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Static Geochemical Testing of Mine Wastes & Ore

Finniss Lithium Project BP33 UG Mine

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LIST OF ABBREVIATIONS

ABBREVIATIONS USED IN GEOCHEMICAL ASSESSMENT

ARD	Acid Rock Drainage
AMD	Acid, Metalliferous and Saline Drainage
NMD	Neutral and Metalliferous Drainage
ABA	Acid Base Account
pH_{1:2}	pH of a sample slurry with a solid to water ratio of 1:2 (by weight)
EC_{1:2}	Electrical Conductivity of a sample slurry with a solid to water ratio of 1:2 (by weight)
ESP	Exchangeable Sodium Percentage
ECEC	Effective Cation Exchange Capacity
S	Sulphur
CRS	Chromium Reducible Sulphur
KCl	Potassium Chloride
H₂SO₄	Sulphuric Acid
SO₄	Sulphate
CaCO₃	Calcium Carbonate
ANC	Acid Neutralising Capacity in kg H ₂ SO ₄ /t
ANC_{ABCC}	Acid Neutralising Capacity in kg H ₂ SO ₄ /t estimated from ABCC testing
CNV	Carbonate Neutralising Value in kg H ₂ SO ₄ /t
MPA	Maximum Potential Acidity, calculated from total S in kg H ₂ SO ₄ /t
NAPP	Net Acid Producing Potential, calculated from ANC and total S (or MPA) in kg H ₂ SO ₄ /t.
NAG	Net Acid Generation (test)
NAG_{pH}	pH of NAG solution before titration
NAG_(pH4.5)	NAG acidity titrated to pH 4.5 in kg H ₂ SO ₄ /t
NAG_(pH7.0)	NAG acidity titrated to pH 7.0 in kg H ₂ SO ₄ /t
ABCC	Acid Buffering Characteristic Curve
GAI	Geochemical Abundance Index based on multi-elements of solids
PAF	Potentially Acid Forming
PAF-LC	Potentially Acid Forming - Low Capacity
NAF	Non Acid Forming
UC	Uncertain
AC	Acid Consuming

UNITS OF MEASUREMENTS

%	Percentage
°C	Degrees Celsius
dS	Deci Siemen
µm	Micrometre
mm	Millimetre
m	Metre
mg	Milligram
g	Gram
kg	Kilogram
t	Tonne
L	Litre
ml	Millilitre

OTHER ABBREVIATIONS

ALS	Australian Laboratory Services
EGi	Environmental Geochemistry International Pty Ltd
IRL	International Resource Laboratories Pty Ltd
Project	Hunter Valley Operations Life-of-Mine Project
ROM	Run-of-Mine

EXECUTIVE SUMMARY

Previously, Environmental Geochemistry International Pty Ltd (EGi) were commissioned by EcoZ Environmental Consultants to undertake data analysis, interpretation and reporting on physical and geochemical analysis results for drill core samples collected from the Core Lithium BP33 project. The results of this study were included in Core Lithium's submissions for mining approvals. The results from the initial test programme suggested that most waste rock, including oxide rock excavated during installation of a box cut portal, transitional and fresh rock excavated during construction of the mine decline and ore that will be mined during the project, will present little risk of acid or saline drainage. However, these investigations identified the potential for some potentially acid forming (PAF) waste, particularly in fresh phyllite rock. Results also suggested that both oxide and fresh rock may contain labile aluminium, arsenic and zinc which could be leached during surface storage.

In the NT EPA's response to the referral document, a Supplementary Environmental Report (SER) was requested. In relation to waste rock characterisation, their response requested that the additional studies should be undertaken and reported as a part of the SER. Consequently, EcoZ who are coordinating the SER on behalf of Core Lithium, requested EGi to undertake the following studies.

1. Complete ANC and NAG testing on selected samples from drill holes FRC166 – FRC171, focusing on, but not exclusively, samples with sulphur content >0.2 %S. Ideally all fresh and transitional waste rock from the 2018 drill holes should be included in the test program.
2. Kinetic testing (leach columns) of oxidised and fresh rock samples to confirm initial results of aluminium, arsenic and zinc leachability and to define the kinetics of this process. Kinetic leach column (KLC) testing conducted under oxidising conditions to simulate conditions during storage in the waste rock dumps (WRD) and in the unsaturated zones within the backfilled UG mine and box cut. Following a period of leaching under oxidising conditions, KLC tests will be conducted under saturated conditions to simulate the leaching properties of backfilled waste which will be placed below the water table upon rebound.

At the time of the current study, samples from the previous investigations were no longer available for further testing. Consequently, an alternate set of 69 samples were obtained from drilling programmes conducted during 2018 and 2019, from which 47 samples were selected for detailed static geochemical testing to meet the requirements of Task 1.

During December 2020 and January 2021, Core Lithium undertook further drilling at the BP33 project. This programme included three diamond drill holes, two of which intersected waste rock to a depth of around 70 m, which will be excavated during construction of the box cut. A third hole to a depth around 350 m, and intersecting waste rock and ore which will be mined during development of the decline and ore extraction, was also drilled as a part of this programme. Twenty-nine samples were obtained from these three drill holes to investigate the suitability of these materials for kinetic testing to meet the requirements of Task 2.

This report provides results for test work conducted for Task 1 above. From these results, criteria were developed to distinguish between non-acid forming (NAF), potentially acid forming – low capacity (PAF-LC) and PAF waste rock and ore. Using these criteria, and a database containing assay data and geological descriptions for over 2500 samples from the BP33 deposit, volumes of NAF, PAF-LC and PAF waste and ore were estimated.

The report also describes results from batch leaching tests under both oxidising and non-oxidising conditions to better define the likely quality of seepage from waste rock stockpiles. These tests can provide insight into elements of concern that may be potentially mobilised during surface storage, but they do not provide understanding of rates of reactivity and likely mobility of various metals and metalloids under field conditions. To obtain this information longer-term leach column testing is being conducted which provides insight into the rate of reactions under conditions

which are closer to field conditions than are provided in the short-term batch leach tests. Column leach tests have now commenced and are expected to be completed in around 12 months.

Preliminary testing was also undertaken on oxide, transition and fresh waste rock samples to define their geochemical properties and to ascertain the representativeness of these materials of waste rock which will be stockpiled in WRD and then backfilled in mine voids, and thereby their suitability for KLC testing (Task 2). Results for this preliminary testing are also reported.

Based on the results of geochemical testing of 144 samples from both the current and earlier test programmes, criteria were developed to identify NAF, PAF-LC and PAF waste rock and ore. These criteria are summarised in the table below. The criteria rely on oxidation and Total S content to classify mined materials according to their acid forming potential. While it is anticipated that there will be some overlap between the classifications, it is expected that the listed criteria can be used to provide a reasonable segregation of waste rock and ore according to their likelihood to produce acid as a consequence of exposure to air during surface storage.

The assay database was analysed to define the distribution of Total S among the various categories of materials including type (ore, waste), lithology and oxidation for waste rock samples. The results show that 99.8% of the sample interval represented by ore samples contain less than 0.2% Total S, supporting the acid rock drainage (ARD) classification criteria suggesting all ore can be classified as NAF. Similarly, 100% of the sample intervals representing oxide rock had a Total S content of below 0.2%, also supporting the classification of all oxide rock as NAF.

ARD Classification	Criteria
NAF	Ore <i>OR</i> Oxide waste rock <i>OR</i> Transition and fresh waste rock with Total S <0.2%
PAF-LC	Transition and fresh waste rock with Total S ≥0.2% and <0.4%
PAF	Transition and fresh waste rock with Total S ≥0.4%

Calculations used to estimate volumes of waste rock and ore indicated that the ARD properties of mined materials at the BP33 projects can be summarised as follows:

- Oxide rock excavated from the box cut and which will be placed in WRD1 is expected to be NAF;
- Ore that will be stored in the ROM pad while awaiting transport to the processing plant is expected to be NAF; and
- Estimates indicate that only around 15,000 tonnes of PAF-LC and PAF waste will be moved to WRD2 through the life of the mine out of a total of 229,000 tonnes of transition and fresh waste rock which will be mined, with most of the 15,000 tonnes likely to be classified as PAF-LC with limited acid producing potential.

These results suggest that all of the stockpiled mine materials (oxide waste in WRD1, transition and fresh waste in WRD2, ore in the ROM pad) will present little risk of producing acidic metalliferous drainage as a result of short-term surface storage during the mining operation.

The results of water extraction tests conducted on ore samples showed:

- Water extracts for the ore samples were slightly alkaline with low salinity;

- Except for Al and Fe, metal and metalloid concentrations were non-detectable in almost all of the water extracts of the ore samples;
- On average, concentrations of Al in ore water extracts were about an order of magnitude higher than the default ANZECC guideline values (DGV) for freshwater systems. Similarly, the concentrations of Al in ore water extracts were in the order of ten times those measured in both nearby surface water and shallow groundwater at the adjacent Grants project. These results suggest that Al in run-off from ore stockpiled in the ROM pad may present an environmental risk; and
- As the ore samples are all likely to be NAF and therefore unlikely to produce acidic drainage, stockpiled ore may not require any specific management to reduce potential impacts from run-off. However, since the results from water extractions indicate a potential risk from elevated Al concentrations in run-off, the likelihood of this risk should be evaluated at site, and it is recommended that any run-off from the ROM stockpile should be monitored and containment of run-off undertaken as required.

The results of water extraction tests conducted on waste rock samples showed:

- Oxide waste rock stored in WRD1, or transition and fresh waste rock stored in WRD2 would be unlikely to produce low pH saline seepage during short-term surface storage.
- The mobility of Al in all waste rock and As in fresh waste rock on contact with water, could potentially result in elevated concentrations of these elements in seepage from WRD1 (Al only) and WRD2 (Al and As) during short-term surface storage.
- Concentrations of As in water extracts of transition and fresh waste rock were of a similar magnitude to those measured in the groundwater collected from bores sampling the deeper aquifer within the Burrell Creek Formation (BCF) at the nearby Grants project. These results suggest that, on backfilling the mine with fresh waste rock that has not undergone extensive weathering, groundwater should not be significantly impacted in terms of mobilisation of As.

The results from kinetic leach column testing will help to confirm if leaching of Al and As from waste rock has the potential to provide any risk to the environment during surface storage in the WRD.


The results of peroxide extraction tests conducted on waste rock samples showed:

- Should substantial oxidation of fresh waste rock occur during surface storage, the concentrations of a number of metals/metalloids including Al, As, Co, Cr, Cu, U and Zn may be elevated in comparison to desirable environmental conditions, and seepage from the WRD could potentially represent a risk of contaminating the receiving environment.

The likelihood that significant oxidation and metal/metalloid release will occur during short-term surface storage is being investigated using kinetic leach column testing currently underway. These tests will also investigate metal mobility under saturated conditions (simulating mine backfill after groundwater rebound) following a period of exposure to oxidative conditions.

Comparison of the combined geochemical test results for the oxide, transition and fresh composite waste rock samples proposed for use in KLC testing with results for the corresponding waste types from all drill holes, suggests that these composite samples are representative of waste to be stored in the WRD at the BP33 project. Kinetic leach column tests using these samples should therefore deliver results which will provide a good indication of the quality of seepage that may result during surface storage of waste and the mobility of solutes in the waste following backfill and inundation by recovering groundwater.

The following recommendations follow from the results of this study:

- 
- Kinetic leach column tests should be completed as proposed including operation under oxidising conditions to simulate conditions during storage in the WRD and in the unsaturated zones within the backfilled UG mine and box cut. Following a period of leaching under oxidising conditions, KLC tests should be continued under saturated conditions to simulate the leaching properties of backfilled waste which will be placed below the water table upon rebound.
 - Groundwater monitoring t BP33 (both shallow alluvial and deeper BCF aquifers) should be on-going to provide baseline water quality data for comparison with column leachate data collected during leach column testing.
 - Similarly, collection of surface water quality should continue to provide baseline water quality data for comparison with KLC test results.
 - The results from static and kinetic geochemical testing should be used to conduct an ARD/Neutral Mine Drainage (NMD) risk assessment which can be applied in developing an ARD/NMD management plan for the operation.

1. INTRODUCTION

The BP33 deposit is a part of Core's Finnis Lithium Project, located in the Northern Territory on the Cox Peninsula, approximately 23 km southwest of Darwin or 90 km by road. The BP33 proposal involves excavation of a box cut portal to a depth of 60 m and construction of a 400 m long decline from the base of the box cut to access the spodumene deposit located beneath the historically worked open pit.

Two separate waste rock dumps (WRD) will be established for temporary storage of waste rock prior to it being used to backfill the underground mine and box-cut. WRD 1 with a design capacity of 2 million m³ will accept oxide waste rock excavated from the box-cut. WRD 2 with a design capacity of 170,000 m³ will accept transitional and fresh waste rock from the underground. Waste rock from WRD2 will be used to progressively backfill the underground mine as each production level is complete to maintain stability as the mine progresses. Ore mined at BP33 will be transported to the Grants processing facility approximately 7 km to the north-west. A ROM pad will be constructed for temporary storage of mined ore ready for transport to the Grants processing facility. Tailings will be deposited in the Tailings Storage Facility constructed as part of the Grants Project.

Previously, Environmental Geochemistry International Pty Ltd (EGi) were commissioned by EcoZ Environmental Consultants to undertake data analysis, interpretation and reporting on physical and geochemical analysis results for drill core samples collected from the Core Lithium BP33 project. This work formed a part of an Environment Protection Act Referral submitted to the NT Environmental Protection Authority (NT EPA) in April 2020 for development of the BP33 Underground mine.

The results from the initial test programme suggested that most waste rock, including oxide and transitional rock excavated during installation of a box cut portal, transitional and fresh rock excavated during construction of the mine decline and ore that will be mined during the project, will present little risk of acid or saline drainage. However, these investigations identified the potential for some potentially acid forming (PAF) waste, particularly in fresh phyllite rock. Results also suggested that both oxide and fresh rock may contain labile aluminium, arsenic and zinc which could be leached during surface storage. As a result of these investigations, EGi recommended the following test work should be conducted to clarify potential environmental issues raised from the study:

- Complete ANC and NAG testing on selected samples from drill holes FRC166 – FRC171, focusing on, but not exclusively, samples with sulphur content >0.2 %S. Ideally all fresh and transitional waste rock from the 2018 drill holes should be included in the test program.
- Kinetic testing (leach columns) of oxidised and fresh rock samples to confirm initial results of aluminium, arsenic and zinc leachability and to define the kinetics of this process. Kinetic leach column (KLC) testing should be conducted under oxidising conditions to simulate conditions during storage in the WRD and in the unsaturated zones within the backfilled UG mine and box cut. Following a period of leaching under oxidising conditions, KLC tests should be conducted under saturated conditions to simulate the leaching properties of backfilled waste which will be placed below the water table upon rebound.

In the NT EPA's response to the referral document, a Supplementary Environmental Report (SER) was requested. In relation to waste rock characterisation, their response requested that the additional studies outlined above should be undertaken and reported as a part of the SER. Consequently, EcoZ who are coordinating the SER on behalf of Core Lithium, requested EGi to undertake the required studies as described in Attachment A, Section 8 Terrestrial environmental quality in the NT EPA referral response.

At the time of the current study, samples from the previous investigations were no longer available for further testing. Consequently, an alternate set of 69 samples were obtained from drilling programmes conducted during 2018 and 2019, from which 47 samples were selected for detailed static geochemical testing. Samples were selected from both waste and ore and covered a range of lithologies, including phyllite, pegmatite and sandstone, focusing on fresh rock with a sulphur content above 0.1%, which were under-represented in the initial geochemical tests and in accordance with the testing requirements of the NT EPA response.

During December 2020 and January 2021, Core Lithium undertook further drilling at the BP33 project. This programme was designed to provide samples for geotechnical testing, and included three diamond drill holes, two of which intersected waste rock to a depth of around 70 m, which will be excavated during construction of the box cut. A third hole to a depth around 350 m, and intersecting waste rock and ore which will be mined during development of the decline and ore extraction, was also drilled as a part of this programme. Twenty nine samples were obtained from these three drill holes to investigate the suitability of these materials for kinetic testing which requires crushed rock available from diamond drill core. Based on assay data, four oxide samples, four transition samples and five fresh samples were composited to produce oxide, transition and fresh rock samples, which subsequently underwent geochemical testing together with the 47 samples selected from earlier drill holes. The results from testing of the three composite samples were used to confirm these samples are likely to be representative of oxide, transition and fresh waste rock which will be temporarily surface stored in WRD prior to return to the underground mine and box cut. Kinetic testing is planned using oxide, transition and fresh rock in accordance with the testing requirements of the NT EPA referral response.

This report describes results of static geochemical testing conducted using fresh waste rock and ore samples, focusing on samples with a sulphur content above 0.1%. The results of this study were then combined with the results from geochemical tests conducted previously, in which most samples contained limited sulphur (<0.1%). Using the combined data set containing 144 samples, criteria were developed to allow identification of non-acid forming (NAF), potentially acid forming – low capacity (PAF-LC) and PAF materials, based around oxidation, type (waste, ore) and Total S content. Using these criteria and a database containing assay data and geological descriptions for around 2500 samples, volumes of NAF, PAF-LC and PAF waste rock and ore were estimated.

Ten samples of fresh higher S waste rock, including the three composite samples selected as potential candidates for kinetic testing, were subjected to batch leaching tests, using water to assess leachability of newly deposited waste, and peroxide to assess leaching from oxidised waste following surface exposure. The results from these leaching tests, which included NAF, PAF-LC and PAF wastes, were then combined with batch water leaching tests from the earlier test programme and which comprised almost exclusively NAF wastes and ore, to assess the leaching characteristics of waste rock and ore as a function of oxidation, lithology and ARD classification.

Finally, results from geochemical testing of the oxide, transition and fresh waste rock composite samples, including acid base accounting (ABA), net acid generation (NAG) testing, assay data and water and peroxide leaching experiments are described and compared with the results from the wider sample set, to evaluate how likely these composite materials are to represent materials which will be mined during the BP33 project and assess their suitability for kinetic testing.

2. STATIC GEOCHEMICAL TESTING

A number of pulp samples from previous drilling campaigns were available for the current test work. From this set of samples, a set of 47 samples were selected for detailed static geochemical testing. Samples were selected from both waste and ore and covered a range of lithologies, including phyllite, pegmatite and sandstone, focusing on fresh rock with a sulphur content above 0.1% (Table 1), which were under-represented in the initial geochemical tests. Figures 1 and 2 show plan and section views of the drill traces for the drill holes in relation to the ore body from which samples were selected.

Table 1: Details of the samples used for current static geochemical test programme

EGi Code	Hole ID	Sample ID	Depth (m)		Interval (m)	Lithology	Oxidation	Type
			From	To				
21086	FDD008	B1174	326	327	1.0	Phyllite	Fresh	Waste
21087	FRC164	A3428	139	140	1.0	Pegmatite	Fresh	Waste
21088	FRC164	A3429	140	141	1.0	Pegmatite	Fresh	Waste
21089	FRC164	A3430	141	142	1.0	Pegmatite	Fresh	Ore
21090	FRC164	A3435	145	148	3.0	Phyllite	Fresh	Waste
21091	FRC166	A3512	212	213	1.0	Phyllite	Fresh	Waste
21093	FRC167	A3515	124	125	1.0	Pegmatite	Fresh	Waste
21094	FRC167	A3516	125	126	1.0	Pegmatite	Fresh	Waste
21095	FRC167	A3517	126	129	3.0	Phyllite	Fresh	Waste
21097	FRC168	A3627	108	109	1.0	Phyllite	Fresh	Waste
21098	FRC168	A4408	109	110	1.0	Phyllite	Fresh	Waste
21099	FRC168	A4409	110	111	1.0	Phyllite	Fresh	Waste
21101	FRC169	A3629	66	69	3.0	Phyllite	Fresh	Waste
21102	FRC169	A3630	69	70	1.0	Phyllite	Fresh	Waste
21103	FRC169	A3632	70	71	1.0	Phyllite	Fresh	Waste
21106	FRC172	A3764	186	187	1.0	Pegmatite	Fresh	Waste
21107	FRC172	A3795	219	222	3.0	Phyllite	Fresh	Waste
21108	FRC172	A3796	222	223	1.0	Phyllite	Fresh	Waste
21109	FRC172	A3797	223	224	1.0	Phyllite	Fresh	Waste
21110	FRC172	A3798	224	225	1.0	Pegmatite	Fresh	Waste
21112	FRC174	A3972	190	191	1.0	Phyllite	Fresh	Waste
21114	FRC203	C3610	81	82	1.0	Sandstone	Fresh	Waste
21115	FRC205	C3617	138	141	3.0	Sandstone	Fresh	Waste
21116	FRC205	C3669	184	185	1.0	Pegmatite	Fresh	Ore
21118	FRC205	C3696	207	208	1.0	Pegmatite	Fresh	Ore
21119	FRC205	C3697	208	209	1.0	Pegmatite	Fresh	Waste
21122	FRC205	C3709	218	219	1.0	Pegmatite	Fresh	Waste
21123	FRC206	C3782	137	138	1.0	Phyllite	Fresh	Waste
21125	FRC212	A6714	88	89	1.0	Phyllite	Fresh	Waste
21126	FRC213	A6787	68	69	1.0	Phyllite	Transition	Waste
21129	FRCD016	B1053	276.2	277	0.8	Phyllite	Fresh	Waste
21130	NRC057	A4851	105	106	1.0	Phyllite	Fresh	Waste
21132	NRC057	A4854	108	109	1.0	Phyllite	Fresh	Waste
21134	NRC057	A4857	111	112	1.0	Phyllite	Fresh	Waste
21135	NRC057	A4858	112	113	1.0	Pegmatite	Fresh	Waste
21138	NRC057	A4869	122	123	1.0	Sandstone	Fresh	Waste
21140	NRC057	A4873	125	126	1.0	Pegmatite	Fresh	Waste
21141	NRC057	A4875	127	128	1.0	Pegmatite	Fresh	Waste
21143	NRC129	A6640	93	96	3.0	Pegmatite	Fresh	Waste
21144	NRC148	A6967	246	247	1.0	Pegmatite	Fresh	Waste
21145	NRC148	A6968	247	250	3.0	Phyllite	Fresh	Waste
21146	NRC148	A6969	250	253	3.0	Phyllite	Fresh	Waste
21148	NRC148	A6977	258	261	3.0	Phyllite	Fresh	Waste
21149	NRC148	A6983	274	275	1.0	Pegmatite	Fresh	Waste
21151	NRC148	A6985	276	277	1.0	Pegmatite	Fresh	Waste
21152	NRC148	A6992	281	282	1.0	Pegmatite	Fresh	Waste
21153	NRC148	A6993	282	283	1.0	Pegmatite	Fresh	Waste

