Rio Tinto

Winu Waste Characterisation

– Upper (Oxidised and Overburden) Zone

29th July 2024

Cover image: Winu drill core storage.

Revision History

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Winu Study

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Version	Date	Author	Reviewer	Changes
10	29/07/24	RG/JP/ST/ Geosyntec		Added fibrous minerals and acid sulfate soils assessments
9	4/03/2024	RG		Formatting and updating text
8	20/12/2021	MHA	RG	Additional plant feed multiple leach tests.
7	19/05/2021	MHA	RG	Added sequential leach data.
6	19/09/2020	MHA	RG	Additional samples from 2020 drill holes
5	24/06/2020	MHA	RG	Added multiple extract leach test results
4		MHA	RG	Updated sample classifications and mineralogy.
3		MHA	PB	Updated tailings based on new assays.
2		MHA	PB	Updated mineralogy based on new information.
1		MHA	PB	Report created

EXECUTIVE SUMMARY

Sixty three samples of waste rock and plant feed material were characterised from the Winu oxidised and overburden (upper) zone. Seven samples were classified as Potentially Acid Forming (PAF). Three samples exhibited relatively high acid generation capacities (> 15 kg H_2SO_4/t) with four had acid producing Low Capacity (PAF-LC). The remainder of the upper zone samples were classified as Non Acid Forming (NAF) or barren, with the barren samples exhibiting negligible acid neutralisation capacity.

The three PAF samples with high acid generation risks, were identified in the arkose 2 lithology (two PAF samples out of seven, one plant feed) and the reduced permian mudstone (one PAF sample out of ten). The PAF reduced permian mudstone sample contained considerably higher sulfur than typical for this lithology (1.3% compared with 75^{th} percentile of < 0.2% in 10,000 drill hole samples).

The samples above a relative level of 160 m are all barren or NAF. The 2 arkose samples (1 plant feed) near the enriched zone of the deposit were classified as PAF, whereas the rest of the samples of this lithology were classified as NAF or barren.

Although on average the upper zone is not considered a risk for potential acid generation, it is unsuitable material for neutralising acid that may be generated from other waste rock zones in the Winu deposit. In addition, some portions of the upper zone may generate acid and should be managed accordingly, in particular the reduced permian mudstone.

Significant metal leaching from the oxide waste rock was not observed. Elevated F release was noted from some samples. Fluoride was initially flushed from the waste rock samples and after a first leach, subsequent leaches resulted in F concentrations near to or at detection limits.

Copper leaching, and constituent leaching in general, was low from plant feed composites. Geochemical modelling suggested that Cu leaching from oxide plant feed material was controlled by solubility of copper oxy-hydroxide or carbonate phases which maintain low concentrations at neutral pH.

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1. INTRODUCTION AND BACKGROUND

1.1. PROJECT BACKGROUND

Exploration activities by Rio Tinto Exploration (RTX) in Western Australia have led to the identification of a new deposit, named Winu. The Winu copper-gold deposit is in the Great Sandy Desert of Western Australia. Winu is located 120 km north west of the Telfer copper-gold deposit and 330 km south east of Port Hedland.

1.2. GEOLOGICAL CONTEXT

The regional geology at Winu is characterised by low-grade metasedimentary rock with granitoid intrusions. The tenement is covered by an overburden composed of sand and a sequence of permian mudstones, sandstones and diamictites. The deposit itself is hosted in low-grade metasedimentary rock dominated by siltstones and sandstones, with some igneous intrusions. Based on the supergene profile, the deposit is divided into a leached cap, a copper oxide zone, enrichment zone and hypogene zone. This sequence is, however, not uniform and the zones may have highly localised expressions.

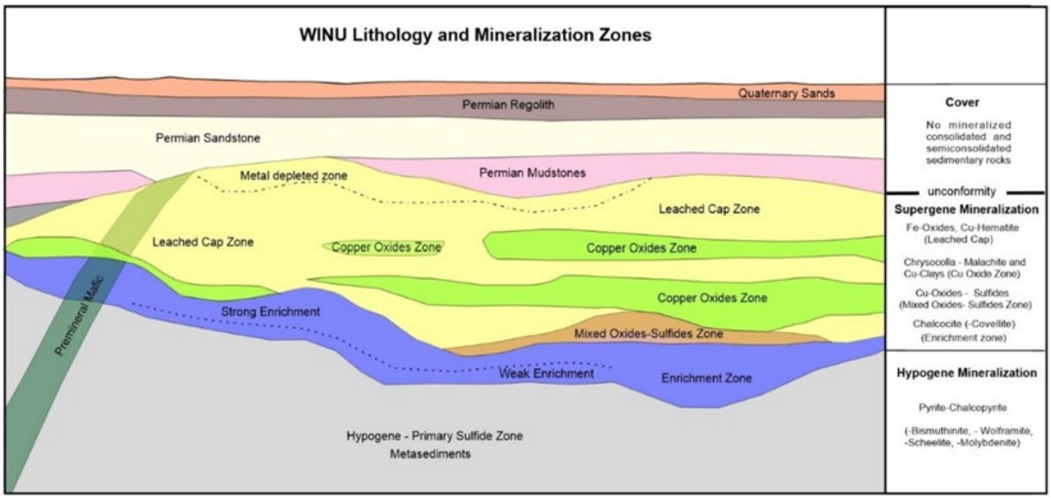

Figure 1: Lithological zones of the Winu deposit.

