CBased Environmental Pty Limited
ABN 62 611 924 264

9 December 2022

Hanson Calga Quarry Products
Hanson Calga Quarry
PO Box 36
GUILDFORD NSW 2161

Six Monthly Hanson Calga Quarry Major Cations and Dissolved Metals Environmental Monitoring Report – November 2022

Please find enclosed the six-monthly detailed groundwater monitoring report for 21 groundwaters at the Hanson Calga site. This report contains the six-monthly detailed water analysis for major cations and dissolved metals that is required by the Site Water Management Plan.

18 sites were able to be collected and analysed on 29 November 2022. Sites CQ8 (No access), CQ11D (Bore damaged), MW10 (No access), MW8, MW16 and MW17 (Not included in sampling) were unable to be collected.

Comparison of results between April 2022 and November 2022 shows generally little apparent change in water quality when it comes to the metal analytes. Analytes such as pH, EC, alkalinity and sulphate show varying apparent changes over all sites.

Please do not hesitate to contact me if further information is required.

Yours Faithfully

Colin Davies
Environmental Scientist / Company Director

Table 1: Comparison of analysis results between April 2022 and November 2022 sampling events.

Species	Units	CQ3	CQ4	CQ5	CQ6	CQ7	CQ8	CQ9	CQ10	CQ11S	CQ11D	CQ12	CQ13	CP3	CP4
pH Value	pH units	-0.15	-0.02	-0.03		0.03			-0.01	0.44		-0.09	0.00		-0.52
Electrical Conductivity @ 25°C	µS/cm	6	9	7		2			13	4		35	8		5
Hydroxide Alkalinity as $CaCO_3$	mg/L	0	0	0		0			0	0		0	0		0
Carbonate Alkalinity as $CaCO_3$	mg/L	0	0	0		0			0	0		0	0		0
Bicarbonate Alkalinity as $CaCO_3$	mg/L	-1	0	0		0			0	-4		0	0		-1
Total Alkalinity as $CaCO_3$	mg/L	-1	0	0		0			0	-4		0	0		-1
Sulphate as SO_4^{2-}	mg/L	-1.0	0.0	2.0		-2.0			0.0	-1.0		-3.0	1.0		-4.0
Chloride	mg/L	-1.0	-1.0	3.0		1.0			0.0	-1.0		0.0	-1.0		-3.0
Calcium	mg/L	0	0	-5		-1			0	0		-1	0		-3
Magnesium	mg/L	-1	0	1		0			0	-1		0	-1		-1
Sodium	mg/L	4	0	8		7			5	5		2	4		5
Potassium	mg/L	1	0	-4		-1			0	-1		0	0		-3
Aluminium	mg/L	0.02	-0.13	0.64		-0.22			0.02	-0.04		0.36	-0.01		0.23
Arsenic	mg/L	-0.001	-0.001	-0.001		-0.001			-0.001	-0.001		-0.001	-0.001		-0.001
Cadmium	mg/L	0	-0.0001	0		0			0	-0.001		0	0		-0.001
Chromium	mg/L	0	-0.001	-0.001		-0.001			0	-0.001		0	0		0
Copper	mg/L	0	-0.001	0.001		-0.002			-0.004	-0.001		-0.001	0		0.002
Nickel	mg/L	-0.001	-0.003	0		0			0.003	-0.001		-0.001	-0.002		-0.003
Lead	mg/L	0	-0.001	0		0			-0.002	-0.001		-0.002	0.001		-0.013
Zinc	mg/L	-0.025	-0.15	-0.013		-0.083			0.022	-0.03		-0.74	-0.001		-0.198
Manganese	mg/L	0.206	0.01	0.007		-0.004			0.001	0.005		-0.007	-0.003		-0.005
Selenium	mg/L	-0.010	0.010	-0.010		-0.010			-0.010	-0.010		-0.010	0.010		-0.010
Boron	mg/L	-0.05	0.05	-0.05		-0.05			-0.05	-0.05		-0.05	0.05		-0.05
Iron	mg/L	1.03	-0.13	0.18		-0.26			0.05	-0.64		0.04	0.00		-0.01
Mercury	mg/L	-0.0001	-0.0001	-0.0001		-0.0001			-0.0001	-0.0001		-0.0001	0.0001		-0.0001
Fluoride	mg/L	0	0.1	0		0			0	-0.3		0	0		0
Nitrite as N	mg/L	0	0	0		0			0	-0.03		0	0.01		0.01
Nitrate as N	mg/L	-0.08	0.32	-1.74		-0.69			0.23	-0.17		3.32	0.00		1.46
Nitrite + Nitrate as N	mg/L	-0.08	0.32	-1.74		-0.69			0.23	-0.21		3.32	0.01		1.47

