project Water Quality Monitoring Plan.

TABLE CM-08: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Inorganics, Nutrients and Organics in Groundwater (CMm) - Pit 34

			Field Parameters					Physical Parameters						Dissolved Inorganics								Nutrients						Organics	
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Field Temperature C	pH (field) pH	Dissolved Oxygen mg/L	Field Conductivity µS/cm	Field ORP mV	pH pH	Hardness mg/L	Conductivity µS/cm	Total Suspended Solids mg/L	Total Dissolved Solids mg/L	Turbidity ntu	Total Alkalinity mg/L	Bicarbonate mg/L	Carbonate mg/L	Hydroxide mg/L	Bromide mg/L	Chloride mg/L	Fluoride mg/L	Sulphate mg/L	Ammonia Nitrogen mg/L	Nitrate Nitrogen mg/L	Nitrite Nitrogen mg/L	Kjeldahl Nitrogen-N mg/L	Ortho-Phosphate mg/L	Phosphorus, Total mg/L	Total Organic Carbon mg/L	Dissolved Organic Carbon mg/L
BC Standard																													
CSR Aquatic Life (AW)[a]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,500	3[b]	4,290[b]	11.3-18.5[c]	400	0.2-0.8[d]	n/a	n/a	n/a	n/a	n/a
CSR Irrigation Watering (IW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSR Livestock Watering (LW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	1	1,000	n/a	100	10	n/a	n/a	n/a	n/a	n/a
CSR Drinking Water (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	250	1.5	500	n/a	10	1	n/a	n/a	n/a	n/a	n/a
CM_MW7-DP	CM_MW7-DP_WG_2022-11-24_N	2022 11 24	5.80	6.99	1.55	2,163.2	27.7	7.83	1,290	2,000	2.2	1,640	5.58	381	464	< 1.0	< 1.0	< 0.250	1.42	0.110	1,040	0.0276	0.0457	< 0.0050	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	CM_MW7-DP_WG_2022-12-06_N	2022 12 06	5.41	6.97	3.54	2,010.4	18.7	7.90	1,380	1,960	2.8	1,660	4.49	367	447	< 1.0	< 1.0	< 0.250	1.24	0.104	1,020	0.0277	< 0.0250	< 0.0050	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
	CM_MW7-DP_WG_2022-12-19_N	2022 12 14	5.71	6.99	2.24	2,104	18.0	8.15	1,400	1,950	< 1.0	1,720	5.17	372	454	< 1.0	< 1.0	< 0.250	1.17	< 0.100	987	0.0336	< 0.0250	0.0053	< 0.050	< 0.0010	< 0.0020	< 0.50	< 0.50
CM_MW7-SH	CM_MW7-SH_WG_2022-11-24_N	2022 11 24	5.98	7.08	2.85	1,741.2	-12.0	7.85	1,100	1,660	4.3	1,470	13.2	352	429	< 1.0	< 1.0	< 0.250	7.28	0.144	787	0.0716	0.225	< 0.0050	0.098	< 0.0010	< 0.0020	0.85	1.03
	CM_MW7-SH_WG_2022-12-05_N	2022 12 05	6.49	7.02	2.33	1,654.2	-26.0	7.65	1,160	1,660	4.3	1,500	7.79	337	411	< 1.0	< 1.0	< 0.250	7.09	0.152	794	0.0715	< 0.0250	< 0.0050	0.086	< 0.0010	0.0038	1.09	1.04
	CM_MW7-SH_WG_2022-12-19_N	2022 12 14	5.99	7.08	2.21	1,794	-22.8	8.16	1,180	1,670	3.2	1,510	12.4	353	430	< 1.0	< 1.0	< 0.250	6.72	0.127	800	0.0720	< 0.0250	< 0.0050	0.106	< 0.0010	< 0.0020	1.06	0.96
CM_MW8	CM_MW8_WG_2022-12-06_N	2022 12 06	2.99	7.76	7.49	636.26	-53.1	8.08	258	626	19.4	416	18.1	322	393	< 1.0	< 1.0	< 0.050	2.56	0.295	48.4	0.152	< 0.0050	< 0.0010	0.303	< 0.0010	0.0241	8.15	7.32
	CM_MW8_WG_2022-12-19_N	2022 12 13	4.68	7.99	6.21	654.4	-88.9	7.92	311	568	11.1	472	20.2	325	396	< 1.0	< 1.0	< 0.050	0.97	0.258	102	1.01	< 0.0050	0.0012	0.936	< 0.0010	0.0197	1.08	< 0.50

All terms defined within the body of SNC-Lavalin's report.

< Denotes concentration less than indicated detection limit.

- Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

* RPDs are not calculated where one or more concentrations are less than five times RDL.

RDL Denotes reported detection limit.

BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH and Temperature. Temperature assumed 10C.

[d] Standard varies with Chloride.

TABLE CM-09: Summary of Analytical Results Compared to Primary Screening Criteria for Dissolved Metals in Groundwater (CMm) - 34 Pit

			Dissolved Metals																														
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Hardness mg/L	Aluminum µg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Bismuth µg/L	Boron µg/L	Cadmium µg/L	Calcium mg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Lithium µg/L	Magnesium mg/L	Manganese µg/L	Molybdenum µg/L	Nickel µg/L	Potassium mg/L	Selenium µg/L	Silver µg/L	Sodium mg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Uranium µg/L	Vanadium µg/L	Zinc[f] µg/L
BC Standard																																	
CSR Aquatic Life (AW)[a]			n/a	n/a	90	50	10,000	1.5	n/a	12,000	4[b]	n/a	10[d]	40	90[b]	n/a	110-160[b]	n/a	n/a	n/a	10,000	1,500[b]	n/a	20	15[b]	n/a	n/a	3	n/a	1,000	85	n/a	1,650-2,400[b]
CSR Irrigation Watering (IW)			n/a	5,000	n/a	100	n/a	100	n/a	500	5	n/a	5[d]	50	200	5,000	200	2,500	n/a	200	10	200	n/a	20	n/a	n/a	n/a	n/a	n/a	n/a	10	100	2,000-5,000[c]
CSR Livestock Watering (LW)			n/a	5,000	n/a	25	n/a	100	n/a	5,000	80	1,000	50[d]	1,000	300	n/a	100	5,000	n/a	n/a	50	1,000	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	200	100	2,000
CSR Drinking Water (DW)			n/a	9,500	6	10	1,000	8	n/a	5,000	5	n/a	50[d]	20[e]	1,500	6,500	10	8	n/a	1,500	250	80	n/a	10	20	200	2,500	n/a	2,500	n/a	20	20	3,000
Health-based Value (HBV)[g]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,200	n/a	n/a	n/a	2,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CM_MW7-DP	CM_MW7-DP_WG_2022-11-24_N	2022 11 24	1,290	2.9	< 0.20	< 0.20	9.87	< 0.040	< 0.100	53	< 0.0100	314	0.28	0.27	< 0.40	475	< 0.100	46.1	124	*317*	0.192	7.46	2.32	0.113	< 0.020	19.6	736	< 0.020	< 0.20	< 0.60	3.05	< 1.00	< 2.0
	CM_MW7-DP_WG_2022-12-06_N	2022 12 06	1,380	< 1.0	< 0.10	< 0.10	10.7	< 0.020	< 0.050	47	< 0.0050	338	< 0.10	0.32	< 0.20	507	< 0.050	47.9	131	*318*	0.052	7.54	2.54	< 0.050	< 0.010	20.5	754	< 0.010	< 0.10	< 0.30	2.96	< 0.50	1.5
	CM_MW7-DP_WG_2022-12-19_N	2022 12 14	1,400	< 2.0	< 0.20	< 0.20	10.2	< 0.040	< 0.100	50	< 0.0100	352	< 0.20	0.28	< 0.40	485	< 0.100	45.7	126	*303*	< 0.100	7.34	2.39	0.111	< 0.020	19.4	792	< 0.020	< 0.20	< 0.60	3.21	< 1.00	3.2
CM_MW7-SH	CM_MW7-SH_WG_2022-11-24_N	2022 11 24	1,100	6.8	< 0.10	0.38	16.5	< 0.020	< 0.050	19	< 0.0050	289	1.30	0.31	< 0.20	1,440	< 0.050	7.4	91.5	*260*	0.606	1.63	1.82	0.127	< 0.010	2.95	553	< 0.010	< 0.10	< 0.30	0.474	< 0.50	1.2
	CM_MW7-SH_WG_2022-12-05_N	2022 12 05	1,160	< 1.0	< 0.10	0.43	17.7	< 0.020	< 0.050	15	< 0.0050	299	< 0.10	0.47	< 0.20	1,440	< 0.050	6.0	99.5	*273*	0.234	2.15	2.07	< 0.050	< 0.010	3.12	527	< 0.010	< 0.10	< 0.30	0.577	< 0.50	1.0
	CM_MW7-SH_WG_2022-12-19_N	2022 12 14	1,180	2.1	< 0.20	0.36	15.3	< 0.040	< 0.100	< 20	< 0.0100	313	< 0.20	0.30	< 0.40	1,360	< 0.100	6.5	95.7	*262*	0.220	1.67	1.89	< 0.100	< 0.020	2.95	612	< 0.020	< 0.20	< 0.60	0.651	< 1.00	< 2.0
CM_MW8	CM_MW8_WG_2022-12-06_N	2022 12 06	258	11.7	0.59	0.23	124	< 0.020	< 0.050	308	< 0.0050	69.9	0.44	0.39	0.74	479	< 0.050	70.7	20.3	150	0.619	2.88	3.39	< 0.050	< 0.010	54.1	5,280	< 0.010	0.43	< 0.30	0.402	< 0.50	281
	CM_MW8_WG_2022-12-19_N	2022 12 13	311	2.8	< 0.10	0.22	85.9	< 0.020	< 0.050	212	< 0.0050	81.4	0.11	0.11	< 0.20	1,820	< 0.050	55.9	26.2	121	0.330	< 0.50	2.72	< 0.050	< 0.010	40.1	6,150	< 0.010	< 0.10	< 0.30	0.266	< 0.50	1.5

All terms defined within the body of SNC-Lavalin's report.

< Denotes concentration less than indicated detection limit.

\- Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

* RPDs are not calculated where one or more concentrations are less than five times RDL.

RDL Denotes reported detection limit.

BOLD	Concentration greater than CSR Aquatic Life (AW) standard
ITALIC	Concentration greater than CSR Irrigation Watering (IW) standard
UNDERLINE	Concentration greater than CSR Livestock Watering (LW) standard
SHADED	Concentration greater than CSR Drinking Water (DW) standard

[a] Standard to protect freshwater aquatic life.

[b] Standard varies with Hardness.

[c] Standard varies with pH.

[d] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.

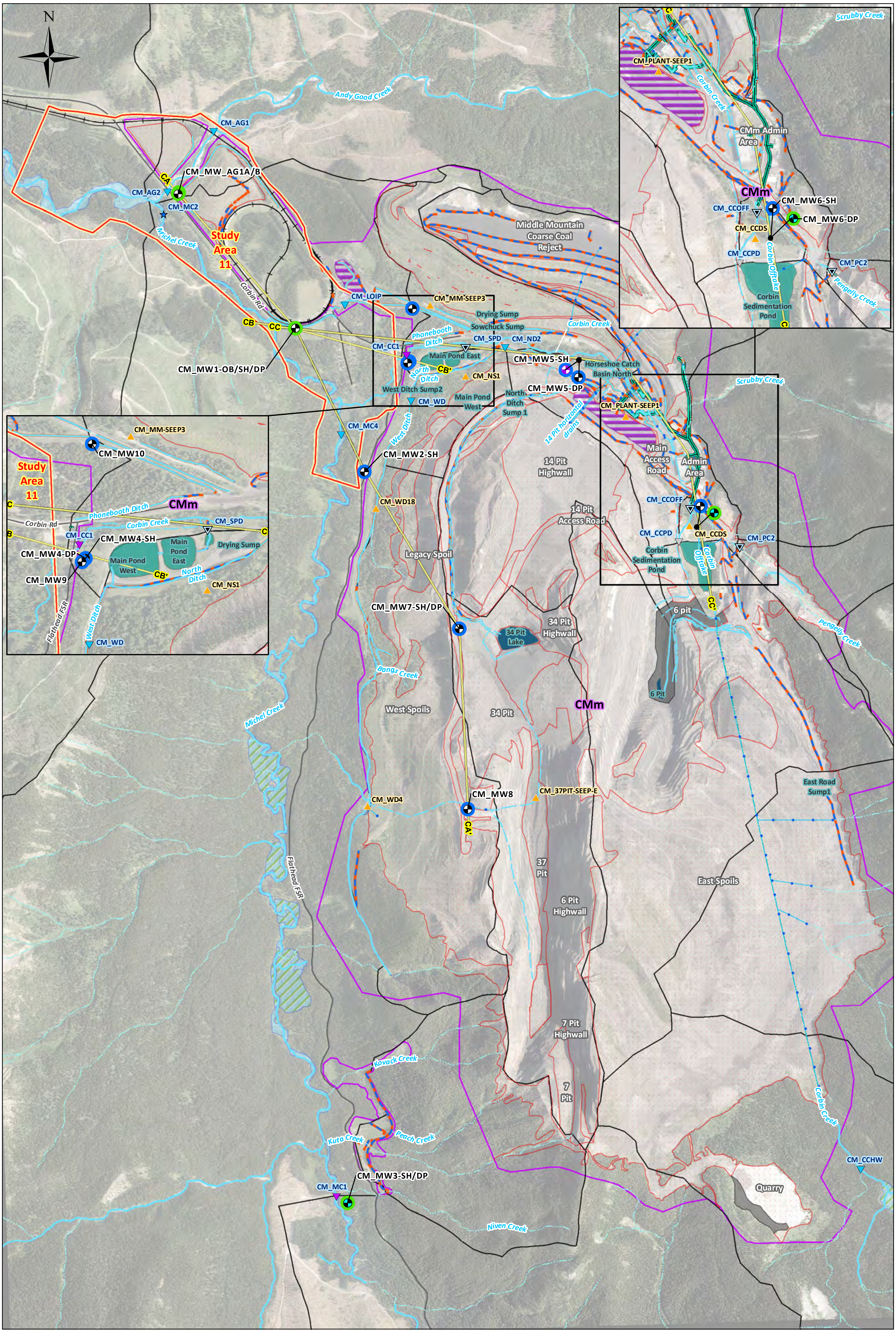
[e] Interim BC MoE Regional Background Estimate (Protocol 9 Determining Background Groundwater Quality).

[f] There is no Zinc standard specified for H > 400; therefore, the standard for H=300-<400 is applied as a conservative comparison.

[g] Ramboll calculated health-based values for these two parameters based on toxicity values (tolerable daily intakes; TDI) and drinking water allocation factors (DW AFs), documented in Appendix IV.

Drawings

CM-01: Sample Location Plan – Coal Mountain mine
CM-02: Groundwater Elevations from Q4 and Conceptual Regional Groundwater Flow – Coal Mountain mine
CM-03: Coal Mountain mine Inferred Geological Cross Section CA-CA'
CM-04: Coal Mountain mine Inferred Geological Cross Section CB-CB'
CM-05: Coal Mountain mine Inferred Geological Cross Section CC-CC'
CM-06: Coal Mountain mine Spatial Distribution of Nitrate Nitrogen in Groundwater
CM-07: Coal Mountain mine Spatial Distribution of Sulphate in Groundwater
CM-08: Coal Mountain mine Spatial Distribution of Dissolved Cadmium Groundwater
CM-09: Coal Mountain mine Spatial Distribution of Dissolved Selenium in Groundwater



Legend

Groundwater Stations[4]
- ◐ Monitoring Well
- ◐ Background Monitoring Well
- ◐ Well included in the SSGMP
- ◐ Well included in both the RGMP and the SSGMP
- ◐ Barologgers associated the SSGMP/RGMP

Surface Water Stations
- ★ Compliance Point
- ▼ Receiving Environment
- ▽ Authorized Discharge
- ▼ Monitoring
- ▽ Monitoring (Retired)
- ▲ Seep

Site Features
- — Secondary Road
- ┼ Rails
- — Geological Cross Section
- ▭ Study Areas

- 🟩 Tailings/Settling/Sediment Pond
- 🟦 End-Pit Lake
- ⬜ Pit
- 🟪 Stockpiles
- ▭ Waste Dump (Spoils)
- ▭ Watersheds
- ▭ Mine Permitted Areas

Water Features
- — Stream + Stream Ditch
- - - Intermittent + Indefinite Stream
- •— Subsurface

- — Ditch
- ═ Potable Waterline
- -· Rock Drain
- - · Water Pipeline
- ═ Bypass/Diversion Channel
- ▭ Lake/River Bed
- ▨ Wetted Area/Wetland (Based on 1:20000 Scale)

Notes:
1. Original in colour.
2. Numerical scale reflects full-size print. Print scaling will distort this scale, however scale bar will remain accurate.
3. Intended for illustration purposes, accuracy has not been verified for construction or navigation purposes.
4. Locations of overlapping wells have been adjusted for clarity.
5. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Information provided by Teck Coal Limited.

0 0.1 0.2 0.4 0.6 0.8 1 km

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

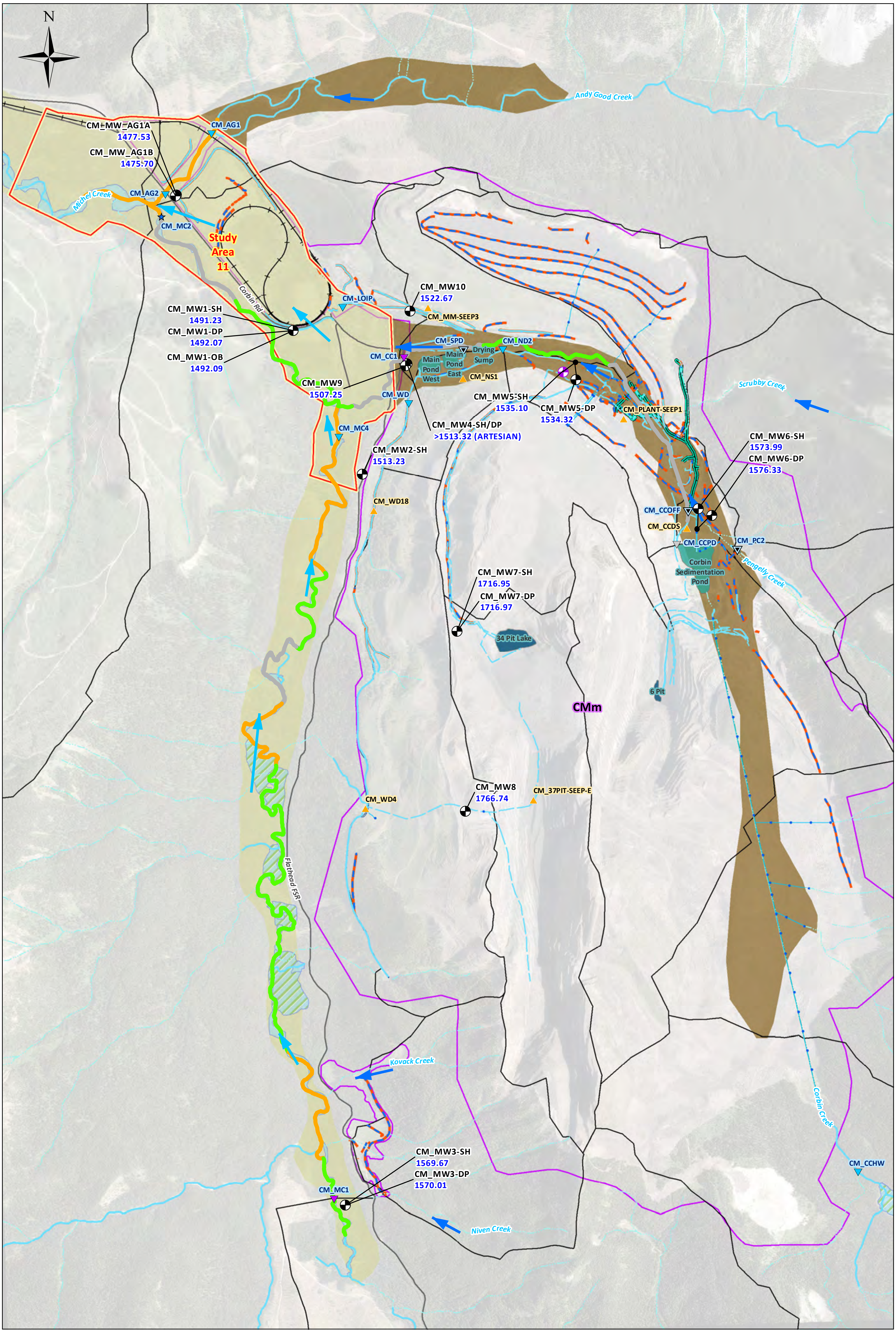
SNC·LAVALIN

Coal Mountain Mine - Sample Location Plan

CHK'D: RS
BY: CW
DATE: 2023-03-22
SCALE: 1:20,000
COORD SYS: NAD 1983 UTM Zone 11N
Ref Num:
DRAWING CM-01

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-LocPlan_CMm.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



Legend

Groundwater Stations[5]
- ◐ Monitoring Well
- ◐ Barologgers associated the SSGMP/RGMP

Surface Water Stations
- ★ Compliance Point
- ▼ Receiving Environment
- ▽ Authorized Discharge
- ▼ Monitoring
- ▽ Monitoring (Retired)
- ▲ Seep

Flow Accretion
- 🟩 Gaining
- 🟧 Losing
- ▬ No Change

Site Features
- — Secondary Road
- —+— Rails
- ➡ Inferred Valley-bottom Flow Direction
- ➡ Inferred Upland or Tributary Valley-bottom Groundwater Flow
- 🟦 Tailings/Settling/ Sediment Pond
- 🟦 End-Pit Lake
- 🟥 Study Areas
- ☐ Watersheds
- 🟪 Mine Permitted Areas
- 🟫 Interpreted Tributary Valley-bottom Extent
- ▨ Interpreted Main Valley-bottom Extent

Water Features
- — Stream + Stream Ditch
- ⋯ Intermittent + Indefinite Stream
- •— Subsurface
- — Ditch
- ═ Potable Waterline
- —⋯ Rock Drain
- – – Water Pipeline
- ═ Bypass/Diversion Channel
- ▭ Lake/River Bed
- ▨ Wetted Area/Wetland (Based on 1:20000 Scale)

1571.51 Groundwater Elevation Q4 (masl) - not used for contouring

< : Groundwater elevation below bottom of screen.

Notes:
1. Original in colour.
2. Numerical scale reflects full-size print. Print scaling will distort this scale, however scale bar will remain accurate.
3. Intended for illustration purposes, accuracy has not been verified for construction or navigation purposes.
4. Stations used to assess flow status are not shown on the map. Readers are referred to report references.
5. Overlapping wells adjusted for clarity.
6. Flow accretion studies completion dates:
- Michel Creek, Corbin Creek and Andy Good Creek: October 2022
7. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Information provided by Teck Coal Limited.

0 85 170 340 510 680 850 Meters

PROJECT LOCATION: Elk Valley, BC

CLIENT NAME: Teck Coal Limited

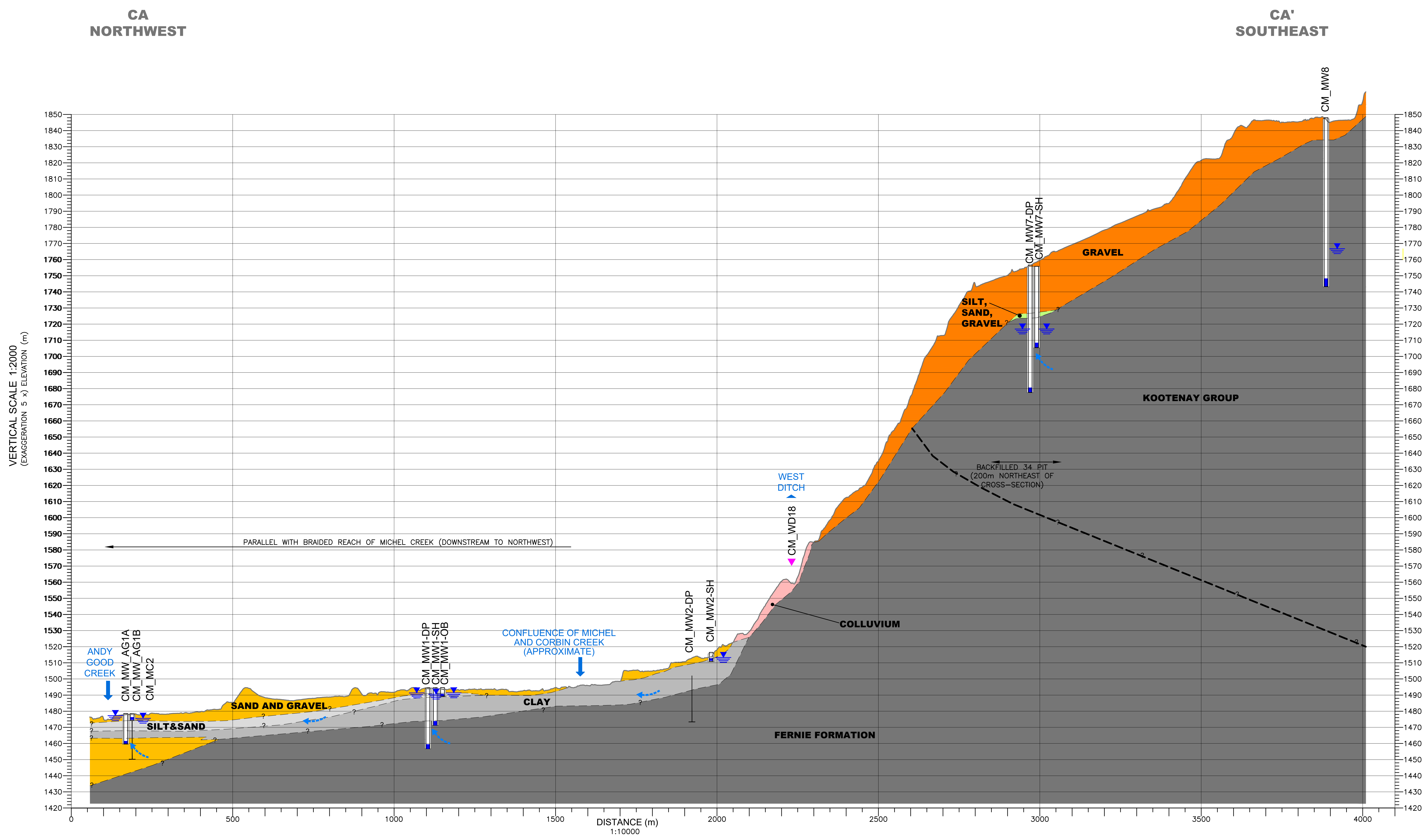
SNC·LAVALIN

Coal Mountain Mine Groundwater Elevations from Q4 2022 and Inferred Groundwater Flow Directions

CHK'D: RS	DATE: 2023-03-22	SCALE: 1:20,000	Ref Num:
BY: CW	COORD SYS: NAD 1983 UTM Zone 11N		DRAWING CM-02

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-GWElev_CMm.mxd

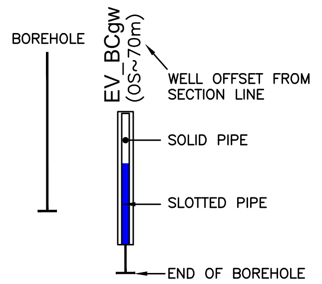
Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



LEGEND

🟧	**GRAVEL (WASTE ROCK)**
🟨	**SAND & GRAVEL (GLACIOFLUVIAL)**
🟥	**COLLUVIUM**
⬜	**SILT & SAND**
▨	**CLAY (TILL)**
🟩	**SILT, SAND, GRAVEL (TILL)**
⬛	**BEDROCK**
— — — —	INFERRED STRATIGRAPHIC BOUNDARY
▼	GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)
▼	SEEP
↖	INFERRED GROUNDWATER FLOW DIRECTION

BOREHOLE LEGEND



NOTES

1. THE CROSS SECTION DEPICTED IS BASED ON INTERPRETATION OF LIMITED GEOLOGICAL DATA. ACTUAL GEOLOGICAL CONDITIONS MAY BE DIFFERENT FROM THOSE INTERPRETED.
2. INFORMATION PRESENTED IS WITHIN 25m OF SECTION LINE UNLESS INDICATED OTHERWISE ON DRAWING.
3. ORIGINAL DRAWING IN COLOUR.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–13	ISSUED TO CLIENT	AJK	MB
0	2022–03–14	ISSUED TO CLIENT	AJK	MB

CLIENT NAME:
TECK COAL LIMITED
–

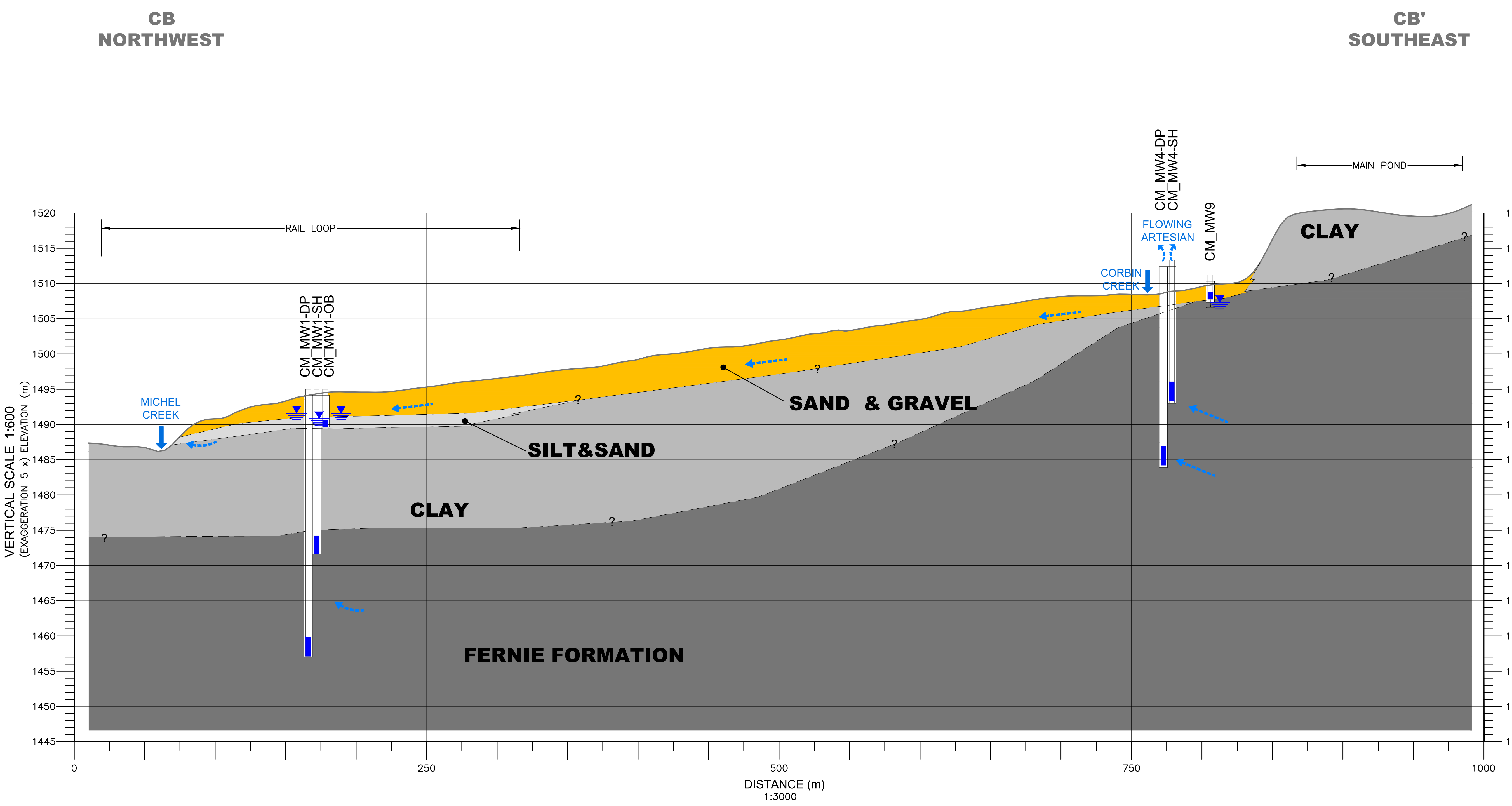
PROJECT LOCATION:
COAL MOUNTAIN MINE
ELK VALLEY, BC

SNC·LAVALIN

TITLE:
COAL MOUNTAIN MINE
INFERRED GEOLOGICAL CROSS SECTION CA-CA'

DWN BY: AJK
SCALE: AS SHOWN
DATE: 2022–02–08
DWG No:
REV.: **1**
CHK'D: MB
PLOT: 20230316.0826
CADFILE: 635544–X2R19
DRAWING CM-03

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R19.DWG



LEGEND

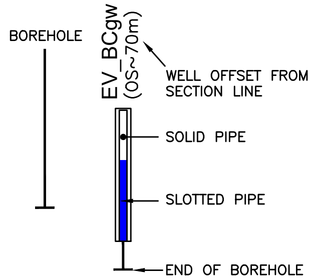
🟧	**SAND & GRAVEL** **(GLACIOFLUVIAL)**
▨	**SILT & SAND**
▨	**CLAY (TILL)**
■	**BEDROCK**

— — — — INFERRED STRATIGRAPHIC BOUNDARY

▼ GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)

⬅ INFERRED GROUNDWATER FLOW DIRECTION

BOREHOLE LEGEND



NOTES

1. THE CROSS SECTION DEPICTED IS BASED ON INTERPRETATION OF LIMITED GEOLOGICAL DATA. ACTUAL GEOLOGICAL CONDITIONS MAY BE DIFFERENT FROM THOSE INTERPRETED.
2. INFORMATION PRESENTED IS WITHIN 25m OF SECTION LINE UNLESS INDICATED OTHERWISE ON DRAWING.
3. ORIGINAL DRAWING IN COLOUR.
4. 2021 Q3 MANUAL WATER LEVEL MEASUREMENT USED FOR CM_MW9. NO 2021 Q4 MEASUREMENT AVAILABLE.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–13	ISSUED TO CLIENT	AJK	MB
0	2022–03–14	ISSUED TO CLIENT	AJK	MB

CLIENT NAME:
TECK COAL LIMITED
–

PROJECT LOCATION:
COAL MOUNTAIN MINE
ELK VALLEY, BC

SNC·LAVALIN

TITLE:
COAL MOUNTAIN MINE
INFERRED GEOLOGICAL CROSS SECTION CB-CB'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2022–02–08	DWG No: REV.: **1**
CHK'D: MB	PLOT: 20230316.0828	CADFILE: 635544–X2R19	**DRAWING CM-04**

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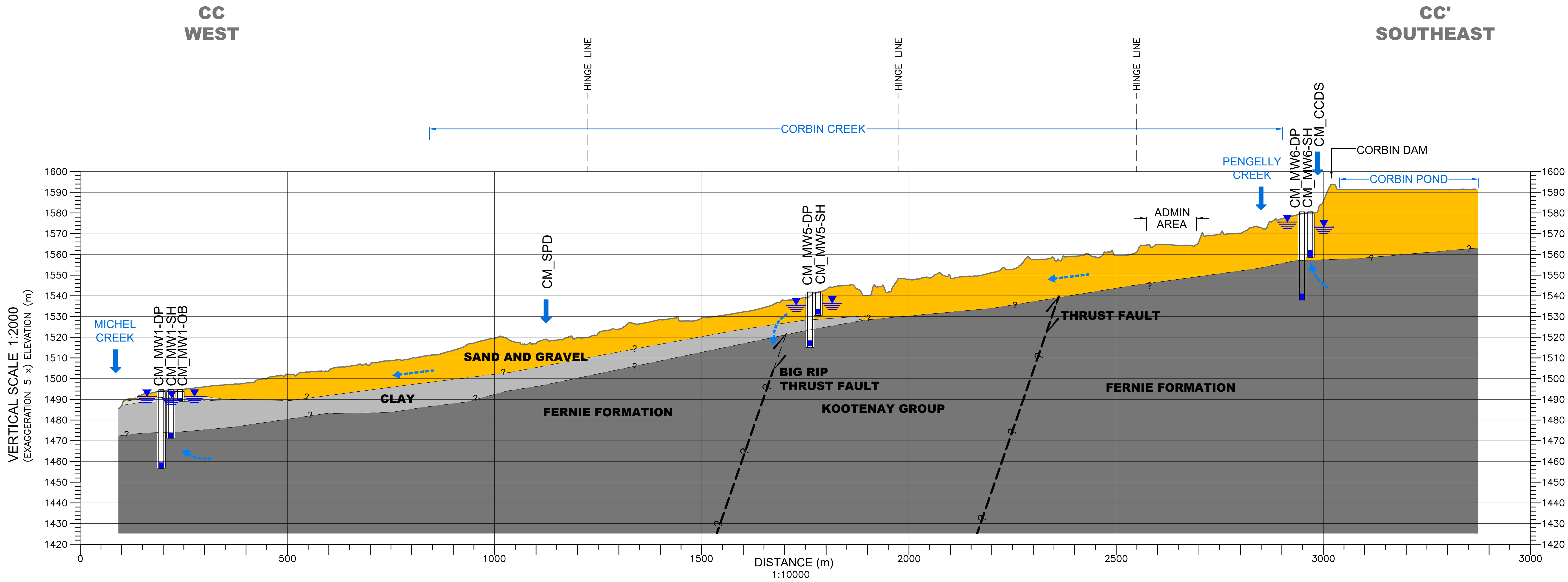


LEGEND

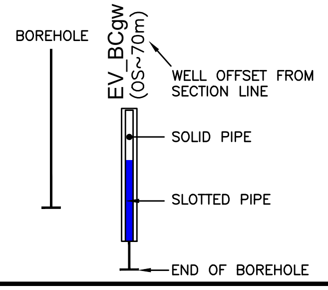
🟨	**SAND & GRAVEL** **(GLACIOFLUVIAL)**
⬜	**SILT & SAND**
▨	**CLAY (TILL)**
⬛	**BEDROCK**

— — — — INFERRED STRATIGRAPHIC BOUNDARY

▼ GROUNDWATER ELEVATION (2022 Q4 MANUAL WATER LEVEL MEASUREMENT)

⇠ INFERRED GROUNDWATER FLOW DIRECTION

BOREHOLE LEGEND



NOTES

1. THE CROSS SECTION DEPICTED IS BASED ON INTERPRETATION OF LIMITED GEOLOGICAL DATA. ACTUAL GEOLOGICAL CONDITIONS MAY BE DIFFERENT FROM THOSE INTERPRETED.
2. INFORMATION PRESENTED IS WITHIN 25m OF SECTION LINE UNLESS INDICATED OTHERWISE ON DRAWING.
3. ORIGINAL DRAWING IN COLOUR.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–03–13	ISSUED TO CLIENT	AJK	MB
0	2022–03–14	ISSUED TO CLIENT	AJK	MB

CLIENT NAME:
TECK COAL LIMITED
–

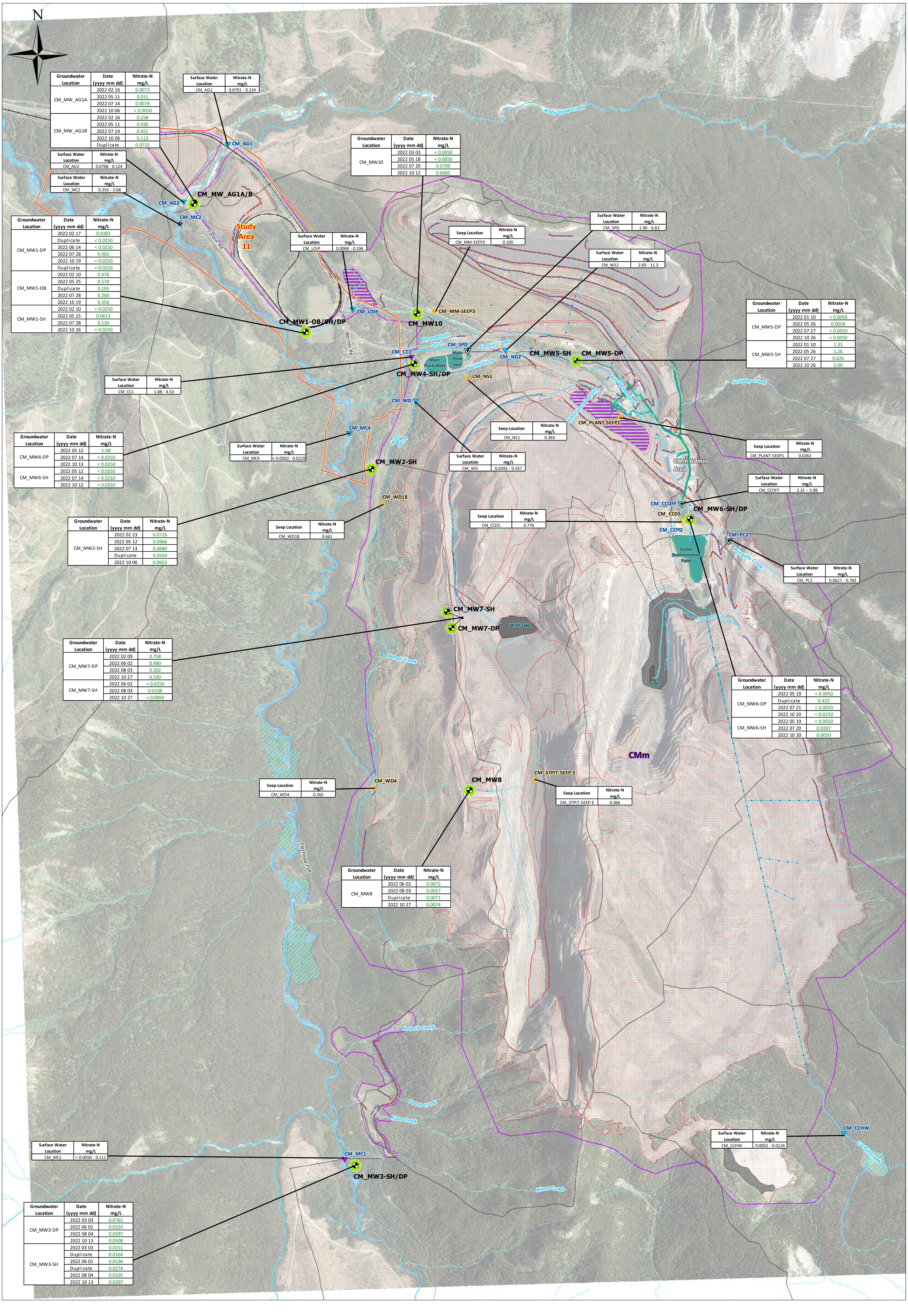
PROJECT LOCATION:
COAL MOUNTAIN MINE
ELK VALLEY, BC

SNC·LAVALIN

TITLE:
COAL MOUNTAIN MINE
INFERRED GEOLOGICAL CROSS SECTION CC-CC'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2022–02–08	DWG No: REV.: **1**
CHK'D: MB	PLOT: 20230316.0829	CADFILE: 635544–X2R19	**DRAWING CM-05**

PATH: \\SLI4395\PROJECTS\CURRENT PROJECTS\TECK COAL LTD\SPO\635544\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\635544–X2R19.DWG



Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
CM_MW_AG1A	2022 02 16	0.0072
	2022 05 11	0.011
	2022 07 14	0.0078
	2022 10 06	< 0.0050
CM_MW_AG1B	2022 02 16	0.258
	2022 05 11	0.436
	2022 07 14	0.451
	2022 10 06	0.113
	Duplicate	0.0715

Surface Water Location	Nitrate-N mg/L
CM_AG1	0.0701 - 0.124

Surface Water Location	Nitrate-N mg/L
CM_AG2	0.0768 - 0.124

Surface Water Location	Nitrate-N mg/L
CM_MC2	0.256 - 2.68

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
CM_MW10	2022 03 03	< 0.0050
	2022 05 18	< 0.0050
	2022 07 20	0.0709
	2022 10 12	0.0065

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
CM_MW1-DP	2022 02 17	0.0383
	Duplicate	< 0.0250
	2022 06 14	< 0.0250
	2022 07 28	0.965
	2022 10 19	< 0.0250
	Duplicate	< 0.0250
CM_MW1-OB	2022 02 10	0.476
	2022 05 25	0.570
	Duplicate	0.195
	2022 07 28	0.260
	2022 10 19	0.356
CM_MW1-SH	2022 02 10	< 0.0250
	2022 05 25	0.0613
	2022 07 28	0.130
	2022 10 26	< 0.0250

Surface Water Location	Nitrate-N mg/L
CM_LOIP	0.0069 - 0.196

Seep Location	Nitrate-N mg/L
CM_MM-SEEP3	0.100

Surface Water Location	Nitrate-N mg/L
CM_SPD	1.90 - 6.63

Surface Water Location	Nitrate-N mg/L
CM_ND2	2.69 - 11.3

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
CM_MW5-DP	2022 01 10	< 0.0050
	2022 05 26	0.0058
	2022 07 27	< 0.0050
	2022 10 26	< 0.0050
CM_MW5-SH	2022 01 10	1.31
	2022 05 26	1.26
	2022 07 27	0.626
	2022 10 26	5.00

Surface Water Location	Nitrate-N mg/L
CM_CC1	1.88 - 4.53

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
CM_MW4-DP	2022 05 12	1.08
	2022 07 14	< 0.0250
	2022 10 13	< 0.0250
CM_MW4-SH	2022 05 12	< 0.0250
	2022 07 14	< 0.0250
	2022 10 12	< 0.0250

Surface Water Location	Nitrate-N mg/L
CM_MC4	< 0.0050 - 0.0229

Seep Location	Nitrate-N mg/L
CM_NS1	0.393

Surface Water Location	Nitrate-N mg/L
CM_WD	0.0392 - 0.437

Seep Location	Nitrate-N mg/L
CM_PLANT-SEEP1	0.0262

Surface Water Location	Nitrate-N mg/L
CM_CCOFF	2.31 – 5.88

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
CM_MW2-SH	2022 02 23	0.0716
	2022 05 12	0.0966
	2022 07 13	0.0680
	Duplicate	0.0554
	2022 10 06	0.0653

Seep Location	Nitrate-N mg/L
CM_WD18	0.661

Seep Location	Nitrate-N mg/L
CM_CCDS	0.776

Surface Water Location	Nitrate-N mg/L
CM_PC2	0.0627 - 0.783

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
CM_MW7-DP	2022 02 09	0.758
	2022 06 02	0.490
	2022 08 03	0.202
	2022 10 27	0.530
CM_MW7-SH	2022 06 02	< 0.0250
	2022 08 03	0.0108
	2022 10 27	< 0.0050

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
CM_MW6-DP	2022 05 19	< 0.0050
	Duplicate	0.423
	2022 07 21	< 0.0050
	2022 10 20	< 0.0250
CM_MW6-SH	2022 05 19	< 0.0050
	2022 07 20	0.0287
	2022 10 20	0.0050

Seep Location	Nitrate-N mg/L
CM_WD4	0.265

Seep Location	Nitrate-N mg/L
CM_37PIT-SEEP-E	0.366

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
CM_MW8	2022 06 02	0.0072
	2022 08 03	0.0057
	Duplicate	0.0071
	2022 10 27	0.0074

Surface Water Location	Nitrate-N mg/L
CM_MC1	< 0.0050 - 0.111

Surface Water Location	Nitrate-N mg/L
CM_CCHW	0.0052 - 0.0124

Groundwater Location	Date (yyyy mm dd)	Nitrate-N mg/L
CM_MW3-DP	2022 03 03	0.0762
	2022 06 01	0.0324
	2022 08 04	0.0397
	2022 10 13	0.0508
CM_MW3-SH	2022 03 03	0.0151
	Duplicate	0.0164
	2022 06 01	0.0136
	Duplicate	0.0274
	2022 08 04	0.0105
	2022 10 13	0.0207

Legend

Groundwater Stations
- Monitoring Well

Surface Water Stations
- ★ Compliance Point
- ▼ Receiving Environment
- ▽ Authorized Discharge
- ▼ Monitoring
- ▽ Monitoring (Retired)
- ▲ Seep

Site Features
- Secondary Road
- Rails
- Study Areas
- Tailings/Settling/Sediment Pond
- End-Pit Lake
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds
- Mine Permitted Areas

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Potable Waterline
- Rock Drain
- Water Pipeline
- Bypass/Diversion Channel
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:10000 Scale)

Q4 Q1
Q3 Q2

symbol locations have been adjusted relative to well locations for visibility

Green below the applicable screening criteria

Blue above the applicable screening criteria

Grey no sample collected

Primary Screening Criteria	Nitrate-N mg/L
CSR Aquatic Life	**400**
CSR Irrigation Watering	*n/a*
CSR Livestock Watering	100
CSR Drinking Water	10

Notes:
1. Original in colour at paper size ANSI C (17x22 in).
2. Numerical scale reflects full-size print. Print scaling will distort this scale; however, scale bar will remain accurate.
3. Intended for illustration purposes. Accuracy has not been verified for construction or navigation.
4. Locations of overlapping wells have been adjusted for clarity.
5. Nitrate-N = Nitrate Nitrogen
6. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Data provided by Teck Coal Limited

0 90 180 360 540 720 900 Meters

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

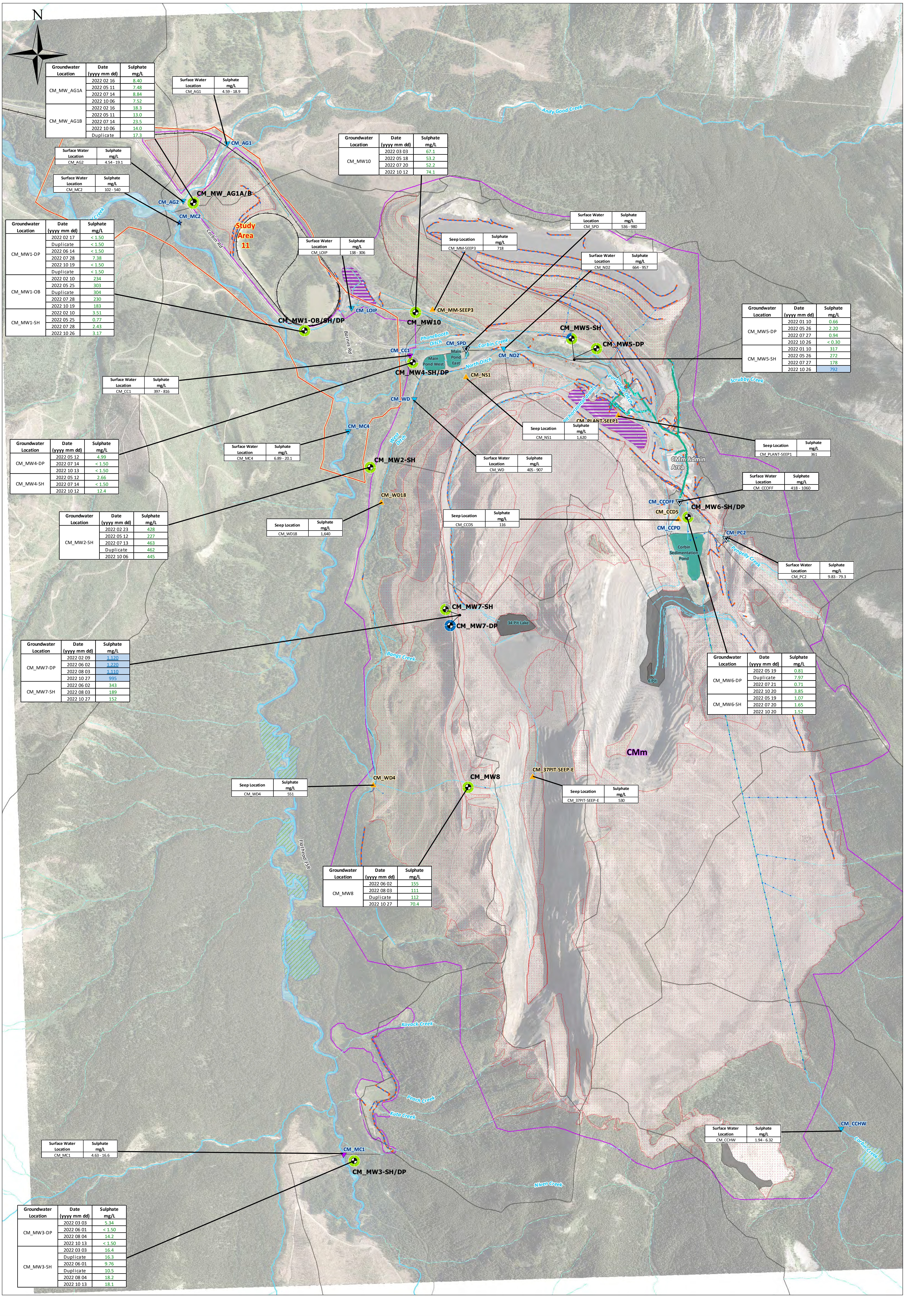
SNC·LAVALIN

Coal Mountain Mine
Spatial Distribution of Nitrate Nitrogen in Groundwater

CHK'D: RS
BY: CW
DATE: 2023-03-22
SCALE: 1:10,000
COORD SYS: NAD 1983 UTM Zone 11N
REF NUM:
REV: 0
DRAWING CM-06

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-SpatialDist_N_CMm.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
CM_MW_AG1A	2022 02 16	8.40
	2022 05 11	7.48
	2022 07 14	8.84
	2022 10 06	7.52
CM_MW_AG1B	2022 02 16	18.3
	2022 05 11	13.0
	2022 07 14	23.5
	2022 10 06	14.0
	Duplicate	17.3

Surface Water Location	Sulphate mg/L
CM_AG1	4.59 - 18.9

Surface Water Location	Sulphate mg/L
CM_AG2	4.54 - 19.1

Surface Water Location	Sulphate mg/L
CM_MC2	102 - 540

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
CM_MW10	2022 03 03	67.1
	2022 05 18	53.2
	2022 07 20	52.2
	2022 10 12	74.1

Surface Water Location	Sulphate mg/L
CM_SPD	536 - 980

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
CM_MW1-DP	2022 02 17	< 1.50
	Duplicate	< 1.50
	2022 06 14	< 1.50
	2022 07 28	7.38
	2022 10 19	< 1.50
	Duplicate	< 1.50
CM_MW1-OB	2022 02 10	234
	2022 05 25	303
	Duplicate	304
	2022 07 28	230
	2022 10 19	183
CM_MW1-SH	2022 02 10	3.51
	2022 05 25	0.77
	2022 07 28	2.43
	2022 10 26	3.17

Surface Water Location	Sulphate mg/L
CM_LOIP	138 - 306

Seep Location	Sulphate mg/L
CM_MM-SEEP3	718

Surface Water Location	Sulphate mg/L
CM_ND2	664 - 957

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
CM_MW5-DP	2022 01 10	0.66
	2022 05 26	2.20
	2022 07 27	0.94
	2022 10 26	< 0.30
CM_MW5-SH	2022 01 10	317
	2022 05 26	272
	2022 07 27	178
	2022 10 26	792

Surface Water Location	Sulphate mg/L
CM_CC1	397 - 816

Seep Location	Sulphate mg/L
CM_NS1	1,620

Seep Location	Sulphate mg/L
CM_PLANT-SEEP1	361

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
CM_MW4-DP	2022 05 12	4.99
	2022 07 14	< 1.50
	2022 10 13	< 1.50
CM_MW4-SH	2022 05 12	2.66
	2022 07 14	< 1.50
	2022 10 12	12.4

Surface Water Location	Sulphate mg/L
CM_MC4	6.89 - 20.1

Surface Water Location	Sulphate mg/L
CM_WD	405 - 907

Surface Water Location	Sulphate mg/L
CM_CCOFF	418 - 1060

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
CM_MW2-SH	2022 02 23	428
	2022 05 12	227
	2022 07 13	463
	Duplicate	462
	2022 10 06	445

Seep Location	Sulphate mg/L
CM_WD18	1,640

Seep Location	Sulphate mg/L
CM_CCDS	116

Surface Water Location	Sulphate mg/L
CM_PC2	9.83 - 79.3

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
CM_MW7-DP	2022 02 09	1,120
	2022 06 02	1,220
	2022 08 03	1,110
	2022 10 27	995
CM_MW7-SH	2022 06 02	343
	2022 08 03	189
	2022 10 27	152

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
CM_MW6-DP	2022 05 19	0.81
	Duplicate	7.97
	2022 07 21	0.71
	2022 10 20	3.85
CM_MW6-SH	2022 05 19	1.07
	2022 07 20	1.65
	2022 10 20	1.52

Seep Location	Sulphate mg/L
CM_WD4	551

Seep Location	Sulphate mg/L
CM_37PIT-SEEP-E	530

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
CM_MW8	2022 06 02	155
	2022 08 03	111
	Duplicate	112
	2022 10 27	70.4

Surface Water Location	Sulphate mg/L
CM_CCHW	1.94 - 6.32

Surface Water Location	Sulphate mg/L
CM_MC1	4.63 - 16.6

Groundwater Location	Date (yyyy mm dd)	Sulphate mg/L
CM_MW3-DP	2022 03 03	5.34
	2022 06 01	< 1.50
	2022 08 04	14.2
	2022 10 13	< 1.50
CM_MW3-SH	2022 03 03	16.4
	Duplicate	16.3
	2022 06 01	9.76
	Duplicate	10.5
	2022 08 04	18.2
	2022 10 13	18.1

Legend

Groundwater Stations
- Monitoring Well

Surface Water Stations
- ★ Compliance Point
- ▼ Receiving Environment
- ▽ Authorized Discharge
- ▼ Monitoring
- ▽ Monitoring
- ▲ Seep

Site Features
- Secondary Road
- Rails
- Study Areas
- Tailings/Settling/Sediment Pond
- End-Pit Lake
- Pit
- Stockpiles
- Waste Dump
- Watersheds
- Mine Permitted Areas

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Potable Waterline
- Rock Drain
- Water Pipeline
- Bypass/Diversion Channel
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:10000 Scale)

Q4	Q1
Q3	Q2

symbol locations have been adjusted relative to well locations for visibility

Green below the applicable screening criteria

Blue above the applicable screening criteria

Grey no sample collected

Primary Screening Criteria	Sulphate mg/L
CSR Aquatic Life	1,280-4,290
CSR Irrigation Watering	*n/a*
CSR Livestock Watering	1,000
CSR Drinking Water	500

Notes:
1. Original in colour at paper size ANSI C (17x22 in).
2. Numerical scale reflects full-size print. Print scaling will distort this scale; however, scale bar will remain accurate.
3. Intended for illustration purposes. Accuracy has not been verified for construction or navigation.
4. Locations of overlapping wells have been adjusted for clarity.
5. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Data provided by Teck Coal Limited

0 125 250 500 750 1,000 Meters

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

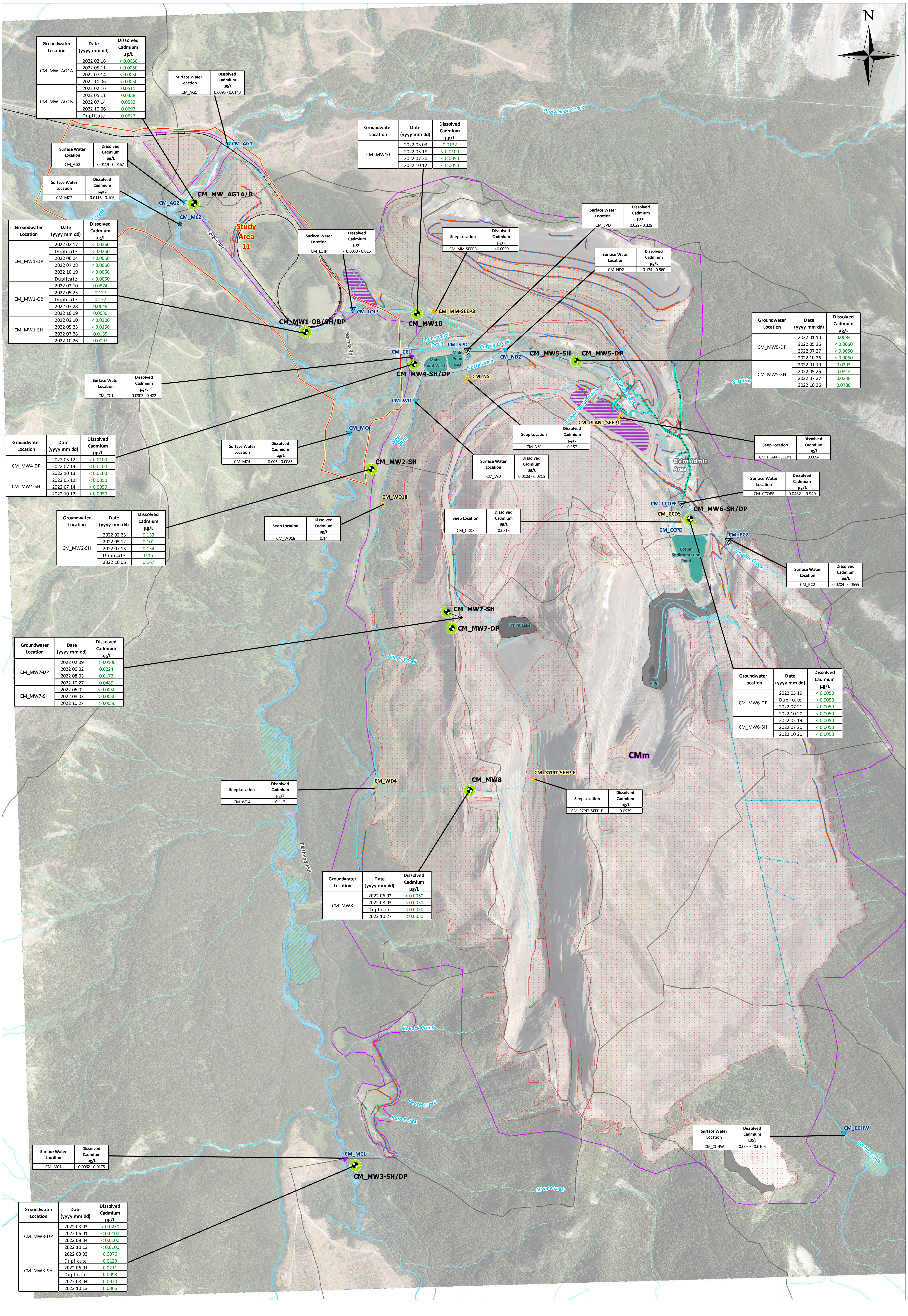
SNC·LAVALIN

Coal Mountain Mine Spatial Distribution of Sulphate in Groundwater

CHK'D: RS
BY: CW
DATE: 2023-03-22
SCALE: 1:10,000
COORD SYS: NAD 1983 UTM Zone 11N
REF NUM:
REV: 0
DRAWING CM-07

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-SpatialDist_SO4_CMm.mxd



Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
CM_MW_AG1A	2022 02 16	< 0.0050
	2022 05 11	< 0.0050
	2022 07 14	< 0.0050
	2022 10 06	< 0.0050
CM_MW_AG1B	2022 02 16	0.0511
	2022 05 11	0.0388
	2022 07 14	0.0582
	2022 10 06	0.0692
	Duplicate	0.0627

Surface Water Location	Dissolved Cadmium µg/L
CM_AG1	0.0095 - 0.0140

Surface Water Location	Dissolved Cadmium µg/L
CM_AG2	0.0119 - 0.0167

Surface Water Location	Dissolved Cadmium µg/L
CM_MC2	0.0116 - 0.106

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
CM_MW10	2022 03 03	0.0132
	2022 05 18	< 0.0100
	2022 07 20	< 0.0050
	2022 10 12	< 0.0050

Surface Water Location	Dissolved Cadmium µg/L
CM_SPD	0.022 - 0.329

Seep Location	Dissolved Cadmium µg/L
CM_MM-SEEP3	< 0.0050

Surface Water Location	Dissolved Cadmium µg/L
CM_ND2	0.134 - 0.560

Surface Water Location	Dissolved Cadmium µg/L
CM_LOIP	< 0.0050 - 0.016

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
CM_MW1-DP	2022 02 17	< 0.0250
	Duplicate	< 0.0250
	2022 06 14	< 0.0050
	2022 07 28	< 0.0050
	2022 10 19	< 0.0050
	Duplicate	< 0.0050
CM_MW1-OB	2022 02 10	0.0874
	2022 05 25	0.127
	Duplicate	0.132
	2022 07 28	0.0649
	2022 10 19	0.0630
CM_MW1-SH	2022 02 10	< 0.0200
	2022 05 25	< 0.0150
	2022 07 28	0.0155
	2022 10 26	0.0097

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
CM_MW5-DP	2022 01 10	0.0084
	2022 05 26	< 0.0050
	2022 07 27	< 0.0050
	2022 10 26	< 0.0050
CM_MW5-SH	2022 01 10	0.0293
	2022 05 26	0.0314
	2022 07 27	0.0238
	2022 10 26	0.0780

Surface Water Location	Dissolved Cadmium µg/L
CM_CC1	0.0303 - 0.482

Seep Location	Dissolved Cadmium µg/L
CM_NS1	0.157

Seep Location	Dissolved Cadmium µg/L
CM_PLANT-SEEP1	0.0094

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
CM_MW4-DP	2022 05 12	< 0.0100
	2022 07 14	< 0.0100
	2022 10 13	< 0.0100
CM_MW4-SH	2022 05 12	< 0.0050
	2022 07 14	< 0.0050
	2022 10 12	< 0.0050

Surface Water Location	Dissolved Cadmium µg/L
CM_MC4	0.005 - 0.0085

Surface Water Location	Dissolved Cadmium µg/L
CM_WD	0.0103 - 0.0315

Surface Water Location	Dissolved Cadmium µg/L
CM_CCOFF	0.0432 – 0.949

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
CM_MW2-SH	2022 02 23	0.133
	2022 05 12	0.101
	2022 07 13	0.154
	Duplicate	0.15
	2022 10 06	0.167

Seep Location	Dissolved Cadmium µg/L
CM_WD18	0.14

Seep Location	Dissolved Cadmium µg/L
CM_CCDS	0.0315

Surface Water Location	Dissolved Cadmium µg/L
CM_PC2	0.0204 - 0.0655

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
CM_MW7-DP	2022 02 09	< 0.0100
	2022 06 02	0.0224
	2022 08 03	0.0172
	2022 10 27	0.0489
CM_MW7-SH	2022 06 02	< 0.0050
	2022 08 03	< 0.0050
	2022 10 27	< 0.0050

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
CM_MW6-DP	2022 05 19	< 0.0050
	Duplicate	< 0.0050
	2022 07 21	< 0.0050
	2022 10 20	< 0.0050
CM_MW6-SH	2022 05 19	< 0.0050
	2022 07 20	< 0.0050
	2022 10 20	< 0.0050

Seep Location	Dissolved Cadmium µg/L
CM_WD4	0.117

Seep Location	Dissolved Cadmium µg/L
CM_37PIT-SEEP-E	0.0939

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
CM_MW8	2022 06 02	< 0.0050
	2022 08 03	< 0.0050
	Duplicate	< 0.0050
	2022 10 27	< 0.0050

Surface Water Location	Dissolved Cadmium µg/L
CM_CCHW	0.0069 - 0.0106

Surface Water Location	Dissolved Cadmium µg/L
CM_MC1	0.0062 - 0.0175

Groundwater Location	Date (yyyy mm dd)	Dissolved Cadmium µg/L
CM_MW3-DP	2022 03 03	< 0.0250
	2022 06 01	< 0.0100
	2022 08 04	< 0.0100
	2022 10 13	< 0.0100
CM_MW3-SH	2022 03 03	0.0076
	Duplicate	0.0129
	2022 06 01	0.0211
	Duplicate	0.0093
	2022 08 04	0.0070
	2022 10 13	0.0066

Legend

Groundwater Stations
- ◐ Monitoring Well

Surface Water Stations
- ★ Compliance Point
- ▼ Receiving Environment
- ▽ Authorized Discharge
- ▼ Monitoring
- ▽ Monitoring (Retired)
- ▲ Seep

Site Features
- Secondary Road
- Rails
- Tailings/Settling/Sediment Pond
- End-Pit Lake
- Study Areas
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds
- Mine Permitted Areas

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Potable Waterline
- Rock Drain
- Water Pipeline
- Bypass/Diversion Channel
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:10000 Scale)

Q4	Q1
Q3	Q2

symbol locations have been adjusted relative to well locations for visibility

Green below the applicable screening criteria

Blue above the applicable screening criteria

Grey no sample collected

^ Dissolved phase of the parameter is shown in the spatial plot.

Primary Screening Criteria	Cadmium^ µg/L
CSR Aquatic Life	0.5-4
CSR Irrigation Watering	5
CSR Livestock Watering	80
CSR Drinking Water	5

Notes:
1. Original in colour at paper size ANSI C (17x22 in).
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3. Intended for illustration purposes. Accuracy has not been verified for construction or navigation.
4. Locations of overlapping wells have been adjusted for clarity.
5. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Data provided by Teck Coal Limited

0 125 250 500 750 1,000 Meters

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

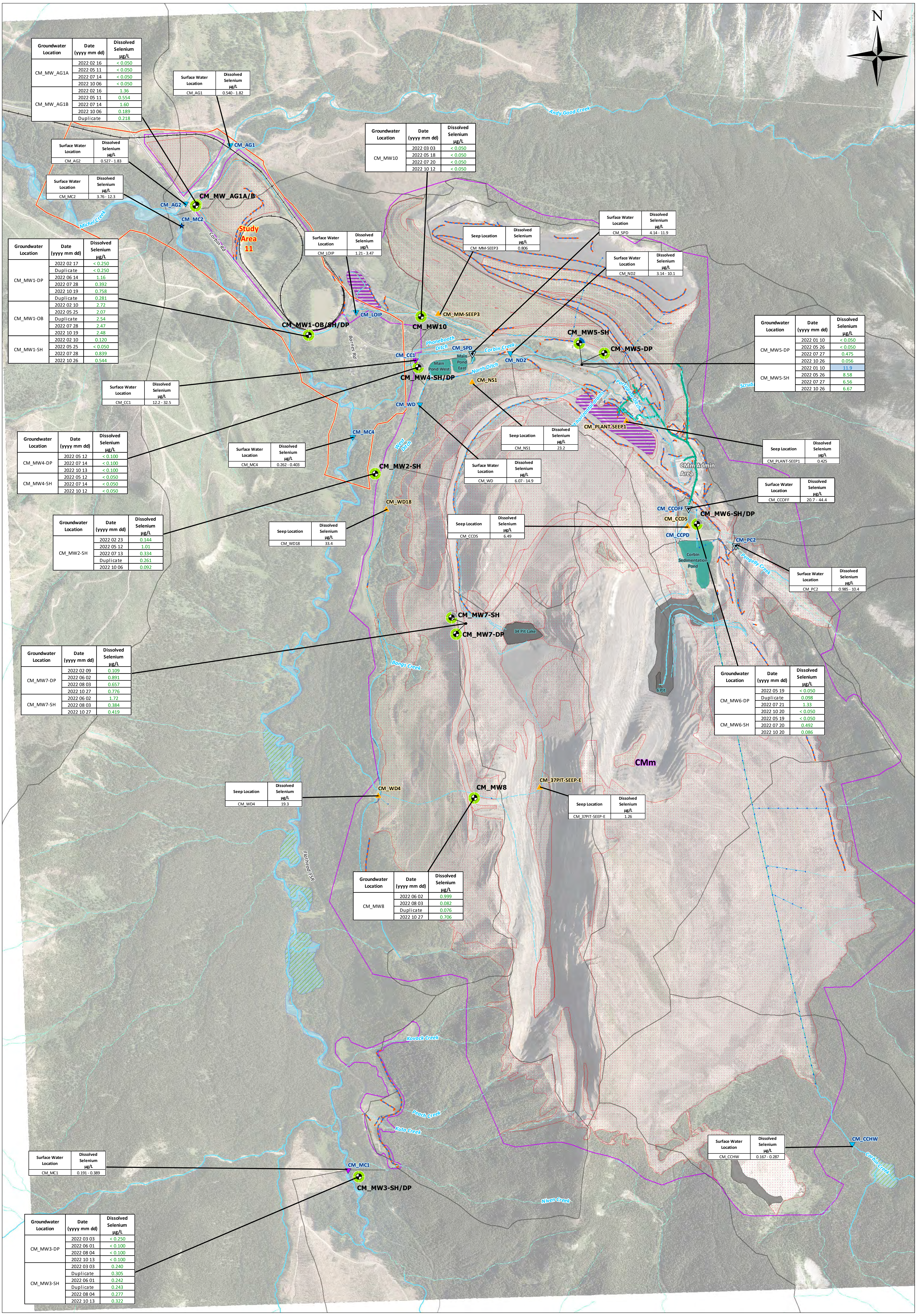
SNC·LAVALIN

Coal Mountain Mine
Spatial Distribution of Dissolved Cadmium in Groundwater

CHK'D: RS
DATE: 2023-03-22 SCALE: 1:10,000
REF NUM: REV: 0
BY: CW
COORD SYS: NAD 1983 UTM Zone 11N
DRAWING CM-08

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-SpatialDist_Cd_CMm1.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
CM_MW_AG1A	2022 02 16	< 0.050
	2022 05 11	< 0.050
	2022 07 14	< 0.050
	2022 10 06	< 0.050
CM_MW_AG1B	2022 02 16	1.36
	2022 05 11	0.554
	2022 07 14	1.60
	2022 10 06	0.189
	Duplicate	0.218

Surface Water Location	Dissolved Selenium µg/L
CM_AG1	0.540 - 1.82

Surface Water Location	Dissolved Selenium µg/L
CM_AG2	0.527 - 1.83

Surface Water Location	Dissolved Selenium µg/L
CM_MC2	3.76 - 12.3

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
CM_MW10	2022 03 03	< 0.050
	2022 05 18	< 0.050
	2022 07 20	< 0.050
	2022 10 12	< 0.050

Surface Water Location	Dissolved Selenium µg/L
CM_SPD	4.14 - 11.9

Seep Location	Dissolved Selenium µg/L
CM_MM-SEEP3	0.806

Surface Water Location	Dissolved Selenium µg/L
CM_ND2	3.14 - 10.1

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
CM_MW1-DP	2022 02 17	< 0.250
	Duplicate	< 0.250
	2022 06 14	1.16
	2022 07 28	0.392
	2022 10 19	0.758
	Duplicate	0.281
CM_MW1-OB	2022 02 10	2.72
	2022 05 25	2.07
	Duplicate	2.54
	2022 07 28	2.47
	2022 10 19	2.48
CM_MW1-SH	2022 02 10	0.120
	2022 05 25	< 0.050
	2022 07 28	0.839
	2022 10 26	0.544

Surface Water Location	Dissolved Selenium µg/L
CM_LOIP	1.21 - 3.47

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
CM_MW5-DP	2022 01 10	< 0.050
	2022 05 26	< 0.050
	2022 07 27	0.475
	2022 10 26	0.056
CM_MW5-SH	2022 01 10	11.9
	2022 05 26	8.58
	2022 07 27	6.56
	2022 10 26	6.67

Surface Water Location	Dissolved Selenium µg/L
CM_CC1	12.2 - 32.5

Seep Location	Dissolved Selenium µg/L
CM_NS1	23.2

Seep Location	Dissolved Selenium µg/L
CM_PLANT-SEEP1	0.425

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
CM_MW4-DP	2022 05 12	< 0.100
	2022 07 14	< 0.100
	2022 10 13	< 0.100
CM_MW4-SH	2022 05 12	< 0.050
	2022 07 14	< 0.050
	2022 10 12	< 0.050

Surface Water Location	Dissolved Selenium µg/L
CM_MC4	0.262 - 0.403

Surface Water Location	Dissolved Selenium µg/L
CM_WD	6.07 - 14.9

Surface Water Location	Dissolved Selenium µg/L
CM_CCOFF	20.7 - 44.4

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
CM_MW2-SH	2022 02 23	0.144
	2022 05 12	1.01
	2022 07 13	0.334
	Duplicate	0.261
	2022 10 06	0.092

Seep Location	Dissolved Selenium µg/L
CM_WD18	33.4

Seep Location	Dissolved Selenium µg/L
CM_CCDS	6.49

Surface Water Location	Dissolved Selenium µg/L
CM_PC2	0.985 - 10.4

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
CM_MW7-DP	2022 02 09	0.109
	2022 06 02	0.891
	2022 08 03	0.657
	2022 10 27	0.776
CM_MW7-SH	2022 06 02	1.72
	2022 08 03	0.384
	2022 10 27	0.419

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
CM_MW6-DP	2022 05 19	< 0.050
	Duplicate	0.098
	2022 07 21	1.33
	2022 10 20	< 0.050
CM_MW6-SH	2022 05 19	< 0.050
	2022 07 20	0.492
	2022 10 20	0.086

Seep Location	Dissolved Selenium µg/L
CM_WD4	19.3

Seep Location	Dissolved Selenium µg/L
CM_37PIT-SEEP-E	1.26

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
CM_MW8	2022 06 02	0.999
	2022 08 03	0.082
	Duplicate	0.076
	2022 10 27	0.706

Surface Water Location	Dissolved Selenium µg/L
CM_CCHW	0.167 - 0.287

Surface Water Location	Dissolved Selenium µg/L
CM_MC1	0.191 - 0.389

Groundwater Location	Date (yyyy mm dd)	Dissolved Selenium µg/L
CM_MW3-DP	2022 03 03	< 0.250
	2022 06 01	< 0.100
	2022 08 04	< 0.100
	2022 10 13	< 0.100
CM_MW3-SH	2022 03 03	0.240
	Duplicate	0.305
	2022 06 01	0.242
	Duplicate	0.243
	2022 08 04	0.277
	2022 10 13	0.322

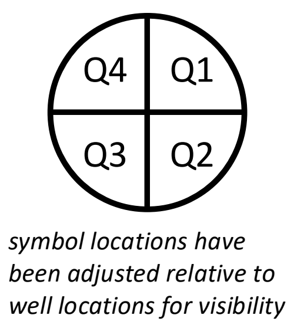
Legend

Groundwater Stations
- Monitoring Well

Surface Water Stations
- ★ Compliance Point
- ▼ Receiving Environment
- ▼ Authorized Discharge
- ▼ Monitoring
- ▽ Monitoring (Retired)
- ▲ Seep

Site Features
- Secondary Road
- Rails
- Tailings/Settling/Sediment Pond
- End-Pit Lake
- Study Areas
- Pit
- Stockpiles
- Waste Dump (Spoils)
- Watersheds
- Mine Permitted Areas

Water Features
- Stream + Stream Ditch
- Intermittent + Indefinite Stream
- Subsurface
- Ditch
- Potable Waterline
- Rock Drain
- Water Pipeline
- Bypass/Diversion Channel
- Lake/River Bed
- Wetted Area/Wetland (Based on 1:10000 Scale)



symbol locations have been adjusted relative to well locations for visibility

Green below the applicable screening criteria

Blue above the applicable screening criteria

Grey no sample collected

^ Dissolved phase of the parameter is shown in the spatial plot.

Primary Screening Criteria	Selenium^ µg/L
CSR Aquatic Life	20
CSR Irrigation Watering	20
CSR Livestock Watering	30
CSR Drinking Water	10

Notes:
1. Original in colour at paper size ANSI C (17x22 in).
2. Numerical scale reflects full-size print. Print scaling will distort this scale; however, scale bar will remain accurate.
3. Intended for illustration purposes. Accuracy has not been verified for construction or navigation.
4. Locations of overlapping wells have been adjusted for clarity.
5. The nomenclature for ponds may not accurately reflect that in the various effluent discharge permits.

References:
1. Data provided by Teck Coal Limited

0 125 250 500 750 1,000 Meters

PROJECT LOCATION:
Elk Valley, BC

CLIENT NAME:
Teck Coal Limited

SNC·LAVALIN

Coal Mountain Mine
Spatial Distribution of Dissolved Selenium in Groundwater

CHK'D: RS
DATE: 2023-03-22 SCALE: 1:10,000
REF NUM: REV: 0
BY: CW
COORD SYS: NAD 1983 UTM Zone 11N
DRAWING CM-09

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-SpatialDist_Se_CMm.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022

Attachment I

Borehole Logs

srk consulting

Teck

PROJECT: Phase 1 Groundwater Monitoring
CLIENT: Teck Coal Ltd. - CMO

HOLE ID: **MW-1**
LOCATION: CMO
PROJECT NO: 1CT017.098
DRILLING CONTRACTOR: AquaPro Drilling Ltd.
DRILLING TYPE: Air Rotary
LOGGED BY: LC
BORING DATE: 8/12/2015 to 8/13/2015

COORDINATES: 667969 E 5487521 N
DATUM: UTM Zone 11
GROUND ELEV (masl): 1500.44
COLLAR DIP: -90
EOH ELEV. (masl): 1463.25
TOTAL DEPTH (mbgs): 37.19
STICKUP HEIGHT (magl): 0.85
CASING STICKUP (magl): 0.85
AREA: **Michel Creek**

Page: 1 of 3

Lithological Symbol

▨	CL-Clay	⁘	SA-Sand	⁙	SS-Sandstone
☐	LO-Loam	◯	GV-Gravel	☐	ST-Siltstone
▥	SI-Silt				

Hydraulic Conductivity (m/s)

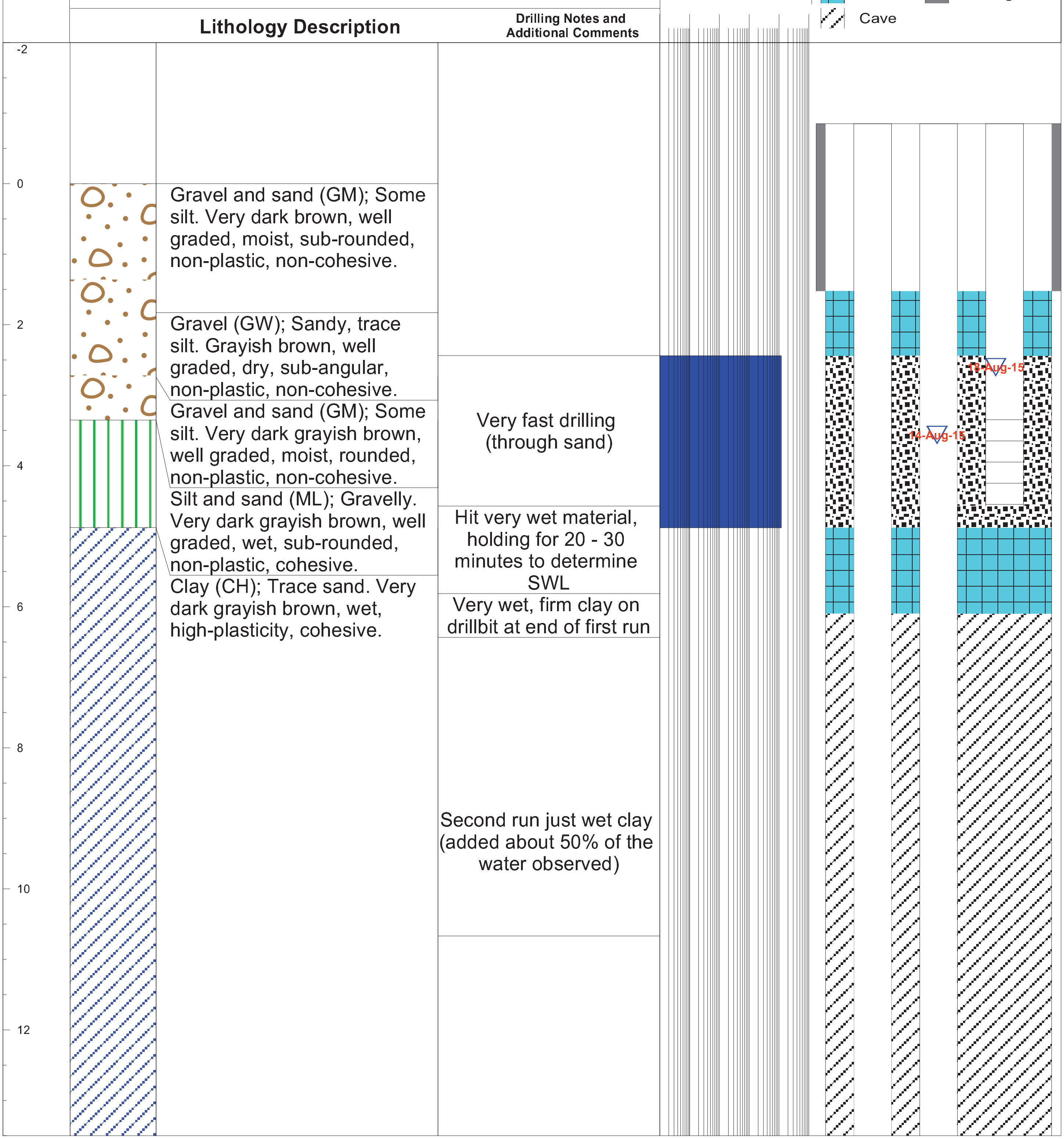
Well Installation

▩	Sand	⊞	Chips
☐	Screen	⊞	Chips/Backfill
☐	PVC	☐	Backfill
⊞	Pellets	■	Casing
▨	Cave		

Depth (m)

Lithology Description

Drilling Notes and Additional Comments



Gravel and sand (GM); Some silt. Very dark brown, well graded, moist, sub-rounded, non-plastic, non-cohesive.

Gravel (GW); Sandy, trace silt. Grayish brown, well graded, dry, sub-angular, non-plastic, non-cohesive.

Gravel and sand (GM); Some silt. Very dark grayish brown, well graded, moist, rounded, non-plastic, non-cohesive.

Silt and sand (ML); Gravelly. Very dark grayish brown, well graded, wet, sub-rounded, non-plastic, cohesive.

Clay (CH); Trace sand. Very dark grayish brown, wet, high-plasticity, cohesive.

Very fast drilling (through sand)

Hit very wet material, holding for 20 - 30 minutes to determine SWL

Very wet, firm clay on drillbit at end of first run

Second run just wet clay (added about 50% of the water observed)

srk consulting

Teck

HOLE ID:	**MW-1**	COORDINATES:	667969 E 5487521 N
LOCATION:	CMO	DATUM:	UTM Zone 11
PROJECT NO:	1CT017.098	GROUND ELEV (masl):	1500.44
DRILLING CONTRACTOR:	AquaPro Drilling Ltd.	COLLAR DIP:	-90
		EOH ELEV. (masl):	1463.25
DRILLING TYPE:	Air Rotary	TOTAL DEPTH (mbgs):	37.19
LOGGED BY:	LC	STICKUP HEIGHT (magl):	0.85
BORING DATE:	8/12/2015 to 8/13/2015	CASING STICKUP (magl):	0.85

PROJECT: Phase 1 Groundwater Monitoring

CLIENT: Teck Coal Ltd. - CMO

AREA: **Michel Creek**

Lithological Symbol

▨ CL-Clay	▨ SA-Sand	▨ SS-Sandstone
☐ LO-Loam	▨ GV-Gravel	▨ ST-Siltstone
▨ SI-Silt		

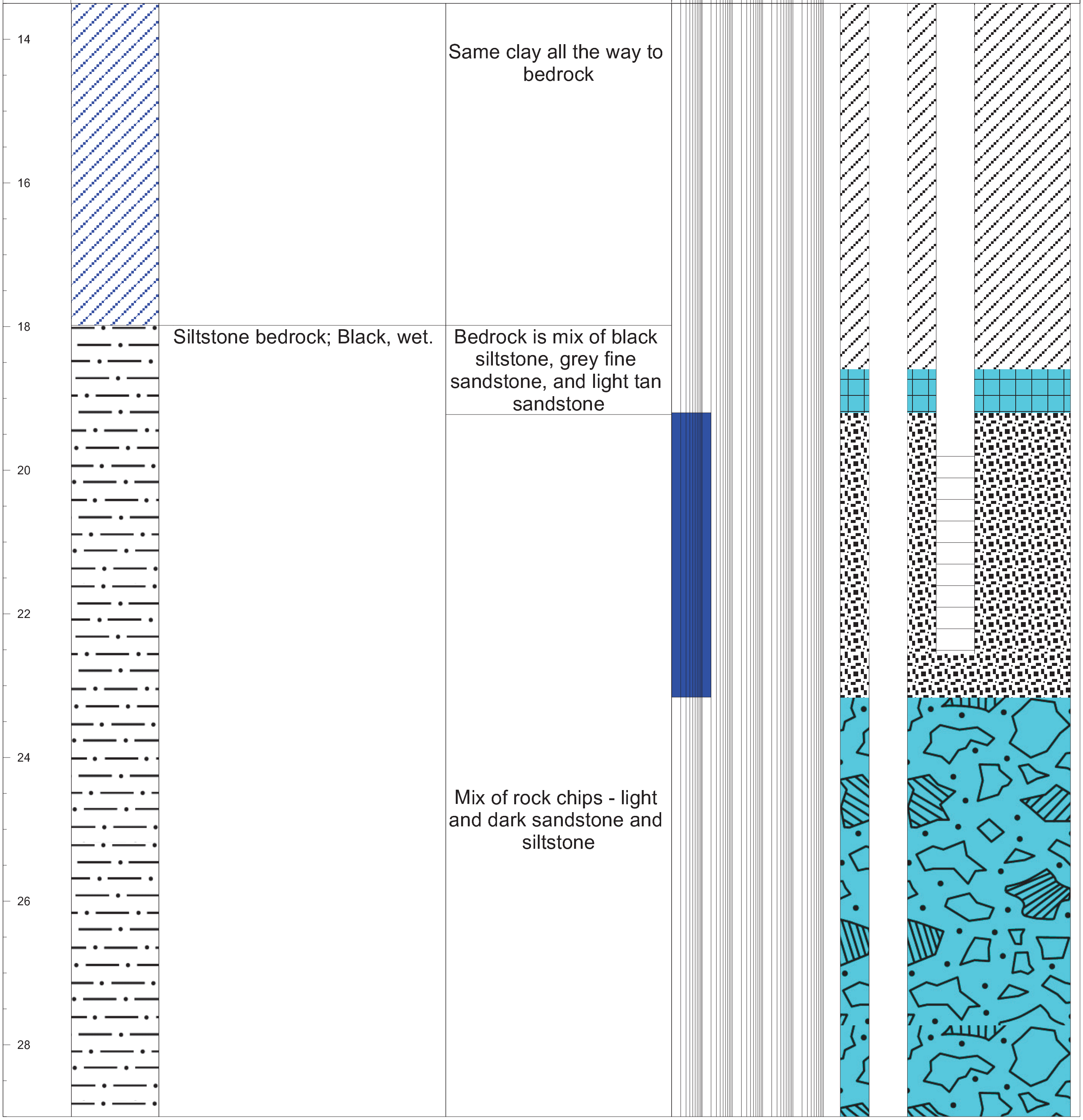
Hydraulic Conductivity (m/s)

1E-8, 1E-7, 1E-6, 1E-5, 0.0001, 0.001

Well Installation

▨ Sand	▨ Chips
☐ Screen	▨ Chips/Backfill
☐ PVC	▨ Backfill
▨ Pellets	■ Casing
▨ Cave	

Depth (m)	Lithology Description	Drilling Notes and Additional Comments
13.5–18		Same clay all the way to bedrock
18	Siltstone bedrock; Black, wet.	Bedrock is mix of black siltstone, grey fine sandstone, and light tan sandstone
		Mix of rock chips - light and dark sandstone and siltstone



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Teck

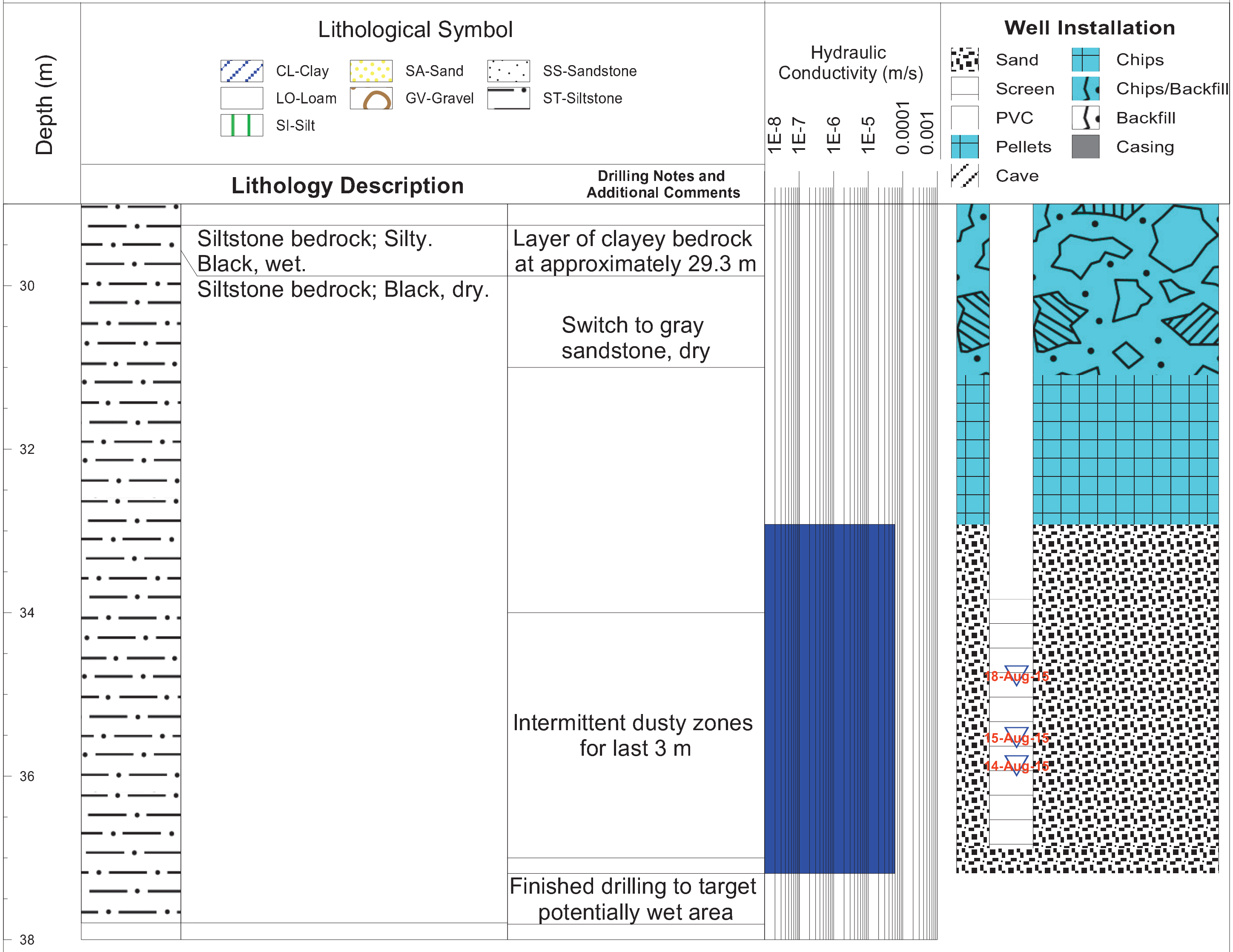
HOLE ID:	**MW-1**	COORDINATES:	667969 E 5487521 N
LOCATION:	CMO	DATUM:	UTM Zone 11
PROJECT NO:	1CT017.098	GROUND ELEV (masl):	1500.44
DRILLING CONTRACTOR:	AquaPro Drilling Ltd.	COLLAR DIP:	-90
		EOH ELEV. (masl):	1463.25
DRILLING TYPE:	Air Rotary	TOTAL DEPTH (mbgs):	37.19
LOGGED BY:	LC	STICKUP HEIGHT (magl):	0.85
BORING DATE:	8/12/2015 to 8/13/2015	CASING STICKUP (magl):	0.85

Page: 3 of 3

PROJECT: Phase 1 Groundwater Monitoring

CLIENT: Teck Coal Ltd. - CMO

AREA: **Michel Creek**



Lithological Symbol

- ▨ CL-Clay
- ☐ LO-Loam
- ▥ SI-Silt
- ▒ SA-Sand
- ◯ GV-Gravel
- ⁘ SS-Sandstone
- ▭ ST-Siltstone

Well Installation

- ▩ Sand
- ☐ Screen
- ☐ PVC
- ▦ Pellets
- ▨ Cave
- ▦ Chips
- ▩ Chips/Backfill
- ☐ Backfill
- ■ Casing

Lithology Description	**Drilling Notes and Additional Comments**
Siltstone bedrock; Silty. Black, wet.	Layer of clayey bedrock at approximately 29.3 m
Siltstone bedrock; Black, dry.	Switch to gray sandstone, dry
	Intermittent dusty zones for last 3 m
	Finished drilling to target potentially wet area

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Teck

HOLE ID:	**MW-2-S**	COORDINATES:	668335 E 5486754 N
LOCATION:	CMO	DATUM:	UTM Zone 11
PROJECT NO:	1CT017.098	GROUND ELEV (masl):	1515.56
DRILLING CONTRACTOR:	AquaPro Drilling Ltd.	COLLAR DIP:	-90
		EOH ELEV. (masl):	1510.68
DRILLING TYPE:	Air Rotary	TOTAL DEPTH (mbgs):	4.88
LOGGED BY:	LC	STICKUP HEIGHT (magl):	0.9
BORING DATE:	8/14/2015 to 8/14/2015	CASING STICKUP (magl):	0.9

Page: 1 of 1

PROJECT: Phase 1 Groundwater Monitoring

CLIENT: Teck Coal Ltd. - CMO

AREA: **Michel Creek**

Depth (m)

Lithological Symbol

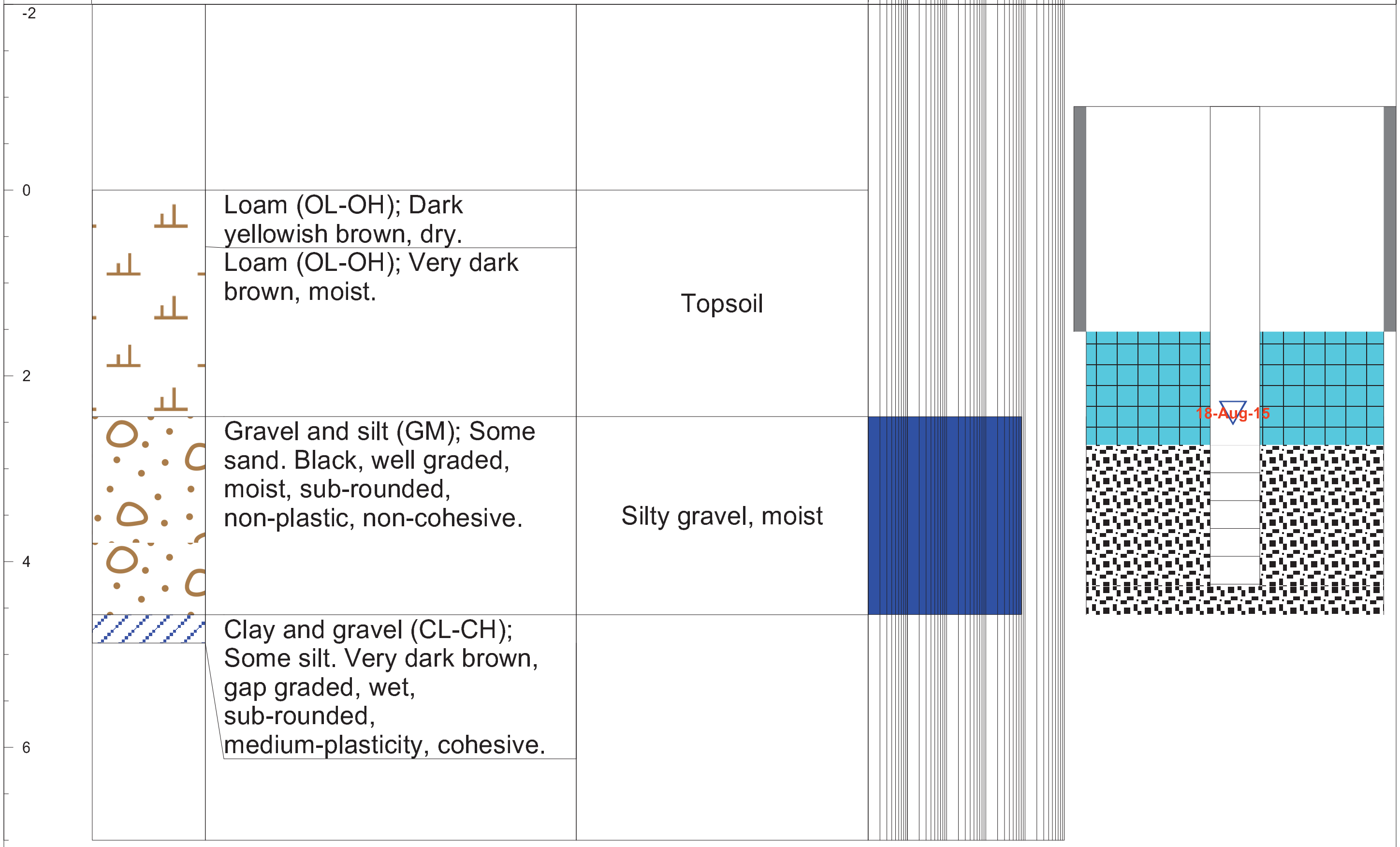
▨ CL-Clay
☐ LO-Loam
SI-Silt
SA-Sand
GV-Gravel
SS-Sandstone
ST-Siltstone

Hydraulic Conductivity (m/s)

1E-8 1E-7 1E-6 1E-5 0.0001 0.001

Well Installation

Sand
Screen
PVC
Pellets
Cave
Chips
Chips/Backfill
Backfill
Casing



Lithology Description	**Drilling Notes and Additional Comments**
Loam (OL-OH); Dark yellowish brown, dry.	Topsoil
Loam (OL-OH); Very dark brown, moist.	
Gravel and silt (GM); Some sand. Black, well graded, moist, sub-rounded, non-plastic, non-cohesive.	Silty gravel, moist
Clay and gravel (CL-CH); Some silt. Very dark brown, gap graded, wet, sub-rounded, medium-plasticity, cohesive.	