1.3. ASBESTOS AND ASBESTIFORM MINERALS

Asbestos and asbestiform minerals have a fibrous crystal habit. Fibrous rocks can contain extremely long and thin fibres that can easily be separated. The minerals that can crystallise as asbestos or asbestiform belong to two groups: serpentine (chrysotile) and amphibole (crocidolite, amosite, anthophyllite, tremolite and actinolite). Amphiboles are distinguished from one another by the amount of Na, Ca, Mg and Fe that they contain. Both groups of minerals have fibrous and non-fibrous varieties, however only the fibrous varieties comprise the asbestos and asbestiform minerals. Asbestos and asbestiform minerals present a hazard only if fibres of a respirable size become airborne and are inhaled.

At Winu, fibrous minerals have been intercepted in two drillholes (as of August 2020). The fibrous minerals were intercepted 600 m south of the Winu pit area (at 130 m depth in permian cover glacier conglomerate as random clasts) and 800 m northwest of the Winu pit (at 190 m in a mafic dyke with subvertical fibrous actinolite-talc vein).

To determine if there are any further instances of fibrous varieties of the amphibole group identified since August 2020, a review of the geological database was conducted. The database was filtered using the following keywords to search:

- Actinolite, Anthrophyllite, Tremolite, Amosite, Crocidolite, Chrysotile, Fibrous, Asbestiform, Asbestos and Fibre.

Based on logging there are three drillholes which have noted actinolite in proximity to, but not within the Winu pit design.

All samples are analysed, and mineral mapped using Short Wave InfraRed (SWIR) on 2 mm crushed sample at ALS laboratory prior to assay. From these results, 63 intervals have been flagged as containing Actinolite by the SWIR. Out of the 63 sample intervals, 27 are within the pit. Instances have been reviewed and occur within both sulfide vein material and the pre-mineral mafic unit. These will need to be further reviewed to ensure correct identification of minerals, with a focus on the pre-mineral mafic unit as this is present both within and outside of the pit. The actinolite is in non-fibrous form, and none of these samples have been flagged as fibrous in the handling process.

Investigation into the form of actinolite was conducted by RTX in 2020 at targets adjacent to Winu. Test work conducted by Occuhealth concluded that the samples did not pose a fibre risk as the actinolite is in non-fibrous form, and it was deemed that for instances where actinolite occurs as disseminated crystals in a siliceous groundmass within the host metasediments, these samples can be treated normally within the workflow. Actinolite can be visually identified by trained geologists during the drilling and logging process.

Winu will implement a fibrous mineral management plan, similar to that already used during Winu exploration activity and within Rio Tinto's iron ore deposits, to manage the fibrous minerals risk going forward.

1.4. ACID SULFATE SOILS

Acid Sulfate Soils (ASS) are unlikely to exist at Winu in the shallow sediments inclusive of the shallow aquifer units (top 30 m of the site stratigraphy) (Red Earth Engineering 2024). The principal line of evidence to support this conclusion are:

- The shallow dunal soils (to a depth of 1.5 mbgl) are dry and fully oxidised.
- It is unlikely that any permanent surface water will exist at the project given the net evaporative climate, therefore the shallow stratigraphic sequence will likely be dry for most of the year.
- Groundwater is around 50 m below ground surface and therefore the shallow stratigraphic sequence (dunal sands and Cenozic sediments, to their maximum depth of around 30 m bgl) will likely be permanently dry/unsaturated and as such will unlikely be ASS.
- Highly localised areas of perched groundwater areas may exist regionally, which may host ASS but these areas are not found within the Winu project area.

In summary, the aeolian sediments inclusive of the dunal soils and Cenozoic sediments above the groundwater water table at the project have a very low potential of being ASS's (Table 1).

Table 1: Summary of ASS risk for soils and sediments at Winu.

Stratigraphic unit	Saturated Y/N	ASS risk
Dunal soils	N	Tenosols and Kandosols on surface (top 1.5 m) of Winu project area have a very low risk of being ASS.

Stratigraphic unit	Saturated Y/N	ASS risk
Cenozoic	N	Soils and sediment from 1.5 mbgl have a very low potential for ASS to be present unless perched water is encountered

1.5. GEOCHEMISTRY

As part of the project development, an Acid and Metalliferous Drainage (AMD) study has been undertaken to assess the potential for future operations to generate AMD. The study has characterised (AMIRA 2002; INAP 2018; DFAT 2016) the waste rock and tailings expected from the deposit and developed mitigation plans for waste storage. This report documents the geochemical characterisation of the waste rock expected from mining of the upper oxidised zone of the deposit. The upper oxidised zone is referred to as "upper zone" in this report to differentiate it from the discrete copper oxide "oxide zone" rock type.

The 2023 mine plan indicated that most of the plant feed will be primary sulfides (85%), followed by secondary sulfides (12%), primary mafics (1.4%), oxides (1.3%), mixed oxides including oxide mafics (0.4%), and secondary mafics (0.01%).

In regard to waste rock, 22% is expected to be classified as Potentially Acid Forming (PAF), with the proportions of PAF predicted to come from the primary sulfides (86%), secondary sulfides (6.8%), leached cap and leached cap mafics (5.2%), primary mafics (1.1%), oxides/overburden (0.8%) and secondary mafics (0.1%). The remaining 78% of the waste rock is classified as Non Acid Forming (NAF) and will primarily consist of oxide and overburden (94%), primary sulfides (4.6%), secondary sulfides and mixed oxides (1.4%). These proportions may change with future iterations of the mine plan.

The remaining focus of this report on the overburden and oxide materials will be on the geochemistry characteristics of rocks, with no further discussion on fibrous minerals or soils.

