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WIRRALIE GOLD MINE

Waste Rock Characterisation

Report Prepared for:



Date:
February 2022

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SUMMARY OF RELEVANT INFORMATION

Project Title	Wirralie Gold Mine – Waste Rock Characterisation
Property Location	Wirralie Gold Mine
Property Description	Open-cut gold mine
Project Purpose	Conduct a geochemical waste rock characterisation study to support the progressive rehabilitation and closure plan for the Wirralie Gold Mine.
Project Number	21078
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DOCUMENT CONTROL

Version	Compiled by	Date issued	Reviewer(s)	Date returned
Draft 1	A. Barnes	20/09/2021	Dr C. Cuff Dr J. Jaffrés	21/09/2021
Draft 2	A. Barnes	21/09/2021	Scott Hayes-Stanley	21/09/2021
Draft 3	A. Barnes	1/12/2021	Dr J. Jaffrés	3/12/2021
Draft 4	A. Barnes	25/01/2022	Scott Hayes-Stanley	24/02/2022
FINAL	A. Barnes	24/02/2022	-	-

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EXECUTIVE SUMMARY

C&R Consulting Pty Ltd (C&R) were commissioned by Wulguru Technical Services (WTS) to undertake a geochemical waste rock characterisation study of the Wirralie Gold Mine (Wirralie). This study will form part of the progressive rehabilitation and closure plan (PRCP) and associated estimated rehabilitation cost (ERC) that WTS are currently preparing on behalf of Wirralie's current owners, Solomons Gold Pty Ltd.

In accordance with the Queensland Department of Environment and Science (DES) *Guideline – Progressive rehabilitation and closure plans (PRC plans)* (DES, 2021), this waste rock characterisation study has been undertaken to:

“Characterise mine wastes in a report that describes the likely physical behaviour and chemical reactivity of the waste materials under the conditions in which they would be stored. The report must address the constituent elements present, and their likely future speciation and mobility.”

To achieve this, 155 rock/sediment samples were collected from 82 sampling locations, including the Wirralie waste rock dumps (WRDs), heap leach pad (HLP), former run-of-mine (ROM), haul road and tailings surface facility (TSF). These samples were tested in a National Association of Testing Authorities (NATA) accredited laboratory for a range of static and kinetic geochemical properties, including acid generation, salinity and metal/metalloid concentrations.

The undertaken geochemical testwork identifies that all of the Wirralie waste rock samples have similar physical and geochemical characteristics, apart from those obtained from the TSF. This is to be expected given that most waste rock areas are constructed of the same lithology (volcaniclastic sediment), whereas the TSF waste consists of processed (mineralised) ore.

The static geochemical results indicate that:

- All waste rock areas, including the TSF, are overwhelmingly (98%) non-acid forming;
- All waste rock areas, excluding the TSF, are not particularly saline (mean of 137 $\mu\text{S}/\text{cm}$), whereas the TSF has a much higher salinity (mean of 1,592 $\mu\text{S}/\text{cm}$) and may present salinity issues;
- All waste rock areas, including the TSF, have significant arsenic enrichment. However, all of the levels are still below the National Environment Protection Measure (NEPM) health-based investigation level (HIL) for 'Recreational C' (public open space scenario) of 300 mg/kg (National Environment Protection Council [NEPC], 2013); and
- All waste rock areas, excluding the TSF, are not particularly enriched with respect to any of the other metals/metalloids analysed.

Further to this, when comparing the TSF static testwork to the other waste rock areas:

- The arsenic enrichment in the TSF is more frequent and occurring at higher mean concentration of 114 mg/kg;
- The arsenic enrichment in the TSF is accompanied by mercury enrichment, although these mercury levels are still below NEPM HIL 'Residential A' (residential garden scenario) of 10 mg/kg (NEPC, 2013); and
- Historical static geochemical samples undertaken on the TSF were also significantly enriched with respect to arsenic, mercury, antimony and selenium (Environmental Geochemistry International [EGI], 2002).

The kinetic geochemical results demonstrate that:

- The kinetic results from waste rock areas – excluding the TSF – compare well with the static results, indicating a level chemical stability.

However, the TSF kinetic geochemical results are quite different and indicate that:

- The pH levels of the TSF are attributed to minor levels of developing or residual acidity;
- The electrical conductivity of TSF leachate does increase over time. Therefore, the static results are underestimating salinity levels;
- The high arsenic and mercury concentrations – as detected in the TSF static testwork – are relatively immobile; and
- The TSF is significantly enriched with respect to selenium – and most likely cadmium.

1. INTRODUCTION

1.1 BACKGROUND INFORMATION

C&R Consulting Pty Ltd (C&R) have been asked to undertake a geochemical waste rock characterisation study of the Wirralie Gold Mine (Wirralie), on behalf of Wulguru Technical Services (WTS). This study will form part of the progressive rehabilitation and closure plan (PRCP) and associated estimated rehabilitation cost (ERC) that WTS are currently preparing on behalf of Wirralie's current owners, Solomons Gold Pty Ltd.

Wirralie is located in north Queensland, approximately 210 km (280 km by road) south of Townsville and 40 km north of the historical gold mining township of Mt Coolon. Surface gold mineralisation was discovered at Wirralie by Australian Consolidated Minerals Limited in March 1986, with mining commencing in November 1987 (Fellows and Hammond, 1990).

Following the initial commencement of mining, a number of different owners acquired and mined the ore body between 1987 and 1993 – and between 1999 and 2001. During this time, all mined ore was treated by an on-site, conventional carbon-in-leach (CIL) mill. The Wirralie site was placed into care and maintenance in January 2002. Subsequently, much of the site infrastructure was sold and removed from the site (Northern Resource Consultants [NRC], 2016).

The latest sale of Wirralie occurred in December 2013, when Solomons Gold Pty Ltd acquired the mining lease (ML1079) and facilities, with a view to recommence mining and processing operations. The current plan is to process the Wirralie ore by utilising converging CIL and heap-leach circuits supplying strip columns (NRC, 2016). These activities will be undertaken under the current environmental authority (EA) EPML00772413 (dated 28 October 2016).

In accordance with the Queensland Department of Environment and Science (DES, 2021), a waste characterisation assessment should be undertaken at Wirralie. This assessment will be a contributing factor when choosing appropriate rehabilitation strategies and suitable post-mining land uses.

1.2 SCOPE OF WORK

The PRCP guideline (DES, 2021) outlines the waste characterisation reporting requirement:

“Characterise mine wastes in a report that describes the likely physical behaviour and chemical reactivity of the waste materials under the conditions in which they would be stored. The report must address the constituent elements present, and their likely future speciation and mobility.”

In order to characterise the mine waste as per the PRCP guideline, this investigation employed the following scope of works:

- Design a sampling programme to allow for correct spatial representation of all waste rock;
- Collate, validate and statistically analyse geochemical test results from a National Association of Testing Authorities (NATA) accredited laboratory;
- Compile a waste rock characterisation dataset to consider the estimated mining waste streams and the environmental risk they may pose; and
- Conduct a waste rock characterisation study to provide supporting evidence for the rehabilitation requirements to support the submission of the Wirralie ERC.

2. SITE DESCRIPTION

Wirralie is an open-cut gold mining operation located within the Whitsunday Regional Shire in north Queensland, approximately 40 km north of Mt Coolon (Figure 1). Mining commenced in 1987 and continued on a periodic basis until January 2002, when the mine was placed on care and maintenance. All mining activities undertaken at Wirralie are permitted under the EA EPML00772413 (dated 28 October 2016).

2.1 CLIMATE

Wirralie is located within the seasonally arid tropics, with the area dominated by intense rainfall events throughout the summer months. These rainfall events are often highly variable in their spatial and temporal distribution, with the majority of the rain falling in distinct, spatially separated cells across the landscape. Rainfall throughout the remainder of the year is generally limited to an occasional shower in June or July and evaporation tends to exceed rainfall for almost all days of the year, with the exception of periods with intense rainfall events. The Wirralie operations are exposed to this seasonal rainfall, where it is expected that more than 90% of the rainfall will eventuate as either surface runoff or waste dump seepage.

2.2 GEOLOGY

The Wirralie deposit is located in the northeastern portion of the Drummond Basin, within the Late Devonian Mount Wyatt Formation (Olgers, 1972). Olgers (1972) recognised that the Mount Wyatt Formation is connected to the earliest Drummond Basin depositional cycle, associated with marine and continental sedimentation followed by widespread volcanism. Locally at Wirralie, the Mount Wyatt Formation comprises volcanoclastic sediments, with subordinate, interbedded lapilli and crystal tuffs (Fellows and Hammond, 1990).

Gold-silver mineralisation at Wirralie is hosted by a low sulphidation, epithermal quartz vein complex, associated with the Mt Wyatt Formation. Host rock lithology is predominantly volcanoclastic sediments (with minor tuff), containing a network of quartz-chalcedony veins and quartz matrix breccia veins (Fellows and Hammond, 1990). The host rock lithology is principally volcanoclastic in origin. Therefore, for the purpose of this waste rock characterisation study, the waste rock is inferred to be entirely composed of the same unit: volcanoclastic sediments with silicified veins and/or breccia.

A series of stratified hydrothermal alteration assemblages surround the Wirralie ore body. Argillic alteration comprised of illite (with interstitial smectite), kaolinite and minor limonite occurs in the oxide zone rocks, whereas phyllic alteration composed of quartz, sericite, pyrite (or iron oxide) and clay is present within the ore body itself (Fellows and Hammond, 1990). Propylitic alteration – including quartz, siderite and calcite – is constrained below both the base of oxidation and Wirralie ore body (Fellows and Hammond, 1990), and has yet to be intersected by mining. Most of the hydrothermal alteration in the Wirralie mining area is clay +/- quartz and/or pyrite (or iron oxide). Alteration was therefore not considered a significant factor in this waste rock characterisation study.

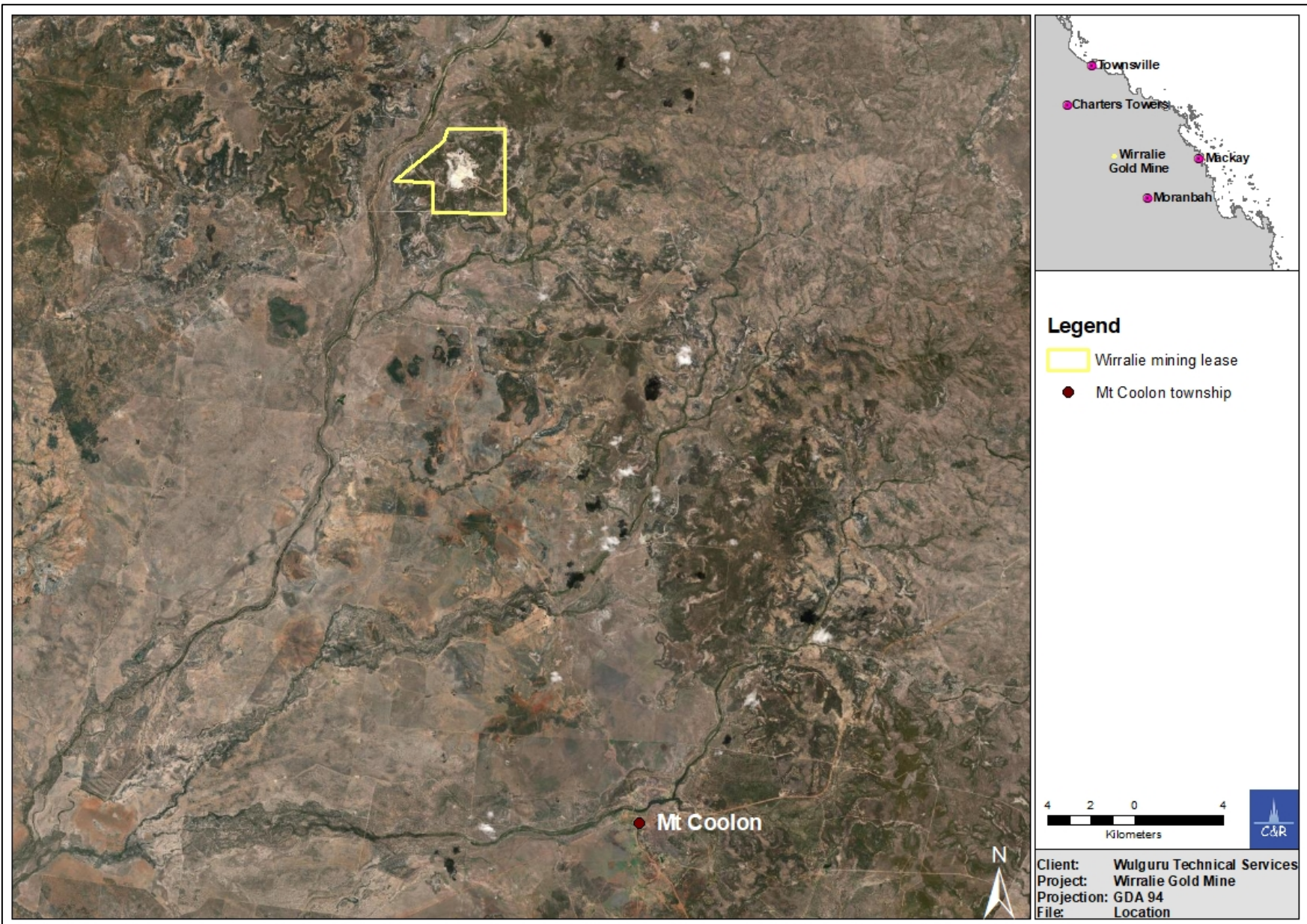


Figure 1: Location of Wirralie operations.

2.3 WASTE AREAS

2.3.1 DESKTOP REVIEW

The relevant waste areas for this investigation were identified as the waste rock dumps (WRDs), heap leach pad (HLP) and tailings surface facility (TSF; Figure 2).

Note: The runoff dam and open-cut pits are not assessed in this waste characterisation study. This is because both are categorised in the Wirralie EA (Schedule F – Table 1) as post-mine land classification *Class VIII - Land not suitable for agricultural or grazing uses* (Department of Mines and Energy [DME], 1995) and should be rehabilitated accordingly.

2.3.2 WASTE CHARACTERISATION SAMPLING STRATEGY

The waste characterisation sampling programme for Wirralie was guided by Australian technical guidelines for the geochemical assessment of mining wastes (DME, 1995; Department of Environment and Heritage Protection [DEHP], 2013; Commonwealth of Australia [COA], 2016). The DME (1995) guideline recommends that the tonnage of mined material determine the sampling interval, whereas the more recent guidelines favour a risk-based approach.

The waste characterisation sampling strategy for Wirralie incorporated the collection of samples from regular intervals in drill holes on the WRDs and HLP – in order to reach to the estimated depth of these piles. The TSF waste was sampled differently: A trowel was used to sample the surface crust and a push-tube was used to sample the tailings to depth.

Standards Australia (2005) was used to validate the Wirralie sampling methodology. This standard corroborated that the Wirralie sampling methodology would provide a good statistical and spatial representation of the potentially contaminated waste material across the Wirralie site.

The proposed Wirralie waste characterisation sampling locations are presented in Figure 3.

2.3.3 FIELD SAMPLING LOCATIONS

The proposed Wirralie waste characterisation sampling locations were not the final field sampling sites. The original, proposed locations were chosen based on the desktop review (section 2.3.1) which did not take into account accessibility issues or ground-truth the extent of the WRDs. Therefore, when the site was accessed for field sampling in July 2021, it became evident that not all of the designated rehabilitated WRD was waste and some intended sampling areas (including portions of the HLP, rehabilitated WRD and TSF) were inaccessible due to surface constraints. As a result, these areas were not sampled (Figure 4).

During the fieldwork, it was also determined that additional areas required sampling, including the former run-of-mine (ROM) pad that was built out of waste rock material, and parts of the haul road that were sheeted with waste material. Therefore, additional sampling was undertaken in these areas (Figure 4).

A comparison between the proposed and actual sampling programme is presented in Table 1.

Table 1: Summary of Wirralie waste characterisation samples.

Waste Area	Proposed Sampling Programme					Actual Sampling Programme				
	Area (hectares)	Estimated Depth* (metres)	Estimated Tonnage# (tonnes)	Proposed Number of Locations	Proposed Number of Samples	Area (hectares)	Estimated Tonnage (tonnes)	Actual Number of Locations	Actual Number of Samples	Comment
WRD01	1.7	10	340,000	5	13	1.7	340,000	5	11	-
WRD02	3.2	10	640,000	9	23	3.2	640,000	8	13	-
WRD03	6.1	5	610,000	13	24	6.1	610,000	12	29	-
Rehabilitated WRD	14.3	10	2,860,000	32	86	8.3	1,660,000	16	31	6.0 ha of rehabilitated WRD identified as natural landform (non-WRD), and 2.2 ha of rehabilitated WRD was inaccessible
Heap leach pad (HLP)	9.6	10	1,920,000	21	57	9.6	1,920,000	7	7	Most of the HLP pad (9.5 ha) was inaccessible
Tailings surface facility (TSF)	72.2	2	2,599,200	37	67	72.2	2,599,200	27	50	20.5 ha of saturated part of TSF (in the southwest) was inaccessible
Former run-of-mine (ROM) pad	2.3	10	460,000	-	-	2.3	460,000	5	12	Former ROM identified as waste rock
Haul road	-	-	-	-	-	-	-	2	2	Parts of the haul road were sheeted with waste material
TOTAL	109.4	-	9,429,200	117	270	103.4	8,229,200	82	155	6.0 ha identified as non-WRD and 32.2 ha was inaccessible^

* Estimated depths based on desktop review of artificial landform high-points versus surrounding natural topography (tiering of dumps, pads and tailings have not been considered).

Estimated tonnage based on area, estimated (high-point) depth and estimated density of the waste material (2.0 t/m³ for waste rock and 1.8 t/m³ for tailings).

^ Refer to Figure 4 for overview of non-WRD and inaccessible areas.

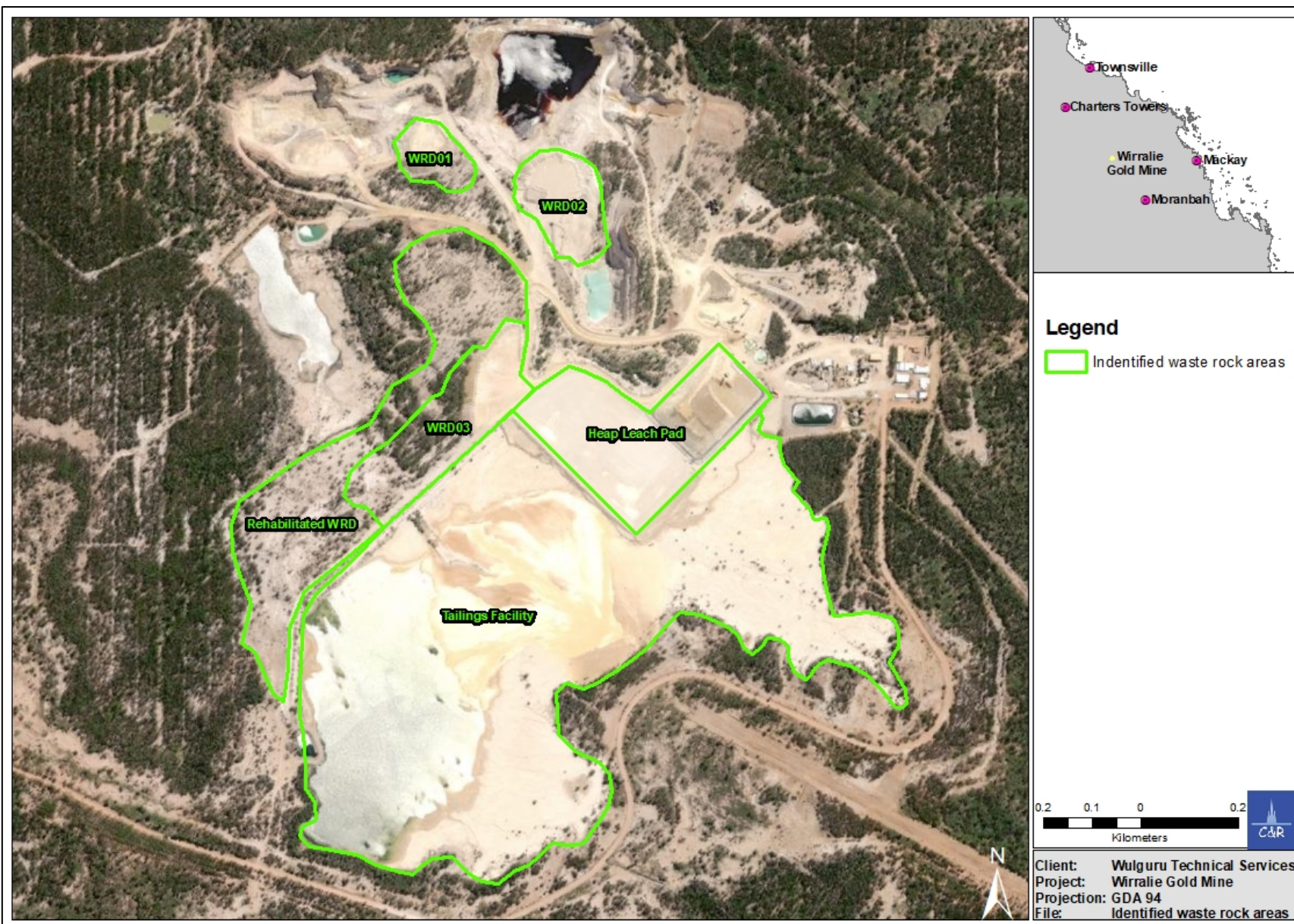


Figure 2: Waste rock areas identified by the desktop review.

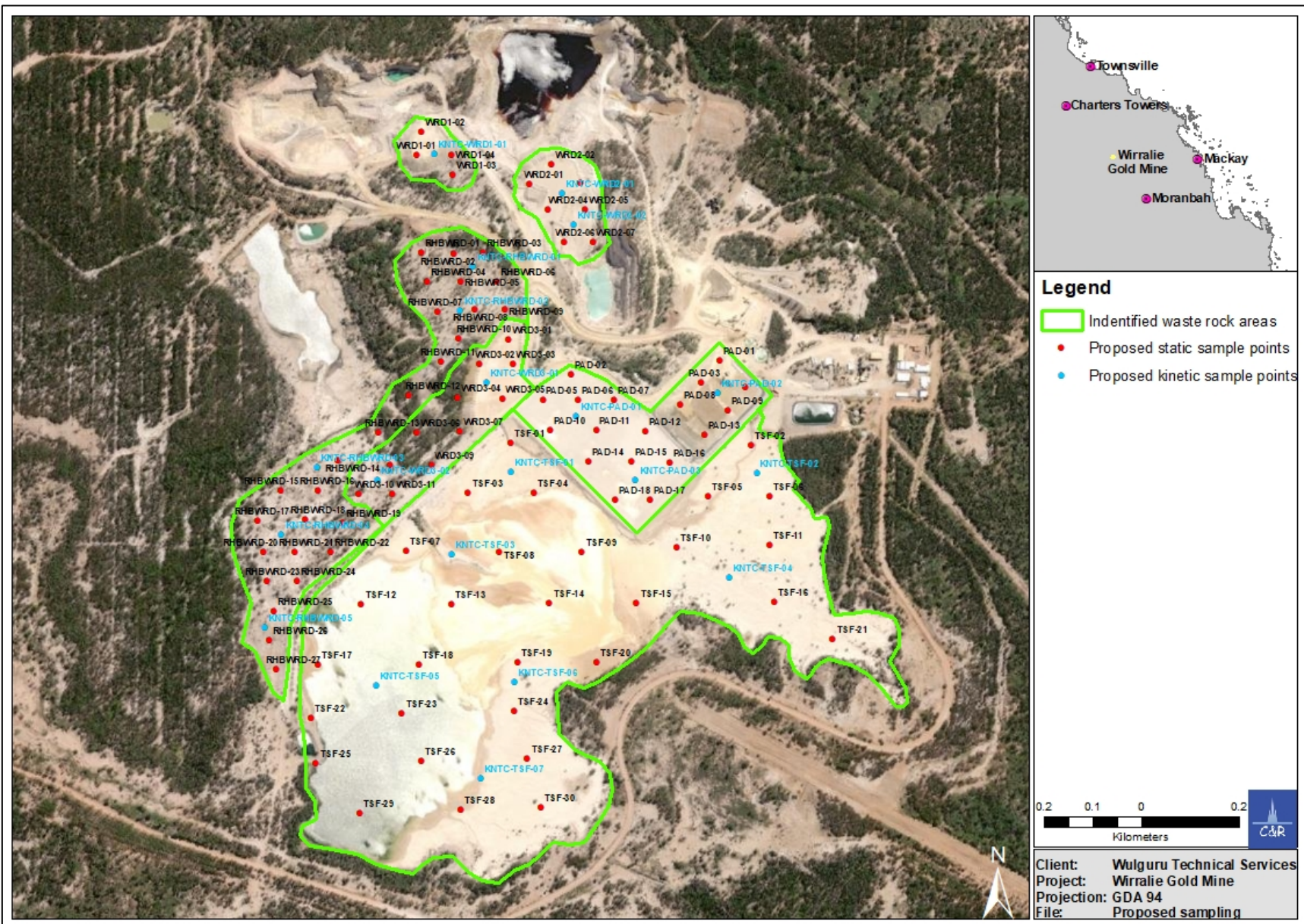


Figure 3: Proposed sampling locations.