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Teck

HOLE ID:	**MW-2-D**	COORDINATES:	668274 E 5486775 N
LOCATION:	CMO	DATUM:	UTM Zone 11
PROJECT NO:	1CT017.098	GROUND ELEV (masl):	1502
DRILLING CONTRACTOR:	AquaPro Drilling Ltd.	COLLAR DIP:	-90
		EOH ELEV. (masl):	1473.4
DRILLING TYPE:	Air Rotary	TOTAL DEPTH (mbgs):	28.6
LOGGED BY:	LC	STICKUP HEIGHT (magl):	-
BORING DATE:	8/13/2015 to 8/14/2015	CASING STICKUP (magl):	0.9

Page: 1 of 2

PROJECT: Phase 1 Groundwater Monitoring

CLIENT: Teck Coal Ltd. - CMO

AREA: **Michel Creek**

Depth (m)

Lithological Symbol

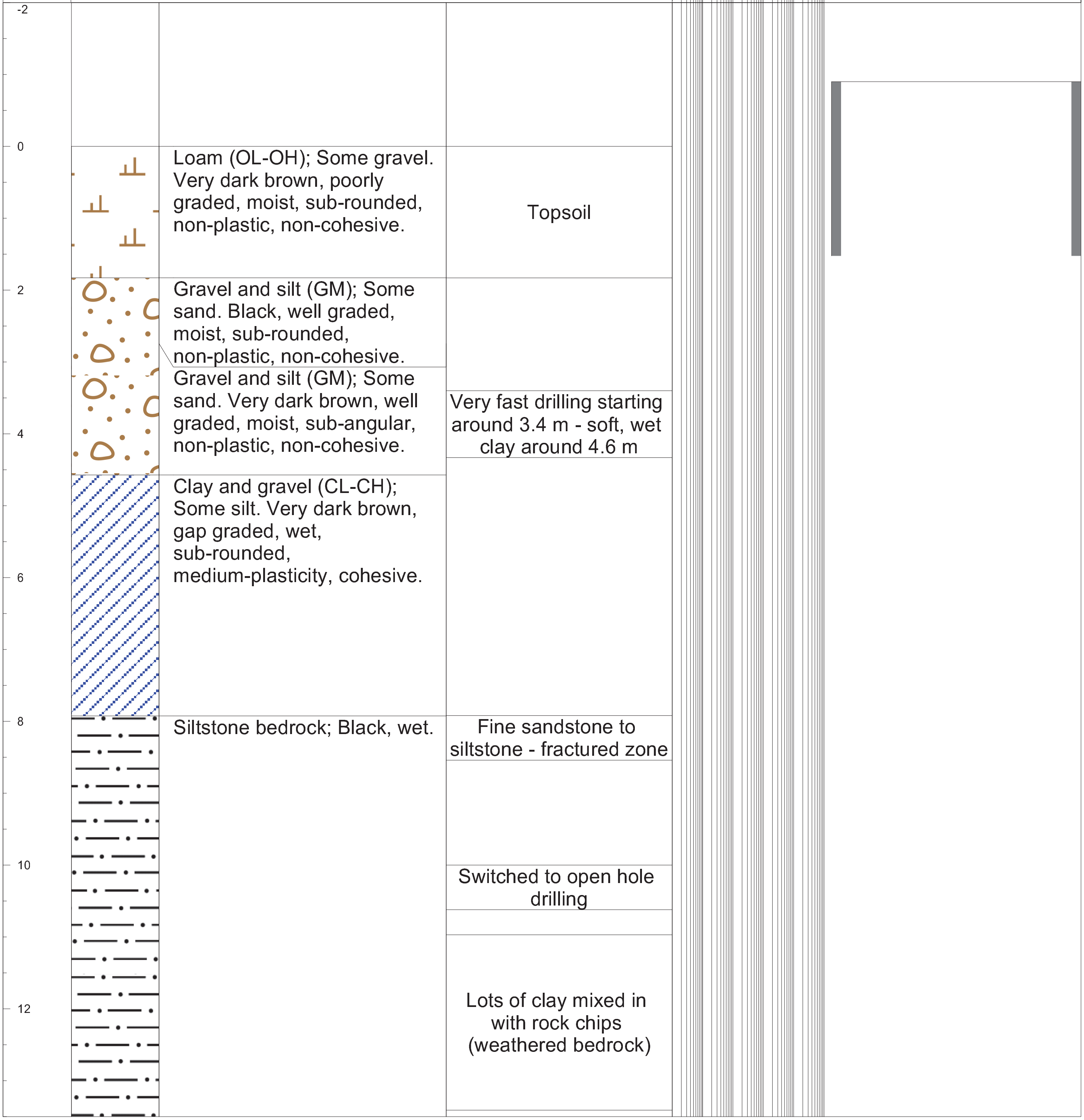
▨ CL-Clay	SA-Sand	SS-Sandstone
LO-Loam	GV-Gravel	ST-Siltstone
SI-Silt		

Hydraulic Conductivity (m/s)

1E-8 1E-7 1E-6 1E-5 0.0001 0.001

Well Installation

Sand	Chips
Screen	Chips/Backfill
PVC	Backfill
Pellets	Casing
Cave	



Lithology Description	**Drilling Notes and Additional Comments**
Loam (OL-OH); Some gravel. Very dark brown, poorly graded, moist, sub-rounded, non-plastic, non-cohesive.	Topsoil
Gravel and silt (GM); Some sand. Black, well graded, moist, sub-rounded, non-plastic, non-cohesive.	
Gravel and silt (GM); Some sand. Very dark brown, well graded, moist, sub-angular, non-plastic, non-cohesive.	Very fast drilling starting around 3.4 m - soft, wet clay around 4.6 m
Clay and gravel (CL-CH); Some silt. Very dark brown, gap graded, wet, sub-rounded, medium-plasticity, cohesive.	
Siltstone bedrock; Black, wet.	Fine sandstone to siltstone - fractured zone
	Switched to open hole drilling
	Lots of clay mixed in with rock chips (weathered bedrock)

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Teck

HOLE ID: **MW-2-D**
LOCATION: CMO
PROJECT NO: 1CT017.098
DRILLING CONTRACTOR: AquaPro Drilling Ltd.
DRILLING TYPE: Air Rotary
LOGGED BY: LC
BORING DATE: 8/13/2015 to 8/14/2015

COORDINATES: 668274 E 5486775 N
DATUM: UTM Zone 11
GROUND ELEV (masl): 1502
COLLAR DIP: -90
EOH ELEV. (masl): 1473.4
TOTAL DEPTH (mbgs): 28.6
STICKUP HEIGHT (magl): -
CASING STICKUP (magl): 0.9

Page: 2 of 2

AREA: **Michel Creek**

PROJECT: Phase 1 Groundwater Monitoring
CLIENT: Teck Coal Ltd. - CMO

Lithological Symbol

▨	CL-Clay	▨	SA-Sand	▨	SS-Sandstone
☐	LO-Loam	◯	GV-Gravel	▭	ST-Siltstone
▥	SI-Silt				

Hydraulic Conductivity (m/s)

1E-8 1E-7 1E-6 1E-5 0.0001 0.001

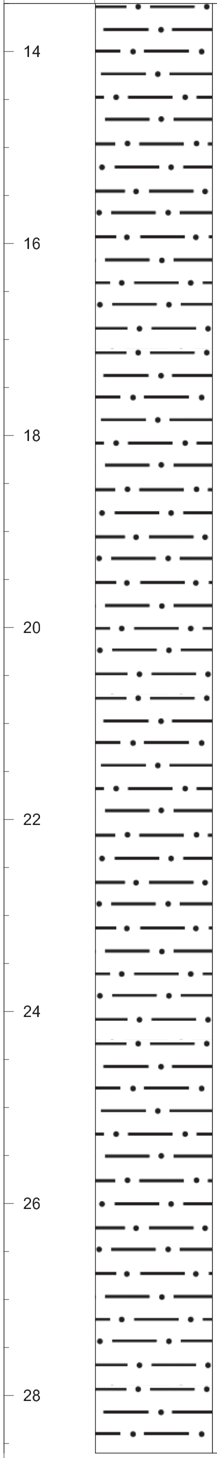
Well Installation

▩	Sand	⊞	Chips
☐	Screen	⊞	Chips/Backfill
☐	PVC	☐	Backfill
⊞	Pellets	■	Casing
▨	Cave		

Depth (m)

Lithology Description

Drilling Notes and Additional Comments



Competent bedrock

Hitting large volumes of water (est. 50-60 gpm), put in casing to 16.8 m

Switched to open hole drilling

Mud, very wet

Flow increased dramatically over this run to 60 gpm

Still in fracture zone. Flow stable but stopped once hole was cased. Decision made to plug hole

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Teck

HOLE ID:	**MW-3**	COORDINATES:	668230 E 5482814 N
LOCATION:	CMO	DATUM:	UTM Zone 11
PROJECT NO:	1CT017.098	GROUND ELEV (masl):	1573.4
DRILLING CONTRACTOR:	AquaPro Drilling Ltd.	COLLAR DIP:	-90
		EOH ELEV. (masl):	1545.97
DRILLING TYPE:	Air Rotary	TOTAL DEPTH (mbgs):	27.43
LOGGED BY:	LC	STICKUP HEIGHT (magl):	0.81
BORING DATE:	8/11/2015 to 8/12/2015	CASING STICKUP (magl):	0.81

PROJECT: Phase 1 Groundwater Monitoring

CLIENT: Teck Coal Ltd. - CMO

AREA: **Michel Creek**

Depth (m)

Lithological Symbol

- ▨ CL-Clay
- ☐ LO-Loam
- ▥ SI-Silt
- ▦ SA-Sand
- ○ GV-Gravel
- ⁚ SS-Sandstone
- ▭ ST-Siltstone

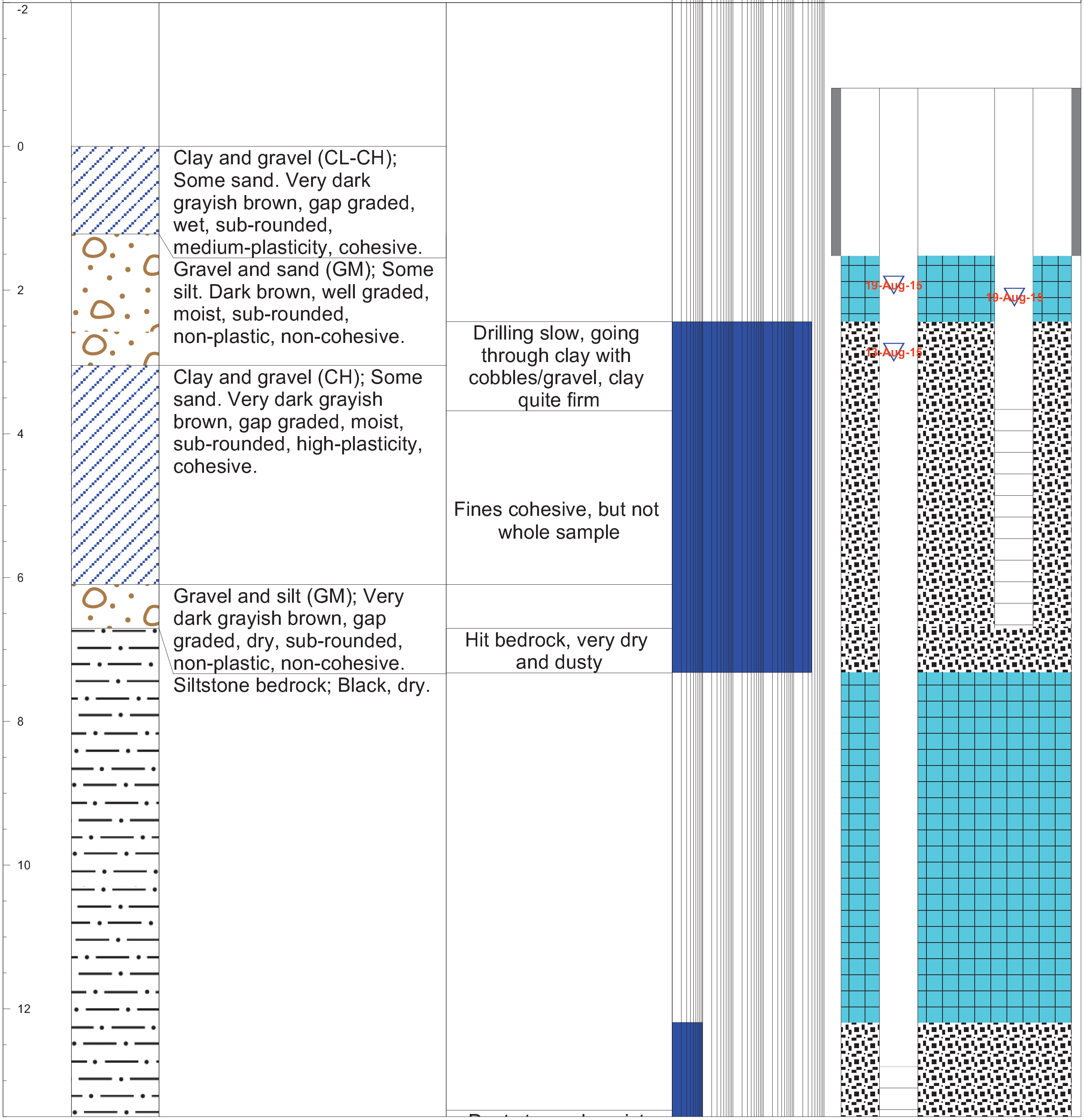
Hydraulic Conductivity (m/s)

Well Installation

- ▩ Sand
- ☐ Screen
- ☐ PVC
- ▦ Pellets
- ▨ Cave
- ▦ Chips
- ▦ Chips/Backfill
- ☐ Backfill
- ■ Casing

Lithology Description

Drilling Notes and Additional Comments



Clay and gravel (CL-CH); Some sand. Very dark grayish brown, gap graded, wet, sub-rounded, medium-plasticity, cohesive.

Gravel and sand (GM); Some silt. Dark brown, well graded, moist, sub-rounded, non-plastic, non-cohesive.

Clay and gravel (CH); Some sand. Very dark grayish brown, gap graded, moist, sub-rounded, high-plasticity, cohesive.

Gravel and silt (GM); Very dark grayish brown, gap graded, dry, sub-rounded, non-plastic, non-cohesive.

Siltstone bedrock; Black, dry.

Drilling slow, going through clay with cobbles/gravel, clay quite firm

Fines cohesive, but not whole sample

Hit bedrock, very dry and dusty

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Teck

PROJECT:	Phase 1 Groundwater Monitoring	HOLE ID:	**MW-3**	COORDINATES:	668230 E 5482814 N
CLIENT:	Teck Coal Ltd. - CMO	LOCATION:	CMO	DATUM:	UTM Zone 11
		PROJECT NO:	1CT017.098	GROUND ELEV (masl):	1573.4
		DRILLING CONTRACTOR:	AquaPro Drilling Ltd.	COLLAR DIP:	-90
				EOH ELEV. (masl):	1545.97
		DRILLING TYPE:	Air Rotary	TOTAL DEPTH (mbgs):	27.43
		LOGGED BY:	LC	STICKUP HEIGHT (magl):	0.81
		BORING DATE:	8/11/2015 to 8/12/2015	CASING STICKUP (magl):	0.81
				AREA:	**Michel Creek**

Page: 2 of 2

Depth (m)

Lithological Symbol

- ▨ CL-Clay
- ☐ LO-Loam
- ▥ SI-Silt
- ▒ SA-Sand
- ◯ GV-Gravel
- ⁙ SS-Sandstone
- ▭ ST-Siltstone

Hydraulic Conductivity (m/s)

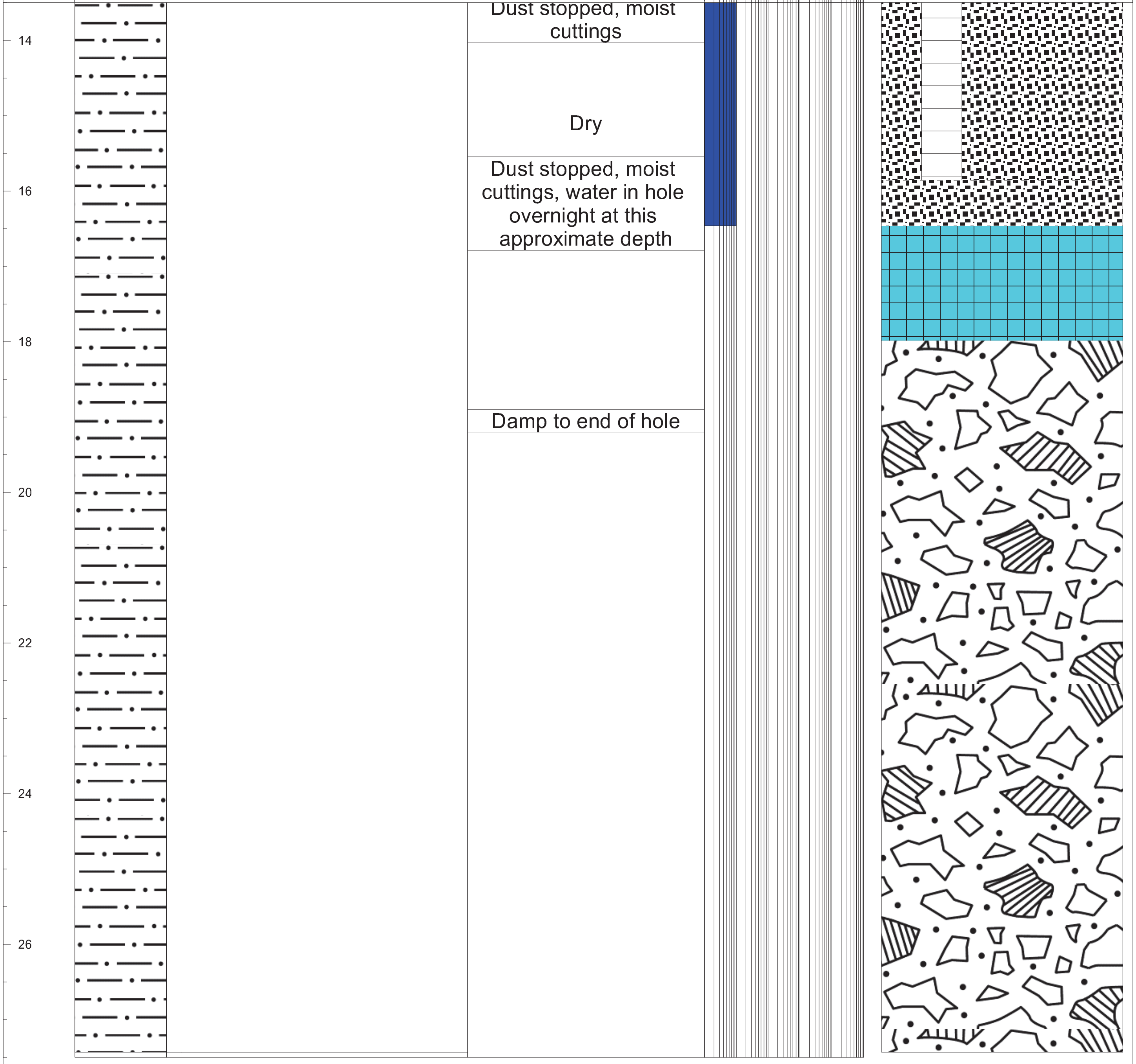
1E-8 1E-7 1E-6 1E-5 0.0001 0.001

Well Installation

- ▩ Sand
- ☐ Screen
- ☐ PVC
- ▦ Pellets
- ▨ Cave
- ▦ Chips
- ▦ Chips/Backfill
- ☐ Backfill
- ■ Casing

Lithology Description

Drilling Notes and Additional Comments



Dust stopped, moist cuttings

Dry

Dust stopped, moist cuttings, water in hole overnight at this approximate depth

Damp to end of hole

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Teck

HOLE ID:	**MW-4**	COORDINATES:	668527 E 5487347 N
LOCATION:	CMO	DATUM:	UTM Zone 11
PROJECT NO:	1CT017.098	GROUND ELEV (masl):	1512.4
DRILLING CONTRACTOR:	AquaPro Drilling Ltd.	COLLAR DIP:	-90
		EOH ELEV. (masl):	1483.9
DRILLING TYPE:	Air Rotary	TOTAL DEPTH (mbgs):	28.5
LOGGED BY:	LC	STICKUP HEIGHT (magl):	0.92
BORING DATE:	8/11/2015 to 8/11/2015	CASING STICKUP (magl):	0.92

Page: 1 of 2

PROJECT: Phase 1 Groundwater Monitoring

CLIENT: Teck Coal Ltd. - CMO

AREA: **Corbin Creek**

Lithological Symbol

▨	CL-Clay	░	SA-Sand	⁘	SS-Sandstone
☐	LO-Loam	○	GV-Gravel	▭	ST-Siltstone
‖	SI-Silt				

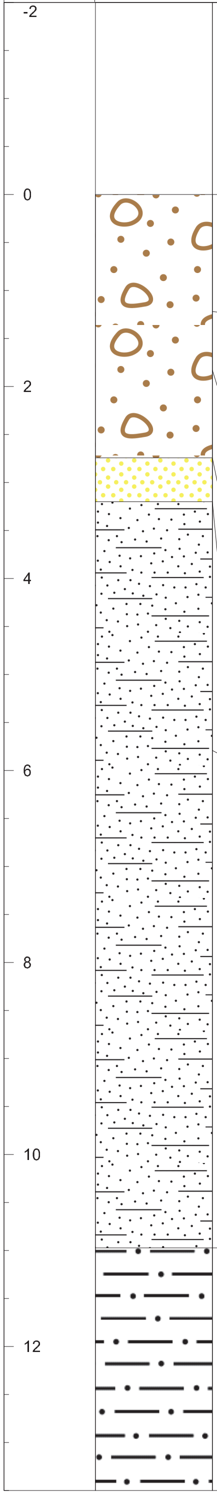
Hydraulic Conductivity (m/s)

1E-8 1E-7 1E-6 1E-5 0.0001 0.001

Well Installation

⁙	Sand	⊞	Chips
☐	Screen	⊞	Chips/Backfill
☐	PVC	⊞	Backfill
⊞	Pellets	■	Casing
▨	Cave		

Depth (m)



Lithology Description

Gravel (GW); Sandy, trace silt. Very dark brown, well graded, moist, angular, non-plastic, non-cohesive.

Gravel and sand (GW); Very dark brown, well graded, moist, sub-angular, non-plastic, non-cohesive.

Gravel (GW-GP); Some sand. Dark grayish brown, gap graded, moist, rounded, non-plastic, non-cohesive.

Sand (SM); Silty, some gravel. Dark grayish brown, well graded, moist, sub-rounded, non-plastic, non-cohesive.

Sandstone bedrock; Dark gray, dry.

Sandstone bedrock; Dark gray, moist.

Siltstone bedrock; Black, dry.

Drilling Notes and Additional Comments

Road fill

Possibly weathered

Some siltstone present

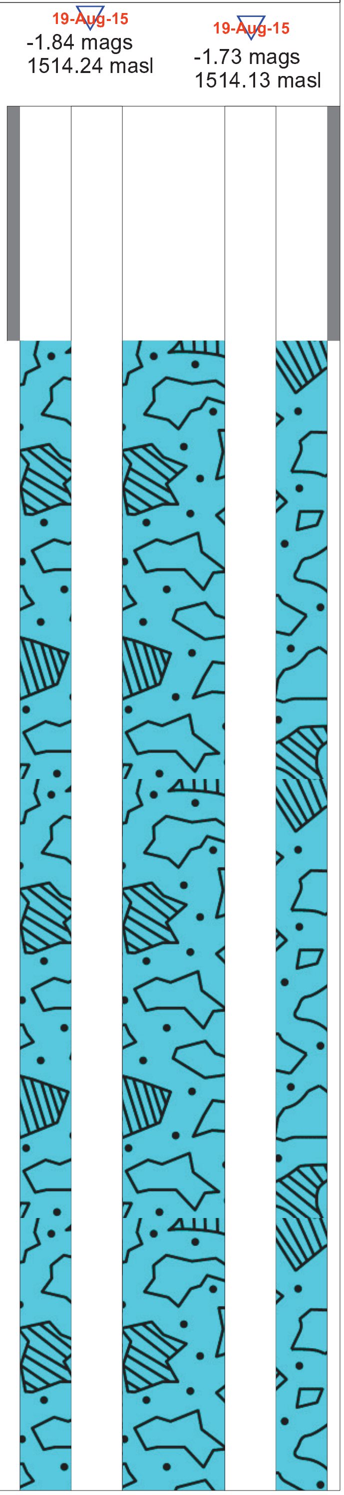
Drilling like bedrock. Switching to open hole to confirm after first casing

Some siltstone present

Continuing through rock, open hole. Moist but not wet. Waiting for 1 hr to check WLs.

No water after 1 hr open hole. About 0.5 m collapse.

Switch from grey fine



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Teck

HOLE ID: **MW-4**
LOCATION: CMO
PROJECT NO: 1CT017.098
DRILLING CONTRACTOR: AquaPro Drilling Ltd.
DRILLING TYPE: Air Rotary
LOGGED BY: LC
BORING DATE: 8/11/2015 to 8/11/2015

COORDINATES: 668527 E 5487347 N
DATUM: UTM Zone 11
GROUND ELEV (masl): 1512.4
COLLAR DIP: -90
EOH ELEV. (masl): 1483.9
TOTAL DEPTH (mbgs): 28.5
STICKUP HEIGHT (magl): 0.92
CASING STICKUP (magl): 0.92

Page: 2 of 2

AREA: **Corbin Creek**

PROJECT: Phase 1 Groundwater Monitoring
CLIENT: Teck Coal Ltd. - CMO

Depth (m)

Lithological Symbol

▨ CL-Clay
☐ LO-Loam
▥ SI-Silt
▒ SA-Sand
◯ GV-Gravel
⁙ SS-Sandstone
▭ ST-Siltstone

Hydraulic Conductivity (m/s)

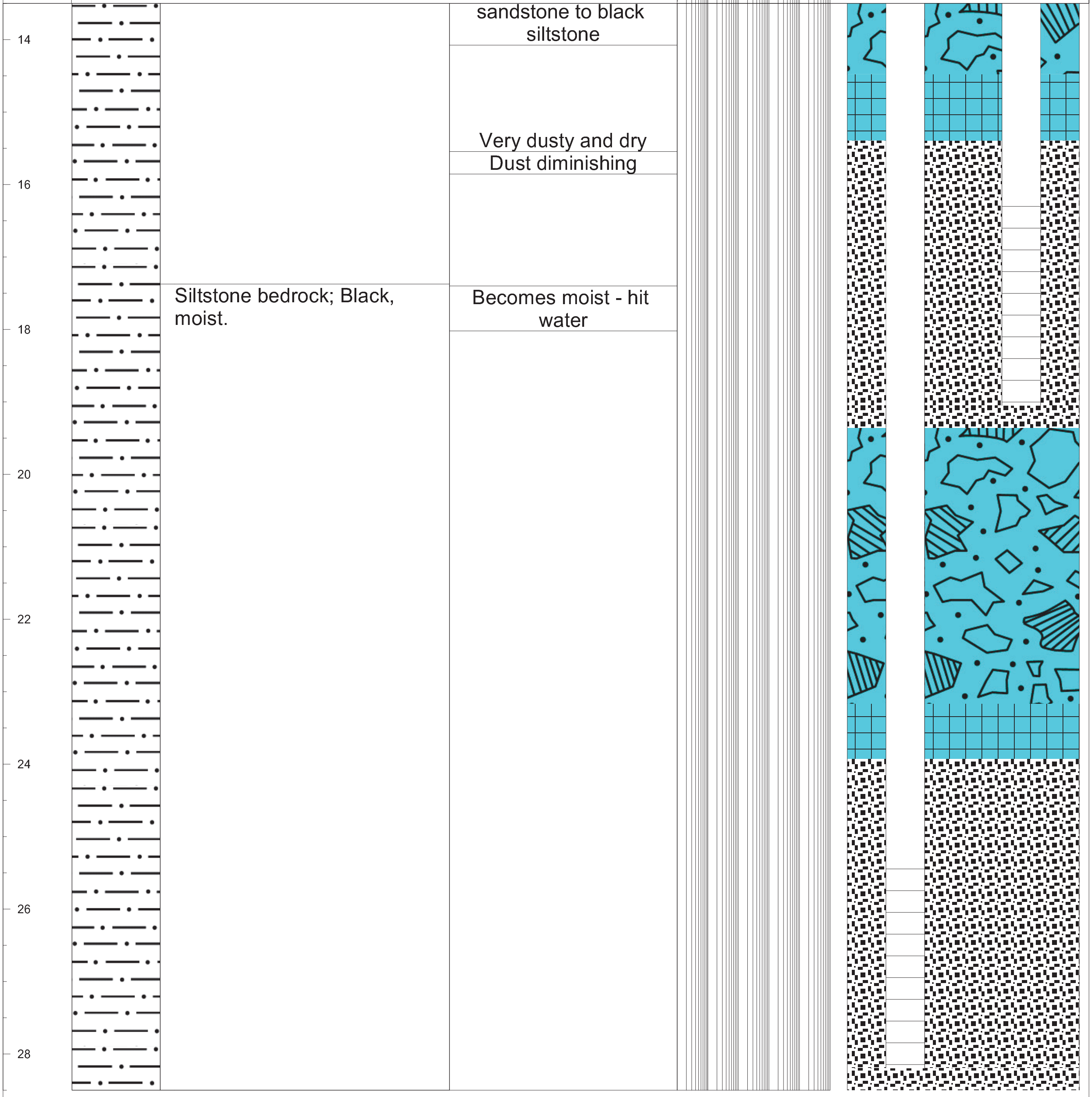
1E-8 | 1E-7 | 1E-6 | 1E-5 | 0.0001 | 0.001

Well Installation

▚ Sand
☐ Screen
☐ PVC
▦ Pellets
⟋ Cave
▦ Chips
▦ Chips/Backfill
☐ Backfill
■ Casing

Lithology Description

Drilling Notes and Additional Comments



Siltstone bedrock; Black, moist.

sandstone to black siltstone

Very dusty and dry

Dust diminishing

Becomes moist - hit water

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Teck

HOLE ID: **MW-5**
LOCATION: CMO
PROJECT NO: 1CT017.098
DRILLING CONTRACTOR: AquaPro Drilling Ltd.
DRILLING TYPE: Air Rotary
LOGGED BY: LC
BORING DATE: 8/10/2015 to 8/10/2015

COORDINATES: 669503 E 5487382 N
DATUM: UTM Zone 11
GROUND ELEV (masl): 1541
COLLAR DIP: -90
EOH ELEV. (masl): 1515.09
TOTAL DEPTH (mbgs): 25.91
STICKUP HEIGHT (magl): 1
CASING STICKUP (magl): 1

PROJECT: Phase 1 Groundwater Monitoring
CLIENT: Teck Coal Ltd. - CMO
AREA: **Corbin Creek**

Lithological Symbol

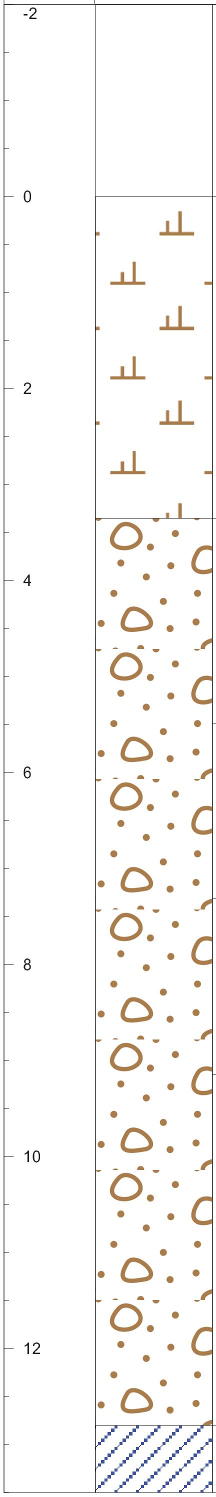
▨ CL-Clay	SA-Sand	SS-Sandstone
LO-Loam	GV-Gravel	ST-Siltstone
SI-Silt		

Hydraulic Conductivity (m/s)

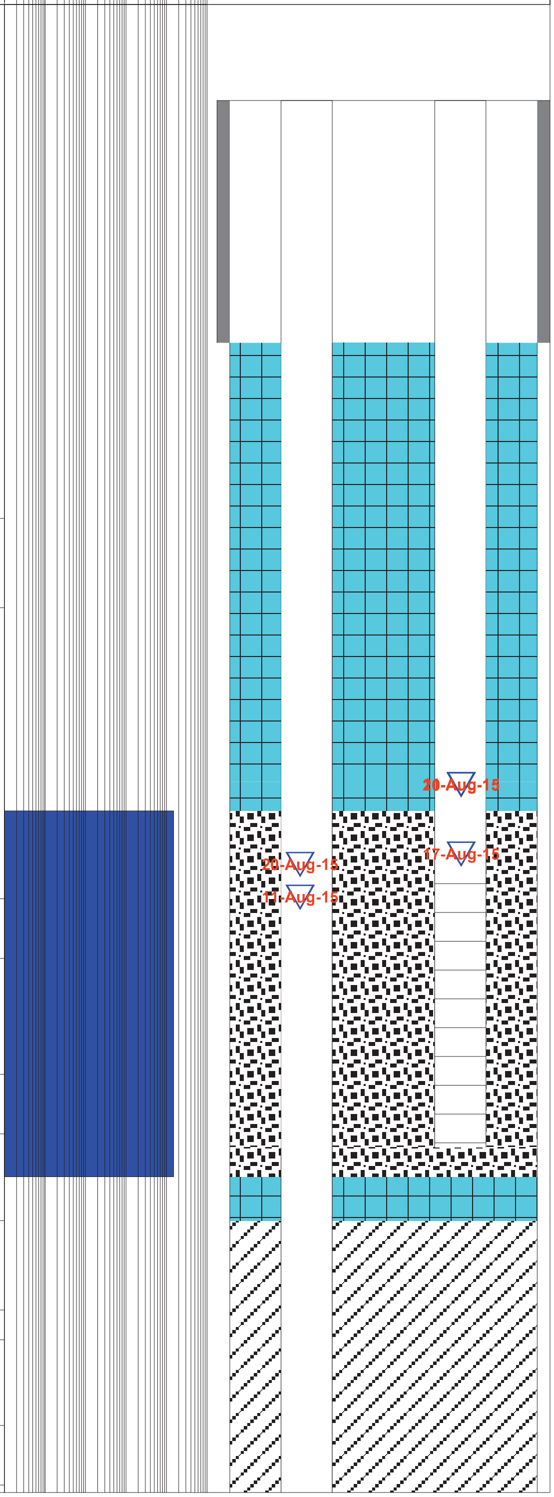
1E-8, 1E-7, 1E-6, 1E-5, 0.0001, 0.001

Well Installation

Sand	Chips
Screen	Chips/Backfill
PVC	Backfill
Pellets	Casing
Cave	



Lithology Description	**Drilling Notes and Additional Comments**
Loam (OL-OH); Sandy. Black, well graded, moist, sub-rounded, non-plastic, non-cohesive. Sharp contact.	
Gravel (GW); Some sand, trace silt. Brown, well graded, dry, rounded, non-plastic, non-cohesive.	Well-graded alluvial sandy gravel under organics layer
Gravel (GW); Some sand, trace silt. Brown, well graded, moist, rounded, non-plastic, non-cohesive.	
Gravel (GW); Trace sand. Brown, well graded, moist, sub-rounded, non-plastic, non-cohesive.	Coarse gravel, 1-3 cm in diameter
Gravel (GW); Trace sand. Brown, well graded, wet, sub-angular, non-plastic, non-cohesive.	Wet coarse gravel (very wet before 10 m) When restarted after welding 3rd casing, lots of water Cave during casing pull
Clay (CL-CH); Some cobbles, some gravel. Brown, gap	Hit wet clay layer with some cobbles



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Teck

HOLE ID:	**MW-5**
LOCATION:	CMO
PROJECT NO:	1CT017.098
DRILLING CONTRACTOR:	AquaPro Drilling Ltd.
DRILLING TYPE:	Air Rotary
LOGGED BY:	LC
BORING DATE:	8/10/2015 to 8/10/2015
COORDINATES:	669503 E 5487382 N
DATUM:	UTM Zone 11
GROUND ELEV (masl):	1541
COLLAR DIP:	-90
EOH ELEV. (masl):	1515.09
TOTAL DEPTH (mbgs):	25.91
STICKUP HEIGHT (magl):	1
CASING STICKUP (magl):	1
AREA:	**Corbin Creek**

Page: 2 of 2

PROJECT: Phase 1 Groundwater Monitoring

CLIENT: Teck Coal Ltd. - CMO

Depth (m)

Lithological Symbol

▨ CL-Clay	SA-Sand	SS-Sandstone
☐ LO-Loam	GV-Gravel	ST-Siltstone
SI-Silt		

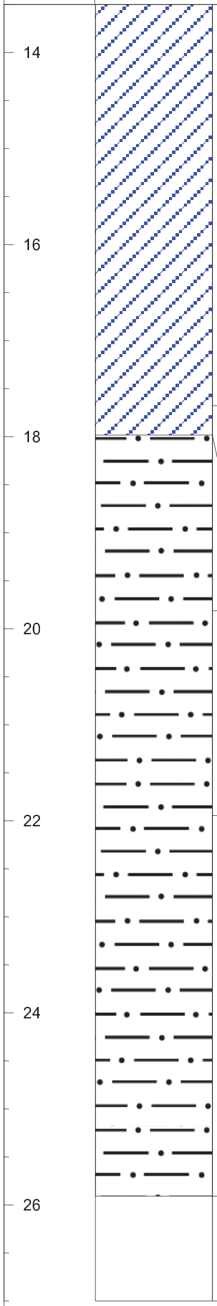
Hydraulic Conductivity (m/s)

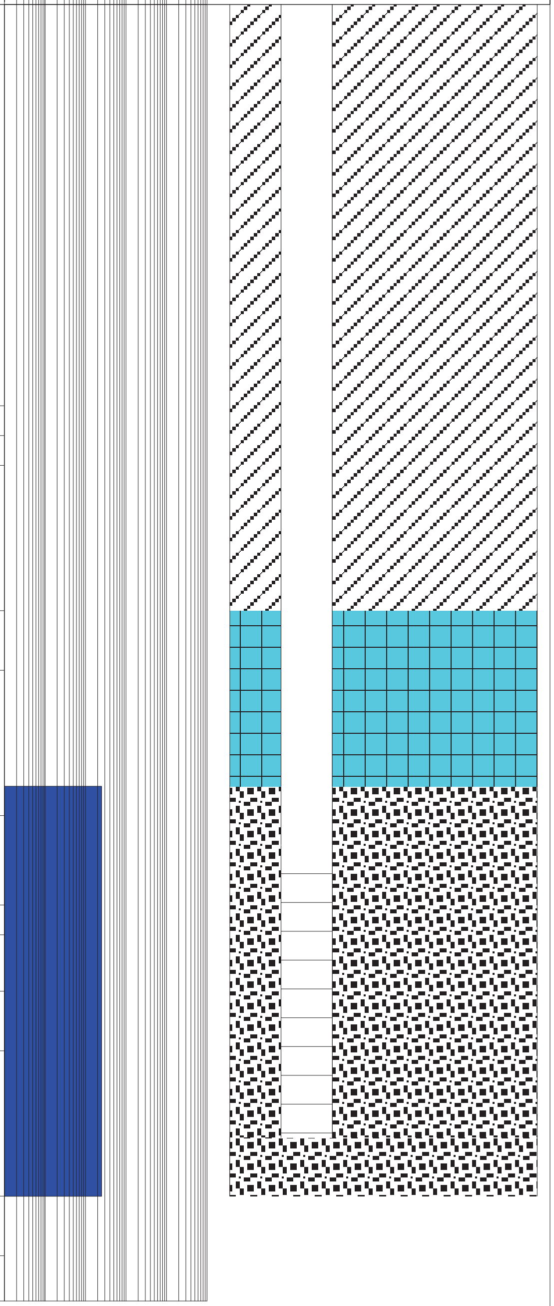
1E-8 1E-7 1E-6 1E-5 0.0001 0.001

Well Installation

Sand	Chips
Screen	Chips/Backfill
PVC	Backfill
Pellets	Casing
Cave	

Lithology Description	**Drilling Notes and Additional Comments**
graded, wet, sub-rounded, medium-plasticity, cohesive. Gradual contact.	
Clay (CL-CH); Some cobbles, some gravel. Brown, gap graded, wet, sub-angular, low-plasticity, non-cohesive.	Sloppy Hit wet boulder/bedrock
Siltstone bedrock; Black, wet.	Rock chips present
Siltstone bedrock; Very dark brown, moist.	In rock, but weathered and dry Weathered
Siltstone bedrock; Black, wet.	Unweathered bedrock, wet, going to switch to drilling open hole Fresh rock Adding water while drilling
	End of hole - sloppy on bottom





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Teck

HOLE ID: **CM_MW6**
LOCATION: CMO
PROJECT NO: 1CT017.114
DRILLING CONTRACTOR: AquaPro Drilling Ltd.
DRILLING TYPE: Air Rotary
LOGGED BY: EH/KK
BORING DATE: 4/26/2016 to 4/27/2016

COORDINATES: 670117.9 E5486463.5 N
DATUM: UTM Zone 11
GROUND ELEV (masl): 1579.66
COLLAR DIP: -90
EOH ELEV. (masl): 1478.30336
TOTAL DEPTH (mbgs): 41.69664
STICKUP HEIGHT (magl): 0.83/0.83
CASING STICKUP (magl): 0.88
AREA: **Corbin Dam**

Page: 1 of 3

PROJECT: Phase 2 Groundwater Monitoring
CLIENT: Teck Coal Ltd. - CMO

Depth (m)

Lithological Symbol

▨ CL-Clay	▨ SA-Sand	▭ ST-Siltstone
■ CO-Coal	▨ GV-Gravel	▭ BO-Boulders
▯ SI-Silt	▨ SS-Sandstone	

Hydraulic Conductivity (m/s)

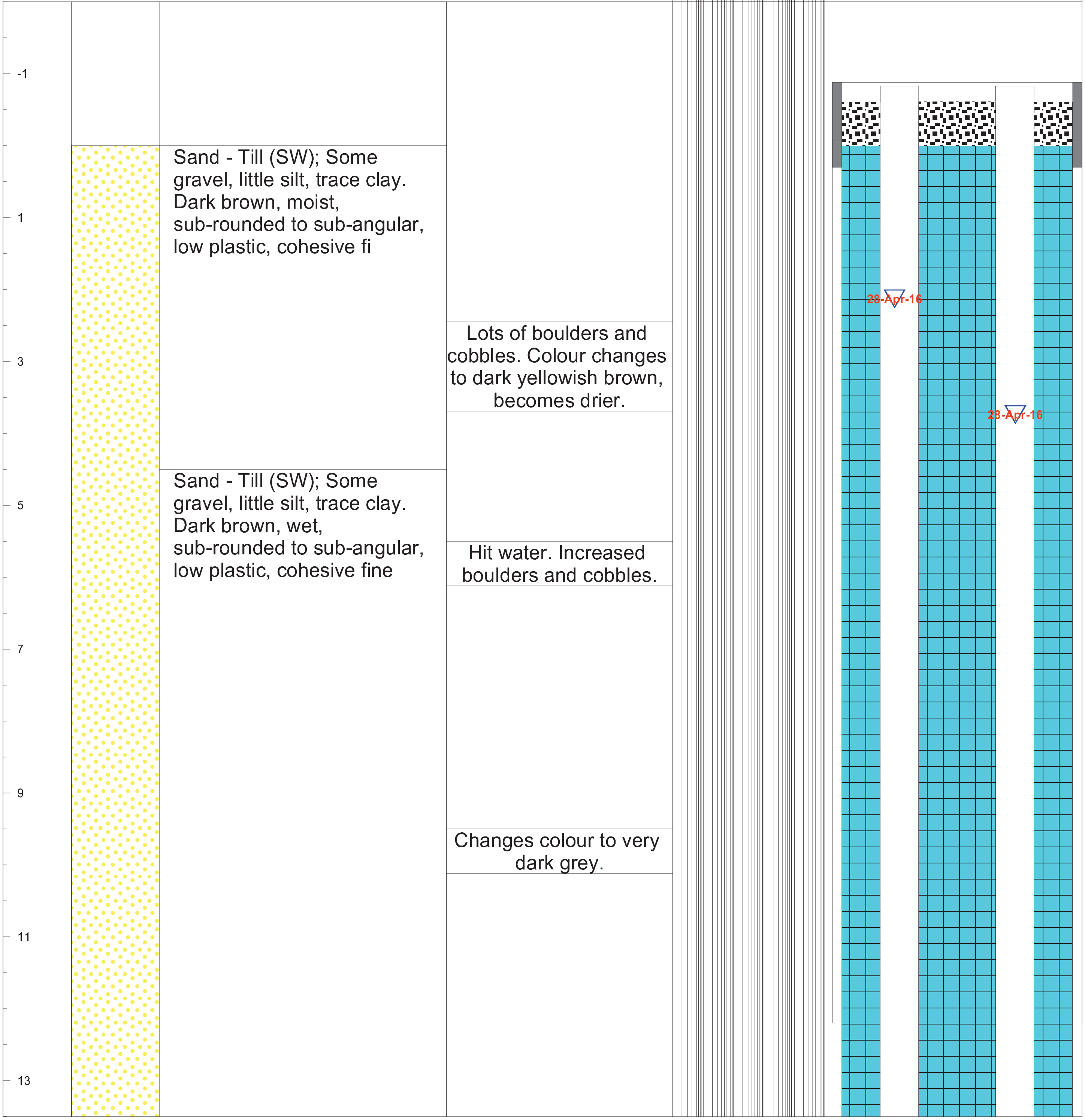
1E-8 1E-7 1E-6 1E-5 0.0001 0.001

Well Installation

▨ Sand	▨ Pellets
▯ Cable	▦ Chips
▨ VWP	▯ Cave
▭ Screen	■ Casing
▭ PVC	■ Grout

Lithology Description

Drilling Notes and Additional Comments



Sand - Till (SW); Some gravel, little silt, trace clay. Dark brown, moist, sub-rounded to sub-angular, low plastic, cohesive fi

Lots of boulders and cobbles. Colour changes to dark yellowish brown, becomes drier.

Sand - Till (SW); Some gravel, little silt, trace clay. Dark brown, wet, sub-rounded to sub-angular, low plastic, cohesive fine

Hit water. Increased boulders and cobbles.

Changes colour to very dark grey.

HOLE ID:	**CM_MW6**	COORDINATES:	670117.9 E5486463.5 N
LOCATION:	CMO	DATUM:	UTM Zone 11
PROJECT NO:	1CT017.114	GROUND ELEV (masl):	1579.66
DRILLING CONTRACTOR:	AquaPro Drilling Ltd.	COLLAR DIP:	-90
		EOH ELEV. (masl):	1478.30336
DRILLING TYPE:	Air Rotary	TOTAL DEPTH (mbgs):	41.69664
LOGGED BY:	EH/KK	STICKUP HEIGHT (magl):	0.83/0.83
BORING DATE:	4/26/2016 to 4/27/2016	CASING STICKUP (magl):	0.88

PROJECT: Phase 2 Groundwater Monitoring

CLIENT: Teck Coal Ltd. - CMO

AREA: **Corbin Dam**

Lithological Symbol

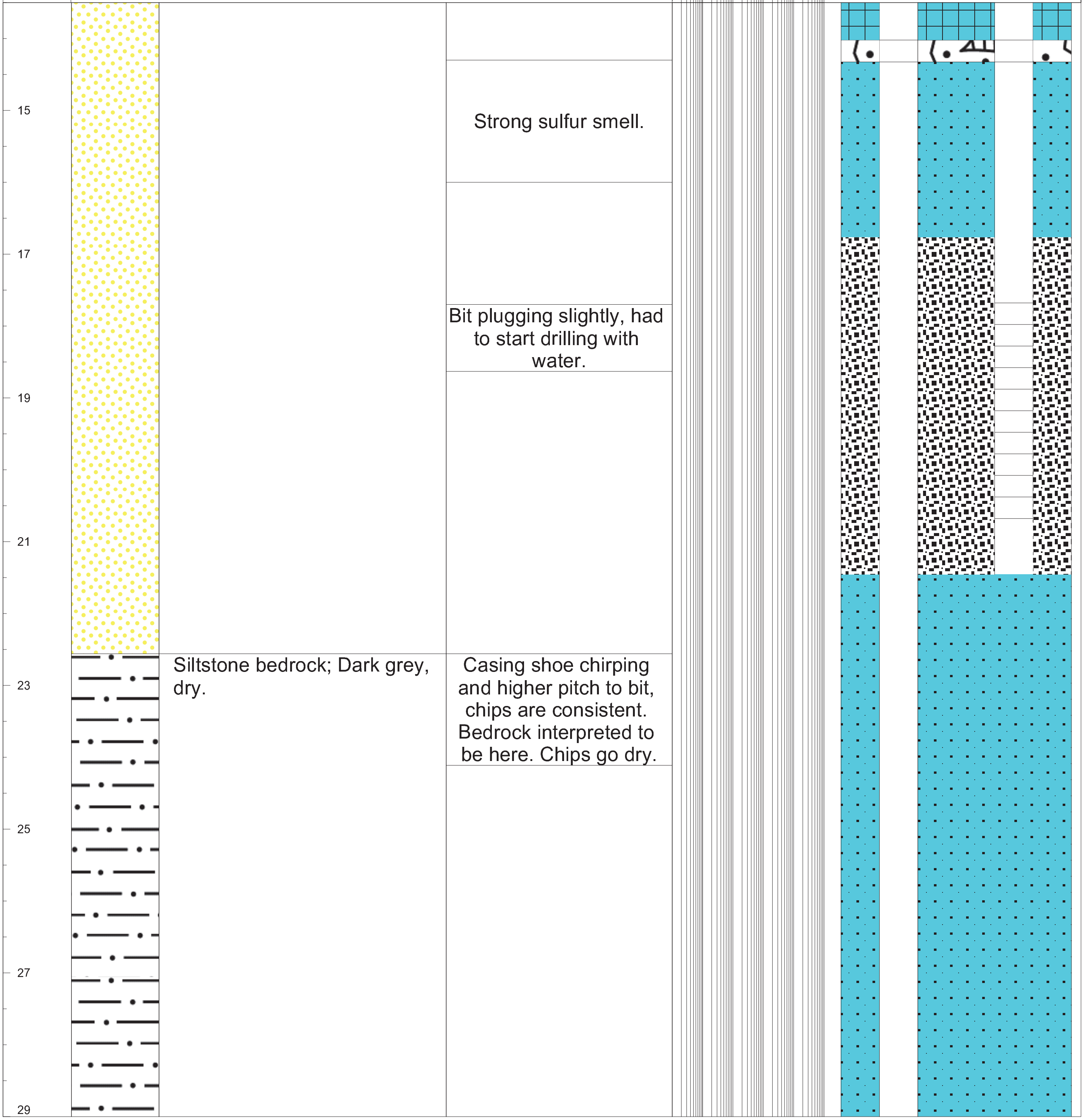
▨ CL-Clay	▒ SA-Sand	▬ ST-Siltstone
■ CO-Coal	◠ GV-Gravel	(BO-Boulders
‖ SI-Silt	⁘ SS-Sandstone	

Hydraulic Conductivity (m/s): 1E-8, 1E-7, 1E-6, 1E-5, 0.0001, 0.001

Well Installation

▩ Sand	🟦 Pellets
▌ Cable	⊞ Chips
■ VWP	(Cave
☐ Screen	■ Casing
☐ PVC	■ Grout

Depth (m)



Depth (m)	Lithology Description	Drilling Notes and Additional Comments
~15		Strong sulfur smell.
~18		Bit plugging slightly, had to start drilling with water.
~22.6	Siltstone bedrock; Dark grey, dry.	Casing shoe chirping and higher pitch to bit, chips are consistent. Bedrock interpreted to be here. Chips go dry.

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Teck

HOLE ID: **CM_MW6**
LOCATION: CMO
PROJECT NO: 1CT017.114
DRILLING CONTRACTOR: AquaPro Drilling Ltd.
DRILLING TYPE: Air Rotary
LOGGED BY: EH/KK
BORING DATE: 4/26/2016 to 4/27/2016

COORDINATES: 670117.9 E5486463.5 N
DATUM: UTM Zone 11
GROUND ELEV (masl): 1579.66
COLLAR DIP: -90
EOH ELEV. (masl): 1478.30336
TOTAL DEPTH (mbgs): 41.69664
STICKUP HEIGHT (magl): 0.83/0.83
CASING STICKUP (magl): 0.88
AREA: **Corbin Dam**

PROJECT: Phase 2 Groundwater Monitoring
CLIENT: Teck Coal Ltd. - CMO

Depth (m)

Lithological Symbol

▨ CL-Clay
▨ SA-Sand
▨ ST-Siltstone
■ CO-Coal
▨ GV-Gravel
▨ BO-Boulders
▨ SI-Silt
▨ SS-Sandstone

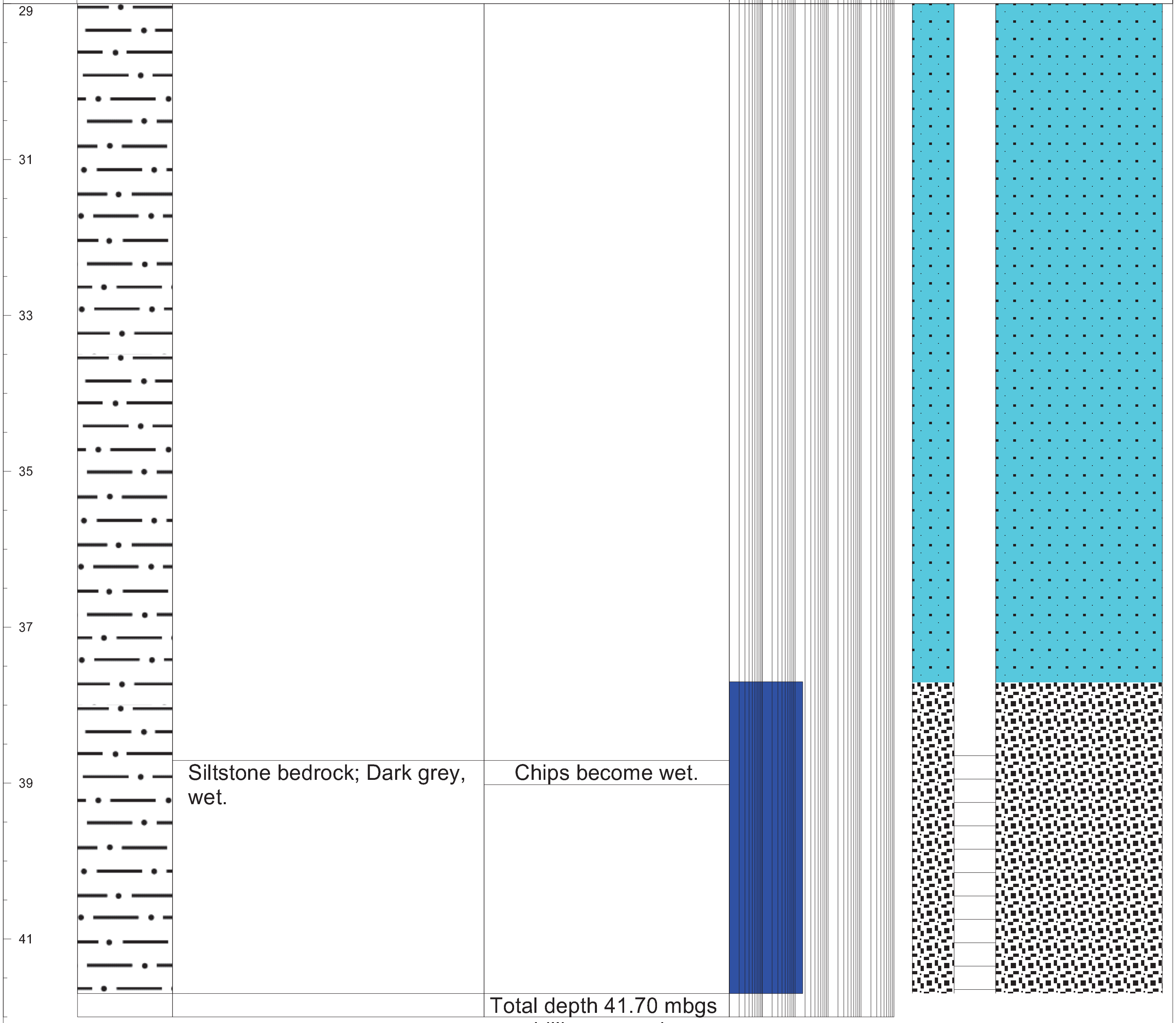
Hydraulic Conductivity (m/s)

Well Installation

▨ Sand
🟦 Pellets
☐ Cable
▨ Chips
▨ VWP
▨ Cave
☐ Screen
■ Casing
☐ PVC
▨ Grout

Lithology Description

Drilling Notes and Additional Comments



Siltstone bedrock; Dark grey, wet.

Chips become wet.

Total depth 41.70 mbgs - drilling ceased as depth target reached.

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Teck

HOLE ID:	**CM_MW7**	COORDINATES:	668833 E 5485919.6 N
LOCATION:	CMO	DATUM:	UTM Zone 11
PROJECT NO:	1CT017.114	GROUND ELEV (masl):	1755.77
DRILLING CONTRACTOR:	AquaPro Drilling Ltd.	COLLAR DIP:	-90
		EOH ELEV. (masl):	1668.72736
DRILLING TYPE:	Air Rotary	TOTAL DEPTH (mbgs):	78.27264
LOGGED BY:	DM/EH	STICKUP HEIGHT (magl):	0.81/0.81
BORING DATE:	4/20/2016 to 4/22/2016	CASING STICKUP (magl):	0.86 AREA: **34 Pit**

Page: 1 of 9

PROJECT: Phase 2 Groundwater Monitoring

CLIENT: Teck Coal Ltd. - CMO

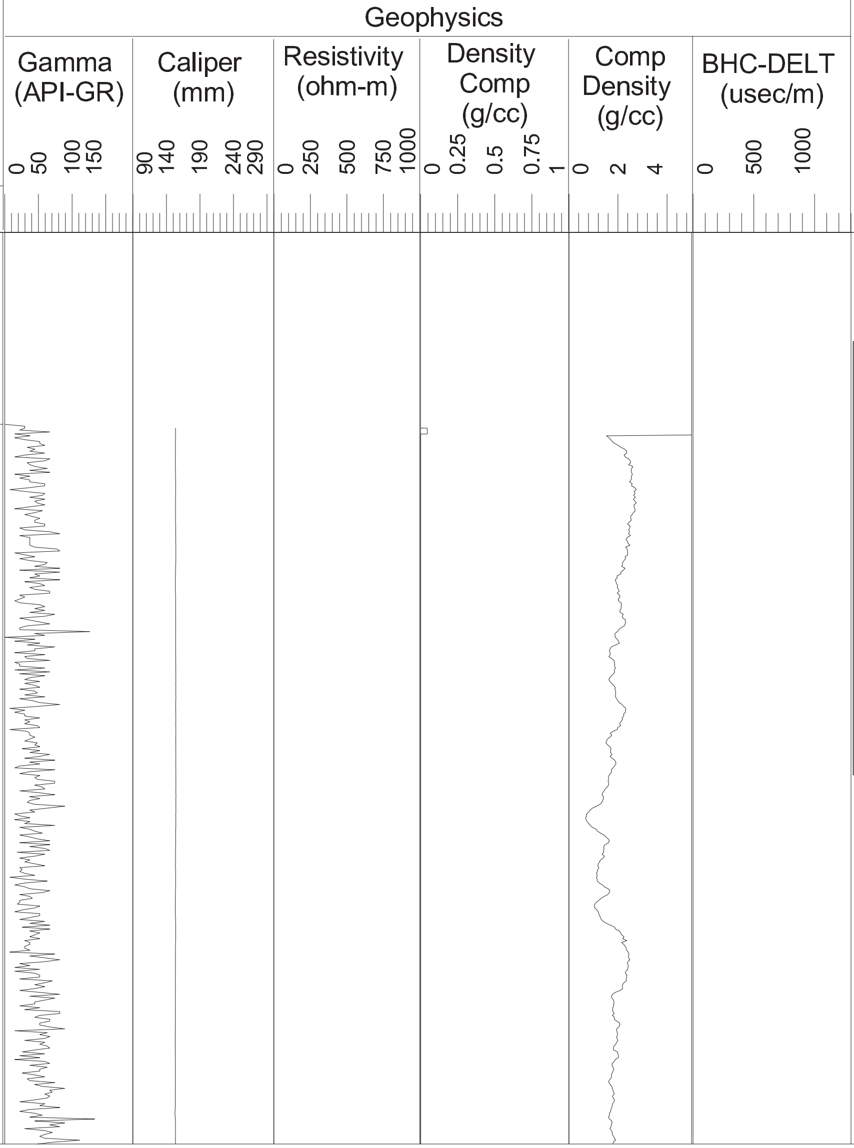
Depth (m)

Lithological Symbol

▨	CL-Clay	⁘	SA-Sand	▬	ST-Siltstone
■	CO-Coal	⌒	GV-Gravel	(	BO-Boulders
‖	SI-Silt	⁚	SS-Sandstone		

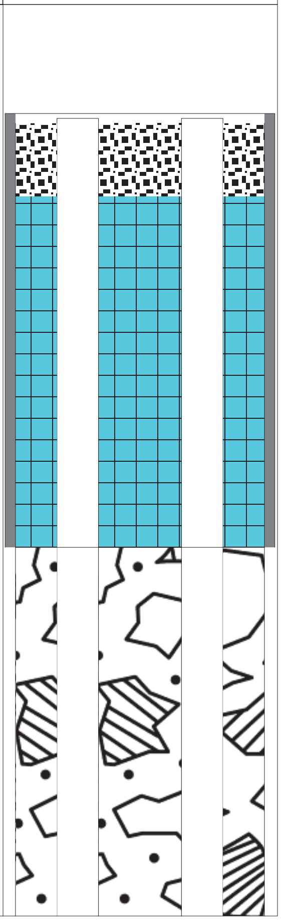
Lithology Description

Drilling Notes and Additional Comments



Well Installation

⁙	Sand	⁘	Pellets
☐	Cable	⊞	Chips
🟥	VWP	(	Cave
☐	Screen	■	Casing
☐	PVC	▨	Grout



Depth (m)	Lithology	Lithology Description	Drilling Notes and Additional Comments
-1			
1			
3			
5			
7	⁘	Sand and Gravel (SW/GM); Sand with gravel and silt, possible cobbles; Dark grey to brown, damp, moist, sub angular, non plastic	

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Teck

HOLE ID: **CM_MW7**
LOCATION: CMO
PROJECT NO: 1CT017.114
DRILLING CONTRACTOR: AquaPro Drilling Ltd.
DRILLING TYPE: Air Rotary
LOGGED BY: DM/EH
BORING DATE: 4/20/2016 to 4/22/2016

PROJECT: Phase 2 Groundwater Monitoring
CLIENT: Teck Coal Ltd. - CMO

COORDINATES: 668833 E 5485919.6 N
DATUM: UTM Zone 11
GROUND ELEV (masl): 1755.77
COLLAR DIP: -90
EOH ELEV. (masl): 1668.72736
TOTAL DEPTH (mbgs): 78.27264
STICKUP HEIGHT (magl): 0.81/0.81
CASING STICKUP (magl): 0.86 AREA: **34 Pit**

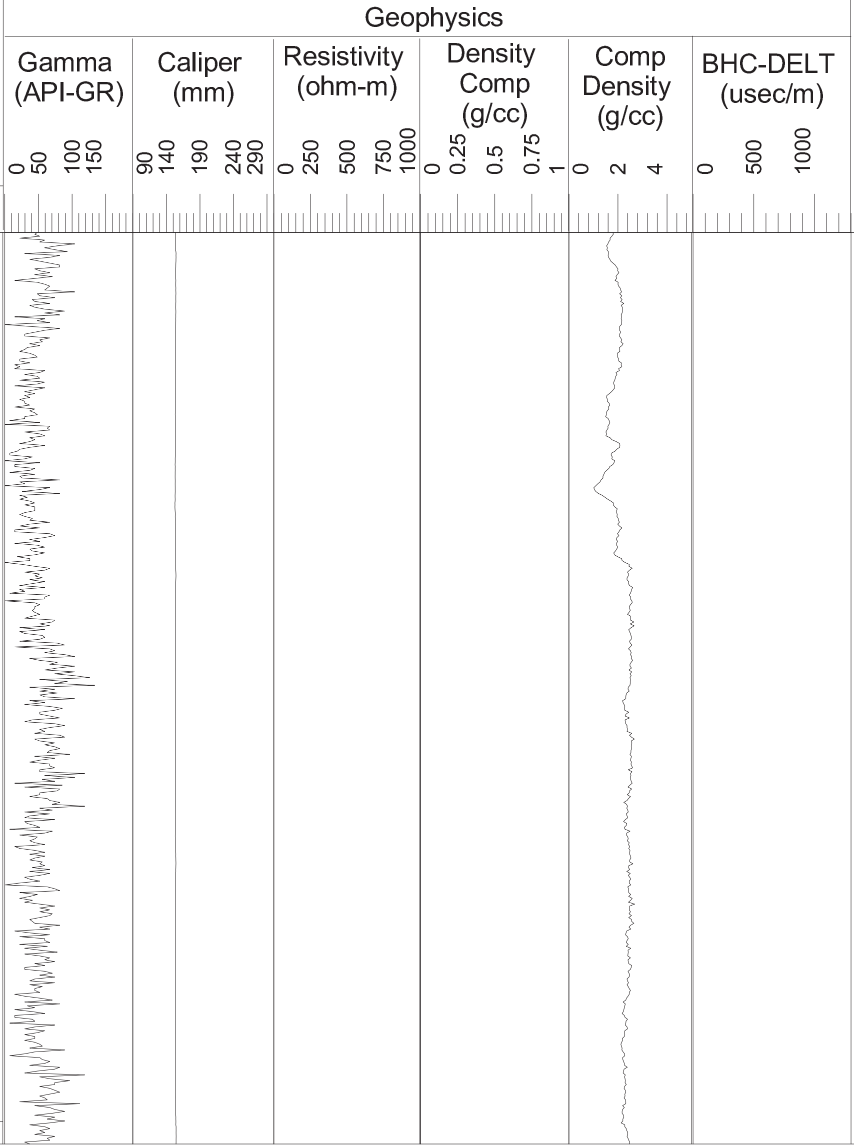
Lithological Symbol

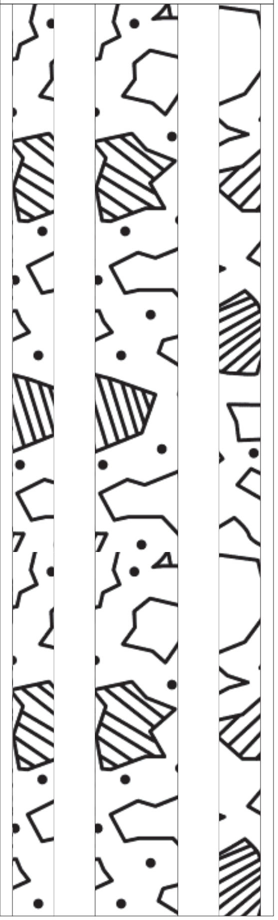
CL-Clay
SA-Sand
ST-Siltstone
CO-Coal
GV-Gravel
BO-Boulders
SI-Silt
SS-Sandstone

Well Installation

Sand
Pellets
Cable
Chips
VWP
Cave
Screen
Casing
PVC
Grout

Depth (m)	Lithology Description	Drilling Notes and Additional Comments
	sub-angular, non-plastic	
	Sand and Gravel (SW/GM); Sand with gravel and some silt, possible cobbles; Dark grey to brown, damp, dry, sub-angular, non-plas	mostly sand and fine gravel; typically dry to moist; not many chips - fines content variable
9		
11	Silty gravel with sand (GM); With silt, trace clay; Dark grey to brown, dry, sub-rounded, non-plastic, nonconhesive	
13	Silty sand with gravel (SM); Significant silt; trace clay. Dark grey to brown, dry, sub-rounded, non-plastic, rapid dilatancy,	
15	Sand and gravel (SP-SM); sandstone chips = possible cobbles or boulders; brown to tan, dry, sub-rounded, non-plastic, noncohesi	
17		





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Teck

PROJECT: Phase 2 Groundwater Monitoring
CLIENT: Teck Coal Ltd. - CMO

HOLE ID: **CM_MW7**
LOCATION: CMO
PROJECT NO: 1CT017.114
DRILLING CONTRACTOR: AquaPro Drilling Ltd.
DRILLING TYPE: Air Rotary
LOGGED BY: DM/EH
BORING DATE: 4/20/2016 to 4/22/2016

COORDINATES: 668833 E 5485919.6 N
DATUM: UTM Zone 11
GROUND ELEV (masl): 1755.77
COLLAR DIP: -90
EOH ELEV. (masl): 1668.72736
TOTAL DEPTH (mbgs): 78.27264
STICKUP HEIGHT (magl): 0.81/0.81
CASING STICKUP (magl): 0.86 AREA: **34 Pit**

Page: 3 of 9

Depth (m)

Lithological Symbol

▨ CL-Clay
■ CO-Coal
▥ SI-Silt
▒ SA-Sand
◠ GV-Gravel
⁖ SS-Sandstone
▬ ST-Siltstone
(BO-Boulders

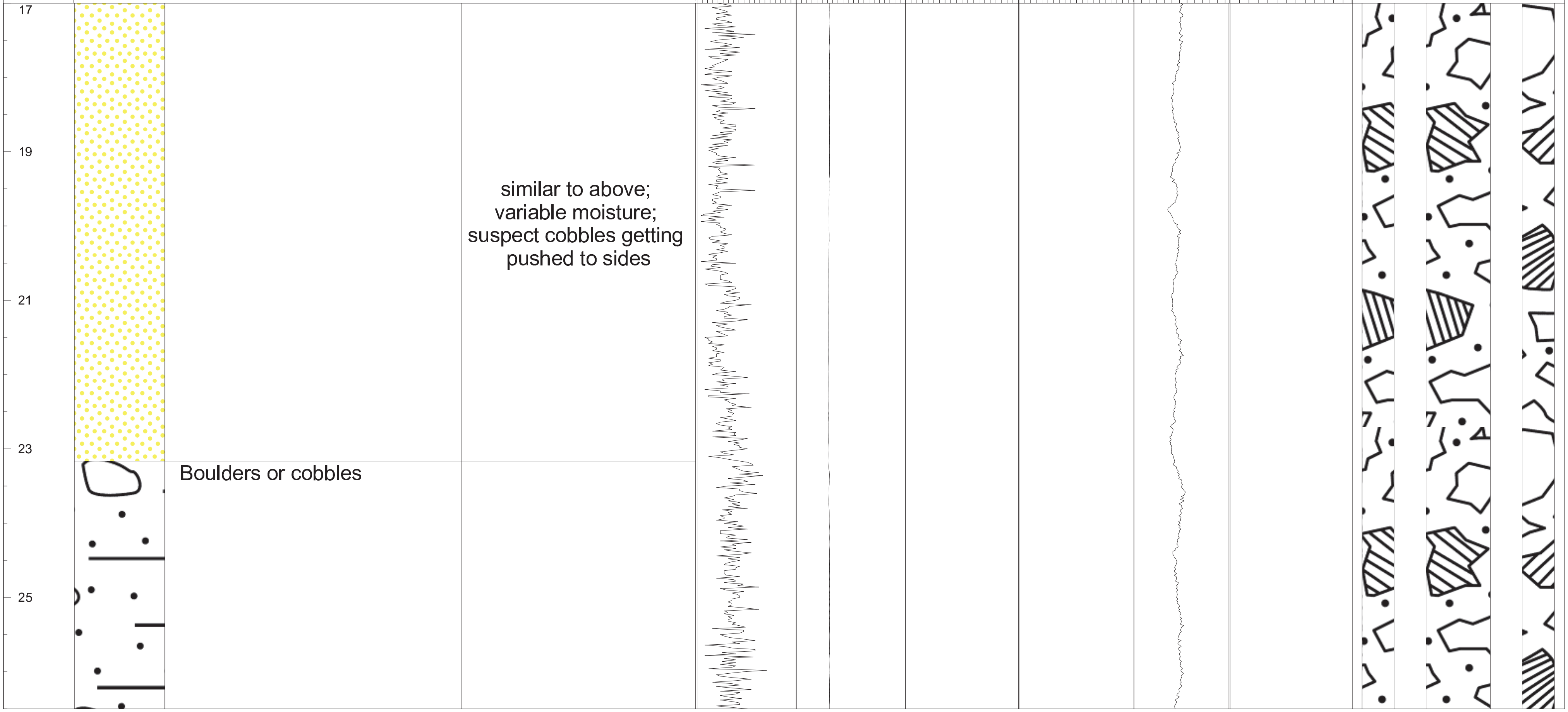
Geophysics

Gamma (API-GR): 0 50 100 150
Caliper (mm): 90 140 190 240 290
Resistivity (ohm-m): 0 250 500 750 1000
Density Comp (g/cc): 0 0.25 0.5 0.75 1
Comp Density (g/cc): 0 2 4
BHC-DELT (usec/m): 0 500 1000

Well Installation

▩ Sand
☐ Cable
🟥 VWP
☐ Screen
☐ PVC
🟦 Pellets
🟦 Chips
(Cave
■ Casing
▒ Grout

Lithology Description | **Drilling Notes and Additional Comments**



similar to above; variable moisture; suspect cobbles getting pushed to sides

Boulders or cobbles

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Teck

HOLE ID: **CM_MW7**
LOCATION: CMO
PROJECT NO: 1CT017.114
DRILLING CONTRACTOR: AquaPro Drilling Ltd.
DRILLING TYPE: Air Rotary
LOGGED BY: DM/EH
BORING DATE: 4/20/2016 to 4/22/2016

COORDINATES: 668833 E 5485919.6 N
DATUM: UTM Zone 11
GROUND ELEV (masl): 1755.77
COLLAR DIP: -90
EOH ELEV. (masl): 1668.72736
TOTAL DEPTH (mbgs): 78.27264
STICKUP HEIGHT (magl): 0.81/0.81
CASING STICKUP (magl): 0.86 AREA: **34 Pit**

Page: 4 of 9

PROJECT: Phase 2 Groundwater Monitoring
CLIENT: Teck Coal Ltd. - CMO

Depth (m)

Lithological Symbol

▨	CL-Clay	▨	SA-Sand	▭	ST-Siltstone
■	CO-Coal	▨	GV-Gravel	▭	BO-Boulders
▥	SI-Silt	▨	SS-Sandstone		

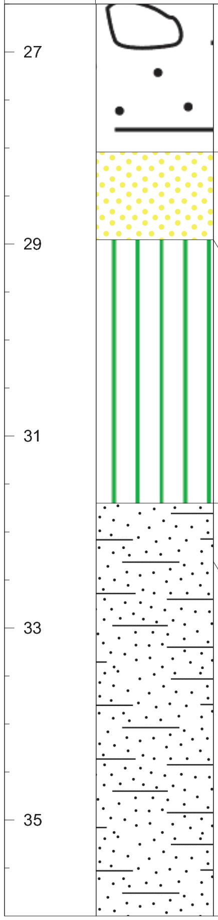
Geophysics

Gamma (API-GR) | Caliper (mm) | Resistivity (ohm-m) | Density Comp (g/cc) | Comp Density (g/cc) | BHC-DELT (usec/m)

Well Installation

▨	Sand	▨	Pellets
☐	Cable	▨	Chips
🟥	VWP	☐	Cave
☐	Screen	■	Casing
☐	PVC	▨	Grout

Lithology Description | **Drilling Notes and Additional Comments**



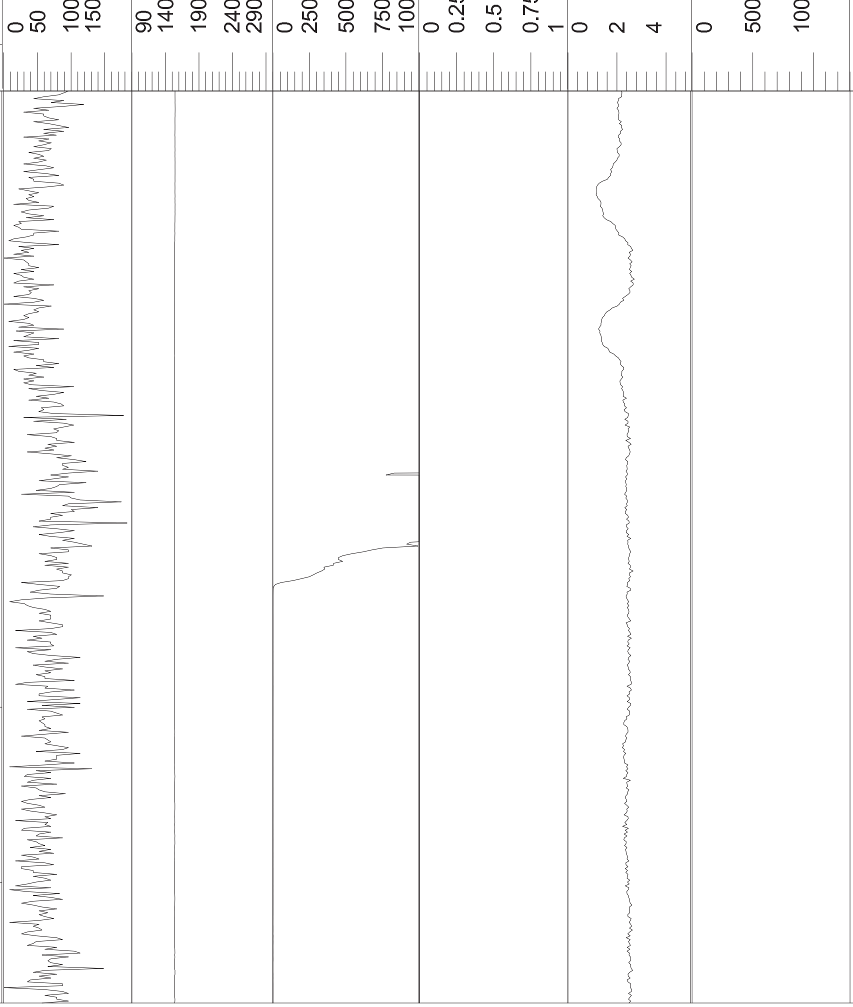
Sand and gravel (SP-SM); brown to tan, dry, sub-rounded, non-plastic, noncohesive

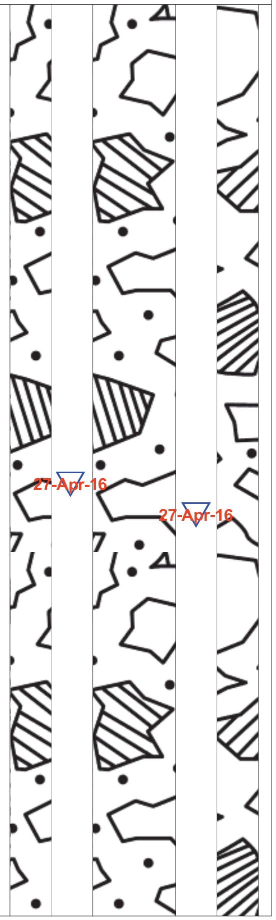
Sandy silt (till?); some gravel, light grey, dry, sub-rounded, non-plastic, noncohesive

Weathered bedrock - silt size and rock flour, orange-brown to brown, dry

Sandstone bedrock, light grey to tan, dry

possibly rock flour and ground up bedrock - difficult to be certain





HOLE ID:	**CM_MW7**	COORDINATES:	668833 E 5485919.6 N
LOCATION:	CMO	DATUM:	UTM Zone 11
PROJECT NO:	1CT017.114	GROUND ELEV (masl):	1755.77
DRILLING CONTRACTOR:	AquaPro Drilling Ltd.	COLLAR DIP:	-90
		EOH ELEV. (masl):	1668.72736
DRILLING TYPE:	Air Rotary	TOTAL DEPTH (mbgs):	78.27264
LOGGED BY:	DM/EH	STICKUP HEIGHT (magl):	0.81/0.81
BORING DATE:	4/20/2016 to 4/22/2016	CASING STICKUP (magl):	0.86

Page: 5 of 9

AREA: **34 Pit**

PROJECT: Phase 2 Groundwater Monitoring

CLIENT: Teck Coal Ltd. - CMO

Depth (m)

Lithological Symbol

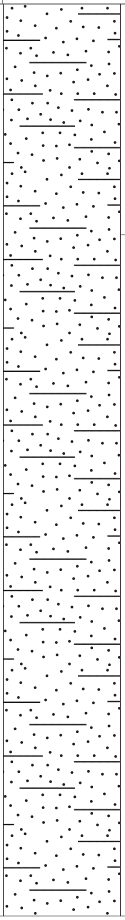
▨ CL-Clay
■ CO-Coal
▥ SI-Silt
SA-Sand
GV-Gravel
SS-Sandstone
ST-Siltstone
BO-Boulders

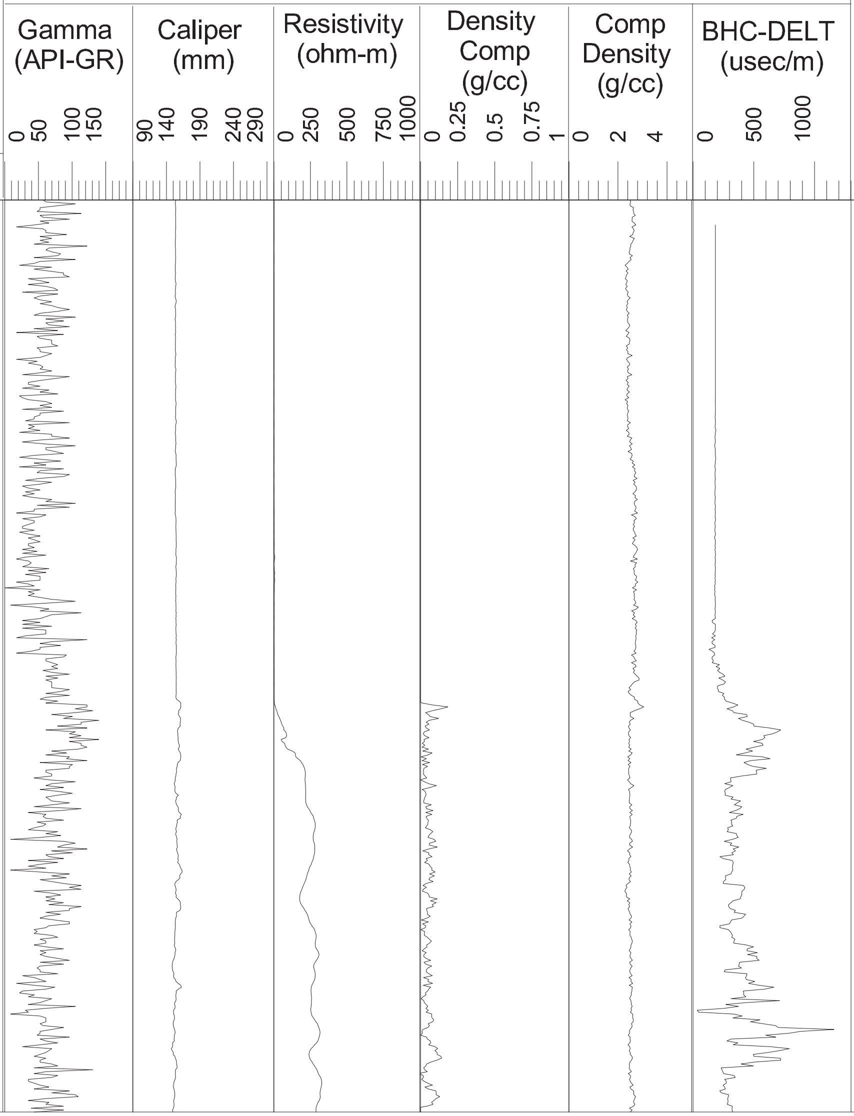
Geophysics

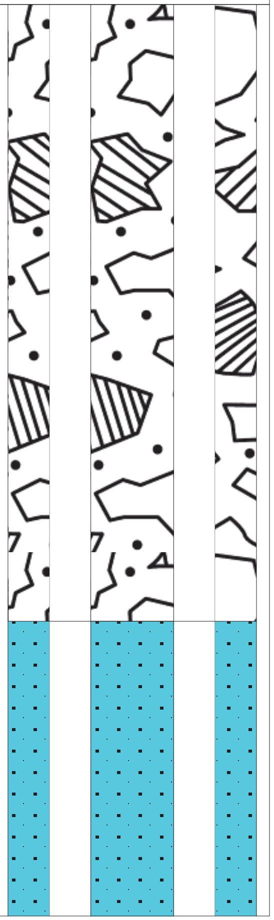
Well Installation

Sand
Cable
VWP
Screen
PVC
Pellets
Chips
Cave
Casing
Grout

Depth (m)	Lithology Description	Drilling Notes and Additional Comments
37		
39	Sandstone bedrock, grey to tan, wet	
41		
43		
45		







HOLE ID: **CM_MW7**
LOCATION: CMO
PROJECT NO: 1CT017.114
DRILLING CONTRACTOR: AquaPro Drilling Ltd.
DRILLING TYPE: Air Rotary
LOGGED BY: DM/EH
BORING DATE: 4/20/2016 to 4/22/2016

COORDINATES: 668833 E 5485919.6 N
DATUM: UTM Zone 11
GROUND ELEV (masl): 1755.77
COLLAR DIP: -90
EOH ELEV. (masl): 1668.72736
TOTAL DEPTH (mbgs): 78.27264
STICKUP HEIGHT (magl): 0.81/0.81
CASING STICKUP (magl): 0.86 AREA: **34 Pit**

PROJECT: Phase 2 Groundwater Monitoring
CLIENT: Teck Coal Ltd. - CMO

Depth (m)

Lithological Symbol

▨ CL-Clay	SA-Sand	ST-Siltstone
■ CO-Coal	GV-Gravel	BO-Boulders
SI-Silt	SS-Sandstone	

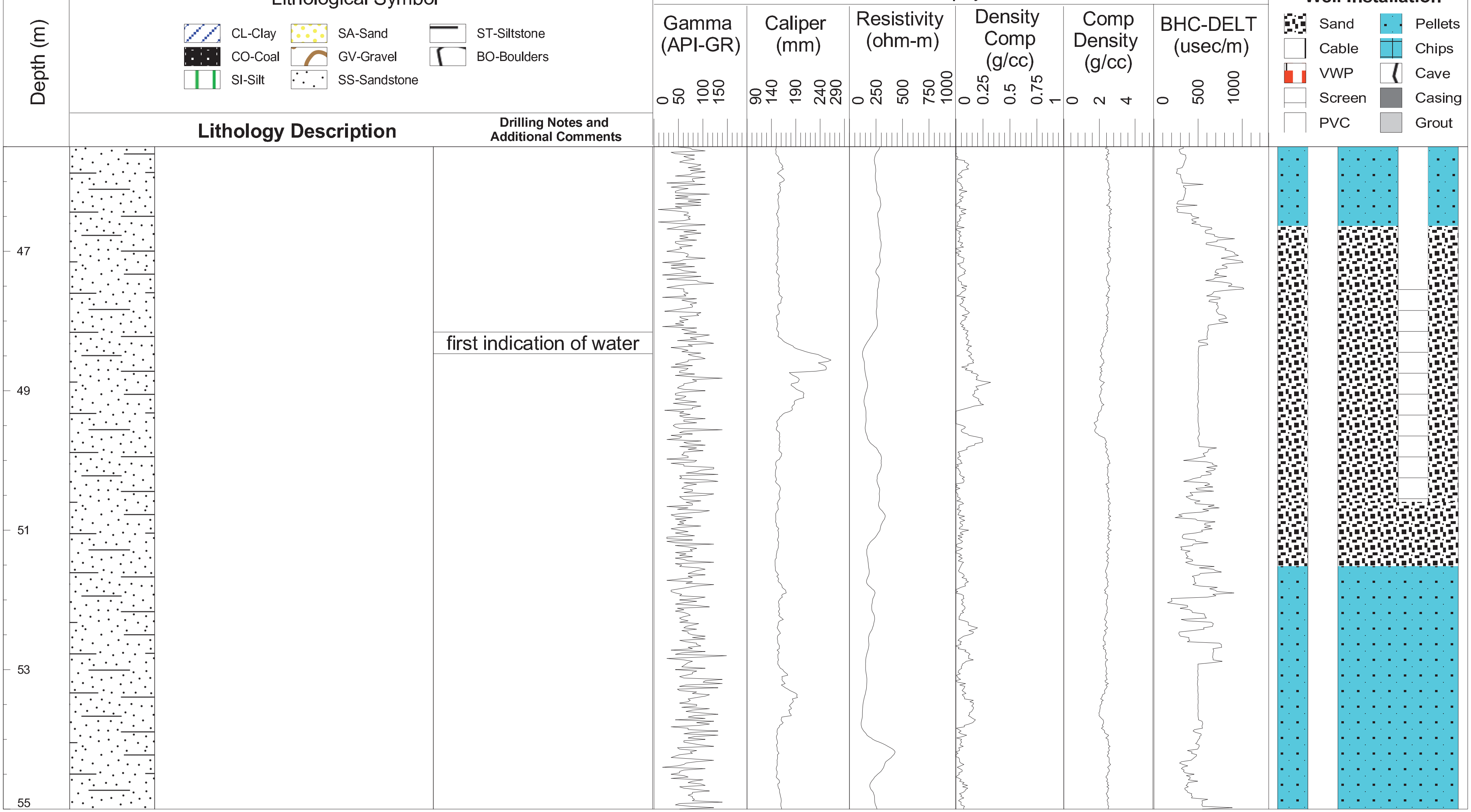
Lithology Description

Drilling Notes and Additional Comments

Geophysics

Well Installation

Sand	Pellets
☐ Cable	Chips
VWP	Cave
Screen	Casing
☐ PVC	Grout



first indication of water

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Teck

PROJECT: Phase 2 Groundwater Monitoring
CLIENT: Teck Coal Ltd. - CMO

HOLE ID: **CM_MW7**
LOCATION: CMO
PROJECT NO: 1CT017.114
DRILLING CONTRACTOR: AquaPro Drilling Ltd.
DRILLING TYPE: Air Rotary
LOGGED BY: DM/EH
BORING DATE: 4/20/2016 to 4/22/2016

COORDINATES: 668833 E 5485919.6 N
DATUM: UTM Zone 11
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COLLAR DIP: -90
EOH ELEV. (masl): 1668.72736
TOTAL DEPTH (mbgs): 78.27264
STICKUP HEIGHT (magl): 0.81/0.81
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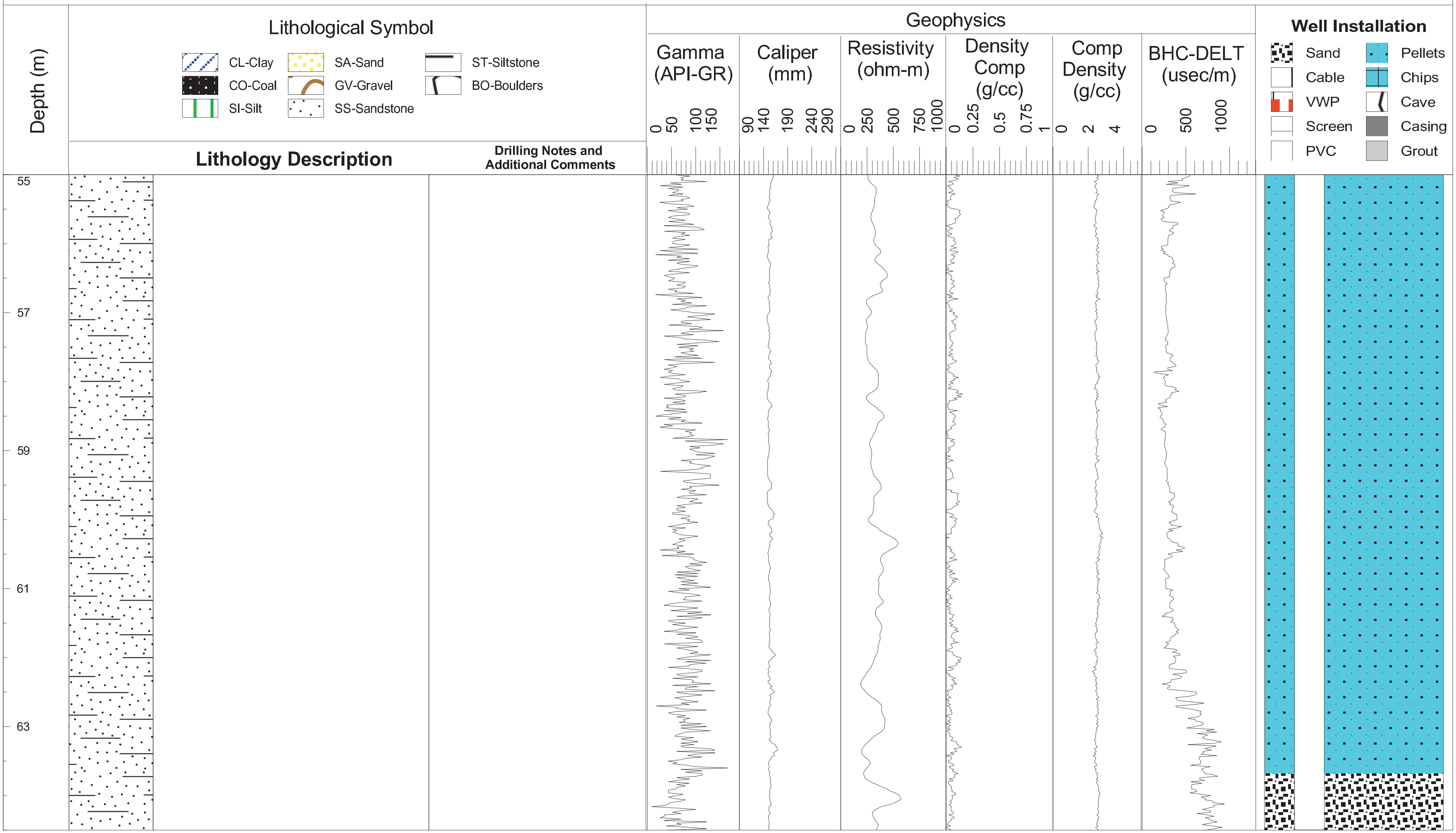
Lithological Symbol

CL-Clay	SA-Sand	ST-Siltstone
CO-Coal	GV-Gravel	BO-Boulders
SI-Silt	SS-Sandstone	

Well Installation

Sand	Pellets
Cable	Chips
VWP	Cave
Screen	Casing
PVC	Grout



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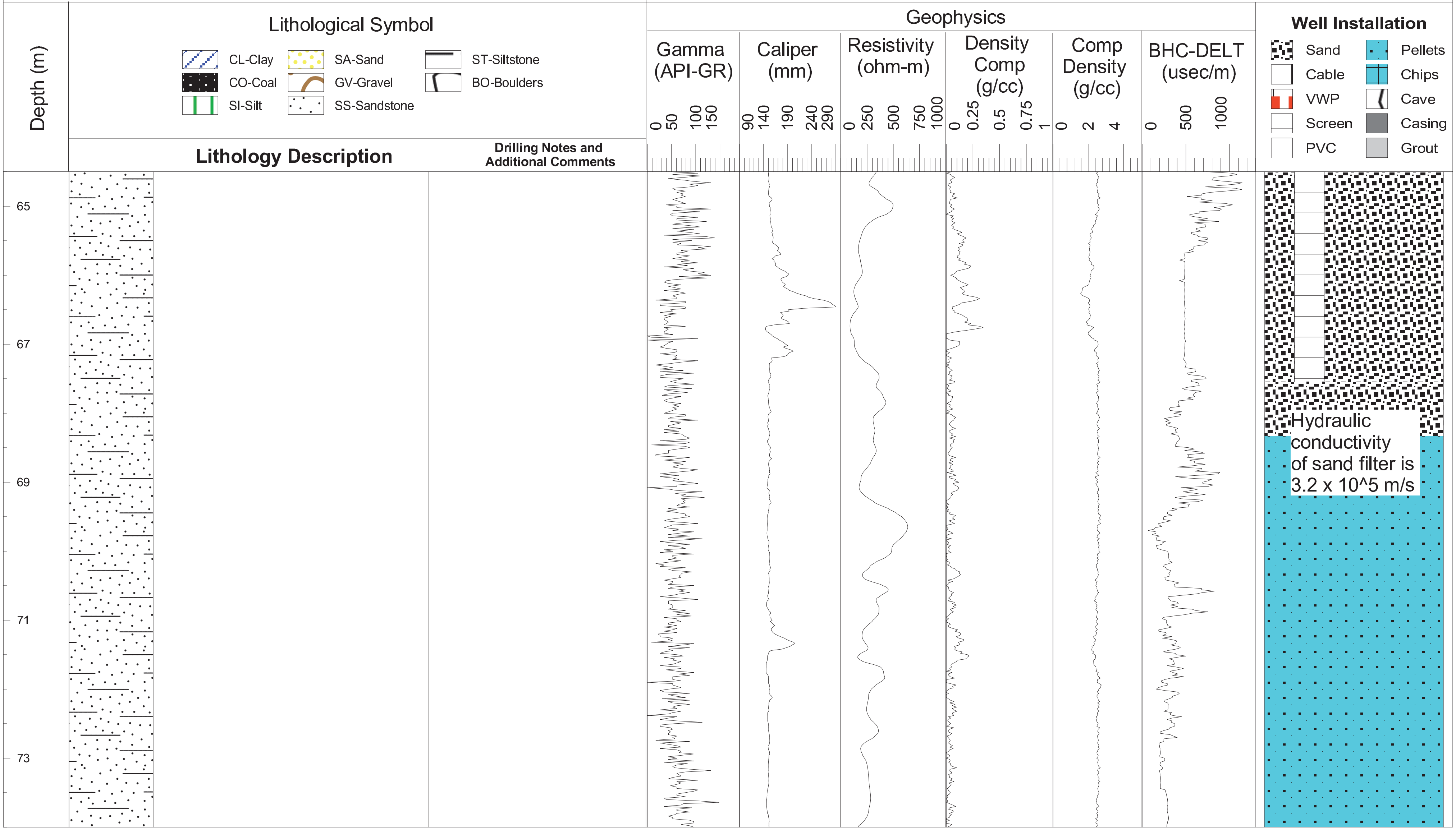
Teck

PROJECT: Phase 2 Groundwater Monitoring
CLIENT: Teck Coal Ltd. - CMO

HOLE ID:	**CM_MW7**	COORDINATES:	668833 E 5485919.6 N
LOCATION:	CMO	DATUM:	UTM Zone 11
PROJECT NO:	1CT017.114	GROUND ELEV (masl):	1755.77
DRILLING CONTRACTOR:	AquaPro Drilling Ltd.	COLLAR DIP:	-90
		EOH ELEV. (masl):	1668.72736
DRILLING TYPE:	Air Rotary	TOTAL DEPTH (mbgs):	78.27264
LOGGED BY:	DM/EH	STICKUP HEIGHT (magl):	0.81/0.81
BORING DATE:	4/20/2016 to 4/22/2016	CASING STICKUP (magl):	0.86

AREA: **34 Pit**



Hydraulic conductivity of sand filter is 3.2 x 10^5 m/s

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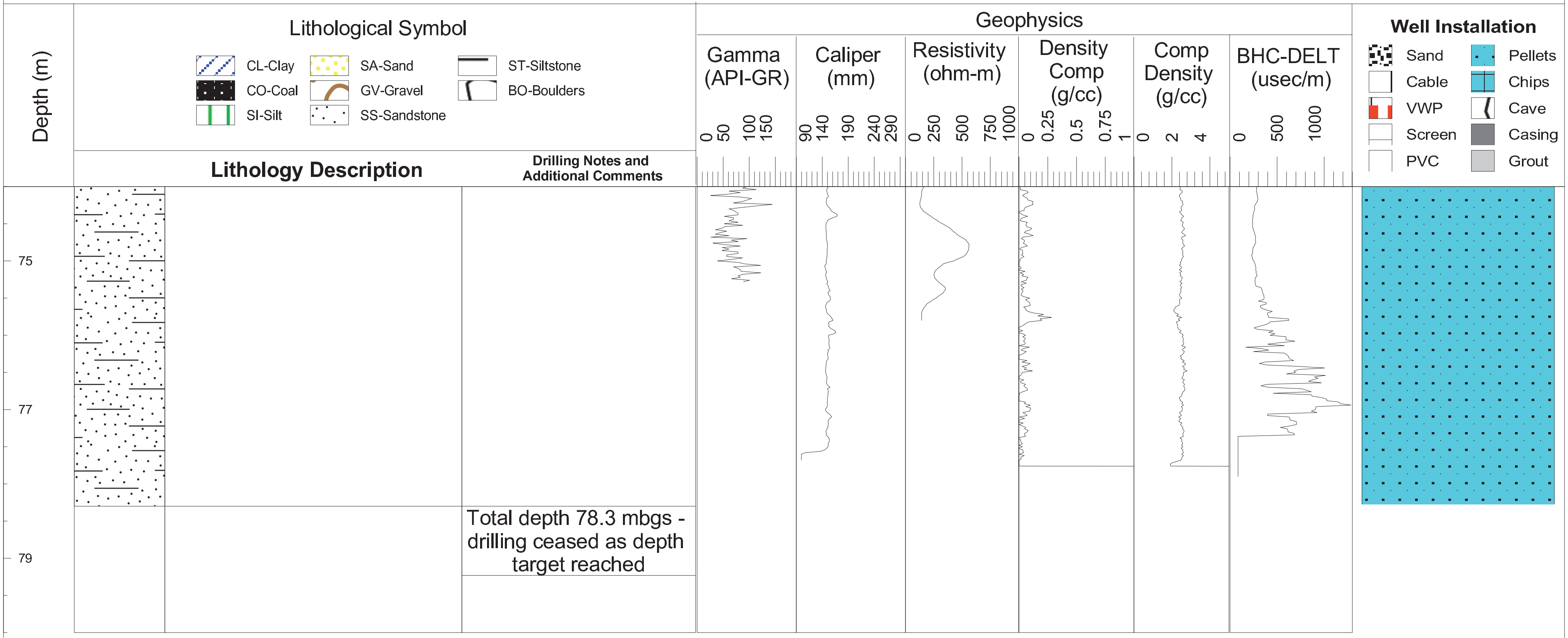
Teck

HOLE ID: **CM_MW7**
LOCATION: CMO
PROJECT NO: 1CT017.114
DRILLING CONTRACTOR: AquaPro Drilling Ltd.
DRILLING TYPE: Air Rotary
LOGGED BY: DM/EH
BORING DATE: 4/20/2016 to 4/22/2016

PROJECT: Phase 2 Groundwater Monitoring
CLIENT: Teck Coal Ltd. - CMO

COORDINATES: 668833 E 5485919.6 N
DATUM: UTM Zone 11
GROUND ELEV (masl): 1755.77
COLLAR DIP: -90
EOH ELEV. (masl): 1668.72736
TOTAL DEPTH (mbgs): 78.27264
STICKUP HEIGHT (magl): 0.81/0.81
CASING STICKUP (magl): 0.86 AREA: **34 Pit**

Page: 9 of 9



Total depth 78.3 mbgs - drilling ceased as depth target reached

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Teck

HOLE ID:	**CM_MW8**	COORDINATES:	668878.2 E 5484957 N
LOCATION:	CMO	DATUM:	UTM Zone 11
PROJECT NO:	1CT017.114	GROUND ELEV (masl):	1847.31
DRILLING CONTRACTOR:	AquaPro Drilling Ltd.	COLLAR DIP:	-90
		EOH ELEV. (masl):	1729.98
DRILLING TYPE:	Air Rotary	TOTAL DEPTH (mbgs):	104.02
LOGGED BY:	EH	STICKUP HEIGHT (magl):	0.68
BORING DATE:	4/23/2016 to 4/26/2016	CASING STICKUP (magl):	0.72

PROJECT: Phase 2 Groundwater Monitoring

CLIENT: Teck Coal Ltd. - CMO

AREA: **37 Pit**

Depth (m)

Lithological Symbol

▨ CL-Clay	▨ SA-Sand	▭ ST-Siltstone
■ CO-Coal	▨ GV-Gravel	▭ BO-Boulders
▯ SI-Silt	▨ SS-Sandstone	

Hydraulic Conductivity (m/s)

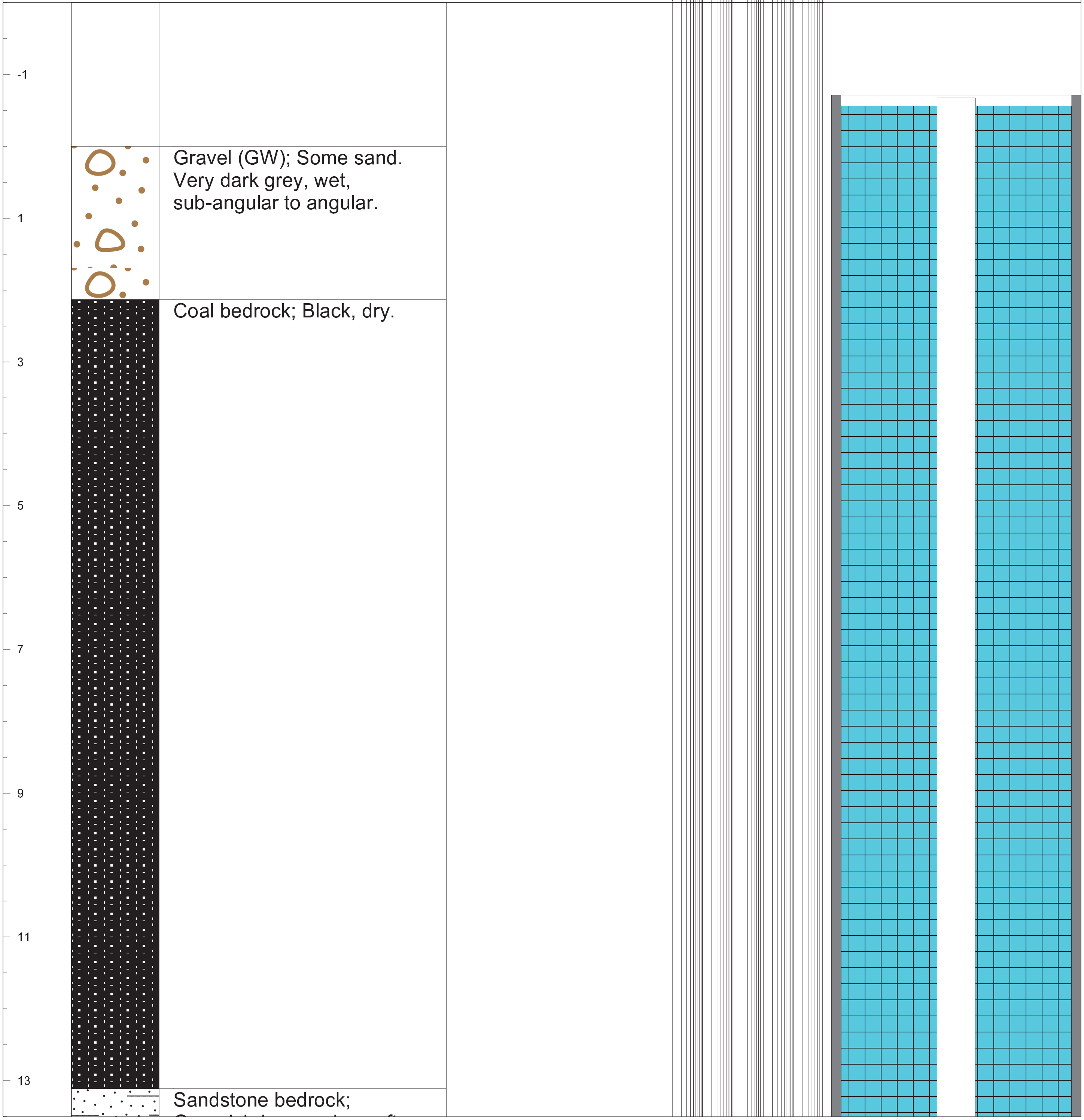
1E-8 1E-7 1E-6 1E-5 0.0001 0.001

Well Installation

▨ Sand	🟦 Pellets
▯ Cable	▦ Chips
🟥 VWP	(Cave
▭ Screen	■ Casing
▭ PVC	▩ Grout

Lithology Description

Drilling Notes and Additional Comments



Gravel (GW); Some sand. Very dark grey, wet, sub-angular to angular.