2. SAMPLE SELECTION AND LABORATORY METHODS

2.1. SAMPLE SELECTION

Samples for characterisation of the upper zone waste rock were selected from available drill core assay data in two stages, as of 1 March 2019 and as of 1 March 2020. Samples were manually selected from the available logging data to cover the range of lithologies, alteration types, ranges of sulfur and Cu, and locations within the drilled area. Waste samples in this report are defined as those with a Cu concentration below 0.2 wt.% and gold concentration below 0.2 mg/kg. Some higher Cu, Au and Ag samples were selected to produce a wider range of samples and an understanding of the geochemistry of plant feed samples that may be stockpiled for prolonged timeframes. Five samples of plant feed composites were also sourced to further characterise the potential future oxide plant feed stockpiles.

The selected samples have been classified into the following lithologies using the September 2020 version of the Solve Winu Model Predictor[1]:

- Arkose 1
- Arkose 2

[1] Solve lithology predictor is based on assay values for immobile trace elements. Accessed 09-09-2020: https://rstudio-connect.riotinto.org/content/102/

- High Nb permian mudstone
- Mottled and siliceous zone
- Oxidised permian mudstone
- Permian sandstone
- Post-mineral mafic
- Quartz sandstone
- Quartz vein
- Quaternary aeolian sands
- Reduced permian mudstone

The Solve Predictor classifies samples based on the concentration of immobile trace elements. Although the classifications are not necessarily stratigraphic, the patterns they generate on a deposit scale are used to generate stratigraphic units. Locations of selected samples for the upper zone are shown in Figure 2.

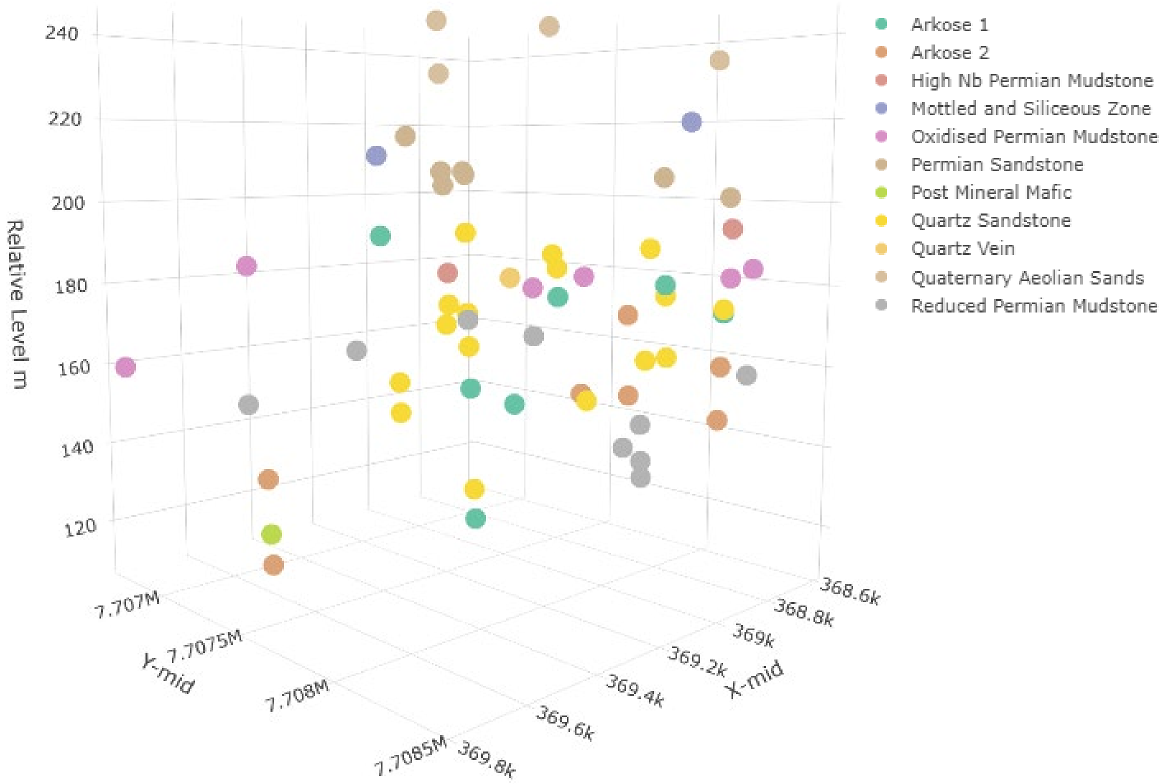

Figure 2: Location of waste rock samples for the upper zone (27 samples with missing location information).

A graph showing the distribution of sulfur concentration in selected waste rock samples (points) compared with the underlying Winu geochemical database (box and whiskers) is shown in

Figure 3 and zoomed in (S < 2 wt.%) for waste samples (Cu < 0.2%, Au < 0.2 ppm) in Figure 4. Some samples taken from the reduced permian mudstone and Arkose 2 lithologies from the oxide zone were above the 75th percentile of the Winu database. This suggests that although these samples may be classified as PAF, they would not be representative of the deposit as an average.

The difference between the box and whiskers in

Figure 3 and Figure 4 demonstrates that the waste grade samples contain substantially less sulfur than the database average. The pre mineral mafic median sulfur content falls from 2.8 wt.% in the overall database to only 1.6% for only low grade samples. A similar large difference is observed for the low abundance quartz vein lithology (1.6% to 0.1%). Notably 80% of the quartz vein samples in the Winu database would be considered plant feed from these graphs and hence the low number of tested samples in this lithology is not considered a concern at this stage.