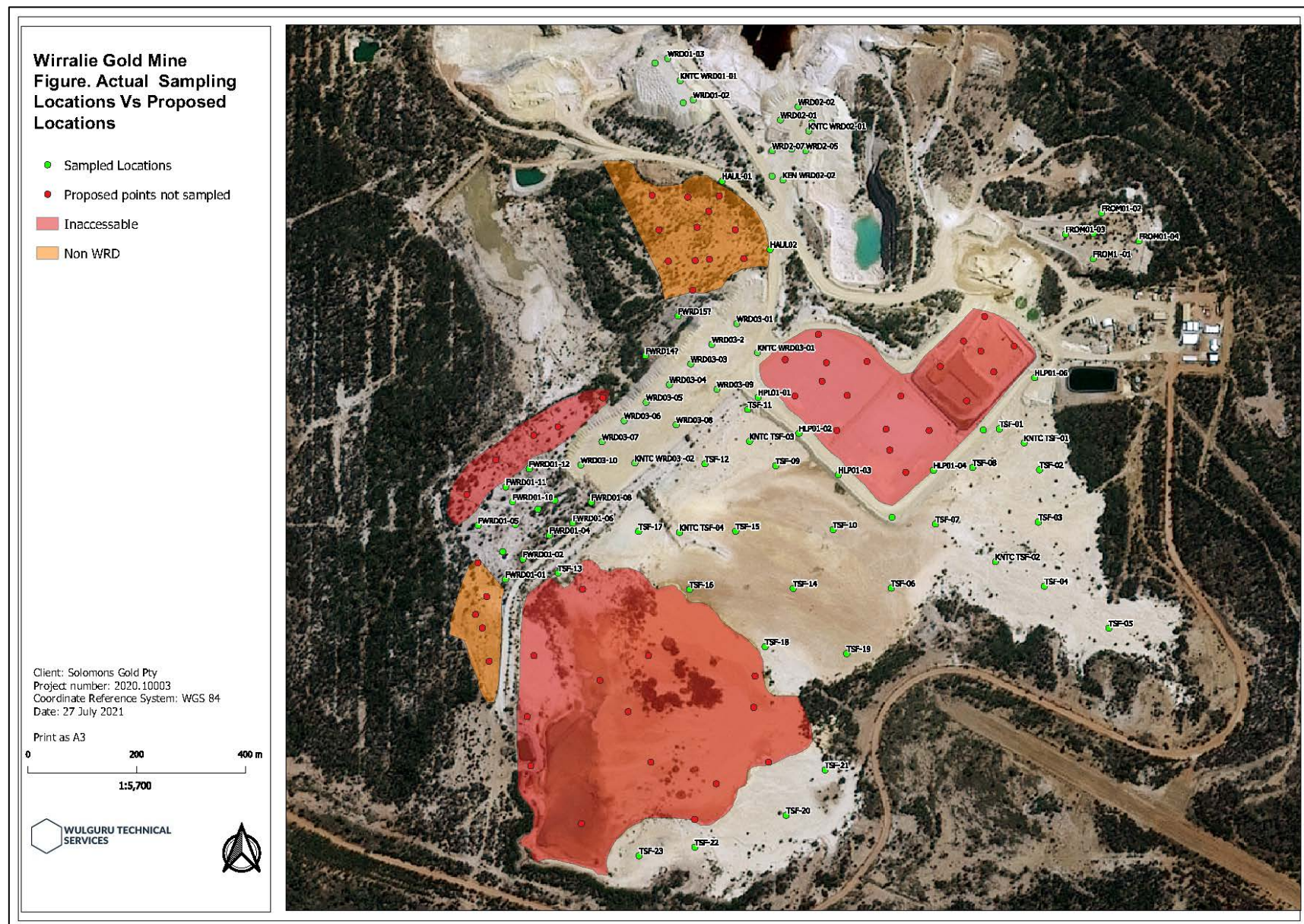


Figure 4: Actual sampling locations vs proposed locations. Figure sourced from Wulguru Technical Services (who undertook actual sampling programme).

3. METHODS

3.1 SAMPLING PROGRAMME

A total of 155 rock/sediment samples were collected from 82 sampling locations at Wirralie (Figure 4). These samples provide a good overall representation of the Wirralie waste material (waste rock and mine tailings), whilst maintaining a suitable site distribution.

Each sample consisted of either drillhole rock cuttings, (trowel) scoops of crust or push-tube sediments. The drillhole cuttings were obtained from the WRD, HLP, former ROM and haul road, whereas the crustal scoops and push-tube sediments were taken from the TSF (Table 2).

Table 2: Summary of Wirralie waste material sample types.

Sample Type	Area	Number of Samples Taken
Drillhole cuttings	WRD01	11 (from 5 holes)
	WRD02	13 (from 8 holes)
	WRD03	29 (from 12 holes)
	Rehabilitated WRD	31 (from 16 holes)
	Former run-of-mine (ROM) pad	12 (from 5 holes)
	Heap leach pad (HLP)	7 (from 7 holes)
	Haul road	2 (from 2 holes)
Trowel scoops	Tailings surface facility (TSF)	23
Push-tube sediments	TSF	27

All waste material samples were collected by WTS personnel during July 2021. The minimum amount of sample collected was 500 g, with up to 10 kg obtained for kinetic testwork. All samples were dispatched to the ALS Environmental Townsville laboratory for geochemical analysis.

3.2 GEOCHEMICAL CHARACTERISATION

The geochemical testwork was based on industry-recognised procedures for the geochemical characterisation and assessment on mine waste (AMIRA, 2002; The International Network for Acid Prevention [INAP], 2014; COA, 2016).

3.2.1 STATIC TESTWORK

Static geochemical tests provide information on the bulk geochemical characteristics of samples at a single point in time. They do not provide information on rates of chemical processes – or the release rates due to weathering processes.

All 155 samples dispatched to the ALS laboratory underwent static geochemical testing to evaluate the risk associated with the potential oxidation of sulphides, acid generation, and the presence of metals/metalloids and salts.

Each sample underwent static geochemical testing for:

- pH;
- Electrical conductivity;
- Moisture;
- Total sulphur;
- Acid neutralising capacity;
- Net acid generation capacity;
- Net acid producing potential; and
- Total metals/metalloids for Al, As, B, Ba, Be, Cd, Co, Cr, Cu, Fe, Hg, Mn, Ni, Pb, Se, V and Zn.

All static geochemical results are provided in Appendix A.

3.2.2 KINETIC LEACH COLUMN TESTWORK

Kinetic leach column (KLC) tests accelerate the weathering of samples, and provide information on the magnitude and/or effects of dynamic processes that result from weathering. Unlike static tests, KLC tests measure the varying geochemical characteristics of sample effluent over a prolonged period of time.

Of the 155 samples dispatched to the ALS laboratory, 11 samples were selected for kinetic geochemical testwork to evaluate the risk associated with dissolution and mobility of metals/metalloids and salts (Table 3).

Table 3: Summary of Wirralie KLC testwork.

Area	Number of undertaken KLC tests	Samples
WRD01	1 (from 1 hole)	WRD01 -01
WRD02	1 (from 1 hole)	WRD02 -01
WRD03	2 (from 2 holes)	WRD03 -01 and WRD03 -02
Rehabilitated WRD	1 (from 1 hole)	WRD03 -02
Former run-of-mine (ROM) pad	1 (from 1 hole)	FROM01 -01
Heap leach pad (HLP)	1 (from 1 hole)	HLP01 -01
Haul road	0	-
Tailings surface facility (TSF)	4 (from 4 holes)	TSF -01, TSF -02, TSF -03 and TSF -04
TOTAL	11	11

Individual leach columns were set up for each of the 11 samples, with leachate-testwork cycles undertaken on a fortnightly basis.

Each kinetic leachate column underwent kinetic geochemical testing for:

- pH;
- Electrical conductivity;
- Total dissolved solids (calculated);
- Total hardness;
- Acidity
- Alkalinity;



- Major cations (Ca, Mg, Na and K);
- Major anions (F, Cl and SO₄); and
- Dissolved metals/metalloids for Al, As, B, Ba, Be, Cd, Co, Cr, Cu, Fe, Hg, Mn, Mo, Ni, Pb, Sb, Se, Th, U, V and Zn.

All kinetic geochemical results are provided in Appendix B.

4. GEOCHEMICAL RESULTS

4.1 ACID BASE ACCOUNT

4.1.1 PH VALUE

The pH value of the 155 Wirralie waste rock samples ranges from strongly acidic (3.6) to slightly basic (9.7), with a slightly acidic median pH value of 4.9. The standard deviation (SD) of the dataset is 1.9 and the data are negatively skewed. In general, most Wirralie samples are in the slightly acidic range (Figure 5), indicative of the waste rock lithology (volcaniclastic sediments). Apart from a few waste rock dump samples, the majority of the strongly acidic samples occur in the sediments below the surface of the tailings dam.

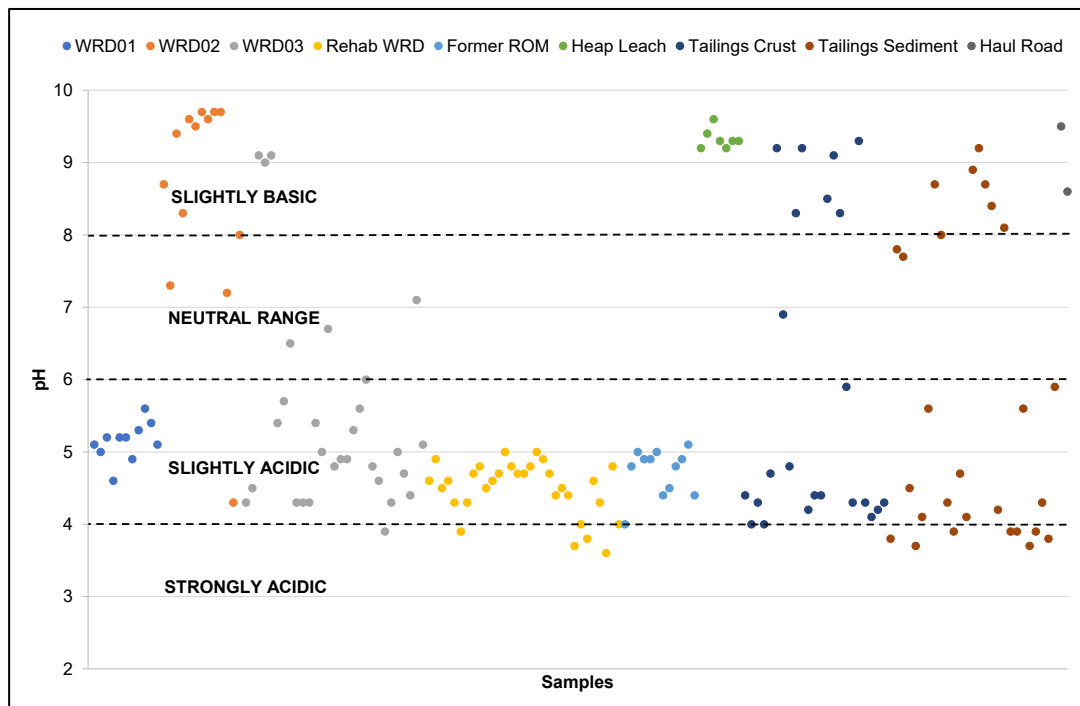


Figure 5: pH values for Wirralie waste rock samples.

Because of the method of testwork (i.e. fluid extract from crushed samples, with a very high surface area to solution ratio), it is expected that both the low and high pH results in the waste rock are a worst-case scenario. Therefore, it is envisaged that the pH of runoff from the Wirralie operations will not be as low or high as that reflected in the waste rock sample test results. Also, in order for significant runoff to occur at Wirralie, the rainfall dilution factor should be greater than the 1:5 (soil:water ratio) used in the extract solutions. This, in turn, would counteract the resulting acidity or alkalinity.

4.1.2 ELECTRICAL CONDUCTIVITY

The electrical conductivity (EC) of the 155 Wirralie waste rock samples ranges from 8 $\mu\text{S}/\text{cm}$ to 4,860 $\mu\text{S}/\text{cm}$ and has a low median value of 204 $\mu\text{S}/\text{cm}$. Most Wirralie waste rock samples have low EC values (<300 $\mu\text{S}/\text{cm}$) and, apart from the tailings dam samples, all waste rock has ECs below 1000 $\mu\text{S}/\text{cm}$ (Figure 6).

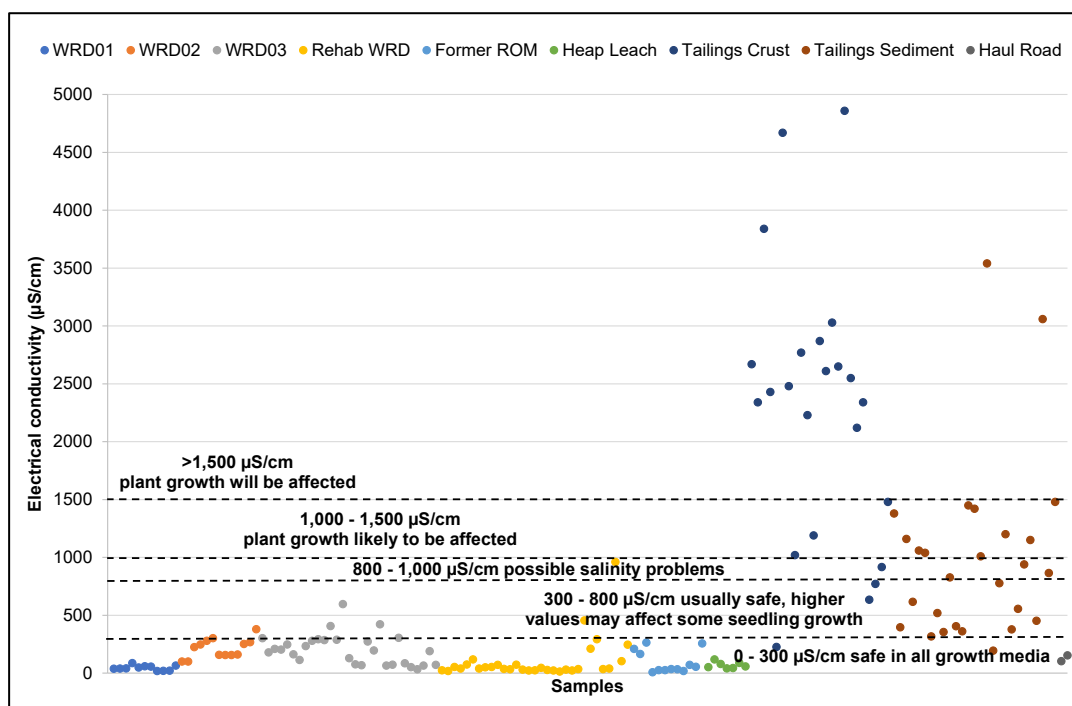


Figure 6: Electrical conductivity for Wirralie waste rock samples.

The Wirralie tailings dam samples have overall higher ECs than the rest of the waste rock samples (Figure 6). In particular, the salinity of the surface crust of the tailings dam is much higher than the rest of the waste rock, including the tailings sediment contained below the crust.

4.1.3 TOTAL SULPHUR

The total sulphur concentrations (measured by LECO method) of the 155 Wirralie waste rock samples range from 0.01% to 0.60% and have an extremely low median of 0.07%.

Figure 7 demonstrates that most of the Wirralie waste rock is barren (<0.1%) with respect to total sulphur concentrations. Both WRD03 and the TSF have higher sulphur levels than the rest of the waste rock. However, most of these elevated sulphur concentrations are still classified as very low (<0.55%).

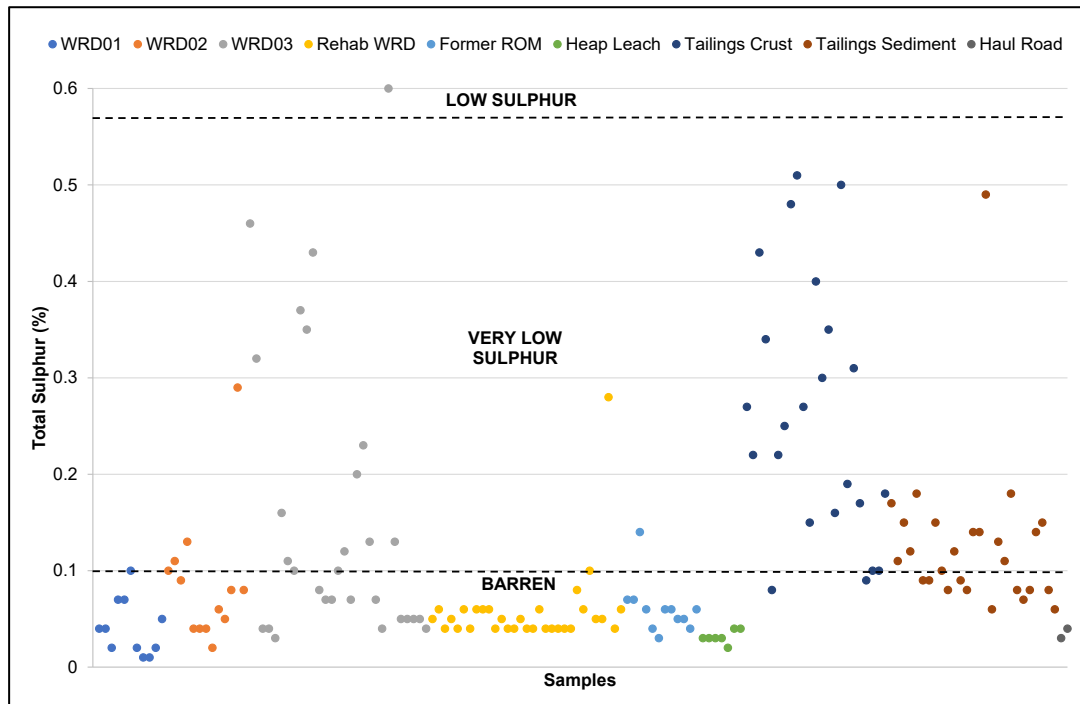


Figure 7: Total sulphur concentration for Wirralie waste rock samples.

4.1.4 MAXIMUM POTENTIAL ACIDITY

Maximum potential acidity (MPA) is the maximum amount of acid that can be produced by the oxidation of sulphur-bearing minerals in the waste rock material. MPA is calculated from the total sulphur content. The MPA – that could be generated by the 155 Wirralie waste rock samples – ranges from 0.3 to 18.4 kg H₂SO₄/t and has a low median value of 2.1 kg H₂SO₄/t.

4.1.5 ACID NEUTRALISING CAPACITY

Acid neutralising capacity (ANC) is related to the amount of acid neutraliser (usually carbonate minerals) in the waste rock sample. ANC is determined experimentally by reacting a standardised acid mixture with a known amount of waste rock sample – and is reported as kg H₂SO₄/t eq. (equivalent). The ANC of the 155 Wirralie waste rock samples ranges from 0.6 to 9.6 kg H₂SO₄/t eq., with a low median of 2.0 kg H₂SO₄/t eq.

4.1.6 ANC:MPA RATIO

The ANC:MPA ratio can assist in classifying the potential for waste rock samples to generate acid.

Generally speaking – and depending on the mineralogy – a sample with an ANC:MPA ratio below 1 is likely to be acid forming because it contains more acid-generating than acid-neutralising minerals. Samples with an ANC:MPA ratio of ≥ 1 but ≤ 2 have degree of uncertainty, whereas samples with an ANC:MPA ratio of > 2 are generally low risk. However there are exceptions because samples with an MPA of < 3.1 kg H₂SO₄/t are considered to contain insufficient acid forming potential (i.e. they are barren), and samples with an MPA of > 3.1 but < 10 kg H₂SO₄/t would, at worst, be classified as low capacity, potentially acid forming (PAF) material.

Wirralie waste rock samples have an ANC:MPA ratio ranging from 0 to 3.9, with a median value of 0.8. According to these ANC:MPA ratios, more than half of the Wirralie waste

samples could be considered to be potentially acid forming. However, given the low MPA values, most of these samples are considered either barren or of low capacity with respect to acid forming potential (Figure 8). Additionally, most of the PAF material, identified using the ANC:MPA ratio, is associated with either WRD03 or the TSF.

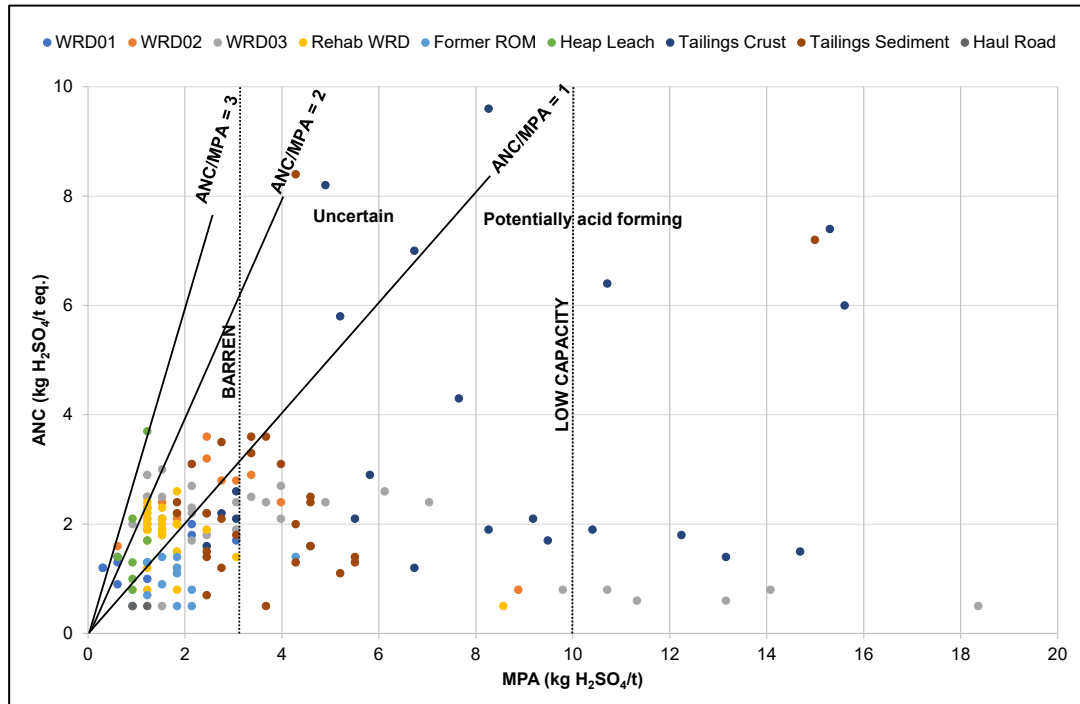


Figure 8: MPA versus ANC for Wirralie waste rock samples.

4.1.7 NET ACID PRODUCING POTENTIAL

Net acid producing potential (NAPP) is a theoretical calculation of the net acid producing (or consuming) value of a waste rock sample.

Generally speaking, waste rock samples with a negative NAPP value are non-acid forming (NAF), and those with a positive NAPP value are PAF. Miller (1997) provides further categorisation of waste rock material based on the magnitude of the NAPP value (Table 4).

Table 4: NAPP classification categories.

ARD Classification	NAPP Value (kg H ₂ SO ₄ /t)
Potentially Acid Forming (PAF)	> 10
Uncertain	0 to 10
Non-Acid Forming (NAF)	-50 to 0
Acid Consuming Material	< -50

Eight-five Wirralie waste rock samples have positive NAPP values. However, most of these positive samples are in the uncertain range, with only seven samples having values greater than 10. These are associated with either WRD03 or the TSF.

4.2 NET ACID GENERATION TEST

The net acid generation (NAG) test is used to directly measure the net amount of acid produced by a waste rock sample.

