



APPENDIX F6

Kinetic testing program

Olympic Dam Expansion

BHP Billiton

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Olympic Dam Kinetic Testing Program

Supplement to Appendix K5 of the Olympic Dam Draft EIS

FINAL REPORT

Olympic Dam Kinetic Testing Program

Supplement to Appendix K5 of the Olympic Dam Draft EIS

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1.0 Introduction

AECOM Australia Pty Ltd (AECOM) (formerly ENSR Australia) has been commissioned by BHP Billiton (BHPB) to conduct long term kinetic tests on a selection of rock chip samples from Olympic Dam to support the studies associated with the proposed Olympic Dam Expansion (ODX). This report is a supplement to the Assessment of the Olympic Dam Mine Rock Geochemistry (see Appendix K5 of the Draft EIS).

The kinetic testing program is based on five samples from the overburden, six from the major basement host rocks, and five from the minor basement rock types. Samples were derived from drill core and stope samples and supplied by BHP Billiton. Samples were subjected to regular flushing and geochemical assay to predict metal and salt release rates under weathering conditions.

As reported in Appendix K5 of the Draft EIS, ENSR developed long term release rate estimates based on kinetic testing extending over a period of 64 weeks (15 months). The kinetic tests have continued since the preparation of that report and data now extends to 174 weeks (40 months). This report is a supplement to Appendix K5 of the Draft EIS and presents additional kinetic data for waste rock associated with the proposed Olympic Dam Expansion.

2.0 Methodology

2.1 Kinetic test design

As discussed in Appendix K5 of the Draft EIS, ENSR performed kinetic tests on 19 samples to determine the reactivity of the main rock units. A summary of the column source material is contained in **Table 1**.

Table 1 Column sample source material

Column ID	Rock Code	Source	Drill Hole	Sampling Interval (m)
OD_1	HEMH (148187)	Basement	UG1*	n / a
OD_2	GRNL (148207)	Basement	UG2*	n / a
OD_3	HEM (148194)	Basement	UG3*	n / a
OD_4	ZWAW	Overburden	RD2744	174-175
OD_5	ZWA	Overburden	RD2744	45-46
OD_6	ZWC	Overburden	RD2744	193-194
OD_7	ZWT	Overburden	RD2744	230-231
OD_8	ZWAR	Overburden	RD2744	103-104
OD_9	ZAL	Overburden	RD2744	24-25
OD_10	HEMQ	Basement	RD2741	793-794
OD_11	HEMH	Basement	RD1638	530-531
OD_12	GRNH	Basement	RD1625	583-594
OD_13	GRNB	Basement	RD2731	754-755
OD_14	GRNL	Basement	RD2730	719-720
OD_15	KASH	Basement	RD1638	651-652
OD_16	KASH Laminated	Basement	RD2748	582-586
OD_17	VHEM	Basement	RD2741	650-651
OD_18	KHEMQ-VASH	Basement	RD2748	730-731
D_19	CONGLO	Basement	RD1638	374-376

Mine rock collected underground: UG1* = sample collected 10May06 from '32 Purple 311 EXT DRV' UG2* = sample collected 11May06 from '39 LJ55 S / PILE'; UG3* = sample collected 10May06 from '45 MJ55 STH PER'.

The leach columns used for the study were similar to those documented in AMIRA P387A ARD Test Handbook (AMIRA, 2002) and they are designed to measure relative reactivity of a given sample material, in this case the mine rock, under atmospheric oxygen concentrations that commonly occur in a RSF. **Figure 1** shows the schematic layout of the columns.

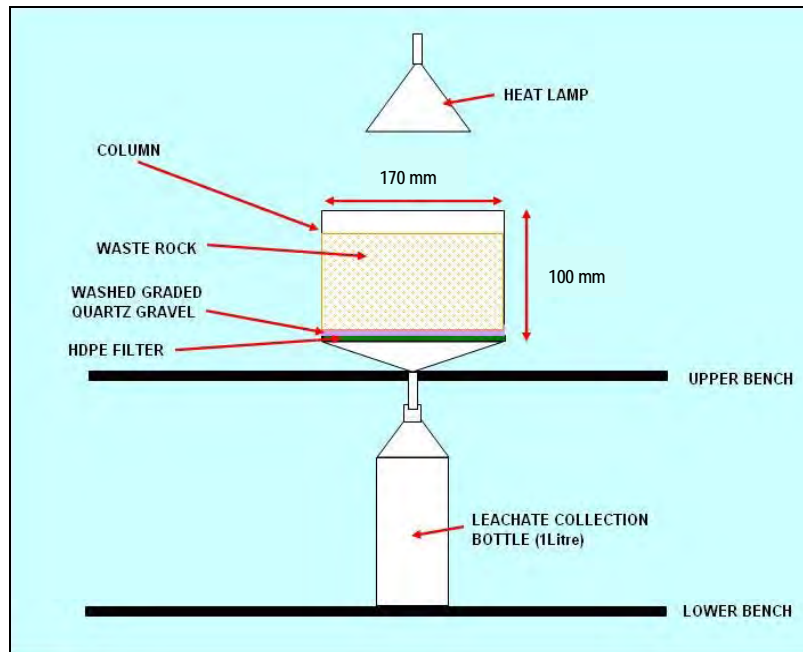


Figure 1 Free draining column configuration

The flushing frequency was modified at week 122 as a result of the declining salt production. A summary of the key program changes is provided in Table 2.

Table 2 Summary of major events in kinetic testing program

Period	Change
Week 0	Kinetic tests established (flushed monthly).
Week 16	Testing of cover rock types terminated due to low yields.
Week 17	Weekly flushing established for basement rock types.
Week 122	Flushing shifted from weekly to monthly intervals due to low yield.
Week 174	Total duration of testing as reported herein.

2.2 Leachate Analysis

Leachate from each column was analysed for the analytes listed in Table 3. The analytical testwork was undertaken at ALS Brisbane Laboratory, a NATA registered laboratory.

Table 3 Analytical program for kinetic testwork leachate

Analyte	Method Code	Detection Limit	Units of Reporting
pH	EA005P: pH by PC Titrator	0.01	pH unit
Electrical conductivity	EA010P: Electrical conductivity by PC Titrator	1	uS/cm
Total alkalinity	EP037P: Titrametric method	1	mg/L
Acidity	EP038: Titrametric method	1	mg/L
Na, K, Ca, Mg	ED093F: Major cations	1	mg/L
Al	EG020F: ICPMS on filtered solution	0.01	mg/L
Fe	EG005F: ICPAES on filtered solution	0.05	mg/L
Total P	EK067: APHA 4500-P H	0.01	mg/L
Si	ED040F: ICPAES on filtered solution	0.05	mg/L
SO4	ED040F: ICPAES on filtered solution	1	mg/L
Cl	ED045P: Titrametric Method	1	mg/L

Analyte	Method Code	Detection Limit	Units of Reporting
Rb, Cs, Be, Sr, Ba, Y, La, Ce, Th, U, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Ti, Zr, Hf, V, Cr, Mo, Mn, Co, Ni, Cu, Ag, Zn, Cd, Al, In, Tl, Ga, Sn, Pb, Sb, Bi, As, Se, Te	EG020F: ICPMS on filtered solution	0.001	mg/L

2.3 Production Rates

The production rate of metals and salts was determined at each flushing interval. The production rate is a function of the mass of sample, the interval over which salts and metals have accumulated, the flush volume and the chemistry of the flush water. This relationship is provided below:

$$\text{Production rate (mg/kg/week)} = \frac{\text{Concentration (mg/L)} \times \text{Rinse volume (L)}}{\text{Sample weight (kg)} \times \text{Rinse interval (week)}}$$

The production rates were plotted over the experiment duration for key analytes: pH, electrical conductivity, aluminium, barium, calcium, copper, magnesium, fluorine, sodium, potassium, iron, lead, magnesium, phosphorus, silicon, strontium chloride, sulfate, uranium, zinc, arsenic, nickel and alkalinity.

The adopted long-term production rate of each element was selected based on a review of the production trends to identify the stabilised production rate. The production rates observed in the early stages of kinetic testing (until week 25) were generally elevated due to flushing of salinity that was present as porewater at the time the samples were obtained, and flushing of accumulated weathering products that were generated subsequent to sampling but prior to testing. These initial elevated values, plus outliers, were excluded from the long-term production rate estimate.

3.0 Summary of sample geochemistry

A summary of metal enrichment in each lithology is provided in **Table 4**. Geochemical assays of kinetic sample material are provided in Appendix B.

Table 4 Geochemical assay summaries

Unit (number of samples)	General Comment	Geochemical Abundance Index*
Overburden		
Andamooka Limestone (ZAL) n=95	elevated Ca and Mg	
Arcoona Quartzite (ZWA, ZWAR, ZWAW) n=514	occasional elevated As, Cu, Mn, Mg, Mo, Ni, S, V,	
Corraberra Sandstone (ZWC) n=77	occasional elevated U	
Tregolana Shale (ZWT) n=469	elevated Fe, Cr, As, Co, Cu, Mn, Ni, S, U, V, Zn, Zr	Enriched in Sb
Pebble Conglomerate (ZWP) n=13	elevated Sb, As, Cu, Fe, Pb, Mn, Mo, S, U	Enriched in Sb, As, Mo
Basement		
Granites (GRN, GRNB, GRNH, GRNL) n~94,000	elevated Au, Ag, Ba, La, Ce, Cu, U, Al, Si, Mn, Ti, Co, Pb	Enriched in Au, Ag, Ba, Ce, Cu, La, Pb, U
Hematite granites (HEMH, HEM, HEMQ) n~20 000	elevated Cu, U, Au, Ag, Fe, Co, La, Ce, Zn,	Enriched in Au, Ag, Ba, Ce, Cu, Fe, La, U
Volcanics (EVB, HEMV, KASH, KHEMQ, VASH, VHEM) n=167	occasional elevated Ba, Ce, Cu, Fe, La, U, Pb	Enriched in Ba, Ce, Cu, La, U, Pb ; HEMV is also enriched in Fe

Notes: na – not analysed; * in reference to crustal abundance

Table 5 summarises the acid base accounting results for the column test material. The Maximum Potential Acidity (MPA) and Nett Acid Producing Potential (NAPP) expressed as kilograms of sulphuric acid per tonne were calculated from sulfide sulfur derived from the total sulfur concentration adjusted for the presence of barite in the sample material tested.

Table 5 Summary of Acid Base Accounting for Column Test Material

Column ID	ANC	Total Sulfur	Sulfide Sulfur	MPA	NAPP	NAG pH	NAG (pH 4.5)	NAG (pH 7.0)
Units	kg H ₂ SO ₄ /t	%	%	kg H ₂ SO ₄ /t	kg H ₂ SO ₄ /t	pH Unit	kg H ₂ SO ₄ /t	kg H ₂ SO ₄ /t
Limit of Reporting		0.01	0.01			0.1	0.1	0.1
OD_1 148187 (HEMH)	1.3	1.2	1.14	34.9	33.6	6.1	<0.1	0.3
OD_2 148207 (GNRL)	2.1	0.17	0.04	1.2	-0.9	7	<0.1	<0.1
OD_3 148194 (HEM)	1.1	0.72	0.64	19.6	18.5	6.2	<0.1	0.3
OD_10 HEMQ	1.8	0.59	0.53	16.2	14.4	8.7	<0.1	<0.1
OD_11 HEMH	9.1	0.04	0.03	0.9	-8.2	7.2	<0.1	<0.1
OD_12 GRNH	4.5	0.38	0.28	8.6	4.1	5.5	<0.1	3.4
OD_13 GRNB	5.4	0.35	0.2	6.1	0.7	7.5	<0.1	<0.1
OD_14 GRNL	2.4	0.16	0.15	4.6	2.2	6.7	<0.1	0.1
OD_15 KASH	65.1	0.01	0	0.0	-65.1	9	<0.1	<0.1
OD_16 KASH laminated	7.8	0.04	0	0.0	-7.8	7.2	<0.1	<0.1
OD_17 VHEM	4.9	0.86	0.8	24.5	19.6	9.2	<0.1	<0.1
OD_18 KHEMQ-VASH	8.9	0.52	0.43	13.2	4.3	6.3	<0.1	<0.1
OD_19 CONGLO	81.7	1.03	0.95	29.1	-52.6	8.5	<0.1	<0.1

ANC - acid neutralising capacity; MPA – maximum potential acidity; NAPP – nett acid producing potential; NAG – nett acid generation

4.0 Results

Raw leachate data is presented in Appendix A. Release rates were determined for each mine rock unit. The release rates are calculated at each flush interval and therefore vary over time, and are presented in Appendix C.

4.1 Release rates

Average release rates over the full 174 week dataset are provided in Table 6. Results from the first 25 weeks of the test were discarded because this was primarily related to flushing of salinity that was present as porewater at the time the samples were obtained, and flushing of accumulated weathering products that were generated subsequent to sampling but prior to testing.

Average release rates from the data to Week 65 were used by ENSR (see Appendix K5 of the Draft EIS) to feed into a geochemical model to predict the changes in chemistry draining from the RSF. A comparison between release rates based on 65 weeks of data and the full 174 week dataset is also provided in Table 6. Release rates that have changed significantly since Week 65 are highlight. The green highlighting suggests a significant reduction in release, and red highlighting suggests a significant increase in release.

Table 6 Release rates based on 174 weeks (g/t/week)

Column ID		SO ₄	Na	Fe	Ba	Cu	U
OD_1 148187 (HEMH)	Release (g/t/wk)	1.02E+00	7.32E-01	5.42E-03	4.79E-02	1.12E-01	4.78E-04
	% change [^]	0%	-91%	11%	-45%	57%	73%
	Percent < LOR	1%	18%	94%	0%	6%	31%
OD_2 148207 (GNRL)	Release (g/t/wk)	5.17E-01	5.63E-01	2.90E-03	1.87E-02	2.63E-03	9.33E-04
	% change [^]	-11%	-74%	-63%	-5%	26%	-111%
	Percent < LOR	0%	3%	82%	7%	8%	18%
OD_3 148194 (HEM)	Release (g/t/wk)	3.81E-01	8.29E-01	2.78E-03	4.88E-02	4.63E-04	7.30E-05
	% change [^]	-48%	-137%	29%	-22%	45%	6%
	Percent < LOR	2%	15%	84%	7%	12%	99%
OD_10 HEMQ	Release (g/t/wk)	4.49E-01	5.90E-01	1.99E-03	4.40E-02	9.01E-04	8.67E-05
	% change [^]	-3%	-99%	48%	-42%	23%	2%
	Percent < LOR	1%	11%	89%	6%	7%	100%
OD_11 HEMH	Release (g/t/wk)	7.79E-01	1.03E+00	1.47E-02	6.19E-03	6.92E-04	1.06E-04
	% change [^]	-25%	-37%	-88%	17%	-14%	2%
	Percent < LOR	1%	2%	46%	7%	12%	98%
OD_12 GRNH	Release (g/t/wk)	4.22E+00	4.21E-01	2.22E-03	7.29E-03	1.55E-01	1.86E-03
	% change [^]	19%	-91%	49%	-2%	86%	75%
	Percent < LOR	0%	35%	92%	1%	4%	11%
OD_13 GRNB	Release (g/t/wk)	1.07E+00	4.64E-01	5.43E-03	1.90E-02	1.60E-03	4.29E-04
	% change [^]	3%	-98%	-15%	-32%	12%	-150%
	Percent < LOR	0%	34%	83%	7%	7%	76%
OD_14 GRNL	Release (g/t/wk)	1.09E+00	1.70E+00	2.73E-02	2.16E-03	3.95E-03	1.74E-03
	% change [^]	-9%	-43%	-100%	-42%	60%	-65%
	Percent < LOR	0%	1%	35%	9%	9%	12%
OD_15 KASH	Release (g/t/wk)	6.10E-01	4.02E+00	7.25E-02	2.79E-03	3.83E-03	1.79E-04
	% change [^]	9%	-25%	-131%	-119%	-102%	-16%
	Percent < LOR	4%	0%	23%	12%	8%	79%
OD_16 KASH laminated	Release (g/t/wk)	1.08E+00	1.76E+00	7.70E-02	1.22E-02	9.47E-04	1.39E-04
	% change [^]	-22%	-29%	-79%	-66%	-40%	-15%
	Percent < LOR	0%	1%	15%	7%	13%	89%
OD_17 VHEM	Release (g/t/wk)	1.82E+00	8.28E-01	4.15E-03	1.18E-02	7.71E-04	8.64E-05
	% change [^]	-73%	-87%	-14%	-10%	-32%	0%
	Percent < LOR	0%	1%	80%	7%	9%	100%
OD_18 KHEMQ-VASH	Release (g/t/wk)	1.05E+00	9.91E-01	1.21E-02	1.95E-02	4.31E-04	2.80E-04
	% change [^]	-54%	-53%	-142%	-11%	-20%	-111%
	Percent < LOR	0%	1%	74%	7%	17%	59%
OD_19 CONGLO	Release (g/t/wk)	3.93E+00	5.65E-01	3.78E-03	1.81E-02	3.99E-04	8.91E-05
	% change [^]	-42%	-89%	25%	-23%	4%	0%
	Percent < LOR	0%	12%	85%	7%	18%	100%

Notes:

1. Colour code:	Definition
No significant change	less than +/-15% change OR more than 50% below LOR
Significant increase	more than +15% change AND less than 50% below LOR
Significant decrease	more than -15% change AND less than 50% below LOR

2. ^ indicates % change from Week 26-65 rates compared to rates based on the full dataset from Week 26-174

4.2 Trends by lithology

The results of the testwork indicate that all the columns have generated low acidity, alkalinity and sulfate concentrations in leachate. Most of the columns yield soluble salts with similar cation and anion composition to saline groundwater. A discussion based on each rock type is provided below.

4.2.1 Overburden

Kinetic tests of the overburden material has yielded negligible metals and sulfate in leachate compared to basement complex mine rock material, consistent with the low metal concentrations identified by the static test work. Refer to Appendix K5 of the Draft EIS for a summary of the kinetic testing of overburden rock types.

4.2.2 Granitic Material

Granitic material (GRNH, GRNB and GRNL) produces leachate with detectable concentrations of copper, molybdenum and uranium. There has been an increase in copper production over time, and appears to be continuing for most samples. There has also been a gradual reduction of pH throughout the kinetic testing program. The leachate water was initially alkaline and consistent with regional groundwater characteristics, and has reduced as the pore water was flushed and oxidation instigated. The GRNH sample (OD_12) shows a reduction in sodium and chloride over the test duration, but an increase in sulfate, uranium and copper. This suggests possible oxidation of sulfides, releasing copper and causing a pH reduction that can also mobilise uranium. The pH trend over the testing program is presented in Figure 2.

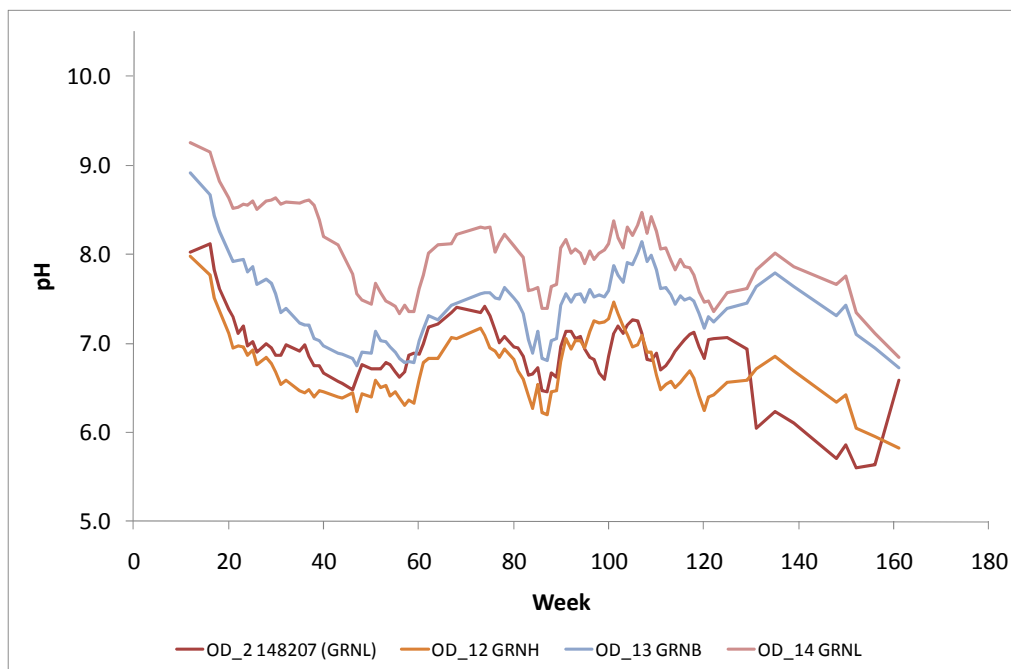


Figure 2 pH trends for Granitic lithologies

4.2.3 Haematitic Material

Haematitic material (HEM, HEMQ and HEMH) has produced leachate with detectable concentrations of arsenic, molybdenum and acidity. The haematites show a reduction in soluble salts, including sulfate, over the testing period. Copper and uranium release rates are generally low, the exception being HEMH (sample OD_1 148187) which exhibits higher copper and sulfate release, with copper release increasing throughout the test period. The pH trends over the program are inconsistent and fluctuate between neutral and slightly acidic, as shown in Figure 3.

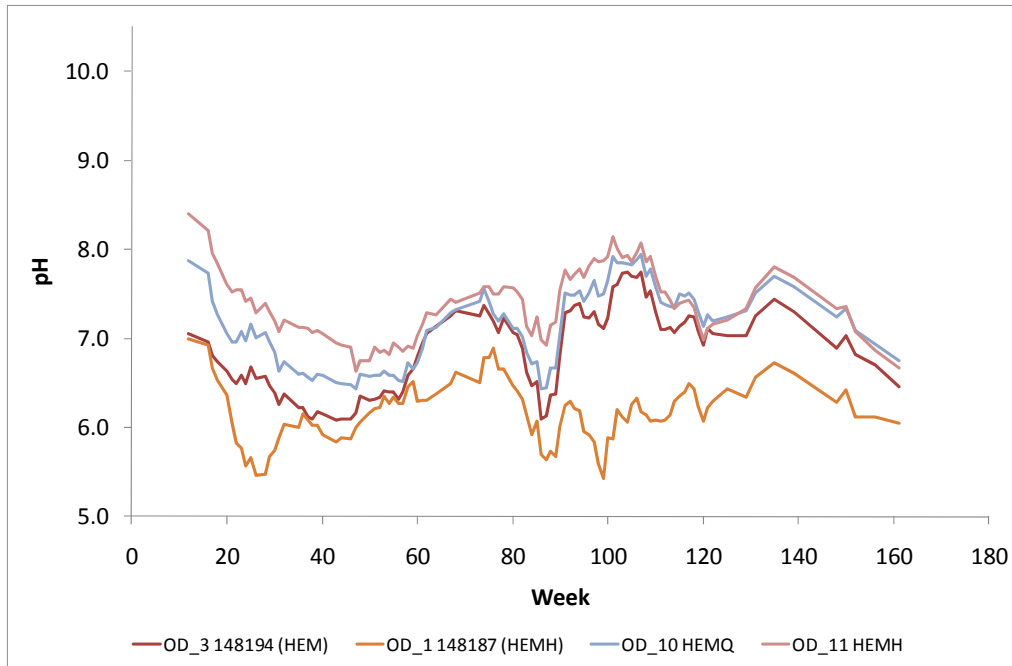


Figure 3 pH trends for Haematitic lithologies

4.2.4 Volcanics and Epiclastics

The volcanic and epiclastic material (KASH, VHEM, KHEMQ VASH and CONGLO) produce leachate with higher sulfate, aluminium, arsenic, copper, iron, manganese and zinc relative to other materials tested. There has been a reduction in concentrations throughout the testing program with a number of parameters now at steady state. Leachate from the volcanic rock material ranges from neutral to alkaline pH and has been consistent throughout the program, as shown in Figure 4.

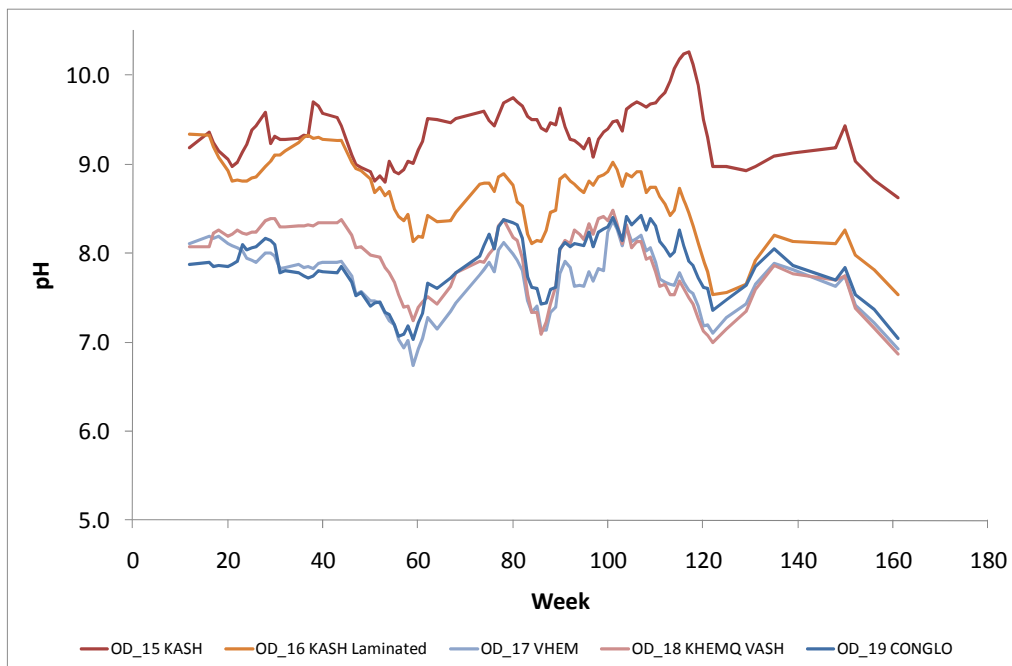


Figure 4 pH trends for Volcanic lithologies

4.3 Steady state

The kinetic testing program has been ongoing for more than 3 years and steady state conditions have been realised for some analytes in some samples, however there are no samples that have conclusively reached steady state for all analytes. A qualitative assessment of whether steady state conditions have been achieved is provided in Table 7.

Table 7 Assessment of whether results indicate steady state conditions have been achieved

Column ID	Sulfate	Sodium	Iron	Barium	Copper	Uranium
OD_1 148187 (HEMH)	✘	✓	?	✓	✘	✘
OD_2 148207 (GNRL)	✓	✓	✓	✓	?	✓
OD_3 148194 (HEM)	✓	✓	✓	?	✘	?
OD_10 HEMQ	✓	✓	✓	✓	?	?
OD_11 HEMH	✓	✓	✓	✓	?	?
OD_12 GRNH	?	✓	✓	✓	✘	✘
OD_13 GRNB	✓	✓	✓	✓	?	✓
OD_14 GRNL	✓	✓	✓	✓	✘	✓
OD_15 KASH	?	✓	✓	✓	✓	?
OD_16 KASH laminated	✓	✓	✓	✓	?	✓
OD_17 VHEM	✓	✓	✓	?	?	?
OD_18 KHEMQ-VASH	?	?	✓	✘	✘	?
OD_19 CONGLO	✓	✓	✓	?	?	?

Notes: ✓ Steady state achieved
 ✘ Steady state not achieved
 ? Steady state possibly achieved

5.0 QA/QC

The QA / QC procedures utilised for the kinetic testwork are described in Appendix D.

Towards the latter part of the kinetic testing program ionic strengths reduced and a greater number of analytes were close to or below limits of reporting, which accounts for increased ionic balance discrepancies towards the end of the program. Overall, ionic balance checks identified that the laboratory data were considered acceptable. A summary of the key considerations in the QA/QC program is provided below:

- Completeness - All samples collected and analysed complied with the DQIs, as such the data obtained are considered to be sufficiently quantitative and complete for the purposes of this investigation (i.e. >95%)
- Comparability - The data obtained throughout the investigation are considered to be suitably comparable.
- Precision - The precision of the data are sufficient for the purposes of this investigation.
- Accuracy - The accuracy of the data are sufficient for the purposes of this investigation

6.0 Conclusion

A kinetic testing program has been undertaken for 174 weeks. The program involves a number of measurements over time, that are used to assess a range of acid drainage and metal leaching issues including sulfide reactivity, oxidation kinetics, metal solubility and the leaching behaviour of materials. Kinetic tests were performed on 19 samples to determine the reactivity of the main rock units present in the basement and overburden.

Samples were subjected to regular flushing (weekly to monthly) and geochemical assay to predict metal and salt release rates under weathering conditions.

The kinetic data indicate the following trends:

- overburden material produces minimal metal and acidity

- granitic material produces leachate with detectable concentrations of copper, molybdenum and uranium and suggests sulfide oxidation is occurring that may continue to release these metals at increasing rates
- haematitic altered material produces leachate with detectable concentrations of arsenic, molybdenum and acidity
- volcanic and epiclastic material produce leachate with higher sulfate, aluminium, arsenic, copper, iron, manganese and zinc relative to other materials tested.

7.0 References

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Appendix A

Laboratory Results

Appendix A - Tabulated Laboratory Analytical Results
 Column OD_1 148187 (HEMH)



Column	OD_1 148187 (HEMH)	Week			0	4	8	12	16	17	18	20	21	22
Sample weight (kg)	2	Extraction vol (L)			0.625	0.375	0.375	0.625	0.42	0.42	0.42	0.42	0.42	0.44
Key		Flushing vol (L)			1.6	1.35	1.3	1.6	1.2	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.22	6.91	7.9	6.66	7.51	7.1	5.7	6.67	5.17	6.9
Electrical Conductivity (field)		µS/cm			3980	938	737	328	801	269	137	202	131	126
pH Value		pH Unit	0.01		6.77		6.64	6.31	6.83	4.73	6.07	6.38	6.72	6.06
Electrical Conductivity @ 25°C		µS/cm	1		3600		762	339	820	332	167	231	118	138
Total Alkalinity as CaCO3		mg/L	1	0.5	8	4	3	7	7	LOR	7	4	3	5
Acidity as CaCO3		mg/L	1	0.5	4	4	24	3		22	4	10	3	1
Sulfate	14808-79-8	mg/L	1	0.5	3	4	7	4	16	7	5	5	9	5
Silicon	7440-21-3	mg/L	0.05	0.025	0.79	0.11	0.13		0.58	0.09	0.06	0.07	0.18	0.08
Chloride	16887-00-6	mg/L	1	0.5					196	77	43	91	5	25
Calcium	7440-70-2	mg/L	1	0.5	43				30	6	5	8	3	5
Magnesium	7439-95-4	mg/L	1	0.5	4				3	LOR	LOR	2	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	636				95	42	22	44	10	17
Potassium	7/09/7440	mg/L	1	0.5	20				11	3	2	4	LOR	2
Iron	7439-89-6	mg/L	0.05	0.025	LOR	0.04	0.1	0.03	LOR	0.87	0.75	0.17	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	LOR	0.04	LOR	0.04	0.02	0.05	0.05	0.06	0.08	LOR
Antimony	7440-36-0	mg/L	0.001	0.0005	0.001	LOR	LOR	LOR	0.002	0.002	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.005	0.009	0.006	0.004	0.003	0.003	0.003	0.002	0.003	0.002
Barium	7440-39-3	mg/L	0.001	0.0005	2.64	1.35	0.822	0.763	0.284	0.71	0.889	0.603	0.568	0.681
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	0.006	0.024	0.001	0.015	0.031	0.006	LOR	0.002
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.003	0.001	0.001	LOR	0.006	0.002	0.001	0.002	0.003	0.001
Copper	7440-50-8	mg/L	0.001	0.0005	0.024	0.039	0.048	0.057	0.114	0.118	0.134	0.131	0.114	0.099
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	0.002	0.011	LOR	0.007	0.015	0.002	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.002	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.11	0.024	0.034	0.022	0.117	0.036	0.028	0.038	0.053	0.028
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.368	0.246	0.249	0.071	0.233	0.076	0.05	0.064	0.052	0.034
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.002	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	3.49	0.944	1.25		1.49	0.469	0.351	0.431	0.397	0.267
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR		0.002	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR		LOR	LOR	0.001	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.017	0.016	0.016	0.019	0.013	0.011	0.02	0.019	0.018
Fluoride	16984-48-8	mg/L	0.1	0.05	0.6	0.3	0.4	0.2	0.8	0.1	0.2	0.2	0.3	0.12
Total Phosphorus		mg/L	0.01	0.005	LOR				LOR	LOR	LOR	LOR	LOR	LOR

Appendix A - Tabulated Laboratory Analytical Results
 Column OD_1 148187 (HEMH)



Column	OD_1 148187 (HEMH)	Week			23	24	25	26	28	29	30	31	32	35
Sample weight (kg)	2	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.65	0.65	0.65	0.65	0.7	0.7	0.65	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			5.47	5.3	5.53	5.3	5.3	5.85	5.5	5.57	6.7	5.95
Electrical Conductivity (field)		µS/cm			126	71	96	102	192					
pH Value		pH Unit	0.01		6.48	6.35	6.07	7.53	4.32		5.83	9.26	6.18	7.07
Electrical Conductivity @ 25°C		µS/cm	1		133	114	102	103	191		82	103	67	84
Total Alkalinity as CaCO3		mg/L	1	0.5	3	4	2	3	LOR		LOR	8	6	13
Acidity as CaCO3		mg/L	1	0.5	5	5	LOR	2	2	8	LOR	LOR	12	6
Sulfate	14808-79-8	mg/L	1	0.5	5	6	6	5	6	3	5	5	4	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.07	0.1	0.21	0.06	LOR	0.07	LOR	0.07	0.07	0.05
Chloride	16887-00-6	mg/L	1	0.5	34	LOR	31	25	52		28		18	20
Calcium	7440-70-2	mg/L	1	0.5	6	6	5	5	4	4	4	4	3	4
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	1	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	14	16	19	15	34	5	14	9	9	11
Potassium	7/09/7440	mg/L	1	0.5	2	3	2	2	2	2	2	2	1	1
Iron	7439-89-6	mg/L	0.05	0.025	0.07	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.02	LOR
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.003	0.003	0.003	0.002	LOR	0.002	0.001	0.001	0.002	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.539	0.484	0.545	0.471	0.36	0.564	0.502	0.516	0.589	0.565
Cerium	7440-45-1	mg/L	0.001	0.0005	0.001	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.002	0.001	0.002
Copper	7440-50-8	mg/L	0.001	0.0005	0.126	0.146	0.148	0.167	0.158	0.161	0.161	0.192	0.178	0.188
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	0.002	LOR	0.002	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.037	0.037	0.026	0.028	0.025	0.05	0.032	0.039	0.032	0.035
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.042	0.033	0.022	0.02	0.016	0.018	0.014	0.018	0.016	0.01
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.296	0.286	0.233	0.243	0.241	0.239	0.211	0.263	0.168	0.15
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.001	LOR	LOR	LOR	0.001	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025		0.009	0.008	0.011	0.006	0.009	0.24	0.006	0.028	0.006
Fluoride	16984-48-8	mg/L	0.1	0.05	0.1	0.3	0.3	0.3	0.2		0.2	0.2	0.2	0.1
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.05	LOR

Appendix A - Tabulated Laboratory Analytical Results
 Column OD_1 148187 (HEMH)



Column	OD_1 148187 (HEMH)	Week			36	37	38	39	40	43	44	46	47	48
Sample weight (kg)	2	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.675	0.675	0.675	0.7	0.65	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.3	6.35	5.6	6.6	5.07	6.3	5.98	5.5		5.85
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		10.4	3.41	6.09	7	7.65	5.35	3.95	5.57	6.35	5.71
Electrical Conductivity @ 25°C		µS/cm	1		98	347	50	45	115.00	85	141	54	52	32
Total Alkalinity as CaCO3		mg/L	1	0.5	25	LOR			4.00	2		2	5	8
Acidity as CaCO3		mg/L	1	0.5	7	45	3	LOR		2	13	3	LOR	4
Sulfate	14808-79-8	mg/L	1	0.5	4	3	3	3	5.00	4	10	5	5	6
Silicon	7440-21-3	mg/L	0.05	0.025	LOR	LOR	LOR	LOR	LOR		0.14	LOR	0.08	LOR
Chloride	16887-00-6	mg/L	1	0.5	17	20	10	9	25.00	11	29	12	14	4
Calcium	7440-70-2	mg/L	1	0.5	4	3	3	2	4.00	3	9	3	3	3
Magnesium	7439-95-4	mg/L	1	0.5	1	LOR	LOR	LOR	1.00	LOR	1	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	13	10	5	4	14.00	6	13	7	8	3
Potassium	7/09/7440	mg/L	1	0.5	1	1	2	1	3.00	1	2	2	2	1
Iron	7439-89-6	mg/L	0.05	0.025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	0.03	0.03	LOR	0.02
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	0.002	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.002	0.002	0.002	0.001	0.00	LOR	LOR	LOR	0.002	0.001
Barium	7440-39-3	mg/L	0.001	0.0005	0.488	0.531	0.502	0.53	0.54	0.383	0.188	0.357	0.298	0.266
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.002	0.002	0.002	0.002	0.00	0.002	0.009	0.002	0.003	0.003
Copper	7440-50-8	mg/L	0.001	0.0005	0.187	0.19	0.169	0.187	0.26	0.303	0.452	0.237	0.228	0.302
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.035	0.039	0.034	0.038	0.05	0.04	0.136	0.034	0.056	0.046
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.009	0.011	0.007	0.009	0.01	0.007	0.013	0.006	0.006	0.008
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.147	0.154	0.126	0.126	0.21	0.13	0.39	0.151	0.196	0.19
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	0.001	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	0.001	LOR	LOR	LOR	LOR	0.001	0.001	LOR	0.001
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.009	LOR	0.005	0.01	0.007	0.017	0.007	LOR	0.008
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	LOR	0.2		0.10	0.2		LOR	0.2	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	0.01	0.01	0.02	0.02

Appendix A - Tabulated Laboratory Analytical Results
 Column OD_1 148187 (HEMH)



Column	OD_1 148187 (HEMH)	Week			50	51	52	53	54	55	56	57	58	59
Sample weight (kg)	2	Extraction vol (L)			0.5	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.53	5.85	6.67	6.61	5.73	6.34	6.75	5.92	6.39	6.18
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		6.38	6.83	6.33	5.71	4.67	5.78	6.09	5.84	6.68	6.71
Electrical Conductivity @ 25°C		µS/cm	1		65	42	60	32	51	49	46	44	47	49
Total Alkalinity as CaCO3		mg/L	1	0.5	6	3	6	8	LOR	5	6	4	9	30
Acidity as CaCO3		mg/L	1	0.5	4	2	2	4	2	2	2	21	3	2
Sulfate	14808-79-8	mg/L	1	0.5	6	4	7	6	6	6	6	5	6	6
Silicon	7440-21-3	mg/L	0.05	0.025	0.08		LOR	LOR		LOR	LOR		LOR	LOR
Chloride	16887-00-6	mg/L	1	0.5	11	10		4	6	4	3	4	9	5
Calcium	7440-70-2	mg/L	1	0.5	4	2	4	3	4	3	3	3	3	3
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	6	4	5	3	3	3	2	3	5	2
Potassium	7/09/7440	mg/L	1	0.5	1	2	2	1	1	1	1	1	1	1
Iron	7439-89-6	mg/L	0.05	0.025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	LOR	LOR	LOR	0.02	LOR	LOR	0.02	LOR	LOR	0.01
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.002	LOR	0.001	0.001	0.001	LOR	LOR	LOR	LOR	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.285	0.36	0.232	0.266	0.252	0.233	0.21	0.27	0.26	0.281
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.004	0.002	0.003	0.003	0.002	0.002	0.003	0.003	0.003	0.003
Copper	7440-50-8	mg/L	0.001	0.0005	0.154	0.131	0.286	0.302	0.212	0.244	0.302	0.298	0.37	0.381
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.058	0.028	0.054	0.046	0.038	0.038	0.047	0.046	0.057	0.052
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.005	0.004	0.006	0.008	0.006	0.006	0.006	0.006	0.006	0.006
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	0.001	0.002	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.208	0.137	0.26	0.19	0.177	0.158	0.158	0.151	0.145	0.156
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR	0.001
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.007	0.012	0.008	0.006	LOR	0.013	0.009	0.011	0.01
Fluoride	16984-48-8	mg/L	0.1	0.05	0.3	0.2	0.2	0.2	0.2	0.2	0.4	2.7	0.2	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	0.02	LOR	LOR	0.12	LOR	0.18	0.04

Appendix A - Tabulated Laboratory Analytical Results
 Column OD_1 148187 (HEMH)



Column	OD_1 148187 (HEMH)	Week			60	61	62	64	67	68	73	74	75	76	
Sample weight (kg)	2	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.65	0.65	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR											
pH (field)		pH Unit			6.60	7.01	6.76	5.20	5.96	6.43	6.68	7.44	7.84	6.00	
Electrical Conductivity (field)		µS/cm								76.7	47	56.4	93.3	46.4	
pH Value		pH Unit	0.01		6.14	5.56	5.79	6.06	5.72	6.33	6.81	6.26	5.71	5.85	
Electrical Conductivity @ 25°C		µS/cm	1		81	29	75	91	45	74	54	45	58	49	
Total Alkalinity as CaCO3		mg/L	1	0.5	5	4	3	8	4	2	5	2	33	2	
Acidity as CaCO3		mg/L	1	0.5	4	LOR	2		2	39	3	2	2	4	
Sulfate	14808-79-8	mg/L	1	0.5	5	5	9	8	7	9	9	7	6	6	
Silicon	7440-21-3	mg/L	0.05	0.025	LOR	LOR	0.06	LOR	0.1	0.28	LOR	LOR	0.23	0.16	
Chloride	16887-00-6	mg/L	1	0.5	2	LOR	6	14	7	15	2	8	57	4	
Calcium	7440-70-2	mg/L	1	0.5	3	3	2	4	3	4	3	3	3	3	
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	1	LOR	LOR	LOR	LOR	LOR	LOR	LOR	
Sodium	7440-23-5	mg/L	1	0.5	4	2	9	10	4	10	8	3	3	3	
Potassium	7/09/7440	mg/L	1	0.5	2	LOR	1	2	3	2	LOR	LOR	LOR	1	
Iron	7439-89-6	mg/L	0.05	0.025	LOR	LOR	LOR	LOR	LOR	0.09	LOR	LOR	LOR	LOR	
Aluminium	7429-90-5	mg/L	0.01	0.005	LOR	0.02	LOR	LOR	0.01	0.01	0.05	0.02	0.01	0.02	
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.003	LOR	0.001	0.001	0.003	0.002	0.002	0.001	0.001	0.001	
Barium	7440-39-3	mg/L	0.001	0.0005	0.236	0.252	0.21	0.204	0.257	0.089	0.287	0.332	0.246	0.33	
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	0.001	LOR	LOR	0.001	0.001	0.001	0.002	0.002	LOR	
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.003	0.003	0.002	0.004	0.003	0.012	0.004	0.005	0.004	0.009	
Copper	7440-50-8	mg/L	0.001	0.0005	0.29	0.36	0.228	0.487	0.519	1.04	0.68	0.702	0.497	0.916	
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.001	LOR	LOR	
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	
Manganese	7439-96-5	mg/L	0.001	0.0005	0.05	0.057	0.034	0.086	0.068	0.196	0.071	0.103	0.078	0.169	
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.005	0.004	0.003	0.005	0.004	0.008	0.004	0.006	0.007	0.005	
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	0.002	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	
Strontium	7440-24-6	mg/L	0.001	0.0005	0.137	0.144	0.079	0.172	0.143	0.22	0.167	0.185	0.148	0.178	
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	0.001	LOR	0.002	0.002	0.002	0.002	0.002	0.002	0.002	
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	
Zinc	7440-66-6	mg/L	0.005	0.0025	0.013	0.01	0.008	0.013	0.013	0.026	0.016	0.028	0.01	0.016	
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.4	0.3	0.2	
Total Phosphorus		mg/L	0.01	0.005	0.67	0.01	LOR	LOR	LOR	0.12	LOR	0.01	1	LOR	

Appendix A - Tabulated Laboratory Analytical Results
 Column OD_1 148187 (HEMH)



Column	OD_1 148187 (HEMH)	Week			77	78	80	81	82	83	84	85	86	87
Sample weight (kg)	2	Extraction vol (L)			0.43	0.43	0.43	0.43	0.375	0.45	0.64	0.41	0.43	0.5
Key		Flushing vol (L)			0.7	0.65	0.65	0.65	0.7	0.65	0.9	0.65	0.75	0.8
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.12	5.95	7.18	5.08	7.38	6.54	5.58	6.48	4.78	5.63
Electrical Conductivity (field)		µS/cm			51.6	37.3	15.28	37	46.9	35.8	48.4	56.7	50.8	19.6
pH Value		pH Unit	0.01		6.49	6.43	6	5.98	5.79	6.02	5.95	6.37	4.91	6.4
Electrical Conductivity @ 25°C		µS/cm	1		45	42	40	63	36	47	90	53	40	24
Total Alkalinity as CaCO3		mg/L	1	0.5	6	10	3	19	5	6	1	2	4	3
Acidity as CaCO3		mg/L	1	0.5	2	2	4	LOR	LOR	3	4	6	10	4
Sulfate	14808-79-8	mg/L	1	0.5	7	4	5	4	4	4	10	7	7	4
Silicon	7440-21-3	mg/L	0.05	0.025	LOR	0.59	0.1	LOR	0.06	LOR	0.26	LOR	0.07	LOR
Chloride	16887-00-6	mg/L	1	0.5	LOR	7	LOR	LOR	LOR		5	LOR	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	2	2	2	2	2	2	4	3	2	2
Magnesium	7439-95-4	mg/L	1	0.5	1	LOR	LOR	LOR	LOR	LOR	1	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	6	4	2	2	2	3	5	4	2	1
Potassium	7/09/7440	mg/L	1	0.5	1	1	LOR	9	1	1	2	1	3	LOR
Iron	7439-89-6	mg/L	0.05	0.025	LOR	LOR	0.07	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.02	0.04	0.03	0.02	0.03	LOR	LOR	LOR	0.01	LOR
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	LOR	0.002	LOR	LOR	LOR	0.001	LOR	LOR	0.001	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.273	0.128	0.343	0.407	0.312	0.28	0.316	0.21	0.237	0.29
Cerium	7440-45-1	mg/L	0.001	0.0005	0.002	LOR	0.001	LOR	0.001	0.001	0.001	0.002	0.001	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.006	LOR	0.003	0.003	0.004	0.004	0.004	0.005	0.004	0.003
Copper	7440-50-8	mg/L	0.001	0.0005	0.633	0.006	0.587	0.49	0.553	0.587	0.608	0.825	0.579	0.425
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.001	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.105	0.005	0.067	0.076	0.088	0.091	0.103	0.103	0.071	0.067
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.004	0.015	0.003	0.004	0.003	0.004	0.003	0.004	0.003	0.002
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.162	0.023	0.125	0.095	0.12	0.133	0.139	0.194	0.11	0.082
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.002
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.013	LOR	0.011	0.011	0.016	0.011	0.015	0.013	0.012	0.018
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.7	0.1	0.2	0.2	0.2	0.3	0.1	0.2	0.2
Total Phosphorus		mg/L	0.01	0.005	0.02	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A - Tabulated Laboratory Analytical Results
 Column OD_1 148187 (HEMH)



Column	OD_1 148187 (HEMH)	Week			88	89	90	91	92	93	94	95	96	97
Sample weight (kg)	2	Extraction vol (L)			0.5	0.43	0.43	0.45	0.47	0.45	0.43	0.42	0.46	0.47
Key		Flushing vol (L)			0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit				5.19	6.20	6.14	6.13	6.77	7.05	6.56	4.59	6.09
Electrical Conductivity (field)		µS/cm			60.8	24.4	29.2	27.2	42.3	47.1	37	38.9	25.57	28.4
pH Value		pH Unit	0.01		7.37	6.27	7.12	7.9	6.12	5.2	6.27	7.98	6.41	6.11
Electrical Conductivity @ 25°C		µS/cm	1		35	32	34	48	38	30	34	30	35	31
Total Alkalinity as CaCO3		mg/L	1	0.5	4	2	20	2	2	2	4	2	LOR	6
Acidity as CaCO3		mg/L	1	0.5	10	LOR	3	LOR	4	10	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	4	3	3	4	6	4	3	4	6	4
Silicon	7440-21-3	mg/L	0.05	0.025	LOR	0.06	0.09	LOR	0.08	LOR	LOR	LOR	0.06	LOR
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	5	LOR	LOR	5	7	5	LOR	3
Calcium	7440-70-2	mg/L	1	0.5	2	1	1	2	2	2	2	2	2	2
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	3	4	3	1	2	2	2	2	2	1
Potassium	7/09/7440	mg/L	1	0.5	2	LOR	1	4	2	1	1	2	4	LOR
Iron	7439-89-6	mg/L	0.05	0.025	LOR	LOR	LOR	LOR	0.01	0.03	LOR	LOR	0.03	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.02
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.002	LOR	0.002	0.003	0.002	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.002	0.001	0.001	0.296	0.181	0.245	0.213	0.203	0.229	0.002
Barium	7440-39-3	mg/L	0.001	0.0005	0.181	0.328	0.421	0.001	0.002	0.002	0.001	0.002	0.002	0.202
Cerium	7440-45-1	mg/L	0.001	0.0005	0.001	LOR	LOR	0.005	0.006	0.004	0.005	0.005	0.005	0.002
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.004	0.003	0.006	0.621	0.737	0.609	0.654	0.59	0.716	0.004
Copper	7440-50-8	mg/L	0.001	0.0005	0.518	0.432	0.587	LOR	0.001	LOR	LOR	LOR	LOR	0.623
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.001	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.092	0.096	0.088	0.087	0.087	0.092	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.077	0.065	0.101	0.003	0.003	0.003	0.003	0.003	0.003	0.077
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.004	0.002	0.003	LOR	0.002	LOR	LOR	LOR	LOR	0.003
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.116	0.124	0.11	0.11	0.099	0.103	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.116	0.072	0.09	LOR	LOR	LOR	LOR	LOR	LOR	0.096
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.002	0.003	0.002	0.002	0.002	0.003	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.002	0.002	0.002	LOR	LOR	LOR	LOR	LOR	LOR	0.003
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	0.031	0.016	0.013	0.008	0.011	0.034	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.012	0.027	0.033	LOR	LOR	LOR	LOR	LOR	LOR	0.012
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.7	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A - Tabulated Laboratory Analytical Results
 Column OD_1 148187 (HEMH)



Column	OD_1 148187 (HEMH)	Week			98	99	100	101	102	103	104	105	106	107
Sample weight (kg)	2	Extraction vol (L)			0.46	0.46	0.46	0.46	0.48	0.46	0.49	0.47	0.46	0.48
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			4.47	5.91	6.16	5.35		7.34	5.99	6.42	5.48	5.75
Electrical Conductivity (field)		µS/cm			41.6	26.1	52.5	25.87	39.7	20.1	27	34.6	43.2	31.9
pH Value		pH Unit	0.01		6.54	6.35	6.68	7.68	6.5	6.11	6.18	6.28	6.3	6.16
Electrical Conductivity @ 25°C		µS/cm	1		29	28	36	25	18	26	24	21	28	24
Total Alkalinity as CaCO3		mg/L	1	0.5	4	LOR	LOR	2	5	3	3	1	8	8
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR		LOR
Sulfate	14808-79-8	mg/L	1	0.5	4	5	6	4	4	4	4	13	4	2
Silicon	7440-21-3	mg/L	0.05	0.025	LOR	LOR	LOR	LOR	LOR	---	0.06	LOR	0.07	0.05
Chloride	16887-00-6	mg/L	1	0.5	4	4	3	LOR	LOR	LOR	LOR	1	3	5
Calcium	7440-70-2	mg/L	1	0.5	1	1	2	1	1	1	2	1	1	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	2	2	2	1	LOR	1	1	2	LOR	1
Potassium	7/09/7440	mg/L	1	0.5	2	2	2	2	LOR	LOR	LOR	LOR	3	2
Iron	7439-89-6	mg/L	0.05	0.025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.03	0.01	0.02	0.01	LOR	0.01	0.02	0.12	0.02	0.02
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	LOR	0.001	LOR	0.002	LOR	LOR	LOR	0.002	0.002	0.001
Barium	7440-39-3	mg/L	0.001	0.0005	0.227	0.152	0.195	0.188	0.2	0.184	0.219	0.174	0.295	0.255
Cerium	7440-45-1	mg/L	0.001	0.0005	0.002	LOR	0.002	LOR	LOR	0.002	0.001	0.002	0.001	0.002
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.004	0.004	0.007	0.004	LOR	0.005	0.006	0.006	0.005	0.006
Copper	7440-50-8	mg/L	0.001	0.0005	0.692	0.495	0.831	0.419	0.552	0.554	0.653	0.562	0.648	0.811
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.088	0.071	0.117	0.066	0.079	0.078	0.101	0.091	0.087	0.092
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.003	0.003	0.004	0.002	LOR	0.002	0.002	0.003	0.003	0.003
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.084	0.065	0.109	0.048	0.069	0.07	0.077	0.069	0.059	0.078
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.003	0.002	0.004	0.002	LOR	0.004	0.004	0.003	0.003	0.004
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.012	0.014	0.016	0.009	LOR	0.02	0.014	0.011	0.013	0.012
Fluoride	16984-48-8	mg/L	0.1	0.05	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A - Tabulated Laboratory Analytical Results
 Column OD_1 148187 (HEMH)



Column	OD_1 148187 (HEMH)	Week			108	109	110	111	112	113	114	115	116	117
Sample weight (kg)	2	Extraction vol (L)			0.48	0.47	0.47	0.46	0.675	0.675	0.46	0.47	0.47	0.48
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.9	0.9	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.56	6.75	6.25	5.74	5.99	5.50	5.69	6.67	7.12	7.33
Electrical Conductivity (field)		µS/cm			32.7	27.4	26.8	26.7	26.9	27.4	23.54	21.72	23.51	19.28
pH Value		pH Unit	0.01		6.68	6.41	5.89	5.99	5.99	6.22	5.98	6.26	6.78	6.41
Electrical Conductivity @ 25°C		µS/cm	1		24	22	22	38	32	27	50	23	23	21
Total Alkalinity as CaCO3		mg/L	1	0.5	4	2	2	20	2	4	5	4	1	5
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	4	2	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	5	4	4	5	6	5	4	5	10	3
Silicon	7440-21-3	mg/L	0.05	0.025	LOR	0.08	LOR	0.12	0.07	LOR	LOR	LOR	0.11	LOR
Chloride	16887-00-6	mg/L	1	0.5	1		LOR	LOR	3	LOR	2		1	6
Calcium	7440-70-2	mg/L	1	0.5	1	1	1	2	2	2	1	2	2	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	LOR	4	LOR	2	2	LOR	LOR	LOR	4	LOR
Potassium	7/09/7440	mg/L	1	0.5	LOR	3	1	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.05	0.025	LOR	LOR	0.18	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.03	LOR	0.03	LOR	0.02	0.04	LOR	LOR	LOR	0.06
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	LOR	LOR	0.002	LOR	0.001	0.001	LOR	LOR	LOR	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.199	0.197	0.121	0.146	0.143	0.226	0.148	0.253	0.13	0.24
Cerium	7440-45-1	mg/L	0.001	0.0005	0.002	0.001	0.002	LOR	0.003	0.003	LOR	LOR	LOR	0.002
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.006	0.005	0.005	0.006	0.03	0.008	0.007	0.007	0.006	0.006
Copper	7440-50-8	mg/L	0.001	0.0005	0.706	0.636	0.66	0.707	3.17	1.07	0.675	0.551	0.581	0.768
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	0.001	LOR	0.002	0.002	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.104	0.09	0.092	0.113	0.389	0.14	0.112	0.114	0.113	0.097
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.003	0.002	0.002	0.003	0.006	0.004	0.002	0.002	0.001	0.002
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.002	0.002	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.087	0.069	0.073	0.097	0.167	0.127	0.096	0.066	0.072	0.067
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.005	0.004	0.004	0.001	0.013	0.006	0.002	0.002	0.002	0.005
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.013	0.014	0.012	0.013	0.051	0.022	0.014	0.014	0.016	0.025
Fluoride	16984-48-8	mg/L	0.1	0.05	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A - Tabulated Laboratory Analytical Results
 Column OD_1 148187 (HEMH)



Column	OD_1 148187 (HEMH)	Week			118	119	120	121	122	125	129	131	135	139
Sample weight (kg)	2	Extraction vol (L)			0.675	0.47	0.46	0.48	0.49	0.48	0.48	0.48	0.46	0.46
Key		Flushing vol (L)			0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.20	6.30	6.10	5.28	5.34	5.95	8.40	6.71	7.28	5.44
Electrical Conductivity (field)		µS/cm			20.67	19.13	19.47	26.2	25.13	26.87	22.96	24.4	34.2	36.5
pH Value		pH Unit	0.01		5.88	5.55	7.1	6.96	5.38	6.45	6.01	5.77	6.52	6.93
Electrical Conductivity @ 25°C		µS/cm	1		24	18	17	28		24	39	23	26	40
Total Alkalinity as CaCO3		mg/L	1	0.5	2	4	4	LOR		4	LOR	2	4	LOR
Acidity as CaCO3		mg/L	1	0.5	4	LOR	4	LOR	2	4		1	4	4
Sulfate	14808-79-8	mg/L	1	0.5	5	LOR	3	5	6	5	30	2	6	5
Silicon	7440-21-3	mg/L	0.05	0.025	0.06	LOR	LOR	LOR	7	LOR	0.27	LOR	0.07	LOR
Chloride	16887-00-6	mg/L	1	0.5	1	5	2	2	2	2	2	5	2	4
Calcium	7440-70-2	mg/L	1	0.5	1	LOR	1	2	LOR	1	5	LOR	1	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	1	LOR	2	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	LOR	1	LOR	3	LOR	LOR	4	1	LOR	LOR
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	1	2
Iron	7439-89-6	mg/L	0.05	0.025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.02	LOR	LOR	0.01	LOR	LOR	0.05	0.11	0.01	0.01
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.003	LOR	LOR	0.002	0.254	LOR	LOR	0.001	0.001	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.146	0.19	0.207	0.234	0.001	0.257	0.119	0.158	0.275	0.169
Cerium	7440-45-1	mg/L	0.001	0.0005	0.005	LOR	LOR	0.005	0.007	0.004	LOR	0.002	0.003	0.004
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.03	0.007	0.006	0.008	1.02	0.006	0.005	0.005	0.007	0.009
Copper	7440-50-8	mg/L	0.001	0.0005	2.94	0.625	0.723	1.31	LOR	1.19	0.798	0.686	1.15	1.04
Lanthanum	7439-91-0	mg/L	0.001	0.0005	0.002	LOR	LOR	0.002	LOR	0.002	LOR	LOR	0.001	0.002
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.122	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.422	0.119	0.096	0.138	0.002	0.112	0.088	0.078	0.117	0.142
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.006	0.002	0.002	0.004	LOR	0.003	0.002	0.002	0.003	0.002
Nickel	7440-02-0	mg/L	0.001	0.0005	0.002	LOR	LOR	LOR	0.114	LOR	0.001	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.159	0.067	0.094	0.118	LOR	0.095	0.074	0.05	0.092	0.073
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.003	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.012	0.002	0.002	0.007	LOR	0.006	0.001	0.003	0.005	0.006
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.017	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.046	0.016	0.018	LOR	0.2	0.015	0.016	0.014	0.016	0.024
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.1	0.2	0.2		LOR	0.1	0.1	0.2	0.1
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A - Tabulated Laboratory Analytical Results
 Column OD_1 148187 (HEMH)