Coal bedrock; Black, dry.

Sandstone bedrock;

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Teck

HOLE ID:	**CM_MW8**	COORDINATES:	668878.2 E 5484957 N
LOCATION:	CMO	DATUM:	UTM Zone 11
PROJECT NO:	1CT017.114	GROUND ELEV (masl):	1847.31
DRILLING CONTRACTOR:	AquaPro Drilling Ltd.	COLLAR DIP:	-90
		EOH ELEV. (masl):	1729.98
DRILLING TYPE:	Air Rotary	TOTAL DEPTH (mbgs):	104.02
LOGGED BY:	EH	STICKUP HEIGHT (magl):	0.68
BORING DATE:	4/23/2016 to 4/26/2016	CASING STICKUP (magl):	0.72

PROJECT: Phase 2 Groundwater Monitoring

CLIENT: Teck Coal Ltd. - CMO

AREA: **37 Pit**

Lithological Symbol

▨ CL-Clay	∴ SA-Sand	▭ ST-Siltstone
■ CO-Coal	⌒ GV-Gravel	(BO-Boulders
‖ SI-Silt	∵ SS-Sandstone	

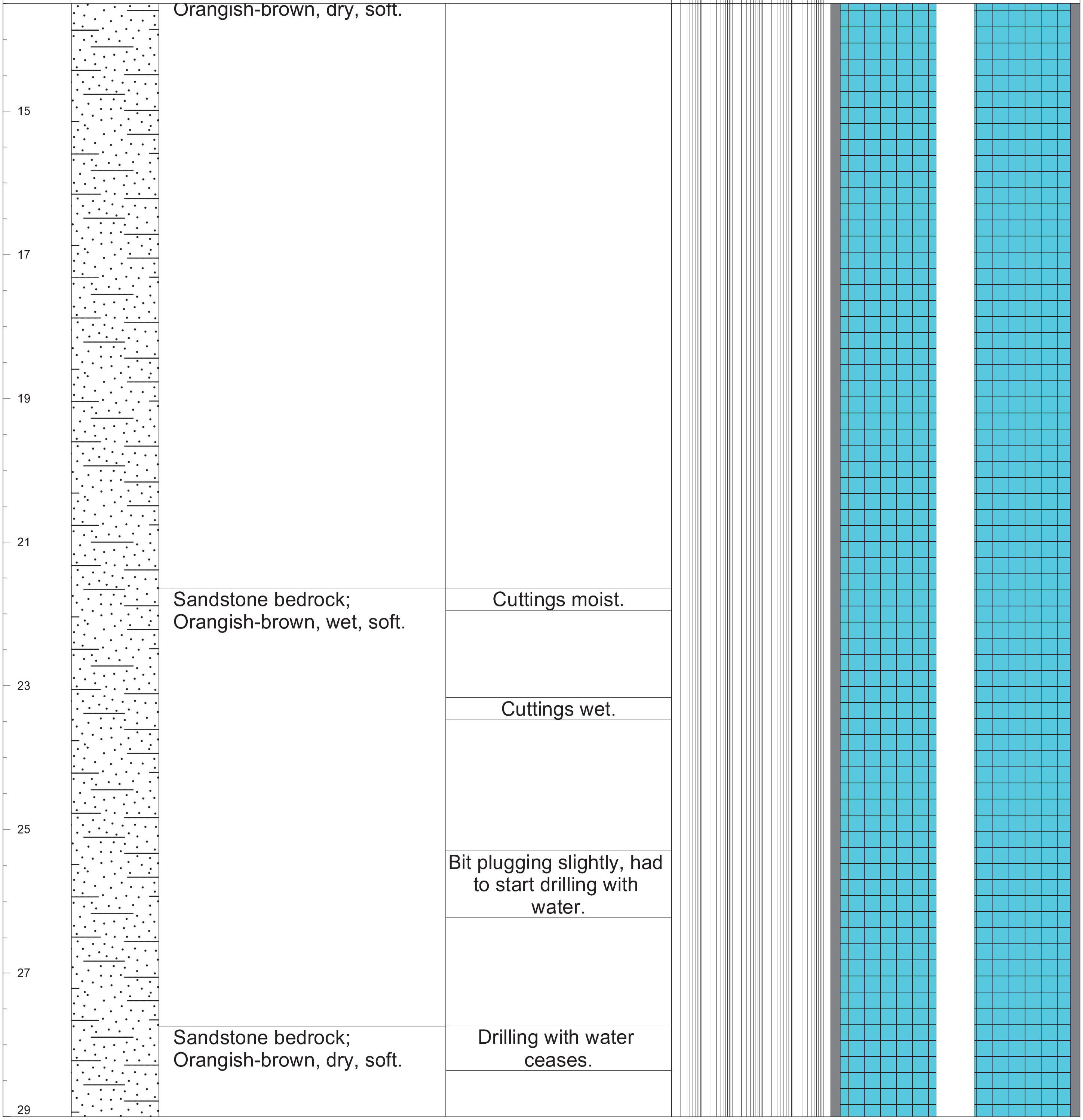
Hydraulic Conductivity (m/s)

1E-8 1E-7 1E-6 1E-5 0.0001 0.001

Well Installation

▦ Sand	∵ Pellets
▯ Cable	⊞ Chips
▮ VWP	(Cave
☐ Screen	■ Casing
☐ PVC	▒ Grout

Depth (m)	**Lithology Description**	**Drilling Notes and Additional Comments**
	Orangish-brown, dry, soft.	
	Sandstone bedrock; Orangish-brown, wet, soft.	Cuttings moist.
		Cuttings wet.
		Bit plugging slightly, had to start drilling with water.
	Sandstone bedrock; Orangish-brown, dry, soft.	Drilling with water ceases.



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Teck

HOLE ID:	**CM_MW8**	COORDINATES:	668878.2 E5484957 N
LOCATION:	CMO	DATUM:	UTM Zone 11
PROJECT NO:	1CT017.114	GROUND ELEV (masl):	1847.31
DRILLING CONTRACTOR:	AquaPro Drilling Ltd.	COLLAR DIP:	-90
		EOH ELEV. (masl):	1729.98
DRILLING TYPE:	Air Rotary	TOTAL DEPTH (mbgs):	104.02
LOGGED BY:	EH	STICKUP HEIGHT (magl):	0.68
BORING DATE:	4/23/2016 to 4/26/2016	CASING STICKUP (magl):	0.72

PROJECT: Phase 2 Groundwater Monitoring

CLIENT: Teck Coal Ltd. - CMO

AREA: **37 Pit**

Depth (m)

Lithological Symbol

CL-Clay
CO-Coal
SI-Silt
SA-Sand
GV-Gravel
SS-Sandstone
ST-Siltstone
BO-Boulders

Hydraulic Conductivity (m/s)

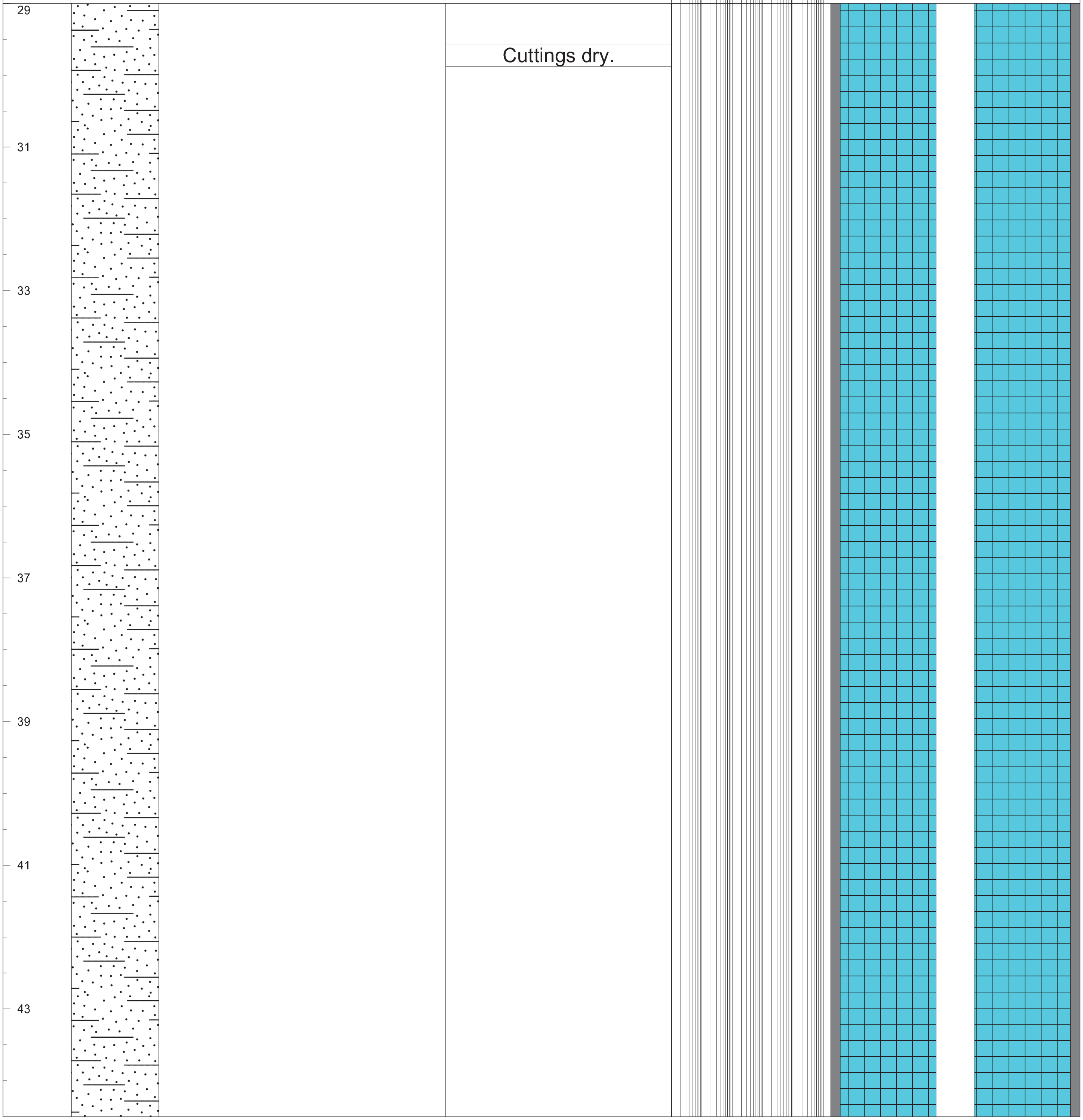
1E-8
1E-7
1E-6
1E-5
0.0001
0.001

Well Installation

Sand
Cable
VWP
Screen
PVC
Pellets
Chips
Cave
Casing
Grout

Lithology Description

Drilling Notes and Additional Comments



Cuttings dry.

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Teck

HOLE ID:	**CM_MW8**	COORDINATES:	668878.2 E5484957 N
LOCATION:	CMO	DATUM:	UTM Zone 11
PROJECT NO:	1CT017.114	GROUND ELEV (masl):	1847.31
DRILLING CONTRACTOR:	AquaPro Drilling Ltd.	COLLAR DIP:	-90
		EOH ELEV. (masl):	1729.98
DRILLING TYPE:	Air Rotary	TOTAL DEPTH (mbgs):	104.02
LOGGED BY:	EH	STICKUP HEIGHT (magl):	0.68
BORING DATE:	4/23/2016 to 4/26/2016	CASING STICKUP (magl):	0.72

PROJECT: Phase 2 Groundwater Monitoring

CLIENT: Teck Coal Ltd. - CMO

AREA: **37 Pit**

Lithological Symbol

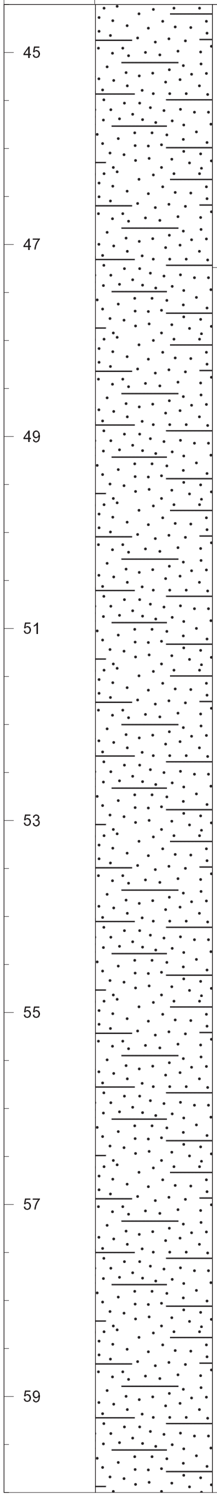
CL-Clay	SA-Sand	ST-Siltstone
CO-Coal	GV-Gravel	BO-Boulders
SI-Silt	SS-Sandstone	

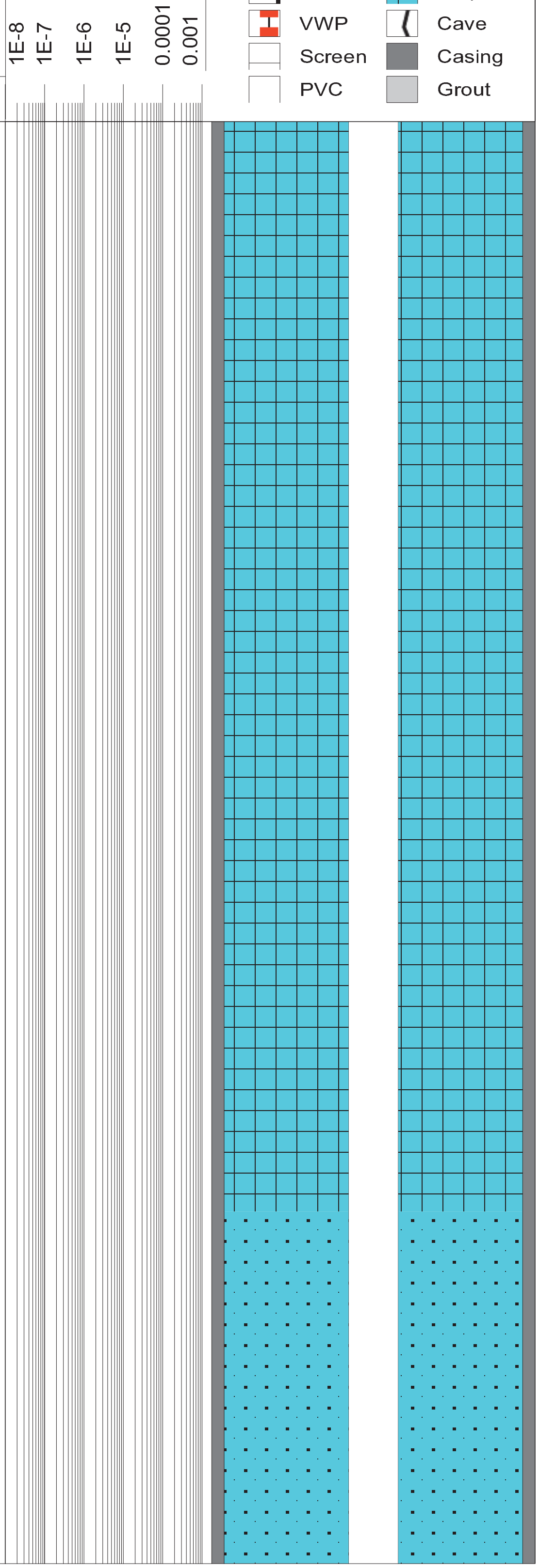
Hydraulic Conductivity (m/s)

Well Installation

Sand	Pellets
Cable	Chips
VWP	Cave
Screen	Casing
PVC	Grout

Depth (m)		**Lithology Description**	**Drilling Notes and Additional Comments**
		Sandstone bedrock; Light brown, dry.	





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Teck

HOLE ID:	**CM_MW8**	COORDINATES:	668878.2 E5484957 N	*Page:* 5 of 7
LOCATION:	CMO	DATUM:	UTM Zone 11	
PROJECT NO:	1CT017.114	GROUND ELEV (masl):	1847.31	
DRILLING CONTRACTOR:	AquaPro Drilling Ltd.	COLLAR DIP:	-90	
		EOH ELEV. (masl):	1729.98	
DRILLING TYPE:	Air Rotary	TOTAL DEPTH (mbgs):	104.02	
PROJECT: Phase 2 Groundwater Monitoring	LOGGED BY: EH	STICKUP HEIGHT (magl):	0.68	
CLIENT: Teck Coal Ltd. - CMO	BORING DATE: 4/23/2016 to 4/26/2016	CASING STICKUP (magl):	0.72	AREA: **37 Pit**

Depth (m)

Lithological Symbol

▨	CL-Clay	▨	SA-Sand	▭	ST-Siltstone
■	CO-Coal	▨	GV-Gravel	▭	BO-Boulders
▯	SI-Silt	▨	SS-Sandstone		

Hydraulic Conductivity (m/s)

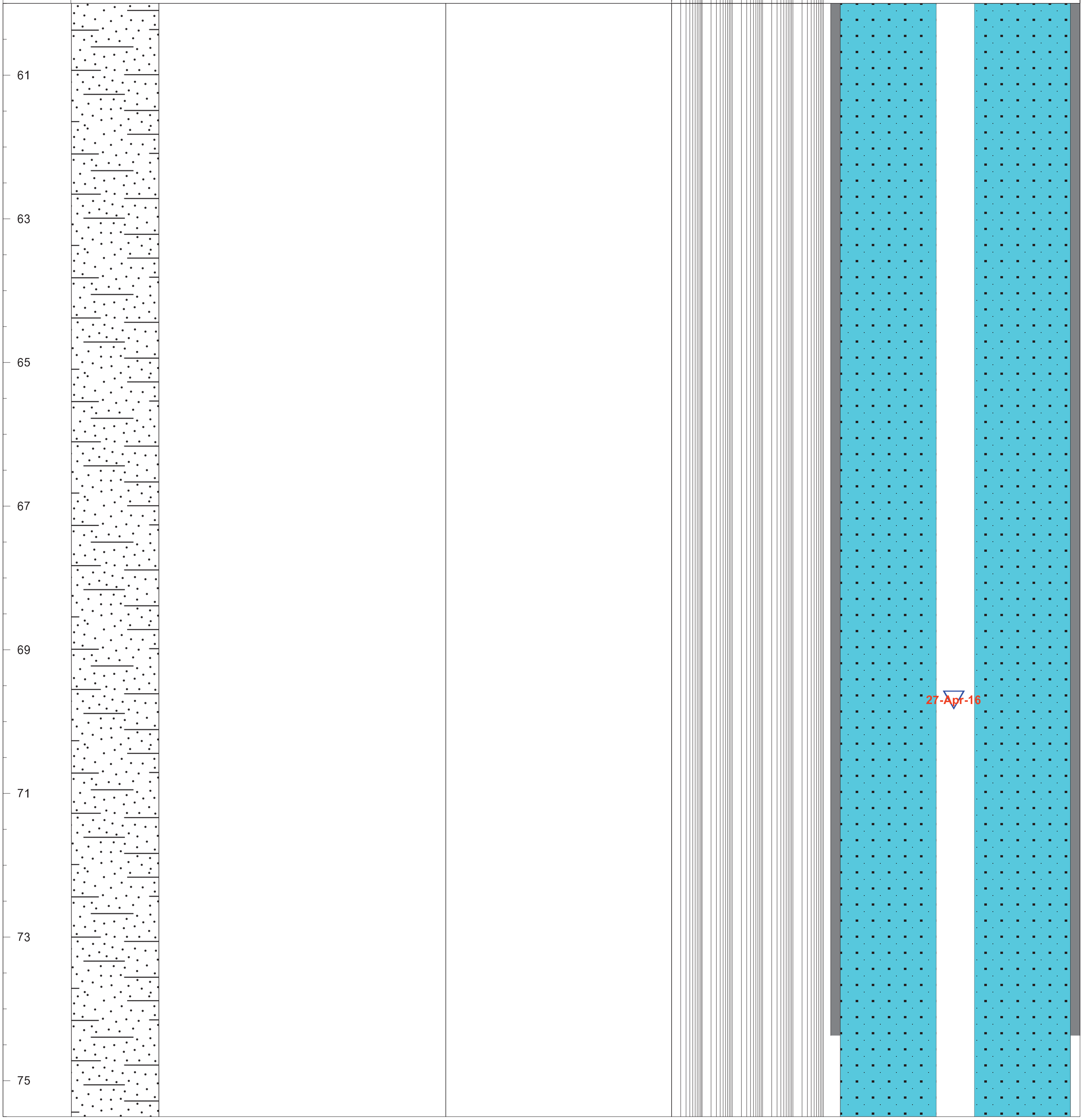
1E-8 1E-7 1E-6 1E-5 0.0001 0.001

Well Installation

▨	Sand	▨	Pellets
▯	Cable	▨	Chips
▨	VWP	▭	Cave
▭	Screen	■	Casing
▭	PVC	■	Grout

Lithology Description

Drilling Notes and Additional Comments



HOLE ID:	**CM_MW8**	COORDINATES:	668878.2 E 5484957 N
LOCATION:	CMO	DATUM:	UTM Zone 11
PROJECT NO:	1CT017.114	GROUND ELEV (masl):	1847.31
DRILLING CONTRACTOR:	AquaPro Drilling Ltd.	COLLAR DIP:	-90
		EOH ELEV. (masl):	1729.98
DRILLING TYPE:	Air Rotary	TOTAL DEPTH (mbgs):	104.02
LOGGED BY:	EH	STICKUP HEIGHT (magl):	0.68
BORING DATE:	4/23/2016 to 4/26/2016	CASING STICKUP (magl):	0.72

Page: 6 of 7

PROJECT: Phase 2 Groundwater Monitoring

CLIENT: Teck Coal Ltd. - CMO

AREA: **37 Pit**

Depth (m)

Lithological Symbol

▨	CL-Clay	▨	SA-Sand	▬	ST-Siltstone
■	CO-Coal	◜	GV-Gravel	(	BO-Boulders
‖	SI-Silt	⁘	SS-Sandstone		

Hydraulic Conductivity (m/s)

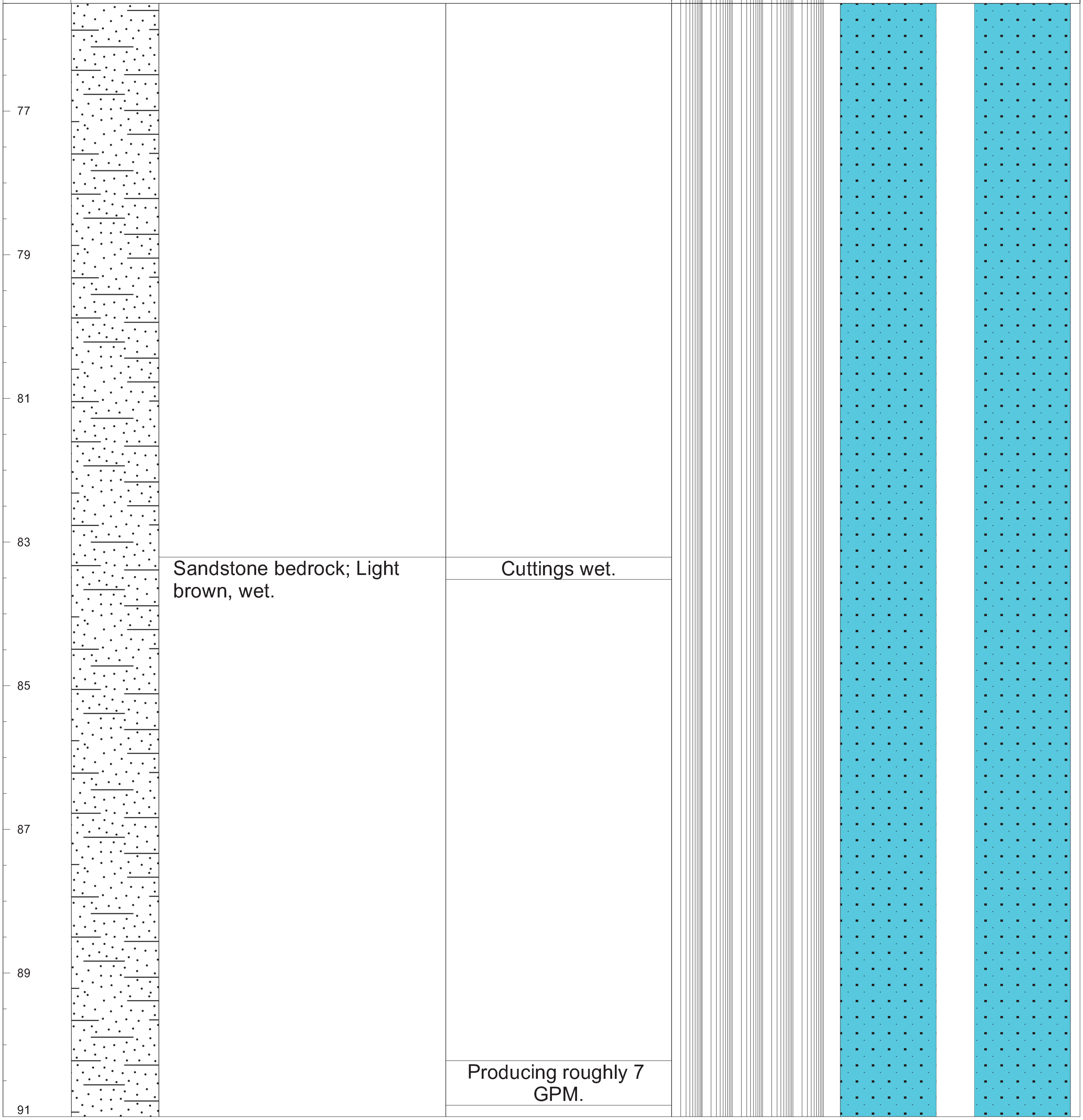
1E-8 1E-7 1E-6 1E-5 0.0001 0.001

Well Installation

▦	Sand	🟦	Pellets
▕	Cable	⊞	Chips
🟥	VWP	(	Cave
☐	Screen	■	Casing
☐	PVC	▩	Grout

Lithology Description

Drilling Notes and Additional Comments



Lithology Description	Drilling Notes and Additional Comments
Sandstone bedrock; Light brown, wet.	Cuttings wet.
	Producing roughly 7 GPM.

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Teck

HOLE ID:	**CM_MW8**	COORDINATES:	668878.2 E5484957 N
LOCATION:	CMO	DATUM:	UTM Zone 11
PROJECT NO:	1CT017.114	GROUND ELEV (masl):	1847.31
DRILLING CONTRACTOR:	AquaPro Drilling Ltd.	COLLAR DIP:	-90
		EOH ELEV. (masl):	1729.98
DRILLING TYPE:	Air Rotary	TOTAL DEPTH (mbgs):	104.02
LOGGED BY:	EH	STICKUP HEIGHT (magl):	0.68
BORING DATE:	4/23/2016 to 4/26/2016	CASING STICKUP (magl):	0.72

Page: 7 of 7

PROJECT: Phase 2 Groundwater Monitoring

CLIENT: Teck Coal Ltd. - CMO

AREA: **37 Pit**

Lithological Symbol

▨ CL-Clay	▨ SA-Sand	▬ ST-Siltstone
■ CO-Coal	▨ GV-Gravel	▨ BO-Boulders
▨ SI-Silt	▨ SS-Sandstone	

Hydraulic Conductivity (m/s)

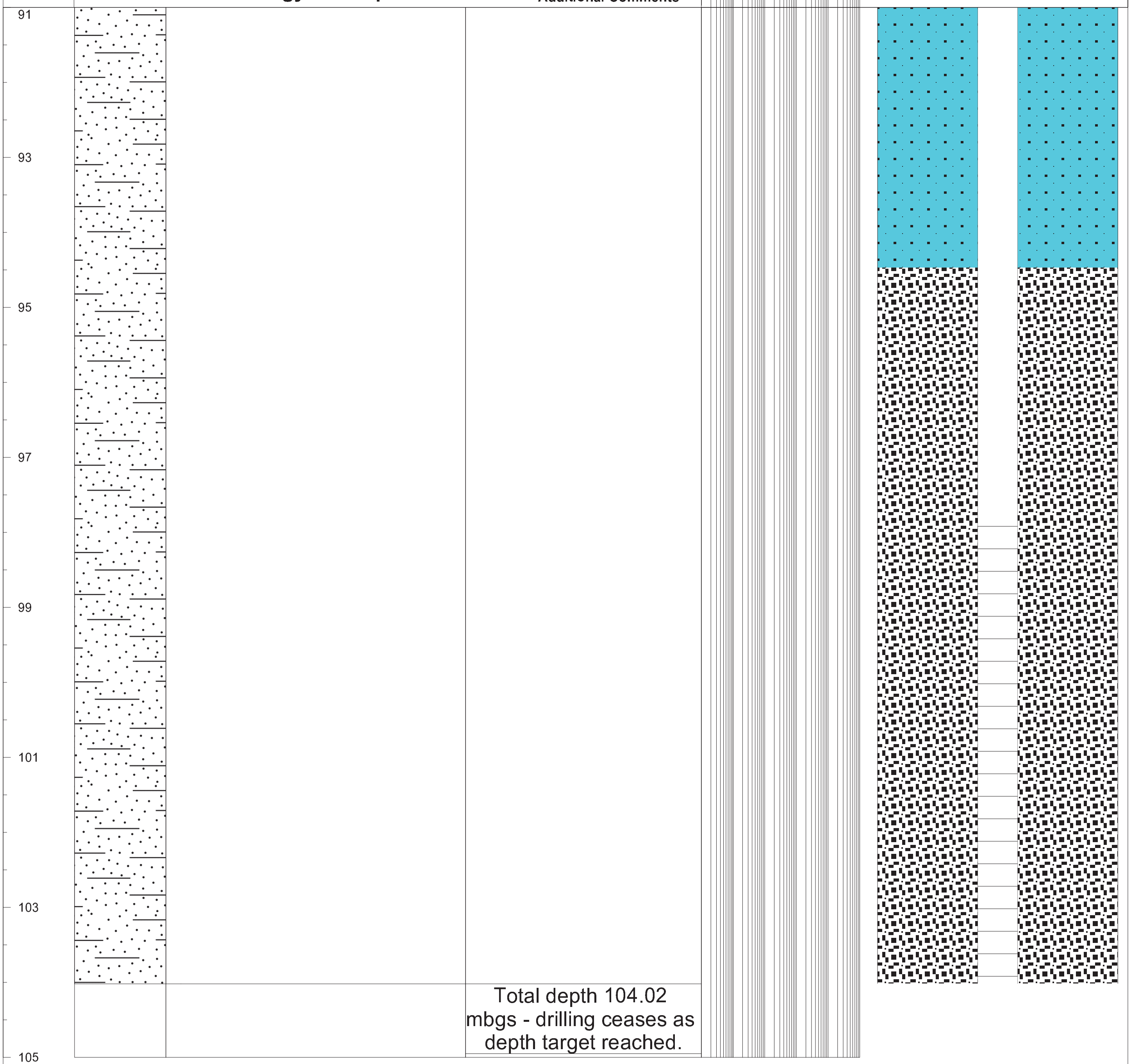
Well Installation

▨ Sand	🟦 Pellets
▨ Cable	▨ Chips
🟥 VWP	▨ Cave
☐ Screen	■ Casing
☐ PVC	▨ Grout

Depth (m)

Lithology Description

Drilling Notes and Additional Comments



Total depth 104.02 mbgs - drilling ceases as depth target reached.

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Teck

PROJECT: Coal Mountain Operation
CLIENT: Coal Mountain Operation

DRILLHOLE ID: CM_MW09
LOCATION: Coal Mountain
PROJECT NO: 1CT017.239
DRILL TYPE: Sonic
HOLE SIZE: 6"
CONTRACTOR: Mud bay Drilling
LOGGED BY: RB

DRILLING DATE: 07-Nov-19 **TO:** 07-Nov-19
COORDINATES: 668562.6 E 5487345.8 N
DATUM: UTM Zone 11N; NAD 83
GROUND EL (masl): 1510.3
TOTAL DEPTH (m): 3.66 **DIP:** 90°
WATER LEVEL (mbgs): 2

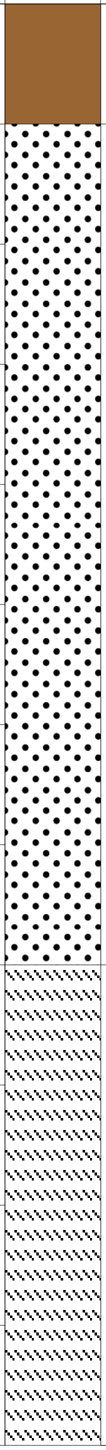
Drillhole Log

Lithologic Symbol

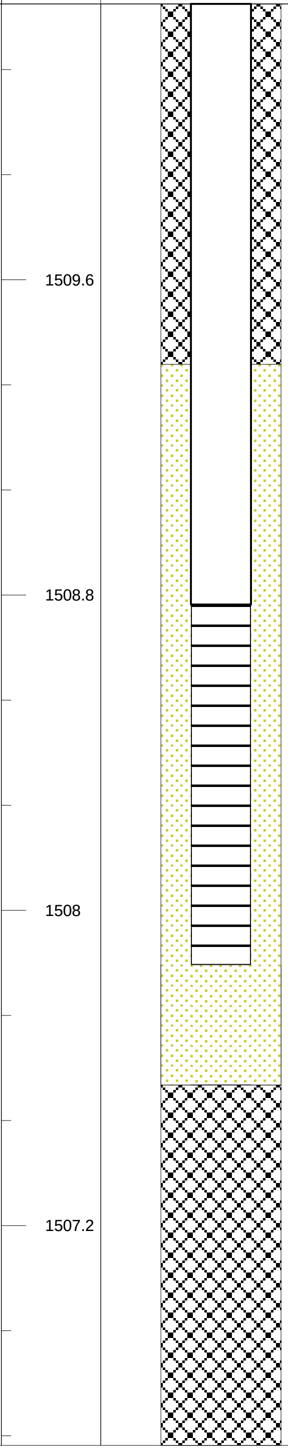
■ Ash
🟫 Organics
▨ Clay
▥ Silt
⁖ Sand
○ Gravel
○ Boulder/Cobbles
▧ Weathered Bedrock
▧ Bedrock
■ No Recovery

Standpipe Piezometer Installation

Stickup (m): 0.88



Graphic	USCS	Soil Description	Additional Comments
		ORGANICS - black, silt w/ sand and gravel, non-plastic	
	GW	SAND - olive grey, sand, some silt w/ gravel, angular to sub-rounded, particle size up to 60 mm, fines are non-plastic	Sample appears dry Driller notes water strike
		WEATHERED BEDROCK - mottled, silt with sand, friable dense silt	
		WEATHERED BEDROCK - olive grey and mottled in places, clay w/ gravel and sand, fines are non-plastic	Drilling becomes harder



Notes:
Coordinates and elevation were measured via differential GPS

Installation Legend

☒ Bentonite Chips
▨ Bentonite Pellets
⁖ Sand
▷ Slough
☐ PVC
☐ Screen
☐ Sump
☐ Casing
▩ Cement

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Teck

PROJECT: Coal Mountain Operation
CLIENT: Coal Mountain Operation

DRILLHOLE ID: CM_MW10
LOCATION: Coal Mountain
PROJECT NO: 1CT017.239
DRILL TYPE: Sonic
HOLE SIZE: 6/7"
CONTRACTOR: Mud bay Drilling
LOGGED BY: RB/NL

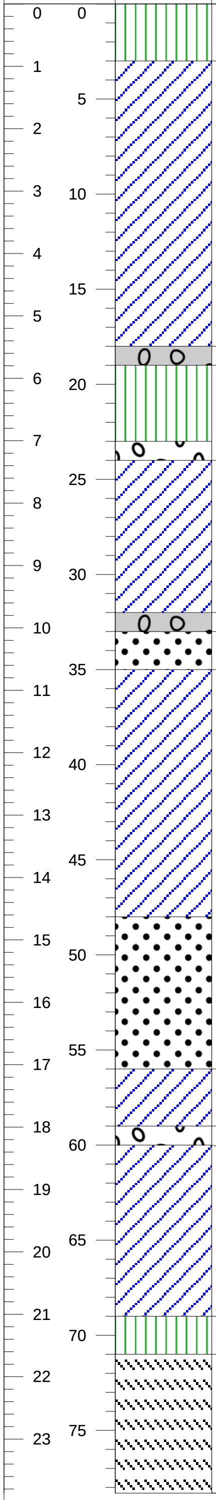
DRILLING DATE: 04-Nov-19 **TO:** 07-Nov-19
COORDINATES: 668582.2 E 5487629.7 N
DATUM: UTM Zone 11N; NAD 83
GROUND EL (masl): 1535.3
TOTAL DEPTH (m): 23.9 **DIP:** 90°
WATER LEVEL (mbgs): 13

Page 1 of 1

Drillhole Log

Lithologic Symbol

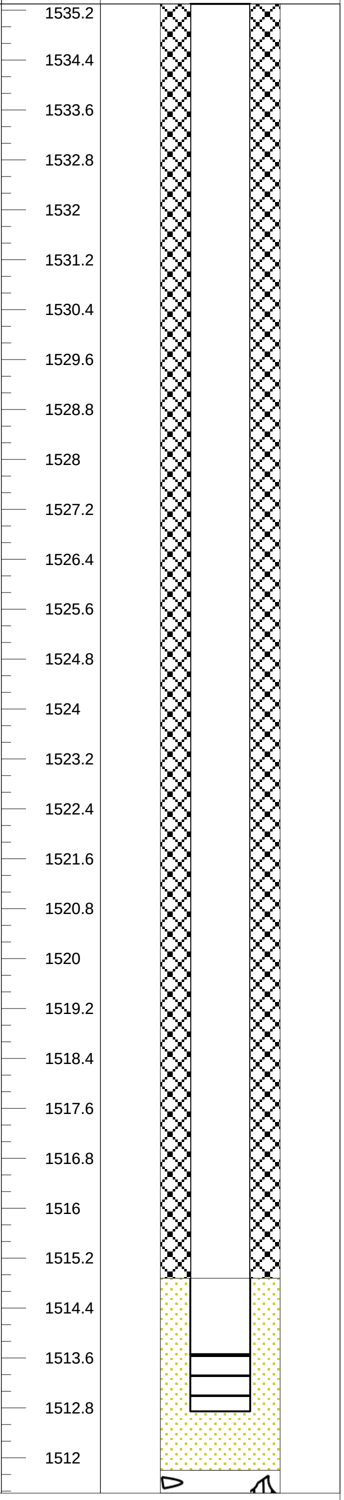
■ Ash ▨ Clay ⁘ Sand ▒ Boulder/Cobbles ▧ Bedrock
■ Organics ▥ Silt O Gravel ▤ Weathered Bedrock ■ No Recovery



USCS	Soil Description	Additional Comments
ML	SANDY SILT W/ GRAVEL - loose, dark gray, 15% cobbles, few silt, >50% sand, non-plastic (ML), moist, noncohesive	Organic matter noted beneath road fill
CL	LEAN CLAY W/ GRAVEL - dense, olive gray, fine grain ,few gravel, few sand, low plasticity (CL), moist, cohesive	
	GRAVELLY LEAN CLAY W/ SAND - dense, light brown, trace cobble, few gravel, >50% fines, medium plasticity (CL), dry, cohesive	
	LEAN CLAY W/ GRAVEL - loose to medium dense, yellowing orange, trace cobble, little gravel, >50% fines, wet to moist, low plasticity (CL), cohesive	
	BOULDER	
ML	SILT W/ GRAVEL - dense, light brown, trace cobble, little gravel, >50% fines, nonplastic (ML), moist, noncohesive	
	SILTY GRAVEL W/ SAND - loose, light gray, some sand, >50% coarse grained sediments, few cobbles, dry, nonplastic (ML), noncohesive	
CL	LEAN CLAY W/ GRAVEL - dense, light brown, few gravel, >50% fine, moist, medium plasticity (CL), cohesive	
	BOULDER	
GW	WELL GRADED SAND & GRAVEL - loose, light brown, >50% coarse-grained sediment, 15-25% gravel, moist, nonplastic, noncohesive	Sample appears dry
CL	LEAN CLAY W/ GRAVEL - dense, light brown, few gravel, >50% fine, moist, medium plasticity (CL), cohesive	
	LEAN CLAY W/ GRAVEL - dense, light brown, few gravel, >50% fine, moist, medium plasticity (CL), cohesive, observed more pebbles/boulders than 10.668m to 12.964m	
	LEAN CLAY W/ GRAVEL - dense, light brown, few gravel, >50% fine, moist, medium plasticity (CL), cohesive	
	CLAYEY SAND W/ GRAVEL - medium dense, light gray, trace cobbles, some gravel, >50% sand, moist, medium plasticity (CL), cohesive	Sample appears dry
CH	FAT CLAY W/ SAND - dense, olive gray, trace cobbles, some gravel, >50% fine, moist, high plasticity, cohesive	
GP	POORLY GRADED GRAVEL W/ SAND - loose, olive gray, >95% sand, moist, nonplastic, noncohesive	
CH	FAT CLAY W/ SAND - dense, olive gray, trace cobble, some gravel >50% fine, moist, high plasticity, cohesive	
ML	GRAVELLY SILT W/ SAND - loose, few cobble, some gravel, >50% sand, wet, nonplastic, noncohesive	7" override drilled to 21.3 m Driller notes water strike
	WEATHERED BEDROCK	Outer casing becomes stuck; casing sheared.

Standpipe Piezometer Installation

Stickup (m): 0.93



Notes:
Coordinates and elevation were measured via differential GPS

Installation Legend

☒ Bentonite Chips ⁘ Sand ☐ PVC ☐ Screen ☐ Sump ☐ Casing ▩ Cement
▨ Bentonite Pellets ▷ Slough

FINAL

SNC • LAVALIN	Client **Teck Coal Limited**	**Borehole No. : CM_BH_AG1A**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 2

Drilling Contractor	Owen's Drilling	Date Monitored	2020 09 01	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1477.754	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1478.653	Date Drilled:	2020 08 19
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5488250.082	Easting: 667334.031	Log Typed By:	AS

Drilling Legend
- ▨ Sample Interval
- ☰ Odex

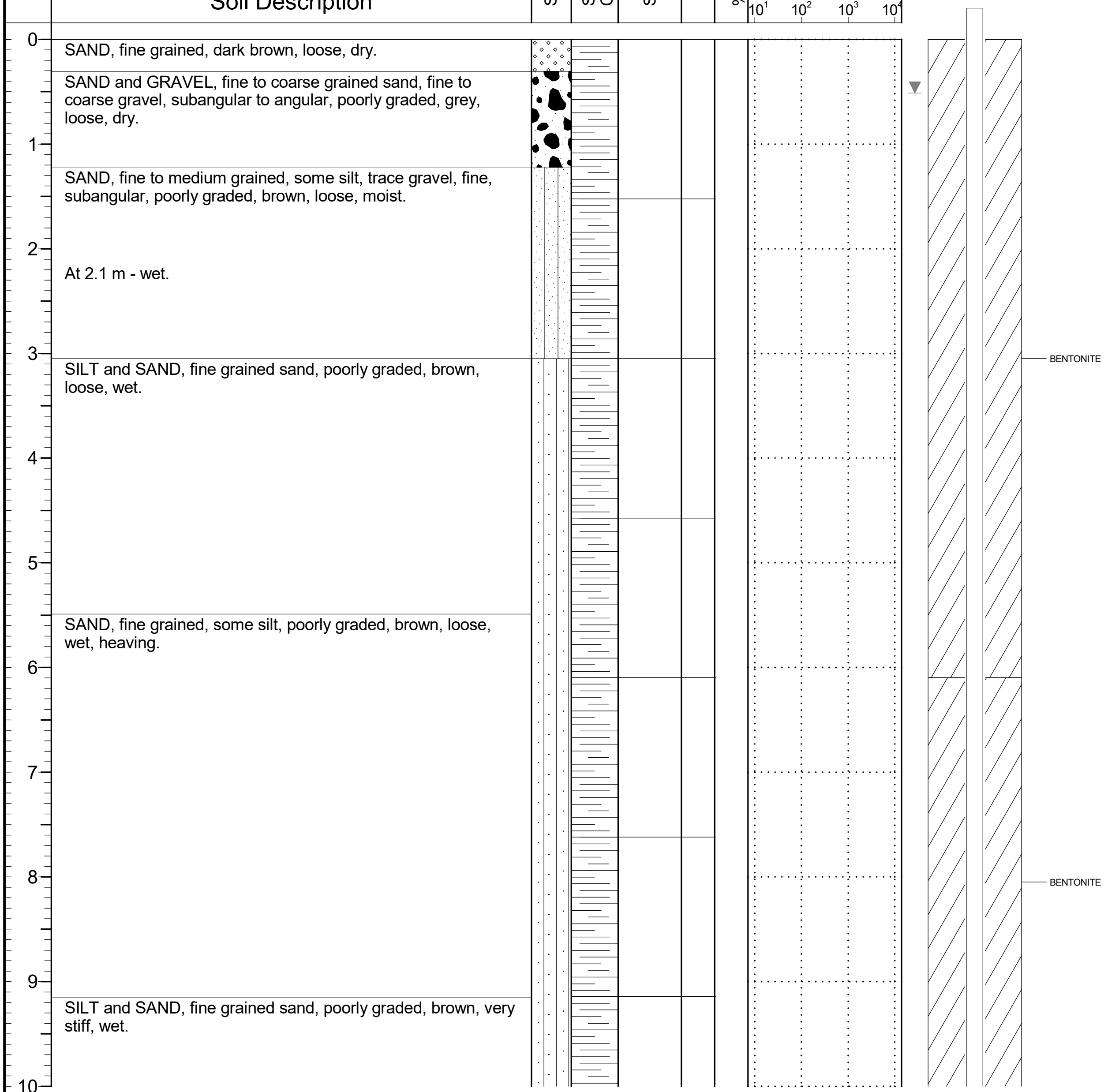
Water/NAPL Levels
- ▼ Water Level 1
- ▽ Water Level 2
- ◆ NAPL
- ◇ NAPL

- ○ Reading within indicated scale
- ● Reading outside indicated scale

- ▯ Solid PVC
- ▯ Slotted PVC

Well Name 1: CM_MW_AG1A

Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm)



SAND, fine grained, dark brown, loose, dry.

SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subangular to angular, poorly graded, grey, loose, dry.

SAND, fine to medium grained, some silt, trace gravel, fine, subangular, poorly graded, brown, loose, moist.

At 2.1 m - wet.

SILT and SAND, fine grained sand, poorly graded, brown, loose, wet.

SAND, fine grained, some silt, poorly graded, brown, loose, wet, heaving.

SILT and SAND, fine grained sand, poorly graded, brown, very stiff, wet.

NOTES

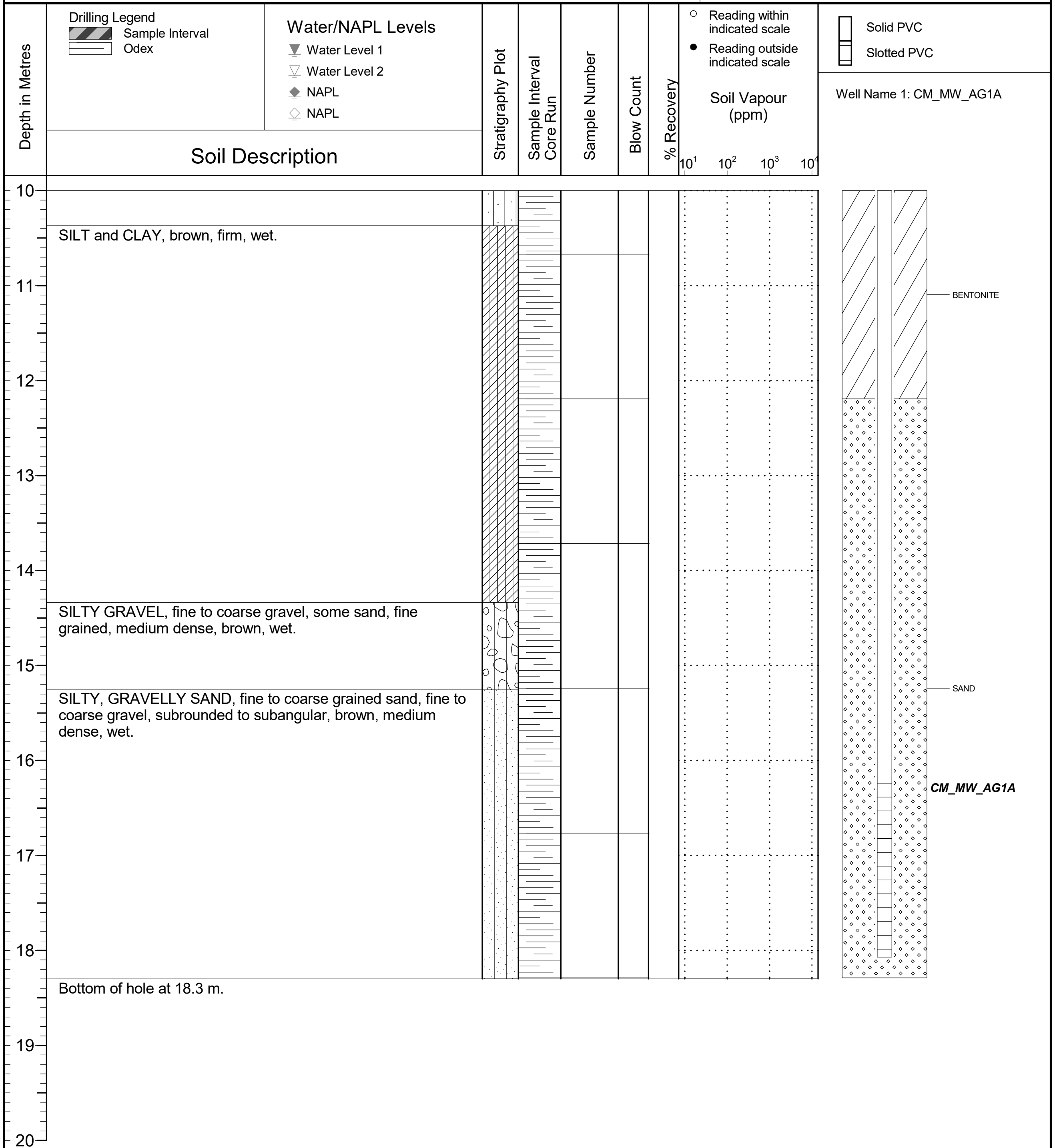
QA/QC: LLH 2020 10 19 Print Date:2020-12-02

FINAL

SNC·LAVALIN

	Client **Teck Coal Limited**	**Borehole No. : CM_BH_AG1A**
	Location **Regional Groundwater Monitoring**	PAGE 2 OF 2

Drilling Contractor	Owen's Drilling	Date Monitored	2020 09 01	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1477.754	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1478.653	Date Drilled:	2020 08 19
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5488250.082	Easting: 667334.031	Log Typed By:	AS



SILT and CLAY, brown, firm, wet.

SILTY GRAVEL, fine to coarse gravel, some sand, fine grained, medium dense, brown, wet.

SILTY, GRAVELLY SAND, fine to coarse grained sand, fine to coarse gravel, subrounded to subangular, brown, medium dense, wet.

Bottom of hole at 18.3 m.

NOTES

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : CM_BH_AG1B**
	Location **Regional Groundwater Monitoring**	PAGE 1 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2020 09 01	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1477.614	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1478.551	Date Drilled:	2020 08 14
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5488243.909	Easting: 667329.527	Log Typed By:	AS

Drilling Legend
▨ Sample Interval
☰ Odex

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: CM_MW_AG1B

Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm)

SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subangular to angular, well graded, grey, loose, dry.

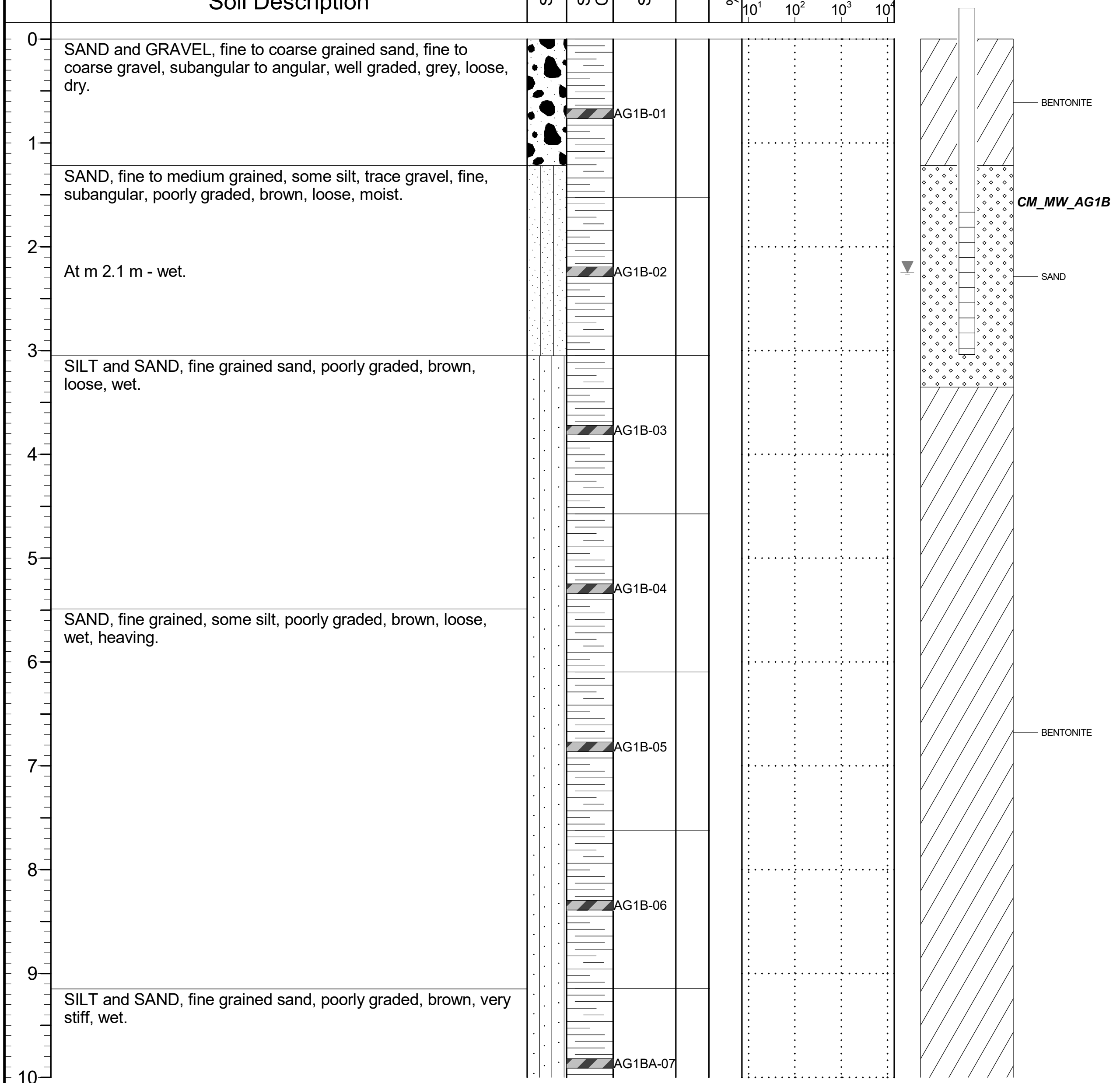
SAND, fine to medium grained, some silt, trace gravel, fine, subangular, poorly graded, brown, loose, moist.

At m 2.1 m - wet.

SILT and SAND, fine grained sand, poorly graded, brown, loose, wet.

SAND, fine grained, some silt, poorly graded, brown, loose, wet, heaving.

SILT and SAND, fine grained sand, poorly graded, brown, very stiff, wet.



NOTES
Bolded sample denotes sample analyzed.
*Denotes blind field duplicate.

QA/QC: LLH 2020 10 19 Print Date:2020-12-02

FINAL

SNC·LAVALIN	Client **Teck Coal Limited**	**Borehole No. : CM_BH_AG1B**
	Location **Regional Groundwater Monitoring**	PAGE 2 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2020 09 01	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1477.614	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1478.551	Date Drilled:	2020 08 14
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5488243.909	Easting: 667329.527	Log Typed By:	AS

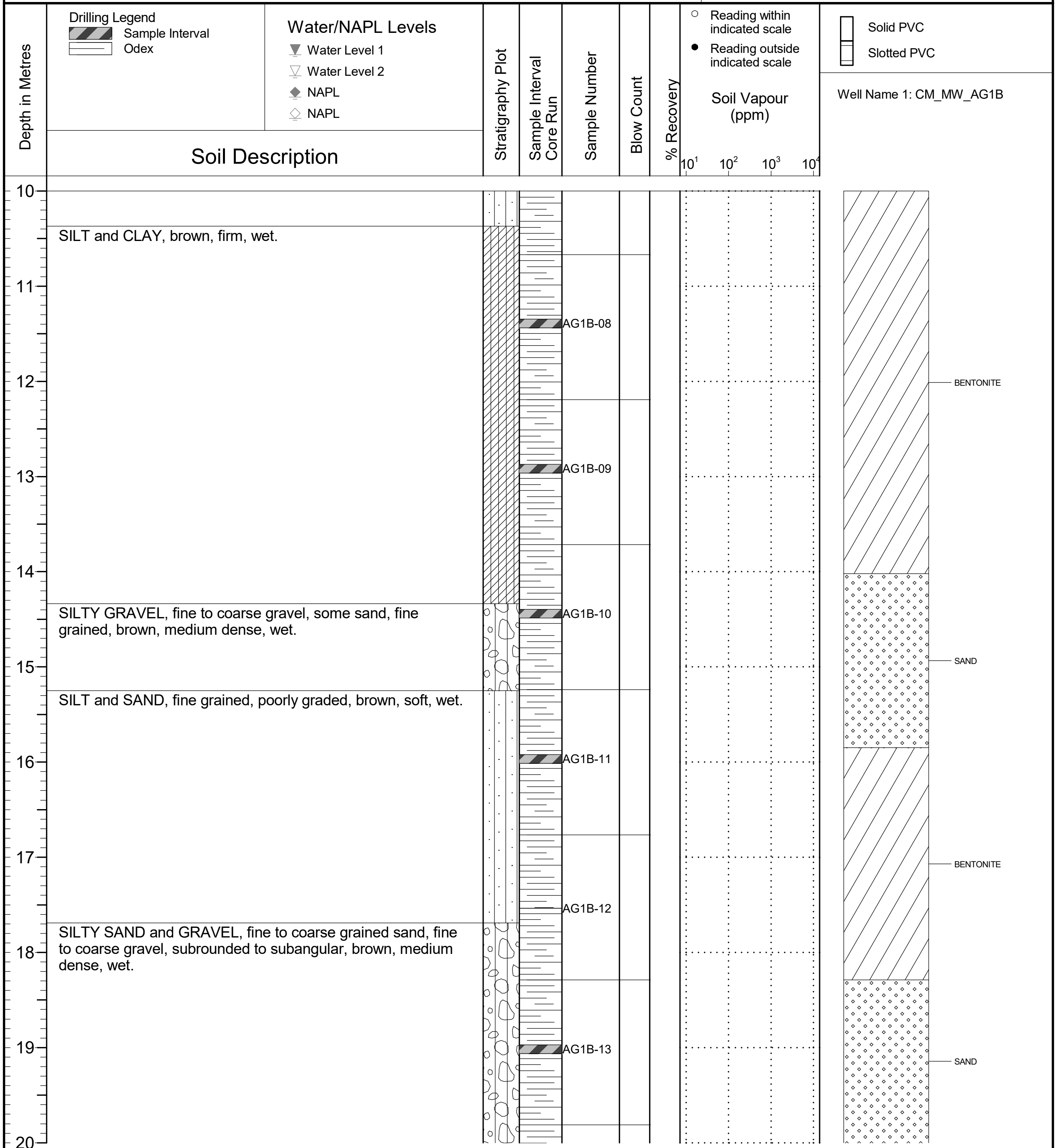
Drilling Legend
▨ Sample Interval
☰ Odex

Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: CM_MW_AG1B



SILT and CLAY, brown, firm, wet.

SILTY GRAVEL, fine to coarse gravel, some sand, fine grained, brown, medium dense, wet.

SILT and SAND, fine grained, poorly graded, brown, soft, wet.

SILTY SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, subrounded to subangular, brown, medium dense, wet.

NOTES
Bolded sample denotes sample analyzed.
*Denotes blind field duplicate.

FINAL

SNC • LAVALIN

Client **Teck Coal Limited**	**Borehole No. : CM_BH_AG1B**
Location **Regional Groundwater Monitoring**	PAGE 3 OF 3

Drilling Contractor	Owen's Drilling	Date Monitored	2020 09 01	Project Number:	631283
Drilling Method	Odex	Ground Surface Elev. (m)	1477.614	Borehole Logged By:	MTB
Borehole Dia. (m)	0.13	Top of Casing Elev. (m)	1478.551	Date Drilled:	2020 08 14
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5488243.909	Easting: 667329.527	Log Typed By:	AS

Drilling Legend
▨ Sample Interval
☰ Odex

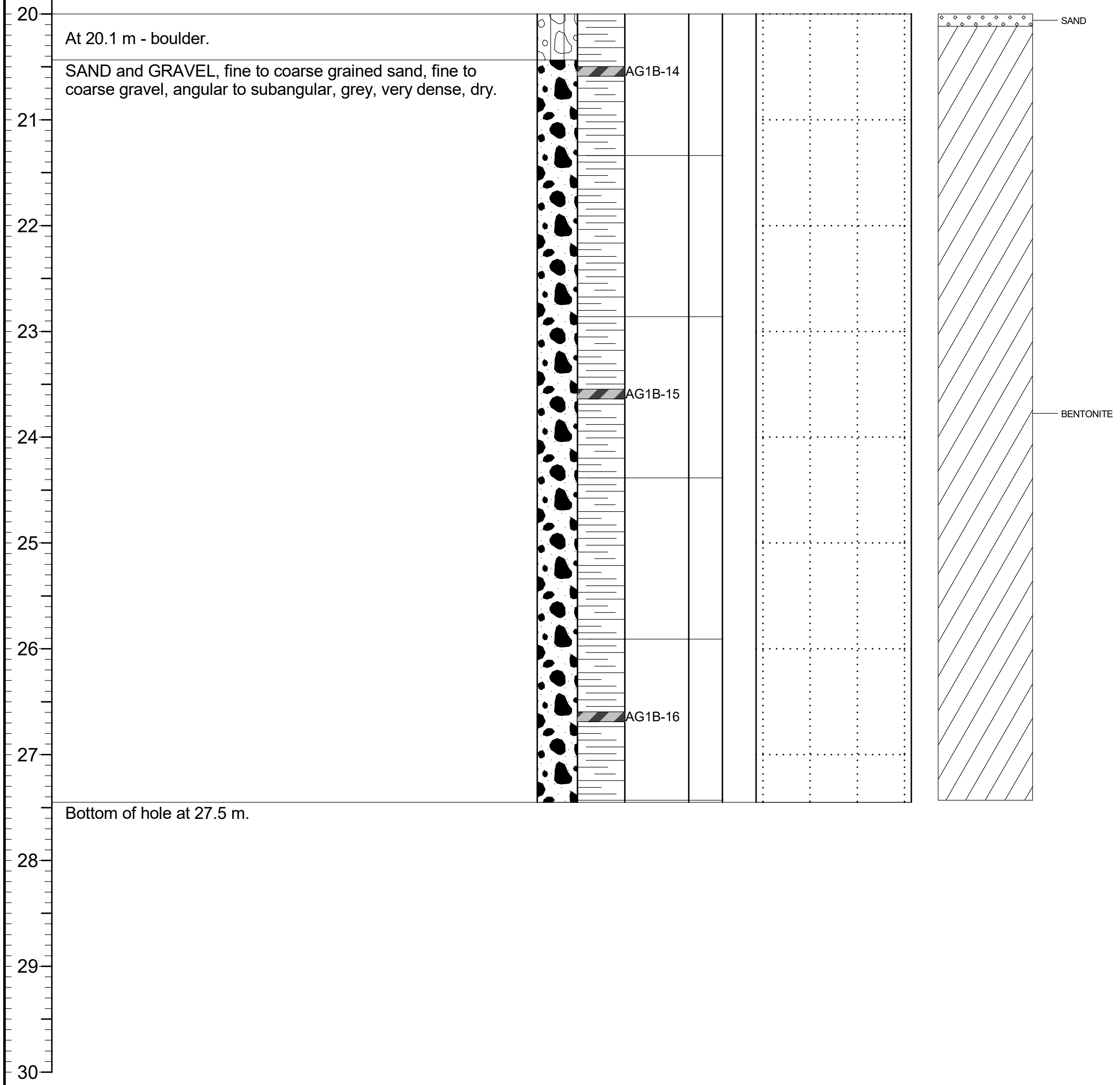
Water/NAPL Levels
▼ Water Level 1
▽ Water Level 2
◆ NAPL
◇ NAPL

○ Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: CM_MW_AG1B

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapour (ppm) 10^1 10^2 10^3 10^4
20	At 20.1 m - boulder.						
	SAND and GRAVEL, fine to coarse grained sand, fine to coarse gravel, angular to subangular, grey, very dense, dry.			AG1B-14			
				AG1B-15			
				AG1B-16			
27.5	Bottom of hole at 27.5 m.						

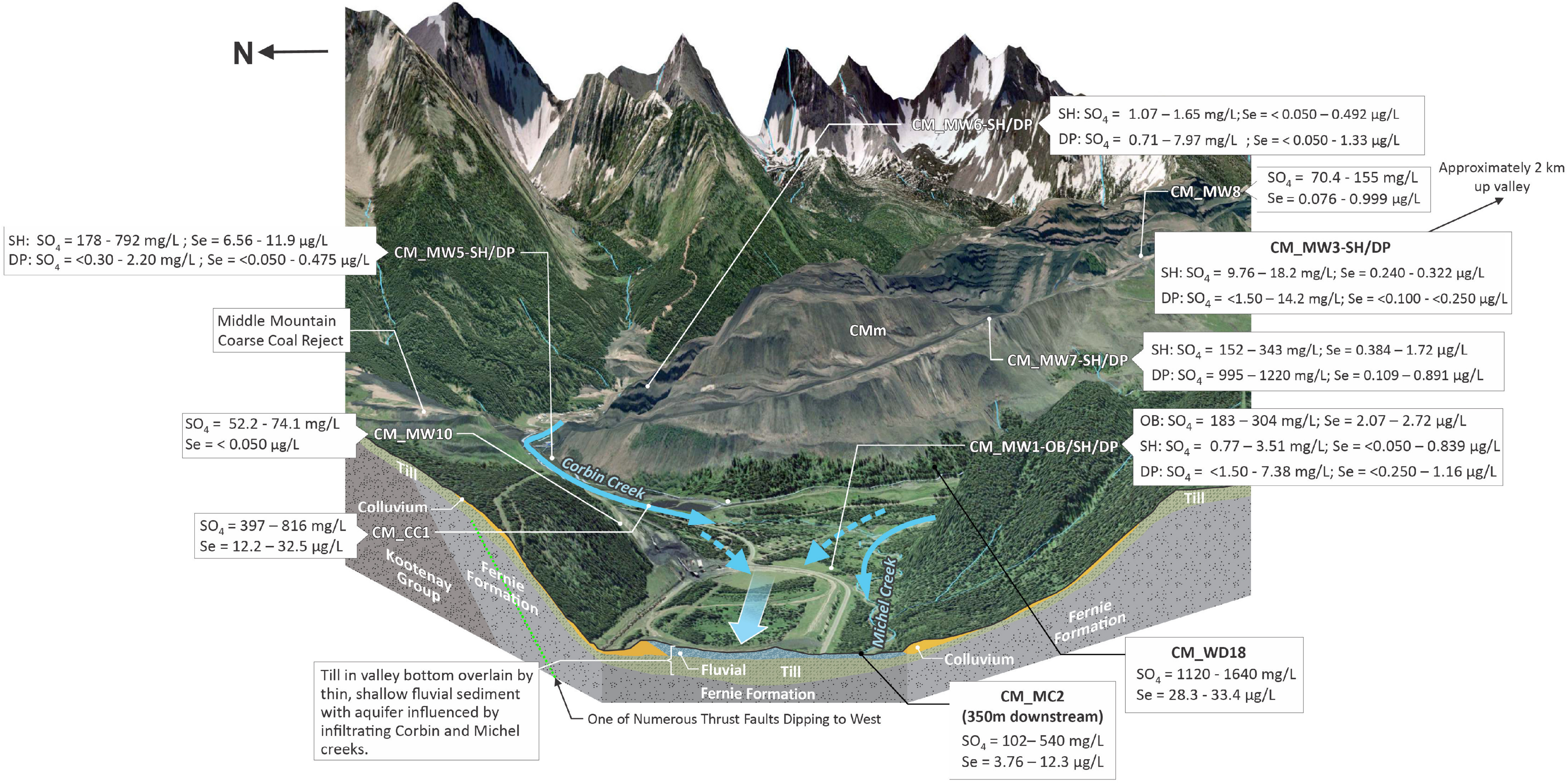


NOTES
Bolded sample denotes sample analyzed.
*Denotes blind field duplicate.

Attachment II

Block Diagrams

Diagram CM-01:	Block Diagram Showing 3D Conceptual Hydrogeology and Transport Pathways of Order Constituents near Michel Creek at CMm
Diagram CM-02:	Block Diagram Showing 3D Conceptual Hydrogeology and Transport Pathways of Order Constituents near Corbin Creek at CMm



CM_MW6-SH/DP
SH: SO_4 = 1.07 – 1.65 mg/L; Se = < 0.050 – 0.492 µg/L
DP: SO_4 = 0.71 – 7.97 mg/L ; Se = < 0.050 - 1.33 µg/L

CM_MW8
SO_4 = 70.4 - 155 mg/L
Se = 0.076 - 0.999 µg/L

Approximately 2 km up valley

CM_MW3-SH/DP
SH: SO_4 = 9.76 – 18.2 mg/L; Se = 0.240 - 0.322 µg/L
DP: SO_4 = <1.50 – 14.2 mg/L; Se = <0.100 - <0.250 µg/L

CM_MW5-SH/DP
SH: SO_4 = 178 - 792 mg/L ; Se = 6.56 - 11.9 µg/L
DP: SO_4 = <0.30 - 2.20 mg/L ; Se = <0.050 - 0.475 µg/L

Middle Mountain Coarse Coal Reject

CM_MW7-SH/DP
SH: SO_4 = 152 – 343 mg/L; Se = 0.384 – 1.72 µg/L
DP: SO_4 = 995 – 1220 mg/L; Se = 0.109 – 0.891 µg/L

CM_MW10
SO_4 = 52.2 - 74.1 mg/L
Se = < 0.050 µg/L

CM_MW1-OB/SH/DP
OB: SO_4 = 183 – 304 mg/L; Se = 2.07 – 2.72 µg/L
SH: SO_4 = 0.77 – 3.51 mg/L; Se = <0.050 – 0.839 µg/L
DP: SO_4 = <1.50 - 7.38 mg/L; Se = <0.250 – 1.16 µg/L

CM_CC1
SO_4 = 397 – 816 mg/L
Se = 12.2 – 32.5 µg/L

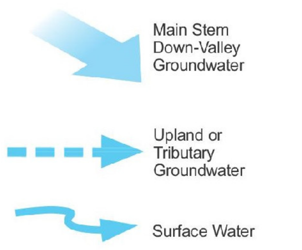
CM_WD18
SO_4 = 1120 - 1640 mg/L
Se = 28.3 - 33.4 µg/L

Till in valley bottom overlain by thin, shallow fluvial sediment with aquifer influenced by infiltrating Corbin and Michel creeks.

One of Numerous Thrust Faults Dipping to West

CM_MC2
(350m downstream)
SO_4 = 102– 540 mg/L
Se = 3.76 – 12.3 µg/L

Flow Legend



Notes:
1. Original in colour.
2. All concentrations shown are for 2022 minimum and maximum unless otherwise stated.
3. Subsurface geology is not to scale.
4. Vertical exaggeration 2x for topographic profile.

References:
1. Graphics from Brick Tudor Studios, LLC.
2. Bedrock geology derived from Monahan, 2000, BC Government.

Revisions:
0 - CW - 2022-12-11 - DRAFT - MB
1 - CW - 2023-03-22 - FINAL - MB

CLIENT: Teck Coal Limited

PROJECT LOCATION: Elk Valley, BC

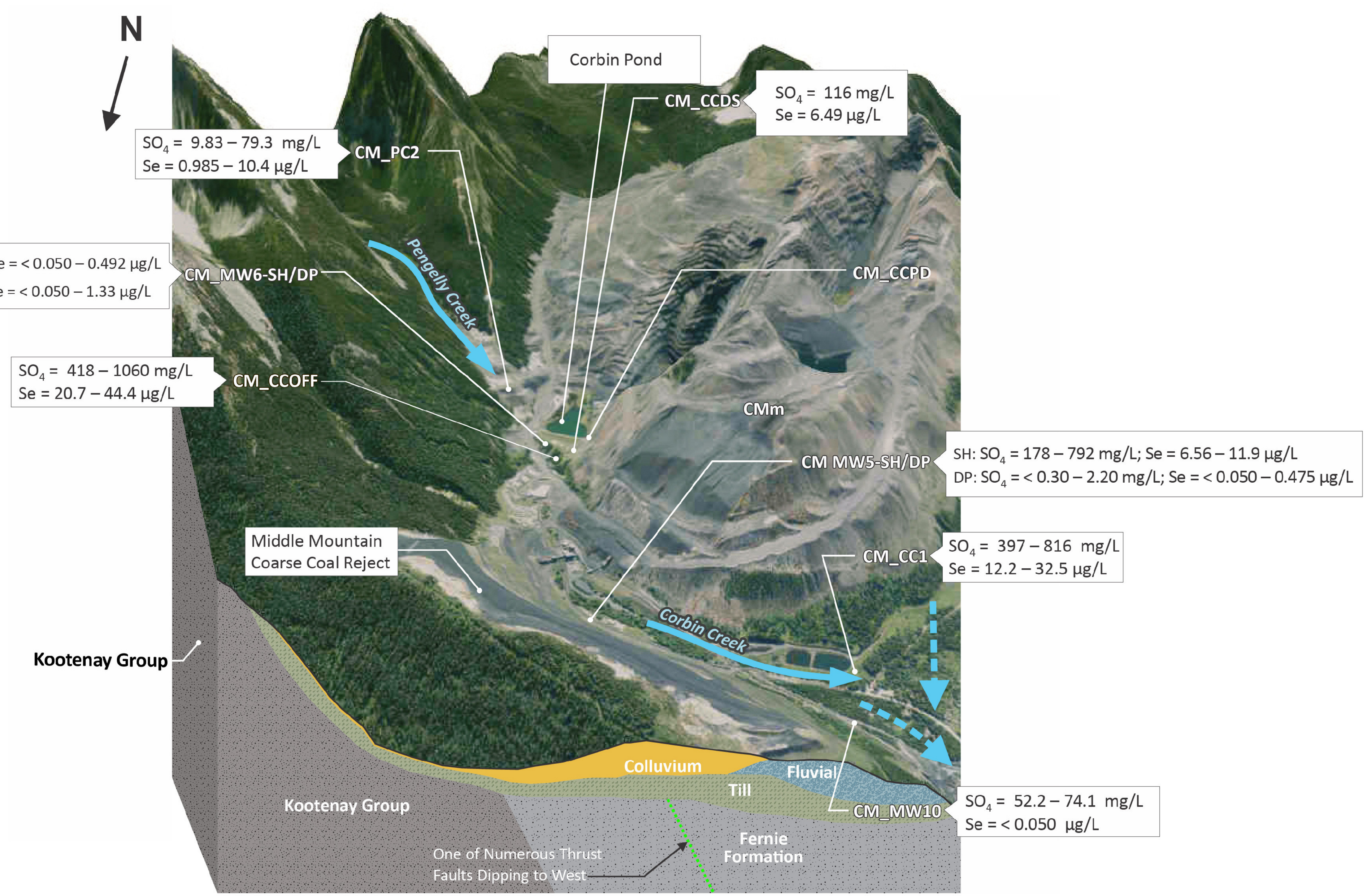
SNC·LAVALIN

Block Diagram Showing 3D Conceptual Hydrogeology and Transport Pathways of Order Constituents near Michel Creek at CMm

BY: CW	SCALE:	DATE: 2023-03-22	REF No:
CHK'D: MB	Proj Coord Sys:		**DIAGRAM CM-01**

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-BlockDiagram_CM01.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022



Flow Legend

Upland or Tributary Groundwater

Surface Water

Notes:
1. Original in colour.
2. All concentrations shown are for 2022 minimum and maximum unless otherwise stated.
3. Subsurface geology is not to scale.
4. Vertical exaggeration 2x for topographic profile.

References:
1. Graphics from Brick Tudor Studios, LLC.
2. Bedrock geology derived from Monahan, 2000, BC Government.

Revisions:
0 - CW - 2022-12-11 - DRAFT - MB
1 - CW - 2023-03-22 - FINAL - MB

CLIENT: Teck Coal Limited

PROJECT LOCATION: Elk Valley, BC

SNC · LAVALIN

Block Diagram Showing 3D Conceptual Hydrogeology and Transport Pathways of Order Constituents near Corbin Creek at CMm

BY: CW
SCALE:
DATE: 2023-03-22
REF No: **DIAGRAM CM-02**
CHK'D: MB
Proj Coord Sys:

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_AnnRpt\635544-BlockDiagram_CM02.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\Exports\635544_SSGMP_RGMP_AnnualReport_2022

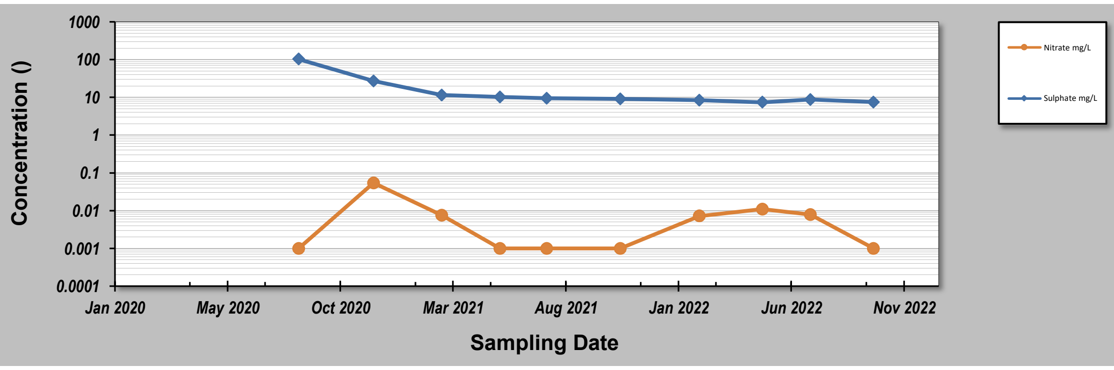
Attachment III

Mann-Kendall Analyses

GSI MANN-KENDALL TOOLKIT

Evaluation Date:	18-Nov-22	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - CMm	**Location**	CM_MW_AG1A
Conducted By:	MF	**Reviewed By:**	MB

	Parameter	**Nitrate**	**Sulphate**						
	units	mg/L	mg/L						
Sampling Event	**Sampling Date**	**CM_MW_AG1A CONCENTRATION**							
1	1-Sep-20	0.001	104						
2	10-Dec-20	0.0545	27						
3	11-Mar-21	0.0076	11.6						
4	27-May-21	0.001	10.2						
5	28-Jul-21	0.001	9.54						
6	3-Nov-21	0.001	9.14						
7	16-Feb-22	0.0072	8.4						
8	11-May-22	0.011	7.48						
9	14-Jul-22	0.0078	8.84						
10	6-Oct-22	0.001	7.52						
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		1.75	1.47						
Mann-Kendall Statistic (S):		1	-39						
Confidence Factor:		50.0%	>99.9%						
Concentration Trend:		No Trend	Decreasing						



Notes:

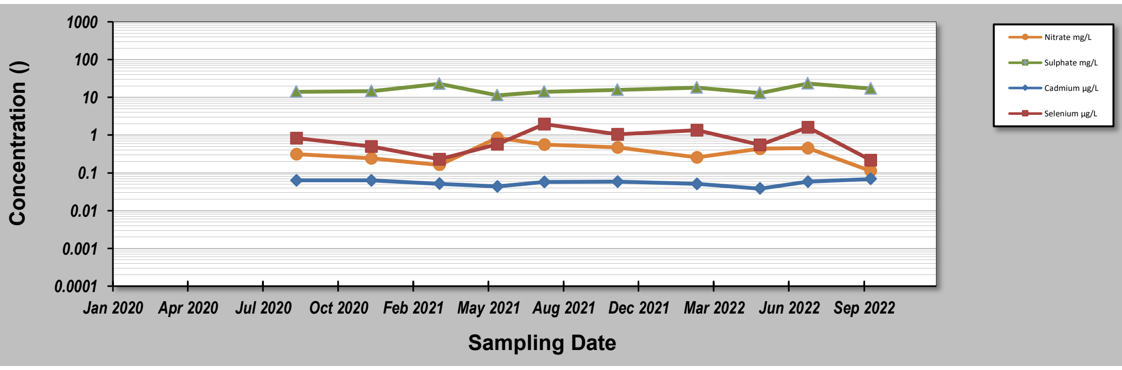
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

Evaluation Date: 18-Nov-22
Facility Name: Teck Coal Regional Groundwater - CMm
Conducted By: MF

Job ID: 635544
Location CM_MW_AG1B
Reviewed By: MB

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	Sampling Date	CM_MW_AG1B CONCENTRATION							
1	1-Sep-20	0.314	14.1	0.0631	0.834				
2	10-Dec-20	0.242	14.6	0.0633	0.497				
3	11-Mar-21	0.163	22.9	0.0516	0.228				
4	27-May-21	0.845	11.5	0.0434	0.568				
5	28-Jul-21	0.557	14.2	0.0576	1.96				
6	3-Nov-21	0.473	16	0.0582	1.05				
7	16-Feb-22	0.258	18.3	0.0511	1.36				
8	11-May-22	0.436	13	0.0388	0.554				
9	14-Jul-22	0.451	23.5	0.0582	1.6				
10	6-Oct-22	0.113	17.3	0.0692	0.218				
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		0.56	0.24	0.17	0.67				
Mann-Kendall Statistic (S):		-5	13	-2	3				
Confidence Factor:		63.6%	85.4%	53.5%	56.9%				
Concentration Trend:		Stable	No Trend	Stable	No Trend				



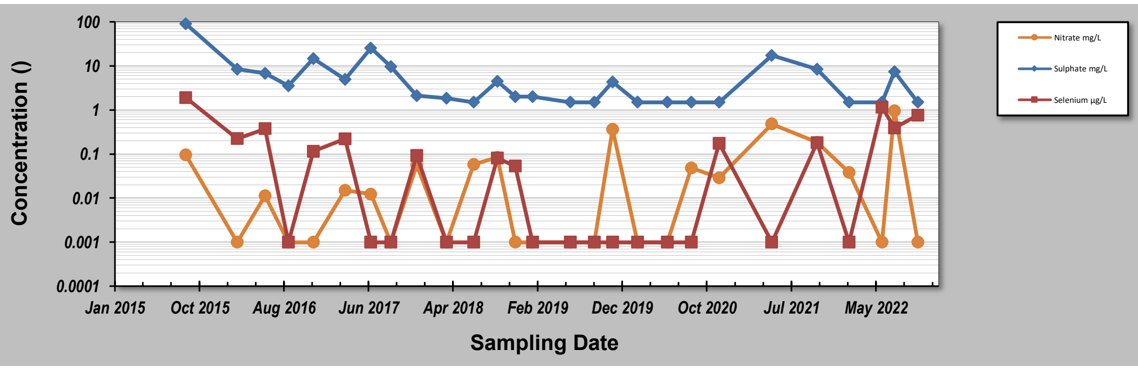
Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

Evaluation Date:	18-Nov-22	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - CMm	**Location**	CM_MW1-DP
Conducted By:	MF	**Reviewed By:**	MB

	Parameter	**Nitrate**	**Sulphate**	**Selenium**					
	units	mg/L	mg/L	µg/L					
Sampling Event	**Sampling Date**	**CM_MW1-DP CONCENTRATION**							
1	9-Sep-15	0.096	90.6	1.92					
2	10-Mar-16	0.001	8.4	0.223					
3	17-Jun-16	0.0113	6.77	0.374					
4	7-Sep-16	0.001	3.54	0.001					
5	5-Dec-16	0.001	14.7	0.115					
6	28-Mar-17	0.0149	4.97	0.22					
7	27-Jun-17	0.0122	25.4	0.001					
8	6-Sep-17	0.001	9.64	0.0010					
9	7-Dec-17	0.056	2.1	0.093					
10	22-Mar-18	0.001	1.84	0.001					
11	27-Jun-18	0.058	1.5	0.001					
12	19-Sep-18	0.084	4.5	0.081					
13	21-Nov-18	0.001	2.0	0.053					
14	22-Jan-19	0.001	2.0	0.001					
15	5-Jun-19	0.001	1.5	0.001					
16	29-Aug-19	0.001	1.5	0.001					
17	1-Nov-19	0.363	4.3	0.001					
18	29-Jan-20	0.001	1.5	0.001					
19	14-May-20	0.001	1.5	0.001					
20	7-Aug-20	0.048	1.5	0.001					
21	13-Nov-20	0.029	1.5	0.176					
22	19-May-21	0.481	17.4	0.001					
23	27-Oct-21	0.183	8.38	0.182					
24	17-Feb-22	0.038	1.50	0.001					
25	14-Jun-22	0.0010	1.50	1.16					
26	28-Jul-22	0.965	7.38	0.392					
27	19-Oct-22	0.001	1.5	0.76					
28									
29									
30									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	2.30	2.05	2.03					
	Mann-Kendall Statistic (S):	47	-141	-18					
	Confidence Factor:	83.0%	99.9%	63.7%					
	Concentration Trend:	No Trend	Decreasing	No Trend					



Notes:

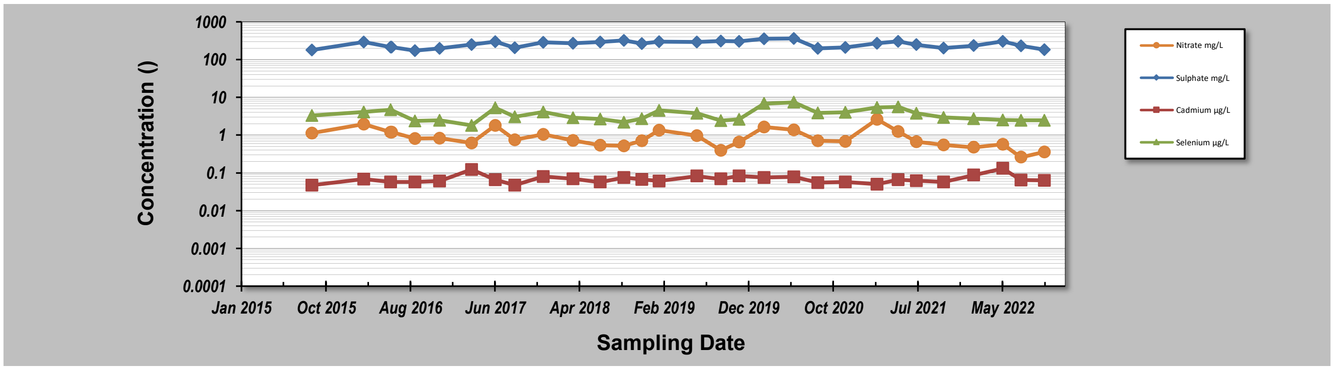
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

Evaluation Date: 18-Nov-22
Facility Name: Teck Coal Regional Groundwater - CMm
Conducted By: MF

Job ID: 635544
Location CM_MW1-OB
Reviewed By: MB

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	Sampling Date	CM_MW1-OB CONCENTRATION							
1	8-Sep-15	1.14	180	0.0474	3.30				
2	10-Mar-16	1.95	291	0.0685	4.10				
3	13-Jun-16	1.21	216	0.0570	4.73				
4	16-Jun-16	1.2	216						
5	7-Sep-16	0.82	174	0.0570	2.36				
6	5-Dec-16	0.824	197	0.0613	2.49				
7	27-Mar-17	0.622	250	0.1220	1.82				
8	19-Jun-17	1.82	297	0.0653	5.24				
9	28-Aug-17	0.751	206	0.0474	3.07				
10	7-Dec-17	1.05	287	0.0799	4.07				
11	22-Mar-18	0.726	272	0.0695	2.89				
12	27-Jun-18	0.538	293	0.0569	2.69				
13	19-Sep-18	0.52	324	0.0761	2.20				
14	21-Nov-18	0.707	264	0.0668	2.71				
15	22-Jan-19	1.36	300	0.0611	4.56				
16	4-Jun-19	0.97	292	0.0824	3.82				
17	29-Aug-19	0.396	310	0.0691	2.43				
18	1-Nov-19	0.657	303	0.0833	2.60				
19	29-Jan-20	1.64	356	0.0749	6.87				
20	14-May-20	1.37	363	0.0791	7.47				
21	7-Aug-20	0.713	200	0.0555	3.90				
22	12-Nov-20	0.686	211	0.0573	4.04				
23	5-Mar-21	2.64	271	0.0504	5.40				
24	19-May-21	1.25	306	0.0658	5.56				
25	22-Jul-21	0.673	248	0.0616	3.77				
26	27-Oct-21	0.549	201	0.0572	2.97				
27	10-Feb-22	0.476	234	0.0874	2.72				
28	25-May-22	0.57	304	0.1320	2.54				
29	28-Jul-22	0.26	230	0.0649	2.47				
30	19-Oct-22	0.356	183.0	0.063	2.480				
31									
32									
33									
34									
35									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	0.56	0.20	0.27	0.39				
	Mann-Kendall Statistic (S):	-155	56	52	-8				
	Confidence Factor:	99.7%	83.6%	82.9%	55.2%				
	Concentration Trend:	Decreasing	No Trend	No Trend	Stable				



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

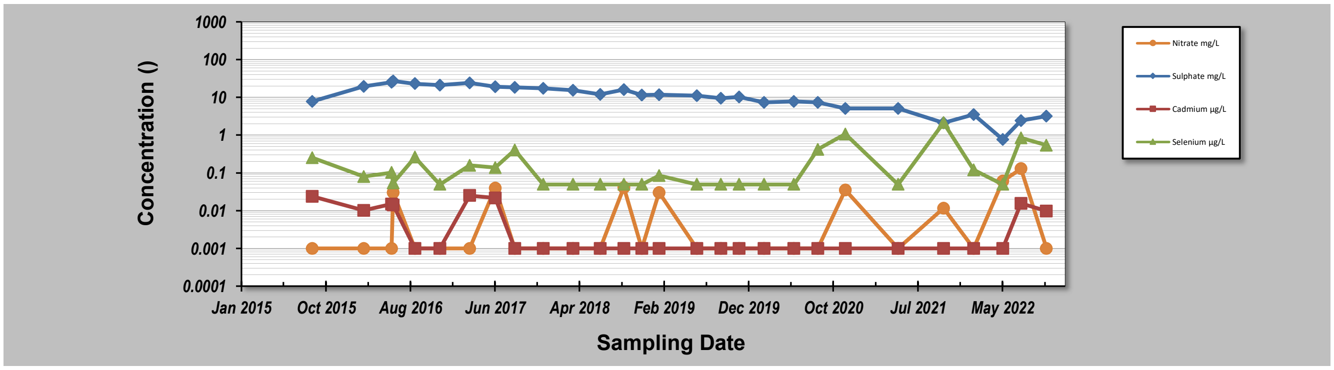
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 18-Nov-22
Facility Name: Teck Coal Regional Groundwater - CMm
Conducted By: MF

Job ID: 635544
Location CM_MW1-SH
Reviewed By: MB

Parameter	Nitrate	Sulphate	Cadmium	Selenium				
units	mg/L	mg/L	µg/L	µg/L				

Sampling Event	Sampling Date	CM_MW1-SH CONCENTRATION							
1	9-Sep-15	0.001	7.8	0.0241	0.252				
2	10-Mar-16	0.001	19.5	0.0102	0.08				
3	16-Jun-16	0.001	25.2	0.015	0.102				
4	22-Jun-16	0.03	27.2	0.0141	0.054				
5	7-Sep-16	0.001	23.0	0.001	0.26				
6	5-Dec-16	0.001	21.1	0.001	0.05				
7	21-Mar-17	0.001	24.1	0.0251	0.159				
8	19-Jun-17	0.040	19.2	0.0218	0.138				
9	28-Aug-17	0.001	18.5	0.001	0.404				
10	7-Dec-17	0.001	17.2	0.001	0.05				
11	22-Mar-18	0.001	15.3	0.001	0.05				
12	27-Jun-18	0.001	12.0	0.001	0.05				
13	19-Sep-18	0.041	16.1	0.001	0.05				
14	21-Nov-18	0.001	11.5	0.001	0.05				
15	22-Jan-19	0.030	11.8	0.001	0.085				
16	4-Jun-19	0.001	11.1	0.001	0.05				
17	29-Aug-19	0.001	9.54	0.001	0.05				
18	1-Nov-19	0.001	10.3	0.001	0.05				
19	29-Jan-20	0.001	7.4	0.001	0.05				
20	14-May-20	0.001	7.86	0.001	0.05				
21	7-Aug-20	0.001	7.32	0.001	0.421				
22	12-Nov-20	0.035	5.1	0.001	1.07				
23	19-May-21	0.001	5.09	0.001	0.05				
24	27-Oct-21	0.0116	2.1	0.001	2.14				
25	10-Feb-22	0.001	3.51	0.001	0.12				
26	25-May-22	0.0613	0.77	0.001	0.05				
27	28-Jul-22	0.130	2.43	0.0155	0.839				
28	26-Oct-22	0.001	3.17	0.0097	0.544				
29									
30									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		1.98	0.63	1.43	1.71				
Mann-Kendall Statistic (S):		55	-304	-76	14				
Confidence Factor:		85.6%	>99.9%	93.0%	60.0%				
Concentration Trend:		No Trend	Decreasing	Prob. Decreasing	No Trend				