The reduced permian mudstone appears to be the most likely lithology in the oxide and overburden zone to generate acid, with 13% of drill holes exceeding 0.2% total sulfur (however the 95% percentile is still relatively low at 0.42%) (see Rio Tinto (2024), that utilised a larger dataset with drilling data up to 2023).

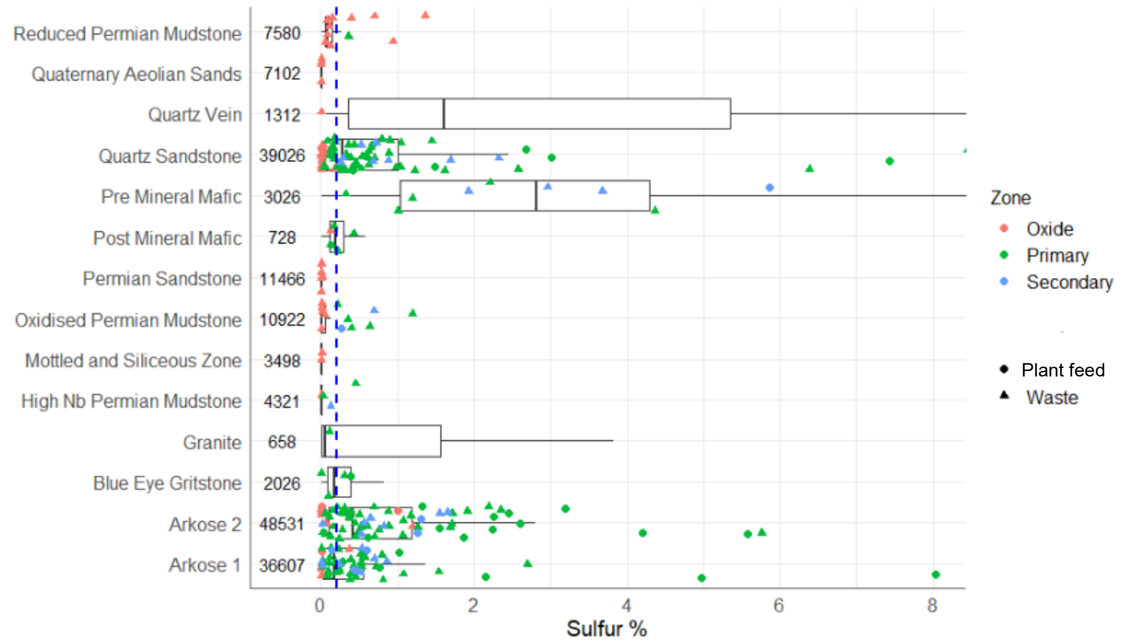

Figure 3: Box plot of all Winu drill hole samples with scatter plot for waste plant feed rock samples overlaid. Upper oxide zone samples coloured pink. [2]

[2] Bars show -1.5 × inter quartile range (IQR), 25th percentile, median, 75th percentile, 1.5 × IQR. Blue dotted line at 0.2% S designated cut-off between low and high sulfur samples. Numbers indicate the number of samples of that type in the Winu database.

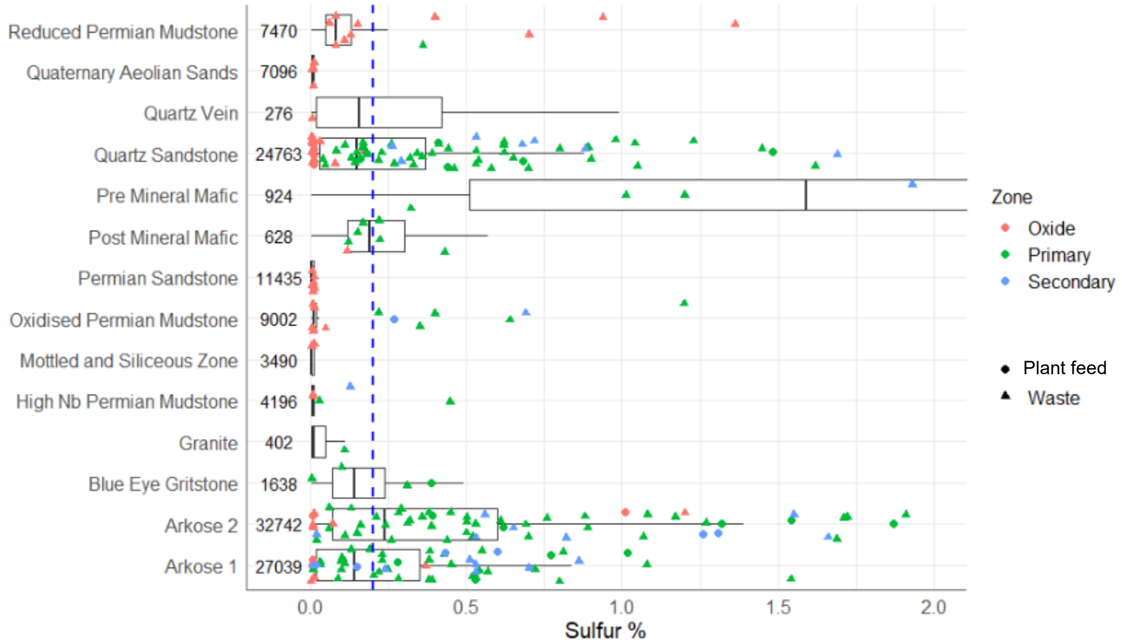

Figure 4: Box plot of waste grade Winu drill hole samples with scatter plot for waste and plant feed rock samples overlaid (zoomed in to 0 – 2% S). Upper oxide zone samples coloured pink.[3]

2.2. LABORATORY METHODS

Whole rock assay information for selected samples was taken from results produced by ALS Geochemistry on behalf of RTX. Mineralogical analysis was conducted by Rio Tinto Growth & Innovation (G&I) through the Bundoora Technical Development Centre (Bundoora). Mineralogical analysis was completed with a focus on plant feed knowledge and to inform mineral processing flowsheet development. Further work in 2020 investigating waste sample mineralogy was completed with a goal of better understanding carbonate and sulfide deportment in the waste.