Generally speaking, samples with a $NAG_{(pH)}$ below 4.5 may be acid generating and samples with a $NAG_{(pH)}$ equal or greater than 4.5 (≥ 4.5) are unlikely to be acid generating. However, the NAG test does not estimate acid neutralisation potential. Therefore, AMIRA (2002) recommends the combined use of the NAPP values and the NAG results for a more detailed classification of acid generation.

Figure 9 demonstrates that most Wirralie waste rock samples have a $NAG_{(pH)}$ greater than 4.5 and are unlikely to be acid generating. There are still numerous uncertain samples (according to the NAPP). However, all of these uncertain samples can be confirmed as NAF based on their corresponding $NAG_{(pH)}$ and total sulphur values (Figure 10).

A summary of the $NAG_{(pH)}$ versus total sulphur geochemical classification criteria for the waste rock samples is presented in Table 5.

Table 5: Geochemical classification criteria for Wirralie waste rock samples (Sed. = sediment).

Geochemical Classification	Total Sulphur (%)	$NAG_{(pH)}$	WRD01	WRD02	WRD03	Rehab WRD	Former ROM	Heap leach	TSF Crust	TSF Sed.	Haul road
NAF (barren)	≤ 0.1	-	11	10	15	30	11	7	4	12	2
NAF (very low sulphur)	>0.1 to ≤ 0.55	≥ 4.5	0	3	11	0	1	0	19	15	0
NAF (low sulphur)	0.55 to 1.5	≥ 4.5	0	0	0	0	0	0	0	0	0
PAF (very low sulphur)	0.1 to ≤ 0.55	< 4.5	0	0	1	1	0	0	0	0	0
PAF (low sulphur)	0.55 to 1.5	< 4.5	0	0	1	0	0	0	0	0	0
Percentage of NAF samples			100%	100%	93%	97%	100%	100%	100%	100%	100%
Percentage of very low sulphur PAF samples			0%	0%	3.5%	3%	0%	0%	0%	0%	0%
Percentage of low sulphur PAF samples			0%	0%	3.5%	0%	0%	0%	0%	0%	0%

Applying the $NAG_{(pH)}$ and total sulphur geochemical classification criteria (Table 5), it can be shown that most waste characterisation samples (including that of the TSF) are NAF (Figure 10).

Of the 155 Wirralie waste rock samples, there are only three samples that could be categorised as PAF when the $NAG_{(pH)}$ and total sulphur values are considered:

- Two samples on WRD03, both of which occur in the same hole; and
- One sample on the rehabilitated WRD.

These samples make up less than 4% of the total sample size for their respective areas – and their sulphur values are still very low to low. It is therefore expected that these three samples will not present an acid drainage issue because:

- The amount of produced acid will be negligible; and
- Any acid produced by the samples will be buffered by the surrounding NAF rock that makes up more than 90% of the waste rock.

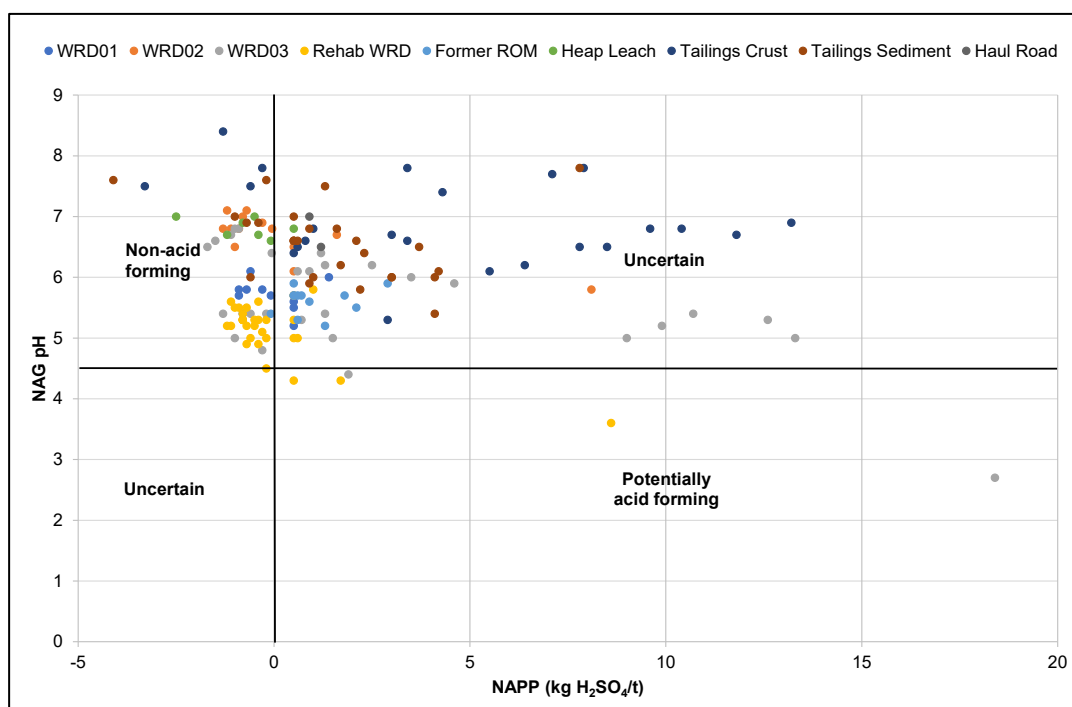


Figure 9: NAG_(pH) versus NAPP for Wirralie waste rock samples.

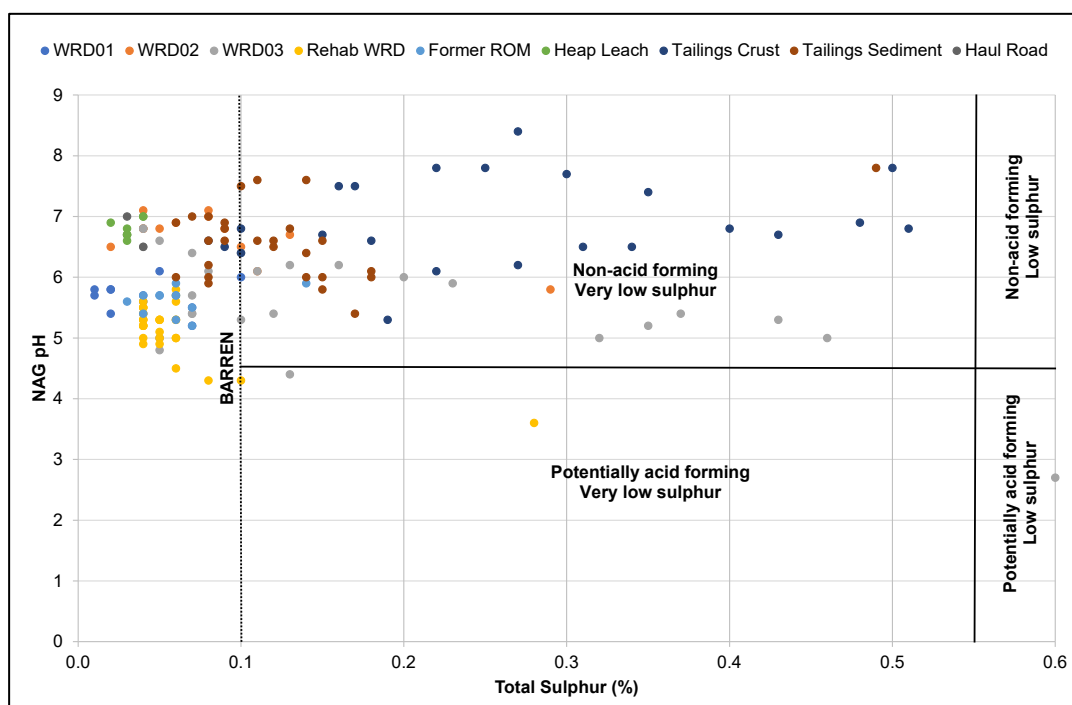


Figure 10: NAG_(pH) versus sulphur for Wirralie waste rock samples.

4.3 METAL/METALLOID ANALYSES

Static multi-element scans were undertaken on the 155 Wirralie waste rock samples. This testwork was carried out to assess natural background elemental levels, and to identify if any elements (particularly metals and metalloids) are present in the waste rock at concentrations that may be of environmental concern with respect to revegetation and water quality.

4.3.1 GEOCHEMICAL ABUNDANCE INDEX

The total metal and metalloid concentrations in the waste rock can be compared to the average crustal abundance of unmineralised soils (INAP, 2014). In this process, the geochemical abundance index (GAI) is used to report on the extent of elemental enrichment, by relating the actual concentration in a sample with the average crustal abundance on a log₂ scale (Table 6).

Table 6: Geochemical abundance index classification categories.

GAI	Enrichment Factor	Classification
<1	Less than 3-fold enrichment	Not enriched
1	3 – 6 fold enrichment	Not Enriched
2	6 – 12 fold enrichment	Slightly Enriched
3	12 – 24 fold enrichment	Significantly Enriched
4	24 – 48 fold enrichment	Significantly Enriched
5	48 – 96 fold enrichment	Highly Enriched
6	Greater than 96 fold enrichment	Highly Enriched

As a general guide, samples with a GAI of 3 or greater indicate enrichment that may warrant further investigation. However, elements identified as enriched may not necessarily be a reason for concern regarding revegetation and/or water quality because:

- The average crustal abundance varies between different literature sources;
- Some elements are more environmentally important than others;
(i.e. As, Al, Cr, Cd, Cu, Pb, Se and Zn are more important than Ca, Fe, Mg and Na);
- If a sample is shown to be enriched in a particular element, there is no direct correlation that the sample will leach the element at elevated concentrations; and
- The nature of an ore deposit means that the background levels for some elements are expected to be elevated.

Similarly, because an element is not enriched does not mean that it will never be a concern because – under certain conditions (e.g. low pH) – the solubility of some common, environmentally important elements (such as Al, Cu, Cd, Fe and Zn) will increase significantly.

Summaries of the multi-element scans and GAIs for the Wirralie waste rock samples are presented in Table 7. Beryllium, boron, cadmium and selenium were intentionally left out of these tables because all of the test results were below the limit of reporting (BLOR). Cobalt and lead were also intentionally left out because all but three cobalt results and one lead result were BLOR – and these four measurements were not enriched (as they all had a GAIs <1). Furthermore, any laboratory analyses that were reported as BLOR were not included in the statistical analysis (e.g. the Wirralie copper statistics were based on only 29 samples because the other 125 samples were BLOR). The BLOR data were purposely omitted to minimise bias in the GAI calculation and resulting statistics.

Table 7: Summary of multi-element analyses, results and geochemical abundance indices for Wirralie waste rock samples.

Element	Unit	Limit of Reporting	ACA*	n#	Concentration Statistics			NEPM Guideline HIL~ Recreational C	GAI Statistics			
					Min.	Median	Max.		Min. GAI	Median GAI	Max. GAI	Number of GAIs ≥3
Aluminium	mg/kg	50	82,000	155	180	1,060	2,450	-	0	0	0	0
Arsenic	mg/kg	5	1.5	129	BLOR^	72	214	300	1	5	6	120
Barium	mg/kg	10	500	137	BLOR	30	280	-	0	0	0	0
Chromium	mg/kg	2	100	92	BLOR	6	19	300	0	0	0	0
Copper	mg/kg	5	50	29	BLOR	6	25	17,000	0	0	0	0
Iron	mg/kg	50	41,000	155	140	3,400	18,700	-	0	0	0	0
Manganese	mg/kg	50	950	67	BLOR	9	65	19,000	0	0	0	0
Mercury	mg/kg	0.1	0.05	64	BLOR	0.5	2.1	80	0	2	4	26
Nickel	mg/kg	2	80	53	BLOR	4	15	1,200	0	0	0	0
Vanadium	mg/kg	0.1	2.4	79	BLOR	8	38	-	0	0	0	0
Zinc	mg/kg	5	75	9	BLOR	7	36	30,000	0	0	0	0

* Average crustal abundance (Bowen, 1979).

Number of reported measurements that were not below the limit of reporting.

~ National Environment Protection (Assessment of Site Contamination) Measure 1999 – Health-based investigation levels (NEPC, 2013).

^ Below limit of reporting.

Based on the GAI assessment of the Wirralie waste rock samples, it can be demonstrated that the waste rock at Wirralie is enriched with respect to arsenic – and to some extent mercury (Table 7). This is because 77% of the samples (including the BLOR samples) have an arsenic GAI ≥ 3 and 17% of samples have a mercury GAI ≥ 3 .

Figure 11 demonstrates that – apart from the tailings facility – there is no direct correlation between arsenic and mercury enrichment in the waste rock samples. Almost all of the tailings facility samples are enriched with respect to both arsenic and mercury. Apart from the tailings facility, mercury is only significantly enriched (GAI ≥ 3) in one WRD01 sample, whereas significant arsenic enrichments (GAI ≥ 3) frequently occur in all waste rock domains.

Arsenic enrichment is present in all of the waste rock samples at Wirralie. However, there is a substantial decrease of arsenic levels in the rehabilitated waste rock dump (Figure 11). The rehabilitated waste rock dump has been capped with Tertiary clay and most (80%) surface samples (<3 metres deep) obtained from the rehabilitated dump are registering arsenic values BLOR.

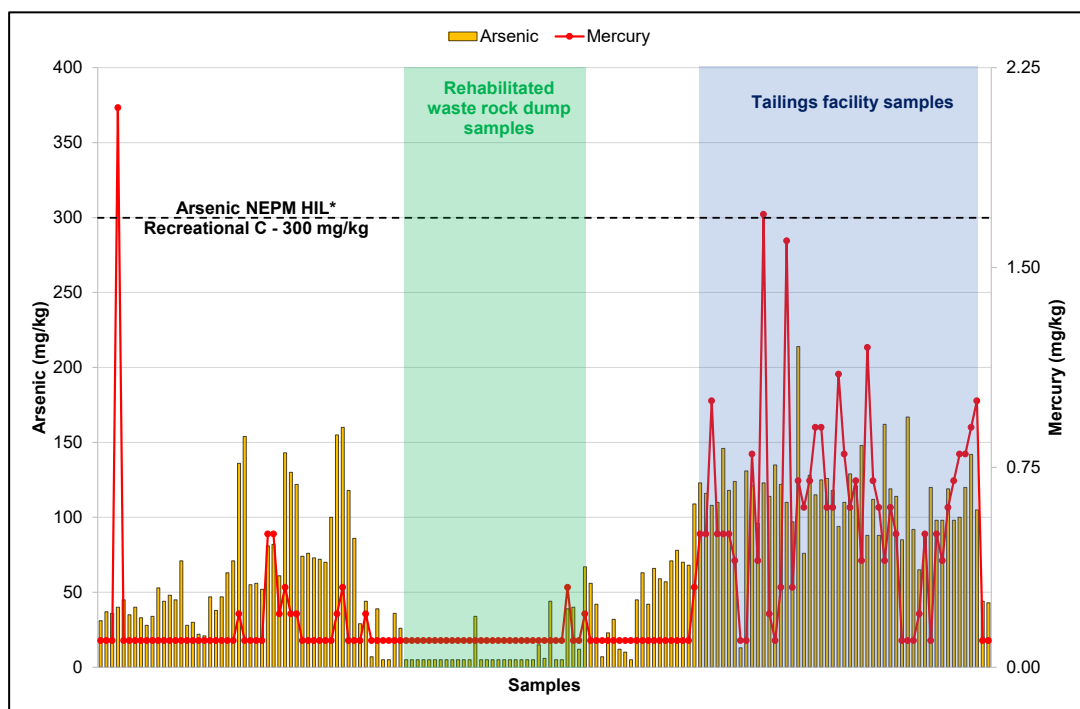


Figure 11: Total arsenic and mercury values for Wirralie waste rock samples (*NEPC, 2013).

The high arsenic values in the Wirralie waste rock are not a particular concern because they remain below the NEPM HIL for 'Recreational C' (public open space scenario) of 300 mg/kg (NEPC, 2013). The mercury enrichments are not a concern either because all mercury concentrations remain well below the HIL 'Residential A' (residential garden scenario) threshold of 10 mg/kg. For these aforementioned enrichments to be of environmental concern with respect to revegetation and water quality, a significant portion of the elements would need to be leached from the waste rock in order to enter the soil, surface water or groundwater, which is highly unlikely given the KLC results (Table 8).

4.4 KINETIC LEACH COLUMN WATER QUALITY ANALYSES

In order to understand the potential for the Wirralie waste rock to leach environmental contaminants into the surrounding environment, KLC testwork was undertaken on 11 samples (Table 3). Unlike static tests, KLC tests measure the varying geochemical characteristics of sample effluent over a prolonged period of time, providing a better indication of chemical reactivity of waste materials under the storage conditions.

The Wirralie KLC testwork has been compared with the receiving water contaminant limits (RWCLs) as listed in the Wirralie EA EPML00772413 (Table 8). It must be noted, however, that the EA metal/metalloid contaminant limits are for unfiltered samples, whereas the kinetic leach metal/metalloid results have been filtered to 0.45 µm.

4.4.1 pH VALUE

The KLC testwork results (Table 8) demonstrate that the majority of the pH values for the waste rock are outside of the EA RWCLs. This is because most of the Wirralie waste rock is slightly acidic (refer to section 4.1.1).

Figure 12 demonstrates that even though a lot of the waste dump KLC samples are below the lower pH limit, they are actually reacting with the leachate solution and increasing in pH. Therefore, it is possible that – as the reaction continues – the solutions may actually reach (and comply with) the EA lower limit. This phenomenon is further justified by the fact that most of the waste dump static samples were NAF (refer to section 4.2).

Figure 12 demonstrates that the TSF KLC samples are reacting with the leachate solution and either decreasing in pH or sustaining a relatively low pH (<4.5). This phenomenon is attributed to acid-forming reactions that are occurring in the TSF KLC samples. Therefore, although most TSF static samples were overwhelmingly NAF (refer to section 4.2), there may be a minor PAF component associated with weathering of the TSF.

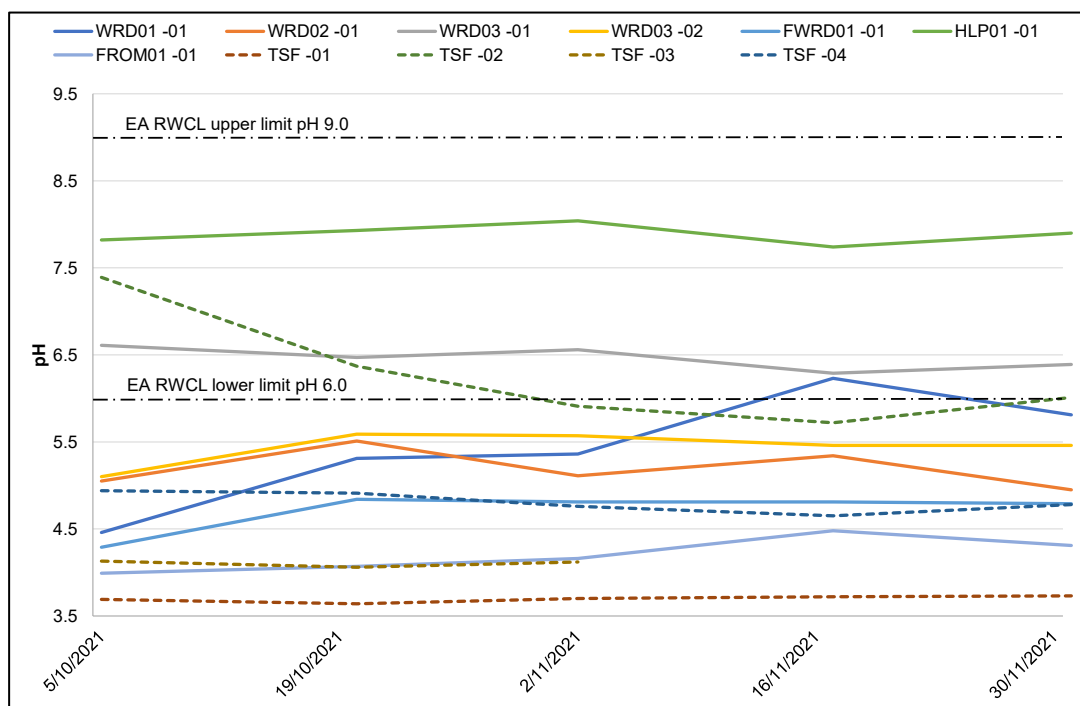


Figure 12: Kinetic leach column pH values for Wirralie waste rock samples.

Table 8: Summary of kinetic leach multi-element analyses and results.

	Sample	Contaminant Limit #	Cumulative Results				
			Leach 0	Leach 1	Leach 2	Leach 3	Leach 4
pH*	WRD01 -01	6.0 – 9.0	4.46	5.31	5.36	6.23	5.81
	WRD02 -01		5.05	5.51	5.11	5.34	4.95
	WRD03 -01		6.61	6.47	6.56	6.29	6.39
	WRD03 -02		5.10	5.59	5.57	5.46	5.46
	FWRD01 -01		4.29	4.84	4.81	4.81	4.79
	HLP01 -01		7.82	7.93	8.04	7.74	7.90
	FROM01 -01		3.99	4.07	4.16	4.48	4.31
	TSF -01		3.69	3.64	3.70	3.72	3.73
	TSF -02		7.39	6.37	5.91	5.72	6.01
	TSF -03		4.13	4.06	4.12	-	-
	TSF -04		4.94	4.91	4.76	4.65	4.78
Total Dissolved Solids (mg/l)	WRD01 -01	4,000	670	722	760	787	809
	WRD02 -01		910	957	987	1,014	1,039
	WRD03 -01		1,220	1,355	1,411	1,453	1,489
	WRD03 -02		949	1,033	1,089	1,123	1,152
	FWRD01 -01		606	640	656	673	688
	HLP01 -01		133	247	324	394	463
	FROM01 -01		819	1,196	1,388	1,510	1,609
	TSF -01		1,830	3,190	4,074	4,744	5,218
	TSF -02		5,970	6,341	6,413	6,589	6,788
	TSF -03		5,940	10,520	-	-	-
	TSF -04		1,160	1,684	2,145	2,603	2,938
Sulphate (mg/l)	WRD01 -01	1,000	9	26	39	49	58
	WRD02 -01		176	195	206	216	226
	WRD03 -01		432	496	524	542	557
	WRD03 -02		279	311	332	344	355
	FWRD01 -01		227	243	249	255	261
	HLP01 -01		38	64	75	81	87
	FROM01 -01		556	774	878	943	994
	TSF -01		1,540	2,570	3,290	3,786	4,124
	TSF -02		2,480	2,602	2,621	2,672	2,728
	TSF -03		3,070	5,850	-	-	-
	TSF -04		349	539	715	887	1,023

	Sample	Contaminant Limit #	Cumulative Results				
			Leach 0	Leach 1	Leach 2	Leach 3	Leach 4
Arsenic (mg/l)	WRD01 -01	0.5	0.0005	0.0025	0.0035	0.0075	0.0095
	WRD02 -01		0.0180	0.0220	0.0240	0.0260	0.0270
	WRD03 -01		0.0060	0.0080	0.0100	0.0140	0.0160
	WRD03 -02		0.0190	0.0200	0.0210	0.0230	0.0240
	FWRD01 -01		0.0040	0.0045	0.0050	0.0055	0.0060
	HLP01 -01		0.1220	0.2870	0.4500	0.6210	0.7840
	FROM01 -01		0.0050	0.0060	0.0070	0.0080	0.0100
	TSF -01		0.0130	0.0160	0.0170	0.0190	0.0200
	TSF -02		0.0040	0.0050	0.0060	0.0080	0.0090
	TSF -03		0.0190	0.0360	0.0420	-	-
	TSF -04		0.0040	0.0050	0.0055	0.0075	0.0095
Cadmium (mg/l)	WRD01 -01	0.01	0.00050	0.00055	0.00060	0.00065	0.00070
	WRD02 -01		0.00040	0.00045	0.00050	0.00055	0.00060
	WRD03 -01		0.00030	0.00035	0.00040	0.00045	0.00050
	WRD03 -02		0.00050	0.00055	0.00060	0.00065	0.00070
	FWRD01 -01		0.00080	0.00085	0.00090	0.00095	0.00100
	HLP01 -01		BLOR^	BLOR	BLOR	BLOR	BLOR
	FROM01 -01		0.00460	0.00640	0.00700	0.00750	0.00790
	TSF -01		0.00690	0.01100	0.01280	0.01410	0.01490
	TSF -02		0.00140	0.00145	0.00150	0.00155	0.00160
	TSF -03		0.03430	0.06410	0.07490	-	-
	TSF -04		0.00210	0.00290	0.00330	0.00390	0.00430
Copper (mg/l)	WRD01 -01	0.5	0.0110	0.0115	0.0120	0.0125	0.0130
	WRD02 -01		0.0020	0.0025	0.0030	0.0035	0.0040
	WRD03 -01		BLOR	BLOR	BLOR	BLOR	BLOR
	WRD03 -02		0.0040	0.0045	0.0050	0.0055	0.0060
	FWRD01 -01		0.0160	0.0165	0.0170	0.0175	0.0180
	HLP01 -01		0.0005	0.0035	0.0040	0.0045	0.0050
	FROM01 -01		0.0030	0.0035	0.0040	0.0045	0.0050
	TSF -01		0.0900	0.1520	0.1880	0.2140	0.2320
	TSF -02		0.0020	0.0025	0.0030	0.0035	0.0040
	TSF -03		0.0980	0.2050	0.2540	-	-
	TSF -04		0.0050	0.0080	0.0110	0.0150	0.0180