Column	OD_1 148187 (HEMH)	Week			148	150	152	156	161	165	169	174
Sample weight (kg)	2	Extraction vol (L)			0.44	0.38	0.475	0.49	0.475	0.49	0.47	0.48
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR								
pH (field)		pH Unit			6.80	6.52	5.08	6.11	7.73	5.13	5.47	6.31
Electrical Conductivity (field)		µS/cm			64.8	46.6	34.4	56.1	24.95	18.39	39	56.7
pH Value		pH Unit	0.01		5.49	5.64	5.69	6.58	6.5	5.87	5.37	5.92
Electrical Conductivity @ 25°C		µS/cm	1		29	31	34	133	27	20	42	56
Total Alkalinity as CaCO3		mg/L	1	0.5	LOR	2	2	9	LOR	LOR	5	13
Acidity as CaCO3		mg/L	1	0.5	LOR	4	LOR	4	4	4	4	6
Sulfate	14808-79-8	mg/L	1	0.5	6	9	7	6	7	5	5	5
Silicon	7440-21-3	mg/L	0.05	0.025	LOR	0.12	LOR	LOR	0.4	0.19	0.05	LOR
Chloride	16887-00-6	mg/L	1	0.5	2	21	2	2	LOR	LOR	5	5
Calcium	7440-70-2	mg/L	1	0.5	1	3	2	1	2	1	LOR	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	4	LOR	LOR	LOR	LOR	3	LOR
Sodium	7440-23-5	mg/L	1	0.5	LOR	6	1	1	1	LOR	LOR	1
Potassium	7/09/7440	mg/L	1	0.5	LOR	1	2	2	LOR	LOR	5	8
Iron	7439-89-6	mg/L	0.05	0.025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	LOR	0.01	0.02	0.01	0.01	LOR	LOR	0.01
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	LOR	0.001	0.001	0.001	0.002	0.001	LOR	0.001
Barium	7440-39-3	mg/L	0.001	0.0005	0.128	0.122	0.15	0.154	0.164	0.191	0.119	0.182
Cerium	7440-45-1	mg/L	0.001	0.0005	0.005	0.006	0.008	0.005	0.006	0.004	0.006	0.008
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.01	0.015	0.014	0.012	0.012	0.007	0.009	0.01
Copper	7440-50-8	mg/L	0.001	0.0005	1.25	1.38	1.73	1.44	1.51	1.08	1.02	1.21
Lanthanum	7439-91-0	mg/L	0.001	0.0005	0.002	0.003	0.004	0.002	0.003	0.002	0.002	0.003
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.141	0.193	0.189	0.195	0.183	0.094	0.11	0.123
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.002
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.077	0.082	0.11	0.089	0.091	0.072	0.062	0.075
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.006	0.009	0.01	0.009	0.01	0.006	0.006	0.009
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.02	0.021	0.022	0.017	0.021	0.016	0.017	0.022
Fluoride	16984-48-8	mg/L	0.1	0.05	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_2 148207 (GRNL)



Column	148207	Week			0	4	8	12	16	17	18	20	21	22
Sample weight (kg)	2.512	Extraction vol (L)			0.625	0.375	0.375	0.625	0.42	0.42	0.42	0.42	0.42	0.45
Key		Flushing vol (L)			1.6	1.35	1.3	1.6	1.2	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.32	8.73	8.88	8.27	8.15	8.45	6.39	7.95	6.7	7.42
Electrical Conductivity (field)		µS/cm			1590	563	350	213	292	156	120	105	84	58
pH Value		pH Unit	0.01		7.9		7.4	7.23	7.44	7.12	7.2	7.3	7.41	7.08
Electrical Conductivity @ 25°C		µS/cm	1		2120		362	196	314	163	135	118	80	68
Total Alkalinity as CaCO3		mg/L	1	0.5	12	12	13	23	29	14	27	28	9	9
Acidity as CaCO3		mg/L	1	0.5	LOR	4	1	2	3	4	2	2	7	1
Sulfate	14808-79-8	mg/L	1	0.5	21	10	10	9	14	11	6	8	6	6
Silicon	7440-21-3	mg/L	0.05	0.025	2.31	0.29	0.54		1	0.63	0.44	0.56	0.56	0.44
Chloride	16887-00-6	mg/L	1	0.5					64	32	25	26		14
Calcium	7440-70-2	mg/L	1	0.5	7				3	1	1	2	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	1				LOR	LOR	LOR	1	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	288				53	26	25	24	15	10
Potassium	7/09/7440	mg/L	1	0.5	26				8	8	4	6	3	2
Iron	7439-89-6	mg/L	0.01	0.005	LOR	0.07	0.2	0.24	0.51	0.88	0.63	0.58	0.26	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.02	0.17	0.19	0.19	0.98	0.34	0.41	0.53	0.57	0.03
Antimony	7440-36-0	mg/L	0.001	0.0005	0.012	0.001	0.001	LOR	0.003	LOR	LOR	LOR	0.001	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.028	0.011	0.015	0.01	0.02	0.016	0.012	0.014	0.011	0.007
Barium	7440-39-3	mg/L	0.001	0.0005	0.276	0.334	0.377	0.222	0.424	0.348	0.343	0.317	0.304	0.241
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	0.004	0.012	0.011	0.029	0.027	0.029	0.021	0.024	0.009
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.005	0.02	0.071	0.068	0.218	0.087	0.09	0.103	0.074	0.052
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	0.002	0.007	0.006	0.018	0.015	0.014	0.017	0.01	0.005
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	0.001	0.001	0.003	0.002	0.001	0.002	0.001	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.018	0.01	0.016	0.013	0.035	0.015	0.015	0.016	0.013	0.007
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.482	0.131	0.116	0.051	0.173	0.097	0.086	0.082	0.064	0.035
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.179	0.068	0.052		0.059	0.027	0.024	0.03	0.022	0.012
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR		0.002	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.058	0.035	0.029		0.032	0.018	0.025	0.017	0.012	0.009
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.006	LOR	LOR	0.012	0.012	LOR	0.014	0.02	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.7	1	1.2	1	2.1	1	0.2	1.5	1.1	0.42
Total Phosphorus		mg/L	0.01	0.005	LOR				LOR	LOR	0.06	0.09	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_2 148207 (GRNL)



Column	148207	Week			23	24	25	26	28	29	30	31	32	35
Sample weight (kg)	2.512	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.65	0.65	0.65	0.65	0.7	0.7	0.65	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.6	7.55	7.17	7	6.36	7.06	6.56	7.25	7.22	6.65
Electrical Conductivity (field)		µS/cm			50	71	37	33	27					
pH Value		pH Unit	0.01		5.47	7.05	6.58	7.91	6.35		6.49	7.28	6.81	6.11
Electrical Conductivity @ 25°C		µS/cm	1		58		39	38	35		42	72	48	35
Total Alkalinity as CaCO3		mg/L	1	0.5	4	12	7	7	5		6	13	9	5
Acidity as CaCO3		mg/L	1	0.5	LOR	1	LOR	2	LOR	4	LOR	LOR	5	2
Sulfate	14808-79-8	mg/L	1	0.5	4	6	4	4	4	5	4	6	5	4
Silicon	7440-21-3	mg/L	0.05	0.025	0.39	0.51	0.86	0.34	0.15	0.59	0.37	0.21	0.24	0.12
Chloride	16887-00-6	mg/L	1	0.5	12		11	3	3		13		9	5
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	1	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	8	15	9	8	8	6	9	10	9	6
Potassium	7/09/7440	mg/L	1	0.5	2	2	2	2	2	2	2	2	2	1
Iron	7439-89-6	mg/L	0.01	0.005	0.22	0.13	0.06	LOR	0.05	0.11	0.18	LOR	0.07	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.21	0.03	0.09	0.07	0.05	0.1	0.19	0.11	0.33	0.07
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.007	0.008	0.007	0.005	0.002	0.008	0.006	0.007	0.008	0.002
Barium	7440-39-3	mg/L	0.001	0.0005	0.26	0.206	0.181	0.157	0.097	0.18	0.16	0.106	0.157	0.125
Cerium	7440-45-1	mg/L	0.001	0.0005	0.015	0.002	LOR	0.002	LOR	LOR	0.005	LOR	0.001	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.073	0.028	0.012	0.018	0.008	0.017	0.019	0.012	0.018	0.008
Lanthanum	7439-91-0	mg/L	0.001	0.0005	0.008	0.001	LOR	LOR	0.001	LOR	0.002	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	0.004	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.012	0.004	0.007	0.004	0.002	0.003	0.003	0.003	0.004	0.002
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.039	0.066	0.028	0.044	0.02	0.046	0.03	0.041	0.036	0.021
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	0.003	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.013	0.016	0.018	0.009	0.006	0.021	0.01	0.012	0.011	0.008
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.007	0.018	0.014	0.014	0.013	0.031	0.017	0.027	0.029	0.014
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025		LOR	0.114	LOR	0.022	LOR	0.113	0.018	0.019	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.6	0.8	LOR	0.6	1.1		0.5	1	0.7	0.6
Total Phosphorus		mg/L	0.01	0.005	0.01	0.02	LOR	LOR	LOR	LOR	LOR	LOR	0.06	0.02

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_2 148207 (GRNL)



Column	148207	Week			36	37	38	39	40	43	44	46	47	48
Sample weight (kg)	2.512	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.675	0.675	0.675	0.7	0.65	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.94	7.2	6.56	7.1	6.3	6.5	6.68	6.3		6.42
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		9.72	6.42	7.11	8.81	6.91	5.89	7.52	6.55	6.88	6.6
Electrical Conductivity @ 25°C		µS/cm	1		93	37	33	29	45.00	47	90	25	34	25
Total Alkalinity as CaCO3		mg/L	1	0.5	34	5	21	27	19.00	4		2	7	10
Acidity as CaCO3		mg/L	1	0.5	LOR	1	1	LOR		2	4	3	LOR	2
Sulfate	14808-79-8	mg/L	1	0.5	2	4	3	2	4.00	3	7	3	4	3
Silicon	7440-21-3	mg/L	0.05	0.025	0.24	0.22	0.22	0.26	0.19		0.56	0.13	0.23	0.3
Chloride	16887-00-6	mg/L	1	0.5	5	6	3	4	4.00	LOR	8	2	2	LOR
Calcium	7440-70-2	mg/L	1	0.5	2	LOR	LOR	1	LOR	LOR	2	LOR	LOR	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	1	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	13	6	8	8	9.00	5	14	4	6	5
Potassium	7/09/7440	mg/L	1	0.5	1	1	2	2	1.00	1	2	1	1	1
Iron	7439-89-6	mg/L	0.01	0.005	0.08	0.08	0.12	0.09	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.1	0.09	0.11	0.2	0.08	0.06	0.09	0.13	0.22	0.12
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.005	0.005	0.004	0.004	0.01	0.003	0.007	0.002	0.003	0.003
Barium	7440-39-3	mg/L	0.001	0.0005	0.132	0.125	0.125	0.126	0.11	0.165	0.176	0.104	0.084	0.127
Cerium	7440-45-1	mg/L	0.001	0.0005	0.001	0.001	0.001	0.002	LOR	LOR	0.001	0.001	0.001	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.012	0.014	0.016	0.017	0.02	0.012	0.026	0.014	0.016	0.009
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.002	LOR	LOR	LOR	LOR	0.001	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.003	0.002	0.003	0.003	0.00	0.005	0.004	0.003	0.003	0.003
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.032	0.03	0.026	0.03	0.03	0.022	0.08	0.018	0.019	0.028
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.01	0.008	0.007	0.008	0.01	0.014	0.025	0.008	0.008	0.016
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.017	0.02	0.013	0.011	0.02	0.008	0.026	0.009	0.012	0.017
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	0.006	0.006	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.5	0.5	0.4		0.40	0.4		0.1	0.5	0.5
Total Phosphorus		mg/L	0.01	0.005	LOR	0.01	LOR	LOR	0.02	LOR	0.02	0.05	0.05	0.05

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_2 148207 (GRNL)



Column	148207	Week			50	51	52	53	54	55	56	57	58	59
Sample weight (kg)	2.512	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.69	7.09	7.36	6.46	6.26	6.69	6.95	6.48	6.53	6.94
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		5.94	5.46	6.88	6.6	6.4	6.78	6.68	5.49	6.7	6.72
Electrical Conductivity @ 25°C		µS/cm	1		24	27	33	25	35	34	26	3	25	29
Total Alkalinity as CaCO3		mg/L	1	0.5	6	5	11	10	7	9	8	2	8	36
Acidity as CaCO3		mg/L	1	0.5	3	2	2	2	2	2	2	5	2	2
Sulfate	14808-79-8	mg/L	1	0.5	3	3	3	3	3	9	3	3	3	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.17	0.24	0.31	0.3	0.33	0.29	0.24	0.19	0.1344	0.24
Chloride	16887-00-6	mg/L	1	0.5	LOR	9	2	LOR	2	LOR	LOR	LOR	7	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	1	1	2	2	1	1	LOR	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	3	4	5	5	4	4	4	4	5	3
Potassium	7/09/7440	mg/L	1	0.5	LOR	1	1	1	1	1	1	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.02	0.04	0.05	0.12	0.14	0.03	0.09	0.05	0.13	0.1
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.002	0.002	0.003	0.003	0.003	0.002	0.003	0.003	0.002	0.002
Barium	7440-39-3	mg/L	0.001	0.0005	0.061	0.095	0.145	0.127	0.121	0.136	0.129	0.137	0.135	0.148
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.004	0.004	0.005	0.009	0.011	0.012	0.012	0.012	0.018	0.011
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.014	0.003	0.004	0.003	0.005	0.002	0.004	0.003	0.004	LOR
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.01	0.017	0.018	0.028	0.022	0.016	0.019	0.018	0.012	0.017
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.008	0.011	0.016	0.016	0.017	0.017	0.016	0.014	0.011	0.013
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.002	0.003	0.005	0.017	0.011	0.008	0.009	0.008	0.005	0.007
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	0.007	LOR	LOR	LOR	0.024	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.5	0.4	0.4	0.5	0.3	0.4	0.5	0.4	0.2	0.3
Total Phosphorus		mg/L	0.01	0.005	LOR	0.07	0.03	0.05	LOR	LOR	LOR	LOR	0.02	0.05

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_2 148207 (GRNL)



Column	148207	Week			60	61	62	64	67	68	73	74	75	76
Sample weight (kg)	2.512	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.65	0.65	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.89	7.59	6.81		7.18	7.67	7.18	7.65	7.94	6.49
Electrical Conductivity (field)		µS/cm								31.1	26	52.3	33	45.6
pH Value		pH Unit	0.01		6.74	6.32	5.93	6.67	6.6	6.91	7.01	6.87	5.79	6.68
Electrical Conductivity @ 25°C		µS/cm	1		39	19	29	32	31	29	30	32	37	47
Total Alkalinity as CaCO3		mg/L	1	0.5	23	7	4	4	5	8	8	6	3	19
Acidity as CaCO3		mg/L	1	0.5	4	2	2	LOR	1	20	2	LOR	1	2
Sulfate	14808-79-8	mg/L	1	0.5	3	3	3	5	3	4	4	4	3	6
Silicon	7440-21-3	mg/L	0.05	0.025	0.2	0.14	0.14	0.08	0.12	0.45	0.08	0.3	0.44	0.54
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	2	LOR	2	1	LOR	4	13	LOR
Calcium	7440-70-2	mg/L	1	0.5	1	LOR	LOR	LOR	LOR	2	LOR	1	1	2
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	9	2	4	4	5	3	5	4	4	5
Potassium	7/09/7440	mg/L	1	0.5	2	LOR	LOR	2	2	1	1	1	LOR	2
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	0.08	LOR	0.06	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.07	0.08	0.04	0.01	0.08	0.05	0.09	0.2	0.1	0.1
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.004
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.002	LOR	0.002	0.002	LOR	0.002	0.002	0.002	0.002	0.003
Barium	7440-39-3	mg/L	0.001	0.0005	0.18	0.104	0.072	0.095	0.096	0.075	0.103	0.235	0.155	0.166
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.008	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.002	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	LOR	0.014	0.008	0.013	0.018	0.01	0.016	0.027	0.057	0.017
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	0.003	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.006	0.004	0.001	0.005	0.005	0.004	0.003	0.007	0.034	0.007
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.018	0.013	0.008	0.008	0.019	0.021	0.014	0.015	0.015	0.034
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.001	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.016	0.01	0.007	0.013	0.013	0.019	0.013	0.02	0.04	0.031
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.004	0.006	0.001	0.007	0.007	0.006	0.004	0.002	0.004	0.009
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.005	LOR	LOR	0.132	0.132	0.005	LOR	0.054	LOR	
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.2	0.2	0.4	0.3	0.4	0.1	0.4	0.5	0.7
Total Phosphorus		mg/L	0.01	0.005	0.42	0.05	0.01	LOR	0.56	0.02	LOR	0.02	1	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_2 148207 (GRNL)



Column	148207	Week			77	78	80	81	82	83	84	85	86	87
Sample weight (kg)	2.512	Extraction vol (L)			0.43	0.43	0.43	0.43	0.375	0.45	0.64	0.44	0.44	0.5
Key		Flushing vol (L)			0.7	0.65	0.65	0.65	0.7	0.55	0.9	0.65	0.75	0.8
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.83	6.44	6.51	6.20	8.14	7.15	6.34	7.19	5.00	6.57
Electrical Conductivity (field)		µS/cm			68.4	31.9	28	20	43.9	45.7	17.4	30.1	29.7	12.8
pH Value		pH Unit	0.01		6.68	6.68	5.97	5	6.61	6.42	6.64	6.72	5.89	6.55
Electrical Conductivity @ 25°C		µS/cm	1		47	47	26	54	28	27	27	28	28	15
Total Alkalinity as CaCO3		mg/L	1	0.5	19	19	LOR	3	8	24	6	3	4	3
Acidity as CaCO3		mg/L	1	0.5	2	2	2	5	LOR	2	1	1	1	LOR
Sulfate	14808-79-8	mg/L	1	0.5	6	6	3	3	3	4	4	3	4	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.54	0.54	0.22	0.24	0.42	0.22	0.38	0.18	0.18	0.12
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR		LOR	LOR	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	2	2	LOR	LOR	2	1	2	LOR	1	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	5	5	3	3	2	4	2	3	3	2
Potassium	7/09/7440	mg/L	1	0.5	2	2	LOR	1	1	1	1	1	2	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.1	0.1	0.05	0.06	0.07	0.03	0.06	0.06	0.07	0.07
Antimony	7440-36-0	mg/L	0.001	0.0005	0.004	0.004	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.003	0.003	LOR	LOR	LOR	0.002	0.002	0.003	0.002	0.001
Barium	7440-39-3	mg/L	0.001	0.0005	0.166	0.166	0.102	0.13	0.126	0.161	0.181	0.103	0.12	0.104
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.001
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.017	0.017	0.024	0.019	0.011	0.019	0.018	0.018	0.034	0.029
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.004
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.002	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.007	0.007	0.005	0.004	0.005	0.006	0.01	0.004	0.004	0.004
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.034	0.034	0.014	0.015	0.013	0.012	0.016	0.022	0.017	0.01
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.031	0.031	0.013	0.013	0.017	0.013	0.02	0.013	0.014	0.008
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.009	0.009	0.004	0.004	0.006	0.004	0.005	0.009	0.006	0.003
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025			LOR	LOR	0.008	LOR	0.078	LOR	0.007	0.016
Fluoride	16984-48-8	mg/L	0.1	0.05	0.7	0.7	0.3	0.4	0.6	0.5	0.5	0.3	0.4	LOR
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_2 148207 (GRNL)



Column	148207	Week			88	89	90	91	92	93	94	95	96	97
Sample weight (kg)	2.512	Extraction vol (L)			0.5	0.43	0.43	0.43	0.43	0.46	0.45	0.46	0.46	0.47
Key		Flushing vol (L)			0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit				6.59	7.02	7.62	6.94	7.01	7.63	7.11	6.06	7.20
Electrical Conductivity (field)		µS/cm			30.2	16.8	20.3	32.8	35.2	21.9	16.1	15.38	19.06	22.5
pH Value		pH Unit	0.01		7.35	8.4	7.23	8.07	6.55	6.11	6.87	7.93	6.42	6.3
Electrical Conductivity @ 25°C		µS/cm	1		22	18	25	25	34	21	26	16	16	31
Total Alkalinity as CaCO3		mg/L	1	0.5	7	4	LOR	7	6		16	3	LOR	LOR
Acidity as CaCO3		mg/L	1	0.5	10	LOR	3	2	LOR	LOR	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	6	2	2	2	4	2	1	2	11	3
Silicon	7440-21-3	mg/L	0.05	0.025	0.12	0.06	0.16	0.12	0.3	0.07	0.1	0.08	0.12	0.14
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	3	3	3	LOR	3
Calcium	7440-70-2	mg/L	1	0.5	1	LOR	1	LOR	2	LOR	1	LOR	2	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	8	3	2	2	3	2	3	2	LOR	3
Potassium	7/09/7440	mg/L	1	0.5	1	LOR	LOR	LOR	1	LOR	1	1	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	0.04	0.04	0.04	0.04	0.02	0.04	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.03	0.03	0.08	LOR	LOR	LOR	LOR	LOR	LOR	0.04
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.002	LOR	0.002	0.002	LOR	0.002	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.002	0.001	0.023	0.132	0.105	0.111	0.133	0.118	0.129	0.002
Barium	7440-39-3	mg/L	0.001	0.0005	0.098	0.084	0.396	LOR	LOR	LOR	LOR	LOR	LOR	0.112
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	0.002	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	0.018	0.027	0.019	0.022	0.022	0.022	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.017	0.018	0.004	LOR	LOR	LOR	LOR	LOR	LOR	0.022
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	0.002	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.004	0.005	0.004	0.005	0.004	0.004	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.004	0.003	0.003	0.013	0.012	0.011	0.01	0.009	0.01	0.004
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.014	0.01	0.022	LOR	0.002	LOR	LOR	LOR	LOR	0.01
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.011	0.016	0.012	0.013	0.01	0.01	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.012	0.007	0.05	LOR	LOR	LOR	LOR	LOR	LOR	0.014
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.003	0.004	0.003	0.003	0.003	0.003	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.006	0.006	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.002
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	0.007	0.011	0.007	0.005	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.4	0.3	0.2	0.3	0.5	0.3	0.3	0.4	0.8	0.4
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_2 148207 (GRNL)



Column	148207	Week			98	99	100	101	102	103	104	105	106	107
Sample weight (kg)	2.512	Extraction vol (L)			0.47	0.47	0.47	0.46	0.48	0.47	0.46	0.49	0.48	0.48
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.59	6.28	6.88	6.57		7.63	8.70	7.08	5.83	7.44
Electrical Conductivity (field)		µS/cm			22.4	16.35	20.19	15.55	25.5	22.6	22.2	36.3	52.2	17.71
pH Value		pH Unit	0.01		7.02	6.22	6.94	7.72	7.74	6.53	6.65	6.67	6.62	6.54
Electrical Conductivity @ 25°C		µS/cm	1		21	21	23	19	19	20	15	18	21	14
Total Alkalinity as CaCO3		mg/L	1	0.5	5	LOR	6	3	5	5	LOR	1	10	6
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	3	4	3	2	2		2	6	2	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.1	0.08	0.09	0.08	0.08	---	0.12	0.14	0.08	0.07
Chloride	16887-00-6	mg/L	1	0.5	1	4	1	LOR	LOR	LOR	5	LOR	2	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	1	LOR	1	---	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	---	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	2	2	2	2	2	---	2	2	1	1
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	---	LOR	LOR	2	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.03	0.02	0.03	0.02	LOR	0.02	LOR	0.03	0.02	0.03
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	LOR	0.001	0.001	0.001	LOR	0.001	LOR	0.002	0.001	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.12	0.107	0.123	0.116	0.137	0.1	0.093	0.105	0.126	0.119
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.019	0.019	0.021	0.011	0.026	0.018	0.017	0.019	0.028	0.021
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.004	0.004	0.004	0.004	0.005	0.003	LOR	0.004	0.004	0.003
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.009	0.008	0.009	0.005	0.006	0.006	0.004	0.007	0.004	0.004
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.012	0.01	0.012	0.009	0.011	0.01	0.005	0.012	0.009	0.01
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.002	0.002	0.003	LOR	LOR	0.003	0.001	0.002	0.002	0.002
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	0.005	LOR	LOR	0.006	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.3	0.3	0.4	0.2	0.3	0.3	0.2	0.9	0.3	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_2 148207 (GRNL)



Column	148207	Week			108	109	110	111	112	113	114	115	116	117
Sample weight (kg)	2.512	Extraction vol (L)			0.465	0.46	0.465	0.49	0.675	0.663	0.4	0.46	0.46	0.48
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.9	0.9	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.93	7.13	6.69	6.62	6.99	6.44	6.14	7.24	7.68	7.32
Electrical Conductivity (field)		µS/cm			21.8	18.41	11.48	17.44	24.4	15.55	15.06	12.14	12.09	10.81
pH Value		pH Unit	0.01		6.92	6.61	6.32	6.53	6.66	6.6	6.05	6.41	6.19	6.44
Electrical Conductivity @ 25°C		µS/cm	1		18	15	14	27	32	18	15	12	12	13
Total Alkalinity as CaCO3		mg/L	1	0.5	4	2	2	7	10	5	1	2	2	5
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	2	2	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	4	2	2	3	4	3	2	2	3	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.05	0.06	0.06	0.08	0.37	0.1	0.08	0.08	0.05	0.06
Chloride	16887-00-6	mg/L	1	0.5	1	LOR	LOR	LOR	3	LOR	3	9	1	14
Calcium	7440-70-2	mg/L	1	0.5	1	LOR	LOR	LOR	2	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	LOR	1	1	2	2	2	1	1	1	1
Potassium	7/09/7440	mg/L	1	0.5	1	LOR	LOR	LOR	1	1	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	0.13	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.03	0.02	0.03	0.01	0.03	0.06	0.02	0.02	0.01	0.06
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.002	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	LOR	LOR	0.002	0.001	0.002	0.002	LOR	0.001	LOR	0.002
Barium	7440-39-3	mg/L	0.001	0.0005	0.138	0.113	0.104	0.07	0.18	0.354	0.071	0.078	0.077	0.123
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.02	0.021	0.026	0.008	0.042	0.026	0.009	0.01	0.013	0.054
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.005	0.003	0.003	0.003	0.008	0.013	0.002	0.002	0.002	0.008
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.007	0.005	0.004	0.007	0.011	0.01	0.005	0.004	0.003	0.004
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.012	0.01	0.009	0.009	0.02	0.038	0.008	0.006	0.007	0.012
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.002	0.002	0.002	LOR	0.003	0.004	LOR	LOR	LOR	0.002
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.036
Fluoride	16984-48-8	mg/L	0.1	0.05	0.3	0.2	0.2	0.2	0.7	0.4	0.2	0.2	0.2	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_2 148207 (GRNL)



Column	148207	Week			118	119	120	121	122	125	129	131	135	139
Sample weight (kg)	2.512	Extraction vol (L)			0.675	0.44	0.47	0.49	0.47	0.48	0.45	0.44	0.45	0.44
Key		Flushing vol (L)			0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.07	7.40	6.86	6.33	6.07	6.73	8.80	7.15	7.53	5.94
Electrical Conductivity (field)		µS/cm			16.48	14.2	15.95	14.67	15.53	20.75	15.44	21.9	22.35	20.76
pH Value		pH Unit	0.01		5.58	5.74	6.96	7.11	6.07	6.8	6.46	6.27	6.63	7.11
Electrical Conductivity @ 25°C		µS/cm	1		25	14	14	16	15	19	17	17	22	23
Total Alkalinity as CaCO3		mg/L	1	0.5	4	5	5	2	2	5	1	3	3	LOR
Acidity as CaCO3		mg/L	1	0.5	2	LOR	2	LOR	2	2		LOR	2	8
Sulfate	14808-79-8	mg/L	1	0.5	3	1	2	3	2	3	2	2	3	3
Silicon	7440-21-3	mg/L	0.05	0.025	0.29	0.07	0.06	0.1	5	0.1	0.36	0.12	0.13	0.08
Chloride	16887-00-6	mg/L	1	0.5	1	5	2	2	LOR	2	2	2	2	4
Calcium	7440-70-2	mg/L	1	0.5	2	LOR	LOR	LOR	LOR	LOR	1	LOR	1	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	1	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	2	2	1	3	LOR	1	2	2	2	2
Potassium	7/09/7440	mg/L	1	0.5	1	LOR	1	LOR	LOR	1	LOR	LOR	2	1
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.03	0.02	LOR	0.01	LOR	0.02	0.1	0.13	0.01	0.01
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.002	0.001	LOR	0.003	0.133	LOR	LOR	LOR	0.001	0.001
Barium	7440-39-3	mg/L	0.001	0.0005	0.184	0.082	0.137	0.135	LOR	0.174	0.06	0.083	0.168	0.092
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.014	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.036	0.019	0.014	0.022	LOR	0.026	0.011	0.024	0.028	0.025
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.004	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.008	0.003	0.005	0.004	0.005	0.006	0.005	0.003	0.005	0.003
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.009	0.008	0.007	0.006	LOR	0.006	0.004	0.003	0.006	0.005
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.01	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.018	0.006	0.012	0.012	LOR	0.013	0.01	0.012	0.015	0.012
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.004	LOR	LOR	0.002	LOR	0.002	LOR	0.001	0.002	0.002
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	0.005	LOR	LOR	0.005	0.005
Fluoride	16984-48-8	mg/L	0.1	0.05	0.5	0.2	0.4	0.3	0.2	0.3	0.2	0.2	0.3	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_2 148207 (GRNL)



Column	148207	Week			148	150	152	156	161	165	169	174
Sample weight (kg)	2.512	Extraction vol (L)			0.44	0.45	0.475	0.47	0.47	0.53	0.46	0.47
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR								
pH (field)		pH Unit			0.11	7.37	5.87	5.96	8.20	5.80	6.12	6.81
Electrical Conductivity (field)		µS/cm			32.7	17.94	20.46	16	15.13	11.58	19.18	27.3
pH Value		pH Unit	0.01		6.53	6.48	6.59	6.51	6.9	6.57	6.34	6.52
Electrical Conductivity @ 25°C		µS/cm	1		24	15	21	22	18	23	16	18
Total Alkalinity as CaCO3		mg/L	1	0.5	2	3	2	1	1	1	2	4
Acidity as CaCO3		mg/L	1	0.5	LOR	2	LOR	2	2	2	2	2
Sulfate	14808-79-8	mg/L	1	0.5	3	3	2	3	3	3	2	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.07	0.1	0.12	0.07	0.24	0.34	0.11	0.08
Chloride	16887-00-6	mg/L	1	0.5	1	LOR	1	LOR	LOR	1	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	2	LOR	1	1	1	1	LOR	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	2	2	2	2	2	2	2	1
Potassium	7/09/7440	mg/L	1	0.5	1	LOR	1	1	1	2	LOR	1
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.01	0.02	0.01	0.02	0.01	0.01	0.01	LOR
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.001	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.001	LOR	LOR	LOR	0.001	0.001	LOR	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.086	0.089	0.089	0.079	0.081	0.071	0.051	0.09
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.022	0.025	0.028	0.024	0.027	0.011	0.02	0.022
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.003	0.003	0.003	0.003	0.004	0.002	0.002	0.005
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.004	0.002	0.004	0.005	0.003	0.009	0.002	0.002
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.012	0.008	0.013	0.012	0.014	0.013	0.008	0.012
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	0.006	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.1	0.3	0.3	0.2	0.3	0.2	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_3 148194 (HEM)



Column	148194	Week			0	4	8	12	16	17	18	20	21	22
Sample weight (kg)	2.786	Extraction vol (L)			0.625	0.375	0.375	0.625	0.42	0.42	0.42	0.42	0.42	0.43
Key		Flushing vol (L)			1.6	1.35	1.3	1.6	1.2	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.09	6.58	7.6	7.23	7.65	6.94	6.25	6.46	5.56	7.1
Electrical Conductivity (field)		µS/cm			7800	4560	2410	890	2180	804	507	370	257	320
pH Value		pH Unit	0.01		6.68		6.39	6.56	6.58	6.5	6.53	6.36	6.58	6.39
Electrical Conductivity @ 25°C		µS/cm	1		7220		2220	891	2230	743	446	373	260	306
Total Alkalinity as CaCO3		mg/L	1	0.5	5	2	7	3	6	5	6	6	5	3
Acidity as CaCO3		mg/L	1	0.5	6	4	2	3	3	8	2	5	1	1
Sulfate	14808-79-8	mg/L	1	0.5	46	30	21	11	33	12	9	10	8	8
Silicon	7440-21-3	mg/L	0.05	0.025	0.85	0.3	0.16		0.41	0.14	0.11	0.18	0.15	0.13
Chloride	16887-00-6	mg/L	1	0.5					637	218		92	63	79
Calcium	7440-70-2	mg/L	1	0.5	32				24	9	6	7	5	5
Magnesium	7439-95-4	mg/L	1	0.5	11				6	2	2	2	1	1
Sodium	7440-23-5	mg/L	1	0.5	1400				382	128	86	55	38	46
Potassium	7/09/7440	mg/L	1	0.5	24				14	6	4	5	3	3
Iron	7439-89-6	mg/L	0.01	0.005	LOR	0.1	0.03	0.03	LOR	LOR	1.27	2.22	0.17	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	LOR	0.06	0.01	0.14	0.2	0.02	0.12	0.23	1.14	LOR
Antimony	7440-36-0	mg/L	0.001	0.0005	0.003	0.005	0.004	LOR	0.001	0.002	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.027	0.04	0.056	0.047	0.054	0.04	0.044	0.047	0.05	0.039
Barium	7440-39-3	mg/L	0.001	0.0005	0.127	0.675	1	0.899	0.351	1.03	1.12	0.895	0.772	0.773
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	0.006	0.028	0.056	0.017	0.034	0.079	0.059	0.047	0.023
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.001	0.006	0.004	0.006	0.003	0.005	0.005	0.005	0.004	0.003
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	0.012	0.022	0.01	0.015	0.037	0.028	0.038	0.01
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	0.004	0.002	LOR	0.002	0.002	0.002	0.002	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.105	0.045	0.028	0.012	0.009	0.009	0.011	0.009	0.012	0.007
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.045	0.055	0.08	0.058	0.14	0.082	0.069	0.057	0.052	0.041
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.583	0.496	0.359		0.564	0.267	0.213	0.231	0.19	0.151
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	0.002	0.002		LOR	0.001	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR		LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.019
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.027	0.013	0.011	0.014	0.009	0.007	0.012	0.053	0.019
Fluoride	16984-48-8	mg/L	0.1	0.05	0.6	0.3	0.5	0.3	0.6	0.3	0.2	0.2	0.3	0.92
Total Phosphorus		mg/L	0.01	0.005	LOR				LOR	LOR	0.13	0.08	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_3 148194 (HEM)



Column	148194	Week			23	24	25	26	28	29	30	31	32	35
Sample weight (kg)	2.786	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.65	0.65	0.65	0.65	0.7	0.7	0.65	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.5	7	6.6	6.85	5.8	6.93	6.15	6.7	6.25	6.02
Electrical Conductivity (field)		µS/cm			384	251	509	340	174					
pH Value		pH Unit	0.01		6.4	5.82	6.07	7.35	5.55		6.18	6.16	6.19	5.94
Electrical Conductivity @ 25°C		µS/cm	1		369	267	459	427	264		163	252	123	144
Total Alkalinity as CaCO3		mg/L	1	0.5	3	6	6	5	16		5	6	6	6
Acidity as CaCO3		mg/L	1	0.5	LOR	3	2	3	2	4	LOR	LOR	4	57
Sulfate	14808-79-8	mg/L	1	0.5	8	6	8	6	7	6	6	6	5	5
Silicon	7440-21-3	mg/L	0.05	0.025	0.1	0.15	0.43	0.08	0.09	0.1	0.08	0.09	0.07	0.07
Chloride	16887-00-6	mg/L	1	0.5	98	66	129	125	72	41	51	59	33	35
Calcium	7440-70-2	mg/L	1	0.5	5	4	4	5	5	3	4	4	3	3
Magnesium	7439-95-4	mg/L	1	0.5	1	1	1	1	1	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	56	43	84	77	45	23	33	36	18	22
Potassium	7/09/7440	mg/L	1	0.5	3	3	4	3	3	3	3	3	2	2
Iron	7439-89-6	mg/L	0.01	0.005	0.55	LOR	LOR	LOR	LOR	0.07	LOR	LOR	0.06	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	LOR	LOR	0.03	0.03	0.02	0.05	0.01	0.04	0.08	0.67
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.001	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.036	0.037	0.035	0.025	0.027	0.032	0.025	0.029	0.025	0.022
Barium	7440-39-3	mg/L	0.001	0.0005	0.671	0.488	0.484	0.424	0.423	0.438	0.441	0.509	0.533	0.525
Cerium	7440-45-1	mg/L	0.001	0.0005	0.019	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.002	0.003	0.002	0.004	0.002	0.003	0.002	0.002	0.002	0.003
Lanthanum	7439-91-0	mg/L	0.001	0.0005	0.008	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.002
Manganese	7439-96-5	mg/L	0.001	0.0005	0.006	0.004	0.004	0.003	0.004	0.004	0.004	0.004	0.004	0.004
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.042	0.037	0.051	0.057	0.047	0.029	0.032	0.034	0.025	0.021
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.145	0.124	0.188	0.157	0.164	0.14	0.144	0.172	0.131	0.116
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025		LOR	LOR	LOR	LOR	LOR	0.021	0.035	0.012	0.247
Fluoride	16984-48-8	mg/L	0.1	0.05	0.1	0.3	0.5	0.2	0.2		0.2	0.3	0.2	0.2
Total Phosphorus		mg/L	0.01	0.005	0.07	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.05	0.02

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_3 148194 (HEM)



Column	148194	Week			36	37	38	39	40	43	44	46	47	48
Sample weight (kg)	2.786	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.675	0.675	0.675	0.7	0.65	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			5.95	6.6	5.87	6.2	5.95	6.1	6.53	5.83		5.93
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		8.64	5.39	6.21	6.57	6.00	5.82	7.1	5.01	6.23	6.04
Electrical Conductivity @ 25°C		µS/cm	1		90	90	63	98	104.00	100	120	62	77	31
Total Alkalinity as CaCO3		mg/L	1	0.5	19	5	8	4	3.00	3	4	2	4	6
Acidity as CaCO3		mg/L	1	0.5	3	1	3	LOR		3	3	5	LOR	2
Sulfate	14808-79-8	mg/L	1	0.5	3	3	3	4	4.00	4	5	5	4	4
Silicon	7440-21-3	mg/L	0.05	0.025	0.12	0.09	0.06	0.1	0.06		0.14	LOR	0.06	0.08
Chloride	16887-00-6	mg/L	1	0.5	20	24	13	19	23.00	15	20	13	21	2
Calcium	7440-70-2	mg/L	1	0.5	4	2	2	2	2.00	3	3	2	2	2
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	15	13	9	12	16.00	9	15	9	15	4
Potassium	7/09/7440	mg/L	1	0.5	2	2	2	2	2.00	2	1	2	1	1
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.05	0.05	0.05	0.07	0.05	0.02	0.06	0.08	0.06	0.09
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.002	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.024	0.022	0.017	0.022	0.02	0.022	0.021	0.021	0.024	0.027
Barium	7440-39-3	mg/L	0.001	0.0005	0.476	0.554	0.499	0.538	0.57	0.465	0.386	0.396	0.381	0.378
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.001	0.002	0.002	0.002	0.00	0.002	0.002	0.002	0.001	0.002
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.002	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.003	0.003	0.002	0.002	0.00	0.002	0.003	0.002	0.002	0.002
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.021	0.019	0.018	0.026	0.02	0.023	0.032	0.02	0.022	0.024
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.094	0.083	0.072	0.085	0.08	0.08	0.114	0.074	0.076	0.07
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.013	LOR	LOR	LOR	LOR	LOR	0.023	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.1	0.1	0.1	0.10	0.2	0.2	LOR	0.2	0.2
Total Phosphorus		mg/L	0.01	0.005	0.01	LOR	LOR	0.98	0.01	LOR	LOR	0.05	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_3 148194 (HEM)



Column	148194	Week			50	51	52	53	54	55	56	57	58	59
Sample weight (kg)	2.786	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.20	6.41	7.18	6.25	5.96	6.43	6.47	6.12	6.41	6.61
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		5.75	5.39	6.48	6.04	6.14	6.32	6.28	5.74	6.4	5.56
Electrical Conductivity @ 25°C		µS/cm	1		83	53	49	31	47	44	32	37	45	36
Total Alkalinity as CaCO3		mg/L	1	0.5	5		6	6	6	6	5	5	5	47
Acidity as CaCO3		mg/L	1	0.5	4	2	2	2	2	2	2	2	2	2
Sulfate	14808-79-8	mg/L	1	0.5	4	4	4	4	3	5	3	3	3	3
Silicon	7440-21-3	mg/L	0.05	0.025	0.06	0.09	0.09	0.08	0.094	0.06	0.08	0.047	0.0448	0.07
Chloride	16887-00-6	mg/L	1	0.5	18	23	9	2	5	3	1	1	10	2
Calcium	7440-70-2	mg/L	1	0.5	2	2	2	2	2	2	2	2	2	2
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	14	7	7	4	4	5	4	4	5	3
Potassium	7/09/7440	mg/L	1	0.5	1	1	1	1	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.07	LOR	LOR	LOR	LOR	0.11	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	LOR	LOR	LOR	0.09	0.08	LOR	0.07	0.04	0.04	0.06
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.022	0.026	0.025	0.027	0.026	0.016	0.026	0.024	0.026	0.027
Barium	7440-39-3	mg/L	0.001	0.0005	0.364	0.386	0.402	0.378	0.366	0.293	0.382	0.42	0.381	0.472
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.002	0.001	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	LOR	LOR	LOR	0.002	0.001	0.001	0.002	0.001	0.002	0.001
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.002
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.002	0.002	0.002	0.002	0.002	LOR	0.002	0.001	0.002	LOR
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.016	0.026	0.016	0.024	0.022	0.012	0.022	0.02	0.021	0.016
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.071	0.084	0.075	0.07	0.068	0.051	0.063	0.06	0.066	0.058
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.006	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	0.04	LOR	0.02	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_3 148194 (HEM)



Column	148194	Week			60	61	62	64	67	68	73	74	75	76
Sample weight (kg)	2.786	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.65	0.65	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.78	7.30	6.88	7.47	7.17	7.20	7.11	7.65	7.67	6.47
Electrical Conductivity (field)		µS/cm								29.7	35	45.3	39.8	45.6
pH Value		pH Unit	0.01		6.36	6.26	6.06	6.28	5.49	6.24	6.34	6.98	5.85	6.24
Electrical Conductivity @ 25°C		µS/cm	1		48	48	36	93	41	28	37	41	51	51
Total Alkalinity as CaCO3		mg/L	1	0.5	17	7	3	3	6	5	5	8	3	4
Acidity as CaCO3		mg/L	1	0.5	4	4	2	1	1	20	3	2	1	LOR
Sulfate	14808-79-8	mg/L	1	0.5	3	3	3	4	2	3	3	3	2	3
Silicon	7440-21-3	mg/L	0.05	0.025	0.09	0.06	0.07	0.07	0.08	0.13	0.08	0.13	0.12	0.1
Chloride	16887-00-6	mg/L	1	0.5	2	7	5	21	6	4	2	8	16	4
Calcium	7440-70-2	mg/L	1	0.5	2	2	2	2	2	1	2	2	2	2
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	4	6	5	13	5	3	4	4	5	5
Potassium	7/09/7440	mg/L	1	0.5	1	LOR	LOR	1	2	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.39	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.06	0.04	0.02	0.01	0.04	0.06	0.08	0.15	0.04	0.06
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.032	0.026	0.027	0.029	0.025	0.032	0.026	0.038	0.025	0.032
Barium	7440-39-3	mg/L	0.001	0.0005	0.491	0.338	0.469	0.342	0.37	0.059	0.451	0.742	0.405	0.389
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.001	LOR	0.027	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.002	0.002	0.001	0.008	0.005	0.004	0.003	0.005	0.005	0.004
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.001	0.001	0.019	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.001	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.004	0.002	0.002	0.004	0.004	0.006	0.004	0.006	0.004	0.002
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.017	0.021	0.019	0.021	0.014	0.024	0.022	0.032	0.024	0.038
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.064	0.067	0.063	0.08	0.057	0.054	0.067	0.085	0.073	0.089
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	0.007	0.007	0.01	LOR	0.01	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total Phosphorus		mg/L	0.01	0.005	0.44	0.02	LOR	0.01	0.73	0.02	LOR	0.05	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_3 148194 (HEM)



Column	148194	Week			77	78	80	81	82	83	84	85	86	87
Sample weight (kg)	2.786	Extraction vol (L)			0.43	0.43	0.43	0.43	0.375	0.44	0.64	0.4	0.42	0.5
Key		Flushing vol (L)			0.7	0.65	0.65	0.65	0.7	0.65	0.9	0.65	0.75	0.8
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.28	6.58	6.57	6.23	8.83	6.51	6.26	7.21	4.71	5.57
Electrical Conductivity (field)		µS/cm			35.8	35.6	25.6	29	40.2	27.7	47.6	43.1	43.1	20.8
pH Value		pH Unit	0.01		6.48	6.28	5.58	5.45	6.21	6.29	6.67	6.73	5.87	6.37
Electrical Conductivity @ 25°C		µS/cm	1		44	45	30	32	37	38	44	41	35	24
Total Alkalinity as CaCO3		mg/L	1	0.5	5	5	5	2	17	7	5	4	4	3
Acidity as CaCO3		mg/L	1	0.5	1	2	2	LOR	LOR	2	1	1	1	LOR
Sulfate	14808-79-8	mg/L	1	0.5	3	3	3	2	3	3	3	2	3	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.13	0.27	0.13	0.08	0.18	0.09	0.38	0.1	0.11	0.1
Chloride	16887-00-6	mg/L	1	0.5	LOR	3	LOR	LOR	LOR		4	2	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	2	2	2	1	2	1	2	2	2	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	5	4	2	2	3	4	4	4	3	2
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	1	LOR	LOR	1	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	0.08	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.08	0.03	0.03	0.05	0.1	0.02	0.03	0.03	0.04	0.02
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	0.001	0.001	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.027	0.029	0.026	0.021	0.028	0.026	0.034	0.026	0.028	0.022
Barium	7440-39-3	mg/L	0.001	0.0005	0.456	0.346	0.418	0.48	0.454	0.384	0.473	0.368	0.41	0.434
Cerium	7440-45-1	mg/L	0.001	0.0005	0.002	LOR	LOR	LOR	0.002	0.001	LOR	LOR	LOR	0.006
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.005	0.002	0.003	0.004	0.003	0.006	0.003	0.004	0.006	0.003
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	0.001	0.002
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.003	0.003	0.004	0.003	0.004	0.006	0.004	0.004	0.004	0.004
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.021	0.02	0.026	0.021	0.026	0.017	0.038	0.033	0.025	0.017
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.063	0.074	0.067	0.055	0.061	0.05	0.093	0.073	0.066	0.053
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.008	LOR	LOR	LOR	0.006	LOR	LOR	LOR	LOR	0.01
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.1	0.2	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	0.06	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_3 148194 (HEM)



Column	148194	Week			88	89	90	91	92	93	94	95	96	97
Sample weight (kg)	2.786	Extraction vol (L)			0.5	0.43	0.43	0.43	0.44	0.44	0.41	0.045	0.445	0.45
Key		Flushing vol (L)			0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit				6.28	6.72	7.72	7.25	7.31	8.45	7.43	6.71	6.88
Electrical Conductivity (field)		µS/cm			41.7	29.4	23.1	30.2	38.8	23.9	22.1	18.24	23.8	24.2
pH Value		pH Unit	0.01		7.41	6.26	7.3	7.91	6.54	6.05	6.8	7.7	6.36	6.32
Electrical Conductivity @ 25°C		µS/cm	1		34	30	23	33	28	24	26	17	18	28
Total Alkalinity as CaCO3		mg/L	1	0.5	5	5	LOR		15		6	3	LOR	LOR
Acidity as CaCO3		mg/L	1	0.5	8	1	3	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	5	2	3	2	2	2	LOR	2	2	2
Silicon	7440-21-3	mg/L	0.05	0.025	LOR	0.08	0.33	0.09	0.15	0.06	0.08	0.06	0.07	0.1
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR		6	3	LOR	4
Calcium	7440-70-2	mg/L	1	0.5	2	1	LOR	2	2	1	2	1	1	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	6	4	3	2	2	2	2	1	2	2
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	1	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	0.04	0.02	0.04	0.03	0.01	0.03	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.04	0.03	0.06	LOR	LOR	LOR	0.001	LOR	LOR	0.03
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.026	0.02	0.025	0.026	0.022	0.023	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.022	0.017	0.001	0.448	0.274	0.379	0.411	0.356	0.366	0.026
Barium	7440-39-3	mg/L	0.001	0.0005	0.313	0.363	0.101	LOR	LOR	LOR	LOR	LOR	LOR	0.356
Cerium	7440-45-1	mg/L	0.001	0.0005	0.001	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	0.004	0.003	0.003	0.004	0.004	0.003	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.003	0.003	0.02	LOR	LOR	LOR	LOR	LOR	LOR	0.004
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.003	0.002	0.004	0.004	0.003	0.003	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.003	0.004	0.004	0.026	0.023	0.021	0.026	0.02	0.024	0.003
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.028	0.018	0.013	LOR	0.002	LOR	LOR	LOR	LOR	0.024
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.06	0.049	0.054	0.06	0.049	0.055	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.064	0.048	0.011	LOR	LOR	LOR	LOR	LOR	LOR	0.054
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	0.004	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	0.108	LOR	0.043	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.2	0.4	0.2	0.2	0.2	0.2	0.2	0.8	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	na

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_3 148194 (HEM)



Column	148194	Week			98	99	100	101	102	103	104	105	106	107
Sample weight (kg)	2.786	Extraction vol (L)			0.44	0.44	0.43	0.44	0.46	0.44	0.44	0.42	0.45	0.44
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.63	7.22	7.81	7.40		7.47	8.98	6.72	8.03	7.85
Electrical Conductivity (field)		µS/cm			22.3	20.6	23.86	25.6	26.2	25.4	31.3	28.7	32.5	25.6
pH Value		pH Unit	0.01		6.94	6.2	6.9	7.62	7.05	6.52	6.68	6.5	6.67	6.57
Electrical Conductivity @ 25°C		µS/cm	1		25	26	22	22	17	20	21	13	28	20
Total Alkalinity as CaCO3		mg/L	1	0.5	6	LOR	5	8	6	4	5	2	9	6
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	6	LOR	LOR	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	2	3	2	2	2	2	2	4	2	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.1	0.06	0.07	0.07	0.06	0.09	0.09	0.09	0.06	0.06
Chloride	16887-00-6	mg/L	1	0.5	4	4	2	LOR	LOR	LOR	3	1	2	4
Calcium	7440-70-2	mg/L	1	0.5	1	1	1	1	1	1	1	LOR	1	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	2	2	2	2	1	1	2	1	2	2
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	0.28	0.06	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.04	0.02	0.03	0.03	LOR	0.02	0.03	0.02	0.03	0.03
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.02	0.019	0.023	0.016	0.02	0.014	0.019	0.012	0.023	0.024
Barium	7440-39-3	mg/L	0.001	0.0005	0.409	0.351	0.385	0.452	0.328	0.32	0.36	0.171	0.391	0.434
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.003	0.002	0.003	0.002	LOR	0.005	0.002	0.002	0.004	0.003
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.003	0.002	0.003	0.004	LOR	0.008	LOR	0.002	0.004	0.004
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.02	0.017	0.022	0.017	0.017	0.015	0.02	0.012	0.022	0.022
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.049	0.044	0.049	0.044	0.04	0.044	0.044	0.026	0.044	0.05
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	0.086	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.9	0.2	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_3 148194 (HEM)



Column	148194	Week			108	109	110	111	112	113	114	115	116	117
Sample weight (kg)	2.786	Extraction vol (L)			0.45	0.45	0.44	0.49	0.64	0.65	0.48	0.45	0.45	0.43
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.9	0.9	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.15	7.56	7.93	7.02	7.20	6.37	6.44	7.19	7.72	7.48
Electrical Conductivity (field)		µS/cm			21.9	29.2	32.8	20.24	23.7	20.48	19.53	17.31	15.86	15.84
pH Value		pH Unit	0.01		6.83	6.64	6.51	6.46	6.7	6.47	6.07	6.27	6.13	6.43
Electrical Conductivity @ 25°C		µS/cm	1		19	20	24	106	33	20	19	17	16	19
Total Alkalinity as CaCO3		mg/L	1	0.5	3	2	3	5	5	5	1	1	2	5
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	2	2	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	2	2	2	2	2	2	1	2	3	1
Silicon	7440-21-3	mg/L	0.05	0.025	0.07	0.06	0.06	0.06	0.32	0.2	0.05	0.06	LOR	LOR
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	LOR	LOR	4	1	2	5	LOR	10
Calcium	7440-70-2	mg/L	1	0.5	1	1	1	1	2	1	1	1	LOR	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	1	1	2	1	1	LOR	LOR	1	LOR	1
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	0.12	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.03	0.02	0.03	LOR	0.03	0.06	LOR	0.01	LOR	0.06
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	0.001	LOR	LOR	LOR	0.001
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.024	0.02	0.019	0.021	0.03	0.031	0.02	0.019	0.016	0.02
Barium	7440-39-3	mg/L	0.001	0.0005	0.349	0.358	0.386	0.259	0.402	0.444	0.269	0.351	0.251	0.381
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.004	0.004	0.004	0.001	0.025	0.007	0.001	0.002	0.001	0.002
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.003	0.003	0.004	0.003	0.004	0.004	0.002	0.003	0.002	0.003
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.023	0.02	0.016	0.022	0.038	0.04	0.025	0.017	0.013	0.018
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.048	0.046	0.044	0.047	0.074	0.069	0.048	0.041	0.037	0.043
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.006
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.2	0.2	0.1	0.4	0.1	0.2	0.1	0.1	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_3 148194 (HEM)



Column	148194	Week			118	119	120	121	122	125	129	131	135	139
Sample weight (kg)	2.786	Extraction vol (L)			0.65	0.42	0.45	0.46	0.46	0.45	0.45	0.45	0.44	0.43
Key		Flushing vol (L)			0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.54	7.50	6.87	6.35	6.07	6.63	8.86	7.13	7.27	6.91
Electrical Conductivity (field)		µS/cm			18.94	16.51	14.99	14.85	14.06	17.78	14.35	22.9	20.35	25.2
pH Value		pH Unit	0.01		6.6	5.76	6.8	7.24	6.09	6.76	6.61	6.2	6.7	7.04
Electrical Conductivity @ 25°C		µS/cm	1		20	16	14	17	13	16	14	13	19	23
Total Alkalinity as CaCO3		mg/L	1	0.5	4	5	5	2	2	5	2	3	5	LOR
Acidity as CaCO3		mg/L	1	0.5	2	LOR	2	2	2	2	2	LOR	2	
Sulfate	14808-79-8	mg/L	1	0.5	2	LOR	1	2	1	2	1	2	2	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.3	0.05	0.11	0.12	4	0.1	0.25	LOR	0.14	0.08
Chloride	16887-00-6	mg/L	1	0.5	1	6	1	2	1	1	2	2	2	2
Calcium	7440-70-2	mg/L	1	0.5	2	LOR	1	1	LOR	LOR	LOR	LOR	1	2
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	LOR	2	LOR	1	LOR	LOR	LOR	LOR	LOR	1
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.04	LOR	LOR	LOR	LOR	0.05	0.08	0.1	0.01	0.02
Antimony	7440-36-0	mg/L	0.001	0.0005	0.001	LOR	LOR	LOR	0.03	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.026	0.018	0.036	0.03	0.459	0.024	0.02	0.022	0.025	0.016
Barium	7440-39-3	mg/L	0.001	0.0005	0.383	0.319	0.373	0.438	LOR	0.527	0.276	0.276	0.587	0.336
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.003	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.012	0.002	0.004	0.005	LOR	0.004	0.003	0.003	0.004	0.005
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.003	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.003	0.003	0.003	0.003	0.019	0.005	0.004	0.002	0.007	0.004
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.033	0.018	0.031	0.024	LOR	0.025	0.016	0.01	0.022	0.018
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.044	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.059	0.043	0.05	0.046	LOR	0.049	0.039	0.035	0.05	0.048
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.005	0.005	LOR	LOR	0.013	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.3	0.1	0.2	0.2	0.1	0.2	0.2	LOR	0.2	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	---	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_3 148194 (HEM)



Column	148194	Week			148	150	152	156	161	165	169	174
Sample weight (kg)	2.786	Extraction vol (L)			0.43	0.44	0.45	0.455	0.46	0.45	0.45	0.455
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR								
pH (field)		pH Unit			7.87	7.41	5.68	5.96	8.12	5.79	6.08	6.15
Electrical Conductivity (field)		µS/cm			25.05	19.75	15.25	14.79	16.23	12.39	18.56	35.4
pH Value		pH Unit	0.01		6.48	6.58	6.57	6.58	6.82	6.51	6.4	6.55
Electrical Conductivity @ 25°C		µS/cm	1		20	21	19	22	21	15	19	21
Total Alkalinity as CaCO3		mg/L	1	0.5	1	4	2	2	1	LOR	2	6
Acidity as CaCO3		mg/L	1	0.5	LOR	2	LOR	2	2	2	LOR	2
Sulfate	14808-79-8	mg/L	1	0.5	2	3	1	2	2	2	1	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.08	0.11	0.1	0.06	0.24	0.24	0.08	0.09
Chloride	16887-00-6	mg/L	1	0.5	2	2	2	1	2	LOR	2	2
Calcium	7440-70-2	mg/L	1	0.5	1	1	2	1	1	1	1	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	1	2	LOR	LOR	1	LOR	1	LOR
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.01	0.01	0.02	0.23	0.01	0.02	0.01	LOR
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.016	0.013	0.02	0.017	0.017	0.017	0.011	0.016
Barium	7440-39-3	mg/L	0.001	0.0005	0.285	0.3	0.343	0.28	0.306	0.377	0.223	0.352
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.004	0.005	0.006	0.006	0.006	0.002	0.002	0.004
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.003	0.003	0.002	0.002	0.002	0.003	0.002	0.006
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.016	0.013	0.022	0.019	0.015	0.013	0.01	0.016
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.044	0.035	0.05	0.048	0.047	0.044	0.034	0.048
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.1	0.1	0.2	0.4	0.2	0.2	0.1	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Results
Column OD_10 HEMQ



Column	OD_10 HEMQ	Week			0	4	8	12	16	17	18	20	21	22
Sample weight (kg)	2.27	Extraction vol (L)			0.625	0.375	0.375	0.625	0.42	0.42	0.42	0.42	0.42	0.47
Key		Flushing vol (L)			1.6	1.35	1.3	1.6	1.2	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.97	8.18	8.7	8.22	8.03	7.14	6.85	7	6	7.61
Electrical Conductivity (field)		µS/cm			3160	1140	577	193	685	284	153	135	71	108
pH Value		pH Unit	0.01		7.56	6.71	6.93	6.84	7.16	6.9	6.91	6.95	7.15	6.82
Electrical Conductivity @ 25°C		µS/cm	1		2810	1140	611	206	683	288	176	153	84	118
Total Alkalinity as CaCO3		mg/L	1	0.5	38	4	8	21	29	9	6	7	21	7
Acidity as CaCO3		mg/L	1	0.5	LOR	4	2	5	2	83	2	5	1	1
Sulfate	14808-79-8	mg/L	1	0.5	23	10	10	5	18	9	5	6	4	5
Silicon	7440-21-3	mg/L	0.05	0.025	0.86	0.06	0.12		0.27	0.16	0.1	0.14	0.22	0.14
Chloride	16887-00-6	mg/L	1	0.5					181	77	43	42	17	29
Calcium	7440-70-2	mg/L	1	0.5	10				9	3	2	3	3	2
Magnesium	7439-95-4	mg/L	1	0.5	4				3	1	LOR	1	2	LOR
Sodium	7440-23-5	mg/L	1	0.5	532				119	55	28	25	15	18
Potassium	7/09/7440	mg/L	1	0.5	6				4	2	1	1	2	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	0.04	0.02	0.04	0.07	1.24	0.45	0.66	0.12	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	LOR	0.07	0.01	0.03	0.08	0.03	0.05	0.11	0.12	LOR
Antimony	7440-36-0	mg/L	0.001	0.0005	0.002	LOR	LOR	0.002	LOR	LOR	LOR	0.001	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.724	0.212	0.326	0.162	0.372	0.196	0.155	0.16	0.131	0.136
Barium	7440-39-3	mg/L	0.001	0.0005	0.214	0.908	0.518	0.772	1.04	1.33	1.15	0.968	0.783	0.702
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	0.041	0.009	0.044	0.077	0.039	0.064	0.054	0.032	0.026
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.003	0.021	0.008	0.013	0.038	0.038	0.016	0.015	0.011	0.009
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	0.023	0.004	0.02	0.036	0.018	0.031	0.028	0.02	0.012
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	0.002	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.031	0.009	0.003	0.004	0.008	0.016	0.007	0.007	0.009	0.004
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.073	0.035	0.049	0.026	0.087	0.044	0.036	0.038	0.031	0.032
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.142	0.089	0.079		0.14	0.07	0.056	0.056	0.044	0.043
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR		LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR		LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	0.018	LOR	0.008	0.007	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	1	0.3	0.5	0.4	0.6	0.3	0.3	0.4	0.6	1.08
Total Phosphorus		mg/L	0.01	0.005	LOR				LOR	LOR	0.08	0.03	LOR	LOR