All other test work was managed by ALS Geochemistry (Perth) and conducted at ALS laboratories globally.

2.2.1. *MINERALOGY*

General plant feed mineralogy was based on automated Scanning Electron Microscopy (SEM) using Mineral Liberation Analysis (MLA). X-ray diffraction results for some samples was undertaken by the Chemistry Centre (Perth, WA).

2.2.2. *WHOLE ROCK DIGESTS*

Assay results were reported for: Ag, Al, As, Au, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cs, Cu, Fe, Ga, Ge, Hf, In, K, La, Li, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Pd, Pt, Rb, Re, Sb, Sc, Si, Sn, S, Sr, Ta, Te, Th, Ti, Tl, U, V, W, Y, Zn. Where this data wasn't available from RTX, additional samples were submitted to ALS Laboratories for analysis via four acid digest.

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[3] Data collected 2020-10-02.

Selected samples were further assessed for trace element concentrations and calculation of Geochemical Abundance Index (GAI). The GAI was calculated using average crustal abundance (Lide 2005) as the background concentration. GAI was calculated as:

$$\mathrm{GAI} = \log_2\left(\frac{Measured\ Concentration}{1.5 \times Average\ Abundance}\right)$$

The results of GAI correspond to the relative concentration of an element compared to background concentrations (Table 2). A GAI of three or above indicates where an element is considered 'enriched'. Although enriched elements may require further investigation, it does not imply that they will be mobile or of environmental concern.

Table 2: Corresponding GAI values relative to global crustal abundance.

GAI	Relative Concentration
0	1–3 times global crustal abundance
1	3–6 times global crustal abundance
2	6–12 times global crustal abundance
3	12–24 times global crustal abundance

2.2.3. *ACID BASE ACCOUNTING*

Acid Base Accounting (ABA) test work was carried out according to the AMIRA (2002). Test work included the methods described in Table 3.

Table 3: ABA test methods.

Test Analyte	Method
Total sulfur wt.%	LECO furnace.
Sulfide sulfur wt.%	HCl leach of sulfate minerals and LECO furnace of residual sulfur.
Total carbon wt.%	LECO furnace.
Organic carbon wt.%	HCl leach of carbonate minerals and LECO furnace for residual carbon.
Acid Neutralisation Capacity by Modified Sobek (ANC), kg H_2SO_4/t	Reaction of sample with HCl and subsequent back-titration with NaOH to determine the amount of acid consumed.
Net Acid Generation (NAG), pH and kg H_2SO_4/t	Addition of hydrogen peroxide (H_2O_2) for oxidation of sulfide minerals and subsequent acid generation. Generated acid is consumed by ANC present in the sample during the test. Residual acid is determined via back-titration.

The tests in Table 3 were used to calculate the Maximum Potential Acidity (MPA), ANC by inorganic carbon (ANC_{IC}), Net Acid Producing Potential (NAPP) and Neutralisation Potential Ratio (NPR) via the following equations:

- MPA (kg H_2SO_4/t) = Sulfide S % × 30.6.
- ANC_{IC} (kg H_2SO_4/t) = Inorganic C % × 81.7.
- NAPP (kg H_2SO_4/t) = MPA – ANC.
- NPR = ANC/MPA.

On the basis of the above tests, samples are classified as either NAF, Uncertain (UNC) or PAF. The following rules were used for sample classification (AMIRA 2002):

- Barren: Total S < 0.1%, ANC ≤ 5 kg H_2SO_4/t
- NAF: NAPP < 0, NAG pH ≥ 4.5.
- PAF: NAPP > 0, NAG pH < 4.5, NAG_pH4.5 > 5 kg H_2SO_4/t.
- PAF-LC (low capacity): NAPP > 0, NAG pH < 4.5, NAG_pH4.5 ≤ 5 kg H_2SO_4/t.

- UNC: Samples not assigned as Barren, NAF or PAF.

2.2.4. *STATIC LEACH TESTS*

Static leach tests were undertaken to determine the potential for metal release from the oxide waste rock through contact with meteoric water. The tests were conducted on pulverised samples at a L:S ratio of 2:1 using Deionised (DI) water over 12 hours. The leachate was filtered and analysed for a multi element suite using ICP-AES (Na, Mg, K, Ca, Si) and ICP-MS (Ag, Al, As, Ba, Bi, Cd, Co, Cr, Cs, Cu, Fe, Mn, Mo, Ni, Pb, Re, Sb, Se, Sn, Te, Ti, V, W, Zn). Mercury was analysed separately via Hg analyser. Anions were analysed using discrete analyser (Cl, NO_3, SO_4, P, F) and alkalinity was determined by titration.