	Sample	Contaminant Limit #	Cumulative Results				
			Leach 0	Leach 1	Leach 2	Leach 3	Leach 4
Lead (mg/l)	WRD01 -01	0.1	BLOR	BLOR	BLOR	BLOR	BLOR
	WRD02 -01		BLOR	BLOR	BLOR	BLOR	BLOR
	WRD03 -01		BLOR	BLOR	BLOR	BLOR	BLOR
	WRD03 -02		BLOR	BLOR	BLOR	BLOR	BLOR
	FWRD01 -01		BLOR	BLOR	BLOR	BLOR	BLOR
	HLP01 -01		BLOR	BLOR	BLOR	BLOR	BLOR
	FROM01 -01		BLOR	BLOR	BLOR	BLOR	BLOR
	TSF -01		BLOR	BLOR	BLOR	BLOR	BLOR
	TSF -02		BLOR	BLOR	BLOR	BLOR	BLOR
	TSF -03		BLOR	BLOR	BLOR	BLOR	BLOR
	TSF -04		BLOR	BLOR	BLOR	BLOR	BLOR
Mercury (mg/l)	WRD01 -01	0.002	BLOR	BLOR	BLOR	BLOR	BLOR
	WRD02 -01		BLOR	BLOR	BLOR	BLOR	BLOR
	WRD03 -01		BLOR	BLOR	BLOR	BLOR	BLOR
	WRD03 -02		BLOR	BLOR	BLOR	BLOR	BLOR
	FWRD01 -01		BLOR	BLOR	BLOR	BLOR	BLOR
	HLP01 -01		BLOR	BLOR	BLOR	BLOR	BLOR
	FROM01 -01		BLOR	BLOR	BLOR	BLOR	BLOR
	TSF -01		BLOR	BLOR	BLOR	BLOR	BLOR
	TSF -02		0.00020	0.00025	0.00030	0.00035	0.00040
	TSF -03		0.00010	0.00015	0.00020	-	-
	TSF -04		BLOR	BLOR	BLOR	BLOR	BLOR
Molybdenum (mg/l)	WRD01 -01	0.05	BLOR	BLOR	BLOR	BLOR	BLOR
	WRD02 -01		BLOR	BLOR	BLOR	BLOR	BLOR
	WRD03 -01		0.0005	0.0025	0.0055	0.0075	0.0095
	WRD03 -02		BLOR	BLOR	BLOR	BLOR	BLOR
	FWRD01 -01		BLOR	BLOR	BLOR	BLOR	BLOR
	HLP01 -01		0.0100	0.0230	0.0310	0.0370	0.0420
	FROM01 -01		BLOR	BLOR	BLOR	BLOR	BLOR
	TSF -01		BLOR	BLOR	BLOR	BLOR	BLOR
	TSF -02		BLOR	BLOR	BLOR	BLOR	BLOR
	TSF -03		BLOR	BLOR	BLOR	BLOR	BLOR
	TSF -04		BLOR	BLOR	BLOR	BLOR	BLOR

	Sample	Contaminant Limit #	Cumulative Results				
			Leach 0	Leach 1	Leach 2	Leach 3	Leach 4
Selenium (mg/l)	WRD01 -01	0.02	BLOR	BLOR	BLOR	BLOR	BLOR
	WRD02 -01		BLOR	BLOR	BLOR	BLOR	BLOR
	WRD03 -01		BLOR	BLOR	BLOR	BLOR	BLOR
	WRD03 -02		BLOR	BLOR	BLOR	BLOR	BLOR
	FWRD01 -01		BLOR	BLOR	BLOR	BLOR	BLOR
	HLP01 -01		BLOR	BLOR	BLOR	BLOR	BLOR
	FROM01 -01		BLOR	BLOR	BLOR	BLOR	BLOR
	TSF -01		BLOR	BLOR	BLOR	BLOR	BLOR
	TSF -02		0.020	0.025	0.030	0.0350	0.040
	TSF -03		0.030	0.060	0.070	-	-
	TSF -04		BLOR	BLOR	BLOR	BLOR	BLOR
Zinc (mg/l)	WRD01 -01	20	1.8000	1.8920	1.9580	1.9880	2.0180
	WRD02 -01		1.3400	1.3990	1.4260	1.4400	1.4570
	WRD03 -01		1.1400	1.1880	1.2100	1.2240	1.2430
	WRD03 -02		1.4400	1.5580	1.63700	1.6660	1.6950
	FWRD01 -01		1.7200	1.8490	1.8750	1.8940	1.9120
	HLP01 -01		0.0025	0.01350	0.01600	0.01850	0.0210
	FROM01 -01		2.2900	3.8500	4.8400	5.4550	6.0110
	TSF -01		2.0000	3.7200	4.8700	5.8260	6.5610
	TSF -02		1.2400	1.2425	1.2450	1.2475	1.2500
	TSF -03		4.5700	9.9800	11.9400	-	-
	TSF -04		0.7150	1.1810	1.6690	2.1500	2.5180

Receiving water contaminant limits as per EA EPML00772413 (Schedule C – Table 2).

* pH results are not cumulative.

^ BLOR = Below limit of reporting.

4.4.2 SALINITY

The KLC testwork results (Table 8) demonstrate that – apart from the TSF samples – all of the total dissolved solids (TDS) values for the waste rock are below the EA TDS RWCL of 4,000 mg/l (Figure 13).

Figure 13 demonstrates that the KLC results for three of the TSF samples exceed the EA TDS RWCL. These exceedances are attributed to the high EC of the three TSF KLC solutions (Figure 14) and it can be shown that these three samples would also exceed a corresponding EC RWCL (calculated from the TDS RWCL using a multiplying factor of 1.493). These results indicate that salinity is an issue in the TSF samples, with the EC (hence salinity) of three samples, dramatically increasing as time and/or weathering progresses (Figure 14).

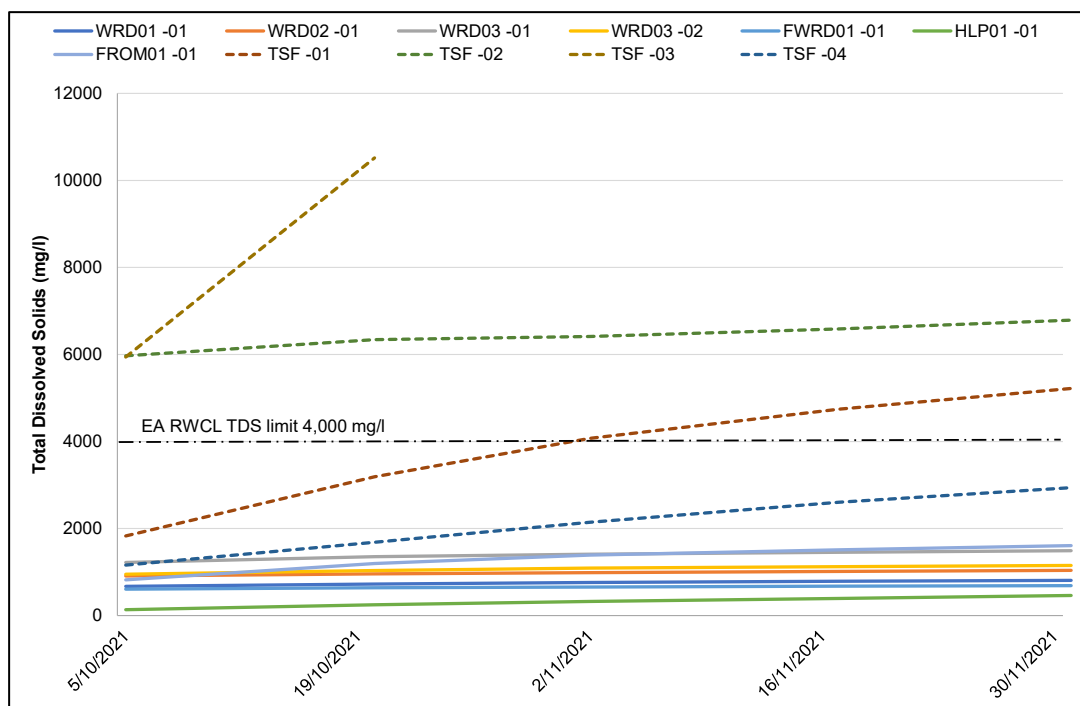


Figure 13: Kinetic leach column total dissolved solids values for Wirralie waste rock samples.

The salinity of the other KLC samples (WRD, HLP and former ROM) are different to the TSF results. This is because – after the initial EC is reported (in Leach 0) – the EC levels of subsequent leaches are not radically increasing (Table 8). Also, none of the samples exceed the EA TDS RWCL (or calculated EC RWCL). Therefore, the salinity of these samples is stabilising after the initial leach – preventing EA RWCL exceedances – and is not of environmental concern.

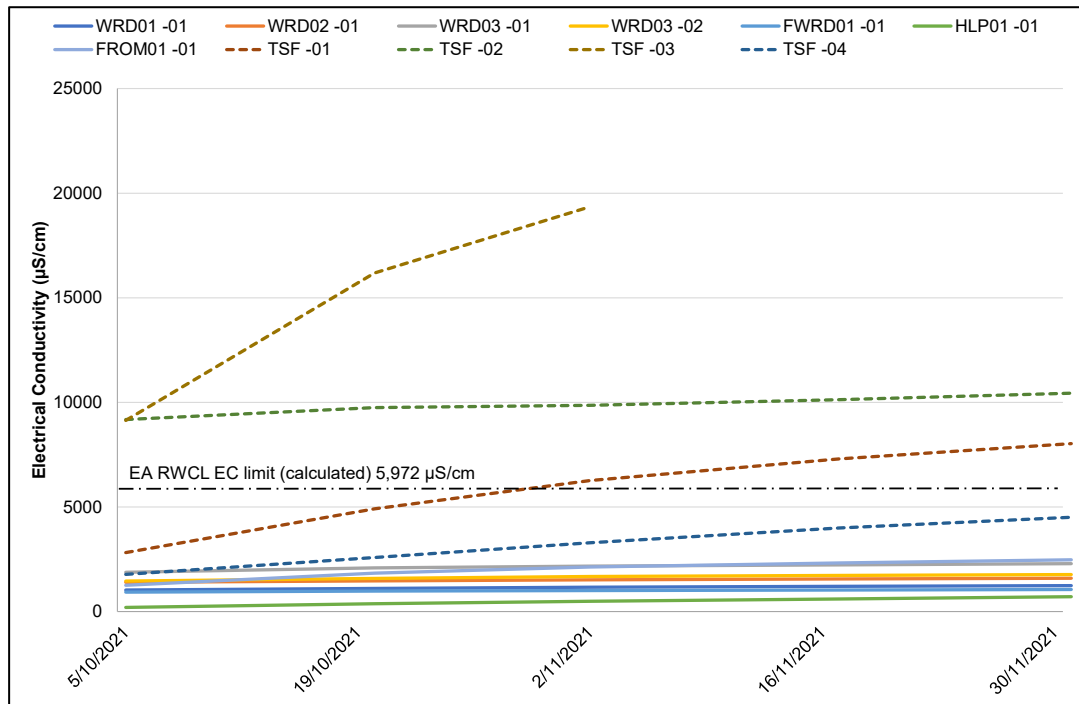


Figure 14: Kinetic leach column electrical conductivities for Wirralie waste rock samples.

4.4.3 METALS/METALLOIDS

The results from the KLC metals/metalloids analyses (Table 8) report:

- an arsenic exceedance in the HLP sample (HLP01 -01);
- cadmium exceedances in two TSF samples (TSF -01 and TSF -03); and
- selenium exceedances in two TSF samples (TSF -02 and TSF -03).

In contrast, all of the other elements – including copper, lead, mercury, molybdenum and zinc – are well below their respective EA RWCLs.

The arsenic exceedance in the HLP KLC test is not of environmental concern because it is most likely attributable to natural background arsenic levels (refer to section 4.3.1). Also, the KLC arsenic results show that – although the waste rock is significantly enriched with respect to arsenic – this arsenic is relatively immobile.

The cadmium and/or selenium exceedances that occur in a couple of the TSF KLC samples are of environmental concern because the RWCL values for both of these elements are exceeded by a minimum of 49% (Table 8). Also, the KLC values reported in Table 8 are dissolved constituents, so it is possible that the total cadmium and selenium values are actually a lot higher than their respective EA RWCLs (that are total limits). Neither of these elements were detected in the waste rock static results (refer to section 4.3.1). However, EGI (2002) previously reported that the TSF was significantly enriched with respect to selenium.

5. CONCLUSION AND RECOMMENDATIONS

Most Wirralie waste rock samples demonstrate similar physical and geochemical characteristics. This is to be expected given that most sample sources have the same lithology. There is, however, a distinct difference between waste rock that occurs in the WRDs, HLP, former ROM, haul road and the waste rock contained in the TSF. The TSF contains processed (mineralised ore) waste and not just mined waste material, explaining the difference.

5.1 ACID MINE DRAINAGE

The acid base account results demonstrate that – although most pH values of the waste rock samples are slightly acidic – these results tend to be misleading due to the nature of the testwork (refer to section 4.1.1). It is expected that – under normal conditions (i.e. dissolution and erosion of the waste rock) – the pH of the surface runoff would not be as acidic as that represented by the 1:5 (pulverised soil:water) extracts.

The ANC:MPA ratio of the waste rock samples is generally low and it could be perceived that a lot of the Wirralie waste rock is PAF. However, both the MPA and ANC values of the waste rock samples are low (< 20kg H₂SO₄/t or eq.). Therefore, the ANC:MPA ratios are only really demonstrating that the ANC of the waste rock is often much lower than the corresponding MPA.

Total sulphur concentrations in all waste areas – apart from the TSF – are mostly <0.1% and therefore considered barren. However, there are some slightly elevated measurements (very low to low concentrations), particularly in WRD03 and the TSF (Figure 7). It can be shown that – although the TSF sample results are all NAF – there is a higher median concentration of sulphur in the TSF (0.15%) when compared with the rest of the waste rock areas (0.05%).

In order to adequately assess the potential acid forming properties of the waste rock, consideration has to be given to both the total sulphur concentration and NAG_(pH) of the waste rock samples. Total sulphur concentrations of all waste rock samples are either barren (<0.1%) or low (<0.55%), with only one slightly higher (0.6%) measurement recorded. Also, the NAG_(pH) of most waste rock samples is generally ≥4.5. Thus, when assessed with the corresponding total sulphur concentrations, most (98%) of the Wirralie waste rock is considered NAF (refer to section 4.2). Of the 155 Wirralie waste rock samples, only 2% are classified as very low to low sulphur PAF (this amounts to 3 samples, as the other 152 are NAF). These PAF instances are considered rare – with a low acid generating potential – and are not representative of the dataset.

The overwhelming majority (98%) of waste rock static samples at Wirralie are considered NAF (refer to Table 5). These samples represent material with a very low to low risk of acid generation and a high safety factor with respect to potential acid mine drainage (AMD). Although AMD is unlikely to occur in the TSF, it must be noted that the KLC results indicate that there is minor (developing or residual) acidity associated with the TSF.

5.2 SALINITY

The majority of EC measurements for the Wirralie waste rock static samples – apart from the TSF – are generally low (<300 µS/cm). In contrast, the TSF waste rock static samples tend to have much higher ECs, ranging from 195 µS/cm to 4,860 µS/cm, with a median value of 1,175 µS/cm. Therefore, it is considered that there is a very low risk of salinity issues in all waste rock areas, apart from the TSF.

The TSF has the potential for salinity issues because a lot of the EC values are greater than 1,000 $\mu\text{S}/\text{cm}$. This is particularly evident with the TSF surface crust (Figure 6), which will have a higher potential for surface dissolution, erosion and transportability. Furthermore, the TSF KLC results demonstrate that the weathering of the TSF material has the potential to form moderately/highly saline waters up to around 20,000 $\mu\text{S}/\text{cm}$ (Figure 14).

5.3 ELEMENTS

The Wirralie waste rock static samples were assessed against the GAls for each individual analysed element. This assessment demonstrates that – although the waste rock is not significantly enriched with respect to the majority of the elements analysed (refer to section 4.3.1) – there is a definite enrichment of arsenic in all waste rock areas – and both arsenic and mercury in the TSF.

The significant arsenic enrichment in the Wirralie waste rock is most likely geological because it occurs in most of the volcanoclastic waste, but not the Tertiary clay (that has been used to cap the rehabilitated WRD). Although arsenic enrichment is common to the waste rock, it can be established – using the KLC results – that the arsenic contained in the waste rock is relatively immobile (refer to section 4.4.3).

The significant mercury enrichments only occur in the TSF, apart from one sample taken from WRD01. Therefore, it is assumed that the mercury enrichment is associated with the ore rather than the mined waste, which is why it is almost entirely constrained to the TSF. Regardless, it can be demonstrated – using the KLC results – that the mercury contained in the waste rock, including the TSF, is relatively immobile (refer to section 4.4.3).

The high arsenic values in the Wirralie waste rock are not a particular concern because they remain below the NEPM HIL for 'Recreational C' (public open space scenario) of 300 mg/kg (NEPC, 2013). The mercury enrichments are not a concern either because all mercury concentrations remain well below the HIL 'Residential A' (residential garden scenario) threshold of 10 mg/kg. Also, the KLC results indicate that both of these elements as they occur in the waste rock are relatively immobile.

The results of this study demonstrate that the Wirralie TSF is enriched with respect to arsenic, mercury, cadmium and selenium. EGI (2002) also indicate that the TSF is enriched with respect to antimony. Therefore, it is assessed that metal/metalloid enrichment in the TSF is at a much higher concentration and potential risk than that of the rest of the waste rock areas.

5.4 RECOMMENDATIONS

This geochemical investigation recognises that – apart from the TSF – all of the waste rock areas sampled for this report have similar physical and geochemical characteristics. As such, the risk profile for all areas (TSF excluded) are very similar. Based on both the static and KLC test results conducted as part of this study, the anticipated risk with the storage of this type of waste material is considered to be very low to low.

The TSF has a different risk profile to the rest of the waste rock areas. When compared with the rest of the waste rock, the TSF has the following characteristics:

- Even though the waste rock samples are NAF, they contain more sulphur and it can be shown that during weathering there is minor developing or residual acidity;
- Samples have elevated salinities (particularly on the crust of the TSF);
- Most samples have elevated arsenic and mercury concentrations;
- The KLC testwork indicates that some samples have elevated selenium and/or cadmium concentrations;



- Previously sampling events (EGI, 2002) have identified antimony enrichments;
- The surface crust will be more prone to dissolution, erosion and transportability; and
- Due to the nature of the TSF waste (chemically processed material), the availability and mobility of metals/metalloids is further enhanced.

It is recommended that – with respect to the TSF risk – further analysis is undertaken of the surface waters contained in the 20.5 ha of ponding in the southwest of the TSF. This analysis should be undertaken in order to understand the pH, salinity, future speciation and mobility of metals/metalloids in runoff and/or seepage from the TSF. Although the KLC tests assist with this type of analysis, examination of the saturated section of the TSF would be more representative of the physical behaviour and chemical reactivity of the TSF waste under the Wirralie storage conditions.

6. REFERENCES

- AMIRA (2002). *ARD test handbook: Prediction & kinetic control of acid mine drainage*. Project 387A prepared by the Ian Wark Research Institute.
- Bowen, H.J.M. (1979). *Environmental chemistry of the elements*. Academic 10. Press, New York.
- COA (2016). *Leading practice sustainable development program for the mining industry. Prevention of acid and metalliferous drainage*. Commonwealth of Australia, Canberra, ACT, pp. 212.
- DEHP (2013). *Application requirements for activities with impacts to land guideline*. Queensland Department of Environment and Heritage Protection, pp. 24.
- DES (2021). *Guideline – Progressive rehabilitation and closure plans (PRC plans)*. Queensland Department of Environment and Science, pp. 70.
- DME (1995). *Assessment and management of acid drainage*. Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland series.
- EGI (2002). *Environmental geochemical assessment of the Wirralie tailings storage*. Prepared for Wirralie Mines Pty Ltd.
- Fellows, M.L., Hammond, J.M. (1990). *Wirralie gold deposit*, in *Geology of the mineral deposits of Australia and New Zealand* (Ed. F.E. Hughes), 1489-1492.
- INAP (2014). *Global acid rock drainage guide*. Sponsored by the International Network for Acid Prevention with the support of the Global Alliance, pp. 473.
- Miller, S.D. (1997). *Advances in acid mine drainage prediction and implications for risk management*. Proceedings of the 3rd International and the 21st Annual Minerals Council of Australia, Environmental Workshop. 14-18 October, Newcastle Australia.
- NEPC (2013). *National environment protection (assessment of site contamination) measure*. Canberra, ACT. Amended in 2013.
- NRC (2016). *Wirralie gold project – Plan of operations (September 2016 – September 2021)*. Prepared for Solomons Gold Pty Ltd.
- Olgers, F. (1972). *Geology of the Drummond Basin*. Australian Government Publishing Service, Canberra.
- Standards Australia (2005). *Australian standard AS 4482.1-2005 – Guide to the investigation and sampling of sites with potentially contaminated soil – Non-volatile and semi-volatile compounds*. Prepared by Committee EV-009, Sampling and Analysis of Soils and Biota.