Appendix A: Tabulated Laboratory Results
 Column OD_10 HEMQ



Column	OD_10 HEMQ	Week			23	24	25	26	28	29	30	31	32	35
Sample weight (kg)	2.27	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.65	0.65	0.65	0.65	0.7	0.7	0.65	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.76	7.33	7.18	7.65	6.3	7.32	6.47	7.17	6.64	6.32
Electrical Conductivity (field)		µS/cm			61	65	68	119	44					
pH Value		pH Unit	0.01		6.96	6.51	6.55	6.42	6.11		6.32	6.34	6.49	6.26
Electrical Conductivity @ 25°C		µS/cm	1		68	78	74	139	48		81	95	90	76
Total Alkalinity as CaCO3		mg/L	1	0.5	7	7	5	3	5		5	6	6	5
Acidity as CaCO3		mg/L	1	0.5	LOR	1	2	5	2	2	LOR	LOR	4	3
Sulfate	14808-79-8	mg/L	1	0.5	4	3	3	4	4	3	3	3	3	3
Silicon	7440-21-3	mg/L	0.05	0.025	0.12	0.15	0.21	0.06	0.05	0.06	LOR	0.06	LOR	0.1
Chloride	16887-00-6	mg/L	1	0.5	19	18	24	31	8		28	22	27	17
Calcium	7440-70-2	mg/L	1	0.5	3	2	2	2	2	2	2	2	2	2
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	11	13	14	24	8	10	20	15	16	11
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.11	0.05	LOR	LOR	0.07	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	LOR	LOR	0.02	LOR	0.01	0.02	LOR	0.02	0.04	0.04
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.116	0.082	0.078	0.086	0.063	0.074	0.057	0.065	0.054	0.056
Barium	7440-39-3	mg/L	0.001	0.0005	0.743	0.627	0.527	0.388	0.406	0.44	0.462	0.436	0.525	0.424
Cerium	7440-45-1	mg/L	0.001	0.0005	0.028	0.001	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.01	0.004	0.002	0.003	0.003	0.004	0.003	0.003	0.004	0.004
Lanthanum	7439-91-0	mg/L	0.001	0.0005	0.013	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.002
Manganese	7439-96-5	mg/L	0.001	0.0005	0.004	0.003	0.003	0.002	0.002	0.003	0.002	0.002	0.004	0.003
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.025	0.025	0.024	0.037	0.023	0.028	0.019	0.024	0.023	0.027
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.034	0.03	0.031	0.029	0.027	0.031	0.027	0.034	0.033	0.03
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025		LOR	LOR	LOR	LOR	LOR	LOR	0.018	0.013	0.17
Fluoride	16984-48-8	mg/L	0.1	0.05	0.1	0.4	0.6	0.3	0.3		0.3	0.3	0.4	0.4
Total Phosphorus		mg/L	0.01	0.005	LOR	0.01	LOR	LOR	LOR	LOR	LOR	0.01	0.06	0.06

Appendix A: Tabulated Laboratory Results
Column OD_10 HEMQ



Column	OD_10 HEMQ	Week			36	37	38	39	40	43	44	46	47	48
Sample weight (kg)	2.27	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.675	0.675	0.675	0.7	0.65	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.2	7.05	6.35	6.52	6.84	6.4	6.8	6.13		6.27
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		8.29	6.14	6.3	6.6	6.37	7.04	6.87	6.2	6.43	6.28
Electrical Conductivity @ 25°C		µS/cm	1		62	72	40	47	70.00	56	51	36	40	30
Total Alkalinity as CaCO3		mg/L	1	0.5	21	3	8	4	4.00	10	7	3	6	6
Acidity as CaCO3		mg/L	1	0.5	3	1	1	2		2	5	3	2	2
Sulfate	14808-79-8	mg/L	1	0.5	2	3	2	2	3.00	3	4	3	3	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.08	0.06	LOR	0.06	0.06		0.15	LOR	0.11	0.06
Chloride	16887-00-6	mg/L	1	0.5	13	19	7	8	13.00	5	9	9	8	LOR
Calcium	7440-70-2	mg/L	1	0.5	3	1	1	LOR	1.00	2	2	1	1	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	11	12	6	5	11.00	5	8	6	8	2
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.02	0.03	0.02	0.03	0.03	0.01	0.06	0.05	0.04	0.04
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.05	0.042	0.038	0.041	0.05	0.043	0.084	0.048	0.05	0.049
Barium	7440-39-3	mg/L	0.001	0.0005	0.392	0.428	0.408	0.458	0.47	0.411	0.35	0.417	0.341	0.347
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	0.001	0.001	0.00	LOR	0.002	0.001	0.001	0.001
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.003	0.003	0.004	0.004	0.00	0.004	0.004	0.006	0.005	0.005
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.00	LOR	LOR	LOR	0.001	0.002
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.003	0.002	0.003	0.002	0.00	0.002	0.003	0.003	0.003	0.003
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.023	0.024	0.017	0.022	0.03	0.014	0.044	0.016	0.028	0.031
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.026	0.025	0.02	0.021	0.02	0.02	0.032	0.019	0.022	0.017
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	0.006	0.006	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.4	0.3	0.4	0.3	0.30	0.2	0.5	0.1	0.3	0.3
Total Phosphorus		mg/L	0.01	0.005	LOR	0.02	LOR	LOR	LOR	LOR	LOR	0.03	LOR	LOR

Appendix A: Tabulated Laboratory Results
 Column OD_10 HEMQ



Column	OD_10 HEMQ	Week			50	51	52	53	54	55	56	57	58	59
Sample weight (kg)	2.27	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.44	6.56	7.36	6.71	6.19	6.55	6.61	6.13	6.54	6.93
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		5.82	6.91	6.58	6.28	6.2	6.36	6.41	6.16	6.47	6.11
Electrical Conductivity @ 25°C		µS/cm	1		34	37	29	30	26	20	20	24	22	27
Total Alkalinity as CaCO3		mg/L	1	0.5	6		6	6	6	5	7	4	5	4
Acidity as CaCO3		mg/L	1	0.5	4	2	2	2	2	2	1	5	2	2
Sulfate	14808-79-8	mg/L	1	0.5	3	3	3	2	2	4	2	2	3	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.11	0.047	0.07	0.06	0.047	LOR	LOR	LOR	LOR	0.06
Chloride	16887-00-6	mg/L	1	0.5	3	19	1	LOR	1	LOR	LOR	LOR	2	LOR
Calcium	7440-70-2	mg/L	1	0.5	1	1	2	1	1	LOR	1	1	1	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	5	4	4	2	2	2	2	2	2	2
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	LOR	0.01	0.01	0.04	0.06	LOR	0.05	0.01	0.02	0.04
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.046	0.055	0.056	0.049	0.048	0.03	0.053	0.042	0.044	0.052
Barium	7440-39-3	mg/L	0.001	0.0005	0.276	0.318	0.347	0.347	0.343	0.232	0.311	0.331	0.298	0.34
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	0.002	LOR	0.001	0.001	0.002	0.001	LOR	LOR	0.001
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.001	0.002	0.002	0.005	0.004	0.004	0.01	0.004	0.005	0.005
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	0.001	0.002	0.001	0.002	0.001	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.003	0.002	0.003	0.003	0.004	LOR	0.003	0.002	0.003	LOR
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.02	0.03	0.03	0.031	0.028	0.022	0.025	0.024	0.027	0.022
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.02	0.02	0.023	0.017	0.019	0.012	0.02	0.019	0.019	0.02
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	0.006	LOR	0.009	0.006
Fluoride	16984-48-8	mg/L	0.1	0.05	0.4	0.4	0.3	0.3	0.2	0.2	0.5	0.3	0.2	0.3
Total Phosphorus		mg/L	0.01	0.005	LOR	0.02	LOR	LOR	LOR	LOR	0.04	LOR	0.02	LOR

Appendix A: Tabulated Laboratory Results
 Column OD_10 HEMQ



Column	OD_10 HEMQ	Week			60	61	62	64	67	68	73	74	75	76
Sample weight (kg)	2.27	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.65	0.65	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.65	7.64	6.07	7.15	7.27	7.93	7.13	7.81	7.89	6.73
Electrical Conductivity (field)		µS/cm								60.1	31	52.7	39.8	35.3
pH Value		pH Unit	0.01		5.61	6.42	6.08	6.67	6.87	6.97	6.38	7.04	6.09	6.54
Electrical Conductivity @ 25°C		µS/cm	1		24	20	22	35	38	59	32	36	36	37
Total Alkalinity as CaCO3		mg/L	1	0.5	5	7	3	4	9	22	5	11	4	6
Acidity as CaCO3		mg/L	1	0.5	4	6	2	2	2	5	2	2	1	LOR
Sulfate	14808-79-8	mg/L	1	0.5	2	2	3	3	3	5	3	4	3	4
Silicon	7440-21-3	mg/L	0.05	0.025	LOR	LOR	LOR	LOR	0.09	0.53	0.06	0.09	0.16	0.19
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	2	3	2	8	LOR	5	6	LOR
Calcium	7440-70-2	mg/L	1	0.5	1	1	1	2	3	4	2	2	2	2
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	1	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	2	2	2	3	3	6	3	3	2	3
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	1	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.08	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.02	0.03	0.01	LOR	0.02	0.06	0.05	0.05	0.04	0.06
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.037	0.036	0.041	0.04	0.041	0.085	0.048	0.071	0.043	0.06
Barium	7440-39-3	mg/L	0.001	0.0005	0.492	0.25	0.209	0.281	0.321	0.226	0.274	0.457	0.252	0.342
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.002	0.001	0.014	0.001	0.002
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.005	0.004	0.003	0.008	0.007	0.007	0.008	0.01	0.011	0.008
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.001	0.001	0.004	LOR	0.002
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.008	0.003	0.001	0.011	0.004	0.002	0.004	0.007	0.003	0.003
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.019	0.023	0.019	0.02	0.022	0.071	0.033	0.044	0.039	0.056
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.021	0.02	0.015	0.02	0.028	0.045	0.029	0.037	0.034	0.034
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	0.007	LOR	0.009	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.3	0.2	0.2	0.7	0.9	0.6	0.3	0.5	0.4	0.4
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	0.46	0.04	LOR	0.02	LOR	0.02

Appendix A: Tabulated Laboratory Results
 Column OD_10 HEMQ



Column	OD_10 HEMQ	Week			77	78	80	81	82	83	84	85	86	87
Sample weight (kg)	2.27	Extraction vol (L)			0.43	0.43	0.43	0.43	0.375	0.51	0.6	0.43	0.44	0.5
Key		Flushing vol (L)			0.7	0.65	0.65	0.65	0.7	0.65	0.9	0.65	0.75	0.8
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.12	6.34	6.93	6.56	8.35	6.74	6.76	7.47	5.13	5.97
Electrical Conductivity (field)		µS/cm			41.8	26.9	19.2	20	36.3	23.4	37.1	36.5	28.0	20.0
pH Value		pH Unit	0.01		6.64	6.56	5.77	5.59	6.53	6.75	6.81	6.85	6.06	6.54
Electrical Conductivity @ 25°C		µS/cm	1		31	35	24	22	30	30	40	35	27	22
Total Alkalinity as CaCO3		mg/L	1	0.5	6	8	6	26	8	25	5	5	5	4
Acidity as CaCO3		mg/L	1	0.5	1	4	4	1	LOR	2	1	1	1	LOR
Sulfate	14808-79-8	mg/L	1	0.5	3	3	4	2	3	3	3	3	3	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.09	0.28	0.43	0.08	0.15	0.08	0.34	0.07	0.08	LOR
Chloride	16887-00-6	mg/L	1	0.5	LOR	4	LOR	LOR	LOR		3	LOR	LOR	5
Calcium	7440-70-2	mg/L	1	0.5	2	2	LOR	1	2	2	2	2	1	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	4	2	4	2	2	2	3	3	2	2
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.04	0.02	0.03	0.03	0.06	0.02	0.02	0.02	0.02	0.02
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.05	0.054	0.044	0.026	0.044	0.035	0.049	0.044	0.034	0.026
Barium	7440-39-3	mg/L	0.001	0.0005	0.317	0.256	0.292	0.296	0.308	0.265	0.339	0.233	0.273	0.211
Cerium	7440-45-1	mg/L	0.001	0.0005	0.002	LOR	LOR	LOR	0.002	LOR	LOR	LOR	LOR	0.001
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.008	0.004	0.008	0.006	0.006	0.008	0.005	0.007	0.008	0.006
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.002
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.004	0.005	0.004	0.004	0.005	0.008	0.004	0.004	0.005	0.003
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.033	0.033	0.035	0.023	0.043	0.029	0.043	0.041	0.032	0.022
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.027	0.032	0.026	0.02	0.025	0.022	0.033	0.028	0.022	0.019
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.007	LOR	LOR	LOR	LOR	0.025	LOR	LOR	LOR	0.008
Fluoride	16984-48-8	mg/L	0.1	0.05	0.4	0.5	0.3	0.3	0.4	0.6	0.5	0.3	0.3	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Results
Column OD_10 HEMQ



Column	OD_10 HEMQ	Week			88	89	90	91	92	93	94	95	96	97
Sample weight (kg)	2.27	Extraction vol (L)			0.5	0.43	0.43	0.45	0.46	0.46	0.45	0.49	0.47	0.48
Key		Flushing vol (L)			0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit				6.55	6.82	8.10	7.47	7.33	8.79	7.34	6.54	7.16
Electrical Conductivity (field)		µS/cm			42.4	29.4	20.6	28.6	42.5	24	23.2	19.87	21.53	27.6
pH Value		pH Unit	0.01		7.4	8.01	7.23	7.87	6.56	6.15	6.92	7.64	6.44	6.37
Electrical Conductivity @ 25°C		µS/cm	1		29	31	23	28	33	22	26	18	19	29
Total Alkalinity as CaCO3		mg/L	1	0.5	8	7	5	2	18	LOR	10	4	LOR	LOR
Acidity as CaCO3		mg/L	1	0.5	8	1	1	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	5	2	2	3	3	2	LOR	2	3	2
Silicon	7440-21-3	mg/L	0.05	0.025	LOR	LOR	0.2	0.09	0.26	0.06	0.06	0.06	0.05	0.08
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	3	6	2	LOR	1
Calcium	7440-70-2	mg/L	1	0.5	2	1	1	2	2	1	2	1	1	2
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	4	4	2	2	2	1	2	1	2	2
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	0.07	0.04	0.04	0.03	0.03	0.03	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.01	0.01	0.05	LOR	LOR	LOR	LOR	LOR	LOR	0.03
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.041	0.041	0.036	0.039	0.031	0.036	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.041	0.025	0.032	0.35	0.194	0.241	0.26	0.226	0.214	0.043
Barium	7440-39-3	mg/L	0.001	0.0005	0.191	0.254	0.297	0.003	LOR	LOR	LOR	LOR	LOR	0.228
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	0.008	0.006	0.006	0.007	0.008	0.005	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.005	0.007	0.007	0.002	LOR	LOR	LOR	LOR	LOR	0.007
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.004	0.003	0.004	0.006	0.006	0.005	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.003	0.005	0.003	0.05	0.051	0.039	0.05	0.043	0.046	0.003
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.046	0.032	0.048	LOR	0.002	LOR	LOR	LOR	LOR	0.05
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.025	0.025	0.021	0.023	0.019	0.02	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.026	0.02	0.021	LOR	LOR	LOR	LOR	LOR	LOR	0.024
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.023	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	0.008	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.4	0.3	0.4	0.4	0.6	0.4	0.4	LOR	0.7	0.4
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	

Appendix A: Tabulated Laboratory Results
Column OD_10 HEMQ



Column	OD_10 HEMQ	Week			98	99	100	101	102	103	104	105	106	107
Sample weight (kg)	2.27	Extraction vol (L)			0.49	0.495	0.465	0.49	0.48	0.5	0.5	0.47	0.5	0.5
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.33	8.11	8.26	7.58		7.46	8.81	6.88	8.14	8.14
Electrical Conductivity (field)		µS/cm			25.2	18.94	29.1	21.9	24.9	27.8	16.25	25.9	28.5	21.05
pH Value		pH Unit	0.01		6.98	5.71	6.89	7.49	6.99	6.74	6.71	6.73	6.76	6.58
Electrical Conductivity @ 25°C		µS/cm	1		24	22	27	19	19	22	16	19	17	15
Total Alkalinity as CaCO3		mg/L	1	0.5	6	LOR	7	4	5	6	LOR	2	6	6
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	3	3	3	2	2	2	2	4	2	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.07	LOR	0.07	LOR	0.06	0.08	0.08	LOR	LOR	LOR
Chloride	16887-00-6	mg/L	1	0.5	1	4	1	LOR	LOR	LOR	LOR	LOR	LOR	3
Calcium	7440-70-2	mg/L	1	0.5	1	LOR	2	1	1	1	LOR	1	1	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	2	2	2	1	1	1	1	1	1	1
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	0.1	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.02	0.02	0.02	0.02	LOR	0.02	0.02	0.02	0.02	0.04
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.029	0.021	0.042	0.02	0.029	0.021	0.025	0.028	0.028	0.025
Barium	7440-39-3	mg/L	0.001	0.0005	0.245	0.194	0.222	0.276	0.2	0.175	0.191	0.17	0.241	0.234
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.006	0.005	0.006	0.005	0.006	0.007	0.005	0.005	0.005	0.006
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.005	0.003	0.003	0.006	LOR	0.005	LOR	0.002	0.004	0.002
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.041	0.035	0.052	0.036	0.036	0.034	0.036	0.043	0.034	0.035
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.02	0.016	0.022	0.015	0.018	0.016	0.013	0.017	0.014	0.016
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.007	LOR	LOR	LOR	0.049	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.6	0.3	0.3
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Results
 Column OD_10 HEMQ



Column	OD_10 HEMQ	Week			108	109	110	111	112	113	114	115	116	117
Sample weight (kg)	2.27	Extraction vol (L)			0.48	0.49	0.5	0.46	0.668	0.665	0.46	0.49	0.5	0.485
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.9	0.9	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.54	8.24	7.86	7.09	7.45	6.77	6.90	7.40	8.01	7.79
Electrical Conductivity (field)		µS/cm			25.1	22.2	28.5	21.59	31.5	25.3	17.25	17.94	17.17	13.11
pH Value		pH Unit	0.01		6.92	6.76	6.53	6.65	6.72	6.62	6.09	6.33	6.28	6.52
Electrical Conductivity @ 25°C		µS/cm	1		20	16	18	1310	34	24	14	16	17	15
Total Alkalinity as CaCO3		mg/L	1	0.5	3	3	3	93	7	7	2	2	4	5
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	4	2	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	2	2	2	2	3	3	2	2	3	1
Silicon	7440-21-3	mg/L	0.05	0.025	0.05	LOR	LOR	LOR	0.27	0.16	0.12	LOR	LOR	LOR
Chloride	16887-00-6	mg/L	1	0.5	1	LOR	LOR	LOR	5	2	3	10	LOR	10
Calcium	7440-70-2	mg/L	1	0.5	1	LOR	1	1	2	2	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	1	1	1	1	2	1	2	1	1	LOR
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	0.11	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.03	LOR	LOR	LOR	0.01	0.01	0.03	LOR	LOR	0.01
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.032	0.02	0.021	0.031	0.042	0.047	0.002	0.021	0.017	0.022
Barium	7440-39-3	mg/L	0.001	0.0005	0.192	0.181	0.198	0.141	0.255	0.264	0.01	0.16	0.116	0.225
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.005	0.006	0.006	0.003	0.018	0.006	LOR	0.002	0.003	0.004
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.002	0.002	0.004	0.002	0.003	0.002	LOR	0.003	0.002	0.003
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.044	0.031	0.032	0.049	0.066	0.063	LOR	0.031	0.027	0.032
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.019	0.014	0.015	0.018	0.029	0.028	0.001	0.014	0.013	0.017
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.3	0.2	0.3	0.3	0.6	0.2	0.1	0.3	0.2	0.3
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Results
Column OD_10 HEMQ



Column	OD_10 HEMQ	Week			118	119	120	121	122	125	129	131	135	139
Sample weight (kg)	2.27	Extraction vol (L)			0.675	0.49	0.47	0.48	0.47	0.48	0.47	0.49	0.48	0.47
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.13	7.30	7.00	6.44	6.46	6.85	8.70	7.63	7.64	7.43
Electrical Conductivity (field)		µS/cm			20.64	14.36	20.6	20.86	24.27	21.82	18.81	19.1	23.18	18.67
pH Value		pH Unit	0.01		6.9	6.02	6.7	7.29	6.44	6.84	6.56	6.15	6.72	7.07
Electrical Conductivity @ 25°C		µS/cm	1		22	14	19	22	24	20	18	17	23	20
Total Alkalinity as CaCO3		mg/L	1	0.5	4	5	4	3	4	4	2	5	4	LOR
Acidity as CaCO3		mg/L	1	0.5	2	LOR	2	LOR	2	2	3	LOR	2	2
Sulfate	14808-79-8	mg/L	1	0.5	2	1	2	2	3	2	2	2	2	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.23	LOR	0.1	0.09	4	0.07	0.27	0.05	0.12	0.06
Chloride	16887-00-6	mg/L	1	0.5	1	4	2	2	2	2	LOR	4	2	4
Calcium	7440-70-2	mg/L	1	0.5	2	LOR	1	2	LOR	1	1	LOR	2	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	LOR	2	1	1	LOR	LOR	LOR	2	1	1
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.01	LOR	0.04	0.02	LOR	LOR	0.1	0.03	LOR	0.01
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.065	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.032	0.019	0.046	0.048	0.269	0.037	0.027	0.023	0.03	0.02
Barium	7440-39-3	mg/L	0.001	0.0005	0.242	0.172	0.26	0.249	LOR	0.3	0.144	0.138	0.388	0.163
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.003	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.012	0.002	0.004	0.007	LOR	0.007	0.003	0.005	0.007	0.008
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.002	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.003	0.002	0.002	0.004	0.059	0.007	0.006	0.002	0.011	0.002
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.042	0.03	0.055	0.04	LOR	0.043	0.032	0.028	0.03	0.024
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.028	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.022	0.013	0.022	0.024	LOR	0.021	0.017	0.013	0.02	0.015
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	0.005	LOR	0.4	0.016	LOR	0.022	LOR	0.005
Fluoride	16984-48-8	mg/L	0.1	0.05	0.4	0.3	0.4	0.5	0.4	0.4	0.3	0.2	0.4	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Results
Column OD_10 HEMQ



Column	OD_10 HEMQ	Week			148	150	152	156	161	165	169	174
Sample weight (kg)	2.27	Extraction vol (L)			0.48	0.49	0.51	0.5	0.495	0.5	0.5	0.5
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR								
pH (field)		pH Unit			7.84	7.78	6.03	6.31	8.32	5.95	6.29	6.55
Electrical Conductivity (field)		µS/cm			14.5	24.5	16.37	12.53	14.63	14.28	12.08	34.8
pH Value		pH Unit	0.01		6.56	6.67	6.54	6.6	6.87	6.5	6.51	6.73
Electrical Conductivity @ 25°C		µS/cm	1		17	20	20	20	21	18	16	22
Total Alkalinity as CaCO3		mg/L	1	0.5	2	4	2	2	2	2	2	8
Acidity as CaCO3		mg/L	1	0.5	LOR	2	LOR	2	2	2	2	1
Sulfate	14808-79-8	mg/L	1	0.5	2	3	2	2	2	2	1	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.06	0.09	0.09	LOR	0.23	0.23	0.05	0.06
Chloride	16887-00-6	mg/L	1	0.5	1	1	2	LOR	2	1	1	1
Calcium	7440-70-2	mg/L	1	0.5	1	1	2	1	1	1	LOR	2
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	LOR	1	1	LOR	1	LOR	LOR	LOR
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	LOR	LOR	LOR	0.16	LOR	LOR	LOR	LOR
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.018	0.019	0.034	0.021	0.026	0.026	0.012	0.026
Barium	7440-39-3	mg/L	0.001	0.0005	0.139	0.144	0.166	0.12	0.147	0.162	0.096	0.18
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.009	0.009	0.009	0.007	0.009	0.008	0.005	0.008
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.003	0.004	0.002	0.002	0.002	0.002	0.002	0.004
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.019	0.028	0.035	0.026	0.023	0.019	0.017	0.031
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.013	0.013	0.019	0.015	0.018	0.018	0.012	0.02
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.2	0.3	0.5	0.3	0.3	0.2	0.3
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_11 HEMH



Column	OD_11 HEMH	Week			0	4	8	12	16	17	18	20	21	22
Sample weight (kg)	1.921	Extraction vol (L)			0.625	0.375	0.375	0.625	0.42	0.42	0.42	0.42	0.42	0.49
Key		Flushing vol (L)			1.6	1.35	1.3	1.6	1.2	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.94	8.86	8.9	8.58	8.4	7.53	7.59	7.66	7.02	8.05
Electrical Conductivity (field)		µS/cm			922	295	77	39.3	111	65	55	96	55	47
pH Value		pH Unit	0.01		8.56	7.8	6.7	7.26	7.01	6.95	7.01	4.67	6.95	6.93
Electrical Conductivity @ 25°C		µS/cm	1		753	305	99	48	129	74	70	172	64	54
Total Alkalinity as CaCO3		mg/L	1	0.5	29	13	6	10	16	10	8	2	9	8
Acidity as CaCO3		mg/L	1	0.5	LOR	4	4	5	3	47	2	40	1	1
Sulfate	14808-79-8	mg/L	1	0.5	42	28	15	8	15	12	7	28	7	8
Silicon	7440-21-3	mg/L	0.05	0.025	1.14	0.49	0.66		0.92	0.67	0.65	0.74	0.84	0.82
Chloride	16887-00-6	mg/L	1	0.5					16	15	12	19	14	8
Calcium	7440-70-2	mg/L	1	0.5	1				LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR				LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	145				26	19	14	22	13	11
Potassium	7/09/7440	mg/L	1	0.5	3				1	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.02	1.93	0.92	1.85	4.5	2.4	2.43	2.12	1.95	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.13	2.69	0.73	1.31	3.25	0.99	1.82	1.93	1.79	0.78
Antimony	7440-36-0	mg/L	0.001	0.0005	0.001	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.012	0.016	0.018	0.01	0.02	0.01	0.008	0.014	0.01	0.01
Barium	7440-39-3	mg/L	0.001	0.0005	0.039	0.201	0.25	0.189	0.5	0.23	0.263	0.315	0.226	0.203
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	0.033	0.004	0.01	0.026	0.008	0.017	0.018	0.019	0.006
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	0.002	LOR	0.002	0.005	0.002	0.002	0.002	0.002	0.001
Copper	7440-50-8	mg/L	0.001	0.0005	LOR	0.022	0.019	0.039	0.119	0.044	0.057	0.063	0.04	0.038
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	0.02	0.002	0.004	0.011	0.003	0.008	0.01	0.009	0.003
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	0.002	LOR	0.002	0.004	0.001	0.002	0.002	0.001	0.001
Manganese	7439-96-5	mg/L	0.001	0.0005	LOR	0.028	0.015	0.028	0.08	0.025	0.032	0.036	0.024	0.021
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.016	0.008	0.006	0.003	0.004	0.004	0.003	0.005	0.003	0.002
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.01	0.013	0.006		0.01	0.005	0.005	0.006	0.009	0.002
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	0.001	LOR		0.001	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	0.004	0.002		0.006	0.002	0.003	0.003	0.002	0.002
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR	0.037
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.02	0.016	0.021	0.043	0.02	0.029	0.027	0.023	0.037
Fluoride	16984-48-8	mg/L	0.1	0.05	2.4	1.3	1.3	0.5	1	0.6	0.3	0.5	0.5	0.93
Total Phosphorus		mg/L	0.01	0.005	LOR				LOR	LOR	0.21	0.21	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_11 HEMH



Column	OD_11 HEMH	Week			23	24	25	26	28	29	30	31	32	35
Sample weight (kg)	1.921	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.65	0.65	0.65	0.65	0.7	0.7	0.65	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7	7.81	7.72	7.55	6.73	7.3	6.91	7.72	7.17	6.95
Electrical Conductivity (field)		µS/cm			30	34	30	32	28					
pH Value		pH Unit	0.01		6.92	6.48	6.47	7.32	6.56		6.73	6.42	6.55	6.08
Electrical Conductivity @ 25°C		µS/cm	1		37	40	33	35	31		41	63	47	57
Total Alkalinity as CaCO3		mg/L	1	0.5	7	5	4	5	4		5	5	6	5
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	1	LOR	2	LOR	LOR	4	13
Sulfate	14808-79-8	mg/L	1	0.5	6	6	5	5	5	5	6	8	6	8
Silicon	7440-21-3	mg/L	0.05	0.025	0.58	0.65	1.71	0.41	0.28	0.32	0.35	0.57	0.43	0.22
Chloride	16887-00-6	mg/L	1	0.5	4	8	11	3	1		13	8	10	9
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	6	9	8	8	7	4	10	12	9	11
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	1	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	1.51	0.19	0.13	0.09	0.16	0.18	0.3	0.24	0.28	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	1	0.14	0.11	0.11	0.1	0.15	0.16	0.2	0.16	0.1
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.008	0.005	0.005	0.006	0.004	0.004	0.004	0.006	0.004	0.002
Barium	7440-39-3	mg/L	0.001	0.0005	0.175	0.026	0.021	0.02	0.017	0.027	0.02	0.027	0.027	0.022
Cerium	7440-45-1	mg/L	0.001	0.0005	0.007	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.001	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.001	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.034	0.006	0.004	0.003	0.003	0.004	0.004	0.006	0.005	0.006
Lanthanum	7439-91-0	mg/L	0.001	0.0005	0.003	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.022	0.003	0.002	0.001	0.001	0.057	0.002	0.003	0.004	0.002
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.002	0.003	0.003	0.011	0.002	0.002	0.002	0.004	0.003	0.003
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.002	LOR	0.001	LOR	LOR	0.002	LOR	0.002	0.002	0.002
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.002	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.001
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025		LOR	LOR	LOR	LOR	LOR	0.191	0.026	0.063	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.1	0.3	0.4	0.3	0.3		0.2	0.4	0.3	0.3
Total Phosphorus		mg/L	0.01	0.005	0.12	0.01	LOR	LOR	LOR	LOR	LOR	0.01	0.07	0.04

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_11 HEMH



Column	OD_11 HEMH	Week			36	37	38	39	40	43	44	46	47	48
Sample weight (kg)	1.921	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.675	0.675	0.675	0.7	0.65	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.75	7.64	6.74	6.9	7.65	6.8	7.13	6.49		6.60
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		8.02	6.35	6.52	6.6	6.59	6.12	6.73	5.98	6.49	6.62
Electrical Conductivity @ 25°C		µS/cm	1		36	44	34	41	71.00	40	81	30	33	26
Total Alkalinity as CaCO3		mg/L	1	0.5	20	6	4	5	7.00	4	5	3	5	4
Acidity as CaCO3		mg/L	1	0.5	2	3	1	3	LOR	2	8	2	LOR	2
Sulfate	14808-79-8	mg/L	1	0.5	5	6	5	5	9.00	4	11	5	6	4
Silicon	7440-21-3	mg/L	0.05	0.025	0.48	0.42	0.36	0.62	0.67		0.93	0.22	0.47	0.43
Chloride	16887-00-6	mg/L	1	0.5	4	7	3	5	11.00	LOR	8	6	4	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	10	9	8	7	14.00	6	16	7	9	7
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.28	0.2	0.29	0.37	0.16	0.08	0.25	0.12	0.07	0.09
Aluminium	7429-90-5	mg/L	0.01	0.005	0.19	0.16	0.19	0.33	0.15	0.07	0.3	0.19	0.12	0.37
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.004	0.004	0.002	0.005	0.01	0.003	0.007	0.003	0.004	0.007
Barium	7440-39-3	mg/L	0.001	0.0005	0.023	0.024	0.018	0.028	0.04	0.035	0.055	0.021	0.026	0.02
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.002	LOR	LOR	LOR	0.001	0.001	0.003
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.004	0.004	0.003	0.007	0.01	0.003	0.009	0.003	0.004	0.005
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.002	LOR	LOR	LOR	0.002	LOR	0.002
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	0.002	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.002	0.002	0.002	0.003	0.00	0.002	0.005	0.002	0.002	0.002
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.002	0.003	0.002	0.003	0.00	0.002	0.005	0.002	0.002	0.003
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.001	0.001	0.001	0.001	0.00	0.002	0.004	0.002	0.002	0.002
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.00	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	0.01	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.3	0.3	0.3	0.2	0.30	0.2	0.4	0.1	0.3	0.3
Total Phosphorus		mg/L	0.01	0.005	0.01	0.01	LOR	LOR	LOR	LOR	0.01	LOR	LOR	0.02

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_11 HEMH



Column	OD_11 HEMH	Week			50	51	52	53	54	55	56	57	58	59
Sample weight (kg)	1.921	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.71	6.06	7.51	7.15	7.39	6.51	6.70	6.41	6.93	7.24
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		5.92	6.3	6.45	6.62	6.3	6.3	6.4	5.95	6.64	5.64
Electrical Conductivity @ 25°C		µS/cm	1		36	34	24	26	21	24	18	21	30	20
Total Alkalinity as CaCO3		mg/L	1	0.5	6		7	4	5	5	5	5	6	48
Acidity as CaCO3		mg/L	1	0.5	2	2	1	2	2	2	1	5	2	2
Sulfate	14808-79-8	mg/L	1	0.5	6	5	3	4	3	4	3	3	4	3
Silicon	7440-21-3	mg/L	0.05	0.025	0.5	0.28	0.22	0.43	0.28	0.21	0.23	0.14	0.1344	0.26
Chloride	16887-00-6	mg/L	1	0.5	2	17		LOR	LOR	LOR	LOR	LOR	2	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	8	7	5	7	4	4	4	4	5	4
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.21	0.07	LOR	0.09	0.14	0.08	0.1	LOR	LOR	0.1
Aluminium	7429-90-5	mg/L	0.01	0.005	0.17	0.11	0.08	0.37	0.15	0.06	0.1	0.08	0.09	0.13
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.003	0.004	0.003	0.007	0.003	0.002	0.003	0.002	LOR	0.003
Barium	7440-39-3	mg/L	0.001	0.0005	0.019	0.021	0.028	0.02	0.026	0.027	0.027	0.021	0.034	0.029
Cerium	7440-45-1	mg/L	0.001	0.0005	0.001	0.001	0.001	0.003	0.002	0.001	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.002	0.002	0.002	0.005	0.006	0.003	0.004	0.002	0.002	0.003
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.002	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.002	0.001	0.002	0.002	0.003	LOR	0.002	LOR	0.002	LOR
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.002	0.002	0.001	0.003	0.002	0.001	0.002	0.001	0.001	0.001
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.002	0.003	0.004	0.002	0.002	0.002	0.003	0.002	0.005	0.001
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	0.005	0.041	LOR	0.008	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.3	0.3	0.1	0.3	0.1	0.1	0.2	0.2	0.1	0.1
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	0.01	0.02	0.02	LOR	0.06	LOR	0.01	0.01

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_11 HEMH



Column	OD_11 HEMH	Week			60	61	62	64	67	68	73	74	75	76
Sample weight (kg)	1.921	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.65	0.65	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.83	7.77	6.38	7.63	7.31	7.85	7.09	8.07	7.49	7.10
Electrical Conductivity (field)		µS/cm								43.3	24	44.3	27	68
pH Value		pH Unit	0.01		5.46	6.41	6.05	6.35	6.49	6.08	6.18	6.42	6.8	6.7
Electrical Conductivity @ 25°C		µS/cm	1		20	16	21	30	28	47	24	34	32	71
Total Alkalinity as CaCO3		mg/L	1	0.5	5	6	2	3	7	5	5	8	3	9
Acidity as CaCO3		mg/L	1	0.5	2	4	2	2	2	10	2	1	1	2
Sulfate	14808-79-8	mg/L	1	0.5	2	3	3	4	4	20	4	4	4	8
Silicon	7440-21-3	mg/L	0.05	0.025	0.14	0.11	0.13	0.1	0.15	0.7	0.1	0.52	0.56	0.79
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	1	LOR	2	3	LOR	4	7	3
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	3	3	3	6	6	10	5	6	5	14
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.06	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.07	0.09	LOR	LOR	LOR		LOR	0.24	LOR	0.1
Aluminium	7429-90-5	mg/L	0.01	0.005	0.07	0.07	0.04	0.03	0.05	0.25	0.08	0.19	0.12	0.13
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.003	0.002	0.003	0.003	0.004	0.007	0.002	0.004	0.003	0.007
Barium	7440-39-3	mg/L	0.001	0.0005	0.035	0.023	0.011	0.024	0.02	0.05	0.018	0.074	0.029	0.066
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.003	0.002	LOR	0.005	0.004	0.007	0.004	0.01	0.005	0.007
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.002	0.001	LOR	0.002	0.002	0.004	0.001	0.004	0.002	0.003
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.001	0.001	LOR	0.001	0.002	0.004	0.001	0.003	0.002	0.005
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.003	0.003	0.002	0.003	0.003	0.006	0.002	0.006	0.004	0.007
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	0.013	0.013	0.006	LOR	0.01	LOR	0.005
Fluoride	16984-48-8	mg/L	0.1	0.05	0.1	0.1	0.1	0.2	0.1	0.3	0.1	0.2	0.2	0.4
Total Phosphorus		mg/L	0.01	0.005	LOR	0.02	LOR	LOR	0.18	0.02	LOR	0.02	LOR	0.04

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_11 HEMH



Column	OD_11 HEMH	Week			77	78	80	81	82	83	84	85	86	87
Sample weight (kg)	1.921	Extraction vol (L)			0.43	0.43	0.43	0.43	0.375	0.47	0.675	0.47	0.48	0.54
Key		Flushing vol (L)			0.7	0.65	0.65	0.65	0.7	0.4	0.9	0.65	0.75	0.8
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.18	7.26	7.27	7.12	8.65	7.43	6.73	7.66	5.05	6.58
Electrical Conductivity (field)		µS/cm			74	39.5	34	46	60.8	27.90	23.6	39.8	33.6	17.7
pH Value		pH Unit	0.01		7.02	6.58	6.3	6.67	6.77	6.8	7.01	7.06	6.35	6.93
Electrical Conductivity @ 25°C		µS/cm	1		57	46	38	41	41	35	25	32	26	20
Total Alkalinity as CaCO3		mg/L	1	0.5	21	19	4	10	9	23	9	4	5	4
Acidity as CaCO3		mg/L	1	0.5	1	2	2	LOR	LOR	2	1	1	1	2
Sulfate	14808-79-8	mg/L	1	0.5	6	5	3	6	6	5	4	4	4	3
Silicon	7440-21-3	mg/L	0.05	0.025	0.73	0.74	0.12	0.79	0.78	0.47	0.4	0.18	0.4	0.32
Chloride	16887-00-6	mg/L	1	0.5	LOR	4	LOR	LOR	LOR		LOR	LOR	LOR	6
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	1	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	11	9	2	11	8	6	5	5	4	4
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.05	0.07	0.11	0.1	0.09	0.06	LOR	LOR	0.09	0.08
Aluminium	7429-90-5	mg/L	0.01	0.005	0.1	0.11	0.12	0.15	0.13	0.06	0.07	0.02	0.15	0.09
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.004	0.005	0.003	0.004	0.003	0.003	0.005	0.003	0.003	0.002
Barium	7440-39-3	mg/L	0.001	0.0005	0.057	0.024	0.043	0.035	0.041	0.051	0.034	0.03	0.044	0.066
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.004	0.004	0.005	0.005	0.004	0.003	0.003	0.003	0.004	0.006
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.002	0.002	0.003	0.002	0.002	0.003	0.002	0.002	0.003	0.002
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.003	0.002	0.003	0.004	0.002	0.002	0.002	0.002	0.002	0.002
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.008	0.004	0.005	0.003	0.004	0.005	0.002	0.004	0.004	0.002
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.022	LOR	0.006	LOR	LOR	0.008	LOR	LOR	LOR	0.01
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_11 HEMH



Column	OD_11 HEMH	Week			88	89	90	91	92	93	94	95	96	97
Sample weight (kg)	1.921	Extraction vol (L)			0.55	0.43	0.43	0.45	0.5	0.48	0.444	0.5	0.5	0.49
Key		Flushing vol (L)			0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.60	6.86	7.00	8.25	7.97	7.54	8.17	7.81	7.33	7.40
Electrical Conductivity (field)		µS/cm			27.2	14.3	33.7	36.1	36.4	21.9	16	15.77	24.7	23.7
pH Value		pH Unit	0.01		6.19	6.7	7.36	8.01	5.65	6.41	6.97	7.86	6.78	6.65
Electrical Conductivity @ 25°C		µS/cm	1		22	15	38	36	28	17	21	13	15	23
Total Alkalinity as CaCO3		mg/L	1	0.5	7	5		---	5	LOR	6	3	LOR	LOR
Acidity as CaCO3		mg/L	1	0.5	6	LOR	1	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	3	2	5	4	4	2	LOR	2	2	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.15	0.1	0.96	0.44	0.42	0.1	0.12	0.12	0.1	0.1
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	7	5	3	LOR	3
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	4	3	7	5	5	3	4	3	3	4
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	0.07	0.13	0.08	0.04	0.04	0.05	0.04	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.05	0.06	0.09	LOR	LOR	LOR	LOR	LOR	LOR	0.04
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.003	0.001	0.002	0.004	0.003	0.002	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.003	0.002	0.003	0.044	0.04	0.031	0.035	0.028	0.036	0.003
Barium	7440-39-3	mg/L	0.001	0.0005	0.021	0.018	0.055	LOR	LOR	LOR	LOR	LOR	LOR	0.039
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	0.004	0.004	0.003	0.003	0.003	0.002	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.003	0.002	0.005	LOR	LOR	LOR	LOR	LOR	LOR	0.002
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.002	0.002	0.008	0.002	0.002	0.001	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.001	0.001	0.002	0.002	0.002	0.001	0.002	0.001	0.001	0.002
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.001	0.001	0.002	LOR	0.002	LOR	LOR	LOR	LOR	0.001
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.005	0.004	0.003	0.003	0.002	0.002	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.004	0.001	0.004	LOR	LOR	LOR	LOR	LOR	LOR	0.004
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	0.034	0.013	LOR	0.032	0.006	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	0.06	0.06	0.75	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	LOR	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.7	0.1
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_11 HEMH



Column	OD_11 HEMH	Week			98	99	100	101	102	103	104	105	106	107
Sample weight (kg)	1.921	Extraction vol (L)			0.5	0.5	0.5	0.5	0.51	0.55	0.51	0.5	0.5	0.5
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.56	8.85	8.13	7.95		7.65	8.69	6.82	8.18	8.33
Electrical Conductivity (field)		µS/cm			20.1	20.04	22.82	18.48	27.8	27.7	18.27	26.4	27.4	19.61
pH Value		pH Unit	0.01		7.08	5.68	7.04	7.64	7.04	6.94	6.46	6.67	6.83	6.73
Electrical Conductivity @ 25°C		µS/cm	1		20	22	20	16	14	20	15	16	16	13
Total Alkalinity as CaCO3		mg/L	1	0.5	6	LOR	6	10	5	7	6	2	5	6
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	2	LOR
Sulfate	14808-79-8	mg/L	1	0.5	2	3	3	2	2	2	2	4	2	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.11	0.08	0.11	0.08	0.08	0.39	0.11	0.08	0.08	0.08
Chloride	16887-00-6	mg/L	1	0.5	3	4	LOR	LOR	2	LOR	LOR	LOR	LOR	2
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	3	3	4	3	2	3	2	3	3	2
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	0.08	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.03	0.03	0.04	0.02	LOR	0.06	0.08	0.03	0.04	0.05
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.002	0.001	0.003	0.001	LOR	0.003	0.003	0.003	0.002	0.002
Barium	7440-39-3	mg/L	0.001	0.0005	0.033	0.029	0.036	0.026	0.03	0.04	0.022	0.034	0.024	0.02
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.002	0.002	0.002	0.002	LOR	0.004	0.003	0.002	0.003	0.002
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.002	0.001	0.002	0.001	LOR	0.003	LOR	0.001	0.001	0.001
Molybdenum	7439-98-7	mg/L	0.001	0.0005	LOR	LOR	0.001	LOR	LOR	0.001	0.001	0.001	0.001	0.001
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.004	0.004	0.003	0.002	LOR	0.004	LOR	0.003	0.002	0.002
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	0.028	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	LOR	LOR	LOR	LOR	0.7	0.1	0.1	0.2	LOR	LOR
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_11 HEMH



Column	OD_11 HEMH	Week			108	109	110	111	112	113	114	115	116	117
Sample weight (kg)	1.921	Extraction vol (L)			0.5	0.49	0.51	0.49	0.675	0.675	0.52	0.5	0.53	0.5
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.9	0.9	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.48	8.62	8.36	7.24	7.20	6.65	7.07	7.48	7.99	7.74
Electrical Conductivity (field)		µS/cm			19.31	20.94	25.7	16.03	21.8	15.75	15.09	14.65	11.88	10.48
pH Value		pH Unit	0.01		5.85	6.87	6.65	6.7	6.9	6.87	6.12	6.55	6.51	6.8
Electrical Conductivity @ 25°C		µS/cm	1		14	14	15	20	33	16	16	13	13	12
Total Alkalinity as CaCO3		mg/L	1	0.5	3	2	2	5	5	3	2	2	4	2
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	2	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	3	2	2	2	3	2	2	2	3	1
Silicon	7440-21-3	mg/L	0.05	0.025	0.08	0.08	0.07	0.11	0.43	0.36	LOR	0.09	0.06	0.07
Chloride	16887-00-6	mg/L	1	0.5	1	LOR	LOR	LOR	3	LOR	3	5	LOR	10
Calcium	7440-70-2	mg/L	1	0.5	1	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	2	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	4	2	2	3	4	3	LOR	2	2	2
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	0.1	LOR	0.1	0.07	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.04	0.02	0.05	0.03	0.07	0.07	LOR	0.04	0.02	0.01
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.002	0.002	0.002	0.002	0.004	0.004	0.025	0.002	0.001	0.004
Barium	7440-39-3	mg/L	0.001	0.0005	0.024	0.026	0.024	0.012	0.048	0.032	0.121	0.008	0.008	0.033
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.002	0.003	0.003	0.001	0.006	0.004	0.002	LOR	LOR	0.002
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	LOR	0.001	0.001	LOR	0.002	0.001	0.002	LOR	LOR	0.001
Molybdenum	7439-98-7	mg/L	0.001	0.0005	LOR	LOR	LOR	0.001	0.002	0.002	0.04	LOR	LOR	0.003
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.003	0.002	0.003	0.001	0.003	0.002	0.014	LOR	LOR	0.003
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	LOR	LOR	LOR	LOR	0.2	LOR	0.3	LOR	LOR	LOR
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_11 HEMH



Column	OD_11 HEMH	Week			118	119	120	121	122	125	129	131	135	139
Sample weight (kg)	1.921	Extraction vol (L)			0.675	0.55	0.5	0.52	0.5	0.5	0.48	0.49	0.48	0.47
Key		Flushing vol (L)			0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.66	7.31	6.75	6.46	6.26	6.70	8.68	7.94	7.67	7.67
Electrical Conductivity (field)		µS/cm			16.67	20.46	14.99	14.66	13.19	14	13.23	26.7	25.1	21.42
pH Value		pH Unit	0.01		7.21	6.25	6.9	7.55	7.06	7	6.62	6.23	6.56	7.28
Electrical Conductivity @ 25°C		µS/cm	1		17	19	14	17	15	12	13	19	21	20
Total Alkalinity as CaCO3		mg/L	1	0.5	3	5	4	2	4	5	1	6	5	LOR
Acidity as CaCO3		mg/L	1	0.5	2	LOR	2	LOR	2	2	4	2	2	2
Sulfate	14808-79-8	mg/L	1	0.5	2	2	2	2	2	2	2	3	4	3
Silicon	7440-21-3	mg/L	0.05	0.025	0.45	0.38	0.17	0.13	5	0.09	0.46	0.3	0.13	0.07
Chloride	16887-00-6	mg/L	1	0.5	1	5	1	2	LOR	1	LOR	2	2	3
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	2	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	3	4	2	2	LOR	2	2	3	4	3
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.05	0.05	LOR	LOR	0.01	LOR	0.06	0.15	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.06	0.07	0.05	0.02	LOR	0.01	0.18	0.19	0.01	0.02
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.002	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.003	0.002	0.003	0.003	0.016	0.002	0.002	0.002	0.002	0.001
Barium	7440-39-3	mg/L	0.001	0.0005	0.039	0.026	0.022	0.032	LOR	0.037	0.008	0.039	0.06	0.033
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.001	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.002	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.005	0.002	0.002	0.003	LOR	0.003	0.002	0.005	0.006	0.004
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.002	0.001	0.001	0.001	LOR	0.002	0.001	0.002	0.003	0.002
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.002	0.001	0.002	0.001	LOR	LOR	0.001	LOR	LOR	LOR
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.003	0.002	0.002	0.003	LOR	0.002	0.001	0.004	0.004	0.003
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	0.2	LOR	LOR	0.088	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.1	0.1	0.1	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_11 HEMH



Column	OD_11 HEMH	Week			148	150	152	156	161	165	169	174
Sample weight (kg)	1.921	Extraction vol (L)			0.48	0.49	0.475	0.51	0.51	0.5	0.5	0.5
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR								
pH (field)		pH Unit			8.08	7.87	5.89	6.20	8.12	5.69	6.23	6.67
Electrical Conductivity (field)		µS/cm			18.7	20.17	14.22	12.43	12.35	9.3	9.61	29.9
pH Value		pH Unit	0.01		6.57	6.65	6.3	6.69	6.82	6.49	6.42	6.76
Electrical Conductivity @ 25°C		µS/cm	1		18	15	17	20	15	11	13	18
Total Alkalinity as CaCO3		mg/L	1	0.5	LOR	3	1	14	1	LOR	3	4
Acidity as CaCO3		mg/L	1	0.5	LOR	2	LOR	2	2	2	2	2
Sulfate	14808-79-8	mg/L	1	0.5	3	3	2	2	2	2	2	3
Silicon	7440-21-3	mg/L	0.05	0.025	0.1	0.11	0.11	0.06	0.24	0.26	0.09	0.08
Chloride	16887-00-6	mg/L	1	0.5	2	1	1	LOR	LOR	LOR	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	4	2	3	3	2	2	2	3
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.01	0.02	0.02	0.2	0.01	0.01	0.01	LOR
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.002	0.001	0.002	0.002	0.002	0.002	LOR	0.001
Barium	7440-39-3	mg/L	0.001	0.0005	0.033	0.036	0.032	0.033	0.034	0.034	0.027	0.05
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.005	0.004	0.005	0.005	0.008	0.002	0.003	0.005
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.002	0.002	0.001	0.001	0.001	0.002	0.001	0.003
Molybdenum	7439-98-7	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.003	0.003	0.002	0.003	0.003	0.002	0.002	0.004
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	LOR	LOR	LOR	0.1	LOR	LOR	LOR	LOR
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Data
Column OD_12 GRNH



Column	OD_12 GRNH	Week			0	4	8	12	16	17	18	20	21	22
Sample weight (kg)	1.688	Extraction vol (L)			0.625	0.375	0.375	0.625	0.42	0.42	0.42	0.42	0.42	0.45
Key		Flushing vol (L)			1.6	1.35	1.3	1.6	1.2	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.63	8.36	8.61	8.33	8.16	6.8	6.95	7.2	6.48	7.64
Electrical Conductivity (field)		µS/cm			886	359	257	192	276	117	93	110	76	76
pH Value		pH Unit	0.01		7.81	7.14	6.82	6.32	6.74	6.53	6.56	5.83	5.57	6.41
Electrical Conductivity @ 25°C		µS/cm	1		744	374	275	132	296	135	119	133	92	86
Total Alkalinity as CaCO3		mg/L	1	0.5	24	8	8	8	8	6	6	6	2	7
Acidity as CaCO3		mg/L	1	0.5	2	4	4	3	3	47	2	LOR	3	1
Sulfate	14808-79-8	mg/L	1	0.5	48	48	55	31	73	39	26	33	21	24
Silicon	7440-21-3	mg/L	0.05	0.025	1.35	0.27	0.34		0.51	0.27	0.21	0.26	0.28	0.2
Chloride	16887-00-6	mg/L	1	0.5					25	15	9	10	7	14
Calcium	7440-70-2	mg/L	1	0.5	3				7	3	3	4	4	3
Magnesium	7439-95-4	mg/L	1	0.5	LOR				1	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	133				40	22	15	16	10	15
Potassium	7/09/7440	mg/L	1	0.5	13				10	4	4	6	3	4
Iron	7439-89-6	mg/L	0.01	0.005	0.01	0.3	0.09	0.15	0.34	0.44	0.36	0.28	0.07	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.08	1.5	0.08	0.25	0.76	0.22	0.55	0.54	0.48	0.1
Antimony	7440-36-0	mg/L	0.001	0.0005	0.005	0.001	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.03	0.011	0.008	0.003	0.006	0.003	0.002	0.003	0.002	0.001
Barium	7440-39-3	mg/L	0.001	0.0005	0.087	0.121	0.139	0.08	0.089	0.094	0.122	0.099	0.151	0.09
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	0.055	0.014	0.038	0.064	0.038	0.022	0.022	0.01	0.016
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	0.003	0.002	0.004	0.01	0.006	0.004	0.006	0.005	0.003
Copper	7440-50-8	mg/L	0.001	0.0005	0.003	0.068	0.047	0.092	0.234	0.124	0.068	0.086	0.044	0.058
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	0.036	0.008	0.021	0.037	0.02	0.012	0.015	0.009	0.01
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	0.001	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.018	0.015	0.036	0.038	0.15	0.075	0.06	0.083	0.075	0.057
Molybdenum	7439-98-7	mg/L	0.001	0.0005	1.02	0.506	0.784	0.32	0.676	0.262	0.261	0.206	0.135	0.13
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.049	0.026	0.036		0.07	0.033	0.03	0.039	0.034	0.027
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	0.002	LOR		0.002	0.001	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.035	0.105	0.022		0.014	0.009	0.007	0.004	0.002	0.003
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	0.001	LOR	LOR	0.002	LOR	LOR	LOR	LOR	0.017
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.006	0.011	0.011	0.011	0.014	0.011	0.013	0.016	0.017
Fluoride	16984-48-8	mg/L	0.1	0.05	4.2	2.2	2	1.1	2.6	1.9	1.8	1.8	1.5	0.22
Total Phosphorus		mg/L	0.01	0.005	LOR				LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Data
Column OD_12 GRNH



Column	OD_12 GRNH	Week			23	24	25	26	28	29	30	31	32	35
Sample weight (kg)	1.688	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.65	0.65	0.65	0.65	0.7	0.7	0.65	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.53	7.05	6.94	6.9	6.5	6.94	6.45	7.13	6.55	6.25
Electrical Conductivity (field)		µS/cm			66	64	67	55	52					
pH Value		pH Unit	0.01		7.12	5.76	4.4	6.85	6.01		6.07	5.52	6.06	5.65
Electrical Conductivity @ 25°C		µS/cm	1		75	78	108	71	72		66	88	69	65
Total Alkalinity as CaCO3		mg/L	1	0.5	8	5	LOR	4	5		5	26	6	6
Acidity as CaCO3		mg/L	1	0.5	5	3	8	2	3	2	1	2	4	3
Sulfate	14808-79-8	mg/L	1	0.5	21	20	20	20	21	16	20	19	20	19
Silicon	7440-21-3	mg/L	0.05	0.025	0.15	0.19	0.86	0.13	0.09	0.1	0.09	0.11	0.06	0.06
Chloride	16887-00-6	mg/L	1	0.5	5	7	10	1	LOR		10	2	5	4
Calcium	7440-70-2	mg/L	1	0.5	3	4	4	3	4	3	4	5	4	3
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	7	9	9	8	8	2	11	9	6	5
Potassium	7/09/7440	mg/L	1	0.5	4	4	4	4	5	3	4	6	4	3
Iron	7439-89-6	mg/L	0.01	0.005	0.08	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.04	LOR	0.03	0.02	0.02	0.02	LOR	0.19	0.03	0.03
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.002	LOR	0.001	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.089	0.05	0.055	0.039	0.038	0.042	0.043	0.039	0.044	0.039
Cerium	7440-45-1	mg/L	0.001	0.0005	0.006	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.003	0.004	0.004	0.004	0.004	0.004	0.003	0.004	0.003	0.004
Copper	7440-50-8	mg/L	0.001	0.0005	0.062	0.046	0.044	0.049	0.067	0.06	0.061	0.071	0.074	0.141
Lanthanum	7439-91-0	mg/L	0.001	0.0005	0.003	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.058	0.072	0.066	0.063	0.068	0.069	0.07	0.088	0.067	0.072
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.084	0.085	0.101	0.088	0.064	0.051	0.054	0.065	0.055	0.038
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.022	0.025	0.029	0.026	0.029	0.026	0.027	0.041	0.03	0.025
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.002	0.003	0.004	0.003	0.003	0.002	0.002	0.003	0.003	0.003
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025		LOR	LOR	0.006	LOR	LOR	0.057	0.01	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	1.1	2	1.7	1.4	1.7		1.4	1.3	1.6	1.1
Total Phosphorus		mg/L	0.01	0.005	0.03	LOR	LOR	LOR	LOR	LOR	LOR	0.01	0.05	0.03

Appendix A: Tabulated Laboratory Analytical Data
Column OD_12 GRNH



Column	OD_12 GRNH	Week			36	37	38	39	40	43	44	46	47	48
Sample weight (kg)	1.688	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.675	0.675	0.675	0.7	0.65	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			5.95	6.86	6.13	6.27	7.36	5.97	6.7	5.93		6.12
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		6.74	7.22	6.02	6.16	5.71	5.2	6.06	5.61	5.79	5.79
Electrical Conductivity @ 25°C		µS/cm	1		63	63	54	70	70.00	67	72	41	35	27
Total Alkalinity as CaCO3		mg/L	1	0.5	7	6	4	2	2.00	3	2	8	2	4
Acidity as CaCO3		mg/L	1	0.5	3	3	2	4	3.00	3	4	3	2	2
Sulfate	14808-79-8	mg/L	1	0.5	19	17	14	16	18.00	14	20	12	12	11
Silicon	7440-21-3	mg/L	0.05	0.025	0.09	0.1	0.06	0.09	0.06		0.1	LOR	0.07	0.05
Chloride	16887-00-6	mg/L	1	0.5	3	3	1	2	2.00	LOR	LOR	LOR	1	LOR
Calcium	7440-70-2	mg/L	1	0.5	4	4	4	3	3.00	4	5	3	3	3
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	1	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	5	4	4	4	6.00	3	4	2	2	2
Potassium	7/09/7440	mg/L	1	0.5	3	3	4	3	4.00	2	3	3	2	2
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.02	0.03	0.03	0.04	0.03	LOR	0.06	0.05	0.02	0.02
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.001	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.036	0.045	0.04	0.034	0.03	0.043	0.038	0.028	0.035	0.022
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.005	0.004	0.003	0.004	0.00	0.003	0.006	0.002	0.007	0.003
Copper	7440-50-8	mg/L	0.001	0.0005	0.094	0.092	0.095	0.102	0.10	0.125	0.141	0.12	0.106	0.098
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.086	0.072	0.066	0.077	0.08	0.068	0.108	0.052	0.126	0.061
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.039	0.04	0.031	0.04	0.05	0.021	0.054	0.021	0.038	0.023
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.00	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.027	0.025	0.022	0.024	0.02	0.021	0.031	0.018	0.03	0.018
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.003	0.002	0.002	0.002	0.00	0.002	0.003	0.002	0.002	0.002
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.006	LOR	LOR	LOR	LOR	0.01	0.005	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	1.4	1.4	1	1.1	1.00	1	1.6	0.1	0.8	0.9
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	0.03	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Data
Column OD_12 GRNH