Notes:
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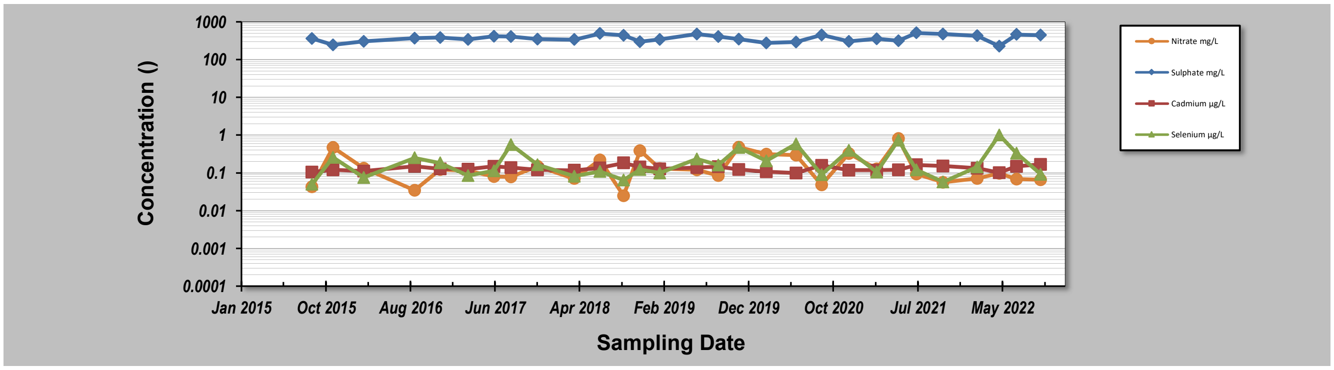
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 18-Nov-22
Facility Name: Teck Coal Regional Groundwater - CMm
Conducted By: MF

Job ID: 635544
Location CM_MW2-SH
Reviewed By: MB

	Parameter	**Nitrate**	**Sulphate**	**Cadmium**	**Selenium**				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	**Sampling Date**	**CM_MW2-SH CONCENTRATION**							
1	8-Sep-15	0.043	363	0.106	0.05				
2	23-Nov-15	0.468	244	0.121	0.258				
3	10-Mar-16	0.133	307	0.112	0.076				
4	6-Sep-16	0.0346	372	0.149	0.25				
5	6-Dec-16	0.123	386	0.127	0.183				
6	15-Mar-17	0.114	343	0.126	0.085				
7	15-Jun-17	0.08	417	0.148	0.113				
8	14-Aug-17	0.079	406	0.137	0.562				
9	16-Nov-17	0.149	348	0.12	0.164				
10	27-Mar-18	0.0705	339	0.117	0.081				
11	25-Jun-18	0.221	491	0.136	0.110				
12	18-Sep-18	0.025	442	0.183	0.065				
13	15-Nov-18	0.391	298	0.144	0.122				
14	24-Jan-19	0.131	344	0.127	0.1				
15	4-Jun-19	0.12	478	0.139	0.232				
16	20-Aug-19	0.0842	409	0.147	0.162				
17	31-Oct-19	0.478	347	0.123	0.473				
18	6-Feb-20	0.312	275	0.107	0.208				
19	21-May-20	0.293	294	0.0991	0.589				
20	20-Aug-20	0.048	450	0.157	0.09				
21	25-Nov-20	0.328	302	0.119	0.395				
22	3-Mar-21	0.128	357	0.119	0.105				
23	20-May-21	0.809	315	0.121	0.732				
24	22-Jul-21	0.094	510	0.163	0.12				
25	25-Oct-21	0.056	476	0.152	0.057				
26	23-Feb-22	0.0716	428	0.133	0.144				
27	12-May-22	0.0966	227	0.101	1.01				
28	13-Jul-22	0.068	463	0.15	0.334				
29	6-Oct-22	0.065	445	0.167	0.092				
30									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	1.00	0.20	0.16	0.96				
	Mann-Kendall Statistic (S):	-14	58	57	64				
	Confidence Factor:	59.5%	85.6%	85.2%	88.0%				
	Concentration Trend:	No Trend	No Trend	No Trend	No Trend				



Notes:
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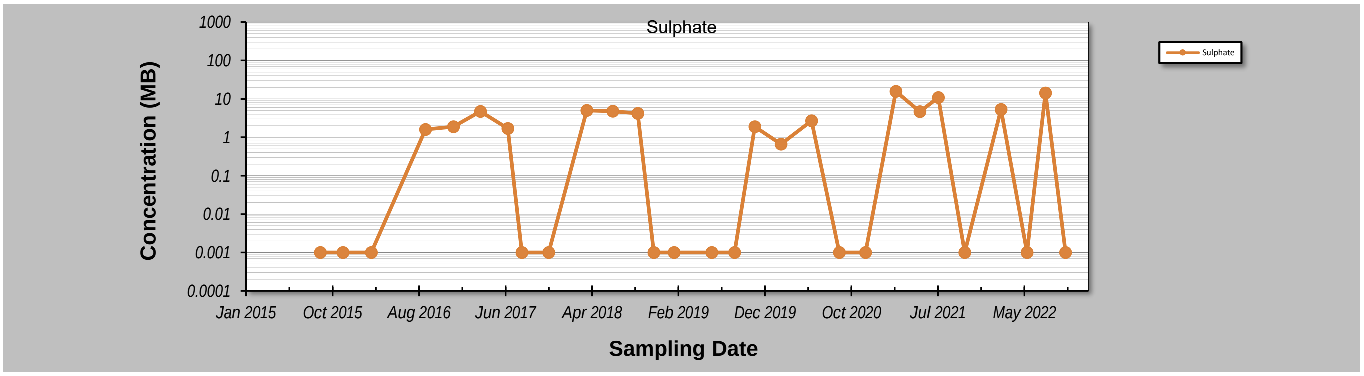
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	**18-Nov-22**	Job ID:	**635544**
Facility Name:	**Teck Coal Regional Groundwater - CMm**	Location	**CM_MW3-DP**
Conducted By:	**MF**	Reviewed By:	**MB**

Sampling Event	Sampling Date	CM_MW3-DP CONCENTRATION							
	Parameter	**Sulphate**							
	units	mg/L							
1	15-Sep-15	0.001							
2	3-Dec-15	0.001							
3	10-Mar-16	0.001							
4	14-Sep-16	1.600							
5	20-Dec-16	1.900							
6	23-Mar-17	4.700							
7	26-Jun-17	1.700							
8	14-Aug-17	0.001							
9	15-Nov-17	0.001							
10	27-Mar-18	5.000							
11	25-Jun-18	4.800							
12	20-Sep-18	4.200							
13	15-Nov-18	0.001							
14	24-Jan-19	0.001							
15	4-Jun-19	0.001							
16	22-Aug-19	0.001							
17	31-Oct-19	1.900							
18	30-Jan-20	0.660							
19	15-May-20	2.700							
20	19-Aug-20	0.001							
21	18-Nov-20	0.001							
22	4-Mar-21	15.700							
23	26-May-21	4.640							
24	29-Jul-21	10.90							
25	28-Oct-21	0.00							
26	3-Mar-22	5.3400							
27	1-Jun-22	0.0010							
28	4-Aug-22	14.2000							
29	13-Oct-22	0.0010							
30									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		**1.54**							
Mann-Kendall Statistic (S):		**58**							
Confidence Factor:		**85.6%**							
Concentration Trend:		No Trend							



Notes:

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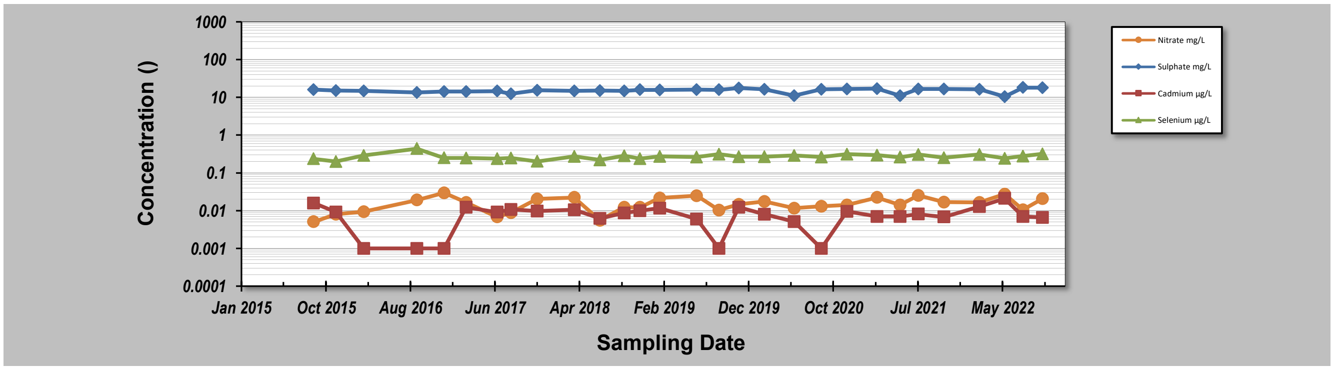
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 18-Nov-22
Facility Name: Teck Coal Regional Groundwater - CMm
Conducted By: MF

Job ID: 635544
Location CM_MW3-SH
Reviewed By: MB

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	Sampling Date	CM_MW3-SH CONCENTRATION							
1	14-Sep-15	0.0051	16	0.0159	0.236				
2	3-Dec-15	0.008	15.1	0.0092	0.201				
3	10-Mar-16	0.0094	14.8	0.001	0.288				
4	14-Sep-16	0.0191	13.4	0.001	0.44				
5	20-Dec-16	0.0298	14.4	0.0010	0.25				
6	8-Mar-17	0.0164	14.2	0.0124	0.249				
7	26-Jun-17	0.0068	14.7	0.0091	0.24				
8	14-Aug-17	0.0089	12.5	0.0107	0.246				
9	15-Nov-17	0.0203	15.4	0.0097	0.202				
10	27-Mar-18	0.0223	14.8	0.0106	0.275				
11	25-Jun-18	0.0055	15.1	0.0062	0.219				
12	20-Sep-18	0.0124	14.9	0.0086	0.286				
13	15-Nov-18	0.0122	15.9	0.01	0.239				
14	24-Jan-19	0.0217	15.8	0.0117	0.273				
15	4-Jun-19	0.0249	16	0.006	0.263				
16	22-Aug-19	0.0103	15.9	0.00	0.313				
17	31-Oct-19	0.0148	17.7	0.0124	0.266				
18	30-Jan-20	0.0176	16.3	0.008	0.267				
19	15-May-20	0.0117	11	0.0051	0.29				
20	19-Aug-20	0.0131	16.5	0.001	0.264				
21	18-Nov-20	0.0141	16.7	0.0095	0.312				
22	4-Mar-21	0.0223	17.1	0.007	0.297				
23	26-May-21	0.0142	11	0.007	0.26				
24	29-Jul-21	0.0253	16.8	0.0081	0.306				
25	28-Oct-21	0.0167	16.7	0.0068	0.254				
26	3-Mar-22	0.0164	16.4	0.0129	0.305				
27	1-Jun-22	0.0274	10.5	0.0211	0.243				
28	4-Aug-22	0.0105	18.2	0.007	0.277				
29	13-Oct-22	0.0207	18.1	0.0066	0.322				
30									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	0.42	0.13	0.57	0.17				
	Mann-Kendall Statistic (S):	110	162	-12	118				
	Confidence Factor:	98.0%	99.9%	58.1%	98.6%				
	Concentration Trend:	Increasing	Increasing	Stable	Increasing				



Notes:

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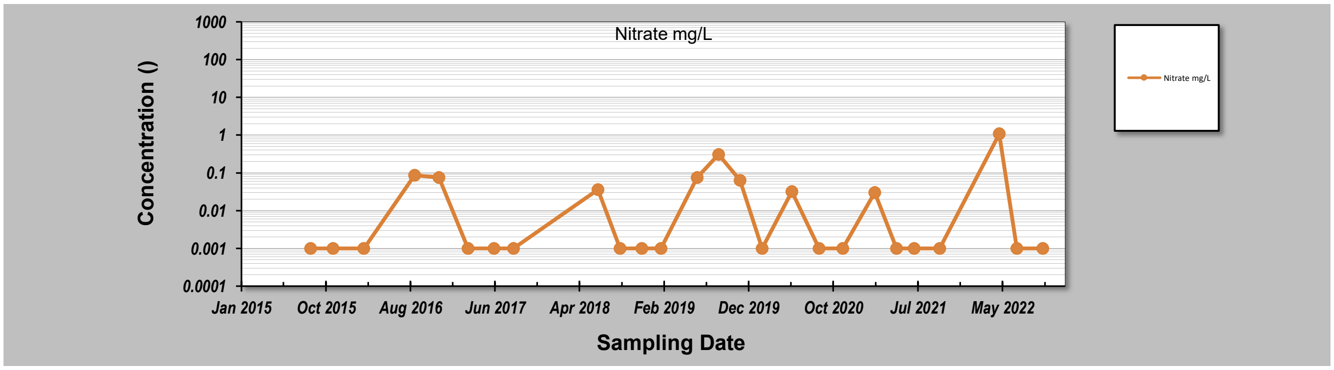
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 18-Nov-22
Facility Name: Teck Coal Regional Groundwater - CMm
Conducted By: MF

Job ID: 635544
Location CM_MW4-DP
Reviewed By: MB

Sampling Event	Sampling Date	CM_MW4-DP CONCENTRATION							
	Parameter	Nitrate							
	units	mg/L							
1	3-Sep-15	0.001							
2	23-Nov-15	0.001							
3	11-Mar-16	0.001							
4	6-Sep-16	0.086							
5	1-Dec-16	0.076							
6	15-Mar-17	0.001							
7	15-Jun-17	0.001							
8	23-Aug-17	0.001							
9	19-Jun-18	0.036							
10	5-Sep-18	0.001							
11	21-Nov-18	0.001							
12	28-Jan-19	0.001							
13	5-Jun-19	0.076							
14	21-Aug-19	0.308							
15	5-Nov-19	0.063							
16	22-Jan-20	0.001							
17	7-May-20	0.032							
18	11-Aug-20	0.001							
19	3-Nov-20	0.001							
20	25-Feb-21	0.0302							
21	13-May-21	0.001							
22	14-Jul-21	0.001							
23	13-Oct-21	0.001							
24	12-May-22	1.080							
25	14-Jul-22	0.001							
26	13-Oct-22	0.001							
27									
28									
29									
30									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	3.11							
	Mann-Kendall Statistic (S):	-8							
	Confidence Factor:	56.1%							
	Concentration Trend:	No Trend							



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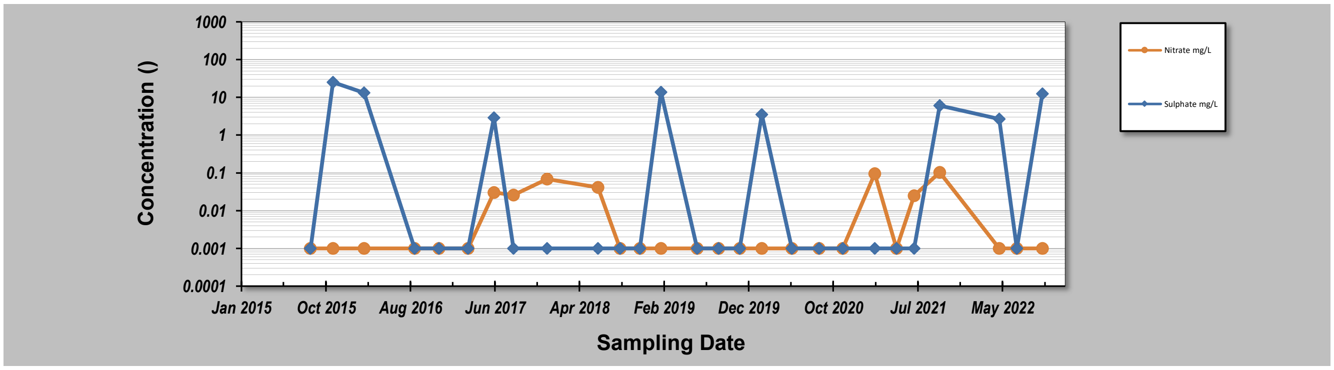
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	18-Nov-22	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - CMm	**Location**	CM_MW4-SH
Conducted By:	MF	**Reviewed By:**	MB

	Parameter	**Nitrate**	**Sulphate**						
	units	mg/L	mg/L						
Sampling Event	**Sampling Date**	**CM_MW4-SH CONCENTRATION**							
1	3-Sep-15	0.001	0.001						
2	23-Nov-15	0.001	25.2						
3	11-Mar-16	0.001	13.3						
4	6-Sep-16	0.001	0.001						
5	1-Dec-16	0.001	0.001						
6	15-Mar-17	0.001	0.001						
7	15-Jun-17	0.030	2.9						
8	23-Aug-17	0.026	0.001						
9	20-Dec-17	0.069	0.001						
10	19-Jun-18	0.041	0.001						
11	5-Sep-18	0.001	0.001						
12	14-Nov-18	0.001	0.001						
13	28-Jan-19	0.001	13.8						
14	5-Jun-19	0.001	0.001						
15	21-Aug-19	0.001	0.001						
16	4-Nov-19	0.001	0.001						
17	21-Jan-20	0.001	3.5						
18	7-May-20	0.001	0.001						
19	11-Aug-20	0.001	0.001						
20	3-Nov-20	0.001	0.001						
21	25-Feb-21	0.0949	0.001						
22	13-May-21	0.001	0.001						
23	14-Jul-21	0.025	0.001						
24	13-Oct-21	0.103	6.1						
25	12-May-22	0.001	2.66						
26	14-Jul-22	0.001	0.001						
27	12-Oct-22	0.001	12.4						
28									
29									
30									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	1.92	2.08						
	Mann-Kendall Statistic (S):	15	2						
	Confidence Factor:	61.4%	50.8%						
	Concentration Trend:	No Trend	No Trend						



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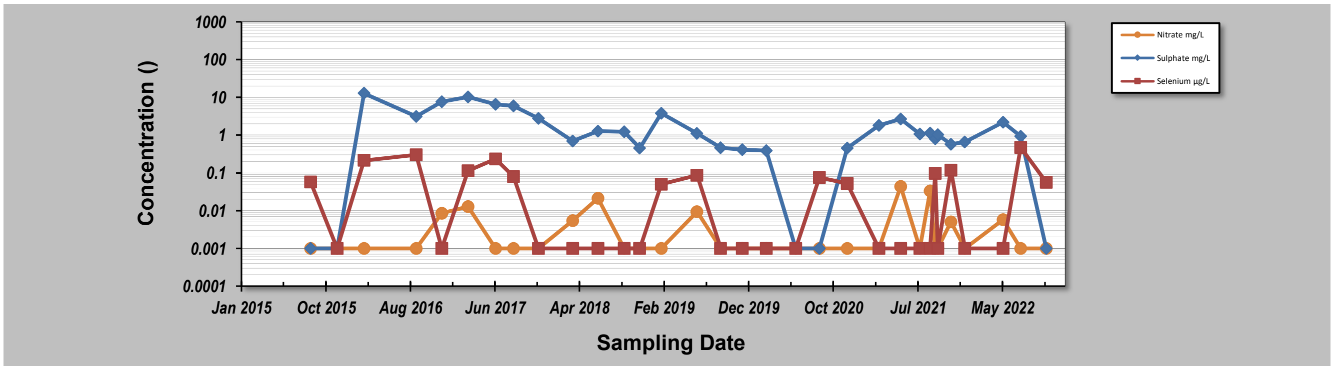
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 18-Nov-22
Facility Name: Teck Coal Regional Groundwater - CMm
Conducted By: MF

Job ID: 635544
Location CM_MW5-DP
Reviewed By: MB

	Parameter	Nitrate	Sulphate	Selenium					
	units	mg/L	mg/L	µg/L					
Sampling Event	Sampling Date	CM_MW5-DP CONCENTRATION							
1	3-Sep-15	0.001	0.001	0.057					
2	7-Dec-15	0.001	0.001	0.001					
3	11-Mar-16	0.001	12.9	0.214					
4	12-Sep-16	0.001	3.1	0.3					
5	12-Dec-16	0.0085	7.66	0.001					
6	15-Mar-17	0.0127	10.2	0.113					
7	20-Jun-17	0.001	6.53	0.232					
8	23-Aug-17	0.001	5.97	0.08					
9	20-Nov-17	0.001	2.78	0.001					
10	21-Mar-18	0.0054	0.7	0.001					
11	19-Jun-18	0.021	1.28	0.001					
12	20-Sep-18	0.001	1.22	0.001					
13	14-Nov-18	0.001	0.45	0.001					
14	29-Jan-19	0.001	3.78	0.05					
15	5-Jun-19	0.009	1.12	0.086					
16	28-Aug-19	0.001	0.46	0.001					
17	13-Nov-19	0.001	0.41	0.001					
18	6-Feb-20	0.001	0.4	0.001					
19	20-May-20	0.001	0.001	0.001					
20	12-Aug-20	0.001	0.001	0.075					
21	19-Nov-20	0.001	0.45	0.052					
22	11-Mar-21	0.001	1.82	0.001					
23	28-May-21	0.044	2.66	0.001					
24	4-Aug-21	0.001	1.07	0.001					
25	9-Sep-21	0.033	1.13	0.001					
26	27-Sep-21	0.001	0.79	0.097					
27	7-Oct-21	0.001	1.03	0.001					
28	22-Nov-21	0.005	0.57	0.119					
29	10-Jan-22	0.001	0.7	0.001					
30	26-May-22	0.006	2.2	0.001					
31	27-Jul-22	0.001	0.94	0.475					
32	26-Oct-22	0.001	0.001	0.056					
33									
34									
35									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		1.88	1.38	1.69					
Mann-Kendall Statistic (S):		9	-133	-37					
Confidence Factor:		55.2%	98.5%	71.9%					
Concentration Trend:		No Trend	Decreasing	No Trend					



Notes:

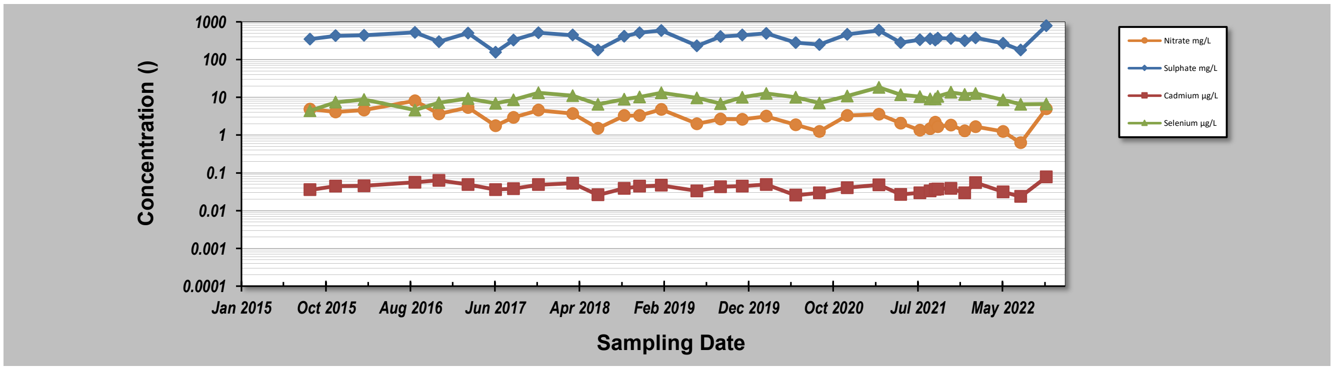
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

Evaluation Date: 18-Nov-22
Facility Name: Teck Coal Regional Groundwater - CMm
Conducted By: MF

Job ID: 635544
Location CM_MW5-SH
Reviewed By: MB

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	Sampling Date	CM_MW5-SH CONCENTRATION							
1	2-Sep-15	4.89	349	0.0356	4.45				
2	2-Dec-15	4.08	428	0.0443	7.43				
3	11-Mar-16	4.62	441	0.0451	8.71				
4	8-Sep-16	8.18	521	0.056	4.59				
5	2-Dec-16	3.68	299	0.063	7.19				
6	15-Mar-17	5.37	508	0.049	9.22				
7	20-Jun-17	1.78	157	0.0359	6.99				
8	23-Aug-17	2.94	330	0.0379	8.65				
9	20-Nov-17	4.57	517	0.0487	13.2				
10	21-Mar-18	3.72	445	0.0527	11				
11	19-Jun-18	1.51	180	0.0261	6.55				
12	20-Sep-18	3.28	419	0.039	9.02				
13	14-Nov-18	3.3	516	0.0442	10.3				
14	29-Jan-19	4.78	595	0.0468	13.3				
15	5-Jun-19	1.99	233	0.0333	9.69				
16	28-Aug-19	2.65	406	0.0429	6.75				
17	13-Nov-19	2.61	445	0.0449	10				
18	6-Feb-20	3.15	497	0.0488	12.6				
19	20-May-20	1.88	281	0.0256	10				
20	12-Aug-20	1.25	249	0.0298	7.08				
21	19-Nov-20	3.31	470	0.0407	10.9				
22	11-Mar-21	3.6	596	0.0486	18.5				
23	28-May-21	2.07	284	0.0267	11.8				
24	4-Aug-21	1.35	334	0.0296	10.4				
25	9-Sep-21	1.48	353	0.0333	9.17				
26	27-Sep-21	2.19	329	0.0365	9.05				
27	7-Oct-21	1.66	368	0.0374	10.6				
28	22-Nov-21	1.86	364	0.0392	13.6				
29	10-Jan-22	1.31	317	0.0293	11.9				
30	17-Feb-22	1.67	378	0.0555	12.6				
31	26-May-22	1.26	272	0.0314	8.58				
32	27-Jul-22	0.626	178	0.0238	6.56				
33	26-Oct-22	5	792	0.078	6.67				
34									
35									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	0.55	0.35	0.29	0.30				
	Mann-Kendall Statistic (S):	-256	-51	-109	122				
	Confidence Factor:	>99.9%	78.0%	95.3%	97.0%				
	Concentration Trend:	Decreasing	Stable	Decreasing	Increasing				



Notes:

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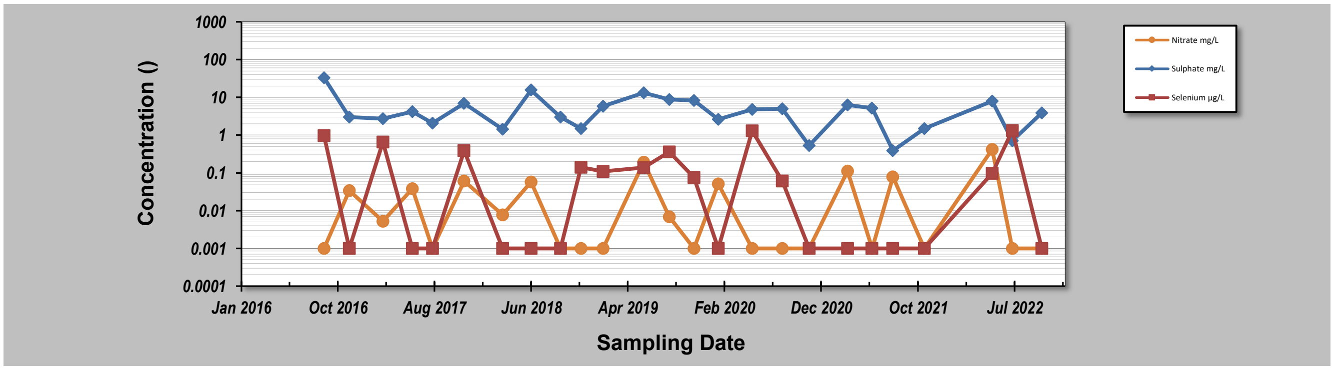
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	18-Nov-22	Job ID:	635544
Facility Name:	Teck Coal Regional Groundwater - CMm	Location	CM_MW6-DP
Conducted By:	MF	Reviewed By:	MB

	Parameter	Nitrate	Sulphate	Selenium					
	units	mg/L	mg/L	µg/L					
Sampling Event	Sampling Date	CM_MW6-DP CONCENTRATION							
1	13-Sep-16	0.001	33.3	0.97					
2	1-Dec-16	0.034	3	0.001					
3	15-Mar-17	0.0052	2.7	0.659					
4	15-Jun-17	0.038	4.2	0.001					
5	16-Aug-17	0.001	2.09	0.001					
6	22-Nov-17	0.061	7.0	0.39					
7	22-Mar-18	0.0077	1.44	0.001					
8	18-Jun-18	0.057	15.6	0.001					
9	17-Sep-18	0.001	3	0.001					
10	20-Nov-18	0.001	1.5	0.14					
11	28-Jan-19	0.001	5.8	0.11					
12	3-Jun-19	0.191	13.3	0.139					
13	21-Aug-19	0.0069	8.77	0.36					
14	6-Nov-19	0.0010	8.22	0.076					
15	20-Jan-20	0.051	2.6	0.001					
16	4-May-20	0.001	4.8	1.31					
17	6-Aug-20	0.001	5.02	0.061					
18	28-Oct-20	0.001	0.53	0.001					
19	24-Feb-21	0.111	6.32	0.001					
20	12-May-21	0.001	5.2	0.001					
21	15-Jul-21	0.0781	0.39	0.001					
22	21-Oct-21	0.001	1.5	0.001					
23	19-May-22	0.423	7.97	0.098					
24	21-Jul-22	0.001	0.71	1.33					
25	20-Oct-22	0.001	3.85	0.001					
26									
27									
28									
29									
30									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		2.12	1.15	1.79					
Mann-Kendall Statistic (S):		-14	-46	-28					
Confidence Factor:		61.8%	85.2%	73.4%					
Concentration Trend:		No Trend	No Trend	No Trend					



Notes:

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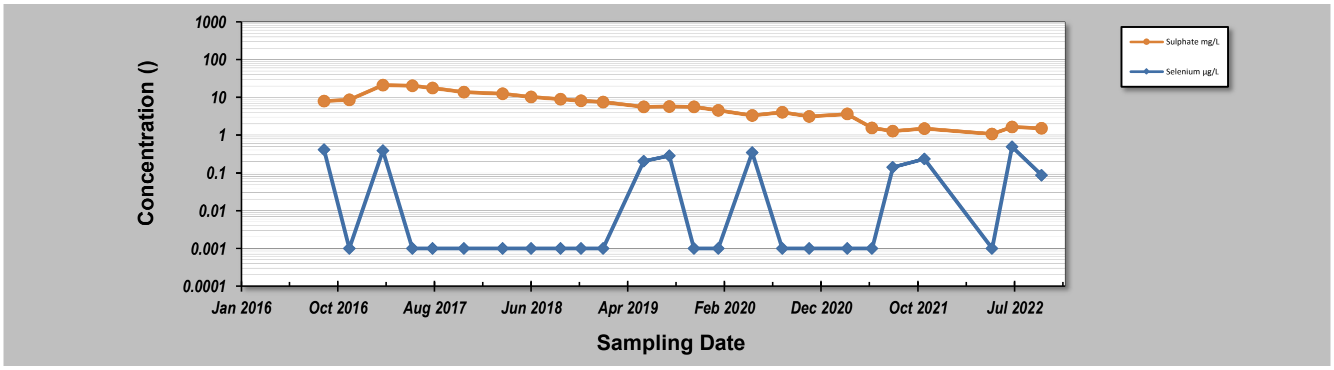
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 18-Nov-22
Facility Name: Teck Coal Regional Groundwater - CMm
Conducted By: MF

Job ID: 635544
Location CM_MW6-SH
Reviewed By: MB

	Parameter	**Sulphate**	**Selenium**						
	units	mg/L	µg/L						
Sampling Event	**Sampling Date**	**CM_MW6-SH CONCENTRATION**							
1	13-Sep-16	7.89	0.41						
2	1-Dec-16	8.61	0.001						
3	15-Mar-17	21.1	0.388						
4	15-Jun-17	20.4	0.001						
5	16-Aug-17	17.6	0.001						
6	22-Nov-17	13.8	0.001						
7	22-Mar-18	12.5	0.001						
8	18-Jun-18	10.2	0.001						
9	17-Sep-18	8.96	0.001						
10	20-Nov-18	8.12	0.001						
11	28-Jan-19	7.56	0.001						
12	3-Jun-19	5.61	0.204						
13	21-Aug-19	5.69	0.284						
14	6-Nov-19	5.65	0.001						
15	20-Jan-20	4.5	0.001						
16	4-May-20	3.3	0.345						
17	6-Aug-20	4	0.001						
18	28-Oct-20	3.11	0.001						
19	24-Feb-21	3.61	0.001						
20	12-May-21	1.56	0.001						
21	15-Jul-21	1.27	0.142						
22	21-Oct-21	1.49	0.234						
23	19-May-22	1.07	0.001						
24	20-Jul-22	1.65	0.492						
25	20-Oct-22	1.52	0.086						
26									
27									
28									
29									
30									
41									
42									
43									
44									
45									
46									
Coefficient of Variation:		0.81	1.54						
Mann-Kendall Statistic (S):		-242	28						
Confidence Factor:		>99.9%	73.4%						
Concentration Trend:		Decreasing	No Trend						



Notes:

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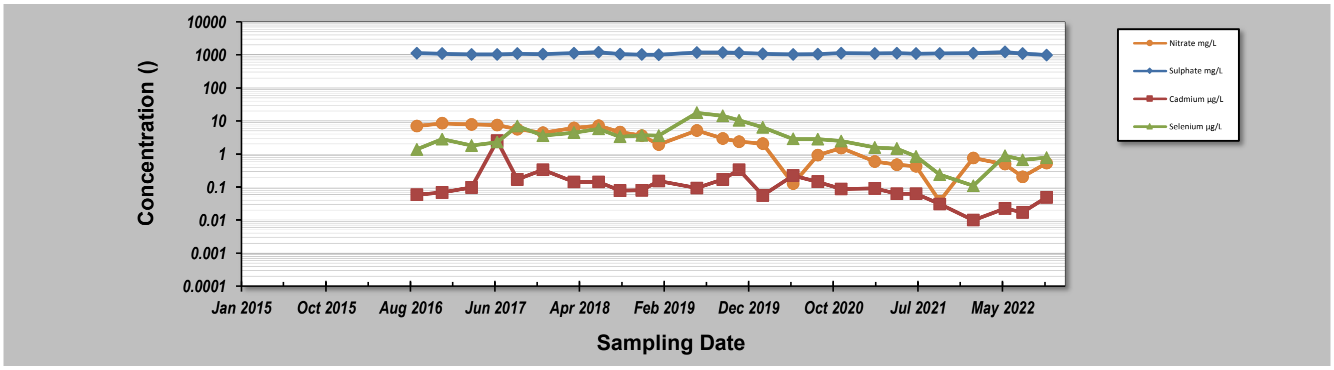
GSI MANN-KENDALL TOOLKIT

Evaluation Date:	18-Nov-22	**Job ID:**	635544
Facility Name:	Teck Coal Regional Groundwater - CMm	**Location**	CM_MW7-DP
Conducted By:	MF	**Reviewed By:**	MB

	Parameter	**Nitrate**	**Sulphate**	**Cadmium**	**Selenium**				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	**Sampling Date**	**CM_MW7-DP CONCENTRATION**							
1	14-Sep-16	7.05	1130	0.058	1.37				
2	13-Dec-16	8.48	1090	0.068	2.83				
3	27-Mar-17	7.77	1040	0.097	1.82				
4	26-Jun-17	7.53	1040	2.530	2.28				
5	6-Sep-17	5.59	1090	0.169	6.98				
6	5-Dec-17	4.40	1060	0.332	3.59				
7	26-Mar-18	6.18	1120	0.142	4.45				
8	21-Jun-18	7.22	1210	0.141	5.73				
9	5-Sep-18	4.58	1060	0.078	3.33				
10	21-Nov-18	3.62	1020	0.079	3.71				
11	21-Jan-19	1.93	1010	0.153	3.57				
12	5-Jun-19	5.11	1190	0.0933	17.8				
13	5-Sep-19	2.95	1170	0.169	14.2				
14	1-Nov-19	2.34	1150	0.330	10.4				
15	24-Jan-20	2.08	1070	0.056	6.38				
16	11-May-20	0.126	1030	0.224	2.85				
17	6-Aug-20	0.928	1050	0.144	2.79				
18	29-Oct-20	1.5	1130	0.088	2.47				
19	25-Feb-21	0.595	1100	0.092	1.59				
20	14-May-21	0.478	1120	0.0622	1.46				
21	21-Jul-21	0.425	1090	0.0625	0.839				
22	13-Oct-21	0.038	1100	0.0308	0.238				
23	9-Feb-22	0.758	1120	0.01	0.109				
24	2-Jun-22	0.49	1220	0.0224	0.891				
25	3-Aug-22	0.202	1110	0.0172	0.657				
26	27-Oct-22	0.53	995	0.0489	0.776				
27									
28									
29									
30									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	0.89	0.05	2.36	1.08				
	Mann-Kendall Statistic (S):	-245	21	-128	-123				
	Confidence Factor:	>99.9%	66.9%	99.8%	99.7%				
	Concentration Trend:	Decreasing	No Trend	Decreasing	Decreasing				



Notes:

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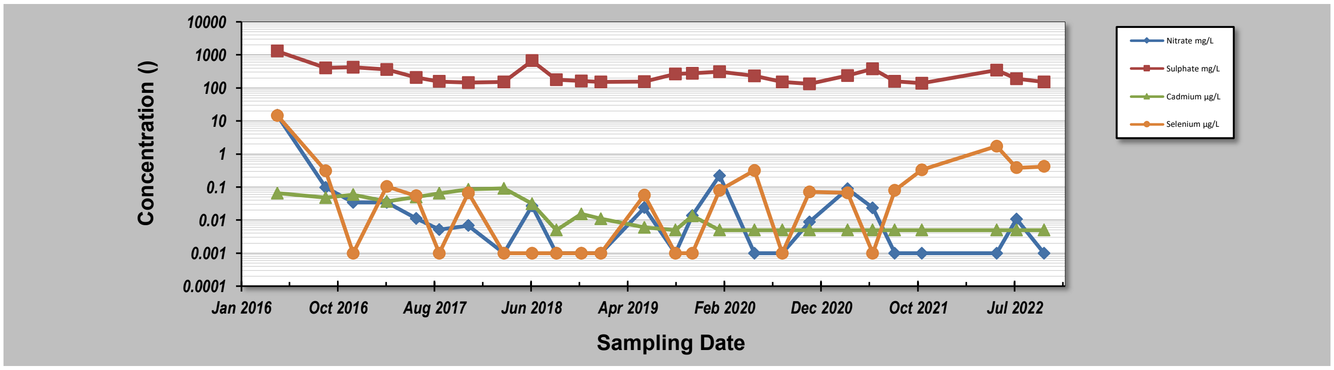
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 18-Nov-22
Facility Name: Teck Coal Regional Groundwater - CMm
Conducted By: MF
Job ID: 635544
Location CM_MW7-SH
Reviewed By: MB

	Parameter	**Nitrate**	**Sulphate**	**Cadmium**	**Selenium**				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	**Sampling Date**	**CM_MW7-SH CONCENTRATION**							
1	21-Apr-16	14.8	1310	0.065	14.7				
2	19-Sep-16	0.098	408	0.048	0.31				
3	13-Dec-16	0.034	424	0.059	0.001				
4	27-Mar-17	0.034	359	0.037	0.105				
5	26-Jun-17	0.011	206	0.0496	0.054				
6	6-Sep-17	0.005	157	0.065	0.001				
7	5-Dec-17	0.007	145	0.086	0.067				
8	26-Mar-18	0.001	153	0.092	0.001				
9	21-Jun-18	0.027	667	0.031	0.001				
10	5-Sep-18	0.001	177	0.005	0.001				
11	21-Nov-18	0.001	161	0.015	0.001				
12	21-Jan-19	0.001	153	0.011	0.001				
13	5-Jun-19	0.024	155	0.006	0.057				
14	9-Sep-19	0.001	264	0.005	0.001				
15	1-Nov-19	0.014	276	0.013	0.001				
16	24-Jan-20	0.222	309	0.005	0.08				
17	11-May-20	0.001	233	0.005	0.316				
18	6-Aug-20	0.001	152	0.005	0.001				
19	29-Oct-20	0.009	133	0.005	0.072				
20	25-Feb-21	0.088	237	0.005	0.067				
21	14-May-21	0.024	380	0.005	0.001				
22	21-Jul-21	0.001	158	0.005	0.08				
23	13-Oct-21	0.001	140	0.005	0.33				
24	2-Jun-22	0.001	343	0.005	1.72				
25	3-Aug-22	0.011	189	0.005	0.384				
26	27-Oct-22	0.001	152	0.005	0.419				
27									
28									
29									
30									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	4.89	0.85	1.14	3.98				
	Mann-Kendall Statistic (S):	-102	-81	-193	70				
	Confidence Factor:	98.8%	96.1%	>99.9%	93.6%				
	Concentration Trend:	Decreasing	Decreasing	Decreasing	Prob. Increasing				



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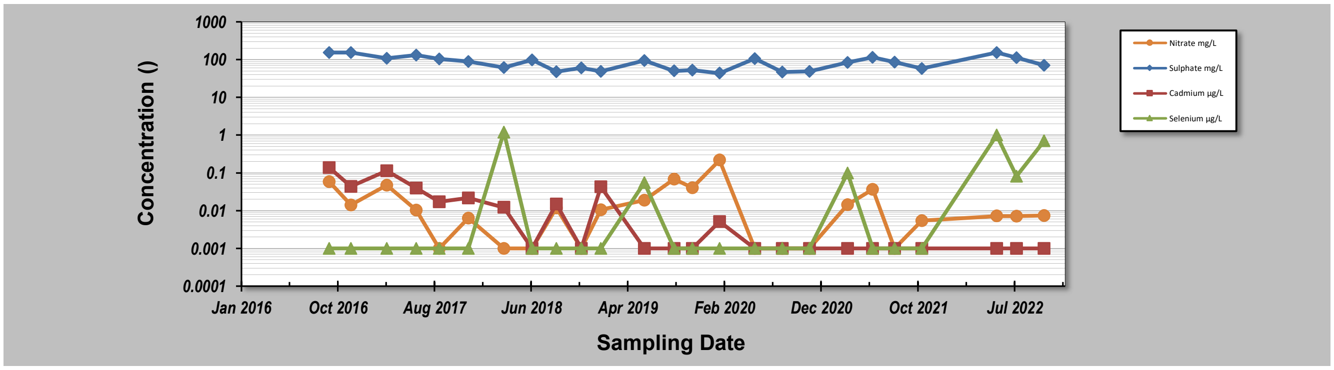
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 18-Nov-22
Facility Name: Teck Coal Regional Groundwater - CMm
Conducted By: MF

Job ID: 635544
Location CM_MW8
Reviewed By: MB

	Parameter	Nitrate	Sulphate	Cadmium	Selenium				
	units	mg/L	mg/L	µg/L	µg/L				
Sampling Event	Sampling Date	CM_MW8 CONCENTRATION							
1	29-Sep-16	0.0584	155	0.139	0.001				
2	6-Dec-16	0.0142	154	0.0439	0.001				
3	27-Mar-17	0.0475	108	0.113	0.001				
4	26-Jun-17	0.0104	132	0.04	0.001				
5	6-Sep-17	0.001	104	0.0172	0.001				
6	5-Dec-17	0.0063	89	0.0218	0.001				
7	26-Mar-18	0.001	61.2	0.0122	1.2				
8	21-Jun-18	0.001	97.6	0.001	0.001				
9	5-Sep-18	0.0118	47.6	0.015	0.001				
10	21-Nov-18	0.001	60.4	0.001	0.001				
11	21-Jan-19	0.0106	48.4	0.0428	0.001				
12	5-Jun-19	0.0189	94.3	0.001	0.055				
13	5-Sep-19	0.0684	50.2	0.001	0.001				
14	1-Nov-19	0.0402	52.5	0.001	0.001				
15	24-Jan-20	0.219	43.9	0.0051	0.001				
16	13-May-20	0.001	107	0.001	0.001				
17	6-Aug-20	0.001	46.9	0.001	0.001				
18	29-Oct-20	0.001	48.5	0.001	0.001				
19	25-Feb-21	0.0145	83.8	0.001	0.1				
20	14-May-21	0.0367	114	0.001	0.001				
21	21-Jul-21	0.001	86.2	0.001	0.001				
22	13-Oct-21	0.0054	58	0.001	0.001				
23	2-Jun-22	0.0072	155	0.001	0.999				
24	3-Aug-22	0.0071	112	0.001	0.082				
25	27-Oct-22	0.0074	70.4	0.001	0.706				
26									
27									
28									
29									
30									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	1.90	0.42	1.90	2.58				
	Mann-Kendall Statistic (S):	-24	-55	-163	63				
	Confidence Factor:	70.3%	89.5%	>99.9%	92.6%				
	Concentration Trend:	No Trend	Stable	Decreasing	Prob. Increasing				



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

__DISCLAIMER:__ The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of the information contained herein, and no such party shall be liable for any direct, indirect, consequential, incidental or other damages resulting from the use of this product or the information contained herein. Information in this publication is subject to change without notice. GSI Environmental Inc., disclaims any responsibility or obligation to update the information contained herein.

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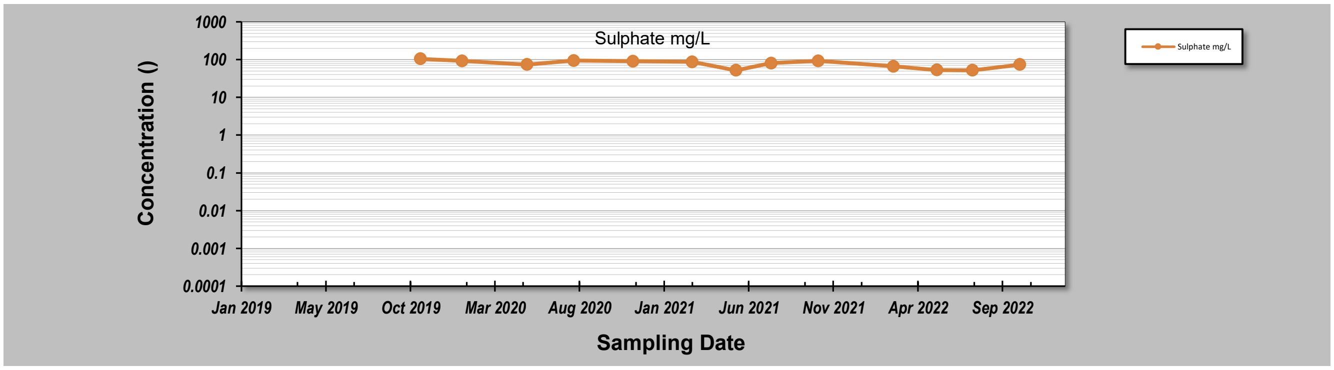
GSI MANN-KENDALL TOOLKIT

Evaluation Date: 18-Nov-22
Facility Name: Teck Coal Regional Groundwater - CMm
Conducted By: MF

Job ID: 635544
Location CM_MW10
Reviewed By: MB

Sampling Event	Sampling Date	CM_MW10 CONCENTRATION							
	Parameter	Sulphate							
	units	mg/L							
1	14-Nov-19	106.0							
2	27-Jan-20	92.6							
3	21-May-20	74.1							
4	12-Aug-20	94.8							
5	25-Nov-20	90.7							
6	10-Mar-21	86.8							
7	27-May-21	52.2							
8	28-Jul-21	80.4							
9	20-Oct-21	92.7							
10	2-Mar-22	67.1							
11	18-May-22	53.2							
12	20-Jul-22	52.2							
13	12-Oct-22	74.1							
14									
15									
16									
17									
18									
19									
20									
41									
42									
43									
44									
45									
46									
	Coefficient of Variation:	0.23							
	Mann-Kendall Statistic (S):	-40							
	Confidence Factor:	99.3%							
	Concentration Trend:	Decreasing							



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

* *

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Attachment IV

Michel Creek Flow and Load Accretion Investigation Report

SNC·LAVALIN

Michel Creek Flow and Load Accretion Investigation

October 2022

Teck Coal Ltd.

March 16, 2023

SNC-Lavalin Project: 692207

Report Contributors

This report was prepared by multiple contributors. Responsible authors and reviewers for each section are identified in the table below.

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Section 2.1	Methodology: Flow Accretion	Andrew Clow	Beth Robertson
Section 2.2	Methodology: Surface Water Sampling	Andrew Clow	Sheila Duchek
Section 2.3	Methodology: Loading of Order Constituents	Taylor Foret	
Section 2.4	Methodology: Quality Control	Andrew Clow	
Section 3	Environmental Setting	Andrew Clow	Beth Robertson
Section 4	Results: Flow Accretion		
	Results: Surface Water Chemistry, Loading of Constituents of Interest and QAQC	Andrew Clow Taylor Foret	Sheila Duchek
Section 5	Discussion	Andrew Clow Taylor Foret	
Section 6	Conclusion		

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Table of Contents

In-Text Tables

Table of Contents (Cont'd)

Figures

Tables

Drawing

Appendices

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1 Introduction

At the request of Teck Coal Limited (Teck Coal), SNC-Lavalin Inc. (SNC-Lavalin) completed a flow and load accretion (FLA) measurement event along Michel Creek and key tributaries in October 2022. The spatial extent of the FLA event is shown on Drawing 1.

1.1 Objectives and Scope of Work

Objectives of the October 2022 FLA event were to:

- Quantify surface water flow and load in the main stem of Michel Creek, Andy Good Creek, and Corbin Creek to identify areas of gains and/or losses to/from groundwater and to assess seasonal variations in flow and load.
- Quantify surface flow and load at tributaries and seeps to quantify the relative contributions of surface flow and load to the main stem of Michel Creek and Corbin Creek.

The scope of work included:

- Field work:
  - Collecting discharge measurements and surface water quality samples from Michel Creek, Andy Good Creek, Corbin Creek, and their flowing tributaries to quantify flow and load along the study reach.
  - Observing tributaries that were not flowing during the FLA events.
  - Identifying and collecting seep samples and approximating flow rates.
- Data analysis: processing of discharge data, identifying gaining and losing reaches, and calculating instantaneous loading of dissolved nickel and order constituents (OC) including: nitrate-nitrogen [nitrate-N], sulphate, dissolved selenium using discharge and water chemistry data.
- Interpretating and analyzing the data set and reporting.

1.2 Report Structure

This report contains a description of methods in Section 2, environmental site conditions in Section 3, and a results summary in Section 4. A discussion regarding the findings (based on the limited data set) is found in Section 5. Conclusions are presented in Section 6 and references in Section 7.

2 Methods

The October 2022 FLA event along Michel Creek spanned 9.2 km (see Drawing 1) and included reaches along Andy Good Creek and Corbin Creek. The Michel Creek reach spanned from 400 m downstream of the confluence with Andy Good Creek to beyond the southern extent and upstream of the Coal Mountain mine (CMm). The Andy Good Creek reach spanned from the mouth (confluence with Michel Creek) to 400 m upstream. The Corbin Creek reach spanned from the mouth (confluence with Michel Creek) to the Corbin sedimentation pond 2.8 km upstream. A summary of the number of discharge measurements, tributary measurements, and r of water quality samples is provided in Table A.

Table A: Summary of Discharge Measurements and Water Quality Samples

Location	Number of Discharge Measurements	Number of Tributary Measurements[1]	Number of Water Quality Samples[2]
Michel Creek	16	6	22
Andy Good Creek	2	0	2
Corbin Creek	5	1	6

[1] Andy Good Creek and Corbin Creek are not included within the count of tributary measurements in Michel Creek.

[2] Count does not include duplicate samples collected for quality assurance and quality control procedures.

2.1 Flow Accretion

Discharge measurements were taken along Michel Creek, Andy Good Creek, Corbin Creek, and their tributaries. Based on the maximum number of measurements that could be collected within a day, the streams were divided into sub-reaches that had no obvious surface water quantity changes (e.g., no un-measured tributaries, no channel bifurcations). Water quality samples were taken in conjunction with flow measurement locations to support the quantification of mass loading.

A reach was defined as:

- **Gaining**: where flows increase downstream, discharging from the local aquifer;
- **Losing**: where flows decrease downstream, recharging the local aquifer; or
- **Stable**: where there is no apparent change in flow.

Categorizing reaches as gaining, losing, and stable was primarily based on the trend in discharge versus chainage. Typically, if the flow change between two locations (accounting for tributary additions) exceeds the measurement accuracy (ranging between 1% to 5%), the stream is characterized as gaining or losing; otherwise, it is characterized as stable. The change in flow between two adjacent measurement locations was calculated as the difference between the two locations in the mainstem of Michel Creek, Andy Good Creek, or Corbin Creek after subtracting the observed tributary discharge within the same reach. The accuracy of the discharge measurements depends on the measurement method used and stream conditions. Two discharge measurements were obtained at each site, and additional measurements were obtained if the error between the two measurements exceeded 5%. The influence of field conditions on the assessments, both dynamic (such as weather) and static (such as geomorphological conditions), were managed as much as possible by the timing and location of field measurements. As a result, inputs from trace precipitation and runoff were assumed to be negligible for the characterization of reaches. Key factors that were observed in the field and managed to the best of our ability are provided in Appendix I, along with a summary of naming convention and discharge measurement methods.

A Solinst Levelogger was installed near MCm.2312 (CM_FLA_MC04) on October 5, day 2 of the program, to obtain water level measurements in Michel Creek while collecting discharge measurements. No measurements were recorded on day 1 of the program due to a miscommunication in the field. Measurements were recorded every minute and corrected with barometric readings collected from a Solinst Barologger installed beside the Levelogger near MCm.2312.

2.2 Surface Water Sampling

Surface water quality samples were collected in conjunction with discharge measurements. Samples were collected using a grab method following SNC-Lavalin's Preferred Operating Procedures (POPs), which are consistent with procedures provided in the BC Field Sampling Manual (Clark, 2013). Water temperature, pH, electrical conductivity (EC), dissolved oxygen (DO), and oxidation-reduction potential (ORP) measurements were recorded in the field with the YSI 556 Handheld Multiparameter Instrument.

Surface water samples were collected into laboratory supplied containers, packed on ice, and shipped to ALS Environmental (ALS), an accredited, third party laboratory in Calgary, Alberta for analysis of routine parameters (major ions, pH, EC, alkalinity, hardness, total dissolved solids [TDS], and total suspended solids [TSS]), dissolved and total metals, nutrients (ammonia-nitrogen, nitrate-nitrogen, nitrite-nitrogen, Total Kjeldahl Nitrogen [TKN], total nitrogen), dissolved organic carbon (DOC), total organic carbon (TOC), total phosphorous, and ortho phosphate. Samples were shipped in ice-chilled coolers under chain-of-custody (COC) documentation and procedures.

In creeks where discharge measurements were collected over multiple days, repeat discharge measurements were taken to assess day over day variation. Repeat water quality samples were also collected when repeat discharge measurements were taken.

2.3 Loading of Order Constituents

Flow rate and analytical results were reviewed to calculate instantaneous loading of nitrate-N, sulphate, dissolved selenium, and dissolved nickel in surface water. Loading calculations were completed based on information provided in the United States Environmental Protection Agency's Tech Notes 8*: Pollutant Load Estimate for Water Quality Monitoring Projects* (Meals et al., 2013) and the following formula was utilized to calculate instantaneous loading:

$$Load = k \sum_{i=1}^{n} c_i q_i$$

Where k = unit conversion factor; c = concentration; q = flow

Based on the load results, the data were graphically presented against distance downstream to better assess changes in loads of nitrate-N, sulphate, dissolved nickel, and dissolved selenium in Michel Creek and tributaries. Where duplicate samples were collected, the maximum concentrations of dissolved nickel and OCs were used to calculate an instantaneous load. Instantaneous load was calculated using concentrations obtained from water quality samples collected on the same day as discharge measurements, allowing for day over day variation in instantaneous loading to be quantified.

2.4 Quality Assurance and Quality Control

A Quality Assurance/Quality Control (QA/QC) program was implemented during the collection and analysis of surface water samples. The program included use of trained field staff; the collection and analysis of blind duplicate samples, field and trip blanks; and the use of a laboratory certified by the Canadian Association for Laboratory Accreditation Inc. (CALA) for analysis of environmental sample media. Further details relating to the QA/QC procedures including methods relating to shipping, handling, duplicate samples, field blanks, trip blanks, and laboratory analysis are provided in Appendix II.

3 Environmental Setting

Precipitation data was obtained from the CMm Andy Good Climate Station. The data set, provided by Teck, included precipitation records observed between September 22 and October 31, 2022. Rain (17 mm) was observed between September 28 and 30, 2022. However, no precipitation was observed within the three days leading up to and during the field program. Based on review of flow levels (described below), precipitation received in the last week of September was not interpreted to affect the observed flows during the FLA event.

On October 5 and 6, 2022, days 2 and 3 of the program, Michel Creek water levels (at CM_FLA_MC04) fluctuated a maximum of 0.01 m (1 cm) during the discharge measurement period (see Figures III-A and III-B in Appendix III). No flow level measurements were available from day 1 of the program due to a miscommunication. However, based on the absence of precipitation, narrow timeframe during which flows were measured, and the stable flow measurements observed later in the program, flows were considered stable on October 4, 2022.

4 Results

4.1 Discharge Rates, Cl Concentrations and Instantaneous Loading of Cl

A summary of flow (e.g., gaining, stable, and losing reaches) and chemistry results for Michel Creek, Andy Good Creek, and Corbin Creek are provided in Table B below. Supporting information associated with this summary table includes appended Tables 1 to 7, Drawing 1, and Figures 1 to 9. Photographs of select locations along Michel Creek, Corbin Creek, and Andy Good Creek are provided in Appendix IV. Analytical results are provided in Appendix V.

Throughout the results section, the water quality samples are identified using an established naming convention where the river name is included in the sample identification name to provide context. The code for the naming convention is OO_FLA_RIVERNAME#, and flow measurement locations are labelled using the XXy.Chainage naming convention as described in Appendix I. Where a sample was collected, both the water quality and flow measurement locations, identified by the naming convention, have been provided on Drawing 1. Additional details regarding the applied data naming conventions are provided in Appendix I. Throughout the results and discussion sections, the water quality sample naming convention is used for consistency.

Table B: Summary of Results for the Michel Creek, Corbin Creek, and Andy Good Creek

Area	Description	Flow	Chemistry	Loading	Supporting Information
Michel Creek	• The October FLA event included thirteen locations along Michel Creek which began 430 m downstream of the confluence with Andy Good Creek (CM_FLA_MC01) and extended to 9.2 km upstream to a point beyond the southern extent of CMm (CM_FLA_MC13). • The tributary flows contributing to Michel Creek along the study reach included Andy Good Creek, Corbin Creek, and six unnamed tributaries.	• The Michel Creek main stem was gaining from CM_FLA_MC13 to CM_FLA_MC11, accounting for the small addition of flow (1% of main stem) from Tributary 07. • The flow from Tributary 01 (41 L/s) was observed to be greater than the main stem of Michel Creek (31 L/s) upstream of the confluence. After accounting for the additional flow from Tributary 01 and 03 (136% of main stem), the reach between CM_FLA_MC11 to CM_FLA_MC10 was identified as losing. • The Michel Creek main stem was gaining from CM_FLA_MC10 to CM_FLA_MC08, accounting for the small addition of flow from Tributary 04 (6% of main stem). • Only one small tributary (Tributary 02) was identified between CM_FLA_MC08 and CM_FLA_MC04. There was a general losing trend within this reach of Michel Creek with a stable reach between CM_FLA_MC07 and CM_FLA_MC06 and a gaining reach between CM_FLA_MC06 and CM_FLA_MC05. • The Michel Creek main stem was gaining from CM_FLA_MC04 to CM_FLA_MC03, accounting for the significant addition of flow (112% of main stem) from Corbin Creek. • A stable reach was identified between CM_FLA_MC03 and CM_FLA_MC02. • The Michel Creek main stem was losing from CM_FLA_MC02 to CM_FLA_MC01, accounting for the significant addition of flow (66% of main stem) from Andy Good Creek.	• The maximum concentrations were: – nitrate-N (1.67 mg/L) at both CM_FLA_MC02 and CM_FLA_MC03. – sulphate (445 mg/L) at CM_FLA_MC02. – dissolved selenium (9.97 µg/L) at CM_FLA_MC02. – dissolved nickel (13.8 µg/L) at CM_FLA_MC03. • CM_FLA_MC02 is located directly downstream of the confluence of Andy Good Creek into Michel Creek. CM_FLA_MC03 is located near the rail loop. • The minimum concentrations were: – nitrate-N (0.0059 mg/L) at CM_FLA_MC10. – sulphate (13.1 mg/L) at CM_FLA_MC09. – dissolved selenium (0.207 µg/L) at CM_FLA_MC13. – dissolved nickel was below DL (<0.50 µg/L) at CM_FLA_MC13.	• Instantaneous loading of nitrate, sulphate, dissolved selenium, and dissolved nickel was noted from CM_FLA_MC04 to CM_FLA_MC03. Loading was relatively stable between CM_FLA_MC13 and CM_FLA_MC04. • The most notable increase of nitrate, sulphate, dissolved selenium, and dissolved nickel occurred between CM_FLA_MC04 to CM_FLA_MC03, where the Corbin Creek enters Michel Creek downstream of CM_FLA_MC04.	• Drawing 1. • Figures 1 to 3a/b. • Tables 1 to 5. • Photos 1 to 7 (Michel Creek) in Appendix IV.

Table B (Cont'd): Summary of Results for the Michel Creek, Corbin Creek, and Andy Good Creek

Area	Description	Flow	Chemistry	Loading	Supporting Information
Corbin Creek	• The FLA event included four locations along Corbin Creek from 75 m upstream of the confluence with Michel Creek (CM_FLA_CC01) to 2.7 km upstream of the confluence and just downstream of Corbin Sedimentation Pond (CM_FLA_CC04). • One tributary was observed to discharge into Corbin Creek from the Main Pond East.	• The Corbin Creek main stem was stable from CM_FLA_CC04 to CM_FLA_CC03. • The Corbin Creek main stem was then gaining from CM_FLA_CC03 to CM_FLA_CC02. • The Corbin Creek main stem was stable again from CM_FLA_CC02 to CM_FLA_CC01, accounting for the significant addition of flow (48% of the main stem flow) from CC Trib 01.	• The maximum concentrations were: – nitrate-N (4.56 mg/L) at CM_FLA_CC04. – sulphate (1,000 mg/L) at CM_FLA_CC04. – dissolved selenium (43.2 µg/L) at CM_FLA_CC04. – dissolved nickel (48.0 µg/L) at CM_FLA_CC01. • CM_FLA_CC04 is located downstream of the outlet from Corbin Sedimentation Pond and CM_FLA_CC01 is located downstream of the confluence from CM_FLA_CC_TRIB01. • The minimum concentrations were: – nitrate-N (3.29 mg/L), sulphate (766 mg/L) and dissolved selenium (20.1 µg/L) at CM_FLA_CC01. – dissolved nickel (48.0 mg/L) at CM_FLA_CC02.	• Between CM_FLA_CC04 (top of survey) and CM_FLA_CC01 (bottom of survey) nitrate and sulphate and dissolved nickel concentrations were relatively stable. Concentrations of dissolved selenium decreased from upstream to downstream samples. • Instantaneous loading of nitrate and sulphate increased from CM_FLA_CC03 to CM_FLA_CC01. • Instantaneous loading of dissolved nickel increased at the highest rate between CM_FLA_CC02 and CM_FLA_CC01. • Between CM_FLA_CC04 and CM_FLA_CC03, the instantaneous loading of nitrate-N, sulphate, and dissolved nickel was relatively stable.	• Drawing 1. • Figures 4 to 6a/b. • Tables 1 to 4, and 6. • Photo 9 in Appendix IV.
Andy Good Creek	• The FLA event included two locations along Andy Good Creek from 40 m upstream of the confluence with Michel Creek (CM_FLA_AG01) to 600 m upstream of the confluence (CM_FLA_AG02).	• The Andy Good Creek main stem was losing from CM_FLA_AG02 to CM_FLA_AG01.	Concentrations were consistent between the two measurement points CM_FLA_AG01 and CM_FLA_AG02: • Nitrate-N: 0.127 and 0.121 mg/L. • Sulphate: 19.9 and 20.0 mg/L. • dissolved selenium: 2.19 and 2.25 µg/L. • dissolved nickel: below method detection limit of <0.50 µg/L.	• Instantaneous loading of nitrate-N and dissolved selenium was relatively stable between CM_FLA_AC02 (top of survey) and CM_FLA_AC01 (bottom of survey). Instantaneous loading of sulphate and dissolved nickel decreased from CM_FLA_AC02 (top of survey) and CM_FLA_AC01 (bottom of survey).	• Drawing 1. • Figures 7 to 9a/b. • Tables 1 to 4, and 7. • Photo 8 in Appendix IV.

4.2 Quality Assurance/Quality Control Results

The field QA/QC program and laboratory QA/QC results for surface water samples are described in detail in Appendix II.

Based on a review of the analytical results, including the QAQC program results, the data collected are considered sufficient and reliable to support the program objectives. Two surface water duplicate samples were collected during the October 2022 event. Of the numerous inorganic and organic parameters analyzed for this program, relative percent differences (RPDs) were less than 20% for most parameters, except total aluminum and dissolved molybdenum for the duplicate sample collected at CM_FLA_MC02. Neither aluminum nor molybdenum are considered primary OCs.

Most parameters were below the detection limit in the field blank sample. All the parameters, except for dissolved molybdenum, were less than the detection limit for the trip blank sample. Due to the high concentrations of molybdenum in the trip blank and the poor reproducibility for dissolved molybdenum (with RPD of 66%), the dissolved molybdenum results may be suspect. However, given that molybdenum is not an order constituent and there are no antiscalent activities occurring as part of CMm operations (antiscalent activities could be a source of molybdenum-derived impacts to water quality), the unreliability of this parameter does not affect the overall interpretation of results.

5 Limited Discussion

This section presents a limited discussion of the Michel Creek, Corbin Creek, Andy Good Creek, and minor tributaries FLA data October 2022.

5.1 Michel Creek

Flow rates for Michel Creek are presented on Figure 1 and loadings are presented on Figure 2 and Figure 3. The most notable increase in flow and loading was measured in the reach that contained the outlet from Corbin Creek (between CM_FLA_MC04 and CM_FLA_MC03). When comparing flow rates and loading between CM_FLA_MC13 and CM_FLA_MC01, the following is considered note worthy:

- Concentrations for dissolved nickel and all OCs remained relatively stable between CM_FLA_MC13 and CM_FLA_MC04 and increases and decreases in loading rates were primarily due to changes in flow rates.
- Flow was characterized as gaining between CM_FLA_MC10, CM_FLA_MC09, and CM_FLA_MC08, with 55% and 43% increases in flow rate in the two reaches, respectively. Loading rates for dissolved nickel and all OCs were the highest relative increase at any station in Michel Creek from unmeasured sources:
  - Between CM_FLA_MC10 and CM_FLA_MC09 increases in load rate were: 91% in nitrate-n; 44% in sulphate; 36% in dissolved selenium; and 55% in dissolved nickel.
  - Between CM_FLA_MC09 and CM_FLA_MC08 increases in load rate were: 49% in nitrate-n; 47% in sulphate; 21% in dissolved selenium; and 43% in dissolved nickel.
- Loading rates were the highest within the reach that included the inflow from Corbin Creek. The instantaneous loads entering Michel Creek from Corbin Creek were 890 times higher for nitrate-n, 54 times higher for sulphate, 87 times higher for dissolved selenium, and 115 times higher for dissolved nickel.
- Concentrations and loading rates remained stable between CM_FLA_MC03 and CM_FLA_MC02. Downstream of this, flow rates were observed to be decreasing between CM_FLA_MC02 and CM_FLA_MC01 after accounting for the addition from Andy Good Creek and concentrations and loading were similarly observed to decrease before the downstream extent of the study.

5.2 Corbin Creek

Flow rates for Corbin Creek are presented on Figure 4 and loadings are presented on Figure 5 and Figure 6. The most notable increase in flow and loading was measured in the reach between CM_FLA_CC03 and CM_FLA_CC02. When comparing flow rates and loading between CM_FLA_CC03 and CM_FLA_CC02, the following is considered note worthy:

- Flow was characterized as gaining between CM_FLA_CC03 and CM_FLA_CC02 with a 35% increase in flow rate. Loading rates for dissolved nickel and all OCs were the highest relative increase at any station in Corbin Creek: 30% in nitrate-n; 33% in sulphate; 29% in dissolved selenium; and 12% in dissolved nickel.
- The other two reaches were characterized as stable with small losses to loading after accounting for the addition from the tributary flow from Main Pond East

5.3 Andy Good Creek

Flow rates for Andy Good Creek are presented on Figure 7 and loadings are presented on Figure 8 and Figure 9. The only reach characterised on Andy Good Creek was between CM_FLA_AG02 and CM_FLA_AG01 and was identified as losing. The flow decreased by 48% between the two sites and concentrations were comparable. Loading rates for dissolved nickel and all OCs decreased between 46% and 49%.

6 Summary

SNC-Lavalin completed a FLA measurement event along Michel Creek, Corbin Creek, and Andy Good Creek in October 2022. The tributary flows contributing to Michel Creek along the study reach included Andy Good Creek, Corbin Creek, and six unnamed tributaries. A summary of key findings is presented below.

Michel Creek:

- The FLA measurement event included thirteen locations along Michel Creek, beginning downstream of the confluence with Andy Good Creek to a point beyond the southern extent of CMm.
- Gaining reaches were identified from:
  - CM_FLA_MC13 to CM_FLA_MC11;
  - CM_FLA_MC10 to CM_FLA_MC08;
  - CM_FLA_MC06 to CM_FLA_MC05; and
  - CM_FLA_MC04 to CM_FLA_MC03.
- Losing reaches were identified from:
  - CM_FLA_MC11 to CM_FLA_MC10;
  - CM_FLA_MC08 to CM_FLA_MC07;
  - CM_FLA_MC05 to CM_FLA_MC04; and
  - CM_FLA_MC02 to CM_FLA_MC01.
- Stable reaches were identified from:
  - CM_FLA_MC07 toCM_FLA_MC06; and
  - CM_FLA_MC03 to CM_FLA_MC02.
- The most notable increase of nitrate, sulphate, dissolved selenium, and dissolved nickel occurred downstream of where the Corbin Creek enters Michel Creek (downstream of CM_FLA_MC04).
- Instantaneous loading of nitrate, sulphate, dissolved selenium, and dissolved nickel was also noted at that location (downstream of CM_FLA_MC04). Loading was relatively stable between the top of survey (CM_FLA_MC13) to upstream of where Corbin Creek enters Michel Creek (CM_FLA_MC04).

Corbin Creek:

- The FLA measurement event included four locations along Corbin Creek, from upstream of the confluence with Michel Creek to downstream of Corbin Sedimentation Pond.
- Stable reaches were identified from:
  - CM_FLA_CC04 to CM_FLA_CC03; and
  - CM_FLA_CC02 to CM_FLA_CC01.
- The Corbin Creek main stem was gaining from CM_FLA_CC03 to CM_FLA_CC02.
- Between the top of the survey (CM_FLA_CC04) and to the bottom (CM_FLA_CC01), nitrate and sulphate and dissolved nickel concentrations were relatively stable. Concentrations of dissolved selenium decreased when comparing upstream and downstream samples.
- Instantaneous loading of nitrate and sulphate increased between the second highest point upstream and the furthest point downstream on Corbin Creek (CM_FLA_CC03 and CM_FLA_CC01).

- Instantaneous loading of dissolved nickel increased at the highest rate between the two locations closest to the confluence of Corbin Creek into Michel Creek (CM_FLA_CC02 and CM_FLA_CC01).

Andy Good Creek:

- The FLA event included two locations along Andy Good Creek from 40m upstream of the confluence with Michel Creek (CM_FLA_AG01) to 600 m upstream of the confluence (CM_FLA_AG02).
- The Andy Good Creek main stem was losing from CM_FLA_AG02 to CM_FLA_AG01.
- Concentrations of nitrate, sulphate and dissolved selenium were consistent between the two locations.
- Instantaneous loading of nitrate-N and dissolved selenium was relatively stable between the two locations.
- Instantaneous loading of sulphate and dissolved nickel decreased between the two locations.

7 References

Clark, M.J.R., 2013. British Columbia Field Sampling Manual: 2013 – For Continuous Monitoring plus the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples. Water, Air and Climate Change Branch, Ministry of Water, Land and Air Protection, Victoria, BC, Canada. 344 pp.

Meals, D.W., Richards, R.P., Dressing, S.A. 2013. Tech Notes 8: Pollutant load estimation for water quality monitoring projects. Developed for the U.S. Environmental Protection Agency by Tetra Tech, Inc., Fairfax, Va, 21p. April 2013.

8 Notice to Reader

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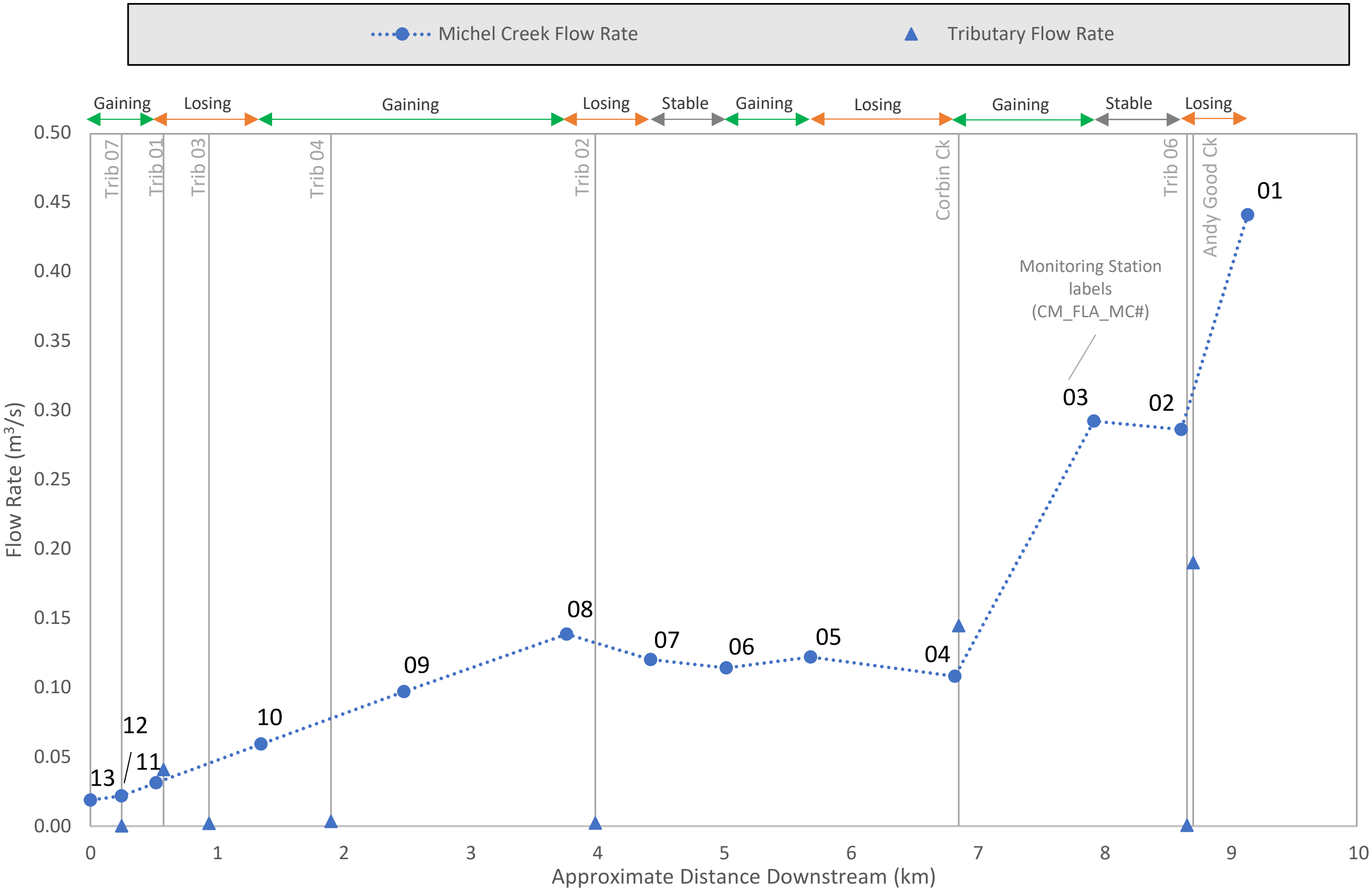
Figures

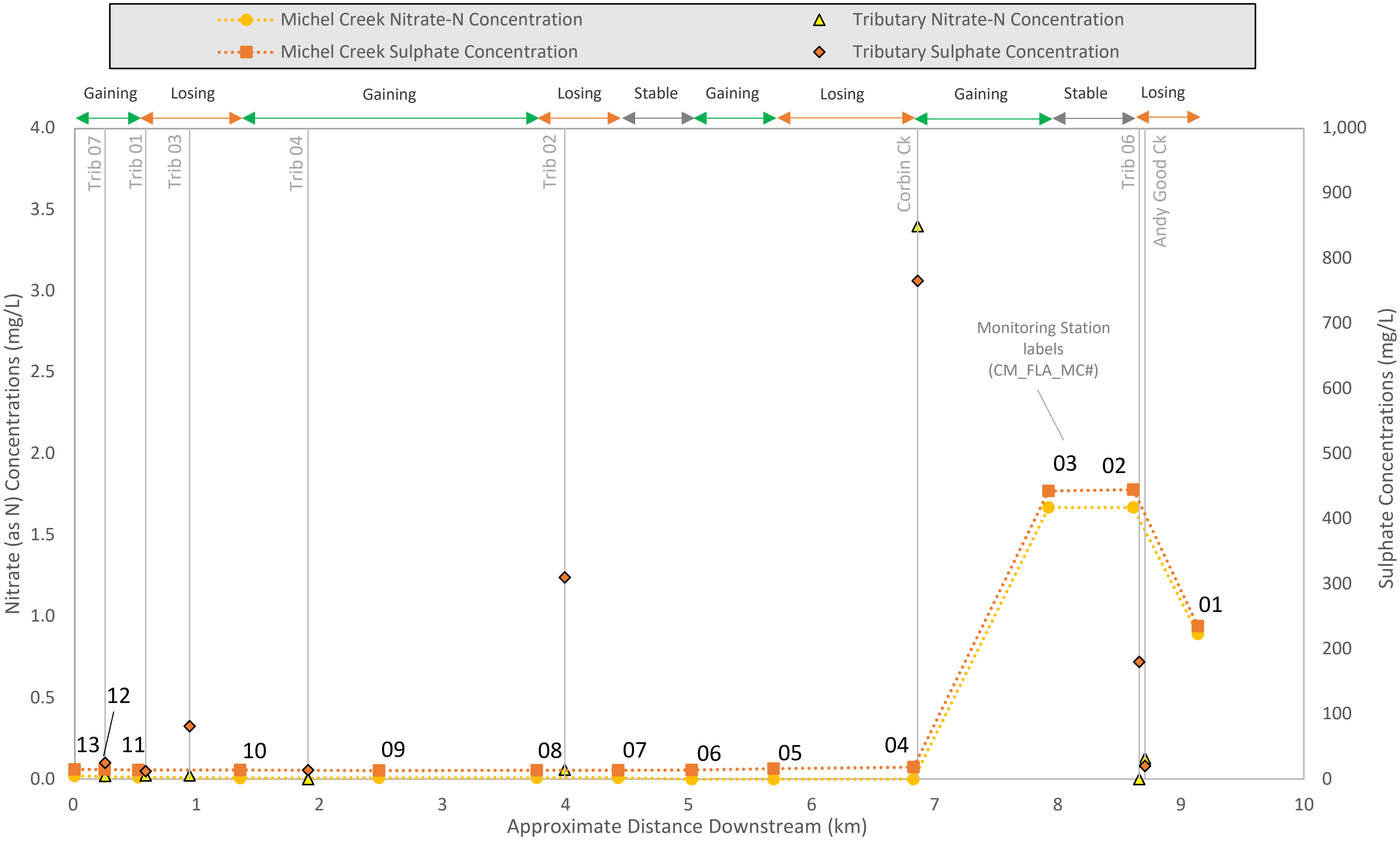
Figure 1: Michel Creek Flow Rate



Notes:

1) Starting point is the most upstream location (CM_FLA_MC13)

Figure 2a: Michel Creek Nitrate-N and Sulphate Concentrations



Notes:

1) Starting point is the most upstream location (CM_FLA_MC13)

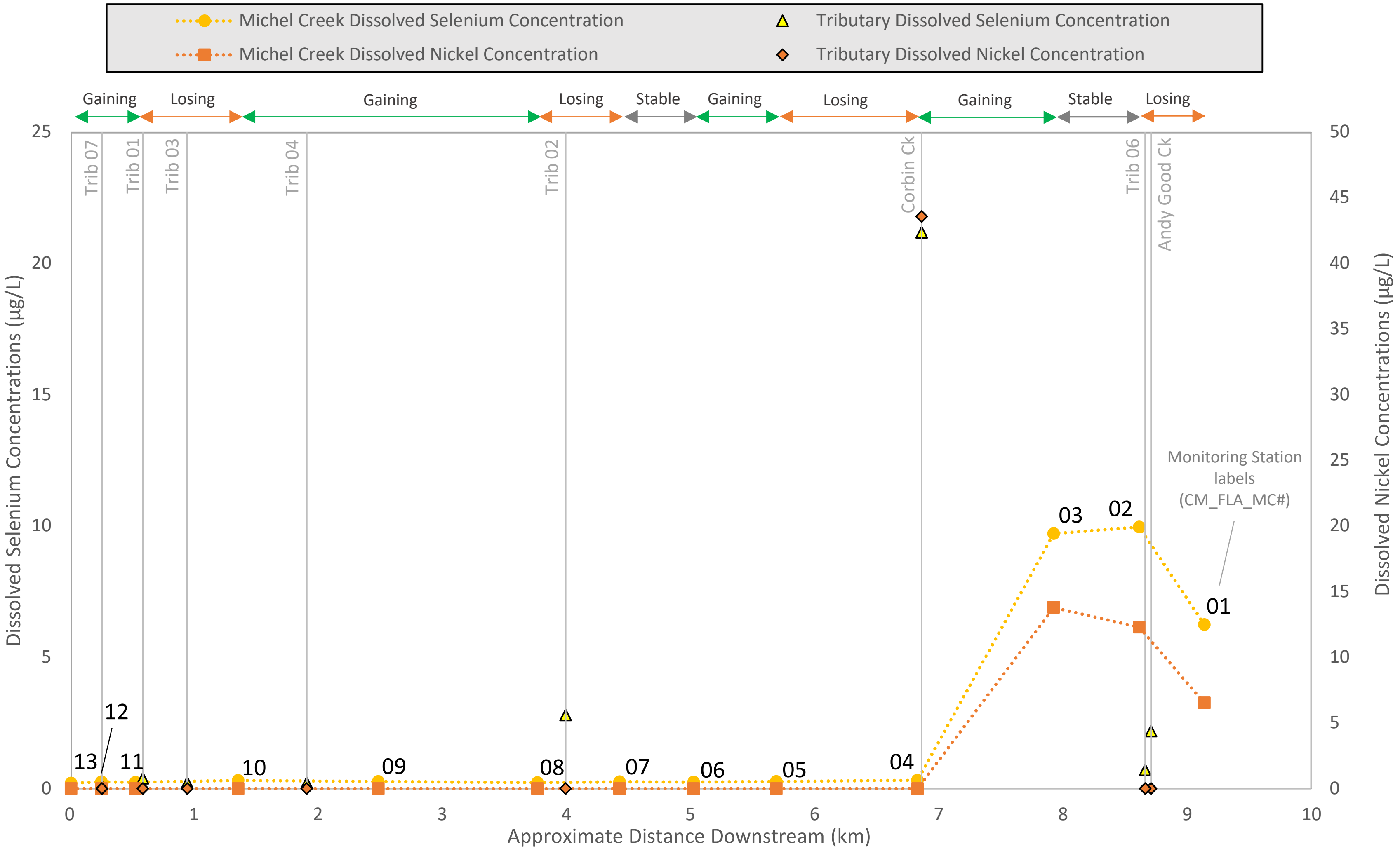
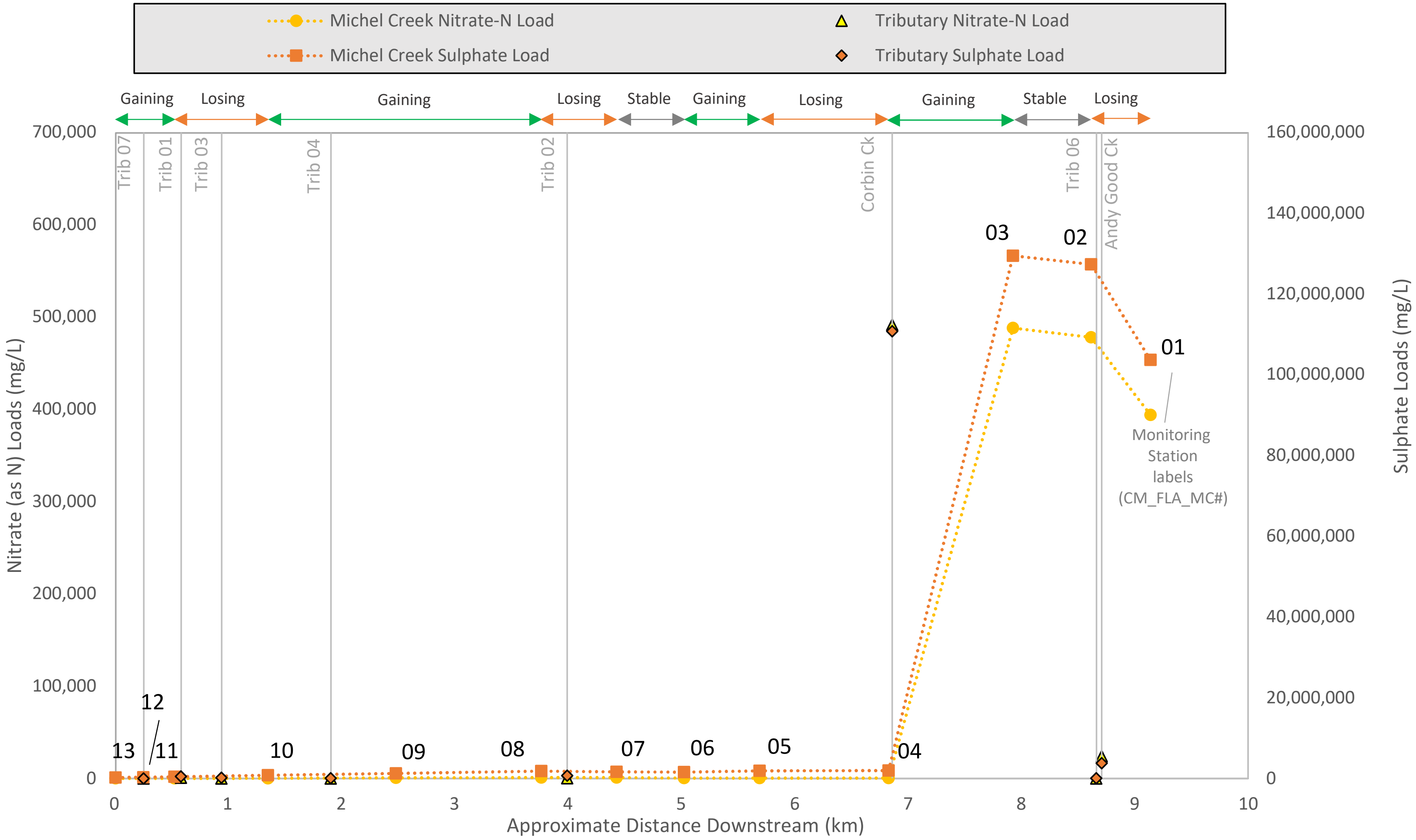


Figure 2b: Michel Creek Dissolved Selenium and Dissolved Nickel Concentrations

Notes:

1) Starting point is the most upstream location (CM_FLA_MC13)

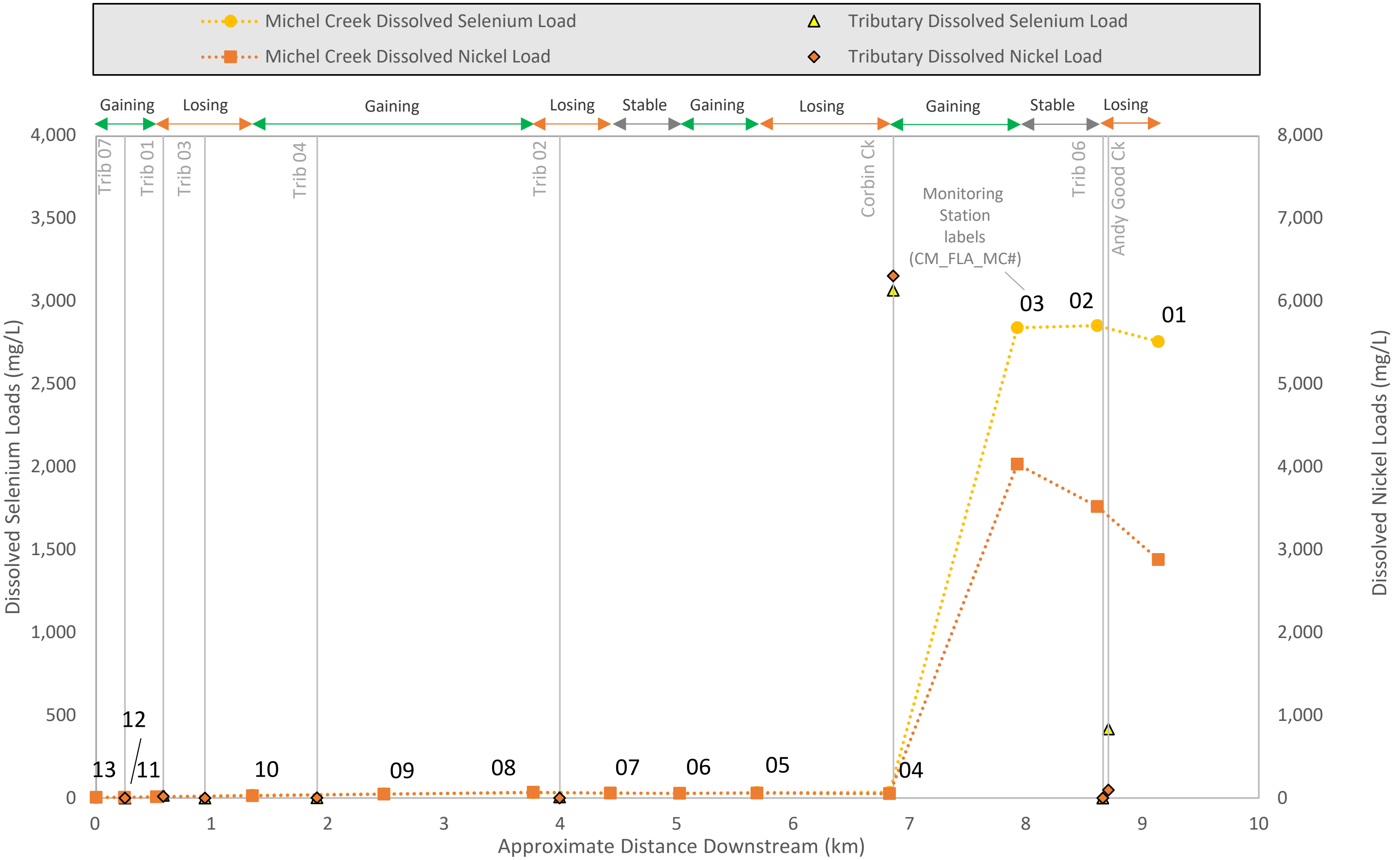
Figure 3a: Michel Creek Nitrate-N and Sulphate Loads



Notes:

1) Starting point is the most upstream location (CM_FLA_MC13)

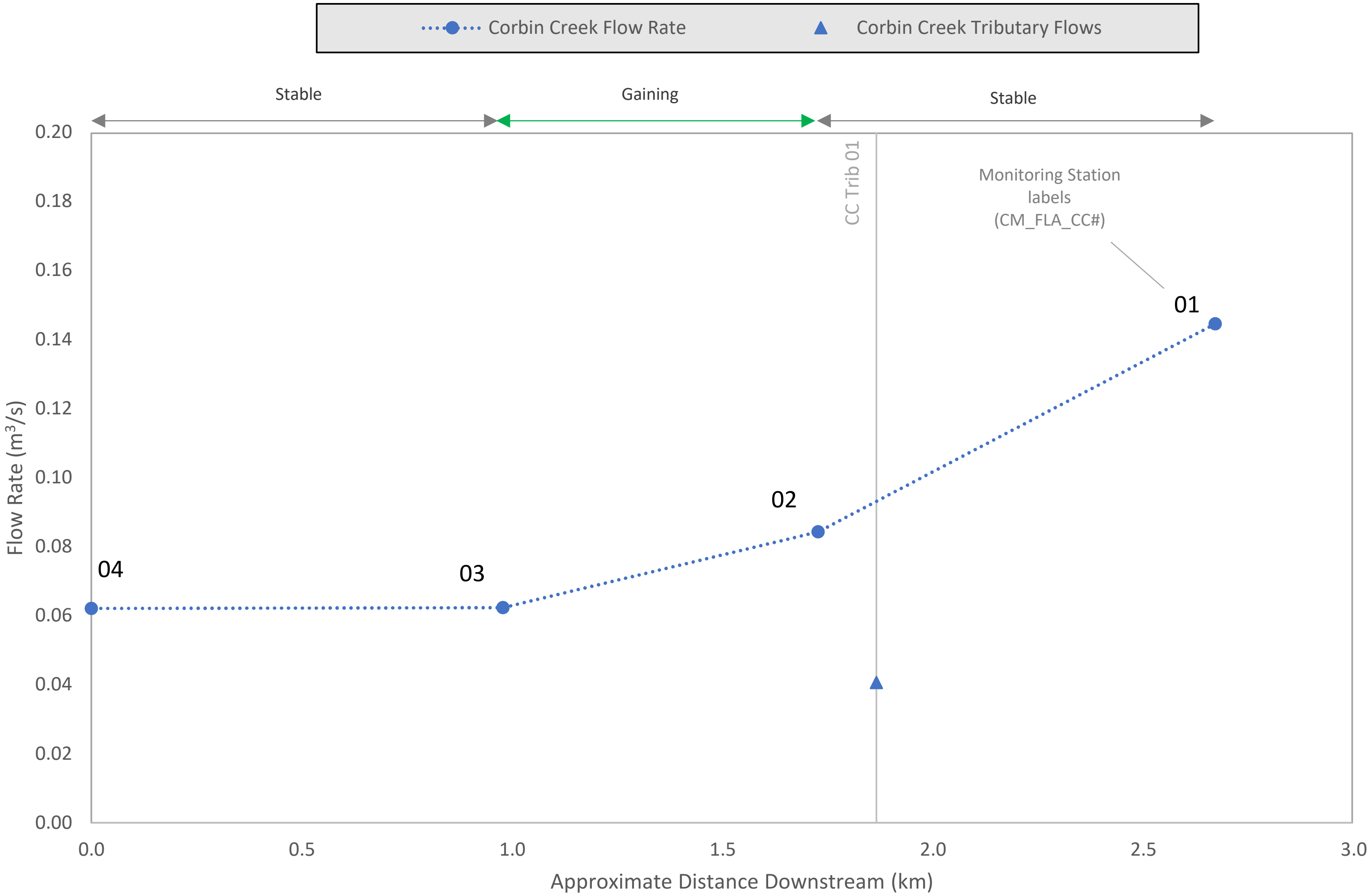
Figure 3b: Michel Creek Dissolved Selenium and Dissolved Nickel Loads



Notes:

1) Starting point is the most upstream location (CM_FLA_MC13)

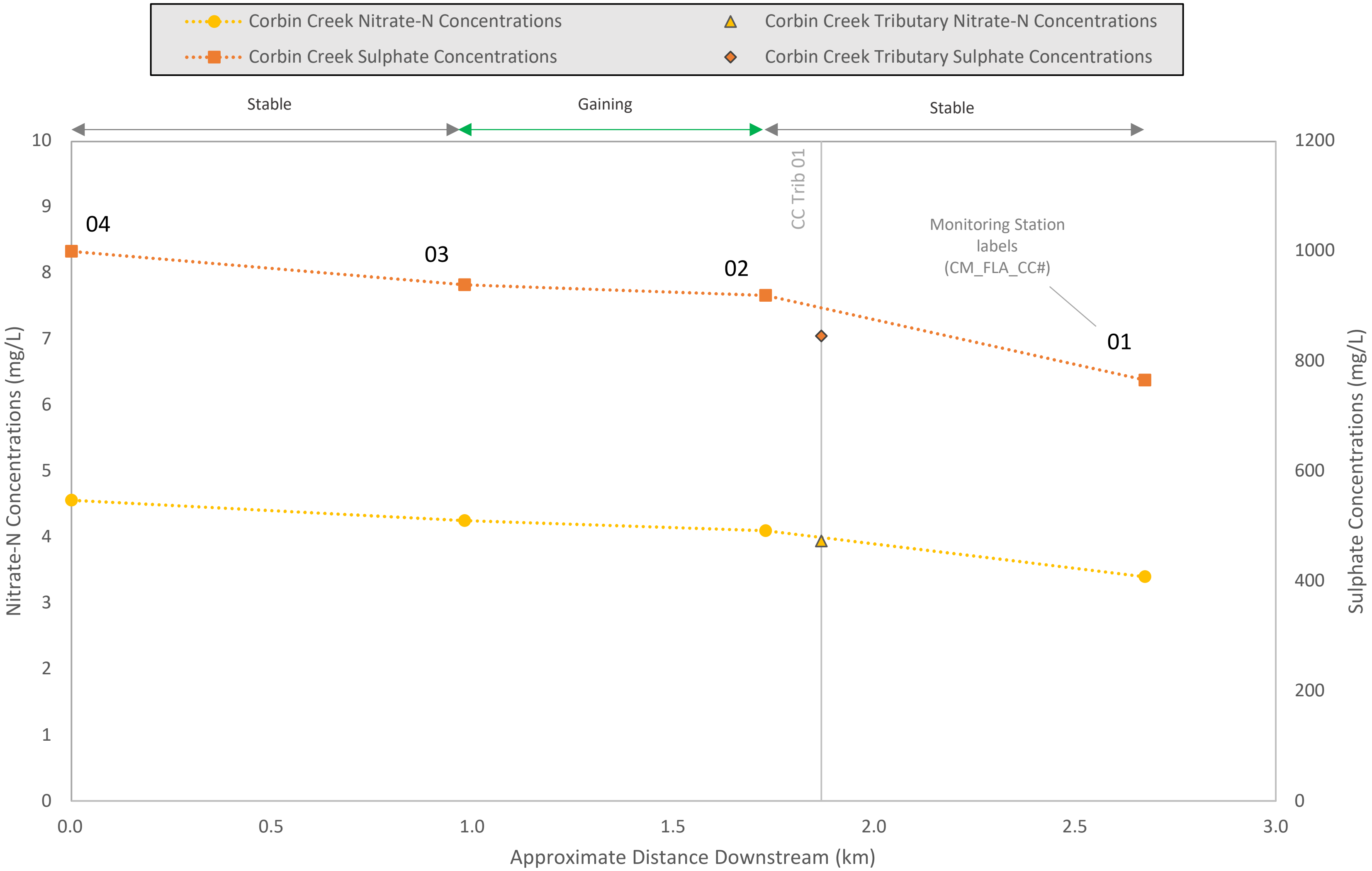
Figure 4: Corbin Creek Flow Rate



Notes:

1) Starting point is the most upstream location (CM_FLA_CC04)

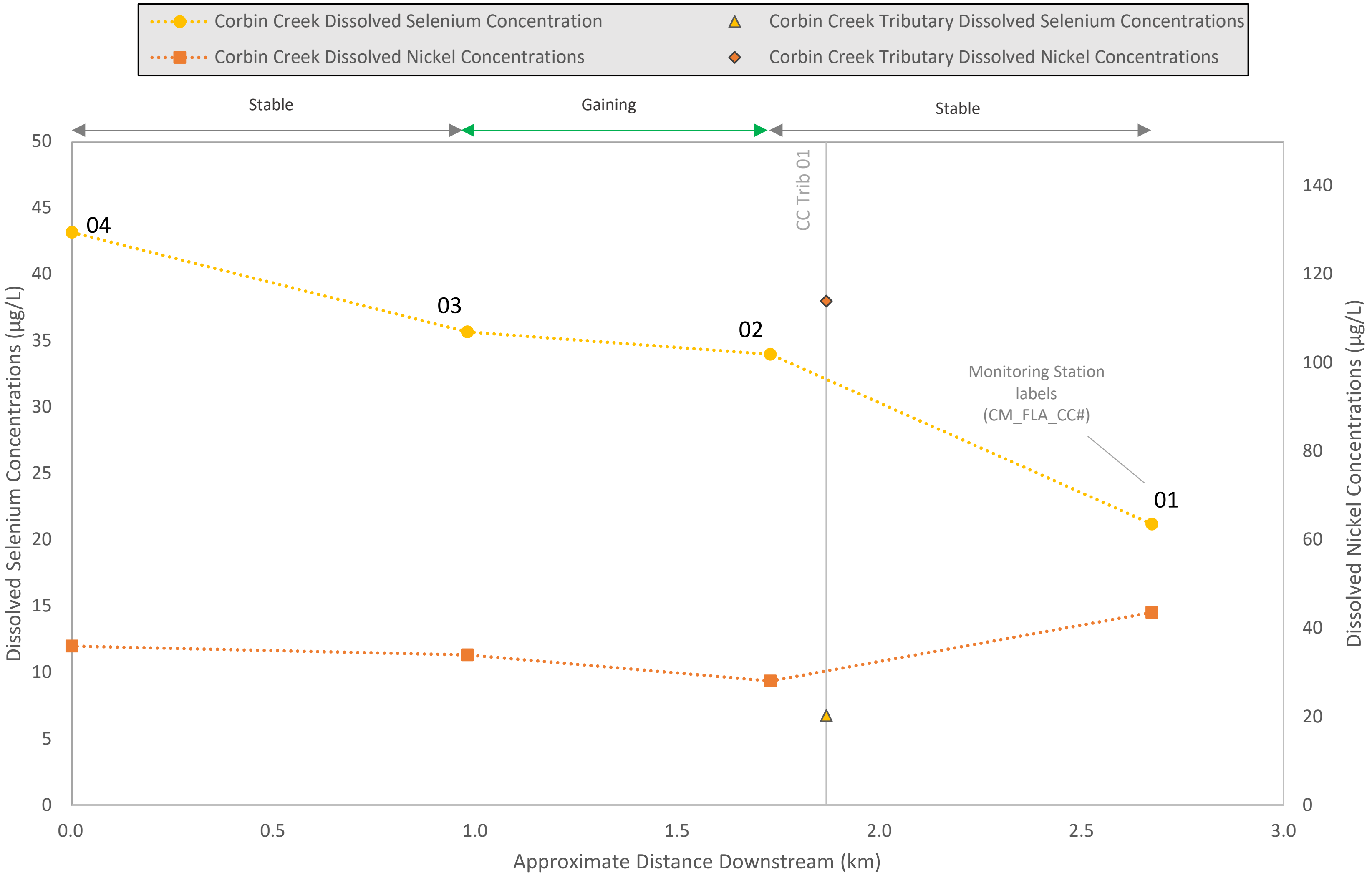
Figure 5a: Corbin Creek Nitrate-N and Sulphate Concentrations