CLIENT: WULGURU TECHNICAL SERVICES
PROJECT: WIRRALIE GOLD MINE
REPORT: WASTE ROCK CHARACTERISATION
DATE: FEBRUARY 2022



Appendix A – Static Results

CERTIFICATE OF ANALYSIS

Work Order : **EB2121644**
Client : **C & R CONSULTING PTY LTD**
Contact : MR MATT KNOTT
Address : 188 ROSS RIVER ROAD
AITKENVALE QUEENSLAND 4812
Telephone : +61 07 47253751
Project : 2020.10003 - Solomons Gold Geochemistry
Order number : ----
C-O-C number : ----
Sampler : MATTHEW AYRE
Site : ----
Quote number : TV/110/21 v2
No. of samples received : 78
No. of samples analysed : 78

Page : 1 of 34
Laboratory : Environmental Division Brisbane
Contact : Princess Marcelo
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 02-Aug-2021 11:25
Date Analysis Commenced : 06-Aug-2021
Issue Date : 18-Aug-2021 15:11



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

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

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

Signatories	Position	Accreditation Category
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

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

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

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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

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

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

- **SPLIT WORK ORDER:** It should be noted that ALS has split this work order over the following work orders (EB2121644, EB2121646) due to the size of the sample numbers. For any further information regarding this processing of samples please contact ALS client services division on ALSEnviro.Brisbane@alsglobal.com
- EG005T (Total Metals by ICP-AES): Sample 'WRD02-01 3-6m' (EB2121644-002) shows poor matrix spike recovery due to sample heterogeneity. Confirmed by visual inspection.
- ASS: EA013 (ANC) Fizz Rating: 0- None; 1- Slight; 2- Moderate; 3- Strong; 4- Very Strong; 5- Lime.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	WRD02-01 0-3m	WRD02-01 3-6m	WRD02-02 0-3m	WRD02-02 3-6m	WRD02-03 0-3m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-001	EB2121644-002	EB2121644-003	EB2121644-004	EB2121644-005
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		8.7	7.3	9.4	8.3	9.6
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		<0.5	<0.5	-0.05	1.6	-1.1
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		101	101	225	247	279
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.5	6.1	6.8	6.7	6.8
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		1.9	1.8	1.0	0.6	0.6
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		2.8	2.9	2.8	2.4	2.3
ANC as CaCO3	----	0.1	% CaCO3		0.3	0.3	0.3	0.2	0.2
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		3.6	3.8	5.1	4.2	2.8
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.10	0.11	0.09	0.13	0.04
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		710	870	520	650	460
Arsenic	7440-38-2	5	mg/kg		44	48	45	71	28
Barium	7440-39-3	10	mg/kg		20	20	30	60	20
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		4	3	<2	<2	7
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	<5	<5	<5
Iron	7439-89-6	50	mg/kg		2890	3720	1680	3600	1680
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		6	<5	6	<5	7
Nickel	7440-02-0	2	mg/kg		3	3	<2	<2	4
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		<5	<5	<5	<5	<5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	WRD02-01 0-3m	WRD02-01 3-6m	WRD02-02 0-3m	WRD02-02 3-6m	WRD02-03 0-3m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-001	EB2121644-002	EB2121644-003	EB2121644-004	EB2121644-005
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	WRD02-03 3-6m	WRD02-04 0-3m	WRD02-04 3-6m	WRD02-05 0-3m	WRD02-05 3-6m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-006	EB2121644-007	EB2121644-008	EB2121644-009	EB2121644-010
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		9.5	9.7	9.6	9.7	9.7
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-0.7	-1.3	-1.0	-0.3	-0.9
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		303	158	157	156	161
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		7.1	6.8	6.5	6.9	6.8
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	0.4	0.7	0.2	0.4
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		1.9	2.5	1.6	2.1	2.4
ANC as CaCO3	----	0.1	% CaCO3		0.2	0.2	0.2	0.2	0.2
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		2.8	3.2	1.2	4.0	2.5
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.04	0.04	0.02	0.06	0.05
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		520	400	600	490	460
Arsenic	7440-38-2	5	mg/kg		30	22	21	47	38
Barium	7440-39-3	10	mg/kg		20	20	20	30	20
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		7	3	5	5	8
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	<5	<5	<5
Iron	7439-89-6	50	mg/kg		1820	1080	1340	2140	2170
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		7	<5	6	7	8
Nickel	7440-02-0	2	mg/kg		5	2	4	3	5
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		<5	<5	<5	<5	<5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	WRD02-03 3-6m	WRD02-04 0-3m	WRD02-04 3-6m	WRD02-05 0-3m	WRD02-05 3-6m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-006	EB2121644-007	EB2121644-008	EB2121644-009	EB2121644-010
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	WRD02-06 0-3m	WRD02-07 0-3m	WRD01-01 0-3m	WRD01-01 3-6m	WRD01-01 6-9m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-011	EB2121644-012	EB2121644-013	EB2121644-014	EB2121644-015
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		7.2	4.3	5.1	5.0	5.2
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-0.8	8.1	-0.08	<0.5	-0.3
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		253	268	39	40	42
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		7.0	5.8	5.7	5.6	5.8
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	1.0	1.5	1.5	1.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		3.2	0.8	1.3	1.0	0.9
ANC as CaCO3	----	0.1	% CaCO3		0.3	<0.1	0.1	0.1	<0.1
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		5.3	5.2	3.1	3.7	2.1
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.08	0.29	0.04	0.04	0.02
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1460	650	560	580	580
Arsenic	7440-38-2	5	mg/kg		47	63	31	37	36
Barium	7440-39-3	10	mg/kg		50	50	<10	<10	<10
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		4	<2	4	<2	7
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	<5	<5	<5
Iron	7439-89-6	50	mg/kg		4490	2500	1450	1620	2000
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		<5	7	<5	<5	<5
Nickel	7440-02-0	2	mg/kg		<2	<2	2	<2	4
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		26	5	<5	<5	<5



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				WRD02-06 0-3m	WRD02-07 0-3m	WRD01-01 0-3m	WRD01-01 3-6m	WRD01-01 6-9m
Sampling date / time				29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit	EB2121644-011	EB2121644-012	EB2121644-013	EB2121644-014	EB2121644-015
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Zinc	7440-66-6	5	mg/kg	<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.1	0.1	<0.1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	WRD01-02 0-3m	WRD01-03 0-3m	WRD01-03 3-6m	WRD01-03 6-9m	WRD01-04 0-3m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-016	EB2121644-019	EB2121644-020	EB2121644-021	EB2121644-022
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		4.6	5.2	5.2	4.9	5.3
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		<0.5	<0.5	1.4	-0.8	-0.9
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		87	49	59	57	19
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		5.2	5.5	6.0	5.4	5.8
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		1.9	2.1	1.2	2.1	1.2
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		2.0	1.8	1.7	1.4	1.2
ANC as CaCO3	----	0.1	% CaCO3		0.2	0.2	0.2	0.1	0.1
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		1.4	1.9	2.1	3.7	2.4
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.07	0.07	0.10	0.02	0.01
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		880	600	590	560	480
Arsenic	7440-38-2	5	mg/kg		40	45	35	40	33
Barium	7440-39-3	10	mg/kg		100	10	<10	<10	10
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		15	9	8	<2	2
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		25	<5	<5	<5	<5
Iron	7439-89-6	50	mg/kg		3300	2320	2070	1690	1340
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		10	6	5	<5	<5
Nickel	7440-02-0	2	mg/kg		10	7	5	<2	<2
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		<5	<5	<5	<5	<5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	WRD01-02 0-3m	WRD01-03 0-3m	WRD01-03 3-6m	WRD01-03 6-9m	WRD01-04 0-3m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-016	EB2121644-019	EB2121644-020	EB2121644-021	EB2121644-022
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		2.1	<0.1	<0.1	<0.1	<0.1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	WRD01-04 3-6m	WRD01-04 6-9m	WRD03-01 0-3m	WRD03-01 3-6m	WRD03-02 0-3m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-023	EB2121644-024	EB2121644-025	EB2121644-026	EB2121644-027
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		5.6	5.4	4.3	4.5	9.1
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-0.9	-0.7	13.3	9.0	-1.7
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		20	21	303	179	210
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		5.7	5.8	5.0	5.0	6.5
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		1.8	1.4	1.5	2.1	1.0
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		1.2	1.3	0.8	0.8	2.9
ANC as CaCO3	----	0.1	% CaCO3		0.1	0.1	<0.1	<0.1	0.3
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		1.0	1.4	4.5	3.4	1.9
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.01	0.02	0.46	0.32	0.04
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		480	560	1450	2450	510
Arsenic	7440-38-2	5	mg/kg		28	34	136	154	55
Barium	7440-39-3	10	mg/kg		10	20	130	280	50
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		14	8	2	5	6
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	<5	<5	<5
Iron	7439-89-6	50	mg/kg		2330	1900	8870	14000	2590
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		10	<5	<5	<5	7
Nickel	7440-02-0	2	mg/kg		8	5	<2	4	4
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		<5	<5	6	11	<5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	WRD01-04 3-6m	WRD01-04 6-9m	WRD03-01 0-3m	WRD03-01 3-6m	WRD03-02 0-3m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-023	EB2121644-024	EB2121644-025	EB2121644-026	EB2121644-027
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	0.2	<0.1	<0.1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	WRD03-02 3-6m	WRD03-02 6-9m	WRD03-03 0-3m	WRD03-03 3-6m	WRD03-03 6-9m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-028	EB2121644-029	EB2121644-030	EB2121644-031	EB2121644-032
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		9.0	9.1	5.4	5.7	6.5
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-0.9	-1.1	2.5	0.9	1.2
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		204	248	162	114	234
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.8	6.7	6.2	6.1	6.4
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		0.3	0.7	0.7	1.2	0.7
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		2.1	2.0	2.4	2.5	1.9
ANC as CaCO3	----	0.1	% CaCO3		0.2	0.2	0.2	0.2	0.2
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	2.0	3.2	2.2	1.6
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.04	0.03	0.16	0.11	0.10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		550	480	720	700	510
Arsenic	7440-38-2	5	mg/kg		56	52	81	82	61
Barium	7440-39-3	10	mg/kg		60	60	80	80	70
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		10	5	<2	<2	<2
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	<5	<5	<5
Iron	7439-89-6	50	mg/kg		2930	2420	4560	4320	3430
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		10	6	<5	<5	<5
Nickel	7440-02-0	2	mg/kg		7	3	<2	<2	<2
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		<5	<5	<5	<5	<5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	WRD03-02 3-6m	WRD03-02 6-9m	WRD03-03 0-3m	WRD03-03 3-6m	WRD03-03 6-9m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-028	EB2121644-029	EB2121644-030	EB2121644-031	EB2121644-032
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	0.5	0.5	0.2



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	WRD03-04 0-3m	WRD03-04 3-6m	WRD03-04 6-9m	WRD03-05 0-3m	WRD03-05 3-6m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-033	EB2121644-034	EB2121644-035	EB2121644-036	EB2121644-037
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		4.3	4.3	4.3	5.4	5.0
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		10.7	9.9	12.6	0.6	<0.5
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		279	293	285	407	288
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		5.4	5.2	5.3	6.1	5.7
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		1.6	1.8	2.1	0.9	0.7
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		0.6	0.8	0.6	1.8	1.7
ANC as CaCO3	----	0.1	% CaCO3		<0.1	<0.1	<0.1	0.2	0.2
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		4.7	4.7	2.2	3.0	2.2
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.37	0.35	0.43	0.08	0.07
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1020	870	1000	620	670
Arsenic	7440-38-2	5	mg/kg		143	130	122	74	76
Barium	7440-39-3	10	mg/kg		100	100	80	70	40
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		<2	<2	<2	<2	<2
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	<5	<5	<5
Iron	7439-89-6	50	mg/kg		9660	9520	7480	2930	2900
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		<5	<5	<5	<5	<5
Nickel	7440-02-0	2	mg/kg		<2	<2	<2	<2	<2
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		<5	<5	<5	<5	<5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	WRD03-04 0-3m	WRD03-04 3-6m	WRD03-04 6-9m	WRD03-05 0-3m	WRD03-05 3-6m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-033	EB2121644-034	EB2121644-035	EB2121644-036	EB2121644-037
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		0.3	0.2	0.2	<0.1	<0.1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	WRD03-05 6-9m	WRD03-06 0-3m	WRD03-06 3-6m	WRD03-06 6-9m	WRD03-07 0-3m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-038	EB2121644-039	EB2121644-040	EB2121644-041	EB2121644-042
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		6.7	4.8	4.9	4.9	5.3
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-0.06	0.7	1.3	-0.2	3.5
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		597	129	77	69	274
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.4	5.3	5.4	5.4	6.0
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		0.5	0.8	0.7	1.2	0.7
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		2.2	2.4	2.4	2.3	2.6
ANC as CaCO3	----	0.1	% CaCO3		0.2	0.2	0.2	0.2	0.3
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		1.1	3.9	3.4	3.8	1.9
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.07	0.10	0.12	0.07	0.20
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		670	780	790	880	730
Arsenic	7440-38-2	5	mg/kg		73	72	70	100	155
Barium	7440-39-3	10	mg/kg		80	40	30	40	80
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		<2	<2	<2	3	2
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	<5	<5	<5
Iron	7439-89-6	50	mg/kg		3140	2570	2480	3400	5610
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		<5	<5	<5	<5	<5
Nickel	7440-02-0	2	mg/kg		3	<2	3	5	4
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		<5	<5	<5	<5	<5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	WRD03-05 6-9m	WRD03-06 0-3m	WRD03-06 3-6m	WRD03-06 6-9m	WRD03-07 0-3m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-038	EB2121644-039	EB2121644-040	EB2121644-041	EB2121644-042
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	0.2



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	WRD03-07 3-6m	WRD03-07 6-9m	WRD03-08 0-3m	WRD03-08 3-6m	WRD03-09 0-3m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-043	EB2121644-044	EB2121644-045	EB2121644-046	EB2121644-047
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		5.6	6.0	4.8	4.6	3.9
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		4.6	1.3	-0.6	-1.3	18.4
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		196	422	66	73	306
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		5.9	6.2	5.4	5.4	2.7
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	12.3
NAG (pH 7.0)	----	0.1	kg H2SO4/t		1.2	0.9	2.1	1.7	16.3
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		2.4	2.7	2.7	2.5	<0.5
ANC as CaCO3	----	0.1	% CaCO3		0.2	0.3	0.3	0.2	<0.1
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		2.4	1.0	2.6	2.6	4.5
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.23	0.13	0.07	0.04	0.60
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		810	720	1160	1470	1450
Arsenic	7440-38-2	5	mg/kg		160	118	86	29	44
Barium	7440-39-3	10	mg/kg		70	80	30	20	30
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		3	2	2	5	3
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	<5	<5	<5
Iron	7439-89-6	50	mg/kg		6790	4500	4820	4760	3360
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		<5	<5	<5	<5	<5
Nickel	7440-02-0	2	mg/kg		<2	5	<2	3	<2
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		<5	<5	11	31	19



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	WRD03-07 3-6m	WRD03-07 6-9m	WRD03-08 0-3m	WRD03-08 3-6m	WRD03-09 0-3m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-043	EB2121644-044	EB2121644-045	EB2121644-046	EB2121644-047
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		0.3	0.1	<0.1	<0.1	0.2



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	WRD03-09 3-6m	WRD03-10 0-3m	WRD03-10 3-6m	FWRD01-01 0-3m	FWRD01-01 3-6m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-048	EB2121644-049	EB2121644-050	EB2121644-051	EB2121644-052
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		4.3	5.0	4.7	4.6	4.9
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		1.9	-0.3	-1.0	-0.8	0.6
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		86	52	33	24	18
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		4.4	4.8	5.0	5.3	5.0
NAG (pH 4.5)	----	0.1	kg H2SO4/t		0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		1.2	2.4	2.1	1.4	1.8
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		2.1	1.8	2.5	2.3	1.2
ANC as CaCO3	----	0.1	% CaCO3		0.2	0.2	0.2	0.2	0.1
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		1.0	5.8	5.0	3.5	3.8
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.13	0.05	0.05	0.05	0.06
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		450	1090	1050	960	890
Arsenic	7440-38-2	5	mg/kg		7	39	5	<5	<5
Barium	7440-39-3	10	mg/kg		20	20	10	<10	20
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		<2	<2	<2	<2	<2
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	<5	<5	<5
Iron	7439-89-6	50	mg/kg		1030	2230	610	270	440
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		<5	<5	<5	<5	<5
Nickel	7440-02-0	2	mg/kg		2	<2	<2	<2	<2
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		7	6	<5	<5	<5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	WRD03-09 3-6m	WRD03-10 0-3m	WRD03-10 3-6m	FWRD01-01 0-3m	FWRD01-01 3-6m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-048	EB2121644-049	EB2121644-050	EB2121644-051	EB2121644-052
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FWRD01-02 0-3m	FWRD01-02 3-6m	FWRD01-03 0-3m	FWRD01-03 3-6m	FWRD01-04 0-3m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-053	EB2121644-054	EB2121644-055	EB2121644-056	EB2121644-057
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		4.5	4.6	4.3	3.9	4.3
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		<0.5	-0.5	-1.1	-0.2	-0.7
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		53	40	74	118	40
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		5.3	5.3	5.2	5.0	4.9
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		1.9	1.3	1.6	1.2	2.6
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		1.2	2.0	2.3	2.0	1.9
ANC as CaCO3	----	0.1	% CaCO3		0.1	0.2	0.2	0.2	0.2
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		3.4	3.3	5.6	4.8	4.2
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.04	0.05	0.04	0.06	0.04
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1130	880	1240	1050	1240
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	<5	<5
Barium	7440-39-3	10	mg/kg		20	30	<10	10	10
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		<2	<2	<2	<2	<2
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	<5	<5	<5
Iron	7439-89-6	50	mg/kg		440	330	360	240	360
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		<5	<5	<5	<5	<5
Nickel	7440-02-0	2	mg/kg		<2	<2	<2	<2	<2
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		<5	<5	<5	<5	<5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FWRD01-02 0-3m	FWRD01-02 3-6m	FWRD01-03 0-3m	FWRD01-03 3-6m	FWRD01-04 0-3m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-053	EB2121644-054	EB2121644-055	EB2121644-056	EB2121644-057
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FWRD01-04 3-6m	FWRD01-05 0-3m	FWRD01-05 3-6m	FWRD01-06 0-3m	FWRD01-06 3-6m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-058	EB2121644-059	EB2121644-060	EB2121644-061	EB2121644-062
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		4.7	4.8	4.5	4.6	4.7
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		<0.5	-0.4	-0.8	<0.5	-0.3
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		50	54	71	37	34
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		5.7	5.6	5.3	5.0	5.1
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		0.7	0.8	1.2	2.3	2.0
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		1.5	2.2	2.6	0.8	1.8
ANC as CaCO3	----	0.1	% CaCO3		0.2	0.2	0.3	<0.1	0.2
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		3.9	3.4	2.4	4.0	3.3
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.06	0.06	0.06	0.04	0.05
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		830	850	780	1040	850
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	<5	<5
Barium	7440-39-3	10	mg/kg		20	20	20	10	<10
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		<2	<2	<2	<2	<2
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	<5	<5	<5
Iron	7439-89-6	50	mg/kg		480	350	470	360	1160
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		<5	<5	<5	<5	<5
Nickel	7440-02-0	2	mg/kg		<2	<2	<2	<2	<2
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		6	<5	6	<5	9



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FWRD01-04 3-6m	FWRD01-05 0-3m	FWRD01-05 3-6m	FWRD01-06 0-3m	FWRD01-06 3-6m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-058	EB2121644-059	EB2121644-060	EB2121644-061	EB2121644-062
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FWRD01-06 6-9m	FWRD01-07 0-3m	FWRD01-07 3-6m	FWRD01-07 6-9m	FWRD01-08 0-3m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-063	EB2121644-064	EB2121644-065	EB2121644-066	EB2121644-067
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		5.0	4.8	4.7	4.7	4.8
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-0.9	-0.8	-0.4	-0.8	-1.0
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		73	30	23	25	46
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		5.5	5.3	5.3	5.3	5.5
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		1.1	1.8	1.1	1.2	1.2
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		2.1	2.0	1.9	2.0	2.2
ANC as CaCO3	----	0.1	% CaCO3		0.2	0.2	0.2	0.2	0.2
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		2.7	4.0	4.1	4.2	3.5
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.04	0.04	0.05	0.04	0.04
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1090	1060	920	990	1120
Arsenic	7440-38-2	5	mg/kg		34	<5	<5	<5	<5
Barium	7440-39-3	10	mg/kg		10	10	20	10	10
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		4	<2	<2	<2	<2
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	<5	<5	<5
Iron	7439-89-6	50	mg/kg		2430	490	430	450	650
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		<5	<5	<5	<5	<5
Nickel	7440-02-0	2	mg/kg		7	<2	<2	<2	<2
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		<5	<5	<5	<5	6



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FWRD01-06 6-9m	FWRD01-07 0-3m	FWRD01-07 3-6m	FWRD01-07 6-9m	FWRD01-08 0-3m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-063	EB2121644-064	EB2121644-065	EB2121644-066	EB2121644-067
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FWRD01-08 3-6m	FWRD01-09 0-3m	FWRD01-09 3-6m	FWRD01-10 0-3m	FWRD01-10 3-6m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-068	EB2121644-069	EB2121644-070	EB2121644-071	EB2121644-072
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		5.0	4.9	4.7	4.4	4.5
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-0.2	-0.7	-1.2	-0.7	-0.8
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		27	23	14	30	23
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		5.3	5.5	5.2	5.2	5.4
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		1.1	1.2	1.5	1.3	1.0
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		2.0	1.9	2.4	1.9	2.0
ANC as CaCO3	----	0.1	% CaCO3		0.2	0.2	0.2	0.2	0.2
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		2.9	4.8	4.6	4.4	3.6
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.06	0.04	0.04	0.04	0.04
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		690	1040	1060	1150	830
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	<5	<5
Barium	7440-39-3	10	mg/kg		10	20	20	<10	<10
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		<2	<2	<2	<2	<2
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	<5	<5	<5
Iron	7439-89-6	50	mg/kg		680	340	350	240	140
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		<5	<5	<5	<5	<5
Nickel	7440-02-0	2	mg/kg		<2	<2	<2	<2	<2
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		6	<5	<5	<5	<5



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				FWRD01-08 3-6m	FWRD01-09 0-3m	FWRD01-09 3-6m	FWRD01-10 0-3m	FWRD01-10 3-6m
Sampling date / time				29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit	EB2121644-068	EB2121644-069	EB2121644-070	EB2121644-071	EB2121644-072
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Zinc	7440-66-6	5	mg/kg	<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FWRD01-11 0-3m	FWRD01-11 3-6m	FWRD01-12 0-3m	FWRD01-12 3-6m	FWRD01-13 0-3m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-073	EB2121644-074	EB2121644-075	EB2121644-076	EB2121644-077
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		4.4	3.7	4.0	3.8	4.6
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-0.5	0.5	-0.2	1.7	-0.4
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		36	456	212	293	36
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		5.2	4.3	4.5	4.3	4.9
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	0.1	<0.1	0.2	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		1.6	1.6	2.8	2.8	2.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		1.7	1.9	2.0	1.4	1.9
ANC as CaCO3	----	0.1	% CaCO3		0.2	0.2	0.2	0.1	0.2
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		3.8	4.0	4.1	2.6	4.6
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.04	0.08	0.06	0.10	0.05
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1160	1070	1410	1160	1040
Arsenic	7440-38-2	5	mg/kg		<5	15	6	44	<5
Barium	7440-39-3	10	mg/kg		20	20	<10	<10	<10
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		<2	<2	3	3	<2
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	<5	<5	<5
Iron	7439-89-6	50	mg/kg		400	910	3480	3840	210
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		<5	<5	<5	<5	<5
Nickel	7440-02-0	2	mg/kg		<2	<2	<2	<2	<2
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		<5	<5	27	20	<5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FWRD01-11 0-3m	FWRD01-11 3-6m	FWRD01-12 0-3m	FWRD01-12 3-6m	FWRD01-13 0-3m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121644-073	EB2121644-074	EB2121644-075	EB2121644-076	EB2121644-077
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	0.1	<0.1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FWRD01-13 3-6m	FWRD01-14 0-3m	FWRD01-15 0-3m	----	----
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2121644-078	EB2121644-079	EB2121644-080	-----	-----
				Result	Result	Result	Result	----	----
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		4.3	3.6	4.8	----	----
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-0.6	8.6	-1.1	----	----
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		40	961	103	----	----
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		5.0	3.6	5.6	----	----
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	1.8	<0.1	----	----
NAG (pH 7.0)	----	0.1	kg H2SO4/t		1.5	5.4	2.5	----	----
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		2.1	<0.5	2.3	----	----
ANC as CaCO3	----	0.1	% CaCO3		0.2	<0.1	0.2	----	----
Fizz Rating	----	0	Fizz Unit		0	0	0	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		5.2	1.6	2.8	----	----
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.05	0.28	0.04	----	----
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1090	2410	1030	----	----
Arsenic	7440-38-2	5	mg/kg		<5	39	40	----	----
Barium	7440-39-3	10	mg/kg		10	<10	10	----	----
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	----	----
Boron	7440-42-8	50	mg/kg		<50	<50	<50	----	----
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	----	----
Chromium	7440-47-3	2	mg/kg		<2	11	2	----	----
Cobalt	7440-48-4	2	mg/kg		<2	3	<2	----	----
Copper	7440-50-8	5	mg/kg		<5	14	<5	----	----
Iron	7439-89-6	50	mg/kg		340	5070	2270	----	----
Lead	7439-92-1	5	mg/kg		<5	<5	<5	----	----
Manganese	7439-96-5	5	mg/kg		<5	6	<5	----	----
Nickel	7440-02-0	2	mg/kg		<2	7	<2	----	----
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	----	----
Vanadium	7440-62-2	5	mg/kg		<5	19	7	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FWRD01-13 3-6m	FWRD01-14 0-3m	FWRD01-15 0-3m	----	----
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2121644-078	EB2121644-079	EB2121644-080	-----	-----
					Result	Result	Result	----	----
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	<5	<5	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	0.3	<0.1	----	----

CERTIFICATE OF ANALYSIS

Work Order : **EB2121646**
Client : **C & R CONSULTING PTY LTD**
Contact : **MR MATT KNOTT**
Address : **188 ROSS RIVER ROAD**
AITKENVALE QUEENSLAND 4812
Telephone : **+61 07 47253751**
Project : **2020.10003 - Solomons Gold Geochemistry**
Order number : **----**
C-O-C number : **----**
Sampler : **MATTHEW AYRE**
Site : **----**
Quote number : **TV/110/21 v2**
No. of samples received : **77**
No. of samples analysed : **74**

Page : 1 of 32
Laboratory : Environmental Division Brisbane
Contact : Princess Marcelo
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 02-Aug-2021 11:25
Date Analysis Commenced : 06-Aug-2021
Issue Date : 17-Aug-2021 16:47



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

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

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

Signatories	Position	Accreditation Category
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

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

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

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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