Column	OD_12 GRNH	Week			50	51	52	53	54	55	56	57	58	59
Sample weight (kg)	1.688	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.60	6.11	7.15	6.49	7.04	6.02	6.29	5.75	6.48	6.61
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		5.62	5.37	6.1	5.79	5.87	5.86	5.84	5.81	6.03	5.54
Electrical Conductivity @ 25°C		µS/cm	1		44	43	45	27	46	46	38	42	50	41
Total Alkalinity as CaCO3		mg/L	1	0.5	2		7	4	4	4	5	5	5	54
Acidity as CaCO3		mg/L	1	0.5	4	2	2	2	2	2	2	4	2	2
Sulfate	14808-79-8	mg/L	1	0.5	14	13	13	11	10	12	12	12	14	11
Silicon	7440-21-3	mg/L	0.05	0.025	0.14	0.047	0.06	0.05	LOR	LOR	LOR	LOR	LOR	LOR
Chloride	16887-00-6	mg/L	1	0.5	LOR	17	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	4	3	4	3	3	3	3	3	3	3
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	1	LOR	LOR	LOR	LOR	LOR	1	LOR
Sodium	7440-23-5	mg/L	1	0.5	2	2	2	2	2	2	2	2	2	1
Potassium	7/09/7440	mg/L	1	0.5	2	2	2	2	2	2	2	2	2	2
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	LOR	0.01	0.01	0.02	0.03	LOR	0.04	LOR	LOR	0.02
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.001
Barium	7440-39-3	mg/L	0.001	0.0005	0.018	0.025	0.024	0.022	0.018	0.021	0.026	0.028	0.025	0.024
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.004	0.003
Copper	7440-50-8	mg/L	0.001	0.0005	0.046	0.07	0.065	0.098	0.072	0.069	0.098	0.094	0.132	0.106
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.09	0.07	0.07	0.061	0.066	0.057	0.075	0.067	0.083	0.067
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.02	0.027	0.027	0.023	0.023	0.023	0.026	0.024	0.026	0.02
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.02	0.023	0.023	0.018	0.018	0.017	0.02	0.02	0.022	0.016
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	0.022	LOR	LOR	0.01	0.008	LOR	0.03	0.017
Fluoride	16984-48-8	mg/L	0.1	0.05	1	0.8	1.1	0.9	0.6	0.7	0.8	0.7	0.7	0.8
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	0.11	LOR	0.02	LOR

Appendix A: Tabulated Laboratory Analytical Data
Column OD_12 GRNH



Column	OD_12 GRNH	Week			60	61	62	64	67	68	73	74	75	76
Sample weight (kg)	1.688	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.65	0.65	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			5.91	7.45	5.79	8.19	7.08	6.77	6.62	7.53	7.42	6.57
Electrical Conductivity (field)		µS/cm								86.1	67	100.3	69.1	80.3
pH Value		pH Unit	0.01		5.77	5.77	5.91	5.53	5.46	5.69	5.58	6.05	5.64	5.65
Electrical Conductivity @ 25°C		µS/cm	1		45	42	45	80	73	85	67	82	76	82
Total Alkalinity as CaCO3		mg/L	1	0.5	4	4	2	3	5	5	5	15	2	3
Acidity as CaCO3		mg/L	1	0.5	4	2	5	3	1	5	4	4	2	
Sulfate	14808-79-8	mg/L	1	0.5	11	13	14	23	22	28	20	20	21	26
Silicon	7440-21-3	mg/L	0.05	0.025	0.05	0.05	0.06	0.06	0.09	0.24	0.06	0.11	0.13	0.12
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	6	8	LOR
Calcium	7440-70-2	mg/L	1	0.5	3	3	3	6	6	6	5	7	5	6
Magnesium	7439-95-4	mg/L	1	0.5	LOR	1	1	2	2	2	2	2	2	2
Sodium	7440-23-5	mg/L	1	0.5	1	1	2	2	3	2	2	2	2	2
Potassium	7/09/7440	mg/L	1	0.5	2	1	2	3	4	3	2	2	LOR	2
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.02	0.02	LOR	0.02	0.01	0.04	0.06	0.09	0.03	0.03
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.001	0.001	LOR	LOR	LOR	0.002	0.001	LOR	LOR	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.056	0.026	0.023	0.052	0.024	0.027	0.035	0.061	0.023	0.026
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.001	LOR	0.002	LOR	0.001
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.004	0.004	0.003	0.005	0.006	0.014	0.006	0.009	0.009	0.012
Copper	7440-50-8	mg/L	0.001	0.0005	0.146	0.139	0.103	0.361	0.326	0.54	0.565	0.541	0.452	0.471
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.002	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.08	0.085	0.074	0.147	0.163	0.311	0.168	0.263	0.22	0.304
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.017	0.025	0.016	0.019	0.015	0.027	0.017	0.019	0.018	0.027
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.002	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.02	0.02	0.023	0.027	0.031	0.038	0.032	0.041	0.031	0.035
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.002	0.002	0.001	0.001	0.001	0.004	0.005	0.005	0.005	0.005
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.006	0.006	0.005	0.006	0.006	0.009	0.024	0.016	0.007	0.007
Fluoride	16984-48-8	mg/L	0.1	0.05	0.9	0.5	0.7	1.3	1	1.2	0.9	1.2	1	0.4
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	0.63	0.02	LOR	0.01	2	0.47

Appendix A: Tabulated Laboratory Analytical Data
Column OD_12 GRNH



Column	OD_12 GRNH	Week			77	78	80	81	82	83	84	85	86	87
Sample weight (kg)	1.688	Extraction vol (L)			0.43	0.43	0.43	0.43	0.375	0.44	0.635	0.4	0.44	0.5
Key		Flushing vol (L)			0.7	0.65	0.65	0.65	0.7	0.65	0.9	0.65	0.75	0.8

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.61	6.11	6.50	6.16	8.18	6.61	5.69	6.96	4.77	5.55
Electrical Conductivity (field)		µS/cm			71.6	57.7	50.5	43	85.8	57.4	101.3	71.5	66.2	41.3
pH Value		pH Unit	0.01		6.05	5.77	5.44	5.53	5.81	6.07	6.02	6.23	5.64	5.98
Electrical Conductivity @ 25°C		µS/cm	1		66	64	56	37	72	60	94	64	65	44
Total Alkalinity as CaCO3		mg/L	1	0.5	5	5	1	20	5	3	20	3	4	2
Acidity as CaCO3		mg/L	1	0.5	2	47	4	4	LOR	4	1	1	1	2
Sulfate	14808-79-8	mg/L	1	0.5	17	18	16	13	21	18	28	17	18	13
Silicon	7440-21-3	mg/L	0.05	0.025	0.07	0.18	0.12	0.06	0.14	0.09	0.33	0.07	0.08	LOR
Chloride	16887-00-6	mg/L	1	0.5	LOR	7	LOR	LOR	LOR		LOR	LOR	LOR	2
Calcium	7440-70-2	mg/L	1	0.5	4	5	4	3	4	4	7	5	5	3
Magnesium	7439-95-4	mg/L	1	0.5	2	2	2	1	2	2	3	2	2	1
Sodium	7440-23-5	mg/L	1	0.5	2	1	1	LOR	2	2	2	1	1	LOR
Potassium	7/09/7440	mg/L	1	0.5	2	2	2	1	2	2	2	2	2	1
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.04	0.03	0.05	0.04	0.04	0.03	0.06	0.02	0.04	0.03
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.023	0.026	0.033	0.027	0.027	0.038	0.058	0.032	0.028	0.055
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	0.001	0.003	0.001	0.001	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.009	0.011	0.007	0.008	0.013	0.009	0.019	0.008	0.011	0.008
Copper	7440-50-8	mg/L	0.001	0.0005	0.373	0.376	0.504	0.379	0.472	0.43	0.872	0.464	0.49	0.337
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	0.002	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.206	0.288	0.191	0.194	0.33	0.268	0.602	0.259	0.248	0.234
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.016	0.01	0.016	0.01	0.016	0.012	0.019	0.012	0.012	0.008
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	0.002	LOR	0.001	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.024	0.029	0.026	0.015	0.024	0.023	0.04	0.029	0.025	0.016
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.004	0.002	0.005	0.004	0.004	0.005	0.008	0.006	0.004	0.003
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.005	0.006	0.007	LOR	0.008	LOR	0.011	LOR	0.026	0.015
Fluoride	16984-48-8	mg/L	0.1	0.05	0.8	0.4	0.8	0.8	1.3	1.4	1.6	0.9	0.9	0.1
Total Phosphorus		mg/L	0.01	0.005	0.01	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Data
Column OD_12 GRNH



Column	OD_12 GRNH	Week			88	89	90	91	92	93	94	95	96	97
Sample weight (kg)	1.688	Extraction vol (L)			0.5	0.43	0.43	0.47	0.49	0.47	0.42	0.46	0.46	0.46
Key		Flushing vol (L)			0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.05	5.94	6.47	7.44	7.02	7.13	7.35	7.17	6.61	6.47
Electrical Conductivity (field)		µS/cm			62.0	48.7	58.3	77.6	87.8	69.5	53.1	58.5	66.8	70.8
pH Value		pH Unit	0.01		6.03	7.52	6.32	7	5.77	5.92	6.4	6.62	5.86	5.98
Electrical Conductivity @ 25°C		µS/cm	1		58	52	64	82	76	61	68	54	55	72
Total Alkalinity as CaCO3		mg/L	1	0.5	4	3	LOR		2	LOR	6	2	LOR	LOR
Acidity as CaCO3		mg/L	1	0.5	6	1	8	2	2	LOR	6	4	2	LOR
Sulfate	14808-79-8	mg/L	1	0.5	19	16	19	22	25	19	17	17	20	22
Silicon	7440-21-3	mg/L	0.05	0.025	LOR	LOR	0.13	0.06	0.14	0.05	0.06	LOR	0.07	LOR
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	2	4	LOR	LOR	2
Calcium	7440-70-2	mg/L	1	0.5	5	3	4	5	6	4	5	4	4	4
Magnesium	7439-95-4	mg/L	1	0.5	2	2	2	2	2	2	2	2	2	2
Sodium	7440-23-5	mg/L	1	0.5	1	LOR	1	2	2	2	2	LOR	2	1
Potassium	7/09/7440	mg/L	1	0.5	2	1	2	2	2	1	2	2	2	2
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	0.03	0.06	0.07	0.04	0.04	0.05	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.02	0.02	0.02	LOR	LOR	LOR	LOR	LOR	LOR	0.06
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	LOR	LOR	LOR	0.044	0.038	0.044	0.059	0.059	0.047	0.001
Barium	7440-39-3	mg/L	0.001	0.0005	0.032	0.035	0.023	0.002	0.002	0.001	LOR	0.001	0.001	0.041
Cerium	7440-45-1	mg/L	0.001	0.0005	0.001	LOR	0.001	0.012	0.015	0.01	0.013	0.013	0.014	0.002
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.011	0.01	0.014	0.561	0.694	0.532	0.615	0.653	0.8	0.016
Copper	7440-50-8	mg/L	0.001	0.0005	0.467	0.432	0.491	0.001	0.002	LOR	LOR	LOR	LOR	0.911
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.001
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.425	0.495	0.341	0.391	0.371	0.408	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.308	0.326	0.401	0.012	0.015	0.011	0.011	0.01	0.009	0.436
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.012	0.01	0.011	LOR	LOR	LOR	0.001	0.002	0.001	0.009
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	0.001	0.03	0.039	0.028	0.029	0.024	0.026	0.001
Strontium	7440-24-6	mg/L	0.001	0.0005	0.026	0.017	0.019	LOR	LOR	LOR	LOR	LOR	LOR	0.025
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.006	0.008	0.006	0.004	0.006	0.008	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.004	0.004	0.004	LOR	LOR	LOR	LOR	LOR	LOR	0.01
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	0.007	0.02	0.005	0.015	0.008	0.008	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.005	0.012	LOR	LOR	LOR	LOR	LOR	LOR	0.008
Fluoride	16984-48-8	mg/L	0.1	0.05	0.8	0.8	1.2	LOR	1.1	0.9	1	0.6	0.7	1
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	

Appendix A: Tabulated Laboratory Analytical Data
Column OD_12 GRNH



Column	OD_12 GRNH	Week			98	99	100	101	102	103	104	105	106	107
Sample weight (kg)	1.688	Extraction vol (L)			0.46	0.455	0.46	0.46	0.47	0.455	0.46	0.46	0.46	0.46
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.88	8.32	7.96	7.21		6.79	7.60	6.13	7.48	7.37
Electrical Conductivity (field)		µS/cm			67.4	70.8	52.5	54.2	64.4	77.6	42	71	86.9	61.9
pH Value		pH Unit	0.01		6.47	5.73	6.46	6.78	6.25	6.02	6.12	6.14	5.88	6.21
Electrical Conductivity @ 25°C		µS/cm	1		60	73	53	50	50	64	35	52	61	50
Total Alkalinity as CaCO3		mg/L	1	0.5	4	LOR	4	6	5	2	LOR	2	10	6
Acidity as CaCO3		mg/L	1	0.5		LOR	LOR	LOR	LOR	LOR	LOR	LOR	4	LOR
Sulfate	14808-79-8	mg/L	1	0.5	20	22	15	16	14	20	11	21	21	18
Silicon	7440-21-3	mg/L	0.05	0.025	0.07	LOR	LOR	LOR	LOR	0.07	0.07	LOR	0.06	LOR
Chloride	16887-00-6	mg/L	1	0.5	2	1	1	LOR	1	LOR	LOR	LOR	1	1
Calcium	7440-70-2	mg/L	1	0.5	4	4	3	4	4	3	3	3	4	4
Magnesium	7439-95-4	mg/L	1	0.5	2	2	1	2	1	2	1	2	2	2
Sodium	7440-23-5	mg/L	1	0.5	1	1	LOR	1	LOR	LOR	LOR	1	1	LOR
Potassium	7/09/7440	mg/L	1	0.5	2	2	1	2	1	2	1	2	2	2
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.03	0.04	0.04	0.04	LOR	0.03	0.04	0.05	0.05	0.05
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.032	0.049	0.04	0.045	0.032	0.022	0.026	0.034	0.03	0.029
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	0.002	0.001	0.001	LOR	0.002	0.001	0.002	0.002	0.002
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.016	0.018	0.012	0.012	0.014	0.025	0.01	0.019	0.02	0.015
Copper	7440-50-8	mg/L	0.001	0.0005	0.618	0.806	0.72	0.629	0.782	0.816	0.666	0.83	0.971	0.995
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	0.001	LOR	LOR	LOR	0.001	LOR	0.001	0.001	0.001
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.445	0.49	0.338	0.312	0.372	0.457	0.295	0.541	0.572	0.427
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.008	0.009	0.006	0.005	LOR	0.006	0.005	0.007	0.006	0.005
Nickel	7440-02-0	mg/L	0.001	0.0005	0.001	0.002	LOR	LOR	LOR	0.002	LOR	0.001	0.001	0.001
Strontium	7440-24-6	mg/L	0.001	0.0005	0.022	0.024	0.018	0.016	0.02	0.018	0.014	0.02	0.02	0.02
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.004	0.01	0.009	0.008	0.008	0.01	0.008	0.011	0.013	0.012
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.008	0.013	0.009	0.008	LOR	0.025	0.007	0.01	0.017	0.009
Fluoride	16984-48-8	mg/L	0.1	0.05	0.8	0.8	0.8	0.8	LOR	0.7	0.8	0.7	0.9	0.8
Total Phosphorus		mg/L	0.01	0.005			LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Data
Column OD_12 GRNH



Column	OD_12 GRNH	Week			108	109	110	111	112	113	114	115	116	117
Sample weight (kg)	1.688	Extraction vol (L)			0.495	0.45	0.47	0.45	0.67	0.66	0.45	0.46	0.46	0.46
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.9	0.9	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.36	7.19	7.48	6.28	6.18	5.61	6.23	6.84	7.41	6.94
Electrical Conductivity (field)		µS/cm			74.5	57.8	57.9	17.9	98	89.5	50	60.2	52.7	47
pH Value		pH Unit	0.01		6.04	6.1	5.98	4.68	6.05	6.18	5.33	5.67	5.71	5.83
Electrical Conductivity @ 25°C		µS/cm	1		66	50	47	100	104	85	49	61	53	46
Total Alkalinity as CaCO3		mg/L	1	0.5	5	2	2	5	7	2	3	2	2	2
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	10	2	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	22	17	14	26	34	29	16	20	18	12
Silicon	7440-21-3	mg/L	0.05	0.025	0.05	LOR	LOR	LOR	0.3	0.16	LOR	0.08	LOR	LOR
Chloride	16887-00-6	mg/L	1	0.5	2	LOR	LOR	LOR	1	LOR	4	5	LOR	2
Calcium	7440-70-2	mg/L	1	0.5	5	4	3	6	8	7	4	4	3	4
Magnesium	7439-95-4	mg/L	1	0.5	2	2	1	2	3	2	1	2	1	1
Sodium	7440-23-5	mg/L	1	0.5	1	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	1
Potassium	7/09/7440	mg/L	1	0.5	2	2	1	2	2	2	1	2	1	1
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	0.07	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.07	0.06	0.05	0.06	0.13	0.11	0.05	0.06	0.06	0.05
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	LOR	LOR	0.001	LOR	LOR	0.001	LOR	LOR	LOR	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.04	0.031	0.027	0.038	0.058	0.06	0.028	0.046	0.032	0.045
Cerium	7440-45-1	mg/L	0.001	0.0005	0.002	0.002	0.002	0.001	0.007	0.006	LOR	LOR	LOR	0.002
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.018	0.016	0.015	0.027	0.039	0.033	0.018	0.025	0.018	0.017
Copper	7440-50-8	mg/L	0.001	0.0005	1.17	0.964	0.861	1.32	2.58	2.18	1.09	1.17	1.11	1.34
Lanthanum	7439-91-0	mg/L	0.001	0.0005	0.002	0.001	0.001	LOR	0.005	0.004	LOR	LOR	LOR	0.001
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.586	0.464	0.433	0.857	1.08	0.918	0.488	0.689	0.479	0.47
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.007	0.004	0.003	0.005	0.007	0.007	0.003	0.003	0.003	0.003
Nickel	7440-02-0	mg/L	0.001	0.0005	0.001	LOR	0.001	0.002	0.003	0.003	LOR	0.002	0.002	0.001
Strontium	7440-24-6	mg/L	0.001	0.0005	0.027	0.02	0.016	0.026	0.036	0.033	0.018	0.019	0.019	0.017
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.017	0.013	0.013	0.009	0.031	0.031	0.01	0.009	0.01	0.018
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.012	0.011	0.007	0.014	0.023	0.017	0.015	0.012	0.012	0.011
Fluoride	16984-48-8	mg/L	0.1	0.05	0.8	0.8	0.8	0.7	1.7	1.3	0.8	1	0.8	0.9
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Data
Column OD_12 GRNH



Column	OD_12 GRNH	Week			118	119	120	121	122	125	129	131	135	139
Sample weight (kg)	1.688	Extraction vol (L)			0.665	0.44	0.46	0.48	0.47	0.48	0.46	0.45	0.45	0.45
Key		Flushing vol (L)			0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.70	6.61	6.10	5.63	5.52	6.26	7.94	6.91	7.59	6.25
Electrical Conductivity (field)		µS/cm			92.8	48.1	80.5	61.8	67.9	72.2	57.6	45.2	91.5	54.2
pH Value		pH Unit	0.01		5.75	5.44	5.75	6.74	5.41	5.92	5.98	5.78	5.52	4.16
Electrical Conductivity @ 25°C		µS/cm	1		97	47	77	60	67	71	60	42	79	83
Total Alkalinity as CaCO3		mg/L	1	0.5	2	4	3	LOR		4	3	8	4	LOR
Acidity as CaCO3		mg/L	1	0.5	4	6	9	10	2	8		2	6	10
Sulfate	14808-79-8	mg/L	1	0.5	30	13	26	19	22	24	18	8	27	15
Silicon	7440-21-3	mg/L	0.05	0.025	0.19	LOR	0.06	0.05	5	0.06	0.13	0.05	0.09	0.07
Chloride	16887-00-6	mg/L	1	0.5	1	3	2	1	6	LOR	2	2	2	1
Calcium	7440-70-2	mg/L	1	0.5	6	3	6	4	1	5	4	2	5	4
Magnesium	7439-95-4	mg/L	1	0.5	3	1	2	1	LOR	2	1	1	2	1
Sodium	7440-23-5	mg/L	1	0.5	LOR	LOR	LOR	LOR	2	LOR	LOR	LOR	LOR	LOR
Potassium	7/09/7440	mg/L	1	0.5	2	1	2	2	LOR	2	1	1	2	1
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	0.05	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.13	0.04	0.08	0.07	LOR	0.06	0.07	0.06	0.07	0.06
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.001	LOR	LOR	0.001	0.034	LOR	LOR	LOR	LOR	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.061	0.02	0.047	0.029	0.002	0.038	0.018	0.01	0.043	0.027
Cerium	7440-45-1	mg/L	0.001	0.0005	0.007	LOR	0.002	0.004	0.025	0.004	LOR	LOR	0.004	0.003
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.05	0.025	0.039	0.026	1.49	0.033	0.027	0.024	0.043	0.022
Copper	7440-50-8	mg/L	0.001	0.0005	2.86	1.14	2.3	1.62	0.001	2.25	1.85	1.18	2.38	1.7
Lanthanum	7439-91-0	mg/L	0.001	0.0005	0.005	LOR	0.002	0.002	LOR	0.003	LOR	LOR	0.003	0.002
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.002	0.744	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	1.28	0.598	1.09	0.773	0.003	0.934	0.652	0.515	1.18	0.634
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.005	0.002	0.006	0.004	0.002	0.004	0.003	0.002	0.004	0.002
Nickel	7440-02-0	mg/L	0.001	0.0005	0.004	0.002	0.003	0.002	0.027	0.003	0.003	0.002	0.003	0.002
Strontium	7440-24-6	mg/L	0.001	0.0005	0.03	0.014	0.032	0.023	LOR	0.021	0.019	0.013	0.025	0.017
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.014	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.034	0.007	0.016	0.024	LOR	0.026	0.007	0.007	0.028	0.02
Yttrium	7440-65-5	mg/L	0.001	0.0005	0.001	LOR	LOR	LOR	0.013	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.025	0.018	0.025	0.017	LOR	0.016	0.014	0.011	0.024	0.015
Fluoride	16984-48-8	mg/L	0.1	0.05	1.2	0.7	1.2	1		1.1	0.6	0.5	1.2	0.5
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Data
Column OD_12 GRNH



Column	OD_12 GRNH	Week			148	150	152	156	161	165	169	174
Sample weight (kg)	1.688	Extraction vol (L)			0.45	0.44	0.46	0.49	0.46	0.45	0.46	0.46
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR								
pH (field)		pH Unit			6.54	6.51	5.13	5.43	7.50	5.01	5.58	5.65
Electrical Conductivity (field)		µS/cm			70.3	62.1	87.1	56.1	67.2	63	75.6	87.7
pH Value		pH Unit	0.01		5.88	5.92	5.95	5.8	5.89	5.72	5.79	5.71
Electrical Conductivity @ 25°C		µS/cm	1		70	58	80	89	72	66	83	83
Total Alkalinity as CaCO3		mg/L	1	0.5	LOR	2	LOR	LOR	LOR	LOR	3	6
Acidity as CaCO3		mg/L	1	0.5	10	6	5	7	8	6	31	10
Sulfate	14808-79-8	mg/L	1	0.5	23	18	27	18	25	22	24	24
Silicon	7440-21-3	mg/L	0.05	0.025	0.07	0.06	0.08	LOR	0.22	0.22	LOR	0.07
Chloride	16887-00-6	mg/L	1	0.5	7	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	4	3	5	4	4	4	4	5
Magnesium	7439-95-4	mg/L	1	0.5	2	1	2	1	2	1	2	2
Sodium	7440-23-5	mg/L	1	0.5	1	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Potassium	7/09/7440	mg/L	1	0.5	2	1	2	2	2	2	2	2
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.06	0.06	0.11	0.07	0.08	0.08	0.07	0.11
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.032	0.017	0.027	0.023	0.029	0.02	0.016	0.031
Cerium	7440-45-1	mg/L	0.001	0.0005	0.004	0.004	0.008	0.004	0.006	0.006	0.006	0.01
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.039	0.03	0.05	0.028	0.042	0.03	0.054	0.049
Copper	7440-50-8	mg/L	0.001	0.0005	2.66	2.25	3.78	2.25	3.04	2.43	3.39	3.61
Lanthanum	7439-91-0	mg/L	0.001	0.0005	0.003	0.002	0.005	0.003	0.004	0.004	0.004	0.006
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	1.06	0.796	1.44	0.863	1.16	0.843	1.34	1.21
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.002	0.002	0.003	0.002	0.002	0.002	0.002	0.002
Nickel	7440-02-0	mg/L	0.001	0.0005	0.003	0.002	0.004	0.002	0.003	LOR	0.004	0.004
Strontium	7440-24-6	mg/L	0.001	0.0005	0.018	0.014	0.025	0.018	0.021	0.02	0.016	0.021
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.033	0.031	0.057	0.038	0.051	0.038	0.048	0.067
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.001
Zinc	7440-66-6	mg/L	0.005	0.0025	0.02	0.016	0.025	0.015	0.02	0.016	0.024	0.024
Fluoride	16984-48-8	mg/L	0.1	0.05	0.6	0.5	0.9	0.9	0.8	0.8	0.7	0.8
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_13 GRNB



Column	OD_13 GRNB	Week			0	4	8	12	16	17	18	20	21	22
Sample weight (kg)	1.734		Extraction vol (L)		0.625	0.375	0.375	0.625	0.42	0.42	0.42	0.42	0.42	0.46
Key			Flushing vol (L)		1.6	1.35	1.3	1.6	1.2	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			9.72	9.17	9.68	9.11	8.71	7.85	8.15	8.05	7.53	8.4
Electrical Conductivity (field)		µS/cm			465	228	160	131.6	160	90	67	77	68	49
pH Value		pH Unit	0.01		9.01	8.87	8.81	8.13	7.68	7.42	7.5	7.36	7.35	7.27
Electrical Conductivity @ 25°C		µS/cm	1		382	233	230	141	184	42	86	101	73	52
Total Alkalinity as CaCO3		mg/L	1	0.5	43	29	33	23	29	10	14	14	13	22
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	2	1	6	2	2	1	1
Sulfate	14808-79-8	mg/L	1	0.5	33	29	40	24	31	19	11	13	12	10
Silicon	7440-21-3	mg/L	0.05	0.025	1.44	0.41	0.56		0.78	0.33	0.59	0.87	0.67	0.36
Chloride	16887-00-6	mg/L	1	0.5					14	9	5	7	4	4
Calcium	7440-70-2	mg/L	1	0.5	LOR				2	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR				LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	77				36	18	15	17	12	14
Potassium	7/09/7440	mg/L	1	0.5	7				5	3	2	3	2	0.28
Iron	7439-89-6	mg/L	0.01	0.005	0.03	0.36	0.13	0.18	0.58	0.43	0.51	0.35	0.26	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.24	2.73	0.19	0.23	0.74	0.29	0.7	0.66	0.82	0.17
Antimony	7440-36-0	mg/L	0.001	0.0005	0.001	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.012	0.008	0.011	0.005	0.008	0.004	0.004	0.004	0.004	0.003
Barium	7440-39-3	mg/L	0.001	0.0005	0.048	0.235	0.202	0.127	0.299	0.242	0.292	0.265	0.252	0.177
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	0.018	0.003	0.004	0.011	0.007	0.009	0.006	0.007	0.003
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	0.001	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.003	0.024	0.02	0.023	0.077	0.045	0.065	0.047	0.051	0.03
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	0.008	0.001	0.005	0.005	0.003	0.004	0.003	0.003	0.002
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.003	0.024	0.014	0.015	0.047	0.024	0.034	0.024	0.028	0.014
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.268	0.267	0.47	0.268	0.423	0.241	0.227	0.245	0.182	0.116
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.008	0.012	0.016		0.021	0.012	0.011	0.013	0.014	0.006
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR		0.002	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.025	0.07	0.075		0.031	0.018	0.035	0.022	0.019	0.015
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	0.003	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.008	0.006	0.007	0.009	0.006	LOR	0.013	0.012	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	7.5	6.1	8.6	4.5	6.6	LOR	2.3	3	2.8	1.8
Total Phosphorus		mg/L	0.01	0.005	LOR				LOR	LOR	0.02	0.01		LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_13 GRNB



Column	OD_13 GRNB	Week			23	24	25	26	28	29	30	31	32	35
Sample weight (kg)	1.734		Extraction vol (L)		0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key			Flushing vol (L)		0.7	0.65	0.65	0.65	0.65	0.7	0.7	0.65	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.49	7.96	7.94	8.2	7.1	7.9	7.03	7.91	7.63	7.13
Electrical Conductivity (field)		µS/cm			40	46	48	33	33					
pH Value		pH Unit	0.01		7.3	6.84	6.83	7.2	6.85	7	6.49	6.49	7.09	6.58
Electrical Conductivity @ 25°C		µS/cm	1		51	54	50	38	37	41	35	45	39	38
Total Alkalinity as CaCO3		mg/L	1	0.5	11	26	23	24	20	10	22	5	20	7
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	2	1	1	2	LOR	LOR	4	LOR
Sulfate	14808-79-8	mg/L	1	0.5	8	8	9	7	7	5	7	7	7	6
Silicon	7440-21-3	mg/L	0.05	0.025	0.25	0.45	0.86	0.21	0.14	0.18	0.17	0.19	0.17	0.1
Chloride	16887-00-6	mg/L	1	0.5	12	4	6	LOR	LOR	LOR	7	1	3	3
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	1	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	11	12	13	10	7	2	13	7	9	6
Potassium	7/09/7440	mg/L	1	0.5	3	3	2	2	2	2	2	2	2	2
Iron	7439-89-6	mg/L	0.01	0.005	0.11	0.06	LOR	LOR	LOR	LOR	0.5	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.12	0.03		0.06	0.04	0.08	0.06	0.1	0.1	0.08
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	0.08	0.001	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.002	0.002	LOR	0.002	LOR	0.002	0.001	LOR	LOR	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.148	0.155	0.001	0.108	0.103	0.129	0.123	0.112	0.113	0.082
Cerium	7440-45-1	mg/L	0.001	0.0005	0.002	LOR	0.114	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.016	0.011	LOR	0.005	0.004	0.006	0.008	0.006	0.007	0.004
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	0.006	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	0.001	LOR	LOR	0.001
Manganese	7439-96-5	mg/L	0.001	0.0005	0.01	0.008	LOR	0.006	0.006	0.009	0.012	0.007	0.008	0.005
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.104	0.156	0.006	0.103	0.085	0.098	0.096	0.086	0.089	0.073
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	0.122	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.006	0.009	LOR	0.006	0.005	0.008	0.007	0.009	0.008	0.006
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	0.008	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.01	0.014	LOR	0.014	0.011	0.012	0.014	0.014	0.016	0.015
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	0.021	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	0.249	LOR	0.024	0.147
Fluoride	16984-48-8	mg/L	0.1	0.05	1.4	1.7	1.8	1.6	1.7	1.1	1	1.3	1.1	1
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.08	0.05	0.01

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_13 GRNB



Column	OD_13 GRNB	Week			36	37	38	39	40	43	44	46	47	48
Sample weight (kg)	1.734		Extraction vol (L)		0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key			Flushing vol (L)		0.7	0.7	0.675	0.675	0.675	0.7	0.65	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.7	7.49	6.7	6.91	7.87	6.55	6.97	6.32		6.64
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		7.54	7.07	6.44	6.85	6.60	5.73	6.65	6.42	6.48	6.62
Electrical Conductivity @ 25°C		µS/cm	1		64	35	25	33	39.00	24	29	16	19	13
Total Alkalinity as CaCO3		mg/L	1	0.5	8	7	8	18	8.00	2	6	3	5	4
Acidity as CaCO3		mg/L	1	0.5	3	3	1	2	LOR	2	3	2	2	2
Sulfate	14808-79-8	mg/L	1	0.5	5	6	5	4	7.00	3	5	3	4	3
Silicon	7440-21-3	mg/L	0.05	0.025	0.23	0.2	0.22	0.31	0.24		0.25	LOR	0.19	0.15
Chloride	16887-00-6	mg/L	1	0.5	1	1	LOR	1	1.00	LOR	LOR	LOR	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	5	5	4	5	6.00	2	4	2	3	2
Potassium	7/09/7440	mg/L	1	0.5	1	2	2	3	2.00	1	1	1	1	2
Iron	7439-89-6	mg/L	0.01	0.005	0.05	0.05	0.06	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.1	0.07	0.18	0.2	0.08	0.03	0.08	0.08	0.08	0.06
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.002	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.134	0.115	0.149	0.161	0.11	0.181	0.144	0.1	0.079	0.135
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.008	0.007	0.009	0.011	0.01	0.007	0.009	0.012	0.006	0.006
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.01	0.01	0.015	0.014	0.01	0.01	0.012	0.008	0.01	0.017
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.075	0.069	0.054	0.068	0.07	0.015	0.032	0.015	0.019	0.017
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.008	0.007	0.009	0.008	0.01	0.008	0.01	0.005	0.006	0.008
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.011	0.009	0.005	0.005	0.01	LOR	0.002	0.001	0.002	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.009	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.9	0.8	0.7	0.8	0.90	0.5	0.9	0.2	0.6	0.7
Total Phosphorus		mg/L	0.01	0.005	0.02	LOR	LOR	LOR	0.17	LOR	LOR	LOR	0.02	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_13 GRNB



Column	OD_13 GRNB	Week			50	51	52	53	54	55	56	57	58	59
Sample weight (kg)	1.734		Extraction vol (L)		0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key			Flushing vol (L)		0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.67	7.33	7.51	6.86	7.79	6.44	6.54	6.28	6.87	7.00
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		5.93	5.43	6.9	6.62	6.35	6.36	6.41	5.79	6.47	5.59
Electrical Conductivity @ 25°C		µS/cm	1		18	25	32	13	24	23	20	21	27	21
Total Alkalinity as CaCO3		mg/L	1	0.5	4		LOR	4	6	5	6	4	5	3
Acidity as CaCO3		mg/L	1	0.5	2	2	1	2	2	2	1	4	2	1
Sulfate	14808-79-8	mg/L	1	0.5	3	5	4	3	3	4	4	4	5	3
Silicon	7440-21-3	mg/L	0.05	0.025	0.14	0.14	0.17	0.15	0.14	0.12	0.14	0.047	0.0896	0.09
Chloride	16887-00-6	mg/L	1	0.5	LOR	14	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	2	3	3	2	2	2	2	2	2	2
Potassium	7/09/7440	mg/L	1	0.5	1	2	2	2	1	2	2	2	3	1
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	LOR	0.05	0.05	0.06	0.09	0.02	0.08	0.04	0.03	0.06
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.046	0.095	0.116	0.135	0.116	0.094	0.096	0.078	0.066	0.138
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.001	0.002	0.003	0.006	0.006	0.007	0.008	0.005	0.005	0.004
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.009	0.01	0.012	0.017	0.014	0.011	0.014	0.01	0.011	0.006
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.009	0.022	0.017	0.017	0.015	0.014	0.015	0.019	0.018	0.016
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.005	0.008	0.009	0.008	0.008	0.006	0.008	0.007	0.008	0.006
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.001	0.001	0.001	0.001	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.018
Fluoride	16984-48-8	mg/L	0.1	0.05	0.6	0.7	0.8	0.7	0.5	0.5	0.7	0.6	0.5	0.5
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	0.13	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_13 GRNB



Column	OD_13 GRNB	Week			60	61	62	64	67	68	73	74	75	76
Sample weight (kg)	1.734		Extraction vol (L)		0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key			Flushing vol (L)		0.7	0.7	0.7	0.7	0.7	0.65	0.65	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.59	7.85	6.37	8.28	7.16	7.90	6.69	7.78	8.01	7.04
Electrical Conductivity (field)		µS/cm								35.5	35	48.8	55.1	41.3
pH Value		pH Unit	0.01		6.24	6.43	6.28	6.32	6.57	6.71	6.35	6.46	5.93	6.52
Electrical Conductivity @ 25°C		µS/cm	1		22	18	16	33	32	37	36	35	38	42
Total Alkalinity as CaCO3		mg/L	1	0.5	17	7	3	4	9	6	5	8	4	23
Acidity as CaCO3		mg/L	1	0.5	4	2	2	2	1	LOR	5	2	1	2
Sulfate	14808-79-8	mg/L	1	0.5	3	4	3	6	5	6	6	5	5	7
Silicon	7440-21-3	mg/L	0.05	0.025	0.1	0.07	0.07	0.07	0.12	0.18	0.08	0.14	0.14	0.18
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	4	4	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	1	2	2	2	2	2	2
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	8	2	1	2	3	2	2	2	2	3
Potassium	7/09/7440	mg/L	1	0.5	2	1	1	3	4	2	3	2	LOR	3
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.05	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.04	0.04	0.02	0.02	0.04	0.06	0.07	0.18	0.14	0.05
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.002	0.001	0.001	LOR	LOR	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.216	0.067	0.048	0.099	0.074	0.135	0.082	0.137	0.074	0.105
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.008	0.005	0.002	0.013	0.009	0.007	0.008	0.014	0.008	0.007
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.021	0.011	0.008	0.027	0.013	0.02	0.012	0.017	0.014	0.017
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.013	0.016	0.006	0.012	0.012	0.022	0.018	0.017	0.016	0.023
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.01	0.007	0.005	0.012	0.014	0.017	0.015	0.016	0.017	0.02
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	0.002	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.001
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.008	LOR	LOR	LOR	LOR	0.005	LOR	0.009	LOR	0.015
Fluoride	16984-48-8	mg/L	0.1	0.05	0.6	0.4	0.3	0.8	0.7	0.9	0.9	1	0.8	1
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	0.69	0.02	LOR	0.01	2	0.02

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_13 GRNB



Column	OD_13 GRNB	Week			77	78	80	81	82	83	84	85	86	87
Sample weight (kg)	1.734		Extraction vol (L)		0.43	0.43	0.43	0.43	0.375	0.44	0.675	0.42	0.44	0.5
Key			Flushing vol (L)		0.7	0.65	0.65	0.65	0.7	0.65	0.9	0.65	0.75	0.8
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.42	7.10	7.51	6.66	8.62	7.19	6.64	7.59	5.07	6.47
Electrical Conductivity (field)		µS/cm			34.3	32.9	18	19	50.9	23.7	38.0	32.4	30.0	19.4
pH Value		pH Unit	0.01		6.43	6.51	5.69	5.82	6.48	6.55	6.73	6.75	6.15	6.35
Electrical Conductivity @ 25°C		µS/cm	1		28	42	28	17	32	27	37	29	30	21
Total Alkalinity as CaCO3		mg/L	1	0.5	5	19	2	28	7	23	6	5	5	3
Acidity as CaCO3		mg/L	1	0.5	1	4	4	1	LOR	2	1	1	1	LOR
Sulfate	14808-79-8	mg/L	1	0.5	4	5	5	4	5	5	6	4	5	4
Silicon	7440-21-3	mg/L	0.05	0.025	0.1	0.25	0.14	0.09	0.14	0.09	0.22	0.09	0.11	0.07
Chloride	16887-00-6	mg/L	1	0.5	LOR	5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	1	2	1	LOR	1	1	2	2	1	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	1	LOR	LOR	LOR	LOR	1	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	2	3	2	1	2	5	1	2	1	LOR
Potassium	7/09/7440	mg/L	1	0.5	1	2	2	2	2	2	2	2	2	2
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	0.08	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.05	0.02	0.05	0.03	0.03	0.02	0.02	0.02	0.03	0.06
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.124	0.077	0.078	0.08	0.11	0.1	0.147	0.089	0.101	0.097
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.007	0.003	0.007	0.006	0.006	0.007	0.008	0.006	0.011	0.011
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.016	0.019	0.012	0.012	0.016	0.02	0.025	0.016	0.016	0.017
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.012	0.011	0.012	0.01	0.013	0.009	0.012	0.01	0.01	0.007
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.012	0.017	0.012	0.009	0.01	0.011	0.02	0.013	0.011	0.009
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.006	LOR	0.01	LOR	LOR	LOR	LOR	LOR	LOR	0.007
Fluoride	16984-48-8	mg/L	0.1	0.05	0.6	LOR	0.6	0.6	0.7	0.8	1.3	0.7	0.7	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_13 GRNB



Column	OD_13 GRNB	Week			88	89	90	91	92	93	94	95	96	97
Sample weight (kg)	1.734		Extraction vol (L)		0.5	0.43	0.43	0.47	0.47	0.48	0.45	0.46	0.45	0.46
Key			Flushing vol (L)		0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.35	6.51	7.02	8.18	7.76	7.69	7.36	7.69	7.10	7.09
Electrical Conductivity (field)		µS/cm			30.6	18.0	29.2	40.8	43.2	30.1	24.3	18.92	23.5	30.6
pH Value		pH Unit	0.01		6.28	6.31	6.52	6.72	6.59	6.17	6.93	6.89	6.23	6.42
Electrical Conductivity @ 25°C		µS/cm	1		26	18	32	32	34	23	28	17	18	29
Total Alkalinity as CaCO3		mg/L	1	0.5	7	6	LOR	3	18	LOR	16	1	LOR	LOR
Acidity as CaCO3		mg/L	1	0.5	4	1	5	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	4	4	6	5	6	4	2	4	4	4
Silicon	7440-21-3	mg/L	0.05	0.025	LOR	LOR	0.16	0.09	0.16	0.06	0.08	LOR	0.06	0.06
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	3	2	4	LOR	2
Calcium	7440-70-2	mg/L	1	0.5	2	LOR	2	2	2	1	2	LOR	LOR	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	1	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	2	LOR	1	1	1	1	2	LOR	LOR	1
Potassium	7/09/7440	mg/L	1	0.5	2	1	2	1	2	1	2	1	1	2
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	0.04	0.05	0.37	0.02	0.04	0.03	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.01	0.01	0.05	LOR	LOR	LOR	LOR	LOR	LOR	0.03
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.002	LOR	0.001	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	LOR	LOR	LOR	0.119	0.092	0.081	0.098	0.09	0.082	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.08	0.092	0.083	LOR	LOR	LOR	LOR	LOR	LOR	0.081
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	0.008	0.008	0.007	0.008	0.008	0.007	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.006	0.007	0.008	LOR	LOR	LOR	LOR	LOR	LOR	0.007
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.017	0.02	0.015	0.02	0.018	0.015	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.016	0.019	0.018	0.011	0.009	0.007	0.008	0.006	0.006	0.015
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.009	0.006	0.012	LOR	LOR	LOR	LOR	LOR	LOR	0.008
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.014	0.018	0.018	0.012	0.009	0.01	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.013	0.009	0.012	LOR	LOR	LOR	LOR	LOR	LOR	0.014
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	0.014	0.014	LOR	LOR	0.006	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	0.032	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.8	0.5	0.7	0.7	1	0.6	0.6	0.4	0.7	0.9
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_13 GRNB



Column	OD_13 GRNB	Week			98	99	100	101	102	103	104	105	106	107
Sample weight (kg)	1.734		Extraction vol (L)		0.465	0.46	0.47	0.47	0.48	0.47	0.47	0.47	0.47	0.48
Key			Flushing vol (L)		0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.59	8.71	7.12	7.49		7.52	8.80	6.98	8.21	8.43
Electrical Conductivity (field)		µS/cm			27	26.8	24.3	24.1	29.4	36.3	22.4	32.7	37.8	33.4
pH Value		pH Unit	0.01		6.83	5.72	6.8	7.47	6.58	6.7	6.77	6.75	6.86	7.33
Electrical Conductivity @ 25°C		µS/cm	1		24	30	23	22	20	24	20	22	29	21
Total Alkalinity as CaCO3		mg/L	1	0.5	5	LOR	5	3	5	5	LOR	3	12	5
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	2	LOR
Sulfate	14808-79-8	mg/L	1	0.5	4	4	4	4	3	4	4	6	5	4
Silicon	7440-21-3	mg/L	0.05	0.025	0.07	0.06	0.05	0.06	LOR	0.1	0.11	LOR	0.06	0.06
Chloride	16887-00-6	mg/L	1	0.5	1	2	LOR	LOR	1	LOR	2	LOR	2	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	1	1	1	1	LOR	1	2	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	1	LOR
Sodium	7440-23-5	mg/L	1	0.5	1	1	1	1	LOR	LOR	LOR	1	LOR	LOR
Potassium	7/09/7440	mg/L	1	0.5	1	2	1	1	1	1	1	1	1	1
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.03	0.02	0.02	0.02	LOR	0.02	0.03	0.02	0.02	0.04
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.084	0.086	0.079	0.105	0.078	0.086	0.065	0.061	0.079	0.075
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.007	0.009	0.009	0.007	0.007	0.007	0.007	0.006	0.005	0.006
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.013	0.015	0.015	0.019	0.011	0.011	0.008	0.012	0.017	0.012
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.006	0.007	0.005	0.005	LOR	0.006	0.006	0.006	0.007	0.006
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.01	0.011	0.009	0.01	0.01	0.009	0.006	0.009	0.014	0.01
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.008	0.04	0.005	LOR	0.01	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.6	0.9	0.6
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_13 GRNB



Column	OD_13 GRNB	Week			108	109	110	111	112	113	114	115	116	117
Sample weight (kg)	1.734		Extraction vol (L)		0.47	0.47	0.47	0.46	0.675	0.675	0.45	0.47	0.48	0.475
Key			Flushing vol (L)		0.7	0.7	0.7	0.7	0.9	0.9	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.38	8.78	8.38	7.25	7.49	7.05	7.01	7.39	8.23	7.67
Electrical Conductivity (field)		µS/cm			26.7	28.6	28.9	27.7	47.2	33	18.57	21.3	17.76	18.29
pH Value		pH Unit	0.01		9.04	6.72	6.55	6.54	7.1	7.93	5.79	6.23	6.24	6.35
Electrical Conductivity @ 25°C		µS/cm	1		20	20	21	30	51	32	18	20	19	20
Total Alkalinity as CaCO3		mg/L	1	0.5	5	3	3	5	11	6	2	2	5	5
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	2	2	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	3	4	4	5	10	6	3	4	4	3
Silicon	7440-21-3	mg/L	0.05	0.025	LOR	LOR	0.05	LOR	0.16	0.1	0.06	LOR	LOR	LOR
Chloride	16887-00-6	mg/L	1	0.5	1	LOR	LOR	LOR	2	LOR	4	8	LOR	6
Calcium	7440-70-2	mg/L	1	0.5	1	1	1	2	3	2	LOR	LOR	LOR	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	1	2	1	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	LOR	LOR	LOR	LOR	1	LOR	LOR	LOR	LOR	LOR
Potassium	7/09/7440	mg/L	1	0.5	1	1	1	1	2	2	1	1	LOR	1
Iron	7439-89-6	mg/L	0.01	0.005	LOR	0.09	0.11	LOR	LOR	LOR	LOR	LOR	LOR	0.11
Aluminium	7429-90-5	mg/L	0.01	0.005	0.03	0.01	0.01	0.01	0.02	0.02	0.02	0.01	LOR	0.01
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.072	0.087	0.073	0.057	0.093	0.069	0.026	0.047	0.042	0.074
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.001
Copper	7440-50-8	mg/L	0.001	0.0005	0.007	0.011	0.008	0.004	0.027	0.018	0.003	0.004	0.004	0.006
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.011	0.017	0.013	0.012	0.02	0.017	0.007	0.011	0.01	0.041
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.005	0.005	0.004	0.006	0.012	0.009	0.004	0.004	0.004	0.005
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.01	0.009	0.008	0.011	0.022	0.015	0.006	0.007	0.007	0.009
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.001
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.6	0.5	0.5	0.6	1.5	1	0.5	0.5	0.5	0.6
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_13 GRNB



Column	OD_13 GRNB	Week			118	119	120	121	122	125	129	131	135	139
Sample weight (kg)	1.734		Extraction vol (L)		0.675	0.45	0.47	0.48	0.48	0.49	0.44	0.47	0.46	0.46
Key			Flushing vol (L)		0.88	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.88	7.21	7.21	6.76	6.35	7.14	8.56	7.47	8.28	7.57
Electrical Conductivity (field)		µS/cm			34.5	18.35	34.4	34.4	28.1	27.9	23.63	26.6	33.4	21.6
pH Value		pH Unit	0.01		6.83	6.13	6.46	7.27	6.58	6.56	6.44	6.49	6.29	6.6
Electrical Conductivity @ 25°C		µS/cm	1		36	18	29	37	25	25	24	24	28	21
Total Alkalinity as CaCO3		mg/L	1	0.5	5	5	4	3	4	5	3	12	5	LOR
Acidity as CaCO3		mg/L	1	0.5	2	LOR	2	LOR	2	2	5	7	2	5
Sulfate	14808-79-8	mg/L	1	0.5	6	3	5	6	5	5	4	5	5	3
Silicon	7440-21-3	mg/L	0.05	0.025	0.12	LOR	0.08	0.08	4	0.06	0.23	0.08	0.1	LOR
Chloride	16887-00-6	mg/L	1	0.5	1	LOR	2	1	2	1	2	2	2	3
Calcium	7440-70-2	mg/L	1	0.5	2	LOR	2	2	1	1	1	1	1	1
Magnesium	7439-95-4	mg/L	1	0.5	2	LOR	2	1	LOR	1	LOR	1	1	LOR
Sodium	7440-23-5	mg/L	1	0.5	LOR	LOR	LOR	LOR	1	LOR	LOR	1	LOR	LOR
Potassium	7/09/7440	mg/L	1	0.5	1	LOR	2	2	LOR	1	1	1	1	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	0.08	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.02	0.01	0.01	0.01	LOR	0.01	0.07	0.05	LOR	0.01
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.065	LOR	0.001	LOR	LOR	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.077	0.042	0.1	0.078	LOR	0.097	0.041	0.035	0.122	0.054
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.005	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.019	0.003	0.006	0.009	LOR	0.007	0.009	0.006	0.022	0.011
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.013	LOR	LOR	LOR	0.007	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.017	0.009	0.017	0.016	0.005	0.017	0.011	0.007	0.02	0.009
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.008	0.004	0.007	0.008	LOR	0.004	0.004	0.004	0.005	0.002
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.014	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.015	0.007	0.018	0.018	LOR	0.012	0.01	0.009	0.013	0.009
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	0.008	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	1.1	0.5	1.1	1.2	0.6	0.7	0.2	0.5	0.7	0.4
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_13 GRNB



Column	OD_13 GRNB	Week			148	150	152	156	161	165	169	174
Sample weight (kg)	1.734		Extraction vol (L)		0.46	0.46	0.52	0.485	0.46	0.46	0.45	0.45
Key			Flushing vol (L)		0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR								
pH (field)		pH Unit			8.07	7.42	6.07	6.31	8.29	6.01	6.43	6.59
Electrical Conductivity (field)		µS/cm			29.2	32.4	29.7	21.45	20.41	17.52	21.96	51.9
pH Value		pH Unit	0.01		6.59	6.71	6.9	6.4	6.63	6.56	6.57	6.68
Electrical Conductivity @ 25°C		µS/cm	1		26	25	71	69	24	22	26	37
Total Alkalinity as CaCO3		mg/L	1	0.5	1	4	10	2	1	2	2	8
Acidity as CaCO3		mg/L	1	0.5	LOR	2	LOR	LOR	2	2	4	2
Sulfate	14808-79-8	mg/L	1	0.5	5	6	13	4	4	4	4	6
Silicon	7440-21-3	mg/L	0.05	0.025	0.08	0.07	0.28	LOR	0.22	0.21	0.06	0.07
Chloride	16887-00-6	mg/L	1	0.5	1	LOR	2	LOR	LOR	LOR	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	1	1	4	1	1	1	1	2
Magnesium	7439-95-4	mg/L	1	0.5	LOR	1	4	1	1	LOR	1	2
Sodium	7440-23-5	mg/L	1	0.5	LOR	1	2	LOR	LOR	LOR	LOR	LOR
Potassium	7/09/7440	mg/L	1	0.5	1	LOR	2	1	1	1	1	1
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	LOR	0.01	LOR	LOR	LOR	0.01	LOR	0.02
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.06	0.049	0.061	0.029	0.04	0.04	0.031	0.062
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.013	0.009	0.008	0.009	0.014	0.008	0.005	0.015
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.011	0.012	0.005	0.005	0.008	0.008	0.008	0.018
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.003	0.004	0.011	0.003	0.003	0.002	0.003	0.004
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.01	0.008	0.026	0.01	0.011	0.011	0.009	0.015
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.4	0.4	1.5	0.8	0.6	0.6	0.5	0.7
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
Column OD_14 GRNL



Column	OD_14 GRNL	Week			0	4	8	12	16	17	18	20	21	22
Sample weight (kg)	1.54	Extraction vol (L)			0.625	0.375	0.375	0.625	0.42	0.42	0.42	0.42	0.42	0.455
Key		Flushing vol (L)			1.6	1.35	1.3	1.6	1.2	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			9.36	9.21	9.93	9.51	9.46	8.6	8.7	8.66	8.1	8.75
Electrical Conductivity (field)		µS/cm			2078	557	573	171.6	645	146	107	107	97	76
pH Value		pH Unit	0.01		8.97	8.86	9.02	7.98	9.2	7.5	7.54	6.15	7.54	7.48
Electrical Conductivity @ 25°C		µS/cm	1		1800	566	613	194	645	156	124	123	105	83
Total Alkalinity as CaCO3		mg/L	1	0.5	38	22	37	23	54	10	15	56	33	23
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	2	LOR	2	2	2	1	1
Sulfate	14808-79-8	mg/L	1	0.5	50	23	33	11	45	14	7	7	8	8
Silicon	7440-21-3	mg/L	0.05	0.025	1.39	0.42	1.09		1.02	0.84	0.95	0.78	0.73	0.7
Chloride	16887-00-6	mg/L	1	0.5					126	36	16	21	16	15
Calcium	7440-70-2	mg/L	1	0.5	2				1	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR				LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	336				126	31	20	38	26	23
Potassium	7/09/7440	mg/L	1	0.5	9				6	1	1	3	2	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.02	0.09	0.76	0.62	1.36	0.46	1.06	1.32	0.46	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.09	0.14	0.94	0.88	1.7	0.57	0.73	0.88	1.92	0.18
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.034	0.015	0.046	0.02	0.075	0.024	0.025	0.025	0.019	0.016
Barium	7440-39-3	mg/L	0.001	0.0005	0.049	0.022	0.502	0.17	0.306	0.272	0.177	0.21	0.166	0.121
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	0.003	0.003	0.006	0.002	0.004	0.002	0.002	0.001
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	0.001	0.001	0.002	0.001	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.001	0.002	0.049	0.047	0.122	0.064	0.04	0.056	0.042	0.031
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	0.001	0.001	0.002	LOR	LOR	0.001	0.001	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	0.009	0.008	0.017	0.008	0.005	0.007	0.006	0.004
Manganese	7439-96-5	mg/L	0.001	0.0005	0.002	LOR	0.078	0.058	0.123	0.053	0.038	0.053	0.04	0.025
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.054	0.018	0.044	0.013	0.062	0.016	0.014	0.017	0.011	0.008
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.018	0.003	0.016		0.014	0.005	0.002	0.003	0.003	0.001
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	0.002		0.004	0.001	LOR	0.001	0.001	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.02	0.04	0.077		0.129	0.027	0.023	0.026	0.017	0.015
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR	0.006
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	0.022	0.011	0.018	0.015	0.006	0.011	0.009	0.006
Fluoride	16984-48-8	mg/L	0.1	0.05	1.9	1.2	3.1	1	5.4	1.5	1.1	1.2	1.3	0.22
Total Phosphorus		mg/L	0.01	0.005	LOR				LOR	LOR	0.04	0.02	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_14 GRNL



Column	OD_14 GRNL	Week			23	24	25	26	28	29	30	31	32	35
Sample weight (kg)	1.54	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.65	0.65	0.65	0.65	0.7	0.7	0.65	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.17	8.65	8.64	9	8.55	8.4	8.1	8.87	8.7	8.82
Electrical Conductivity (field)		µS/cm			49	73	100	78	68					
pH Value		pH Unit	0.01		6.59	6.96	7.26	7.38	5.65	6.58	6.87	6.98	7.15	7.31
Electrical Conductivity @ 25°C		µS/cm	1		59	81	97	74	71	68	48	93	74	75
Total Alkalinity as CaCO3		mg/L	1	0.5	4	26	30	14	19	12	10	10	9	35
Acidity as CaCO3		mg/L	1	0.5	1	LOR	1	1	LOR	2	LOR	LOR	4	LOR
Sulfate	14808-79-8	mg/L	1	0.5	5	6	10	8	7	5	5	9	7	6
Silicon	7440-21-3	mg/L	0.05	0.025	0.63	1.01	2.57	0.49	0.38	0.43	0.4	0.47	0.43	0.36
Chloride	16887-00-6	mg/L	1	0.5	12	15	17	8	6	6	13	11	11	8
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	10	19	26	17	16	10	11	18	15	20
Potassium	7/09/7440	mg/L	1	0.5	LOR	1	1	1	1	LOR	LOR	1	1	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.53	0.39	0.26	0.06	0.6	0.69	0.69	0.31	0.13	0.1
Aluminium	7429-90-5	mg/L	0.01	0.005	0.21	0.08	0.11	0.15	0.08	0.1	0.22	2.09	0.12	0.08
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.013	0.016	0.022	0.019	0.013	0.015	0.012	0.022	0.017	0.02
Barium	7440-39-3	mg/L	0.001	0.0005	0.112	0.012	0.009	0.006	0.004	0.006	0.005	0.016	0.007	0.005
Cerium	7440-45-1	mg/L	0.001	0.0005	0.001	LOR	LOR	LOR	LOR	LOR	LOR	0.002	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.03	0.01	0.007	0.005	0.005	0.006	0.005	0.007	0.006	0.006
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	0.003	0.001	LOR	LOR	LOR	LOR	LOR	0.002	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.024	0.006	0.004	0.002	0.002	0.003	0.002	0.005	0.003	0.002
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.006	0.012	0.016	0.013	0.009	0.01	0.008	0.014	0.011	0.011
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.002	LOR	LOR	LOR	LOR	LOR	LOR	0.045	LOR	LOR
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.007	0.015	0.028	0.023	0.018	0.014	0.012	0.03	0.023	0.031
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025		LOR	LOR	LOR	LOR	LOR	LOR	0.04	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.5	0.7	1.4	1.2	1.6	0.9	0.5	1.3	1	0.9
Total Phosphorus		mg/L	0.01	0.005	0.03	LOR	LOR	LOR	LOR	LOR	0.02	0.02	0.06	0.02

Appendix A: Tabulated Laboratory Analytical Results
Column OD_14 GRNL



Column	OD_14 GRNL	Week			36	37	38	39	40	43	44	46	47	48
Sample weight (kg)	1.54	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.675	0.675	0.675	0.7	0.65	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.47	8.76	8.3	8.3	8.9	8.3	7.72	7.15		7.71
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		7.98	7.26	7.15	7.24	7.11	6.28	7.05	6.75	6.98	6.66
Electrical Conductivity @ 25°C		µS/cm	1		62	64	51	64	80.00	57	72	32	46	17
Total Alkalinity as CaCO3		mg/L	1	0.5	13	25	12	10	13.00	4	10	8	9	6
Acidity as CaCO3		mg/L	1	0.5	2	1	1	1	LOR	2	19	2	2	2
Sulfate	14808-79-8	mg/L	1	0.5	7	5	5	6	8.00	6	8	4	7	3
Silicon	7440-21-3	mg/L	0.05	0.025	0.59	0.6	0.49	0.58	0.43		0.96	0.34	0.72	0.34
Chloride	16887-00-6	mg/L	1	0.5	8	8	4	6	12.00	LOR	7	8	8	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	13	15	12	12	17.00	8	15	8	13	6
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	1.00	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	0.48	0.73	0.54	LOR	0.05	0.12	0.1	0.54	0.07
Aluminium	7429-90-5	mg/L	0.01	0.005	0.18	0.09	0.1	0.05	0.10	0.1	0.13	0.34	0.89	0.52
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.021	0.016	0.012	0.015	0.02	0.011	0.014	0.009	0.012	0.008
Barium	7440-39-3	mg/L	0.001	0.0005	0.007	0.008	0.006	0.007	0.01	0.005	0.015	0.007	0.155	0.006
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.003	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.007	0.007	0.006	0.007	0.01	0.007	0.015	0.007	0.026	0.006
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	0.001	LOR	0.002	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.003	0.003	0.003	0.003	0.00	0.002	0.006	0.002	0.013	0.002
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.011	0.011	0.008	0.011	0.02	0.006	0.014	0.006	0.006	0.006
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	LOR	LOR	LOR	0.002	LOR	LOR	0.002	0.001	0.004	LOR
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.019	0.019	0.014	0.016	0.03	0.008	0.013	0.007	0.011	0.006
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	0.006	LOR	0.008	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.8	0.8	0.6	0.8	0.70	0.5	0.6	0.3	0.5	0.3
Total Phosphorus		mg/L	0.01	0.005	0.02	0.02	LOR	0.01	0.02	LOR	LOR	LOR	0.01	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_14 GRNL