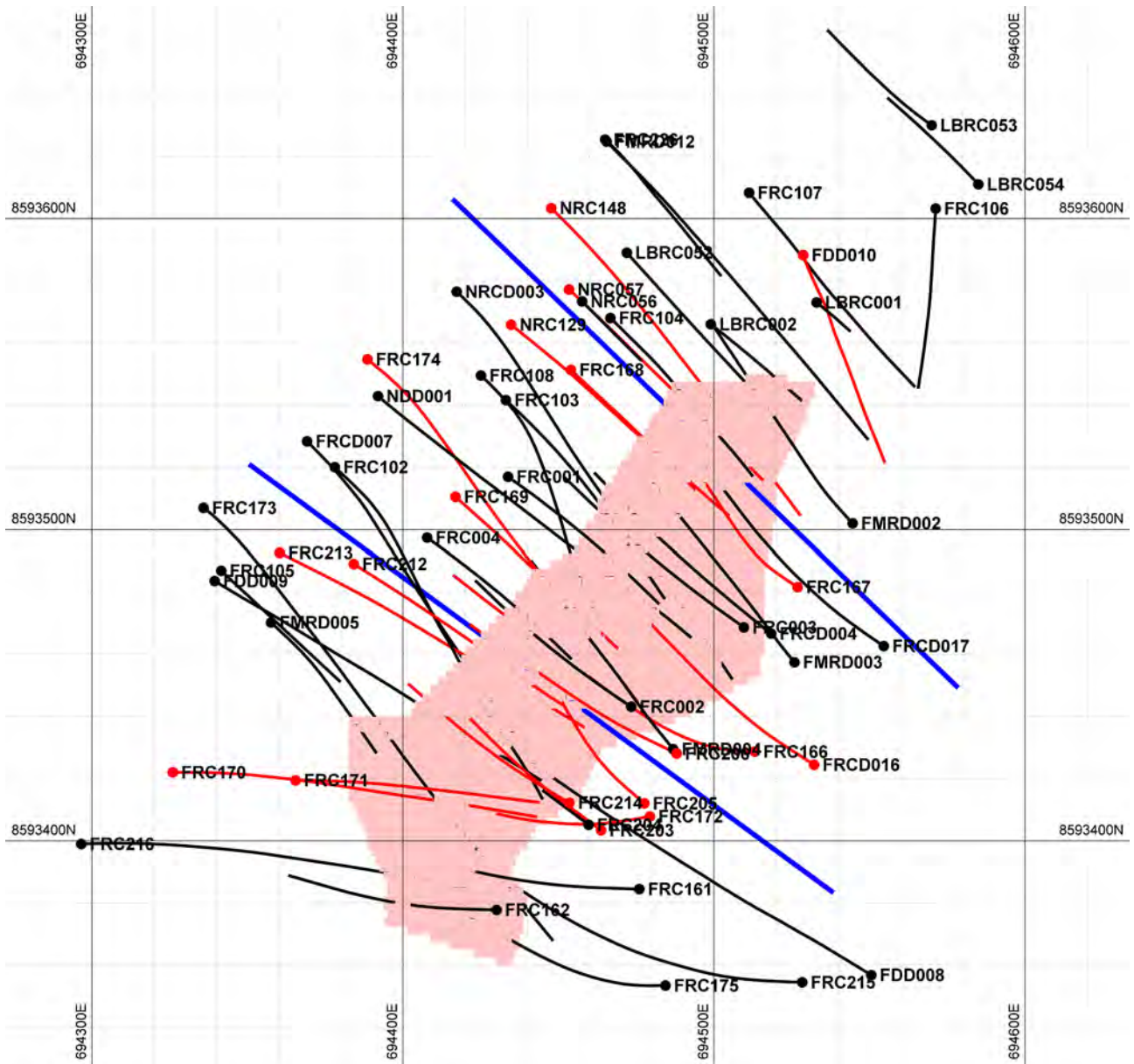


Figure 1: Plan view showing drill hole traces for the BP33 project. Drill hole traces shown in red are for holes from which samples were collected for testing during the current study. The current resource block model is highlighted in pink. The two blue lines show the locations for sections shown in Figure 2 below.

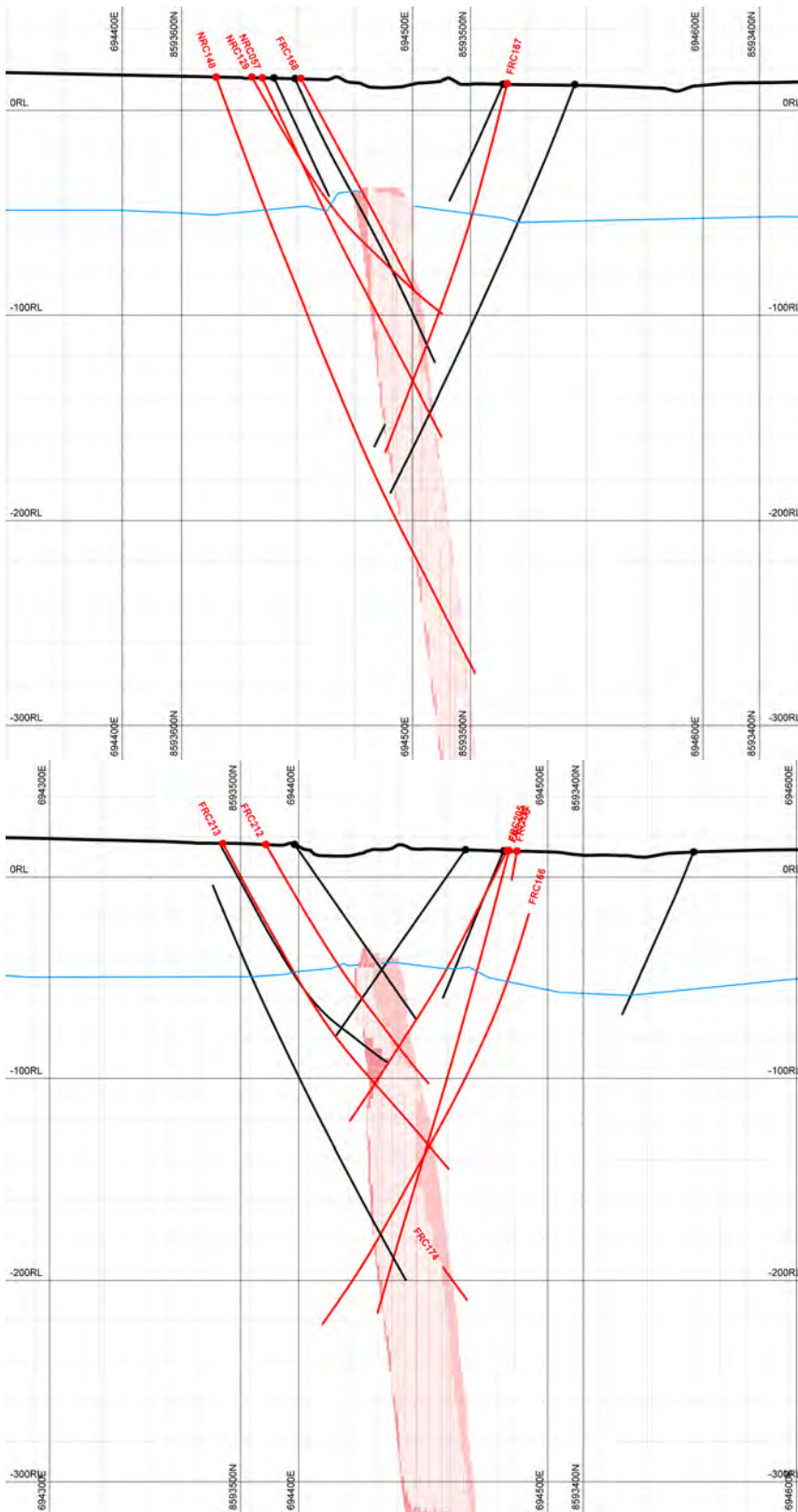


Figure 2: Section views showing drill hole traces for the BP33 project. Traces shown in red are for holes from which samples were collected for testing during the current study. The current resource block model is highlighted in pink. The light blue line shows the top of the fresh rock profile.

2.1. ABA and NAG testing: Current test samples

Geochemical testing conducted on 47 samples included Total S, carbon speciation (Total C, Organic C, Inorganic C), ANC and NAG tests. Additional testing including CRS which gives a measure of pyritic sulphur content and ABCC testing which provides a measure of readily available neutralising capacity was also conducted on 10 of the samples. The full set of results for these tests are provided in Appendix A (Table A1).

Total S values for the samples examined ranged from 0.1 to 1.1 % showing little variation between lithologies, with average Total S of 0.26, 0.31 and 0.18% for pegmatite, phyllite and sandstone respectively. However, samples with the highest sulphur content were all phyllites. The neutralising potential of these materials appears to be low to moderate with average ANC around 10 kg H₂SO₄/t, ranging from 4 to 27 kg H₂SO₄/t and with little variation between lithologies.

NAGpH ranged from 2.7 to 9.0, with most samples giving a pH between 3 and 4.5 after digestion with peroxide. Many of these samples gave a negative net acid producing potential (NAPP) value based on Total S and standard ANC measurements, which meant these materials plotted in the uncertain region of the ARD classification plot (Figure 3).

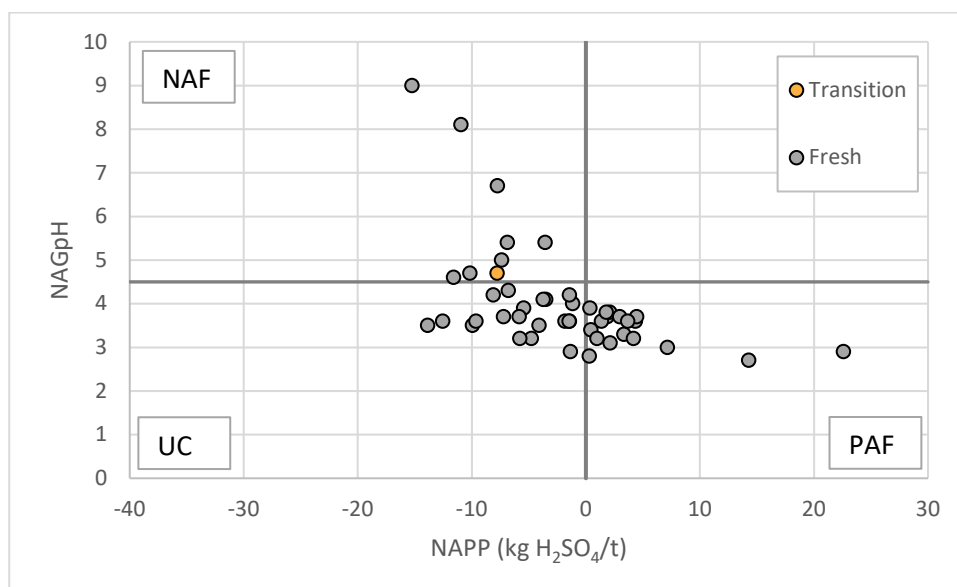


Figure 3: ARD classification plot split by oxidation type.

To further understand the reasons for the uncertain ARD classification of these samples, more detailed measurements were made to determine the nature of the neutralising phases present. Selected samples were subjected to acid buffering characteristic curve measurements (ABCC), which determines the amount of readily available neutralising capacity within the sample. The neutralising capacity of the samples was also calculated from their inorganic carbon (IC) content. Figure 4 shows a comparison between the neutralising capacity measured using the standard ANC method and neutralising capacity calculated from IC (ANC_{IC}) or by the ABCC method. The plot shows that with one exception the neutralising capacity of these materials measured using ANC_{IC} or ABCC methods is significantly less than the standard ANC method, with the former methods measuring only around 20 -25% of the standard ANC on average. The results from ABCC testing (

Table 2 and Appendix B), indicate these samples contain very few reactive neutralising minerals, with effective ANC typically at or below 5 kg H₂SO₄/t. ABCC plots (Appendix B) suggest most of the carbonate is in the form of iron carbonates which provide limited neutralising capacity.

The presence of iron carbonates may have impacted inorganic carbon measurements, resulting in low ANC_{IC} values for these samples. Figure 5 shows a comparison between neutralising capacity measured by ANC_{IC} and ABCC, demonstrating that for all but one sample, ABCC was higher than ANC_{IC}. For samples containing iron carbonates, the opposite is often true. The measured values are very low for all of the samples where ABCC > ANC_{IC}, and the difference may just reflect uncertainties in the measurements at such low values. However, it is also possible that the presence of iron carbonates has resulted in an underestimation of the IC content of these materials, as precise measurement of IC can be difficult for iron carbonates.

Notwithstanding the issues described above, the results show that the fresh waste rock samples from the BP33 project represented by the materials tested here, have very limited acid neutralising capacities and consequently the presence of even minor sulphide sulphur will likely result in the potential for acid formation following oxidation. Use of ANC_{IC} to generate the ARD classification plot suggests that many of these samples may be PAF (Figure 6), albeit with limited acid potential, with NAG values typically below 5 kg H₂SO₄/t (Table A1).

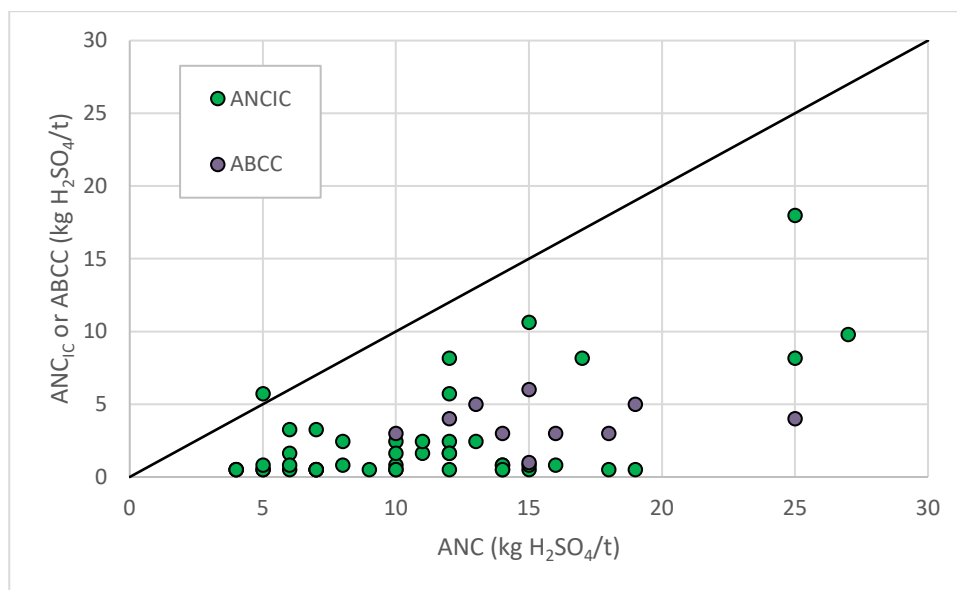


Table 2: ABCC test results

EGi Code	Sample ID	Figure Number (Appendix B)	Type of Carbonate Buffering	Effective ANC to pH 4 (kg H ₂ SO ₄ /t)	ANC (kg H ₂ SO ₄ /t)	Effective ANC as % of Measured ANC
21091	A3512	B1	Siderite	3	10	32
21094	A3516	B2	Ferroan Dolomite	5	13	38
21103	A3632	B3	Siderite	4	25	16
21109	A3797	B4	Siderite	3	18	16
21110	A3798	B2	Siderite/Ferroan Dolomite	3	14	23
21130	A4851	B2	Siderite	1	15	10
21134	A4857	B2	Siderite	3	16	18
21135	A4858	B4	Siderite	5	19	26
21141	A4875	B2	Ferroan Dolomite	6	15	41
21144	A6967	B1	Siderite	4	12	31

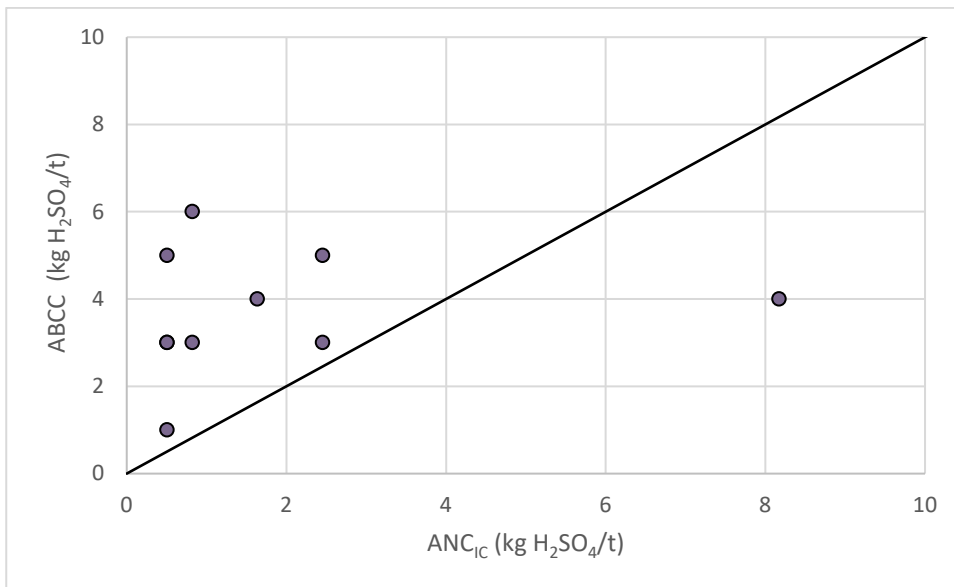


Figure 5: Comparison between the neutralising capacity measured using carbonate ANC calculated from inorganic carbon assay (ANC_{IC}) and readily available ANC measured using the ABCC method. The black line represents agreement between the methods.

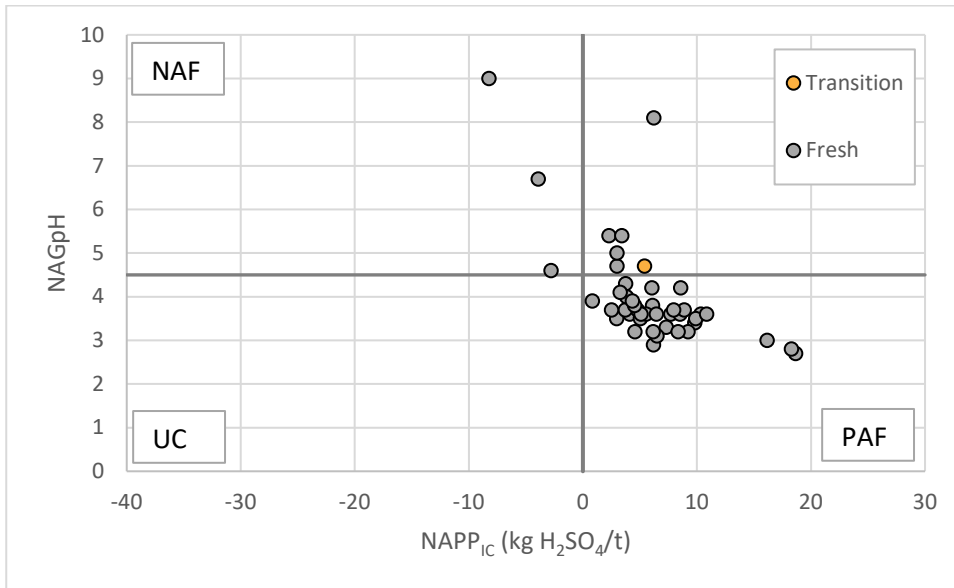


Figure 6: ARD classification plot with NAPP calculated from ANC_C .

2.2. ABA and NAG testing: All samples

To provide a set of samples which would be more representative of waste and ore from the BP33 project, the results of ABA and NAG testing from the earlier study which investigated geochemical properties of waste rock¹ were combined with results from the current sample set. This provided a set of samples covering the major lithotypes (approximately two thirds phyllite, one third pegmatite, minor sandstone, laterite, soil), oxidation types (approximately 20% oxide and transition, 60% fresh), sample types (approximately 90% waste and 10% ore) and ARD classes (approximately 55% NAF, 40% PAF-LC and minor PAF) (Table 3). The total number of samples tested across the two test programmes was 144, but only 91 of these samples had sufficient results to provide ARD classification. Test results for the full sample set are presented in Appendix A (Table A2).

Figure 7 shows NAGpH and NAG (pH4.5) as a function of Total S for the full samples set (91 samples). The figure shows that where Total S is less than 0.2%, most samples gave a NAGpH above 4.5, although there were some samples where the NAGpH was between 3.5 to 4.5. However, the measured NAG(pH4.5) for these samples was less than 2 kg H₂SO₄/t, with uncertainty about the ARD classification assigned to these samples due to the very close balance between the acid generating and acid neutralising capacity.