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

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

- **SPLIT WORK ORDER:** It should be noted that ALS has split this work order over the following work orders (EB2121644, EB2121646) due to the size of the sample numbers. For any further information regarding this processing of samples please contact ALS client services division on ALSEnviro.Brisbane@alsglobal.com
- EG035T (Total Mercury): Sample TSF-03 0m and TSF-13 0m(EB2121646-023 and 043) shows poor matrix spike recovery due to sample heterogeneity. Confirmed by visual inspection.
- ASS: EA013 (ANC) Fizz Rating: 0- None; 1- Slight; 2- Moderate; 3- Strong; 4- Very Strong; 5- Lime.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HLP-01 0-2m	HLP-02 0-2m	HLP-03 0-2m	HLP-04 0-2m	HLP-05 0-2m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121646-001	EB2121646-002	EB2121646-003	EB2121646-004	EB2121646-005
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		9.2	9.4	9.6	9.3	9.2
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-0.08	<0.5	-1.2	-0.4	-0.8
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		52	119	79	42	45
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.6	6.8	6.7	6.7	6.9
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		1.5	1.2	1.1	1.0	0.2
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		1.0	0.8	2.1	1.3	1.4
ANC as CaCO3	----	0.1	% CaCO3		0.1	<0.1	0.2	0.1	0.1
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		5.6	5.7	4.9	5.8	6.3
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.03	0.03	0.03	0.03	0.02
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		520	570	580	600	580
Arsenic	7440-38-2	5	mg/kg		66	59	57	71	78
Barium	7440-39-3	10	mg/kg		50	60	50	60	60
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		<2	<2	<2	<2	<2
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	<5	<5	<5
Iron	7439-89-6	50	mg/kg		2160	2540	2680	2660	2730
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		<5	<5	<5	<5	<5
Nickel	7440-02-0	2	mg/kg		<2	<2	<2	<2	<2
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		<5	<5	<5	<5	<5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HLP-01 0-2m	HLP-02 0-2m	HLP-03 0-2m	HLP-04 0-2m	HLP-05 0-2m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121646-001	EB2121646-002	EB2121646-003	EB2121646-004	EB2121646-005
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	HLP-06 0-2m	FROM01-01 0-3m	FROM01-01 3-6m	FROM01-01 6-9m	FROM01-02 0-3m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121646-006	EB2121646-007	EB2121646-008	EB2121646-009	EB2121646-010
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		9.3	4.0	4.8	5.0	4.9
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-0.5	1.3	2.1	2.9	<0.5
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		88	210	166	265	8
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		7.0	5.2	5.5	5.9	5.9
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	1.8	2.0	1.4	1.3
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		1.7	0.8	<0.5	1.4	1.4
ANC as CaCO3	----	0.1	% CaCO3		0.2	<0.1	<0.1	0.1	0.1
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		5.5	3.2	1.3	3.3	1.9
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.04	0.07	0.07	0.14	0.06
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		650	1790	1750	2070	1110
Arsenic	7440-38-2	5	mg/kg		70	67	56	42	7
Barium	7440-39-3	10	mg/kg		40	20	150	100	<10
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		<2	7	14	19	3
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	<5	<5	<5
Iron	7439-89-6	50	mg/kg		2720	4940	9520	18700	2610
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		<5	<5	23	47	<5
Nickel	7440-02-0	2	mg/kg		<2	3	12	15	<2
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		<5	24	22	18	19



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				HLP-06 0-2m	FROM01-01 0-3m	FROM01-01 3-6m	FROM01-01 6-9m	FROM01-02 0-3m
Sampling date / time				29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit	EB2121646-006	EB2121646-007	EB2121646-008	EB2121646-009	EB2121646-010
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Zinc	7440-66-6	5	mg/kg	<5	<5	7	11	<5
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FROM01-02 3-6m	FROM01-02 6-9m	FROM01-03 0-3m	FROM01-03 3-6m	FROM01-04 0-3m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121646-011	EB2121646-012	EB2121646-013	EB2121646-014	EB2121646-016
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		4.9	5.0	4.4	4.5	4.8
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		0.5	0.9	1.8	0.7	0.6
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		26	26	35	34	18
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		5.7	5.6	5.7	5.7	5.7
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		2.0	2.3	1.2	1.1	1.3
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		0.7	<0.5	<0.5	1.1	0.9
ANC as CaCO3	----	0.1	% CaCO3		<0.1	<0.1	<0.1	0.1	<0.1
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		1.3	2.1	4.7	3.8	5.2
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.04	0.03	0.06	0.06	0.05
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1610	1520	1290	1190	1080
Arsenic	7440-38-2	5	mg/kg		23	32	12	10	<5
Barium	7440-39-3	10	mg/kg		30	50	10	20	20
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		13	12	6	5	<2
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	<5	<5	<5
Iron	7439-89-6	50	mg/kg		3290	3540	5440	3800	1320
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		9	8	<5	<5	<5
Nickel	7440-02-0	2	mg/kg		10	9	<2	<2	<2
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		13	15	38	28	12



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FROM01-02 3-6m	FROM01-02 6-9m	FROM01-03 0-3m	FROM01-03 3-6m	FROM01-04 0-3m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121646-011	EB2121646-012	EB2121646-013	EB2121646-014	EB2121646-016
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FROM01-04 3-6m	FROM01-04 6-9m	TSF-01 0m	TSF-01 0-2m	TSF-02 0m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121646-017	EB2121646-018	EB2121646-019	EB2121646-020	EB2121646-021
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		4.9	5.1	4.4	3.8	4.0
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		<0.5	-0.08	6.4	4.1	5.5
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		71	55	2670	1380	2340
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		5.7	5.4	6.2	5.4	6.1
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		2.6	2.2	0.7	1.0	0.7
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		1.4	1.3	1.9	1.1	1.2
ANC as CaCO3	----	0.1	% CaCO3		0.1	0.1	0.2	0.1	0.1
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		3.2	2.3	3.6	9.3	3.7
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.05	0.04	0.27	0.17	0.22
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1420	1370	1140	1260	1360
Arsenic	7440-38-2	5	mg/kg		45	63	109	126	123
Barium	7440-39-3	10	mg/kg		30	50	30	20	30
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		5	9	6	6	7
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	5	5	8
Iron	7439-89-6	50	mg/kg		3890	4850	6290	6990	6360
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		<5	5	17	8	14
Nickel	7440-02-0	2	mg/kg		4	7	<2	<2	<2
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		16	28	10	9	10



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FROM01-04 3-6m	FROM01-04 6-9m	TSF-01 0m	TSF-01 0-2m	TSF-02 0m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121646-017	EB2121646-018	EB2121646-019	EB2121646-020	EB2121646-021
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	<5	<5	<5	6
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	0.3	0.6	0.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TSF-02 0-2m	TSF-03 0m	TSF-03 0-2m	TSF-04 0m	TSF-04 0-2m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121646-022	EB2121646-023	EB2121646-024	EB2121646-025	EB2121646-026
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		7.8	4.3	7.7	4.0	4.5
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		<0.5	11.8	2.1	8.5	<0.5
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		396	3840	1160	2430	617
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.6	6.7	6.6	6.5	6.6
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		0.4	0.6	0.7	0.7	1.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		3.3	1.4	2.5	1.9	3.6
ANC as CaCO3	----	0.1	% CaCO3		0.3	0.1	0.2	0.2	0.4
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		15.3	6.6	14.0	5.3	12.4
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.11	0.43	0.15	0.34	0.12
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1110	970	1070	1220	1170
Arsenic	7440-38-2	5	mg/kg		118	116	94	108	110
Barium	7440-39-3	10	mg/kg		40	20	50	30	30
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		6	7	7	8	8
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		7	<5	6	6	6
Iron	7439-89-6	50	mg/kg		5580	5730	5390	6250	6830
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		28	19	23	25	65
Nickel	7440-02-0	2	mg/kg		2	2	2	3	4
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		6	6	5	7	9



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TSF-02 0-2m	TSF-03 0m	TSF-03 0-2m	TSF-04 0m	TSF-04 0-2m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121646-022	EB2121646-023	EB2121646-024	EB2121646-025	EB2121646-026
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	7	<5	5	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		0.6	0.5	1.1	1.0	0.8



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TSF-05 0m	TSF-05 0-2m	TSF-06 0m	TSF-06 0-2m	TSF-07 0m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121646-027	EB2121646-028	EB2121646-029	EB2121646-030	EB2121646-031
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		4.7	3.7	9.2	4.1	6.9
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		0.8	4.1	-0.3	-0.7	3.4
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		227	1060	4670	1040	2480
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.6	6.0	7.8	6.9	7.8
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		0.8	0.8	<0.1	0.2	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		1.6	1.4	7.0	3.5	4.3
ANC as CaCO3	----	0.1	% CaCO3		0.2	0.1	0.7	0.4	0.4
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		2.2	14.5	4.1	13.0	6.1
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.08	0.18	0.22	0.09	0.25
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		710	1270	1500	1220	1500
Arsenic	7440-38-2	5	mg/kg		110	129	146	121	118
Barium	7440-39-3	10	mg/kg		30	20	110	20	40
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		9	6	2	6	8
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		5	6	<5	5	7
Iron	7439-89-6	50	mg/kg		6720	6290	6350	6210	6290
Lead	7439-92-1	5	mg/kg		26	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		8	10	7	6	8
Nickel	7440-02-0	2	mg/kg		<2	<2	<2	<2	<2
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		6	8	8	7	8



Analytical Results

Sub-Matrix: **SOIL**
 (Matrix: **SOIL**)

Sample ID

				TSF-05 0m	TSF-05 0-2m	TSF-06 0m	TSF-06 0-2m	TSF-07 0m
Sampling date / time				29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit	EB2121646-027	EB2121646-028	EB2121646-029	EB2121646-030	EB2121646-031
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Zinc	7440-66-6	5	mg/kg	<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.5	0.6	0.5	0.7	0.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TSF-07 0-2m	TSF-08 0m	TSF-08 0-2m	TSF-09 0m	TSF-09 0-2m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121646-032	EB2121646-033	EB2121646-034	EB2121646-035	EB2121646-036
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		5.6	4.8	8.7	8.3	8.0
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		1.6	13.2	2.2	9.6	1.3
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		317	1020	520	2770	356
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.8	6.9	5.8	6.8	7.5
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		0.4	0.4	1.7	2.8	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		1.2	1.5	2.4	6.0	1.8
ANC as CaCO3	----	0.1	% CaCO3		0.1	0.2	0.2	0.6	0.2
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		9.4	6.4	16.4	14.0	16.2
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.09	0.48	0.15	0.51	0.10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1210	1350	1260	180	1100
Arsenic	7440-38-2	5	mg/kg		148	124	88	13	112
Barium	7440-39-3	10	mg/kg		20	40	20	<10	30
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		6	8	8	<2	7
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	6	6	<5	<5
Iron	7439-89-6	50	mg/kg		6250	6670	6250	520	5620
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		<5	10	9	<5	16
Nickel	7440-02-0	2	mg/kg		<2	<2	<2	<2	<2
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		7	8	8	<5	7



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TSF-07 0-2m	TSF-08 0m	TSF-08 0-2m	TSF-09 0m	TSF-09 0-2m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121646-032	EB2121646-033	EB2121646-034	EB2121646-035	EB2121646-036
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		0.4	0.4	1.2	<0.1	0.7



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TSF-10 0m	TSF-10 0-2m	TSF-11 0m	TSF-11 0-2m	TSF-12 0m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121646-037	EB2121646-038	EB2121646-039	EB2121646-040	EB2121646-041
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		9.2	4.3	4.2	3.9	4.4
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-1.3	<0.5	3.0	3.7	10.4
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		2230	828	1190	405	2870
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		8.4	7.0	6.7	6.5	6.8
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	0.2	1.1	1.2	1.0
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		9.6	2.2	1.6	<0.5	1.8
ANC as CaCO3	----	0.1	% CaCO3		1.0	0.2	0.2	<0.1	0.2
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		3.0	15.5	8.7	13.4	12.1
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.27	0.08	0.15	0.12	0.40
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1280	1080	1450	1320	1920
Arsenic	7440-38-2	5	mg/kg		131	88	121	162	96
Barium	7440-39-3	10	mg/kg		240	40	40	30	20
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		<2	6	7	15	7
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	<5	8	6
Iron	7439-89-6	50	mg/kg		6180	5440	7460	10300	5040
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		6	19	8	14	7
Nickel	7440-02-0	2	mg/kg		<2	<2	<2	<2	<2
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		5	7	14	8	10



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TSF-10 0m	TSF-10 0-2m	TSF-11 0m	TSF-11 0-2m	TSF-12 0m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121646-037	EB2121646-038	EB2121646-039	EB2121646-040	EB2121646-041
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		0.1	0.6	0.8	0.4	0.4



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TSF-12 0-2m	TSF-13 0m	TSF-13 0-2m	TSF-14 0m	TSF-14 0-2m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121646-042	EB2121646-043	EB2121646-044	EB2121646-045	EB2121646-046
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		4.7	4.4	4.1	8.5	8.9
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		0.6	7.1	1.7	4.3	-4.1
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		362	2610	1450	3030	1420
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.6	7.7	6.2	7.4	7.6
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		0.6	<0.1	1.0	<0.1	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		2.1	2.1	0.7	6.4	8.4
ANC as CaCO3	----	0.1	% CaCO3		0.2	0.2	<0.1	0.6	0.8
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		15.4	7.6	8.8	20.4	22.5
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.09	0.30	0.08	0.35	0.14
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1380	1710	1170	1580	1720
Arsenic	7440-38-2	5	mg/kg		119	123	114	114	85
Barium	7440-39-3	10	mg/kg		30	20	30	110	50
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		8	9	8	<2	<2
Cobalt	7440-48-4	2	mg/kg		<2	8	<2	<2	<2
Copper	7440-50-8	5	mg/kg		9	20	<5	<5	<5
Iron	7439-89-6	50	mg/kg		6660	6970	6170	4310	3080
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		15	41	<5	7	15
Nickel	7440-02-0	2	mg/kg		2	10	<2	<2	<2
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		9	7	10	<5	<5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TSF-12 0-2m	TSF-13 0m	TSF-13 0-2m	TSF-14 0m	TSF-14 0-2m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121646-042	EB2121646-043	EB2121646-044	EB2121646-045	EB2121646-046
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	36	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		0.6	1.7	0.5	0.2	<0.1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TSF-15 0m	TSF-15 0-2m	TSF-16 0m	TSF-16 0-2m	TSF-17 0m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121646-047	EB2121646-048	EB2121646-049	EB2121646-050	EB2121646-051
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		9.1	9.2	8.3	8.7	5.9
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-3.3	2.3	7.9	7.8	2.9
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		2650	1010	4860	3540	2550
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		7.5	6.4	7.8	7.8	5.3
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	0.9	<0.1	<0.1	1.7
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		8.2	2.0	7.4	7.2	2.9
ANC as CaCO3	----	0.1	% CaCO3		0.8	0.2	0.8	0.7	0.3
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		19.8	22.6	21.8	23.6	4.7
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.16	0.14	0.50	0.49	0.19
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1800	1890	1870	1640	1190
Arsenic	7440-38-2	5	mg/kg		135	167	122	92	110
Barium	7440-39-3	10	mg/kg		100	100	140	210	20
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		<2	2	<2	<2	9
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	<5	<5	8
Iron	7439-89-6	50	mg/kg		5510	6130	4860	3940	5840
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		6	6	7	6	12
Nickel	7440-02-0	2	mg/kg		<2	<2	<2	<2	<2
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		5	7	5	<5	5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TSF-15 0m	TSF-15 0-2m	TSF-16 0m	TSF-16 0-2m	TSF-17 0m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121646-047	EB2121646-048	EB2121646-049	EB2121646-050	EB2121646-051
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		0.1	0.1	0.3	0.1	1.6



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TSF-17 0-2m	TSF-18 0m	TSF-18 0-2m	TSF-19 0m	TSF-19 0-2m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121646-052	EB2121646-053	EB2121646-054	EB2121646-055	EB2121646-056
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		8.4	4.3	4.2	9.3	8.1
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-0.4	7.8	0.9	-0.6	-0.2
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		195	2120	778	2340	1200
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.9	6.5	6.8	7.5	7.6
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		0.2	1.0	0.6	<0.1	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		2.2	1.7	3.1	5.8	3.6
ANC as CaCO3	----	0.1	% CaCO3		0.2	0.2	0.3	0.6	0.4
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		8.3	3.6	18.4	11.2	13.3
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.06	0.31	0.13	0.17	0.11
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		540	1000	1360	2190	1350
Arsenic	7440-38-2	5	mg/kg		65	97	90	214	120
Barium	7440-39-3	10	mg/kg		30	<10	30	50	110
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		10	6	7	2	<2
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	6	<5	<5	<5
Iron	7439-89-6	50	mg/kg		5710	4960	7840	10200	4470
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		18	13	11	<5	6
Nickel	7440-02-0	2	mg/kg		<2	2	2	<2	<2
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		8	6	13	10	5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TSF-17 0-2m	TSF-18 0m	TSF-18 0-2m	TSF-19 0m	TSF-19 0-2m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121646-052	EB2121646-053	EB2121646-054	EB2121646-055	EB2121646-056
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		0.2	0.3	0.5	0.7	<0.1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TSF-20 0m	TSF-20 0-2m	TSF-21 0m	TSF-21 0-2m	TSF-22 0m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121646-057	EB2121646-058	EB2121646-059	EB2121646-060	EB2121646-061
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		4.3	3.9	4.1	3.9	4.2
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		0.6	4.2	<0.5	0.9	1.0
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		634	378	772	556	917
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.5	6.1	6.4	5.9	6.8
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		1.1	0.3	0.4	0.4	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		2.2	1.3	2.6	1.5	2.1
ANC as CaCO3	----	0.1	% CaCO3		0.2	0.1	0.3	0.1	0.2
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		2.0	8.8	3.0	9.2	4.4
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.09	0.18	0.10	0.08	0.10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		590	800	1040	1070	980
Arsenic	7440-38-2	5	mg/kg		76	98	128	98	115
Barium	7440-39-3	10	mg/kg		<10	30	10	20	20
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		5	5	7	5	15
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	6	<5	9
Iron	7439-89-6	50	mg/kg		4180	5490	6900	5140	6450
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg		9	8	20	6	13
Nickel	7440-02-0	2	mg/kg		<2	<2	3	<2	<2
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		<5	7	6	6	6



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TSF-20 0m	TSF-20 0-2m	TSF-21 0m	TSF-21 0-2m	TSF-22 0m
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit		EB2121646-057	EB2121646-058	EB2121646-059	EB2121646-060	EB2121646-061
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		0.6	0.5	0.7	0.4	0.9



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				TSF-22 0-2m	TSF-23 0m	TSF-23 0-2m	KNTC WRD01 -01 0-3m	KNTC WRD02 -01 0-6m
Sampling date / time				29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit	EB2121646-062	EB2121646-063	EB2121646-064	EB2121646-065	EB2121646-066
				Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	5.6	4.3	3.7	5.1	8.0
EA009: Net Acid Production Potential								
Net Acid Production Potential	----	0.5	kg H2SO4/t	-1.0	3.4	1.0	-0.6	-1.2
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C	----	1	µS/cm	940	1480	1150	65	380
EA011: Net Acid Generation								
pH (OX)	----	0.1	pH Unit	7.0	6.6	6.0	6.1	7.1
NAG (pH 4.5)	----	0.1	kg H2SO4/t	<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t	<0.1	0.3	0.3	1.3	<0.1
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	3.1	2.1	1.4	2.1	3.6
ANC as CaCO3	----	0.1	% CaCO3	0.3	0.2	0.1	0.2	0.4
Fizz Rating	----	0	Fizz Unit	0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	9.4	5.9	8.2	1.8	3.4
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.07	0.18	0.08	0.05	0.08
EG005(ED093)T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	1200	1320	1190	830	840
Arsenic	7440-38-2	5	mg/kg	119	125	98	53	71
Barium	7440-39-3	10	mg/kg	30	20	30	30	30
Beryllium	7440-41-7	1	mg/kg	<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	8	9	7	4	4
Cobalt	7440-48-4	2	mg/kg	<2	2	<2	<2	<2
Copper	7440-50-8	5	mg/kg	6	7	5	<5	<5
Iron	7439-89-6	50	mg/kg	6570	6400	5840	2630	2930
Lead	7439-92-1	5	mg/kg	<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg	15	36	6	<5	<5
Nickel	7440-02-0	2	mg/kg	<2	4	<2	2	4
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	8	6	8	<5	<5



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				TSF-22 0-2m	TSF-23 0m	TSF-23 0-2m	KNTC WRD01 -01 0-3m	KNTC WRD02 -01 0-6m
Sampling date / time				29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit	EB2121646-062	EB2121646-063	EB2121646-064	EB2121646-065	EB2121646-066
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Zinc	7440-66-6	5	mg/kg	<5	7	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.6	0.9	0.7	<0.1	<0.1



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				KNTC WRD03 -01 0-4m	KNTC WRD03 -02 0-3m	KNTC FWRD01 -01 0-9m	KNTC HLP01 -01 0-2m	KNTC FROM01-01 0-9m
Sampling date / time				29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit	EB2121646-067	EB2121646-068	EB2121646-069	EB2121646-070	EB2121646-071
				Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	7.1	5.1	4.0	9.3	4.4
EA009: Net Acid Production Potential								
Net Acid Production Potential	----	0.5	kg H2SO4/t	-1.5	-1.0	1.0	-2.5	0.6
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C	----	1	µS/cm	190	71	246	58	257
EA011: Net Acid Generation								
pH (OX)	----	0.1	pH Unit	6.6	6.8	5.8	7.0	5.3
NAG (pH 4.5)	----	0.1	kg H2SO4/t	<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t	0.4	0.3	0.5	<0.1	1.2
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	3.0	2.2	0.8	3.7	1.2
ANC as CaCO3	----	0.1	% CaCO3	0.3	0.2	<0.1	0.4	0.1
Fizz Rating	----	0	Fizz Unit	0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	3.5	4.2	1.7	5.3	1.3
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.05	0.04	0.06	0.04	0.06
EG005(ED093)T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	1520	1420	1230	490	1880
Arsenic	7440-38-2	5	mg/kg	36	26	12	68	42
Barium	7440-39-3	10	mg/kg	40	70	20	40	20
Beryllium	7440-41-7	1	mg/kg	<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	4	3	4	<2	12
Cobalt	7440-48-4	2	mg/kg	<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	<5
Iron	7439-89-6	50	mg/kg	5630	2160	1960	2610	4990
Lead	7439-92-1	5	mg/kg	<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg	<5	<5	<5	<5	10
Nickel	7440-02-0	2	mg/kg	<2	2	10	<2	8
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	27	10	7	<5	23



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				KNTC WRD03 -01 0-4m	KNTC WRD03 -02 0-3m	KNTC FWRD01 -01 0-9m	KNTC HLP01 -01 0-2m	KNTC FROM01-01 0-9m
Sampling date / time				29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00
Compound	CAS Number	LOR	Unit	EB2121646-067	EB2121646-068	EB2121646-069	EB2121646-070	EB2121646-071
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Zinc	7440-66-6	5	mg/kg	<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	KNTC TSF - 01 0-2m	KNTC TSF - 02 0-2m	KNTC TSF - 03 0-2m	KNTC TSF - 04 0-2m	----
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	----
Compound	CAS Number	LOR	Unit		EB2121646-072	EB2121646-073	EB2121646-074	EB2121646-075	-----
				Result	Result	Result	Result	Result	----
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		3.9	4.3	3.8	5.9	----
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		3.0	3.0	<0.5	-0.6	----
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		453	3060	865	1480	----
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.0	6.0	6.6	6.0	----
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	----
NAG (pH 7.0)	----	0.1	kg H2SO4/t		0.5	0.5	0.2	0.6	----
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		1.3	1.6	2.2	2.4	----
ANC as CaCO3	----	0.1	% CaCO3		0.1	0.2	0.2	0.2	----
Fizz Rating	----	0	Fizz Unit		0	0	0	0	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		16.8	6.8	15.9	2.2	----
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.14	0.15	0.08	0.06	----
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1140	1420	1220	1360	----
Arsenic	7440-38-2	5	mg/kg		100	120	142	105	----
Barium	7440-39-3	10	mg/kg		20	20	30	30	----
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	----
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	----
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	----
Chromium	7440-47-3	2	mg/kg		4	9	10	10	----
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	----
Copper	7440-50-8	5	mg/kg		<5	11	8	10	----
Iron	7439-89-6	50	mg/kg		5210	7080	7110	7070	----
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	----
Manganese	7439-96-5	5	mg/kg		6	18	<5	11	----
Nickel	7440-02-0	2	mg/kg		<2	2	<2	2	----
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	----
Vanadium	7440-62-2	5	mg/kg		6	7	8	12	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	KNTC TSF - 01 0-2m	KNTC TSF - 02 0-2m	KNTC TSF - 03 0-2m	KNTC TSF - 04 0-2m	----
Sampling date / time					29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	29-Jul-2021 00:00	----
Compound	CAS Number	LOR	Unit		EB2121646-072	EB2121646-073	EB2121646-074	EB2121646-075	-----
					Result	Result	Result	Result	----
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	6	<5	7	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		0.8	0.8	0.9	1.0	----