Column	OD_14 GRNL	Week			50	51	52	53	54	55	56	57	58	59
Sample weight (kg)	1.54	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.90	7.55	7.91	7.45	8.55	6.94	7.04	6.73	7.28	7.39
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		6.16	5.49	8.62	6.66	5.86	6.62	6.8	5.92	8.07	6.38
Electrical Conductivity @ 25°C		µS/cm	1		42	25	46	17	27	28	24	25	34	27
Total Alkalinity as CaCO3		mg/L	1	0.5	8		2	6	5	8	8	5	8	28
Acidity as CaCO3		mg/L	1	0.5	2	2	2	2	2	2	1	2	2	2
Sulfate	14808-79-8	mg/L	1	0.5	5	3	4	3	2	3	3	2	4	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.48	0.33	0.33	0.34	0.235	0.21	0.28	0.19	0.224	0.2
Chloride	16887-00-6	mg/L	1	0.5	2	15	2	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	10	6	7	6	5	6	5	5	6	4
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.11	0.16	0.11	0.07	0.12	0.15	LOR	0.08	0.05	0.19
Aluminium	7429-90-5	mg/L	0.01	0.005	0.16	0.14	0.13	0.52	0.16	0.06	0.09	0.08	0.12	0.1
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.012	0.007	0.011	0.008	0.007	0.008	0.01	0.008	0.009	0.007
Barium	7440-39-3	mg/L	0.001	0.0005	0.002	0.004	0.006	0.006	0.005	0.007	0.007	0.005	0.008	0.008
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.003	0.002	0.002	0.006	0.004	0.004	0.005	0.004	0.006	0.004
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	LOR	0.001	0.001	0.002	0.002	LOR	0.002	LOR	0.002	LOR
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.006	0.004	0.005	0.006	0.005	0.004	0.005	0.005	0.005	0.004
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	LOR	0.001	0.002	LOR	0.002	0.001	0.002	0.001	0.003	0.001
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.004	0.002	0.004	0.006	0.005	0.007	0.006	0.005	0.01	0.004
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.016	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.5	0.3	0.4	0.3	0.3	0.3	0.5	0.3	0.4	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	0.13	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_14 GRNL



Column	OD_14 GRNL	Week			60	61	62	64	67	68	73	74	75	76
Sample weight (kg)	1.54	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.65	0.65	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.06	8.04	6.98	8.86	7.78	9.01	8.02	8.17	8.71	7.63
Electrical Conductivity (field)		µS/cm								43.7	31	58.5	56.5	60.2
pH Value		pH Unit	0.01		7.09	6.74	6.18	6.75	6.83	6.94	6.57	6.51	6.27	6.91
Electrical Conductivity @ 25°C		µS/cm	1		25	21	24	42	31	39	33	32	38	61
Total Alkalinity as CaCO3		mg/L	1	0.5	7	8	7	14	6	8	6	9	5	10
Acidity as CaCO3		mg/L	1	0.5	4	2	2	2	1	5	3	2	1	LOR
Sulfate	14808-79-8	mg/L	1	0.5	2	3	3	5	3	5	5	4	4	8
Silicon	7440-21-3	mg/L	0.05	0.025	0.22	0.17	0.16	0.13	0.22	0.68	0.18	0.35	0.41	0.7
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	3	LOR	1	1	LOR	4	5	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	4	4	7	8	6	8	6	6	6	12
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	1	LOR	LOR	LOR	0.06	1
Iron	7439-89-6	mg/L	0.01	0.005	0.11	0.08	0.06	0.09	0.2	0.14	0.07	0.31	LOR	0.06
Aluminium	7429-90-5	mg/L	0.01	0.005	0.1	0.08	0.07	0.16	0.08	0.15	0.27	0.39	0.06	0.07
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.006	0.006	0.007	0.01	0.005	0.013	0.007	0.008	0.008	0.015
Barium	7440-39-3	mg/L	0.001	0.0005	0.01	0.005	0.003	0.006	0.008	0.009	0.005	0.05	0.008	0.011
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.005	0.004	0.002	0.005	0.006	0.012	0.005	0.019	0.007	0.01
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.001	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.003	0.001	LOR	LOR	0.002	0.005	0.001	0.008	0.002	0.002
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.004	0.005	0.003	0.006	0.005	0.009	0.005	0.005	0.006	0.016
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.005	0.004	0.003
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.001	0.007	0.002	0.004	0.004	0.011	0.006	0.006	0.009	0.013
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	0.01	0.01	LOR	LOR	0.015	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.2	0.3	0.6	0.2	0.4	0.3	0.3	0.4	0.5
Total Phosphorus		mg/L	0.01	0.005	LOR	0.02	LOR	LOR	0.51	0.03	LOR	0.02	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_14 GRNL



Column	OD_14 GRNL	Week			77	78	80	81	82	83	84	85	86	87
Sample weight (kg)	1.54	Extraction vol (L)			0.43	0.43	0.43	0.43	0.585	0.44	0.675	0.42	0.44	0.53
Key		Flushing vol (L)			0.7	0.65	0.65	0.5	0.7	0.65	0.9	0.65	0.75	0.8
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.73	7.91	7.04	8.70	8.88	7.81	7.15	8.28	5.27	7.14
Electrical Conductivity (field)		µS/cm			66.4	47.2	22.7	93	62.2	16.9	40.7	36.4	19.5	16.9
pH Value		pH Unit	0.01		6.82		6.09	6.94	6.76	6.75	7.08	6.97	6.47	6.79
Electrical Conductivity @ 25°C		µS/cm	1		43		22	80	49	22	39	28	20	19
Total Alkalinity as CaCO3		mg/L	1	0.5	24		4	24	6	202	22	5	5	2
Acidity as CaCO3		mg/L	1	0.5	1	2	2	LOR	LOR	2	1	1	1	LOR
Sulfate	14808-79-8	mg/L	1	0.5	5	7	3	12	6	3	5	3	2	3
Silicon	7440-21-3	mg/L	0.05	0.025	0.61	1.03	0.21	1.19	0.62	0.11	0.48	0.12	0.23	0.25
Chloride	16887-00-6	mg/L	1	0.5	LOR	4	LOR	LOR	LOR		LOR	LOR	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	9	10	4	19	9	4	8	5	3	4
Potassium	7/09/7440	mg/L	1	0.5	LOR	1	LOR	2	1	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.11	0.18	0.07	0.1	0.1	LOR	0.08	LOR	0.06	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.09	0.22	0.06	0.1	0.12	0.07	0.09	0.08	0.15	0.08
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.006	0.012	0.006	0.028	0.011	0.005	0.011	0.006	0.004	0.005
Barium	7440-39-3	mg/L	0.001	0.0005	0.009	0.009	0.011	0.016	0.009	0.004	0.008	0.003	0.005	0.048
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.008	0.005	0.005	0.012	0.006	0.004	0.007	0.005	0.005	0.011
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.002	0.003	0.002	0.004	0.002	0.001	0.002	0.001	0.002	0.003
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.008	0.009	0.005	0.027	0.013	0.004	0.011	0.006	0.004	0.005
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.006	0.005	0.002	0.004	0.002	0.003	0.002	0.003	0.003	0.001
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.007	0.003	0.004	0.023	0.007	0.004	0.009	0.007	0.002	0.004
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.006	LOR	0.006	LOR	LOR	LOR	LOR	LOR	LOR	0.007
Fluoride	16984-48-8	mg/L	0.1	0.05	0.5		0.2	0.9	0.4	0.2	0.4	0.2	0.2	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_14 GRNL



Column	OD_14 GRNL	Week			88	89	90	91	92	93	94	95	96	97
Sample weight (kg)	1.54	Extraction vol (L)			0.55	0.43	0.43	0.47	0.47	0.48	0.43	0.47	0.48	0.48
Key		Flushing vol (L)			0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.89	7.21	7.83	8.86	8.46	8.08	7.79	7.86	7.50	7.54
Electrical Conductivity (field)		µS/cm			28.1	21.8	34.9	48.1	40.1	27.5	20.3	16.62	24.9	30.2
pH Value		pH Unit	0.01		6.46	7.98	6.95	6.98	6.83	6.45	7.07	7.15	6.61	6.75
Electrical Conductivity @ 25°C		µS/cm	1		20	22	35	38	27	21	21	16	16	28
Total Alkalinity as CaCO3		mg/L	1	0.5	10	9	LOR	4	10	---	4	3	LOR	LOR
Acidity as CaCO3		mg/L	1	0.5	4	2	2	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	3	4	6	6	4	3	1	3	3	4
Silicon	7440-21-3	mg/L	0.05	0.025	LOR	0.11	0.51	0.46	0.12	0.09	0.11	0.09	0.24	0.12
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	2	7	2	LOR	4
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	4	5	8	7	4	4	4	3	4	6
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	0.06	0.23	0.09	0.03	0.04	0.06	0.12	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.05	0.07	0.08	LOR	LOR	LOR	LOR	LOR	LOR	0.07
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.009	0.005	0.007	0.006	0.006	0.006	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.006	0.005	0.007	0.007	0.006	0.003	0.003	0.003	0.004	0.009
Barium	7440-39-3	mg/L	0.001	0.0005	0.003	0.003	0.004	LOR	LOR	LOR	LOR	LOR	LOR	0.004
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	0.005	0.006	0.004	0.004	0.004	0.008	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.003	0.003	0.005	LOR	LOR	LOR	LOR	LOR	LOR	0.004
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.002	0.002	0.002	0.002	0.002	0.002	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	LOR	LOR	0.001	0.01	0.006	0.004	0.005	0.004	0.004	0.002
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.005	0.005	0.008	LOR	LOR	LOR	LOR	LOR	LOR	0.006
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.003	0.004	0.002	0.002	0.001	0.002	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.002	LOR	0.001	LOR	LOR	LOR	LOR	LOR	LOR	0.003
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.01	0.006	0.005	0.004	0.004	0.004	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.006	0.008	0.01	LOR	LOR	LOR	LOR	LOR	LOR	0.006
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	0.008	0.007	LOR	LOR	LOR	0.015	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.172	LOR	0.09	0.07	LOR	LOR	LOR	0.09	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.7	0.3
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	

Appendix A: Tabulated Laboratory Analytical Results
Column OD_14 GRNL



Column	OD_14 GRNL	Week			98	99	100	101	102	103	104	105	106	107
Sample weight (kg)	1.54	Extraction vol (L)			0.49	0.48	0.48	0.48	0.49	0.43	0.5	0.48	0.49	0.49
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.03	9.45	7.40	8.34		7.93	9.13	6.88	8.74	8.79
Electrical Conductivity (field)		µS/cm			25.1	26.1	31.6	26.8	44.5	40.3	28	34.2	33.9	27.3
pH Value		pH Unit	0.01		7.72	6.47	6.98	7.86	6.8	6.92	7.07	7.15	7.13	7.75
Electrical Conductivity @ 25°C		µS/cm	1		23	25	25	23	20	27	24	20	23	19
Total Alkalinity as CaCO3		mg/L	1	0.5	7	LOR	8	8	7	17	LOR	2	7	7
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	3	4	4	4	3	3	4	4	4	3
Silicon	7440-21-3	mg/L	0.05	0.025	0.17	0.16	0.11	0.12	0.1	0.29	0.32	0.09	0.12	0.11
Chloride	16887-00-6	mg/L	1	0.5	2	4	LOR	LOR	LOR	LOR	5	LOR	LOR	1
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	4	4	4	4	4	5	5	4	4	4
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	0.06	LOR	LOR	LOR	0.08	LOR	LOR	0.08
Aluminium	7429-90-5	mg/L	0.01	0.005	0.05	LOR	0.08	0.08	LOR	0.08	0.04	0.04	0.06	0.08
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	LOR	LOR	0.006	0.005	LOR	0.005	0.006	0.006	0.006	0.006
Barium	7440-39-3	mg/L	0.001	0.0005	0.034	LOR	0.003	0.004	LOR	0.006	0.004	0.003	0.003	0.004
Cerium	7440-45-1	mg/L	0.001	0.0005	0.001	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.016	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.768	LOR	0.004	0.004	LOR	0.004	0.006	0.003	0.005	0.007
Lanthanum	7439-91-0	mg/L	0.001	0.0005	0.001	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.435	LOR	0.002	0.002	LOR	0.003	LOR	0.002	0.002	0.002
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.008	LOR	0.005	0.004	LOR	0.004	0.005	0.004	0.005	0.004
Nickel	7440-02-0	mg/L	0.001	0.0005	0.001	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.022	LOR	0.002	0.003	LOR	0.003	LOR	0.002	0.002	0.002
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.009	LOR	0.005	0.004	LOR	0.007	0.008	0.005	0.005	0.004
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.008	LOR	LOR	LOR	LOR	0.01	0.005	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_14 GRNL



Column	OD_14 GRNL	Week			108	109	110	111	112	113	114	115	116	117
Sample weight (kg)	1.54	Extraction vol (L)			0.47	0.47	0.485	0.48	0.675	0.675	0.48	0.52	0.47	0.48
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.9	0.9	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.82	9.03	8.92	7.49	8.14	7.59	7.45	7.90	8.04	8.14
Electrical Conductivity (field)		µS/cm			25	23.67	35	28.3	35.1	24.6	25.8	25.6	20.85	17.24
pH Value		pH Unit	0.01		6.67	6.98	6.8	6.92	7.32	8.57	6.1	6.61	6.59	6.65
Electrical Conductivity @ 25°C		µS/cm	1		19	17	24	45	41	23	26	24	21	19
Total Alkalinity as CaCO3		mg/L	1	0.5	6	2	4	11	12	10	3	3	12	5
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	4	2	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	3	2	4	5	6	4	3	4	4	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.08	0.09	0.08	0.14	0.6	0.55	0.24	0.24	0.14	0.1
Chloride	16887-00-6	mg/L	1	0.5	1	LOR	LOR	LOR	2	LOR	7	7	LOR	9
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	3	3	4	5	7	5	4	4	3	5
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	0.13	0.05	LOR	0.07	0.05	LOR	LOR	0.05
Aluminium	7429-90-5	mg/L	0.01	0.005	0.05	0.03	0.06	0.04	0.07	0.08	0.07	0.09	0.06	0.05
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.005	0.005	LOR0	0.008	0.014	0.009	0.005	0.006	0.005	0.006
Barium	7440-39-3	mg/L	0.001	0.0005	0.003	0.003	0.003	0.002	0.007	0.006	0.002	0.002	0.002	0.007
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.004	0.004	0.004	0.002	0.011	0.007	0.002	0.003	0.002	0.004
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.001	0.002	0.002	0.001	0.002	0.002	0.001	LOR	0.001	0.002
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.004	0.004	0.004	0.007	0.012	0.008	0.004	0.005	0.004	0.005
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.002	0.002	0.002	0.001	0.002	0.001	0.003	LOR	0.001	0.002
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.004	0.003	0.005	0.002	0.008	0.005	0.002	0.002	0.001	0.003
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.008
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.2	0.2	0.2	0.4	0.2	0.2	0.2	0.2	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_14 GRNL



Column	OD_14 GRNL	Week			118	119	120	121	122	125	129	131	135	139
Sample weight (kg)	1.54	Extraction vol (L)			0.65	0.48	0.48	0.49	0.48	0.49	0.46	0.48	0.47	0.47
Key		Flushing vol (L)			0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.37	7.53	7.53	6.84	6.60	7.26	8.21	7.56	8.95	7.89
Electrical Conductivity (field)		µS/cm			25.6	19.1	33.9	27.6	23.3	25.63	17.31	30.6	21.58	29.7
pH Value		pH Unit	0.01		7.2	6.44	6.81	7.7	7.33	6.98	6.49	6.83	6.61	6.89
Electrical Conductivity @ 25°C		µS/cm	1		26	18	30	28	23	39	17	19	19	29
Total Alkalinity as CaCO3		mg/L	1	0.5	5	5	4	4	4	7	2	10	5	LOR
Acidity as CaCO3		mg/L	1	0.5	2	LOR	2	LOR	2	2		5	2	2
Sulfate	14808-79-8	mg/L	1	0.5	3	2	4	4	4	3	2	3	3	4
Silicon	7440-21-3	mg/L	0.05	0.025	0.57	0.06	0.38	0.22	4	0.15	0.32	0.12	0.14	0.13
Chloride	16887-00-6	mg/L	1	0.5	1	LOR	2	2	LOR	1	2	2	2	1
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	4	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	4	4	7	5	LOR	4	3	3	3	4
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	1	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.06	LOR	0.08	LOR	0.04	0.06	LOR	0.11	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.08	0.03	0.12	0.02	LOR	0.04	0.12	0.16	0.04	0.06
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.007	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.007	0.004	0.009	0.009	0.002	0.007	0.006	0.004	0.002	0.003
Barium	7440-39-3	mg/L	0.001	0.0005	0.007	0.001	0.004	0.004	LOR	0.004	0.001	0.004	0.006	0.004
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.002	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.008	0.001	0.005	0.007	LOR	0.006	0.005	0.005	0.005	0.007
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.003	LOR	0.002	0.002	0.006	0.002	0.002	0.002	0.004	0.002
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.009	0.004	0.01	0.009	LOR	0.007	0.003	0.003	0.003	0.004
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.001	LOR	0.002	0.003	LOR	0.001	LOR	0.004	0.002	0.003
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.004	LOR	0.003	0.004	LOR	0.002	LOR	0.001	0.001	0.003
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	0.3	LOR	LOR	0.069	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.3	0.2	0.3	0.2		0.2	0.8	0.1	0.1	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_14 GRNL



Column	OD_14 GRNL	Week			148	150	152	156	161	165	169	174
Sample weight (kg)	1.54	Extraction vol (L)			0.45	0.47	0.5	0.485	0.49	0.475	0.475	0.47
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Analyte	Method	Unit	LOR	<LOR								
pH (field)		pH Unit			8.35	7.90	6.17	6.79	8.27	6.04	6.30	6.41
Electrical Conductivity (field)		µS/cm			25.91	25.7	18.8	20.86	20.43	14.84	17.31	37.9
pH Value		pH Unit	0.01		6.71	6.75	6.72	6.52	6.69	6.74	6.66	6.89
Electrical Conductivity @ 25°C		µS/cm	1		26	18	22	34	23	18	21	27
Total Alkalinity as CaCO3		mg/L	1	0.5	1	4	2	1	1	1	3	6
Acidity as CaCO3		mg/L	1	0.5	LOR	2	LOR	2	2	2	LOR	2
Sulfate	14808-79-8	mg/L	1	0.5	5	4	3	4	4	3	4	4
Silicon	7440-21-3	mg/L	0.05	0.025	0.12	0.3	0.14	0.1	0.25	0.27	0.1	0.12
Chloride	16887-00-6	mg/L	1	0.5	2	LOR	1	LOR	LOR	LOR	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	4	3	4	4	4	2	3	4
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	1
Iron	7439-89-6	mg/L	0.01	0.005	LOR	0.11	0.06	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.04	0.16	0.08	0.05	0.06	0.04	0.03	0.03
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.002	0.002	0.002	0.003	0.002	0.002	0.001	0.001
Barium	7440-39-3	mg/L	0.001	0.0005	0.005	0.005	0.005	0.004	0.005	0.005	0.004	0.007
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.008	0.008	0.008	0.006	0.008	0.006	0.004	0.01
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.002	0.003	0.002	0.001	0.002	0.002	0.001	0.004
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.002	0.002	0.002	0.002	0.003	0.002	0.002	0.004
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.003	0.001	0.002	0.002	0.002	0.001	0.001	0.002
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.1	0.1	0.2	0.2	0.2	0.1	0.1	LOR
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
Column OD_15 KASH



Column	OD_15 KASH	Week			0	4	8	12	16	17	18	20	21	22
Sample weight (kg)	1.612	Extraction vol (L)			0.625	0.375	0.375	0.625	0.42	0.42	0.42	0.42	0.42	0.465
Key		Flushing vol (L)			1.6	1.35	1.3	1.6	1.2	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.92	9.43	9.77	9.42	9.72	8.85	9.2	9.15	8.58	9.08
Electrical Conductivity (field)		µS/cm			1412	445	306	104.7	365	102	68	156	84	47
pH Value		pH Unit	0.01		9.15	9.46	9.35	8.98	9.71	8.29	8.61	9.15	8.14	7.67
Electrical Conductivity @ 25°C		µS/cm	1		1190	455	324	116	370	109	80	169	86	53
Total Alkalinity as CaCO3		mg/L	1	0.5	65	43	54	24	90	24	23	41	29	18
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	1
Sulfate	14808-79-8	mg/L	1	0.5	3	2	3	1	5	2	LOR	3	1	2
Silicon	7440-21-3	mg/L	0.05	0.025	1.34	1.06	2.93		3.15	2.16	6.03	1.44	3.24	2.38
Chloride	16887-00-6	mg/L	1	0.5					66	19	14	26	13	10
Calcium	7440-70-2	mg/L	1	0.5	2				LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR				LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	224				85	22	15	35	19	11
Potassium	7/09/7440	mg/L	1	0.5	8				5	2	2	2	1	1
Iron	7439-89-6	mg/L	0.01	0.005	0.04	5.44	3.05	4.72	9.67	2.62	6.06	3.94	4.2	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.19	3.67	1.95	2.52	6.5	1.85	3.99	3.36	2.38	1.58
Antimony	7440-36-0	mg/L	0.001	0.0005	0.002	LOR	LOR	LOR	0.001	LOR	0.003	0.001	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.098	0.074	0.083	0.038	0.117	0.037	0.041	0.052	0.033	0.024
Barium	7440-39-3	mg/L	0.001	0.0005	0.021	0.507	0.559	0.291	0.49	0.328	0.351	0.365	0.236	0.234
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	0.008	0.004	0.007	0.015	0.006	0.008	0.007	0.005	0.004
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	0.007	0.004	0.004	0.01	0.004	0.006	0.004	0.003	0.003
Copper	7440-50-8	mg/L	0.001	0.0005	0.001	0.328	0.214	0.218	0.568	0.235	0.352	0.329	0.226	0.208
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	0.003	0.001	0.003	0.006	0.002	0.003	0.002	0.002	0.002
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	0.017	0.01	0.011	0.024	0.009	0.014	0.013	0.009	0.009
Manganese	7439-96-5	mg/L	0.001	0.0005	0.003	0.324	0.152	0.24	0.605	0.236	0.368	0.341	0.264	0.215
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.011	0.003	0.006	0.002	0.008	0.003	0.002	0.009	0.003	0.001
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	0.016	0.009	0.011	0.031	0.006	0.019	0.013	0.008	0.008
Strontium	7440-24-6	mg/L	0.001	0.0005	0.019	0.04	0.03		0.035	0.016	0.022	0.016	0.015	0.012
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR		LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	0.003	0.001		0.002	0.001	0.001	0.002	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	0.002	LOR	0.002	0.004	0.002	0.002	0.002	0.001	0.019
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.034	0.027	0.028	0.056	0.024	0.033	0.034	0.019	0.019
Fluoride	16984-48-8	mg/L	0.1	0.05	1.1	0.4	0.5	0.2	0.8	0.2	0.1	0.3	0.2	2.56
Total Phosphorus		mg/L	0.01	0.005	LOR				LOR	LOR	0.19	0.14	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
Column OD_15 KASH



Column	OD_15 KASH	Week			23	24	25	26	28	29	30	31	32	35
Sample weight (kg)	1.612	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.65	0.65	0.65	0.65	0.7	0.7	0.65	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.81	9.12	9.2	10	9.78	9.65	9.47	9.81	6.69	9.76
Electrical Conductivity (field)		µS/cm			55	92	147	153	115					
pH Value		pH Unit	0.01		5.45	7.68	8.99	8.94	6.07	8.27	7.96	9.3	8.04	9.31
Electrical Conductivity @ 25°C		µS/cm	1		65	99	138	147	116	64	68	219	117	141
Total Alkalinity as CaCO3		mg/L	1	0.5	4	33	34	47	50	28		62	41	50
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	1	2	3	2	2	LOR	2	5	3	3
Silicon	7440-21-3	mg/L	0.05	0.025	1.51	3.44	5.79	1.72	1.52	2.1	2.59	2.29	2.25	1.79
Chloride	16887-00-6	mg/L	1	0.5	7	17	26	16	9	3	14	21	13	11
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	11	21	33	34	28	10	15	42	24	35
Potassium	7/09/7440	mg/L	1	0.5	LOR	2	2	2	2	1	1	2	1	1
Iron	7439-89-6	mg/L	0.01	0.005	2.73	0.78	0.78	0.67	1.12	1.61	1.87	1.17	0.7	0.59
Aluminium	7429-90-5	mg/L	0.01	0.005	1.83	0.6	0.53	0.59	0.5	0.66	0.67	0.93	0.58	0.46
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.023	0.023	0.029	0.03	0.015	0.019	0.018	0.031	0.02	0.02
Barium	7440-39-3	mg/L	0.001	0.0005	0.196	0.034	0.023	0.021	0.016	0.022	0.026	0.034	0.028	0.023
Cerium	7440-45-1	mg/L	0.001	0.0005	0.004	LOR	LOR	LOR	LOR	LOR	LOR	0.001	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.003	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.17	0.058	0.035	0.033	0.029	0.041	0.047	0.054	0.048	0.038
Lanthanum	7439-91-0	mg/L	0.001	0.0005	0.001	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	0.007	0.002	0.001	LOR	LOR	0.001	0.002	0.002	0.002	0.001
Manganese	7439-96-5	mg/L	0.001	0.0005	0.192	0.047	0.033	0.029	0.026	0.04	0.044	0.05	0.044	0.032
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.001	0.01	0.01	0.011	0.004	0.004	0.004	0.01	0.004	0.005
Nickel	7440-02-0	mg/L	0.001	0.0005	0.008	0.003	0.002	0.002	0.003	0.003	0.002	0.004	0.002	0.002
Strontium	7440-24-6	mg/L	0.001	0.0005	0.007	0.005	0.004	0.003	LOR	0.004	0.003	0.006	0.004	0.003
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	0.001	0.001	0.002	0.001	LOR	0.001	0.002	0.001	0.001
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025		0.006	0.005	LOR	LOR	0.005	LOR	0.008	0.007	0.005
Fluoride	16984-48-8	mg/L	0.1	0.05	LOR	0.2	0.5	0.5	0.3	0.2	0.2	0.7	0.3	0.4
Total Phosphorus		mg/L	0.01	0.005	0.11	0.01	LOR	LOR	LOR	0.02	LOR	0.03	0.07	0.03

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_15 KASH



Column	OD_15 KASH	Week			36	37	38	39	40	43	44	46	47	48
Sample weight (kg)	1.612	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.675	0.675	0.675	0.7	0.65	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			9.75	9.8	9.77	9.7	9.75	9.33	9.45	9.15		9.22
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		9.3	9.12	7.86	9.08	9.25	5.99	8.57	6.99	8.66	9.16
Electrical Conductivity @ 25°C		µS/cm	1		108	124	95	145	224.00	43	95	43	83	53
Total Alkalinity as CaCO3		mg/L	1	0.5	48	41	38	51	65.00	13	31	9	39	38
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	2	LOR	1	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	2	3	1	2	6.00	1	3	2	3	2
Silicon	7440-21-3	mg/L	0.05	0.025	2.74	1.55	2.46	1.94	1.90		1.71	1.4	3.13	0.77
Chloride	16887-00-6	mg/L	1	0.5	6	12	5	7	21.00	LOR	7	4	7	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	23	26	22	28	48.00	6	22	11	24	20
Potassium	7/09/7440	mg/L	1	0.5	1	1	1	1	2.00	LOR	LOR	LOR	2	1
Iron	7439-89-6	mg/L	0.01	0.005	1.42	0.69	1.7	0.78	1.01	0.24	0.69	1.01	1.49	0.17
Aluminium	7429-90-5	mg/L	0.01	0.005	0.65	0.34	0.71	0.83	0.50	0.31	0.49	0.45	1.76	0.11
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.001	0.00	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.023	0.02	0.015	0.022	0.04	0.01	0.023	0.012	0.03	0.018
Barium	7440-39-3	mg/L	0.001	0.0005	0.028	0.021	0.024	0.021	0.03	0.01	0.022	0.127	0.237	0.013
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	0.001	LOR	LOR	LOR	0.001	LOR	0.002	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.002	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.044	0.038	0.045	0.04	0.05	0.018	0.054	0.055	0.147	0.02
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	0.001	0.002	0.002	0.001	0.00	LOR	0.002	0.004	0.005	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.037	0.031	0.042	0.038	0.04	0.015	0.066	0.041	0.129	0.016
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.005	0.004	0.004	0.009	0.02	0.002	0.005	0.002	0.002	0.005
Nickel	7440-02-0	mg/L	0.001	0.0005	0.003	0.001	0.004	0.002	0.00	0.001	0.002	0.002	0.005	0.002
Strontium	7440-24-6	mg/L	0.001	0.0005	0.005	0.003	0.003	0.004	0.00	0.004	0.006	0.004	0.01	0.005
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.001	0.002	LOR	0.001	0.00	LOR	0.001	LOR	0.001	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.01	0.006	0.006	0.01	LOR	0.009	0.022	0.019	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.3	0.2	0.3	0.60	0.1	0.3	0.3	0.2	0.2
Total Phosphorus		mg/L	0.01	0.005	0.02	0.02	0.01	LOR	0.03	LOR	0.02	0.01	0.02	0.1

Appendix A: Tabulated Laboratory Analytical Results
Column OD_15 KASH



Column	OD_15 KASH	Week			50	51	52	53	54	55	56	57	58	59
Sample weight (kg)	1.612	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.68	9.15	9.14	9.17	8.52	9.17	8.79	9.25	8.34	9.01
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		6.69	5.63	8.26	9.16	8.59	8.57	8.33	8.32	7.62	6.05
Electrical Conductivity @ 25°C		µS/cm	1		81	38	63	53	168	84	56	69	56	68
Total Alkalinity as CaCO3		mg/L	1	0.5	30	3	22	38	73	32	30	37	26	52
Acidity as CaCO3		mg/L	1	0.5	12	1	LOR	LOR	LOR	LOR	LOR	2	1	LOR
Sulfate	14808-79-8	mg/L	1	0.5	3	1	1	2	3	3	2	2	2	2
Silicon	7440-21-3	mg/L	0.05	0.025	1.5	1.5	1.32	0.77	1.74	0.73	0.76	0.56	0.5376	0.84
Chloride	16887-00-6	mg/L	1	0.5	4	13	1	LOR	5	LOR	LOR	LOR	6	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	1	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	20	10	14	20	35	17	15	17	14	14
Potassium	7/09/7440	mg/L	1	0.5	1	LOR	1	1	2	LOR	LOR	LOR	1	1
Iron	7439-89-6	mg/L	0.01	0.005	0.46	0.4	0.3	0.17	0.5	0.35	0.33	0.19	0.4	0.62
Aluminium	7429-90-5	mg/L	0.01	0.005	0.64	0.7	0.66	0.11	0.76	0.32	0.22	0.21	0.24	0.28
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.002	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.029	0.012	0.017	0.018	0.021	0.01	0.013	0.016	0.012	0.012
Barium	7440-39-3	mg/L	0.001	0.0005	0.005	0.006	0.008	0.013	0.008	0.009	0.01	0.009	0.007	0.011
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.01	0.01	0.01	0.02	0.013	0.017	0.018	0.014	0.014	0.021
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.009	0.009	0.009	0.016	0.005	0.013	0.015	0.011	0.01	0.01
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.005	0.002	0.003	0.005	0.008	0.002	0.002	0.004	0.002	0.003
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	0.001	LOR	0.002	LOR	LOR	LOR	LOR	LOR	0.001
Strontium	7440-24-6	mg/L	0.001	0.0005	LOR	0.002	0.004	0.005	LOR	0.002	0.004	0.004	0.003	0.002
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	0.006	0.006	LOR	0.009
Fluoride	16984-48-8	mg/L	0.1	0.05	0.3	0.2	0.1	0.2	0.3	0.2	0.2	0.3	0.3	0.1
Total Phosphorus		mg/L	0.01	0.005	0.02	LOR	LOR	0.1	0.01	LOR	LOR	LOR	0.02	0.08

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_15 KASH



Column	OD_15 KASH	Week			60	61	62	64	67	68	73	74	75	76
Sample weight (kg)	1.612	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.65	0.65	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			9.46	9.22	8.98	9.84	9.94	10.12	8.94	9.22	9.55	9.45
Electrical Conductivity (field)		µS/cm								163.9	61	78.4	110.4	180.1
pH Value		pH Unit	0.01		7.37	7.73	6.97	9.16	8.46	8.79	7.46	7.57	7.76	8.79
Electrical Conductivity @ 25°C		µS/cm	1		49	43	50	164	125	149	55	58	95	177
Total Alkalinity as CaCO3		mg/L	1	0.5	25	24	19	58		47	23	27	25	58
Acidity as CaCO3		mg/L	1	0.5	4	LOR	2	2	LOR	LOR	2	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	LOR	2	3	4	5	4	3	2	3	6
Silicon	7440-21-3	mg/L	0.05	0.025	0.55	0.39	0.4	0.28	0.53	0.67	0.36	0.54	0.6	0.63
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	2	5	5	8	LOR	6	6	8
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	10	10	12	33	31	31	12	12	16	34
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	2	3	2	1	1	0.14	4
Iron	7439-89-6	mg/L	0.01	0.005	0.28	0.16	0.16	0.13	0.42	0.49	0.11	0.23	LOR	0.13
Aluminium	7429-90-5	mg/L	0.01	0.005	0.2	0.15	0.24	0.24	0.22	0.37	0.51	0.25	0.2	0.19
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	0.002
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.012	0.008	0.009	0.02	0.02	0.043	0.011	0.014	0.019	0.048
Barium	7440-39-3	mg/L	0.001	0.0005	0.009	0.005	0.002	0.007	0.011	0.01	0.006	0.037	0.006	0.009
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.014	0.01	0.003	0.012	0.027	0.025	0.011	0.021	0.014	0.014
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.013	0.007	0.002	0.006	0.013	0.017	0.006	0.014	0.007	0.008
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.003	0.002	0.002	0.001	0.005	0.019	0.004	0.003	0.005	0.02
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	0.002	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.004	0.003	0.002	0.006	0.007	0.005	0.002	0.006	0.007	0.01
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.002	0.002	0.001	LOR	LOR	LOR	0.001
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.005	LOR	LOR	0.006	0.006	0.006	LOR	0.01	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	LOR	0.1	0.1	0.5	1	0.3	0.2	0.2	0.3	0.4
Total Phosphorus		mg/L	0.01	0.005	LOR	0.02	LOR	LOR	0.71	0.04	LOR	0.01	2	0.02

Appendix A: Tabulated Laboratory Analytical Results
Column OD_15 KASH



Column	OD_15 KASH	Week			77	78	80	81	82	83	84	85	86	87
Sample weight (kg)	1.612	Extraction vol (L)			0.43	0.43	0.43	0.43	0.585	0.45	0.675	0.45	0.47	0.5
Key		Flushing vol (L)			0.7	0.65	0.65	0.65	0.7	0.65	0.9	0.65	0.75	0.8

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			9.96	9.16	9.75	9.75	10.16	9.96	9.12	9.65	8.37	9.46
Electrical Conductivity (field)		µS/cm			76.9	80.1	52.2	68	118	65.1	84.8	130.3	65.5	53.7
pH Value		pH Unit	0.01		7.63	7.5	7.26	5.59	8.57	8.32	8.78	9.19	8.35	9.25
Electrical Conductivity @ 25°C		µS/cm	1		72	88	49	50	90	60	74	1070	61	49
Total Alkalinity as CaCO3		mg/L	1	0.5	28	34	27	21	43	213	29	31	24	21
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	1	1	LOR	1	LOR
Sulfate	14808-79-8	mg/L	1	0.5	3	3	2	2	3	3	3	4	2	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.48	0.79	0.32	0.54	0.63	0.49	0.7	0.24	0.35	0.47
Chloride	16887-00-6	mg/L	1	0.5	LOR	5	LOR	LOR	LOR		LOR	LOR	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	14	17	10	14	19	13	15	19	12	10
Potassium	7/09/7440	mg/L	1	0.5	1	2	1	LOR	2	1	2	2	2	1
Iron	7439-89-6	mg/L	0.01	0.005	0.18	0.07	0.08	0.17	0.23	0.19	0.13	0.1	0.12	0.15
Aluminium	7429-90-5	mg/L	0.01	0.005	0.23	0.19	0.1	0.15	0.23	0.08	0.13	0.11	0.16	0.14
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.015	0.021	0.011	0.014	0.013	0.01	0.018	0.014	0.014	0.008
Barium	7440-39-3	mg/L	0.001	0.0005	0.006	0.003	0.004	0.006	0.008	0.006	0.008	0.004	0.006	0.034
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.011	0.005	0.009	0.012	0.016	0.015	0.012	0.01	0.011	0.016
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.007	0.003	0.004	0.008	0.011	0.008	0.008	0.004	0.007	0.013
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.005	0.005	0.004	0.005	0.004	0.004	0.005	0.006	0.004	0.002
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.007	0.005	0.004	0.003	0.004	0.005	0.006	0.005	0.006	0.003
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.001	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	0.011	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	LOR	0.1	0.2	0.2	0.1	0.2	0.1	0.2	LOR
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_15 KASH



Column	OD_15 KASH	Week			88	89	90	91	92	93	94	95	96	97
Sample weight (kg)	1.612	Extraction vol (L)			0.5	0.43	0.43	0.47	0.48	0.49	0.42	0.46	0.46	0.47
Key		Flushing vol (L)			0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			9.81	9.44	9.76	9.78	9.45	9.69	7.99	8.82	9.36	9.41
Electrical Conductivity (field)		µS/cm			74.7	57.0	105.4	115.2	128.5	88.7	52.6	69.7	79.1	80.7
pH Value		pH Unit	0.01		9.85	8.49	9.14	9.39	9.22	9.26	8.72	8.87	8.78	8.9
Electrical Conductivity @ 25°C		µS/cm	1		61	50	97	99	108	69	56	54	62	68
Total Alkalinity as CaCO3		mg/L	1	0.5	26	27	32	25	41	43	24	21	LOR	LOR
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	2	2	4	4	5	3	LOR	2	3	3
Silicon	7440-21-3	mg/L	0.05	0.025	0.34	0.23	0.48	0.45	0.52	0.26	0.21	0.25	0.32	0.18
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	2	7	4	LOR	4
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	1	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	14	12	20	17	22	16	13	13	14	16
Potassium	7/09/7440	mg/L	1	0.5	2	1	2	2	2	LOR	1	1	1	2
Iron	7439-89-6	mg/L	0.01	0.005	0.08	LOR	0.12	0.45	0.12	0.2	0.07	0.15	0.12	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.09	0.09	0.11	0.001	LOR	LOR	LOR	0.002	LOR	0.11
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.018	0.022	0.012	0.011	0.01	0.01	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.011	0.009	0.014	0.007	0.007	0.004	0.003	0.003	0.004	0.015
Barium	7440-39-3	mg/L	0.001	0.0005	0.005	0.003	0.005	LOR	LOR	LOR	LOR	LOR	LOR	0.002
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	0.014	0.014	0.01	0.008	0.008	0.009	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.01	0.007	0.012	LOR	LOR	LOR	LOR	LOR	LOR	0.004
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.009	0.006	0.005	0.003	0.003	0.006	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.005	0.003	0.008	0.008	0.007	0.003	0.003	0.003	0.003	0.002
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.004	0.002	0.006	LOR	0.001	LOR	LOR	LOR	LOR	0.003
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.006	0.008	0.006	0.004	0.002	0.003	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.004	0.002	0.004	LOR	LOR	LOR	LOR	LOR	LOR	0.003
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	0.012	0.005	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	0.18	0.16	0.12	0.06	0.07	0.09	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.1	0.1	0.2	LOR	0.3	0.2	LOR	0.1	0.7	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_15 KASH



Column	OD_15 KASH	Week			98	99	100	101	102	103	104	105	106	107
Sample weight (kg)	1.612	Extraction vol (L)			0.51	0.48	0.48	0.48	0.48	0.465	0.5	0.475	0.48	0.49
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			9.52	10.20	8.21	9.44		9.56	9.95	9.58	9.45	9.72
Electrical Conductivity (field)		µS/cm			118.3	77.7	82.1	71	62.7	80.2	64.6	88.4	91.4	72.6
pH Value		pH Unit	0.01		9.12	7.44	6.96	8.73	9	9.2	9.3	8.91	8.77	8.76
Electrical Conductivity @ 25°C		µS/cm	1		99	71	71	62	45	66	51	61	69	47
Total Alkalinity as CaCO3		mg/L	1	0.5	45	25	26	19	20	27	16	26	35	25
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	3	3	3	3	2	2	2	4	2	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.56	0.25	0.22	0.22	0.15	0.19	0.27	0.13	0.27	0.18
Chloride	16887-00-6	mg/L	1	0.5	3	3	2	LOR	1	LOR	4	1	4	3
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	22	15	15	13	10	14	13	15	16	12
Potassium	7/09/7440	mg/L	1	0.5	1	1	1	1	1	1	LOR	1	2	1
Iron	7439-89-6	mg/L	0.01	0.005	0.22	LOR	0.11	LOR	LOR	LOR	0.1	LOR	0.14	0.08
Aluminium	7429-90-5	mg/L	0.01	0.005	0.17	0.02	0.16	0.12	0.1	0.1	0.08	0.06	0.11	0.09
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.014	0.005	0.011	0.009	0.008	0.008	0.009	0.014	0.019	0.011
Barium	7440-39-3	mg/L	0.001	0.0005	0.008	0.004	0.004	0.004	LOR	0.002	0.003	0.002	0.004	0.003
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.017	0.005	0.009	0.008	LOR	0.005	0.008	0.004	0.013	0.009
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.011	0.002	0.004	0.004	LOR	0.002	0.002	0.001	0.014	0.004
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.003	0.005	0.003	0.003	LOR	0.002	0.003	0.004	0.004	0.002
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.006	0.003	0.004	0.004	LOR	0.004	0.001	0.004	0.004	0.003
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	0.006	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	0.009	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.1	0.1	0.1	LOR	0.1	0.1	0.1	0.2	LOR
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
Column OD_15 KASH



Column	OD_15 KASH	Week			108	109	110	111	112	113	114	115	116	117
Sample weight (kg)	1.612	Extraction vol (L)			0.47	0.48	0.495	0.47	0.675	0.675	0.5	0.48	0.5	0.49
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.9	0.9	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			9.74	9.89	9.41	9.68	9.80	9.53	10.20	10.15	10.79	10.37
Electrical Conductivity (field)		µS/cm			75.7	69.3	52.6	64.3	101.4	79.7	61.6	41.7	45.4	38.1
pH Value		pH Unit	0.01		9.3	8.91	8.63	9.25	9.23	9.19	8.71	8.32	8.74	7.87
Electrical Conductivity @ 25°C		µS/cm	1		58	46	37	58	98	76	56	36	45	45
Total Alkalinity as CaCO3		mg/L	1	0.5	27	20	15	26	45	34	16	14	19	18
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	2	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	2	2	2	2	3	2	2	2	3	1
Silicon	7440-21-3	mg/L	0.05	0.025	0.13	0.21	0.15	0.26	0.59	0.49	0.19	0.22	0.17	0.12
Chloride	16887-00-6	mg/L	1	0.5	2	1	LOR	LOR	4	2	4	4	LOR	12
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	14	11	8	14	20	15	12	8	8	9
Potassium	7/09/7440	mg/L	1	0.5	2	1	LOR	2	3	2	1	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	0.13	0.14	0.06	0.13	0.1	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.1	0.1	0.11	0.1	0.13	0.11	0.08	0.08	0.09	0.09
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.014	0.009	LOR0	0.014	0.032	0.023	0.009	0.007	0.008	0.013
Barium	7440-39-3	mg/L	0.001	0.0005	0.002	0.003	0.003	0.001	0.006	0.004	0.001	LOR	0.001	0.002
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.005	0.008	0.005	0.003	0.01	0.009	0.003	0.002	0.001	0.004
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.001	0.004	0.003	0.001	0.005	0.005	LOR	0.001	0.001	0.001
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.003	0.003	0.002	0.005	0.01	0.007	0.004	0.002	0.002	0.003
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.004	0.003	0.003	LOR	0.006	0.004	0.001	LOR	0.002	0.003
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.1	0.1	0.1	LOR	0.2	0.2	0.1	LOR	0.1	
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
Column OD_15 KASH



Column	OD_15 KASH	Week			118	119	120	121	122	125	129	131	135	139
Sample weight (kg)	1.612	Extraction vol (L)			0.675	0.47	0.47	0.47	0.49	0.48	0.49	0.45	0.47	0.47
Key		Flushing vol (L)			0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			10.40	10.18	9.77	9.15	8.56	8.06	8.99	8.12	10.15	9.45
Electrical Conductivity (field)		µS/cm			75.6	56.7	82.8	59	33	65.1	46.1	43.4	61.2	47.2
pH Value		pH Unit	0.01		9.33	8.98	8.93	9.77	7.59	7.33	6.88	6.97	6.93	7.13
Electrical Conductivity @ 25°C		µS/cm	1		77	51	72	58	31	64	48	30	52	40
Total Alkalinity as CaCO3		mg/L	1	0.5	24	23	36	23	8	28	20	20	18	LOR
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	2	LOR	2	2		5	2	2
Sulfate	14808-79-8	mg/L	1	0.5	2	2	2	2	1	2	1	2	3	2
Silicon	7440-21-3	mg/L	0.05	0.025	1.07	0.2	0.38	0.43	4	0.26	0.39	0.25	0.24	0.18
Chloride	16887-00-6	mg/L	1	0.5	1	2	2	2	LOR	1	2	2	2	5
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	6	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	14	13	18	12	1	12	9	7	10	7
Potassium	7/09/7440	mg/L	1	0.5	2	1	3	2	LOR	2	2	1	2	1
Iron	7439-89-6	mg/L	0.01	0.005	0.15	LOR	0.07	0.17	0.07	0.14	LOR	0.1	LOR	0.05
Aluminium	7429-90-5	mg/L	0.01	0.005	0.15	0.09	0.22	0.12	LOR	0.1	0.15	0.1	0.1	0.12
Antimony	7440-36-0	mg/L	0.001	0.0005	0.001	LOR	LOR	LOR	0.011	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.026	0.009	0.026	0.024	0.001	0.013	0.008	0.007	0.006	0.005
Barium	7440-39-3	mg/L	0.001	0.0005	0.006	LOR	0.002	0.006	LOR	0.004	LOR	0.003	0.004	0.002
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.002	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.008	0.002	0.004	0.011	LOR	0.007	0.002	0.008	0.006	0.006
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.005	0.001	0.001	0.006	0.002	0.004	0.001	0.004	0.004	0.002
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.008	0.004	0.01	0.007	LOR	0.005	0.004	0.002	0.003	0.002
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.002	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.005	0.001	0.002	0.005	LOR	0.004	0.001	0.004	0.005	0.003
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.001	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	0.5	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.1	0.1	0.2	0.1		0.1	0.1	LOR	LOR	LOR
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_15 KASH



Column	OD_15 KASH	Week			148	150	152	156	161	165	169	174
Sample weight (kg)	1.612	Extraction vol (L)			0.465	0.48	0.51	0.49	0.5	0.5	0.46	0.46
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR								
pH (field)		pH Unit			9.45	9.42	8.33	9.35	9.87	7.31	8.05	8.01
Electrical Conductivity (field)		µS/cm			46.1	44.1	31.6	43.6	18.23	18.64	15.83	55.7
pH Value		pH Unit	0.01		7.4	7.34	6.89	7.24	6.94	7.05	7.06	7.19
Electrical Conductivity @ 25°C		µS/cm	1		44	35	33	49	21	22	20	37
Total Alkalinity as CaCO3		mg/L	1	0.5	11	12	11	13	6	7	7	9
Acidity as CaCO3		mg/L	1	0.5	LOR	1	LOR	LOR	2	2	LOR	3
Sulfate	14808-79-8	mg/L	1	0.5	3	3	2	3	1	1	LOR	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.27	0.25	0.17	0.16	0.28	0.35	0.15	0.23
Chloride	16887-00-6	mg/L	1	0.5	1	1	1	1	LOR	LOR	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	8	6	6	8	4	3	3	6
Potassium	7/09/7440	mg/L	1	0.5	1	LOR	1	2	1	1	LOR	1
Iron	7439-89-6	mg/L	0.01	0.005	LOR	0.06	0.05	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.11	0.14	0.12	0.09	0.07	0.09	0.08	0.04
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.004	0.005	0.005	0.006	0.003	0.005	0.002	0.004
Barium	7440-39-3	mg/L	0.001	0.0005	0.003	0.003	0.002	0.003	0.002	0.003	0.002	0.003
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.008	0.007	0.007	0.006	0.006	0.004	0.004	0.006
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.002	0.003	0.002	0.002	0.002	0.003	0.002	0.004
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.002	0.002	0.002	0.003	LOR	0.001	LOR	0.002
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.004	0.003	0.003	0.004	0.003	0.003	0.002	0.004
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Data
Column OD_16 KASH Laminated



Column	OD_16 KASH Laminated	Week			0	4	8	12	16	17	18	20	21	22
Sample weight (kg)	1.76	Extraction vol (L)			0.625	0.375	0.375	0.625	0.42	0.42	0.42	0.42	0.42	0.48
Key		Flushing vol (L)			1.6	1.35	1.3	1.6	1.2	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			9.16	9.37	9.7	9.56	9.6	8.9	9.06	9.05	8.46	8.9
Electrical Conductivity (field)		µS/cm			1271	367	333	130.6	433	98	65	141	65	43
pH Value		pH Unit	0.01		9.12	9.36	9.13	8.81	9.46	7.67	7.61	8.55	7.52	6.96
Electrical Conductivity @ 25°C		µS/cm	1		1090	384	335	146	443	105	76	154	69	46
Total Alkalinity as CaCO3		mg/L	1	0.5	53	30	48	25	69	35	16	24	14	10
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	2	2	1	1	1
Sulfate	14808-79-8	mg/L	1	0.5	82	47	41	18	59	16	6	18	9	8
Silicon	7440-21-3	mg/L	0.05	0.025	1.57	1.38	2.19		4.12	6.1	5.87	1.4	1.79	1.53
Chloride	16887-00-6	mg/L	1	0.5					54	16	14	22	8	8
Calcium	7440-70-2	mg/L	1	0.5	LOR				LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR				LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	209				91	30	14	31	13	9
Potassium	7/09/7440	mg/L	1	0.5	6				4	3	2	1	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.04	5.08	6.11	6.87	14.2	3.68	4.05	2.89	2.95	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.29	3.58	3.57	3.89	8.4	2.32	2.96	2.45	2.38	1.01
Antimony	7440-36-0	mg/L	0.001	0.0005	0.002	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.093	0.051	0.07	0.038	0.101	0.029	0.023	0.03	0.016	0.012
Barium	7440-39-3	mg/L	0.001	0.0005	0.019	0.654	0.733	0.961	1.07	0.796	0.755	0.569	0.453	0.466
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	0.006	0.004	0.006	0.01	0.004	0.008	0.003	0.004	0.002
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	0.009	0.01	0.009	0.023	0.005	0.008	0.005	0.004	0.003
Copper	7440-50-8	mg/L	0.001	0.0005	LOR	0.042	0.041	0.053	0.111	0.046	0.037	0.033	0.023	0.023
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	0.002	0.002	0.002	0.004	0.001	0.001	0.001	0.001	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	0.006	0.006	0.007	0.012	0.004	0.005	0.003	0.002	0.002
Manganese	7439-96-5	mg/L	0.001	0.0005	LOR	0.108	0.101	0.132	0.266	0.089	0.09	0.072	0.05	0.048
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.038	0.007	0.021	0.006	0.025	0.006	0.004	0.012	0.004	0.002
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	0.03	0.038	0.032	0.081	0.015	0.028	0.019	0.011	0.009
Strontium	7440-24-6	mg/L	0.001	0.0005	0.006	0.018	0.016		0.028	0.012	0.011	0.008	0.007	0.005
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR		0.002	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	0.004	0.004		0.006	0.002	0.002	0.002	0.001	0.001
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	0.002	0.002	0.002	0.004	0.001	0.001	0.001	LOR	0.018
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.049	0.069	0.056	0.124	0.033	0.167	0.039	0.03	0.018
Fluoride	16984-48-8	mg/L	0.1	0.05	2.8	1.6	2.6	1.2	4.9	1.2	0.7	1.2	0.8	1.33
Total Phosphorus		mg/L	0.01	0.005	LOR				LOR	LOR	0.13	0.06	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Data
 Column OD_16 KASH Laminated



Column	OD_16 KASH Laminated	Week			23	24	25	26	28	29	30	31	32	35
Sample weight (kg)	1.76	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.65	0.65	0.65	0.65	0.7	0.7	0.65	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.49	8.83	8.94	9	9.06	8.65	9.02	9.27	9.3	9.4
Electrical Conductivity (field)		µS/cm			38	48	88	91	47					
pH Value		pH Unit	0.01		7.96	7.02	7.3	8.1	5.62	6.64	7.61	7.3	7.04	7.21
Electrical Conductivity @ 25°C		µS/cm	1		45	56	85	89	48		62	88	50	48
Total Alkalinity as CaCO3		mg/L	1	0.5	11	11	29	15	17	10	26	13	21	10
Acidity as CaCO3		mg/L	1	0.5	1	1	LOR	2	LOR	2	LOR	LOR	3	LOR
Sulfate	14808-79-8	mg/L	1	0.5	6	8	11	12	7	5	8	12	8	8
Silicon	7440-21-3	mg/L	0.05	0.025	1.07	3.74	3.21	1.67	1.02	1.3	1.42	1.71	1.6	1.3
Chloride	16887-00-6	mg/L	1	0.5	6		15	7	2	1	11	7	6	3
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	8	13	24	20	12	5	19	18	13	11
Potassium	7/09/7440	mg/L	1	0.5	LOR	1	LOR	1	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	2.18	0.85	0.75	0.68	0.8	0.92	1.18	1.02	0.69	0.49
Aluminium	7429-90-5	mg/L	0.01	0.005	1.45	0.71	0.39	0.56	0.34	0.44	0.54	17.9	0.5	0.28
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.003	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.011	0.012	0.018	0.016	0.008	0.011	0.01	0.018	0.01	0.009
Barium	7440-39-3	mg/L	0.001	0.0005	0.419	0.154	0.103	0.078	0.05	0.06	0.074	0.17	0.067	0.044
Cerium	7440-45-1	mg/L	0.001	0.0005	0.002	LOR	LOR	LOR	LOR	LOR	LOR	0.012	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	0.004	0.002	LOR	0.001	LOR	0.001	LOR	0.001	0.001	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.022	0.01	0.005	0.005	0.004	0.005	0.005	0.013	0.006	0.004
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.006	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	0.002	LOR	LOR	LOR	LOR	LOR	LOR	0.017	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.056	0.023	0.012	0.011	0.008	0.01	0.011	0.028	0.014	0.007
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.002	0.005	0.011	0.009	0.002	0.003	0.003	0.007	0.003	0.002
Nickel	7440-02-0	mg/L	0.001	0.0005	0.013	0.007	0.003	0.004	0.002	0.004	0.004	0.006	0.004	0.002
Strontium	7440-24-6	mg/L	0.001	0.0005	0.004	0.002	0.003	0.002	LOR	0.002	0.001	0.442	0.002	LOR
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	0.001	0.001	LOR	LOR	LOR	0.002	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.002	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025		0.012	0.008	LOR	LOR	0.007	LOR	0.092	0.01	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.3	0.6	0.9	1.1	1.2		0.7	1.1	0.7	0.7
Total Phosphorus		mg/L	0.01	0.005	0.07	0.01	LOR	LOR	LOR	0.01	LOR	0.02	0.06	0.02

Appendix A: Tabulated Laboratory Analytical Data
 Column OD_16 KASH Laminated



Column	OD_16 KASH Laminated	Week			36	37	38	39	40	43	44	46	47	48
Sample weight (kg)	1.76	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.675	0.675	0.675	0.7	0.65	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			9.05	9.35	9.3	9.4	9.48	9.05	9.5	8.86		9.33
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		7.62	7.28		9	7.36	5.86	7.6	6.78	7.36	6.93
Electrical Conductivity @ 25°C		µS/cm	1		45	43	29	33	87.00	30	104	23	55	19
Total Alkalinity as CaCO3		mg/L	1	0.5	11	11			13.00	4		8	14	6
Acidity as CaCO3		mg/L	1	0.5	1	2	1	LOR		4	4	2	LOR	2
Sulfate	14808-79-8	mg/L	1	0.5	8	6	4	5	10.00	3	11	3	9	3
Silicon	7440-21-3	mg/L	0.05	0.025	1.66	2.51	1.26	2.25	1.61		2.49	1.77	3.25	1.56
Chloride	16887-00-6	mg/L	1	0.5	3	2	LOR	4	8.00	LOR	5	LOR	5	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	9	9	7	7	19.00	5	22	5	15	6
Potassium	7/09/7440	mg/L	1	0.5	LOR	1	LOR	LOR	1.00	LOR	LOR	LOR	1	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.77	0.96	0.85	0.66	0.77	0.22	0.93	1.69	1.07	0.35
Aluminium	7429-90-5	mg/L	0.01	0.005	0.47	0.36	0.34	0.79	0.38	0.25	0.44	0.91	1.72	0.22
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.011	0.01	0.007	0.008	0.02	0.008	0.032	0.009	0.02	0.01
Barium	7440-39-3	mg/L	0.001	0.0005	0.066	0.077	0.049	0.071	0.08	0.062	0.123	0.32	0.436	0.074
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.002	0.002	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	0.001	LOR	LOR	0.001	0.001	0.003	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.004	0.005	0.004	0.005	0.01	0.004	0.01	0.015	0.025	0.006
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.002	0.002	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.01	0.011	0.008	0.012	0.01	0.006	0.017	0.027	0.05	0.011
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.003	0.002	0.002	0.002	0.01	0.002	0.01	0.001	0.002	0.002
Nickel	7440-02-0	mg/L	0.001	0.0005	0.003	0.003	0.003	0.003	0.00	0.002	0.004	0.005	0.008	0.004
Strontium	7440-24-6	mg/L	0.001	0.0005	0.002	0.002	0.001	0.001	0.00	0.001	0.004	0.006	0.007	0.002
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.00	LOR	0.002	LOR	0.001	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.02	0.006	0.007	0.01	LOR	0.014	0.018	0.019	0.012
Fluoride	16984-48-8	mg/L	0.1	0.05	0.7	0.6	LOR		0.70	0.1		0.2	0.7	0.4
Total Phosphorus		mg/L	0.01	0.005	0.01	0.03	LOR	LOR	0.02	LOR	0.02	LOR	0.07	0.01

Appendix A: Tabulated Laboratory Analytical Data
 Column OD_16 KASH Laminated



Column	OD_16 KASH Laminated	Week			50	51	52	53	54	55	56	57	58	59
Sample weight (kg)	1.76	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.90	9.08	8.89	8.94	7.95	9.11	8.63	8.28	7.68	8.28
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		6.36	5.51	7.18	6.93	6.78	7.14	6.76	6.44	6.91	5.65
Electrical Conductivity @ 25°C		µS/cm	1		47	40	35	19	77	56	32	24	36	24
Total Alkalinity as CaCO3		mg/L	1	0.5	11	5	18	6	20	12	8	11	23	62
Acidity as CaCO3		mg/L	1	0.5	1	1	2	2	2	2	1	2	2	2
Sulfate	14808-79-8	mg/L	1	0.5	7	5	4	3	7	9	4	3	3	3
Silicon	7440-21-3	mg/L	0.05	0.025	1.33	1.55	1.08	1.56	4.9	1.34	0.97	0.47	0.5376	0.85
Chloride	16887-00-6	mg/L	1	0.5	1	14	LOR	LOR	1	LOR	LOR	LOR	3	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	11	11	7	6	16	12	8	5	10	5
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	2	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.42	0.34	0.18	0.35	1.35	0.64	0.49	0.19	0.24	0.66
Aluminium	7429-90-5	mg/L	0.01	0.005	0.69	0.79	0.53	0.22	1.3	0.61	0.3	0.17	0.28	0.27
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.014	0.012	0.01	0.01	0.02	0.009	0.012	0.009	0.008	0.008
Barium	7440-39-3	mg/L	0.001	0.0005	0.026	0.031	0.055	0.074	0.192	0.097	0.067	0.05	0.051	0.084
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.002	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.002	0.002	0.002	0.006	0.018	0.006	0.006	0.003	0.003	0.003
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.003	0.005	0.004	0.011	0.033	0.011	0.008	0.005	0.005	LOR
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.003	0.002	0.001	0.002	0.004	0.002	0.002	0.002	0.002	0.002
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	0.001	0.001	0.004	0.006	0.003	0.002	0.001	0.002	0.002
Strontium	7440-24-6	mg/L	0.001	0.0005	0.001	0.002	0.005	0.002	0.005	0.002	0.004	0.003	0.003	0.002
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	0.002	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	0.012	0.014	LOR	0.009	0.01	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.5	0.5	0.3	0.4	0.5	0.5	0.6	0.2	0.4	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	0.01	0.01	0.01	0.03	LOR	LOR	LOR	0.02	0.06