Notes:

1) Starting point is the most upstream location (CM_FLA_CC04)

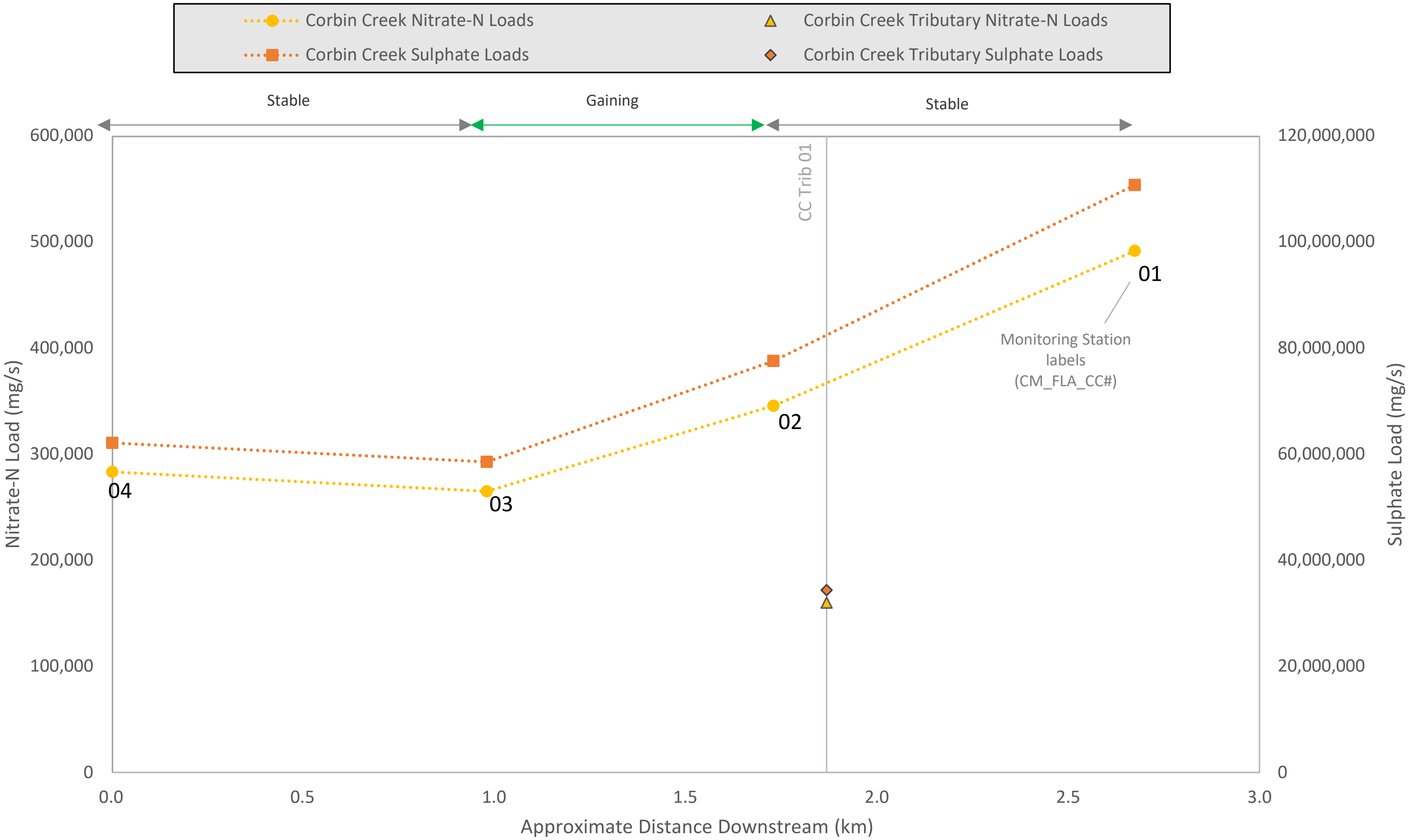
Figure 5b: Corbin Creek Dissolved Selenium and Dissolved Nickel Concentrations



Notes:

1) Starting point is the most upstream location (CM_FLA_CC04)

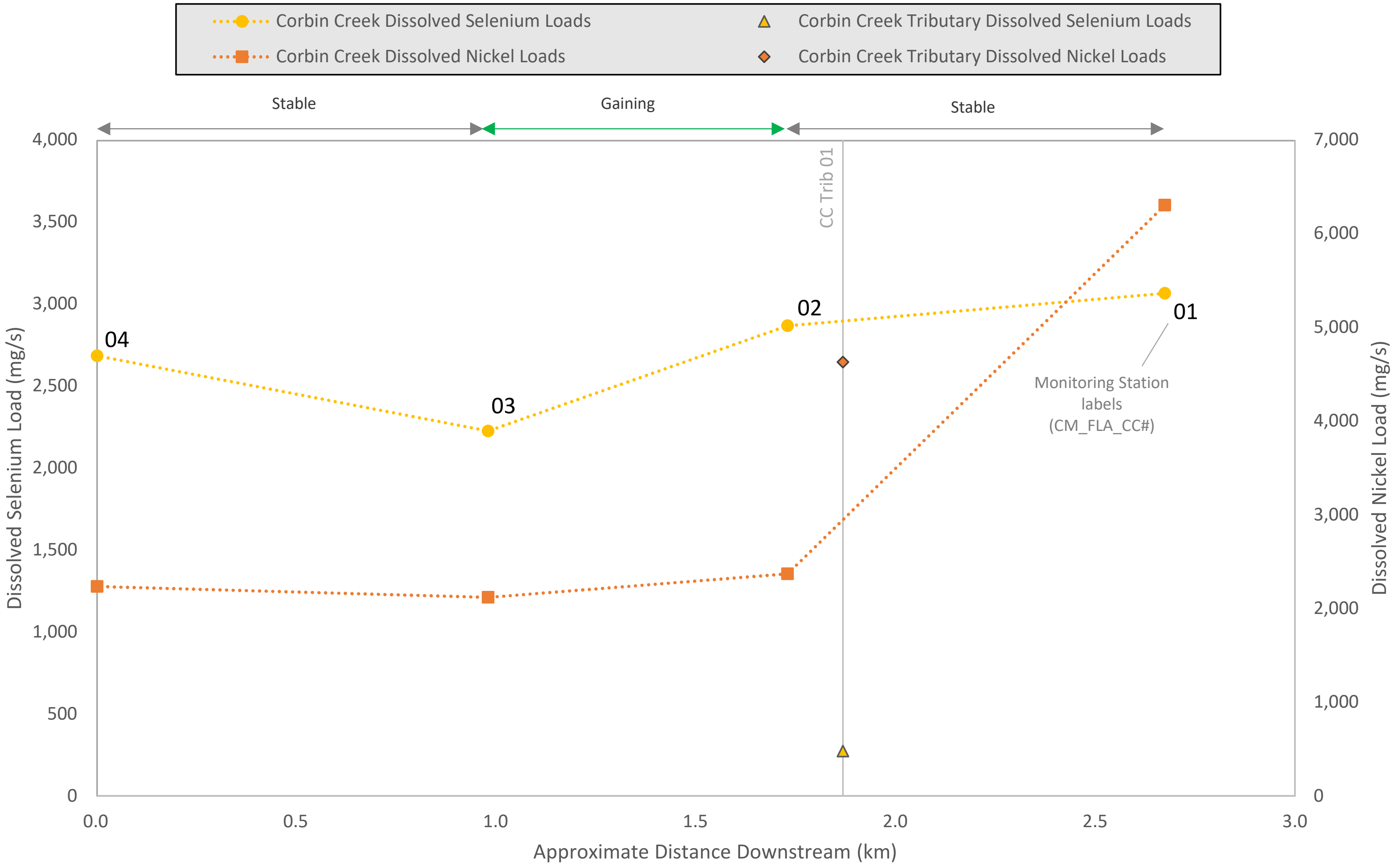
Figure 6a: Corbin Creek Nitrate-N and Sulphate Loads



Notes:

1) Starting point is the most upstream location (CM_FLA_CC04)

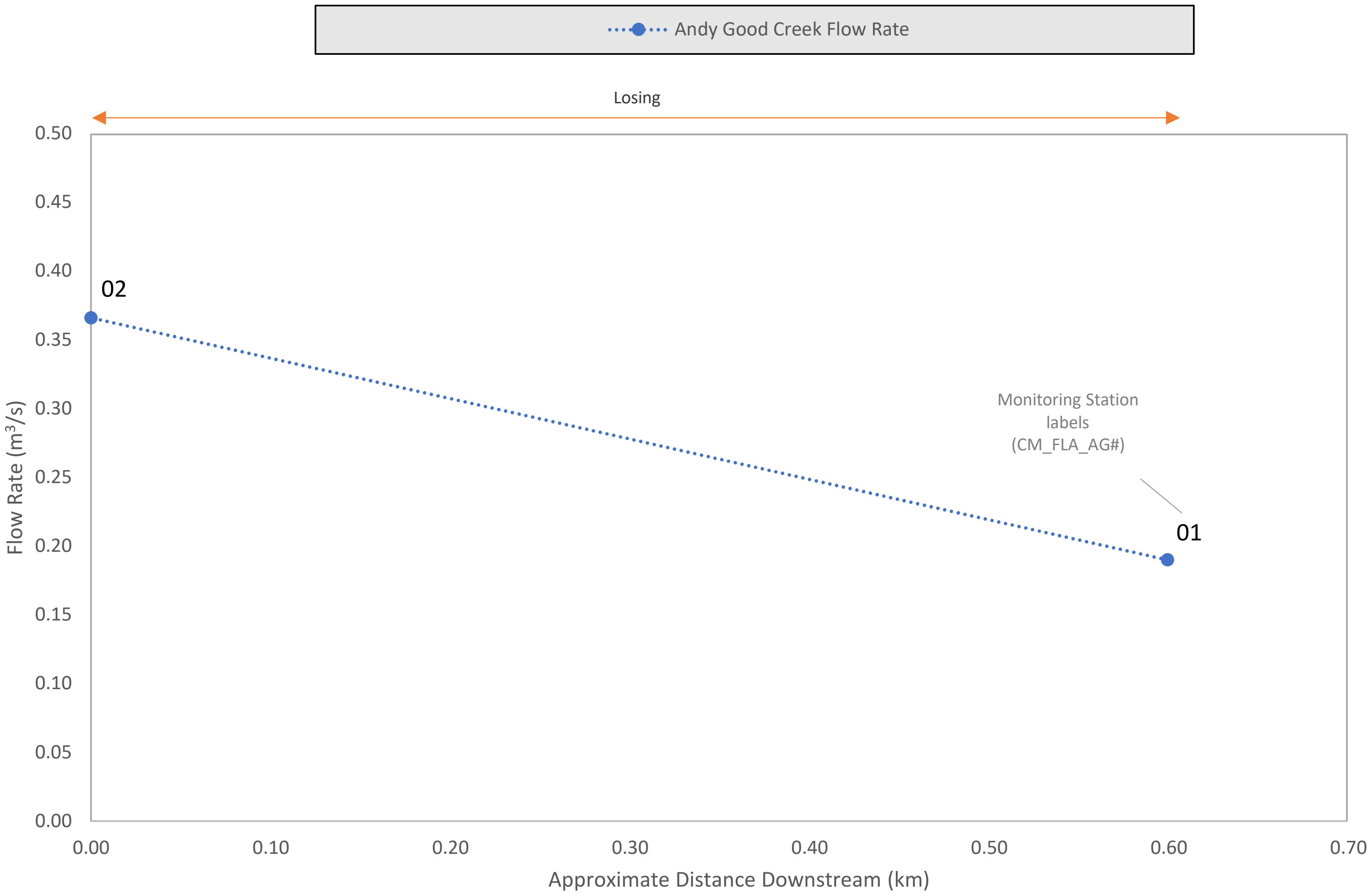
Figure 6b: Corbin Creek Dissolved Selenium and Dissolved Nickel Loads



Notes:

1) Starting point is the most upstream location (CM_FLA_CC04)

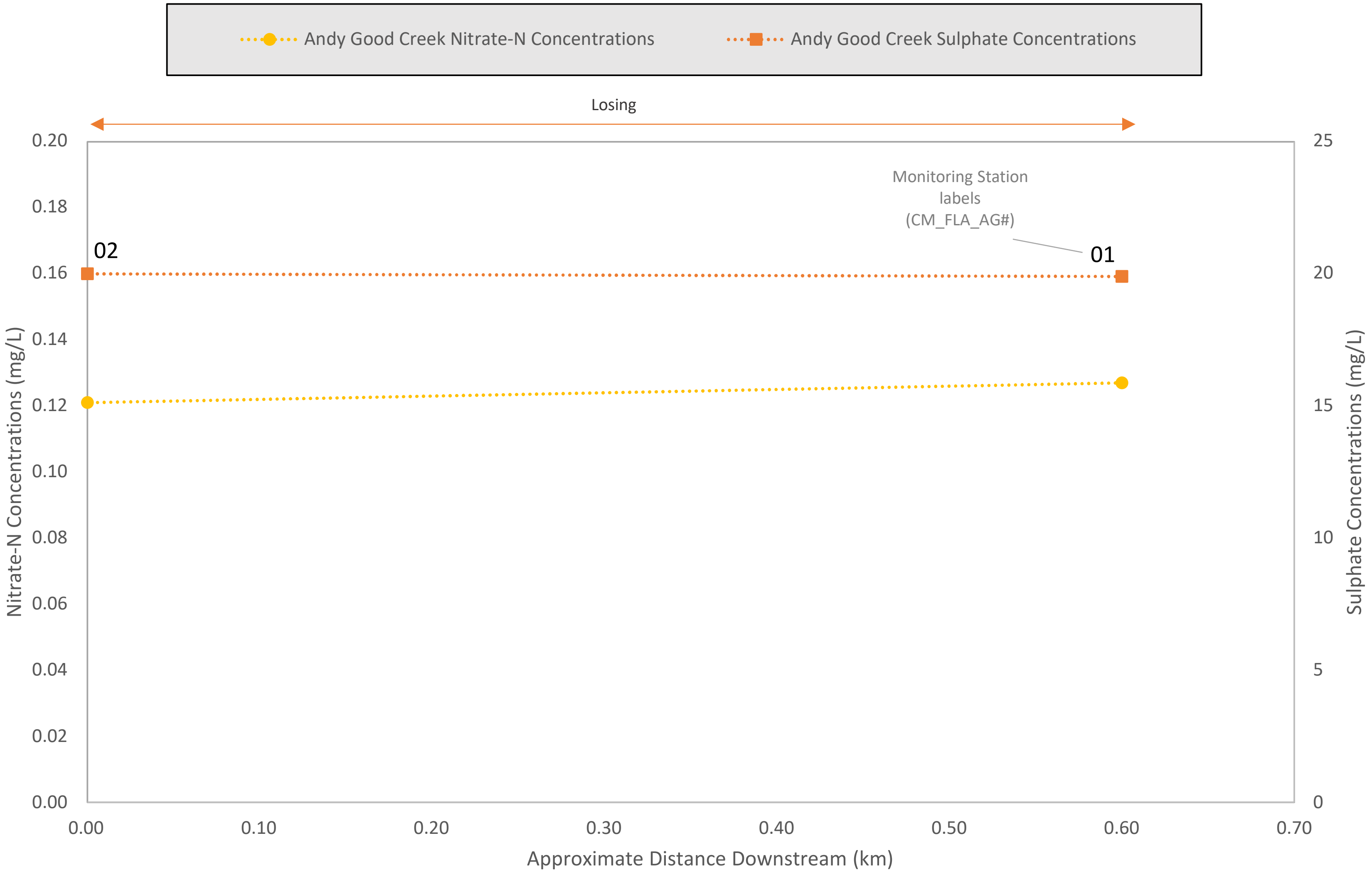
Figure 7: Andy Good Creek Flow Rate



Notes:

1) Starting point is the most upstream location (CM_FLA_AG02)

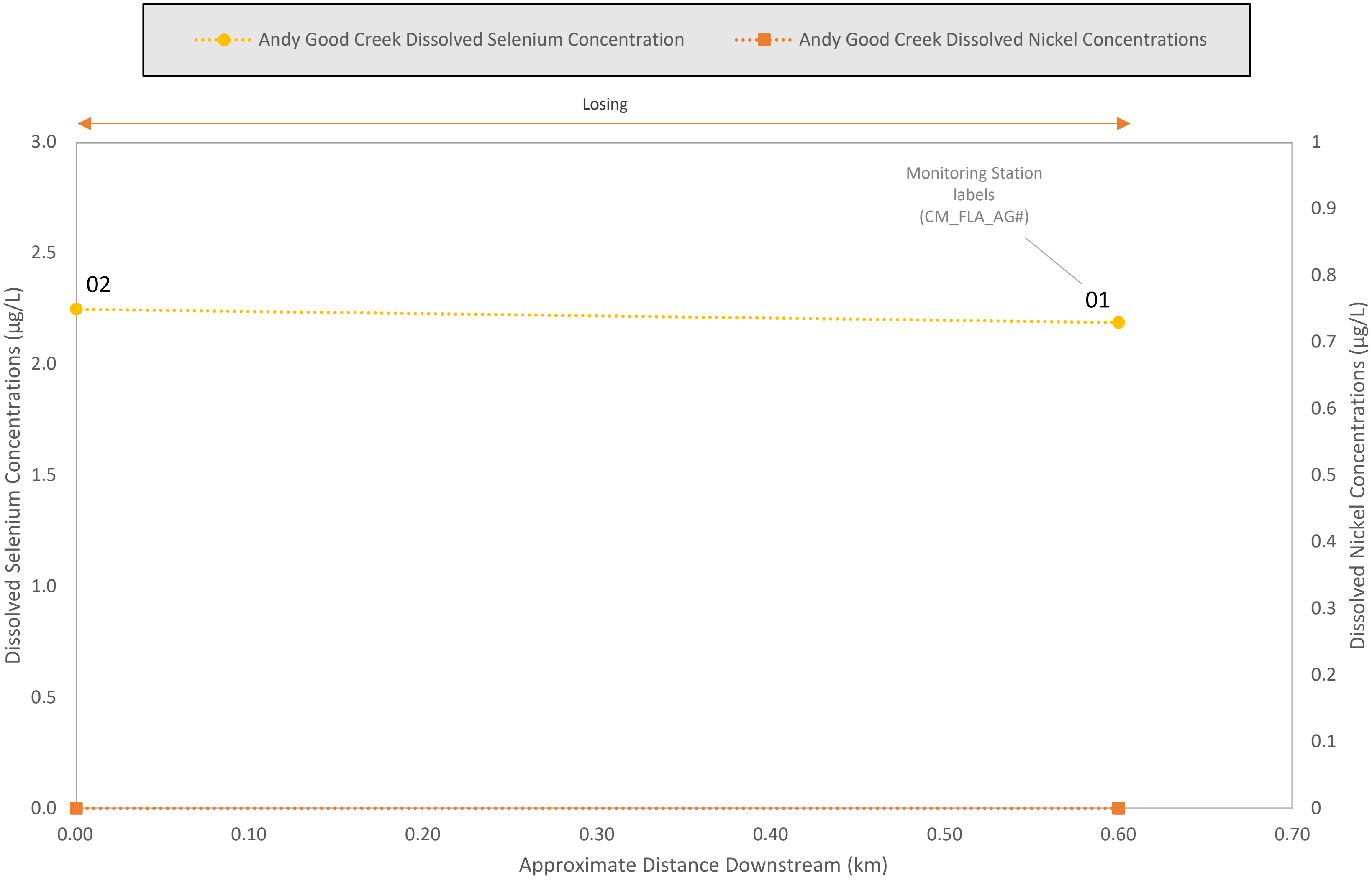
Figure 8a: Andy Good Creek Nitrate-N and Sulphate Concentrations



Notes:

1) Starting point is the most upstream location (CM_FLA_AG02)

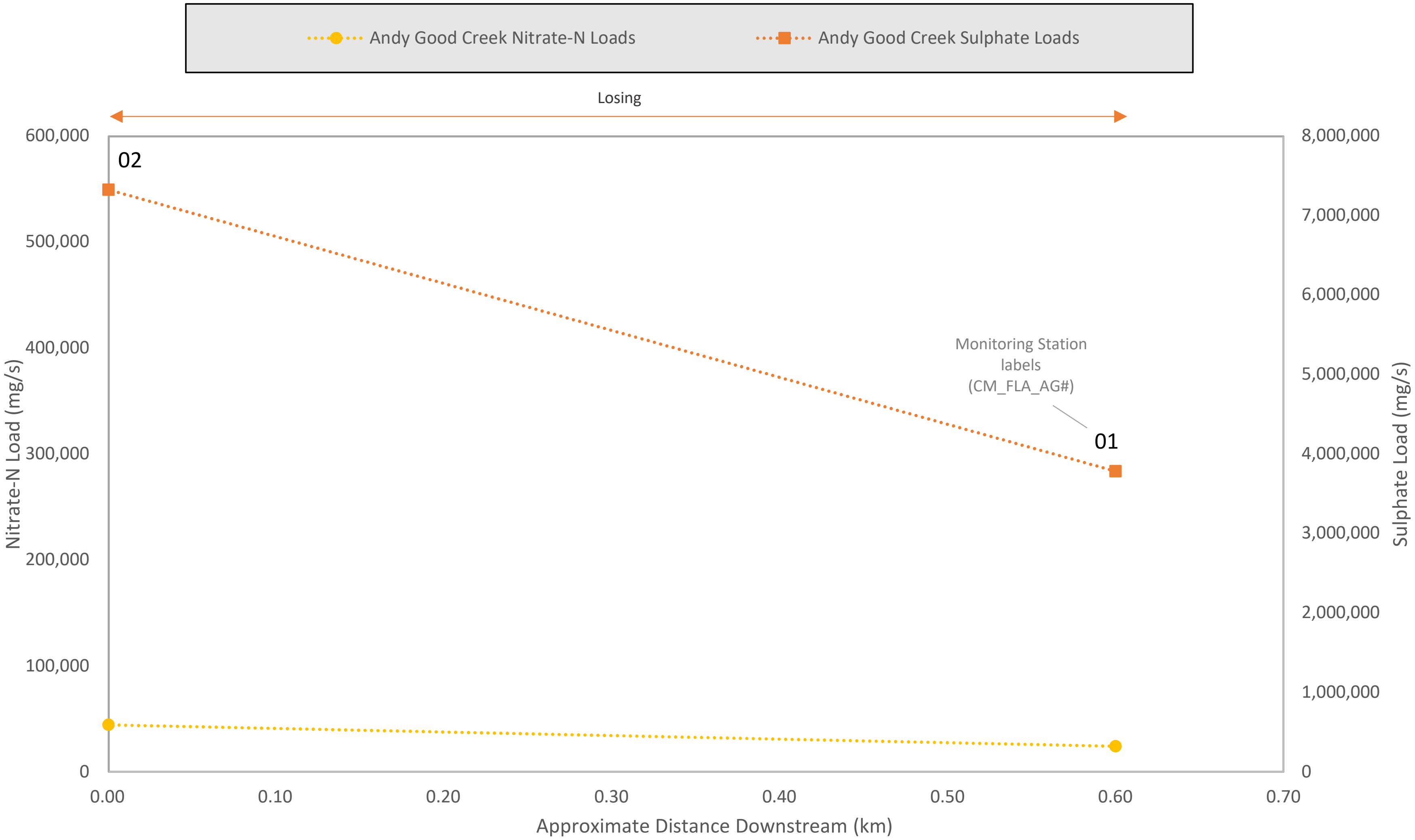
Figure 8b: Andy Good Creek Dissolved Selenium and Dissolved Nickel Concentrations



Notes:

1) Starting point is the most upstream location (CM_FLA_AG02)

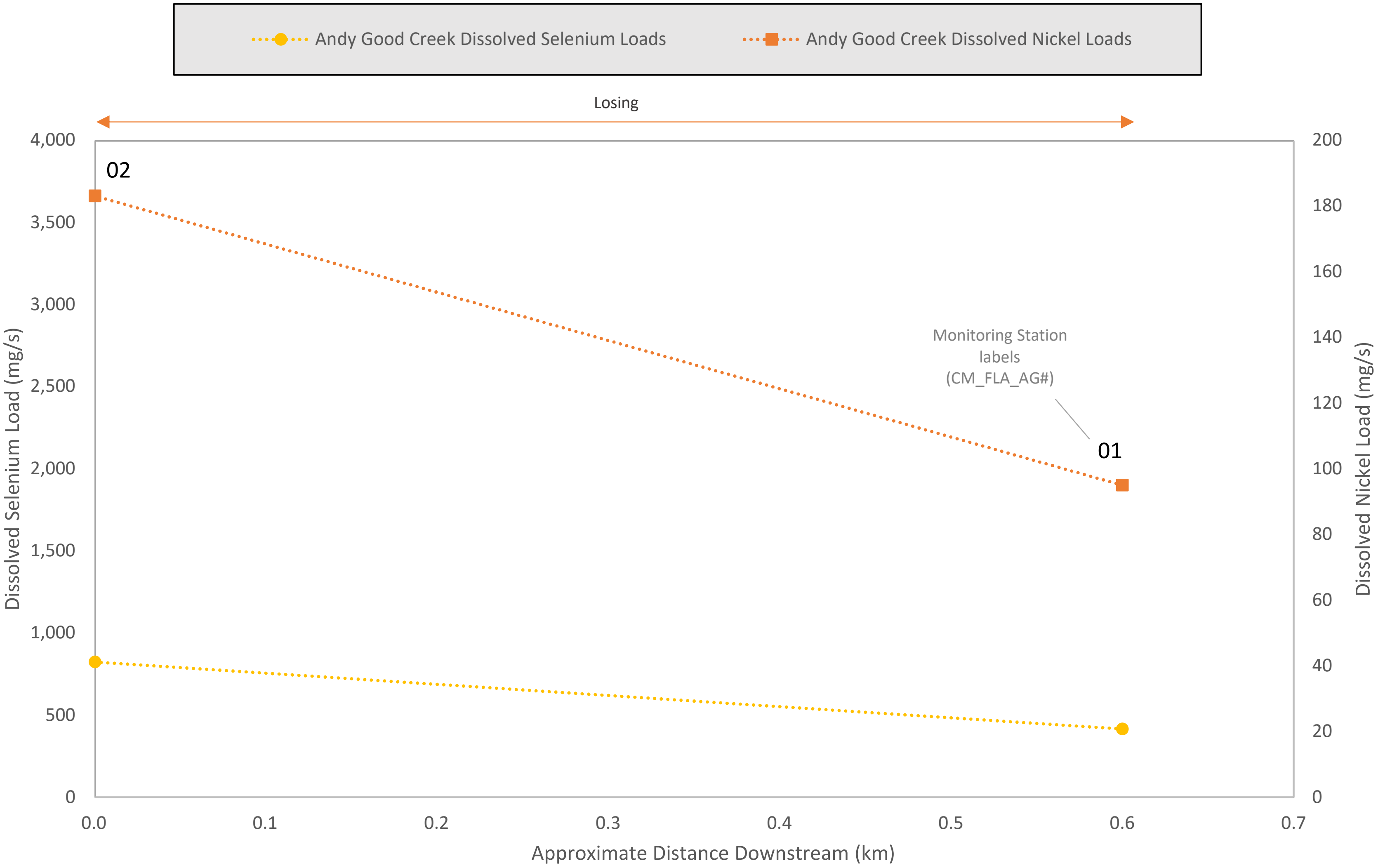
Figure 9a: Andy Good Creek Nitrate-N and Sulphate Loads



Notes:

1) Starting point is the most upstream location (CM_FLA_AG02)

Figure 9b: Andy Good Creek Dissolved Selenium and Dissolved Nickel Loads



Notes:

1) Starting point is the most upstream location (CM_FLA_AG02)

Tables

TABLE 1: Summary of Flow Measurements in Michel Creek and Tributaries

Stream	Reach	Site #	SWQ Sample Name	UTM Z11		Date (MM/DD)	Time	Discharge (L/s)	Method	Reach Type[1]	Notes
				Easting	Northing	(2021)					
Michel Creek	Main	MCm.0000	CM_FLA_MC01	666828	5488226	10/06	13:10	441	Velocity-Area	No further downstream measurement	-
Michel Creek	Tributary	MCt.0477	CM_FLA_MC_Trib06	667244	5488160	10/06	11:50	0.5	Estimate	-	Tributary entering on right side downstream of MCm.0525
Michel Creek	Main	MCm.0525	CM_FLA_MC02	667215	5488108	10/06	11:20	286	Velocity-Area	Losing	-
Michel Creek	Main	MCm.1214	CM_FLA_MC03	667644	5487680	10/06	11:15	292	Velocity-Area	Stable	-
Michel Creek	Main	MCm.2312	CM_FLA_MC04	668184	5487092	10/04	10:10	108	Velocity-Area	Gaining	-
Michel Creek	Main	MCm.2312	CM_FLA_MC04	668184	5487092	10/06	8:40	116	Velocity-Area	Gaining	Duplicate measurement on October 6, 2022
Michel Creek	Main	MCm.3452	CM_FLA_MC05	668135	5486235	10/04	13:30	122	Velocity-Area	Losing	-
Michel Creek	Main	MCm.4118	CM_FLA_MC06	667976	5485839	10/04	15:30	114	Velocity-Area	Gaining	-
Michel Creek	Main	MCm.4118	CM_FLA_MC06	667976	5485839	10/05	9:20	122	Velocity-Area	Gaining	Duplicate measurement on October 5, 2022
Michel Creek	Main	MCm.4715	CM_FLA_MC07	667891	5485537	10/05	11:05	120	Velocity-Area	Stable	-
Michel Creek	Tributary	MCt.5150	CM_FLA_MC_Trib02	668017	5485305	10/05	9:00	2.3	Volumetric	-	Tributary entering on right side downstream of MCm.5378
Michel Creek	Main	MCm.5378	CM_FLA_MC08	667859	5485200	10/05	10:30	139	Velocity-Area	Losing	-
Michel Creek	Main	MCm.6662	CM_FLA_MC09	667823	5484501	10/05	13:35	97	Velocity-Area	Gaining	-
Michel Creek	Tributary	MCt.7237	CM_FLA_MC_Trib04	667890	5484159	10/05	14:15	3.5	Estimate	-	Tributary entering on right side downstream of MCm.7792
Michel Creek	Main	MCm.7792	CM_FLA_MC10	667896	5483641	10/05	12:30	59	Velocity-Area	Gaining	-
Michel Creek	Tributary	MCt.8202	CM_FLA_MC_Trib03	668160	5483460	10/05	14:15	2.0	Volumetric	-	Tributary entering on right side downstream of MCm.8619
Michel Creek	Tributary	MCt.8560	CM_FLA_MC_Trib01	668075	5483129	10/05	15:15	41	Salt Tracer	-	Tributary entering on left side downstream of MCm.8619
Michel Creek	Main	MCm.8619	CM_FLA_MC11	668118	5483103	10/05	15:45	31	Salt Tracer	Losing	-
Michel Creek	Main	MCm.8619	CM_FLA_MC11	668118	5483103	10/06	15:15	31	Salt Tracer	Losing	Duplicate measurement on October 6, 2022
Michel Creek	Tributary	MCt.8890	CM_FLA_MC_Trib07	668385	5482865	10/06	15:10	0.2	Volumetric	-	Tributary entering on right side downstream of MCm.8894
Michel Creek	Main	MCm.8894	CM_FLA_MC12	668204	5482857	10/06	15:45	22	Salt Tracer	Gaining	-
Michel Creek	Main	MCm.9138	CM_FLA_MC13	668231	5482695	10/06	16:00	19	Salt Tracer	Gaining	-
Andy Good Creek	Main	AGm.0040	CM_FLA_AG01	667224	5488209	10/06	12:00	190	Velocity-Area	Losing	Tributary entering on right side downstream of MCm.0525
Andy Good Creek	Main	AGm.0632	CM_FLA_AG02	667544	5488659	10/06	13:45	366	Velocity-Area	Losing	-
Corbin Creek	Main	CCm.0075	CM_FLA_CC01	668270	5487124	10/04	10:00	145	Salt Tracer	Gaining	Tributary entering on right side downstream of MCm.2312
Corbin Creek	Main	CCm.0075	CM_FLA_CC01	668270	5487124	10/06	8:20	130	Salt Tracer	Gaining	Duplicate measurement on October 6, 2022
Corbin Creek	Tributary	CCt.0881	CM_FLA_CC_Trib01	668848	5487439	10/06	14:20	41	Salt Tracer	-	Tributary entering on left side downstream of CCm.1020
Corbin Creek	Main	CCm.1020	CM_FLA_CC02	668976	5487444	10/04	12:30	84	Salt Tracer	Stable	-
Corbin Creek	Main	CCm.1770	CM_FLA_CC03	669635	5487266	10/04	14:15	62	Salt Tracer	Gaining	-
Corbin Creek	Main	CCm.2749	CM_FLA_CC04	670060	5486512	10/04	15:20	62	Salt Tracer	Stable	-

[1] Describes the relative change in measured surface flows between the site location and the next measured location downstream.

TABLE 2: Summary of Analytical Results for Surface Water on Michel Creek, Corbin Creek, Andy Good Creek, and their Tributaries – Parameters, Dissolved Inorganics, Nutrients, and Organics.

			Field Parameters					Physical Parameters							Dissolved Inorganics											Nutrients					Organics	
Sample	Sample	Sample Date	Field Temperature	pH (field)	Dissolved Oxygen	Field Conductivity	Field ORP	pH	Hardness	Conductivity	Total Dissolved Solids	Total Suspended Solids	Turbidity	Oxidation Reduction Potential	Total Alkalinity	Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Carbonate (as CaCO3)	Alkalinity, Hydroxide (as CaCO3)	Bicarbonate	Carbonate	Hydroxide	Bromide	Chloride	Fluoride	Sulphate	Ammonia Nitrogen	Nitrate Nitrogen	Nitrite Nitrogen	Kjeldahl Nitrogen-N	Ortho-Phosphate	Total Organic Carbon	Dissolved Organic Carbon
Location	ID	(yyyy mm dd)	°C	pH	mg/L	µS/cm	mV	pH	mg/L	uS/cm	mg/L	mg/L	NTU	mV	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L
CM_FLA_AG01	CM_FLA_AG01_WS_2022-10-06_NP	2022 10 06	6.5	8.27	11.00	265	161.4	8.13	145	262	147	< 1.0	< 0.10	425	126	126	< 1.0	< 1.0	154	< 1.0	< 1.0	< 0.050	0.24	0.299	19.9	< 0.0050	0.127	< 0.0010	< 0.050	< 1.0	< 0.50	< 0.50
CM_FLA_AG02	CM_FLA_AG02_WS_2022-10-06_NP	2022 10 06	7.5	8.38	11.04	256	130.1	8.27	141	243	142	< 1.0	< 0.10	383	123	123	< 1.0	< 1.0	150	< 1.0	< 1.0	< 0.050	0.23	0.310	20.0	< 0.0050	0.121	< 0.0010	0.059	< 1.0	< 0.50	< 0.50
CM_FLA_CC01	CM_FLA_CC01_WS_2022-10-04_NP	2022 10 04	8.20	7.77	10.50	1,650	207.0	8.20	996	1,510	1,260	1.1	0.58	299	288	288	< 1.0	< 1.0	351	< 1.0	< 1.0	< 0.250	4.23	0.203	766	0.0050	3.40	0.0238	0.222	< 1.0	0.82	0.88
	CM_FLA_CC01_WS_2022-10-06_NP	2022 10 06	7.9	8.08	10.14	1,669	231.4	8.19	1,080	1,530	1,330	2.8	0.28	351	302	302	< 1.0	< 1.0	368	< 1.0	< 1.0	< 0.250	3.74	0.163	769	< 0.0050	3.29	0.0175	0.318	< 1.0	0.71	0.59
CM_FLA_CC02	CM_FLA_CC02_WS_2022-10-04_NP	2022 10 04	9.00	8.06	10.20	1,827	148.4	8.24	1,160	1,690	1,400	1.8	0.47	302	340	340	< 1.0	< 1.0	414	< 1.0	< 1.0	< 0.250	1.64	0.141	920	< 0.0050	4.10	0.0105	0.105	< 1.0	0.79	0.98
CM_FLA_CC03	CM_FLA_CC03_WS_2022-10-04_NP	2022 10 04	10.40	8.17	10.26	1,898	95.5	8.19	1,280	1,740	1,550	3.9	0.77	304	361	361	< 1.0	< 1.0	440	< 1.0	< 1.0	< 0.250	1.27	0.125	939	< 0.0050	4.25	0.0119	0.275	< 1.0	0.98	0.78
CM_FLA_CC04	CM_FLA_CC04_WS_2022-10-04_NP	2022 10 04	10.20	8.05	9.84	1,999	104.8	8.13	1,320	1,830	1,650	2.7	1.00	307	374	374	< 1.0	< 1.0	456	< 1.0	< 1.0	< 0.250	1.14	0.149	1,000	0.0115	4.56	0.0165	0.330	< 1.0	0.81	0.99
CM_FLA_CC_TRIB01	CM_FLA_CC_TRIB01_WS_2022-10-06_NP	2022 10 06	12.8	7.95	11.2	172	140.1	8.18	1,130	1,650	1,440	4.9	1.14	364	258	258	< 1.0	< 1.0	315	< 1.0	< 1.0	< 0.250	7.16	0.246	846	0.0543	3.94	0.0522	0.375	< 1.0	1.03	0.72
CM_FLA_MC_TRIB01	CM_FLA_MC_TRIB01_WS_2022-10-05_NP	2022 10 05	7.1	8.41	10.43	238	169.5	8.23	131	225	128	2.4	0.30	440	131	131	< 1.0	< 1.0	159	< 1.0	< 1.0	< 0.050	0.16	0.101	12.1	< 0.0050	0.0220	< 0.0010	0.153	2.9	0.97	0.72
CM_FLA_MC_TRIB02	CM_FLA_MC_TRIB02_WS_2022-10-05_NP	2022 10 05	5.5	7.92	10.84	909	252.2	8.33	535	857	682	2.4	1.18	314	242	236	5.8	< 1.0	288	3.5	< 1.0	< 0.050	1.29	0.107	310	< 0.0050	0.0576	< 0.0010	0.075	< 1.0	1.86	1.67
CM_FLA_MC_TRIB03	CM_FLA_MC_TRIB03_WS_2022-10-05_NP	2022 10 05	7.6	8.40	10.27	512	181.6	8.42	248	492	314	< 1.0	0.92	280	214	204	9.0	< 1.0	249	5.4	< 1.0	< 0.050	1.29	0.154	81.2	< 0.0050	0.0219	< 0.0010	0.061	3.2	1.51	1.82
CM_FLA_MC_TRIB04	CM_FLA_MC_TRIB04_WS_2022-10-05_NP	2022 10 05	-	-	-	-	-	8.18	164	279	160	1.8	1.69	274	159	159	< 1.0	< 1.0	194	< 1.0	< 1.0	< 0.050	0.26	0.086	13.8	< 0.0050	< 0.0050	< 0.0010	0.056	1.1	1.12	1.16
CM_FLA_MC_TRIB06	CM_FLA_MC_TRIB06_WS_2022-10-06_NP	2022 10 06	6.3	7.58	9.12	777	166.4	7.97	418	739	483	6.5	0.52	286	275	275	< 1.0	< 1.0	335	< 1.0	< 1.0	< 0.050	5.83	0.116	180	0.0074	< 0.0050	< 0.0010	0.302	< 1.0	1.81	1.17
CM_FLA_MC_TRIB07	CM_FLA_MC_TRIB07_WS_2022-10-06_NP	2022 10 06	8.2	8.38	10.56	422	134.2	8.41	228	390	231	< 1.0	0.38	286	218	208	9.8	< 1.0	254	5.9	< 1.0	< 0.050	0.78	0.097	24.8	< 0.0050	0.0198	< 0.0010	0.072	2.0	1.98	1.96
CM_FLA_MC01	CM_FLA_MC01_WS_2022-10-06_NP	2022 10 06	8.2	8.25	11.0	700	123.1	8.35	421	693	481	8.2	0.42	322	191	185	5.8	< 1.0	226	3.5	< 1.0	< 0.050	1.55	0.204	235	< 0.0050	0.893	0.0017	0.086	< 1.0	< 0.50	< 0.50
CM_FLA_MC02	CM_FLA_MC02_WS_2022-10-06_NP	2022 10 06	7.4	8.32	10.83	1,101	173.2	8.35	661	1,030	795	3.0	0.20	329	225	217	8.2	< 1.0	264	4.9	< 1.0	< 0.250	2.76	0.135	445	< 0.0050	1.67	< 0.0050	0.136	< 1.0	< 0.50	< 0.50
	CM_NNP_WS_2022-10-06_NP	Duplicate	-	-	-	-	-	8.35	658	1,030	768	2.4	0.18	292	223	215	7.4	< 1.0	263	4.4	< 1.0	< 0.250	2.45	0.129	431	< 0.0050	1.60	< 0.0050	0.114	< 1.0	< 0.50	< 0.50
	QA/QC RPD%		-	-	-	-	-	0	0	0	3	*	*	12	1	1	10	*	0	*	*	*	12	5	3	*	4	*	*	*	*	*
CM_FLA_MC03	CM_FLA_MC03_WS_2022-10-06_NP	2022 10 06	7.8	8.07	11.1	1,067	144.8	8.30	679	1,040	796	2.0	0.61	342	237	234	3.2	< 1.0	286	1.9	< 1.0	< 0.250	2.92	0.131	443	< 0.0050	1.67	< 0.0050	0.113	< 1.0	0.70	< 0.50
CM_FLA_MC04	CM_FLA_MC04_WS_2022-10-04_NP	2022 10 04	4.80	8.79	11.14	311.4	214.4	8.36	161	290	160	< 1.0	0.47	307	159	155	3.6	< 1.0	189	2.2	< 1.0	< 0.050	0.32	0.081	18.5	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 1.0	0.55	< 0.50
	CM_FLA_MC04_WS_2022-10-06_NP	2022 10 06	4.7	7.74	11.3	309	215.1	8.27	174	300	171	3.0	< 0.10	311	191	191	< 1.0	< 1.0	232	< 1.0	< 1.0	< 0.050	0.54	0.078	18.6	< 0.0050	0.0075	< 0.0010	< 0.050	< 1.0	0.93	< 0.50
CM_FLA_MC05	CM_FLA_MC05_WS_2022-10-04_NP	2022 10 04	8.30	8.31	10.66	300	142.9	8.34	155	284	156	< 1.0	0.35	310	161	158	3.2	< 1.0	192	1.9	< 1.0	< 0.050	0.30	0.081	15.9	< 0.0050	< 0.0050	< 0.0010	< 0.050	2.8	< 0.50	0.70
CM_FLA_MC06	CM_FLA_MC06_WS_2022-10-04_NP	2022 10 04	10.20	8.31	10.14	294	124.5	8.33	153	277	160	< 1.0	0.39	312	165	162	2.8	< 1.0	198	1.7	< 1.0	< 0.050	0.28	0.081	13.9	< 0.0050	< 0.0050	< 0.0010	< 0.050	3.4	0.57	< 0.50
	CM_FLA_MC06_WS_2022-10-05_NP	2022 10 05	5.1	7.68	10.8	299	233.0	8.20	161	278	149	< 1.0	0.56	395	174	174	< 1.0	< 1.0	212	< 1.0	< 1.0	< 0.050	0.29	0.079	13.8	< 0.0050	0.0076	< 0.0010	< 0.050	1.2	0.87	0.70
CM_FLA_MC07	CM_FLA_MC07_WS_2022-10-05_NP	2022 10 05	5.6	7.82	11.0	287	153.0	8.23	161	273	154	< 1.0	0.44	378	154	154	< 1.0	< 1.0	188	< 1.0	< 1.0	< 0.050	0.30	0.079	13.6	< 0.0050	0.0081	< 0.0010	< 0.050	1.2	0.84	0.83
CM_FLA_MC08	CM_FLA_MC08_WS_2022-10-05_NP	2022 10 05	5.1	7.96	10.15	292	206.6	8.19	160	274	155	6.2	1.41	353	153	153	< 1.0	< 1.0	187	< 1.0	< 1.0	< 0.050	0.28	0.080	13.5	< 0.0050	0.0075	< 0.0010	< 0.050	< 1.0	0.94	0.73
CM_FLA_MC09	CM_FLA_MC09_WS_2022-10-05_NP	2022 10 05	8.4	7.85	10.2	281	142.6	8.19	158	272	158	< 1.0	0.44	343	156	156	< 1.0	< 1.0	190	< 1.0	< 1.0	< 0.050	0.26	0.083	13.1	< 0.0050	0.0072	< 0.0010	< 0.050	1.2	0.73	0.69
CM_FLA_MC10	CM_FLA_MC10_WS_2022-10-05_NP	2022 10 05	6.3	8.43	11.31	267	179.4	8.28	146	252	143	< 1.0	0.18	333	140	140	< 1.0	< 1.0	171	< 1.0	< 1.0	< 0.050	0.32	0.091	14.1	< 0.0050	0.0059	< 0.0010	0.065	< 1.0	0.90	0.90
	CM_NNP_WS_2022-10-05_NP	Duplicate	-	-	-	-	-	8.30	147	250	153	< 1.0	0.19	311	133	131	2.0	< 1.0	160	1.2	< 1.0	< 0.050	0.35	0.093	14.0	< 0.0050	0.0060	< 0.0010	0.051	1.2	0.92	0.87
	QA/QC RPD%		-	-	-	-	-	0	1	1	7	*	*	7	5	7	*	*	7	*	*	*	*	*	1	*	*	*	*	*	*	*
CM_FLA_MC11	CM_FLA_MC11_WS_2022-10-05_NP	2022 10 05	7.2	8.00	10.4	286	148.3	8.20	158	276	159	< 1.0	0.19	327	170	170	< 1.0	< 1.0	207	< 1.0	< 1.0	< 0.050	0.44	0.074	13.9	< 0.0050	0.0117	< 0.0010	< 0.050	1.0	0.82	1.05
	CM_FLA_MC11_WS_2022-10-06_NP	2022 10 06	6.9	7.97	10.6	287	39.7	8.25	162	279	162	< 1.0	0.20	317	157	157	< 1.0	< 1.0	192	< 1.0	< 1.0	< 0.050	0.45	0.070	13.7	< 0.0050	0.0145	< 0.0010	< 0.050	< 1.0	< 0.50	< 0.50
CM_FLA_MC12	CM_FLA_MC12_WS_2022-10-06_NP	2022 10 06	6.8	8.18	10.22	291	135.8	8.22	156	273	149	< 1.0	0.15	262	150	150	< 1.0	< 1.0	183	< 1.0	< 1.0	< 0.050	0.45	0.069	15.0	< 0.0050	0.0167	< 0.0010	0.066	2.4	< 0.50	< 0.50
CM_FLA_MC13	CM_FLA_MC13_WS_2022-10-06_NP	2022 10 06	6.8	7.99	10.6	277	70.9	8.26	156	269	160	< 1.0	0.27	289	144	144	< 1.0	< 1.0	175	< 1.0	< 1.0	< 0.050	0.48	0.069	15.0	< 0.0050	0.0189	< 0.0010	< 0.050	1.0	< 0.50	< 0.50
Field Blanks																																
CM_Field Blank	CM_NNT_WS_2022-10-06_NP	2022 10 06	-	-	-	-	-	5.63	< 0.50	< 2.0	< 10	< 1.0	< 0.10	492	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 1.0	< 0.50	< 0.50
Trip Blanks																																
CM_Trip Blank	CM_TRP_WS_2022-10-06_NP	2022 10 06	-	-	-	-	-	5.15	< 0.50	< 2.0	< 10	< 1.0	< 0.10	523	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.050	< 0.10	< 0.020	< 0.30	< 0.0050	< 0.0050	< 0.0010	< 0.050	< 1.0	< 0.50	< 0.50

Associated ALS file(s): CG2213784, CG2213851, CG2214000.

All terms defined within the body of SNC-Lavalin's report.

< Denotes concentration less than indicated detection limit.

\- Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference.

* RPDs are not calculated where one or more concentrations are less than five times RDL.

RDL Denotes reported detection limit.

TABLE 3: Summary of Analytical Results for Surface Water on Michel Creek, Corbin Creek, Andy Good Creek, and their Tributaries – Total Metals

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Total Metals																																
			Aluminum µg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Bismuth µg/L	Boron µg/L	Cadmium µg/L	Calcium mg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Lithium µg/L	Magnesium mg/L	Manganese µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Potassium mg/L	Selenium µg/L	Silicon mg/L	Silver µg/L	Sodium mg/L	Strontium µg/L	Sulphur mg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Uranium µg/L	Vanadium µg/L	Zinc µg/L
CM_FLA_AG01	CM_FLA_AG01_WS_2022-10-06_NP	2022 10 06	4.7	< 0.10	0.46	23.1	< 0.020	< 0.050	< 10	0.0092	44.5	0.34	< 0.10	< 0.50	< 10	< 0.050	3.3	8.41	0.12	< 0.0050	0.773	< 0.50	0.267	1.83	1.52	< 0.010	0.738	151	7.34	0.042	< 0.10	< 0.30	0.822	0.53	< 3.0
CM_FLA_AG02	CM_FLA_AG02_WS_2022-10-06_NP	2022 10 06	5.4	< 0.10	0.54	21.0	< 0.020	< 0.050	< 10	0.0208	41.6	0.31	< 0.10	< 0.50	< 10	< 0.050	2.8	8.35	0.13	< 0.0050	1.21	< 0.50	0.301	1.73	1.52	< 0.010	0.732	144	7.64	0.045	< 0.10	< 0.30	0.814	0.69	< 3.0
CM_FLA_CC01	CM_FLA_CC01_WS_2022-10-04_NP	2022 10 04	4.9	0.34	0.25	48.8	< 0.020	< 0.050	68	0.0466	220	0.12	2.24	< 0.50	< 10	< 0.050	35.6	125	9.62	< 0.0050	1.30	48.2	3.61	16.0	2.46	< 0.010	27.2	787	286	0.043	< 0.10	< 0.30	6.06	< 0.50	< 3.0
	CM_FLA_CC01_WS_2022-10-06_NP	2022 10 06	5.4	0.36	0.23	49.5	< 0.020	< 0.050	71	0.0750	214	< 0.10	2.17	< 0.50	13	< 0.050	37.8	120	10.2	< 0.0050	1.23	46.0	3.62	17.0	2.63	< 0.010	26.6	757	234	0.036	< 0.10	< 0.30	5.80	< 0.50	< 3.0
CM_FLA_CC02	CM_FLA_CC02_WS_2022-10-04_NP	2022 10 04	6.7	0.26	0.19	33.4	< 0.020	< 0.050	47	0.0857	232	0.14	0.13	< 0.50	< 10	< 0.050	25.7	156	1.36	< 0.0050	0.776	31.8	3.56	33.0	2.22	< 0.010	18.8	613	332	0.045	< 0.10	< 0.30	7.86	< 0.50	< 3.0
CM_FLA_CC03	CM_FLA_CC03_WS_2022-10-04_NP	2022 10 04	9.6	0.27	0.20	30.8	< 0.020	< 0.050	49	0.156	258	0.11	0.21	< 0.50	10	< 0.050	27.8	168	3.07	< 0.0050	0.741	37.1	3.84	34.2	2.28	< 0.010	20.0	650	348	0.051	< 0.10	0.35	8.27	< 0.50	9.4
CM_FLA_CC04	CM_FLA_CC04_WS_2022-10-04_NP	2022 10 04	17.1	0.27	0.17	27.2	< 0.020	< 0.050	51	0.643	280	0.14	0.30	< 0.50	26	< 0.050	28.2	175	6.27	< 0.0050	0.701	42.4	4.01	32.8	2.25	< 0.010	19.8	688	368	0.059	< 0.10	0.32	9.11	< 0.50	43.7
CM_FLA_CC_TRIB01	CM_FLA_CC_TRIB01_WS_2022-10-06_NP	2022 10 06	10.0	0.69	0.23	25.5	< 0.020	< 0.050	111	0.0670	236	< 0.10	10.9	< 0.50	28	< 0.050	65.5	122	47.1	< 0.0050	2.29	114	5.05	6.06	2.31	< 0.010	44.5	1,110	270	0.048	< 0.10	< 0.30	6.54	< 0.50	4.0
CM_FLA_MC_TRIB01	CM_FLA_MC_TRIB01_WS_2022-10-05_NP	2022 10 05	23.1	< 0.10	0.18	38.2	< 0.020	< 0.050	< 10	0.0146	32.2	0.34	< 0.10	< 0.50	36	0.054	1.6	13.3	5.96	< 0.0050	0.691	< 0.50	0.340	0.339	1.77	< 0.010	0.941	70.0	4.24	< 0.010	< 0.10	< 0.30	0.363	< 0.50	< 3.0
CM_FLA_MC_TRIB02	CM_FLA_MC_TRIB02_WS_2022-10-05_NP	2022 10 05	15.5	< 0.10	0.20	82.7	< 0.020	< 0.050	23	0.0065	128	< 0.10	< 0.10	< 0.50	13	< 0.050	10.0	51.8	0.90	< 0.0050	0.430	< 0.50	1.39	2.13	3.57	< 0.010	7.83	548	118	< 0.010	< 0.10	0.43	1.04	< 0.50	< 3.0
CM_FLA_MC_TRIB03	CM_FLA_MC_TRIB03_WS_2022-10-05_NP	2022 10 05	15.5	< 0.10	0.20	104	< 0.020	< 0.050	41	0.0087	67.4	< 0.10	< 0.10	< 0.50	59	< 0.050	22.7	21.3	9.65	< 0.0050	0.355	< 0.50	1.05	0.205	3.35	< 0.010	23.6	506	29.2	< 0.010	< 0.10	< 0.30	0.253	< 0.50	< 3.0
CM_FLA_MC_TRIB04	CM_FLA_MC_TRIB04_WS_2022-10-05_NP	2022 10 05	45.3	< 0.10	0.21	71.4	< 0.020	< 0.050	12	0.0078	46.6	0.24	< 0.10	< 0.50	88	0.067	3.9	13.8	3.53	< 0.0050	0.700	< 0.50	0.540	0.174	2.10	< 0.010	2.90	164	5.10	< 0.010	< 0.10	0.45	0.270	< 0.50	< 3.0
CM_FLA_MC_TRIB06	CM_FLA_MC_TRIB06_WS_2022-10-06_NP	2022 10 06	22.0	< 0.10	0.24	174	< 0.020	< 0.050	31	0.0162	113	0.11	0.15	< 0.50	229	0.059	8.1	29.6	51.1	< 0.0050	0.504	0.56	1.21	0.598	4.42	< 0.010	19.2	320	64.6	< 0.010	< 0.10	< 0.30	0.686	< 0.50	< 3.0
CM_FLA_MC_TRIB07	CM_FLA_MC_TRIB07_WS_2022-10-06_NP	2022 10 06	16.2	< 0.10	0.23	121	< 0.020	< 0.050	37	< 0.0050	62.1	< 0.10	< 0.10	< 0.50	38	< 0.050	14.0	15.8	14.1	< 0.0050	0.412	< 0.50	1.12	0.086	3.36	< 0.010	8.09	563	9.14	< 0.010	< 0.10	< 0.30	0.185	< 0.50	< 3.0
CM_FLA_MC01	CM_FLA_MC01_WS_2022-10-06_NP	2022 10 06	18.5	0.16	0.33	58.1	< 0.020	< 0.050	26	0.0244	93.5	0.24	0.37	< 0.50	29	< 0.050	13.7	42.0	4.83	< 0.0050	0.929	6.90	1.29	5.32	2.05	< 0.010	9.36	338	85.9	0.023	< 0.10	< 0.30	2.14	< 0.50	< 3.0
CM_FLA_MC02	CM_FLA_MC02_WS_2022-10-06_NP	2022 10 06	6.9	0.22	0.16	83.5	< 0.020	< 0.050	45	0.0305	136	0.14	0.24	< 0.50	< 10	< 0.050	23.5	69.4	3.15	< 0.0050	1.13	11.9	2.17	8.23	2.44	< 0.010	16.5	499	156	0.012	< 0.10	< 0.30	3.23	< 0.50	< 3.0
	CM_NNP_WS_2022-10-06_NP	Duplicate	9.1	0.21	0.20	84.7	< 0.020	< 0.050	46	0.0284	136	0.16	0.29	< 0.50	13	< 0.050	23.0	71.3	3.85	< 0.0050	1.07	12.4	2.19	8.52	2.51	< 0.010	17.1	492	160	0.012	< 0.10	< 0.30	3.25	< 0.50	< 3.0
	QA/QC RPD%		27	*	*	1	*	*	*	7	0	*	*	*	*	*	2	3	20	*	5	4	1	3	3	*	4	1	3	*	*	*	1	*	*
CM_FLA_MC03	CM_FLA_MC03_WS_2022-10-06_NP	2022 10 06	7.4	0.22	0.16	84.3	< 0.020	< 0.050	45	0.0274	137	0.14	0.30	< 0.50	11	< 0.050	23.6	71.8	4.22	< 0.0050	1.09	13.1	2.23	8.74	2.49	< 0.010	17.1	496	160	0.012	< 0.10	< 0.30	3.28	< 0.50	< 3.0
CM_FLA_MC04	CM_FLA_MC04_WS_2022-10-04_NP	2022 10 04	8.8	< 0.10	0.13	84.3	< 0.020	< 0.050	12	0.0071	46.7	0.19	< 0.10	< 0.50	13	< 0.050	3.5	13.5	1.64	< 0.0050	0.705	< 0.50	0.446	0.283	2.39	< 0.010	2.82	152	7.14	< 0.010	< 0.10	< 0.30	0.328	< 0.50	< 3.0
	CM_FLA_MC04_WS_2022-10-06_NP	2022 10 06	9.6	< 0.10	0.14	79.2	< 0.020	< 0.050	12	0.0060	44.7	0.19	< 0.10	< 0.50	14	< 0.050	4.7	13.2	1.54	< 0.0050	0.693	< 0.50	0.488	0.251	2.40	< 0.010	2.89	154	6.60	< 0.010	< 0.10	< 0.30	0.267	< 0.50	< 3.0
CM_FLA_MC05	CM_FLA_MC05_WS_2022-10-04_NP	2022 10 04	8.8	< 0.10	0.20	76.2	< 0.020	< 0.050	10	0.0144	43.8	21.8	< 0.10	1.07	156	< 0.050	3.1	13.2	3.92	< 0.0050	0.792	0.59	0.460	0.300	2.37	< 0.010	2.47	142	5.91	< 0.010	< 0.10	< 0.30	0.267	< 0.50	< 3.0
CM_FLA_MC06	CM_FLA_MC06_WS_2022-10-04_NP	2022 10 04	7.6	< 0.10	0.17	76.9	< 0.020	< 0.050	10	0.0107	42.2	0.28	< 0.10	< 0.50	11	< 0.050	3.1	13.6	2.19	< 0.0050	0.742	< 0.50	0.485	0.183	2.42	< 0.010	2.49	147	5.40	< 0.010	< 0.10	< 0.30	0.270	< 0.50	< 3.0
	CM_FLA_MC06_WS_2022-10-05_NP	2022 10 05	11.0	< 0.10	0.14	72.4	< 0.020	< 0.050	11	0.0079	41.8	0.20	< 0.10	< 0.50	15	< 0.050	3.8	13.3	2.32	< 0.0050	0.686	< 0.50	0.441	0.213	2.26	< 0.010	2.73	148	5.11	< 0.010	< 0.10	< 0.30	0.245	< 0.50	< 3.0
CM_FLA_MC07	CM_FLA_MC07_WS_2022-10-05_NP	2022 10 05	11.6	< 0.10	0.14	77.3	< 0.020	< 0.050	12	0.0087	45.6	0.20	< 0.10	< 0.50	19	< 0.050	4.0	13.8	3.86	< 0.0050	0.705	< 0.50	0.460	0.189	2.36	< 0.010	2.82	156	5.07	< 0.010	< 0.10	< 0.30	0.250	< 0.50	< 3.0
CM_FLA_MC08	CM_FLA_MC08_WS_2022-10-05_NP	2022 10 05	44.3	< 0.10	0.16	75.3	< 0.020	< 0.050	12	0.0129	42.7	0.26	< 0.10	< 0.50	70	0.069	4.0	13.6	7.33	< 0.0050	0.694	< 0.50	0.492	0.201	2.34	< 0.010	2.82	151	4.99	< 0.010	< 0.10	0.45	0.247	< 0.50	< 3.0
CM_FLA_MC09	CM_FLA_MC09_WS_2022-10-05_NP	2022 10 05	7.1	< 0.10	0.17	65.2	< 0.020	< 0.050	10	0.0081	42.2	0.23	< 0.10	< 0.50	30	< 0.050	3.3	13.8	11.6	< 0.0050	0.711	< 0.50	0.416	0.190	2.16	< 0.010	2.44	135	4.76	< 0.010	< 0.10	< 0.30	0.263	< 0.50	< 3.0
CM_FLA_MC10	CM_FLA_MC10_WS_2022-10-05_NP	2022 10 05	6.6	< 0.10	0.16	48.9	< 0.020	< 0.050	10	0.0082	39.0	0.30	< 0.10	< 0.50	< 10	< 0.050	3.4	13.1	1.28	< 0.0050	0.730	< 0.50	0.400	0.222	2.03	< 0.010	2.41	125	5.26	< 0.010	< 0.10	< 0.30	0.300	< 0.50	< 3.0
	CM_NNP_WS_2022-10-05_NP	Duplicate	6.7	< 0.10	0.14	50.0	< 0.020	< 0.050	< 10	0.0102	39.4	0.26	< 0.10	< 0.50	< 10	< 0.050	3.2	13.2	1.33	< 0.0050	0.775	< 0.50	0.399	0.236	2.00	< 0.010	2.49	130	4.93	< 0.010	< 0.10	< 0.30	0.297	< 0.50	< 3.0
	QA/QC RPD%		2	*	*	2	*	*	*	*	1	*	*	*	*	*	*	1	4	*	6	*	0	*	1	*	3	4	6	*	*	*	1	*	*
CM_FLA_MC11	CM_FLA_MC11_WS_2022-10-05_NP	2022 10 05	7.0	< 0.10	0.15	61.6	< 0.020	< 0.050	16	0.0119	43.6	0.18	< 0.10	< 0.50	< 10	< 0.050	5.0	12.8	0.50	< 0.0050	0.800	< 0.50	0.507	0.187	2.36	< 0.010	3.32	177	4.97	< 0.010	< 0.10	< 0.30	0.217	< 0.50	< 3.0
	CM_FLA_MC11_WS_2022-10-06_NP	2022 10 06	6.6	< 0.10	0.18	61.6	< 0.020	< 0.050	16	0.0080	43.1	0.21	< 0.10	< 0.50	< 10	< 0.050	5.6	11.7	0.40	< 0.0050	0.837	< 0.50	0.548	0.216	2.48	< 0.010	3.03	168	4.93	< 0.010	< 0.10	< 0.30	0.215	< 0.50	< 3.0
CM_FLA_MC12	CM_FLA_MC12_WS_2022-10-06_NP	2022 10 06	6.6	< 0.10	0.17	52.7	< 0.020	< 0.050	17	0.0162	41.4	0.19	< 0.10	< 0.50	< 10	< 0.050	5.8	11.8	0.24	< 0.0050	0.947	< 0.50	0.581	0.166	2.48	< 0.010	3.22	170	5.30	< 0.010	< 0.10	< 0.30	0.225	< 0.50	< 3.0
CM_FLA_MC13	CM_FLA_MC13_WS_2022-10-06_NP	2022 10 06	10.5	< 0.10	0.22	52.9	< 0.020	< 0.050	17	0.0182	40.9	0.20	< 0.10	< 0.50	< 10	< 0.050	6.0	12.0	0.87	< 0.0050	0.920	< 0.50	0.558	0.223	2.48	< 0.010	3.24	171	5.45	< 0.010	< 0.10	< 0.30	0.231	< 0.50	< 3.0
Field Blanks																																			
CM_Field Blank	CM_NNT_WS_2022-10-06_NP	2022 10 06	< 3.0	< 0.10	< 0.10	0.25	< 0.020	< 0.050	< 10	< 0.0050	0.065	< 0.10	< 0.10	0.82	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.10	< 0.010	0.182	< 0.20	< 0.50	< 0.010	0.13	< 0.30	< 0.010	< 0.50	< 3.0
Trip Blanks																																			
CM_Trip Blank	CM_TRP_WS_2022-10-06_NP	2022 10 06	< 3.0	< 0.10	< 0.10	< 0.10	< 0.020	< 0.050	< 10	< 0.0050	< 0.050	< 0.10	< 0.10	< 0.50	< 10	< 0.050	< 1.0	< 0.0050	< 0.10	< 0.0050	< 0.050	< 0.50	< 0.050	< 0.050	< 0.10	< 0.010	< 0.050	< 0.20	< 0.50	< 0.010	< 0.10	< 0.30	< 0.010	< 0.50	< 3.0

Associated ALS file(s): CG2213851, CG2214000.

All terms defined within the body of SNC-Lavalin's report.

< Denotes concentration less than indicated detection limit.

\- Denotes analysis not conducted.

n/a Denotes no applicable standard/guideline.

QA/QC RPD Denotes quality assurance/quality control relative percent difference

* RPDs are not calculated where one or more concentrations are less than five times RDL.

RDL Denotes reported detection limit.

TABLE 4: Summary of Analytical Results for Surface Water on Michel Creek, Corbin Creek, Andy Good Creek, and their Tributaries – Dissolved Metals.

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Dissolved Metals																															
			Dissolved Aluminum µg/L	Dissolved Calcium mg/L	Dissolved Iron µg/L	Dissolved Magnesium mg/L	Dissolved Manganese µg/L	Dissolved Potassium mg/L	Dissolved Sodium mg/L	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Boron µg/L	Cadmium µg/L	Chromium µg/L	Cobalt µg/L	Copper µg/L	Lead µg/L	Lithium µg/L	Mercury µg/L	Molybdenum µg/L	Nickel µg/L	Selenium µg/L	Silver µg/L	Strontium µg/L	Thallium µg/L	Tin µg/L	Titanium µg/L	Tungsten µg/L	Uranium µg/L	Vanadium µg/L	Zinc µg/L
CM_FLA_AG01	CM_FLA_AG01_WS_2022-10-06_NP	2022 10 06	< 1.0	42.8	< 10	9.22	< 0.10	0.213	0.643	< 0.10	0.47	23.5	< 0.020	< 10	0.0167	0.28	< 0.10	< 0.20	< 0.050	2.0	< 0.0050	0.834	< 0.50	2.19	< 0.010	149	0.039	< 0.10	< 0.30	< 0.10	0.792	< 0.50	1.5
CM_FLA_AG02	CM_FLA_AG02_WS_2022-10-06_NP	2022 10 06	< 1.0	41.2	< 10	9.20	< 0.10	0.214	0.612	< 0.10	0.43	21.7	< 0.020	< 10	0.0067	0.28	< 0.10	< 0.20	< 0.050	2.1	< 0.0050	1.04	< 0.50	2.25	< 0.010	148	0.044	< 0.10	< 0.30	< 0.10	0.831	< 0.50	1.6
CM_FLA_CC01	CM_FLA_CC01_WS_2022-10-04_NP	2022 10 04	< 1.0	214	< 10	112	7.76	3.97	28.2	0.38	0.26	50.3	< 0.020	73	0.0348	0.18	2.15	< 0.20	< 0.050	37.3	< 0.0050	1.26	43.6	21.2	< 0.010	782	0.037	< 0.10	< 0.30	-	5.87	< 0.50	1.4
	CM_FLA_CC01_WS_2022-10-06_NP	2022 10 06	< 1.0	222	< 10	129	8.27	3.62	27.8	0.37	0.23	50.3	< 0.020	74	0.0524	0.14	2.00	< 0.20	< 0.050	42.3	< 0.0050	3.07	48.0	20.1	< 0.010	785	0.037	< 0.10	< 0.30	< 0.10	5.93	< 0.50	1.5
CM_FLA_CC02	CM_FLA_CC02_WS_2022-10-04_NP	2022 10 04	1.3	240	< 10	135	1.21	3.73	18.9	0.27	0.21	31.4	< 0.020	54	0.0747	0.12	0.12	0.20	< 0.050	28.2	< 0.0050	1.76	28.1	34.0	< 0.010	638	0.042	< 0.10	< 0.30	-	7.47	< 0.50	2.2
CM_FLA_CC03	CM_FLA_CC03_WS_2022-10-04_NP	2022 10 04	1.3	260	< 10	152	2.52	4.12	20.6	0.28	0.21	30.6	< 0.020	54	0.136	0.10	0.19	0.24	< 0.050	28.7	< 0.0050	0.768	34.0	35.7	< 0.010	659	0.048	< 0.10	< 0.30	-	7.96	< 0.50	9.9
CM_FLA_CC04	CM_FLA_CC04_WS_2022-10-04_NP	2022 10 04	1.2	281	< 10	149	4.99	4.14	19.6	0.30	0.24	24.8	< 0.020	56	0.595	0.12	0.28	0.25	< 0.050	29.9	< 0.0050	1.66	36.0	43.2	< 0.010	673	0.053	< 0.10	< 0.30	-	8.57	< 0.50	42.7
CM_FLA_CC_TRIB01	CM_FLA_CC_TRIB01_WS_2022-10-06_NP	2022 10 06	1.7	242	< 10	127	32.1	4.97	45.5	0.71	0.24	25.0	< 0.020	113	0.0371	< 0.10	9.46	< 0.20	< 0.050	68.6	< 0.0050	2.32	114	6.75	< 0.010	1,140	0.047	< 0.10	< 0.30	< 0.10	6.59	< 0.50	1.5
CM_FLA_MC_TRIB01	CM_FLA_MC_TRIB01_WS_2022-10-05_NP	2022 10 05	1.6	31.7	< 10	12.5	0.18	0.325	0.808	< 0.10	0.15	38.5	< 0.020	< 10	0.0055	0.34	< 0.10	< 0.20	< 0.050	1.5	< 0.0050	0.769	< 0.50	0.394	< 0.010	67.9	< 0.010	< 0.10	< 0.30	< 0.10	0.377	< 0.50	< 1.0
CM_FLA_MC_TRIB02	CM_FLA_MC_TRIB02_WS_2022-10-05_NP	2022 10 05	< 1.0	132	< 10	49.8	0.31	1.43	6.97	< 0.10	0.12	86.2	< 0.020	22	< 0.0050	< 0.10	< 0.10	< 0.20	< 0.050	10.8	< 0.0050	0.425	< 0.50	2.80	< 0.010	544	< 0.010	< 0.10	< 0.30	< 0.10	1.09	< 0.50	< 1.0
CM_FLA_MC_TRIB03	CM_FLA_MC_TRIB03_WS_2022-10-05_NP	2022 10 05	1.3	65.5	19	20.4	7.13	1.06	21.0	< 0.10	0.17	106	< 0.020	41	0.0085	< 0.10	< 0.10	< 0.20	< 0.050	23.3	< 0.0050	0.359	< 0.50	0.231	< 0.010	492	< 0.010	< 0.10	< 0.30	< 0.10	0.255	< 0.50	< 1.0
CM_FLA_MC_TRIB04	CM_FLA_MC_TRIB04_WS_2022-10-05_NP	2022 10 05	2.6	43.6	< 10	13.3	2.01	0.547	2.56	< 0.10	0.15	72.0	< 0.020	11	< 0.0050	0.16	< 0.10	< 0.20	< 0.050	3.9	< 0.0050	0.648	< 0.50	0.216	< 0.010	149	< 0.010	< 0.10	< 0.30	< 0.10	0.256	< 0.50	2.1
CM_FLA_MC_TRIB06	CM_FLA_MC_TRIB06_WS_2022-10-06_NP	2022 10 06	1.2	116	16	31.2	31.7	1.16	20.1	< 0.10	0.19	181	< 0.020	32	0.0111	< 0.10	< 0.10	< 0.20	< 0.050	8.1	< 0.0050	0.560	< 0.50	0.717	< 0.010	324	< 0.010	< 0.10	< 0.30	< 0.10	0.677	< 0.50	< 1.0
CM_FLA_MC_TRIB07	CM_FLA_MC_TRIB07_WS_2022-10-06_NP	2022 10 06	1.7	64.4	16	16.4	14.1	1.15	8.52	< 0.10	0.22	130	< 0.020	39	< 0.0050	< 0.10	< 0.10	< 0.20	< 0.050	13.9	< 0.0050	0.461	< 0.50	0.090	< 0.010	577	< 0.010	< 0.10	< 0.30	< 0.10	0.185	< 0.50	< 1.0
CM_FLA_MC01	CM_FLA_MC01_WS_2022-10-06_NP	2022 10 06	1.5	94.8	< 10	44.8	1.33	1.26	9.89	0.15	0.30	59.7	< 0.020	27	0.0210	0.21	0.12	< 0.20	< 0.050	14.3	< 0.0050	0.981	6.53	6.25	< 0.010	339	0.024	< 0.10	< 0.30	< 0.10	2.12	< 0.50	< 1.0
CM_FLA_MC02	CM_FLA_MC02_WS_2022-10-06_NP	2022 10 06	< 1.0	141	< 10	75.0	2.85	2.14	17.6	0.20	0.16	86.6	< 0.020	47	0.0221	0.11	0.22	< 0.20	< 0.050	24.9	< 0.0050	1.10	12.3	9.97	< 0.010	503	0.012	< 0.10	< 0.30	< 0.10	3.24	< 0.50	< 1.0
	CM_NNP_WS_2022-10-06_NP	Duplicate	1.1	140	< 10	74.9	2.96	2.25	17.8	0.21	0.22	90.6	< 0.020	46	0.0256	0.11	0.24	< 0.20	< 0.050	24.9	< 0.0050	2.18	12.3	9.66	< 0.010	507	0.013	< 0.10	< 0.30	< 0.10	3.24	< 0.50	< 1.0
	QA/QC RPD%		*	1	*	0	4	5	1	*	*	5	*	*	*	*	*	*	*	0	*	66	0	3	*	1	*	*	*	*	0	*	*
CM_FLA_MC03	CM_FLA_MC03_WS_2022-10-06_NP	2022 10 06	1.1	142	< 10	78.8	3.95	2.39	18.5	0.22	0.22	89.6	< 0.020	47	0.0314	0.16	0.28	0.24	< 0.050	25.0	< 0.0050	2.48	13.8	9.72	< 0.010	507	0.013	< 0.10	< 0.30	< 0.10	3.28	< 0.50	< 1.0
CM_FLA_MC04	CM_FLA_MC04_WS_2022-10-04_NP	2022 10 04	< 1.0	44.5	< 10	12.1	1.06	0.468	2.84	< 0.10	0.14	77.1	< 0.020	12	0.0057	0.14	< 0.10	< 0.20	< 0.050	3.6	< 0.0050	0.730	< 0.50	0.320	< 0.010	153	< 0.010	< 0.10	< 0.30	-	0.265	< 0.50	< 1.0
	CM_FLA_MC04_WS_2022-10-06_NP	2022 10 06	1.3	46.2	< 10	14.2	1.25	0.563	3.14	< 0.10	0.17	85.2	< 0.020	13	0.0068	0.12	< 0.10	< 0.20	< 0.050	4.6	< 0.0050	2.32	< 0.50	0.332	< 0.010	158	< 0.010	< 0.10	< 0.30	< 0.10	0.269	< 0.50	< 1.0
CM_FLA_MC05	CM_FLA_MC05_WS_2022-10-04_NP	2022 10 04	< 1.0	43.0	< 10	11.6	1.61	0.472	2.49	< 0.10	0.12	75.2	< 0.020	12	0.0078	0.21	< 0.10	< 0.20	< 0.050	3.4	< 0.0050	0.742	< 0.50	0.271	< 0.010	149	< 0.010	< 0.10	< 0.30	-	0.257	< 0.50	< 1.0
CM_FLA_MC06	CM_FLA_MC06_WS_2022-10-04_NP	2022 10 04	1.6	42.2	< 10	11.5	1.72	0.498	2.45	< 0.10	0.13	75.3	< 0.020	12	< 0.0050	0.23	< 0.10	< 0.20	< 0.050	3.4	< 0.0050	1.72	< 0.50	0.248	< 0.010	146	< 0.010	< 0.10	< 0.30	-	0.250	< 0.50	< 1.0
	CM_FLA_MC06_WS_2022-10-05_NP	2022 10 05	< 1.0	43.7	< 10	12.6	1.47	0.442	2.38	< 0.10	0.12	77.2	< 0.020	11	0.0075	0.19	< 0.10	< 0.20	< 0.050	4.0	< 0.0050	0.735	< 0.50	0.240	< 0.010	149	< 0.010	< 0.10	< 0.30	< 0.10	0.246	< 0.50	< 1.0
CM_FLA_MC07	CM_FLA_MC07_WS_2022-10-05_NP	2022 10 05	1.7	43.4	< 10	12.9	2.95	0.460	2.43	< 0.10	0.10	76.5	< 0.020	11	0.0055	0.19	< 0.10	< 0.20	< 0.050	4.0	< 0.0050	0.702	< 0.50	0.256	< 0.010	148	< 0.010	1.24	< 0.30	< 0.10	0.245	< 0.50	2.0
CM_FLA_MC08	CM_FLA_MC08_WS_2022-10-05_NP	2022 10 05	< 1.0	43.2	< 10	12.7	3.11	0.467	2.39	< 0.10	0.14	75.9	< 0.020	11	0.0075	0.19	< 0.10	< 0.20	< 0.050	4.0	< 0.0050	0.719	< 0.50	0.227	< 0.010	146	< 0.010	< 0.10	< 0.30	< 0.10	0.249	< 0.50	< 1.0
CM_FLA_MC09	CM_FLA_MC09_WS_2022-10-05_NP	2022 10 05	1.3	42.0	< 10	12.8	10.8	0.425	2.15	< 0.10	0.14	67.9	< 0.020	10	0.0065	0.20	< 0.10	< 0.20	< 0.050	3.6	< 0.0050	0.695	< 0.50	0.267	< 0.010	132	< 0.010	< 0.10	< 0.30	< 0.10	0.271	< 0.50	< 1.0
CM_FLA_MC10	CM_FLA_MC10_WS_2022-10-05_NP	2022 10 05	< 1.0	38.0	< 10	12.3	0.73	0.391	2.06	< 0.10	0.13	49.7	< 0.020	10	0.0145	0.26	< 0.10	0.23	< 0.050	3.6	< 0.0050	0.747	< 0.50	0.310	< 0.010	122	< 0.010	< 0.10	< 0.30	< 0.10	0.297	< 0.50	< 1.0
	CM_NNP_WS_2022-10-05_NP	Duplicate	1.4	38.3	< 10	12.4	0.80	0.400	2.07	< 0.10	0.13	50.1	< 0.020	10	0.0165	0.29	< 0.10	< 0.20	< 0.050	3.6	< 0.0050	0.745	< 0.50	0.313	< 0.010	122	< 0.010	< 0.10	< 0.30	< 0.10	0.292	< 0.50	< 1.0
	QA/QC RPD%		*	1	*	1	9	2	0	*	*	1	*	*	*	*	*	*	*	*	*	0	*	1	*	0	*	*	*	*	2	*	*
CM_FLA_MC11	CM_FLA_MC11_WS_2022-10-05_NP	2022 10 05	1.7	44.2	< 10	11.6	0.25	0.499	2.78	< 0.10	0.15	62.8	< 0.020	16	0.0145	0.18	< 0.10	< 0.20	< 0.050	5.3	< 0.0050	0.810	< 0.50	0.241	< 0.010	172	< 0.010	< 0.10	< 0.30	< 0.10	0.214	< 0.50	3.0
	CM_FLA_MC11_WS_2022-10-06_NP	2022 10 06	1.0	44.8	< 10	12.2	0.28	0.518	3.05	< 0.10	0.16	64.9	< 0.020	17	0.0089	0.21	< 0.10	< 0.20	< 0.050	5.4	< 0.0050	0.845	< 0.50	0.234	< 0.010	174	< 0.010	< 0.10	< 0.30	< 0.10	0.217	< 0.50	< 1.0
CM_FLA_MC12	CM_FLA_MC12_WS_2022-10-06_NP	2022 10 06	1.3	42.6	< 10	12.1	0.14	0.522	3.20	< 0.10	0.23	55.6	< 0.020	18	0.0100	0.20	< 0.10	< 0.20	< 0.050	5.7	< 0.0050	0.902	< 0.50	0.261	< 0.010	174	< 0.010	< 0.10	< 0.30	< 0.10	0.229	< 0.50	< 1.0
CM_FLA_MC13	CM_FLA_MC13_WS_2022-10-06_NP	2022 10 06	1.4	42.2	< 10	12.3	0.11	0.552	3.32	< 0.10	0.14	56.2	< 0.020	18	0.0079	0.24	< 0.10	< 0.20	< 0.050	5.8	< 0.0050	0.967	< 0.50	0.207	< 0.010	175	< 0.010	< 0.10	< 0.30	< 0.10	0.235	< 0.50	< 1.0
Field Blanks																																	
CM_Field Blank	CM_NNT_WS_2022-10-06_NP	2022 10 06	< 1.0	< 0.050	< 10	< 0.0050	< 0.10	< 0.050	0.156	< 0.10	< 0.10	0.22	< 0.020	< 10	< 0.0050	< 0.10	< 0.10	0.77	< 0.050	< 1.0	< 0.0050	0.059	< 0.50	< 0.050	< 0.010	< 0.2	< 0.010	0.13	< 0.30	< 0.10	< 0.010	< 0.50	< 1.0
Trip Blanks																																	
CM_Trip Blank	CM_TRP_WS_2022-10-06_NP	2022 10 06	< 1.0	< 0.050	< 10	< 0.0050	< 0.10	< 0.050	< 0.050	< 0.10	< 0.10	< 0.10	< 0.020	< 10	< 0.0050	< 0.10	< 0.10	< 0.20	< 0.050	< 1.0	< 0.0050	1.07	< 0.50	< 0.050	< 0.010	< 0.2	< 0.010	< 0.1	< 0.30	< 0.10	< 0.010	< 0.50	< 1.0

Associated ALS file(s): CG2213851, CG2214000.

All terms defined within the body of SNC-Lavalin's report.

< Denotes concentration less than indicated detection limit.

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QA/QC RPD Denotes quality assurance/quality control relative percent difference

* RPDs are not calculated where one or more concentrations are less than five times RDL.

RDL Denotes reported detection limit.

Table 5: Summary of Flow and Loading of Order Constituents in Michel Creek

Study Area Domain		Data Collection Points			Distance Downstream of Starting Point[1]		Flow Rate	Concentrations				Main Channel Instantaneous Load				Load Relative Change[2] (%)			
Tributary	Main	WQ Location ID		Sample Date	Main Channel	Tributary		Nitrate-N	Sulphate	Dissolved Selenium	Dissolved Nickel	Nitrate-N	Sulphate	Dissolved Selenium	Dissolved Nickel	Nitrate - N	Sulphate	Dissolved Selenium	Dissolved Nickel
		Main Channel	Tributary		km	km	L/s	mg/L	mg/L	ug/L	ug/L	mg/s	mg/s	mg/s	mg/s				
	Michel Creek	CM_FLA_MC01		2022 10 06	9.1		441	0.893	235	6.25	6.53	3.94E+05	1.04E+08	2759	2883				
Andy Good Creek →			CM_FLA_AG01	2022 10 06		8.7	190	0.1	19.9	2.19	< 0.50	2.42E+04	3.78E+06	416	95.1				
Tributary 6 →			CM_FLA_MC_TRIB06	2022 10 06		8.7	0.5	< 0.0050	180	0.717	< 0.50	3	9.00E+04	0.36	0.25				
		CM_FLA_MC02		2022 10 06	8.6		286	1.670	445	9.97	12.3	4.78E+05	1.27E+08	2855	3523	-22%	-21%	-16%	-20%
		CM_FLA_MC03		2022 10 06	7.9		292	1.670	443	9.72	13.8	4.88E+05	1.30E+08	2843	4036	-2%	-2%	0%	-13%
Corbin Creek →			CM_FLA_CC01	2022 10 04		6.9	145	3.40	766	21.2	43.6	4.92E+05	1.11E+08	3068	6309				
		CM_FLA_MC04		2022 10 04	6.8		108	< 0.0050	18.5	0.32	< 0.50	542	2.00E+06	34.7	54.2	-1%	15%	-8%	-37%
		CM_FLA_MC05		2022 10 04	5.7		122	< 0.0050	15.9	0.271	< 0.50	611	1.94E+06	33.1	61.1	-11%	3%	5%	-11%
		CM_FLA_MC06		2022 10 04	5.0		114	< 0.0050	13.9	0.248	< 0.50	572	1.59E+06	28.4	57.2	7%	22%	17%	7%
		CM_FLA_MC07		2022 10 05	4.4		120	0.008	13.6	0.256	< 0.50	976	1.64E+06	30.8	60.2	-41%	-3%	-8%	-5%
Tributary 2→			CM_FLA_MC_TRIB02	2022 10 05		4.0	2.3	0.1	310	2.8	< 0.50	132	7.13E+05	6.44	1.15				
		CM_FLA_MC08		2022 10 05	3.8		139	0.008	13.5	0.227	< 0.50	1040	1.87E+06	31.5	69.3	-17%	-37%	-19%	-15%
		CM_FLA_MC09		2022 10 05	2.5		97	0.007	13.1	0.267	< 0.50	700	1.27E+06	26.0	48.6	49%	47%	21%	43%
Tributary 4 →			CM_FLA_MC_TRIB04	2022 10 05		1.9	3.5	< 0.0050	13.8	0.216	< 0.50	18	4.83E+04	0.76	1.75				
		CM_FLA_MC10		2022 10 05	1.3		59	0.006	14.1	0.31	< 0.50	350	8.36E+05	18.4	29.6	91%	44%	36%	55%
Tributary 3 →			CM_FLA_MC_TRIB03	2022 10 05		0.9	2.0	0.02	81.2	0.231	< 0.50	44	1.65E+05	0.47	1.02				
Tributary 1 →			CM_FLA_MC_TRIB01	2022 10 05		0.6	41	0.02	12.1	0.394	< 0.50	901	4.95E+05	16.1	20.5				
		CM_FLA_MC11		2022 10 05	0.5		31	0.012	13.9	0.241	< 0.50	367	4.36E+05	7.57	15.7	-73%	-24%	-24%	-20%
Tributary 7 →			CM_FLA_MC_TRIB07	2022 10 06		0.2	0.2	0.02	24.8	0.09	< 0.50	3	4.22E+03	0.02	0.09				
		CM_FLA_MC12		2022 10 06	0.2		22	0.02	15	0.261	< 0.50	365	3.28E+05	5.70	10.9	0%	31%	32%	43%
		CM_FLA_MC13		2022 10 06	0.0		19	0.02	15	0.207	< 0.50	357	2.84E+05	3.91	9.45	2%	16%	46%	16%

Notes:

1) Starting point is the most upstream location (CM_FLA_MC13)

2) Relative change instantaneous loading was calculated as follows: (downstream – upstream – tributaries) / (upstream + tributaries) * 100% on the same date, where possible.

Table 6: Summary of Flow and Loading of Order Constituents in Corbin Creek

Study Area Domain		Data Collection Points			Distance Downstream of Starting Point[1]		Flow Rate	Concentrations				Main Channel Instantaneous Load				Load Relative Change[2] (%)			
Tributary	Main	WQ Location ID		Sample Date	Main Channel	Tributary		Nitrate-N	Sulphate	Dissolved Selenium	Dissolved Nickel	Nitrate-N	Sulphate	Dissolved Selenium	Dissolved Nickel	Nitrate-N	Sulphate	Dissolved Selenium	Dissolved Nickel
		Main Channel	Tributary		km	km	L/s	mg/L	mg/L	ug/L	ug/L	mg/s	mg/s	mg/s	mg/s				
	Corbin Creek ↑	CM_FLA_CC01		2022 10 04	2.7		145	3.40	766	21.2	43.6	4.92E+05	1.11E+08	3068	6309				
CC Tributary 1 →			CM_FLA_CC_TRIB01	2022 10 06		1.9	41	3.94	846	6.75	114	1.60E+05	3.44E+07	274	4634.1				
		CM_FLA_CC02		2022 10 04	1.7		84	4.10	920	34.0	28.1	3.46E+05	7.76E+07	2870	2372	-3%	-1%	-2%	-10%
		CM_FLA_CC03		2022 10 04	1.0		62	4.25	939	35.7	34.0	2.65E+05	5.86E+07	2228	2122	30%	33%	29%	12%
		CM_FLA_CC04		2022 10 04	0.0		62	4.56	1000	43.2	36.0	2.84E+05	6.22E+07	2686	2238	-6%	-6%	-17%	-5%

Notes:

1) Starting point is the most upstream location (CM_FLA_CC04)

2) Relative change instantaneous loading was calculated as follows: (downstream – upstream – tributaries) / (upstream + tributaries) * 100% on the same date, where possible.

Table 7: Summary of Flow and Loading of Order Constituents in Andy Good Creek

Data Collection Points		Distance Downstream of Starting Point[1]	Flow Rate	Concentrations				Main Channel Instantaneous Load				Load Relative Change[2] (%)			
WQ Location ID	Sample Date	Main Channel		Nitrate-N	Sulphate	Dissolved Selenium	Dissolved Nickel	Nitrate-N	Sulphate	Dissolved Selenium	Dissolved Nickel	Nitrate-N	Sulphate	Dissolved Selenium	Dissolved Nickel
Main Channel		km	L/s	mg/L	mg/L	ug/L	ug/L	mg/s	mg/s	mg/s	mg/s				
CM_FLA_AG01	2022 10 06	0.6	190	0.13	19.9	2.19	< 0.50	2.42E+04	3.78E+06	416	95				
CM_FLA_AG02	2022 10 06	0.0	366	0.12	20	2.25	< 0.50	4.43E+04	7.33E+06	824	183	-46%	-48%	-49%	-48%

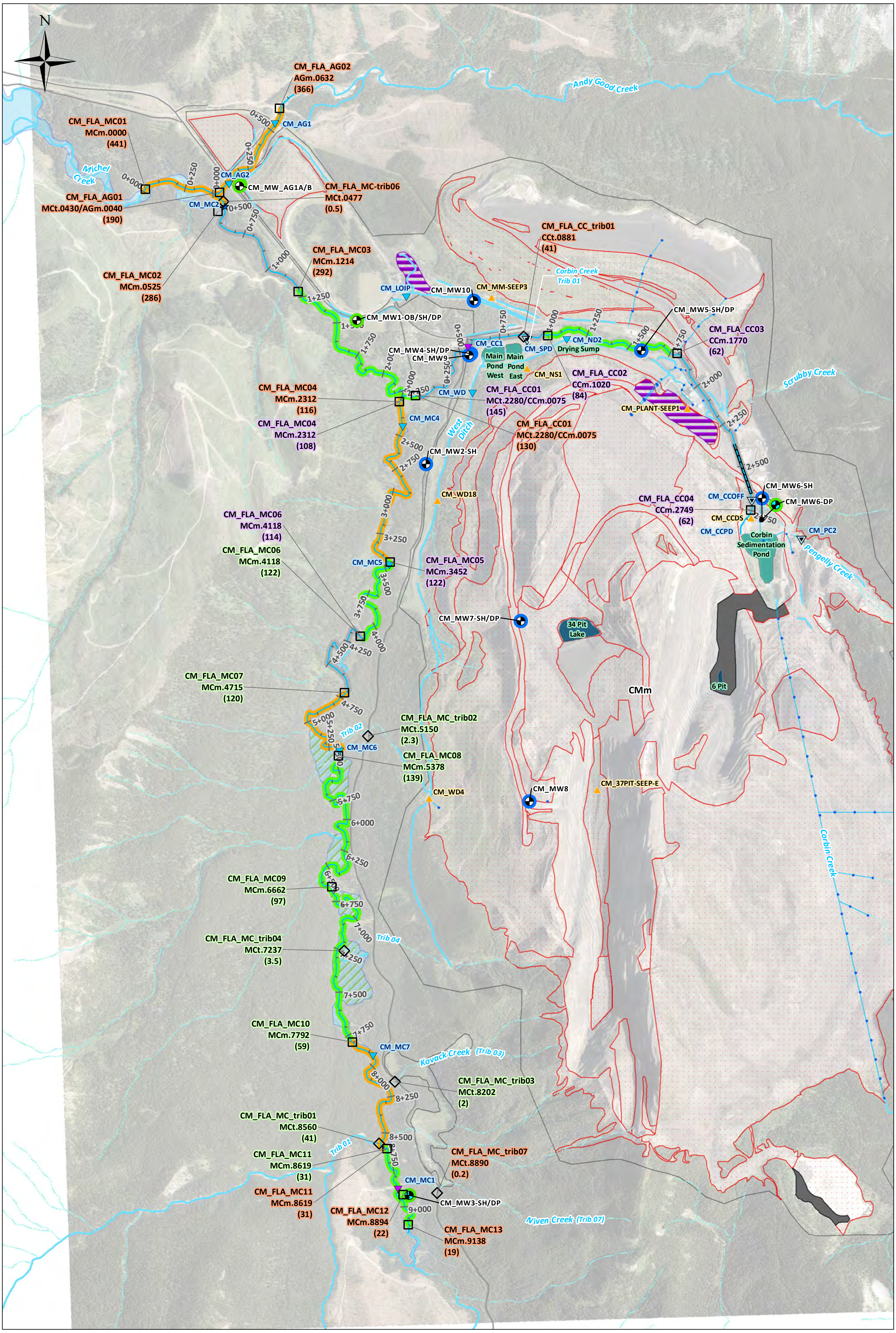
Notes:

1) Starting point is the most upstream location (CM_FLA_AG02)

2) Relative change instantaneous loading was calculated as follows: (downstream – upstream) / (upstream) * 100% on the same date, where possible.

Drawing

1: October 2022 Michel Creek Flow Accretion



Legend

- ☐ Main
- ◇ Tributary

Groundwater Stations

- ◓ Monitoring Well
- ◓ Background Monitoring Well
- 🔵 Well included in the SSGMP
- 🟢 Well included in both the RGMP and the SSGMP

Surface Water Stations

- ★ Compliance Point
- ▼ Receiving Environment
- ▽ Authorized Discharge
- ▼ Monitoring
- ▲ Seep

Flow Accretion

- 🟩 Gaining
- 🟧 Losing
- ⬜ No Change

- ▬ Inferred Pipe
- ▬ Stream + Stream Ditch
- ┈ Intermittent + Indefinite Stream
- ●— Subsurface
- ▬ Secondary Road
- 🟩 Tailings/Settling/ Sediment Pond
- 🟦 End-Pit Lake
- ⬛ Pit
- 🟪 Stockpiles
- 🟥 Waste Dump (Spoils)
- ☐ Mine Permitted Areas
- 🟦 Lake/River Bed
- ▨ Wetted Area/Wetland (Based on 1:20000 Scale)

Sample Name Abbreviations

CM: Coal Mountain
FLA: Flow Accretion
MC: Michel Creek
CC: Corbin Creek
AG: Andy Good Creek

CM_FLA_****	Flow Measured and/or Sampled on October 4, 2022
CM_FLA_****	Flow Measured and/or Sampled on October 5, 2022
CM_FLA_****	Flow Measured and/or Sampled on October 6, 2022

CM_FLA_MC13	SWQ Sample Name
MCm.8840	Site Name
(19)	Discharge (L/s)

Notes:
1. Original in colour.
2. Numerical scale reflects full-size print. Print scaling will distort this scale; however, scale bar will remain accurate.
3. Intended for illustration purposes. Accuracy has not been verified for construction or navigation.

References:
1. Data provided by Teck Coal Ltd.

Revisons:
0 - CW - 2023-01-30 - DRAFT - AC

0 125 250 500 Meters

PROJECT LOCATION:
Coal Mountain Mine,
Elk Valley, BC

CLIENT NAME:
Teck Coal Ltd.

SNC · LAVALIN

Oct 2022 Michel Creek, Corbin Creek and Andy Good Creek Flow Accretion

CHK'D: AC	DATE: 2023-03-22	SCALE: 1:20,000	Ref Num: REV: 0
BY: CW	COORD SYS: NAD 1983 UTM Zone 11N		DRAWING 1

MXD Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\GISCAD\GIS\Map Series\635544_2022_RGMPSSGMP_DrillingProgram\635544-1-CMm_FLA.mxd

Project Path: \\Sli4395\projects\Current Projects\Teck Coal Ltd\SPO\635544\4.0 Execution\4.5 GIS and Drawings\Exports\2022 RGMP SSGMP Drilling

Appendix I

Detailed Methodology

Detailed Methodology

Flow Accretion

Discharge measurements were taken along portions of Michel Creek, Andy Good Creek, Corbin Creek, and their tributaries. Based on the maximum number of measurements that could be collected within a day, the streams were divided into sub-reaches that had no obvious surface water quantity changes (e.g., no un-measured tributaries, no channel bifurcations). Water quality samples were taken in conjunction with flow measurement locations to support the quantification of mass loading.

A reach was defined as:

- **Gaining**: where flows increase downstream, discharging from the local aquifer;
- **Losing**: where flows decrease downstream, recharging the local aquifer; or
- **Stable**: where there is no apparent change in flow.

Categorization of reaches as gaining, losing, and stable was primarily based on the trend in discharge versus chainage. Typically, if the flow change between two locations (accounting for tributary additions) exceeds the accuracy of the measurement (ranging between 1% to 5%), the stream is characterized as gaining or losing; otherwise, it is characterized as stable. The influence of field conditions on our assessments, both dynamic (such as weather) and static, (such as geomorphological conditions) were managed as much as possible by the timing and location of field measurements. Key factors that were observed in the field and managed to the best of our ability include but are not limited to:

- **Measurement method accuracy**: This was managed through high standards of measurement accuracy and repeat measurements;
- **Fluvial geomorphological conditions**: Geomorphology can be a strong indicator of the opportunity for gaining and losing reaches. This was managed by the selection of key locations in the evolution of the river's planform;
- **Water chemistry**: Changes in electrical conductivity (EC) and pH can be an indicator of different source of water. This was managed where changes in EC were identified and attempts to measure upstream and downstream of the locations were undertaken;
- **General site observations**: Visual indications of gaining and losing such as seeps, springs, overland flow going to ground etc. were observed. This was managed though documenting and quantifying/estimating visual changes where possible; and
- **Weather and hydrology**: Rainfall, melting snow, increase in catchment area are all potential contributors to changes in surface flows. This was managed by minimising the timing between neighbouring measurements, avoiding melting or rainfall periods, and measuring changes in water levels at a constant location throughout the field program.

The categorization of gaining, losing, and stable reaches presented in this report is driven by flow measurements and supported by the surficial factors listed above. Interpretation of groundwater-surface water interactions is complex and is best undertaken by a weight-of-evidence approach integrating surface and subsurface factors as well as temporal variability. Other potential factors influencing groundwater-surface water interactions, such as bedrock depths, fractures/faults, regional aquifer seasonality, vertical hydraulic gradients, and preferential subsurface flow paths, are not included in this interpretation. The interpretations and observations of this report should be considered in conjunction with geological and hydrogeological assessments to provide context for surface water gains and/or losses to/from watercourses.

Naming Conventions

SNC-Lavalin's flow measurement locations are identified by the site name followed by the chainage using the naming convention: **XXy**.***Chainage.***

Where:

- XX represents the creek, river, or side channel name abbreviation;
- y is a description of the location along the stream; and
- Chainage is a numeric value representing the distance in metres upstream from the most downstream measurement on Michel Creek.

This naming convention allows for sites to be labeled sequentially based on their location and means the order of sites will not be interrupted if sites are moved or added during later programs. Table I-2 summarizes the abbreviations that identify the flow accretion studies site names and water quality sample name.

Table I-2: Flow Accretion Site Name Abbreviations Summary

Abbreviated Creek Name (XX)	Creek Name
MC	Michel Creek
AG	Andy Good Creek
CC	Corbin Creek
Abbreviated Location (y)	**Location Along Creek**
m	Main Channel
t	Tributary

Water quality sample names for the flow accretion study are identified by the operations name, study type, river name, and numbered sequentially **OO_FLA_RIVERNAME##**

Where:

- OO represents the Teck Operations;
- FLA stands for flow/loading accretion study;
- RIVERNAME is the creek name abbreviation; and
- ## is a sequential number.

This naming convention follows the requested format and is consistent with different sample programs. Table I-3 summarizes the abbreviations that identify the flow accretion water quality site names.

Table I-3: Flow Accretion Water Quality Sampling Names Abbreviations Summary

Abbreviated Operation (OO)	Operation Name
RG	Regional Operations
CM	Coal Mountain Mine
Abbreviated River name (RIVERNAME)	**River Name**
MC	Michel Creek
AG	Andy Good Creek
CC	Corbin Creek

Discharge Measurement Methods

Discharge at incremental locations along the study reaches was measured using a variety of methods, as described herein. Methods to calculate discharge were chosen depending on the site characteristics and engineering judgement. Repeated readings were taken using the same measurement method and averaged when readings were taken on the same day. Where discharge measurements were collected over multiple days, repeat discharge measurements were taken to assess day over day variation. Relevant procedures outlined in the Manual of British Columbia Hydrometric Standards (BC Ministry of Environment and Climate Change Strategy [ENV] 2018) were followed.