CERTIFICATE OF ANALYSIS

Work Order : **EB2125703**
Client : **C & R CONSULTING PTY LTD**
Contact : MR MATT KNOTT
Address : 188 ROSS RIVER ROAD
AITKENVALE QUEENSLAND 4812
Telephone : +61 07 47253751
Project : 2020.10003 - Solomons Gold Geochemistry
Order number : ----
C-O-C number : ----
Sampler : MATTHEW AYRE
Site : ----
Quote number : TV/110/21 v2
No. of samples received : 3
No. of samples analysed : 3

Page : 1 of 4
Laboratory : Environmental Division Brisbane
Contact : Princess Marcelo
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 09-Sep-2021 11:56
Date Analysis Commenced : 10-Sep-2021
Issue Date : 17-Sep-2021 12:28



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

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

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

Signatories	Position	Accreditation Category
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Inorganics, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

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

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

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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

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

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

- EG005T (Total Metals by ICP-AES): Sample (EB2125627_041) shows poor duplicate results due to sample heterogeneity. Confirmed by visual inspection.
- ASS: EA013 (ANC) Fizz Rating: 0- None; 1- Slight; 2- Moderate; 3- Strong; 4- Very Strong; 5- Lime.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	Haul-01 0-2m	Haul-02 0-1m	WRD03-10 6-9m	----	----
Sampling date / time					25-Jul-2021 00:00	25-Jul-2021 00:00	25-Jul-2021 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2125703-001	EB2125703-002	EB2125703-003	-----	-----
				Result	Result	Result	Result	----	----
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		9.5	8.6	4.4	----	----
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		0.9	1.2	1.5	----	----
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		103	154	66	----	----
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		7.0	6.5	5.0	----	----
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	----	----
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	0.7	1.2	----	----
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		<0.5	<0.5	<0.5	----	----
ANC as CaCO3	----	0.1	% CaCO3		<0.1	<0.1	<0.1	----	----
Fizz Rating	----	0	Fizz Unit		0	0	0	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		3.6	3.3	3.7	----	----
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.03	0.04	0.05	----	----
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		370	530	1060	----	----
Arsenic	7440-38-2	5	mg/kg		44	43	<5	----	----
Barium	7440-39-3	10	mg/kg		40	40	20	----	----
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	----	----
Boron	7440-42-8	50	mg/kg		<50	<50	<50	----	----
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	----	----
Chromium	7440-47-3	2	mg/kg		<2	<2	<2	----	----
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	----	----
Copper	7440-50-8	5	mg/kg		<5	<5	<5	----	----
Iron	7439-89-6	50	mg/kg		1220	1730	770	----	----
Lead	7439-92-1	5	mg/kg		<5	<5	<5	----	----
Manganese	7439-96-5	5	mg/kg		<5	<5	<5	----	----
Nickel	7440-02-0	2	mg/kg		<2	<2	<2	----	----
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	----	----
Vanadium	7440-62-2	5	mg/kg		<5	<5	6	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	Haul-01 0-2m	Haul-02 0-1m	WRD03-10 6-9m	----	----
Sampling date / time					25-Jul-2021 00:00	25-Jul-2021 00:00	25-Jul-2021 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2125703-001	EB2125703-002	EB2125703-003	-----	-----
					Result	Result	Result	----	----
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Zinc	7440-66-6	5	mg/kg		<5	<5	<5	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	----	----

CLIENT: WULGURU TECHNICAL SERVICES
PROJECT: WIRRALIE GOLD MINE
REPORT: WASTE ROCK CHARACTERISATION
DATE: FEBRUARY 2022



Appendix B – Kinetic Results

CERTIFICATE OF ANALYSIS

Work Order : **EB2128027**
Client : **C & R CONSULTING PTY LTD**
Contact : ALEXANDER BARNES
Address : 188 ROSS RIVER ROAD
AITKENVALE QUEENSLAND 4812
Telephone : ----
Project : Wirralie KLC - Leach 0
Order number : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : TV/110/21 v2
No. of samples received : 11
No. of samples analysed : 11

Page : 1 of 11
Laboratory : Environmental Division Brisbane
Contact : Princess Marcelo
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 05-Oct-2021 11:21
Date Analysis Commenced : 07-Oct-2021
Issue Date : 12-Oct-2021 14:38



Accreditation No. 825
Accredited for compliance with
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

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- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

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

Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



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

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EG035F (Dissolved Mercury): Positive mercury results have been confirmed by re-extraction and re-analysis.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				KNTC WRD01-01 0-3m	KNTC WRD02-01 0-6m	KNTC WRD03-01 0-4m	KNTC WRD03-02 0-3m	KNTC FWRD01-01 0-9m
Sampling date / time				05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00
Compound	CAS Number	LOR	Unit	EB2128027-001	EB2128027-002	EB2128027-003	EB2128027-004	EB2128027-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	4.46	5.05	6.61	5.10	4.29
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	1030	1400	1880	1460	933
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	670	910	1220	949	606
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	47	180	322	95	134
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	111	100	9	<1
Total Alkalinity as CaCO3	----	1	mg/L	<1	111	100	9	<1
ED038: Acidity								
Acidity as CaCO3	----	1	mg/L	68	13	11	20	58
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	9	176	432	279	227
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	68	292	228	235	118
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	4	59	96	28	11
Magnesium	7439-95-4	1	mg/L	9	8	20	6	26
Sodium	7440-23-5	1	mg/L	48	193	234	242	97
Potassium	7440-09-7	1	mg/L	67	8	18	13	19
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	1.16	0.63	0.05	0.36	5.67
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	7440-38-2	0.001	mg/L	<0.001	0.018	0.006	0.019	0.004
Boron	7440-42-8	0.05	mg/L	1.22	0.81	0.81	0.86	1.27
Barium	7440-39-3	0.001	mg/L	2.12	0.274	0.128	0.172	0.338
Beryllium	7440-41-7	0.001	mg/L	0.001	<0.001	<0.001	<0.001	0.003
Cadmium	7440-43-9	0.0001	mg/L	0.0005	0.0004	0.0003	0.0005	0.0008
Cobalt	7440-48-4	0.001	mg/L	0.023	0.013	0.011	0.018	0.050
Chromium	7440-47-3	0.001	mg/L	<0.001	0.001	<0.001	<0.001	0.002



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				KNTC WRD01-01 0-3m	KNTC WRD02-01 0-6m	KNTC WRD03-01 0-4m	KNTC WRD03-02 0-3m	KNTC FWRD01-01 0-9m
Sampling date / time				05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00
Compound	CAS Number	LOR	Unit	EB2128027-001	EB2128027-002	EB2128027-003	EB2128027-004	EB2128027-005
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Copper	7440-50-8	0.001	mg/L	0.011	0.002	<0.001	0.004	0.016
Manganese	7439-96-5	0.001	mg/L	0.695	0.165	0.466	0.537	0.438
Nickel	7440-02-0	0.001	mg/L	0.445	0.050	0.306	0.536	0.508
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	1.80	1.34	1.14	1.44	1.72
Molybdenum	7439-98-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Thorium	7440-29-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	7439-89-6	0.05	mg/L	11.2	0.35	0.19	3.38	4.10
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.4	0.4	0.5	0.3	1.8



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				KNTC HLP01-01 0-2m	KNTC FROM01-01 0-9m	KNTC TSF-01 0-2m	KNTC TSF-02 0-2m	KNTC TSF-03 0-2m
Sampling date / time				05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00
Compound	CAS Number	LOR	Unit	EB2128027-006	EB2128027-007	EB2128027-008	EB2128027-009	EB2128027-010
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.82	3.99	3.69	7.39	4.13
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	205	1260	2820	9180	9140
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	133	819	1830	5970	5940
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	25	381	918	1450	1630
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	152	<1	<1	157	<1
Total Alkalinity as CaCO3	----	1	mg/L	152	<1	<1	157	<1
ED038: Acidity								
Acidity as CaCO3	----	1	mg/L	<1	198	204	10	189
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	38	556	1540	2480	3070
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	15	38	56	1640	1390
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	10	85	323	529	456
Magnesium	7439-95-4	1	mg/L	<1	41	27	31	119
Sodium	7440-23-5	1	mg/L	31	40	256	1600	1460
Potassium	7440-09-7	1	mg/L	2	10	24	30	55
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.03	28.6	28.9	0.02	23.4
Antimony	7440-36-0	0.001	mg/L	0.002	<0.001	<0.001	0.003	<0.001
Arsenic	7440-38-2	0.001	mg/L	0.122	0.005	0.013	0.004	0.019
Boron	7440-42-8	0.05	mg/L	0.09	0.79	1.12	1.44	2.94
Barium	7440-39-3	0.001	mg/L	0.085	0.332	0.153	0.058	0.072
Beryllium	7440-41-7	0.001	mg/L	<0.001	0.002	0.006	<0.001	0.005
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.0046	0.0069	0.0014	0.0343
Cobalt	7440-48-4	0.001	mg/L	<0.001	0.240	0.184	0.125	0.244
Chromium	7440-47-3	0.001	mg/L	<0.001	0.009	0.018	<0.001	0.012



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				KNTC HLP01-01 0-2m	KNTC FROM01-01 0-9m	KNTC TSF-01 0-2m	KNTC TSF-02 0-2m	KNTC TSF-03 0-2m
Sampling date / time				05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00
Compound	CAS Number	LOR	Unit	EB2128027-006	EB2128027-007	EB2128027-008	EB2128027-009	EB2128027-010
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Copper	7440-50-8	0.001	mg/L	<0.001	0.003	0.090	0.002	0.098
Manganese	7439-96-5	0.001	mg/L	<0.001	2.80	3.40	1.18	9.45
Nickel	7440-02-0	0.001	mg/L	<0.001	0.775	0.448	0.055	1.54
Lead	7439-92-1	0.001	mg/L	<0.001	0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	0.02	0.03
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	<0.005	2.29	2.00	1.24	4.57
Molybdenum	7439-98-7	0.001	mg/L	0.010	<0.001	<0.001	<0.001	<0.001
Thorium	7440-29-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	0.015	0.003	0.010
Iron	7439-89-6	0.05	mg/L	<0.05	1.43	0.16	<0.05	0.15
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	0.0002	0.0001
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.4	1.1	0.7	0.3	0.5



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)		Sample ID		KNTC TSF-04 0-2m	----	----	----	----
		Sampling date / time		05-Oct-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2128027-011	-----	-----	-----	-----
Result				----	----	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	4.94	----	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	1780	----	----	----	----
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	1160	----	----	----	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	105	----	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	<1	----	----	----	----
ED038: Acidity								
Acidity as CaCO3	----	1	mg/L	9	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	349	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	341	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	32	----	----	----	----
Magnesium	7439-95-4	1	mg/L	6	----	----	----	----
Sodium	7440-23-5	1	mg/L	304	----	----	----	----
Potassium	7440-09-7	1	mg/L	6	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.22	----	----	----	----
Antimony	7440-36-0	0.001	mg/L	<0.001	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L	0.004	----	----	----	----
Boron	7440-42-8	0.05	mg/L	0.42	----	----	----	----
Barium	7440-39-3	0.001	mg/L	0.158	----	----	----	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	0.0021	----	----	----	----
Cobalt	7440-48-4	0.001	mg/L	0.024	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	0.005	----	----	----	----



Analytical Results

Sub-Matrix: **LEACHATE**
 (Matrix: **WATER**)

Sample ID

				KNTC TSF-04 0-2m	----	----	----	----
Sampling date / time				05-Oct-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2128027-011	-----	-----	-----	-----
Result				----	----	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Manganese	7439-96-5	0.001	mg/L	0.336	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	0.046	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	----	----	----	----
Vanadium	7440-62-2	0.01	mg/L	<0.01	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	0.715	----	----	----	----
Molybdenum	7439-98-7	0.001	mg/L	<0.001	----	----	----	----
Thorium	7440-29-1	0.001	mg/L	<0.001	----	----	----	----
Uranium	7440-61-1	0.001	mg/L	<0.001	----	----	----	----
Iron	7439-89-6	0.05	mg/L	<0.05	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.3	----	----	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				KNTC WRD01-01 0-3m	KNTC WRD02-01 0-6m	KNTC WRD03-01 0-4m	KNTC WRD03-02 0-3m	KNTC FWRD01-01 0-9m
Sampling date / time				05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00
Compound	CAS Number	LOR	Unit	EB2128027-001	EB2128027-002	EB2128027-003	EB2128027-004	EB2128027-005
				Result	Result	Result	Result	Result
EA047 Free Draining Leach Column								
∅ Initial weight of sample	----	0.001	g	2000	2000	2000	2000	2000
∅ Leachate added	----	0.01	mL	800	800	900	800	900
∅ Leachate collected	----	0.01	mL	350	340	380	360	280
∅ Initial pH	----	0.01	pH Unit	4.57	5.17	6.60	5.20	4.30
∅ Initial Electrical Conductivity	----	1	µS/cm	1070	1420	1890	1480	953



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				KNTC HLP01-01 0-2m	KNTC FROM01-01 0-9m	KNTC TSF-01 0-2m	KNTC TSF-02 0-2m	KNTC TSF-03 0-2m
Sampling date / time				05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00
Compound	CAS Number	LOR	Unit	EB2128027-006	EB2128027-007	EB2128027-008	EB2128027-009	EB2128027-010
				Result	Result	Result	Result	Result
EA047 Free Draining Leach Column								
∅ Initial weight of sample	----	0.001	g	2000	2000	2000	2000	2000
∅ Leachate added	----	0.01	mL	800	800	800	900	900
∅ Leachate collected	----	0.01	mL	380	410	300	250	350
∅ Initial pH	----	0.01	pH Unit	8.73	3.98	3.62	7.55	4.03
∅ Initial Electrical Conductivity	----	1	µS/cm	215	1280	2870	9410	9330



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	KNTC TSF-04 0-2m	----	----	----	----
			Sampling date / time	05-Oct-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2128027-011	-----	-----	-----	-----
				Result	----	----	----	----
EA047 Free Draining Leach Column								
∅ Initial weight of sample	----	0.001	g	2000	----	----	----	----
∅ Leachate added	----	0.01	mL	800	----	----	----	----
∅ Leachate collected	----	0.01	mL	410	----	----	----	----
∅ Initial pH	----	0.01	pH Unit	4.89	----	----	----	----
∅ Initial Electrical Conductivity	----	1	µS/cm	1800	----	----	----	----

CERTIFICATE OF ANALYSIS

Work Order : **EB2129795**
Client : **C & R CONSULTING PTY LTD**
Contact : ALEXANDER BARNES
Address : 188 ROSS RIVER ROAD
AITKENVALE QUEENSLAND 4812
Telephone : ----
Project : Wirralie KLC - Leach 1
Order number : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : TV/110/21 v2
No. of samples received : 11
No. of samples analysed : 11

Page : 1 of 11
Laboratory : Environmental Division Brisbane
Contact : Princess Marcelo
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 20-Oct-2021 11:33
Date Analysis Commenced : 20-Oct-2021
Issue Date : 27-Oct-2021 18:54



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

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

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

Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

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

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

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				KNTC WRD01-01 0-3m	KNTC WRD02-01 0-6m	KNTC WRD03-01 0-4m	KNTC WRD03-02 0-3m	KNTC FWRD01-01 0-9m
Sampling date / time				20-Oct-2021 00:00	20-Oct-2021 00:00	20-Oct-2021 00:00	20-Oct-2021 00:00	20-Oct-2021 00:00
Compound	CAS Number	LOR	Unit	EB2129795-001	EB2129795-002	EB2129795-003	EB2129795-004	EB2129795-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	5.31	5.51	6.47	5.59	4.84
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	80	72	208	129	52
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	52	47	135	84	34
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	<1	5	19	2	<1
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	4	1	3	1	<1
Total Alkalinity as CaCO3	----	1	mg/L	4	1	3	1	<1
ED038: Acidity								
Acidity as CaCO3	----	1	mg/L	6	4	4	4	6
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	17	19	64	32	16
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	2	5	4	10	<1
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	<1	2	6	1	<1
Magnesium	7439-95-4	1	mg/L	<1	<1	1	<1	<1
Sodium	7440-23-5	1	mg/L	6	11	28	21	4
Potassium	7440-09-7	1	mg/L	6	<1	4	2	4
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.02	0.48	<0.01	0.28	0.29
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	7440-38-2	0.001	mg/L	0.002	0.004	0.002	0.001	<0.001
Boron	7440-42-8	0.05	mg/L	1.06	0.37	0.56	0.99	0.81
Barium	7440-39-3	0.001	mg/L	0.050	0.030	0.072	0.023	0.047
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	0.002
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				KNTC WRD01-01 0-3m	KNTC WRD02-01 0-6m	KNTC WRD03-01 0-4m	KNTC WRD03-02 0-3m	KNTC FWRD01-01 0-9m
Sampling date / time				20-Oct-2021 00:00	20-Oct-2021 00:00	20-Oct-2021 00:00	20-Oct-2021 00:00	20-Oct-2021 00:00
Compound	CAS Number	LOR	Unit	EB2129795-001	EB2129795-002	EB2129795-003	EB2129795-004	EB2129795-005
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	0.019	0.008	0.022	0.024	0.021
Nickel	7440-02-0	0.001	mg/L	0.010	0.002	0.013	0.025	0.019
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	0.092	0.059	0.048	0.118	0.129
Molybdenum	7439-98-7	0.001	mg/L	<0.001	<0.001	0.002	<0.001	<0.001
Thorium	7440-29-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	7439-89-6	0.05	mg/L	0.19	<0.05	<0.05	0.13	0.10
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.1	<0.1	<0.1



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				KNTC HLP01-01 0-2m	KNTC FROM01-01 0-9m	KNTC TSF-01 0-2m	KNTC TSF-02 0-2m	KNTC TSF-03 0-2m
Sampling date / time				20-Oct-2021 00:00	20-Oct-2021 00:00	20-Oct-2021 00:00	20-Oct-2021 00:00	20-Oct-2021 00:00
Compound	CAS Number	LOR	Unit	EB2129795-006	EB2129795-007	EB2129795-008	EB2129795-009	EB2129795-010
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.93	4.07	3.64	6.37	4.06
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	175	580	2090	571	7050
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	114	377	1360	371	4580
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	32	158	808	92	1600
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	46	<1	<1	4	<1
Total Alkalinity as CaCO3	----	1	mg/L	46	<1	<1	4	<1
ED038: Acidity								
Acidity as CaCO3	----	1	mg/L	<1	59	147	4	131
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	26	218	1030	122	2780
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	8	9	22	76	855
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	13	37	299	35	476
Magnesium	7439-95-4	1	mg/L	<1	16	15	1	100
Sodium	7440-23-5	1	mg/L	25	18	124	74	1030
Potassium	7440-09-7	1	mg/L	2	6	14	2	46
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	6.64	17.1	<0.01	15.0
Antimony	7440-36-0	0.001	mg/L	0.002	<0.001	<0.001	<0.001	0.002
Arsenic	7440-38-2	0.001	mg/L	0.165	0.001	0.003	0.001	0.017
Boron	7440-42-8	0.05	mg/L	0.34	0.96	1.37	<0.05	4.32
Barium	7440-39-3	0.001	mg/L	0.062	0.056	0.024	0.003	0.043
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.003	<0.001	0.004
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.0018	0.0041	<0.0001	0.0298
Cobalt	7440-48-4	0.001	mg/L	<0.001	0.106	0.122	0.004	0.236
Chromium	7440-47-3	0.001	mg/L	<0.001	0.004	0.008	<0.001	0.007



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				KNTC HLP01-01 0-2m	KNTC FROM01-01 0-9m	KNTC TSF-01 0-2m	KNTC TSF-02 0-2m	KNTC TSF-03 0-2m
Sampling date / time				20-Oct-2021 00:00	20-Oct-2021 00:00	20-Oct-2021 00:00	20-Oct-2021 00:00	20-Oct-2021 00:00
Compound	CAS Number	LOR	Unit	EB2129795-006	EB2129795-007	EB2129795-008	EB2129795-009	EB2129795-010
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Copper	7440-50-8	0.001	mg/L	0.003	<0.001	0.062	<0.001	0.107
Manganese	7439-96-5	0.001	mg/L	0.001	1.35	1.85	0.010	9.17
Nickel	7440-02-0	0.001	mg/L	<0.001	0.494	0.266	<0.001	1.71
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	0.03
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	0.011	1.56	1.72	<0.005	5.41
Molybdenum	7439-98-7	0.001	mg/L	0.013	<0.001	<0.001	<0.001	<0.001
Thorium	7440-29-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	0.002
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	0.008	<0.001	0.007
Iron	7439-89-6	0.05	mg/L	<0.05	0.07	0.06	<0.05	0.23
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.3	0.6	0.6	<0.1	0.5



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)		Sample ID		KNTC TSF-04 0-2m	----	----	----	----
Sampling date / time		20-Oct-2021 00:00		----	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2129795-011	-----	-----	-----	-----
Result				----	----	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	4.91	----	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	806	----	----	----	----
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	524	----	----	----	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	70	----	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	<1	----	----	----	----
ED038: Acidity								
Acidity as CaCO3	----	1	mg/L	8	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	190	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	104	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	23	----	----	----	----
Magnesium	7439-95-4	1	mg/L	3	----	----	----	----
Sodium	7440-23-5	1	mg/L	126	----	----	----	----
Potassium	7440-09-7	1	mg/L	3	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.10	----	----	----	----
Antimony	7440-36-0	0.001	mg/L	<0.001	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L	0.001	----	----	----	----
Boron	7440-42-8	0.05	mg/L	1.06	----	----	----	----
Barium	7440-39-3	0.001	mg/L	0.015	----	----	----	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	0.0008	----	----	----	----
Cobalt	7440-48-4	0.001	mg/L	0.015	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	0.003	----	----	----	----



Analytical Results

Sub-Matrix: **LEACHATE**
 (Matrix: **WATER**)

Sample ID

				KNTC TSF-04 0-2m	----	----	----	----
Sampling date / time				20-Oct-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2129795-011	-----	-----	-----	-----
Result				----	----	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Manganese	7439-96-5	0.001	mg/L	0.149	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	0.023	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	----	----	----	----
Vanadium	7440-62-2	0.01	mg/L	<0.01	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	0.466	----	----	----	----
Molybdenum	7439-98-7	0.001	mg/L	<0.001	----	----	----	----
Thorium	7440-29-1	0.001	mg/L	<0.001	----	----	----	----
Uranium	7440-61-1	0.001	mg/L	<0.001	----	----	----	----
Iron	7439-89-6	0.05	mg/L	<0.05	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	----	----	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				KNTC WRD01-01 0-3m	KNTC WRD02-01 0-6m	KNTC WRD03-01 0-4m	KNTC WRD03-02 0-3m	KNTC FWRD01-01 0-9m
Sampling date / time				20-Oct-2021 00:00	20-Oct-2021 00:00	20-Oct-2021 00:00	20-Oct-2021 00:00	20-Oct-2021 00:00
Compound	CAS Number	LOR	Unit	EB2129795-001	EB2129795-002	EB2129795-003	EB2129795-004	EB2129795-005
				Result	Result	Result	Result	Result
EA047 Free Draining Leach Column								
∅ Leachate added	----	0.01	mL	800	800	800	800	800
∅ Leachate collected	----	0.01	mL	650	680	620	670	670
∅ Initial pH	----	0.01	pH Unit	5.34	5.21	6.41	5.38	4.65
∅ Initial Electrical Conductivity	----	1	µS/cm	82	73	211	129	52



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				KNTC HLP01-01 0-2m	KNTC FROM01-01 0-9m	KNTC TSF-01 0-2m	KNTC TSF-02 0-2m	KNTC TSF-03 0-2m
Sampling date / time				20-Oct-2021 00:00	20-Oct-2021 00:00	20-Oct-2021 00:00	20-Oct-2021 00:00	20-Oct-2021 00:00
Compound	CAS Number	LOR	Unit	EB2129795-006	EB2129795-007	EB2129795-008	EB2129795-009	EB2129795-010
				Result	Result	Result	Result	Result
EA047 Free Draining Leach Column								
∅ Leachate added	----	0.01	mL	800	800	800	800	800
∅ Leachate collected	----	0.01	mL	660	700	700	730	320
∅ Initial pH	----	0.01	pH Unit	8.31	3.98	3.59	6.51	4.04
∅ Initial Electrical Conductivity	----	1	µS/cm	176	578	2070	566	7120