Appendix A: Tabulated Laboratory Analytical Data
 Column OD_16 KASH Laminated



Column	OD_16 KASH Laminated	Week			60	61	62	64	67	68	73	74	75	76
Sample weight (kg)	1.76	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.65	0.65	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.65	8.44	6.95	9.06	8.19	9.36	7.83	8.70	9.11	9.16
Electrical Conductivity (field)		µS/cm								98.4	29	46.2	83.4	118.3
pH Value		pH Unit	0.01		6.57	6.76	6.21	6.58	6.84	7.51	6.67	6.69	7.14	7.41
Electrical Conductivity @ 25°C		µS/cm	1		31	18	26	38	33	95	28	28	45	111
Total Alkalinity as CaCO3		mg/L	1	0.5	11	9	7	5	19	20	6	9	27	23
Acidity as CaCO3		mg/L	1	0.5	4	LOR	2		1	LOR	3	2	1	LOR
Sulfate	14808-79-8	mg/L	1	0.5	3	3	5	6	3	12	4	3	4	13
Silicon	7440-21-3	mg/L	0.05	0.025	0.7	0.43	0.37	0.15	1.47	2.25	0.35	0.76	0.74	1.12
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	LOR		2	5	LOR	5	1	2
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	6	4	6	8	7	19	6	6	7	22
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	1	1	LOR	LOR	0.18	1
Iron	7439-89-6	mg/L	0.01	0.005	0.22	0.15	0.12	LOR	0.95	2.09	0.18	1.07	LOR	0.26
Aluminium	7429-90-5	mg/L	0.01	0.005	0.25	0.22	0.24	0.17	0.31	1.37	0.68	0.55	0.12	0.21
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.008	0.007	0.007	0.005	0.008	0.047	0.007	0.013	0.014	0.048
Barium	7440-39-3	mg/L	0.001	0.0005	0.124	0.056	0.026	0.04	0.078	0.036	0.022	0.162	0.042	0.067
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.004	LOR	0.001	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.004	0.002	LOR	0.002	0.01	0.016	0.004	0.01	0.005	0.006
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.006	0.004	LOR	LOR	0.012	0.031	0.004	0.018	0.003	0.005
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.002	0.001	0.001	LOR	0.002	0.011	0.002	0.002	0.002	0.013
Nickel	7440-02-0	mg/L	0.001	0.0005	0.002	0.001	LOR	LOR	0.002	0.015	0.002	0.004	0.001	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.006	0.003	0.002	0.002	0.004	0.003	0.002	0.005	0.007	0.004
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	0.001
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.009	LOR	LOR	0.008	0.008	0.027	LOR	0.016	LOR	0.01
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.2	0.2	0.4	0.3	1	0.2	0.2	0.3	0.9
Total Phosphorus		mg/L	0.01	0.005	LOR	0.02	0.01	0.05	0.47	LOR	0.02	0.03	LOR	0.03

Appendix A: Tabulated Laboratory Analytical Data
 Column OD_16 KASH Laminated



Column	OD_16 KASH Laminated	Week			77	78	80	81	82	83	84	85	86	87
Sample weight (kg)	1.76	Extraction vol (L)			0.43	0.43	0.43	0.43	0.625	0.41	0.675	0.45	0.47	0.58
Key		Flushing vol (L)			0.7	0.65	0.5	0.4	0.7	0.6	0.9	0.65	0.75	0.8

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			9.13	8.25	8.64	8.97	8.95	8.27	7.84	8.79	6.03	7.91
Electrical Conductivity (field)		µS/cm			57.7	56.5	38.1	135	87	11.7	39.3	35.6	30.3	18.9
pH Value		pH Unit	0.01		7.19		6.86	7.28	7.08	6.83	7.31	7.54	7.48	7.45
Electrical Conductivity @ 25°C		µS/cm	1		59		41	109	61	21	40	29	30	20
Total Alkalinity as CaCO3		mg/L	1	0.5	16		6	36	16		20	6	8	5
Acidity as CaCO3		mg/L	1	0.5	1	2	3	2	LOR	1	1	1	1	LOR
Sulfate	14808-79-8	mg/L	1	0.5	6	8	5	4	7	2	5	3	3	3
Silicon	7440-21-3	mg/L	0.05	0.025	0.96	1.76	1.26	0.57	1.1	0.27	0.62	0.24	1.05	1.04
Chloride	16887-00-6	mg/L	1	0.5	LOR	6	LOR	LOR	LOR		LOR	LOR	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	11	13	8	15	13	3	8	5	5	4
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	1	LOR	LOR	LOR	1	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.34	0.3	0.3	0.53	0.24	0.06	0.12	0.09	0.2	0.28
Aluminium	7429-90-5	mg/L	0.01	0.005	0.2	0.69	0.16	0.41	0.32	0.05	0.08	0.1	0.2	0.2
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.014	0.026	0.017	0.055	0.023	0.005	0.018	0.008	0.01	0.008
Barium	7440-39-3	mg/L	0.001	0.0005	0.051	0.08	0.081	0.088	0.059	0.024	0.037	0.017	0.064	0.1
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.007	0.003	0.005	0.008	0.004	0.002	0.003	0.003	0.005	0.006
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.01	0.005	0.005	0.009	0.004	0.002	0.002	0.002	0.006	0.008
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.004	0.004	0.004	0.015	0.006	LOR	0.003	0.002	0.002	0.001
Nickel	7440-02-0	mg/L	0.001	0.0005	0.002	0.002	0.001	0.003	0.001	LOR	LOR	LOR	0.001	0.002
Strontium	7440-24-6	mg/L	0.001	0.0005	0.007	0.005	0.005	0.004	0.004	0.003	0.001	0.003	0.003	0.002
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.002	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.01	0.006	LOR	0.006	LOR	LOR	LOR	LOR	LOR	0.008
Fluoride	16984-48-8	mg/L	0.1	0.05	0.4		0.3	1.2	0.6		0.4	0.2	0.2	0.3
Total Phosphorus		mg/L	0.01	0.005	LOR	0.02	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Data
 Column OD_16 KASH Laminated



Column	OD_16 KASH Laminated	Week			88	89	90	91	92	93	94	95	96	97
Sample weight (kg)	1.76	Extraction vol (L)			0.6	0.43	0.43	0.48	0.58	0.6	0.46	0.495	0.5	0.5
Key		Flushing vol (L)			0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			9.18	8.93	9.12	9.21	8.95	8.53	8.21	8.75	8.62	8.72
Electrical Conductivity (field)		µS/cm			26.4	15.9	51.9	51.2	44	31.2	21.7	17.26	30.2	34.1
pH Value		pH Unit	0.01		8.91	8.94	8.26	8.3	8.2	8.45	7.34	7.71	7.28	7.57
Electrical Conductivity @ 25°C		µS/cm	1		19	15	52	48	43	24	24	15	21	31
Total Alkalinity as CaCO3		mg/L	1	0.5	9	9	7	7	28	4	6	6	LOR	LOR
Acidity as CaCO3		mg/L	1	0.5	4	LOR	2	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	2	2	8	6	6	3	1	2	3	4
Silicon	7440-21-3	mg/L	0.05	0.025	0.42	0.34	1.59	1.11	1.5	0.42	0.27	0.2	0.26	0.16
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	68	LOR	LOR	4	6	2	LOR	3
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	4	4	12	9	10	4	5	3	4	6
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	1	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.08	LOR	0.3	0.47	0.4	0.35	0.07	0.16	0.16	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.09	0.1	0.16	LOR	LOR	LOR	LOR	0.001	LOR	0.11
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.015	0.02	0.01	0.01	0.009	0.008	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.007	0.006	0.016	0.066	0.095	0.041	0.034	0.02	0.027	0.013
Barium	7440-39-3	mg/L	0.001	0.0005	0.03	0.019	0.051	LOR	LOR	LOR	LOR	LOR	LOR	0.018
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	0.005	0.008	0.003	0.004	0.003	0.002	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.002	0.002	0.005	LOR	LOR	LOR	LOR	LOR	LOR	0.002
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.005	0.007	0.003	0.002	0.001	0.002	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.003	0.002	0.006	0.003	0.003	0.001	0.001	0.001	0.001	LOR
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.001	0.001	0.003	0.001	0.002	LOR	LOR	LOR	LOR	0.002
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	0.001	0.004	0.009	0.008	0.003	0.001	0.003	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.002	LOR	0.001	LOR	LOR	LOR	LOR	LOR	LOR	0.003
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	0.008	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	0.19	0.33	0.13	0.08	0.06	0.07	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.2	0.4	0.2	0.5	0.2	0.2	0.2	0.6	0.3
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	

Appendix A: Tabulated Laboratory Analytical Data
 Column OD_16 KASH Laminated



Column	OD_16 KASH Laminated	Week			98	99	100	101	102	103	104	105	106	107
Sample weight (kg)	1.76	Extraction vol (L)			0.55	0.515	0.51	0.5	0.52	0.52	0.52	0.5	0.51	0.51
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			9.02	9.85	8.19	8.85		8.89	9.33	8.52	8.75	9.02
Electrical Conductivity (field)		µS/cm			50.5	35	31.2	24.6	45.8	50.4	26.3	37.7	30.4	32.8
pH Value		pH Unit	0.01		6.99	6.58	9.06	6.83	7.85	7.6	7.82	7.73	6.7	7.53
Electrical Conductivity @ 25°C		µS/cm	1		43	32	24	22	27	33	22	22	20	17
Total Alkalinity as CaCO3		mg/L	1	0.5	9	LOR	5	6	8	8	11	4	11	6
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	4	LOR
Sulfate	14808-79-8	mg/L	1	0.5	6	4	3	3	4	4	3	4	3	3
Silicon	7440-21-3	mg/L	0.05	0.025	1.34	0.49	0.3	0.26	0.17	0.24	0.37	0.12	0.27	0.27
Chloride	16887-00-6	mg/L	1	0.5	3	3	1	LOR	LOR	LOR	LOR	LOR	LOR	5
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	8	6	4	4	6	6	5	5	4	4
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.38	0.07	0.06	LOR	LOR	LOR	0.08	LOR	0.05	0.09
Aluminium	7429-90-5	mg/L	0.01	0.005	0.25	0.06	0.11	0.12	0.13	0.1	0.06	0.07	0.07	0.13
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.013	0.007	0.007	0.007	0.011	0.01	0.008	0.008	0.007	0.008
Barium	7440-39-3	mg/L	0.001	0.0005	0.128	0.047	0.034	0.036	0.026	0.027	0.025	0.025	0.026	0.035
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.007	0.004	0.003	0.004	LOR	0.003	0.002	0.002	0.002	0.004
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.01	0.003	0.002	0.002	LOR	0.002	LOR	LOR	0.002	0.002
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.002	0.001	LOR	0.001	LOR	0.002	0.001	0.001	LOR	0.001
Nickel	7440-02-0	mg/L	0.001	0.0005	0.002	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.006	0.004	0.003	0.003	0.006	0.004	LOR	0.003	0.002	0.002
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.005	0.008	LOR	LOR	0.015	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Data
 Column OD_16 KASH Laminated



Column	OD_16 KASH Laminated	Week			108	109	110	111	112	113	114	115	116	117
Sample weight (kg)	1.76	Extraction vol (L)			0.5	0.5	0.5	0.48	0.675	0.675	0.55	0.52	0.55	0.5
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.9	0.9	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.60	9.33	8.84	7.67	8.95	8.80	8.26	8.04	8.43	9.26
Electrical Conductivity (field)		µS/cm			33.1	35.7	25.8	25.38	42	37.7	26.7	23.36	17.06	15.25
pH Value		pH Unit	0.01		7.34	6.52	6.94	7.32	7.18	7.48	6.76	7.48	6.36	7.21
Electrical Conductivity @ 25°C		µS/cm	1		24	24	15	26	42	35	26	21	17	18
Total Alkalinity as CaCO3		mg/L	1	0.5	7	2	4	5	13	3	3	4	5	6
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	1	2	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	4	4	2	4	6	5	4	3	3	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.19	0.26	0.14	0.38	1.06	1.12	0.36	0.4	0.19	0.1
Chloride	16887-00-6	mg/L	1	0.5	1	LOR	LOR	LOR	3	2	4	3	LOR	7
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	5	4	3	5	9	7	5	4	3	4
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.06	0.39	0.13	0.1	0.12	0.1	<0.05	0.07	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.15	0.21	0.13	0.19	0.12	0.1	0.11	0.21	0.09	0.08
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.009	0.007	LOR0	0.01	0.025	0.021	0.008	0.008	0.006	0.009
Barium	7440-39-3	mg/L	0.001	0.0005	0.024	0.058	0.025	0.011	0.026	0.026	0.011	0.01	0.008	0.019
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.003	0.004	0.002	0.001	0.003	0.003	LOR	0.001	LOR	0.001
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.001	0.007	0.001	0.001	0.003	0.003	LOR	0.001	LOR	LOR
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.001	0.001	LOR	0.002	0.003	0.003	0.001	0.001	LOR	0.001
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	0.002	LOR	LOR	0.001	0.001	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.002	0.002	0.002	LOR	0.001	LOR	LOR	LOR	LOR	0.002
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.2	0.1	0.2	0.4	0.4	0.3	0.2	0.2	0.4
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Data
Column OD_16 KASH Laminated



Column	OD_16 KASH Laminated	Week			118	119	120	121	122	125	129	131	135	139
Sample weight (kg)	1.76	Extraction vol (L)			0.675	0.51	0.49	0.5	0.5	0.5	0.49	0.5	0.49	0.47
Key		Flushing vol (L)			0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			9.39	7.99	7.85	7.15	6.67	7.24	8.28	7.58	8.16	8.51
Electrical Conductivity (field)		µS/cm			31.4	28	31.6	27.8	20.94	22	21.77	23.7	26.6	26.2
pH Value		pH Unit	0.01		7.66	7.27	8.05	9.02	7.7	7.35	7.24	6.93	7.03	6.86
Electrical Conductivity @ 25°C		µS/cm	1		31	27	27	29	20	17	24	20	21	22
Total Alkalinity as CaCO3		mg/L	1	0.5	6	6	8	4	4	6	4	5	4	LOR
Acidity as CaCO3		mg/L	1	0.5	2	LOR	2	LOR	2	2	4	7	2	8
Sulfate	14808-79-8	mg/L	1	0.5	4	3	3	4	3	2	3	3	3	3
Silicon	7440-21-3	mg/L	0.05	0.025	1.54	0.14	0.59	0.54	2	0.36	0.34	0.8	0.24	0.26
Chloride	16887-00-6	mg/L	1	0.5	1	LOR	2	1	LOR	1	2	2	2	3
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	4	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	6	6	7	6	LOR	4	4	4	4	3
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.12	LOR	0.13	0.18	0.1	0.17	LOR	0.31	0.08	0.09
Aluminium	7429-90-5	mg/L	0.01	0.005	0.13	0.06	0.3	0.11	LOR	0.09	0.11	0.17	0.16	0.19
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.011	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.019	0.009	0.018	0.016	0.016	0.009	0.008	0.008	0.004	0.004
Barium	7440-39-3	mg/L	0.001	0.0005	0.031	0.01	0.022	0.034	LOR	0.053	0.019	0.062	0.06	0.026
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.002	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.003	LOR	0.002	0.004	LOR	0.003	0.002	0.005	0.004	0.004
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.002	LOR	0.002	0.004	0.001	0.004	0.001	0.006	0.005	0.003
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.003	0.002	0.003	0.002	LOR	0.002	0.002	0.001	0.001	0.001
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.001	0.001	0.001	LOR	0.001	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.001	LOR	0.001	0.003	LOR	0.002	0.001	0.003	0.003	0.002
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.006	LOR	LOR	LOR	0.6	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.3	0.3	0.3	0.3		0.2	0.2	0.2	0.1	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Data
 Column OD_16 KASH Laminated



Column	OD_16 KASH Laminated	Week			148	150	152	156	161	165	169	174
Sample weight (kg)	1.76	Extraction vol (L)			0.47	0.49	0.5	0.495	0.51	0.51	0.49	0.485
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR								
pH (field)		pH Unit			9.03	8.62	6.77	8.08	8.66	6.19	7.33	7.05
Electrical Conductivity (field)		µS/cm			23.75	31.4	12.47	19.92	13.91	12.4	13.62	36.6
pH Value		pH Unit	0.01		6.77	6.9	6.7	7.04	6.8	6.95	6.76	7.09
Electrical Conductivity @ 25°C		µS/cm	1		21	18	19	26	17	15	17	19
Total Alkalinity as CaCO3		mg/L	1	0.5	2	4	3	2	2	1	2	4
Acidity as CaCO3		mg/L	1	0.5	LOR	2	LOR	2	2	2	1	2
Sulfate	14808-79-8	mg/L	1	0.5	3	3	2	3	2	2	2	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.37	0.44	0.26	0.18	0.32	0.33	0.29	0.24
Chloride	16887-00-6	mg/L	1	0.5	1	LOR	1	LOR	LOR	LOR	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	4	3	4	4	3	2	3	3
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.08	0.13	0.15	0.06	LOR	LOR	0.1	0.09
Aluminium	7429-90-5	mg/L	0.01	0.005	0.17	0.26	0.33	0.1	0.1	0.09	0.17	0.11
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.004	0.005	0.005	0.006	0.004	0.005	0.004	0.003
Barium	7440-39-3	mg/L	0.001	0.0005	0.024	0.03	0.024	0.019	0.024	0.022	0.028	0.036
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.004	0.004	0.005	0.004	0.004	0.002	0.006	0.003
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.003	0.003	0.003	0.001	0.002	0.002	0.002	0.003
Molybdenum	7439-98-7	mg/L	0.001	0.0005	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.002	0.002	0.003	0.002	0.002	0.002	0.002	0.003
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
Column OD_17 VHEM



Column	OD_17 VHEM	Week			0	4	8	12	16	17	18	20	21	22
Sample weight (kg)	2.23	Extraction vol (L)			0.625	0.375	0.375	0.375	0.42	0.42	0.42	0.42	0.42	0.445
Key		Flushing vol (L)			1.6	1.35	1.3	1.6	1.2	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.96	7.76			8.15	8.25	8.4	8.4	7.64	8.3
Electrical Conductivity (field)		µS/cm			1922	353			660	107	80	134	72	56
pH Value		pH Unit	0.01		7.68	7.41		7.2	7.76	7.27	7.26	7.46	8.61	6.91
Electrical Conductivity @ 25°C		µS/cm	1		1680	923		807	670	117	96	152	81	57
Total Alkalinity as CaCO3		mg/L	1	0.5	12	13	27	22	38	LOR	28	15	12	7
Acidity as CaCO3		mg/L	1	0.5	4	4	LOR	3	3	9	2	2	1	1
Sulfate	14808-79-8	mg/L	1	0.5	104	96	100	127	112	28	13	37	20	15
Silicon	7440-21-3	mg/L	0.05	0.025	0.94	1.28	0.3		1.67	0.42	1.48	0.9	0.71	0.38
Chloride	16887-00-6	mg/L	1	0.5					106	14	8	11	5	6
Calcium	7440-70-2	mg/L	1	0.5	10				4	1	LOR	2	1	LOR
Magnesium	7439-95-4	mg/L	1	0.5	1				1	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	306				127	20	19	26	12	12
Potassium	7/09/7440	mg/L	1	0.5	12				11	2	2	4	2	2
Iron	7439-89-6	mg/L	0.01	0.005	LOR	0.41	0.13	0.06	0.64	0.14	0.73	0.56	0.16	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.02	0.54	0.12	0.06	0.88	0.2	0.71	0.64	0.48	LOR
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	0.001	LOR	LOR	0.005	LOR	0.001	0.002	0.001	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.049	0.118	0.059	0.09	0.203	0.079	0.106	0.131	0.068	0.042
Barium	7440-39-3	mg/L	0.001	0.0005	0.027	0.19	0.079	0.061	0.178	0.358	0.413	0.261	0.169	0.166
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	0.014	LOR	LOR	0.016	0.004	0.01	0.006	0.004	0.002
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	0.001	LOR	LOR	0.002	LOR	0.001	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	LOR	0.034	0.012	0.015	0.134	0.044	0.063	0.054	0.025	0.022
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	0.005	LOR	LOR	0.005	0.001	0.009	0.01	0.004	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	0.002	LOR	LOR	0.003	0.001	0.002	0.002	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.015	0.033	0.004	0.002	0.059	0.014	0.026	0.018	0.014	0.007
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.037	0.089	0.067	0.3	0.301	0.044	0.052	0.124	0.054	0.03
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	0.001	LOR	0.001	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.093	0.066	0.038		0.043	0.02	0.018	0.019	0.016	0.009
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR		LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	0.001	LOR		0.004	LOR	0.001	0.002	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.028	0.009	LOR	0.038	0.007	0.013	0.014	0.018	0.007
Fluoride	16984-48-8	mg/L	0.1	0.05	0.7	0.9	0.9	0.7	1	0.5	0.4	0.5	0.3	0.007
Total Phosphorus		mg/L	0.01	0.005	LOR				LOR	LOR	0.17	0.12	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
Column OD_17 VHEM



Column	OD_17 VHEM	Week			23	24	25	26	28	29	30	31	32	35
Sample weight (kg)	2.23	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.65	0.65	0.65	0.65	0.7	0.7	0.65	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.61	8.02	8.07	8.15	7.8	7.5	8.14	8.33	8.05	7.8
Electrical Conductivity (field)		µS/cm			58	62	70	61	52					
pH Value		pH Unit	0.01		7	6.56	6.57	7.2	5.49		6.84	6.73	6.38	6.59
Electrical Conductivity @ 25°C		µS/cm	1		67	72	76	76	75		67	103	66	76
Total Alkalinity as CaCO3		mg/L	1	0.5	6	9	7	9	21		5	5	5	7
Acidity as CaCO3		mg/L	1	0.5	1	1	3	4	LOR	6	LOR	LOR	3	3
Sulfate	14808-79-8	mg/L	1	0.5	20	19	22	24	22	18	20	31	19	22
Silicon	7440-21-3	mg/L	0.05	0.025	LOR	0.29	1.07	0.26	0.14	0.16	0.18	0.22	0.13	0.14
Chloride	16887-00-6	mg/L	1	0.5	5	5	8	1	1	LOR	8	4	6	3
Calcium	7440-70-2	mg/L	1	0.5	LOR	1	1	1	2	1	1	2	1	2
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	10	12	14	14	13	7	11	16	10	11
Potassium	7/09/7440	mg/L	1	0.5	2	2	3	3	3	2	2	3	2	2
Iron	7439-89-6	mg/L	0.01	0.005	0.08	0.08	0.12	LOR	LOR	0.06	0.15	LOR	0.07	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.05	LOR	0.06	0.06	0.04	0.08	0.18	0.1	0.11	0.08
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.038	0.041	0.047	0.044	0.031	0.034	0.033	0.044	0.027	0.03
Barium	7440-39-3	mg/L	0.001	0.0005	0.076	0.091	0.077	0.076	0.066	0.082	0.084	0.082	0.06	0.06
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.009	0.008	0.009	0.009	0.008	0.008	0.01	0.008	0.007	0.007
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.002	0.003	0.002	0.002	0.002	0.003	0.004	0.003	0.002	0.002
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.034	0.047	0.068	0.065	0.038	0.038	0.044	0.074	0.044	0.043
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.008	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.008	0.011	0.012	0.012	0.009	0.013	0.012	0.019	0.012	0.013
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025		0.006	LOR	LOR	LOR	LOR	LOR	0.006	0.138	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.1	0.3	0.4	0.3	0.2	0.2	0.2	0.3	0.2	0.2
Total Phosphorus		mg/L	0.01	0.005	0.06	0.02	LOR	LOR	LOR	LOR	LOR	0.01	0.06	0.02

Appendix A: Tabulated Laboratory Analytical Results
Column OD_17 VHEM



Column	OD_17 VHEM	Week			36	37	38	39	40	43	44	46	47	48
Sample weight (kg)	2.23	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.675	0.675	0.675	0.7	0.65	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.13	7.9	7.78	7.87	8.38	7.94	8.18	7.2		7.91
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		7.86	6.43	6.24	6.68	6.53	6.07	6.81	6.41	6.53	6.59
Electrical Conductivity @ 25°C		µS/cm	1		61	63	65	73	84.00	84	97	56	64	39
Total Alkalinity as CaCO3		mg/L	1	0.5	9	6	8	6	6.00	4	7	3	6	6
Acidity as CaCO3		mg/L	1	0.5	3	3	2	3	2.00	2	6	2	4	2
Sulfate	14808-79-8	mg/L	1	0.5	20	18	18	19	23.00	19	28	18	22	15
Silicon	7440-21-3	mg/L	0.05	0.025	0.13	0.18	0.12	0.19	0.17		0.33	0.13	0.19	0.21
Chloride	16887-00-6	mg/L	1	0.5	3	3	1	2	3.00	LOR	2	3	1	LOR
Calcium	7440-70-2	mg/L	1	0.5	1	1	1	1	2.00	2	3	2	2	2
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	10	9	10	10	12.00	9	16	9	12	7
Potassium	7/09/7440	mg/L	1	0.5	2	2	2	2	3.00	2	2	3	2	2
Iron	7439-89-6	mg/L	0.01	0.005	LOR	0.11	0.1	0.06	LOR	LOR	LOR	LOR	0.11	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.08	0.07	0.09	0.22	0.10	0.04	0.09	0.31	0.32	0.3
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.026	0.025	0.023	0.027	0.03	0.025	0.033	0.024	0.023	0.025
Barium	7440-39-3	mg/L	0.001	0.0005	0.075	0.078	0.079	0.077	0.08	0.074	0.079	0.075	0.063	0.094
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.002	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.006	0.006	0.006	0.007	0.01	0.007	0.013	0.008	0.006	0.006
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.001	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.002	0.002	0.002	0.003	0.00	0.002	0.003	0.003	0.003	0.004
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.042	0.039	0.036	0.047	0.08	0.034	0.125	0.039	0.045	0.041
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.012	0.011	0.012	0.011	0.01	0.013	0.021	0.015	0.015	0.014
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	0.007	LOR	LOR	0.025	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.2	0.2	0.2	0.10	0.2	0.2	0.1	0.1	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	0.02	LOR	0.78	LOR	LOR	0.02	LOR	LOR	0.04

Appendix A: Tabulated Laboratory Analytical Results
Column OD_17 VHEM



Column	OD_17 VHEM	Week			50	51	52	53	54	55	56	57	58	59
Sample weight (kg)	2.23	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.88	7.10	8.17	7.49	7.25	7.27	7.13	6.29	6.73	7.04
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		6.01	5.56	6.81	6.59	6.28	6.65	6.58	5.9	6.57	5.59
Electrical Conductivity @ 25°C		µS/cm	1		62		64	39	54	59	73	50	59	51
Total Alkalinity as CaCO3		mg/L	1	0.5	2		5	6	4	7	8	5	7	48
Acidity as CaCO3		mg/L	1	0.5	2	2	2	2	2	2	2	2	2	2
Sulfate	14808-79-8	mg/L	1	0.5	20	18	17	15	12	15	15	13	16	12
Silicon	7440-21-3	mg/L	0.05	0.025	0.11	0.19	0.16	0.21	0.14	0.14	0.13	0.09	0.1344	0.11
Chloride	16887-00-6	mg/L	1	0.5	LOR	12	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	2	2	2	2	2	2	2	2	2	2
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	10	8	8	7	6	7	6	6	7	5
Potassium	7/09/7440	mg/L	1	0.5	2	3	2	2	2	2	2	2	2	2
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.02	0.03	0.04	0.3	0.17	0.04	0.1	0.08	0.07	0.09
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.021	0.028	0.024	0.025	0.022	0.023	0.022	0.02	0.025	0.021
Barium	7440-39-3	mg/L	0.001	0.0005	0.048	0.074	0.065	0.094	0.064	0.065	0.071	0.068	0.064	0.071
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.002	0.002	0.003	0.006	0.005	0.004	0.005	0.004	0.005	0.003
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.002	0.002	0.002	0.004	0.002	LOR	0.002	0.001	0.002	LOR
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.032	0.037	0.03	0.041	0.028	0.028	0.03	0.027	0.031	0.023
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.012	0.015	0.016	0.014	0.013	0.015	0.016	0.015	0.017	0.013
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	LOR	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	0.04	LOR	LOR	0.09	0.13	0.02	0.09

Appendix A: Tabulated Laboratory Analytical Results
Column OD_17 VHEM



Column	OD_17 VHEM	Week			60	61	62	64	67	68	73	74	75	76
Sample weight (kg)	2.23	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.65	0.65	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.82	7.81	5.36	8.42	7.12	8.36	6.18	8.19	8.45	7.59
Electrical Conductivity (field)		µS/cm								64.2	64	64	67.7	62.3
pH Value		pH Unit	0.01		6.61	6.66	6.39	6.52	6.81	6.94	6.7	6.77	6.12	6.98
Electrical Conductivity @ 25°C		µS/cm	1		54	48	63	75	53	64	63	47	61	63
Total Alkalinity as CaCO3		mg/L	1	0.5	19	8	7	5	6	8	6	6	5	11
Acidity as CaCO3		mg/L	1	0.5	4	2	2	2	1	10	4	2	1	2
Sulfate	14808-79-8	mg/L	1	0.5	12	15	18	21	13	16	17	12	12	15
Silicon	7440-21-3	mg/L	0.05	0.025	0.12	0.18	0.18	0.13	0.14	0.46	0.2	0.28	0.35	0.45
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	2	LOR	1	LOR	LOR	2	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	2	3	3	4	3	4	3	3	2	3
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	7	6	6	7	6	6	6	5	4	6
Potassium	7/09/7440	mg/L	1	0.5	2	1	3	3	3	2	3	2	LOR	2
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.09	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.07	0.06	0.03	0.1	0.08	0.13	0.18	0.11	0.11	0.1
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.018	0.014	0.022	0.018	0.017	0.023	0.021	0.017	0.017	0.026
Barium	7440-39-3	mg/L	0.001	0.0005	0.094	0.085	0.07	0.115	0.062	0.11	0.055	0.174	0.057	0.076
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.003	0.004	0.002	0.007	0.006	0.007	0.01	0.011	0.005	0.006
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	LOR	0.002	0.002	0.005	0.005	0.003	0.002	0.004	0.001	0.002
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.022	0.03	0.028	0.031	0.02	0.065	0.044	0.031	0.034	0.074
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.016	0.018	0.018	0.024	0.016	0.025	0.02	0.02	0.017	0.026
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	0.007	LOR	0.019	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total Phosphorus		mg/L	0.01	0.005	0.47	0.01	0.03	LOR	0.5	0.09	0.05	0.06	2	LOR

Appendix A: Tabulated Laboratory Analytical Results
Column OD_17 VHEM



Column	OD_17 VHEM	Week			77	78	80	81	82	83	84	85	86	87
Sample weight (kg)	2.23	Extraction vol (L)			0.43	0.43	0.43	0.43	0.605	0.43	0.63	0.4	0.42	0.5
Key		Flushing vol (L)			0.7	0.65	0.65	0.65	0.7	0.65	0.9	0.65	0.75	0.8

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.83	7.67	7.65	7.91	8.70	7.61	7.10	7.94	5.35	6.72
Electrical Conductivity (field)		µS/cm			52.9	45.5	32.9	40	58	29.2	50.0	45.7	39.9	26.9
pH Value		pH Unit	0.01		6.98	6.73	6.15	5.45	6.74	6.72	6.86	6.92	6.72	6.75
Electrical Conductivity @ 25°C		µS/cm	1		53	57	45	36	45	41	48	41	38	28
Total Alkalinity as CaCO3		mg/L	1	0.5	10	21	20	2	8	23	7	5	5	3
Acidity as CaCO3		mg/L	1	0.5	1	2	4	2	LOR	1	1	1	1	LOR
Sulfate	14808-79-8	mg/L	1	0.5	11	10	9	10	10	7	9	8	7	7
Silicon	7440-21-3	mg/L	0.05	0.025	0.46	0.75	0.19	0.22	0.34	0.14	0.65	0.14	0.19	0.14
Chloride	16887-00-6	mg/L	1	0.5	LOR	4	LOR	LOR	LOR		LOR	LOR	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	3	3	2	2	2	2	3	2	2	2
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	4	5	3	5	4	4	4	4	3	2
Potassium	7/09/7440	mg/L	1	0.5	1	2	2	1	2	1	2	2	2	1
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	0.07	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.09	0.04	0.06	0.1	0.06	0.09	0.05	0.06	0.03	0.06
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	0.001	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.018	0.02	0.014	0.014	0.015	0.013	0.02	0.016	0.014	0.013
Barium	7440-39-3	mg/L	0.001	0.0005	0.087	0.076	0.053	0.082	0.078	0.063	0.096	0.06	0.08	0.211
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.001
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.005	0.003	0.005	0.005	0.003	0.004	0.002	0.004	0.004	0.016
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.003
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.013
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.049	0.033	0.033	0.055	0.042	0.027	0.057	0.04	0.036	0.03
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.022	0.022	0.012	0.011	0.017	0.012	0.02	0.014	0.014	0.013
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.029	LOR	0.01
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.2	LOR	0.1	0.2	LOR	0.2	LOR	0.1	LOR
Total Phosphorus		mg/L	0.01	0.005	0.02	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
Column OD_17 VHEM



Column	OD_17 VHEM	Week			88	89	90	91	92	93	94	95	96	97
Sample weight (kg)	2.23	Extraction vol (L)			0.5	0.43	0.43	0.45	0.47	0.46	0.41	0.445	0.44	0.45
Key		Flushing vol (L)			0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.42	6.78	7.62	8.52	8.36	7.98	7.64	7.97	5.31	7.73
Electrical Conductivity (field)		µS/cm			30.5	21.4	28.3	44.1	34.4	36.4	26.7	26.3	33.9	25.06
pH Value		pH Unit	0.01		8.18	7.19	7.37	7.77	7.31	7.47	7.02	7.23	7.04	7.02
Electrical Conductivity @ 25°C		µS/cm	1		29	22	30	44	40	33	30	24	30	29
Total Alkalinity as CaCO3		mg/L	1	0.5	8	7	LOR	4	19	LOR	5	4	LOR	LOR
Acidity as CaCO3		mg/L	1	0.5	2	2	3	5	LOR	LOR	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	6	6	8	8	8	7	4	6	6	6
Silicon	7440-21-3	mg/L	0.05	0.025	0.1	0.08	0.27	0.15	0.32	0.13	0.13	0.11	0.1	0.1
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	3	6	1	LOR	3
Calcium	7440-70-2	mg/L	1	0.5	2	LOR	2	2	2	1	2	1	1	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	3	2	3	4	4	3	3	2	2	2
Potassium	7/09/7440	mg/L	1	0.5	1	1	1	1	1	1	2	1	3	1
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	0.06	0.08	0.36	0.04	0.06	0.05	0.05	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.03	0.04	0.06	LOR	LOR	LOR	LOR	LOR	LOR	0.05
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.014	0.016	0.016	0.015	0.013	0.012	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.012	0.011	0.013	0.069	0.08	0.101	0.069	0.064	0.067	0.013
Barium	7440-39-3	mg/L	0.001	0.0005	0.057	0.061	0.063	LOR	LOR	LOR	LOR	LOR	LOR	0.058
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	0.006	0.006	0.008	0.005	0.004	0.004	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.004	0.003	0.005	LOR	LOR	LOR	LOR	LOR	LOR	0.003
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.001	0.002	0.009	0.001	0.001	0.002	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.001	0.001	0.003	0.044	0.049	0.034	0.031	0.032	0.032	0.001
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.03	0.029	0.046	LOR	0.001	LOR	LOR	LOR	LOR	0.032
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.015	0.023	0.012	0.012	0.009	0.01	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.01	0.007	0.01	LOR	LOR	LOR	LOR	LOR	LOR	0.01
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.006	0.007	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	LOR	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.7	0.1
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_17 VHEM



Column	OD_17 VHEM	Week			98	99	100	101	102	103	104	105	106	107
Sample weight (kg)	2.23	Extraction vol (L)			0.45	0.45	0.44	0.44	0.47	0.47	0.47	0.46	0.46	0.46
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.36	9.56	7.19	8.66		7.88	8.56	7.76	8.43	8.46
Electrical Conductivity (field)		µS/cm			37	31.1	36.4	28.6	39.6	47.8	32.5	37.4	32.7	32.4
pH Value		pH Unit	0.01		6.45	6.5	7.06	6.31	7.13	6.85	6.86	7.35	6.16	7.62
Electrical Conductivity @ 25°C		µS/cm	1		29	28	19	28	23	26	27	22	22	20
Total Alkalinity as CaCO3		mg/L	1	0.5	7	LOR	6	5	6	7	LOR	2	5	6
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	6	5	7	6	5	5	7	5	4	5
Silicon	7440-21-3	mg/L	0.05	0.025	0.12	0.09	0.1	0.1	0.09	0.14	0.16	0.09	0.11	0.1
Chloride	16887-00-6	mg/L	1	0.5	2	3	1	LOR	1	LOR	LOR	LOR	LOR	1
Calcium	7440-70-2	mg/L	1	0.5	1	1	1	1	1	1	1	1	1	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	3	2	2	3	2	2	2	2	2	2
Potassium	7/09/7440	mg/L	1	0.5	1	1	1	1	1	LOR	LOR	LOR	1	1
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.04	0.02	0.06	0.06	LOR	0.04	0.04	0.06	0.05	0.05
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.011	0.011	0.012	0.009	0.01	0.01	0.012	0.012	0.014	0.012
Barium	7440-39-3	mg/L	0.001	0.0005	0.06	0.054	0.055	0.067	0.054	0.062	0.059	0.05	0.052	0.065
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.003	0.004	0.004	0.003	LOR	0.002	0.005	0.004	0.003	0.003
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.001	0.001	0.002	0.002	LOR	0.002	0.001	0.003	0.004	0.003
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.032	0.029	0.03	0.031	0.026	0.026	0.042	0.031	0.028	0.028
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.001
Strontium	7440-24-6	mg/L	0.001	0.0005	0.01	0.009	0.009	0.009	0.009	0.01	0.009	0.009	0.008	0.008
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	0.007	LOR	LOR	0.005	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_17 VHEM



Column	OD_17 VHEM	Week			108	109	110	111	112	113	114	115	116	117
Sample weight (kg)	2.23	Extraction vol (L)			0.46	0.45	0.46	0.45	0.653	0.675	0.46	0.45	0.47	0.455
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.9	0.9	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.68	8.36	8.18	7.29	7.98	7.32	7.18	7.42	8.16	8.09
Electrical Conductivity (field)		µS/cm			33.9	33.4	33.7	23.18	38.9	26.6	21.42	23.59	23.87	22.46
pH Value		pH Unit	0.01		6.81	6.94	6.69	6.62	6.83	7.12	6.15	7.32	7.07	6.89
Electrical Conductivity @ 25°C		µS/cm	1		24	21	21	23	39	25	18	22	24	24
Total Alkalinity as CaCO3		mg/L	1	0.5	4	2	2	5	9	9	LOR	3	5	6
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	4	2	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	5	5	4	5	9	5	4	5	6	3
Silicon	7440-21-3	mg/L	0.05	0.025	0.09	0.08	0.08	0.09	0.51	0.36	0.09	0.1	0.08	0.1
Chloride	16887-00-6	mg/L	1	0.5	1	LOR	LOR	LOR	1	LOR	1	1	LOR	6
Calcium	7440-70-2	mg/L	1	0.5	1	1	1	1	3	2	LOR	LOR	LOR	1
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	2	2	2	2	2	2	3	2	2	2
Potassium	7/09/7440	mg/L	1	0.5	1	1	1	LOR	2	LOR	LOR	1	1	1
Iron	7439-89-6	mg/L	0.01	0.005	LOR	0.05	0.06	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.05	0.05	0.04	0.01	0.05	0.06	0.01	0.02	0.01	0.02
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.013	0.01	0.011	0.01	0.019	0.017	0.009	0.01	0.01	0.011
Barium	7440-39-3	mg/L	0.001	0.0005	0.063	0.061	0.057	0.037	0.103	0.082	0.034	0.046	0.057	0.08
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.003	0.004	0.004	0.001	0.006	0.006	LOR	0.001	0.001	0.002
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.002	0.003	0.002	0.001	0.002	0.002	LOR	0.002	0.002	0.002
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.031	0.027	0.022	0.025	0.056	0.04	0.021	0.029	0.028	0.032
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.01	0.008	0.008	0.006	0.017	0.012	0.001	0.007	0.009	0.009
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.1	0.1	0.1	LOR	0.2	0.1	0.5	0.1	0.1	0.1
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
Column OD_17 VHEM



Column	OD_17 VHEM	Week			118	119	120	121	122	125	129	131	135	139
Sample weight (kg)	2.23	Extraction vol (L)			0.66	0.44	0.46	0.47	0.47	0.46	0.45	0.45	0.44	0.45
Key		Flushing vol (L)			0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.34	7.23	6.65	6.95	6.45	6.56	8.19	7.67	8.43	7.72
Electrical Conductivity (field)		µS/cm			32.8	24.35	31.3	27.6	27.8	30.4	26.11	26.4	31.9	29.7
pH Value		pH Unit	0.01		7.84	6.21	7.39	8.49	6.31	6.84	6.85	7.12	6.71	7.32
Electrical Conductivity @ 25°C		µS/cm	1		33	23	28	28	25	27	26	25	31	29
Total Alkalinity as CaCO3		mg/L	1	0.5	4	5	4	3	4	4	4	4	4	LOR
Acidity as CaCO3		mg/L	1	0.5	2	LOR	2	LOR	2	4	4	5	2	
Sulfate	14808-79-8	mg/L	1	0.5	6	4	5	5	6	6	5	4	6	5
Silicon	7440-21-3	mg/L	0.05	0.025	0.39	0.09	0.07	0.17	3	0.16	0.13	0.12	0.17	0.12
Chloride	16887-00-6	mg/L	1	0.5	1	1	1	2	2	2	2	2	2	1
Calcium	7440-70-2	mg/L	1	0.5	2	LOR	2	2	LOR	2	2	1	2	2
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	2	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	2	2	2	2	1	2	1	2	2	2
Potassium	7/09/7440	mg/L	1	0.5	1	1	2	1	LOR	2	1	1	2	1
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	0.01	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.06	0.01	LOR	0.06	LOR	0.03	0.01	0.05	0.01	0.04
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.016	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.014	0.01	0.015	0.015	0.084	0.012	0.009	0.009	0.01	0.008
Barium	7440-39-3	mg/L	0.001	0.0005	0.112	0.045	0.096	0.104	LOR	0.1	0.08	0.043	0.127	0.062
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.002	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.01	0.001	0.002	0.004	LOR	0.004	0.002	0.004	0.004	0.006
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.002	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.002	0.002	0.002	0.001	0.027	0.005	0.007	0.005	0.012	0.008
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.043	0.031	0.044	0.032	LOR	0.026	0.015	0.018	0.024	0.021
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.012	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.016	0.008	0.014	0.007	LOR	0.011	0.011	0.01	0.012	0.011
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.013	0.006	LOR	0.3	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	LOR
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
Column OD_17 VHEM



Column	OD_17 VHEM	Week			148	150	152	156	161	165	169	174
Sample weight (kg)	2.23	Extraction vol (L)			0.44	0.43	0.475	0.455	0.455	0.425	0.46	0.465
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR								
pH (field)		pH Unit			8.53	8.11	6.07	6.86	8.47	6.14	6.36	6.45
Electrical Conductivity (field)		µS/cm			26.9	13.5	17.22	18.41	18.55	18.26	18.33	85.3
pH Value		pH Unit	0.01		6.74	6.7	6.66	6.48	6.6	6.68	6.74	7.31
Electrical Conductivity @ 25°C		µS/cm	1		28	21	22	26	22	21	23	76
Total Alkalinity as CaCO3		mg/L	1	0.5	2	3	3	2	1	2	4	15
Acidity as CaCO3		mg/L	1	0.5	LOR	2	LOR	2	2	2	2	2
Sulfate	14808-79-8	mg/L	1	0.5	5	5	3	4	4	4	4	7
Silicon	7440-21-3	mg/L	0.05	0.025	0.14	0.12	0.15	0.1	0.27	0.3	0.11	0.5
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	6
Calcium	7440-70-2	mg/L	1	0.5	1	1	1	1	1	1	1	5
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	2
Sodium	7440-23-5	mg/L	1	0.5	2	2	2	1	1	LOR	1	5
Potassium	7/09/7440	mg/L	1	0.5	1	LOR	1	1	1	2	1	2
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.03	0.08	0.06	0.13	0.04	0.04	0.04	0.02
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.006	0.006	0.007	0.008	0.007	0.008	0.005	0.006
Barium	7440-39-3	mg/L	0.001	0.0005	0.052	0.037	0.041	0.042	0.044	0.052	0.04	0.118
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.006	0.004	0.006	0.004	0.005	0.003	0.005	0.01
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.008	0.007	0.007	0.006	0.007	0.009	0.005	0.014
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.018	0.015	0.016	0.016	0.015	0.012	0.014	0.014
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.01	0.007	0.009	0.009	0.009	0.009	0.008	0.027
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.006	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	LOR	LOR	0.1	0.1	0.1	0.1	LOR	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_18 KEMQI VASH



Column	OD_18 KEMQI VASH	Week			0	4	8	12	16	17	18	20	21	22
Sample weight (kg)	2.055	Extraction vol (L)			0.625	0.375	0.375	0.375	0.42	0.42	0.42	0.42	0.42	0.515
Key		Flushing vol (L)			1.6	1.35	1.3	1.6	1.2	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.41	7.21			8.05	8.14	8.52	8.45	7.97	8.4
Electrical Conductivity (field)		µS/cm			561	1543			504	20	45	64	52	24
pH Value		pH Unit	0.01		7.53	7.22		7.15	7.87	6.56	7.24	7.25	7.19	6.9
Electrical Conductivity @ 25°C		µS/cm	1		466	378		1010	520	26	56	75	60	31
Total Alkalinity as CaCO3		mg/L	1	0.5	27	8	9	12	49	27	26	11	21	6
Acidity as CaCO3		mg/L	1	0.5	2	4	LOR	3	3	2	2	2	1	1
Sulfate	14808-79-8	mg/L	1	0.5	25	28	22	131	53	4	5	14	11	7
Silicon	7440-21-3	mg/L	0.05	0.025	0.99	1.36	1.11		3.19	0.4	1.82	1.59	1.99	0.98
Chloride	16887-00-6	mg/L	1	0.5					92	3	4	8	6	3
Calcium	7440-70-2	mg/L	1	0.5	LOR				2	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR				2	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	89				101	12	14	16	14	6
Potassium	7/09/7440	mg/L	1	0.5	3				5	1	LOR	1	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.03	0.48	0.16	0.03	0.71	0.08	1.21	1.01	0.54	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.25	1.28	0.24	0.03	2.79	0.23	0.91	0.83	1.15	0.12
Antimony	7440-36-0	mg/L	0.001	0.0005	0.002	0.002	LOR	0.002	0.006	LOR	0.005	0.003	0.004	0.001
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.043	0.067	0.03	0.011	0.172	0.021	0.083	0.097	0.082	0.03
Barium	7440-39-3	mg/L	0.001	0.0005	0.046	0.655	0.212	0.059	0.517	1.42	1.42	1.18	1.05	0.791
Cerium	7440-45-1	mg/L	0.001	0.0005	0.001	0.011	LOR	LOR	0.009	0.004	0.012	0.011	0.01	0.003
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	0.003	LOR	LOR	0.004	LOR	0.002	0.001	0.001	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	LOR	0.02	0.006	0.003	0.057	0.008	0.019	0.017	0.017	0.008
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	0.004	LOR	LOR	0.004	0.001	0.006	0.006	0.006	0.001
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	0.008	0.001	LOR	0.008	0.003	0.006	0.004	0.005	0.002
Manganese	7439-96-5	mg/L	0.001	0.0005	LOR	0.031	0.004	0.031	0.03	0.007	0.015	0.012	0.012	0.006
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.216	0.193	0.122	0.19	0.88	0.03	0.108	0.146	0.094	0.041
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	0.001	0.001	LOR	0.002	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.007	0.024	0.01		0.041	0.018	0.018	0.015	0.015	0.009
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR		LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	0.007	0.002		0.032	0.002	0.006	0.008	0.005	0.002
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.01
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.04	0.014	LOR	0.03	0.006	0.011	0.016	0.027	0.01
Fluoride	16984-48-8	mg/L	0.1	0.05	1.1	1.1	0.6	0.4	2	0.2	1	1.4	1	0.09
Total Phosphorus		mg/L	0.01	0.005	LOR				LOR	LOR	0.17	0.09	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_18 KEMQI VASH



Column	OD_18 KEMQI VASH	Week		23	24	25	26	28	29	30	31	32	35
Sample weight (kg)	2.055	Extraction vol (L)		0.5	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)		0.7	0.65	0.65	0.65	0.65	0.7	0.7	0.65	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.83	8.21	8.4	8.32	8.35	8.1	8.47	8.67	8.41	8.36
Electrical Conductivity (field)		µS/cm			20	30	65	47	33					
pH Value		pH Unit	0.01		5.38	6.54	6.7	7.19	6.32		7.4	6.82	6.26	6.3
Electrical Conductivity @ 25°C		µS/cm	1		24	35	69	60	36		60	106	57	46
Total Alkalinity as CaCO3		mg/L	1	0.5	4	6	18	6	5		8	10	6	5
Acidity as CaCO3		mg/L	1	0.5	1	LOR	LOR	3	LOR	6	LOR	LOR	3	LOR
Sulfate	14808-79-8	mg/L	1	0.5	7	8	16	14	10	8	14	24	14	12
Silicon	7440-21-3	mg/L	0.05	0.025	0.38	1.26	3.64	0.73	0.12	0.62	1.08	1.11	0.54	0.12
Chloride	16887-00-6	mg/L	1	0.5	11	2	7	LOR	LOR	LOR	8	4	3	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	3	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	6	7	16	13	8	4	13	21	11	9
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	1	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.28	0.15	0.12	LOR	LOR	0.38	0.61	0.26	0.09	3.73
Aluminium	7429-90-5	mg/L	0.01	0.005	0.12	0.12	0.08	0.08	0.02	0.11	0.25	0.14	0.1	0.06
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	0.001	0.002	0.002	LOR	0.001	0.003	0.002	0.001	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.016	0.032	0.072	0.049	0.01	0.026	0.046	0.089	0.042	0.012
Barium	7440-39-3	mg/L	0.001	0.0005	0.517	0.262	0.105	0.119	0.093	0.133	0.127	0.105	0.085	0.087
Cerium	7440-45-1	mg/L	0.001	0.0005	0.002	0.001	LOR	LOR	LOR	0.003	0.004	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.004	0.006	0.004	0.003	0.002	0.003	0.004	0.005	0.004	0.016
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	0.003	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	0.002	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.004	0.003	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.034
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.022	0.061	0.144	0.114	0.029	0.049	0.08	0.186	0.082	0.032
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.007	0.004	0.002	0.002	LOR	0.003	0.002	0.003	0.002	0.002
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.002	0.002	0.005	0.005	0.004	0.002	0.005	0.011	0.004	0.006
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025		LOR	LOR	LOR	LOR	LOR	0.008	0.01	LOR	0.027
Fluoride	16984-48-8	mg/L	0.1	0.05	0.3	0.8	1.5	1.4	1.4	1.1	1.5	2.5	1.6	1.3
Total Phosphorus		mg/L	0.01	0.005	0.05	LOR	LOR	LOR	LOR	LOR	LOR	0.02	0.07	0.02

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_18 KEMQI VASH



Column	OD_18 KEMQI VASH	Week			36	37	38	39	40	43	44	46	47	48
Sample weight (kg)	2.055	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.675	0.675	0.675	0.65	0.65	0.65	0.65	0.65

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.7	8.33	8.23	8.4	8.76	8.37	8.57	7.72		8.46
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		6.79	6.1	6.71	6.73	6.49	6.71	6.76	6	6.41	6.53
Electrical Conductivity @ 25°C		µS/cm	1		36	40	34	52	91.00	18	54	17	29	31
Total Alkalinity as CaCO3		mg/L	1	0.5	7	6	8	4	7.00	2	7	3	5	6
Acidity as CaCO3		mg/L	1	0.5	LOR	3	1	1	2.00	2	2	2	LOR	2
Sulfate	14808-79-8	mg/L	1	0.5	9	10	8	10	18.00	3	10	4	8	8
Silicon	7440-21-3	mg/L	0.05	0.025	0.37	0.25	0.33	0.7	0.73		0.85	LOR	0.67	0.63
Chloride	16887-00-6	mg/L	1	0.5	1	1	LOR	1	5.00	LOR	LOR	LOR	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	7	8	7	10	18.00	3	12	4	8	10
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	1.00	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.26	0.3	0.43	0.19	LOR	LOR	LOR	LOR	0.3	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.12	0.08	0.12	0.04	0.12	0.02	0.16	0.1	0.52	0.39
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.001	0.00	LOR	0.002	LOR	0.001	0.002
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.014	0.015	0.017	0.034	0.07	0.011	0.068	0.013	0.029	0.052
Barium	7440-39-3	mg/L	0.001	0.0005	0.129	0.106	0.135	0.108	0.11	0.169	0.144	0.103	0.067	0.116
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	0.001	LOR	LOR	LOR	LOR	0.002	0.002	0.001
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.002	0.002	0.002	0.003	0.00	0.001	0.005	0.002	0.001	0.004
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	0.002	LOR	LOR	LOR	LOR	LOR	0.002	0.002
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	0.002	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.002	0.001	0.002	0.001	0.00	0.002	0.002	0.001	0.001	0.001
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.034	0.034	0.04	0.089	0.20	0.023	0.1	0.022	0.036	0.091
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.003	0.002	0.003	0.003	0.00	0.002	0.004	0.002	0.002	0.003
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.003	0.005	0.003	0.005	0.01	0.001	0.004	0.002	0.001	0.002
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.008	LOR	LOR	0.01	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	1.3	1.2	1.1	1.5	1.80	0.4	1.7	0.5	1.2	1.6
Total Phosphorus		mg/L	0.01	0.005	0.01	0.02	LOR	0.32	0.03	LOR	0.01	LOR	0.03	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_18 KEMQI VASH



Column	OD_18 KEMQI VASH	Week		50	51	52	53	54	55	56	57	58	59
Sample weight (kg)	2.055	Extraction vol (L)		0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)		0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.34	7.88	8.47	8.01	7.63	7.93	7.63	6.89	7.19	7.45
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		5.64	5.45	6.72	6.53	6.15	6.41	6.9	5.93	6.06	5.63
Electrical Conductivity @ 25°C		µS/cm	1		25	24	31	31	27	29	29	24	39	26
Total Alkalinity as CaCO3		mg/L	1	0.5	2	1	LOR	6	3	5	10	4	5	16
Acidity as CaCO3		mg/L	1	0.5	4	2	2	2	2	2	2	2	2	2
Sulfate	14808-79-8	mg/L	1	0.5	6	5	5	8	4	6	6	4	6	5
Silicon	7440-21-3	mg/L	0.05	0.025	0.26	0.47	0.37	0.63	0.33	0.22	0.32	0.19	0.4032	0.1
Chloride	16887-00-6	mg/L	1	0.5	LOR	9	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	5	5	6	10	4	5	6	5	6	5
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.05	0.08	LOR	LOR	0.05	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.04	0.14	0.09	0.39	0.1	0.04	0.1	0.3	0.07	0.06
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.002	LOR	LOR	LOR	LOR	0.001	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.021	0.021	0.025	0.052	0.021	0.018	0.023	0.019	0.029	0.016
Barium	7440-39-3	mg/L	0.001	0.0005	0.032	0.082	0.12	0.116	0.124	0.107	0.13	0.133	0.109	0.15
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	0.001	LOR	0.001	LOR	0.002	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	LOR	0.001	0.001	0.004	0.002	0.001	0.005	0.002	0.002	0.002
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.002	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.001	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	LOR	0.001	0.001	0.001	0.001	LOR	0.001	0.001	0.002	LOR
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.027	0.028	0.033	0.091	0.034	0.029	0.034	0.029	0.046	0.027
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	LOR	0.003	0.005	0.003	0.004	0.002	0.005	0.008	0.003	0.003
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.056	0.006
Fluoride	16984-48-8	mg/L	0.1	0.05	0.8	0.9	1.1	1.6	0.7	0.9	1	0.7	0.6	0.7
Total Phosphorus		mg/L	0.01	0.005	0.02	LOR	LOR	LOR	LOR	LOR	LOR	0.06	0.01	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_18 KEMQI VASH



Column	OD_18 KEMQI VASH	Week			60	61	62	64	67	68	73	74	75	76
Sample weight (kg)	2.055	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.65	0.65	0.65	0.65	0.7	0.7	0.65	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.02	7.69	6.84	8.64	7.33	7.60	6.89	8.37	8.77	7.79
Electrical Conductivity (field)		µS/cm								87.1	20	50.3	50.1	56.8
pH Value		pH Unit	0.01		6.15	6.32	6.12	6.1	6.69	6.94	6.03	6.24	5.85	6.47
Electrical Conductivity @ 25°C		µS/cm	1		25	31	29	28	35	87	21	22	34	45
Total Alkalinity as CaCO3		mg/L	1	0.5	6	6	2	3	5	21	5	17	36	7
Acidity as CaCO3		mg/L	1	0.5	4	1	2	2	1	2	1	2	1	2
Sulfate	14808-79-8	mg/L	1	0.5	4	8	6	5	6	16	4	1	5	7
Silicon	7440-21-3	mg/L	0.05	0.025	0.1	0.06	0.1	0.05	0.1	0.93	0.07	0.13	0.35	0.56
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	2	LOR	LOR	2	LOR	2	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	4	6	6	5	6	16	4	5	5	9
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	1	2	LOR	LOR	LOR	1
Iron	7439-89-6	mg/L	0.01	0.005	0.06	LOR	LOR	LOR	LOR	LOR	LOR	0.13	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.07	0.03	0.04	0.05	0.05	0.18	0.07	0.19	0.08	0.09
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.002	LOR	LOR	LOR	0.001
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.016	0.013	0.014	0.012	0.009	0.094	0.011	0.013	0.016	0.034
Barium	7440-39-3	mg/L	0.001	0.0005	0.222	0.112	0.063	0.118	0.112	0.04	0.06	0.196	0.115	0.11
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.002	LOR	0.007	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.002	0.002	0.001	0.003	0.004	0.01	0.002	0.003	0.003	0.002
Lanthanum	7439-91-0	mg/L	0.001	0.0005	0.001	LOR	LOR	LOR	LOR	0.001	LOR	0.005	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	LOR	0.002	LOR	LOR	0.001	0.002	LOR	0.002	LOR	LOR
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.026	0.038	0.027	0.027	0.021	0.222	0.027	0.03	0.037	0.092
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.006	0.004	0.003	0.004	0.005	0.007	0.002	0.006	0.007	0.004
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	0.005	LOR	0.001	0.001	0.003	0.001	LOR	LOR	0.001
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.006	LOR	LOR	0.006	0.006	0.007	LOR	0.011	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.6	0.5	0.8	0.7	0.7	2.5	0.5	0.5	0.7	1
Total Phosphorus		mg/L	0.01	0.005	LOR	0.02	LOR	LOR	0.38	0.02	0.03	0.06	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_18 KEMQI VASH



Column	OD_18 KEMQI VASH	Week			77	78	80	81	82	83	84	85	86	87
Sample weight (kg)	2.055	Extraction vol (L)			0.43	0.43	0.43	0.43	0.605	0.44	0.675	0.44	0.47	0.53
Key		Flushing vol (L)			0.7	0.65	0.65	0.6	0.7	0.65	0.9	0.65	0.75	0.8