Note: Results shown as below the limit of detection (<) have been taken as zero for the purposes of the comparison.

Table 1 continued.

Species	Units	CP5	CP6	CP7	CP8	CP13	CP15	MW7	MW8	MW9	MW10	MW13	MW16	MW17
pH Value	pH units	-0.25	0.36	-0.65	-0.11	-0.31	-1.10	0.18	-4.90	0.02		0.01		
Electrical Conductivity @ 25°C	µS/cm	14	2	-5	6	82	17	4	-72	0		4		
Hydroxide Alkalinity as $CaCO_3$	mg/L	0	0	0	0	0	0	0	-1	0		0		
Carbonate Alkalinity as $CaCO_3$	mg/L	0	0	0	0	0	0	0	-1	0		0		
Bicarbonate Alkalinity as $CaCO_3$	mg/L	-7	1	-9	0	0	-5	14	-2	1		0		
Total Alkalinity as $CaCO_3$	mg/L	-7	1	-9	0	0	-5	14	-2	1		0		
Sulphate as SO_4^{2-}	mg/L	-1.0	-1.0	6.0	-1.0	-3.0	2.0	-6.0	-4.0	-1.0		0.0		
Chloride	mg/L	1.0	1.0	-2.0	0.0	18.0	7.0	-8.0	-18.0	-2.0		0.0		
Calcium	mg/L	0	0	-4	0	-1	-2	0	-1	0		0		
Magnesium	mg/L	-1	-2	-1	0	1	2	0	-2	0		0		
Sodium	mg/L	0	4	4	4	15	5	-2	-6	0		1		
Potassium	mg/L	0	0	-1	0	-1	-5	0	-1	0		0		
Aluminium	mg/L	0.03	-0.20	-0.37	-0.07	0.02	0.19	-1.06	-0.30	-0.22		-0.02		
Arsenic	mg/L	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001		-0.001		
Cadmium	mg/L	0.0001	0.0004	-0.0001	0	0.003	0	0	-0.0001	-0.0002		0		
Chromium	mg/L	0.002	-0.002	-0.001	-0.001	0	0	-0.001	-0.004	-0.001		0		
Copper	mg/L	0.007	0.007	-0.032	0	0.03	-0.003	-0.002	-0.003	-0.006		-0.002		
Nickel	mg/L	0.011	0.018	0	0	-0.001	0	0	-0.001	0		-0.001		
Lead	mg/L	0	0.007	-0.007	0	0	0	0	-0.001	-0.001		0		
Zinc	mg/L	0.777	1.103	-0.058	-0.03	0.026	-0.271	-0.031	-0.056	-0.049		-0.028		
Manganese	mg/L	-0.063	0.019	-0.108	0	0.012	-0.052	0.026	-0.012	-0.006		-0.011		
Selenium	mg/L	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010		-0.010		
Boron	mg/L	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05		-0.05		
Iron	mg/L	-0.23	0.22	0.74	-0.12	-0.18	-2.32	-0.26	-0.28	-0.21		-0.03		
Mercury	mg/L	-0.0001	-0.0001	-0.0001	-0.001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001		-0.0001		
Fluoride	mg/L	0	0	0	-0.2	-0.3	-0.1	0	-0.1	0		0		
Nitrite as N	mg/L	0	0.01	0.01	0	0	-0.05	0	-0.01	0		0		
Nitrate as N	mg/L	1.95	-0.85	-1.73	-0.09	0.47	-0.26	-0.02	-0.17	0.06		-0.17		
Nitrite + Nitrate as N	mg/L	1.95	-0.84	-1.72	-0.09	0.47	-0.31	-0.02	-0.17	0.06		-0.17		

Note: Results shown as below the limit of detection (<) have been taken as zero for the purposes of the comparison.