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	KNTC TSF-04 0-2m	----	----	----	----
				Sampling date / time	20-Oct-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2129795-011	-----	-----	-----	-----
					Result	----	----	----	----
EA047 Free Draining Leach Column									
ø Leachate added	----	0.01	mL		800	----	----	----	----
ø Leachate collected	----	0.01	mL		650	----	----	----	----
ø Initial pH	----	0.01	pH Unit		4.68	----	----	----	----
ø Initial Electrical Conductivity	----	1	µS/cm		800	----	----	----	----

CERTIFICATE OF ANALYSIS

Work Order : **EB2131161**
Client : **C & R CONSULTING PTY LTD**
Contact : ALEXANDER BARNES
Address : 188 ROSS RIVER ROAD
AITKENVALE QUEENSLAND 4812
Telephone : ----
Project : Wirralie KLC - Leach 2
Order number : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : TV/110/21 v2
No. of samples received : 11
No. of samples analysed : 11

Page : 1 of 11
Laboratory : Environmental Division Brisbane
Contact : Princess Marcelo
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 02-Nov-2021 11:40
Date Analysis Commenced : 03-Nov-2021
Issue Date : 19-Nov-2021 14:55



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

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

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

Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

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

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

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				KNTC WRD01-01 0-3m	KNTC WRD02-01 0-6m	KNTC WRD03-01 0-4m	KNTC WRD03-02 0-3m	KNTC FWRD01-01 0-9m
Sampling date / time				02-Nov-2021 00:00	02-Nov-2021 00:00	02-Nov-2021 00:00	02-Nov-2021 00:00	02-Nov-2021 00:00
Compound	CAS Number	LOR	Unit	EB2131161-001	EB2131161-002	EB2131161-003	EB2131161-004	EB2131161-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	5.36	5.11	6.56	5.57	4.81
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	58	46	86	87	25
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	38	30	56	56	16
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	<1	2	5	<1	<1
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	<1	3	<1	<1
Total Alkalinity as CaCO3	----	1	mg/L	<1	<1	3	<1	<1
ED038: Acidity								
Acidity as CaCO3	----	1	mg/L	6	4	4	4	4
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	13	11	28	21	6
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	2	3	1	7	<1
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	<1	1	2	<1	<1
Magnesium	7439-95-4	1	mg/L	<1	<1	<1	<1	<1
Sodium	7440-23-5	1	mg/L	4	6	11	14	2
Potassium	7440-09-7	1	mg/L	4	<1	2	1	2
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.06	0.39	0.01	0.07	0.42
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	7440-38-2	0.001	mg/L	0.001	0.002	0.002	0.001	<0.001
Boron	7440-42-8	0.05	mg/L	1.35	0.24	0.40	0.85	0.22
Barium	7440-39-3	0.001	mg/L	0.043	0.024	0.077	0.026	0.027
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				KNTC WRD01-01 0-3m	KNTC WRD02-01 0-6m	KNTC WRD03-01 0-4m	KNTC WRD03-02 0-3m	KNTC FWRD01-01 0-9m
Sampling date / time				02-Nov-2021 00:00	02-Nov-2021 00:00	02-Nov-2021 00:00	02-Nov-2021 00:00	02-Nov-2021 00:00
Compound	CAS Number	LOR	Unit	EB2131161-001	EB2131161-002	EB2131161-003	EB2131161-004	EB2131161-005
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	0.012	0.006	0.005	0.016	0.012
Nickel	7440-02-0	0.001	mg/L	0.006	0.002	0.005	0.016	0.010
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	0.066	0.027	0.022	0.079	0.026
Molybdenum	7439-98-7	0.001	mg/L	<0.001	<0.001	0.003	<0.001	<0.001
Thorium	7440-29-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.2	<0.1	<0.1



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				KNTC HLP01-01 0-2m	KNTC FROM01-01 0-9m	KNTC TSF-01 0-2m	KNTC TSF-02 0-2m	KNTC TSF-03 0-2m
Sampling date / time				02-Nov-2021 00:00	02-Nov-2021 00:00	02-Nov-2021 00:00	02-Nov-2021 00:00	02-Nov-2021 00:00
Compound	CAS Number	LOR	Unit	EB2131161-006	EB2131161-007	EB2131161-008	EB2131161-009	EB2131161-010
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	8.04	4.16	3.70	5.91	4.12
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	119	295	1360	110	3160
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	77	192	884	72	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	30	73	572	10	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	38	<1	<1	1	----
Total Alkalinity as CaCO3	----	1	mg/L	38	<1	<1	1	----
ED038: Acidity								
Acidity as CaCO3	----	1	mg/L	2	25	77	4	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	11	104	720	19	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	3	2	6	15	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	12	16	216	4	----
Magnesium	7439-95-4	1	mg/L	<1	8	8	<1	----
Sodium	7440-23-5	1	mg/L	13	8	46	16	----
Potassium	7440-09-7	1	mg/L	1	4	8	<1	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	2.06	8.92	<0.01	4.99
Antimony	7440-36-0	0.001	mg/L	0.002	<0.001	<0.001	<0.001	0.002
Arsenic	7440-38-2	0.001	mg/L	0.163	0.001	0.001	0.001	0.006
Boron	7440-42-8	0.05	mg/L	0.50	1.04	1.29	<0.05	1.70
Barium	7440-39-3	0.001	mg/L	0.093	0.068	0.026	0.002	0.034
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.002	<0.001	0.002
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.0006	0.0018	<0.0001	0.0108
Cobalt	7440-48-4	0.001	mg/L	<0.001	0.046	0.056	<0.001	0.102
Chromium	7440-47-3	0.001	mg/L	<0.001	0.002	0.004	<0.001	0.003



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				KNTC HLP01-01 0-2m	KNTC FROM01-01 0-9m	KNTC TSF-01 0-2m	KNTC TSF-02 0-2m	KNTC TSF-03 0-2m
Sampling date / time				02-Nov-2021 00:00	02-Nov-2021 00:00	02-Nov-2021 00:00	02-Nov-2021 00:00	02-Nov-2021 00:00
Compound	CAS Number	LOR	Unit	EB2131161-006	EB2131161-007	EB2131161-008	EB2131161-009	EB2131161-010
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.036	<0.001	0.049
Manganese	7439-96-5	0.001	mg/L	<0.001	0.703	0.952	0.002	3.79
Nickel	7440-02-0	0.001	mg/L	<0.001	0.288	0.140	<0.001	0.860
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	0.01
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	<0.005	0.990	1.15	<0.005	1.96
Molybdenum	7439-98-7	0.001	mg/L	0.008	<0.001	<0.001	<0.001	<0.001
Thorium	7440-29-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	0.004	<0.001	0.003
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.3	0.2	0.4	<0.1	----



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)		Sample ID		KNTC TSF-04 0-2m	----	----	----	----
		Sampling date / time		02-Nov-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2131161-011	-----	-----	-----	-----
				Result	----	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	4.76	----	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	709	----	----	----	----
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	461	----	----	----	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	67	----	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	<1	----	----	----	----
ED038: Acidity								
Acidity as CaCO3	----	1	mg/L	9	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	176	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	86	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	22	----	----	----	----
Magnesium	7439-95-4	1	mg/L	3	----	----	----	----
Sodium	7440-23-5	1	mg/L	109	----	----	----	----
Potassium	7440-09-7	1	mg/L	3	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.09	----	----	----	----
Antimony	7440-36-0	0.001	mg/L	<0.001	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Boron	7440-42-8	0.05	mg/L	1.18	----	----	----	----
Barium	7440-39-3	0.001	mg/L	0.015	----	----	----	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	0.0004	----	----	----	----
Cobalt	7440-48-4	0.001	mg/L	0.013	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	0.003	----	----	----	----



Analytical Results

Sub-Matrix: **LEACHATE**
 (Matrix: **WATER**)

Sample ID

				KNTC TSF-04 0-2m	----	----	----	----
Sampling date / time				02-Nov-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2131161-011	-----	-----	-----	-----
Result				----	----	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Manganese	7439-96-5	0.001	mg/L	0.133	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	0.022	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	----	----	----	----
Vanadium	7440-62-2	0.01	mg/L	<0.01	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	0.488	----	----	----	----
Molybdenum	7439-98-7	0.001	mg/L	<0.001	----	----	----	----
Thorium	7440-29-1	0.001	mg/L	<0.001	----	----	----	----
Uranium	7440-61-1	0.001	mg/L	<0.001	----	----	----	----
Iron	7439-89-6	0.05	mg/L	<0.05	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	----	----	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				KNTC WRD01-01 0-3m	KNTC WRD02-01 0-6m	KNTC WRD03-01 0-4m	KNTC WRD03-02 0-3m	KNTC FWRD01-01 0-9m
Sampling date / time				02-Nov-2021 00:00	02-Nov-2021 00:00	02-Nov-2021 00:00	02-Nov-2021 00:00	02-Nov-2021 00:00
Compound	CAS Number	LOR	Unit	EB2131161-001	EB2131161-002	EB2131161-003	EB2131161-004	EB2131161-005
				Result	Result	Result	Result	Result
EA047 Free Draining Leach Column								
∅ Leachate added	----	0.01	mL	800	800	800	800	800
∅ Leachate collected	----	0.01	mL	670	680	660	670	660
∅ Initial pH	----	0.01	pH Unit	5.73	5.21	6.40	5.37	4.60
∅ Initial Electrical Conductivity	----	1	µS/cm	61	46	86	84	25



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				KNTC HLP01-01 0-2m	KNTC FROM01-01 0-9m	KNTC TSF-01 0-2m	KNTC TSF-02 0-2m	KNTC TSF-03 0-2m
Sampling date / time				02-Nov-2021 00:00	02-Nov-2021 00:00	02-Nov-2021 00:00	02-Nov-2021 00:00	02-Nov-2021 00:00
Compound	CAS Number	LOR	Unit	EB2131161-006	EB2131161-007	EB2131161-008	EB2131161-009	EB2131161-010
				Result	Result	Result	Result	Result
EA047 Free Draining Leach Column								
∅ Leachate added	----	0.01	mL	800	800	800	800	800
∅ Leachate collected	----	0.01	mL	670	690	680	750	380
∅ Initial pH	----	0.01	pH Unit	8.03	4.11	3.71	6.11	3.98
∅ Initial Electrical Conductivity	----	1	µS/cm	117	290	1320	110	3340



Analytical Results

Sub-Matrix: **SOIL**
 (Matrix: **SOIL**)

Sample ID

				KNTC TSF-04 0-2m	----	----	----	----
				Sampling date / time	02-Nov-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2131161-011	-----	-----	-----	-----
				Result	----	----	----	----
EA047 Free Draining Leach Column								
ø Leachate added	----	0.01	mL	800	----	----	----	----
ø Leachate collected	----	0.01	mL	660	----	----	----	----
ø Initial pH	----	0.01	pH Unit	4.68	----	----	----	----
ø Initial Electrical Conductivity	----	1	µS/cm	697	----	----	----	----

CERTIFICATE OF ANALYSIS

Work Order : **EB2133060**
Client : **C & R CONSULTING PTY LTD**
Contact : ALEXANDER BARNES
Address : 188 ROSS RIVER ROAD
AITKENVALE QUEENSLAND 4812
Telephone : ----
Project : Wirralie KLC - Leach 3
Order number : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : TV/110/21 v2
No. of samples received : 10
No. of samples analysed : 10

Page : 1 of 7
Laboratory : Environmental Division Brisbane
Contact : Princess Marcelo
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 17-Nov-2021 11:50
Date Analysis Commenced : 18-Nov-2021
Issue Date : 24-Nov-2021 13:58



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

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

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

Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

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

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

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				KNTC WRD01-01 0-3m	KNTC WRD02-01 0-6m	KNTC WRD03-01 0-4m	KNTC WRD03-02 0-3m	KNTC FWRD01-01 0-9m
Sampling date / time				17-Nov-2021 00:00	17-Nov-2021 00:00	17-Nov-2021 00:00	17-Nov-2021 00:00	17-Nov-2021 00:00
Compound	CAS Number	LOR	Unit	EB2133060-001	EB2133060-002	EB2133060-003	EB2133060-004	EB2133060-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	6.23	5.34	6.29	5.46	4.81
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	42	42	64	52	26
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	27	27	42	34	17
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	<1	2	2	<1	<1
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	4	<1	2	<1	<1
Total Alkalinity as CaCO3	----	1	mg/L	4	<1	2	<1	<1
ED038: Acidity								
Acidity as CaCO3	----	1	mg/L	4	3	3	3	4
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	10	10	18	12	6
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	<1	2	<1	3	<1
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	<1	1	1	<1	<1
Magnesium	7439-95-4	1	mg/L	<1	<1	<1	<1	<1
Sodium	7440-23-5	1	mg/L	3	6	8	8	2
Potassium	7440-09-7	1	mg/L	3	<1	2	1	2
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.22	<0.01	0.05	0.21	0.01
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	7440-38-2	0.001	mg/L	0.004	0.002	0.004	0.002	<0.001
Boron	7440-42-8	0.05	mg/L	0.83	0.18	0.33	0.42	0.21
Barium	7440-39-3	0.001	mg/L	0.026	0.019	0.051	0.021	0.019
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				KNTC WRD01-01 0-3m	KNTC WRD02-01 0-6m	KNTC WRD03-01 0-4m	KNTC WRD03-02 0-3m	KNTC FWRD01-01 0-9m
Sampling date / time				17-Nov-2021 00:00	17-Nov-2021 00:00	17-Nov-2021 00:00	17-Nov-2021 00:00	17-Nov-2021 00:00
Compound	CAS Number	LOR	Unit	EB2133060-001	EB2133060-002	EB2133060-003	EB2133060-004	EB2133060-005
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	0.008	0.005	0.003	0.009	0.011
Nickel	7440-02-0	0.001	mg/L	0.004	0.001	0.003	0.008	0.009
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	0.030	0.014	0.014	0.029	0.019
Molybdenum	7439-98-7	0.001	mg/L	<0.001	<0.001	0.002	<0.001	<0.001
Thorium	7440-29-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.1	<0.1	<0.1



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				KNTC HLP01-01 0-2m	KNTC FROM01-01 0-9m	KNTC TSF-01 0-2m	KNTC TSF-02 0-2m	KNTC TSF-04 0-2m
Sampling date / time				17-Nov-2021 00:00	17-Nov-2021 00:00	17-Nov-2021 00:00	17-Nov-2021 00:00	17-Nov-2021 00:00
Compound	CAS Number	LOR	Unit	EB2133060-006	EB2133060-007	EB2133060-008	EB2133060-009	EB2133060-011
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.74	4.48	3.72	5.72	4.65
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	107	188	1030	270	704
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	70	122	670	176	458
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	30	39	430	27	65
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	36	<1	<1	1	<1
Total Alkalinity as CaCO3	----	1	mg/L	36	<1	<1	1	<1
ED038: Acidity								
Acidity as CaCO3	----	1	mg/L	2	13	43	3	8
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	6	65	496	51	172
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	1	<1	3	38	69
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	12	9	164	11	21
Magnesium	7439-95-4	1	mg/L	<1	4	5	<1	3
Sodium	7440-23-5	1	mg/L	8	5	24	36	105
Potassium	7440-09-7	1	mg/L	1	3	6	1	3
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	0.85	4.51	<0.01	0.44
Antimony	7440-36-0	0.001	mg/L	0.002	<0.001	<0.001	<0.001	<0.001
Arsenic	7440-38-2	0.001	mg/L	0.171	0.001	0.002	0.002	0.002
Boron	7440-42-8	0.05	mg/L	0.67	0.71	1.11	0.06	1.22
Barium	7440-39-3	0.001	mg/L	0.151	0.079	0.028	0.007	0.021
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.0005	0.0013	<0.0001	0.0006
Cobalt	7440-48-4	0.001	mg/L	<0.001	0.025	0.035	0.002	0.012
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.002	<0.001	<0.001



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				KNTC HLP01-01 0-2m	KNTC FROM01-01 0-9m	KNTC TSF-01 0-2m	KNTC TSF-02 0-2m	KNTC TSF-04 0-2m
Sampling date / time				17-Nov-2021 00:00	17-Nov-2021 00:00	17-Nov-2021 00:00	17-Nov-2021 00:00	17-Nov-2021 00:00
Compound	CAS Number	LOR	Unit	EB2133060-006	EB2133060-007	EB2133060-008	EB2133060-009	EB2133060-011
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.026	<0.001	0.004
Manganese	7439-96-5	0.001	mg/L	<0.001	0.415	0.620	0.002	0.123
Nickel	7440-02-0	0.001	mg/L	<0.001	0.165	0.090	<0.001	0.020
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	<0.005	0.615	0.956	<0.005	0.481
Molybdenum	7439-98-7	0.001	mg/L	0.006	<0.001	<0.001	<0.001	<0.001
Thorium	7440-29-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	0.003	<0.001	<0.001
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	0.08
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.3	0.2	0.3	<0.1	<0.1



Analytical Results

Sub-Matrix: **SOIL**
 (Matrix: **SOIL**)

Sample ID

				KNTC TSF-01 0-2m	KNTC TSF-02 0-2m	KNTC TSF-04 0-2m	----	----
Sampling date / time				17-Nov-2021 00:00	17-Nov-2021 00:00	17-Nov-2021 00:00	----	----
Compound	CAS Number	LOR	Unit	EB2133060-008	EB2133060-009	EB2133060-011	-----	-----
				Result	Result	Result	----	----
EA047 Free Draining Leach Column								
ø Leachate added	----	0.01	mL	800	800	800	----	----
ø Leachate collected	----	0.01	mL	460	700	630	----	----
ø Initial pH	----	0.01	pH Unit	3.81	6.34	4.79	----	----
ø Initial Electrical Conductivity	----	1	µS/cm	1080	282	730	----	----

CERTIFICATE OF ANALYSIS

Work Order	: EB2134748	Page	: 1 of 8
Amendment	: 1		
Client	: C & R CONSULTING PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: ALEXANDER BARNES	Contact	: Princess Marcelo
Address	: 188 ROSS RIVER ROAD	Address	: 2 Byth Street Stafford QLD Australia 4053
	AITKENVALE QUEENSLAND 4812		
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: Wirralie KLC - Leach 4	Date Samples Received	: 01-Dec-2021 12:05
Order number	: ----	Date Analysis Commenced	: 01-Dec-2021
C-O-C number	: ----	Issue Date	: 24-Jan-2022 15:12
Sampler	: ----		
Site	: ----		
Quote number	: TV/110/21 v2		
No. of samples received	: 10		
No. of samples analysed	: 10		



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

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Mark Hallas	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

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

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

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				KNTC WRD01-01 0-3m	KNTC WRD02-01 0-6m	KNTC WRD03-01 0-4m	KNTC WRD03-02 0-3m	KNTC FWRD01-01 0-9m
Sampling date / time				01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00
Compound	CAS Number	LOR	Unit	EB2134748-001	EB2134748-002	EB2134748-003	EB2134748-004	EB2134748-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	5.81	4.95	6.39	5.46	4.79
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	34	39	56	45	23
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	22	25	36	29	15
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	<1	2	<1	<1	<1
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	1	<1	3	1	1
Total Alkalinity as CaCO3	----	1	mg/L	1	<1	3	1	1
ED038: Acidity								
Acidity as CaCO3	----	1	mg/L	3	3	3	3	3
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	9	10	15	11	6
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	<1	2	<1	3	<1
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	<1	1	<1	<1	<1
Magnesium	7439-95-4	1	mg/L	<1	<1	<1	<1	<1
Sodium	7440-23-5	1	mg/L	2	5	7	7	1
Potassium	7440-09-7	1	mg/L	2	<1	1	<1	1
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.06	<0.01	0.03	0.10	0.18
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	7440-38-2	0.001	mg/L	0.002	0.001	0.002	0.001	<0.001
Boron	7440-42-8	0.05	mg/L	0.91	0.27	0.36	0.49	0.26
Barium	7440-39-3	0.001	mg/L	0.022	0.018	0.038	0.019	0.017
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				KNTC WRD01-01 0-3m	KNTC WRD02-01 0-6m	KNTC WRD03-01 0-4m	KNTC WRD03-02 0-3m	KNTC FWRD01-01 0-9m
Sampling date / time				01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00
Compound	CAS Number	LOR	Unit	EB2134748-001	EB2134748-002	EB2134748-003	EB2134748-004	EB2134748-005
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	0.006	0.005	0.002	0.008	0.009
Nickel	7440-02-0	0.001	mg/L	0.003	0.001	0.003	0.008	0.007
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	0.030	0.017	0.019	0.029	0.018
Molybdenum	7439-98-7	0.001	mg/L	<0.001	<0.001	0.002	<0.001	<0.001
Thorium	7440-29-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				KNTC HLP01-01 0-2m	KNTC FROM01-01 0-9m	KNTC TSF-01 0-2m	KNTC TSF-02 0-2m	KNTC TSF-04 0-2m
Sampling date / time				01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00
Compound	CAS Number	LOR	Unit	EB2134748-006	EB2134748-007	EB2134748-008	EB2134748-009	EB2134748-010
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.90	4.31	3.73	6.01	4.78
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	106	153	729	306	515
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	69	99	474	199	335
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	32	30	300	37	51
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	48	<1	<1	2	<1
Total Alkalinity as CaCO3	----	1	mg/L	48	<1	<1	2	<1
ED038: Acidity								
Acidity as CaCO3	----	1	mg/L	2	10	27	3	5
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	6	51	338	56	136
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	<1	<1	1	35	40
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	13	7	115	15	17
Magnesium	7439-95-4	1	mg/L	<1	3	3	<1	2
Sodium	7440-23-5	1	mg/L	7	4	14	40	75
Potassium	7440-09-7	1	mg/L	1	3	5	<1	2
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	1.03	2.90	<0.01	0.62
Antimony	7440-36-0	0.001	mg/L	0.002	<0.001	<0.001	<0.001	<0.001
Arsenic	7440-38-2	0.001	mg/L	0.163	0.002	0.001	0.001	0.002
Boron	7440-42-8	0.05	mg/L	0.87	0.77	1.00	<0.05	1.09
Barium	7440-39-3	0.001	mg/L	0.188	0.080	0.029	0.008	0.018
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.0004	0.0008	<0.0001	0.0004
Cobalt	7440-48-4	0.001	mg/L	<0.001	0.019	0.021	0.002	0.008
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.001	<0.001	<0.001



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				KNTC HLP01-01 0-2m	KNTC FROM01-01 0-9m	KNTC TSF-01 0-2m	KNTC TSF-02 0-2m	KNTC TSF-04 0-2m
Sampling date / time				01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00
Compound	CAS Number	LOR	Unit	EB2134748-006	EB2134748-007	EB2134748-008	EB2134748-009	EB2134748-010
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.018	<0.001	0.003
Manganese	7439-96-5	0.001	mg/L	<0.001	0.333	0.378	0.001	0.086
Nickel	7440-02-0	0.001	mg/L	<0.001	0.144	0.056	<0.001	0.014
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	<0.005	0.556	0.735	<0.005	0.368
Molybdenum	7439-98-7	0.001	mg/L	0.005	<0.001	<0.001	<0.001	<0.001
Thorium	7440-29-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	0.002	<0.001	<0.001
Iron	7439-89-6	0.05	mg/L	<0.05	0.06	<0.05	<0.05	0.09
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.2	0.1	0.2	<0.1	<0.1



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				KNTC WRD01-01 0-3m	KNTC WRD02-01 0-6m	KNTC WRD03-01 0-4m	KNTC WRD03-02 0-3m	KNTC FWRD01-01 0-9m
Sampling date / time				01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00
Compound	CAS Number	LOR	Unit	EB2134748-001	EB2134748-002	EB2134748-003	EB2134748-004	EB2134748-005
				Result	Result	Result	Result	Result
EA047 Free Draining Leach Column								
∅ Leachate added	----	0.01	mL	800	800	800	800	800
∅ Leachate collected	----	0.01	mL	680	710	690	680	660
∅ Initial pH	----	0.01	pH Unit	5.42	4.97	6.21	5.49	4.78
∅ Initial Electrical Conductivity	----	1	µS/cm	35	38	53	44	22



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				KNTC HLP01-01 0-2m	KNTC FROM01-01 0-9m	KNTC TSF-01 0-2m	KNTC TSF-02 0-2m	KNTC TSF-04 0-2m
Sampling date / time				01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00
Compound	CAS Number	LOR	Unit	EB2134748-006	EB2134748-007	EB2134748-008	EB2134748-009	EB2134748-010
				Result	Result	Result	Result	Result
EA047 Free Draining Leach Column								
∅ Leachate added	----	0.01	mL	800	800	800	800	800
∅ Leachate collected	----	0.01	mL	660	660	690	670	710
∅ Initial pH	----	0.01	pH Unit	7.79	4.31	3.82	6.16	4.84
∅ Initial Electrical Conductivity	----	1	µS/cm	104	150	710	292	498