Figure 7 also shows that for samples with Total S between 0.2 and 0.4% the NAG pH was below 4.5 for all but two samples, but the NAG(pH4.5) was below 5 kg H₂SO₄/t, suggesting these materials may have the potential to produce acid after oxidation, but that the amount of acidity generated is likely to be minor.

For samples where Total S was above 0.4%, the NAGpH was below 3.5 with one exception, and NAG(pH4.5) was above 5 kg H₂SO₄/t. Although there are a limited number of samples in this category, results suggest that materials with Total S above 0.4% may have the potential to be acid forming.

¹ Core Lithium BP33Project - Geochemical characterisation of waste rock and ore, March 2020, Document No. S1312/J000390/R1346.

Table 3: Details of sample set used to define criteria for ARD classification of waste rock and ore

Category	No. of Samples	Percentage of Samples
<i>Lithology</i>		
Py	95	66%
Pg	40	28%
Sst	5	3%
Soil	1	1%
Laterite	3	2%
Total	144	
<i>Oxidation</i>		
Oxide	27	19%
Transition	29	20%
Fresh	88	61%
Total	144	
<i>Type</i>		
Ore	12	8%
Waste	132	92%
Total	144	
<i>ARD Classification</i>		
NAF	50	55%
PAF-LC	35	38%
PAF	6	7%
Total	91	

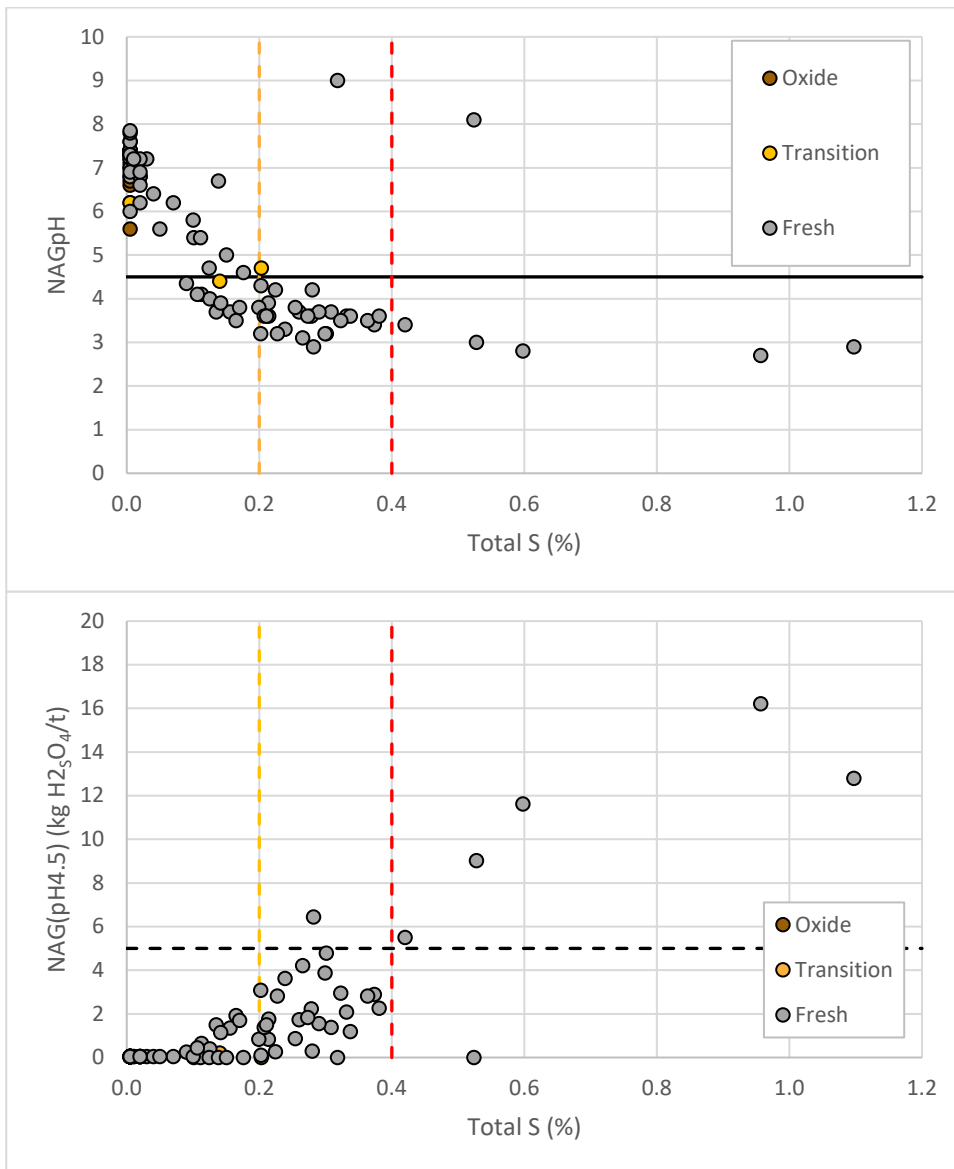


Figure 7: NAGpH (top) and NAG(pH 4.5) (bottom) as a function of Total S for the full sample set.

Figure 8 shows box plots displaying the distribution of Total S within set of samples examined in this and the earlier geochemical characterisation programmes. Total S distributions were split according to lithology/waste/ore, oxidation and ARD classification. Also shown in these figures are lines showing 0.2 and 0.4% Total S, which NAG test results suggest may form a basis for delineating NAF, PAF-LC and PAF materials.

This Figure shows that of the ore samples examined, a clear majority have a Total S content below 0.2%. These samples classified as NAF materials with a couple of exceptions, which while having a NAGpH below 4.5, produced very little acidity when treated with peroxide ($\text{NAG}(\text{pH}4.5) < 2 \text{ kg H}_2\text{SO}_4/\text{t}$). While around 75% of the phyllite samples examined had Total S of below 0.2%, it is likely that the sulphur content of some materials from this rock type may be higher, and consequently may potentially produce acid on oxidation. More than half of the waste pegmatite samples contained more than 0.2% Total S, suggesting that these materials may also have the potential to produce acid on oxidation.

All but one of the oxide samples contained Total S below the reporting limit of 0.01%, a clear indication that oxidised waste rock will likely classify as NAF. While many of the transition waste rock samples also gave a Total S assay below the reporting limit, the Total S content of these materials appears to be higher than highly oxidised rock, with sulphur content ranging up to 0.51%, but with around 95% of samples below 0.2% Total S. While the majority of fresh waste rock from within this sample set contained below 0.2% Total S, there is a significant proportion of the fresh rock samples with higher Total S content, indicating that fresh waste rock is likely to encompass a range of materials from NAF through to PAF rock.

Based on the results of geochemical testing of 144 samples from both the current and earlier test programmes as discussed above, criteria were developed to identify NAF, PAF-LC and PAF waste rock and ore. These criteria are summarised in Table 4 below. The criteria rely on oxidation and Total S content to classify mined materials according to their acid forming potential. Ore and oxidised waste rock are classified as NAF, with transitional and fresh waste rock with a Total S of below 0.2% also classified as NAF. For fresh and transitional waste rock with a Total S content above 0.2%, a Total S value of 0.4% is suggested for differentiating between PAF-LC and PAF materials. While there is likely to be some overlap between the classifications, it is expected that the listed criteria may be used to provide a reasonable segregation of waste rock and ore according to their likelihood to produce acid as a consequence of exposure to air during surface storage.

Table 4: Criteria for ARD classification of waste rock and ore

ARD Classification	Criteria
NAF	Ore <i>OR</i> Oxide waste rock <i>OR</i> Transition and fresh waste rock with Total S <0.2%
PAF-LC	Transition and fresh waste rock with Total S ≥0.2% and <0.4%
PAF	Transition and fresh waste rock with Total S ≥0.4%

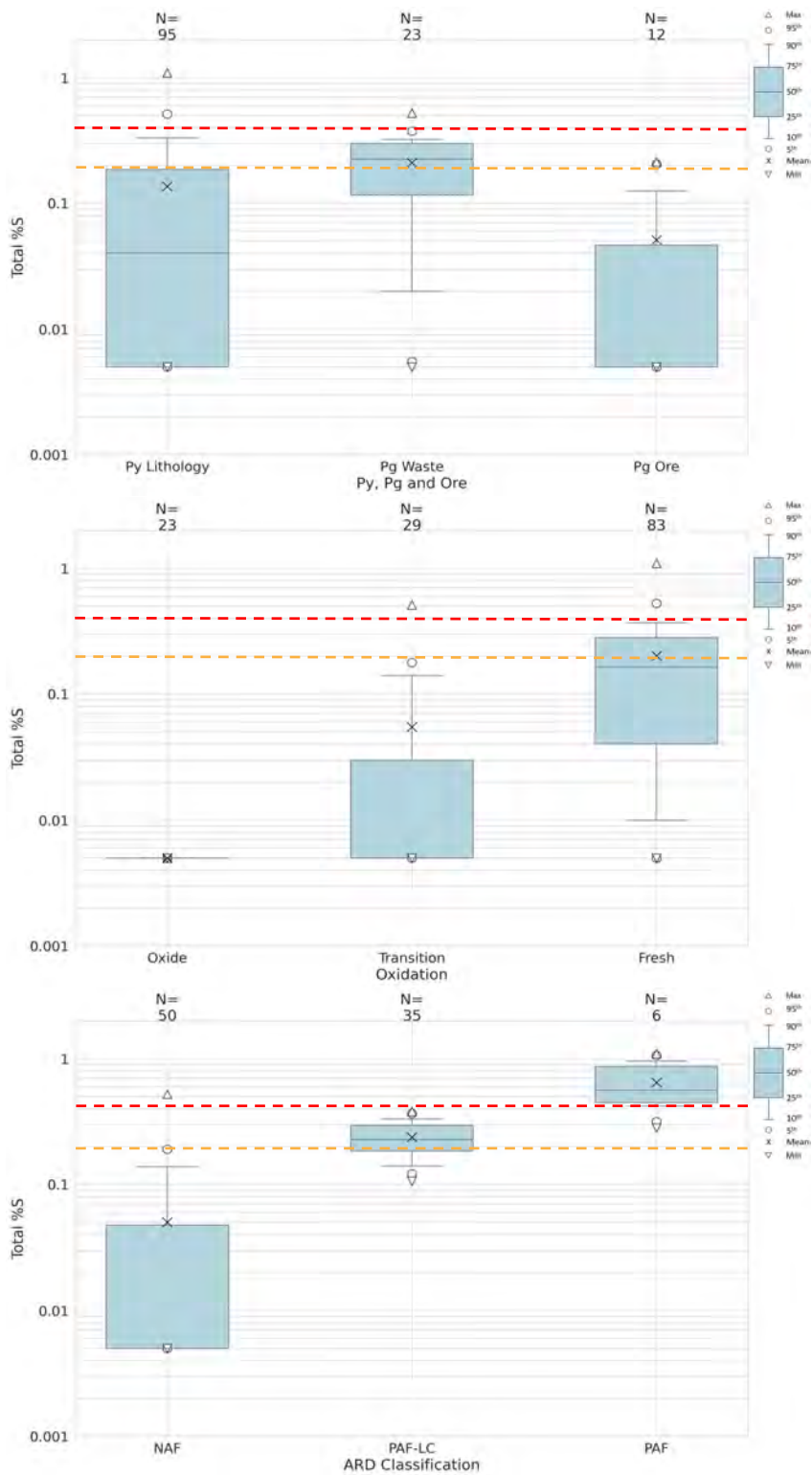


Figure 8: Distributions of Total S as a function of lithology/waste/ore (top), oxidation (middle) and ARD classification (bottom) for the full sample set. The orange broken lines show 0.2% Total S and the red broken lines 0.4% Total S.

2.3. Estimates of NAF, PAF-LC and PAF waste volumes

Core Lithium supplied a database containing assay data for around 2500 samples from 48 drill holes for the BP33 deposit (Figure 1). The database also contained a drill log which included details of sample colour, weathering, lithology and mineralogy. Samples were collected using RC, (36 holes), DD (3 holes), RC/DD (5 holes) and MR/DD (4 holes) drilling methods. Assays covered a standard set of 14 elements, including Li (value), As, Fe and Total S. Total S assay results provided in the database were employed to define ARD classification using criteria shown in Table 4 above.

Drilling programmes at BP33 have in the main been designed to provide resource definition data and consequently have been focused on fresh pegmatite which hosts the spodumene containing the value element (Li). Consequently, the sample set consists of nearly 90% fresh rock, with around 5% transition and oxide by sample interval length (Table 5). Pegmatite is the dominant lithology (63%) represented in the database, but a significant proportion of phyllite (36%) sample interval is present in the set. The split between ore and waste rock interval length is approximately even, with a slightly higher amount of waste sample interval (57%).

The assay database was analysed to define the distribution of Total S among the various categories of materials including type (ore, waste) and lithology and oxidation for waste rock samples. The results (Table 6) show that 99.8% of the sample interval represented by ore samples contain less than 0.2% Total S, supporting the ARD classification criteria suggesting all ore can be classified as NAF. Similarly, 100% of the sample intervals representing oxide rock had a Total S content of below 0.2%, also supporting the classification of all oxide rock as NAF. Around 90 to 95% of phyllite, pegmatite (waste) and sandstone samples contain a Total S content below 0.2%. Similarly, when waste rock is categorised according to oxidation, transitional and fresh waste rock display a similar sulphur distribution, suggesting that the majority of transitional and fresh waste rock, irrespective of the lithotype, will classify as NAF.

Table 5: Details of samples from the BP33 deposit database used to estimated volumes of rock from each ARD class

Category	Sample Interval Length (m)	Percentage of Total Interval Length
<i>Lithology</i>		
Pegmatite	1989.55	63%
Phyllite	1131.45	36%
Quartz (massive)	2.25	0.1%
Quartz Vein	9.4	0.3%
Soil		0%
Sandstone	46.6	1.5%
Shale	1	0.03%
Total	3180.25	
<i>Oxidation</i>		
Oxide	179	5.6%
Transition	178	5.6%
Fresh	2823.25	88.8%
Total	3180.25	
<i>Type</i>		
Ore	1371.6	43%
Waste	1808.65	57%
Total	3180.25	

Table 6: Percentage interval length for drill hole samples as a function of Total S content

Total S →	<0.2%	≥0.2 & <0.4%	≥0.4%
Category ↓	(NAF)	(PAF-LC)	(PAF)
Ore	99.8%	0.2%	0.0%
Waste	94.3%	5.1%	0.6%
Pegmatite	95.9%	3.8%	0.3%
Phyllite	94.0%	5.4%	0.6%
Sandstone	87.3%	11.6%	1.1%
Oxide	100.0%	0.0%	0.0%
Transition	90.1%	9.9%	0.0%
Fresh	93.8%	5.5%	0.7%
All	96.6%	3.1%	0.3%

The amounts of waste rock and ore which will be mined during the BP33 operation are shown in Table 7. Amounts of waste rock are further divided according to oxidation, with the majority waste rock produced during construction of the box cut. This material is expected to be comprised of only oxide rock which will be placed in WRD1. All of this material is expected to be NAF, as is any ore that will be stored in the ROM pad while awaiting transport to the processing plant.

A much smaller volume of transition and fresh waste rock which will be mined to develop the underground operation, will be placed in WRD2. Assuming the sample set provided in the drill hole assay database is representative of mined waste rock, then around 90% of waste rock removed from the UG mine will be fresh rock with the remainder as transitional rock. Based on the same assumption, using the proportions of transitional and fresh waste as a function of ARD class shown in Table 6, the estimated volumes/tonnages of NAF, PAF-LC and PAF waste rock to be placed in WRD2 were calculated. The results of these estimates are shown in Figure 9 and Table 8.

These estimates indicate that only around 15,000 tonnes of PAF-LC and PAF waste will be moved to WRD2 through the life of the mine out of a total of 229,000 tonnes of transition and fresh waste rock which will be mined, with most of the 15,000 tonnes likely to be classified as PAF-LC with limited acid producing potential.

These results suggest that all of the stockpiled mine materials (oxide waste in WRD1, transition and fresh waste in WRD2, ore in the ROM pad) will present little risk of producing acidic metalliferous drainage as a result of surface storage during the mining operation.

Table 7: Volumes and tonnages of waste rock and ore which will be moved to LOM

Material	Volume (BCM)	Volume (LCM) ¹	Tonnage (kt)
Oxide waste (box cut)	1,000,000	1,500,000	2,000
Transition/fresh waste (from underground)	85,000	127,500	229
Ore (production tonnes)	776,000	1,164,000	2,095

1. Assumes a swell factor of 50%

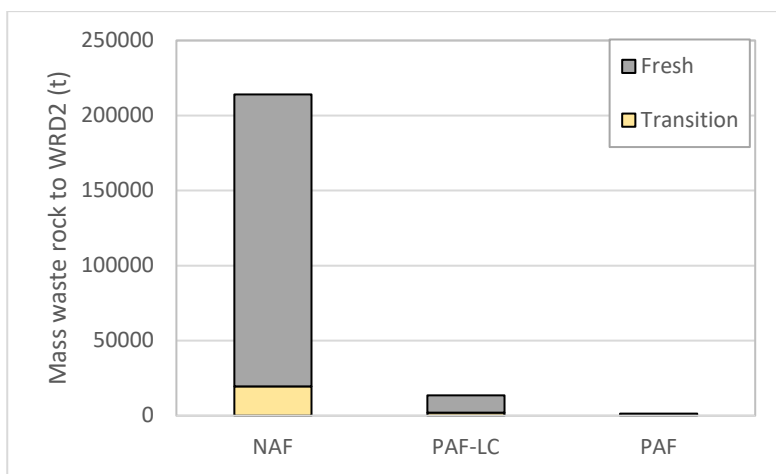


Figure 9: Estimated mass of transition and fresh waste rock by ARD class to be placed in WRD2.

Table 8: Estimated volumes and tonnages of transition and fresh waste rock to be placed in WRD2

Rock Type	ARD Class	BCM	LCM	Tonnage (t)
Transition/fresh waste (from underground)		85000	127500	229000
Transition rock in WRD2		8036	12053	21649
Fresh Rock in WRD2		76964	115447	207351
Transition Rock in WRD2	NAF	7239	10859	19503
	PAF-LC	796	1194	2145
	PAF	0	0	0
Fresh Rock in WRD2	NAF	72223	108334	194576
	PAF-LC	4199	6298	11312
	PAF	543	814	1463
Waste Rock in WRD2	NAF	79462	119193	214080
	PAF-LC	4995	7493	13457
	PAF	543	814	1463

3. LEACHING CHARACTERISTICS

Results from the previous study indicated that drainage from oxidised rock stored in the Box cut WRD may contain low concentrations of aluminium and zinc and some of the fresh rock stored on the UG WRD may contain water leachable arsenic and zinc. Consequently, as a part of the current study, the fresh rock samples examined here were subject to water extraction tests. Because these materials also contained higher than average sulphur content, NAG test liquors were also assayed to examine potential metal content of drainage from oxidised materials containing elevated sulphur.

The results of water extraction provide an indication of chemical mobility for a material that is freshly mined and exposed to atmospheric conditions, whereas the results of the peroxide extractions (NAG test) provide information on metal mobility for sulphidic materials that undergo oxidation. These two tests represent the two extremes of the leaching process. As waste rock at the BP33 project will only be stored on the surface for a short period of time, and residual ore remaining in stopes will only be exposed for a relatively short time prior to inundation, it is expected any sulphidic material will only undergo partial oxidation. Therefore, the potential for metals leaching will lie somewhere between the findings of the tests representing the two extremes.

Batch-leaching tests are short-term tests that can be used to provide an indication of the potential for environmental risk associated with leaching of metals from the ore and waste rock. However, these tests are also conducted at solid to liquid ratios far from what can be typically expected in waste rock or ore stockpiles, where precipitation reactions can be expected in addition to dissolution. Consequently, these tests can provide insight into elements of concern that may be potentially mobilised during surface storage, but they do not provide understanding of rates of reactivity and likely mobility of various metals and metalloids under field conditions. To obtain this information longer-term leach column testing is conducted which provides insight into the rate of reactions under conditions which are closer to field conditions than are provided by in the short-term batch leach tests. Column leach tests are currently being conducted and are expected to be completed in 12 months.

3.1. Multi-Element Assays

Multi-element assays were conducted on selected samples from the current sample set. The results are shown in Appendix C (Table C1). Using the results from the multi-element assays, geochemical abundance indices (GAI) were calculated to determine where there is significant enrichment of various elements in these samples. The calculated GAI are provided in Table 9. Where the GAI value is 3 or above this represents significant enrichment above the typical background level of each element. Note, where the GAI value is shown as “-”, this indicates a calculated GAI of <0.5. The data provided in Table 9, show most samples have significant enrichment in As, Be, Cs, Li, Sn and Tl, with Bi, Ta and W displaying evidence of some enrichment.

While elevated concentrations in a rock sample may indicate the potential for higher concentrations in leachates, the mobility of any given element will depend on the mineral associations and environmental conditions including extent of oxidation, leachate pH etc. Nevertheless, the results suggest that elevated concentrations of typically mobile elements such as As (especially as arsenate), Li and Cs could result in elevated concentrations in leachates.