2.2.5. *MULTIPLE EXTRACT PROCEDURES*

Multi-step DI water leach tests (Multiple Extract Procedures or MEP) were undertaken on selected oxide-zone samples to investigate whether constituent release was occurring as a flush or sustained release from waste rock samples. These tests are useful for low sulfur samples where leaching is subject to equilibrium controls. The sample was contacted with DI water over ten separate bottle roll leaches.

Each extract was conducted at a L:S ratio of 2:1 using DI water over 12 hours. The leachate was filtered and analysed for a multi element suite using ICP-AES (Na, Mg, K, Ca, Si) and ICP-MS (Ag, Al, As, Ba, Bi, Cd, Co, Cr, Cs, Cu, Fe, Mn, Mo, Ni, Pb, Re, Sb, Se, Sn, Te, Ti, V, W, Zn). Hg was analysed separately via Hg analyser. Anions were analysed using discrete analyser (Cl, NO_3, SO_4, P, F) and alkalinity was determined by titration.

2.2.6. *SEQUENTIAL EXTRACTION METHOD*

Sequential leach tests were completed by Chemistry Centre (Perth, WA) using an in-house protocol for determining type of mobility for constituents under eight varying regimes: water soluble, ion-exchangeable, labile (metal carbonates), easily reducible (amorphous iron/manganese oxides), moderately reducible (crystalline iron/manganese oxides), easily oxidizable, recalcitrant oxidisable and total (Table 4). The Chemistry Centre method uses a liquid/solid (L/S) ratio of 1:20 by weight for the water soluble fraction.

The mass of the residue following Step seven was recorded and indicated that between 10% and 18% of the sample mass had been lost. The residue was submitted for assay in the final step via four acid digests.

Table 4: Leaching regime for Chemistry Centre sequential leach test method.

Step	Fraction	Reagent
1	Water extractable	Deionised water
2	Exchangeable	Ammonium acetate
3	Carbonate	Dilute acetic acid
4	Amorphous Fe/Mn oxide	Hydroxylamine in HCl
5	Crystalline Fe/Mn oxide	4 M HCl
6	Easily oxidisable	Sodium chlorate and HCl
7	Recalcitrant oxidisable	Hydrogen peroxide
8	Residual	Four acid digest

3. RESULTS AND DISCUSSION

3.1. MINERALOGY

The upper zone is characterized by the common presence of Fe-oxyhydroxide minerals, such as goethite and hematite, high modes of kaolinite and muscovite and a general absence of sulfide minerals (Figure 5). Kaolinite and muscovite are major gangue minerals in the upper zone, while modes of other micas are small. The bulk of Cu in the upper zone deports to chrysocolla, malachite and Cu adsorbed onto clays.

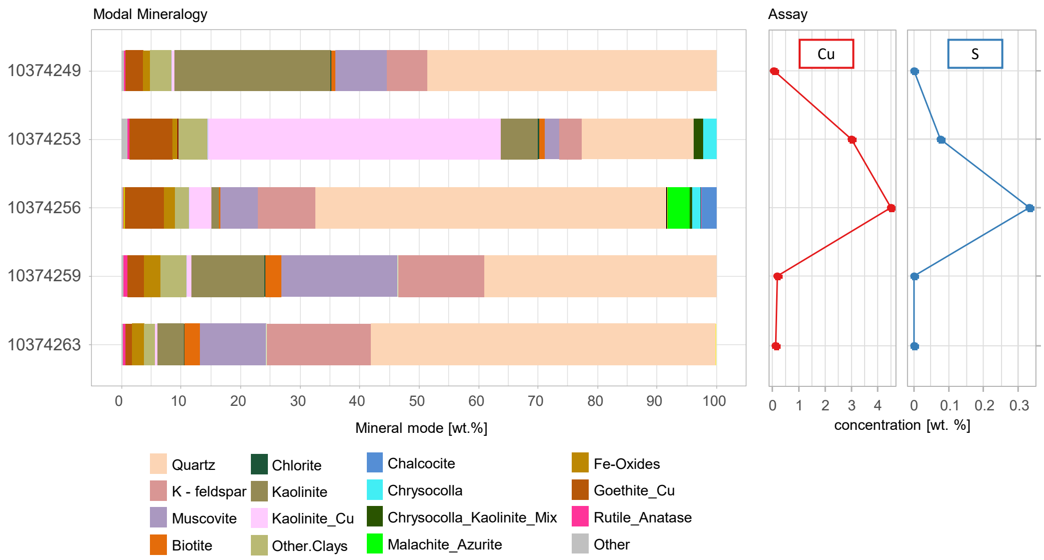

Figure 5: Head modal mineralogy of upper zone plant feed and waste samples.

Example mineral deportment is shown in Figure 6. In the figure, A and B show a goethite (Gth) particle with inclusions of quartz (Qz), K-feldspar (Kfs) and chrysocolla as the only Cu mineral (pink colours in B). The presence of chalcocite in Figure 6-C shows incomplete oxidation of sulfide minerals alongside oxide minerals in the oxide zones. The particle has native Cu with a rim of cuprite at the bottom and is surrounded by malachite with patches of chalcocite. D and E show intergrowth of quartz, chrysocolla and kaolinite with adsorbed Cu. Goethite rims around chalcocite are shown in F.