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.53	8.01	8.07	8.56	8.93	7.35	7.56	7.10	5.17	6.67
Electrical Conductivity (field)		µS/cm			42	36.9	16.8	42	30.8	12.5	31.2	30.2	20.6	14.8
pH Value		pH Unit	0.01		6.66	6.3	5.94	6.01	6.1	6.65	6.79	7.13	7.05	6.8
Electrical Conductivity @ 25°C		µS/cm	1		36	40	21	35	23	18	31	24	21	16
Total Alkalinity as CaCO3		mg/L	1	0.5	8	19	2	30	5	8	9	4	3	3
Acidity as CaCO3		mg/L	1	0.5	1	2	2	2	LOR	2	1	1	1	LOR
Sulfate	14808-79-8	mg/L	1	0.5	5	6	4	8	4	3	4	4	3	4
Silicon	7440-21-3	mg/L	0.05	0.025	0.7	0.6	0.35	0.47	0.2	0.07	0.35	0.08	0.09	0.05
Chloride	16887-00-6	mg/L	1	0.5	LOR	4	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	6	7	3	9	4	3	6	4	3	3
Potassium	7/09/7440	mg/L	1	0.5	LOR	1	LOR	LOR	LOR	LOR	1	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	0.06	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.07	0.05	0.09	0.1	0.07	0.03	0.03	0.03	0.03	0.06
Antimony	7440-36-0	mg/L	0.001	0.0005	0.001	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.023	0.023	0.015	0.04	0.011	0.008	0.018	0.011	0.01	0.008
Barium	7440-39-3	mg/L	0.001	0.0005	0.097	0.075	0.122	0.097	0.111	0.106	0.115	0.102	0.138	0.101
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.006	0.001	0.002	0.002	0.002	0.002	LOR	0.003	0.003	0.002
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.001	LOR	0.002	0.002	LOR
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.055	0.036	0.035	0.101	0.028	0.019	0.042	0.032	0.026	0.022
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.006	0.006	0.004	0.002	0.003	0.004	0.003	0.005	0.004	0.002
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	0.001	LOR	LOR	0.002	LOR	LOR	0.001	0.001	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.011	LOR	LOR	0.014	LOR	LOR	LOR	LOR	0.008
Fluoride	16984-48-8	mg/L	0.1	0.05	0.9	0.8	0.4	1.1	0.7	0.3	0.9	0.4	0.4	0.4
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_18 KEMQI VASH



Column	OD_18 KEMQI VASH	Week		88	89	90	91	92	93	94	95	96	97
Sample weight (kg)	2.055	Extraction vol (L)		0.55	0.43	0.43	0.45	0.49	0.5	0.44	0.48	0.5	0.48
Key		Flushing vol (L)		0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.59	7.20	8.30	8.95	8.53	8.01	7.45	8.29	8.29	8.00
Electrical Conductivity (field)		µS/cm			23.3	17.1	23.5	33.8	27.2	20.5	20.4	15.56	32.7	22.5
pH Value		pH Unit	0.01		8.5	7.92	7.82	8.13	7.63	7.83	6.93	7.57	7.41	7.3
Electrical Conductivity @ 25°C		µS/cm	1		17	17	24	29	32	20	23	14	16	22
Total Alkalinity as CaCO3		mg/L	1	0.5	5	4	LOR	5	6	LOR	5	2	LOR	LOR
Acidity as CaCO3		mg/L	1	0.5	2	1	3	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	3	4	6	4	6	3	2	3	3	4
Silicon	7440-21-3	mg/L	0.05	0.025	LOR	LOR	0.41	0.41	0.42	0.08	0.07	0.06	LOR	LOR
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	2	5	3	LOR	2
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	3	3	5	4	5	3	4	3	3	4
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	0.1	0.05	0.16	0.02	0.04	0.03	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.01	0.02	0.06	LOR	LOR	LOR	LOR	LOR	LOR	0.03
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.017	0.02	0.012	0.013	0.01	0.01	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.008	0.009	0.014	0.138	0.108	0.113	0.113	0.102	0.116	0.01
Barium	7440-39-3	mg/L	0.001	0.0005	0.088	0.083	0.081	LOR	LOR	LOR	LOR	LOR	LOR	0.105
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	0.003	0.004	0.003	0.003	0.002	0.002	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.002	0.001	0.002	LOR	LOR	LOR	LOR	LOR	LOR	0.002
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	LOR	LOR	LOR	0.047	0.044	0.026	0.026	0.019	0.02	LOR
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.02	0.021	0.04	LOR	LOR	LOR	LOR	LOR	LOR	0.023
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.006	0.006	0.007	0.004	0.003	0.003	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.004	0.002	0.002	LOR	LOR	LOR	LOR	LOR	LOR	0.004
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	0.001	0.001	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.008	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.091	0.01	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.4	0.5	0.9	0.6	0.8	0.4	0.4	0.4	0.8	0.5
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_18 KEMQI VASH



Column	OD_18 KEMQI VASH	Week		98	99	100	101	102	103	104	105	106	107
Sample weight (kg)	2.055	Extraction vol (L)		0.55	0.5	0.49	0.5	0.51	0.51	0.51	0.51	0.5	0.5
Key		Flushing vol (L)		0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.53	9.71	7.19	8.73		8.00	8.75	7.60	8.39	8.44
Electrical Conductivity (field)		µS/cm			26.6	21.8	25.7	23.2	25.8	30	20.5	26	26.1	22.7
pH Value		pH Unit	0.01		6.56	6.39	7.22	6.37	7.5	6.91	6.62	7.38	6.24	7.6
Electrical Conductivity @ 25°C		µS/cm	1		26	22	18	21	16	20	17	16	16	12
Total Alkalinity as CaCO3		mg/L	1	0.5	6	LOR	5	3	6	5	LOR	2	7	6
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	2	LOR
Sulfate	14808-79-8	mg/L	1	0.5	5	4	3	4	3	3	3	4	3	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.24	LOR	LOR	0.06	LOR	0.07	0.08	LOR	LOR	0.06
Chloride	16887-00-6	mg/L	1	0.5	1	4	1	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	4	3	3	4	3	3	3	3	2	2
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.06	0.02	0.02	0.03	LOR	0.02	0.03	0.02	0.03	0.04
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.012	0.008	0.009	0.009	0.007	0.007	0.009	0.008	0.008	0.007
Barium	7440-39-3	mg/L	0.001	0.0005	0.124	0.098	0.108	0.131	0.111	0.109	0.093	0.097	0.124	0.166
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.002	0.002	0.002	0.002	LOR	0.002	0.001	0.003	0.002	0.002
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.001	LOR	LOR	LOR	LOR	0.001	LOR	LOR	0.001	0.001
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.023	0.021	0.017	0.019	0.014	0.016	0.019	0.018	0.015	0.012
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.005	0.004	0.004	0.005	LOR	0.004	0.002	0.004	0.004	0.004
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	0.006	LOR	0.005	LOR	LOR	0.012	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.6	0.4	0.3	0.4	0.3	0.4	0.4	0.3	0.3	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_18 KEMQI VASH



Column	OD_18 KEMQI VASH	Week			108	109	110	111	112	113	114	115	116	117
Sample weight (kg)	2.055	Extraction vol (L)			0.5	0.49	0.505	0.5	0.675	0.675	0.52	0.49	0.5	0.49
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.9	0.9	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.20	8.51	8.04	7.31	7.81	7.25	7.26	7.38	7.67	8.04
Electrical Conductivity (field)		µS/cm			23.55	23.41	23.44	15.1	24.4	20.81	19.42	16.62	13.14	13.22
pH Value		pH Unit	0.01		6.66	6.82	6.57	6.54	6.96	7.29	6.38	7.1	6.92	7.13
Electrical Conductivity @ 25°C		µS/cm	1		16	16	18	174	26	19	21	14	14	47
Total Alkalinity as CaCO3		mg/L	1	0.5	5	2	2	11	6	12	LOR	2	4	5
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	2	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	3	3	3	3	5	4	5	3	3	2
Silicon	7440-21-3	mg/L	0.05	0.025	LOR	LOR	LOR	LOR	0.29	0.14	0.12	LOR	LOR	0.06
Chloride	16887-00-6	mg/L	1	0.5	1	LOR	LOR	LOR	LOR	LOR	1	3	LOR	4
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	1	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	2	2	3	2	4	3	2	2	2	2
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	1	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	0.08	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.08	0.03	0.02	0.01	0.04	0.04	0.03	0.02	LOR	0.01
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.008	0.007	0.008	0.008	0.019	0.016	0.01	0.01	0.009	0.009
Barium	7440-39-3	mg/L	0.001	0.0005	0.119	0.112	0.113	0.036	0.125	0.114	0.041	0.04	0.032	0.115
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.005	0.002	0.002	LOR	0.002	0.002	0.002	LOR	LOR	LOR
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.001	0.002	LOR	LOR	LOR
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.017	0.015	0.014	0.018	0.036	0.031	0.026	0.02	0.017	0.02
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.004	0.004	0.003	0.001	0.003	0.003	0.008	0.001	0.001	0.004
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.3	0.3	0.4	0.3	0.6	0.5	LOR	0.4	0.4	0.4
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_18 KEMQI VASH



Column	OD_18 KEMQI VASH	Week			118	119	120	121	122	125	129	131	135	139
Sample weight (kg)	2.055	Extraction vol (L)			0.675	0.48	0.49	0.5	0.49	0.5	0.49	0.5	0.5	0.49
Key		Flushing vol (L)			0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.41	7.25	6.51	6.73	6.27	6.66	7.71	7.81	8.35	7.86
Electrical Conductivity (field)		µS/cm			20.04	19.32	18.63	20.49	15.87	19.06	18.63	28.1	23.29	19.32
pH Value		pH Unit	0.01		6.8	5.41	7.8	8.65	6.51	7.11	6.95	6.84	7.03	6.97
Electrical Conductivity @ 25°C		µS/cm	1		20	19	16	21	15	15	18	19	20	17
Total Alkalinity as CaCO3		mg/L	1	0.5	4	4	5	1	4	5	2	8	5	LOR
Acidity as CaCO3		mg/L	1	0.5	2	LOR	2	LOR	2	6	4		2	LOR
Sulfate	14808-79-8	mg/L	1	0.5	4	3	2	4	2	3	3	3	3	2
Silicon	7440-21-3	mg/L	0.05	0.025	0.24	0.06	LOR	0.1	7	0.07	0.05	0.08	0.09	0.06
Chloride	16887-00-6	mg/L	1	0.5	1	LOR	1	2	LOR	1	2	2	2	3
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	2	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	3	3	3	3	LOR	2	3	3	3	2
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	0.11	LOR	LOR	LOR	0.01	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.04	0.01	LOR	0.02	LOR	0.02	0.01	0.04	LOR	0.02
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.011	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.017	0.009	0.012	0.017	0.078	0.011	0.009	0.008	0.007	0.005
Barium	7440-39-3	mg/L	0.001	0.0005	0.112	0.046	0.074	0.118	LOR	0.178	0.174	0.105	0.208	0.102
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.002	LOR	0.001	0.003	LOR	0.002	0.006	0.002	0.002	0.003
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.004	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.001	LOR	LOR	0.001	0.019	0.002	0.002	LOR	0.002	0.002
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.037	0.024	0.028	0.033	LOR	0.024	0.018	0.018	0.022	0.015
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.002	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.003	0.001	0.002	0.004	LOR	0.003	0.004	0.003	0.005	0.004
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.5	0.4	0.5	0.5	0.3	0.3	0.5	0.4	0.3	0.2
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_18 KEMQI VASH



Column	OD_18 KEMQI VASH	Week			148	150	152	156	161	165	169	174
Sample weight (kg)	2.055	Extraction vol (L)			0.49	0.49	0.51	0.51	0.51	0.51	0.51	0.51
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR								
pH (field)		pH Unit			8.45	8.18	6.03	7.21	8.12	5.81	6.33	6.41
Electrical Conductivity (field)		µS/cm			24.34	24.3	13.74	13.47	9.89	10.22	9.86	78.6
pH Value		pH Unit	0.01		6.31	6.75	6.58	6.69	6.7	6.6	6.45	7.21
Electrical Conductivity @ 25°C		µS/cm	1		17	16	17	29	13	12	12	71
Total Alkalinity as CaCO3		mg/L	1	0.5	LOR	3	1	LOR	LOR	LOR	3	9
Acidity as CaCO3		mg/L	1	0.5	LOR	1	LOR	2	2	2	2	2
Sulfate	14808-79-8	mg/L	1	0.5	3	3	2	3	2	2	2	6
Silicon	7440-21-3	mg/L	0.05	0.025	0.09	0.05	0.07	0.05	0.23	0.22	LOR	0.46
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	6
Calcium	7440-70-2	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	2
Magnesium	7439-95-4	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sodium	7440-23-5	mg/L	1	0.5	2	2	3	2	2	1	2	8
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	2
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.01	0.01	0.02	0.03	0.01	0.01	0.01	0.01
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.004	0.005	0.006	0.006	0.005	0.005	0.003	0.005
Barium	7440-39-3	mg/L	0.001	0.0005	0.079	0.086	0.09	0.078	0.105	0.124	0.076	0.776
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.002	0.002	0.003	0.002	0.003	LOR	0.002	0.006
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.002	0.002	0.001	LOR	0.001	0.001	LOR	0.005
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.013	0.017	0.016	0.015	0.011	0.012	0.011	0.015
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.003	0.003	0.003	0.003	0.004	0.003	0.002	0.034
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.002
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.4
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_19 CONGLO



Column	OD_19 CONGLO	Week			0	4	8	12	16	17	18	20	21	22
Sample weight (kg)	2.145	Extraction vol (L)			0.625	0.375	0.375	0.375	0.42	0.42	0.42	0.42	0.42	0.42
Key		Flushing vol (L)			1.6	1.35	1.3	1.6	1.2	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.97	7.92			7.64	7.85	8	8.06	7.72	7.92
Electrical Conductivity (field)		µS/cm			3170	910			1203	225	291	239	175	176
pH Value		pH Unit	0.01		7.44	7.14		6.53	7.75	7.04	7.17	7.17	7.18	6.99
Electrical Conductivity @ 25°C		µS/cm	1		2690	1550		277	1210	233	319	250	185	174
Total Alkalinity as CaCO3		mg/L	1	0.5	13	11	28	13	42	23	27	14	22	9
Acidity as CaCO3		mg/L	1	0.5	LOR	6	3	8	1	4	2	4	1	3
Sulfate	14808-79-8	mg/L	1	0.5	135	116	47	27	178	40	70	59	44	46
Silicon	7440-21-3	mg/L	0.05	0.025	0.8	1.02	0.09		1.14	0.14	0.38	0.2	0.05	0.12
Chloride	16887-00-6	mg/L	1	0.5					228	40		29	17	18
Calcium	7440-70-2	mg/L	1	0.5	36				50	12	24	20	16	14
Magnesium	7439-95-4	mg/L	1	0.5	15				17	3	3	3	3	2
Sodium	7440-23-5	mg/L	1	0.5	452				160	31	26	21	16	13
Potassium	7/09/7440	mg/L	1	0.5	14	12	5	2	12	3	3	3	2	2
Iron	7439-89-6	mg/L	0.01	0.005	LOR	0.11	0.03	0.21	LOR	0.13	0.94	0.93	0.14	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	LOR	0.04	0.08	0.59	0.14	0.07	0.26	0.39	0.98	LOR
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	0.001	LOR	0.002	0.002	LOR	0.001	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.007	0.01	0.003	0.063	0.003	0.008	0.007	0.007	0.005	0.003
Barium	7440-39-3	mg/L	0.001	0.0005	0.028	0.138	0.08	0.384	0.046	0.754	0.351	0.493	0.468	0.314
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.003	0.003	LOR	0.001	0.006	0.004	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.001	0.003	0.004	0.02	0.004	0.006	0.004	0.005	0.004	0.002
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.001	LOR	LOR	0.002	LOR	0.007	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.003	LOR	0.001	LOR	0.001	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.146	0.071	0.074	0.009	0.434	0.039	0.04	0.047	0.066	0.031
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.047	0.072	0.032	0.379	0.179	0.028	0.038	0.035	0.025	0.021
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	0.001	0.003	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.199	0.178	0.079		0.264	0.098	0.157	0.126	0.104	0.085
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR		LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR		LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR		LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.012	0.01	0.098	0.005	LOR	LOR	0.024	0.023	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	0.4	0.5	0.2	1.1	0.6	0.1	0.2	0.1	0.1	LOR
Total Phosphorus		mg/L	0.01	0.005	LOR				LOR	LOR	0.02	0.07	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
Column OD_19 CONGLO



Column	OD_19 CONGLO	Week			23	24	25	26	28	29	30	31	32	35
Sample weight (kg)	2.145	Extraction vol (L)			0.425	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.65	0.65	0.65	0.65	0.7	0.7	0.65	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.72	7.86	8.04	9.35	7.65	7.88	8.03	8.36	7.72	7.67
Electrical Conductivity (field)		µS/cm			190	172	178	107	98					
pH Value		pH Unit	0.01		7.14	6.63	6.71	6.92	6.85		6.88	6.78	6.68	6.72
Electrical Conductivity @ 25°C		µS/cm	1		193	182	170	148	139		141	140	105	106
Total Alkalinity as CaCO3		mg/L	1	0.5	10	9	18	18	17		23	9	6	7
Acidity as CaCO3		mg/L	1	0.5	5	1	2	6	3	2	2	LOR	3	3
Sulfate	14808-79-8	mg/L	1	0.5	62	43	39	39	37	37	34	34	28	26
Silicon	7440-21-3	mg/L	0.05	0.025	LOR	0.15	0.43	0.15	0.11	0.1	0.09	0.11	0.08	0.08
Chloride	16887-00-6	mg/L	1	0.5	19	22	25	12	8	9		13	11	8
Calcium	7440-70-2	mg/L	1	0.5	18	14	14	12	13	11	10	10	8	9
Magnesium	7439-95-4	mg/L	1	0.5	2	2	2	2	2	1	2	2	1	2
Sodium	7440-23-5	mg/L	1	0.5	17	16	18	13	11	6	12	10	7	7
Potassium	7/09/7440	mg/L	1	0.5	2	2	2	2	2	2	2	2	1	1
Iron	7439-89-6	mg/L	0.01	0.005	0.26	0.06	LOR	LOR	LOR	LOR	0.08	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.11	LOR	0.06	0.06	0.03	0.06	0.13	0.1	0.1	0.08
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.005	0.002	0.003	0.004	0.004	0.004	0.002	0.003	0.003	0.003
Barium	7440-39-3	mg/L	0.001	0.0005	0.288	0.144	0.15	0.127	0.136	0.142	0.142	0.14	0.159	0.131
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.003	LOR	0.003	0.006	0.004	0.003	0.003	0.003	0.002	0.003
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.03	0.033	0.023	0.024	0.022	0.027	0.021	0.022	0.015	0.012
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.028	0.031	0.041	0.049	0.038	0.026	0.029	0.038	0.024	0.022
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.092	0.078	0.079	0.07	0.096	0.071	0.065	0.072	0.061	0.055
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025		LOR	LOR	0.005	LOR	LOR	LOR	0.008	0.006	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	LOR	0.1	0.2	LOR	0.1	LOR	LOR	0.1	LOR	LOR
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	0.01	LOR	LOR	0.05	0.01

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_19 CONGLO



Column	OD_19 CONGLO	Week			36	37	38	39	40	43	44	46	47	48
Sample weight (kg)	2.145	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.675	0.675	0.675	0.7	0.65	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.14	7.85	7.66	7.77	8.21	7.87	8.15	7.05		8.04
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		7.05	4.39	6.76	6.91	6.69	6.38	6.88	6.51	6.66	6.68
Electrical Conductivity @ 25°C		µS/cm	1		108	188	92	113	110.00	118	138	100	87	85
Total Alkalinity as CaCO3		mg/L	1	0.5	21	LOR	4	19	6.00	6	19	6	7	6
Acidity as CaCO3		mg/L	1	0.5	3	17	1	LOR	3.00	2	2	2	2	3
Sulfate	14808-79-8	mg/L	1	0.5	21	26	24	25	28.00	27	40	32	30	38
Silicon	7440-21-3	mg/L	0.05	0.025	0.08	0.1	0.08	0.1	0.08		0.1	LOR	0.07	0.1
Chloride	16887-00-6	mg/L	1	0.5	8	10	6	7	7.00	3	6	7	3	1
Calcium	7440-70-2	mg/L	1	0.5	9	8	8	9	9.00	10	13	11	9	13
Magnesium	7439-95-4	mg/L	1	0.5	1	2	2	2	2.00	2	3	2	2	2
Sodium	7440-23-5	mg/L	1	0.5	7	6	6	8	7.00	5	8	6	6	4
Potassium	7/09/7440	mg/L	1	0.5	1	1	1	1	1.00	1	LOR	1	1	1
Iron	7439-89-6	mg/L	0.01	0.005	0.08	0.1	0.06	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.1	0.06	0.13	0.16	0.08	0.04	0.06	0.15	0.12	0.14
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.003	0.003	0.002	0.002	0.00	0.002	0.002	0.002	0.003	0.002
Barium	7440-39-3	mg/L	0.001	0.0005	0.152	0.135	0.138	0.141	0.14	0.126	0.097	0.113	0.117	0.116
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.002	0.002	0.001	0.002	0.00	0.002	0.002	0.002	0.002	0.002
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.02	0.015	0.018	0.013	0.01	0.004	0.006	0.008	0.008	0.005
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.02	0.023	0.019	0.029	0.03	0.018	0.044	0.022	0.032	0.033
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.05	0.049	0.049	0.05	0.05	0.047	0.067	0.056	0.051	0.067
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	0.006	LOR	0.01	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	LOR	LOR	0.1	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Total Phosphorus		mg/L	0.01	0.005	LOR	0.02	LOR	0.1	0.01	LOR	0.02	LOR	0.02	LOR

Appendix A: Tabulated Laboratory Analytical Results
Column OD_19 CONGLO



Column	OD_19 CONGLO	Week			50	51	52	53	54	55	56	57	58	59
Sample weight (kg)	2.145	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			6.70	7.31	8.12	7.24	7.22	7.54	7.19	6.53	6.55	7.17
Electrical Conductivity (field)		µS/cm												
pH Value		pH Unit	0.01		5.95	5.41	7.05	6.68	6.43	6.46	6.84	5.34	6.69	6.24
Electrical Conductivity @ 25°C		µS/cm	1		88	113	128	85	105	116	116	89	104	76
Total Alkalinity as CaCO3		mg/L	1	0.5	3		18	6	6	21	22	2	9	27
Acidity as CaCO3		mg/L	1	0.5	4	2	2	3	4	2	1	3	2	2
Sulfate	14808-79-8	mg/L	1	0.5	28	36	37	38	30	33	38	35	34	22
Silicon	7440-21-3	mg/L	0.05	0.025	0.06	0.09	0.11	0.1	0.09	0.07	0.08	0.047	LOR	0.09
Chloride	16887-00-6	mg/L	1	0.5	3	15	4	1	3	2	2	2	5	LOR
Calcium	7440-70-2	mg/L	1	0.5	8	13	13	13	10	12	13	13	9	8
Magnesium	7439-95-4	mg/L	1	0.5	2	2	3	2	2	2	3	2	3	2
Sodium	7440-23-5	mg/L	1	0.5	4	4	6	4	4	4	4	4	5	2
Potassium	7/09/7440	mg/L	1	0.5	1	1	1	1	1	1	1	1	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	LOR	LOR	LOR	0.14	0.11	0.01	0.08	0.07	0.07	0.1
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.002	0.002	0.003	0.002	0.002	0.002	0.002	0.002	LOR	0.002
Barium	7440-39-3	mg/L	0.001	0.0005	0.109	0.133	0.116	0.116	0.109	0.114	0.139	0.138	0.09	0.112
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	LOR	LOR	0.001	0.002	0.002	0.001	0.003	0.002	0.003	LOR
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.014	0.008	0.006	0.005	0.006	0.004	0.006	0.005	0.006	LOR
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.023	0.03	0.033	0.033	0.022	0.027	0.033	0.027	0.036	0.019
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.051	0.07	0.073	0.067	0.056	0.058	0.076	0.068	0.054	0.043
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Total Phosphorus		mg/L	0.01	0.005	LOR	0.01	0.01	LOR	LOR	LOR	0.08	LOR	0.01	0.04

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_19 CONGLO



Column	OD_19 CONGLO	Week			60	61	62	64	67	68	73	74	75	76
Sample weight (kg)	2.145	Extraction vol (L)			0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.65	0.65	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			7.46	7.87	6.47	8.44	7.27	8.95	6.77	8.25	8.32	7.79
Electrical Conductivity (field)		µS/cm								92.1	106	107.1	115.1	88.6
pH Value		pH Unit	0.01		6.76	6.81	6.6	6.68	6.03	6.94	6.67	6.71	6.36	6.7
Electrical Conductivity @ 25°C		µS/cm	1		90	87	76	102	76	90	103	86	107	93
Total Alkalinity as CaCO3		mg/L	1	0.5	23	9	5	5	5	8	8	23	7	19
Acidity as CaCO3		mg/L	1	0.5	4	2	3	1	1	5	5	2	1	2
Sulfate	14808-79-8	mg/L	1	0.5	21	28	23	29	21	28	30	20	28	25
Silicon	7440-21-3	mg/L	0.05	0.025	0.09	0.09	0.1	0.09	0.09	0.15	0.1	0.14	0.14	0.09
Chloride	16887-00-6	mg/L	1	0.5	LOR	2	2	2	2	2	LOR	7	5	LOR
Calcium	7440-70-2	mg/L	1	0.5	8	8	8	9	8	8	9	9	8	7
Magnesium	7439-95-4	mg/L	1	0.5	2	2	2	3	2	3	3	2	3	3
Sodium	7440-23-5	mg/L	1	0.5	6	3	3	3	4	3	4	4	3	3
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	1	2	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	0.09	LOR	0.15	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.1	0.06	0.02	0.14	0.09	0.21	0.19	0.21	0.07	0.07
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.003	0.001	0.003	0.002	0.003	0.004	0.002	0.003	0.002	0.002
Barium	7440-39-3	mg/L	0.001	0.0005	0.126	0.092	0.1	0.098	0.096	0.101	0.086	0.196	0.093	0.086
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.004	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.002	0.002	0.001	0.004	0.004	0.004	0.003	0.004	0.004	0.003
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.004	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.022	0.006	0.003	0.02	0.008	0.008	0.004	0.01	0.004	0.003
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.021	0.03	0.02	0.029	0.016	0.04	0.035	0.027	0.043	0.048
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.046	0.051	0.042	0.055	0.04	0.053	0.055	0.049	0.055	0.048
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	0.009	0.009	0.008	0.005	0.01	0.01	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	LOR	LOR	0.4	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	0.55	0.06	0.03	0.06	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_19 CONGLO



Column	OD_19 CONGLO	Week			77	78	80	81	82	83	84	85	86	87
Sample weight (kg)	2.145	Extraction vol (L)			0.43	0.43	0.43	0.43	0.605	0.4	0.63	0.39	0.41	0.49
Key		Flushing vol (L)			0.7	0.65	0.65	0.65	0.7	0.65	0.9	0.65	0.75	0.8

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			9.26	8.13	7.85	8.47	8.85	8.01	7.62	8.24	5.09	6.99
Electrical Conductivity (field)		µS/cm			88.2	94.3	70.1	58	83.2	73.1	110.7	92.1	81.8	46.7
pH Value		pH Unit	0.01		6.79	6.89	6.55	6.59	6.6	7.08	7.09	7.14	6.9	6.7
Electrical Conductivity @ 25°C		µS/cm	1		85	100	75	49	71		99	90	85	49
Total Alkalinity as CaCO3		mg/L	1	0.5	7	20	9	20	7		20	7	7	4
Acidity as CaCO3		mg/L	1	0.5	1	2	4	2	LOR	1	1	1	1	LOR
Sulfate	14808-79-8	mg/L	1	0.5	21	23	20	15	18	21	25	23	22	13
Silicon	7440-21-3	mg/L	0.05	0.025	0.12	0.58	0.17	0.12	0.15	0.1	0.44	0.1	0.12	0.09
Chloride	16887-00-6	mg/L	1	0.5	LOR	8	LOR	LOR	LOR		1	LOR	LOR	LOR
Calcium	7440-70-2	mg/L	1	0.5	6	10	6	5	5	6	9	7	6	5
Magnesium	7439-95-4	mg/L	1	0.5	3	3	2	2	2	3	4	3	3	2
Sodium	7440-23-5	mg/L	1	0.5	3	4	2	2	2	3	3	3	3	1
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	1	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	0.05	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.08	0.02	0.08	0.35	0.15	0.06	0.06	0.08	0.09	0.07
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.002	0.003	0.001	0.002	0.002	0.001	0.003	0.002	0.002	0.001
Barium	7440-39-3	mg/L	0.001	0.0005	0.1	0.161	0.105	0.121	0.119	0.113	0.12	0.088	0.096	0.132
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.005	0.001	0.003	0.003	0.003	0.003	LOR	0.002	0.003	0.002
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.005	0.004	0.006	0.005	0.008	0.011	0.008	0.006	0.009	0.009
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.038	0.037	0.034	0.033	0.034	0.037	0.055	0.05	0.033	0.017
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.042	0.059	0.044	0.034	0.032	0.037	0.052	0.043	0.037	0.024
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	0.008
Fluoride	16984-48-8	mg/L	0.1	0.05	LOR	LOR	LOR	LOR	LOR		LOR	LOR	LOR	LOR
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_19 CONGLO



Column	OD_19 CONGLO	Week			88	89	90	91	92	93	94	95	96	97
Sample weight (kg)	2.145	Extraction vol (L)			0.5	0.43	0.43	0.47	0.47	0.45	0.41	0.445	0.445	0.44
Key		Flushing vol (L)			0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.40	7.61	8.10	8.71	8.41	8.12	7.46	8.08	7.89	7.99
Electrical Conductivity (field)		µS/cm			84.6	67.7	72.5	80.9	72.6	64.6	59.8	63.5	65.7	68.6
pH Value		pH Unit	0.01		8.45	7.12	7.67	7.86	7.53	8.19	7.17	7.05	7.3	6.97
Electrical Conductivity @ 25°C		µS/cm	1		79	69	76	82	72	57	72	59	58	65
Total Alkalinity as CaCO3		mg/L	1	0.5	9	9	7	11	8	LOR	7	4	LOR	LOR
Acidity as CaCO3		mg/L	1	0.5	4	LOR	3	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	22	20	24	20	19	14	17	18	17	18
Silicon	7440-21-3	mg/L	0.05	0.025	LOR	0.06	0.16	0.11	0.19	0.1	0.09	0.07	0.08	0.08
Chloride	16887-00-6	mg/L	1	0.5	LOR	LOR	35	LOR	LOR	3	7	4	LOR	3
Calcium	7440-70-2	mg/L	1	0.5	6	4	5	6	6	4	6	5	5	5
Magnesium	7439-95-4	mg/L	1	0.5	3	3	3	3	3	2	3	2	2	2
Sodium	7440-23-5	mg/L	1	0.5	3	2	3	2	2	2	2	2	1	2
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	0.16	0.29	0.07	0.04	0.07	0.07	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.06	0.06	0.07	LOR	LOR	LOR	LOR	0.001	LOR	0.06
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.002	0.001	0.002	0.002	0.002	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.001	0.001	0.002	0.102	0.108	0.11	0.116	0.101	0.104	0.002
Barium	7440-39-3	mg/L	0.001	0.0005	0.095	0.092	0.089	LOR	LOR	LOR	LOR	LOR	LOR	0.1
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	0.005	0.005	0.004	0.004	0.004	0.002	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.002	0.003	0.003	LOR	LOR	LOR	LOR	LOR	LOR	0.002
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.004	0.004	0.004	0.004	0.005	0.005	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.005	0.007	0.004	0.039	0.04	0.028	0.04	0.035	0.032	0.005
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.037	0.04	0.041	LOR	0.001	LOR	LOR	LOR	LOR	0.035
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	0.035	0.044	0.033	0.037	0.032	0.032	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.034	0.028	0.028	LOR	LOR	LOR	LOR	LOR	LOR	0.033
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	LOR	LOR	LOR	0.4	LOR	LOR	LOR	LOR	0.9	LOR
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	

Appendix A: Tabulated Laboratory Analytical Results
Column OD_19 CONGLO



Column	OD_19 CONGLO	Week			98	99	100	101	102	103	104	105	106	107
Sample weight (kg)	2.145	Extraction vol (L)			0.45	0.44	0.45	0.44	0.47	0.45	0.46	0.45	0.45	0.45
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.61	9.48	7.03	8.6		8.03	8.64	8	8.54	8.66
Electrical Conductivity (field)		µS/cm			59	72.5	71.4	62.5	70	71.5	56.6	79.6	78.2	73.3
pH Value		pH Unit	0.01		6.53	6.58	7.44	6.49	7.3	7.04	7.08	6.95	6.26	7.3
Electrical Conductivity @ 25°C		µS/cm	1		53	72	71	61	51	56	48	53	55	55
Total Alkalinity as CaCO3		mg/L	1	0.5	8	LOR	4	4	7	4	4	3	4	9
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	2	LOR
Sulfate	14808-79-8	mg/L	1	0.5	14	18	19	17	14	14	13	17	16	19
Silicon	7440-21-3	mg/L	0.05	0.025	0.15	0.08	0.07	0.09	0.06	0.15	0.1	0.07	0.08	0.09
Chloride	16887-00-6	mg/L	1	0.5	3	4	2	LOR	1	LOR	1	1	1	1
Calcium	7440-70-2	mg/L	1	0.5	4	4	4	4	4	4	4	4	4	5
Magnesium	7439-95-4	mg/L	1	0.5	2	3	3	3	2	2	2	2	2	2
Sodium	7440-23-5	mg/L	1	0.5	2	2	2	2	2	1	2	2	2	2
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.09	0.03	0.07	0.1	LOR	0.05	0.03	0.04	0.05	0.06
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.002	LOR	0.002	0.002	LOR	0.002	0.002	0.001	0.002	0.002
Barium	7440-39-3	mg/L	0.001	0.0005	0.131	0.099	0.094	0.099	0.091	0.096	0.085	0.084	0.092	0.102
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.002	0.003	0.003	0.004	LOR	0.002	0.002	0.002	0.002	0.003
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.005	0.005	0.005	0.006	0.006	0.006	0.005	0.004	0.011	0.009
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.02	0.038	0.035	0.032	0.024	0.027	0.031	0.034	0.03	0.032
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.026	0.029	0.027	0.026	0.026	0.024	0.022	0.026	0.024	0.029
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	0.008	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_19 CONGLO



Column	OD_19 CONGLO	Week			108	109	110	111	112	113	114	115	116	117
Sample weight (kg)	2.145	Extraction vol (L)			0.45	0.44	0.45	0.44	0.653	0.65	0.46	0.44	0.43	0.45
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.9	0.9	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			8.07	8.73	8.33	7.47	8.88	8.03	7.38	7.58	8.12	8.61
Electrical Conductivity (field)		µS/cm			58.3	51.1	59.4	64.9	80.8	70.8	54.1	54.3	49.4	48.3
pH Value		pH Unit	0.01		7.03	6.9	6.84	6.85	6.85	7.86	6.57	6.88	7.1	6.88
Electrical Conductivity @ 25°C		µS/cm	1		48	40	45	65	81	64	54	51	48	18
Total Alkalinity as CaCO3		mg/L	1	0.5	5	3	3	5	19	7	2	4	6	5
Acidity as CaCO3		mg/L	1	0.5	LOR	LOR	LOR	LOR	6	2	LOR	LOR	LOR	LOR
Sulfate	14808-79-8	mg/L	1	0.5	15	12	12	19	22	18	16	14	14	13
Silicon	7440-21-3	mg/L	0.05	0.025	0.07	0.07	0.06	0.07	0.36	0.22	0.06	0.07	0.06	0.07
Chloride	16887-00-6	mg/L	1	0.5	2	LOR	LOR	LOR	2	2	4	6	LOR	8
Calcium	7440-70-2	mg/L	1	0.5	4	3	3	5	7	6	4	4	3	4
Magnesium	7439-95-4	mg/L	1	0.5	2	2	2	2	3	2	2	2	2	2
Sodium	7440-23-5	mg/L	1	0.5	1	1	1	1	2	1	1	LOR	LOR	1
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	0.06	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.06	0.05	0.06	LOR	0.06	0.06	LOR	0.01	LOR	0.04
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.001	LOR	0.002	LOR	0.002	0.002	0.001	0.002	LOR	0.002
Barium	7440-39-3	mg/L	0.001	0.0005	0.098	0.1	0.101	0.078	0.113	0.119	0.071	0.081	0.071	0.097
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.002	0.002	0.002	LOR	0.005	0.004	LOR	0.001	LOR	LOR
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.005	0.007	0.006	0.003	0.004	0.005	0.004	0.005	0.004	0.005
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.026	0.021	0.018	0.035	0.046	0.04	0.024	0.021	0.02	0.024
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.027	0.023	0.022	0.029	0.041	0.039	0.024	0.023	0.021	0.022
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
Column OD_19 CONGLO



Column	OD_19 CONGLO	Week			118	119	120	121	122	125	129	131	135	139
Sample weight (kg)	2.145	Extraction vol (L)			0.655	0.42	0.44	0.46	0.46	0.46	0.45	0.44	0.44	0.44
Key		Flushing vol (L)			0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR										
pH (field)		pH Unit			9.25	7.59	6.79	7.05	6.61	7.44	8.49	7.52	8.44	7.9
Electrical Conductivity (field)		µS/cm			70.6	54.8	57.6	59.5	53.9	61.8	49.7	47.6	72.7	42.9
pH Value		pH Unit	0.01		7.46	6.8	7.4	8.69	6.25	6.83	7.21	6.62	6.57	6.73
Electrical Conductivity @ 25°C		µS/cm	1		73	53	49	59	54	61	53	42	67	44
Total Alkalinity as CaCO3		mg/L	1	0.5	6	5	4	4		6	5	5	8	LOR
Acidity as CaCO3		mg/L	1	0.5	2	LOR	2	LOR	2	2	5	2	2	LOR
Sulfate	14808-79-8	mg/L	1	0.5	18	14	13	17	15	16	13	9	18	10
Silicon	7440-21-3	mg/L	0.05	0.025	0.31	LOR	0.1	0.11	8	0.12	0.08	0.09	0.14	0.12
Chloride	16887-00-6	mg/L	1	0.5	7	LOR	2	2	5	2	2	3	2	3
Calcium	7440-70-2	mg/L	1	0.5	6	3	6	6	2	6	4	3	5	3
Magnesium	7439-95-4	mg/L	1	0.5	3	2	2	2	LOR	2	2	1	2	1
Sodium	7440-23-5	mg/L	1	0.5	1	LOR	1	LOR	LOR	LOR	LOR	1	1	1
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.08	LOR	0.01	0.02	LOR	0.04	LOR	0.05	0.03	0.04
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.001	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	0.002	0.001	0.002	0.002	0.133	0.002	0.001	LOR	LOR	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.108	0.074	0.126	0.134	LOR	0.126	0.12	0.091	0.135	0.086
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.002	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.005	LOR	0.002	0.004	LOR	0.003	0.002	0.002	0.003	0.003
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	0.001	0.005	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.004	0.004	0.004	0.004	0.022	0.017	0.018	0.006	0.024	0.008
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.039	0.022	0.029	0.03	LOR	0.025	0.014	0.012	0.026	0.014
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	0.032	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.034	0.023	0.036	0.042	LOR	0.035	0.028	0.019	0.032	0.022
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	0.032	LOR	0.005	0.2	LOR	LOR	0.007	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	LOR	LOR	LOR	LOR		LOR	LOR	LOR	LOR	LOR
Total Phosphorus		mg/L	0.01	0.005	LOR	---	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix A: Tabulated Laboratory Analytical Results
 Column OD_19 CONGLO



Column	OD_19 CONGLO	Week			148	150	152	156	161	165	169	174
Sample weight (kg)	2.145	Extraction vol (L)			0.43	0.43	0.45	0.45	0.455	0.475	0.45	0.46
Key		Flushing vol (L)			0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Analyte	Method	Unit	LOR	<LOR								
pH (field)		pH Unit			8.52	8.05	6.12	7.33	8.5	6.3	6.74	6.25
Electrical Conductivity (field)		µS/cm			47.8	50.7	39.5	40.1	45.8	31.8	30.7	61.1
pH Value		pH Unit	0.01		6.59	6.81	6.54	6.77	6.61	6.76	6.71	6.84
Electrical Conductivity @ 25°C		µS/cm	1		47	48	43	51	50	35	37	49
Total Alkalinity as CaCO3		mg/L	1	0.5	3	6	3	2	3	2	7	8
Acidity as CaCO3		mg/L	1	0.5	LOR	2	LOR	2	4	2	2	3
Sulfate	14808-79-8	mg/L	1	0.5	12	13	10	11	14	8	8	10
Silicon	7440-21-3	mg/L	0.05	0.025	0.15	0.19	0.13	0.08	0.24	0.27	0.09	0.13
Chloride	16887-00-6	mg/L	1	0.5	1	1	2	1	1	LOR	1	1
Calcium	7440-70-2	mg/L	1	0.5	3	3	4	3	4	3	3	4
Magnesium	7439-95-4	mg/L	1	0.5	2	2	2	2	2	LOR	1	1
Sodium	7440-23-5	mg/L	1	0.5	1	1	1	LOR	1	LOR	LOR	LOR
Potassium	7/09/7440	mg/L	1	0.5	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Iron	7439-89-6	mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Aluminium	7429-90-5	mg/L	0.01	0.005	0.06	0.08	0.08	0.06	0.05	0.06	0.07	0.03
Antimony	7440-36-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Arsenic	7440-38-2	mg/L	0.001	0.0005	LOR	0.001	0.001	0.001	0.002	0.002	LOR	LOR
Barium	7440-39-3	mg/L	0.001	0.0005	0.086	0.084	0.095	0.093	0.098	0.126	0.082	0.103
Cerium	7440-45-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Cobalt	7440-48-4	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Copper	7440-50-8	mg/L	0.001	0.0005	0.003	0.003	0.004	0.004	0.004	0.002	0.003	0.003
Lanthanum	7439-91-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Lead	7439-92-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Manganese	7439-96-5	mg/L	0.001	0.0005	0.005	0.009	0.007	0.005	0.008	0.01	0.007	0.009
Molybdenum	7439-98-7	mg/L	0.001	0.0005	0.017	0.018	0.016	0.016	0.016	0.008	0.011	0.014
Nickel	7440-02-0	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Strontium	7440-24-6	mg/L	0.001	0.0005	0.022	0.019	0.023	0.021	0.024	0.021	0.016	0.025
Thorium	7440-29-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Uranium	7440-61-1	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Yttrium	7440-65-5	mg/L	0.001	0.0005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Zinc	7440-66-6	mg/L	0.005	0.0025	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR
Fluoride	16984-48-8	mg/L	0.1	0.05	LOR	LOR	LOR	0.1	LOR	LOR	LOR	LOR
Total Phosphorus		mg/L	0.01	0.005	LOR	LOR	LOR	LOR	LOR	LOR	LOR	LOR

Appendix B

Sample Geochemistry

Table B-1: Leach Column Mine rock Material Geochemistry (mg/kg unless noted otherwise)

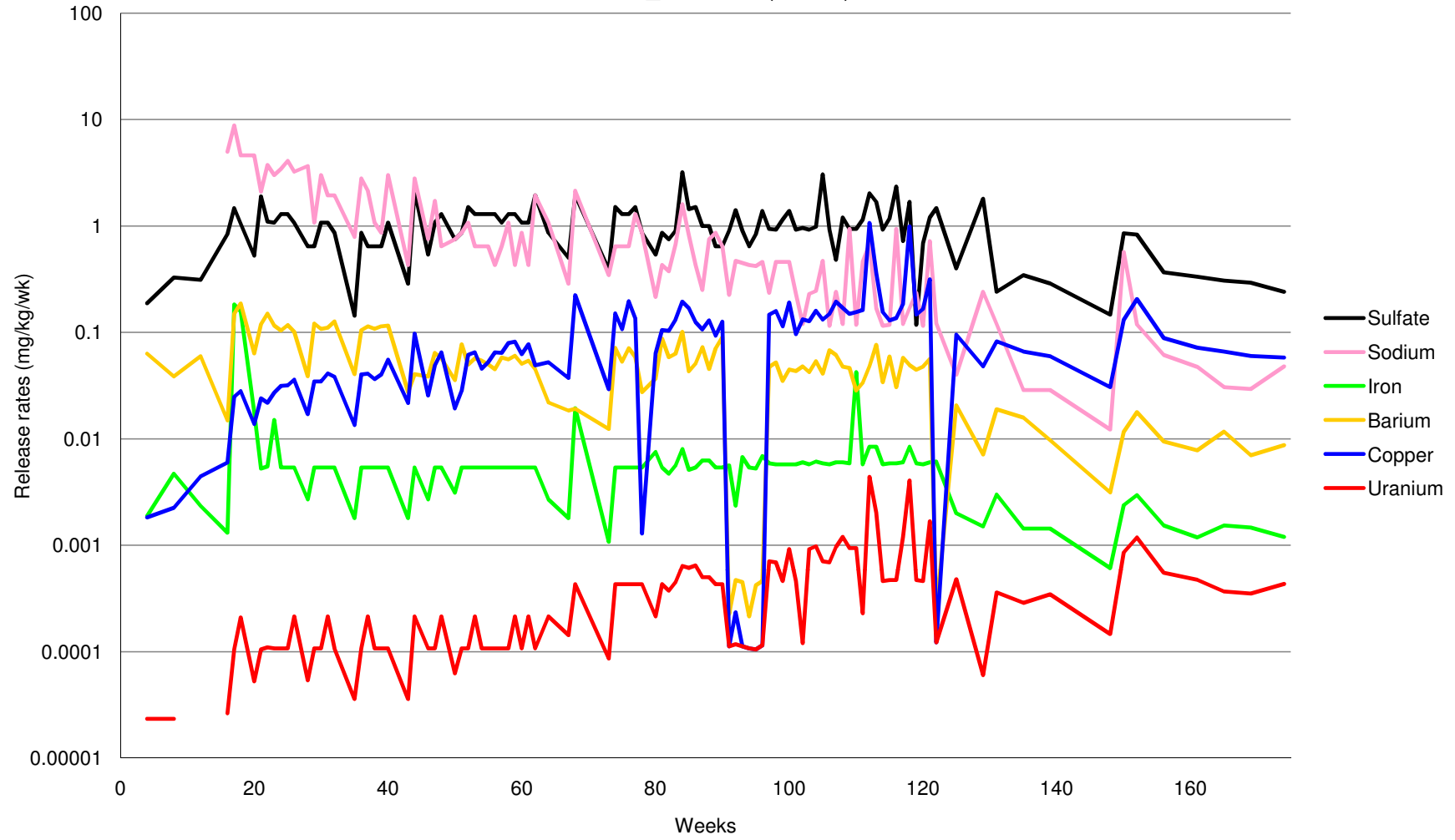
Analyte	DL	OD_1 HEMH 148187	OD_2 GRNL 148207	OD_3 HEM 148194	OD_4 ZWAW	OD_5 ZWA	OD_6 ZWC	OD_7 ZWT	OD_8 ZWAR	OD_9 ZAL	OD_10 HEMQ	OD_11 HEMH	OD_12 GRNH	OD_13 GRNB	OD_14 GRNL	OD_15 KASH	OD_16 KASH LAM	OD_17 VHEM	OD_18 KHEMQ VASH	OD_19 CONGLO
Ag	0.01	1.68	0.61	0.92	0.07	0.09	0.04	0.16	0.08	0.05	0.76	1.11	1.62	1.08	0.35	0.33	0.18	0.56	0.46	0.41
Al (%)	0.01	0.78	4.54	0.32	0.75	2.41	1.09	6.68	3.16	0.24	0.33	5.17	6.13	5.84	6.12	8.34	7.33	3.71	3.39	0.93
As	0.2	204	34.7	299	1	5.5	1.1	9.4	1.8	bdl	252	106	25.6	31.3	39.3	27.4	29.2	351	246	146
Ba	10	2720	5760	3520	120	840	110	320	260	10	2590	280	4150	6230	420	590	1880	2780	4030	3600
Bi	0.01	2.48	1	1.27	0.02	0.06	0.04	0.12	0.06	0.24	1.94	0.87	3.88	7.24	0.11	0.28	0.92	5.96	2.58	1.3
Ca (%)	0.01	0.03	0.07	0.05	0.02	0.68	0.46	0.37	0.08	20.2	0.4	0.09	0.78	0.27	0.06	0.79	0.21	0.03	0.22	2.34
Cd	0.02	bdl	bdl	bdl	bdl	0.04	bdl	bdl	bdl	0.04	bdl	bdl	bdl	bdl	0.02	bdl	0.29	bdl	bdl	0.15
Ce	0.01	>500	>500	>500	9	59	19	79	34	6	>500	>500	>500	344	180	132	228	>500	>500	221
Co	0.1	13.5	11.6	4.9	2.6	2.8	5.8	19	8.6	2.8	3.9	31.5	21.4	23.3	10.6	37.9	100	11.8	8.1	16.6
Cr	1	91	125	71	111	114	82	82	114	4	56	56	73	83	81	486	356	198	268	402
Cs	1	0.33	1.48	0.22	0.41	0.7	0.32	5.21	2.37	0.07	1.88	1.94	1.89	2.37	2.44	9.52	5.76	4.69	11.6	0.6
Cu	0.2	882	422	166	2.6	7.8	1.9	55.3	2.3	2.9	423	271	3160	2130	143	329	184	138	404	158
Fe (%)	0.01	33.1	16.6	45.4	0.63	1.34	3.36	4.69	1.99	0.35	36.3	16.1	4.03	4.03	5.37	7.31	10.1	24.4	26.3	23.8
K (%)	0.01	0.23	3.67	0.12	0.42	1.52	0.52	2.53	2.1	0.03	0.08	0.97	6.18	5.2	5.16	3.49	2.59	1.88	1.67	0.31
La	0.5	>500	>500	>500	4.9	37.2	5.8	39.2	15	2.2	>500	>500	>500	233	109	66	137	>500	>500	156
Li	0.2	6.3	10	1.8	8.2	5.4	14.3	24.6	13.8	2	3.5	132	10.5	9.1	10	44.9	34.8	12	14.6	9.2
Mg (%)	0.01	0.03	0.13	0.03	0.26	0.5	0.75	1.39	0.62	13.3	0.03	2.39	0.16	0.19	0.22	2.96	1.48	0.26	0.19	1.1
Mn	5	45	49	52	22	200	98	246	56	984	17	132	518	1755	153	1330	603	53	312	3030
Mo	0.1	157	15.1	164	4.28	9.93	2.56	2.21	3.21	0.84	168	35.4	41.6	43.8	4.53	1.54	14.6	113	115	62.5
Na (%)	0.01	0.08	0.08	0.14	0.03	0.77	0.1	1.47	0.14	0.07	0.07	0.06	0.13	0.18	0.14	0.18	0.1	0.06	0.08	0.15
Ni	0.2	3.3	5.2	3.7	6	6.1	4.6	34.6	18.2	1	1.8	2.9	4.4	3.1	3.2	200	292	12.6	3.9	9.6
P	10	500	920	610	70	210	1240	950	340	60	980	2110	260	280	260	1060	990	840	790	460
Pb	0.5	19.7	8.8	151	2.5	10.9	9.5	12.4	9.1	11.2	36.2	18.2	7.6	7.1	6.1	11.2	27.2	199	78.6	50.3
Sb	0.05	29.3	5.49	33.5	2.31	3.74	1.04	2.14	1.14	0.16	32.2	14.6	17.9	13.9	17.9	8.48	19.3	49.8	46.7	24.3
Sn	0.2	33.1	11.6	40.5	0.4	1.4	0.4	4	1.8	bdl	31.6	26.2	5.5	2.1	1.4	2.6	4.5	22.5	25.3	17.8
Sr	0.2	428	204	446	10	35.3	26	74.6	33.3	95.9	628	468	176	167	30.8	36.9	83.8	478	278	492
Th	0.2	17.8	30.2	6.9	1.5	4.9	2.2	15.2	7.9	0.8	6.1	49.3	59	52.3	46.6	22.3	28.3	49.8	33.3	11.2
U	0.1	157	43.2	33.2	0.6	2	1.4	3.4	1.8	1.2	39	32.9	53.9	34.6	39.7	7	15.8	54.8	52.9	15.6
V	1	13	24	21	12	17	29	115	38	9	27	17	15	14	16	141	111	24	54	26
Y	0.1	76.4	19.2	26.3	3.9	11.6	19.8	29.8	15.8	3.4	21.3	18	50.8	20.8	17.4	34.1	44.7	35.2	38.7	18.2
Zn	2	43	40	25	7	15	15	61	19	10	19	115	34	75	19	243	605	73	116	110
Si (%)	0.01	13.1	25.4	4.17	38.2	37.6	39.6	33.5	39.6	0.95	11.2	24.8	33.7	34.1	33.2	26.9	28.1	18.2	18.9	19.8
ANC (kg/t)	0.5	1.3	2.1	1.1	1.3	11	8.4	9.6	2.4	993	1.8	9.1	4.5	5.4	2.4	65.1	7.8	4.9	8.9	81.7
S-tot (%)	0.01	1.2	0.17	0.72	0.02	0.06	0.02	0.02	0.02	bdl	0.59	0.04	0.38	0.35	0.16	0.01	0.04	0.86	0.52	1.03
Sulfide S	100	11365	355	6378	172	404	174	125	139	0	5295	335	2831	2045	1502	0	0	7951	4259	9459
AP (kg/t)	0.1	35	1	20	1	1	1	0	0	0	16	1	9	6	5	0	0	24	13	29

Notes: Sulfide sulfur derived from total sulfur corrected for barite
 AP – acid potential expressed as kg H₂SO₄/t

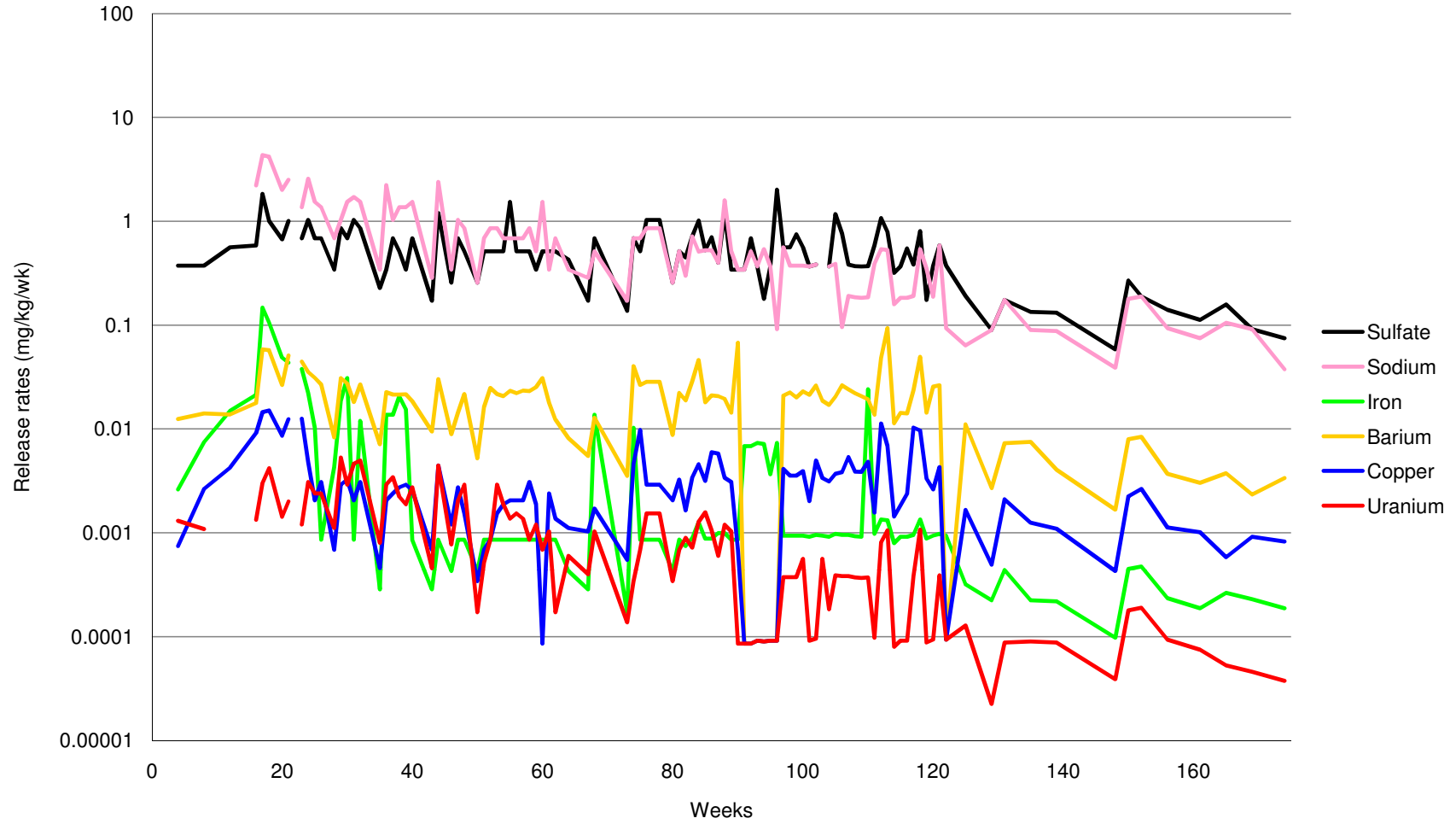
Appendix C

Production Rate Graphs

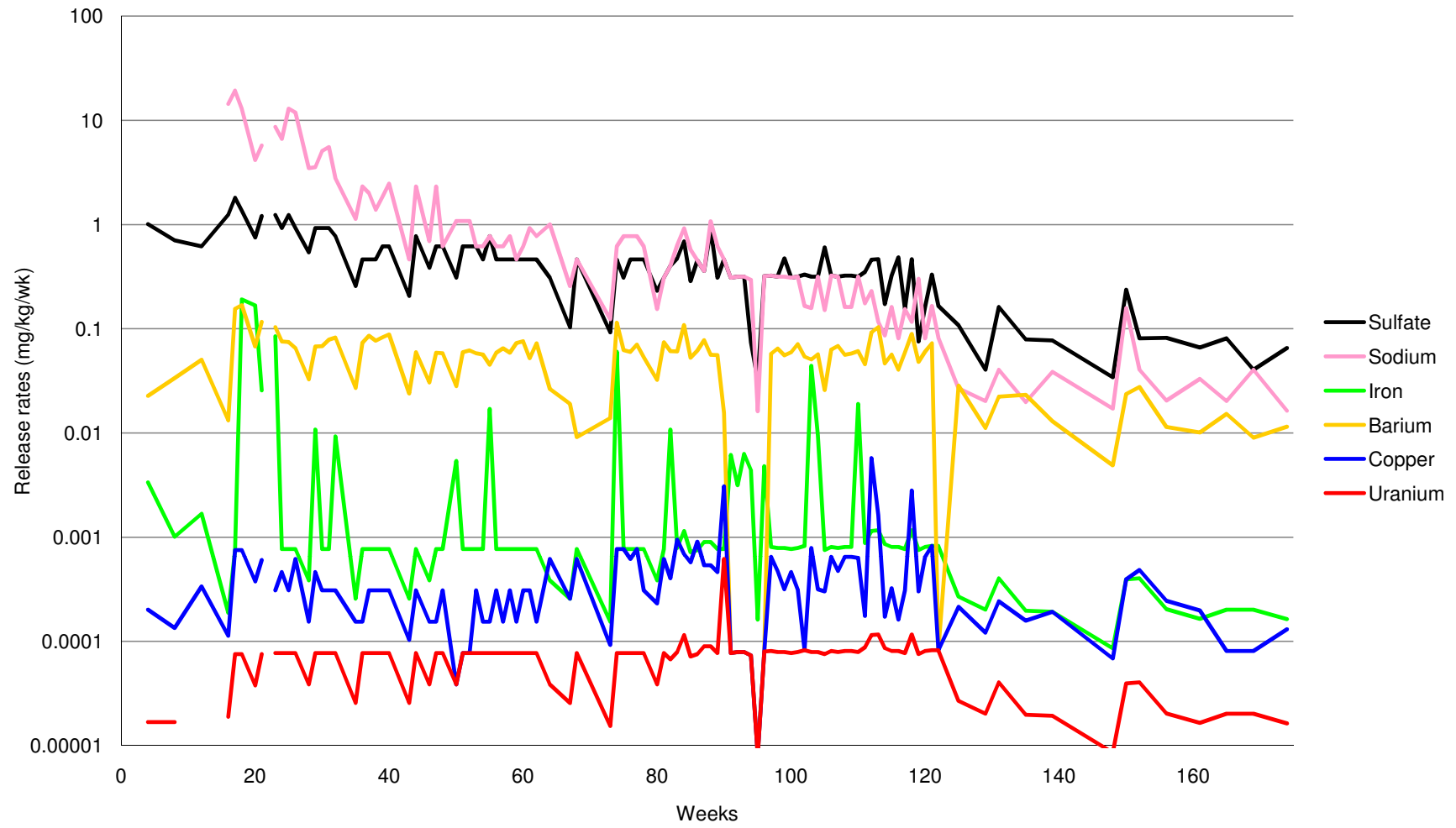
OD_1 148187 (HEMH)