Table 9: Geochemical Abundance Indices (GAI) for selected samples from the BP33 project

Element	Median Soil Abundance ²	Sample ID									
		21095	21093	21291	21290	21138	21134	21109	21102	21086	21289
Ag	0.05	-	-	-	-	-	1	2	2	2	3
Al	7.1%	-	-	-	-	-	-	-	-	-	-
As	6	8	9	3	3	7	9	10	5	5	3
Ba	500	-	-	-	-	-	-	-	-	-	-
Be	0.3	5	6	2	3	7	7	6	5	4	6
Bi	0.2	2	3	-	1	2	3	3	3	1	1
Ca	1.5%	-	-	-	-	-	-	-	-	-	-
Cd	0.35	-	-	-	-	-	2	1	-	2	-
Ce	50	-	-	-	-	-	-	-	-	-	-
Co	8	-	-	-	-	-	-	-	-	-	-
Cr	70	-	1	-	-	2	-	-	-	-	-
Cs	4	>6	6	3	5	6	>6	5	>6	>6	4
Cu	30	-	-	-	-	-	-	-	1	-	-
Fe	4.0%	-	-	-	-	-	-	-	-	-	-
Ga	20	-	-	-	-	-	-	-	-	-	-
Ge	1	-	-	-	-	-	-	-	-	-	-
Hf	6	-	-	-	-	-	-	-	-	-	-
Hg	0.06	-	-	-	-	-	-	-	-	-	-
In	1	-	-	-	-	-	-	-	-	-	-
K	1.4%	1	-	-	-	1	1	1	-	1	-
La	40	-	-	-	-	-	-	-	-	-	-
Li	25	5	4	2	2	6	6	5	5	4	2
Mg	0.5%	-	-	-	-	-	-	-	-	-	-
Mn	1000	-	-	-	-	-	-	-	-	-	-
Mo	1.2	-	-	-	-	-	-	-	-	-	-
Na	0.5%	-	-	-	-	-	-	-	-	-	1
Nb	10	-	1	-	-	1	1	1	-	-	2
Ni	50	-	-	-	-	-	-	-	-	-	-
P	800	-	1	-	-	1	2	2	2	-	-
Pb	35	-	-	-	-	-	-	-	-	3	-
Rb	150	2	2	-	-	2	3	2	1	1	-
S	0.07%	-	1	-	-	-	1	3	3	1	-
Sb	1	-	-	-	-	-	-	-	-	-	-
Sc	7	-	-	-	-	-	-	-	-	-	-
Se	0.4	1	1	1	1	1	1	1	1	1	1
Sn	4	5	5	-	-	5	6	5	4	3	2
Sr	250	-	-	-	-	-	-	-	-	-	-
Ta	2	1	5	-	-	3	3	2	1	-	5
Th	9	2	3	-	-	1	1	-	-	1	-
Ti	0.50%	-	-	-	-	-	-	-	-	-	-
Tl	0.2	5	4	2	2	5	6	5	4	4	3
U	2	1	1	-	-	1	-	1	-	1	-
V	90	-	-	-	-	-	-	-	-	-	-
W	1.5	3	3	2	1	3	3	3	2	2	2
Zn	90	-	-	-	-	-	-	-	-	3	-
Zr	400	-	-	-	-	-	-	-	-	-	-

² Bowen H.J.M.(1979) Environmental Chemistry of the Elements.

3.2. Water Extraction

Batch water extraction tests were conducted by extracting samples with deionised water at a solid to liquid ratio of 1:5 for 24 hours, which is generally sufficient for chemical equilibrium to be established. Extract pHs were recorded after the equilibration period, then the liquors were filtered and analysed for a suite of elements, the results of which are given in Appendix D (Table D1).

The results from the water extraction tests conducted as a part of the earlier study³ were added to the water extraction results for the current sample set. The combined sample set provided samples that covered both ore (9 samples) and waste rock (45 samples). The properties of the waste rock samples used for water extraction tests are shown in Table 10. Samples covered oxide, transition and fresh rock types, with the majority of samples classified as NAF, showing the selected samples are reasonably representative of the waste rock which will be mined during the BP33 project. However, the number of PAF samples is likely to over-represent this ARD class in the waste rock stockpiles at the mine.

Table 10: Details of samples used for water extraction tests

Category	No. Samples	Percentage of Total Samples
Oxide	9	20%
Transition	13	29%
Fresh	23	51%
Total	45	
NAF	38	84%
PAF-LC	4	9%
PAF	3	7%
Total	45	

Water extracts from the ore samples were slightly alkaline (average pH 9.2) with low salinity (average EC 105 $\mu\text{S}/\text{cm}$). Figure 10 shows the average concentration of metals in water extracts for the nine ore samples tested. For comparison, the average concentrations of metals in water extracts for the 45 waste rock samples tested are also shown in the figure. With the exception of Al and Fe, metal and metalloid concentrations were non-detectable in almost all of the water extracts of the ore samples. On average, concentrations of Al in ore water extracts were about an order of magnitude higher than the default ANZECC guideline values for freshwater systems. Analysis of surface water collected from ephemeral water courses at BP33 site, gave a median Al concentration also about an order of magnitude below that measured in water extracts of the ore samples. Similarly, water samples from bores within the oxidised rock profile at the nearby Grants project, indicated Al concentrations in the water contained in the shallow alluvial aquifer are also typically about an order of magnitude below those in water extracts of the BP33 ore. These results suggest that Al in run-off from ore stockpiled in the ROM pad may present an environmental risk. As all ore is likely to be NAF and therefore not produce acidic drainage, it would appear that stockpiled ore should not require any specific management to reduce potential impacts from run-off. However, since the results from water extractions indicate a potential risk from elevated Al concentrations in run-off, the likelihood of this risk should be evaluated at

³ Core Lithium BP33Project - Geochemical characterisation of waste rock and ore, March 2020, Document No. S1312/J000390/R1346. Appendix B

site and it is recommended that any run-off from the ROM stockpile should be monitored and containment of run-off undertaken as required.

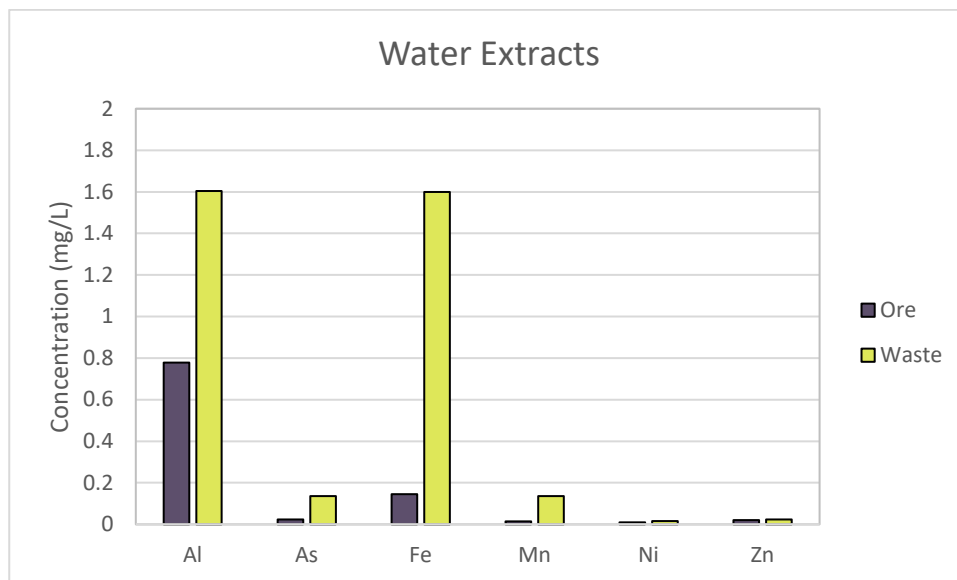


Figure 10: Metal concentrations in water extracts for ore and waste rock.

The results for water extraction tests conducted on waste rock samples are summarised in Figures 11 and 12. Results are grouped according to the oxidation state of the waste rock. Water extract pH for waste rock samples were slightly alkaline (average pH 8.2) with little difference between oxide, transition and fresh samples (Figure 11). Salinity in water extracts from oxide and transition waste rock samples were low (typically below 80 $\mu\text{S}/\text{cm}$), with fresh waste rock producing slightly higher salinity in water extracts (average 108 $\mu\text{S}/\text{cm}$). These results imply that oxide waste rock stored in WRD1, or transition and fresh waste rock stored in WRD2 are unlikely to produce low pH saline seepage during short-term surface storage.

Selected metal and metalloid concentrations in the water extracts for waste rock samples are summarised in Figure 12. For many metals, concentrations in water extracts were below the detection limit in all waste rock extracts, including Be, Sn and Tl which all showed significant enrichment in these materials. Mn, Ni and Zn concentrations in water extracts for waste rocks were all low and of a similar order of magnitude to the corresponding ANZECC DGV, with the exception of Mn where water extract concentrations were significantly below the DGV.

Similar to the ore samples, concentrations of Al in water extracts of waste rock were typically up to and order of magnitude or more higher than the ANZECC DGV and background surface and groundwater concentrations. Al concentrations were similar in water extracts for oxide, transition and fresh waste rock.

Arsenic concentrations in water extracts of fresh waste rock were significantly higher than in the water extracts of oxide and transition waste rock, and on average about an order of magnitude higher than the ANZECC DGV and background surface water concentrations. However, background concentrations of As in the aquifer hosted within the Burrell Creek Formation appear to be of a similar magnitude to those in water extracts, indicating elevated As concentrations in the deeper aquifer are in agreement with the apparent aqueous mobility of As within fresh rock.

There appears to be an inverse relationship between the amount of iron found in water extracts and As concentrations, with oxide and transition rock extracts having elevated concentrations of iron and lower As concentrations, while the reverse is true of the water extracts from the fresh waste rock. This may imply that iron is controlling As leachability to some extent, with higher iron concentrations in the leachate possibly associated with higher amounts of ferric oxyhydroxide precipitate which can attenuate As concentrations through adsorption.

These water extraction tests suggest that the mobility of Al in all waste rock and As in fresh waste rock on contact with water, could potentially result in elevated concentrations of these elements in seepage from WRD1 (Al only) and WRD2 (Al and As) during short-term surface storage. The results from kinetic leach column testing will help to confirm if leaching of Al and As from waste rock has the potential to provide any risk to the environment during surface storage in the WRD.

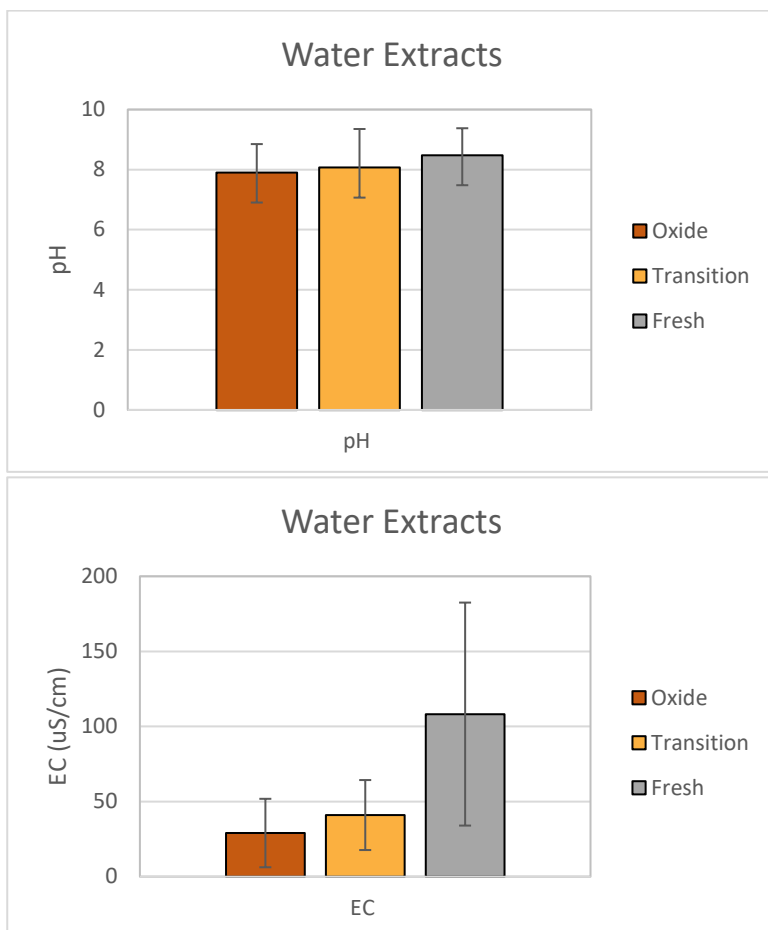


Figure 11: Mean pH (top) and EC (bottom) in water extracts for waste rock samples. Error bars show plus/minus one standard deviation from the mean.

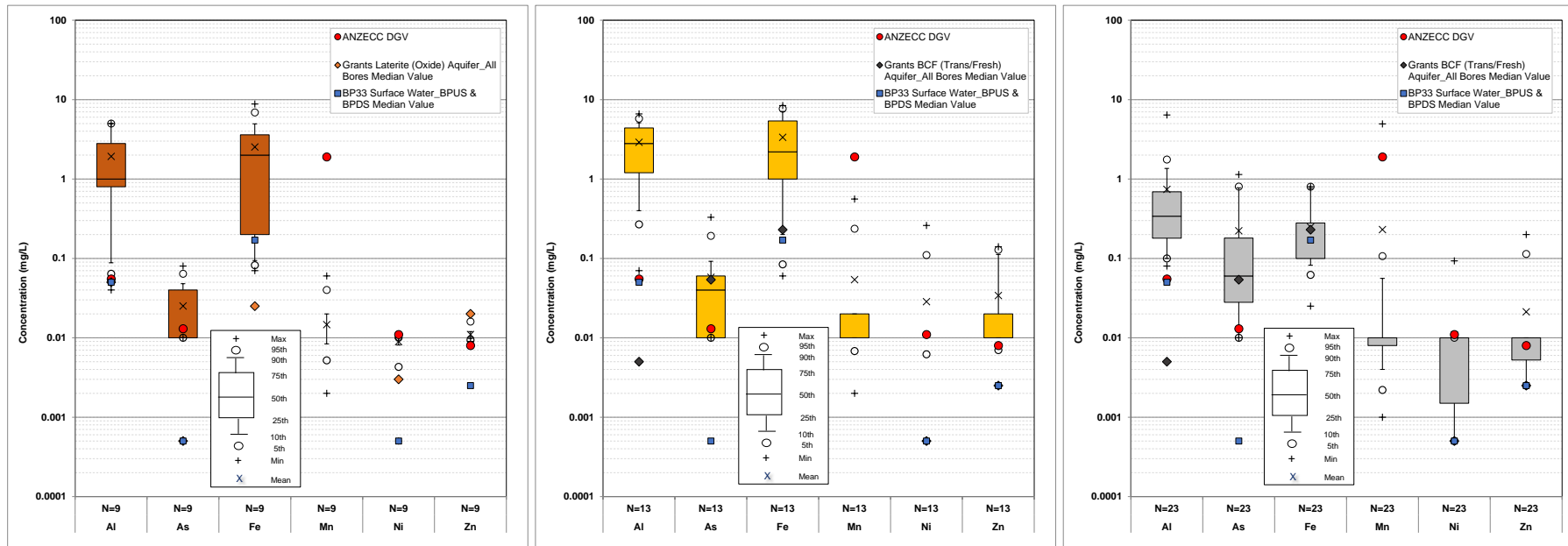


Figure 12: Box plots for metal concentrations in water extracts for oxide(left), transition (middle) and fresh (right) waste rock samples. The water extracts were produced at a solid to liquid ratio of 1:5. Also shown for comparison are ANZECC DGV for fresh water at 95% protection level (red circles), median concentrations for groundwater from the Grants project shallow (oxide) aquifer (brown diamonds), median concentrations for groundwater from the Grants project deep BCF (trans/fresh)) aquifer (grey diamonds), and median concentrations for surface water from the BP33 project site (blue squares). Note, where median values were below the limit of reporting (LOR), 0.5 x LOR are shown. LOR are: Al – 0.01, As – 0.001, Ni – 0.001, Zn – 0.005 mg/L.

3.3. Peroxide Extraction

A series of accelerated oxidation tests based on the NAG test procedure were also carried out to provide indicative data on metals and metalloids that are likely to occur in runoff from waste rock that is subject to oxidation processes following surface storage. The NAG test involves reaction of a sample with hydrogen peroxide to rapidly oxidise any sulphides that are present. Normally only the pH and acidity of the NAG solution are measured following the oxidation stage, but elemental analysis of the NAG liquor can also be carried out to provide data on the release of elements that may be of interest. Past experience has suggested NAG test concentrations typically need to be multiplied by between 3 to 10 times to provide a reasonable guide to what might be expected from column leach tests, so multiplication by a factor of five of metal concentrations in peroxide leachate was undertaken to give indicative metal/metalloid concentrations from column tests.

The full results for multi-element analysis of NAG liquors are provided in Appendix D (Table D2) and Figure 13 summarises the results. Analysis of NAG liquors was only carried out for fresh rock samples where peroxide treatment would result in sulphide oxidation. Comparison of the concentrations between water extracts (Figure 12) and peroxide extracts (Figure 13), considering the different solid to liquid ratios used in the two extraction tests, show that metal and metalloid concentrations were significantly higher in the peroxide extracts. Typically, Al and As concentrations were 1 to 2 orders of magnitude higher following oxidation with peroxide in comparison with water extracts, while Mn, Ni and Zn concentrations were 2 to 3 orders of magnitude higher in peroxide extracts in comparison with water extraction. A number of other metals, including Co, Cr, Cu, Mo, Pb and U were measurable following peroxide treatment, but non-detectable in the water extracts.

The pH of the peroxide extracts were substantially lower than the water extracts, with NAG liquor pH ranging from 2.7 to 6.2. This lower pH has undoubtedly led to increased solubility for a number of the metals after peroxide treatment. However, estimates of the volume of transition and fresh waste rock which will be temporarily stored in WRD2, and which will potentially be acid forming, are very low (Section 2.3) and widespread low pH conditions in pore water within the dump are unlikely. Consequently, even if significant oxidation were to occur during short-term storage of fresh waste rock in WRD2, mobilisation of many metals may be limited due to the likely near-neutral conditions within the WRD. This effect can be seen by comparing the concentration range of the various elements in peroxide extracts when all samples are included (pH range 2.7 – 6.2, average 4.6) shown in the top part of Figure 13, with the concentrations of the same elements in the peroxide extracts for NAF samples only (pH range 4.5 – 6.2, average 5.4) shown in the bottom part of Figure 13. For hydrolysable metals such as Al, Co, Cu, Ni and Zn, there is a significant increase in concentrations in peroxide extracts when PAF-LC samples are included in the sample set, but little change in the concentrations of metals which will be present as metal oxy anions (As, Cr, and Mo), where changes in pH will not influence hydrolysis and subsequent solubility. For the later metal types, oxidation during surface storage may result in mobility and elevated concentrations in seepage even if pH conditions remain circum-neutral.

ANZECC default guideline values for various metals in fresh water systems are also shown in Figure 13 for comparison with the concentrations in the NAG liquors. Also shown in the figure are the background concentrations of various metals in both surface water and the aquifer hosted within the Burrell Creek Formation (fresh rock) at the nearby Grants project. Comparisons with DGV and background surface and groundwater quality suggest that should substantial oxidation of fresh waste rock occur during surface storage, the concentrations of a number of metals/metalloids including Al, As, Co, Cr, Cu, U and Zn may be elevated in comparison to background water quality, and seepage from the WRD could potentially represent a risk of contaminating the receiving environment. The likelihood that significant oxidation and metal/metalloid release will occur during short-term surface storage will be further investigated using the kinetic leach column testing now in progress.

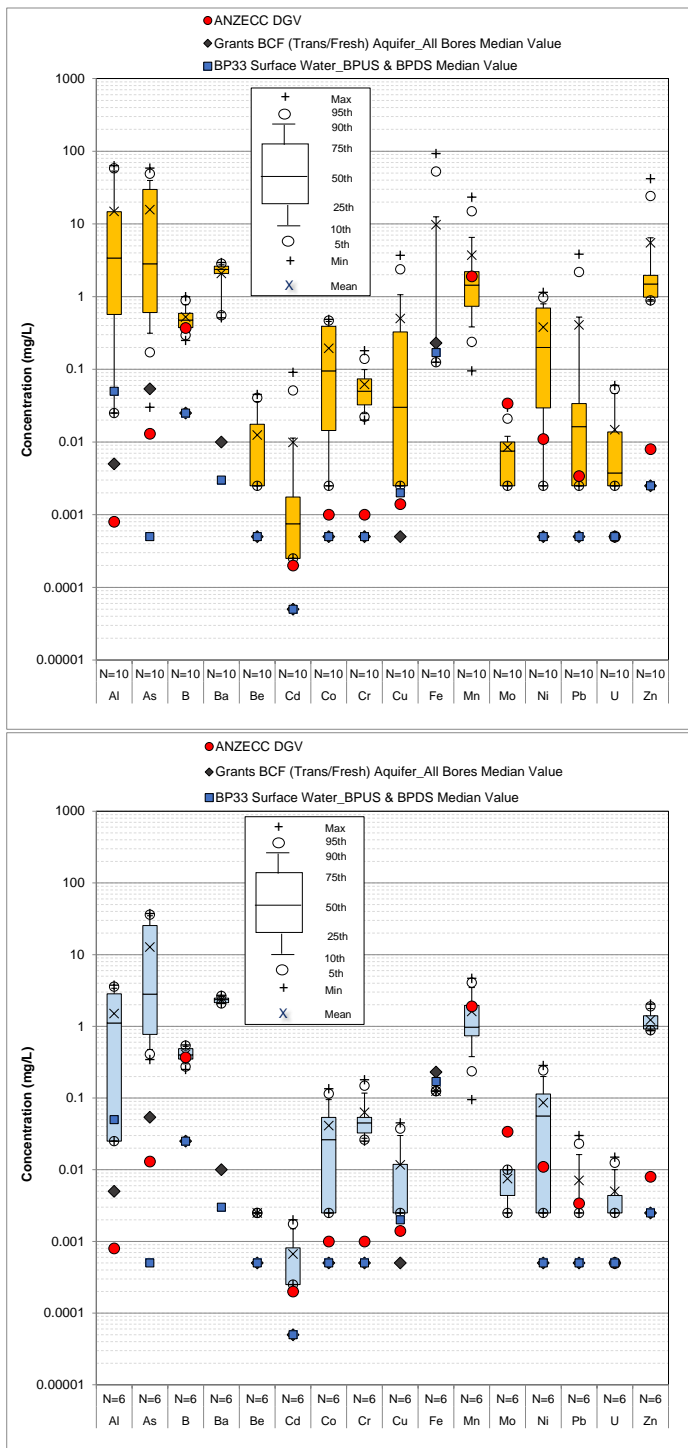


Figure 13: Box plots for metal concentrations in peroxide extracts for all (top) and NAF only (bottom) waste rock samples. Note the concentrations shown here have been multiplied by a factor of five which provides an equivalent solid to liquid ratio of 1:20. Also shown for comparison are ANZECC DGV for fresh water at 95% protection level (red circles), median concentrations for groundwater from the Grants project deep BCF (trans/fresh) aquifer (grey diamonds), and median concentrations for surface water from the BP33 project site (blue squares). Note, where median values were below the limit of reporting (LOR), 0.5 x LOR are shown. LOR are: Al – 0.01, As – 0.001, B – 0.05, Be – 0.001, Cd – 0.0001, Co – 0.001, Cr – 0.001, Cu – 0.001, Ni – 0.001, Pb – 0.001, U – 0.001, Zn – 0.005 mg/L.