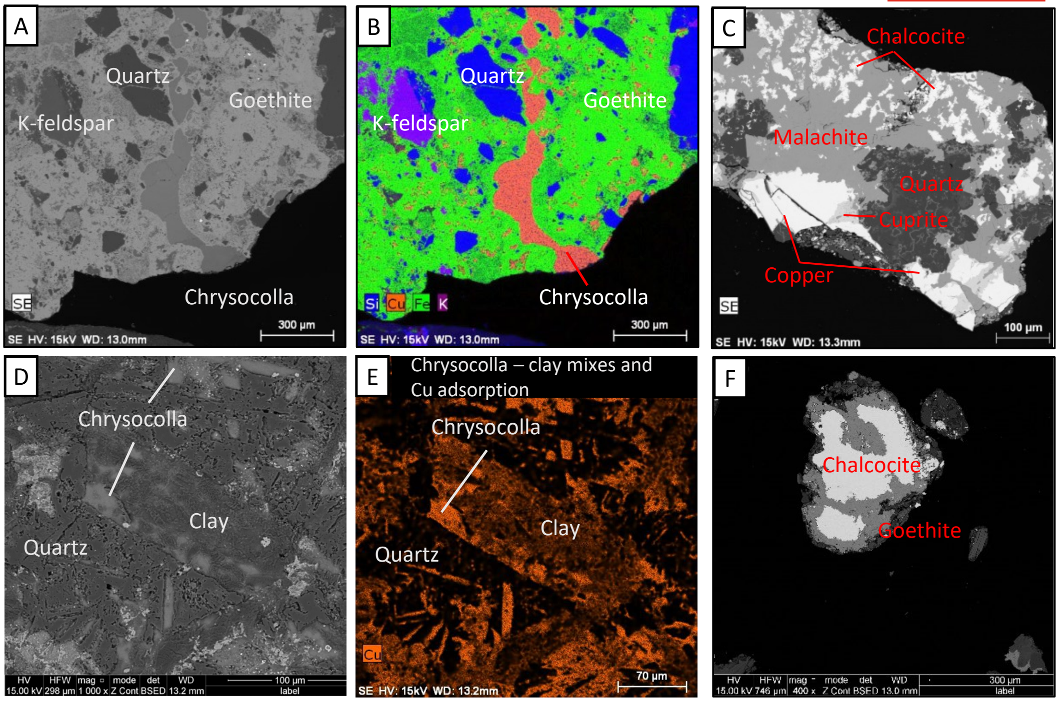

Figure 6: Back-scatter electron images, electron maps and classification maps of composite particles of the oxide and mixed Cu mineral zone.

Carbonate minerals in the upper zone are generally of low abundance due to the acid leaching that formed this zone. Mineralogy was conducted on more than 65 copper oxide and iron oxide samples from the Winu deposit. Of the 37 samples with Cu under 0.2%, only six samples resulted in carbon concentrations over 0.05 wt.% and no waste samples presented carbonate over 0.1%. In these waste samples, siderite, malachite and calcite were the most abundant carbonates.

Tungsten, Bi and Te were present at concentrations that were around or just below the detection limit for automated mineralogy. Qualitative assessments suggested the following:

- Bismuth is predominantly present as bismite and native bismuth in the upper zone.
- Tellurium is present as bismuth telluride and silver telluride minerals.
- Tungsten appears to be present as W-rutile and wolframite.

X-Ray Diffraction (XRD) was completed on three samples of oxide zone material by Chemistry Centre (WA). The clay samples showed high modal abundance of quartz (> 70%) with the remainder present as clay (kaolinite) or host rock residual microcline (Table 5). The arkose sample contained significant mica concentrations (muscovite) and other aluminosilicates (chlinochlore).

Table 5: XRD mineralogical results for oxide zone waste samples.

	10534953 Arkose 2	10689905 Permian clay reduced	10689927 Permian clay oxidised
Quartz	37%	70%	71%
Albite	4%	2%	2%
Microcline	12%	9%	5%
Muscovite	29%	4%	6%
Clinochlore	14%	4%	-
Kaolinite	4%	10%	15%
Hematite	-	-	1%
Magnetite	-	-	1%
Siderite	1%	1%	1%

3.2. ACID BASE ACCOUNTING

3.2.1. *NET ACID PRODUCTION POTENTIAL AND NEUTRALISATION POTENTIAL RATIO*

Many of the samples contained sulfide sulfur below the detection limit (0.01 wt.%) and calculated inorganic carbon less than or equal to 0%. The ANC by AMIRA method (HCl leach) was consistently low and only reported in a range of 0.5 – 13 kg H_2SO_4/t. As a result, although the samples typically appear unable to generate acidity, they are similarly not able to neutralise acidity that may be generated.

With the calculated MPA often at the detection limit (0.31 kg/t), the NPR for the samples was often greater than one (Figure 7). Four reduced permian mudstone samples and three arkose samples, however, had higher sulfide sulfur contents and resulted in NPR values less than one. The remaining samples had NAPP of less than 0 kg H_2SO_4/t (Figure 8). These samples were at or above the 75th percentile of total sulfur for the entire Winu geochemical database. This suggests that although these samples may be classified as PAF, they would not be representative of these sample types averaged over the deposit.

Although the measured ANC was typically low, subsequent investigations have shown that the results were still over-estimated due to over-dissolution of micas and other silicate minerals. An updated ANC test method has been developed to generate values that are more aligned with expected reaction extents in the field (described further in the primary sulfide waste rock report).