C BASED ENVIRONMENTAL PTY LIMITED

GROUNDWATERS

pH/EC meter #: V0228

Laptop ID #:

Sampled by: Sm LK

Signed:

Client : Hanson Calga
Project : Bi-Annual Bores

Site	Time	DEPTH	Typical Depth (m)	Odour	Water Turbidity	Water Colour	1		2		Bottles	Downloaded Logger? (Y/N)*	Comments
							pH	EC	pH	EC			
CQ3	8.10	10.88	10.74	N	CST	CLOOBG	5.84	108.8uS	5.94	95.5uS	1x 250ml GP, 1x 500mL GP, 1RP	N	
CQ4	9.00	10.48	11.19	N	CST	CLOOBG	4.59	116.5uS	4.52	118.5uS	1x 250ml GP, 1x 500mL GP, 1RP	N	track needs slashing
CQ5	9.30	6.34	8.04	N	CST	CLOOBG	4.12	209.9uS	4.13	212.9uS	1x 250ml GP, 1x 500mL GP, 1RP		
CQ7	9.45	6.24	6.61	N	CST	CLOOBG	4.36	125.4uS	4.36	126.8uS	1x 250ml GP, 1x 500mL GP, 1RP	N	
CQ8	9.40	—	6.93		CST	CLOOBG					1x 250ml GP, 1x 500mL GP, 1RP	N	LOCK RUSTED!
CQ10	12.00	24.33	25.86	N	CST	CLOOBG	4.50	120.8uS	4.51	126.6uS	1x 250ml GP, 1x 500mL GP, 1RP	N	track needs slashing
CQ11S	9.10	10.45	12.1	N	CST	CLOOBG	5.70	135.9uS	5.66	119.9uS	1x 250ml GP, 1x 500mL GP, 1RP	N	
CQ11D	9.15	12.21	12.98	—	CST	CLOOBG					1x 250ml GP, 1x 500mL GP, 1RP	N	BORE DAMAGED
CQ12	9.55	4.18	5.46	N	CST	CLOOBG	4.19	167.9uS	4.15	163.8uS	1x 250ml GP, 1x 500mL GP, 1RP	N	
CQ13	10.10	12.53	14.42	N	CST	CLOOBG	4.43	129.9uS	4.45	133.5uS	1x 250ml GP, 1x 500mL GP, 1RP	N	
CP4	10.15	8.25	10.56	N	CST	CLOOBG	4.53	161.9uS	4.50	159.3uS	1x 250ml GP, 1x 500mL GP, 1RP		
CP5	10.30	5.93	7.95	N	CST	CLOOBG	5.59	90.4uS	5.51	90.1uS	1x 250ml GP, 1x 500mL GP, 1RP		
CP6	10.20	8.22	10.73	N	CST	CLOOBG	4.73	123.5uS	4.84	121.1uS	1x 250ml GP, 1x 500mL GP, 1RP		
CP7	10.35	1.70	3.47	N	CST	CLOOBG	5.43	108.7uS	5.07	108.0uS	1x 250ml GP, 1x 500mL GP, 1RP		
CP8	11.50	20.21	22.36	N	CST	CLOOBG	4.41	81.2uS	4.36	89.8uS	1x 250ml GP, 1x 500mL GP, 1RP		
CP13**	11.20	9.68	13.4	N	CST	CLOOBG	4.39	178.8uS	4.35	170.9uS	1x 250ml GP, 1x 500mL GP, 1RP		
CP15	10.45	2.63	3.01	N	CST	CLOOBG	4.87	135.4uS	4.90	129.2uS	1x 250ml GP, 1x 500mL GP, 1RP		
MW7	13.30	11.71	15.3	N	CST	CLOOBG	6.27	48.7uS	6.30	48.8uS	1x 250ml GP, 1x 500mL GP, 1RP	N	
MW9	12.10	22.82	24.09	N	CST	CLOOBG	4.50	62.9uS	4.45	63.6uS	1x 250ml GP, 1x 500mL GP, 1RP	N	
MW10	—		11.44		CST	CLOOBG					1x 250ml GP, 1x 500mL GP, 1RP	N	NO ACCESS TRACK WASHED OUT!
MW13	12.45	8.00	7.71	N	CST	CLOOBG	4.55	72.3	4.50	76.1	1x 250ml GP, 1x 500mL GP, 1RP		