4. STATIC GEOCHEMICAL TESTING OF SAMPLES FOR KINETIC COLUMN TESTS

Twenty-nine samples obtained from the three DD holes drilled during December 2020 and January 2021 were tested to investigate the suitability of these materials for kinetic testing which requires crushed rock available from diamond drill core. Based on assay data (Appendix E), four oxide samples, four transition samples and five fresh samples were composited to produce oxide, transition and fresh rock samples, which subsequently underwent geochemical testing. The results from testing of the three composite samples have been compared with results for typical oxide, transition and fresh waste rock samples to ascertain if these samples can be used as representative of waste rock which will be temporarily surface stored in WRD prior to return to the underground mine and box cut. Kinetic testing is planned using oxide, transition and fresh rock in accordance with the testing requirements of the NT EPA referral response.

Results from ABA and NAG testing of the composite samples are given in Appendix A (Table A1). As is the case for most waste rock samples at the BP33 project, there is little neutralising capacity in the composite samples with ANC less than 10 kg H₂SO₄/t for the three samples. Despite the limited ANC, the very low concentrations of sulphur in these samples mean that all samples are NAPP negative. NAGpH for the three composite samples were between 5.7 and 6.3, confirming that the oxide, transition and fresh composite samples are classified as NAF. Since all oxide samples and the large majority of transition and fresh waste rock from the BP33 project are likely to be classified as NAF, the NAF classification of the three composite samples to be used for kinetic testing is in agreement with the acid forming characteristics expected for waste rock to be stored in the WRD during mining operations.

Figure 14 displays box plots which show the distributions of sulphur and arsenic in oxide, transition and fresh waste rock from the BP33 drill hole assay database. Overlaying the box plots are the sulphur and arsenic concentrations in the oxide, transition and fresh waste rock composite samples. The figure shows that sulphur and arsenic concentrations in the composite samples lie just either side of the corresponding median values for waste rock, except for the sulphur content of the oxide composite sample, which is significantly lower than the median sulphur value for oxide waste.

Figure 15 shows a similar comparison between the water leachability of various metals/metalloids in the three composite samples with the results from water leach tests conducted on 45 waste rock samples. In general, the concentrations of metals in water leachates of the composite samples were significantly lower than concentrations in leachates from the larger sample set. The exceptions are As and Al (fresh waste rock composite sample only), where concentrations in water extracts in the composite samples were close to median values for the larger sample set. These results suggest that these composite samples may not be entirely representative of the waste rock to be stored in the WRD at the BP33 project, with the possible exception of Al and As which are potentially the most significant elements in seepage from the WRD. However, the set of 45 samples used to compare with the three composite samples may not be entirely representative of waste rock in general, because for the fresh waste rock samples in particular, the sulphur content was significantly higher than the average value and this may have biased the results of water leachate tests towards higher concentrations.

Comparison of the combined geochemical test results for the oxide, transition and fresh composite waste rock samples with results for the corresponding waste types from all drill holes, suggests that these composite samples provide a representative set of waste rock types to be stored in the WRD at the BP33 project. Kinetic leach column tests using these samples should therefore provide results which will give a good indication of the nature of seepage that may result during surface storage of waste and leachability of solutes from the waste following backfill and inundation by recovering groundwater.

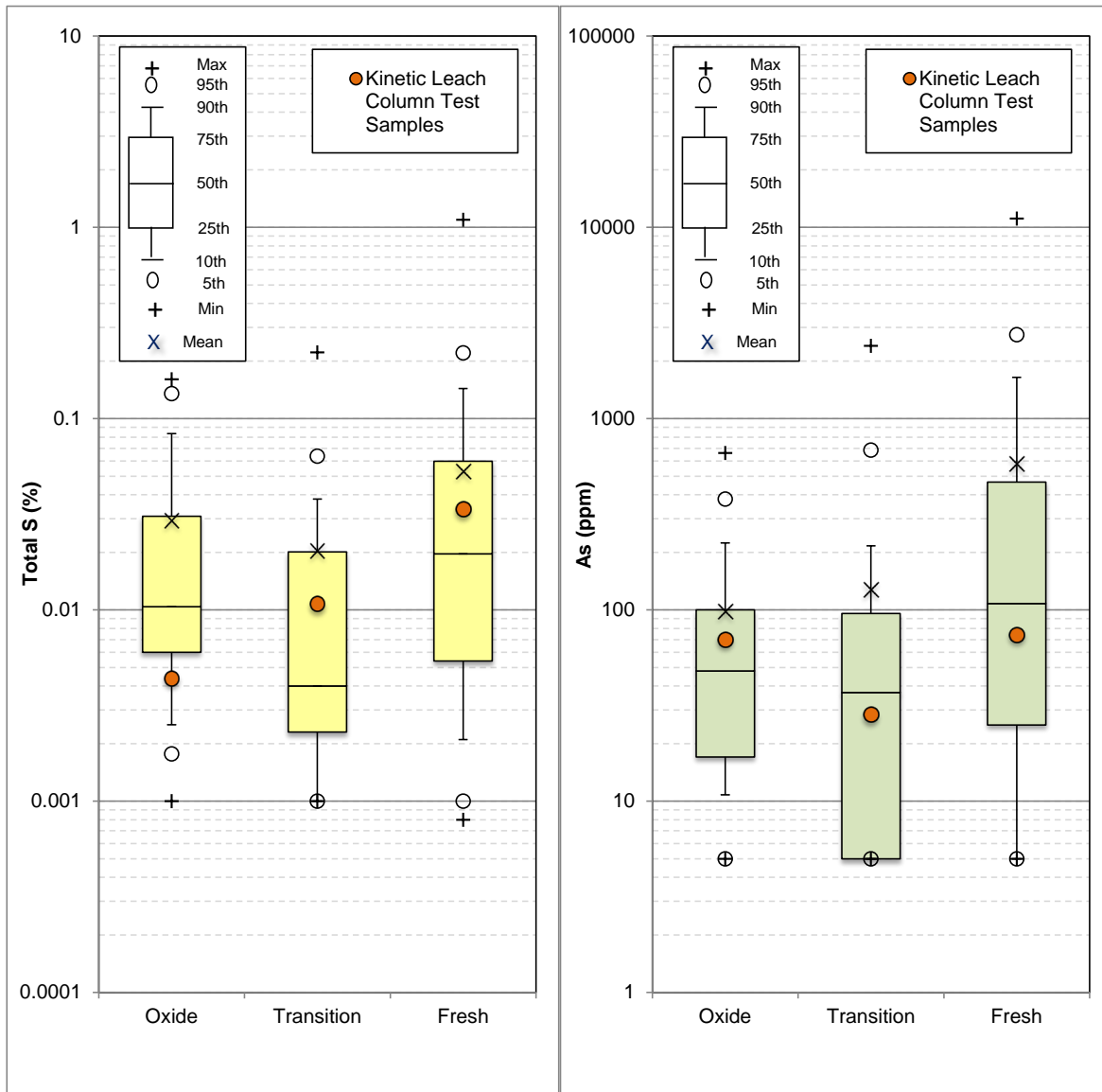


Figure 14: Box plots for sulphur content (left) and arsenic content (right) for waste rock from the BP33 project. The brown circles show the concentrations of sulphur and arsenic for the composite oxide, transition and fresh rock samples.

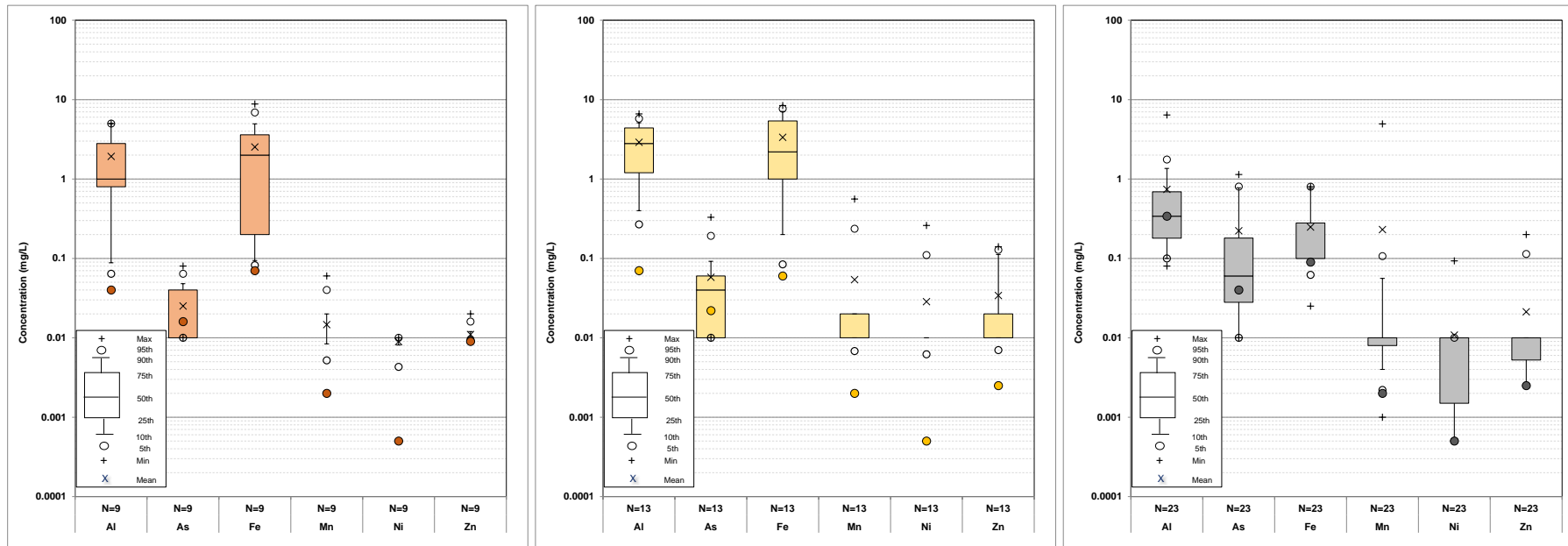


Figure 15: Box plots for metal concentrations in water extracts for oxide(left), transition (middle) and fresh (right) waste rock samples. The brown, yellow and grey circles show the concentrations of metals in water extracts for the composite oxide, transition and fresh rock samples respectively.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1. Study Conclusions

Static geochemical testing conducted on samples covering the range of oxidation, lithologies and type (waste and ore) from the BP33 project showed that oxidation and sulphur content could be used to determine the ARD classification of materials which will be disturbed during mining of the BP33 deposit. Using the derived criteria, waste rock and ore were classified to categorise their acid forming potential. The results show:

- Oxide rock excavated from the box cut and which will be placed in WRD1 is expected to be NAF;
- Ore that will be stored in the ROM pad while awaiting transport to the processing plant is expected to be NAF; and
- Estimates indicate that only around 15,000 tonnes of PAF-LC and PAF waste will be moved to WRD2 through the life of the mine out of a total of 229,000 tonnes of transition and fresh waste rock which will be mined, with most of the 15,000 tonnes likely to be classified as PAF-LC with limited acid producing potential.

These results suggest that waste rock and ore stockpiled on the surface prior to backfill of the mine excavations or processing are unlikely to produce low pH metalliferous drainage during short-term storage.

Despite the unlikely occurrence of low pH drainage, water extraction tests suggest that Al in both waste rock and ore could be readily mobilised from freshly mined materials at neutral to slightly alkaline pH. Results also indicated that As may be mobilised from fresh waste rock on contact with water, even in the absence of significant oxidation. Consequently, the preponderance of NAF waste and likely limited oxidation of minor PAF-LC and PAF waste during short-term surface storage, does not ensure that seepage from stockpiled waste and ore will contain concentrations of Al and As near to or below local surface and shallow groundwater background concentrations.

Peroxide extraction of fresh wastes, especially PAF-LC and PAF wastes, showed that, should extensive oxidation of waste rock in WRD2 occur, the concentrations of a number of metals/metalloids including Al, As, Co, Cr, Cu, U and Zn may be elevated in comparison to background water quality, and seepage from the WRD could potentially represent a risk of contaminating the receiving environment. While PAF-LC and PAF waste volumes in this WRD are likely to represent only a very small volume of the total waste rock, testing has shown that these wastes contain very limited readily available neutralising capacity. Therefore, the possibility of poor-quality drainage from WRD2 cannot be discounted should waste be stored for an extended period, beyond what is currently anticipated under the current mine plan.

The likelihood that significant oxidation and metal/metalloid release will occur during short-term surface storage is being investigated using kinetic leach column testing currently underway. Geochemical test results for the oxide, transition and fresh composite waste rock samples suggest that these composite samples provide a representative set of waste rock types to be stored in the WRD at the BP33 project. Kinetic leach column tests using these samples should therefore provide results which will give a good indication of the nature of seepage that may result during surface storage of waste and leachability of solutes from the waste following backfill and inundation by recovering groundwater.

5.2. Recommendations

The results of this study have confirmed the requirement for kinetic testing to fully understand the geochemistry of waste rock from the BP33 project and the potential implications for environmental impacts as a result of mining. The following recommendations follow from the results of this study:

- Kinetic leach column tests should be completed as proposed including operation under oxidising conditions to simulate conditions during storage in the WRD and in the unsaturated zones within the backfilled UG mine and box cut. Following a period of leaching under oxidising conditions, KLC tests should be continued under saturated conditions to simulate the leaching properties of backfilled waste which will be placed below the water table upon rebound.
- Groundwater monitoring at BP33 (both shallow alluvial and deeper BCF aquifers) should be on-going to provide baseline water quality data for comparison with column leachate data collected during leach column testing.
- Similarly, collection of surface water quality should continue to provide baseline water quality data for comparison with KLC test results.
- The results from static and kinetic geochemical testing should be used to conduct an ARD/NMD risk assessment which can be applied in developing an ARD/NMD management plan for the operation.

APPENDIX A

ABA and NAG Test Results

Table A1: Acid forming characteristics of samples from Core Lithium BP33 Project – Current study samples set

Egi Code	Hole ID	Sample ID	Depth (m)		Interval (m)	Lithology	Oxidation	Type	pH _{1.5}	EC ₁₅	ACID-BASE ANALYSIS											NAG TEST			Reaction Comments	ARD Classification	
			From	To							Total %S	CRS (%)	Total %C	Organic %C	Inorganic %C	MPA	ANC	ANC _{Tc}	ABCC	NAPP	NAPP _{IC}	ANC/MPA	NAG _{pH}	NAG _(pH4.5)			NAG _(pH7.0)
21086	FDD008	B1174	326	327	1.0	Py	Fr	Waste	9.0	0.111	0.11		0.02	0.03	<0.01	3	7	<1		-4	3	2.0	4.1	1	3		UC (PAF-LC)
21087	FRC164	A3428	139	140	1.0	Pg	Fr	Waste	9.1	0.195	0.32		0.27	0.05	0.22	10	25	18		-15	-8	2.6	9.0	0	0		NAF
21088	FRC164	A3429	140	141	1.0	Pg	Fr	Waste	8.9	0.272	0.52		0.16	0.04	0.12	16	27	10		-11	6	1.7	8.1	0	0		NAF
21089	FRC164	A3430	141	142	1.0	Pg	Fr	Ore	9.0	0.192	0.21		0.08	0.05	0.03	7	8	2		-1	4	1.2	3.6	2	4		PAF-LC
21090	FRC164	A3435	145	148	3.0	Py	Fr	Waste	9.1	0.159	0.21		0.11	0.04	0.07	7	12	6		-5	1	1.8	3.9	1	3		UC (PAF-LC)
21091	FRC166	A3512	212	213	1.0	Py	Fr	Waste	8.2	0.092	0.28	0.20	0.18	0.15	0.03	9	10	2	3	-1	6	1.2	2.9	6	12		PAF
21093	FRC167	A3515	124	125	1.0	Pg	Fr	Waste	9.3	0.121	0.18		0.14	0.04	0.10	5	17	8		-12	-3	3.2	4.6	0	3		NAF
21094	FRC167	A3516	125	126	1.0	Pg	Fr	Waste	9.3	0.113	0.20	<0.02	0.07	0.04	0.03	6	13	2	5	-7	4	2.1	4.3	0	2		UC (PAF-LC)
21095	FRC167	A3517	126	129	3.0	Py	Fr	Waste	9.4	0.126	0.10		0.04	0.03	0.01	3	10	1		-7	2	3.2	5.4	0	3		NAF
21097	FRC168	A3627	108	109	1.0	Py	Fr	Waste	8.8	0.099	0.16		0.05	0.05	<0.01	5	12	<1		-7	5	2.5	3.7	1	6		PAF-LC
21098	FRC168	A4408	109	110	1.0	Py	Fr	Waste	8.7	0.125	0.33		0.07	0.04	0.03	10	12	2		-2	8	1.2	3.6	2	6		PAF-LC
21099	FRC168	A4409	110	111	1.0	Py	Fr	Waste	8.4	0.162	0.37		0.05	0.03	0.02	11	11	2		0	10	1.0	3.4	3	8		PAF-LC
21101	FRC169	A3629	66	69	3.0	Py	Fr	Waste	5.8	0.752	1.10		0.08	0.05	0.03	34	11	2		23	31	0.3	2.9	13	26	Reacted	PAF
21102	FRC169	A3630	69	70	1.0	Py	Fr	Waste	6.0	0.346	0.96		0.16	0.03	0.13	29	15	11		14	19	0.5	2.7	16	27	Reacted	PAF
21103	FRC169	A3632	70	71	1.0	Py	Fr	Waste	7.1	0.337	0.36	0.12	0.15	0.05	0.10	11	25	8	4	-14	3	2.2	3.5	3	7		PAF-LC
21106	FRC172	A3764	186	187	1.0	Pg	Fr	Waste	8.4	0.054	0.34		0.02	0.03	<0.01	10	6	<1		4	10	0.6	3.6	1	3		PAF-LC
21107	FRC172	A3795	219	222	3.0	Py	Fr	Waste	8.2	0.143	0.28		0.04	0.04	<0.01	9	10	<1		-1	9	1.2	3.6	2	6		PAF-LC
21108	FRC172	A3796	222	223	1.0	Py	Fr	Waste	7.5	0.231	0.53		0.02	0.03	<0.01	16	9	<1		7	16	0.6	3.0	9	15		PAF
21109	FRC172	A3797	223	224	1.0	Py	Fr	Waste	7.5	0.122	0.60	0.39	0.02	0.03	<0.01	18	18	<1	3	0	18	1.0	2.8	12	16		PAF
21110	FRC172	A3798	224	225	1.0	Pg	Fr	Waste	8.5	0.096	0.30	0.13	0.03	0.04	<0.01	9	14	<1	3	-5	9	1.5	3.2	5	8		PAF-LC
21112	FRC174	A3972	190	191	1.0	Py	Fr	Waste	8.4	0.123	0.31		0.14	0.07	0.07	9	5	6		4	4	0.5	3.7	1	5		PAF-LC
21114	FRC203	C3610	81	82	1.0	Sst	Fr	Waste	8.8	0.087	0.11		0.03	0.05	<0.01	3	7	<1		-4	3	2.1	5.4	0	2		UC (NAF)
21115	FRC205	C3617	138	141	3.0	Sst	Fr	Waste	8.5	0.137	0.29		0.04	0.06	<0.01	9	7	<1		2	9	0.8	3.7	2	5		PAF-LC
21116	FRC205	C3669	184	185	1.0	Pg	Fr	Ore	9.7	0.275	0.20		0.02	0.03	<0.01	6	4	<1		2	6	0.7	3.8	1	3		PAF-LC
21118	FRC205	C3696	207	208	1.0	Pg	Fr	Ore	9.5	0.302	0.13		0.01	0.02	<0.01	4	5	<1		-1	4	1.3	4.0	0	3		UC (PAF-LC)
21119	FRC205	C3697	208	209	1.0	Pg	Fr	Waste	8.8	0.365	0.24		0.01	0.02	<0.01	7	4	<1		3	7	0.5	3.3	4	7		PAF-LC
21122	FRC205	C3709	218	219	1.0	Pg	Fr	Waste	7.9	0.279	0.26		0.03	0.03	<0.01	8	5	<1		3	8	0.6	3.7	2	6		PAF-LC
21123	FRC206	C3782	137	138	1.0	Py	Fr	Waste	8.6	0.096	0.13		0.06	0.04	0.02	4	10	2		-6	2	2.4	3.7	2	5		UC (PAF-LC)
21125	FRC212	A6714	88	89	1.0	Py	Fr	Waste	9.0	0.111	0.12		0.04	0.03	0.01	4	14	1		-10	3	3.7	4.7	0	3		UC (NAF)
21126	FRC213	A6787	68	69	1.0	Py	SW	Waste	7.9	0.107	0.20		0.07	0.06	0.01	6	14	1		-8	5	2.3	4.7	0	2		UC (NAF)
21129	FRC016	B1053	276.2	277	0.8	Py	Fr	Waste	9.3	0.133	0.14		0.12	0.02	0.10	4	12	8		-8	-4	2.8	6.7	0	0		NAF
21130	NRC057	A4851	105	106	1.0	Py	Fr	Waste	8.5	0.059	0.16	0.03	0.04	0.04	<0.01	5	15	<1	1	-10	5	3.0	3.5	2	5		PAF-LC
21132	NRC057	A4854	108	109	1.0	Py	Fr	Waste	8.6	0.133	0.28		0.05	0.05	<0.01	9	10	<1		-1	9	1.2	4.2	0	4		UC (PAF-LC)
21134	NRC057	A4857	111	112	1.0	Py	Fr	Waste	8.3	0.096	0.21	0.02	0.04	0.03	0.01	6	16	1	3	-10	6	2.5	3.6	1	5		PAF-LC
21135	NRC057	A4858	112	113	1.0	Pg	Fr	Waste	8.1	0.140	0.21	0.08	0.13	0.13	<0.01	6	19	<1	5	-13	6	3.0	3.6	1	5		PAF-LC
21138	NRC057	A4869	122	123	1.0	Sst	Fr	Waste	8.4	0.091	0.15		0.17	0.15	0.02	5	12	2		-7	3	2.6	5.0	0	2		UC (NAF)
21140	NRC057	A4873	125	126	1.0	Pg	Fr	Waste	8.4	0.150	0.32		0.02	0.03	<0.01	10	14	<1		-4	10	1.4	3.5	3	7		PAF-LC
21141	NRC057	A4875	127	128	1.0	Pg	Fr	Waste	9.1	0.201	0.22	0.07	0.07	0.06	0.01	7	15	1	6	-8	6	2.2	4.2	0	4		PAF-LC
21143	NRC129	A6640	93	96	3.0	Pg	Fr	Waste	8.5	0.135	0.38		0.09	0.08	0.01	12	8	1		-4	11	0.7	3.6	2	8		PAF-LC
21144	NRC148	A6967	246	247	1.0	Pg	Fr	Waste	8.1	0.166	0.20	0.04	0.21	0.19	0.02	6	12	2	4	-6	5	1.9	3.2	3	9		PAF-LC
21145	NRC148	A6968	247	250	3.0	Py	Fr	Waste	8.2	0.116	0.27		0.10	0.08	0.02	8	6	2		2	6	0.7	3.1	4	10		PAF-LC
21146	NRC148	A6969	250	253	3.0	Py	Fr	Waste	8.0	0.140	0.11		0.55	0.58	<0.01	3	7	<1		-4	3	2.2	4.1	0	5		UC (PAF-LC)
21148	NRC148	A6977	258	261	3.0	Py	Fr	Waste	7.4	0.245	0.23		0.11	0.10	0.01	7	6	1		1	6	0.9	3.2	3	11		PAF-LC
21149	NRC148	A6983	274	275	1.0	Pg	Fr	Waste	8.5	0.164	0.30		0.09	0.08	0.01	9	5	1		4	8	0.5	3.2	4	8		PAF-LC
21151	NRC148	A6985	276	277	1.0	Pg	Fr	Waste	8.2	0.170	0.27		0.33	0.29	0.04	8	7	3		1	5	0.8	3.6	2	6		PAF-LC