Estimate Method

The estimate method is used to provide order of magnitude contextual assessments when other quantitative methods cannot be applied. Typically, this occurs in tributary flow paths where: flows are much less than main channel flows; flow paths are not channelized; flow is moving through rock, soil, or vegetation; and/or the distance between source and mixing with another channel is shorter than other discharge methods allow. The estimation can be completed by attempting to capture all or a portion of the flow using the volumetric method and then approximating the portion that was not captured. As a part of every measurement, field personnel estimate flows visually prior to quantification to train their estimation skills.

Salt-Tracer Method

The salt-tracer method, commonly referred to as dilution gauging, is a discharge measurement method that involves dosing a stream with a known mass of salt and measuring its dilution. The salt is injected sufficiently far upstream of the measurement site to ensure complete mixing in both the vertical and horizontal directions has been accomplished. A probe measuring conductivity at the measurement site records the concentration and time it takes for the slug of salt to travel through, which can be used to calculate the discharge. This method is well-suited for turbulent, shallower streams.

The instrument used to measure discharge with the salt-tracer method is called a Sommer Messtechnik TQ-S. The data recorded were linked to field computers to process discharge results simultaneously.

Velocity-Area Method

The velocity-area method, commonly referred to as the current meter method, is used to assess the discharge using the velocity and cross-sectional area of a stream. The instrument used to measure the velocity was an Acoustic Doppler Velocimeter (ADV), which involves dividing a cross section into panels across the stream, manually measuring the width, depth, and point velocity in each one. The ADV requires at least 0.15 m depth, relatively straight flow lines, and the user to measure width and depth.

The instrument used to measure velocity and calculate discharge was the Flow Tracker2 Handheld ADV.

Volumetric Method

The volumetric method, commonly referred to as the bucket method, is used to assess the discharge by timing how long it takes to fill a specified volume of water. This method works for smaller flows concentrated in a single location taking about 5 to 10 seconds to fill a bucket. It is important to ensure the total flow passes through one point (e.g., a culvert) and no flow bypasses the measurement location.

Water Level Measurement Methods

Water level data loggers use sensors to measure the water pressure above the device, which is converted to water level equivalent measurements. The pressure measurements are corrected with barometric pressure measurements on a separate barologger device installed nearby. If several varying discharge measurements are collected for varying water levels, a rating curve can be established to relate water level to discharge. However, for this study, the fluctuations in water level were simply used to represent fluctuations in discharge, which was not quantified.

The instruments used to measure water level pressure and barometric pressure were the Solinst® Levelogger Edge (Model 3001) and Solinst® Barologger Edge (Model 3001).

Appendix II

Quality Assurance / Quality Control (QA/QC)

Quality Assurance/Quality Control

SNC-Lavalin QA/QC Procedures

Quality Assurance/Quality Control (QA/QC) measures were instituted in accordance with SNC-Lavalin Inc.'s (SNC-Lavalin's) Preferred Operating Procedures (POPs), the British Columbia Field Sampling Manual[1], and Teck's Standard Practice and Procedures (SP&P).

SNC-Lavalin personnel followed internally established QA/QC protocols for field activities and reviewed QA/QC programs implemented by the laboratories. The QA/QC assessment completed for the surface water sampling included reviewing shipping and handling, summarizing results of relative percent differences (RPDs) from duplicate samples, and any detection of analytes in field blanks. A summary of QA/QC methods and results of the QA/QC programs are summarized in the following sections.

Shipping and Handling

Shipping and handling QA/QC includes assessment of sample integrity upon arrival at the laboratory and analysis hold time exceedances. Sample integrity observations are documented by the laboratory upon receipt of the sample and may include elevated sample temperature, bottle damage, or labelling errors.

There were no shipping and handling issues identified for any of the samples collected with the exception of laboratory measured pH and ORP. All laboratory measured pH and ORP exceeded a hold time of 15 minutes. These parameters are also measured in the field, which provides a more reliable measurement.

Duplicate Samples

Duplicate samples were collected to determine sampling precision and submitted to the laboratory at a minimum frequency of at least one per ten samples during sampling events. Analytical precision was evaluated by calculating the RPD between the results of each sample and its associated duplicate. The RPD of the concentration between the sample and duplicate is calculated as follows:

$$RPD = \frac{|sample\ 1 - sample\ 2|}{\frac{1}{2}(sample\ 1 + sample\ 2)} \times 100\%$$

RPDs are calculated for parameters where at least one of the samples was greater than five times the laboratory detection limit; an RPD of less than 20% for metals and inorganics is considered as an acceptable level of precision per the British Columbia Field Sampling Manual[1]. Teck have a QA/QC program based on this manual; where the result is less than five times the detection limit, the acceptable RPD will be modified as follows:

- RPD < 20%: Acceptable;
- RPD ≥ 20% with value > 5 times the DL: Possible problem; and
- RPD > 50% with results > 5 times the DL: Definite problem, most likely sample contamination or lack of sample representativeness.

---

[1] Clark, M.J.R., 2013. British Columbia Field Sampling Manual: 2013 – For Continuous Monitoring plus the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples. Water, Air and Climate Change Branch, Ministry of Water, Land and Air Protection, Victoria, BC, Canada. 344 pp.

During the October 2022 flow accretion event, a total of two duplicate samples were collected from Michel Creek. All RPDs calculated were less than the acceptable levels (RPD less than the data quality objective of 20% and less than 5 times the DL), apart from the following at CM_FLA_MC02:

- The total aluminum RDP was 27%; and
- The dissolved molybdenum RDP was 66%.

As the data was not compared to any screening criteria, these elevated RPDs have not affected the data interpretation. The aluminum RPDs was only marginally greater than the 20% data quality objective. RPDs greater than the data quality objective were not interpreted to indicate contamination or lack of sample representativeness, based on the evaluation of other RPDs calculated between the sample and the associated duplicate. Overall, these results indicated a good sampling program with low variability in constituent concentrations from sampling and handling.

Blanks

Field and trip blanks were processed and submitted for analysis as part of each sampling event. Teck's standard practice for collecting field blank samples is to open a designated field blank sample bottle pre-filled with ultra-pure de-ionized (DI) water and preservative (where applicable) at the sampling site during regular sample collection. Field blanks provide information on contamination resulting from the handling technique and exposure to ambient air. For dissolved parameters (i.e., dissolved metals and dissolved organic carbon), field blanks are collected by passing laboratory-supplied DI water through a filter and collecting the sample. The sample is subsequently preserved in the same manner as the original samples, replicating the sampling protocol. Blanks from the dissolved parameters provide information on contamination results from potential residue remaining on the filter, which may result in sample bias.

Standard practice for trip blanks includes delivery of a sample set from the laboratory pre-filled with ultra-pure DI water and preservative (where applicable), which are kept in a cooler (with the other samples) and are unopened throughout the sampling trip. Trip blanks are meant to detect widespread contamination from the container and preservative during transport and storage. Field and trip blanks were shipped to the laboratory with routine samples and screened for analyte detections.

One field blank set was filled, and one trip blank set was obtained to support the quality control program. Most parameters were below the detection limit in the field blank sample. Exceptions included:

- Total parameters: barium, calcium, copper, sodium, and tin; and
- Dissolved parameters: sodium, copper, molybdenum, and tin.

All the parameters, except for dissolved molybdenum, were less than the detection limit for the trip blank sample. Dissolved molybdenum concentration was 1.07 µg/L which was 21 times the detection limit of 0.050 µg/L. Due to the high concentrations of molybdenum in the trip blank and the poor reproducibility for dissolved molybdenum (with RPD of 66%), the dissolved molybdenum results may be suspect. However, given that molybdenum is not an order constituent and there are no antiscalent activities occurring as part of CMm operations (antiscalent activities could be be a source of molybdenum-derived impacts to water quality), the unreliability of this parameter does not affect the overall interpretation of results.

Laboratory QA/QC

ALS Environmental (ALS) conducted routine internal QA/QC and reported these results as analyte qualifiers alongside the sample analysis results. SNC-Lavalin reviewed the qualifiers and considered them in the context of the other QA/QC analyses in evaluating their potential effects on the groundwater quality data.

The detailed results of laboratory QA/QC are included in COAs in Appendix III. The Quality Control Reports noted the following for some samples: DLDS, DTC, TKNI, RRV, and HTD:

- DLDS: (Detection Limit Raised) Dilution required due to high Dissolved Solids / Electrical Conductivity.
- DTC: dissolved concentration exceeds total. Results were confirmed by re-analysis.
- TKNI: TKN result may be biased low due to nitrate interference.
- RRV: reported result verified by repeat analysis.

These notes are not unusual for these analyses considering the chemistry of the samples that reflects a mine-influenced surface water (i.e., select samples have high total dissolved solids or nitrate concentrations). The results of the laboratory QA/QC were acceptable for the purpose of this assessment. A review of the quality assurance portion of the laboratory analytical reports did not identify any additional QA/QC issues.

Summary

Based on a review of the analytical results, including the QAQC program results, the data collected are considered sufficient and reliable to support the program objectives. Two surface water duplicate samples were collected during the October 2022 event. Of the numerous inorganic and organic parameters analyzed for this program, relative percent differences (RPDs) were less than 20% for most parameters, except total aluminum and dissolved molybdenum for the duplicate sample collected at CM_FLA_MC02. Neither aluminum nor molybdenum are considered primary OCs.

Most parameters were below the detection limit in the field blank sample. All the parameters, except for dissolved molybdenum, were less than the detection limit for the trip blank sample. Due to the high concentrations of molybdenum in the trip blank and the poor reproducibility for dissolved molybdenum (with RPD of 66%), the dissolved molybdenum results may be suspect. However, given that molybdenum is not an order constituent and there are no antiscalent activities occurring as part of CMm operations (antiscalent activities could be a source of molybdenum-derived impacts to water quality), the unreliability of this parameter does not affect the overall interpretation of results.

Appendix III

Environmental Setting Figures

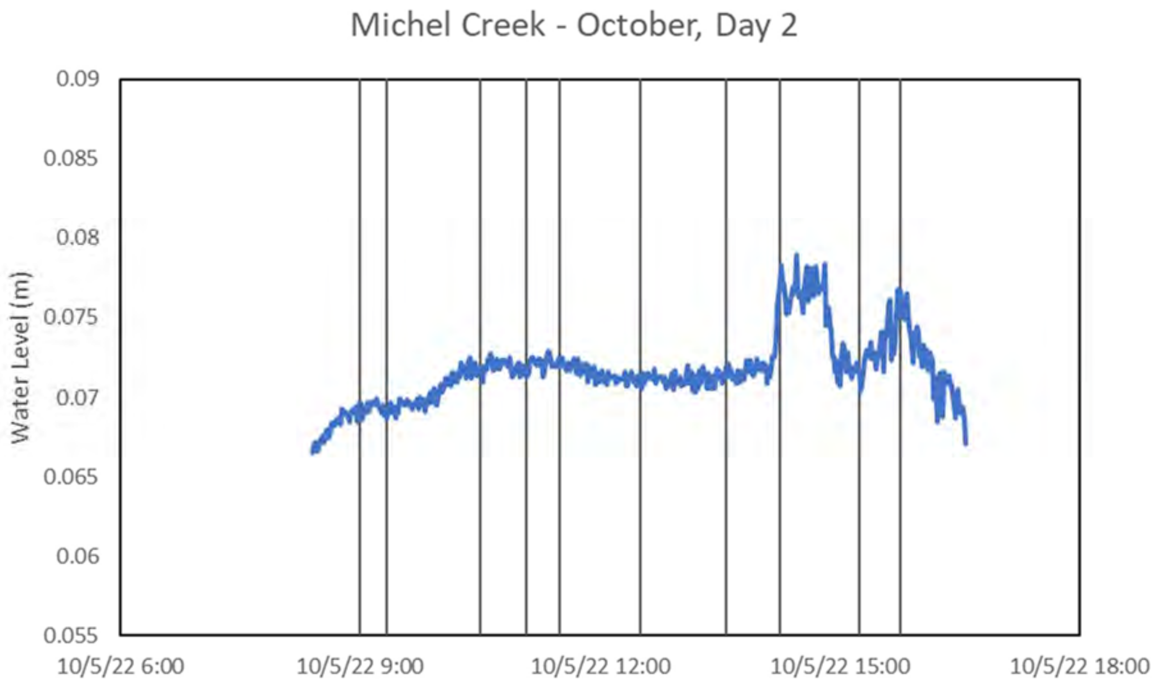


Figure III-A: Michel Creek water levels upstream of Corbin Creek confluence near MCm.2312 (CM_FLA_MC04) on October 5, 2022 (discharge measurements at black lines).

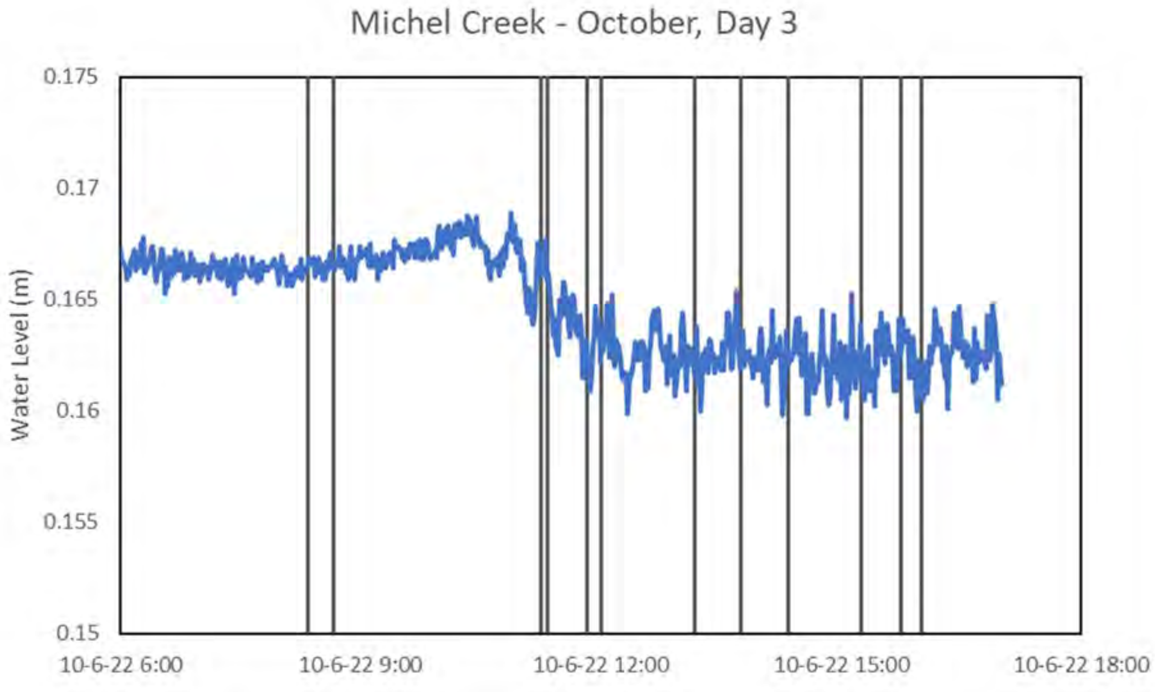
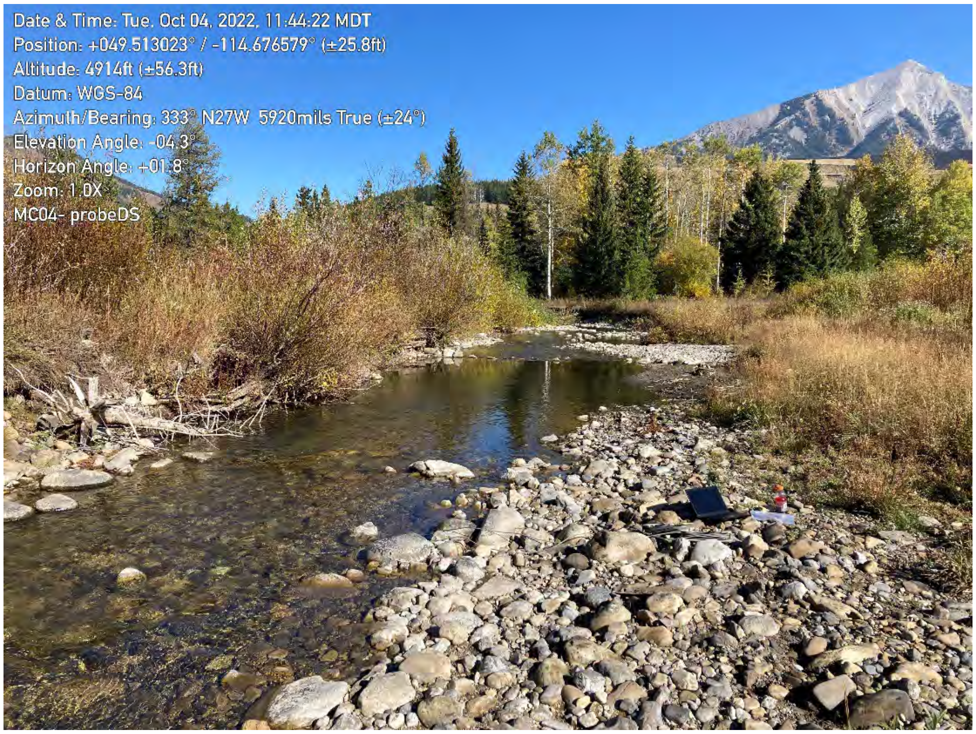


Figure III-B: Michel Creek water levels downstream of Corbin Creek confluence near MCm.2312 (CM_FLA_MC04) on October 6, 2022 (discharge measurements at black lines).

Appendix IV

Photographs

Photograph 1: Michel Creek at CM_FLA_MC01. View from the left bank facing downstream towards the west.



Photograph 2: Michel Creek at CM_FLA_MC04. View from the right bank facing downstream towards the north.

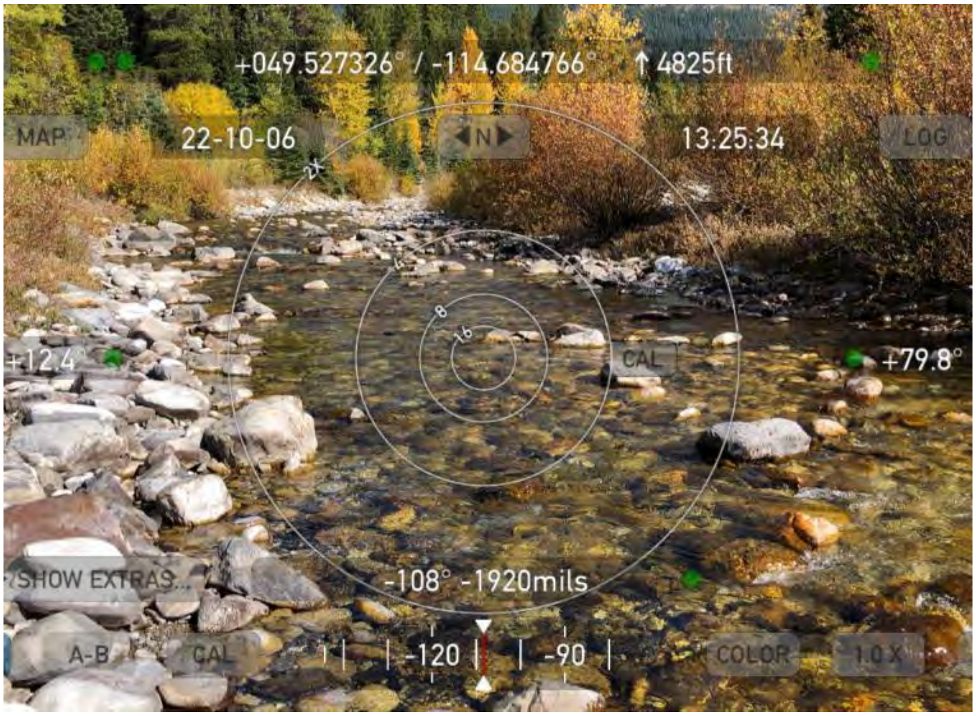
Photograph 3: Michel Creek at CM_FLA_MC06. View from the right bank facing upstream towards the northwest.

Photograph 4: Michel Creek at CM_FLA_MC09. View from the right bank facing upstream towards the south.

Photograph 5: Michel Creek at CM_FLA_MC11 in July 2021. View from the left bank facing upstream towards the south.

Photograph 6: Michel Creek at CM_FLA_MC13. View from the left bank facing downstream towards the north.

Photograph 7: Corbin Creek at CC_FLA_CC01. View facing the left bank towards the south from the right bank.



Photograph 8: Andy Good Creek at CM_FLA_AG02. View upstream towards the northeast.

Photograph 9: Main Pond East outlet at CM_FLA_CC_Trib01. View upstream towards the southeast.

Appendix V

Certificates of Analysis

CERTIFICATE OF ANALYSIS

Work Order	: **CG2213784**	Page	: 1 of 10
Amendment	: **2**		
Client	: **SNC-Lavalin Inc.**	Laboratory	: Calgary - Environmental
Contact	: Ronald Salomonson	Account Manager	: Lovepreet Kaur
Address	: 640 5th Avenue SW Calgary AB Canada T2P 3G4	Address	: 2559 29th Street NE Calgary AB Canada T1Y 7B5
Telephone	: ----	Telephone	: +1 403 407 1800
Project	: Coal Mountain Operations	Date Samples Received	: 05-Oct-2022 09:00
PO	: 692207	Date Analysis Commenced	: 06-Oct-2022
C-O-C number	: CMO FLA October 4th 2022	Issue Date	: 02-Feb-2023 16:55
Sampler	: ----		
Site	: ----		
Quote number	: TECK Coal codes		
No. of samples received	: 7		
No. of samples analysed	: 7		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Anthony Calero	Supervisor - Inorganic	Inorganics, Calgary, Alberta
Anthony Calero	Supervisor - Inorganic	Metals, Calgary, Alberta
Elke Tabora		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Kevin Baxter	Team Leader - Inorganics	Metals, Calgary, Alberta
Mackenzie Lamoureux	Laboratory Analyst	Metals, Calgary, Alberta
Millicent Brentnall	Laboratory Analyst	Metals, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sara Niroomand		Metals, Calgary, Alberta

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
mV	millivolts
NTU	nephelometric turbidity units
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*
DTC	*Dissolved concentration exceeds total. Results were confirmed by re-analysis.*
TKNI	*TKN result may be biased low due to Nitrate interference. Nitrate-N is > 10x TKN.*

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	CM_FLA_CC01_WS_2022-10-04_NP	CM_FLA_CC02_WS_2022-10-04_NP	CM_FLA_CC03_WS_2022-10-04_NP	CM_FLA_CC04_WS_2022-10-04_NP	CM_FLA_MC04_WS_2022-10-04_NP
Client sampling date / time					04-Oct-2022 09:45	04-Oct-2022 12:12	04-Oct-2022 13:59	04-Oct-2022 15:05	04-Oct-2022 09:45
					CG2213784-001	CG2213784-002	CG2213784-003	CG2213784-004	CG2213784-005
					Result	Result	Result	Result	Result
Physical Tests									
Acidity (as CaCO3)	----	E283	2.0	mg/L	3.3	3.2	5.7	6.0	<2.0
Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	288	340	361	374	155
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	351	414	440	456	189
Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	3.6
Alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	2.2
Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	288	340	361	374	159
Conductivity	----	E100	2.0	µS/cm	1510	1690	1740	1830	290
Hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	996	1160	1280	1320	161
Oxidation-reduction potential [ORP]	----	E125	0.10	mV	299	302	304	307	307
pH	----	E108	0.10	pH units	8.20	8.24	8.19	8.13	8.36
Solids, total dissolved [TDS]	----	E162	10	mg/L	1260	1400	1550	1650	160
Solids, total suspended [TSS]	----	E160-L	1.0	mg/L	1.1	1.8	3.9	2.7	<1.0
Turbidity	----	E121	0.10	NTU	0.58	0.47	0.77	1.00	0.47
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0050	<0.0050	<0.0050	0.0115	<0.0050
Bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.250 DLDS	<0.250 DLDS	<0.250 DLDS	<0.250 DLDS	<0.050
Chloride	16887-00-6	E235.Cl-L	0.10	mg/L	4.23	1.64	1.27	1.14	0.32
Fluoride	16984-48-8	E235.F	0.020	mg/L	0.203	0.141	0.125	0.149	0.081
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.222 TKNI	0.105 TKNI	0.275 TKNI	0.330 TKNI	<0.050
Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	3.40	4.10	4.25	4.56	<0.0050
Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0238	0.0105	0.0119	0.0165	<0.0010
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	0.0041	<0.0020	0.0027	0.0042
Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	766	920	939	1000	18.5
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	0.88	0.98	0.78	0.99	<0.50

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	CM_FLA_CC01_WS_2022-10-04_NP	CM_FLA_CC02_WS_2022-10-04_NP	CM_FLA_CC03_WS_2022-10-04_NP	CM_FLA_CC04_WS_2022-10-04_NP	CM_FLA_MC04_WS_2022-10-04_NP
				Client sampling date / time	04-Oct-2022 09:45	04-Oct-2022 12:12	04-Oct-2022 13:59	04-Oct-2022 15:05	04-Oct-2022 09:45
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2213784-001**	**CG2213784-002**	**CG2213784-003**	**CG2213784-004**	**CG2213784-005**
					Result	Result	Result	Result	Result
Organic / Inorganic Carbon									
Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	0.82	0.79	0.98	0.81	0.55
Ion Balance									
Anion sum	----	EC101	0.10	meq/L	22.1	26.3	27.1	28.7	3.58
Cation sum	----	EC101	0.10	meq/L	21.2	24.0	26.5	27.2	3.35
Ion balance (cations/anions)	----	EC101	0.010	%	95.9	91.2	97.8	94.8	93.6
Ion balance (APHA)	----	EC101	0.010	%	2.08	4.57	1.12	2.68	3.32
Total Metals									
Aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0049	0.0067	0.0096	0.0171	0.0088
Antimony, total	7440-36-0	E420	0.00010	mg/L	0.00034	0.00026	0.00027	0.00027	<0.00010
Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00025	0.00019	0.00020	0.00017	0.00013
Barium, total	7440-39-3	E420	0.00010	mg/L	0.0488	0.0334	0.0308	0.0272	0.0843
Beryllium, total	7440-41-7	E420	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron, total	7440-42-8	E420	0.010	mg/L	0.068	0.047	0.049	0.051	0.012
Cadmium, total	7440-43-9	E420	0.0050	µg/L	0.0466	0.0857	0.156	0.643	0.0071
Calcium, total	7440-70-2	E420	0.050	mg/L	220	232	258	280	46.7
Chromium, total	7440-47-3	E420.Cr-L	0.00010	mg/L	0.00012	0.00014	0.00011	0.00014	0.00019
Cobalt, total	7440-48-4	E420	0.10	µg/L	2.24	0.13	0.21	0.30	<0.10
Copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Iron, total	7439-89-6	E420	0.010	mg/L	<0.010	<0.010	0.010	0.026	0.013
Lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium, total	7439-93-2	E420	0.0010	mg/L	0.0356	0.0257	0.0278	0.0282	0.0035
Magnesium, total	7439-95-4	E420	0.0050	mg/L	125	156	168	175	13.5
Manganese, total	7439-96-5	E420	0.00010	mg/L	0.00962	0.00136	0.00307	0.00627	0.00164
Mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.00130	0.000776 DTC	0.000741	0.000701 DTC	0.000705
Nickel, total	7440-02-0	E420	0.00050	mg/L	0.0482	0.0318	0.0371	0.0424	<0.00050
Potassium, total	7440-09-7	E420	0.050	mg/L	3.61	3.56	3.84	4.01	0.446
Selenium, total	7782-49-2	E420	0.050	µg/L	16.0	33.0	34.2	32.8	0.283

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	**CM_FLA_CC01_WS_2022-10-04_NP**	**CM_FLA_CC02_WS_2022-10-04_NP**	**CM_FLA_CC03_WS_2022-10-04_NP**	**CM_FLA_CC04_WS_2022-10-04_NP**	**CM_FLA_MC04_WS_2022-10-04_NP**
				Client sampling date / time	04-Oct-2022 09:45	04-Oct-2022 12:12	04-Oct-2022 13:59	04-Oct-2022 15:05	04-Oct-2022 09:45
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2213784-001**	**CG2213784-002**	**CG2213784-003**	**CG2213784-004**	**CG2213784-005**
					Result	Result	Result	Result	Result
Total Metals									
Silicon, total	7440-21-3	E420	0.10	mg/L	2.46	2.22	2.28	2.25	2.39
Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium, total	7440-23-5	E420	0.050	mg/L	27.2	18.8	20.0	19.8	2.82
Strontium, total	7440-24-6	E420	0.00020	mg/L	0.787	0.613	0.650	0.688	0.152
Sulfur, total	7704-34-9	E420	0.50	mg/L	286	332	348	368	7.14
Thallium, total	7440-28-0	E420	0.000010	mg/L	0.000043	0.000045	0.000051	0.000059	<0.000010
Tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	0.00035	0.00032	<0.00030
Uranium, total	7440-61-1	E420	0.000010	mg/L	0.00606	0.00786	0.00827	0.00911	0.000328
Vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0.0094	0.0437	<0.0030
Dissolved Metals									
Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	<0.0010	0.0013	0.0013	0.0012	<0.0010
Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00038	0.00027	0.00028	0.00030	<0.00010
Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00026	0.00021	0.00021	0.00024	0.00014
Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0503	0.0314	0.0306	0.0248	0.0771
Beryllium, dissolved	7440-41-7	E421	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron, dissolved	7440-42-8	E421	0.010	mg/L	0.073	0.054	0.054	0.056	0.012
Cadmium, dissolved	7440-43-9	E421	0.0050	µg/L	0.0348	0.0747	0.136	0.595	0.0057
Calcium, dissolved	7440-70-2	E421	0.050	mg/L	214	240	260	281	44.5
Chromium, dissolved	7440-47-3	E421.Cr-L	0.00010	mg/L	0.00018	0.00012	0.00010	0.00012	0.00014
Cobalt, dissolved	7440-48-4	E421	0.10	µg/L	2.15	0.12	0.19	0.28	<0.10
Copper, dissolved	7440-50-8	E421	0.00020	mg/L	<0.00020	0.00020	0.00024	0.00025	<0.00020
Iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0373	0.0282	0.0287	0.0299	0.0036
Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	112	135	152	149	12.1
Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00776	0.00121	0.00252	0.00499	0.00106

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	CM_FLA_CC01_WS_2022-10-04_NP	CM_FLA_CC02_WS_2022-10-04_NP	CM_FLA_CC03_WS_2022-10-04_NP	CM_FLA_CC04_WS_2022-10-04_NP	CM_FLA_MC04_WS_2022-10-04_NP
				Client sampling date / time	04-Oct-2022 09:45	04-Oct-2022 12:12	04-Oct-2022 13:59	04-Oct-2022 15:05	04-Oct-2022 09:45
Analyte	CAS Number	Method	LOR	Unit	CG2213784-001	CG2213784-002	CG2213784-003	CG2213784-004	CG2213784-005
					Result	Result	Result	Result	Result
Dissolved Metals									
Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00126	0.00176 DTC	0.000768	0.00166 DTC	0.000730
Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.0436	0.0281	0.0340	0.0360	<0.00050
Potassium, dissolved	7440-09-7	E421	0.050	mg/L	3.97	3.73	4.12	4.14	0.468
Selenium, dissolved	7782-49-2	E421	0.050	µg/L	21.2	34.0	35.7	43.2	0.320
Silicon, dissolved	7440-21-3	E421	0.050	mg/L	2.65	2.35	2.44	2.32	2.28
Silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium, dissolved	7440-23-5	E421	0.050	mg/L	28.2	18.9	20.6	19.6	2.84
Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.782	0.638	0.659	0.673	0.153
Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	219	252	271	274	6.18
Thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000037	0.000042	0.000048	0.000053	<0.000010
Tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00587	0.00747	0.00796	0.00857	0.000265
Vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0014	0.0022	0.0099	0.0427	<0.0010
Dissolved mercury filtration location	----	EP509	-	-	Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	Field	Field

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	**CM_FLA_MC05_WS_2022-10-04_NP**	**CM_FLA_MC06_WS_2022-10-04_NP**	----	----	----
				Client sampling date / time	04-Oct-2022 13:15	04-Oct-2022 15:20	----	----	----
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2213784-006**	**CG2213784-007**	--------	--------	--------
					Result	Result	----	----	----
Physical Tests									
Acidity (as CaCO3)	----	E283	2.0	mg/L	<2.0	<2.0	----	----	----
Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	158	162	----	----	----
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	192	198	----	----	----
Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	3.2	2.8	----	----	----
Alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	1.9	1.7	----	----	----
Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	----	----	----
Alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	<1.0	----	----	----
Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	161	165	----	----	----
Conductivity	----	E100	2.0	µS/cm	284	277	----	----	----
Hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	155	153	----	----	----
Oxidation-reduction potential [ORP]	----	E125	0.10	mV	310	312	----	----	----
pH	----	E108	0.10	pH units	8.34	8.33	----	----	----
Solids, total dissolved [TDS]	----	E162	10	mg/L	156	160	----	----	----
Solids, total suspended [TSS]	----	E160-L	1.0	mg/L	<1.0	<1.0	----	----	----
Turbidity	----	E121	0.10	NTU	0.35	0.39	----	----	----
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	----	----	----
Bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	<0.050	----	----	----
Chloride	16887-00-6	E235.Cl-L	0.10	mg/L	0.30	0.28	----	----	----
Fluoride	16984-48-8	E235.F	0.020	mg/L	0.081	0.081	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	<0.050	<0.050	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0050	<0.0050	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	----	----	----
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0028	0.0034	----	----	----
Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0038	0.0045	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	15.9	13.9	----	----	----
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	0.70	<0.50	----	----	----
Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	<0.50	0.57	----	----	----

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	**CM_FLA_MC05_WS_2022-10-04_NP**	**CM_FLA_MC06_WS_2022-10-04_NP**	----	----	----
				Client sampling date / time	04-Oct-2022 13:15	04-Oct-2022 15:20	----	----	----
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2213784-006**	**CG2213784-007**	--------	--------	--------
					Result	Result	----	----	----
Ion Balance									
Anion sum	----	EC101	0.10	meq/L	3.56	3.60	----	----	----
Cation sum	----	EC101	0.10	meq/L	3.22	3.17	----	----	----
Ion balance (cations/anions)	----	EC101	0.010	%	90.4	88.0	----	----	----
Ion balance (APHA)	----	EC101	0.010	%	5.01	6.35	----	----	----
Total Metals									
Aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0088	0.0076	----	----	----
Antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----
Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00020	0.00017	----	----	----
Barium, total	7440-39-3	E420	0.00010	mg/L	0.0762	0.0769	----	----	----
Beryllium, total	7440-41-7	E420	0.020	µg/L	<0.020	<0.020	----	----	----
Bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	----	----	----
Boron, total	7440-42-8	E420	0.010	mg/L	0.010	0.010	----	----	----
Cadmium, total	7440-43-9	E420	0.0050	µg/L	0.0144	0.0107	----	----	----
Calcium, total	7440-70-2	E420	0.050	mg/L	43.8	42.2	----	----	----
Chromium, total	7440-47-3	E420.Cr-L	0.00010	mg/L	0.0218	0.00028	----	----	----
Cobalt, total	7440-48-4	E420	0.10	µg/L	<0.10	<0.10	----	----	----
Copper, total	7440-50-8	E420	0.00050	mg/L	0.00107	<0.00050	----	----	----
Iron, total	7439-89-6	E420	0.010	mg/L	0.156	0.011	----	----	----
Lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	----	----	----
Lithium, total	7439-93-2	E420	0.0010	mg/L	0.0031	0.0031	----	----	----
Magnesium, total	7439-95-4	E420	0.0050	mg/L	13.2	13.6	----	----	----
Manganese, total	7439-96-5	E420	0.00010	mg/L	0.00392	0.00219	----	----	----
Mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	----	----	----
Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000792	0.000742 DTC	----	----	----
Nickel, total	7440-02-0	E420	0.00050	mg/L	0.00059	<0.00050	----	----	----
Potassium, total	7440-09-7	E420	0.050	mg/L	0.460	0.485	----	----	----
Selenium, total	7782-49-2	E420	0.050	µg/L	0.300	0.183	----	----	----
Silicon, total	7440-21-3	E420	0.10	mg/L	2.37	2.42	----	----	----
Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	----	----	----

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	**CM_FLA_MC05 _WS_2022-10-04_NP**	**CM_FLA_MC06 _WS_2022-10-04_NP**	----	----	----
				Client sampling date / time	04-Oct-2022 13:15	04-Oct-2022 15:20	----	----	----
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2213784-006**	**CG2213784-007**	--------	--------	--------
					Result	Result	----	----	----
Total Metals									
Sodium, total	7440-23-5	E420	0.050	mg/L	2.47	2.49	----	----	----
Strontium, total	7440-24-6	E420	0.00020	mg/L	0.142	0.147	----	----	----
Sulfur, total	7704-34-9	E420	0.50	mg/L	5.91	5.40	----	----	----
Thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	----	----	----
Tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----
Titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	----	----	----
Uranium, total	7440-61-1	E420	0.000010	mg/L	0.000267	0.000270	----	----	----
Vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	----	----	----
Zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	----	----	----
Dissolved Metals									
Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	<0.0010	0.0016	----	----	----
Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	----	----	----
Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00012	0.00013	----	----	----
Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0752	0.0753	----	----	----
Beryllium, dissolved	7440-41-7	E421	0.020	µg/L	<0.020	<0.020	----	----	----
Bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	----	----	----
Boron, dissolved	7440-42-8	E421	0.010	mg/L	0.012	0.012	----	----	----
Cadmium, dissolved	7440-43-9	E421	0.0050	µg/L	0.0078	<0.0050	----	----	----
Calcium, dissolved	7440-70-2	E421	0.050	mg/L	43.0	42.2	----	----	----
Chromium, dissolved	7440-47-3	E421.Cr-L	0.00010	mg/L	0.00021	0.00023	----	----	----
Cobalt, dissolved	7440-48-4	E421	0.10	µg/L	<0.10	<0.10	----	----	----
Copper, dissolved	7440-50-8	E421	0.00020	mg/L	<0.00020	<0.00020	----	----	----
Iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	----	----	----
Lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	----	----	----
Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0034	0.0034	----	----	----
Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	11.6	11.5	----	----	----
Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00161	0.00172	----	----	----
Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	----	----	----
Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000742	0.00172 DTC	----	----	----

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	**CM_FLA_MC05_WS_2022-10-04_NP**	**CM_FLA_MC06_WS_2022-10-04_NP**	----	----	----
				Client sampling date / time	04-Oct-2022 13:15	04-Oct-2022 15:20	----	----	----
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2213784-006**	**CG2213784-007**	--------	--------	--------
					Result	Result	----	----	----
Dissolved Metals									
Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	----	----	----
Potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.472	0.498	----	----	----
Selenium, dissolved	7782-49-2	E421	0.050	µg/L	0.271	0.248	----	----	----
Silicon, dissolved	7440-21-3	E421	0.050	mg/L	2.31	2.37	----	----	----
Silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	----	----	----
Sodium, dissolved	7440-23-5	E421	0.050	mg/L	2.49	2.45	----	----	----
Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.149	0.146	----	----	----
Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	5.21	4.75	----	----	----
Thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	----	----	----
Tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	----	----	----
Titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	----	----	----
Uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000257	0.000250	----	----	----
Vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	----	----	----
Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	----	----	----
Dissolved mercury filtration location	----	EP509	-	-	Field	Field	----	----	----
Dissolved metals filtration location	----	EP421	-	-	Field	Field	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **CG2213784**	Page	: 1 of 30
Amendment	: **2**		
Client	: **SNC-Lavalin Inc.**	Laboratory	: Calgary - Environmental
Contact	: Ronald Salomonson	Account Manager	: Lovepreet Kaur
Address	: 640 5th Avenue SW Calgary AB Canada T2P 3G4	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: ----	Telephone	: +1 403 407 1800
Project	: Coal Mountain Operations	Date Samples Received	: 05-Oct-2022 09:00
PO	: 692207	Issue Date	: 02-Feb-2023 16:55
C-O-C number	: CMO FLA October 4th 2022		
Sampler	: ----		
Site	: ----		
Quote number	: TECK Coal codes		
No. of samples received	: 7		
No. of samples analysed	: 7		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_CC01_WS_2022-10-04_NP	E298	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_CC02_WS_2022-10-04_NP	E298	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_CC03_WS_2022-10-04_NP	E298	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_CC04_WS_2022-10-04_NP	E298	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_MC04_WS_2022-10-04_NP	E298	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_MC05_WS_2022-10-04_NP	E298	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_MC06_WS_2022-10-04_NP	E298	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_CC01_WS_2022-10-04_NP	E235.Br-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_CC02_WS_2022-10-04_NP	E235.Br-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_CC03_WS_2022-10-04_NP	E235.Br-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_CC04_WS_2022-10-04_NP	E235.Br-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_MC04_WS_2022-10-04_NP	E235.Br-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_MC05_WS_2022-10-04_NP	E235.Br-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_MC06_WS_2022-10-04_NP	E235.Br-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_CC01_WS_2022-10-04_NP	E235.Cl-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_CC02_WS_2022-10-04_NP	E235.Cl-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_CC03_WS_2022-10-04_NP	E235.Cl-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_CC04_WS_2022-10-04_NP	E235.Cl-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_MC04_WS_2022-10-04_NP	E235.Cl-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_MC05_WS_2022-10-04_NP	E235.Cl-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_MC06_WS_2022-10-04_NP	E235.Cl-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_CC01_WS_2022-10-04_NP	E378-U	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_CC02_WS_2022-10-04_NP	E378-U	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_CC03_WS_2022-10-04_NP	E378-U	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation* Preparation Date	 Holding Times Rec	 Holding Times Actual	 Eval	*Analysis* Analysis Date	 Holding Times Rec	 Holding Times Actual	 Eval
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_CC04_WS_2022-10-04_NP	E378-U	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_MC04_WS_2022-10-04_NP	E378-U	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_MC05_WS_2022-10-04_NP	E378-U	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_MC06_WS_2022-10-04_NP	E378-U	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_FLA_CC01_WS_2022-10-04_NP	E235.F	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_FLA_CC02_WS_2022-10-04_NP	E235.F	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_FLA_CC03_WS_2022-10-04_NP	E235.F	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_FLA_CC04_WS_2022-10-04_NP	E235.F	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_FLA_MC04_WS_2022-10-04_NP	E235.F	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_FLA_MC05_WS_2022-10-04_NP	E235.F	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_FLA_MC06_WS_2022-10-04_NP	E235.F	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_CC01_WS_2022-10-04_NP	E235.NO3-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_CC02_WS_2022-10-04_NP	E235.NO3-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_CC03_WS_2022-10-04_NP	E235.NO3-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_CC04_WS_2022-10-04_NP	E235.NO3-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_MC04_WS_2022-10-04_NP	E235.NO3-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_MC05_WS_2022-10-04_NP	E235.NO3-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation* *Preparation Date*	*Holding Times* *Rec*	*Actual*	*Eval*	*Analysis* *Analysis Date*	*Holding Times* *Rec*	*Actual*	*Eval*
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_MC06_WS_2022-10-04_NP	E235.NO3-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_CC01_WS_2022-10-04_NP	E235.NO2-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_CC02_WS_2022-10-04_NP	E235.NO2-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_CC03_WS_2022-10-04_NP	E235.NO2-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_CC04_WS_2022-10-04_NP	E235.NO2-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_MC04_WS_2022-10-04_NP	E235.NO2-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_MC05_WS_2022-10-04_NP	E235.NO2-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_MC06_WS_2022-10-04_NP	E235.NO2-L	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_CC01_WS_2022-10-04_NP	E235.SO4	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_CC02_WS_2022-10-04_NP	E235.SO4	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_CC03_WS_2022-10-04_NP	E235.SO4	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_CC04_WS_2022-10-04_NP	E235.SO4	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_MC04_WS_2022-10-04_NP	E235.SO4	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_MC05_WS_2022-10-04_NP	E235.SO4	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_MC06_WS_2022-10-04_NP	E235.SO4	04-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_CC01_WS_2022-10-04_NP	E318	04-Oct-2022	10-Oct-2022	----	----		10-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_CC02_WS_2022-10-04_NP	E318	04-Oct-2022	10-Oct-2022	----	----		10-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_CC03_WS_2022-10-04_NP	E318	04-Oct-2022	10-Oct-2022	----	----		10-Oct-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_CC04_WS_2022-10-04_NP	E318	04-Oct-2022	10-Oct-2022	----	----		10-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC04_WS_2022-10-04_NP	E318	04-Oct-2022	10-Oct-2022	----	----		10-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC05_WS_2022-10-04_NP	E318	04-Oct-2022	10-Oct-2022	----	----		10-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC06_WS_2022-10-04_NP	E318	04-Oct-2022	10-Oct-2022	----	----		10-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_CC01_WS_2022-10-04_NP	E372-U	04-Oct-2022	07-Oct-2022	----	----		12-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_CC02_WS_2022-10-04_NP	E372-U	04-Oct-2022	07-Oct-2022	----	----		12-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_CC03_WS_2022-10-04_NP	E372-U	04-Oct-2022	07-Oct-2022	----	----		12-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_CC04_WS_2022-10-04_NP	E372-U	04-Oct-2022	07-Oct-2022	----	----		12-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_MC04_WS_2022-10-04_NP	E372-U	04-Oct-2022	07-Oct-2022	----	----		12-Oct-2022	28 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation* *Preparation Date*	*Holding Times* *Rec*	*Actual*	*Eval*	*Analysis* *Analysis Date*	*Holding Times* *Rec*	*Actual*	*Eval*
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_MC05_WS_2022-10-04_NP	E372-U	04-Oct-2022	07-Oct-2022	----	----		12-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_MC06_WS_2022-10-04_NP	E372-U	04-Oct-2022	07-Oct-2022	----	----		12-Oct-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE - dissolved (lab preserved) CM_FLA_CC01_WS_2022-10-04_NP	E421.Cr-L	04-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE - dissolved (lab preserved) CM_FLA_CC02_WS_2022-10-04_NP	E421.Cr-L	04-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE - dissolved (lab preserved) CM_FLA_CC03_WS_2022-10-04_NP	E421.Cr-L	04-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE - dissolved (lab preserved) CM_FLA_CC04_WS_2022-10-04_NP	E421.Cr-L	04-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE - dissolved (lab preserved) CM_FLA_MC04_WS_2022-10-04_NP	E421.Cr-L	04-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE - dissolved (lab preserved) CM_FLA_MC05_WS_2022-10-04_NP	E421.Cr-L	04-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE - dissolved (lab preserved) CM_FLA_MC06_WS_2022-10-04_NP	E421.Cr-L	04-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) CM_FLA_CC01_WS_2022-10-04_NP	E509	04-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) CM_FLA_CC02_WS_2022-10-04_NP	E509	04-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) CM_FLA_CC03_WS_2022-10-04_NP	E509	04-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) CM_FLA_CC04_WS_2022-10-04_NP	E509	04-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) CM_FLA_MC04_WS_2022-10-04_NP	E509	04-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) CM_FLA_MC05_WS_2022-10-04_NP	E509	04-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) CM_FLA_MC06_WS_2022-10-04_NP	E509	04-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) CM_FLA_CC01_WS_2022-10-04_NP	E421	04-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) CM_FLA_CC02_WS_2022-10-04_NP	E421	04-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) CM_FLA_CC03_WS_2022-10-04_NP	E421	04-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) CM_FLA_CC04_WS_2022-10-04_NP	E421	04-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) CM_FLA_MC04_WS_2022-10-04_NP	E421	04-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) CM_FLA_MC05_WS_2022-10-04_NP	E421	04-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) CM_FLA_MC06_WS_2022-10-04_NP	E421	04-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_CC01_WS_2022-10-04_NP	E358-L	04-Oct-2022	06-Oct-2022	----	----		07-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_CC02_WS_2022-10-04_NP	E358-L	04-Oct-2022	06-Oct-2022	----	----		07-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_CC03_WS_2022-10-04_NP	E358-L	04-Oct-2022	06-Oct-2022	----	----		07-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_CC04_WS_2022-10-04_NP	E358-L	04-Oct-2022	06-Oct-2022	----	----		07-Oct-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_MC04_WS_2022-10-04_NP	E358-L	04-Oct-2022	06-Oct-2022	----	----		07-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_MC05_WS_2022-10-04_NP	E358-L	04-Oct-2022	06-Oct-2022	----	----		07-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_MC06_WS_2022-10-04_NP	E358-L	04-Oct-2022	06-Oct-2022	----	----		07-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_CC01_WS_2022-10-04_NP	E355-L	04-Oct-2022	06-Oct-2022	----	----		07-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_CC02_WS_2022-10-04_NP	E355-L	04-Oct-2022	06-Oct-2022	----	----		07-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_CC03_WS_2022-10-04_NP	E355-L	04-Oct-2022	06-Oct-2022	----	----		07-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_CC04_WS_2022-10-04_NP	E355-L	04-Oct-2022	06-Oct-2022	----	----		07-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC04_WS_2022-10-04_NP	E355-L	04-Oct-2022	06-Oct-2022	----	----		07-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC05_WS_2022-10-04_NP	E355-L	04-Oct-2022	06-Oct-2022	----	----		07-Oct-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC06_WS_2022-10-04_NP	E355-L	04-Oct-2022	06-Oct-2022	----	----		07-Oct-2022	28 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_CC01_WS_2022-10-04_NP	E283	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_CC02_WS_2022-10-04_NP	E283	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_CC03_WS_2022-10-04_NP	E283	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_CC04_WS_2022-10-04_NP	E283	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_MC04_WS_2022-10-04_NP	E283	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_MC05_WS_2022-10-04_NP	E283	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_MC06_WS_2022-10-04_NP	E283	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_CC01_WS_2022-10-04_NP	E290	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	14 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_CC02_WS_2022-10-04_NP	E290	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_CC03_WS_2022-10-04_NP	E290	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_CC04_WS_2022-10-04_NP	E290	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_MC04_WS_2022-10-04_NP	E290	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_MC05_WS_2022-10-04_NP	E290	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_MC06_WS_2022-10-04_NP	E290	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	14 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_CC01_WS_2022-10-04_NP	E100	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_CC02_WS_2022-10-04_NP	E100	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_CC03_WS_2022-10-04_NP	E100	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: ✘ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : Conductivity in Water										
HDPE CM_FLA_CC04_WS_2022-10-04_NP	E100	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_MC04_WS_2022-10-04_NP	E100	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_MC05_WS_2022-10-04_NP	E100	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_MC06_WS_2022-10-04_NP	E100	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	28 days	3 days	✓
Physical Tests : ORP by Electrode										
HDPE CM_FLA_MC06_WS_2022-10-04_NP	E125	04-Oct-2022	----	----	----		10-Oct-2022	0.25 hrs	135 hrs	✘ EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_FLA_CC04_WS_2022-10-04_NP	E125	04-Oct-2022	----	----	----		10-Oct-2022	0.25 hrs	136 hrs	✘ EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_FLA_CC03_WS_2022-10-04_NP	E125	04-Oct-2022	----	----	----		10-Oct-2022	0.25 hrs	137 hrs	✘ EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_FLA_MC05_WS_2022-10-04_NP	E125	04-Oct-2022	----	----	----		10-Oct-2022	0.25 hrs	137 hrs	✘ EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_FLA_CC02_WS_2022-10-04_NP	E125	04-Oct-2022	----	----	----		10-Oct-2022	0.25 hrs	139 hrs	✘ EHTR-FM

Matrix: **Water**

Evaluation: ✗ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation* *Preparation Date*	*Extraction / Preparation* *Holding Times Rec*	*Extraction / Preparation* *Holding Times Actual*	*Extraction / Preparation* *Eval*	*Analysis* *Analysis Date*	*Analysis* *Holding Times Rec*	*Analysis* *Holding Times Actual*	*Analysis* *Eval*
Physical Tests : ORP by Electrode										
HDPE CM_FLA_CC01_WS_2022-10-04_NP	E125	04-Oct-2022	----	----	----		10-Oct-2022	0.25 hrs	141 hrs	✗ EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_FLA_MC04_WS_2022-10-04_NP	E125	04-Oct-2022	----	----	----		10-Oct-2022	0.25 hrs	141 hrs	✗ EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_CC01_WS_2022-10-04_NP	E108	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	0.25 hrs	0.25 hrs	✗ EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_CC02_WS_2022-10-04_NP	E108	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	0.25 hrs	0.25 hrs	✗ EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_CC03_WS_2022-10-04_NP	E108	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	0.25 hrs	0.25 hrs	✗ EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_CC04_WS_2022-10-04_NP	E108	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	0.25 hrs	0.25 hrs	✗ EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_MC04_WS_2022-10-04_NP	E108	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	0.25 hrs	0.25 hrs	✗ EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_MC05_WS_2022-10-04_NP	E108	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	0.25 hrs	0.25 hrs	✗ EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_MC06_WS_2022-10-04_NP	E108	04-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	0.25 hrs	0.25 hrs	✗ EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_CC01_WS_2022-10-04_NP	E162	04-Oct-2022	----	----	----		10-Oct-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_CC02_WS_2022-10-04_NP	E162	04-Oct-2022	----	----	----		10-Oct-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_CC03_WS_2022-10-04_NP	E162	04-Oct-2022	----	----	----		10-Oct-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_CC04_WS_2022-10-04_NP	E162	04-Oct-2022	----	----	----		10-Oct-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_MC04_WS_2022-10-04_NP	E162	04-Oct-2022	----	----	----		10-Oct-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_MC05_WS_2022-10-04_NP	E162	04-Oct-2022	----	----	----		10-Oct-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_MC06_WS_2022-10-04_NP	E162	04-Oct-2022	----	----	----		10-Oct-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_CC01_WS_2022-10-04_NP	E160-L	04-Oct-2022	----	----	----		11-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_CC02_WS_2022-10-04_NP	E160-L	04-Oct-2022	----	----	----		11-Oct-2022	7 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_CC03_WS_2022-10-04_NP	E160-L	04-Oct-2022	----	----	----		11-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_CC04_WS_2022-10-04_NP	E160-L	04-Oct-2022	----	----	----		11-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_MC04_WS_2022-10-04_NP	E160-L	04-Oct-2022	----	----	----		11-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_MC05_WS_2022-10-04_NP	E160-L	04-Oct-2022	----	----	----		11-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_MC06_WS_2022-10-04_NP	E160-L	04-Oct-2022	----	----	----		11-Oct-2022	7 days	7 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_CC01_WS_2022-10-04_NP	E121	04-Oct-2022	----	----	----		06-Oct-2022	3 days	2 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_CC02_WS_2022-10-04_NP	E121	04-Oct-2022	----	----	----		06-Oct-2022	3 days	2 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_MC04_WS_2022-10-04_NP	E121	04-Oct-2022	----	----	----		06-Oct-2022	3 days	2 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_CC03_WS_2022-10-04_NP	E121	04-Oct-2022	----	----	----		07-Oct-2022	3 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_CC04_WS_2022-10-04_NP	E121	04-Oct-2022	----	----	----		07-Oct-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_MC05_WS_2022-10-04_NP	E121	04-Oct-2022	----	----	----		07-Oct-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_MC06_WS_2022-10-04_NP	E121	04-Oct-2022	----	----	----		07-Oct-2022	3 days	3 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE - total (lab preserved) CM_FLA_CC01_WS_2022-10-04_NP	E420.Cr-L	04-Oct-2022	10-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE - total (lab preserved) CM_FLA_CC02_WS_2022-10-04_NP	E420.Cr-L	04-Oct-2022	10-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE - total (lab preserved) CM_FLA_CC03_WS_2022-10-04_NP	E420.Cr-L	04-Oct-2022	10-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE - total (lab preserved) CM_FLA_CC04_WS_2022-10-04_NP	E420.Cr-L	04-Oct-2022	10-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE - total (lab preserved) CM_FLA_MC04_WS_2022-10-04_NP	E420.Cr-L	04-Oct-2022	10-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE - total (lab preserved) CM_FLA_MC05_WS_2022-10-04_NP	E420.Cr-L	04-Oct-2022	10-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE - total (lab preserved) CM_FLA_MC06_WS_2022-10-04_NP	E420.Cr-L	04-Oct-2022	10-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) CM_FLA_CC01_WS_2022-10-04_NP	E508	04-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) CM_FLA_CC02_WS_2022-10-04_NP	E508	04-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) CM_FLA_CC03_WS_2022-10-04_NP	E508	04-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) CM_FLA_CC04_WS_2022-10-04_NP	E508	04-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) CM_FLA_MC04_WS_2022-10-04_NP	E508	04-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) CM_FLA_MC05_WS_2022-10-04_NP	E508	04-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) CM_FLA_MC06_WS_2022-10-04_NP	E508	04-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	28 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) CM_FLA_CC01_WS_2022-10-04_NP	E420	04-Oct-2022	10-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) CM_FLA_CC02_WS_2022-10-04_NP	E420	04-Oct-2022	10-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) CM_FLA_CC03_WS_2022-10-04_NP	E420	04-Oct-2022	10-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) CM_FLA_CC04_WS_2022-10-04_NP	E420	04-Oct-2022	10-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) CM_FLA_MC04_WS_2022-10-04_NP	E420	04-Oct-2022	10-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) CM_FLA_MC05_WS_2022-10-04_NP	E420	04-Oct-2022	10-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) CM_FLA_MC06_WS_2022-10-04_NP	E420	04-Oct-2022	10-Oct-2022	----	----		11-Oct-2022	180 days	7 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			*Count*		*Frequency (%)*		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Acidity by Titration	E283	685753	1	19	5.2	5.0	✓
Alkalinity Species by Titration	E290	685776	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	683676	1	20	5.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	683352	1	20	5.0	5.0	✓
Chloride in Water by IC (Low Level)	E235.Cl-L	683353	1	20	5.0	5.0	✓
Conductivity in Water	E100	685775	1	19	5.2	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	688589	1	18	5.5	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	692060	2	28	7.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	688590	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	684545	1	19	5.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	684144	2	40	5.0	5.0	✓
Fluoride in Water by IC	E235.F	683351	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	683354	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	683355	1	20	5.0	5.0	✓
ORP by Electrode	E125	688754	1	10	10.0	5.0	✓
pH by Meter	E108	685774	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	683356	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	687518	2	40	5.0	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	689066	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	687919	1	18	5.5	5.0	✓
Total Mercury in Water by CVAAS	E508	692339	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	689067	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	684546	1	19	5.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	685609	1	20	5.0	5.0	✓
Turbidity by Nephelometry	E121	684414	3	57	5.2	5.0	✓
Laboratory Control Samples (LCS)							
Acidity by Titration	E283	685753	1	19	5.2	5.0	✓
Alkalinity Species by Titration	E290	685776	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	683676	1	20	5.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	683352	1	20	5.0	5.0	✓
Chloride in Water by IC (Low Level)	E235.Cl-L	683353	1	20	5.0	5.0	✓
Conductivity in Water	E100	685775	1	19	5.2	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	688589	1	18	5.5	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	692060	2	28	7.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	688590	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	684545	1	19	5.2	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			*Count*		*Frequency (%)*		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	684144	2	40	5.0	5.0	✓
Fluoride in Water by IC	E235.F	683351	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	683354	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	683355	1	20	5.0	5.0	✓
ORP by Electrode	E125	688754	1	10	10.0	5.0	✓
pH by Meter	E108	685774	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	683356	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	687518	2	40	5.0	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	689066	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	687919	1	18	5.5	5.0	✓
Total Mercury in Water by CVAAS	E508	692339	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	689067	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	684546	1	19	5.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	685609	1	20	5.0	5.0	✓
TSS by Gravimetry (Low Level)	E160-L	687535	2	40	5.0	5.0	✓
Turbidity by Nephelometry	E121	684414	3	57	5.2	5.0	✓
Method Blanks (MB)							
Acidity by Titration	E283	685753	1	19	5.2	5.0	✓
Alkalinity Species by Titration	E290	685776	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	683676	1	20	5.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	683352	1	20	5.0	5.0	✓
Chloride in Water by IC (Low Level)	E235.Cl-L	683353	1	20	5.0	5.0	✓
Conductivity in Water	E100	685775	1	19	5.2	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	688589	1	18	5.5	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	692060	2	28	7.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	688590	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	684545	1	19	5.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	684144	2	40	5.0	5.0	✓
Fluoride in Water by IC	E235.F	683351	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	683354	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	683355	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	683356	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	687518	2	40	5.0	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	689066	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	687919	1	18	5.5	5.0	✓
Total Mercury in Water by CVAAS	E508	692339	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	689067	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	684546	1	19	5.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	685609	1	20	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB) - Continued							
TSS by Gravimetry (Low Level)	E160-L	687535	2	40	5.0	5.0	✓
Turbidity by Nephelometry	E121	684414	3	57	5.2	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	683676	1	20	5.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	683352	1	20	5.0	5.0	✓
Chloride in Water by IC (Low Level)	E235.Cl-L	683353	1	20	5.0	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	688589	1	18	5.5	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	692060	2	28	7.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	688590	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	684545	1	19	5.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	684144	2	40	5.0	5.0	✓
Fluoride in Water by IC	E235.F	683351	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	683354	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	683355	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	683356	1	20	5.0	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	689066	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	687919	1	18	5.5	5.0	✓
Total Mercury in Water by CVAAS	E508	692339	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	689067	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	684546	1	19	5.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	685609	1	20	5.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Conductivity in Water	E100 Calgary - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 Calgary - Environmental	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
ORP by Electrode	E125 Calgary - Environmental	Water	ASTM D1498 (mod)	Oxidation redution potential is reported as the oxidation-reduction potential of the platinum metal-reference electrode employed, measured in mV. For high accuracy test results, it is recommended that this analysis be conducted in the field.
TSS by Gravimetry (Low Level)	E160-L Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Calgary - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Water by IC (Low Level)	E235.Br-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC (Low Level)	E235.Cl-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

Analytical Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Acidity by Titration	E283 Calgary - Environmental	Water	APHA 2310 B (mod)	Acidity is determined by potentiometric titration to pH endpoint of 8.3
Alkalinity Species by Titration	E290 Calgary - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Calgary - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Calgary - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Total metals in Water by CRC ICPMS	E420 Calgary - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L Calgary - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.

Analytical Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Dissolved Metals in Water by CRC ICPMS	E421 Calgary - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L Calgary - Environmental	Water	APHA 3030 B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS
Total Mercury in Water by CVAAS	E508 Calgary - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Mercury in Water by CVAAS	E509 Calgary - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Dissolved Hardness (Calculated)	EC100 Calgary - Environmental	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Calgary - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).

Preparation Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Calgary - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

Preparation Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Dissolved Metals Water Filtration	EP421 Calgary - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO_3.
Dissolved Mercury Water Filtration	EP509 Calgary - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.

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QUALITY CONTROL REPORT

Work Order	: **CG2213784**	Page	: 1 of 18
Amendment	: **2**		
Client	: SNC-Lavalin Inc.	Laboratory	: Calgary - Environmental
Contact	: Ronald Salomonson	Account Manager	: Lovepreet Kaur
Address	: 640 5th Avenue SW Calgary AB Canada T2P 3G4	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	:	Telephone	: +1 403 407 1800
Project	: Coal Mountain Operations	Date Samples Received	: 05-Oct-2022 09:00
PO	: 692207	Date Analysis Commenced	: 06-Oct-2022
C-O-C number	: CMO FLA October 4th 2022	Issue Date	: 02-Feb-2023 16:55
Sampler	: ---- ----		
Site	: ----		
Quote number	: TECK Coal codes		
No. of samples received	: 7		
No. of samples analysed	: 7		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Anthony Calero	Supervisor - Inorganic	Calgary Inorganics, Calgary, Alberta
Anthony Calero	Supervisor - Inorganic	Calgary Metals, Calgary, Alberta
Elke Tabora		Calgary Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Kevin Baxter	Team Leader - Inorganics	Calgary Metals, Calgary, Alberta
Mackenzie Lamoureux	Laboratory Analyst	Calgary Metals, Calgary, Alberta
Millicent Brentnall	Laboratory Analyst	Calgary Metals, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Calgary Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Metals, Calgary, Alberta

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 684414)											
CG2213759-011	Anonymous	Turbidity	----	E121	0.10	NTU	0.38	0.38	0.004	Diff <2x LOR	----
Physical Tests (QC Lot: 684637)											
CG2213715-001	Anonymous	Turbidity	----	E121	0.10	NTU	1.41	1.49	5.52%	15%	----
Physical Tests (QC Lot: 685579)											
CG2213718-001	Anonymous	Turbidity	----	E121	0.10	NTU	0.10	<0.10	0.0002	Diff <2x LOR	----
Physical Tests (QC Lot: 685753)											
CG2213727-011	Anonymous	Acidity (as CaCO3)	----	E283	10.0	mg/L	10.0	13.0	3.0	Diff <2x LOR	----
Physical Tests (QC Lot: 685774)											
CG2213727-010	Anonymous	pH	----	E108	0.10	pH units	7.85	7.89	0.508%	4%	----
Physical Tests (QC Lot: 685775)											
CG2213727-011	Anonymous	Conductivity	----	E100	2.0	µS/cm	1760	1730	1.95%	10%	----
Physical Tests (QC Lot: 685776)											
CG2213727-011	Anonymous	Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	349	337	3.44%	20%	----
		Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	349	338	3.14%	20%	----
Physical Tests (QC Lot: 687518)											
CG2213759-011	Anonymous	Solids, total dissolved [TDS]	----	E162	20	mg/L	137	140	3	Diff <2x LOR	----
Physical Tests (QC Lot: 687519)											
CG2213784-007	CM_FLA_MC06_WS_2022-10-04_NP	Solids, total dissolved [TDS]	----	E162	20	mg/L	160	156	4	Diff <2x LOR	----
Physical Tests (QC Lot: 688754)											
CG2213782-001	Anonymous	Oxidation-reduction potential [ORP]	----	E125	0.10	mV	281	288	2.60%	15%	----
Anions and Nutrients (QC Lot: 683351)											
CG2213784-001	CM_FLA_CC01_WS_2022-10-04_NP	Fluoride	16984-48-8	E235.F	0.100	mg/L	0.203	0.196	0.007	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 683352)											
CG2213784-001	CM_FLA_CC01_WS_2022-10-04_NP	Bromide	24959-67-9	E235.Br-L	0.250	mg/L	<0.250	<0.250	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 683353)											
CG2213784-001	CM_FLA_CC01_WS_2022-10-04_NP	Chloride	16887-00-6	E235.Cl-L	0.50	mg/L	4.23	3.91	0.31	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Anions and Nutrients (QC Lot: 683354)											
CG2213784-001	CM_FLA_CC01_WS_2022-10-04_NP	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	3.40	3.38	0.375%	20%	----
Anions and Nutrients (QC Lot: 683355)											
CG2213784-001	CM_FLA_CC01_WS_2022-10-04_NP	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	0.0238	0.0221	0.0017	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 683356)											
CG2213784-001	CM_FLA_CC01_WS_2022-10-04_NP	Sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	766	770	0.579%	20%	----
Anions and Nutrients (QC Lot: 683676)											
CG2213782-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 684144)											
CG2213784-001	CM_FLA_CC01_WS_2022-10-04_NP	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 684395)											
CG2213784-002	CM_FLA_CC02_WS_2022-10-04_NP	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 685609)											
CG2213759-016	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0026	0.0025	0.0001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 687919)											
CG2213784-001	CM_FLA_CC01_WS_2022-10-04_NP	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.222	0.251	0.029	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 684545)											
CG2213778-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	0.88	0.90	0.02	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 684546)											
CG2213778-001	Anonymous	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Total Metals (QC Lot: 689066)											
CG2213784-001	CM_FLA_CC01_WS_2022-10-04_NP	Chromium, total	7440-47-3	E420.Cr-L	0.00010	mg/L	0.00012	0.00013	0.00002	Diff <2x LOR	----
Total Metals (QC Lot: 689067)											
CG2213784-001	CM_FLA_CC01_WS_2022-10-04_NP	Aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0049	0.0046	0.0003	Diff <2x LOR	----
		Antimony, total	7440-36-0	E420	0.00010	mg/L	0.00034	0.00033	0.000008	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00025	0.00024	0.000009	Diff <2x LOR	----
		Barium, total	7440-39-3	E420	0.00010	mg/L	0.0488	0.0507	3.98%	20%	----
		Beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.020 µg/L	<0.000020	0	Diff <2x LOR	----
		Bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Boron, total	7440-42-8	E420	0.010	mg/L	0.068	0.064	0.004	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0466 µg/L	0.0000412	0.0000054	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 689067) - continued											
CG2213784-001	CM_FLA_CC01_WS_2022-10-04_NP	Calcium, total	7440-70-2	E420	0.050	mg/L	220	211	4.46%	20%	----
		Cobalt, total	7440-48-4	E420	0.00010	mg/L	2.24 µg/L	0.00226	1.01%	20%	----
		Copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Iron, total	7439-89-6	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Lithium, total	7439-93-2	E420	0.0010	mg/L	0.0356	0.0329	7.96%	20%	----
		Magnesium, total	7439-95-4	E420	0.0050	mg/L	125	128	2.52%	20%	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	0.00962	0.00992	2.98%	20%	----
		Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.00130	0.00128	1.90%	20%	----
		Nickel, total	7440-02-0	E420	0.00050	mg/L	0.0482	0.0501	3.88%	20%	----
		Potassium, total	7440-09-7	E420	0.050	mg/L	3.61	3.69	2.08%	20%	----
		Selenium, total	7782-49-2	E420	0.000050	mg/L	16.0 µg/L	0.0158	1.38%	20%	----
		Silicon, total	7440-21-3	E420	0.10	mg/L	2.46	2.46	0.0919%	20%	----
		Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, total	7440-23-5	E420	0.050	mg/L	27.2	28.2	3.84%	20%	----
		Strontium, total	7440-24-6	E420	0.00020	mg/L	0.787	0.756	3.97%	20%	----
		Sulfur, total	7704-34-9	E420	0.50	mg/L	286	286	0.0518%	20%	----
		Thallium, total	7440-28-0	E420	0.000010	mg/L	0.000043	0.000039	0.000004	Diff <2x LOR	----
		Tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		Uranium, total	7440-61-1	E420	0.000010	mg/L	0.00606	0.00611	0.856%	20%	----
		Vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
Total Metals (QC Lot: 692339)											
CG2213735-004	Anonymous	Mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 688589)											
CG2213778-001	Anonymous	Chromium, dissolved	7440-47-3	E421.Cr-L	0.00010	mg/L	0.00014	0.00020	0.00006	Diff <2x LOR	----
Dissolved Metals (QC Lot: 688590)											
CG2213778-001	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0011	<0.0010	0.00008	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00012	0.00011	0.000006	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	<0.00010	0.00012	0.00002	Diff <2x LOR	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0597	0.0576	3.61%	20%	----
		Beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.020 µg/L	<0.000020	0	Diff <2x LOR	----
		Bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report						
					LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 688590) - continued											
CG2213778-001	Anonymous	Boron, dissolved	7440-42-8	E421	0.010	mg/L	0.038	0.037	0.0005	Diff <2x LOR	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0487 µg/L	0.0000423	0.0000064	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	159	158	0.794%	20%	----
		Cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00126	0.00121	0.00006	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0453	0.0444	2.08%	20%	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	51.8	51.0	1.45%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00050	0.00052	0.00002	Diff <2x LOR	----
		Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000741	0.000734	0.991%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00135	0.00132	0.00004	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.050	mg/L	2.08	2.03	2.33%	20%	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	49.3 µg/L	0.0486	1.47%	20%	----
		Silicon, dissolved	7440-21-3	E421	0.050	mg/L	3.62	3.48	4.08%	20%	----
		Silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.050	mg/L	8.28	8.18	1.19%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.314	0.310	1.36%	20%	----
		Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	127	124	2.80%	20%	----
		Thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		Uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00154	0.00154	0.211%	20%	----
		Vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0024	0.0029	0.0006	Diff <2x LOR	----
Dissolved Metals (QC Lot: 692060)											
CG2213735-004	Anonymous	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 692061)											
CG2213784-007	CM_FLA_MC06_WS_2022-10-04_NP	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Result*	*Qualifier*
Physical Tests (QCLot: 684414)						
Turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 684637)						
Turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 685579)						
Turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 685753)						
Acidity (as CaCO3)	----	E283	2	mg/L	<2.0	----
Physical Tests (QCLot: 685775)						
Conductivity	----	E100	1	μS/cm	1.1	----
Physical Tests (QCLot: 685776)						
Alkalinity, bicarbonate (as CaCO3)	----	E290	1	mg/L	<1.0	----
Alkalinity, carbonate (as CaCO3)	----	E290	1	mg/L	<1.0	----
Alkalinity, hydroxide (as CaCO3)	----	E290	1	mg/L	<1.0	----
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 687518)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 687519)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 687535)						
Solids, total suspended [TSS]	----	E160-L	1	mg/L	<1.0	----
Physical Tests (QCLot: 687536)						
Solids, total suspended [TSS]	----	E160-L	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 683351)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 683352)						
Bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 683353)						
Chloride	16887-00-6	E235.Cl-L	0.1	mg/L	<0.10	----
Anions and Nutrients (QCLot: 683354)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 683355)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----

Sub-Matrix: **Water**

Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Result*	*Qualifier*
Anions and Nutrients (QCLot: 683356)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 683676)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 684144)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 684395)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 685609)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 687919)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Organic / Inorganic Carbon (QCLot: 684545)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 684546)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 689066)						
Chromium, total	7440-47-3	E420.Cr-L	0.0001	mg/L	<0.00010	----
Total Metals (QCLot: 689067)						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
Barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
Boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
Calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
Copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
Iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
Lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----

Sub-Matrix: **Water**

Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Result*	*Qualifier*
Total Metals (QCLot: 689067) - continued						
Nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
Potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
Sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
Tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
Zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
Total Metals (QCLot: 692339)						
Mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 688589)						
Chromium, dissolved	7440-47-3	E421.Cr-L	0.0001	mg/L	<0.00010	----
Dissolved Metals (QCLot: 688590)						
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----

Sub-Matrix: **Water**

Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Result*	*Qualifier*
Dissolved Metals (QCLot: 688590) - continued						
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
Dissolved Metals (QCLot: 692060)						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 692061)						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	***CAS Number***	***Method***	***LOR***	***Unit***	**Concentration**	**LCS**	**Low**	**High**	**Qualifier**
Physical Tests (QCLot: 684414)									
Turbidity	----	E121	0.1	NTU	200 NTU	98.2	85.0	115	----
Physical Tests (QCLot: 684637)									
Turbidity	----	E121	0.1	NTU	200 NTU	97.1	85.0	115	----
Physical Tests (QCLot: 685579)									
Turbidity	----	E121	0.1	NTU	200 NTU	101	85.0	115	----
Physical Tests (QCLot: 685753)									
Acidity (as CaCO3)	----	E283	2	mg/L	50 mg/L	101	85.0	115	----
Physical Tests (QCLot: 685774)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Physical Tests (QCLot: 685775)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	97.5	90.0	110	----
Physical Tests (QCLot: 685776)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	105	85.0	115	----
Physical Tests (QCLot: 687518)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	90.7	85.0	115	----
Physical Tests (QCLot: 687519)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	93.6	85.0	115	----
Physical Tests (QCLot: 687535)									
Solids, total suspended [TSS]	----	E160-L	1	mg/L	150 mg/L	105	85.0	115	----
Physical Tests (QCLot: 687536)									
Solids, total suspended [TSS]	----	E160-L	1	mg/L	150 mg/L	101	85.0	115	----
Physical Tests (QCLot: 688754)									
Oxidation-reduction potential [ORP]	----	E125	----	mV	220 mV	101	95.4	104	----
Anions and Nutrients (QCLot: 683351)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 683352)									
Bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	105	85.0	115	----
Anions and Nutrients (QCLot: 683353)									
Chloride	16887-00-6	E235.Cl-L	0.1	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 683354)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	102	90.0	110	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 683355)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 683356)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 683676)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	98.8	85.0	115	----
Anions and Nutrients (QCLot: 684144)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	105	80.0	120	----
Anions and Nutrients (QCLot: 684395)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	106	80.0	120	----
Anions and Nutrients (QCLot: 685609)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	101	80.0	120	----
Anions and Nutrients (QCLot: 687919)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	99.8	75.0	125	----
Organic / Inorganic Carbon (QCLot: 684545)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	91.4	80.0	120	----
Organic / Inorganic Carbon (QCLot: 684546)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	98.8	80.0	120	----
Total Metals (QCLot: 689066)									
Chromium, total	7440-47-3	E420.Cr-L	0.0001	mg/L	0.25 mg/L	103	80.0	120	----
Total Metals (QCLot: 689067)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	108	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	92.2	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	97.6	80.0	120	----
Barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	99.1	80.0	120	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	94.8	80.0	120	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	93.3	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	92.2	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	98.3	80.0	120	----
Calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	97.0	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	99.4	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	91.5	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	90.9	80.0	120	----
Lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	89.7	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 689067) - continued									
Magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	101	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	103	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	96.5	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	100	80.0	120	----
Potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	101	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	90.4	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	101	60.0	140	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	86.7	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	104	80.0	120	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	103	80.0	120	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	100	80.0	120	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	92.5	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	96.0	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	95.7	80.0	120	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	93.0	80.0	120	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	99.8	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	101	80.0	120	----
Total Metals (QCLot: 692339)									
Mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	99.7	80.0	120	----
Dissolved Metals (QCLot: 688589)									
Chromium, dissolved	7440-47-3	E421.Cr-L	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
Dissolved Metals (QCLot: 688590)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	96.1	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	103	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	97.7	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	96.5	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	97.5	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	97.2	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	92.9	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	93.4	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	97.8	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	97.3	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	93.1	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	101	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	97.0	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	*Recovery (%)*	*Recovery Limits (%)*		
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Concentration*	*LCS*	*Low*	*High*	*Qualifier*
Dissolved Metals (QCLot: 688590) - continued									
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	89.5	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	88.0	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	91.9	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	100	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	88.8	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	99.6	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	90.2	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	98.3	60.0	140	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	93.2	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	95.3	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	94.6	80.0	120	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	93.4	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	96.9	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	93.8	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	86.6	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	91.7	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	97.5	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	94.2	80.0	120	----
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	99.6	80.0	120	----
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	99.3	80.0	120	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		*Recovery (%)*	*Recovery Limits (%)*		
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*Concentration*	*Target*	*MS*	*Low*	*High*	*Qualifier*
Anions and Nutrients (QCLot: 683351)										
CG2213784-002	CM_FLA_CC02_WS_2022-10-04_NP	Fluoride	16984-48-8	E235.F	0.818 mg/L	1 mg/L	81.8	75.0	125	----
Anions and Nutrients (QCLot: 683352)										
CG2213784-002	CM_FLA_CC02_WS_2022-10-04_NP	Bromide	24959-67-9	E235.Br-L	0.501 mg/L	0.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 683353)										
CG2213784-002	CM_FLA_CC02_WS_2022-10-04_NP	Chloride	16887-00-6	E235.Cl-L	100 mg/L	100 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 683354)										
CG2213784-002	CM_FLA_CC02_WS_2022-10-04_NP	Nitrate (as N)	14797-55-8	E235.NO3-L	ND mg/L	2.5 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 683355)										
CG2213784-002	CM_FLA_CC02_WS_2022-10-04_NP	Nitrite (as N)	14797-65-0	E235.NO2-L	0.504 mg/L	0.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 683356)										
CG2213784-002	CM_FLA_CC02_WS_2022-10-04_NP	Sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 683676)										
CG2213782-002	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.103 mg/L	0.1 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 684144)										
CG2213784-005	CM_FLA_MC04_WS_2022-10-04_NP	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0502 mg/L	0.05 mg/L	100	70.0	130	----
Anions and Nutrients (QCLot: 684395)										
CG2213784-003	CM_FLA_CC03_WS_2022-10-04_NP	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0522 mg/L	0.05 mg/L	104	70.0	130	----
Anions and Nutrients (QCLot: 685609)										
CG2213759-017	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0432 mg/L	0.05 mg/L	86.5	70.0	130	----
Anions and Nutrients (QCLot: 687919)										
CG2213784-002	CM_FLA_CC02_WS_2022-10-04_NP	Kjeldahl nitrogen, total [TKN]	----	E318	2.57 mg/L	2.5 mg/L	103	70.0	130	----
Organic / Inorganic Carbon (QCLot: 684545)										
CG2213778-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	4.72 mg/L	5 mg/L	94.4	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*Concentration*	*Target*	*MS*	*Low*	*High*	*Qualifier*
Organic / Inorganic Carbon (QCLot: 684546)										
CG2213778-001	Anonymous	Carbon, total organic [TOC]	----	E355-L	5.76 mg/L	5 mg/L	115	70.0	130	----
Total Metals (QCLot: 689066)										
CG2213784-002	CM_FLA_CC02_WS_2022-10-04_NP	Chromium, total	7440-47-3	E420.Cr-L	0.400 mg/L	0.4 mg/L	99.9	70.0	130	----
Total Metals (QCLot: 689067)										
CG2213784-002	CM_FLA_CC02_WS_2022-10-04_NP	Aluminum, total	7429-90-5	E420	2.02 mg/L	2 mg/L	101	70.0	130	----
		Antimony, total	7440-36-0	E420	0.183 mg/L	0.2 mg/L	91.5	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.194 mg/L	0.2 mg/L	96.9	70.0	130	----
		Barium, total	7440-39-3	E420	0.201 mg/L	0.2 mg/L	100	70.0	130	----
		Beryllium, total	7440-41-7	E420	0.364 mg/L	0.4 mg/L	90.9	70.0	130	----
		Bismuth, total	7440-69-9	E420	0.0968 mg/L	0.1 mg/L	96.8	70.0	130	----
		Boron, total	7440-42-8	E420	0.875 mg/L	1 mg/L	87.5	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.0399 mg/L	0.04 mg/L	99.7	70.0	130	----
		Calcium, total	7440-70-2	E420	ND mg/L	40 mg/L	ND	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.194 mg/L	0.2 mg/L	97.2	70.0	130	----
		Copper, total	7440-50-8	E420	0.192 mg/L	0.2 mg/L	96.1	70.0	130	----
		Iron, total	7439-89-6	E420	18.9 mg/L	20 mg/L	94.4	70.0	130	----
		Lead, total	7439-92-1	E420	0.186 mg/L	0.2 mg/L	93.2	70.0	130	----
		Lithium, total	7439-93-2	E420	0.896 mg/L	1 mg/L	89.6	70.0	130	----
		Magnesium, total	7439-95-4	E420	ND mg/L	10 mg/L	ND	70.0	130	----
		Manganese, total	7439-96-5	E420	0.194 mg/L	0.2 mg/L	97.2	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.197 mg/L	0.2 mg/L	98.7	70.0	130	----
		Nickel, total	7440-02-0	E420	0.385 mg/L	0.4 mg/L	96.2	70.0	130	----
		Potassium, total	7440-09-7	E420	38.5 mg/L	40 mg/L	96.3	70.0	130	----
		Selenium, total	7782-49-2	E420	0.373 mg/L	0.4 mg/L	93.3	70.0	130	----
		Silicon, total	7440-21-3	E420	99.1 mg/L	100 mg/L	99.1	70.0	130	----
		Silver, total	7440-22-4	E420	0.0385 mg/L	0.04 mg/L	96.2	70.0	130	----
		Sodium, total	7440-23-5	E420	18.3 mg/L	20 mg/L	91.6	70.0	130	----
		Strontium, total	7440-24-6	E420	ND mg/L	0.2 mg/L	ND	70.0	130	----
		Sulfur, total	7704-34-9	E420	ND mg/L	200 mg/L	ND	70.0	130	----
		Thallium, total	7440-28-0	E420	0.0368 mg/L	0.04 mg/L	92.1	70.0	130	----
		Tin, total	7440-31-5	E420	0.188 mg/L	0.2 mg/L	93.9	70.0	130	----
		Titanium, total	7440-32-6	E420	0.390 mg/L	0.4 mg/L	97.4	70.0	130	----
		Uranium, total	7440-61-1	E420	0.0385 mg/L	0.04 mg/L	96.4	70.0	130	----
		Vanadium, total	7440-62-2	E420	0.959 mg/L	1 mg/L	95.9	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 689067) - continued										
CG2213784-002	CM_FLA_CC02_WS_2022-	Zinc, total	7440-66-6	E420	3.95 mg/L	4 mg/L	98.8	70.0	130	----
Total Metals (QCLot: 692339)										
CG2213735-005	Anonymous	Mercury, total	7439-97-6	E508	0.000102 mg/L	0.0001 mg/L	102	70.0	130	----
Dissolved Metals (QCLot: 688589)										
CG2213778-002	Anonymous	Chromium, dissolved	7440-47-3	E421.Cr-L	0.491 mg/L	0.4 mg/L	123	70.0	130	----
Dissolved Metals (QCLot: 688590)										
CG2213778-002	Anonymous	Aluminum, dissolved	7429-90-5	E421	2.35 mg/L	2 mg/L	117	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.234 mg/L	0.2 mg/L	117	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.242 mg/L	0.2 mg/L	121	70.0	130	----
		Barium, dissolved	7440-39-3	E421	0.185 mg/L	0.2 mg/L	92.7	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.447 mg/L	0.4 mg/L	112	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.110 mg/L	0.1 mg/L	110	70.0	130	----
		Boron, dissolved	7440-42-8	E421	1.05 mg/L	1 mg/L	105	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.0463 mg/L	0.04 mg/L	116	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	40 mg/L	ND	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	0.236 mg/L	0.2 mg/L	118	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.235 mg/L	0.2 mg/L	118	70.0	130	----
		Iron, dissolved	7439-89-6	E421	22.1 mg/L	20 mg/L	110	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.225 mg/L	0.2 mg/L	112	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	0.992 mg/L	1 mg/L	99.2	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	10 mg/L	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.212 mg/L	0.2 mg/L	106	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.233 mg/L	0.2 mg/L	116	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.434 mg/L	0.4 mg/L	109	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	47.6 mg/L	40 mg/L	119	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.438 mg/L	0.4 mg/L	109	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	86.8 mg/L	100 mg/L	86.8	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.0500 mg/L	0.04 mg/L	125	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	19.4 mg/L	20 mg/L	97.3	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	0.173 mg/L	0.2 mg/L	86.7	70.0	130	----
		Sulfur, dissolved	7704-34-9	E421	158 mg/L	200 mg/L	78.9	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.0431 mg/L	0.04 mg/L	108	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.226 mg/L	0.2 mg/L	113	70.0	130	----
		Titanium, dissolved	7440-32-6	E421	0.400 mg/L	0.4 mg/L	100	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*Concentration*	*Target*	*MS*	*Low*	*High*	*Qualifier*
Dissolved Metals (QCLot: 688590) - continued										
CG2213778-002	Anonymous	Uranium, dissolved	7440-61-1	E421	0.0428 mg/L	0.04 mg/L	107	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	1.17 mg/L	1 mg/L	117	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	4.79 mg/L	4 mg/L	120	70.0	130	----
Dissolved Metals (QCLot: 692060)										
CG2213735-005	Anonymous	Mercury, dissolved	7439-97-6	E509	0.000108 mg/L	0.0001 mg/L	108	70.0	130	----
Dissolved Metals (QCLot: 692061)										
CG2213785-001	Anonymous	Mercury, dissolved	7439-97-6	E509	0.0000901 mg/L	0.0001 mg/L	90.1	70.0	130	----

Teck

Page 1 of 2

COC ID: CMO FLA October 4th 2022

TURNAROUND TIME:

RUSH:

PROJECT/CLIENT INFO			
Facility Name / Job#	Coal Mountain Operation		
Project Manager			
Email			
Address	PO Box 3000		
City	Sparwood	Province	BC
Postal Code	V0B 2G0	Country	Canada
Phone Number			

LABORATORY			
Lab Name	ALS Calgary		
Lab Contact	Justine Buma-a		
Email	justine.bumaa@alsglobal.com		
Address	2259 29 Street NE		
City	Calgary	Province	AB
Postal Code	T1Y 7B5	Country	Canada
Phone Number	403-407-1761		

OTHER INFO				
Report Format / Distribution		Excel	PDF	EDD
Email 1:	DL-EQUIS-CMO@Teck.com	X	X	X
Email 2:	teckcoal@equisonline.com			X
Email 3:	[illegible]	X	X	X
Email 4:	[illegible]	X	X	X
Email 5:				
PO number				

SAMPLE DETAILS / **ANALYSIS REQUESTED**

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Environmental Division
Calgary
Work Order Reference
CG2213784

Telephone : +1 403 407 1800

	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	DOC	Mercury_Dissolved	Mercury_Total	TECKCOAL_METNHG_D	TECKCOAL_METNHG_T	TECKCOAL_ROUTINE	TOC_TKN_NH3_TP
Fil.								F	F	N	F	N	N	N
PRESERV.								H2SO4	HCL	HCL	HNO3	HNO3	NONE	H2SO4
~~CM_FLA_AG01_WS_2022-10-04_NP~~	~~CM_FLA_AG01~~	~~WS~~		~~2022/10/04~~	—	~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
~~CM_FLA_AG02_WS_2022-10-04_NP~~	~~CM_FLA_AG02~~	~~WS~~		~~2022/10/04~~	—	~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
~~CM_FLA_CC_TRIB01_WS_2022-10-04_NP~~	~~CM_FLA_CC_TRIB01~~	~~WS~~		~~2022/10/04~~	—	~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
CM_FLA_CC01_WS_2022-10-04_NP	CM_FLA_CC01	WS		2022/10/04	945	G	7	1	1	1	1	1	1	1
CM_FLA_CC02_WS_2022-10-04_NP	CM_FLA_CC02	WS		2022/10/04	1212	G	7	1	1	1	1	1	1	1
CM_FLA_CC03_WS_2022-10-04_NP	CM_FLA_CC03	WS		2022/10/04	1359	G	7	1	1	1	1	1	1	1
CM_FLA_CC04_WS_2022-10-04_NP	CM_FLA_CC04	WS		2022/10/04	1505	G	7	1	1	1	1	1	1	1
~~CM_FLA_MC_TRIB01_WS_2022-10-04_NP~~	~~CM_FLA_MC_TRIB01~~	~~WS~~		~~2022/10/04~~	—	~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
~~CM_FLA_MC01_WS_2022-10-04_NP~~	~~CM_FLA_MC01~~	~~WS~~		~~2022/10/04~~	—	~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
~~CM_FLA_MC02_WS_2022-10-04_NP~~	~~CM_FLA_MC02~~	~~WS~~		~~2022/10/04~~	—	~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	Brody Klank	1700 22/10/04		10/5 9:00

SERVICE REQUEST (rush - subject to availability)	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Brody Klank	**Mobile #**	250-421-4662
Sampler's Signature		**Date/Time**	22/10/04 18:00

2c

Environmental Division
Calgary
Work Order Reference
CG2213784

Teck

Page 2 of 2

COC ID:	CMO FLA October 2022	TURNAROUND TIME:		RUSH:

PROJECT/CLIENT INFO			
Facility Name / Job#	Coal Mountain Operation		
Project Manager			
Email			
Address	PO Box 3000		
City	Sparwood	Province	BC
Postal Code	V0B 2G0	Country	Canada
Phone Number			

LABORATORY			
Lab Name	ALS Calgary		
Lab Contact	Justine Buma-a		
Email	justine.bumaa@alsglobal.com		
Address	2259 29 Street NE		
City	Calgary	Province	AB
Postal Code	T1Y 7B5	Country	Canada
Phone Number	403-407-1761		

OTHER INFO				
Report Format / Distribution		Excel	PDF	EDD
Email 1:	DL-EQuIS-CMO@Teck.com	X	X	X
Email 2:	teckcoal@equisonline.com			X
Email 3:	[illegible]	X	X	X
Email 4:	[illegible]	X	X	X
Email 5:				
PO number				

SAMPLE DETAILS / ANALYSIS REQUESTED — Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	DOC	Mercury_Dissolved	Mercury_Total	TECKCOAL_METNHG_D	TECKCOAL_METNHG_T	TECKCOAL_ROUTINE	TOC_TKN_NH3_TP
Filt.								F	F	N	F	N	N	N
PRESERV.								H2SO4	HCL	HCL	HNO3	HNO3	NONE	H2SO4
~~CM_FLA_MC03_WS_2022-10-04_NP~~	~~CM_FLA_MC03~~	~~WS~~		~~2022/10/04~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
CM_FLA_MC04_WS_2022-10-04_NP	CM_FLA_MC04	WS		2022/10/04	9:45	G	7	1	1	1	1	1	1	1
CM_FLA_MC05_WS_2022-10-04_NP	CM_FLA_MC05	WS		2022/10/04	13:15	G	7	1	1	1	1	1	1	1
CM_FLA_MC06_WS_2022-10-04_NP	CM_FLA_MC06	WS		2022/10/04	15:20	G	7	1	1	1	1	1	1	1
~~CM_FLA_MC07_WS_2022-10-04_NP~~	~~CM_FLA_MC07~~	~~WS~~		~~2022/10/04~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
~~CM_FLA_MC08_WS_2022-10-04_NP~~	~~CM_FLA_MC08~~	~~WS~~		~~2022/10/04~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
~~CM_FLA_MC09_WS_2022-10-04_NP~~	~~CM_FLA_MC09~~	~~WS~~		~~2022/10/04~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
~~CM_FLA_MC10_WS_2022-10-04_NP~~	~~CM_FLA_MC10~~	~~WS~~		~~2022/10/04~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
~~CM_FLA_MC11_WS_2022-10-04_NP~~	~~CM_FLA_MC11~~	~~WS~~		~~2022/10/04~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
~~CM_FLA_MC12_WS_2022-10-04_NP~~	~~CM_FLA_MC12~~	~~WS~~		~~2022/10/04~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	Brody Klenk	22/10/04 17:00		10/5 9:00

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Elly Foster	Mobile #	(403)710-5845
Sampler's Signature		Date/Time	October 4, 2022 16:00

2e

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order : **CG2213851**
Client : **SNC-Lavalin Inc.**
Contact : Ronald Salomonson
Address : 640 5th Avenue SW
Calgary AB Canada T2P 3G4
Telephone : ----
Project : 692207
PO : ----
C-O-C number : CMO FLA October 5th 2022
Sampler : EF
Site : ----
Quote number : TECK Coal codes
No. of samples received : 11
No. of samples analysed : 11

Page : 1 of 14
Laboratory : Calgary - Environmental
Account Manager : Lovepreet Kaur
Address : 2559 29th Street NE
Calgary AB Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 06-Oct-2022 09:15
Date Analysis Commenced : 06-Oct-2022
Issue Date : 14-Oct-2022 19:08

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Anthony Calero	Supervisor - Inorganic	Inorganics, Calgary, Alberta
Anthony Calero	Supervisor - Inorganic	Metals, Calgary, Alberta
Elke Tabora		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Kevin Baxter		Metals, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sara Niroomand		Metals, Calgary, Alberta
Shirley Li		Metals, Calgary, Alberta

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.
Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	No Unit
%	percent
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
mV	millivolts
NTU	nephelometric turbidity units
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DTC	*Dissolved concentration exceeds total. Results were confirmed by re-analysis.*
RRV	*Reported result verified by repeat analysis.*

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	CM_FLA_MC_TRIB01_WS_2022-10-05_NP	CM_FLA_MC06_WS_2022-10-05_NP	CM_FLA_MC07_WS_2022-10-05_NP	CM_FLA_MC08_WS_2022-10-05_NP	CM_FLA_MC09_WS_2022-10-05_NP
				Client sampling date / time	05-Oct-2022 15:00	05-Oct-2022 09:07	05-Oct-2022 10:50	05-Oct-2022 10:15	05-Oct-2022 13:18
Analyte	CAS Number	Method	LOR	Unit	CG2213851-001	CG2213851-002	CG2213851-003	CG2213851-004	CG2213851-005
					Result	Result	Result	Result	Result
Physical Tests									
acidity (as CaCO3)	----	E283	2.0	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	131	174	154	153	156
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	159	212	188	187	190
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	131	174	154	153	156
conductivity	----	E100	2.0	µS/cm	225	278	273	274	272
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	131	161	161	160	158
oxidation-reduction potential [ORP]	----	E125	0.10	mV	440	395	378	353	343
pH	----	E108	0.10	pH units	8.23	8.20	8.23	8.19	8.19
solids, total dissolved [TDS]	----	E162	10	mg/L	128	149	154	155	158
solids, total suspended [TSS]	----	E160-L	1.0	mg/L	2.4	<1.0	<1.0	6.2	<1.0
turbidity	----	E121	0.10	NTU	0.30	0.56	0.44	1.41	0.44
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
chloride	16887-00-6	E235.Cl-L	0.10	mg/L	0.16	0.29	0.30	0.28	0.26
fluoride	16984-48-8	E235.F	0.020	mg/L	0.101	0.079	0.079	0.080	0.083
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.153	<0.050	<0.050	<0.050	<0.050
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0220	0.0076	0.0081	0.0075	0.0072
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0029	0.0012	0.0012	<0.0010	0.0012
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0211	0.0042	0.0056	0.0095	0.0027
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	12.1	13.8	13.6	13.5	13.1
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	0.72	0.70	0.83	0.73	0.69
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	0.97	0.87	0.84	0.94	0.73

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	CM_FLA_MC_TRIB01_WS_2022-10-05_NP	CM_FLA_MC06_WS_2022-10-05_NP	CM_FLA_MC07_WS_2022-10-05_NP	CM_FLA_MC08_WS_2022-10-05_NP	CM_FLA_MC09_WS_2022-10-05_NP
				Client sampling date / time	05-Oct-2022 15:00	05-Oct-2022 09:07	05-Oct-2022 10:50	05-Oct-2022 10:15	05-Oct-2022 13:18
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2213851-001**	**CG2213851-002**	**CG2213851-003**	**CG2213851-004**	**CG2213851-005**
					Result	Result	Result	Result	Result
Ion Balance									
anion sum	----	EC101	0.10	meq/L	2.88	3.78	3.37	3.35	3.40
cation sum	----	EC101	0.10	meq/L	2.65	3.33	3.34	3.32	3.25
ion balance (cations/anions)	----	EC101	0.010	%	92.0	88.1	99.1	99.1	95.6
ion balance (APHA)	----	EC101	0.010	%	4.16	6.33	0.447	0.450	2.26
Total Metals									
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0231	0.0110	0.0116	0.0443	0.0071
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00018	0.00014	0.00014	0.00016	0.00017
barium, total	7440-39-3	E420	0.00010	mg/L	0.0382	0.0724	0.0773	0.0753	0.0652
beryllium, total	7440-41-7	E420	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
boron, total	7440-42-8	E420	0.010	mg/L	<0.010	0.011	0.012	0.012	0.010
cadmium, total	7440-43-9	E420	0.0050	µg/L	0.0146	0.0079	0.0087	0.0129	0.0081
calcium, total	7440-70-2	E420	0.050	mg/L	32.2	41.8	45.6	42.7	42.2
chromium, total	7440-47-3	E420.Cr-L	0.00010	mg/L	0.00034	0.00020	0.00020	0.00026	0.00023
cobalt, total	7440-48-4	E420	0.10	µg/L	<0.10	<0.10	<0.10	<0.10	<0.10
copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
iron, total	7439-89-6	E420	0.010	mg/L	0.036	0.015	0.019	0.070	0.030
lead, total	7439-92-1	E420	0.000050	mg/L	0.000054	<0.000050	<0.000050	0.000069	<0.000050
lithium, total	7439-93-2	E420	0.0010	mg/L	0.0016	0.0038	0.0040	0.0040	0.0033
magnesium, total	7439-95-4	E420	0.0050	mg/L	13.3	13.3	13.8	13.6	13.8
manganese, total	7439-96-5	E420	0.00010	mg/L	0.00596	0.00232	0.00386	0.00733	0.0116
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000691	0.000686	0.000705	0.000694	0.000711
nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
potassium, total	7440-09-7	E420	0.050	mg/L	0.340	0.441	0.460	0.492	0.416
selenium, total	7782-49-2	E420	0.050	µg/L	0.339	0.213	0.189	0.201	0.190
silicon, total	7440-21-3	E420	0.10	mg/L	1.77	2.26	2.36	2.34	2.16
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
sodium, total	7440-23-5	E420	0.050	mg/L	0.941	2.73	2.82	2.82	2.44

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	CM_FLA_MC_TRIB01_WS_2022-10-05_NP	CM_FLA_MC06_WS_2022-10-05_NP	CM_FLA_MC07_WS_2022-10-05_NP	CM_FLA_MC08_WS_2022-10-05_NP	CM_FLA_MC09_WS_2022-10-05_NP
				Client sampling date / time	05-Oct-2022 15:00	05-Oct-2022 09:07	05-Oct-2022 10:50	05-Oct-2022 10:15	05-Oct-2022 13:18
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2213851-001**	**CG2213851-002**	**CG2213851-003**	**CG2213851-004**	**CG2213851-005**
					Result	Result	Result	Result	Result
Total Metals									
strontium, total	7440-24-6	E420	0.00020	mg/L	0.0700	0.148	0.156	0.151	0.135
sulfur, total	7704-34-9	E420	0.50	mg/L	4.24	5.11	5.07	4.99	4.76
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010 DTC	<0.00010	<0.00010
titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	<0.00030	0.00045	<0.00030
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000363	0.000245	0.000250	0.000247	0.000263
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0016	<0.0010	0.0017	<0.0010	0.0013
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00015	0.00012	0.00010	0.00014	0.00014
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0385	0.0772	0.0765	0.0759	0.0679
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	0.011	0.011	0.011	0.010
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000055	0.0000075	0.0000055	0.0000075	0.0000065
calcium, dissolved	7440-70-2	E421	0.050	mg/L	31.7	43.7	43.4	43.2	42.0
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
chromium, dissolved	7440-47-3	E421.Cr-L	0.00010	mg/L	0.00034	0.00019	0.00019	0.00019	0.00020
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
copper, dissolved	7440-50-8	E421	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0015	0.0040	0.0040	0.0040	0.0036
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	12.5	12.6	12.9	12.7	12.8
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00018	0.00147	0.00295	0.00311	0.0108
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000769	0.000735	0.000702	0.000719	0.000695
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	CM_FLA_MC_TRIB01_WS_2022-10-05_NP	CM_FLA_MC06_WS_2022-10-05_NP	CM_FLA_MC07_WS_2022-10-05_NP	CM_FLA_MC08_WS_2022-10-05_NP	CM_FLA_MC09_WS_2022-10-05_NP
				Client sampling date / time	05-Oct-2022 15:00	05-Oct-2022 09:07	05-Oct-2022 10:50	05-Oct-2022 10:15	05-Oct-2022 13:18
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2213851-001**	**CG2213851-002**	**CG2213851-003**	**CG2213851-004**	**CG2213851-005**
					Result	Result	Result	Result	Result
Dissolved Metals									
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.325	0.442	0.460	0.467	0.425
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00024	<0.00020	<0.00020	<0.00020	<0.00020
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000394	0.000240	0.000256	0.000227	0.000267
silicon, dissolved	7440-21-3	E421	0.050	mg/L	1.84	2.35	2.39	2.40	2.26
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
sodium, dissolved	7440-23-5	E421	0.050	mg/L	0.808	2.38	2.43	2.39	2.15
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0679	0.149	0.148	0.146	0.132
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	4.56	5.28	5.50	5.21	5.15
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0.00124 DTC	<0.00010	<0.00010
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000377	0.000246	0.000245	0.000249	0.000271
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	0.0020	<0.0010	<0.0010
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
dissolved mercury filtration location	----	EP509	-	-	Field	Field	Field	Field	Field
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	Field	Field