Contact Wynston 15 min prior to access on: **0414 900 555

Colour: C=Colourless, LO=Light Orange, O=Orange, B=Brown, G=Green (CIRCLE)
Turbidity: C=Clear, S= Slight, T=Turbid (CIRCLE)

***If unable to download logger please provide comment/ explanation above**

6.24 10.48

CHAIN OF CUSTODY DOCUMENTATION

Australian Laboratory Services Pty Ltd

CLIENT: CBased Environmental Pty Ltd
LABORATORY BATCH NO.:
POSTAL ADDRESS: PO BOX 245 CESSNOCK NSW 2325
SAMPLERS: Sim LK
SEND REPORT TO: monitoringresults@cbased.com.au
SEND INVOICE TO: accounts@cbased.com.au
PHONE: 0265713334
E-MAIL: monitoringresults@cbased.com.au
DATA NEEDED BY: 5 working days
REPORT NEEDED BY: 5 working days
REPORT FORMAT: HARD: Yes FAX: DISK: BULLETIN BOARD: E-MAIL: Yes
PROJECT ID: Hanson GW
QUOTE NO.: SYBQ-403-18
QC LEVEL: QCS1: QCS2: QCS3: Yes QCS4:
P.O. NO.:
COMMENTS/SPECIAL HANDLING/STORAGE OR DIPOSAL:

FOR LAB USE ONLY
COOLER SEAL
Yes ..... No .....
Broken ....3.6 Intact ...
COOLER TEMP: deg.C

ANALYSIS REQUIRED

SAMPLE ID		MATRIX	DATE	TIME	TYPE & PRESERVATIVE	NO.	pH	EC	Ca, Mg, K, Na	Alkalinity	Sulfate	Chloride	Fluoride	Nitrate	Al, Cd, Cr (tot)	Cu, Fe, Mn (tot)	Ni, Pb, Zn (tot)	NOTES
CQ3	1	Water	27.11.22	8.10	1x500mlGP, 1x250mlGP,1xRP	3	x	x	x	x	x	x	x	x	x	x	x	
CQ4	2	Water		8.00	1x500mlGP, 1x250mlGP,1xRP	3	x	x	x	x	x	x	x	x	x	x	x	
CQ5	3	Water		9.30	1x500mlGP, 1x250mlGP,1xRP	3	x	x	x	x	x	x	x	x	x	x	x	
CQ7	4	Water		7.45	1x500mlGP, 1x250mlGP,1xRP	3	x	x	x	x	x	x	x	x	x	x	x	
CQ8		Water			1x500mlGP, 1x250mlGP,1xRP	3	x	x	x	x	x	x	x	x	x	x	x	
CQ10	5	Water	27.11.22	12.00	1x500mlGP, 1x250mlGP,1xRP	3	x	x	x	x	x	x	x	x	x	x	x	
CQ11s	6	Water		9.10	1x500mlGP, 1x250mlGP,1xRP	3	x	x	x	x	x	x	x	x	x	x	x	
CQ11d		Water			1x500mlGP, 1x250mlGP,1xRP	3	x	x	x	x	x	x	x	x	x	x	x	
CQ12	7	Water	27.11.22	7.55	1x500mlGP, 1x250mlGP,1xRP	3	x	x	x	x	x	x	x	x	x	x	x	
CQ13	8	Water		10.15	1x500mlGP, 1x250mlGP,1xRP	3	x	x	x	x	x	x	x	x	x	x	x	
CP4	9	Water		10.15	1x500mlGP, 1x250mlGP,1xRP	3	x	x	x	x	x	x	x	x	x	x	x	
CP5	10	Water		10.30	1x500mlGP, 1x250mlGP,1xRP	3	x	x	x	x	x	x	x	x	x	x	x	
CP6	11	Water		10.20	1x500mlGP, 1x250mlGP,1xRP	3	x	x	x	x	x	x	x	x	x	x	x	
CP7	12	Water		10.35	1x500mlGP, 1x250mlGP,1xRP	3	x	x	x	x	x	x	x	x	x	x	x	
CP8	13	Water		11.40	1x500mlGP, 1x250mlGP,1xRP	3	x	x	x	x	x	x	x	x	x	x	x	
CP13	14	Water		11.20	1x500mlGP, 1x250mlGP,1xRP	3	x	x	x	x	x	x	x	x	x	x	x	
CP15	15	Water		10.45	1x500mlGP, 1x250mlGP,1xRP	3	x	x	x	x	x	x	x	x	x	x	x	
MW7	16	Water		13.30	1x500mlGP, 1x250mlGP,1xRP	3	x	x	x	x	x	x	x	x	x	x	x	
MW9	17	Water		12.10	1x500mlGP, 1x250mlGP,1xRP	3	x	x	x	x	x	x	x	x	x	x	x	
MW10		Water			1x500mlGP, 1x250mlGP,1xRP	3	x	x	x	x	x	x	x	x	x	x	x	
MW13	18	Water	27.11.22	1245	1x500mlGP, 1x250mlGP,1xRP	3	x	x	x	x	x	x	x	x	x	x	x	
					Total Bottles													