EGi Code	Hole ID	Sample ID	Depth (m)		Interval (m)	Lithology	Oxidation	Type	pH _{1.5}	EC _{1.5}	ACID-BASE ANALYSIS										NAG TEST			Reaction Comments	ARD Classification		
			From	To							Total %S	CRS (%)	Total %C	Organic %C	Inorganic %C	MPA	ANC	ANC _{Tc}	ABCC	NAPP	NAPP _{ic}	ANC/MPA	NAGpH			NAG _(pH4.5)	NAG _(pH7.0)
21152	NRC148	A6992	281	282	1.0	Pg	Fr	Waste	8.9	0.134	0.25		0.13	0.09	0.04	8	6	3		2	5	0.8	3.8	1	6		PAF-LC
21153	NRC148	A6993	282	283	1.0	Pg	Fr	Waste	5.9	0.613	0.14		2.29	2.33	<0.01	4	4	<1		0	4	0.9	3.9	1	6		UC (PAF-LC)
21289	-	-	-	-	-	Oxide Composite			7.8	0.085	0.002		0.03	0.04	<0.01	0	1	<1		-1	0	18.7	5.8	0	4		NAF
21290	-	-	-	-	-	Transition Composite			7.9	0.083	0.011		0.01	0.02	<0.01	0	4	<1		-4	0	12.2	5.7	0	3		NAF
21291	-	-	-	-	-	Fresh Composite			9.5	0.076	0.034		0.07	0.02	0.05	1	6	4		-5	-3	5.8	6.3	0	1		NAF

KEY

pH_{1.2} = pH of 1:2 extract
 EC_{1.2} = Electrical Conductivity of 1:2 extract (dS/m)
 MPA = Maximum Potential Acidity (kgH₂SO₄/t)
 ANC = Acid Neutralising Capacity (kgH₂SO₄/t)
 NAPP = Net Acid Producing Potential (kgH₂SO₄/t)

NAGpH = pH of NAG liquor
 NAG_(pH4.5) = Net Acid Generation capacity to pH 4.5 (kgH₂SO₄/t)
 NAG_(pH7.0) = Net Acid Generation capacity to pH 7.0 (kgH₂SO₄/t)

NAF = Non-Acid Forming
 PAF = Potentially Acid Forming
 PAF-LC = PAF - lower capacity
 UC = Uncertain Classification
 (expected classification in brackets)

Table A2: Acid forming characteristics of samples from Core Lithium BP33 Project – Current and previous study sample sets

EGI Code	Hole ID	Sample ID	Depth (m)		Depth (m)	Lithology	Weathering	Oxidation	Type	pH _{1:2}	EC _{1:2}	ACID-BASE ANALYSIS											NAG TEST			Reaction Comments	ARD Classification		
			From	To								Total %S	CRS (%)	Total %C	Organic %C	Inorganic %C	MPA	ANC	ANC _{TC}	ABCC	NAPP	NAPP _C	ANC/MPA	NAG _{pH}	NAG _{pH4.2}			NAG _{pH7.2}	
21086	FDD008	B1174	326	327	327	Py	FR	Fresh	Waste	9.0	0.111	0.11		0.02	0.03	<0.01	3	7	<1		-4	3	2.0	4.1	1	3		UC (PAF-LC)	
21087	FRC164	A3428	139	140	140	Pg	FR	Fresh	Waste	9.1	0.195	0.32		0.27	0.05	0.22	10	25	18		-15	-8	2.6	9.0	0	0		NAF	
21088	FRC164	A3429	140	141	141	Pg	FR	Fresh	Waste	8.9	0.272	0.52		0.16	0.04	0.12	16	27	10		-11	6	1.7	8.1	0	0		NAF	
21089	FRC164	A3430	141	142	142	Pg	FR	Fresh	Ore	9.0	0.192	0.21		0.08	0.05	0.03	7	8	2		-1	4	1.2	3.6	2	4		PAF-LC	
21090	FRC164	A3435	145	148	147	Py	FR	Fresh	Waste	9.1	0.159	0.21		0.11	0.04	0.07	7	12	6		-5	1	1.8	3.9	1	3		UC (PAF-LC)	
	FRC166	FRC166_002			2	Laterite	CW	Oxide	Waste	5.5	0.003	<0.01																	
	FRC166	FRC166_008			8	Py	CW	Oxide	Waste	6.8	0.009	<0.01																	
	FRC166	FRC166_018			18	Py	HW	Oxide	Waste	7.0	0.008	<0.01																	
	FRC166	FRC166_032			32	Py	HW	Oxide	Waste	7.7	0.009	<0.01																	
	FRC166	FRC166_046			46	Py	MW	Transition	Waste	8.4	0.022	0.1																	
	FRC166	FRC166_052			52	Py	SW	Transition	Waste	8.4	0.028	0.14																	
	FRC166	FRC166_064			64	Py	SW	Transition	Waste	7.9	0.055	0.51																	
	FRC166	FRC166_075			75	Py	FR	Fresh	Waste	8.5	0.032	0.29																	
	FRC166	FRC166_088			88	Py	FR	Fresh	Waste	9.2	0.048	0.05																	
	FRC166	FRC166_108			108	Py	FR	Fresh	Waste	9.2	0.037	0.09																	
	FRC166	FRC166_144			144	Py	FR	Fresh	Waste	9.0	0.034	0.29																	
	FRC166	FRC166_152			152	Py	FR	Fresh	Waste	9.1	0.039	0.21																	
21091	FRC166	A3512	212	213	213	Py	FR	Fresh	Waste	8.2	0.092	0.28		0.20	0.18	0.15	0.03	9	10	2	3	-1	6	1.2	2.9	6	12		PAF
	FRC166	FRC166_226			226	Py	FR	Fresh	Waste	9.1	0.055	0.04																	
	FRC167	FRC167_004			4	Py	CW	Oxide	Waste	7.2	0.008	<0.01																	
	FRC167	FRC167_013			13	Py	HW	Oxide	Waste	7.2	0.007	<0.01																	
	FRC167	FRC167_020			20	Py	HW	Oxide	Waste	6.9	0.009	<0.01																	
	FRC167	FRC167_031			31	Py	HW	Oxide	Waste	7.0	0.009	<0.01																	
	FRC167	FRC167_044			44	Py	MW	Transition	Waste	7.8	0.010	<0.01																	
	FRC167	FRC167_049			49	Py	MW	Transition	Waste	7.0	0.066	0.14																	
	FRC167	FRC167_060			60	Py	SW	Transition	Waste	8.7	0.033	0.13																	
	FRC167	FRC167_072			72	Py	FR	Fresh	Waste	7.8	0.050	0.23																	
	FRC167	FRC167_076			76	Py	FR	Fresh	Waste	8.6	0.025	0.05																	
	FRC167	FRC167_098			98	Py	FR	Fresh	Waste	9.4	0.087	0.02																	
	FRC167	FRC167_117			117	Py	FR	Fresh	Waste	9.4	0.088	0.16																	
21093	FRC167	A3515	124	125	125	Pg	FR	Fresh	Waste	9.3	0.121	0.18		0.14	0.04	0.10	5	17	8		-12	-3	3.2	4.6	0	3		NAF	
21094	FRC167	A3516	125	126	126	Pg	FR	Fresh	Waste	9.3	0.113	0.20		<0.02	0.07	0.04	0.03	6	13	2	5	-7	4	2.1	4.3	0	2		UC (PAF-LC)
21095	FRC167	A3517	126	129	128	Py	FR	Fresh	Waste	9.4	0.126	0.10		0.04	0.03	0.01	3	10	1		-7	2	3.2	5.4	0	3		NAF	
	FRC167	FRC167_140			140	Py	FR	Fresh	Waste	9.0	0.032	0.10																	
	FRC167	FRC167_189			189	Py	FR	Fresh	Waste	9.2	0.052	0.04																	
	FRC168	FRC168_001			1	Laterite	CW	Oxide	Waste	6.0	0.005	<0.01																	
	FRC168	FRC168_005			5	Py	CW	Oxide	Waste	6.0	0.004	<0.01																	
	FRC168	FRC168_017			17	Py	HW	Oxide	Waste	6.1	0.004	<0.01																	
	FRC168	FRC168_042			42	Py	MW	Transition	Waste	7.8	0.012	<0.01																	
	FRC168	FRC168_045			45	Py	MW	Transition	Waste	7.9	0.012	<0.01																	
	FRC168	FRC168_052			52	Py	SW	Transition	Waste	8.2	0.012	0.02																	
	FRC168	FRC168_060			60	Py	MW	Transition	Waste	8.5	0.023	0.03																	
21097	FRC168	A3627	108	109	109	Py	FR	Fresh	Waste	8.8	0.099	0.16		0.05	0.05	0.00	5	12	0		-7	5	2.5	3.7	1	6		PAF-LC	
21098	FRC168	A4408	109	110	110	Py	FR	Fresh	Waste	8.7	0.125	0.33		0.07	0.04	0.03	10	12	2		-2	8	1.2	3.6	2	6		PAF-LC	
21099	FRC168	A4409	110	111	111	Py	FR	Fresh	Waste	8.4	0.162	0.37		0.05	0.03	0.02	11	11	2		0	10	1.0	3.4	3	8		PAF-LC	
	FRC168	FRC168_118			118	Py	FR	Fresh	Waste	8.7	0.076	0.37																	
	FRC169	FRC169_002			2	Laterite	CW	Oxide	Waste	7.3	0.010	<0.01																	
	FRC169	FRC169_004			4	Py	CW	Oxide	Waste	7.3	0.005	<0.01																	
	FRC169	FRC169_014			14	Py	HW	Oxide	Waste	7.1	0.007	<0.01																	
	FRC169	FRC169_026			26	Py	HW	Oxide	Waste	7.6	0.007	<0.01																	
	FRC169	FRC169_036			36	Py	MW	Transition	Waste	8.3	0.014	<0.01																	
	FRC169	FRC169_057			57	Py	SW	Transition	Waste	8.5	0.018	0.03																	
	FRC169	FRC169_065			65	Py	FR	Fresh	Waste	6.6	0.120	1.05																	
21101	FRC169	A3629	66	69	68	Py	FR	Fresh	Waste	5.8	0.752	1.10					34	11	2		23	31	0.3	2.9	13	26	Reacted	PAF	

EGI Code	Hole ID	Sample ID	Depth (m)		Depth (m)	Lithology	Weathering	Oxidation	Type	pH _{1:2}	EC _{1:2}	ACID-BASE ANALYSIS										NAG TEST			Reaction Comments	ARD Classification				
			From	To								Total %S	CRS (%)	Total %C	Organic %C	Inorganic %C	MPA	ANC	ANC _{Tc}	ABCC	NAPP	NAPP _c	ANC/MPA	NAG _{pH}			NAG _{pH4.5}	NAG _{pH7.5}		
21102	FRC169	A3630	69	70	70	Py	FR	Fresh	Waste	6.0	0.346	0.96		0.16	0.03	0.13	29	15	11			14	19	0.5	2.7	16	27	Reacted	PAF	
21103	FRC169	A3632	70	71	71	Py	FR	Fresh	Waste	7.1	0.337	0.36	0.12	0.15	0.05	0.10	11	25	8	4	-14	3	2.2	3.5	3	7		PAF-LC		
	FRC169	FRC169_153			153	Py	FR	Fresh	Waste	9.0	0.033	0.07																		
	FRC170	FRC170_004			4	SOIL	CW	Oxide	Waste	6.0	0.004	0.02																		
	FRC170	FRC170_011			11	Py	CW	Oxide	Waste	6.7	0.004	<0.01																		
	FRC170	FRC170_023			23	Py	HW	Oxide	Waste	7.5	0.006	<0.01																		
	FRC170	FRC170_035			35	Py	HW	Oxide	Waste	7.6	0.009	<0.01																		
	FRC170	FRC170_044			44	Py	MW	Transition	Waste	8.0	0.007	0.02																		
	FRC170	FRC170_056			56	Py	SW	Transition	Waste	8.5	0.016	0.02																		
	FRC170	FRC170_064			64	Py	FR	Fresh	Waste	9.0	0.023	0.02																		
	FRC170	FRC170_099			99	Py	FR	Fresh	Waste	9.2	0.076	0.02																		
	FRC170	FRC170_142			142	Py	FR	Fresh	Waste	9.4	0.041	0.03																		
	FRC171	FRC171_040			40	Py	MW	Transition	Waste	8.1	0.007	<0.01																		
	FRC171	FRC171_065			65	Py	SW	Transition	Waste	6.2	0.002	<0.01																		
21106	FRC172	A3764	186	187	187	Pg	FR	Fresh	Waste	8.4	0.054	0.34		0.02	0.03	<-0.01	10	6	<1			-4	10	0.6	3.6	1	3		PAF-LC	
21107	FRC172	A3795	219	222	221	Py	FR	Fresh	Waste	8.2	0.143	0.28		0.04	0.04	<-0.01	9	10	<1			-1	9	1.2	3.6	2	6		PAF-LC	
21108	FRC172	A3796	222	223	223	Py	FR	Fresh	Waste	7.5	0.231	0.53		0.02	0.03	<-0.01	16	9	<1			7	16	0.6	3.0	9	15		PAF	
21109	FRC172	A3797	223	224	224	Py	FR	Fresh	Waste	7.5	0.122	0.60		0.39	0.02	0.03	<-0.01	18	18	<1	3	0	18	1.0	2.8	12	16		PAF	
21110	FRC172	A3798	224	225	225	Pg	FR	Fresh	Waste	8.5	0.096	0.30	0.13	0.03	0.04	<-0.01	9	14	<1	3	-5	9	1.5	3.2	5	8		PAF-LC		
21112	FRC174	A3972	190	191	191	Py	FR	Fresh	Waste	8.4	0.123	0.31		0.14	0.07	0.07	9	5	6			4	4	0.5	3.7	1	5		PAF-LC	
21114	FRC203	C3610	81	82	82	Sst	FR	Fresh	Waste	8.8	0.087	0.11		0.03	0.05	<-0.01	3	7	<1			-4	3	2.1	5.4	0	2		UC (NAF)	
21115	FRC205	C3617	138	141	140	Sst	FR	Fresh	Waste	8.5	0.137	0.29		0.04	0.06	<-0.01	9	7	<1			2	9	0.8	3.7	2	5		PAF-LC	
21116	FRC205	C3669	184	185	185	Pg	FR	Fresh	Ore	9.7	0.275	0.20		0.02	0.03	<-0.01	6	4	<1			2	6	0.7	3.8	1	3		PAF-LC	
21118	FRC205	C3696	207	208	208	Pg	FR	Fresh	Ore	9.5	0.302	0.13		0.01	0.02	<-0.01	4	5	<1			-1	4	1.3	4.0	0	3		UC (PAF-LC)	
21119	FRC205	C3697	208	209	209	Pg	FR	Fresh	Waste	8.8	0.365	0.24		0.01	0.02	<-0.01	7	4	<1			3	7	0.5	3.3	4	7		PAF-LC	
21122	FRC205	C3709	218	219	219	Pg	FR	Fresh	Waste	7.9	0.279	0.26		0.03	0.03	<-0.01	8	5	<1			3	8	0.6	3.7	2	6		PAF-LC	
21123	FRC206	C3782	137	138	138	Py	FR	Fresh	Waste	8.6	0.096	0.13		0.06	0.04	0.02	4	10	2			-6	2	2.4	3.7	2	5		UC (PAF-LC)	
	FRC212	FRC212 - 8			8	Pg	HW	Oxide	Waste	8.0	0.015	<0.01					<-0.3	8					-8		>25	6.6	<-0.1	1		NAF
	FRC212	FRC212 - 15			15	Py	MW	Transition	Waste	7.9	0.017	<0.01					<-0.3	12					-12		>40	7.4	<-0.1	<0.1		NAF
	FRC212	FRC212 - 44			44	Py	MW	Transition	Waste	7.9	0.021	<0.01					<-0.3	16					-16		>54	7.3	<-0.1	<0.1		NAF
	FRC212	FRC212 - 53			53	Pg	MW	Transition	Waste	8.7	0.038	<0.01					<-0.3	13					-13		>42	7.0	<-0.1	<0.1		NAF
	FRC212	FRC212 - 66			66	Py	SW	Transition	Waste	8.9	0.042	<0.01					<-0.3	14					-14		>47	6.2	<-0.1	4		NAF
	FRC212	FRC212 - 81			81	Pg	FR	Fresh	Waste	8.5	0.039	<0.01					<-0.3	13					-13		>44	6.8	<-0.1	1		NAF
	FRC212	FRC212 - 88			88	Py	FR	Fresh	Waste	8.6	0.072	0.02					1	23					-22		37.6	6.2	<-0.1	2		NAF
	FRC212	A6714	88	89	89	Py	FR	Fresh	Waste	9.0	0.111	0.12	0.04	0.03	0.01		4	14	1				-10	3	3.7	4.7	0	3		UC (NAF)
	FRC212	FRC212 - 92			92	Pg	FR	Fresh	Waste	9.3	0.050	<0.01					<-0.3	12					-12		>41	7.2	<-0.1	<0.1		NAF
	FRC212	FRC212 - 97			97	Pg	FR	Fresh	Ore	9.3	0.051	<0.01					<-0.3	13					-13		>42	6.0	<-0.1	4		NAF
	FRC212	FRC212 - 109			109	Pg	FR	Fresh	Ore	9.4	0.129	<0.01					<-0.3	16					-16		>53	7.6	<-0.1	<0.1		NAF
	FRC212	FRC212 - 122			122	Pg	FR	Fresh	Ore	9.6	0.130	<0.01					<-0.3	12					-12		>41	7.0	<-0.1	1		NAF
	FRC212	FRC212 - 131			131	Pg	FR	Fresh	Waste	9.3	0.077	0.01					0.3	36					-35		116.3	7.1	<-0.1	<0.1		NAF
	FRC212	FRC212 - 143			143	Py	FR	Fresh	Waste	9.4	0.076	0.07					2	21					-19		9.8	6.2	<-0.1	1		NAF
	FRC213	FRC213 - 5			5	Py	HW	Oxide	Waste	8.1	0.012	<0.01					<-0.3	11					-11		>35	6.7	<-0.1	1		NAF
	FRC213	FRC213 - 26			26	Py	MW	Transition	Waste	7.7	0.016	<0.01					<-0.3	14					-14		>45	7.4	<-0.1	<0.1		NAF
	FRC213	FRC213 - 37			37	Pg	HW	Oxide	Waste	8.1	0.032	<0.01					<-0.3	16					-16		>53	7.6	<-0.1	<0.1		NAF
	FRC213	FRC213 - 58			58	Py	SW	Transition	Waste	8.7	0.030	<0.01					<-0.3	17					-17		>56	6.2	<-0.1	3		NAF
	FRC213	FRC213 - 62			62	Pg	SW	Transition	Waste	8.3	0.056	<0.01					<-0.3	13					-13		>43	6.8	<-0.1	1		NAF
	FRC213	FRC213 - 67			67	Pg	SW	Transition	Waste	8.4	0.037	0.02					1	22					-21		35.1	6.8	<-0.1	1		NAF
	FRC213	A6787	68	69	69	Py	SW	Transition	Waste	7.9	0.107	0.20	0.07	0.06	0.01		6	14	1				-8	5	2.3	4.7	0	2		UC (NAF)
	FRC213	FRC213 - 86			86	Pg	FR	Fresh	Waste	9.2	0.048	0.09					3	16					-13		5.7	4.4	0	2.4		UC (NAF)
	FRC213	FRC213 - 107			107	Sst	FR	Fresh	Waste	9.4	0.082	0.02					1	22					-21		35.3	6.8	<-0.1	0.6		NAF
	FRC213	FRC213 - 131			131	Py	FR	Fresh	Waste	9.5	0.089	0.03					1	15					-14		16.8	7.2	<-0.1	<0.1		