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	CM_FLA_MC10_WS_2022-10-05_NP	CM_FLA_MC11_WS_2022-10-05_NP	CM_NNP_WS_2022-10-05_NP	CM_FLA_MC_TRIB02_WS_2022-10-05_NP	CM_FLA_MC_TRIB03_WS_2022-10-05_NP
				Client sampling date / time	05-Oct-2022 12:15	05-Oct-2022 15:30	05-Oct-2022 13:00	05-Oct-2022 08:45	05-Oct-2022 14:00
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2213851-006**	**CG2213851-007**	**CG2213851-008**	**CG2213851-009**	**CG2213851-010**
					Result	Result	Result	Result	Result
Physical Tests									
acidity (as CaCO3)	----	E283	2.0	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	140	170	131	236	204
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	171	207	160	288	249
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	2.0	5.8	9.0
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	<1.0	<1.0	1.2	3.5	5.4
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	140	170	133	242	214
conductivity	----	E100	2.0	µS/cm	252	276	250	857	492
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	146	158	147	535	248
oxidation-reduction potential [ORP]	----	E125	0.10	mV	333	327	311	314	280
pH	----	E108	0.10	pH units	8.28	8.20	8.30	8.33	8.42
solids, total dissolved [TDS]	----	E162	10	mg/L	143	159	153	682	314
solids, total suspended [TSS]	----	E160-L	1.0	mg/L	<1.0	<1.0	<1.0	2.4	<1.0
turbidity	----	E121	0.10	NTU	0.18	0.19	0.19	1.18	0.92
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
chloride	16887-00-6	E235.Cl-L	0.10	mg/L	0.32	0.44	0.35	1.29	1.29
fluoride	16984-48-8	E235.F	0.020	mg/L	0.091	0.074	0.093	0.107	0.154
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.065	<0.050	0.051	0.075	0.061
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0059	0.0117	0.0060	0.0576	0.0219
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	0.0010	0.0012	<0.0010	0.0032
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0045	0.0050	0.0053	0.0060	0.0079
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	14.1	13.9	14.0	310	81.2
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	0.90	1.05 ^{RRV}	0.87	1.67	1.82
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	0.90	0.82 ^{RRV}	0.92	1.86	1.51
Ion Balance									

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	**CM_FLA_MC10_WS_2022-10-05_NP**	**CM_FLA_MC11_WS_2022-10-05_NP**	**CM_NNP_WS_2022-10-05_NP**	**CM_FLA_MC_TRIB02_WS_2022-10-05_NP**	**CM_FLA_MC_TRIB03_WS_2022-10-05_NP**
				Client sampling date / time	05-Oct-2022 12:15	05-Oct-2022 15:30	05-Oct-2022 13:00	05-Oct-2022 08:45	05-Oct-2022 14:00
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2213851-006**	**CG2213851-007**	**CG2213851-008**	**CG2213851-009**	**CG2213851-010**
					Result	Result	Result	Result	Result
Ion Balance									
anion sum	----	EC101	0.10	meq/L	3.10	3.70	2.96	11.3	6.01
cation sum	----	EC101	0.10	meq/L	3.01	3.29	3.03	11.0	5.89
ion balance (cations/anions)	----	EC101	0.010	%	97.1	88.9	102	97.3	98.0
ion balance (APHA)	----	EC101	0.010	%	1.47	5.86	1.17	1.34	1.01
Total Metals									
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0066	0.0070	0.0067	0.0155	0.0155
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00016	0.00015	0.00014	0.00020	0.00020
barium, total	7440-39-3	E420	0.00010	mg/L	0.0489	0.0616	0.0500	0.0827	0.104
beryllium, total	7440-41-7	E420	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
boron, total	7440-42-8	E420	0.010	mg/L	0.010	0.016	<0.010	0.023	0.041
cadmium, total	7440-43-9	E420	0.0050	µg/L	0.0082	0.0119	0.0102	0.0065	0.0087
calcium, total	7440-70-2	E420	0.050	mg/L	39.0	43.6	39.4	128	67.4
chromium, total	7440-47-3	E420.Cr-L	0.00010	mg/L	0.00030	0.00018	0.00026	<0.00010	<0.00010
cobalt, total	7440-48-4	E420	0.10	µg/L	<0.10	<0.10	<0.10	<0.10	<0.10
copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
iron, total	7439-89-6	E420	0.010	mg/L	<0.010	<0.010	<0.010	0.013	0.059
lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
lithium, total	7439-93-2	E420	0.0010	mg/L	0.0034	0.0050	0.0032	0.0100	0.0227
magnesium, total	7439-95-4	E420	0.0050	mg/L	13.1	12.8	13.2	51.8	21.3
manganese, total	7439-96-5	E420	0.00010	mg/L	0.00128	0.00050	0.00133	0.00090	0.00965
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000730	0.000800	0.000775	0.000430	0.000355
nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
potassium, total	7440-09-7	E420	0.050	mg/L	0.400	0.507	0.399	1.39	1.05
selenium, total	7782-49-2	E420	0.050	µg/L	0.222	0.187	0.236	2.13	0.205
silicon, total	7440-21-3	E420	0.10	mg/L	2.03	2.36	2.00	3.57	3.35
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
sodium, total	7440-23-5	E420	0.050	mg/L	2.41	3.32	2.49	7.83	23.6

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	CM_FLA_MC10_WS_2022-10-05_NP	CM_FLA_MC11_WS_2022-10-05_NP	CM_NNP_WS_2022-10-05_NP	CM_FLA_MC_TRIB02_WS_2022-10-05_NP	CM_FLA_MC_TRIB03_WS_2022-10-05_NP
				Client sampling date / time	05-Oct-2022 12:15	05-Oct-2022 15:30	05-Oct-2022 13:00	05-Oct-2022 08:45	05-Oct-2022 14:00
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2213851-006**	**CG2213851-007**	**CG2213851-008**	**CG2213851-009**	**CG2213851-010**
					Result	Result	Result	Result	Result
Total Metals									
strontium, total	7440-24-6	E420	0.00020	mg/L	0.125	0.177	0.130	0.548	0.506
sulfur, total	7704-34-9	E420	0.50	mg/L	5.26	4.97	4.93	118	29.2
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	<0.00030	0.00043	<0.00030
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000300	0.000217	0.000297	0.00104	0.000253
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	<0.0010	0.0017	0.0014	<0.0010	0.0013
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00013	0.00015	0.00013	0.00012	0.00017
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0497	0.0628	0.0501	0.0862	0.106
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.010	0.016	0.010	0.022	0.041
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000145	0.0000145	0.0000165	<0.0000050	0.0000085
calcium, dissolved	7440-70-2	E421	0.050	mg/L	38.0	44.2	38.3	132	65.5
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
chromium, dissolved	7440-47-3	E421.Cr-L	0.00010	mg/L	0.00026	0.00018	0.00029	<0.00010	<0.00010
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00023	<0.00020	<0.00020	<0.00020	<0.00020
iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	0.019
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0036	0.0053	0.0036	0.0108	0.0233
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	12.3	11.6	12.4	49.8	20.4
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00073	0.00025	0.00080	0.00031	0.00713
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000747	0.000810	0.000745	0.000425	0.000359
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water)**

				Client sample ID	**CM_FLA_MC10_WS_2022-10-05_NP**	**CM_FLA_MC11_WS_2022-10-05_NP**	**CM_NNP_WS_2022-10-05_NP**	**CM_FLA_MC_TRIB02_WS_2022-10-05_NP**	**CM_FLA_MC_TRIB03_WS_2022-10-05_NP**
				Client sampling date / time	05-Oct-2022 12:15	05-Oct-2022 15:30	05-Oct-2022 13:00	05-Oct-2022 08:45	05-Oct-2022 14:00
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2213851-006**	**CG2213851-007**	**CG2213851-008**	**CG2213851-009**	**CG2213851-010**
					Result	Result	Result	Result	Result
Dissolved Metals									
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.391	0.499	0.400	1.43	1.06
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00023	<0.00020	0.00029	0.00054	0.00049
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000310	0.000241	0.000313	0.00280	0.000231
silicon, dissolved	7440-21-3	E421	0.050	mg/L	2.06	2.42	2.06	3.81	3.58
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
sodium, dissolved	7440-23-5	E421	0.050	mg/L	2.06	2.78	2.07	6.97	21.0
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.122	0.172	0.122	0.544	0.492
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	5.26	5.18	5.39	123	30.4
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000297	0.000214	0.000292	0.00109	0.000255
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	0.0030	<0.0010	<0.0010	<0.0010
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
dissolved mercury filtration location	----	EP509	-	-	Field	Field	Field	Field	Field
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	Field	Field

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	CM_FLA_MC_TRIB04_WS_2022-10-05_NP	----	----	----	----
				Client sampling date / time	05-Oct-2022 11:15	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit	CG2213851-011	--------	--------	--------	--------
					Result	----	----	----	----
Physical Tests									
acidity (as CaCO3)	----	E283	2.0	mg/L	<2.0	----	----	----	----
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	159	----	----	----	----
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	194	----	----	----	----
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	----	----	----	----
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	<1.0	----	----	----	----
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	----	----	----	----
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	----	----	----	----
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	159	----	----	----	----
conductivity	----	E100	2.0	µS/cm	279	----	----	----	----
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	164	----	----	----	----
oxidation-reduction potential [ORP]	----	E125	0.10	mV	274	----	----	----	----
pH	----	E108	0.10	pH units	8.18	----	----	----	----
solids, total dissolved [TDS]	----	E162	10	mg/L	160	----	----	----	----
solids, total suspended [TSS]	----	E160-L	1.0	mg/L	1.8	----	----	----	----
turbidity	----	E121	0.10	NTU	1.69	----	----	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	----	----	----	----
bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	----	----	----	----
chloride	16887-00-6	E235.Cl-L	0.10	mg/L	0.26	----	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	0.086	----	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.056	----	----	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0050	----	----	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	----	----	----	----
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0011	----	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0110	----	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	13.8	----	----	----	----
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	1.16	----	----	----	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	1.12	----	----	----	----
Ion Balance									

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	**CM_FLA_MC_TRIB04_WS_2022-10-05_NP**	**----**	**----**	**----**	**----**
				Client sampling date / time	05-Oct-2022 11:15	----	----	----	----
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2213851-011**	**--------**	**--------**	**--------**	**--------**
					Result	----	----	----	----
Ion Balance									
anion sum	----	EC101	0.10	meq/L	3.48	----	----	----	----
cation sum	----	EC101	0.10	meq/L	3.40	----	----	----	----
ion balance (cations/anions)	----	EC101	0.010	%	97.7	----	----	----	----
ion balance (APHA)	----	EC101	0.010	%	1.16	----	----	----	----
Total Metals									
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0453	----	----	----	----
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	----	----	----	----
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00021	----	----	----	----
barium, total	7440-39-3	E420	0.00010	mg/L	0.0714	----	----	----	----
beryllium, total	7440-41-7	E420	0.020	µg/L	<0.020	----	----	----	----
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	----	----	----	----
boron, total	7440-42-8	E420	0.010	mg/L	0.012	----	----	----	----
cadmium, total	7440-43-9	E420	0.0050	µg/L	0.0078	----	----	----	----
calcium, total	7440-70-2	E420	0.050	mg/L	46.6	----	----	----	----
chromium, total	7440-47-3	E420.Cr-L	0.00010	mg/L	0.00024	----	----	----	----
cobalt, total	7440-48-4	E420	0.10	µg/L	<0.10	----	----	----	----
copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	----	----	----	----
iron, total	7439-89-6	E420	0.010	mg/L	0.088	----	----	----	----
lead, total	7439-92-1	E420	0.000050	mg/L	0.000067	----	----	----	----
lithium, total	7439-93-2	E420	0.0010	mg/L	0.0039	----	----	----	----
magnesium, total	7439-95-4	E420	0.0050	mg/L	13.8	----	----	----	----
manganese, total	7439-96-5	E420	0.00010	mg/L	0.00353	----	----	----	----
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	----	----	----	----
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000700	----	----	----	----
nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	----	----	----	----
potassium, total	7440-09-7	E420	0.050	mg/L	0.540	----	----	----	----
selenium, total	7782-49-2	E420	0.050	µg/L	0.174	----	----	----	----
silicon, total	7440-21-3	E420	0.10	mg/L	2.10	----	----	----	----
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	----	----	----	----
sodium, total	7440-23-5	E420	0.050	mg/L	2.90	----	----	----	----

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

Client sample ID					**CM_FLA_MC_TRIB04_WS_2022-10-05_NP**	----	----	----	----
Client sampling date / time					05-Oct-2022 11:15	----	----	----	----
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2213851-011**	--------	--------	--------	--------
					Result	----	----	----	----
Total Metals									
strontium, total	7440-24-6	E420	0.00020	mg/L	0.164	----	----	----	----
sulfur, total	7704-34-9	E420	0.50	mg/L	5.10	----	----	----	----
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	----	----	----	----
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	----	----	----	----
titanium, total	7440-32-6	E420	0.00030	mg/L	0.00045	----	----	----	----
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000270	----	----	----	----
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	----	----	----	----
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	----	----	----	----
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0026	----	----	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	----	----	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00015	----	----	----	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0720	----	----	----	----
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	----	----	----	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	----	----	----	----
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.011	----	----	----	----
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	----	----	----	----
calcium, dissolved	7440-70-2	E421	0.050	mg/L	43.6	----	----	----	----
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	----	----	----	----
chromium, dissolved	7440-47-3	E421.Cr-L	0.00010	mg/L	0.00016	----	----	----	----
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	----	----	----	----
copper, dissolved	7440-50-8	E421	0.00020	mg/L	<0.00020	----	----	----	----
iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	----	----	----	----
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	----	----	----	----
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0039	----	----	----	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	13.3	----	----	----	----
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00201	----	----	----	----
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	----	----	----	----
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000648	----	----	----	----
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	----	----	----	----

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water)**

				Client sample ID	**CM_FLA_MC_TRIB04_WS_2022-10-05_NP**	**----**	**----**	**----**	**----**
				Client sampling date / time	05-Oct-2022 11:15	----	----	----	----
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2213851-011**	**--------**	**--------**	**--------**	**--------**
					Result	----	----	----	----
Dissolved Metals									
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	----	----	----	----
potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.547	----	----	----	----
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	<0.00020	----	----	----	----
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000216	----	----	----	----
silicon, dissolved	7440-21-3	E421	0.050	mg/L	2.13	----	----	----	----
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	----	----	----	----
sodium, dissolved	7440-23-5	E421	0.050	mg/L	2.56	----	----	----	----
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.149	----	----	----	----
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	5.10	----	----	----	----
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	----	----	----	----
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	----	----	----	----
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	----	----	----	----
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	----	----	----	----
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	----	----	----	----
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	----	----	----	----
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000256	----	----	----	----
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	----	----	----	----
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0021	----	----	----	----
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	----	----	----	----
dissolved mercury filtration location	----	EP509	-	-	Field	----	----	----	----
dissolved metals filtration location	----	EP421	-	-	Field	----	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order : **CG2213851**

Client : **SNC-Lavalin Inc.**
Contact : Ronald Salomonson
Address : 640 5th Avenue SW
Calgary AB Canada T2P 3G4
Telephone : ----
Project : 692207
PO : ----
C-O-C number : CMO FLA October 5th 2022
Sampler : EF
Site : ----
Quote number : TECK Coal codes
No. of samples received : 11
No. of samples analysed : 11

Page : 1 of 41
Laboratory : Calgary - Environmental
Account Manager : Lovepreet Kaur
Address : 2559 29th Street NE
Calgary, Alberta Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 06-Oct-2022 09:15
Issue Date : 14-Oct-2022 19:08

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: ✗ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E298	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E298	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E298	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_MC06_WS_2022-10-05_NP	E298	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_MC07_WS_2022-10-05_NP	E298	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_MC08_WS_2022-10-05_NP	E298	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_MC09_WS_2022-10-05_NP	E298	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_MC10_WS_2022-10-05_NP	E298	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_MC11_WS_2022-10-05_NP	E298	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_NNP_WS_2022-10-05_NP	E298	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E298	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E235.Br-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E235.Br-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E235.Br-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E235.Br-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_MC06_WS_2022-10-05_NP	E235.Br-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation* *Preparation Date*	*Holding Times* *Rec*	*Holding Times* *Actual*	*Eval*	*Analysis* *Analysis Date*	*Holding Times* *Rec*	*Holding Times* *Actual*	*Eval*
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_MC07_WS_2022-10-05_NP	E235.Br-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_MC08_WS_2022-10-05_NP	E235.Br-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_MC09_WS_2022-10-05_NP	E235.Br-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_MC10_WS_2022-10-05_NP	E235.Br-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_MC11_WS_2022-10-05_NP	E235.Br-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_NNP_WS_2022-10-05_NP	E235.Br-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E235.Cl-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E235.Cl-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E235.Cl-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times Rec*	*Holding Times Actual*	*Eval*	*Analysis Date*	*Holding Times Rec*	*Holding Times Actual*	*Eval*
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E235.Cl-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_MC06_WS_2022-10-05_NP	E235.Cl-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_MC07_WS_2022-10-05_NP	E235.Cl-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_MC08_WS_2022-10-05_NP	E235.Cl-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_MC09_WS_2022-10-05_NP	E235.Cl-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_MC10_WS_2022-10-05_NP	E235.Cl-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_MC11_WS_2022-10-05_NP	E235.Cl-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_NNP_WS_2022-10-05_NP	E235.Cl-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E378-U	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E378-U	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E378-U	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E378-U	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_MC06_WS_2022-10-05_NP	E378-U	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_MC07_WS_2022-10-05_NP	E378-U	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_MC08_WS_2022-10-05_NP	E378-U	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_MC09_WS_2022-10-05_NP	E378-U	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_MC10_WS_2022-10-05_NP	E378-U	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_MC11_WS_2022-10-05_NP	E378-U	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_NNP_WS_2022-10-05_NP	E378-U	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E235.F	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E235.F	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E235.F	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E235.F	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_FLA_MC06_WS_2022-10-05_NP	E235.F	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_FLA_MC07_WS_2022-10-05_NP	E235.F	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_FLA_MC08_WS_2022-10-05_NP	E235.F	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_FLA_MC09_WS_2022-10-05_NP	E235.F	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_FLA_MC10_WS_2022-10-05_NP	E235.F	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_FLA_MC11_WS_2022-10-05_NP	E235.F	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_NNP_WS_2022-10-05_NP	E235.F	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E235.NO3-L	05-Oct-2022	06-Oct-2022	3 days	1 days	✓	06-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E235.NO3-L	05-Oct-2022	06-Oct-2022	3 days	1 days	✓	06-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E235.NO3-L	05-Oct-2022	06-Oct-2022	3 days	1 days	✓	06-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E235.NO3-L	05-Oct-2022	06-Oct-2022	3 days	1 days	✓	06-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_MC06_WS_2022-10-05_NP	E235.NO3-L	05-Oct-2022	06-Oct-2022	3 days	1 days	✓	06-Oct-2022	3 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_MC07_WS_2022-10-05_NP	E235.NO3-L	05-Oct-2022	06-Oct-2022	3 days	1 days	✓	06-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_MC08_WS_2022-10-05_NP	E235.NO3-L	05-Oct-2022	06-Oct-2022	3 days	1 days	✓	06-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_MC09_WS_2022-10-05_NP	E235.NO3-L	05-Oct-2022	06-Oct-2022	3 days	1 days	✓	06-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_MC10_WS_2022-10-05_NP	E235.NO3-L	05-Oct-2022	06-Oct-2022	3 days	1 days	✓	06-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_MC11_WS_2022-10-05_NP	E235.NO3-L	05-Oct-2022	06-Oct-2022	3 days	1 days	✓	06-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_NNP_WS_2022-10-05_NP	E235.NO3-L	05-Oct-2022	06-Oct-2022	3 days	1 days	✓	06-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E235.NO2-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E235.NO2-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E235.NO2-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation* *Preparation Date*	*Holding Times* *Rec*	*Actual*	*Eval*	*Analysis* *Analysis Date*	*Holding Times* *Rec*	*Actual*	*Eval*
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E235.NO2-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_MC06_WS_2022-10-05_NP	E235.NO2-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_MC07_WS_2022-10-05_NP	E235.NO2-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_MC08_WS_2022-10-05_NP	E235.NO2-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_MC09_WS_2022-10-05_NP	E235.NO2-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_MC10_WS_2022-10-05_NP	E235.NO2-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_MC11_WS_2022-10-05_NP	E235.NO2-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_NNP_WS_2022-10-05_NP	E235.NO2-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E235.SO4	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E235.SO4	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E235.SO4	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E235.SO4	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_MC06_WS_2022-10-05_NP	E235.SO4	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_MC07_WS_2022-10-05_NP	E235.SO4	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_MC08_WS_2022-10-05_NP	E235.SO4	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_MC09_WS_2022-10-05_NP	E235.SO4	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_MC10_WS_2022-10-05_NP	E235.SO4	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_MC11_WS_2022-10-05_NP	E235.SO4	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_NNP_WS_2022-10-05_NP	E235.SO4	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E318	05-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E318	05-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E318	05-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E318	05-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC06_WS_2022-10-05_NP	E318	05-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC07_WS_2022-10-05_NP	E318	05-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC08_WS_2022-10-05_NP	E318	05-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC09_WS_2022-10-05_NP	E318	05-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC10_WS_2022-10-05_NP	E318	05-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC11_WS_2022-10-05_NP	E318	05-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_NNP_WS_2022-10-05_NP	E318	05-Oct-2022	11-Oct-2022	----	----		11-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E372-U	05-Oct-2022	12-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E372-U	05-Oct-2022	12-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E372-U	05-Oct-2022	12-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E372-U	05-Oct-2022	12-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_MC06_WS_2022-10-05_NP	E372-U	05-Oct-2022	12-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_MC07_WS_2022-10-05_NP	E372-U	05-Oct-2022	12-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation* Preparation Date	*Extraction / Preparation* Holding Times Rec	*Extraction / Preparation* Holding Times Actual	*Extraction / Preparation* Eval	*Analysis* Analysis Date	*Analysis* Holding Times Rec	*Analysis* Holding Times Actual	*Analysis* Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_MC08_WS_2022-10-05_NP	E372-U	05-Oct-2022	12-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_MC09_WS_2022-10-05_NP	E372-U	05-Oct-2022	12-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_MC10_WS_2022-10-05_NP	E372-U	05-Oct-2022	12-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_MC11_WS_2022-10-05_NP	E372-U	05-Oct-2022	12-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_NNP_WS_2022-10-05_NP	E372-U	05-Oct-2022	12-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE - dissolved (lab preserved) CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E421.Cr-L	05-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE - dissolved (lab preserved) CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E421.Cr-L	05-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE - dissolved (lab preserved) CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E421.Cr-L	05-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE - dissolved (lab preserved) CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E421.Cr-L	05-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	180 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE - dissolved (lab preserved) CM_FLA_MC06_WS_2022-10-05_NP	E421.Cr-L	05-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE - dissolved (lab preserved) CM_FLA_MC07_WS_2022-10-05_NP	E421.Cr-L	05-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE - dissolved (lab preserved) CM_FLA_MC08_WS_2022-10-05_NP	E421.Cr-L	05-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE - dissolved (lab preserved) CM_FLA_MC09_WS_2022-10-05_NP	E421.Cr-L	05-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE - dissolved (lab preserved) CM_FLA_MC10_WS_2022-10-05_NP	E421.Cr-L	05-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE - dissolved (lab preserved) CM_FLA_MC11_WS_2022-10-05_NP	E421.Cr-L	05-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE - dissolved (lab preserved) CM_NNP_WS_2022-10-05_NP	E421.Cr-L	05-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial - dissolved (lab preserved) CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E509	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial - dissolved (lab preserved) CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E509	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times Rec*	*Holding Times Actual*	*Eval*	*Analysis Date*	*Holding Times Rec*	*Holding Times Actual*	*Eval*
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial - dissolved (lab preserved) CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E509	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial - dissolved (lab preserved) CM_FLA_MC06_WS_2022-10-05_NP	E509	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial - dissolved (lab preserved) CM_FLA_MC07_WS_2022-10-05_NP	E509	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial - dissolved (lab preserved) CM_FLA_MC08_WS_2022-10-05_NP	E509	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial - dissolved (lab preserved) CM_FLA_MC09_WS_2022-10-05_NP	E509	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial - dissolved (lab preserved) CM_FLA_MC10_WS_2022-10-05_NP	E509	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial - dissolved (lab preserved) CM_FLA_MC11_WS_2022-10-05_NP	E509	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial - dissolved (lab preserved) CM_NNP_WS_2022-10-05_NP	E509	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial - dissolved (lab preserved) CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E509	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	9 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E421	05-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E421	05-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E421	05-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E421	05-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) CM_FLA_MC06_WS_2022-10-05_NP	E421	05-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) CM_FLA_MC07_WS_2022-10-05_NP	E421	05-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) CM_FLA_MC08_WS_2022-10-05_NP	E421	05-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) CM_FLA_MC09_WS_2022-10-05_NP	E421	05-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) CM_FLA_MC10_WS_2022-10-05_NP	E421	05-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	180 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) CM_FLA_MC11_WS_2022-10-05_NP	E421	05-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) CM_NNP_WS_2022-10-05_NP	E421	05-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	180 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E358-L	05-Oct-2022	07-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E358-L	05-Oct-2022	07-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E358-L	05-Oct-2022	07-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E358-L	05-Oct-2022	07-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_MC06_WS_2022-10-05_NP	E358-L	05-Oct-2022	07-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_MC07_WS_2022-10-05_NP	E358-L	05-Oct-2022	07-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_MC08_WS_2022-10-05_NP	E358-L	05-Oct-2022	07-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_MC09_WS_2022-10-05_NP	E358-L	05-Oct-2022	07-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_MC10_WS_2022-10-05_NP	E358-L	05-Oct-2022	07-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_MC11_WS_2022-10-05_NP	E358-L	05-Oct-2022	07-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_NNP_WS_2022-10-05_NP	E358-L	05-Oct-2022	07-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E355-L	05-Oct-2022	07-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E355-L	05-Oct-2022	07-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E355-L	05-Oct-2022	07-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E355-L	05-Oct-2022	07-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC06_WS_2022-10-05_NP	E355-L	05-Oct-2022	07-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC07_WS_2022-10-05_NP	E355-L	05-Oct-2022	07-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC08_WS_2022-10-05_NP	E355-L	05-Oct-2022	07-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC09_WS_2022-10-05_NP	E355-L	05-Oct-2022	07-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC10_WS_2022-10-05_NP	E355-L	05-Oct-2022	07-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC11_WS_2022-10-05_NP	E355-L	05-Oct-2022	07-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_NNP_WS_2022-10-05_NP	E355-L	05-Oct-2022	07-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E283	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E283	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E283	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	14 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation* *Preparation Date*	*Holding Times* *Rec*	 *Actual*	*Eval*	*Analysis* *Analysis Date*	*Holding Times* *Rec*	 *Actual*	*Eval*
Physical Tests : Acidity by Titration										
HDPE CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E283	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_MC06_WS_2022-10-05_NP	E283	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_MC07_WS_2022-10-05_NP	E283	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_MC08_WS_2022-10-05_NP	E283	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_MC09_WS_2022-10-05_NP	E283	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_MC10_WS_2022-10-05_NP	E283	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_MC11_WS_2022-10-05_NP	E283	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_NNP_WS_2022-10-05_NP	E283	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E290	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	14 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times Rec*	*Holding Times Actual*	*Eval*	*Analysis Date*	*Holding Times Rec*	*Holding Times Actual*	*Eval*
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E290	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E290	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E290	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_MC06_WS_2022-10-05_NP	E290	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_MC07_WS_2022-10-05_NP	E290	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_MC08_WS_2022-10-05_NP	E290	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_MC09_WS_2022-10-05_NP	E290	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_MC10_WS_2022-10-05_NP	E290	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_MC11_WS_2022-10-05_NP	E290	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	14 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation* *Preparation Date*	*Holding Times* *Rec*	*Actual*	*Eval*	*Analysis* *Analysis Date*	*Holding Times* *Rec*	*Actual*	*Eval*
Physical Tests : Alkalinity Species by Titration										
HDPE CM_NNP_WS_2022-10-05_NP	E290	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	14 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E100	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E100	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E100	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E100	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_MC06_WS_2022-10-05_NP	E100	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_MC07_WS_2022-10-05_NP	E100	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_MC08_WS_2022-10-05_NP	E100	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_MC09_WS_2022-10-05_NP	E100	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: ✘ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : Conductivity in Water										
HDPE CM_FLA_MC10_WS_2022-10-05_NP	E100	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_MC11_WS_2022-10-05_NP	E100	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_NNP_WS_2022-10-05_NP	E100	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	3 days	✓
Physical Tests : ORP by Electrode										
HDPE CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E125	05-Oct-2022	----	----	----		11-Oct-2022	0.25 hrs	142 hrs	✘ EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_FLA_MC11_WS_2022-10-05_NP	E125	05-Oct-2022	----	----	----		11-Oct-2022	0.25 hrs	142 hrs	✘ EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E125	05-Oct-2022	----	----	----		11-Oct-2022	0.25 hrs	143 hrs	✘ EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_FLA_MC09_WS_2022-10-05_NP	E125	05-Oct-2022	----	----	----		11-Oct-2022	0.25 hrs	144 hrs	✘ EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_NNP_WS_2022-10-05_NP	E125	05-Oct-2022	----	----	----		11-Oct-2022	0.25 hrs	144 hrs	✘ EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_FLA_MC10_WS_2022-10-05_NP	E125	05-Oct-2022	----	----	----		11-Oct-2022	0.25 hrs	145 hrs	✘ EHTR-FM

Matrix: **Water**

Evaluation: ✗ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : ORP by Electrode										
HDPE CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E125	05-Oct-2022	----	----	----		11-Oct-2022	0.25 hrs	146 hrs	✗ EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_FLA_MC07_WS_2022-10-05_NP	E125	05-Oct-2022	----	----	----		11-Oct-2022	0.25 hrs	147 hrs	✗ EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_FLA_MC08_WS_2022-10-05_NP	E125	05-Oct-2022	----	----	----		11-Oct-2022	0.25 hrs	147 hrs	✗ EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_FLA_MC06_WS_2022-10-05_NP	E125	05-Oct-2022	----	----	----		11-Oct-2022	0.25 hrs	148 hrs	✗ EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E125	05-Oct-2022	----	----	----		11-Oct-2022	0.25 hrs	149 hrs	✗ EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E108	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	0.25 hrs	0.26 hrs	✗ EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E108	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	0.25 hrs	0.26 hrs	✗ EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E108	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	0.25 hrs	0.26 hrs	✗ EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E108	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	0.25 hrs	0.26 hrs	✗ EHTR-FM

Matrix: **Water**

Evaluation: ✘ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : pH by Meter										
HDPE CM_FLA_MC06_WS_2022-10-05_NP	E108	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	0.25 hrs	0.26 hrs	✘ EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_MC07_WS_2022-10-05_NP	E108	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	0.25 hrs	0.26 hrs	✘ EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_MC08_WS_2022-10-05_NP	E108	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	0.25 hrs	0.26 hrs	✘ EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_MC09_WS_2022-10-05_NP	E108	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	0.25 hrs	0.26 hrs	✘ EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_MC10_WS_2022-10-05_NP	E108	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	0.25 hrs	0.26 hrs	✘ EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_MC11_WS_2022-10-05_NP	E108	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	0.25 hrs	0.26 hrs	✘ EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_NNP_WS_2022-10-05_NP	E108	05-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	0.25 hrs	0.26 hrs	✘ EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E162	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E162	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times Rec*	*Holding Times Actual*	*Eval*	*Analysis Date*	*Holding Times Rec*	*Holding Times Actual*	*Eval*
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E162	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E162	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_MC06_WS_2022-10-05_NP	E162	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_MC07_WS_2022-10-05_NP	E162	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_MC08_WS_2022-10-05_NP	E162	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_MC09_WS_2022-10-05_NP	E162	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_MC10_WS_2022-10-05_NP	E162	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_MC11_WS_2022-10-05_NP	E162	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_NNP_WS_2022-10-05_NP	E162	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E160-L	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E160-L	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E160-L	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E160-L	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_MC06_WS_2022-10-05_NP	E160-L	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_MC07_WS_2022-10-05_NP	E160-L	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_MC08_WS_2022-10-05_NP	E160-L	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_MC09_WS_2022-10-05_NP	E160-L	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_MC10_WS_2022-10-05_NP	E160-L	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_MC11_WS_2022-10-05_NP	E160-L	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_NNP_WS_2022-10-05_NP	E160-L	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E121	05-Oct-2022	----	----	----		07-Oct-2022	3 days	2 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_MC06_WS_2022-10-05_NP	E121	05-Oct-2022	----	----	----		07-Oct-2022	3 days	2 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E121	05-Oct-2022	----	----	----		08-Oct-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E121	05-Oct-2022	----	----	----		08-Oct-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E121	05-Oct-2022	----	----	----		08-Oct-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_MC07_WS_2022-10-05_NP	E121	05-Oct-2022	----	----	----		08-Oct-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_MC08_WS_2022-10-05_NP	E121	05-Oct-2022	----	----	----		08-Oct-2022	3 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_MC09_WS_2022-10-05_NP	E121	05-Oct-2022	----	----	----		08-Oct-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_MC10_WS_2022-10-05_NP	E121	05-Oct-2022	----	----	----		08-Oct-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_MC11_WS_2022-10-05_NP	E121	05-Oct-2022	----	----	----		08-Oct-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_NNP_WS_2022-10-05_NP	E121	05-Oct-2022	----	----	----		08-Oct-2022	3 days	3 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE - total (lab preserved) CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E420.Cr-L	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	8 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE - total (lab preserved) CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E420.Cr-L	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	8 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE - total (lab preserved) CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E420.Cr-L	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	8 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE - total (lab preserved) CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E420.Cr-L	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	8 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE - total (lab preserved) CM_FLA_MC06_WS_2022-10-05_NP	E420.Cr-L	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE - total (lab preserved) CM_FLA_MC07_WS_2022-10-05_NP	E420.Cr-L	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	8 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE - total (lab preserved) CM_FLA_MC08_WS_2022-10-05_NP	E420.Cr-L	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	8 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE - total (lab preserved) CM_FLA_MC09_WS_2022-10-05_NP	E420.Cr-L	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	8 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE - total (lab preserved) CM_FLA_MC10_WS_2022-10-05_NP	E420.Cr-L	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	8 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE - total (lab preserved) CM_FLA_MC11_WS_2022-10-05_NP	E420.Cr-L	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	8 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE - total (lab preserved) CM_NNP_WS_2022-10-05_NP	E420.Cr-L	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial - total (lab preserved) CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E508	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial - total (lab preserved) CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E508	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial - total (lab preserved) CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E508	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Total Metals : Total Mercury in Water by CVAAS										
Glass vial - total (lab preserved) CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E508	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial - total (lab preserved) CM_FLA_MC06_WS_2022-10-05_NP	E508	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial - total (lab preserved) CM_FLA_MC07_WS_2022-10-05_NP	E508	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial - total (lab preserved) CM_FLA_MC08_WS_2022-10-05_NP	E508	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial - total (lab preserved) CM_FLA_MC09_WS_2022-10-05_NP	E508	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial - total (lab preserved) CM_FLA_MC10_WS_2022-10-05_NP	E508	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial - total (lab preserved) CM_FLA_MC11_WS_2022-10-05_NP	E508	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial - total (lab preserved) CM_NNP_WS_2022-10-05_NP	E508	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) CM_FLA_MC_TRIB01_WS_2022-10-05_NP	E420	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) CM_FLA_MC_TRIB02_WS_2022-10-05_NP	E420	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) CM_FLA_MC_TRIB03_WS_2022-10-05_NP	E420	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) CM_FLA_MC_TRIB04_WS_2022-10-05_NP	E420	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) CM_FLA_MC06_WS_2022-10-05_NP	E420	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) CM_FLA_MC07_WS_2022-10-05_NP	E420	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) CM_FLA_MC08_WS_2022-10-05_NP	E420	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) CM_FLA_MC09_WS_2022-10-05_NP	E420	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) CM_FLA_MC10_WS_2022-10-05_NP	E420	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) CM_FLA_MC11_WS_2022-10-05_NP	E420	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	8 days	✓

Matrix: **Water** Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) CM_NNP_WS_2022-10-05_NP	E420	05-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	8 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			*Count*		*Frequency (%)*		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Acidity by Titration	E283	687801	1	20	5.0	5.0	✓
Alkalinity Species by Titration	E290	687812	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	684800	1	20	5.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	684435	1	20	5.0	5.0	✓
Chloride in Water by IC (Low Level)	E235.Cl-L	684436	1	20	5.0	5.0	✓
Conductivity in Water	E100	687811	1	20	5.0	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	691608	1	15	6.6	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	695353	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	691609	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	686807	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	684575	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	684434	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	684437	2	30	6.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	684438	2	30	6.6	5.0	✓
ORP by Electrode	E125	688793	1	20	5.0	5.0	✓
pH by Meter	E108	687810	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	684439	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	689097	2	40	5.0	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	692044	1	15	6.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	688870	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	694798	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	692043	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	686808	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	691548	2	40	5.0	5.0	✓
Turbidity by Nephelometry	E121	686139	6	120	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Acidity by Titration	E283	687801	1	20	5.0	5.0	✓
Alkalinity Species by Titration	E290	687812	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	684800	1	20	5.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	684435	1	20	5.0	5.0	✓
Chloride in Water by IC (Low Level)	E235.Cl-L	684436	1	20	5.0	5.0	✓
Conductivity in Water	E100	687811	1	20	5.0	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	691608	1	15	6.6	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	695353	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	691609	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	686807	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	684575	1	20	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Fluoride in Water by IC	E235.F	684434	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	684437	2	30	6.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	684438	2	30	6.6	5.0	✓
ORP by Electrode	E125	688793	1	20	5.0	5.0	✓
pH by Meter	E108	687810	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	684439	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	689097	2	40	5.0	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	692044	1	15	6.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	688870	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	694798	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	692043	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	686808	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	691548	2	40	5.0	5.0	✓
TSS by Gravimetry (Low Level)	E160-L	689086	1	20	5.0	5.0	✓
Turbidity by Nephelometry	E121	686139	6	120	5.0	5.0	✓
Method Blanks (MB)							
Acidity by Titration	E283	687801	1	20	5.0	5.0	✓
Alkalinity Species by Titration	E290	687812	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	684800	1	20	5.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	684435	1	20	5.0	5.0	✓
Chloride in Water by IC (Low Level)	E235.Cl-L	684436	1	20	5.0	5.0	✓
Conductivity in Water	E100	687811	1	20	5.0	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	691608	1	15	6.6	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	695353	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	691609	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	686807	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	684575	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	684434	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	684437	2	30	6.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	684438	2	30	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	684439	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	689097	2	40	5.0	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	692044	1	15	6.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	688870	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	694798	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	692043	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	686808	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	691548	2	40	5.0	5.0	✓
TSS by Gravimetry (Low Level)	E160-L	689086	1	20	5.0	5.0	✓
Turbidity by Nephelometry	E121	686139	6	120	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	684800	1	20	5.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	684435	1	20	5.0	5.0	✓
Chloride in Water by IC (Low Level)	E235.Cl-L	684436	1	20	5.0	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	691608	1	15	6.6	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	695353	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	691609	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	686807	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	684575	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	684434	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	684437	2	30	6.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	684438	2	30	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	684439	1	20	5.0	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	692044	1	15	6.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	688870	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	694798	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	692043	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	686808	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	691548	2	40	5.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by “mod”).

Analytical Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Conductivity in Water	E100 Calgary - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 Calgary - Environmental	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
ORP by Electrode	E125 Calgary - Environmental	Water	ASTM D1498 (mod)	Oxidation redution potential is reported as the oxidation-reduction potential of the platinum metal-reference electrode employed, measured in mV. For high accuracy test results, it is recommended that this analysis be conducted in the field.
TSS by Gravimetry (Low Level)	E160-L Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Calgary - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Water by IC (Low Level)	E235.Br-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC (Low Level)	E235.Cl-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Acidity by Titration	E283 Calgary - Environmental	Water	APHA 2310 B (mod)	Acidity is determined by potentiometric titration to pH endpoint of 8.3

Analytical Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Alkalinity Species by Titration	E290 Calgary - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Calgary - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO 2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Calgary - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Total metals in Water by CRC ICPMS	E420 Calgary - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L Calgary - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.
Dissolved Metals in Water by CRC ICPMS	E421 Calgary - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analytical Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L Calgary - Environmental	Water	APHA 3030 B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS
Total Mercury in Water by CVAAS	E508 Calgary - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Mercury in Water by CVAAS	E509 Calgary - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Dissolved Hardness (Calculated)	EC100 Calgary - Environmental	Water	APHA 2340B	“Hardness (as CaCO3), dissolved” is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. “Total Hardness” refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Calgary - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).

Preparation Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Calgary - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Calgary - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration	EP509 Calgary - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.

QUALITY CONTROL REPORT

Work Order	: **CG2213851**	Page	: 1 of 20
Client	: SNC-Lavalin Inc.	Laboratory	: Calgary - Environmental
Contact	: Ronald Salomonson	Account Manager	: Lovepreet Kaur
Address	: 640 5th Avenue SW Calgary AB Canada T2P 3G4	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: ----	Telephone	: +1 403 407 1800
Project	: 692207	Date Samples Received	: 06-Oct-2022 09:15
PO	: ----	Date Analysis Commenced	: 06-Oct-2022
C-O-C number	: CMO FLA October 5th 2022	Issue Date	: 14-Oct-2022 19:08
Sampler	: EF		
Site	: ----		
Quote number	: TECK Coal codes		
No. of samples received	: 11		
No. of samples analysed	: 11		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Anthony Calero	Supervisor - Inorganic	Calgary Inorganics, Calgary, Alberta
Anthony Calero	Supervisor - Inorganic	Calgary Metals, Calgary, Alberta
Elke Tabora		Calgary Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Kevin Baxter		Calgary Metals, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Metals, Calgary, Alberta
Shirley Li		Calgary Metals, Calgary, Alberta

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	***Client sample ID***	***Analyte***	***CAS Number***	***Method***	***LOR***	***Unit***	***Original Result***	***Duplicate Result***	***RPD(%) or Difference***	***Duplicate Limits***	***Qualifier***
Physical Tests (QC Lot: 686139)											
CG2213818-004	Anonymous	turbidity	----	E121	0.10	NTU	0.23	0.20	0.03	Diff <2x LOR	----
Physical Tests (QC Lot: 687211)											
CG2213818-001	Anonymous	turbidity	----	E121	0.10	NTU	<0.10	<0.10	0	Diff <2x LOR	----
Physical Tests (QC Lot: 687212)											
CG2213794-001	Anonymous	turbidity	----	E121	0.10	NTU	0.66	0.59	0.06	Diff <2x LOR	----
Physical Tests (QC Lot: 687214)											
CG2213851-006	CM_FLA_MC10_WS_2022-10-05_NP	turbidity	----	E121	0.10	NTU	0.18	0.19	0.02	Diff <2x LOR	----
Physical Tests (QC Lot: 687215)											
CG2213794-002	Anonymous	turbidity	----	E121	0.10	NTU	6.50	6.57	1.04%	15%	----
Physical Tests (QC Lot: 687216)											
CG2213851-007	CM_FLA_MC11_WS_2022-10-05_NP	turbidity	----	E121	0.10	NTU	0.19	0.24	0.05	Diff <2x LOR	----
Physical Tests (QC Lot: 687801)											
CG2213846-001	Anonymous	acidity (as CaCO3)	----	E283	2.0	mg/L	<2.0	<2.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 687810)											
CG2213846-001	Anonymous	pH	----	E108	0.10	pH units	8.12	8.23	1.34%	4%	----
Physical Tests (QC Lot: 687811)											
CG2213846-001	Anonymous	conductivity	----	E100	2.0	µS/cm	996	989	0.705%	10%	----
Physical Tests (QC Lot: 687812)											
CG2213846-001	Anonymous	alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	259	254	1.95%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	259	254	1.95%	20%	----
Physical Tests (QC Lot: 688793)											
CG2213804-004	Anonymous	oxidation-reduction potential [ORP]	----	E125	0.10	mV	280	280	0.214%	15%	----
Physical Tests (QC Lot: 689097)											
CG2213793-001	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	336	336	0.149%	20%	----
Physical Tests (QC Lot: 689098)											
CG2213851-009	CM_FLA_MC_TRIB02_WS_2022-10-05_NP	solids, total dissolved [TDS]	----	E162	20	mg/L	682	692	1.38%	20%	----
Anions and Nutrients (QC Lot: 684434)											
CG2213818-001	Anonymous	fluoride	16984-48-8	E235.F	0.100	mg/L	0.392	0.383	0.009	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Anions and Nutrients (QC Lot: 684435)											
CG2213818-001	Anonymous	bromide	24959-67-9	E235.Br-L	0.250	mg/L	<0.250	<0.250	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 684436)											
CG2213818-001	Anonymous	chloride	16887-00-6	E235.Cl-L	0.50	mg/L	16.6	16.4	1.21%	20%	----
Anions and Nutrients (QC Lot: 684437)											
CG2213818-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	0.157	0.153	0.0034	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 684438)											
CG2213818-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 684439)											
CG2213818-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	315	310	1.50%	20%	----
Anions and Nutrients (QC Lot: 684440)											
CG2213851-010	CM_FLA_MC_TRIB03_WS_2022-10-05_NP	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0219	0.0217	0.0002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 684441)											
CG2213851-010	CM_FLA_MC_TRIB03_WS_2022-10-05_NP	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 684575)											
CG2213851-001	CM_FLA_MC_TRIB01_WS_2022-10-05_NP	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0029	0.0029	0.00004	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 684800)											
CG2213834-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0118	0.0064	0.0054	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 688870)											
CG2213851-001	CM_FLA_MC_TRIB01_WS_2022-10-05_NP	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.153	0.139	0.014	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 691548)											
CG2213766-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.200	mg/L	7.35	7.49	1.92%	20%	----
Anions and Nutrients (QC Lot: 691549)											
CG2213851-003	CM_FLA_MC07_WS_2022-10-05_NP	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0056	0.0046	0.0011	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 686807)											
CG2213851-001	CM_FLA_MC_TRIB01_WS_2022-10-05_NP	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	0.72	0.78	0.06	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 686808)											
CG2213851-001	CM_FLA_MC_TRIB01_WS_2022-10-05_NP	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	0.97	0.89	0.08	Diff <2x LOR	----
Total Metals (QC Lot: 692043)											
CG2213851-001	CM_FLA_MC_TRIB01_WS_2022-10-05_NP	aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0231	0.0230	0.0002	Diff <2x LOR	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00018	0.00019	0.00001	Diff <2x LOR	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.0382	0.0378	0.795%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 692043) - continued											
CG2213851-001	CM_FLA_MC_TRIB01_WS _2022-10-05_NP	beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.020 µg/L	<0.000020	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0146 µg/L	0.0000109	0.0000038	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	32.2	32.8	2.03%	20%	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.010	mg/L	0.036	0.034	0.002	Diff <2x LOR	----
		lead, total	7439-92-1	E420	0.000050	mg/L	0.000054	0.000054	0.00000005	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	0.0016	0.0014	0.0002	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.0050	mg/L	13.3	13.7	2.86%	20%	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.00596	0.00609	2.11%	20%	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000691	0.000711	2.90%	20%	----
		nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	0.340	0.346	0.007	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	0.339 µg/L	0.000327	0.000012	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	0.10	mg/L	1.77	1.76	0.320%	20%	----
		silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.050	mg/L	0.941	0.960	1.97%	20%	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	0.0700	0.0694	0.761%	20%	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	4.24	4.22	0.02	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.000363	0.000368	1.41%	20%	----
		vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
Total Metals (QC Lot: 692044)											
CG2213851-001	CM_FLA_MC_TRIB01_WS _2022-10-05_NP	chromium, total	7440-47-3	E420.Cr-L	0.00010	mg/L	0.00034	0.00033	0.000003	Diff <2x LOR	----
Total Metals (QC Lot: 694798)											
CG2213846-001	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 691608)											
CG2213851-001	CM_FLA_MC_TRIB01_WS _2022-10-05_NP	chromium, dissolved	7440-47-3	E421.Cr-L	0.00010	mg/L	0.00034	0.00027	0.00006	Diff <2x LOR	----
Dissolved Metals (QC Lot: 691609)											

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	***Client sample ID***	***Analyte***	***CAS Number***	***Method***	***LOR***	***Unit***	***Original Result***	***Duplicate Result***	***RPD(%) or Difference***	***Duplicate Limits***	***Qualifier***
Dissolved Metals (QC Lot: 691609) - continued											
CG2213851-001	CM_FLA_MC_TRIB01_WS_2022-10-05_NP	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0016	0.0016	0.00004	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00015	0.00015	0.000005	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0385	0.0381	1.04%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000055	0.0000065	0.0000010	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	31.7	31.7	0.0515%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0015	0.0015	0.00002	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	12.5	12.5	0.0668%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00018	0.00017	0.00001	Diff <2x LOR	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000769	0.000740	3.87%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.325	0.312	0.013	Diff <2x LOR	----
		rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00024	<0.00020	0.00004	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000394	0.000366	0.000028	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.050	mg/L	1.84	1.81	1.71%	20%	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.050	mg/L	0.808	0.807	0.187%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0679	0.0679	0.0523%	20%	----
		sulfur, dissolved	7704-34-9	E421	0.50	mg/L	4.56	4.46	0.10	Diff <2x LOR	----
		tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000377	0.000379	0.595%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 691609) - continued											
CG2213851-001	CM_FLA_MC_TRIB01_WS_2022-10-05_NP	vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 695353)											
CG2213428-001	Anonymous	mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 686139)						
turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 687211)						
turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 687212)						
turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 687214)						
turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 687215)						
turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 687216)						
turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 687801)						
acidity (as CaCO3)	----	E283	2	mg/L	<2.0	----
Physical Tests (QCLot: 687811)						
conductivity	----	E100	1	µS/cm	1.4	----
Physical Tests (QCLot: 687812)						
alkalinity, bicarbonate (as CaCO3)	----	E290	1	mg/L	<1.0	----
alkalinity, carbonate (as CaCO3)	----	E290	1	mg/L	<1.0	----
alkalinity, hydroxide (as CaCO3)	----	E290	1	mg/L	<1.0	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 689086)						
solids, total suspended [TSS]	----	E160-L	1	mg/L	<1.0	----
Physical Tests (QCLot: 689097)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 689098)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 684434)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 684435)						
bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 684436)						
chloride	16887-00-6	E235.Cl-L	0.1	mg/L	<0.10	----
Anions and Nutrients (QCLot: 684437)						

Sub-Matrix: **Water**

Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Result*	*Qualifier*
Anions and Nutrients (QCLot: 684437) - continued						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 684438)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 684439)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 684440)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 684441)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 684575)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 684800)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 688870)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 691548)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 691549)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Organic / Inorganic Carbon (QCLot: 686807)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 686808)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 692043)						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 692043) - continued						
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
Total Metals (QCLot: 692044)						
chromium, total	7440-47-3	E420.Cr-L	0.0001	mg/L	<0.00010	----
Total Metals (QCLot: 694798)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 691608)						
chromium, dissolved	7440-47-3	E421.Cr-L	0.0001	mg/L	<0.00010	----
Dissolved Metals (QCLot: 691609)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----

Sub-Matrix: **Water**

Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Result*	*Qualifier*
Dissolved Metals (QCLot: 691609) - continued						
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 695353)						
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	*Recovery (%)*	*Recovery Limits (%)*		
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Concentration*	*LCS*	*Low*	*High*	*Qualifier*
Physical Tests (QCLot: 686139)									
turbidity	----	E121	0.1	NTU	200 NTU	100.0	85.0	115	----
Physical Tests (QCLot: 687211)									
turbidity	----	E121	0.1	NTU	200 NTU	97.8	85.0	115	----
Physical Tests (QCLot: 687212)									
turbidity	----	E121	0.1	NTU	200 NTU	99.4	85.0	115	----
Physical Tests (QCLot: 687214)									
turbidity	----	E121	0.1	NTU	200 NTU	97.0	85.0	115	----
Physical Tests (QCLot: 687215)									
turbidity	----	E121	0.1	NTU	200 NTU	96.6	85.0	115	----
Physical Tests (QCLot: 687216)									
turbidity	----	E121	0.1	NTU	200 NTU	95.1	85.0	115	----
Physical Tests (QCLot: 687801)									
acidity (as CaCO3)	----	E283	2	mg/L	50 mg/L	107	85.0	115	----
Physical Tests (QCLot: 687810)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Physical Tests (QCLot: 687811)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	97.8	90.0	110	----
Physical Tests (QCLot: 687812)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	102	85.0	115	----
Physical Tests (QCLot: 688793)									
oxidation-reduction potential [ORP]	----	E125	----	mV	220 mV	98.1	95.4	104	----
Physical Tests (QCLot: 689086)									
solids, total suspended [TSS]	----	E160-L	1	mg/L	150 mg/L	95.8	85.0	115	----
Physical Tests (QCLot: 689097)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	94.6	85.0	115	----
Physical Tests (QCLot: 689098)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	96.7	85.0	115	----
Anions and Nutrients (QCLot: 684434)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 684435)									
bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	103	85.0	115	----
Anions and Nutrients (QCLot: 684436)									

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Concentration*	*LCS*	*Low*	*High*	*Qualifier*
Anions and Nutrients (QCLot: 684436) - continued									
chloride	16887-00-6	E235.Cl-L	0.1	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 684437)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 684438)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 684439)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 684440)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 684441)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 684575)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	104	80.0	120	----
Anions and Nutrients (QCLot: 684800)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	100	85.0	115	----
Anions and Nutrients (QCLot: 688870)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 691548)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	95.3	80.0	120	----
Anions and Nutrients (QCLot: 691549)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	100	80.0	120	----
Organic / Inorganic Carbon (QCLot: 686807)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	101	80.0	120	----
Organic / Inorganic Carbon (QCLot: 686808)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	93.3	80.0	120	----
Total Metals (QCLot: 692043)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	104	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	93.2	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	96.2	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	105	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	95.2	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	100	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	98.2	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	96.8	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	96.9	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 692043) - continued									
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	99.8	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	99.3	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	98.2	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	100	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	101	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	110	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	99.9	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	94.5	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	95.6	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	103	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	93.1	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	103	60.0	140	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	91.1	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	112	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	106	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	103	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	95.4	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	97.8	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	86.9	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	90.8	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	102	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	95.0	80.0	120	----
Total Metals (QCLot: 692044)									
chromium, total	7440-47-3	E420.Cr-L	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
Total Metals (QCLot: 694798)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	102	80.0	120	----
Dissolved Metals (QCLot: 691608)									
chromium, dissolved	7440-47-3	E421.Cr-L	0.0001	mg/L	0.25 mg/L	95.4	80.0	120	----
Dissolved Metals (QCLot: 691609)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	97.3	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	107	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	93.6	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	99.9	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	99.4	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	99.9	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	93.2	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 691609) - continued									
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	99.1	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	96.9	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	93.0	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	92.5	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	103	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	100	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	100	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	94.4	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	93.3	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	101	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	92.8	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	97.5	70.0	130	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	92.7	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	95.4	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	94.9	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	101	60.0	140	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	95.6	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	95.3	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	98.9	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	102	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	91.4	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	101	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	93.9	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	96.3	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	89.7	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	95.2	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	96.1	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	92.7	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	88.6	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	104	80.0	120	----
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	104	80.0	120	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 684434)										
CG2213818-002	Anonymous	fluoride	16984-48-8	E235.F	0.938 mg/L	1 mg/L	93.8	75.0	125	----
Anions and Nutrients (QCLot: 684435)										
CG2213818-002	Anonymous	bromide	24959-67-9	E235.Br-L	0.432 mg/L	0.5 mg/L	86.4	75.0	125	----
Anions and Nutrients (QCLot: 684436)										
CG2213818-002	Anonymous	chloride	16887-00-6	E235.Cl-L	90.0 mg/L	100 mg/L	90.0	75.0	125	----
Anions and Nutrients (QCLot: 684437)										
CG2213818-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.27 mg/L	2.5 mg/L	90.7	75.0	125	----
Anions and Nutrients (QCLot: 684438)										
CG2213818-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.458 mg/L	0.5 mg/L	91.6	75.0	125	----
Anions and Nutrients (QCLot: 684439)										
CG2213818-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 684440)										
CG2213851-011	CM_FLA_MC_TRIB04_WS_2022-10-05_NP	nitrate (as N)	14797-55-8	E235.NO3-L	2.32 mg/L	2.5 mg/L	92.9	75.0	125	----
Anions and Nutrients (QCLot: 684441)										
CG2213851-011	CM_FLA_MC_TRIB04_WS_2022-10-05_NP	nitrite (as N)	14797-65-0	E235.NO2-L	0.471 mg/L	0.5 mg/L	94.1	75.0	125	----
Anions and Nutrients (QCLot: 684575)										
CG2213851-002	CM_FLA_MC06_WS_2022-10-05_NP	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0573 mg/L	0.05 mg/L	115	70.0	130	----
Anions and Nutrients (QCLot: 684800)										
CG2213834-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.105 mg/L	0.1 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 688870)										
CG2213851-002	CM_FLA_MC06_WS_2022-10-05_NP	Kjeldahl nitrogen, total [TKN]	----	E318	2.67 mg/L	2.5 mg/L	107	70.0	130	----
Anions and Nutrients (QCLot: 691548)										
CG2213766-002	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0423 mg/L	0.05 mg/L	84.6	70.0	130	----
Anions and Nutrients (QCLot: 691549)										
CG2213851-004	CM_FLA_MC08_WS_2022-10-05_NP	phosphorus, total	7723-14-0	E372-U	0.0491 mg/L	0.05 mg/L	98.2	70.0	130	----
Organic / Inorganic Carbon (QCLot: 686807)										

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*Concentration*	*Target*	*MS*	*Low*	*High*	*Qualifier*
Organic / Inorganic Carbon (QCLot: 686807) - continued										
CG2213851-001	CM_FLA_MC_TRIB01_WS_2022-10-05_NP	carbon, dissolved organic [DOC]	----	E358-L	5.13 mg/L	5 mg/L	103	70.0	130	----
Organic / Inorganic Carbon (QCLot: 686808)										
CG2213851-001	CM_FLA_MC_TRIB01_WS_2022-10-05_NP	carbon, total organic [TOC]	----	E355-L	4.90 mg/L	5 mg/L	98.0	70.0	130	----
Total Metals (QCLot: 692043)										
CG2213851-002	CM_FLA_MC06_WS_2022-10-05_NP	aluminum, total	7429-90-5	E420	1.91 mg/L	2 mg/L	95.6	70.0	130	----
		antimony, total	7440-36-0	E420	0.175 mg/L	0.2 mg/L	87.7	70.0	130	----
		arsenic, total	7440-38-2	E420	0.185 mg/L	0.2 mg/L	92.6	70.0	130	----
		barium, total	7440-39-3	E420	0.188 mg/L	0.2 mg/L	94.1	70.0	130	----
		beryllium, total	7440-41-7	E420	0.351 mg/L	0.4 mg/L	87.9	70.0	130	----
		bismuth, total	7440-69-9	E420	0.0900 mg/L	0.1 mg/L	90.0	70.0	130	----
		boron, total	7440-42-8	E420	0.955 mg/L	1 mg/L	95.5	70.0	130	----
		cadmium, total	7440-43-9	E420	0.0369 mg/L	0.04 mg/L	92.2	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	40 mg/L	ND	70.0	130	----
		cobalt, total	7440-48-4	E420	0.190 mg/L	0.2 mg/L	95.0	70.0	130	----
		copper, total	7440-50-8	E420	0.190 mg/L	0.2 mg/L	94.8	70.0	130	----
		iron, total	7439-89-6	E420	18.5 mg/L	20 mg/L	92.4	70.0	130	----
		lead, total	7439-92-1	E420	0.185 mg/L	0.2 mg/L	92.5	70.0	130	----
		lithium, total	7439-93-2	E420	0.937 mg/L	1 mg/L	93.7	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	10 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	0.191 mg/L	0.2 mg/L	95.3	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.184 mg/L	0.2 mg/L	92.1	70.0	130	----
		nickel, total	7440-02-0	E420	0.368 mg/L	0.4 mg/L	92.1	70.0	130	----
		potassium, total	7440-09-7	E420	36.9 mg/L	40 mg/L	92.2	70.0	130	----
		selenium, total	7782-49-2	E420	0.352 mg/L	0.4 mg/L	88.0	70.0	130	----
		silicon, total	7440-21-3	E420	92.9 mg/L	100 mg/L	92.9	70.0	130	----
		silver, total	7440-22-4	E420	0.0383 mg/L	0.04 mg/L	95.7	70.0	130	----
		sodium, total	7440-23-5	E420	20.4 mg/L	20 mg/L	102	70.0	130	----
		strontium, total	7440-24-6	E420	0.203 mg/L	0.2 mg/L	101	70.0	130	----
		sulfur, total	7704-34-9	E420	190 mg/L	200 mg/L	95.1	70.0	130	----
		thallium, total	7440-28-0	E420	0.0353 mg/L	0.04 mg/L	88.3	70.0	130	----
		tin, total	7440-31-5	E420	0.181 mg/L	0.2 mg/L	90.7	70.0	130	----
		titanium, total	7440-32-6	E420	0.360 mg/L	0.4 mg/L	90.0	70.0	130	----
		uranium, total	7440-61-1	E420	0.0336 mg/L	0.04 mg/L	84.0	70.0	130	----
		vanadium, total	7440-62-2	E420	0.942 mg/L	1 mg/L	94.2	70.0	130	----
		zinc, total	7440-66-6	E420	3.78 mg/L	4 mg/L	94.5	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*Concentration*	*Target*	*MS*	*Low*	*High*	*Qualifier*
Total Metals (QCLot: 692044)										
CG2213851-002	CM_FLA_MC06_WS_2022-10-05_NP	chromium, total	7440-47-3	E420.Cr-L	0.379 mg/L	0.4 mg/L	94.9	70.0	130	----
Total Metals (QCLot: 694798)										
CG2213846-002	Anonymous	mercury, total	7439-97-6	E508	0.0000949 mg/L	0.0001 mg/L	94.9	70.0	130	----
Dissolved Metals (QCLot: 691608)										
CG2213851-002	CM_FLA_MC06_WS_2022-10-05_NP	chromium, dissolved	7440-47-3	E421.Cr-L	0.390 mg/L	0.4 mg/L	97.5	70.0	130	----
Dissolved Metals (QCLot: 691609)										
CG2213851-002	CM_FLA_MC06_WS_2022-10-05_NP	aluminum, dissolved	7429-90-5	E421	1.93 mg/L	2 mg/L	96.5	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.206 mg/L	0.2 mg/L	103	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.190 mg/L	0.2 mg/L	95.0	70.0	130	----
		barium, dissolved	7440-39-3	E421	0.195 mg/L	0.2 mg/L	97.3	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.393 mg/L	0.4 mg/L	98.2	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.0915 mg/L	0.1 mg/L	91.5	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.988 mg/L	1 mg/L	98.8	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.0396 mg/L	0.04 mg/L	99.1	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	40 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.0931 mg/L	0.1 mg/L	93.1	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.188 mg/L	0.2 mg/L	94.1	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.187 mg/L	0.2 mg/L	93.5	70.0	130	----
		iron, dissolved	7439-89-6	E421	19.0 mg/L	20 mg/L	95.2	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.187 mg/L	0.2 mg/L	93.6	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.990 mg/L	1 mg/L	99.0	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	10 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.185 mg/L	0.2 mg/L	92.7	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.199 mg/L	0.2 mg/L	99.4	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.378 mg/L	0.4 mg/L	94.5	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	93.2 mg/L	100 mg/L	93.2	70.0	130	----
		potassium, dissolved	7440-09-7	E421	37.0 mg/L	40 mg/L	92.5	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.186 mg/L	0.2 mg/L	92.8	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.389 mg/L	0.4 mg/L	97.2	70.0	130	----
		silicon, dissolved	7440-21-3	E421	99.4 mg/L	100 mg/L	99.4	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.0422 mg/L	0.04 mg/L	105	70.0	130	----
		sodium, dissolved	7440-23-5	E421	18.8 mg/L	20 mg/L	93.9	70.0	130	----
		strontium, dissolved	7440-24-6	E421	0.193 mg/L	0.2 mg/L	96.6	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	196 mg/L	200 mg/L	98.3	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.384 mg/L	0.4 mg/L	95.9	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*Concentration*	*Target*	*MS*	*Low*	*High*	*Qualifier*
Dissolved Metals (QCLot: 691609) - continued										
CG2213851-002	CM_FLA_MC06_WS_2022-10-05_NP	thallium, dissolved	7440-28-0	E421	0.0358 mg/L	0.04 mg/L	89.6	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.207 mg/L	0.2 mg/L	104	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.199 mg/L	0.2 mg/L	99.6	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.383 mg/L	0.4 mg/L	95.8	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.189 mg/L	0.2 mg/L	94.5	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.0365 mg/L	0.04 mg/L	91.2	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.926 mg/L	1 mg/L	92.6	70.0	130	----
		zinc, dissolved	7440-66-6	E421	3.73 mg/L	4 mg/L	93.2	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.410 mg/L	0.4 mg/L	102	70.0	130	----
Dissolved Metals (QCLot: 695353)										
CG2213428-002	Anonymous	mercury, dissolved	7439-97-6	E509	0.000104 mg/L	0.0001 mg/L	104	70.0	130	----

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Page 1 of 3

COC ID:	**CMO FLA October 5th 2022**	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO			
Facility Name / Job#	Coal Mountain Operation		
Project Manager			
Email			
Address	PO Box 3000		
City	Sparwood	Province	BC
Postal Code	V0B 2G0	Country	Canada
Phone Number			

LABORATORY			
Lab Name	ALS Calgary		
Lab Contact	Justine Buma-a		
Email	justine.bumaa@alsglobal.com		
Address	2259 29 Street NE		
City	Calgary	Province	AB
Postal Code	T1Y 7B5	Country	Canada
Phone Number	403-407-1761		

OTHER INFO				
Report Format / Distribution		Excel	PDF	EDD
Email 1:	DL-EQuIS-CMO@Teck.com	X	X	X
Email 2:	teckcoal@equisonline.com			X
Email 3:	[illegible]	X	X	X
Email 4:	[illegible]	X	X	X
Email 5:				
PO number				

Environmental Division
Calgary
Work Order Reference
CG2213851

Telephone : +1 403 407 1800

SAMPLE DETAILS / ANALYSIS REQUESTED — Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	DOC	Mercury_Dissolved	Mercury_Total	TECKCOAL_METNHG_D	TECKCOAL_METNHG_T	TECKCOAL_ROUTINE	TOC_TKN_NH3_TP
Filt.								F	F	N	F	N	N	N
PRESERV.								H2SO4	HCL	HCL	HNO3	HNO3	NONE	H2SO4
~~CM_FLA_AG01_WS_2022-10-05_NP~~	~~CM_FLA_AG01~~	~~WS~~		~~2022/10/05~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
~~CM_FLA_AG02_WS_2022-10-05_NP~~	~~CM_FLA_AG02~~	~~WS~~		~~2022/10/05~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
~~CM_FLA_CC_TRIB01_WS_2022-10-05_NP~~	~~CM_FLA_CC_TRIB01~~	~~WS~~		~~2022/10/05~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
~~CM_FLA_CC01_WS_2022-10-05_NP~~	~~CM_FLA_CC01~~	~~WS~~		~~2022/10/05~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
~~CM_FLA_CC02_WS_2022-10-05_NP~~	~~CM_FLA_CC02~~	~~WS~~		~~2022/10/05~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
~~CM_FLA_CC03_WS_2022-10-05_NP~~	~~CM_FLA_CC03~~	~~WS~~		~~2022/10/05~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
~~CM_FLA_CC04_WS_2022-10-05_NP~~	~~CM_FLA_CC04~~	~~WS~~		~~2022/10/05~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
1 CM_FLA_MC_TRIB01_WS_2022-10-05_NP	CM_FLA_MC_TRIB01	WS		2022/10/05	1500	G	7	1	1	1	1	1	1	1
~~CM_FLA_MC01_WS_2022-10-05_NP~~	~~CM_FLA_MC01~~	~~WS~~		~~2022/10/05~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
~~CM_FLA_MC02_WS_2022-10-05_NP~~	~~CM_FLA_MC02~~	~~WS~~		~~2022/10/05~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	Elly Foster	2022/10/05 1700		10/6 915 4°

SERVICE REQUEST (rush - subject to availability)	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Elly Foster	Mobile #	(403)710-5845
Sampler's Signature		Date/Time	2022/10/05, 1700

Page 2 of 3

COC ID:	CMO FLA October 5th 2022	TUR[illegible]AROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Coal Mountain Operation			Lab Name	ALS Calgary			Report Format / Distribution	Excel	PDF	EDD
Project Manager				Lab Contact	Justine Buma-a			Email 1: DL-EQuIS-CMO@Teck.com	X	X	X
Email				Email	justine.bumaa@alsglobal.com			Email 2: teckcoal@equisonline.com			X
Address	PO Box 3000			Address	2259 29 Street NE			Email 3: [illegible]	X	X	X
								Email 4: [illegible]	X	X	X
City	Sparwood	Province	BC	City	Calgary	Province	AB	Email 5:			
Postal Code	V0B 2G0	Country	Canada	Postal Code	T1Y 7B5	Country	Canada				
Phone Number				Phone Number	403-407-1761			PO number			

SAMPLE DETAILS — ANALYSIS REQUESTED — Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

	Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	DOC	Mercury_Dissolved	Mercury_Total	TECKCOAL_METNHG_D	TECKCOAL_METNHG_T	TECKCOAL_ROUTINE	TOC_TKN_NH3_TP					
								Filt.	F	F	N	F	N	N	N					
								PRESERV.	H2SO4	HCL	HCL	HNO3	HNO3	NONE	H2SO4					
	~~CM_FLA_MC03_WS_2022-10-05_NP~~	~~CM_FLA_MC03~~	~~WS~~		~~2022/10/05~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~					
	~~CM_FLA_MC04_WS_2022-10-05_NP~~	~~CM_FLA_MC04~~	~~WS~~		~~2022/10/05~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~					
	~~CM_FLA_MC06_WS_2022-10-05_NP~~	~~CM_FLA_MC05~~	~~WS~~		~~2022/10/05~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~					
2	CM_FLA_MC06_WS_2022-10-05_NP	CM_FLA_MC06	WS		2022/10/05	0907	G	7	1	1	1	1	1	1	1					
3	CM_FLA_MC07_WS_2022-10-05_NP	CM_FLA_MC07	WS		2022/10/05	1050	G	7	1	1	1	1	1	1	1					
4	CM_FLA_MC08_WS_2022-10-05_NP	CM_FLA_MC08	WS		2022/10/05	1015	G	7	1	1	1	1	1	1	1					
5	CM_FLA_MC09_WS_2022-10-05_NP	CM_FLA_MC09	WS		2022/10/05	1318	G	7	1	1	1	1	1	1	1					
6	CM_FLA_MC10_WS_2022-10-05_NP	CM_FLA_MC10	WS		2022/10/05	1215	G	7	1	1	1	1	1	1	1					
7	CM_FLA_MC11_WS_2022-10-05_NP	CM_FLA_MC11	WS		2022/10/05	1530	G	7	1	1	1	1	1	1	1					
	~~CM_FLA_MC12_WS_2022-10-05_NP~~	~~CM_FLA_MC12~~	~~WS~~		~~2022/10/05~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~					

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name		Mobile #	
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

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COC ID:	**CMO FLA October 5th 2022**	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				**LABORATORY**			
Facility Name / Job#	Coal Mountain Operation			Lab Name	ALS Calgary		
Project Manager				Lab Contact	Justine Buma-a		
Email				Email	justine.bumaa@alsglobal.com		
Address	PO Box 3000			Address	2259 29 Street NE		
City	Sparwood	Province	BC	City	Calgary	Province	AB
Postal Code	V0B 2G0	Country	Canada	Postal Code	T1Y 7B5	Country	Canada
Phone Number				Phone Number	403-407-1761		

OTHER INFO				
Report Format / Distribution		Excel	PDF	EDD
Email 1:	DL-EQuIS-CMO@Teck.com	X	X	X
Email 2:	teckcoal@equisonline.com			X
Email 3:	[illegible]	X	X	X
Email 4:	[illegible]	X	X	X
Email 5:				
PO number				

SAMPLE DETAILS / **ANALYSIS REQUESTED**

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

	Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	DOC	Mercury_Dissolved	Mercury_Total	TECKCOAL_METNHG_D	TECKCOAL_METNHG_T	TECKCOAL_ROUTINE	TOC_TKN_NH3_TP
	Filt.								F	F	N	F	N	N	N
	PRESERV.								H2SO4	HCL	HCL	HNO3	HNO3	NONE	H2SO4
	~~CM_FLA_MC13_WS_2022-10-05_NP~~	~~CM_FLA_MC13~~	~~WS~~		~~2022/10/05~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
8	CM_NNP_WS_2022-10-05_NP	CM_NNP	WS		2022/10/05	1300	G	7	1	1	1	1	1	1	1
	~~CM_NNT_WS_2022-10-05_NP~~	~~CM_NNT~~	~~WS~~		~~2022/10/05~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
	~~CM_TRP_WS_2022-10-05_NP~~	~~CM_TRP~~	~~WS~~		~~2022/10/05~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
	~~CM-FLA-MC~~														
9	CM-FLA_MC_TRIB02_WS_2022_10-5_NP	CM_FLA_MC-TRIB02	WS		2022/10/05	845	G	7	1	1	1	1	1	1	1
10	CM_FLA_MC_TRIB03_WS-2022_10-05_NP	CM_FLA_MC_TRIB03	WS		2022/10/05	1400	G	7	1	1	1	1	1	1	1
11	CM_FLA_MC-TRIB04_WS-2022-10-05_NP	CM_FLA_MC_TRIB04	WS		2022/10/05	1115	G	7	1	1	1	1	1	1	1

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X	**Sampler's Name**		**Mobile #**	
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		**Sampler's Signature**		**Date/Time**	
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

ALS Canada Ltd.

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right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **CG2214000**	Page	: 1 of 19
Amendment	: **1**		
Client	: **SNC-Lavalin Inc.**	Laboratory	: Calgary - Environmental
Contact	: Ronald Salomonson	Account Manager	: Lovepreet Kaur
Address	: 901 INDUSTRIAL ROAD 2 CRANBROOK BC Canada V1C 4C9	Address	: 2559 29th Street NE Calgary AB Canada T1Y 7B5
Telephone	: ----	Telephone	: +1 403 407 1800
Project	: Coal Mountain Operations	Date Samples Received	: 07-Oct-2022 09:20
PO	: 692207	Date Analysis Commenced	: 08-Oct-2022
C-O-C number	: CMO FLA OCTOBER 6TH 2022	Issue Date	: 19-Oct-2022 15:59
Sampler	: Elly Foster		
Site	: ----		
Quote number	: TECK Coal codes		
No. of samples received	: 16		
No. of samples analysed	: 16		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Anthony Calero	Supervisor - Inorganic	Inorganics, Calgary, Alberta
Anthony Calero	Supervisor - Inorganic	Metals, Calgary, Alberta
Elke Tabora		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Metals, Calgary, Alberta
Kevin Baxter		Metals, Calgary, Alberta
Mackenzie Lamoureux	Laboratory Analyst	Metals, Calgary, Alberta
Naeun Kim	Analyst	Metals, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Vladka Stamenova	Analyst	Inorganics, Calgary, Alberta

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.
Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	No Unit
%	percent
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
mV	millivolts
NTU	nephelometric turbidity units
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*
DTC	*Dissolved concentration exceeds total. Results were confirmed by re-analysis.*
RRV	*Reported result verified by repeat analysis.*
TKNI	*TKN result may be biased low due to Nitrate interference. Nitrate-N is > 10x TKN.*

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	**CM_FLA_AG01_WS_2022-10-06_NP**	**CM_FLA_AG02_WS_2022-10-06_NP**	**CM_FLA_CC_TRIB01_WS_2022-10-06_NP**	**CM_FLA_CC01_WS_2022-10-06_NP**	**CM_FLA_MC01_WS_2022-10-06_NP**
				Client sampling date / time	06-Oct-2022 12:00	06-Oct-2022 13:30	06-Oct-2022 14:07	06-Oct-2022 08:05	06-Oct-2022 12:56
Analyte	CAS Number	Method	LOR	Unit	**CG2214000-001**	**CG2214000-002**	**CG2214000-003**	**CG2214000-004**	**CG2214000-005**
					Result	Result	Result	Result	Result
Physical Tests									
acidity (as CaCO3)	----	E283	2.0	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	126	123	258	302	185
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	154	150	315	368	226
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	5.8
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	3.5
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	126	123	258	302	191
conductivity	----	E100	2.0	µS/cm	262	243	1650	1530	693
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	145	141	1130	1080	421
oxidation-reduction potential [ORP]	----	E125	0.10	mV	425	383	364	351	322
pH	----	E108	0.10	pH units	8.13	8.27	8.18	8.19	8.35
solids, total dissolved [TDS]	----	E162	10	mg/L	147	142	1440	1330	481
solids, total suspended [TSS]	----	E160-L	1.0	mg/L	<1.0	<1.0	4.9	2.8	8.2
turbidity	----	E121	0.10	NTU	<0.10	<0.10	1.14	0.28	0.42
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0.0543	<0.0050	<0.0050
bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	<0.050	<0.250 DLDS	<0.250 DLDS	<0.050
chloride	16887-00-6	E235.Cl-L	0.10	mg/L	0.24	0.23	7.16	3.74	1.55
fluoride	16984-48-8	E235.F	0.020	mg/L	0.299	0.310	0.246	0.163	0.204
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	<0.050	0.059	0.375 TKNI	0.318 TKNI	0.086 TKNI
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.127	0.121	3.94	3.29	0.893
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0.0522	0.0175	0.0017
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	<0.0020	0.0033	<0.0020	0.0067
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	19.9	20.0	846	769	235
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	<0.50	<0.50	0.72	0.59	<0.50

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	**CM_FLA_AG01_WS_2022-10-06_NP**	**CM_FLA_AG02_WS_2022-10-06_NP**	**CM_FLA_CC_TRIB01_WS_2022-10-06_NP**	**CM_FLA_CC01_WS_2022-10-06_NP**	**CM_FLA_MC01_WS_2022-10-06_NP**
				Client sampling date / time	06-Oct-2022 12:00	06-Oct-2022 13:30	06-Oct-2022 14:07	06-Oct-2022 08:05	06-Oct-2022 12:56
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2214000-001**	**CG2214000-002**	**CG2214000-003**	**CG2214000-004**	**CG2214000-005**
					Result	Result	Result	Result	Result
Organic / Inorganic Carbon									
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	<0.50	<0.50	1.03	0.71	<0.50
Ion Balance									
anion sum	----	EC101	0.10	meq/L	2.96	2.90	23.3	22.4	8.83
cation sum	----	EC101	0.10	meq/L	2.93	2.84	24.6	23.0	8.88
ion balance (cations/anions)	----	EC101	0.010	%	99.0	97.9	106	103	100
ion balance (APHA)	----	EC101	0.010	%	0.509	1.04	2.71	1.32	0.282
Total Metals									
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0047	0.0054	0.0100	0.0054	0.0185
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0.00069	0.00036	0.00016
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00046	0.00054	0.00023	0.00023	0.00033
barium, total	7440-39-3	E420	0.00010	mg/L	0.0231	0.0210	0.0255	0.0495	0.0581
beryllium, total	7440-41-7	E420	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0.111	0.071	0.026
cadmium, total	7440-43-9	E420	0.0050	µg/L	0.0092	0.0208	0.0670	0.0750	0.0244
calcium, total	7440-70-2	E420	0.050	mg/L	44.5	41.6	236	214	93.5
chromium, total	7440-47-3	E420.Cr-L	0.00010	mg/L	0.00034	0.00031	<0.00010	<0.00010	0.00024
cobalt, total	7440-48-4	E420	0.10	µg/L	<0.10	<0.10	10.9	2.17	0.37
copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
iron, total	7439-89-6	E420	0.010	mg/L	<0.010	<0.010	0.028	0.013	0.029
lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
lithium, total	7439-93-2	E420	0.0010	mg/L	0.0033	0.0028	0.0655	0.0378	0.0137
magnesium, total	7439-95-4	E420	0.0050	mg/L	8.41	8.35	122	120	42.0
manganese, total	7439-96-5	E420	0.00010	mg/L	0.00012	0.00013	0.0471	0.0102	0.00483
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000773	0.00121	0.00229	0.00123 DTC, RRV	0.000929
nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	0.114	0.0460	0.00690
potassium, total	7440-09-7	E420	0.050	mg/L	0.267	0.301	5.05	3.62	1.29
selenium, total	7782-49-2	E420	0.050	µg/L	1.83	1.73	6.06	17.0	5.32

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	CM_FLA_AG01_WS_2022-10-06_NP	CM_FLA_AG02_WS_2022-10-06_NP	CM_FLA_CC_TRIB01_WS_2022-10-06_NP	CM_FLA_CC01_WS_2022-10-06_NP	CM_FLA_MC01_WS_2022-10-06_NP
				Client sampling date / time	06-Oct-2022 12:00	06-Oct-2022 13:30	06-Oct-2022 14:07	06-Oct-2022 08:05	06-Oct-2022 12:56
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2214000-001**	**CG2214000-002**	**CG2214000-003**	**CG2214000-004**	**CG2214000-005**
					Result	Result	Result	Result	Result
Total Metals									
silicon, total	7440-21-3	E420	0.10	mg/L	1.52	1.52	2.31	2.63	2.05
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
sodium, total	7440-23-5	E420	0.050	mg/L	0.738	0.732	44.5	26.6	9.36
strontium, total	7440-24-6	E420	0.00020	mg/L	0.151	0.144	1.11	0.757	0.338
sulfur, total	7704-34-9	E420	0.50	mg/L	7.34	7.64	270	234	85.9
thallium, total	7440-28-0	E420	0.000010	mg/L	0.000042	0.000045	0.000048	0.000036	0.000023
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000822	0.000814	0.00654	0.00580	0.00214
vanadium, total	7440-62-2	E420	0.00050	mg/L	0.00053	0.00069	<0.00050	<0.00050	<0.00050
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0.0040	<0.0030	<0.0030
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	<0.0010	<0.0010	0.0017	<0.0010	0.0015
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0.00071	0.00037	0.00015
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00047	0.00043	0.00024	0.00023	0.00030
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0235	0.0217	0.0250	0.0503	0.0597
beryllium, dissolved	7440-41-7	E421	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	0.113	0.074	0.027
cadmium, dissolved	7440-43-9	E421	0.0050	µg/L	0.0167	0.0067	0.0371	0.0524	0.0210
calcium, dissolved	7440-70-2	E421	0.050	mg/L	42.8	41.2	242	222	94.8
chromium, dissolved	7440-47-3	E421.Cr-L	0.00010	mg/L	0.00028	0.00028	<0.00010	0.00014	0.00021
cobalt, dissolved	7440-48-4	E421	0.10	µg/L	<0.10	<0.10	9.46	2.00	0.12
copper, dissolved	7440-50-8	E421	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0020	0.0021	0.0686	0.0423	0.0143
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	9.22	9.20	127	129	44.8
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	<0.00010	<0.00010	0.0321	0.00827	0.00133

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	**CM_FLA_AG01_WS_2022-10-06_NP**	**CM_FLA_AG02_WS_2022-10-06_NP**	**CM_FLA_CC_TRIB01_WS_2022-10-06_NP**	**CM_FLA_CC01_WS_2022-10-06_NP**	**CM_FLA_MC01_WS_2022-10-06_NP**
				Client sampling date / time	06-Oct-2022 12:00	06-Oct-2022 13:30	06-Oct-2022 14:07	06-Oct-2022 08:05	06-Oct-2022 12:56
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2214000-001**	**CG2214000-002**	**CG2214000-003**	**CG2214000-004**	**CG2214000-005**
					Result	Result	Result	Result	Result
Dissolved Metals									
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000834 $^{\text{DTC, RRV}}$	0.00104	0.00232	0.00307	0.000981
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	0.114	0.0480	0.00653
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.213	0.214	4.97	3.62	1.26
selenium, dissolved	7782-49-2	E421	0.050	µg/L	2.19	2.25	6.75	20.1	6.25
silicon, dissolved	7440-21-3	E421	0.050	mg/L	1.55	1.51	2.28	2.66	2.05
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
sodium, dissolved	7440-23-5	E421	0.050	mg/L	0.643	0.612	45.5	27.8	9.89
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.149	0.148	1.14	0.785	0.339
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	7.86	7.75	351	309	91.9
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000039	0.000044	0.000047	0.000037	0.000024
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000792	0.000831	0.00659	0.00593	0.00212
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0015	0.0016	0.0015	0.0015	<0.0010
dissolved mercury filtration location	----	EP509	-	-	Field	Field	Field	Field	Field
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	Field	Field

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	**CM_FLA_MC02_WS_2022-10-06_NP**	**CM_FLA_MC03_WS_2022-10-06_NP**	**CM_FLA_MC04_WS_2022-10-06_NP**	**CM_FLA_MC11_WS_2022-10-06_NP**	**CM_FLA_MC12_WS_2022-10-06_NP**
				Client sampling date / time	06-Oct-2022 11:00	06-Oct-2022 10:54	06-Oct-2022 08:24	06-Oct-2022 15:00	06-Oct-2022 15:30
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2214000-006**	**CG2214000-007**	**CG2214000-008**	**CG2214000-009**	**CG2214000-010**
					Result	Result	Result	Result	Result
Physical Tests									
acidity (as CaCO3)	----	E283	2.0	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	217	234	191	157	150
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	264	286	232	192	183
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	8.2	3.2	<1.0	<1.0	<1.0
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	4.9	1.9	<1.0	<1.0	<1.0
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	225	237	191	157	150
conductivity	----	E100	2.0	µS/cm	1030	1040	300	279	273
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	661	679	174	162	156
oxidation-reduction potential [ORP]	----	E125	0.10	mV	329	342	311	317	262
pH	----	E108	0.10	pH units	8.35	8.30	8.27	8.25	8.22
solids, total dissolved [TDS]	----	E162	10	mg/L	795	796	171	162	149
solids, total suspended [TSS]	----	E160-L	1.0	mg/L	3.0	2.0	3.0	<1.0	<1.0
turbidity	----	E121	0.10	NTU	0.20	0.61	<0.10	0.20	0.15
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.250 DLDS	<0.250 DLDS	<0.050	<0.050	<0.050
chloride	16887-00-6	E235.Cl-L	0.10	mg/L	2.76	2.92	0.54	0.45	0.45
fluoride	16984-48-8	E235.F	0.020	mg/L	0.135	0.131	0.078	0.070	0.069
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.136 TKNI	0.113 TKNI	<0.050	<0.050	0.066
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	1.67	1.67	0.0075	0.0145	0.0167
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0050 DLDS	<0.0050 DLDS	<0.0010	<0.0010	<0.0010
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0024
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0029	0.0021	0.0026	<0.0020	0.0042
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	445	443	18.6	13.7	15.0
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	<0.50	<0.50	<0.50	<0.50	<0.50
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	<0.50	0.70	0.93	<0.50	<0.50

Analytical Results

Sub-Matrix: Water

(Matrix: Water)

				Client sample ID	CM_FLA_MC02_WS_2022-10-06_NP	CM_FLA_MC03_WS_2022-10-06_NP	CM_FLA_MC04_WS_2022-10-06_NP	CM_FLA_MC11_WS_2022-10-06_NP	CM_FLA_MC12_WS_2022-10-06_NP
				Client sampling date / time	06-Oct-2022 11:00	06-Oct-2022 10:54	06-Oct-2022 08:24	06-Oct-2022 15:00	06-Oct-2022 15:30
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2214000-006**	**CG2214000-007**	**CG2214000-008**	**CG2214000-009**	**CG2214000-010**
					Result	Result	Result	Result	Result
Ion Balance									
anion sum	----	EC101	0.10	meq/L	14.0	14.2	4.22	3.44	3.33
cation sum	----	EC101	0.10	meq/L	14.0	14.4	3.62	3.38	3.27
ion balance (cations/anions)	----	EC101	0.010	%	100	101	85.8	98.2	98.2
ion balance (APHA)	----	EC101	0.010	%	<0.010	0.699	7.65	0.880	0.909
Total Metals									
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0069	0.0074	0.0096	0.0066	0.0066
antimony, total	7440-36-0	E420	0.00010	mg/L	0.00022	0.00022	<0.00010	<0.00010	<0.00010
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00016	0.00016	0.00014	0.00018	0.00017
barium, total	7440-39-3	E420	0.00010	mg/L	0.0835	0.0843	0.0792	0.0616	0.0527
beryllium, total	7440-41-7	E420	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
boron, total	7440-42-8	E420	0.010	mg/L	0.045	0.045	0.012	0.016	0.017
cadmium, total	7440-43-9	E420	0.0050	µg/L	0.0305	0.0274	0.0060	0.0080	0.0162
calcium, total	7440-70-2	E420	0.050	mg/L	136	137	44.7	43.1	41.4
chromium, total	7440-47-3	E420.Cr-L	0.00010	mg/L	0.00014	0.00014	0.00019	0.00021	0.00019
cobalt, total	7440-48-4	E420	0.10	µg/L	0.24	0.30	<0.10	<0.10	<0.10
copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
iron, total	7439-89-6	E420	0.010	mg/L	<0.010	0.011	0.014	<0.010	<0.010
lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
lithium, total	7439-93-2	E420	0.0010	mg/L	0.0235	0.0236	0.0047	0.0056	0.0058
magnesium, total	7439-95-4	E420	0.0050	mg/L	69.4	71.8	13.2	11.7	11.8
manganese, total	7439-96-5	E420	0.00010	mg/L	0.00315	0.00422	0.00154	0.00040	0.00024
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.00113	0.00109 DTC, RRV	0.000693 DTC, RRV	0.000837	0.000947
nickel, total	7440-02-0	E420	0.00050	mg/L	0.0119	0.0131	<0.00050	<0.00050	<0.00050
potassium, total	7440-09-7	E420	0.050	mg/L	2.17	2.23	0.488	0.548	0.581
selenium, total	7782-49-2	E420	0.050	µg/L	8.23	8.74	0.251	0.216	0.166
silicon, total	7440-21-3	E420	0.10	mg/L	2.44	2.49	2.40	2.48	2.48
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	**CM_FLA_MC02_WS_2022-10-06_NP**	**CM_FLA_MC03_WS_2022-10-06_NP**	**CM_FLA_MC04_WS_2022-10-06_NP**	**CM_FLA_MC11_WS_2022-10-06_NP**	**CM_FLA_MC12_WS_2022-10-06_NP**
				Client sampling date / time	06-Oct-2022 11:00	06-Oct-2022 10:54	06-Oct-2022 08:24	06-Oct-2022 15:00	06-Oct-2022 15:30
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2214000-006**	**CG2214000-007**	**CG2214000-008**	**CG2214000-009**	**CG2214000-010**
					Result	Result	Result	Result	Result
Total Metals									
sodium, total	7440-23-5	E420	0.050	mg/L	16.5	17.1	2.89	3.03	3.22
strontium, total	7440-24-6	E420	0.00020	mg/L	0.499	0.496	0.154	0.168	0.170
sulfur, total	7704-34-9	E420	0.50	mg/L	156	160	6.60	4.93	5.30
thallium, total	7440-28-0	E420	0.000010	mg/L	0.000012	0.000012	<0.000010	<0.000010	<0.000010
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
uranium, total	7440-61-1	E420	0.000010	mg/L	0.00323	0.00328	0.000267	0.000215	0.000225
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	<0.0010	0.0011	0.0013	0.0010	0.0013
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00020	0.00022	<0.00010	<0.00010	<0.00010
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00016	0.00022	0.00017	0.00016	0.00023
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0866	0.0896	0.0852	0.0649	0.0556
beryllium, dissolved	7440-41-7	E421	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.047	0.047	0.013	0.017	0.018
cadmium, dissolved	7440-43-9	E421	0.0050	µg/L	0.0221	0.0314	0.0068	0.0089	0.0100
calcium, dissolved	7440-70-2	E421	0.050	mg/L	141	142	46.2	44.8	42.6
chromium, dissolved	7440-47-3	E421.Cr-L	0.00010	mg/L	0.00011	0.00016	0.00012	0.00021	0.00020
cobalt, dissolved	7440-48-4	E421	0.10	µg/L	0.22	0.28	<0.10	<0.10	<0.10
copper, dissolved	7440-50-8	E421	0.00020	mg/L	<0.00020	0.00024	<0.00020	<0.00020	<0.00020
iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0249	0.0250	0.0046	0.0054	0.0057
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	75.0	78.8	14.2	12.2	12.1
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00285	0.00395	0.00125	0.00028	0.00014
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00110	0.00248 DTC, RRV	0.00232 DTC, RRV	0.000845	0.000902

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	**CM_FLA_MC02_WS_2022-10-06_NP**	**CM_FLA_MC03_WS_2022-10-06_NP**	**CM_FLA_MC04_WS_2022-10-06_NP**	**CM_FLA_MC11_WS_2022-10-06_NP**	**CM_FLA_MC12_WS_2022-10-06_NP**
				Client sampling date / time	06-Oct-2022 11:00	06-Oct-2022 10:54	06-Oct-2022 08:24	06-Oct-2022 15:00	06-Oct-2022 15:30
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2214000-006**	**CG2214000-007**	**CG2214000-008**	**CG2214000-009**	**CG2214000-010**
					Result	Result	Result	Result	Result
Dissolved Metals									
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.0123	0.0138	<0.00050	<0.00050	<0.00050
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
potassium, dissolved	7440-09-7	E421	0.050	mg/L	2.14	2.39	0.563	0.518	0.522
selenium, dissolved	7782-49-2	E421	0.050	µg/L	9.97	9.72	0.332	0.234	0.261
silicon, dissolved	7440-21-3	E421	0.050	mg/L	2.45	2.47	2.51	2.53	2.52
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
sodium, dissolved	7440-23-5	E421	0.050	mg/L	17.6	18.5	3.14	3.05	3.20
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.503	0.507	0.158	0.174	0.174
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	165	164	7.34	5.29	5.80
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000012	0.000013	<0.000010	<0.000010	<0.000010
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00324	0.00328	0.000269	0.000217	0.000229
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
dissolved mercury filtration location	----	EP509	-	-	Field	Field	Field	Field	Field
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	Field	Field

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	**CM_FLA_MC13_WS_2022-10-06_NP**	**CM_NNP_WS_2022-10-06_NP**	**CM_NNT_WS_2022-10-06_NP**	**CM_TRP_WS_2022-10-06_NP**	**CM_FLA_MC_TRIB06_WS_2022-10-06_NP**
				Client sampling date / time	06-Oct-2022 15:54	06-Oct-2022 14:00	06-Oct-2022 14:15	06-Oct-2022 14:20	06-Oct-2022 11:36
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2214000-011**	**CG2214000-012**	**CG2214000-013**	**CG2214000-014**	**CG2214000-015**
					Result	Result	Result	Result	Result
Physical Tests									
acidity (as CaCO3)	----	E283	2.0	mg/L	<2.0	<2.0	<2.0	<2.0	2.5
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	144	215	<1.0	<1.0	275
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	175	263	<1.0	<1.0	335
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	7.4	<1.0	<1.0	<1.0
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	<1.0	4.4	<1.0	<1.0	<1.0
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	144	223	<1.0	<1.0	275
conductivity	----	E100	2.0	µS/cm	269	1030	<2.0	<2.0	739
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	156	658	<0.50	<0.50	418
oxidation-reduction potential [ORP]	----	E125	0.10	mV	289	292	492	523	286
pH	----	E108	0.10	pH units	8.26	8.35	5.63	5.15	7.97
solids, total dissolved [TDS]	----	E162	10	mg/L	160	768	<10	<10	483
solids, total suspended [TSS]	----	E160-L	1.0	mg/L	<1.0	2.4	<1.0	<1.0	6.5
turbidity	----	E121	0.10	NTU	0.27	0.18	<0.10	<0.10	0.52
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	0.0074
bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	<0.250 DLDS	<0.050	<0.050	<0.050
chloride	16887-00-6	E235.Cl-L	0.10	mg/L	0.48	2.45	<0.10	<0.10	5.83
fluoride	16984-48-8	E235.F	0.020	mg/L	0.069	0.129	<0.020	<0.020	0.116
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	<0.050	0.114 TKNI	<0.050	<0.050	0.302
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0189	1.60	<0.0050	<0.0050	<0.0050
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0050 DLDS	<0.0010	<0.0010	<0.0010
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.0010
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0047	<0.0020	<0.0020	<0.0020	0.0340
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	15.0	431	<0.30	<0.30	180
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	<0.50	<0.50	<0.50	<0.50	1.17
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	<0.50	<0.50	<0.50	<0.50	1.81

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	CM_FLA_MC13_WS_2022-10-06_NP	CM_NNP_WS_2022-10-06_NP	CM_NNT_WS_2022-10-06_NP	CM_TRP_WS_2022-10-06_NP	CM_FLA_MC_TRIB06_WS_2022-10-06_NP
				Client sampling date / time	06-Oct-2022 15:54	06-Oct-2022 14:00	06-Oct-2022 14:15	06-Oct-2022 14:20	06-Oct-2022 11:36
Analyte	CAS Number	Method	LOR	Unit	CG2214000-011	CG2214000-012	CG2214000-013	CG2214000-014	CG2214000-015
					Result	Result	Result	Result	Result
Ion Balance									
anion sum	----	EC101	0.10	meq/L	3.21	13.6	<0.10	<0.10	9.41
cation sum	----	EC101	0.10	meq/L	3.28	14.0	<0.10	<0.10	9.26
ion balance (cations/anions)	----	EC101	0.010	%	102	103	100	100	98.4
ion balance (APHA)	----	EC101	0.010	%	1.08	1.45	<0.010	<0.010	0.803
Total Metals									
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0105	0.0091	<0.0030	<0.0030	0.0220
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	0.00021	<0.00010	<0.00010	<0.00010
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00022	0.00020	<0.00010	<0.00010	0.00024
barium, total	7440-39-3	E420	0.00010	mg/L	0.0529	0.0847	0.00025 [RRV]	<0.00010	0.174
beryllium, total	7440-41-7	E420	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
boron, total	7440-42-8	E420	0.010	mg/L	0.017	0.046	<0.010	<0.010	0.031
cadmium, total	7440-43-9	E420	0.0050	µg/L	0.0182	0.0284	<0.0050	<0.0050	0.0162
calcium, total	7440-70-2	E420	0.050	mg/L	40.9	136	0.065 [RRV]	<0.050	113
chromium, total	7440-47-3	E420.Cr-L	0.00010	mg/L	0.00020	0.00016	<0.00010	<0.00010	0.00011
cobalt, total	7440-48-4	E420	0.10	µg/L	<0.10	0.29	<0.10	<0.10	0.15
copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.00050	0.00082 [RRV]	<0.00050	<0.00050
iron, total	7439-89-6	E420	0.010	mg/L	<0.010	0.013	<0.010	<0.010	0.229
lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000059
lithium, total	7439-93-2	E420	0.0010	mg/L	0.0060	0.0230	<0.0010	<0.0010	0.0081
magnesium, total	7439-95-4	E420	0.0050	mg/L	12.0	71.3	<0.0050	<0.0050	29.6
manganese, total	7439-96-5	E420	0.00010	mg/L	0.00087	0.00385	<0.00010	<0.00010	0.0511
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000920	0.00107 [DTC, RRV]	<0.000050	<0.000050 [DTC, RRV]	0.000504
nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	0.0124	<0.00050	<0.00050	0.00056
potassium, total	7440-09-7	E420	0.050	mg/L	0.558	2.19	<0.050	<0.050	1.21
selenium, total	7782-49-2	E420	0.050	µg/L	0.223	8.52	<0.050	<0.050	0.598
silicon, total	7440-21-3	E420	0.10	mg/L	2.48	2.51	<0.10	<0.10	4.42
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