Environmental Division Sydney
Work Order Reference
ES2243280

Telephone : +61-2-8784 8555

LAB OF ORIGIN: NEWCASTLE

RELINQUISHED BY:		RECEIVED BY		METHOD OF SHIPMENT
NAME: A. SMITH	DATE: 30.11.22	NAME:	DATE: 30.11.22	CONSIGNMENT NOTE NO.
OF: C Based Environmental	TIME: 13:20	OF: ALS	TIME: 1:26	
NAME:	DATE: 30.11.22	NAME:	DATE:	TRANSPORT CO. NAME.
OF: ALS	TIME: 5pm	OF:	TIME:	

*Container Type and Preservative Codes: P = Neutral Plastic; N = Nitric Acid Preserved; C = Sodium Hydroxide Preserved; J = Solvent Washed Acid Rinced Jar; S = Solvent Washed Acid Rinced Glass Bottle; VC = Hydrochloric Acid Preserved Vial; VS = Sulfuric Acid Preserved Vial; BS = Sulfuric Acid Preserved Glass Bottle; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; O = Other.

AUSTRALIAN LABORATORY SERVICES P/L

pH @ WN

EMAILED

CERTIFICATE OF ANALYSIS

Work Order	: **ES2243280**	Page	: 1 of 10
Client	: **CBASED ENVIRONMENTAL PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: All Deliverables	Contact	: Helen Simpson
Address	: Unit 3 2 Enterprise Cres Singleton NSW 2330	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 6571 3334	Telephone	: +61 2 8784 8555
Project	: Hanson GW	Date Samples Received	: 30-Nov-2022 13:26
Order number	: ----	Date Analysis Commenced	: 30-Nov-2022
C-O-C number	: ----	Issue Date	: 07-Dec-2022 18:11
Sampler	: SM LK		
Site	:		
Quote number	: SYBQ/403/18		
No. of samples received	: 19		
No. of samples analysed	: 18		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. 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, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Neil Martin	Team Leader - Chemistry	Chemistry, Newcastle West, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