EGI Code	Hole ID	Sample ID	Depth (m)		Depth (m)	Lithology	Weathering	Oxidation	Type	pH _{1:2}	EC _{1:2}	ACID-BASE ANALYSIS										NAG TEST			Reaction Comments	ARD Classification					
			From	To								Total %S	CRS (%)	Total %C	Organic %C	Inorganic %C	MPA	ANC	ANC _{TC}	ABCC	NAPP	NAPP _c	ANC/MPA	NAG _{pH}			NAG _{pH4.5}	NAG _{pH7.0}			
	FRC213	FRC213 - 178			178	Pg	FR	Fresh	Ore	9.4	0.138	<0.01																			NAF
	FRC213	FRC213 - 187			187	Py	FR	Fresh	Waste	9.1	0.089	0.10																			NAF
	FRC214	FRC214 - 6			6	Py	CW	Oxide	Waste	7.9	0.032	<0.01																			NAF
	FRC214	FRC214 - 13			13	Py	HW	Oxide	Waste	7.3	0.018	<0.01																			NAF
	FRC214	FRC214 - 20			20	Py	CW	Oxide	Waste	7.7	0.030	<0.01																			NAF
	FRC214	FRC214 - 34			34	Py	HW	Oxide	Waste	8.5	0.034	<0.01																			NAF
	FRC214	FRC214 - 45			45	Py	MW	Transition	Waste	8.6	0.034	<0.01																			NAF
	FRC214	FRC214 - 50			50	Py	SW	Transition	Waste	8.9	0.040	<0.01																			NAF
	FRC214	FRC214 - 74			74	Py	FR	Fresh	Waste	9.0	0.048	0.01																			NAF
	FRC214	FRC214 - 102			102	Pg	FR	Fresh	Ore	9.2	0.115	<0.01																			NAF
	FRC214	FRC214 - 116			116	Pg	FR	Fresh	Waste	9.1	0.056	0.04																			NAF
21129	FRCD016	B1053	276.2	277	277	Py	FR	Fresh	Waste	9.3	0.133	0.14																			NAF
21130	NRC057	A4851	105	106	106	Py	FR	Fresh	Waste	8.5	0.059	0.16	0.03	0.04	0.04	<0.01	5	15	<1	1	-10	5	3.0	3.5	2	5					PAF-LC
21132	NRC057	A4854	108	109	109	Py	FR	Fresh	Waste	8.6	0.133	0.28				<0.01	9	10	<1	-1	9	1.2	4.2	0	4					UC (PAF-LC)	
21134	NRC057	A4857	111	112	112	Py	FR	Fresh	Waste	8.3	0.096	0.21	0.02	0.04	0.03	0.01	6	16	1	3	-10	6	2.5	3.6	1	5					PAF-LC
21135	NRC057	A4858	112	113	113	Pg	FR	Fresh	Waste	8.1	0.140	0.21	0.08	0.13	0.13	<0.01	6	19	<1	5	-13	6	3.0	3.6	1	5					PAF-LC
21138	NRC057	A4869	122	123	123	Sst	FR	Fresh	Waste	8.4	0.091	0.15		0.17	0.15	0.02	5	12	2		-7	3	2.6	5.0	0	2					UC (NAF)
21140	NRC057	A4873	125	126	126	Pg	FR	Fresh	Waste	8.4	0.150	0.32		0.02	0.03	<0.01	10	14	<1		-4	10	1.4	3.5	3	7					PAF-LC
21141	NRC057	A4875	127	128	128	Pg	FR	Fresh	Waste	9.1	0.201	0.22	0.07	0.07	0.06	0.01	7	15	1	6	-8	6	2.2	4.2	0	4					PAF-LC
	NRC129	NRC129 - 4			4	Py	EW	Oxide	Waste	5.6	0.007	<0.01																			NAF
	NRC129	NRC129 - 20			20	Py	MW	Transition	Waste	7.0	0.015	<0.01																			NAF
	NRC129	NRC129 - 55			55	Py	SW	Transition	Waste	8.3	0.082	0.14																			UC (PAF-LC)
	NRC129	NRC129 - 68			68	Sst	FR	Fresh	Waste	9.0	0.052	0.05																			NAF
	NRC129	NRC129 - 89			89	Py	FR	Fresh	Waste	8.8	0.062	0.17																			UC (PAF-LC)
21143	NRC129	A6640	93	96	95	Pg	FR	Fresh	Waste	8.5	0.135	0.38		0.09	0.08	0.01	12	8	1		-12	4	11	0.7	3.6	2	8				PAF-LC
	NRC129	NRC129 - 98			98	Pg	FR	Fresh	Waste	9.0	0.069	0.02																			NAF
	NRC129	NRC129 - 134			134	Py	FR	Fresh	Waste	9.3	0.095	0.42																			UC (PAF)
21144	NRC148	A6967	246	247	247	Pg	FR	Fresh	Waste	8.1	0.166	0.20	0.04	0.21	0.19	0.02	6	12	2	4	-6	5	1.9	3.2	3	9					PAF-LC
21145	NRC148	A6968	247	250	249	Py	FR	Fresh	Waste	8.2	0.116	0.27		0.10	0.08	0.02	8	6	2		2	6	0.7	3.1	4	10					PAF-LC
21146	NRC148	A6969	250	253	252	Py	FR	Fresh	Waste	8.0	0.140	0.11		0.55	0.58	<0.01	3	7	<1		-4	3	2.2	4.1	0	5					UC (PAF-LC)
21148	NRC148	A6977	258	261	260	Py	FR	Fresh	Waste	7.4	0.245	0.23		0.11	0.10	0.01	7	6	1		1	6	0.9	3.2	3	11					PAF-LC
21149	NRC148	A6983	274	275	275	Pg	FR	Fresh	Waste	8.5	0.164	0.30		0.09	0.08	0.01	9	5	1		4	8	0.5	3.2	4	8					PAF-LC
21151	NRC148	A6985	276	277	277	Pg	FR	Fresh	Waste	8.2	0.170	0.27		0.33	0.29	0.04	8	7	3		1	5	0.8	3.6	2	6					PAF-LC
21152	NRC148	A6992	281	282	282	Pg	FR	Fresh	Waste	8.9	0.134	0.25		0.13	0.09	0.04	8	6	3		2	5	0.8	3.8	1	6					PAF-LC
21153	NRC148	A6993	282	283	283	Pg	FR	Fresh	Waste	5.9	0.613	0.14		2.29	2.33	<0.01	4	4	<1		0	4	0.9	3.9	1	6					UC (PAF-LC)

KEY
pH_{1:2} = pH of 1:2 extract
EC_{1:2} = Electrical Conductivity of 1:2 extract (dS/m)
MPA = Maximum Potential Acidity (kgH₂SO₄/t)
ANC = Acid Neutralising Capacity (kgH₂SO₄/t)
NAPP = Net Acid Producing Potential (kgH₂SO₄/t)

NAG_{pH} = pH of NAG liquor
NAG_(pH4.5) = Net Acid Generation capacity to pH 4.5 (kgH₂SO₄/t)
NAG_(pH7.0) = Net Acid Generation capacity to pH 7.0 (kgH₂SO₄/t)

NAF = Non-Acid Forming
PAF = Potentially Acid Forming
PAF-LC = PAF - lower capacity
UC = Uncertain Classification
(expected classification in bracket)

APPENDIX B

ABCC Test Results

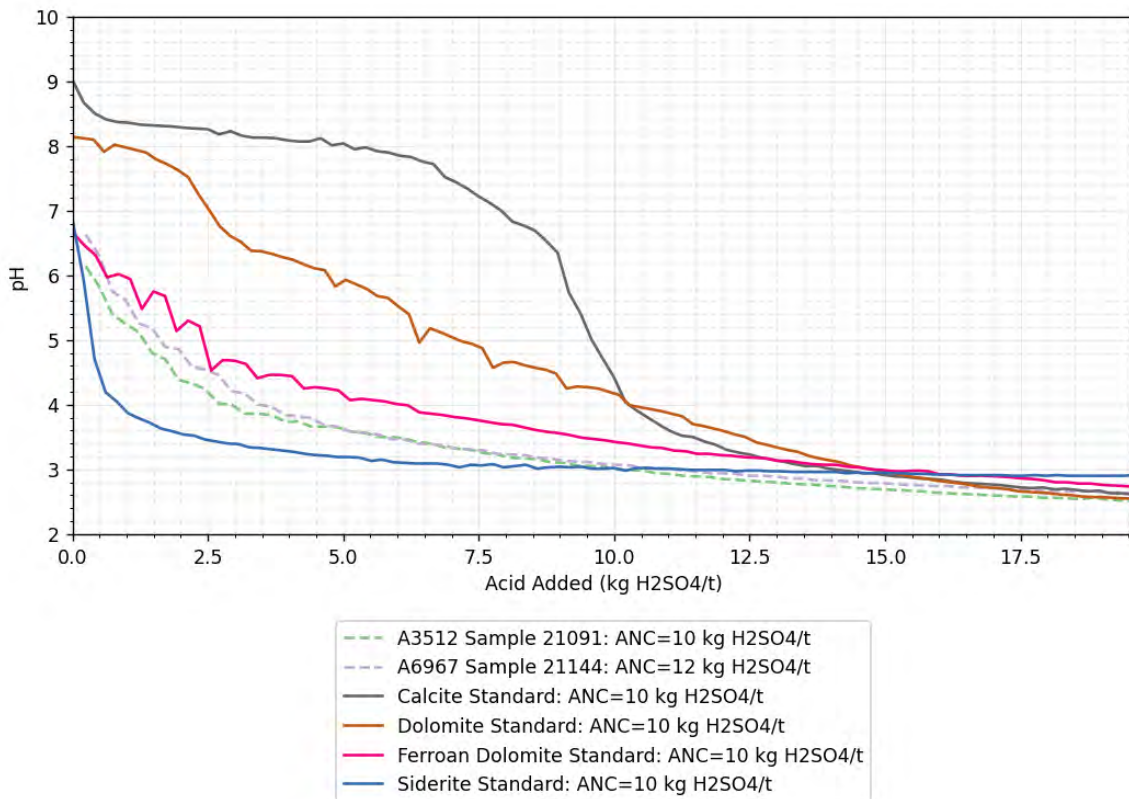


Figure B16: ABCC profile for samples 21091, 21144 with an ANC value close to 10 kg H₂SO₄/t. Carbonate standard curves are included for reference. Note sample IDs used here are the EGi Codes. Sample details for each EGi Code can be found in Table A1 (Appendix A).

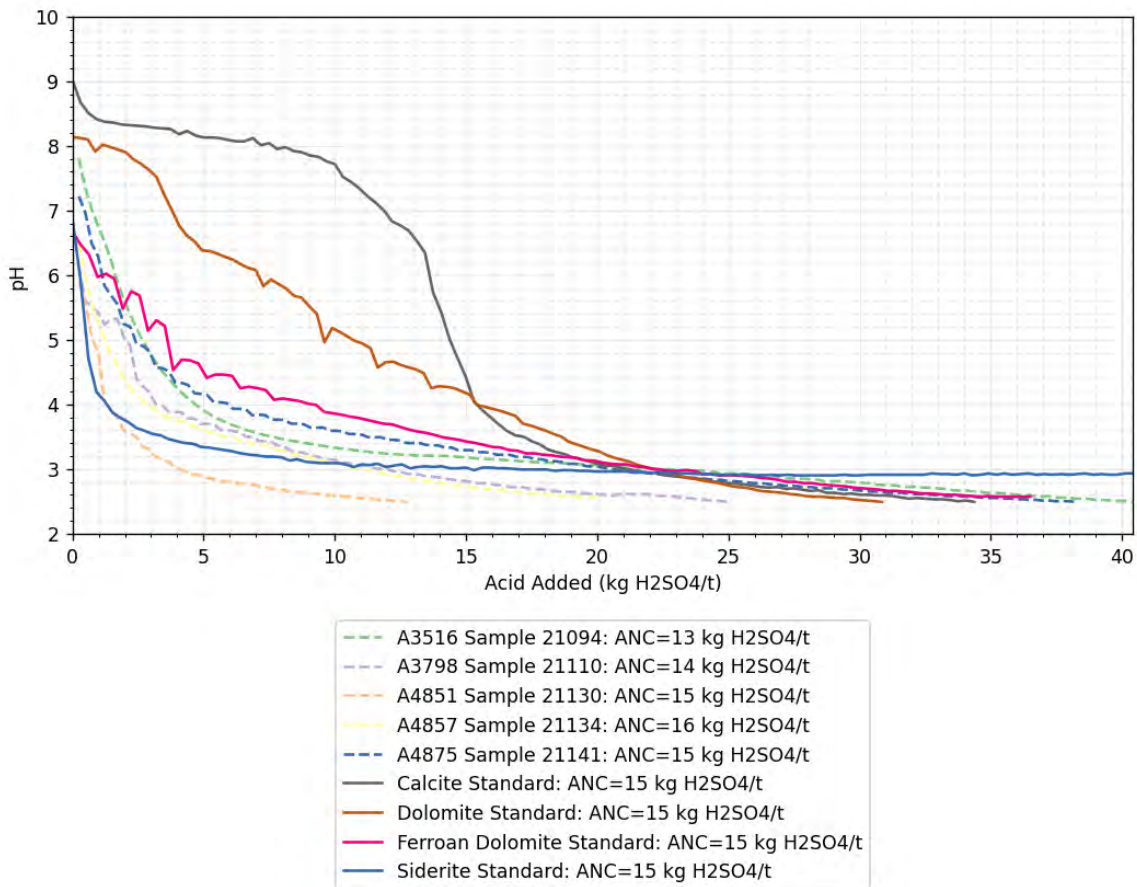


Figure B17: ABCC profile for samples 21094, 21110, 21130, 21134, 21141 with an ANC value close to 15 kg H₂SO₄/t. Carbonate standard curves are included for reference. Note sample IDs used here are the EGi Codes. Sample details for each EGi Code can be found in Table A1 (Appendix A).

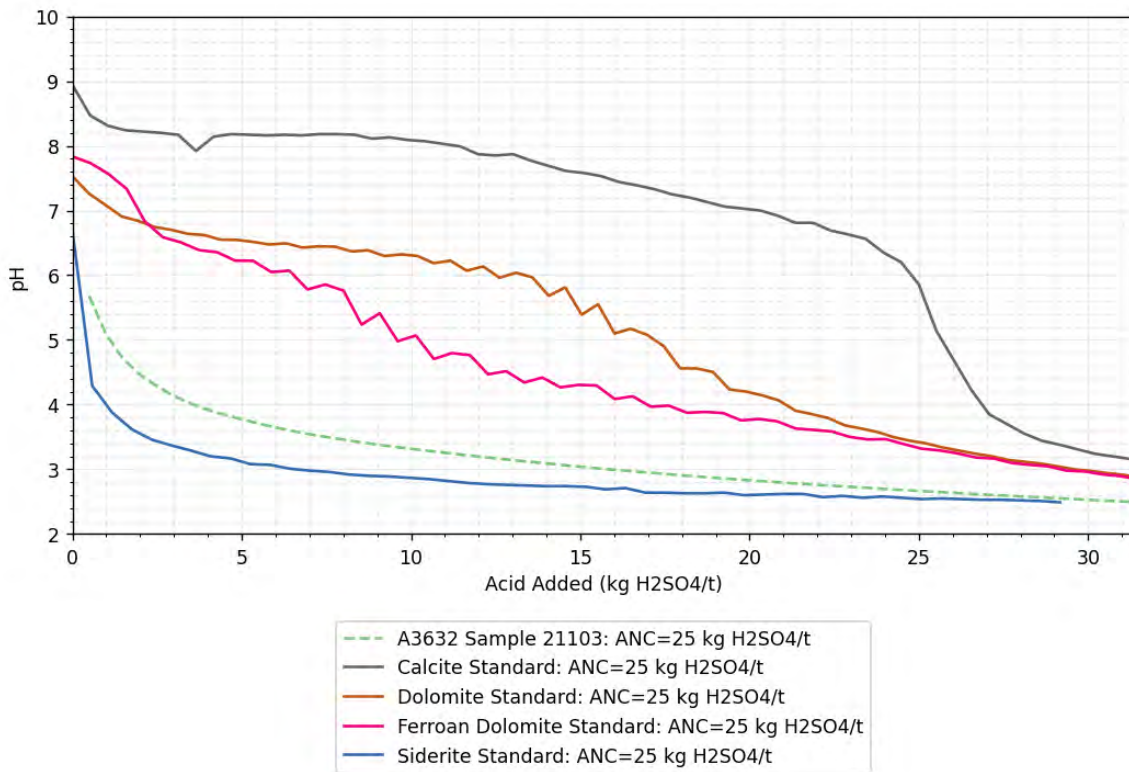


Figure B18: ABCC profile for sample 21103 with an ANC value close to 25 kg H₂SO₄/t. Carbonate standard curves are included for reference. Note sample IDs used here are the EGi Codes. Sample details for each EGi Code can be found in Table A1 (Appendix A).

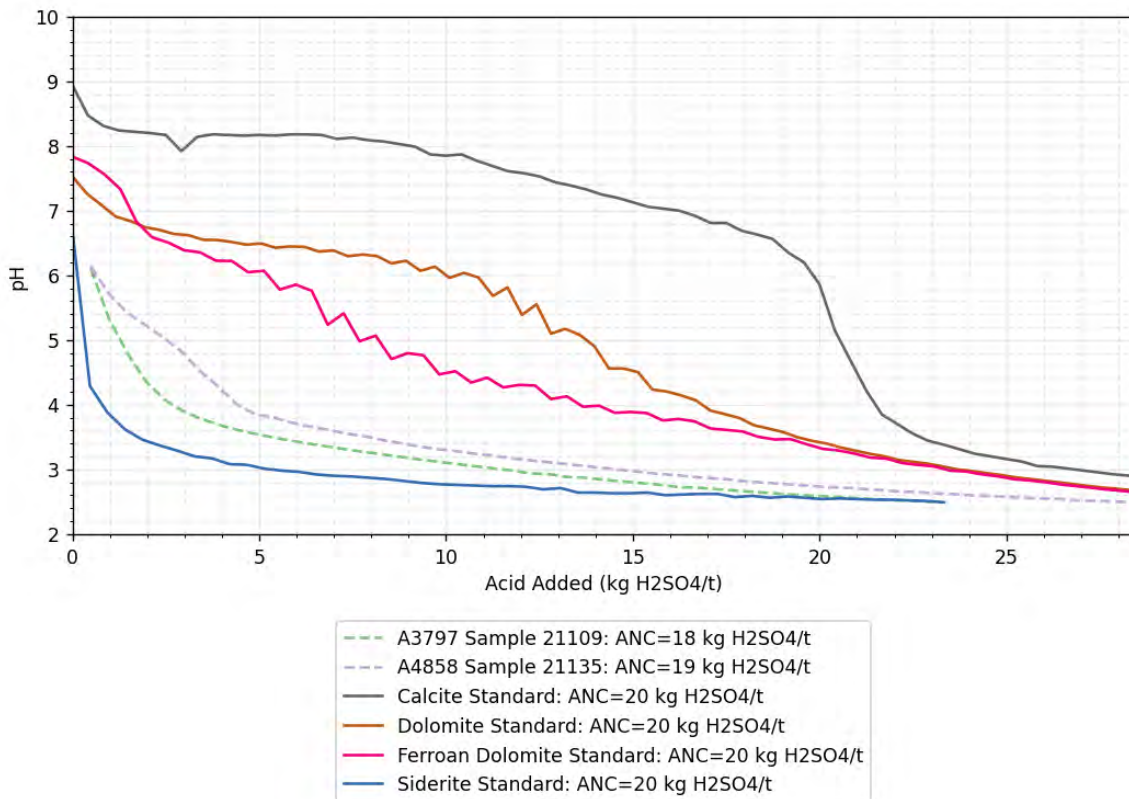


Figure B19: ABCC profile for samples 21109, 21135 with an ANC value close to 20 kg H₂SO₄/t. Carbonate standard curves are included for reference. Note sample IDs used here are the EGi Codes. Sample details for each EGi Code can be found in Table A1 (Appendix A).

APPENDIX C

Bulk Assay Results

Table C1: Multi-element assay results for selected samples from Core Lithium BP33 Project. All results are ppm except where indicated. Note sample IDs used here are the EGI Codes. Sample details for each EGI Code can be found in Table A1 (Appendix A).