				Client sample ID	CM_FLA_MC13_WS_2022-10-06_NP	CM_NNP_WS_2022-10-06_NP	CM_NNT_WS_2022-10-06_NP	CM_TRP_WS_2022-10-06_NP	CM_FLA_MC_TRIB06_WS_2022-10-06_NP
				Client sampling date / time	06-Oct-2022 15:54	06-Oct-2022 14:00	06-Oct-2022 14:15	06-Oct-2022 14:20	06-Oct-2022 11:36
Analyte	CAS Number	Method	LOR	Unit	CG2214000-011	CG2214000-012	CG2214000-013	CG2214000-014	CG2214000-015
					Result	Result	Result	Result	Result
Total Metals									
sodium, total	7440-23-5	E420	0.050	mg/L	3.24	17.1	0.182 RRV	<0.050	19.2
strontium, total	7440-24-6	E420	0.00020	mg/L	0.171	0.492	<0.00020	<0.00020	0.320
sulfur, total	7704-34-9	E420	0.50	mg/L	5.45	160	<0.50	<0.50	64.6
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	0.000012	<0.000010	<0.000010	<0.000010
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0.00013 RRV	<0.00010	<0.00010
titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000231	0.00325	<0.000010	<0.000010	0.000686
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0014	0.0011	<0.0010	<0.0010	0.0012
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	0.00021	<0.00010	<0.00010	<0.00010
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00014	0.00022	<0.00010	<0.00010	0.00019
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0562	0.0906	0.00022 RRV	<0.00010	0.181
beryllium, dissolved	7440-41-7	E421	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.018	0.046	<0.010	<0.010	0.032
cadmium, dissolved	7440-43-9	E421	0.0050	µg/L	0.0079	0.0256	<0.0050	<0.0050	0.0111
calcium, dissolved	7440-70-2	E421	0.050	mg/L	42.2	140	<0.050	<0.050	116
chromium, dissolved	7440-47-3	E421.Cr-L	0.00010	mg/L	0.00024	0.00011	<0.00010	<0.00010	<0.00010
cobalt, dissolved	7440-48-4	E421	0.10	µg/L	<0.10	0.24	<0.10	<0.10	<0.10
copper, dissolved	7440-50-8	E421	0.00020	mg/L	<0.00020	<0.00020	0.00077 RRV	<0.00020	<0.00020
iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	0.016
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0058	0.0249	<0.0010	<0.0010	0.0081
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	12.3	74.9	<0.0050	<0.0050	31.2
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00011	0.00296	<0.00010	<0.00010	0.0317
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000967	0.00218 DTC, RRV	0.000059 RRV	0.00107 DTC, RRV	0.000560

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	**CM_FLA_MC13_WS_2022-10-06_NP**	**CM_NNP_WS_2022-10-06_NP**	**CM_NNT_WS_2022-10-06_NP**	**CM_TRP_WS_2022-10-06_NP**	**CM_FLA_MC_TRIB06_WS_2022-10-06_NP**
				Client sampling date / time	06-Oct-2022 15:54	06-Oct-2022 14:00	06-Oct-2022 14:15	06-Oct-2022 14:20	06-Oct-2022 11:36
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2214000-011**	**CG2214000-012**	**CG2214000-013**	**CG2214000-014**	**CG2214000-015**
					Result	Result	Result	Result	Result
Dissolved Metals									
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	0.0123	<0.00050	<0.00050	<0.00050
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.552	2.25	<0.050	<0.050	1.16
selenium, dissolved	7782-49-2	E421	0.050	µg/L	0.207	9.66	<0.050	<0.050	0.717
silicon, dissolved	7440-21-3	E421	0.050	mg/L	2.58	2.48	<0.050	<0.050	4.48
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
sodium, dissolved	7440-23-5	E421	0.050	mg/L	3.32	17.8	0.156 RRV	<0.050	20.1
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.175	0.507	<0.00020	<0.00020	0.324
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	5.80	164	<0.50	<0.50	67.8
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	0.000013	<0.000010	<0.000010	<0.000010
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0.00010 RRV	<0.00010	<0.00010
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000235	0.00324	<0.000010	<0.000010	0.000677
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
dissolved mercury filtration location	----	EP509	-	-	Field	Field	Field	Field	Field
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	Field	Field

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	**CM_FLA_MC_TRIB07_WS_2022-10-06_NP**	----	----	----	----
				Client sampling date / time	06-Oct-2022 15:00	----	----	----	----
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2214000-016**	--------	--------	--------	--------
					Result	----	----	----	----
Physical Tests									
acidity (as CaCO3)	----	E283	2.0	mg/L	<2.0	----	----	----	----
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	208	----	----	----	----
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	254	----	----	----	----
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	9.8	----	----	----	----
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	5.9	----	----	----	----
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	----	----	----	----
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	----	----	----	----
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	218	----	----	----	----
conductivity	----	E100	2.0	µS/cm	390	----	----	----	----
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	228	----	----	----	----
oxidation-reduction potential [ORP]	----	E125	0.10	mV	286	----	----	----	----
pH	----	E108	0.10	pH units	8.41	----	----	----	----
solids, total dissolved [TDS]	----	E162	10	mg/L	231	----	----	----	----
solids, total suspended [TSS]	----	E160-L	1.0	mg/L	<1.0	----	----	----	----
turbidity	----	E121	0.10	NTU	0.38	----	----	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	----	----	----	----
bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	----	----	----	----
chloride	16887-00-6	E235.Cl-L	0.10	mg/L	0.78	----	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	0.097	----	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.072	----	----	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0198	----	----	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	----	----	----	----
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0020	----	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0070	----	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	24.8	----	----	----	----
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	1.96	----	----	----	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	1.98	----	----	----	----

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	**CM_FLA_MC_TRIB07_WS_2022-10-06_NP**	----	----	----	----
				Client sampling date / time	06-Oct-2022 15:00	----	----	----	----
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2214000-016**	--------	--------	--------	--------
					Result	----	----	----	----
Ion Balance									
anion sum	----	EC101	0.10	meq/L	4.90	----	----	----	----
cation sum	----	EC101	0.10	meq/L	4.96	----	----	----	----
ion balance (cations/anions)	----	EC101	0.010	%	101	----	----	----	----
ion balance (APHA)	----	EC101	0.010	%	0.608	----	----	----	----
Total Metals									
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0162	----	----	----	----
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	----	----	----	----
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00023	----	----	----	----
barium, total	7440-39-3	E420	0.00010	mg/L	0.121	----	----	----	----
beryllium, total	7440-41-7	E420	0.020	µg/L	<0.020	----	----	----	----
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	----	----	----	----
boron, total	7440-42-8	E420	0.010	mg/L	0.037	----	----	----	----
cadmium, total	7440-43-9	E420	0.0050	µg/L	<0.0050	----	----	----	----
calcium, total	7440-70-2	E420	0.050	mg/L	62.1	----	----	----	----
chromium, total	7440-47-3	E420.Cr-L	0.00010	mg/L	<0.00010	----	----	----	----
cobalt, total	7440-48-4	E420	0.10	µg/L	<0.10	----	----	----	----
copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	----	----	----	----
iron, total	7439-89-6	E420	0.010	mg/L	0.038	----	----	----	----
lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	----	----	----	----
lithium, total	7439-93-2	E420	0.0010	mg/L	0.0140	----	----	----	----
magnesium, total	7439-95-4	E420	0.0050	mg/L	15.8	----	----	----	----
manganese, total	7439-96-5	E420	0.00010	mg/L	0.0141	----	----	----	----
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	----	----	----	----
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000412	----	----	----	----
nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	----	----	----	----
potassium, total	7440-09-7	E420	0.050	mg/L	1.12	----	----	----	----
selenium, total	7782-49-2	E420	0.050	µg/L	0.086	----	----	----	----
silicon, total	7440-21-3	E420	0.10	mg/L	3.36	----	----	----	----
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	----	----	----	----

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	**CM_FLA_MC_TRIB07_WS_2022-10-06_NP**	----	----	----	----
				Client sampling date / time	06-Oct-2022 15:00	----	----	----	----
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2214000-016**	--------	--------	--------	--------
					Result	----	----	----	----
Total Metals									
sodium, total	7440-23-5	E420	0.050	mg/L	8.09	----	----	----	----
strontium, total	7440-24-6	E420	0.00020	mg/L	0.563	----	----	----	----
sulfur, total	7704-34-9	E420	0.50	mg/L	9.14	----	----	----	----
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	----	----	----	----
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	----	----	----	----
titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	----	----	----	----
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000185	----	----	----	----
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	----	----	----	----
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	----	----	----	----
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0017	----	----	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	----	----	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00022	----	----	----	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.130	----	----	----	----
beryllium, dissolved	7440-41-7	E421	0.020	μg/L	<0.020	----	----	----	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	----	----	----	----
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.039	----	----	----	----
cadmium, dissolved	7440-43-9	E421	0.0050	μg/L	<0.0050	----	----	----	----
calcium, dissolved	7440-70-2	E421	0.050	mg/L	64.4	----	----	----	----
chromium, dissolved	7440-47-3	E421.Cr-L	0.00010	mg/L	<0.00010	----	----	----	----
cobalt, dissolved	7440-48-4	E421	0.10	μg/L	<0.10	----	----	----	----
copper, dissolved	7440-50-8	E421	0.00020	mg/L	<0.00020	----	----	----	----
iron, dissolved	7439-89-6	E421	0.010	mg/L	0.016	----	----	----	----
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	----	----	----	----
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0139	----	----	----	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	16.4	----	----	----	----
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.0141	----	----	----	----
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	----	----	----	----
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000461	----	----	----	----

Analytical Results

Sub-Matrix: **Water**

(Matrix: **Water**)

				Client sample ID	**CM_FLA_MC_TRIB07_WS_2022-10-06_NP**	----	----	----	----
				Client sampling date / time	06-Oct-2022 15:00	----	----	----	----
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**CG2214000-016**	--------	--------	--------	--------
					Result	----	----	----	----
Dissolved Metals									
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	----	----	----	----
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	----	----	----	----
potassium, dissolved	7440-09-7	E421	0.050	mg/L	1.15	----	----	----	----
selenium, dissolved	7782-49-2	E421	0.050	µg/L	0.090	----	----	----	----
silicon, dissolved	7440-21-3	E421	0.050	mg/L	3.48	----	----	----	----
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	----	----	----	----
sodium, dissolved	7440-23-5	E421	0.050	mg/L	8.52	----	----	----	----
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.577	----	----	----	----
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	9.79	----	----	----	----
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	----	----	----	----
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	----	----	----	----
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	----	----	----	----
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	----	----	----	----
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000185	----	----	----	----
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	----	----	----	----
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	----	----	----	----
dissolved mercury filtration location	----	EP509	-	-	Field	----	----	----	----
dissolved metals filtration location	----	EP421	-	-	Field	----	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **CG2214000**	Page	: 1 of 56
Amendment	: **1**		
Client	: **SNC-Lavalin Inc.**	Laboratory	: Calgary - Environmental
Contact	: Ronald Salomonson	Account Manager	: Lovepreet Kaur
Address	: 901 INDUSTRIAL ROAD 2 CRANBROOK BC Canada V1C 4C9	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: ----	Telephone	: +1 403 407 1800
Project	: Coal Mountain Operations	Date Samples Received	: 07-Oct-2022 09:20
PO	: 692207	Issue Date	: 19-Oct-2022 15:59
C-O-C number	: CMO FLA OCTOBER 6TH 2022		
Sampler	: Elly Foster		
Site	: ----		
Quote number	: TECK Coal codes		
No. of samples received	: 16		
No. of samples analysed	: 16		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_AG01_WS_2022-10-06_NP	E298	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_AG02_WS_2022-10-06_NP	E298	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E298	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_CC01_WS_2022-10-06_NP	E298	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_MC_TRIB06_WS_2022-10-06_NP	E298	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_MC_TRIB07_WS_2022-10-06_NP	E298	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_MC01_WS_2022-10-06_NP	E298	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_MC02_WS_2022-10-06_NP	E298	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_MC03_WS_2022-10-06_NP	E298	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_MC04_WS_2022-10-06_NP	E298	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_MC11_WS_2022-10-06_NP	E298	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_MC12_WS_2022-10-06_NP	E298	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_FLA_MC13_WS_2022-10-06_NP	E298	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_NNP_WS_2022-10-06_NP	E298	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_NNT_WS_2022-10-06_NP	E298	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) CM_TRP_WS_2022-10-06_NP	E298	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_AG01_WS_2022-10-06_NP	E235.Br-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_AG02_WS_2022-10-06_NP	E235.Br-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E235.Br-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_CC01_WS_2022-10-06_NP	E235.Br-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_MC_TRIB06_WS_2022-10-06_NP	E235.Br-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_MC_TRIB07_WS_2022-10-06_NP	E235.Br-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_MC01_WS_2022-10-06_NP	E235.Br-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_MC02_WS_2022-10-06_NP	E235.Br-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_MC03_WS_2022-10-06_NP	E235.Br-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_MC04_WS_2022-10-06_NP	E235.Br-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_MC11_WS_2022-10-06_NP	E235.Br-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_MC12_WS_2022-10-06_NP	E235.Br-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_FLA_MC13_WS_2022-10-06_NP	E235.Br-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_NNP_WS_2022-10-06_NP	E235.Br-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_NNT_WS_2022-10-06_NP	E235.Br-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE CM_TRP_WS_2022-10-06_NP	E235.Br-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_AG01_WS_2022-10-06_NP	E235.Cl-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_AG02_WS_2022-10-06_NP	E235.Cl-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓

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Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E235.Cl-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
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Anions and Nutrients : Chloride in Water by IC (Low Level)										
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Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_MC_TRIB07_WS_2022-10-06_NP	E235.Cl-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_MC01_WS_2022-10-06_NP	E235.Cl-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_MC02_WS_2022-10-06_NP	E235.Cl-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_MC03_WS_2022-10-06_NP	E235.Cl-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_MC04_WS_2022-10-06_NP	E235.Cl-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_MC11_WS_2022-10-06_NP	E235.Cl-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓

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Analyte Group Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation* *Preparation Date*	*Holding Times* *Rec*	*Holding Times* *Actual*	*Eval*	*Analysis* *Analysis Date*	*Holding Times* *Rec*	*Holding Times* *Actual*	*Eval*
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_MC12_WS_2022-10-06_NP	E235.Cl-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_FLA_MC13_WS_2022-10-06_NP	E235.Cl-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_NNP_WS_2022-10-06_NP	E235.Cl-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE CM_NNT_WS_2022-10-06_NP	E235.Cl-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
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Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_AG01_WS_2022-10-06_NP	E378-U	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_AG02_WS_2022-10-06_NP	E378-U	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E378-U	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	3 days	3 days	✓

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HDPE CM_FLA_MC02_WS_2022-10-06_NP	E378-U	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_MC03_WS_2022-10-06_NP	E378-U	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_MC04_WS_2022-10-06_NP	E378-U	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	3 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_MC11_WS_2022-10-06_NP	E378-U	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_MC12_WS_2022-10-06_NP	E378-U	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE CM_FLA_MC13_WS_2022-10-06_NP	E378-U	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	3 days	3 days	✓
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Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_FLA_AG01_WS_2022-10-06_NP	E235.F	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_FLA_AG02_WS_2022-10-06_NP	E235.F	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓

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HDPE CM_FLA_MC03_WS_2022-10-06_NP	E235.F	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_FLA_MC04_WS_2022-10-06_NP	E235.F	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_FLA_MC11_WS_2022-10-06_NP	E235.F	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓

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Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_FLA_MC12_WS_2022-10-06_NP	E235.F	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_FLA_MC13_WS_2022-10-06_NP	E235.F	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_NNP_WS_2022-10-06_NP	E235.F	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_NNT_WS_2022-10-06_NP	E235.F	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE CM_TRP_WS_2022-10-06_NP	E235.F	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_AG01_WS_2022-10-06_NP	E235.NO3-L	06-Oct-2022	08-Oct-2022	3 days	2 days	✓	08-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_AG02_WS_2022-10-06_NP	E235.NO3-L	06-Oct-2022	08-Oct-2022	3 days	2 days	✓	08-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E235.NO3-L	06-Oct-2022	08-Oct-2022	3 days	2 days	✓	08-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_CC01_WS_2022-10-06_NP	E235.NO3-L	06-Oct-2022	08-Oct-2022	3 days	2 days	✓	08-Oct-2022	3 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_MC_TRIB06_WS_2022-10-06_NP	E235.NO3-L	06-Oct-2022	08-Oct-2022	3 days	2 days	✓	08-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_MC_TRIB07_WS_2022-10-06_NP	E235.NO3-L	06-Oct-2022	08-Oct-2022	3 days	2 days	✓	08-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_MC01_WS_2022-10-06_NP	E235.NO3-L	06-Oct-2022	08-Oct-2022	3 days	2 days	✓	08-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_MC02_WS_2022-10-06_NP	E235.NO3-L	06-Oct-2022	08-Oct-2022	3 days	2 days	✓	08-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_MC03_WS_2022-10-06_NP	E235.NO3-L	06-Oct-2022	08-Oct-2022	3 days	2 days	✓	08-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_MC04_WS_2022-10-06_NP	E235.NO3-L	06-Oct-2022	08-Oct-2022	3 days	2 days	✓	08-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_MC11_WS_2022-10-06_NP	E235.NO3-L	06-Oct-2022	08-Oct-2022	3 days	2 days	✓	08-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_MC12_WS_2022-10-06_NP	E235.NO3-L	06-Oct-2022	08-Oct-2022	3 days	2 days	✓	08-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_FLA_MC13_WS_2022-10-06_NP	E235.NO3-L	06-Oct-2022	08-Oct-2022	3 days	2 days	✓	08-Oct-2022	3 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_NNP_WS_2022-10-06_NP	E235.NO3-L	06-Oct-2022	08-Oct-2022	3 days	2 days	✓	08-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_NNT_WS_2022-10-06_NP	E235.NO3-L	06-Oct-2022	08-Oct-2022	3 days	2 days	✓	08-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE CM_TRP_WS_2022-10-06_NP	E235.NO3-L	06-Oct-2022	08-Oct-2022	3 days	2 days	✓	08-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_AG01_WS_2022-10-06_NP	E235.NO2-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_AG02_WS_2022-10-06_NP	E235.NO2-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E235.NO2-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_CC01_WS_2022-10-06_NP	E235.NO2-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_MC_TRIB06_WS_2022-10-06_NP	E235.NO2-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_MC_TRIB07_WS_2022-10-06_NP	E235.NO2-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_MC01_WS_2022-10-06_NP	E235.NO2-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_MC02_WS_2022-10-06_NP	E235.NO2-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_MC03_WS_2022-10-06_NP	E235.NO2-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_MC04_WS_2022-10-06_NP	E235.NO2-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_MC11_WS_2022-10-06_NP	E235.NO2-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_MC12_WS_2022-10-06_NP	E235.NO2-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_FLA_MC13_WS_2022-10-06_NP	E235.NO2-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_NNP_WS_2022-10-06_NP	E235.NO2-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_NNT_WS_2022-10-06_NP	E235.NO2-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE CM_TRP_WS_2022-10-06_NP	E235.NO2-L	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_AG01_WS_2022-10-06_NP	E235.SO4	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_AG02_WS_2022-10-06_NP	E235.SO4	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E235.SO4	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_CC01_WS_2022-10-06_NP	E235.SO4	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_MC_TRIB06_WS_2022-10-06_NP	E235.SO4	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_MC_TRIB07_WS_2022-10-06_NP	E235.SO4	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_MC01_WS_2022-10-06_NP	E235.SO4	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_MC02_WS_2022-10-06_NP	E235.SO4	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_MC03_WS_2022-10-06_NP	E235.SO4	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_MC04_WS_2022-10-06_NP	E235.SO4	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_MC11_WS_2022-10-06_NP	E235.SO4	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_MC12_WS_2022-10-06_NP	E235.SO4	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_FLA_MC13_WS_2022-10-06_NP	E235.SO4	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_NNP_WS_2022-10-06_NP	E235.SO4	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_NNT_WS_2022-10-06_NP	E235.SO4	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE CM_TRP_WS_2022-10-06_NP	E235.SO4	06-Oct-2022	08-Oct-2022	----	----		08-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_AG01_WS_2022-10-06_NP	E318	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation* *Preparation Date*	*Holding Times* *Rec*	*Actual*	*Eval*	*Analysis* *Analysis Date*	*Holding Times* *Rec*	*Actual*	*Eval*
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_AG02_WS_2022-10-06_NP	E318	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E318	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_CC01_WS_2022-10-06_NP	E318	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC_TRIB06_WS_2022-10-06_NP	E318	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC_TRIB07_WS_2022-10-06_NP	E318	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC01_WS_2022-10-06_NP	E318	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC02_WS_2022-10-06_NP	E318	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC03_WS_2022-10-06_NP	E318	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC04_WS_2022-10-06_NP	E318	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC11_WS_2022-10-06_NP	E318	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC12_WS_2022-10-06_NP	E318	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC13_WS_2022-10-06_NP	E318	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_NNP_WS_2022-10-06_NP	E318	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_NNT_WS_2022-10-06_NP	E318	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) CM_TRP_WS_2022-10-06_NP	E318	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_AG01_WS_2022-10-06_NP	E372-U	06-Oct-2022	13-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_AG02_WS_2022-10-06_NP	E372-U	06-Oct-2022	13-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E372-U	06-Oct-2022	13-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓

Matrix: **Water**

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Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_CC01_WS_2022-10-06_NP	E372-U	06-Oct-2022	13-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_MC_TRIB06_WS_2022-10-06_NP	E372-U	06-Oct-2022	13-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_MC_TRIB07_WS_2022-10-06_NP	E372-U	06-Oct-2022	13-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_MC01_WS_2022-10-06_NP	E372-U	06-Oct-2022	13-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_MC02_WS_2022-10-06_NP	E372-U	06-Oct-2022	13-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_MC03_WS_2022-10-06_NP	E372-U	06-Oct-2022	13-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_MC04_WS_2022-10-06_NP	E372-U	06-Oct-2022	13-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_MC11_WS_2022-10-06_NP	E372-U	06-Oct-2022	13-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_MC12_WS_2022-10-06_NP	E372-U	06-Oct-2022	13-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_FLA_MC13_WS_2022-10-06_NP	E372-U	06-Oct-2022	13-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_NNP_WS_2022-10-06_NP	E372-U	06-Oct-2022	13-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_NNT_WS_2022-10-06_NP	E372-U	06-Oct-2022	13-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) CM_TRP_WS_2022-10-06_NP	E372-U	06-Oct-2022	13-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE dissolved (nitric acid) CM_FLA_AG01_WS_2022-10-06_NP	E421.Cr-L	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE dissolved (nitric acid) CM_FLA_AG02_WS_2022-10-06_NP	E421.Cr-L	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE dissolved (nitric acid) CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E421.Cr-L	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE dissolved (nitric acid) CM_FLA_CC01_WS_2022-10-06_NP	E421.Cr-L	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE dissolved (nitric acid) CM_FLA_MC_TRIB06_WS_2022-10-06_NP	E421.Cr-L	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE dissolved (nitric acid) CM_FLA_MC_TRIB07_WS_2022-10-06_NP	E421.Cr-L	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE dissolved (nitric acid) CM_FLA_MC01_WS_2022-10-06_NP	E421.Cr-L	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE dissolved (nitric acid) CM_FLA_MC02_WS_2022-10-06_NP	E421.Cr-L	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE dissolved (nitric acid) CM_FLA_MC03_WS_2022-10-06_NP	E421.Cr-L	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE dissolved (nitric acid) CM_FLA_MC04_WS_2022-10-06_NP	E421.Cr-L	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE dissolved (nitric acid) CM_FLA_MC11_WS_2022-10-06_NP	E421.Cr-L	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE dissolved (nitric acid) CM_FLA_MC12_WS_2022-10-06_NP	E421.Cr-L	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE dissolved (nitric acid) CM_FLA_MC13_WS_2022-10-06_NP	E421.Cr-L	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE dissolved (nitric acid) CM_NNP_WS_2022-10-06_NP	E421.Cr-L	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE dissolved (nitric acid) CM_NNT_WS_2022-10-06_NP	E421.Cr-L	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)										
HDPE dissolved (nitric acid) CM_TRP_WS_2022-10-06_NP	E421.Cr-L	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) CM_FLA_AG01_WS_2022-10-06_NP	E509	06-Oct-2022	15-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) CM_FLA_AG02_WS_2022-10-06_NP	E509	06-Oct-2022	15-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E509	06-Oct-2022	15-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) CM_FLA_CC01_WS_2022-10-06_NP	E509	06-Oct-2022	15-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) CM_FLA_MC_TRIB06_WS_2022-10-06_NP	E509	06-Oct-2022	15-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) CM_FLA_MC_TRIB07_WS_2022-10-06_NP	E509	06-Oct-2022	15-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) CM_FLA_MC01_WS_2022-10-06_NP	E509	06-Oct-2022	15-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) CM_FLA_MC02_WS_2022-10-06_NP	E509	06-Oct-2022	15-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) CM_FLA_MC03_WS_2022-10-06_NP	E509	06-Oct-2022	15-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) CM_FLA_MC04_WS_2022-10-06_NP	E509	06-Oct-2022	15-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) CM_FLA_MC11_WS_2022-10-06_NP	E509	06-Oct-2022	15-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) CM_FLA_MC12_WS_2022-10-06_NP	E509	06-Oct-2022	15-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) CM_FLA_MC13_WS_2022-10-06_NP	E509	06-Oct-2022	15-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) CM_NNP_WS_2022-10-06_NP	E509	06-Oct-2022	15-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) CM_NNT_WS_2022-10-06_NP	E509	06-Oct-2022	15-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) CM_TRP_WS_2022-10-06_NP	E509	06-Oct-2022	15-Oct-2022	----	----		15-Oct-2022	28 days	9 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) CM_FLA_AG01_WS_2022-10-06_NP	E421	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) CM_FLA_AG02_WS_2022-10-06_NP	E421	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E421	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) CM_FLA_CC01_WS_2022-10-06_NP	E421	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) CM_FLA_MC_TRIB06_WS_2022-10-06_NP	E421	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) CM_FLA_MC_TRIB07_WS_2022-10-06_NP	E421	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) CM_FLA_MC01_WS_2022-10-06_NP	E421	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) CM_FLA_MC02_WS_2022-10-06_NP	E421	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) CM_FLA_MC03_WS_2022-10-06_NP	E421	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓

Matrix: **Water**

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Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) CM_FLA_MC04_WS_2022-10-06_NP	E421	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) CM_FLA_MC11_WS_2022-10-06_NP	E421	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) CM_FLA_MC12_WS_2022-10-06_NP	E421	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) CM_FLA_MC13_WS_2022-10-06_NP	E421	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) CM_NNP_WS_2022-10-06_NP	E421	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) CM_NNT_WS_2022-10-06_NP	E421	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) CM_TRP_WS_2022-10-06_NP	E421	06-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	180 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_AG01_WS_2022-10-06_NP	E358-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_AG02_WS_2022-10-06_NP	E358-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓

Matrix: **Water**

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Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E358-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_CC01_WS_2022-10-06_NP	E358-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_MC_TRIB06_WS_2022-10-06_NP	E358-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_MC_TRIB07_WS_2022-10-06_NP	E358-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_MC01_WS_2022-10-06_NP	E358-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_MC02_WS_2022-10-06_NP	E358-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_MC03_WS_2022-10-06_NP	E358-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_MC04_WS_2022-10-06_NP	E358-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_MC11_WS_2022-10-06_NP	E358-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓

Matrix: **Water**

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Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_MC12_WS_2022-10-06_NP	E358-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_FLA_MC13_WS_2022-10-06_NP	E358-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_NNP_WS_2022-10-06_NP	E358-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_NNT_WS_2022-10-06_NP	E358-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) CM_TRP_WS_2022-10-06_NP	E358-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_AG01_WS_2022-10-06_NP	E355-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_AG02_WS_2022-10-06_NP	E355-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E355-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_CC01_WS_2022-10-06_NP	E355-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓

Matrix: **Water**

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Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC_TRIB06_WS_2022-10-06_NP	E355-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC_TRIB07_WS_2022-10-06_NP	E355-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC01_WS_2022-10-06_NP	E355-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC02_WS_2022-10-06_NP	E355-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC03_WS_2022-10-06_NP	E355-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC04_WS_2022-10-06_NP	E355-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC11_WS_2022-10-06_NP	E355-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC12_WS_2022-10-06_NP	E355-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_FLA_MC13_WS_2022-10-06_NP	E355-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_NNP_WS_2022-10-06_NP	E355-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_NNT_WS_2022-10-06_NP	E355-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) CM_TRP_WS_2022-10-06_NP	E355-L	06-Oct-2022	09-Oct-2022	----	----		10-Oct-2022	28 days	4 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_AG01_WS_2022-10-06_NP	E283	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_AG02_WS_2022-10-06_NP	E283	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E283	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_CC01_WS_2022-10-06_NP	E283	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_MC_TRIB06_WS_2022-10-06_NP	E283	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_MC_TRIB07_WS_2022-10-06_NP	E283	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : Acidity by Titration										
HDPE CM_FLA_MC01_WS_2022-10-06_NP	E283	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_MC02_WS_2022-10-06_NP	E283	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_MC03_WS_2022-10-06_NP	E283	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_MC04_WS_2022-10-06_NP	E283	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_MC11_WS_2022-10-06_NP	E283	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_MC12_WS_2022-10-06_NP	E283	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_FLA_MC13_WS_2022-10-06_NP	E283	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_NNP_WS_2022-10-06_NP	E283	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Acidity by Titration										
HDPE CM_NNT_WS_2022-10-06_NP	E283	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation* *Preparation Date*	*Holding Times* *Rec*	 *Actual*	 *Eval*	*Analysis* *Analysis Date*	*Holding Times* *Rec*	 *Actual*	 *Eval*
Physical Tests : Acidity by Titration										
HDPE CM_TRP_WS_2022-10-06_NP	E283	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_AG01_WS_2022-10-06_NP	E290	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_AG02_WS_2022-10-06_NP	E290	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E290	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_CC01_WS_2022-10-06_NP	E290	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_MC_TRIB06_WS_2022-10-06_NP	E290	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_MC_TRIB07_WS_2022-10-06_NP	E290	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_MC01_WS_2022-10-06_NP	E290	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_MC02_WS_2022-10-06_NP	E290	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_MC03_WS_2022-10-06_NP	E290	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_MC04_WS_2022-10-06_NP	E290	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_MC11_WS_2022-10-06_NP	E290	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_MC12_WS_2022-10-06_NP	E290	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_FLA_MC13_WS_2022-10-06_NP	E290	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_NNP_WS_2022-10-06_NP	E290	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_NNT_WS_2022-10-06_NP	E290	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE CM_TRP_WS_2022-10-06_NP	E290	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	14 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_AG01_WS_2022-10-06_NP	E100	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times Rec*	*Holding Times Actual*	*Eval*	*Analysis Date*	*Holding Times Rec*	*Holding Times Actual*	*Eval*
Physical Tests : Conductivity in Water										
HDPE CM_FLA_AG02_WS_2022-10-06_NP	E100	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E100	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_CC01_WS_2022-10-06_NP	E100	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_MC_TRIB06_WS_2022-10-06_NP	E100	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_MC_TRIB07_WS_2022-10-06_NP	E100	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_MC01_WS_2022-10-06_NP	E100	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_MC02_WS_2022-10-06_NP	E100	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_MC03_WS_2022-10-06_NP	E100	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_MC04_WS_2022-10-06_NP	E100	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: ✗ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : Conductivity in Water										
HDPE CM_FLA_MC11_WS_2022-10-06_NP	E100	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_MC12_WS_2022-10-06_NP	E100	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_FLA_MC13_WS_2022-10-06_NP	E100	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_NNP_WS_2022-10-06_NP	E100	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_NNT_WS_2022-10-06_NP	E100	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE CM_TRP_WS_2022-10-06_NP	E100	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	28 days	3 days	✓
Physical Tests : ORP by Electrode										
HDPE CM_FLA_MC11_WS_2022-10-06_NP	E125	06-Oct-2022	----	----	----		13-Oct-2022	0.25 hrs	165 hrs	✗ EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_FLA_MC12_WS_2022-10-06_NP	E125	06-Oct-2022	----	----	----		13-Oct-2022	0.25 hrs	165 hrs	✗ EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_FLA_MC13_WS_2022-10-06_NP	E125	06-Oct-2022	----	----	----		13-Oct-2022	0.25 hrs	165 hrs	✗ EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : ORP by Electrode										
HDPE CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E125	06-Oct-2022	----	----	----		13-Oct-2022	0.25 hrs	166 hrs	× EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_FLA_MC_TRIB07_WS_2022-10-06_NP	E125	06-Oct-2022	----	----	----		13-Oct-2022	0.25 hrs	166 hrs	× EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_NNT_WS_2022-10-06_NP	E125	06-Oct-2022	----	----	----		13-Oct-2022	0.25 hrs	166 hrs	× EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_TRP_WS_2022-10-06_NP	E125	06-Oct-2022	----	----	----		13-Oct-2022	0.25 hrs	166 hrs	× EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_FLA_AG02_WS_2022-10-06_NP	E125	06-Oct-2022	----	----	----		13-Oct-2022	0.25 hrs	167 hrs	× EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_FLA_MC01_WS_2022-10-06_NP	E125	06-Oct-2022	----	----	----		13-Oct-2022	0.25 hrs	167 hrs	× EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_NNP_WS_2022-10-06_NP	E125	06-Oct-2022	----	----	----		13-Oct-2022	0.25 hrs	167 hrs	× EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_FLA_AG01_WS_2022-10-06_NP	E125	06-Oct-2022	----	----	----		13-Oct-2022	0.25 hrs	168 hrs	× EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_FLA_MC_TRIB06_WS_2022-10-06_NP	E125	06-Oct-2022	----	----	----		13-Oct-2022	0.25 hrs	169 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: ✗ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation* *Preparation Date*	*Holding Times Rec*	*Holding Times Actual*	*Eval*	*Analysis* *Analysis Date*	*Holding Times Rec*	*Holding Times Actual*	*Eval*
Physical Tests : ORP by Electrode										
HDPE CM_FLA_MC02_WS_2022-10-06_NP	E125	06-Oct-2022	----	----	----		13-Oct-2022	0.25 hrs	169 hrs	✗ EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_FLA_MC03_WS_2022-10-06_NP	E125	06-Oct-2022	----	----	----		13-Oct-2022	0.25 hrs	169 hrs	✗ EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_FLA_CC01_WS_2022-10-06_NP	E125	06-Oct-2022	----	----	----		13-Oct-2022	0.25 hrs	172 hrs	✗ EHTR-FM
Physical Tests : ORP by Electrode										
HDPE CM_FLA_MC04_WS_2022-10-06_NP	E125	06-Oct-2022	----	----	----		13-Oct-2022	0.25 hrs	172 hrs	✗ EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_AG01_WS_2022-10-06_NP	E108	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	0.25 hrs	0.26 hrs	✗ EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_AG02_WS_2022-10-06_NP	E108	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	0.25 hrs	0.26 hrs	✗ EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E108	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	0.25 hrs	0.26 hrs	✗ EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_CC01_WS_2022-10-06_NP	E108	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	0.25 hrs	0.26 hrs	✗ EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_MC_TRIB06_WS_2022-10-06_NP	E108	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	0.25 hrs	0.26 hrs	✗ EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times* Rec	*Holding Times* Actual	*Eval*	*Analysis Date*	*Holding Times* Rec	*Holding Times* Actual	*Eval*
Physical Tests : pH by Meter										
HDPE CM_FLA_MC_TRIB07_WS_2022-10-06_NP	E108	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_MC01_WS_2022-10-06_NP	E108	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_MC02_WS_2022-10-06_NP	E108	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_MC03_WS_2022-10-06_NP	E108	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_MC04_WS_2022-10-06_NP	E108	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_MC11_WS_2022-10-06_NP	E108	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_MC12_WS_2022-10-06_NP	E108	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_FLA_MC13_WS_2022-10-06_NP	E108	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_NNP_WS_2022-10-06_NP	E108	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	0.25 hrs	0.26 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: ✗ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : pH by Meter										
HDPE CM_NNT_WS_2022-10-06_NP	E108	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	0.25 hrs	0.26 hrs	✗ EHTR-FM
Physical Tests : pH by Meter										
HDPE CM_TRP_WS_2022-10-06_NP	E108	06-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	0.25 hrs	0.26 hrs	✗ EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_AG01_WS_2022-10-06_NP	E162	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_AG02_WS_2022-10-06_NP	E162	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E162	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_CC01_WS_2022-10-06_NP	E162	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_MC_TRIB06_WS_2022-10-06_NP	E162	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_MC_TRIB07_WS_2022-10-06_NP	E162	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_MC01_WS_2022-10-06_NP	E162	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_MC02_WS_2022-10-06_NP	E162	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_MC03_WS_2022-10-06_NP	E162	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_MC04_WS_2022-10-06_NP	E162	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_MC11_WS_2022-10-06_NP	E162	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_MC12_WS_2022-10-06_NP	E162	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_FLA_MC13_WS_2022-10-06_NP	E162	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_NNP_WS_2022-10-06_NP	E162	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_NNT_WS_2022-10-06_NP	E162	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE CM_TRP_WS_2022-10-06_NP	E162	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_AG01_WS_2022-10-06_NP	E160-L	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_AG02_WS_2022-10-06_NP	E160-L	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E160-L	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_CC01_WS_2022-10-06_NP	E160-L	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_MC_TRIB06_WS_2022-10-06_NP	E160-L	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_MC_TRIB07_WS_2022-10-06_NP	E160-L	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_MC01_WS_2022-10-06_NP	E160-L	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_MC02_WS_2022-10-06_NP	E160-L	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_MC03_WS_2022-10-06_NP	E160-L	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_MC04_WS_2022-10-06_NP	E160-L	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_MC11_WS_2022-10-06_NP	E160-L	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_MC12_WS_2022-10-06_NP	E160-L	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_FLA_MC13_WS_2022-10-06_NP	E160-L	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_NNP_WS_2022-10-06_NP	E160-L	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_NNT_WS_2022-10-06_NP	E160-L	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE CM_TRP_WS_2022-10-06_NP	E160-L	06-Oct-2022	----	----	----		13-Oct-2022	7 days	7 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_AG01_WS_2022-10-06_NP	E121	06-Oct-2022	----	----	----		09-Oct-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_AG02_WS_2022-10-06_NP	E121	06-Oct-2022	----	----	----		09-Oct-2022	3 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation* *Preparation Date*	*Holding Times Rec*	*Holding Times Actual*	*Eval*	*Analysis* *Analysis Date*	*Holding Times Rec*	*Holding Times Actual*	*Eval*
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E121	06-Oct-2022	----	----	----		09-Oct-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_CC01_WS_2022-10-06_NP	E121	06-Oct-2022	----	----	----		09-Oct-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_MC_TRIB06_WS_2022-10-06_NP	E121	06-Oct-2022	----	----	----		09-Oct-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_MC_TRIB07_WS_2022-10-06_NP	E121	06-Oct-2022	----	----	----		09-Oct-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_MC01_WS_2022-10-06_NP	E121	06-Oct-2022	----	----	----		09-Oct-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_MC02_WS_2022-10-06_NP	E121	06-Oct-2022	----	----	----		09-Oct-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_MC03_WS_2022-10-06_NP	E121	06-Oct-2022	----	----	----		09-Oct-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_MC04_WS_2022-10-06_NP	E121	06-Oct-2022	----	----	----		09-Oct-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_MC11_WS_2022-10-06_NP	E121	06-Oct-2022	----	----	----		09-Oct-2022	3 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times* *Rec*	*Holding Times* *Actual*	*Eval*	*Analysis Date*	*Holding Times* *Rec*	*Holding Times* *Actual*	*Eval*
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_MC12_WS_2022-10-06_NP	E121	06-Oct-2022	----	----	----		09-Oct-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_FLA_MC13_WS_2022-10-06_NP	E121	06-Oct-2022	----	----	----		09-Oct-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_NNP_WS_2022-10-06_NP	E121	06-Oct-2022	----	----	----		09-Oct-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_NNT_WS_2022-10-06_NP	E121	06-Oct-2022	----	----	----		09-Oct-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE CM_TRP_WS_2022-10-06_NP	E121	06-Oct-2022	----	----	----		09-Oct-2022	3 days	3 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE total (nitric acid) CM_FLA_AG01_WS_2022-10-06_NP	E420.Cr-L	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE total (nitric acid) CM_FLA_AG02_WS_2022-10-06_NP	E420.Cr-L	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE total (nitric acid) CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E420.Cr-L	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE total (nitric acid) CM_FLA_CC01_WS_2022-10-06_NP	E420.Cr-L	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times Rec*	*Holding Times Actual*	*Eval*	*Analysis Date*	*Holding Times Rec*	*Holding Times Actual*	*Eval*
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE total (nitric acid) CM_FLA_MC_TRIB06_WS_2022-10-06_NP	E420.Cr-L	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE total (nitric acid) CM_FLA_MC_TRIB07_WS_2022-10-06_NP	E420.Cr-L	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE total (nitric acid) CM_FLA_MC01_WS_2022-10-06_NP	E420.Cr-L	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE total (nitric acid) CM_FLA_MC02_WS_2022-10-06_NP	E420.Cr-L	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE total (nitric acid) CM_FLA_MC03_WS_2022-10-06_NP	E420.Cr-L	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE total (nitric acid) CM_FLA_MC04_WS_2022-10-06_NP	E420.Cr-L	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE total (nitric acid) CM_FLA_MC11_WS_2022-10-06_NP	E420.Cr-L	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE total (nitric acid) CM_FLA_MC12_WS_2022-10-06_NP	E420.Cr-L	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE total (nitric acid) CM_FLA_MC13_WS_2022-10-06_NP	E420.Cr-L	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times Rec*	*Holding Times Actual*	*Eval*	*Analysis Date*	*Holding Times Rec*	*Holding Times Actual*	*Eval*
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE total (nitric acid) CM_NNP_WS_2022-10-06_NP	E420.Cr-L	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE total (nitric acid) CM_NNT_WS_2022-10-06_NP	E420.Cr-L	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE total (nitric acid) CM_TRP_WS_2022-10-06_NP	E420.Cr-L	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) CM_FLA_AG01_WS_2022-10-06_NP	E508	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) CM_FLA_AG02_WS_2022-10-06_NP	E508	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E508	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) CM_FLA_CC01_WS_2022-10-06_NP	E508	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) CM_FLA_MC_TRIB06_WS_2022-10-06_NP	E508	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) CM_FLA_MC_TRIB07_WS_2022-10-06_NP	E508	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) CM_FLA_MC01_WS_2022-10-06_NP	E508	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) CM_FLA_MC02_WS_2022-10-06_NP	E508	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) CM_FLA_MC03_WS_2022-10-06_NP	E508	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) CM_FLA_MC04_WS_2022-10-06_NP	E508	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) CM_FLA_MC11_WS_2022-10-06_NP	E508	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) CM_FLA_MC12_WS_2022-10-06_NP	E508	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) CM_FLA_MC13_WS_2022-10-06_NP	E508	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) CM_NNP_WS_2022-10-06_NP	E508	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) CM_NNT_WS_2022-10-06_NP	E508	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) CM_TRP_WS_2022-10-06_NP	E508	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) CM_FLA_AG01_WS_2022-10-06_NP	E420	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) CM_FLA_AG02_WS_2022-10-06_NP	E420	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) CM_FLA_CC_TRIB01_WS_2022-10-06_NP	E420	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) CM_FLA_CC01_WS_2022-10-06_NP	E420	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) CM_FLA_MC_TRIB06_WS_2022-10-06_NP	E420	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) CM_FLA_MC_TRIB07_WS_2022-10-06_NP	E420	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) CM_FLA_MC01_WS_2022-10-06_NP	E420	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) CM_FLA_MC02_WS_2022-10-06_NP	E420	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) CM_FLA_MC03_WS_2022-10-06_NP	E420	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) CM_FLA_MC04_WS_2022-10-06_NP	E420	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) CM_FLA_MC11_WS_2022-10-06_NP	E420	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) CM_FLA_MC12_WS_2022-10-06_NP	E420	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) CM_FLA_MC13_WS_2022-10-06_NP	E420	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) CM_NNP_WS_2022-10-06_NP	E420	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) CM_NNT_WS_2022-10-06_NP	E420	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) CM_TRP_WS_2022-10-06_NP	E420	06-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	180 days	8 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			*Count*		*Frequency (%)*		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Acidity by Titration	E283	688636	1	20	5.0	5.0	✓
Alkalinity Species by Titration	E290	688639	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	688182	1	19	5.2	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	687984	1	20	5.0	5.0	✓
Chloride in Water by IC (Low Level)	E235.Cl-L	687985	1	20	5.0	5.0	✓
Conductivity in Water	E100	688638	1	20	5.0	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	694072	1	18	5.5	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	697964	2	40	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	694073	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	688238	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	688516	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	687983	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	687986	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	687987	1	20	5.0	5.0	✓
ORP by Electrode	E125	690009	2	29	6.9	5.0	✓
pH by Meter	E108	688637	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	687988	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	691525	2	39	5.1	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	694537	1	18	5.5	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	691557	2	40	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	696847	2	39	5.1	5.0	✓
Total metals in Water by CRC ICPMS	E420	694536	1	18	5.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	688239	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	693892	2	39	5.1	5.0	✓
Turbidity by Nephelometry	E121	688066	1	19	5.2	5.0	✓
Laboratory Control Samples (LCS)							
Acidity by Titration	E283	688636	1	20	5.0	5.0	✓
Alkalinity Species by Titration	E290	688639	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	688182	1	19	5.2	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	687984	1	20	5.0	5.0	✓
Chloride in Water by IC (Low Level)	E235.Cl-L	687985	1	20	5.0	5.0	✓
Conductivity in Water	E100	688638	1	20	5.0	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	694072	1	18	5.5	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	697964	2	40	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	694073	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	688238	1	20	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			*Count*		*Frequency (%)*		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	688516	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	687983	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	687986	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	687987	1	20	5.0	5.0	✓
ORP by Electrode	E125	690009	2	29	6.9	5.0	✓
pH by Meter	E108	688637	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	687988	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	691525	2	39	5.1	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	694537	1	18	5.5	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	691557	2	40	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	696847	2	39	5.1	5.0	✓
Total metals in Water by CRC ICPMS	E420	694536	1	18	5.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	688239	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	693892	2	39	5.1	5.0	✓
TSS by Gravimetry (Low Level)	E160-L	691492	2	39	5.1	5.0	✓
Turbidity by Nephelometry	E121	688066	1	19	5.2	5.0	✓
Method Blanks (MB)							
Acidity by Titration	E283	688636	1	20	5.0	5.0	✓
Alkalinity Species by Titration	E290	688639	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	688182	1	19	5.2	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	687984	1	20	5.0	5.0	✓
Chloride in Water by IC (Low Level)	E235.Cl-L	687985	1	20	5.0	5.0	✓
Conductivity in Water	E100	688638	1	20	5.0	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	694072	1	18	5.5	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	697964	2	40	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	694073	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	688238	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	688516	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	687983	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	687986	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	687987	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	687988	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	691525	2	39	5.1	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	694537	1	18	5.5	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	691557	2	40	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	696847	2	39	5.1	5.0	✓
Total metals in Water by CRC ICPMS	E420	694536	1	18	5.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	688239	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	693892	2	39	5.1	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB) - Continued							
TSS by Gravimetry (Low Level)	E160-L	691492	2	39	5.1	5.0	✓
Turbidity by Nephelometry	E121	688066	1	19	5.2	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	688182	1	19	5.2	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	687984	1	20	5.0	5.0	✓
Chloride in Water by IC (Low Level)	E235.Cl-L	687985	1	20	5.0	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	694072	1	18	5.5	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	697964	2	40	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	694073	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	688238	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	688516	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	687983	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	687986	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	687987	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	687988	1	20	5.0	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	694537	1	18	5.5	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	691557	2	40	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	696847	2	39	5.1	5.0	✓
Total metals in Water by CRC ICPMS	E420	694536	1	18	5.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	688239	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	693892	2	39	5.1	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by “mod”).

Analytical Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Conductivity in Water	E100 Calgary - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 Calgary - Environmental	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
ORP by Electrode	E125 Calgary - Environmental	Water	ASTM D1498 (mod)	Oxidation redution potential is reported as the oxidation-reduction potential of the platinum metal-reference electrode employed, measured in mV. For high accuracy test results, it is recommended that this analysis be conducted in the field.
TSS by Gravimetry (Low Level)	E160-L Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Calgary - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Water by IC (Low Level)	E235.Br-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC (Low Level)	E235.Cl-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

Analytical Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Acidity by Titration	E283 Calgary - Environmental	Water	APHA 2310 B (mod)	Acidity is determined by potentiometric titration to pH endpoint of 8.3
Alkalinity Species by Titration	E290 Calgary - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Calgary - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Calgary - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Total metals in Water by CRC ICPMS	E420 Calgary - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L Calgary - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.

Analytical Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Dissolved Metals in Water by CRC ICPMS	E421 Calgary - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L Calgary - Environmental	Water	APHA 3030 B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS
Total Mercury in Water by CVAAS	E508 Calgary - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Mercury in Water by CVAAS	E509 Calgary - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Dissolved Hardness (Calculated)	EC100 Calgary - Environmental	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Calgary - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).

Preparation Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Calgary - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

Preparation Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Dissolved Metals Water Filtration	EP421 Calgary - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration	EP509 Calgary - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.

QUALITY CONTROL REPORT

Work Order	:**CG2214000**	Page	: 1 of 19
Amendment	:**1**		
Client	:SNC-Lavalin Inc.	Laboratory	:Calgary - Environmental
Contact	:Ronald Salomonson	Account Manager	:Lovepreet Kaur
Address	:901 INDUSTRIAL ROAD 2 CRANBROOK BC Canada V1C 4C9	Address	:2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	:	Telephone	:+1 403 407 1800
Project	:Coal Mountain Operations	Date Samples Received	:07-Oct-2022 09:20
PO	:692207	Date Analysis Commenced	:08-Oct-2022
C-O-C number	:CMO FLA OCTOBER 6TH 2022	Issue Date	:19-Oct-2022 15:59
Sampler	:Elly Foster ----		
Site	:----		
Quote number	:TECK Coal codes		
No. of samples received	: 16		
No. of samples analysed	: 16		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Anthony Calero	Supervisor - Inorganic	Calgary Inorganics, Calgary, Alberta
Anthony Calero	Supervisor - Inorganic	Calgary Metals, Calgary, Alberta
Elke Tabora		Calgary Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Metals, Calgary, Alberta
Kevin Baxter		Calgary Metals, Calgary, Alberta
Mackenzie Lamoureux	Laboratory Analyst	Calgary Metals, Calgary, Alberta
Naeun Kim	Analyst	Calgary Metals, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Calgary Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Vladka Stamenova	Analyst	Calgary Inorganics, Calgary, Alberta

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 688066)											
CG2213996-001	Anonymous	turbidity	----	E121	0.10	NTU	8.45	8.06	4.73%	15%	----
Physical Tests (QC Lot: 688636)											
CG2214000-001	CM_FLA_AG01_WS_2022-10-06_NP	acidity (as CaCO3)	----	E283	2.0	mg/L	<2.0	<2.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 688637)											
CG2214000-001	CM_FLA_AG01_WS_2022-10-06_NP	pH	----	E108	0.10	pH units	8.13	8.21	0.979%	4%	----
Physical Tests (QC Lot: 688638)											
CG2214000-001	CM_FLA_AG01_WS_2022-10-06_NP	conductivity	----	E100	2.0	µS/cm	262	251	4.29%	10%	----
Physical Tests (QC Lot: 688639)											
CG2214000-001	CM_FLA_AG01_WS_2022-10-06_NP	alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	126	126	0.00%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	126	126	0.00%	20%	----
Physical Tests (QC Lot: 690009)											
CG2213793-001	Anonymous	oxidation-reduction potential [ORP]	----	E125	0.10	mV	235	239	1.56%	15%	----
Physical Tests (QC Lot: 690010)											
CG2214000-010	CM_FLA_MC12_WS_2022-10-06_NP	oxidation-reduction potential [ORP]	----	E125	0.10	mV	262	265	1.14%	15%	----
Physical Tests (QC Lot: 691525)											
CG2213917-001	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	477	471	1.26%	20%	----
Physical Tests (QC Lot: 691526)											
CG2214000-005	CM_FLA_MC01_WS_2022-10-06_NP	solids, total dissolved [TDS]	----	E162	20	mg/L	481	493	2.57%	20%	----
Anions and Nutrients (QC Lot: 687983)											
CG2213986-001	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.203	0.203	0.246%	20%	----
Anions and Nutrients (QC Lot: 687984)											
CG2213986-001	Anonymous	bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 687985)											
CG2213986-001	Anonymous	chloride	16887-00-6	E235.Cl-L	0.10	mg/L	0.82	0.82	0.0006	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 687986)											

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Anions and Nutrients (QC Lot: 687986) - continued											
CG2213986-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	2.53	2.56	1.20%	20%	----
Anions and Nutrients (QC Lot: 687987)											
CG2213986-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 687988)											
CG2213986-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	150	152	0.776%	20%	----
Anions and Nutrients (QC Lot: 688182)											
CG2214000-001	CM_FLA_AG01_WS_2022-10-06_NP	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 688516)											
CG2213996-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0100	mg/L	0.109	0.108	1.22%	20%	----
Anions and Nutrients (QC Lot: 691557)											
CG2213917-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.086	0.084	0.001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 691558)											
CG2214000-006	CM_FLA_MC02_WS_2022-10-06_NP	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.136	0.110	0.026	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 693892)											
CG2213917-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0059	0.0066	0.0006	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 693893)											
CG2214000-010	CM_FLA_MC12_WS_2022-10-06_NP	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0042	0.0044	0.0001	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 688238)											
CG2214000-001	CM_FLA_AG01_WS_2022-10-06_NP	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 688239)											
CG2214000-001	CM_FLA_AG01_WS_2022-10-06_NP	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Total Metals (QC Lot: 694536)											
CG2214000-001	CM_FLA_AG01_WS_2022-10-06_NP	aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0047	0.0057	0.0010	Diff <2x LOR	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00046	0.00049	0.00003	Diff <2x LOR	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.0231	0.0225	2.96%	20%	----
		beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.020 µg/L	<0.000020	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0092 µg/L	0.0000124	0.0000032	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	44.5	42.9	3.57%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 694536) - continued											
CG2214000-001	CM_FLA_AG01_WS_2022-10-06_NP	cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	0.0033	0.0030	0.0004	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.0050	mg/L	8.41	8.36	0.667%	20%	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.00012	<0.00010	0.00002	Diff <2x LOR	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000773	0.000769	0.533%	20%	----
		nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	0.267	0.259	0.009	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	1.83 µg/L	0.00183	0.118%	20%	----
		silicon, total	7440-21-3	E420	0.10	mg/L	1.52	1.54	1.20%	20%	----
		silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.050	mg/L	0.738	0.703	4.86%	20%	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	0.151	0.146	3.47%	20%	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	7.34	7.21	1.90%	20%	----
		thallium, total	7440-28-0	E420	0.000010	mg/L	0.000042	0.000040	0.000002	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.000822	0.000786	4.42%	20%	----
		vanadium, total	7440-62-2	E420	0.00050	mg/L	0.00053	0.00059	0.00006	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
Total Metals (QC Lot: 694537)											
CG2214000-001	CM_FLA_AG01_WS_2022-10-06_NP	chromium, total	7440-47-3	E420.Cr-L	0.00010	mg/L	0.00034	0.00041	0.00006	Diff <2x LOR	----
Total Metals (QC Lot: 696847)											
CG2213918-001	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Total Metals (QC Lot: 696848)											
CG2214000-013	CM_NNT_WS_2022-10-06_NP	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 694072)											
CG2214000-001	CM_FLA_AG01_WS_2022-10-06_NP	chromium, dissolved	7440-47-3	E421.Cr-L	0.00010	mg/L	0.00028	0.00026	0.00002	Diff <2x LOR	----
Dissolved Metals (QC Lot: 694073)											
CG2214000-001	CM_FLA_AG01_WS_2022-10-06_NP	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	<0.0010	0.0018	0.0008	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 694073) - continued											
CG2214000-001	CM_FLA_AG01_WS_2022-10-06_NP	antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00047	0.00048	0.0000006	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0235	0.0234	0.605%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.020 µg/L	<0.000020	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0167 µg/L	0.0000167	0	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	42.8	42.8	0.163%	20%	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0020	0.0021	0.00006	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	9.22	9.30	0.765%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000834	0.000817	2.06%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.213	0.218	0.005	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	2.19 µg/L	0.00198	10.2%	20%	----
		silicon, dissolved	7440-21-3	E421	0.050	mg/L	1.55	1.54	0.958%	20%	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.050	mg/L	0.643	0.652	1.38%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.149	0.149	0.0178%	20%	----
		sulfur, dissolved	7704-34-9	E421	0.50	mg/L	7.86	7.72	1.78%	20%	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000039	0.000041	0.000002	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000792	0.000806	1.76%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0015	0.0015	0.0000006	Diff <2x LOR	----
Dissolved Metals (QC Lot: 697964)											
CG2213990-014	Anonymous	mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	**Client sample ID**	**Analyte**	**CAS Number**	**Method**	**LOR**	**Unit**	**Original Result**	**Duplicate Result**	**RPD(%) or Difference**	**Duplicate Limits**	**Qualifier**
Dissolved Metals (QC Lot: 697965)											
CG2214000-002	CM_FLA_AG02_WS_2022-10-06_NP	mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Result*	*Qualifier*
Physical Tests (QCLot: 688066)						
turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 688636)						
acidity (as CaCO3)	----	E283	2	mg/L	<2.0	----
Physical Tests (QCLot: 688638)						
conductivity	----	E100	1	µS/cm	1.0	----
Physical Tests (QCLot: 688639)						
alkalinity, bicarbonate (as CaCO3)	----	E290	1	mg/L	<1.0	----
alkalinity, carbonate (as CaCO3)	----	E290	1	mg/L	<1.0	----
alkalinity, hydroxide (as CaCO3)	----	E290	1	mg/L	<1.0	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 691492)						
solids, total suspended [TSS]	----	E160-L	1	mg/L	<1.0	----
Physical Tests (QCLot: 691493)						
solids, total suspended [TSS]	----	E160-L	1	mg/L	<1.0	----
Physical Tests (QCLot: 691525)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 691526)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 687983)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 687984)						
bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 687985)						
chloride	16887-00-6	E235.Cl-L	0.1	mg/L	<0.10	----
Anions and Nutrients (QCLot: 687986)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 687987)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 687988)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 688182)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----

Sub-Matrix: **Water**

Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Result*	*Qualifier*
Anions and Nutrients (QCLot: 688516)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 691557)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 691558)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 693892)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 693893)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Organic / Inorganic Carbon (QCLot: 688238)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 688239)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 694536)						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 694536) - continued						
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
Total Metals (QCLot: 694537)						
chromium, total	7440-47-3	E420.Cr-L	0.0001	mg/L	<0.00010	----
Total Metals (QCLot: 696847)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Total Metals (QCLot: 696848)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 694072)						
chromium, dissolved	7440-47-3	E421.Cr-L	0.0001	mg/L	<0.00010	----
Dissolved Metals (QCLot: 694073)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 694073) - continued						
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
Dissolved Metals (QCLot: 697964)						
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 697965)						
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	*Recovery (%)*	*Recovery Limits (%)*		
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Concentration*	*LCS*	*Low*	*High*	*Qualifier*
Physical Tests (QCLot: 688066)									
turbidity	----	E121	0.1	NTU	200 NTU	94.0	85.0	115	----
Physical Tests (QCLot: 688636)									
acidity (as CaCO3)	----	E283	2	mg/L	50 mg/L	104	85.0	115	----
Physical Tests (QCLot: 688637)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Physical Tests (QCLot: 688638)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	101	90.0	110	----
Physical Tests (QCLot: 688639)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	104	85.0	115	----
Physical Tests (QCLot: 690009)									
oxidation-reduction potential [ORP]	----	E125	----	mV	220 mV	99.5	95.4	104	----
Physical Tests (QCLot: 690010)									
oxidation-reduction potential [ORP]	----	E125	----	mV	220 mV	98.6	95.4	104	----
Physical Tests (QCLot: 691492)									
solids, total suspended [TSS]	----	E160-L	1	mg/L	150 mg/L	96.0	85.0	115	----
Physical Tests (QCLot: 691493)									
solids, total suspended [TSS]	----	E160-L	1	mg/L	150 mg/L	92.7	85.0	115	----
Physical Tests (QCLot: 691525)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	92.2	85.0	115	----
Physical Tests (QCLot: 691526)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	95.2	85.0	115	----
Anions and Nutrients (QCLot: 687983)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 687984)									
bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	96.3	85.0	115	----
Anions and Nutrients (QCLot: 687985)									
chloride	16887-00-6	E235.Cl-L	0.1	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 687986)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 687987)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	102	90.0	110	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Concentration*	*LCS*	*Low*	*High*	*Qualifier*
Anions and Nutrients (QCLot: 687988)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 688182)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	98.8	85.0	115	----
Anions and Nutrients (QCLot: 688516)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	96.4	80.0	120	----
Anions and Nutrients (QCLot: 691557)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	90.2	75.0	125	----
Anions and Nutrients (QCLot: 691558)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	89.9	75.0	125	----
Anions and Nutrients (QCLot: 693892)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	98.4	80.0	120	----
Anions and Nutrients (QCLot: 693893)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	97.9	80.0	120	----
Organic / Inorganic Carbon (QCLot: 688238)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	95.4	80.0	120	----
Organic / Inorganic Carbon (QCLot: 688239)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	92.2	80.0	120	----
Total Metals (QCLot: 694536)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	95.8	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	98.2	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	101	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	99.4	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	100	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	96.5	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	105	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	100	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	96.3	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	98.5	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	96.5	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	103	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	97.4	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	103	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	89.9	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	104	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Concentration*	*LCS*	*Low*	*High*	*Qualifier*
Total Metals (QCLot: 694536) - continued									
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	97.0	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	98.9	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	96.4	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	93.2	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	98.4	60.0	140	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	93.0	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	102	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	92.5	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	91.8	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	97.2	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	96.9	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	98.9	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	89.3	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	101	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	96.1	80.0	120	----
Total Metals (QCLot: 694537)									
chromium, total	7440-47-3	E420.Cr-L	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
Total Metals (QCLot: 696847)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	110	80.0	120	----
Total Metals (QCLot: 696848)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	105	80.0	120	----
Dissolved Metals (QCLot: 694072)									
chromium, dissolved	7440-47-3	E421.Cr-L	0.0001	mg/L	0.25 mg/L	99.4	80.0	120	----
Dissolved Metals (QCLot: 694073)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	97.8	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	98.4	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	97.1	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	98.9	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	96.5	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	96.4	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	99.2	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	97.5	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	97.3	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	96.5	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	93.7	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	 High	Qualifier
Dissolved Metals (QCLot: 694073) - continued									
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	104	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	98.0	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	105	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	98.7	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	99.6	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	96.1	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	106	70.0	130	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	95.8	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	92.3	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	101	60.0	140	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	93.0	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	97.5	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	94.0	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	101	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	96.3	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	98.5	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	101	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	99.0	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	92.0	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	98.2	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	98.0	80.0	120	----
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	110	80.0	120	----
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	109	80.0	120	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		*Recovery (%)*	*Recovery Limits (%)*		
Laboratory sample ID	***Client sample ID***	***Analyte***	***CAS Number***	***Method***	***Concentration***	***Target***	***MS***	***Low***	***High***	***Qualifier***
Anions and Nutrients (QCLot: 687983)										
CG2214000-014	CM_TRP_WS_2022-10-06_NP	fluoride	16984-48-8	E235.F	0.889 mg/L	1 mg/L	88.9	75.0	125	----
Anions and Nutrients (QCLot: 687984)										
CG2214000-014	CM_TRP_WS_2022-10-06_NP	bromide	24959-67-9	E235.Br-L	0.457 mg/L	0.5 mg/L	91.4	75.0	125	----
Anions and Nutrients (QCLot: 687985)										
CG2214000-014	CM_TRP_WS_2022-10-06_NP	chloride	16887-00-6	E235.Cl-L	88.0 mg/L	100 mg/L	88.0	75.0	125	----
Anions and Nutrients (QCLot: 687986)										
CG2214000-014	CM_TRP_WS_2022-10-06_NP	nitrate (as N)	14797-55-8	E235.NO3-L	2.21 mg/L	2.5 mg/L	88.5	75.0	125	----
Anions and Nutrients (QCLot: 687987)										
CG2214000-014	CM_TRP_WS_2022-10-06_NP	nitrite (as N)	14797-65-0	E235.NO2-L	0.450 mg/L	0.5 mg/L	89.9	75.0	125	----
Anions and Nutrients (QCLot: 687988)										
CG2214000-014	CM_TRP_WS_2022-10-06_NP	sulfate (as SO4)	14808-79-8	E235.SO4	89.5 mg/L	100 mg/L	89.5	75.0	125	----
Anions and Nutrients (QCLot: 688182)										
CG2214000-002	CM_FLA_AG02_WS_2022-10-06_NP	ammonia, total (as N)	7664-41-7	E298	0.104 mg/L	0.1 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 688516)										
CG2213997-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 691557)										
CG2213917-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.42 mg/L	2.5 mg/L	96.9	70.0	130	----
Anions and Nutrients (QCLot: 691558)										
CG2214000-007	CM_FLA_MC03_WS_2022-10-06_NP	Kjeldahl nitrogen, total [TKN]	----	E318	2.44 mg/L	2.5 mg/L	97.5	70.0	130	----
Anions and Nutrients (QCLot: 693892)										
CG2213917-002	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0480 mg/L	0.05 mg/L	96.0	70.0	130	----
Anions and Nutrients (QCLot: 693893)										
CG2214000-011	CM_FLA_MC13_WS_2022-10-06_NP	phosphorus, total	7723-14-0	E372-U	0.0456 mg/L	0.05 mg/L	91.2	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*Concentration*	*Target*	*MS*	*Low*	*High*	*Qualifier*
Organic / Inorganic Carbon (QCLot: 688238)										
CG2214000-001	CM_FLA_AG01_WS_2022-10-06_NP	carbon, dissolved organic [DOC]	----	E358-L	5.27 mg/L	5 mg/L	105	70.0	130	----
Organic / Inorganic Carbon (QCLot: 688239)										
CG2214000-001	CM_FLA_AG01_WS_2022-10-06_NP	carbon, total organic [TOC]	----	E355-L	5.74 mg/L	5 mg/L	115	70.0	130	----
Total Metals (QCLot: 694536)										
CG2214000-002	CM_FLA_AG02_WS_2022-10-06_NP	aluminum, total	7429-90-5	E420	2.48 mg/L	2 mg/L	124	70.0	130	----
		antimony, total	7440-36-0	E420	0.234 mg/L	0.2 mg/L	117	70.0	130	----
		arsenic, total	7440-38-2	E420	0.229 mg/L	0.2 mg/L	114	70.0	130	----
		barium, total	7440-39-3	E420	0.239 mg/L	0.2 mg/L	120	70.0	130	----
		beryllium, total	7440-41-7	E420	0.501 mg/L	0.4 mg/L	125	70.0	130	----
		bismuth, total	7440-69-9	E420	0.106 mg/L	0.1 mg/L	106	70.0	130	----
		boron, total	7440-42-8	E420	1.23 mg/L	1 mg/L	123	70.0	130	----
		cadmium, total	7440-43-9	E420	0.0480 mg/L	0.04 mg/L	120	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	40 mg/L	ND	70.0	130	----
		cobalt, total	7440-48-4	E420	0.240 mg/L	0.2 mg/L	120	70.0	130	----
		copper, total	7440-50-8	E420	0.240 mg/L	0.2 mg/L	120	70.0	130	----
		iron, total	7439-89-6	E420	23.6 mg/L	20 mg/L	118	70.0	130	----
		lead, total	7439-92-1	E420	0.235 mg/L	0.2 mg/L	118	70.0	130	----
		lithium, total	7439-93-2	E420	1.18 mg/L	1 mg/L	118	70.0	130	----
		magnesium, total	7439-95-4	E420	12.7 mg/L	10 mg/L	127	70.0	130	----
		manganese, total	7439-96-5	E420	0.249 mg/L	0.2 mg/L	124	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.231 mg/L	0.2 mg/L	115	70.0	130	----
		nickel, total	7440-02-0	E420	0.500 mg/L	0.4 mg/L	125	70.0	130	----
		potassium, total	7440-09-7	E420	44.0 mg/L	40 mg/L	110	70.0	130	----
		selenium, total	7782-49-2	E420	0.464 mg/L	0.4 mg/L	116	70.0	130	----
		silicon, total	7440-21-3	E420	118 mg/L	100 mg/L	118	70.0	130	----
		silver, total	7440-22-4	E420	0.0514 mg/L	0.04 mg/L	128	70.0	130	----
		sodium, total	7440-23-5	E420	24.1 mg/L	20 mg/L	121	70.0	130	----
		strontium, total	7440-24-6	E420	0.238 mg/L	0.2 mg/L	119	70.0	130	----
		sulfur, total	7704-34-9	E420	219 mg/L	200 mg/L	110	70.0	130	----
		thallium, total	7440-28-0	E420	0.0412 mg/L	0.04 mg/L	103	70.0	130	----
		tin, total	7440-31-5	E420	0.229 mg/L	0.2 mg/L	115	70.0	130	----
		titanium, total	7440-32-6	E420	0.366 mg/L	0.4 mg/L	91.4	70.0	130	----
		uranium, total	7440-61-1	E420	0.0437 mg/L	0.04 mg/L	109	70.0	130	----
		vanadium, total	7440-62-2	E420	1.20 mg/L	1 mg/L	120	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*Concentration*	*Target*	*MS*	*Low*	*High*	*Qualifier*
Total Metals (QCLot: 694536) - continued										
CG2214000-002	CM_FLA_AG02_WS_2022-1	zinc, total	7440-66-6	E420	4.80 mg/L	4 mg/L	120	70.0	130	----
Total Metals (QCLot: 694537)										
CG2214000-002	CM_FLA_AG02_WS_2022-10-06_NP	chromium, total	7440-47-3	E420.Cr-L	0.497 mg/L	0.4 mg/L	124	70.0	130	----
Total Metals (QCLot: 696847)										
CG2213918-002	Anonymous	mercury, total	7439-97-6	E508	0.000104 mg/L	0.0001 mg/L	104	70.0	130	----
Total Metals (QCLot: 696848)										
CG2214000-014	CM_TRP_WS_2022-10-06_NP	mercury, total	7439-97-6	E508	0.000104 mg/L	0.0001 mg/L	104	70.0	130	----
Dissolved Metals (QCLot: 694072)										
CG2214000-002	CM_FLA_AG02_WS_2022-10-06_NP	chromium, dissolved	7440-47-3	E421.Cr-L	0.410 mg/L	0.4 mg/L	102	70.0	130	----
Dissolved Metals (QCLot: 694073)										
CG2214000-002	CM_FLA_AG02_WS_2022-10-06_NP	aluminum, dissolved	7429-90-5	E421	2.00 mg/L	2 mg/L	100	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.201 mg/L	0.2 mg/L	101	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.195 mg/L	0.2 mg/L	97.4	70.0	130	----
		barium, dissolved	7440-39-3	E421	0.198 mg/L	0.2 mg/L	98.8	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.399 mg/L	0.4 mg/L	99.8	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.0899 mg/L	0.1 mg/L	89.9	70.0	130	----
		boron, dissolved	7440-42-8	E421	1.03 mg/L	1 mg/L	103	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.0400 mg/L	0.04 mg/L	100	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	40 mg/L	ND	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.194 mg/L	0.2 mg/L	97.2	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.190 mg/L	0.2 mg/L	95.1	70.0	130	----
		iron, dissolved	7439-89-6	E421	18.7 mg/L	20 mg/L	93.6	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.198 mg/L	0.2 mg/L	99.0	70.0	130	----
		lithium, dissolved	7439-93-2	E421	1.000 mg/L	1 mg/L	100.0	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	9.69 mg/L	10 mg/L	96.9	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.197 mg/L	0.2 mg/L	98.6	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.199 mg/L	0.2 mg/L	99.6	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.395 mg/L	0.4 mg/L	98.8	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	99.0 mg/L	100 mg/L	99.0	70.0	130	----
		potassium, dissolved	7440-09-7	E421	38.7 mg/L	40 mg/L	96.8	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.388 mg/L	0.4 mg/L	97.0	70.0	130	----
		silicon, dissolved	7440-21-3	E421	101 mg/L	100 mg/L	101	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*Concentration*	*Target*	*MS*	*Low*	*High*	*Qualifier*
Dissolved Metals (QCLot: 694073) - continued										
CG2214000-002	CM_FLA_AG02_WS_2022-10-06_NP	silver, dissolved	7440-22-4	E421	0.0429 mg/L	0.04 mg/L	107	70.0	130	----
		sodium, dissolved	7440-23-5	E421	19.7 mg/L	20 mg/L	98.4	70.0	130	----
		strontium, dissolved	7440-24-6	E421	0.173 mg/L	0.2 mg/L	86.5	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	195 mg/L	200 mg/L	97.7	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.0356 mg/L	0.04 mg/L	89.0	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.197 mg/L	0.2 mg/L	98.6	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.409 mg/L	0.4 mg/L	102	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.200 mg/L	0.2 mg/L	100	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.0368 mg/L	0.04 mg/L	92.0	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.984 mg/L	1 mg/L	98.4	70.0	130	----
		zinc, dissolved	7440-66-6	E421	4.00 mg/L	4 mg/L	99.9	70.0	130	----
Dissolved Metals (QCLot: 697964)										
CG2213990-015	Anonymous	mercury, dissolved	7439-97-6	E509	0.000105 mg/L	0.0001 mg/L	105	70.0	130	----
Dissolved Metals (QCLot: 697965)										
CG2214000-003	CM_FLA_CC_TRIB01_WS_2022-10-06_NP	mercury, dissolved	7439-97-6	E509	0.0000976 mg/L	0.0001 mg/L	97.6	70.0	130	----

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Page 1 of 3

COC ID:	CMO FLA October 6th 2022	TURNAROUND TIME:	RUSH:

PROJECT/CLIENT INFO			
Facility Name / Job#	Coal Mountain Operation		
Project Manager			
Email			
Address	PO Box 3000		
City	Sparwood	Province	BC
Postal Code	V0B 2G0	Country	Canada
Phone Number			

LABORATORY			
Lab Name	ALS Calgary		
Lab Contact	Justine Bumaa		
Email	justine.bumaa@alsglobal.com		
Address	2259 29 Street NE		
City	Calgary	Province	AB
Postal Code	T1Y 7B5	Country	Canada
Phone Number	403-407-1761		

OTHER INFO				
Report Format / Distribution		Excel	PDF	EDD
Email 1:	[illegible]	X	X	X
Email 2:	teckcoal@equisonline.com			X
Email 3:	[illegible]	X	X	X
Email 4:	[illegible]	X	X	X
Email 5:				
PO number				

Environmental Division
Calgary
Work Order Reference
CG2214000

Telephone : +1 403 407 1600

Environmental Division
Calgary
Work Order Reference
CG2214000

SAMPLE DETAILS / ANALYSIS REQUESTED

	Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	DOC	Mercury_Dissolved	Mercury_Total	TECKCOAL_METNHG_D	TECKCOAL_METNHG_T	TECKCOAL_ROUTINE	TOC_TKN_NH3_TP
								Filt.	F	F	N	F	N	N	N
								PRESERV.	H2SO4	HCL	HCL	HNO3	HNO3	NONE	H2SO4
1	CM_FLA_AG01_WS_2022-10-06_NP	CM_FLA_AG01	WS		2022/10/06	1200	G	7	1	1	1	1	1	1	1
2	CM_FLA_AG02_WS_2022-10-06_NP	CM_FLA_AG02	WS		2022/10/06	1330	G	7	1	1	1	1	1	1	1
3	CM_FLA_CC_TRIB01_WS_2022-10-06_NP	CM_FLA_CC_TRIB01	WS		2022/10/06	1407	G	7	1	1	1	1	1	1	1
4	CM_FLA_CC01_WS_2022-10-06_NP	CM_FLA_CC01	WS		2022/10/06	805	G	7	1	1	1	1	1	1	1
	~~CM_FLA_CC02_WS_2022-10-06_NP~~	~~CM_FLA_CC02~~	~~WS~~		~~2022/10/06~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
	~~CM_FLA_CC03_WS_2022-10-06_NP~~	~~CM_FLA_CC03~~	~~WS~~		~~2022/10/06~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
	~~CM_FLA_CC04_WS_2022-10-06_NP~~	~~CM_FLA_CC04~~	~~WS~~		2022/10/06		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
	~~CM_FLA_MC_TRIB01_WS_2022-10-06_NP~~	~~CM_FLA_MC_TRIB01~~	~~WS~~		~~2022/10/06~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
5	CM_FLA_MC01_WS_2022-10-06_NP	CM_FLA_MC01	WS		2022/10/06	1256	G	7	1	1	1	1	1	1	1
6	CM_FLA_MC02_WS_2022-10-06_NP	CM_FLA_MC02	WS		2022/10/06	1100	G	7	1	1	1	1	1	1	1

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	Elly Foster	2022/10/06 1600		10/7 920

SERVICE REQUEST (rush - subject to availability)	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Elly Foster	Mobile #	(403)710-5845
Sampler's Signature		Date/Time	2022/10/06, 1600

3

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Page 2 of 3

COC ID:	CMO FLA October 6th 2022	TUR[illegible]ROUND TIME:	RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Coal Mountain Operation			Lab Name	ALS Calgary			Report Format / Distribution	Excel	PDF	EDD
Project Manager				Lab Contact	Justine Buma-a			Email 1: DL-EQuIS-CMO@teck.com	X	X	X
Email				Email	justine.bumaa@alsglobal.com			Email 2: teckcoal@equisonline.com			X
Address	PO Box 3000			Address	2259 29 Street NE			Email 3: [illegible]	X	X	X
								Email 4: [illegible]	X	X	X
City	Sparwood	Province	BC	City	Calgary	Province	AB	Email 5:			
Postal Code	V0B 2G0	Country	Canada	Postal Code	T1Y 7B5	Country	Canada				
Phone Number				Phone Number	403-407-1761			PO number			

SAMPLE DETAILS — ANALYSIS REQUESTED (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	DOC	Mercury_Dissolved	Mercury_Total	TECKCOAL_METNHG_D	TECKCOAL_METNHG_T	TECKCOAL_ROUTINE	TOC_TKN_NH3_TP					
							Filt.	F	F	N	F	N	N	N					
							PRESERV.	H2SO4	HCL	HCL	HNO3	HNO3	NONE	H2SO4					
7 CM_FLA_MC03_WS_2022-10-06_NP	CM_FLA_MC03	WS		2022/10/06	1054	G	7	1	1	1	1	1	1	1					
8 CM_FLA_MC04_WS_2022-10-06_NP	CM_FLA_MC04	WS		2022/10/06	824	G	7	1	1	1	1	1	1	1					
~~CM_FLA_MC05_WS_2022-10-06_NP~~	~~CM_FLA_MC05~~	~~WS~~		~~2022/10/06~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~					
~~CM_FLA_MC06_WS_2022-10-06_NP~~	~~CM_FLA_MC06~~	~~WS~~		~~2022/10/06~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~					
~~CM_FLA_MC07_WS_2022-10-06_NP~~	~~CM_FLA_MC07~~	~~WS~~		~~2022/10/06~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~					
~~CM_FLA_MC08_WS_2022-10-06_NP~~	~~CM_FLA_MC08~~	~~WS~~		~~2022/10/06~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~					
~~CM_FLA_MC09_WS_2022-10-06_NP~~	~~CM_FLA_MC09~~	~~WS~~		~~2022/10/06~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~					
~~CM_FLA_MC10_WS_2022-10-06_NP~~	~~CM_FLA_MC10~~	~~WS~~		~~2022/10/06~~		~~G~~	~~7~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~					
9 CM_FLA_MC11_WS_2022-10-06_NP	CM_FLA_MC11	WS		2022/10/06	1500	G	7	1	1	1	1	1	1	1					
10 CM_FLA_MC12_WS_2022-10-06_NP	CM_FLA_MC12	WS		2022/10/06	1530	G	7	1	1	1	1	1	1	1					

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name		Mobile #	
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

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Page 3 of 3

COC ID: CMO FLA October 6th 2022

TUR[illegible]ROUND TIME:

RUSH:

PROJECT/CLIENT INFO				**LABORATORY**				**OTHER INFO**			
Facility Name / Job#	Coal Mountain Operation			Lab Name	ALS Calgary			Report Format / Distribution	Excel	PDF	EDD
Project Manager				Lab Contact	Justine Bumaa			Email 1: DLEOHS-CMO@Teck.com	X	X	X
Email				Email	justine.bumaa@alsglobal.com			Email 2: teckcoal@equisonline.com			X
Address	PO Box 3000			Address	2259 29 Street NE			Email 3: [illegible]	X	X	X
								Email 4: [illegible]	X	X	X
City	Sparwood	Province	BC	City	Calgary	Province	AB	Email 5:			
Postal Code	V0B 2G0	Country	Canada	Postal Code	T1Y 7B5	Country	Canada				
Phone Number				Phone Number	403-407-1761			PO number			

SAMPLE DETAILS — **ANALYSIS REQUESTED** — Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

								Filt.	F	F	N	F	N	N	N
								PRESERV.	H2SO4	HCL	HCL	HNO3	HNO3	NONE	H2SO4
Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	DOC	Mercury_Dissolved	Mercury_Total	TECKCOAL_METNHG_D	TECKCOAL_METNHG_T	TECKCOAL_ROUTINE	TOC_TKN_NH3_TP
11 CM_FLA_MC13_WS_2022-10-06_NP	CM_FLA_MC13	WS		2022/10/06	1554	G	7		1	1	1	1	1	1	1
12 CM_NNP_WS_2022-10-06_NP	CM_NNP	WS		2022/10/06	1400	G	7		1	1	1	1	1	1	1
13 CM_NNT_WS_2022-10-06_NP	CM_NNT	WS		2022/10/06	1415	G	7		1	1	1	1	1	1	1
14 CM_TRP_WS_2022-10-06_NP	CM_TRP	WS		2022/10/06	1420	G	7		1	1	1	1	1	1	1
15 CM-FLA-MCtrib06-WS-2022-10-06-NP	CM_FLA_MC06trib	WS		2022/10/06	1136	G	7		1	1	1	1	1	1	1
16 CM-FLA-MCtrib07-WS-2022-10-06-NP	CM_FLA_MC-trib07	WS		2022/10/06	1500	G	7		1	1	1	1	1	1	1

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	**RELINQUISHED BY/AFFILIATION**	**DATE/TIME**	**ACCEPTED BY/AFFILIATION**	**DATE/TIME**

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	**Sampler's Name**		**Mobile #**	
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		**Sampler's Signature**		**Date/Time**	
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

SNC·LAVALIN

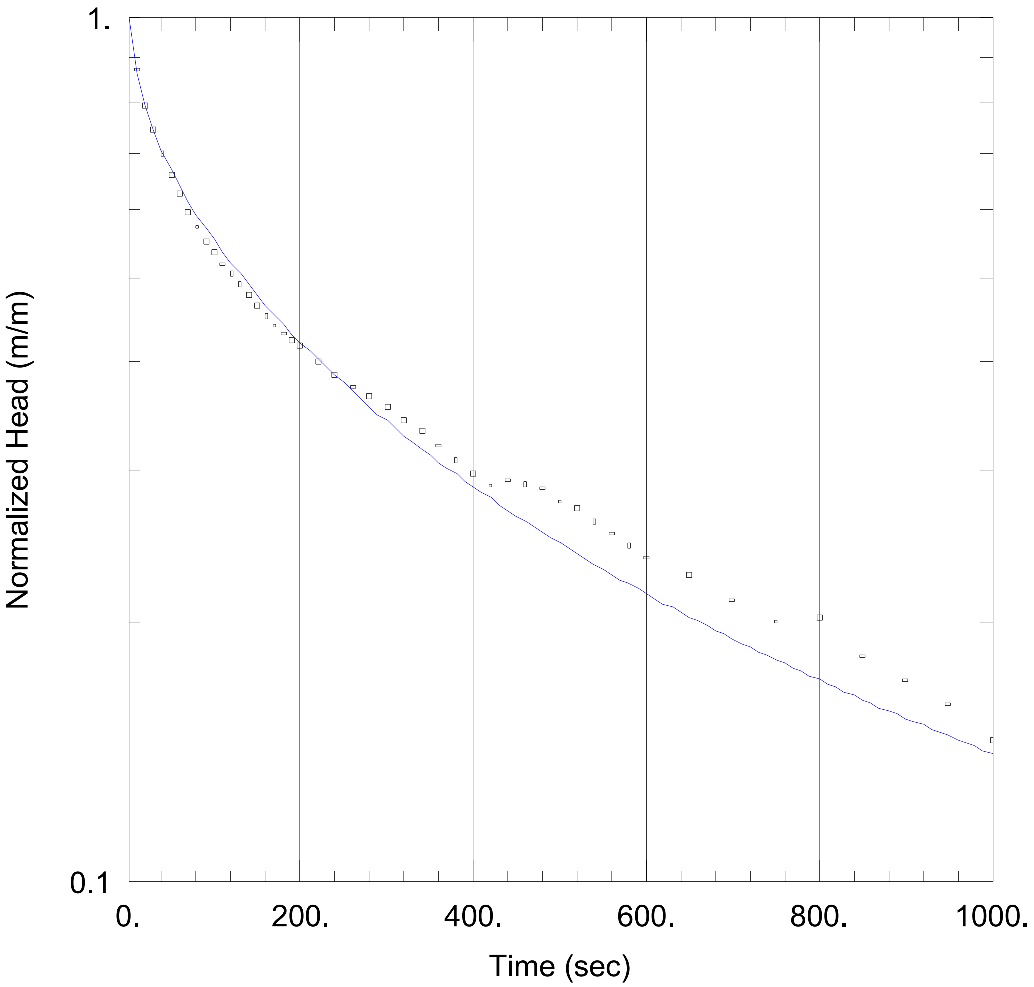
SNC-Lavalin Inc.
#3 – 520 Lake Street
Nelson, British Columbia, Canada V1L 4C6
t. 250.354.1664
www.snclavalin.com

Attachment V

Hydraulic Conductivity Testing Results

CM_MW4-DP

Prepared By: SNC Lavalin Inc.	Prepared For: Teck Coal Ltd.
Project: 692529	Location: CMm - Corbin Creek Valley



SOLUTION

Aquifer Model: Fractured
Solution Method: Barker-Black

T = 1.293E-6 m^2/sec
S = 1.062E-10
K' = 1.997E-5 m/sec
Ss' = 0.001327 m^{-1}

AQUIFER DATA

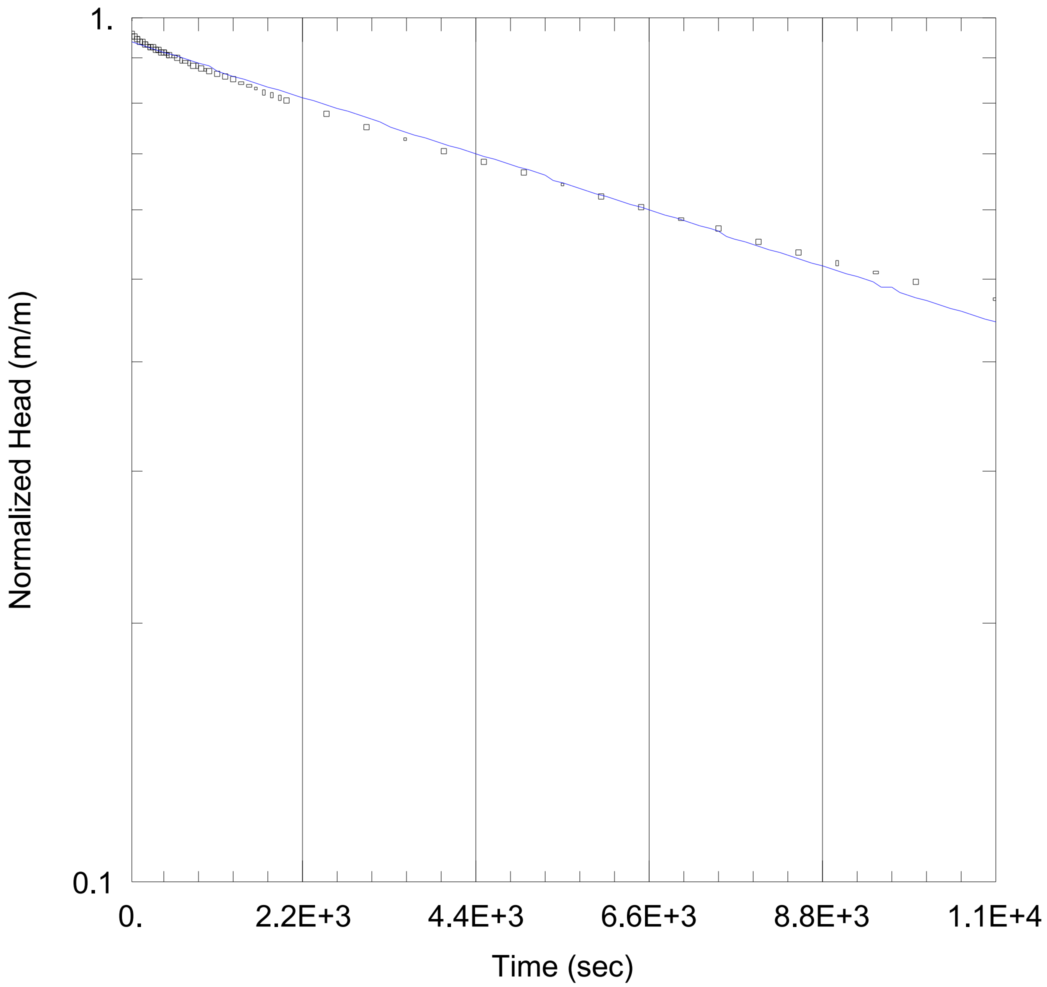
Saturated Thickness: 11.2 m
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (CM_MW4-DP)

Initial Displacement: 1. m
Static Water Column Height: 27.95 m
Total Well Penetration Depth: 10.9 m
Screen Length: 3.1 m
Casing Radius: 0.025 m
Well Radius: 0.1 m

CM_MW6-SH

Prepared By: SNC Lavalin Inc.	Prepared For: Teck Coal Ltd.
Project: 692529	Location: CMm - Corbin Creek Valley



SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 2.407E-8 m/sec
y0 = 0.5682 m

AQUIFER DATA

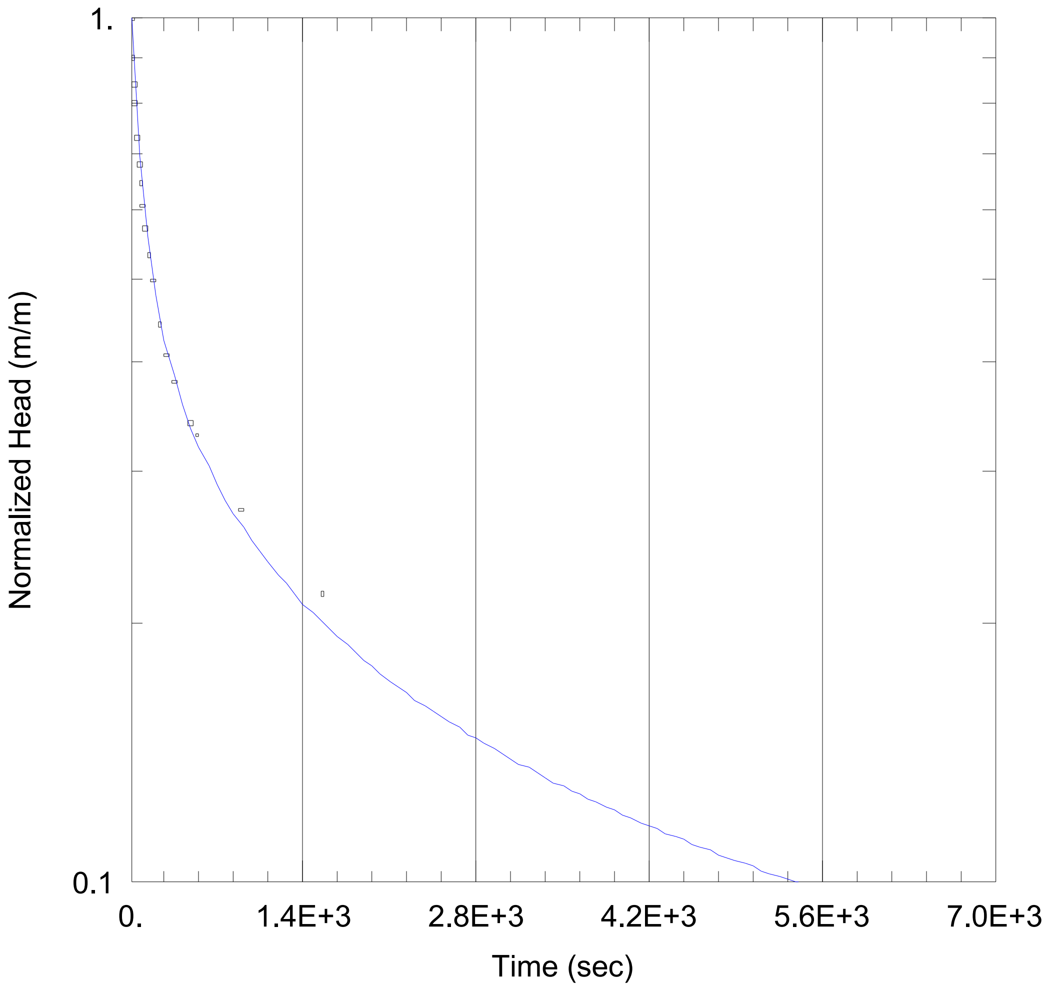
Saturated Thickness: 16.18 m
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (CM_MW6-SH)

Initial Displacement: 0.6041 m
Static Water Column Height: 14.4 m
Total Well Penetration Depth: 14.28 m
Screen Length: 3. m
Casing Radius: 0.025 m
Well Radius: 0.1 m

CM_MW6-DP

Prepared By: SNC Lavalin Inc.	Prepared For: Teck Coal Ltd.
Project: 692529	Location: CMm - Corbin Creek Valley



SOLUTION

Aquifer Model: Fractured
Solution Method: Barker-Black

T = 9.762E-8 m^2/sec
K' = 9.734E-5 m/sec

S = 1.607E-12
Ss' = 0.1141 m^{-1}

AQUIFER DATA

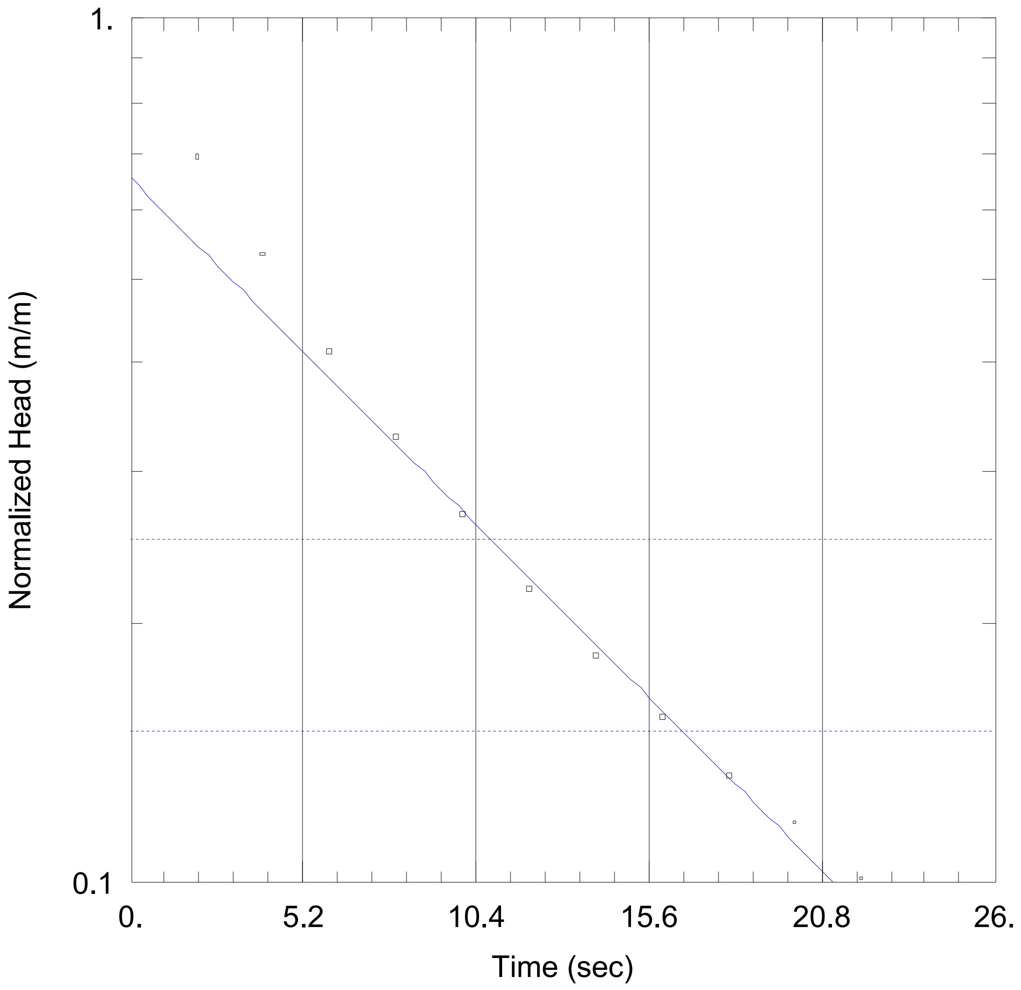
Saturated Thickness: 3. m
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (CM_MW6-DP)

Initial Displacement: 0.5 m
Static Water Column Height: 38.46 m
Total Well Penetration Depth: 3. m
Screen Length: 3. m
Casing Radius: 0.025 m
Well Radius: 0.1 m

CM_MW7-SH

Prepared By: SNC Lavalin Inc.	Prepared For: Teck Coal Ltd.
Project: 692529	Location: CMm - Michel Creek Valley



SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 3.193E-5 m/sec
y0 = 0.31 m

AQUIFER DATA

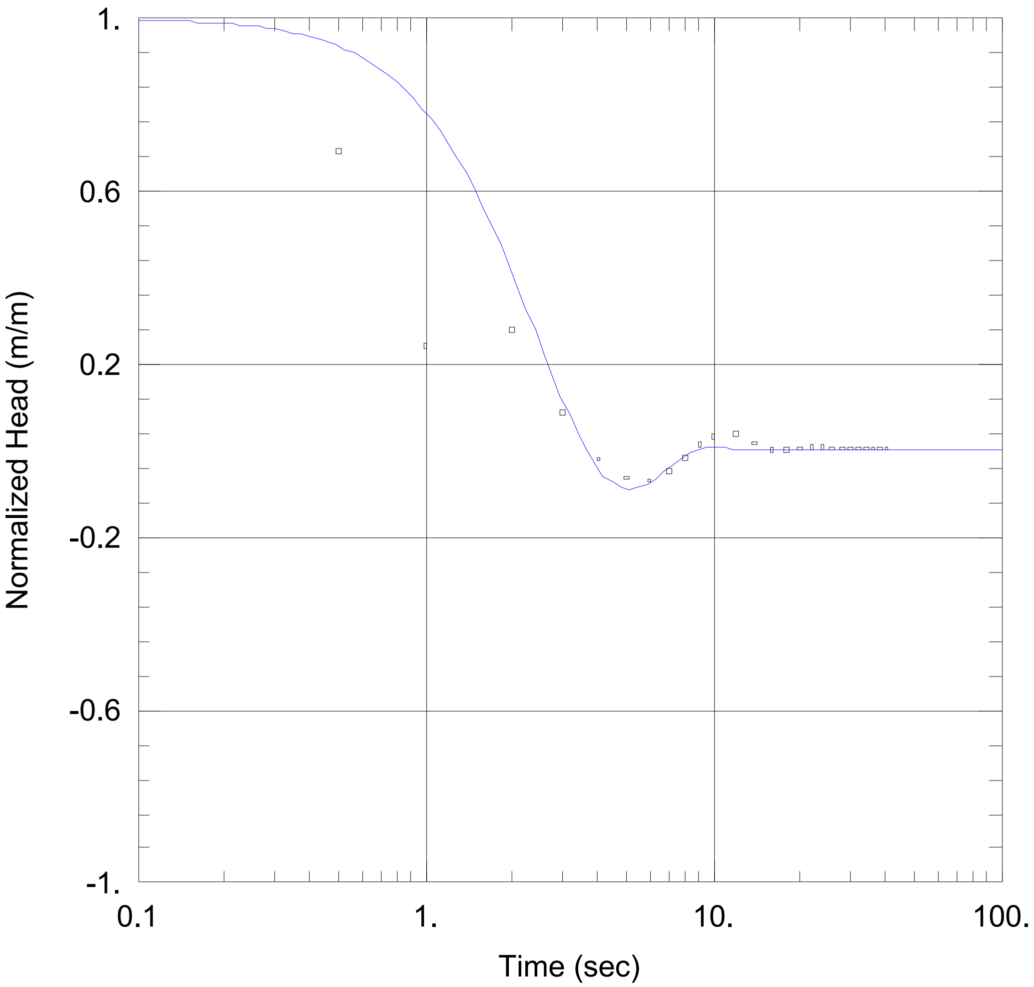
Saturated Thickness: 39.9 m
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (CM_MW7-SH)

Initial Displacement: 0.4744 m
Static Water Column Height: 11.01 m
Total Well Penetration Depth: 12.2 m
Screen Length: 3.1 m
Casing Radius: 0.0255 m
Well Radius: 0.1 m

CM_MW7-DP

Prepared By: SNC Lavalin Inc.	Prepared For: Teck Coal Ltd.
Project: 692529	Location: CMm - Michel Creek Valley



SOLUTION

Aquifer Model: Confined
Solution Method: Butler

K = 0.0004352 m/sec

Le = 16.33 m

AQUIFER DATA

Saturated Thickness: 39.9 m

Anisotropy Ratio (Kz/Kr): 0.00691

WELL DATA (CM_MW7-DP)

Initial Displacement: 0.7851 m
Static Water Column Height: 27.93 m
Total Well Penetration Depth: 29.1 m
Screen Length: 2.7 m
Casing Radius: 0.025 m
Well Radius: 0.1 m

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