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.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	CQ3	CQ4	CQ5	CQ7	CQ10
			Sampling date / time	29-Nov-2022 08:10	29-Nov-2022 09:00	29-Nov-2022 09:30	29-Nov-2022 09:45	29-Nov-2022 12:00
Compound	CAS Number	LOR	Unit	ES2243280-001	ES2243280-002	ES2243280-003	ES2243280-004	ES2243280-005
				Result	Result	Result	Result	Result
EA005: pH								
pH Value	----	0.01	pH Unit	6.06	4.53	4.06	4.35	4.46
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	123	141	243	152	150
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	24	<1	<1	<1	<1
Total Alkalinity as CaCO3	----	1	mg/L	24	<1	<1	<1	<1
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3	9	18	8	17
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	23	23	29	26	28
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	2	<1	3	<1	1
Magnesium	7439-95-4	1	mg/L	4	3	6	4	2
Sodium	7440-23-5	1	mg/L	14	19	17	17	19
Potassium	7440-09-7	1	mg/L	2	<1	2	<1	<1
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.05	0.33	2.50	0.98	0.73
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	0.001	0.002
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.002	0.003	0.032
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.002	0.002	0.003
Manganese	7439-96-5	0.001	mg/L	1.03	0.020	0.022	0.012	0.021
Nickel	7440-02-0	0.001	mg/L	0.011	<0.001	0.001	<0.001	0.005
Zinc	7440-66-6	0.005	mg/L	0.054	0.040	0.027	0.054	0.068
Iron	7439-89-6	0.05	mg/L	1.13	<0.05	0.25	0.46	0.31
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	0.2	<0.1	<0.1	<0.1
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.11	4.14	9.66	4.12	0.81

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	CQ3	CQ4	CQ5	CQ7	CQ10
			Sampling date / time	29-Nov-2022 08:10	29-Nov-2022 09:00	29-Nov-2022 09:30	29-Nov-2022 09:45	29-Nov-2022 12:00
Compound	CAS Number	LOR	Unit	ES2243280-001	ES2243280-002	ES2243280-003	ES2243280-004	ES2243280-005
				Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.11	4.14	9.66	4.12	0.81
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	1.19	0.84	1.19	0.90	1.14
ø Total Cations	----	0.01	meq/L	1.09	1.07	1.43	1.07	1.04

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	CQ11s	CQ12	CQ13	CP4	CP5
			Sampling date / time	29-Nov-2022 09:10	29-Nov-2022 09:55	29-Nov-2022 10:10	29-Nov-2022 10:15	29-Nov-2022 10:30
Compound	CAS Number	LOR	Unit	ES2243280-006	ES2243280-007	ES2243280-008	ES2243280-009	ES2243280-010
				Result	Result	Result	Result	Result
EA005: pH								
pH Value	----	0.01	pH Unit	5.68	4.14	4.36	4.51	5.64
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	168	194	148	179	120
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	22	<1	<1	<1	5
Total Alkalinity as CaCO3	----	1	mg/L	22	<1	<1	<1	5
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	13	19	5	32	7
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	26	18	27	19	16
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	2	1	<1	4	1
Magnesium	7439-95-4	1	mg/L	3	7	4	4	6
Sodium	7440-23-5	1	mg/L	21	13	16	16	8
Potassium	7440-09-7	1	mg/L	2	<1	2	3	2
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.07	1.54	0.34	0.42	0.06
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	0.0003
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	0.005
Copper	7440-50-8	0.001	mg/L	0.002	<0.001	<0.001	<0.001	0.012
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.001	0.002	0.003
Manganese	7439-96-5	0.001	mg/L	0.032	0.002	0.003	0.002	0.060
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	0.042
Zinc	7440-66-6	0.005	mg/L	0.024	<0.005	0.015	0.043	1.49
Iron	7439-89-6	0.05	mg/L	0.18	<0.05	<0.05	0.05	0.17
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.01	0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	8.54	3.81	3.08	4.61

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	CQ11s	CQ12	CQ13	CP4	CP5
			Sampling date / time	29-Nov-2022 09:10	29-Nov-2022 09:55	29-Nov-2022 10:10	29-Nov-2022 10:15	29-Nov-2022 10:30
Compound	CAS Number	LOR	Unit	ES2243280-006	ES2243280-007	ES2243280-008	ES2243280-009	ES2243280-010
				Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	8.54	3.82	3.09	4.61
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	1.44	0.90	0.86	1.20	0.70
ø Total Cations	----	0.01	meq/L	1.31	1.19	1.08	1.30	0.94