Element	Detection Limit	Sample ID									
		21095	21093	21291	21290	21138	21134	21109	21102	21086	21289
Ag	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.22	0.26	0.28	0.59
Al	0.01%	6.72%	5.95%	6.20%	5.79%	6.82%	7.45%	8.39%	6.07%	6.54%	6.63%
As	0.2	2710	5370	70.7	65.1	1100	6180	11350	380	397	87.1
Ba	10	570	360	550	570	400	490	450	580	590	370
Be	0.05	18.9	36	2.17	2.88	59.1	56.2	38.3	16	9.12	40
Bi	0.01	1.02	1.93	0.28	0.52	0.87	2.8	2.45	1.82	0.65	0.79
Ca	0.01%	0.37%	0.68%	0.28%	0.24%	0.52%	0.85%	1.14%	0.84%	0.20%	0.04%
Cd	0.02	0.66	0.55	0.02	0.03	0.67	1.58	0.86	0.39	1.9	0.06
Ce	0.01	77.5	50.5	79.7	80.7	56.9	17.15	26.3	90.1	63.2	59
Co	0.1	8.2	6	7.4	9.1	7.1	12.4	9.9	9.3	11.5	6.1
Cr	1	129	149	71	76	357	112	69	105	76	99
Cs	0.05	500	321	47.6	159.5	452	>500	225	>500	>500	99
Cu	0.2	3.8	4	16.7	14.9	16.2	3.9	8.5	69.8	29	16.2
Fe	0.01%	2.65%	2.19%	2.96%	2.58%	2.35%	3.22%	2.23%	5.86%	4.11%	2.46%
Ga	0.05	19.55	24.4	17.6	15.65	18.95	22.1	27.7	18.55	20.2	19.75
Ge	0.05	0.16	0.14	0.19	0.15	0.15	0.12	0.13	0.17	0.15	0.16
Hf	0.01	5.2	4.4	5.3	5.8	4.3	6.5	4	3.8	4.5	5.1
Hg	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.007	<0.005	0.008
In	0.005	0.155	0.153	0.049	0.046	0.14	0.319	0.185	0.113	0.125	0.042
K	0.01%	3.23%	2.76%	2.72%	2.38%	3.05%	3.80%	4.01%	2.38%	3.14%	2.09%
La	0.5	38.5	24.9	39.9	41.8	29.7	7.1	12.3	46.4	32	31.6
Li	0.2	1490	820	153	200	2340	2560	1380	900	840	113
Mg	0.01%	0.55%	0.36%	0.66%	0.53%	0.45%	0.63%	0.42%	0.64%	0.79%	0.25%
Mn	5	328	486	329	196	299	211	335	2000	526	243
Mo	0.05	1.09	1.3	0.24	0.2	2	0.57	0.44	0.88	0.91	0.52
Na	0.01%	0.23%	0.62%	0.68%	0.60%	0.68%	0.12%	0.88%	0.27%	0.36%	1.16%
Nb	0.1	14.5	31.3	11.4	11	31.2	23.6	23.3	16.3	11.7	54.6
Ni	0.2	18.6	14.5	15.5	16.5	21.4	21.3	14.3	25	20	12.5
P	10	1450	2530	300	290	2460	4010	5560	3710	560	280
Pb	0.5	10.8	12.6	12.9	14.6	10.6	7.3	11.2	10.8	309	22.4
Rb	0.1	1150	667	169.5	206	1160	2360	1060	508	602	307
Re	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
S	0.01%	0.12%	0.22%	0.05%	0.02%	0.12%	0.20%	0.73%	1.09%	0.21%	0.01%
Sb	0.05	0.38	0.55	0.05	0.05	0.43	1.15	0.87	0.08	0.17	0.09
Sc	0.1	9.7	6.7	9.2	8.6	7.7	10	8.2	11	11.9	6.2
Se	1	<1	<1	<1	<1	<1	<1	1	1	<1	<1
Sn	0.2	147.5	183.5	5.8	6.1	141.5	363	210	91.5	35.8	22.9
Sr	0.2	44.8	66.8	47.4	53.4	126	369	400	64.3	43.9	24.2
Ta	0.05	7.02	77.2	1.01	1.04	18.75	19.05	12.65	4.59	1.06	87.8
Te	0.05	0.06	0.1	<0.05	<0.05	0.05	0.17	0.1	0.11	<0.05	<0.05
Th	0.2	50.5	111	16.25	15.75	22	36.4	8.84	17.4	19.85	13.3
Ti	0.005%	0.23%	0.17%	0.26%	0.26%	0.18%	0.22%	0.15%	0.20%	0.25%	0.17%
Tl	0.02	11.6	5.89	0.88	1.16	11.6	24.8	8.85	5.12	5.97	2.54
U	0.1	6.3	6	3.7	4	5.8	3.3	5.6	3.9	6.9	4.1
V	1	43	29	40	38	36	46	31	40	51	28
W	0.1	18	16.1	7.6	4.6	12.8	17.9	21.8	7.2	11.5	10.6
Y	0.1	17.5	16.2	10.9	11.5	12	17.6	10.6	24.2	10.5	10.8
Zn	2	55	62	44	45	110	87	55	81	928	56
Zr	0.5	145	105.5	152	168.5	109	119	103.5	103	122	126

APPENDIX D

Water and Peroxide Extraction Results

Table D1: Multi-element assay results for water extracts of selected samples from Core Lithium BP33 Project.
 Note sample IDs used here are the EGi Codes. Sample details for each EGi Code can be found in Table A1 (Appendix A).

Element	Units	Detection Limit	Sample ID									
			21086	21093	21095	21102	21109	21134	21138	21289	21290	21291
pH		0.1	9.0	9.3	9.4	6.0	7.5	8.3	8.4	7.8	7.9	9.5
EC	dS/m	0.001	0.111	0.121	0.126	0.346	0.122	0.096	0.091	0.085	0.083	0.076
Acidity	mg/l	1				21						
Alkalinity	mg/l	1	34	86	49		16	23	25	14	49	41
Ag	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Al	mg/l	0.01	0.08	0.26	0.58	0.18	0.19	0.23	0.18	0.04	0.07	0.34
As	mg/l	0.001	0.016	0.578	0.739	0.014	0.805	0.785	0.161	0.016	0.022	0.04
B	mg/l	0.05	<0.05	<0.05	<0.05	0.17	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ba	mg/l	0.001	0.193	0.088	0.072	0.114	0.022	0.005	0.007	0.021	0.015	0.13
Be	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ca	mg/l	1	4	3	2	20	<1	<1	<1	<1	<1	2
Cd	mg/l	0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cl	mg/l	1	<1	1	1	<1	2	1	2	2	<1	<1
Co	mg/l	0.001	<0.001	<0.001	<0.001	0.024	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cr	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cu	mg/l	0.001	<0.001	<0.001	<0.001	0.012	<0.001	<0.001	0.002	<0.001	<0.001	<0.001
F	mg/l	0.1	1.2	2.1	3.2	0.4	2	3	2.2	0.6	0.5	0.4
Fe	mg/l	0.05	<0.05	0.08	0.21	0.35	0.06	0.1	0.1	0.07	0.06	0.09
Hg	mg/l	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
K	mg/l	1	20	24	30	29	24	15	15	1	2	15
Mg	mg/l	1	<1	<1	<1	17	<1	<1	<1	<1	<1	<1
Mn	mg/l	0.001	0.004	0.006	0.004	4.94	0.112	0.001	0.006	0.002	0.002	0.002
Mo	mg/l	0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Na	mg/l	1	6	6	4	8	6	2	6	5	4	4
Ni	mg/l	0.001	<0.001	<0.001	<0.001	0.093	0.002	<0.001	0.001	<0.001	<0.001	<0.001
P	mg/l	1	<1	<1	<1	<1	<1	<1	1	<1	<1	<1
Pb	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sb	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Se	mg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Si	mg/l	0.1	0.6	1.7	2.0	0.5	0.8	0.7	0.9	1.1	1.5	1.6
Sn	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
SO4	mg/l	1	18	6	4	160	24	5	9	<1	<1	1
Sr	mg/l	0.001	0.009	0.007	0.004	0.074	0.006	0.001	0.001	<0.001	0.001	0.006
Th	mg/l	0.001	<0.001	0.004	0.004	<0.001	<0.001	0.005	<0.001	<0.001	<0.001	<0.001
Tl	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
U	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zn	mg/l	0.005	<0.005	<0.005	<0.005	0.125	0.008	<0.005	<0.005	0.009	<0.005	<0.005

Table D2: Multi-element assay results for peroxide extracts of selected samples from Core Lithium BP33 Project. Measured extract concentrations have been multiplied by five to provide an estimate of likely leachate concentrations from column leach tests. Note sample IDs used here are the EGI Codes. Sample details for each EGI Code can be found in Table A1 (Appendix A).

Element	Units	Detection Limit	Sample ID									
			21086	21093	21095	21102	21109	21134	21138	21289	21290	21291
Ag	mg/l	0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Al	mg/l	0.01	6.2	3.75	2.2	52.35	63.35	17.55	3.05	<0.05	<0.05	<0.05
As	mg/l	0.001	0.03	37.45	32.45	0.605	58.45	21.95	4.37	0.345	0.605	1.27
B	mg/l	0.05	0.45	0.5	0.55	1	0.75	0.6	0.45	0.25	0.35	0.35
Ba	mg/l	0.001	2.66	2.085	2.415	0.51	0.61	2.95	2.72	2.09	2.31	2.495
Be	mg/l	0.001	0.01	<0.005	<0.005	0.045	0.035	0.02	<0.005	<0.005	<0.005	<0.005
Ca	mg/l	1	20	85	30	55	85	15	10	<5	<5	30
Cd	mg/l	0.0001	0.091	0.002	<0.0005	0.003	0.001	5E-04	0.001	<0.0005	<0.0005	<0.0005
Cl	mg/l	1	<5	<5	5	<5	<5	<5	<5	15	15	<5
Co	mg/l	0.001	0.4	0.135	0.055	0.36	0.485	0.45	0.05	<0.005	<0.005	<0.005
Cr	mg/l	0.001	0.02	0.055	0.04	0.09	0.08	0.05	0.18	0.05	0.03	0.025
Cu	mg/l	0.001	0.765	0.045	<0.005	3.705	0.415	0.06	0.015	<0.005	<0.005	<0.005
F	mg/l	0.1	2.5	4	4	6.5	8	5.5	3	1	0.5	0.5
Fe	mg/l	0.05	<0.25	<0.25	<0.25	93	3.6	<0.25	<0.25	<0.25	<0.25	<0.25
Hg	mg/l	0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
K	mg/l	1	40	50	70	65	80	80	80	15	20	35
Mg	mg/l	1	15	5	5	20	10	10	10	<5	<5	5
Mn	mg/l	0.001	1.895	4.675	0.97	23.34	1.955	0.415	2.285	0.98	0.095	0.66
Mo	mg/l	0.001	0.03	0.01	0.01	<0.005	0.005	<0.005	0.01	<0.005	<0.005	0.01
Na	mg/l	1	40	30	40	45	45	45	50	40	40	50
Ni	mg/l	0.001	0.755	0.285	0.11	1.145	0.675	0.705	0.115	<0.005	<0.005	<0.005
P	mg/l	1	<5	<5	<5	<5	15	<5	<5	<5	<5	<5
Pb	mg/l	0.001	3.83	0.03	<0.005	0.155	0.03	0.035	<0.005	<0.005	<0.005	<0.005
Sb	mg/l	0.001	<0.005	0.01	0.01	<0.005	<0.005	0.015	0.005	<0.005	<0.005	<0.005
Se	mg/l	0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Si	mg/l	0.1	31.65	49.7	42.3	62	68	49.95	60	23.2	27.3	25
Sn	mg/l	0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SO4	mg/l	1	285	365	160	1570	1230	335	185	5	30	95
Sr	mg/l	0.001	0.09	0.135	0.065	0.19	2.585	0.41	0.18	0.04	0.06	0.07
Th	mg/l	0.001	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Tl	mg/l	0.001	<0.005	<0.005	<0.005	<0.005	<0.005	0.01	<0.005	<0.005	<0.005	<0.005
U	mg/l	0.001	<0.005	0.015	0.005	0.06	0.045	0.01	<0.005	<0.005	<0.005	<0.005
Zn	mg/l	0.005	41.925	2.04	1.1	2.505	1.71	1.475	1.505	0.87	0.945	0.915

APPENDIX E
**Assay Results for DD Drill
Core Samples for use in
Kinetic Column Testing**

Table E1: Multi-element assay results for oxide DD drill core samples from BP33 deposit. Samples highlighted in brown were composited to produce an oxide sample for use in kinetic leach column testing.

Hole ID	Easting	Northing	Lithology 1	Lithology 2	Weathering	Description	Depth from m	Depth to m	Mean Depth	Sample ID	Type_Method	Date	Cs_ppm	Sr_ppm	Nb_ppm	Sn_ppm	Ta_ppm	U_ppm	Sb_ppm	Li_ppm	Rb_ppm	As_ppm	K_ppm	P_ppm	Fe_ppm	S_ppm
FDD010	694530	8593587	Py		EW to MW	Saprolite/saprock (phylite) in weathered/oxidised zone. Variable colour inc pale to dark brown, pale yellow, tan, pale to mid green.	0	40	20	FDD010_WC01	Composite of corefragments from each metre	12/12/2020														
FDD011	694282	8593699	Py	Sst	EW to MW	Saprolite/saprock (phylite) in weathered/oxidised zone. Variable colour inc pale to mid brown, pale yellow, tan.	0	25	12.5	FDD011_WC01	Composite of corefragments from each metre	17/01/2021	250.64	34.07	12.96	33.25	11.03	3.14	0.16	343	505	193	26213	103	49410	<20
FDD011	694282	8593699	Pg		HW	Clay-weathered pegmatite, often crumbly and broken up into fine powder. Bright white.	37	38	37.5	FDD011_WC03	Half PQ core split	17/01/2021	113.91	6.69	7.16	2.12	0.83	2.3	<0.05	197	533	77	21208	L	39870	33
FDD012	694257	8593850	Py	Sst	EW to MW	Saprolite/saprock (phylite and sandstone) in weathered/oxidised zone. Variable colour inc pale to dark brown and red-brown, pale yellow, tan, pale to mid green. However, pale dominates.	0	28	14	FDD012_WC01	Composite of corefragments from each metre	22/01/2021														
FDD012	694257	8593850	Sst	Py	HW to MW	Sandstone and lesser phyllite interlayered. Minor (<2%) quartz veins and joints. Mixed loose and coherent core. Some unconsolidated "flowing" sand. More highly weathered than 28-38m interval. Pale grey and yellow.	38	48	43	FDD012_WC03	Composite of corefragments from each metre	22/01/2021	18.33	9.07	6.72	2.31	0.62	2.36	0.05	48	275	33	13457	85	39465	44
													16.27	15.86	6.33	3.8	0.58	2.62	0.1	52	236	45	15961	170	33420	<20

Table E2: Multi-element assay results for transition DD drill core samples from BP33 deposit. Samples highlighted in brown were composited to produce a transition sample for use in kinetic leach column testing.

Hole ID	Easting	Northing	Lithology 1	Lithology 2	Weathering	Description	Depth from m	Depth to m	Mean Depth	Sample ID	Type_Method	Date	Cs_ppm	Sr_ppm	Nb_ppm	Sn_ppm	Ta_ppm	U_ppm	Sb_ppm	Li_ppm	Rb_ppm	As_ppm	K_ppm	P_ppm	Fe_ppm	S_ppm	S_%
FDD010	694530	8593587	Py		SW	Phyllite with fractures at high angle to core axis and minor (<2%) quartz veins in transitional zone. Pale grey.	46.3	47.3	46.8	FDD010_WC02	Half PQ core split	12/12/2020															
FDD011	694282	8593699	Py		MW	Phyllite moderately weathered zone. Coherent core. Pale yellow-brown.	28	29	28.5	FDD011_WC02	Half PQ core cut	17/01/2021	172.87	25.91	8.22	5.36	0.88	3.03	0.06	218	292	80	19404	383	27630	400	0.04
FDD011	694282	8593699	Sst		MW	Sandstone, finely laminated/foliated in transitional zone. Minor (<2%) quartz veins. Pale grey.	53	54	53.5	FDD011_WC05	Half PQ core cut	17/01/2021															
FDD011	694282	8593699	Sst		SW	Sandstone, finely laminated/foliated in transitional zone. Minor joints. Pale grey.	60	61	60.5	FDD011_WC06	Half PQ core cut	17/01/2021	183.4	58.4	10.27	4.43	0.95	3.52	<0.05	383	340	<10	22446	249	32513	<20	<0.002
FDD012	694257	8593850	Sst	Py	MW	Sandstone and lesser phyllite interlayered. Minor (<2%) quartz veins and joints. Mostly coherent core. Pale green, brown and yellow.	28	38	33	FDD012_WC02	Composite of core fragments from each metre	22/01/2021	40.72	37.89	7.11	1.44	0.74	2.61	<0.05	238	226	<10	18095	312	24503	<20	<0.002
FDD012	694257	8593850	Sst		MW	Sandstone, fine grained banded. Minor (<1%) quartz veins and joints. Coherent core. Pale to mid green-grey, with yellow and red staining pervading along joints.	50	51	50.5	FDD012_WC04	Half PQ core cut	26/01/2021	21.2	21.97	8.31	3.46	0.76	2.35	1.45	92	360	17	26571	90	39473	50	0.01
FDD012	694257	8593850	Sst		MW	Sandstone, fine grained banded. Minor (<1%) quartz veins and joints. Coherent core. Pale to mid green-grey, with yellow and red staining pervading along joints.	50	51	50.5	FDD012_WC04	Half PQ core cut	26/01/2021	33.35	32.33	7.71	3.76	0.86	2.6	0.07	104	261	23	21236	338	32616	<20	<0.002
FDD012	694257	8593850	Sst		SW	Sandstone, fine grained banded. Coherent core. Pale to mid green-grey.	67	68	67.5	FDD012_WC06	Half PQ core cut	26/01/2021	126.33	30.73	8.76	3.92	0.64	2.77	<0.05	176	353	<10	20433	192	31658	<20	<0.002
FDD012	694257	8593850	Sst		MW	Sandstone, fine grained banded. Jointed fractured core. Pale to mid green-grey, with yellow and red staining pervading along joints. More weathered than above.	73	74	73.5	FDD012_WC08	Half PQ core split	26/01/2021	43.13	11.44	8.32	4.97	0.84	2.02	<0.05	195	295	<10	18981	351	35273	<20	<0.002

Table E3: Multi-element assay results for fresh DD drill core samples from BP33 deposit. Samples highlighted in brown were composited to produce a fresh sample for use in kinetic leach column testing.

Hole ID	Eastin g	Northing	Litholog y 1	Litholog y 2	Weatheri ng	Description	Depth_fr o m	Depth_to	Mean Depth	Sample ID	Type_Me t hod	Photo info	Date	SAMPLE_Lab	Cs_ppm	Sr_ppm	Nb_pp m	Sn_ppm	Ta_ppm	U_ppm	Sb_ppm	LI_ppm	Rb_ppm	As_ppm	K_ppm	P_ppm	Fe_ppm	S_ppm
FDD010	694530	8593587	Py		FR	Phyllite - solid core with no imperfections. Dark grey.	91	92	91.5	FDD010_WC04	Half HQ core cut	Refer to core tray photos	15/12/2020	FDD010_WC04	200	18.8	10.77	5.86	1.03	3.39	0.05	337	329	154	32802	226	42158	1074
FDD010	694530	8593587	Sst		FR	Sandstone, highly fractured (partly drilling related but atleast some natural) with no alteration. Dark grey.	149	150	149.5	FDD010_WC06	Half HQ core split	Refer to core tray photos	15/12/2020	FDD010_WC06	24.19	45.25	8.96	3.07	0.88	3.31	<0.05	164	206	28	22022	311	24203	40
FDD010	694530	8593587	Py		FR	Phyllite, foliated and jointed throughout. Dark grey.	185	186	185.5	FDD010_WC07	Half HQ core cut	Refer to core tray photos	19/12/2020	FDD010_WC07	23.02	21.56	9.86	4.36	0.91	2.72	0.07	178	374	25	38407	124	44723	610
FDD010	694530	8593587	Py		FR	Phyllite, jointed throughout. Dark grey.	235	236	235.5	FDD010_WC09	Half HQ core cut	Refer to core tray photos	19/12/2020	FDD010_WC09	17.47	27.42	9.97	4.12	0.69	3.23	<0.05	120	269	38	29271	430	28118	103
FDD010	694530	8593587	Py	Sst	FR	Phyllite with lesser interbands of fine sandstone. Solid core with no imperfections. Dark grey.	258	259	258.5	FDD010_WC10	Half HQ core cut	Refer to core tray photos	19/12/2020	FDD010_WC10	18.04	37.14	5	1.79	0.44	1.83	<0.05	104	263	50	20856	310	36525	37
FDD010	694530	8593587	Py	Sst	FR	Phyllite with lesser interbands of fine sandstone. Solid core with no imperfections. Dark grey.	322	323	322.5	FDD010_WC11	Half HQ core cut	Refer to core tray photos	21/12/2020	FDD010_WC11	27.01	14.46	10.03	6.6	0.95	2.94	<0.05	131	300	78	23414	440	39480	82
FDD010	694530	8593587	Py	Sst	FR	Phyllite with lesser interbands of fine sandstone. Jointed throughout. Dark grey.	352	353	352.5	FDD010_WC12	Half HQ core cut	Refer to core tray photos	21/12/2020	FDD010_WC12	51.39	11.39	8.06	5.85	0.74	1.67	0.06	133	297	264	28347	445	47033	937
FDD011	694282	8593699	Sst		FR	Sandstone, finely laminated/foliated in fresh zone. Minor (<2%) quartz veins. Mid grey.	71	72	71.5	FDD011_WC09	Half PQ core cut	Refer to core tray photos	17/01/2021	FDD011_WC09	23.35	12.82	5.84	1.67	0.6	1.35	<0.05	250	295	<10	20647	372	29453	51



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