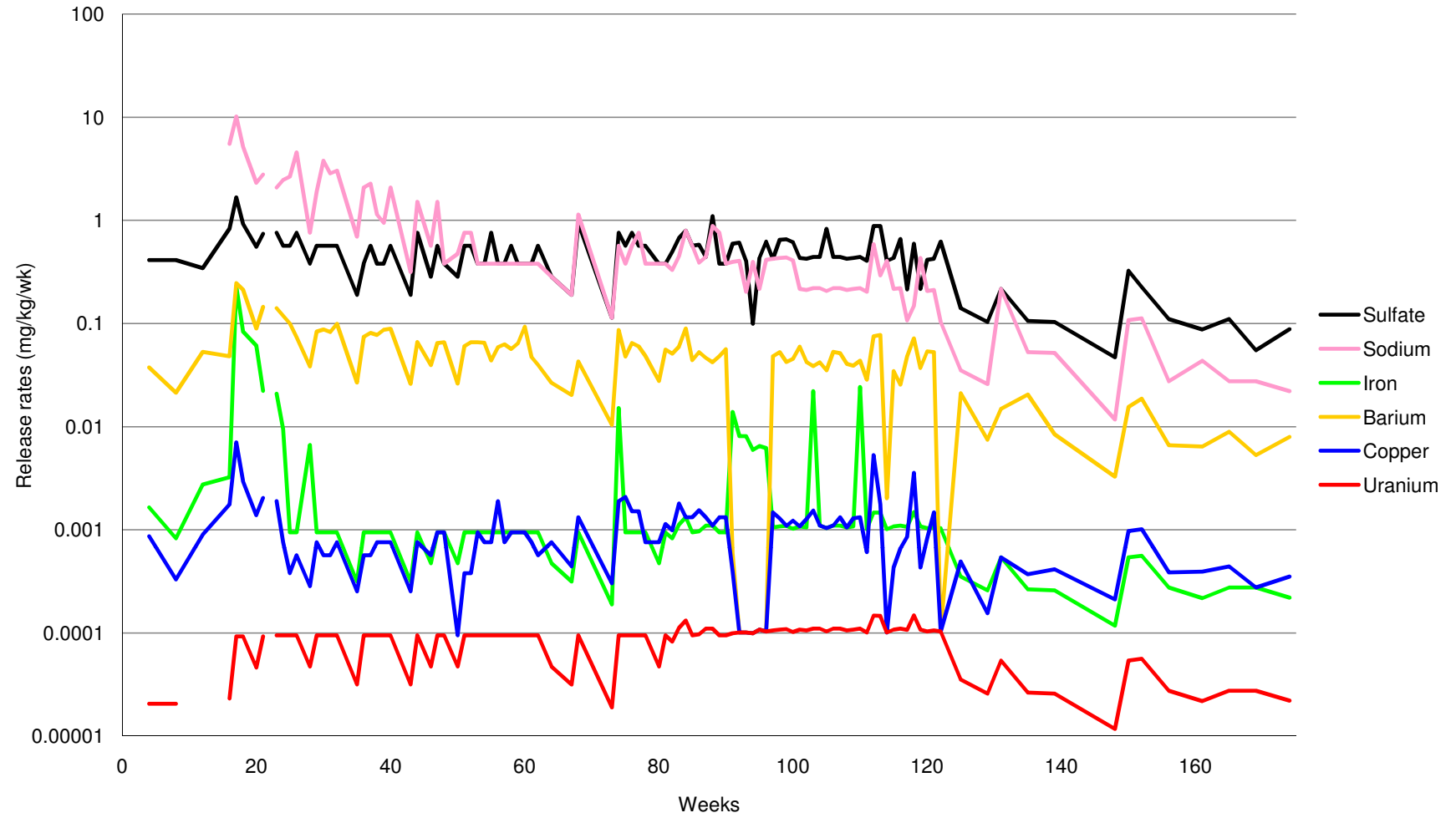
OD_2 148207 (GRNL)



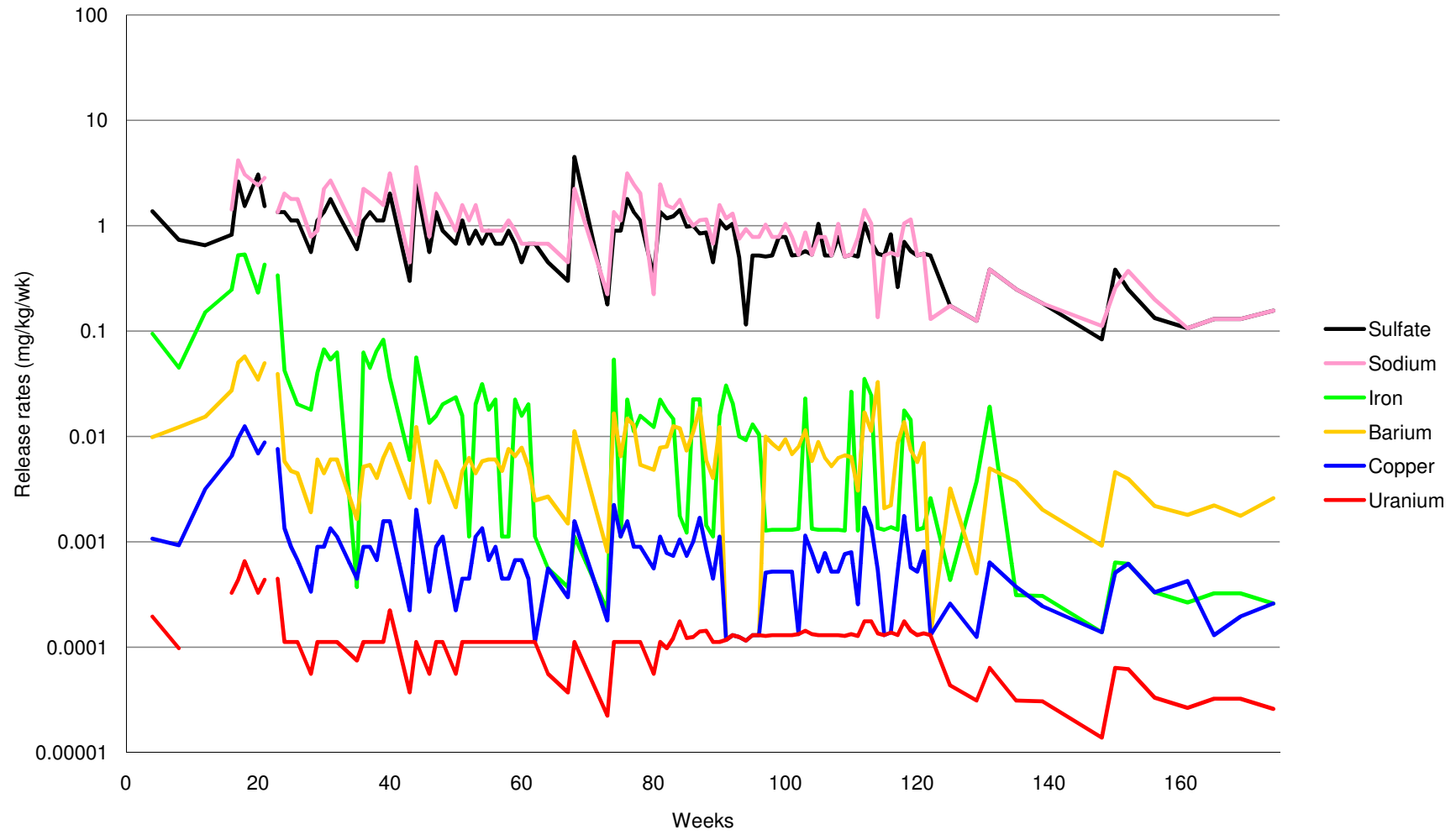
OD_3 148194 (HEM)



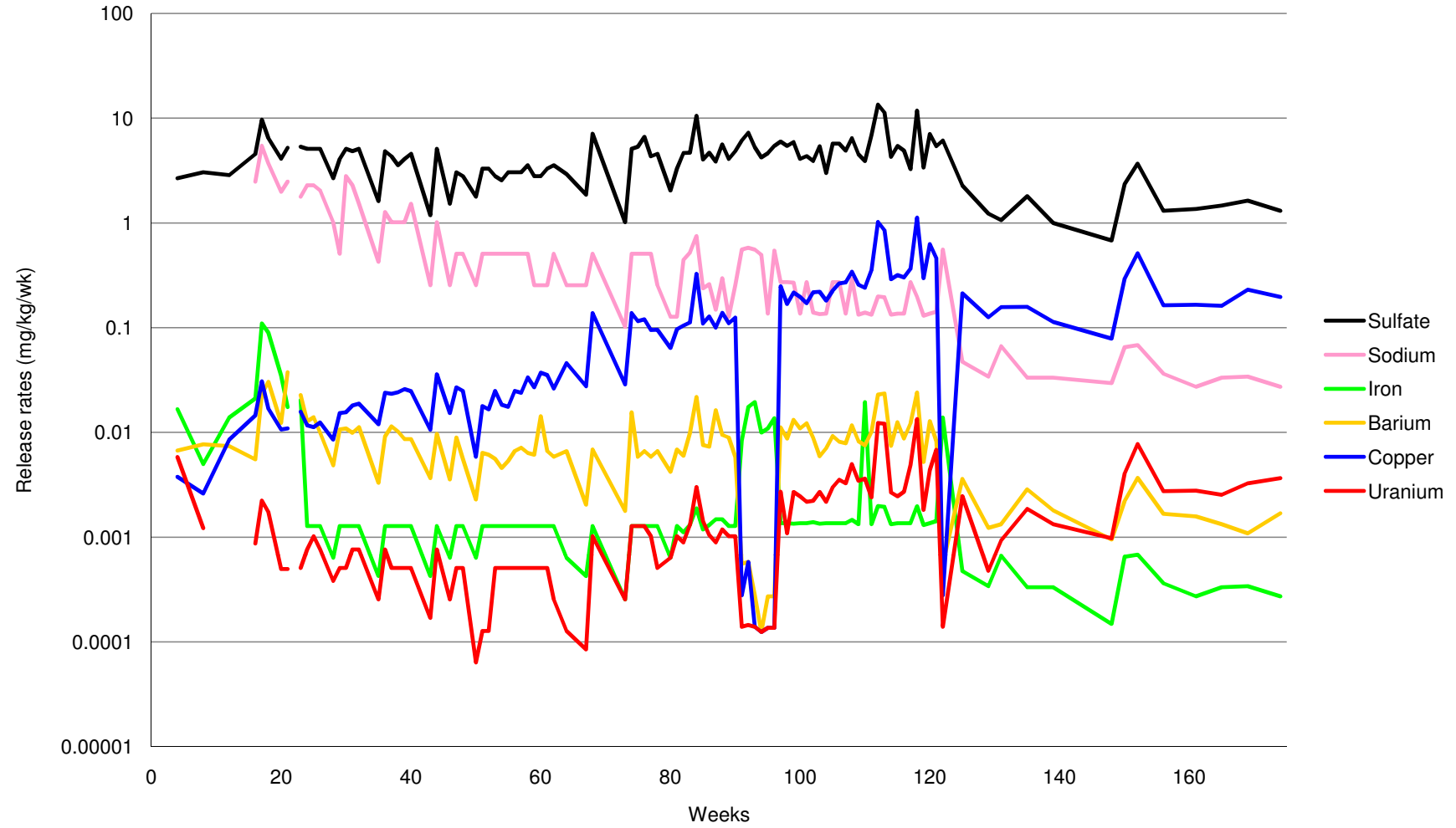
OD_10 HEMQ



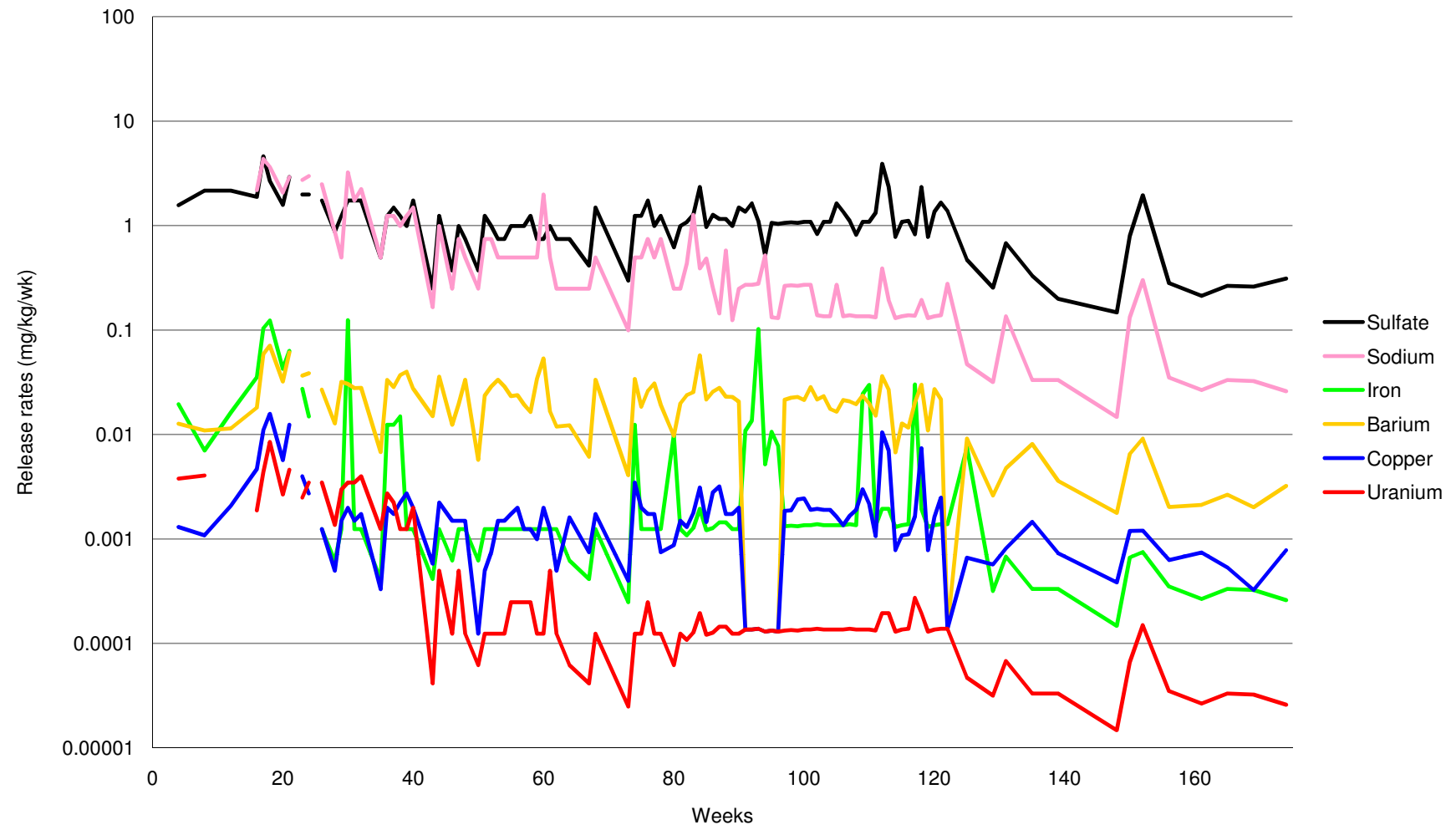
OD_11 HEMH



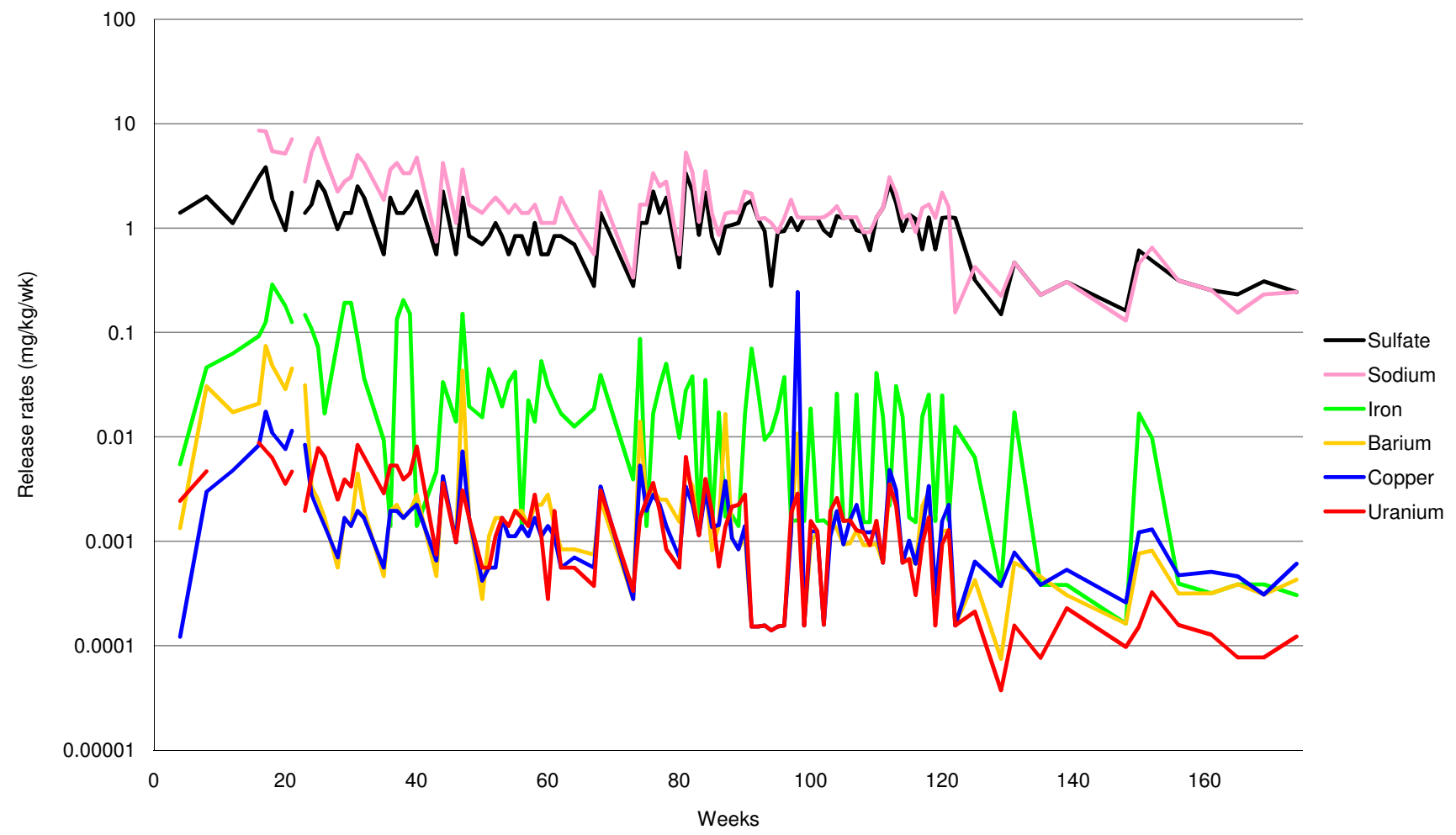
OD_12 GRNH



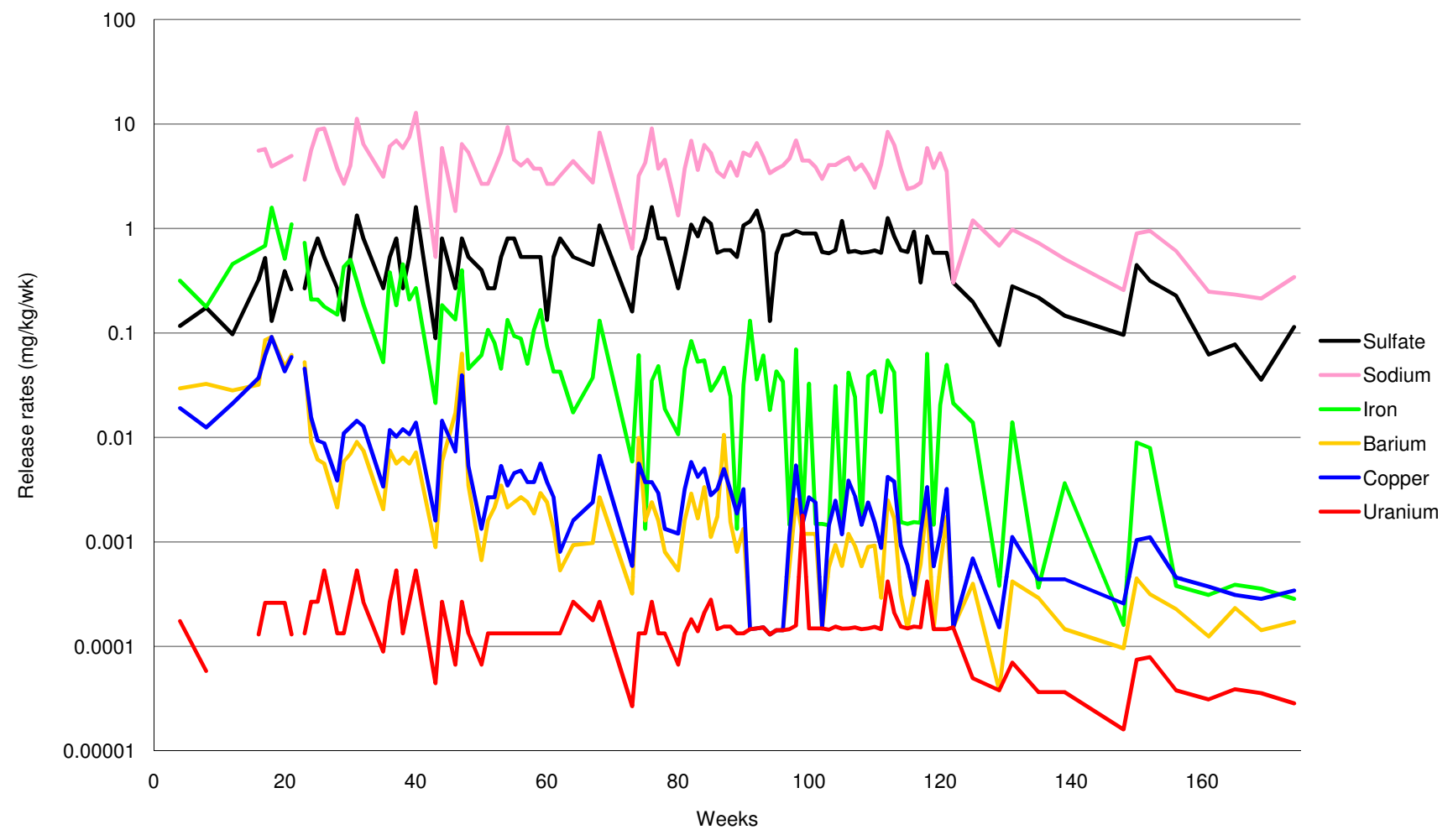
OD_13 GRNB



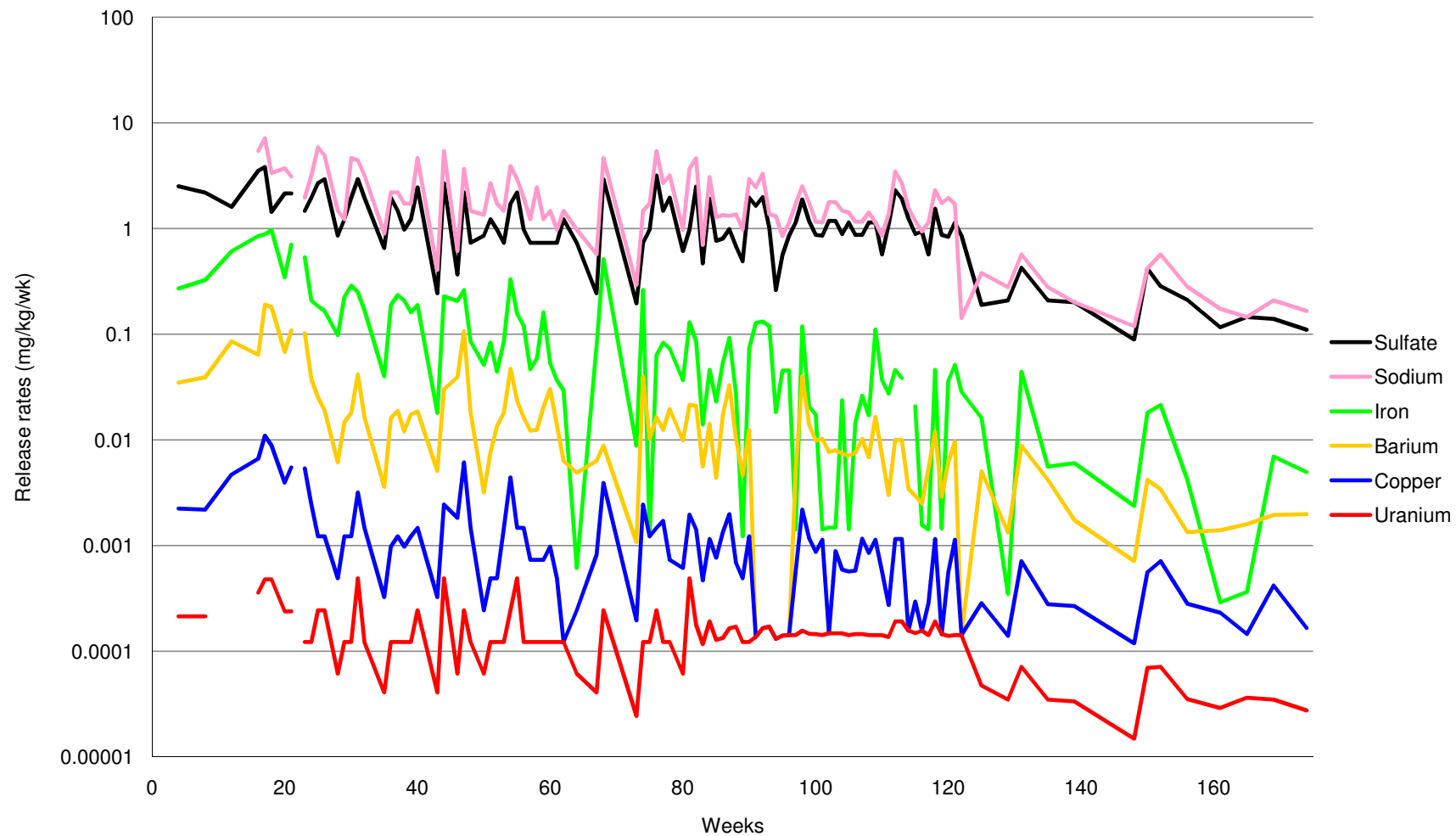
OD_14 GRNL



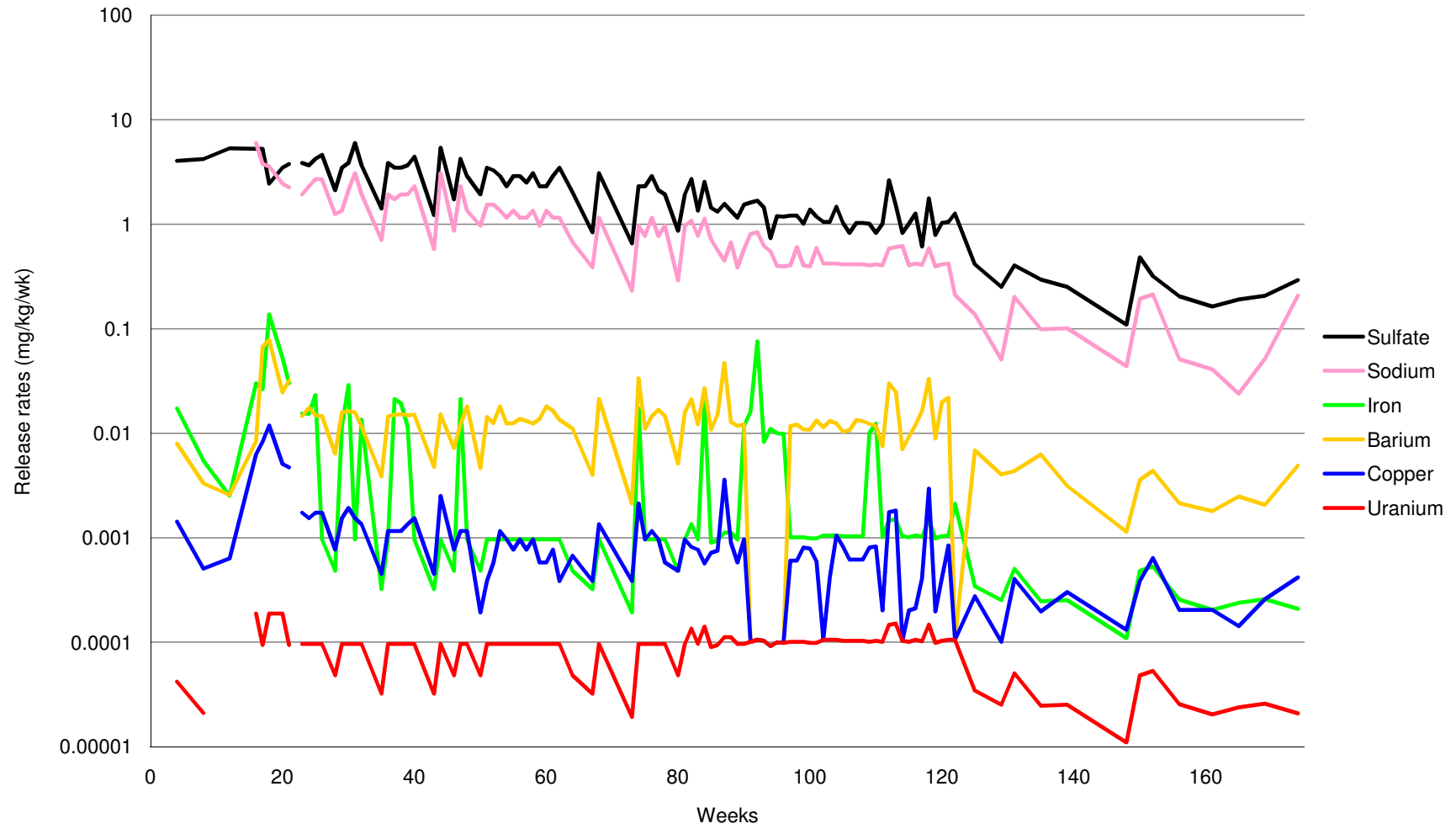
OD_15 KASH



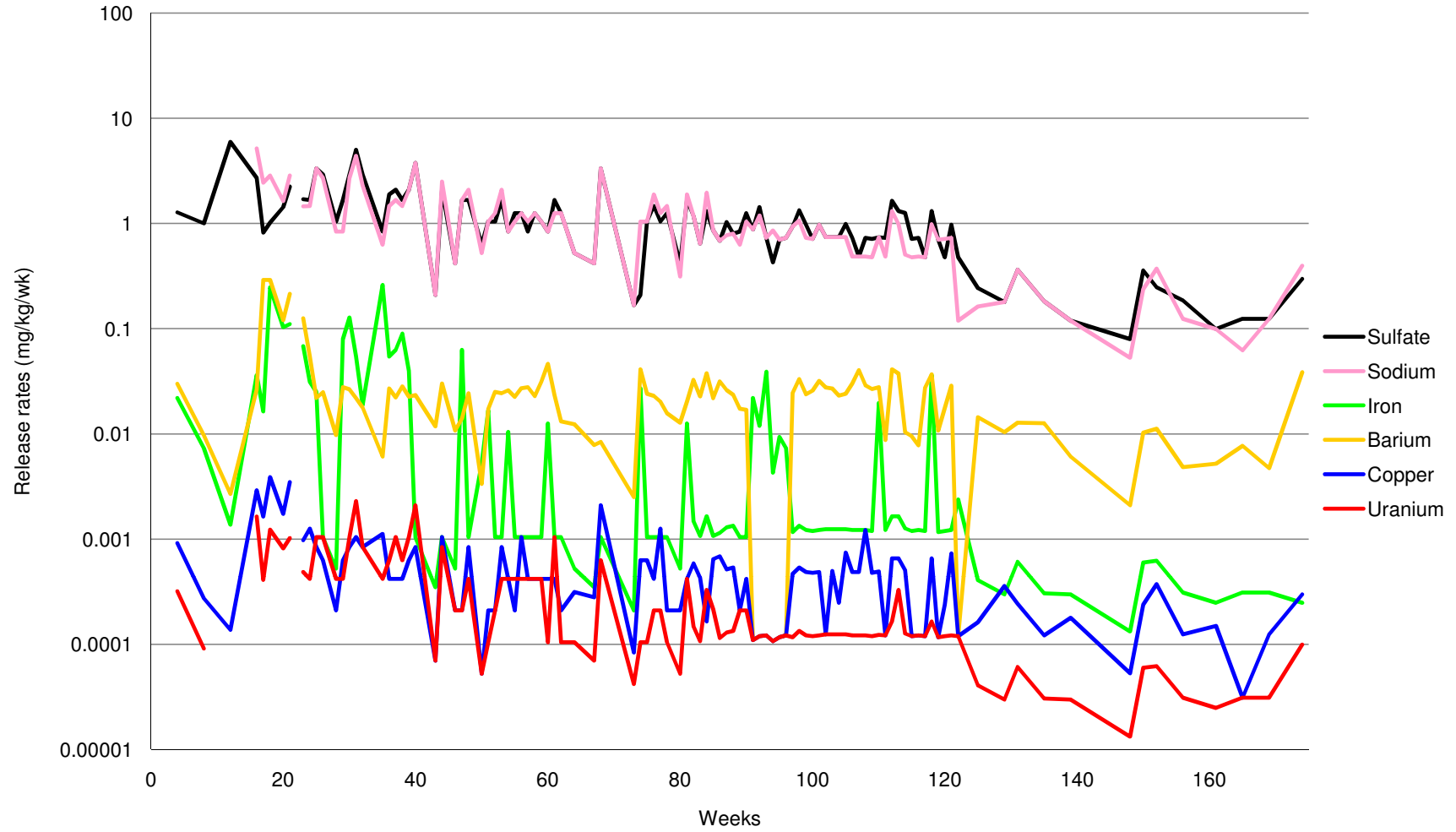
OD_16 KASH Laminated



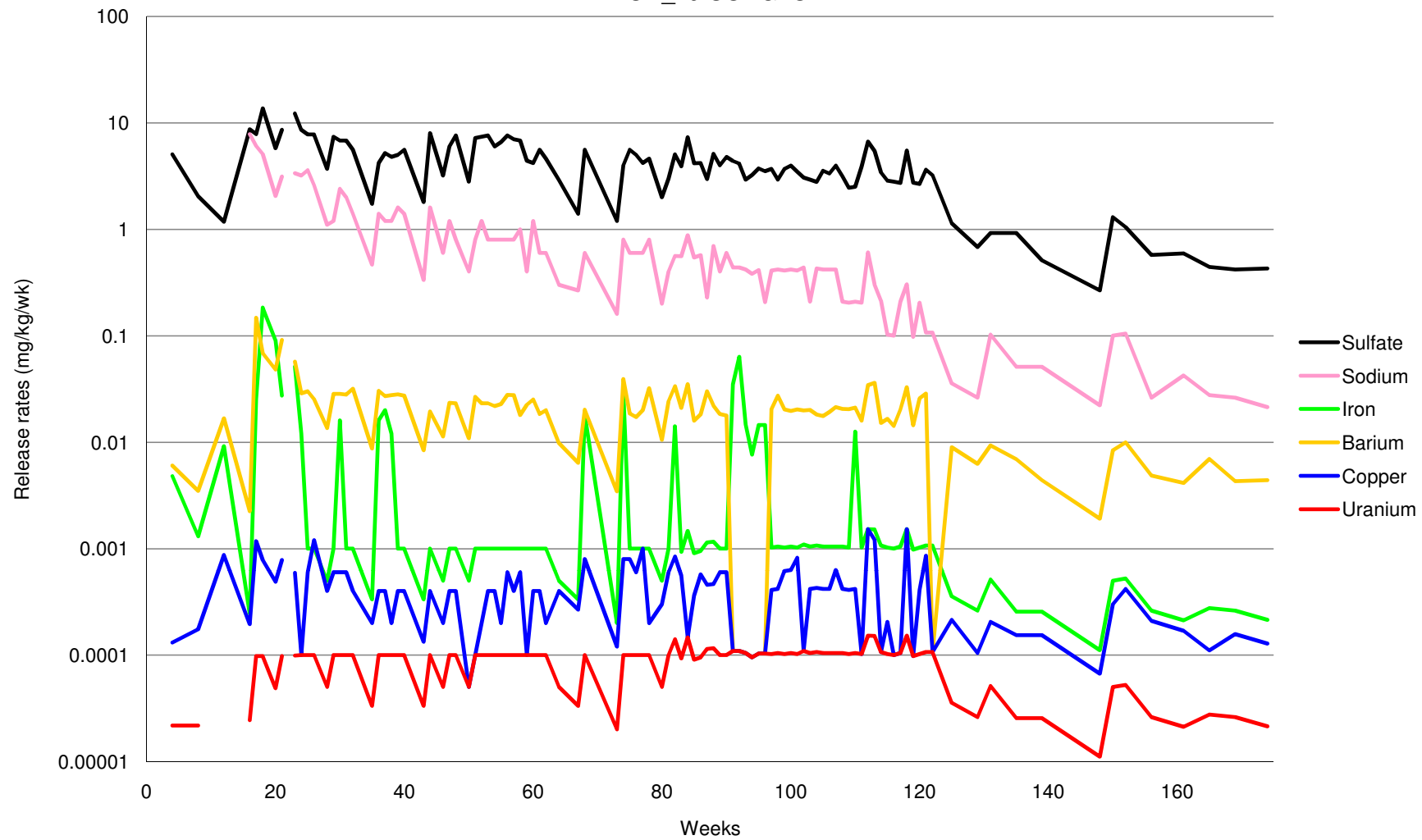
OD_17 VHEM



OD_18 KEMQI VASH



OD_19 CONGLO



Appendix D

QA/QC

1.0 Introduction

The following sections describe the components of the quality assurance and quality control procedures implemented for the kinetic testing. Quality assurance (QA) refers to the implementation of checks on the success of quality control (QC), which is largely concerned with maintaining the integrity of the sample. QA/QC protocols apply to both the sampling and the laboratory component.

2.0 Data Quality Indicators

Project data quality indicators (DQIs) have been established to ensure high quality sample collection and laboratory procedures (Table D-1).

Table D-1: Data Quality Indicators for Sampling and Laboratory Analyses

DQI	Sampling	Laboratory
Completeness	Experienced sampler Documentation Correct	All critical samples analysed Appropriate methods Sample documentation complete Sample holding times complied with standard procedures
Comparability	Experienced Sampler	Sample analytical methods used (including clean-up) Same NAT accredited laboratory Same units
Precision		Laboratory duplicate samples Laboratory control samples
Accuracy		Method blanks Matrix spikes Laboratory control samples

3.0 Sampling

3.1 Sampling Details

Leachate samples were collected weekly from week 16 (14 August 2006) to week 122 (15 to 19 December 2008), the exception being for the following weeks where no samples were collected:

- Week 65 and 66
- Week 69 to 72 (Christmas 2007 break)
- Week 79 (25 to 29 February 2008)

Leachate samples were then collected on a monthly basis from week 122 to week 174 (14 to 18 December 2009).

The sampling was undertaken by a qualified and experienced AECOM geoscientist or environmental technician.

3.2 Sample Handling and Preservation


Samples were suction filtered through 0.45 µm filters and were immediately placed into laboratory prepared and supplied sample containers appropriate for each analyte. The unpreserved bottles were filled so that no headspace remained. Samples for metals analysis were placed in nitric acid preserved bottles supplied by the laboratory.

Filled sample bottles were placed in a chilled, insulated container with ice for transport to the laboratory. Samples were preserved for the various analytes in accordance with the requirements of American Public Health Association (APHA, 2005) as detailed in the **Table D-2** below.

Table D-2: Data Quality Indicators for Sampling and Laboratory Analyses

Analytes	Container	Preservation
All metals	125 mL plastic bottle	Nitric Acid (HNO ₃), chill to 4°C
Acidity, alkalinity, chloride, fluoride, pH, phosphorus, sulphate, silica	250 mL plastic bottle	Unpreserved, chill to 4°C

Samples codes, preservation and analytical requirements were recorded on the chain of custody (CoC) documentation (Figure D-1), which accompanied the samples to the laboratory.

CLIENT: ENSR AECOM		SAMPLER: Nicole Johnston		 ALS Laboratory Group											
ADDRESS / OFFICE: Level 1, 53-57 Berwick Street		MOBILE:													
PROJECT MANAGER (PM): Peter Scott		PHONE: 36068903		EMAIL REPORT TO: micaela.preda@ensr.aecom.com and peter.scott@ensr.aecom.com EMAIL INVOICE TO: micaela.preda@ensr.aecom.com and accounts@ensr.aecom.com											
PROJECT ID: B4386		P.O. No.: 1400502													
SITE: Olympic Dam		ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)		Notes: e.g. Highly contaminated samples e.g. "High PAHs expected". Extra volume for QC or trace LORs etc.											
RESULTS REQUIRED (Date):		QUOTE NO.:													
FOR LABORATORY USE ONLY		COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:													
COOLER SEAL (note appropriate):															
Intact: <input checked="" type="checkbox"/> No: <input type="checkbox"/> N/A				Disolved metals (Calcium, Iron, Magnesium, Phosphorus, Potassium, Sodium, Aluminium, Antimony, Arsenic, Barium, Cerium, Cobalt, Copper, Lanthanum, Lead, Manganese, Molybdenum, Nickel, Strontium, Thorium, Uranium, Vanadium, Zinc) Solids and chloride Silicon Phosphate											
SAMPLE TEMPERATURE															
CHILLED: <input checked="" type="checkbox"/> No: <input type="checkbox"/>															
SAMPLE INFORMATION (note: S = Soil, W=Water)		CONTAINER INFORMATION													
ALS ID	SAMPLE ID	MATRIX	DATE			Time	Type / Code	Total bottles	PH	EC	Total alkalinity	Acidity	Solids and chloride	Silicon	Phosphate
1	148187	water	7/08/2008				green&red	2	x	x	x	x	x	x	x
2	148207	water	7/08/2008				green&red	2	x	x	x	x	x	x	x
3	148194	water	7/08/2008				green&red	2	x	x	x	x	x	x	x
4	HEMQ	water	7/08/2008				green&red	2	x	x	x	x	x	x	x
5	HEMH	water	7/08/2008				green&red	2	x	x	x	x	x	x	x
6	GRNH	water	7/08/2008		green&red	2	x	x	x	x	x	x	x		
7	GRNB	water	7/08/2008		green&red	2	x	x	x	x	x	x	x		
8	GRNL	water	7/08/2008		green&red	2	x	x	x	x	x	x	x		
9	KASH	water	7/08/2008		green&red	2	x	x	x	x	x	x	x		
10	KASH Laminated	water	7/08/2008		green&red	2	x	x	x	x	x	x	x		
11	CONGLO	water	7/08/2008		green&red	2	x	x	x	x	x	x	x		
12	KEMQI VASH	water	7/08/2008		green&red	2	x	x	x	x	x	x	x		
13	VHEM	water	7/08/2008		green&red	2	x	x	x	x	x	x	x		
RELINQUISHED BY:		RECEIVED BY:		METHOD OF SHIPMENT											
Name: <i>Nicole Johnston</i>		Name: <i>Christon HCS</i>		Date: 7.8.08											
Of: ENSR Australia		Of: <i>HCS</i>		Time: 16:30											
Name:		Name:		Date:											
Of:		Of:		Time:											
Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved;		V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;		Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.											

ALS LABORATORY GROUP

COC Page _1_ of _1_

FNFM / 20/4/5/

Figure D-1: CoC form completed for all leachate data sets sent to the laboratory

3.3 Calibration

3.3.1 Water Quality Meter

Measurement of leachate physio-chemical parameters was undertaken using a WP 81 TPS water quality meter. It was successfully calibrated with pH buffers 4.01 and 6.88, and electrical conductivity (EC) 2.76 mS/cm solution each time measurements were taken.

4.0 Laboratory QA/QC

The laboratory data review covered a total of 33 batches from week 103 (07 August 2008) to week 174 (17 December 2009)..

4.1 Analytical Laboratory

Samples were submitted to Australian Laboratory Services (ALS) in Stafford, Queensland.

The ALS NATA accreditation number is 825; its analytical procedures are based on well established internationally recognised procedures such as those published by APHA (2005) and National Environmental

Protection Measures (NEPM, 1999). In house procedures are employed by ALS in the absence of documented standards.

4.2 Analytical Methods

The analytical methods included physico-chemical measurements and chemical analysis of cations (major, minor and trace metals) and anions. Details are presented in

Table D-3 Laboratory Method References

Analyte	Reference	ALS Method Code	Limit of Reporting
pH	APHA 4500-H ⁺ B	EA005	0.01 (pH unit)
Electrical Conductivity	APHA 2510 B	EA010P	1 µS/cm
Total Alkalinity	APHA 2320 B	ED037P	1 mg/L
Acidity	APHA 2310 B	ED038A	1 mg/L
Silicon	APHA 3120	ED040F	0.05 mg/L
Sulfate	APHA 3120	ED040F	1 mg/L
Chloride	APHA 4500-Cl ⁻ - B	ED045P	1 mg/L
Ca, Mg, Na, K	3120 Ca-B / 3120 Mg-B / 3120 Na-B / 3120 K-B	ED093F	1 mg/L
Total Phosphorus	APFA 4500-P H	EG005F	1 mg/L
Silica	USEPA 1983B-365.1	EG052F	0.1 mg/L
Fluoride	APHA 4500-F ⁻ C	EK040P	0.1 mg/L
Al, Sb, As, Ba, Ce, Co, Cu, Fe, La, Pb, Mn, Mo, Ni, Sr, Th, U, Y, Zn	USEPA 6020 ICP/AES	EG020F	0.001 to 0.05 mg/L

4.3 Ionic Balance

Ionic balances were undertaken on all flush water results. Ionic balance checks were undertaken from week 103 to 174 and compared to the initial ionic balance checks.

Ionic strengths reduced from week 58 onwards and a greater number of analytes were close to or below the limits of reporting. This resulted in ionic balance discrepancies at the end of the program. Overall, ionic balance checks identified that the laboratory data were acceptable, with kinetic columns that represent major rock units (by mass) exhibiting a median error of 10-23%, which is considered acceptable as the results were close to or below the limits of reporting. **Table D-4** presents summary statistics of the ionic balance error.

Table D-4: Ionic Balance Percent Error (median)

Column	Week 0-64	Week 103-174
OD_1 148187 (HEMH)	0.5 %	38.5 %
OD_2 148208 (GNRL)	0.5 %	28.6 %
OD_3 148194 (HEM)	0.5 %	29.7 %
OD_10 HEMQ	7.6 %	23.1%
OD_11 HEMH	0.5 %	18.5 %
OD_12 GRNH	3.5 %	10.6 %
OD_13 GRNB	13.7%	22.6 %
OD_14 GRNL	0.5 %	15.9 %

Column	Week 0-64	Week 103-174
OD_15 KASH	0.8 %	5.8 %
OD_16 KASH laminated	0.8 %	10.7 %
OD_17 VHEM	1.4 %	13.7 %
OD_18 KEMQI VASH	0.8 %	20.9 %
OD_19 CONGLO	0.2 %	7.1 %

1. Bold values indicate samples representing significant mass within the RSF

4.4 Laboratory Method Blanks

Laboratory or control blanks consist of reagents specific to each individual analytical method and are prepared and analysed by laboratories in the same manner as regular samples. The preparation and analysis of laboratory blanks enables the measurement of contamination within the laboratory.

Laboratory blanks were generally analysed at a frequency of 1 in 10, with a minimum of one analysed per batch.

Review of all the laboratory QA/QC reports indicated that the results for all method blanks were below the laboratory detection limit.

4.5 Laboratory Duplicates

Laboratory duplicate samples are prepared in the laboratory by splitting a field sample and analysing it as two independent samples. The analysis of laboratory duplicate samples provides an indication of analytical precision and may be influenced by sample heterogeneity. The laboratory duplicate relative percent differences (RPDs) are used to assess laboratory precision.

Laboratory duplicates were generally analysed at a frequency of 1 in 10, with a minimum of one analysed per batch. Analysis frequency was not respected for the following week:

- Week 103: major anions and cations analyses – 3 duplicates analysed instead of 4; however on a batch basis (13 samples) ALS complies with the NEPM requirements.
- Week 105: chloride analysis - 3 duplicates analysed instead of 4; however on a batch basis (13 samples) ALS complies with the NEPM requirements.
- Week 113: chloride analysis – 2 duplicates analysed instead of 3, however on a batch basis (13 samples) ALS complies with the NEPM requirements.
- Week 114: pH analysis – 3 duplicates analysed instead of 4, however on a batch basis (13 samples) ALS complies with the NEPM requirements.
- Week 122: fluoride analysis – 1 duplicate analysed instead of 2 and on a batch basis (13 samples) ALS does not comply with the NEPM requirements.
- Week 148: fluoride analysis – 1 duplicate analysed instead of 2 and on a batch basis (13 samples) ALS does not comply with the NEPM requirements.

Review of all the laboratory QA/QC reports indicated that the RPDs for all laboratory duplicate samples ranged from 0 to 100 and were within the acceptance criteria.

The permitted ranges for the RPD of laboratory duplicates (relative percent deviation) are dependent on the magnitude of results in comparison to the level of reporting:

- result < 10 times limit of recovery (LOR), no limit
- result between 10 and 20 times LOR, 0% - 50%
- result > 20 times LOR, 0% - 20%

The non compliance with the frequency of analysis on two occasions out of 33 is considered acceptable and not to have an adverse impact on the data quality as the RPD results all fell within the acceptance criteria.

4.6 Laboratory Control Samples

Laboratory control samples (LCS) or quality control check samples are prepared within the laboratory by spiking an aliquot of an appropriate clean matrix reagent with known concentrations of specific analytes. The LCS sample is then analysed and the results are used to assess the laboratory performance on sample preparation and analysis procedure. Certified reference material may also be used to assess analytical accuracy independent of the investigations. Accuracy is assessed by calculation of percent recovery.

LCSs were generally analysed at a frequency of 1 in 20, with a minimum of one analysed per analytical batch.

Review of the entire laboratory QA/QC reports indicated that the percent recoveries for laboratory control samples were within the acceptance criteria except for the weeks listed in **Table D-5**.

Table D-5: LCS non compliances

Week	Analytes	Recovery (%)	Accepted limits (%)	ALS Comment	AECOM Conclusion
103	Antimony	85.2	87.7 – 114	Recovery less than lower control limit	Marginal under-estimation of concentrations – no adverse impacts on data quality
103	Arsenic	118	79.6 – 115	Recovery greater than upper control limit	Over-estimation of concentrations leading to more conservative approach – no adverse impact on data quality
106	Antimony	121	87.7 – 114	Recovery greater than upper control limit	Over-estimation of concentrations leading to more conservative approach – no adverse impact on data quality
	Arsenic	130	79.6 – 115		
	Cobalt	119	86.6 – 117		
	Lead	123	84.4 - 117		
	Molybdenum	126	89.6 – 110		
	Nickel	120	86.3 - 118		
106	Strontium	82.4	84.1 – 116	Recovery less than lower control limit	Marginal under-estimation of concentrations – no adverse impacts on data quality
107	Copper	122	85 – 117	Recovery greater than upper control limit	Over-estimation of concentrations leading to more conservative approach – no adverse impact on data quality
114	Antimony	123	87.7 – 114	Recovery greater than upper control limit	Over-estimation of concentrations leading to more conservative approach – no adverse impact on data quality
	Lead	124	84.4 - 117		
116	Total Alkalinity	118	77.5 – 112	Recovery greater than upper control limit	Over-estimation of concentrations leading to more conservative approach – no adverse impact on data quality
122	Acidity	105	95 – 105	Recovery greater than upper control limit	Over-estimation of concentrations leading to more conservative approach – no adverse impact on data quality
125	Fluoride	116	76 – 116	Recovery greater than upper control limit	Over-estimation of concentrations leading to more conservative approach – no adverse impact on data quality

Week	Analytes	Recovery (%)	Accepted limits (%)	ALS Comment	AECOM Conclusion
165	Chloride	81.3	90 – 110	Recovery less than lower control limit	Marginal under-estimation of concentrations – no adverse impacts on data quality
174	Chloride	82.7	90 – 110	Recovery less than lower control limit	Marginal under-estimation of concentrations – no adverse impacts on data quality

4.7 Matrix Spikes

Matrix spikes are samples prepared within the laboratory by dividing a field sample into two aliquots, then spiking each with identical concentrations of the analytes. The matrix spike and matrix spike duplicate are then analysed separately and the results compared to determine the effects of the sample matrix on the accuracy and precision of the analytes. Accuracy is assessed by the calculation of the percent recovery.

Review of the entire laboratory QA/QC reports indicated that the matrix spike recoveries were within the acceptance criteria except for the weeks listed in **Table D-6**.

Table D-6 MS non compliances

Week	Analytes	Recovery (%)	Accepted limits (%)	ALS Comment	AECOM Conclusion
105	Copper	Not Determined	---	MS recovery not determined, background level greater than or equal to 4 times the spike level	Spike levels lower than actual target analyte concentration – under-estimation of concentrations unlikely - no adverse impact on data quality
106	Copper Manganese Zinc	Not determined	---	MS recovery not determined, background level greater than or equal to 4 times the spike level	Spike levels lower than actual target analyte concentration – under-estimation of concentrations unlikely - no adverse impact on data quality
107	Copper	Not Determined	---	MS recovery not determined, background level greater than or equal to 4 times the spike level	Spike levels lower than actual target analyte concentration – under-estimation of concentrations unlikely - no adverse impact on data quality
111	Chloride Manganese	Not Determined	---	MS recovery not determined, background level greater than or equal to 4 times the spike level	Spike levels lower than actual target analyte concentration – under-estimation of concentrations unlikely - no adverse impact on data quality
112	Copper	Not Determined	---	MS recovery not determined, background level greater than or equal to 4 times the spike level	Spike levels lower than actual target analyte concentration – under-estimation of concentrations unlikely - no adverse impact on data quality
113	Copper	Not Determined	---	MS recovery not determined, background level greater than or equal to 4 times the spike level	Spike levels lower than actual target analyte concentration – under-estimation of concentrations unlikely - no adverse impact on data quality

Week	Analytes	Recovery (%)	Accepted limits (%)	ALS Comment	AECOM Conclusion
116	Copper	Not Determined	---	MS recovery not determined, background level greater than or equal to 4 times the spike level	Spike levels lower than actual target analyte concentration – under-estimation of concentrations unlikely - no adverse impact on data quality
119	Aluminium	Not Determined	---	MS recovery not determined, background level greater than or equal to 4 times the spike level	Spike levels lower than actual target analyte concentration – under-estimation of concentrations unlikely - no adverse impact on data quality
120	Chloride	Not Determined	---	MS recovery not determined, background level greater than or equal to 4 times the spike level	Spike levels lower than actual target analyte concentration – under-estimation of concentrations unlikely - no adverse impact on data quality
121	Manganese Fluoride	Not Determined	---	MS recovery not determined, background level greater than or equal to 4 times the spike level	Spike levels lower than actual target analyte concentration – under-estimation of concentrations unlikely - no adverse impact on data quality
122	Chloride Aluminium Zinc	Not Determined	---	MS recovery not determined, background level greater than or equal to 4 times the spike level	Spike levels lower than actual target analyte concentration – under-estimation of concentrations unlikely - no adverse impact on data quality
131	Manganese	Not Determined	---	MS recovery not determined, background level greater than or equal to 4 times the spike level	Spike levels lower than actual target analyte concentration – under-estimation of concentrations unlikely - no adverse impact on data quality
148	Chloride	Not Determined	---	MS recovery not determined, background level greater than or equal to 4 times the spike level	Spike levels lower than actual target analyte concentration – under-estimation of concentrations unlikely - no adverse impact on data quality
150	Chloride	Not Determined	---	MS recovery not determined, background level greater than or equal to 4 times the spike level	Spike levels lower than actual target analyte concentration – under-estimation of concentrations unlikely - no adverse impact on data quality
169	Copper	Not Determined	---	MS recovery not determined, background level greater than or equal to 4 times the spike level	Spike levels lower than actual target analyte concentration – under-estimation of concentrations unlikely - no adverse impact on data quality

4.8 Holding Times

NEPM (1999), APHA 21st Edition and AS2031.1-1986 recommend holding times for various analyses (under specified conditions, for example below 4°C in an airtight container), which must be met in order to consider the results valid. The holding times may vary slightly depending on the document referenced.

Review of all laboratory QA/QC reports indicated pH were consistently analysed outside the recommended holding time. However it does not have an adverse impact on the data quality as field pH were recorded and used in the calculations.

5.0 Data Validation

The overall assessment of the quality of the data obtained during this investigation is discussed below in terms of the data quality indicators provided in **Table D-7**.

Table D-7: Data validation procedures

DQI	Description	Compliance
Completeness	Completeness is a measure of the amount of usable data (expressed as %) from a data collection activity.	<p>The completeness of data is defined as the percentage of analytical results that are considered valid. Valid chemical data are values that have been identified as acceptable or acceptable as qualified during the data validation process. The completeness is a comparison of the total number of samples accepted against the total number of samples, calculated as a percentage. The project goal for completeness is 95%. Completeness also includes checking that all entries in the data tables are correct, properly entered, and that any typographical errors are corrected and the data are re-entered properly, as required.</p> <p>All samples collected and analysed complied with the DQIs, as such the data obtained are considered to be sufficiently quantitative and complete for the purposes of this investigation (i.e. >95%)</p>
Comparability	Comparability is the confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event.	<p>Comparability expresses the confidence with which one data set can be compared with another. In order to assess comparability, sampling procedures, laboratory sample preparation procedures, analytical procedures, and reporting units must be known and similar to established protocols, as was the case during this investigation. Qualitatively, data subjected to strict QA/QC procedures will be deemed more reliable, and therefore more comparable, than other data.</p> <p>The sampling was conducted by an AECOM geoscientist or environmental technician in accordance with the standard sampling and analysis procedures. Each analyte was analysed by the same analytical laboratory using identical methods and laboratory LORs were consistent over each laboratory batch.</p> <p>Based on the above, the data obtained throughout the investigation are considered to be suitably comparable.</p>
Precision	Precision is a quantitative measure of the variability (or reproducibility) of data.	<p>Precision or variability of the data was assessed by determining RPDs between the original and duplicate samples analysed.</p> <p>Based on results discussed above, AECOM considers that the precision of the data are sufficient for the purposes of this investigation.</p>
Accuracy	Accuracy is a quantitative measure of the closeness of reported data to the true value.	<p>Accuracy of the data was assessed through review of the laboratory QA/QC results.</p> <p>Based on results discussed above, AECOM considers that the accuracy of the data are sufficient for the purposes of this investigation.</p>

Based on an assessment of field and laboratory QA/QC data, the reported analytical results are considered, by achievement of the DQIs, to be reliable and representative of concentrations of the compounds analysed in the leachates sampled.

6.0 Data Integrity

Errors of transcription between laboratory supplied data and the analysis spreadsheets were checked via a random selection of approximately 10% of all analytes. The original values from ALS reports for random weeks were transposed into a separate spreadsheet, then the coinciding values from the database were compiled alongside the ALS columns and each cell was compared for consistency. Data samples were taken from weeks 103 to 174. No discrepancies were found.

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