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	CP6	CP7	CP8	CP13	CP15
			Sampling date / time	29-Nov-2022 10:20	29-Nov-2022 10:35	29-Nov-2022 11:40	29-Nov-2022 11:20	29-Nov-2022 10:45
Compound	CAS Number	LOR	Unit	ES2243280-011	ES2243280-012	ES2243280-013	ES2243280-014	ES2243280-015
				Result	Result	Result	Result	Result
EA005: pH								
pH Value	----	0.01	pH Unit	4.83	5.19	4.35	4.32	4.80
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	146	139	118	208	163
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	2	3	<1	<1	2
Total Alkalinity as CaCO3	----	1	mg/L	2	3	<1	<1	2
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	11	26	10	10	17
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	24	13	22	46	20
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	<1	5	<1	1	<1
Magnesium	7439-95-4	1	mg/L	4	3	2	3	6
Sodium	7440-23-5	1	mg/L	15	9	16	27	14
Potassium	7440-09-7	1	mg/L	<1	7	<1	1	3
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.12	0.23	0.46	0.56	0.42
Cadmium	7440-43-9	0.0001	mg/L	0.0007	<0.0001	<0.0001	0.0004	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	0.021	0.003	<0.001	0.031	<0.001
Lead	7439-92-1	0.001	mg/L	0.014	0.002	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	0.075	0.136	0.002	0.028	0.050
Nickel	7440-02-0	0.001	mg/L	0.028	<0.001	<0.001	<0.001	<0.001
Zinc	7440-66-6	0.005	mg/L	1.46	0.012	0.007	0.036	<0.005
Iron	7439-89-6	0.05	mg/L	0.82	4.18	0.06	<0.05	1.61
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.1	<0.1	<0.1
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	0.01	0.02	<0.01	<0.01	0.02
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	4.00	2.27	0.87	0.88	6.55

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	CP6	CP7	CP8	CP13	CP15
			Sampling date / time	29-Nov-2022 10:20	29-Nov-2022 10:35	29-Nov-2022 11:40	29-Nov-2022 11:20	29-Nov-2022 10:45
Compound	CAS Number	LOR	Unit	ES2243280-011	ES2243280-012	ES2243280-013	ES2243280-014	ES2243280-015
				Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	4.01	2.29	0.87	0.88	6.57
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	0.94	0.97	0.83	1.50	0.96
ø Total Cations	----	0.01	meq/L	0.98	1.07	0.86	1.50	1.18

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW7	MW9	MW13	----	----
			Sampling date / time	29-Nov-2022 13:30	29-Nov-2022 12:10	29-Nov-2022 12:45	----	----
Compound	CAS Number	LOR	Unit	ES2243280-016	ES2243280-017	ES2243280-018	--------	--------
				Result	Result	Result	----	----
EA005: pH								
pH Value	----	0.01	pH Unit	6.32	4.57	4.44	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	69	89	106	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	23	2	<1	----	----
Total Alkalinity as CaCO3	----	1	mg/L	23	2	<1	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1	3	3	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	6	21	27	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	5	<1	<1	----	----
Magnesium	7439-95-4	1	mg/L	<1	1	2	----	----
Sodium	7440-23-5	1	mg/L	4	12	14	----	----
Potassium	7440-09-7	1	mg/L	2	<1	<1	----	----
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.17	0.23	0.13	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.002	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Manganese	7439-96-5	0.001	mg/L	0.057	0.004	0.026	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	0.001	0.001	----	----
Zinc	7440-66-6	0.005	mg/L	0.088	0.010	0.038	----	----
Iron	7439-89-6	0.05	mg/L	0.75	0.07	<0.05	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	<0.1	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	0.16	0.43	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW7	MW9	MW13	----	----
			Sampling date / time	29-Nov-2022 13:30	29-Nov-2022 12:10	29-Nov-2022 12:45	----	----
Compound	CAS Number	LOR	Unit	ES2243280-016	ES2243280-017	ES2243280-018	--------	--------
				Result	Result	Result	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	**0.16**	**0.43**	----	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**0.65**	**0.69**	**0.82**	----	----
ø Total Cations	----	0.01	meq/L	**0.47**	**0.60**	**0.77**	----	----

Inter-Laboratory Testing

Analysis conducted by ALS Newcastle - Water, NATA accreditation no. 825, site no. 1656 (Chemistry) 9854 (Biology).

(WATER) EA005: pH