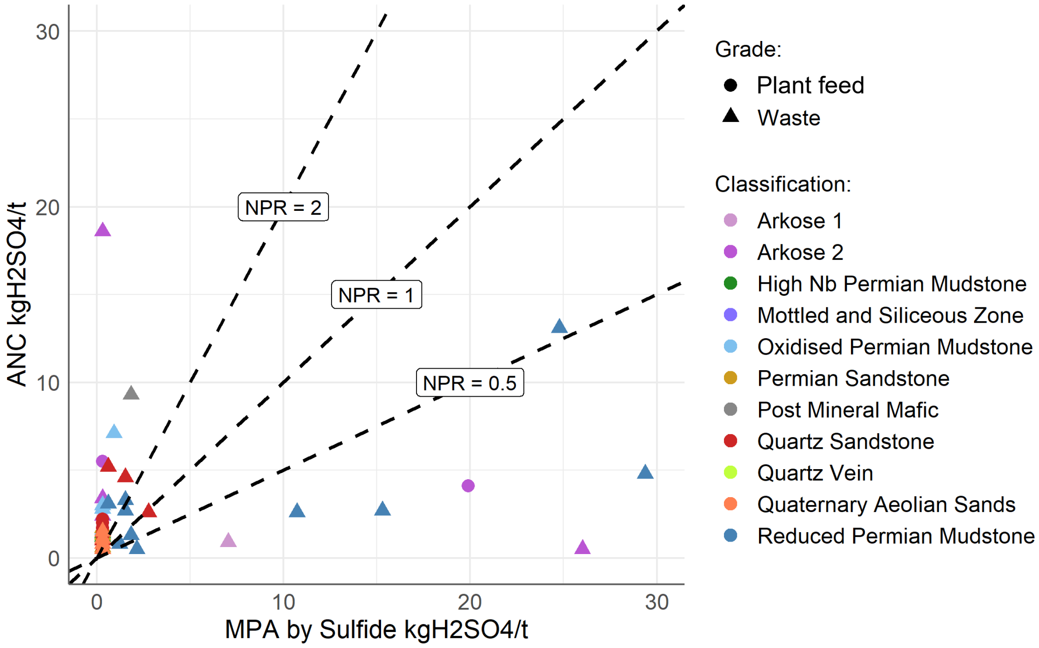

Figure 7: Plot of the NPR.

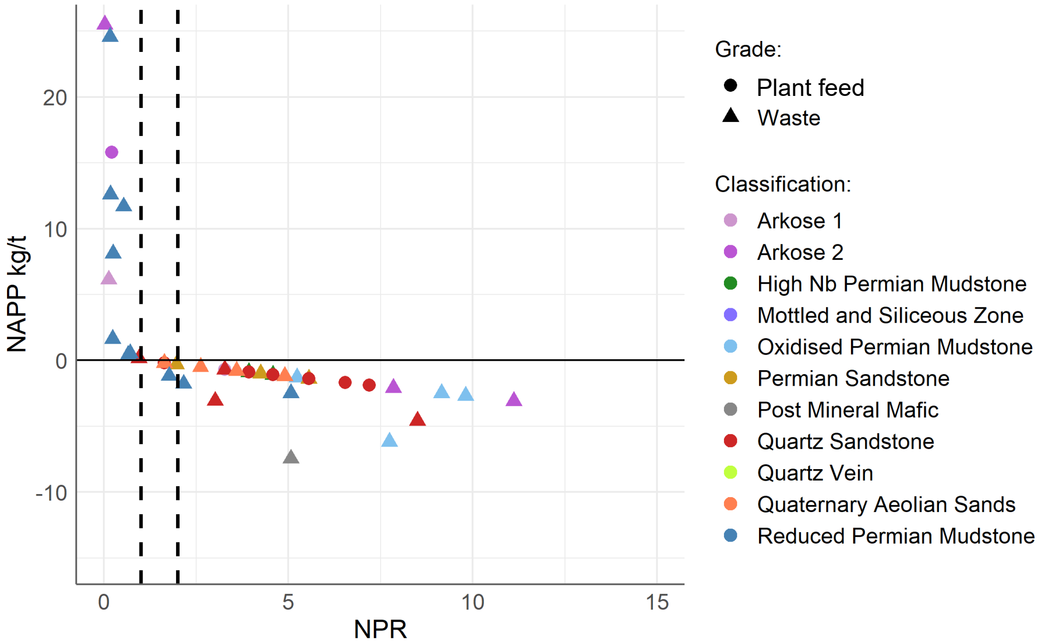

Figure 8: NPR versus NAPP.

The five oxide plant feed composites taken for further characterisation were all classified as barren, with ANC below 5 kg H_2SO_4/t and total sulfur ≤ 0.1%.

3.2.2. *NET ACID GENERATION*

In general, samples with higher NPR values generated higher NAG pH vales (Figure 9), corroborating the validity of the results even at the low levels of Modified Sobek ANC. Six of the seven samples with NPR less than one were classified as PAF based on the NAG plot, the other sample had a high NAG pH and was classified as UNC on the plot.

The remaining upper zone samples were classified NAF, with the exception of one quartz sandstone and one mottled and siliceous zone sample. The quartz sandstone sample had a NAG value of only 0.05 kg H_2SO_4/t and hence it can be classified as PAF-LC. The mottled and siliceous sample had very low sulfur and ANC and hence was classified as barren.

Two arkose samples with relatively high sulfide sulfur (1 wt.%) and two reduced permian clay samples generated significant acid during the NAG test (> 10 kg H_2SO_4/t). For these four samples, the sample depth was relatively deep (> 100 m down hole) and hence these samples may be near the top of the enrichment zone. Deeper samples of the upper zone of the Winu deposit may therefore contain more unoxidised sulfur, which has the potential to generate acid when brought to the surface.

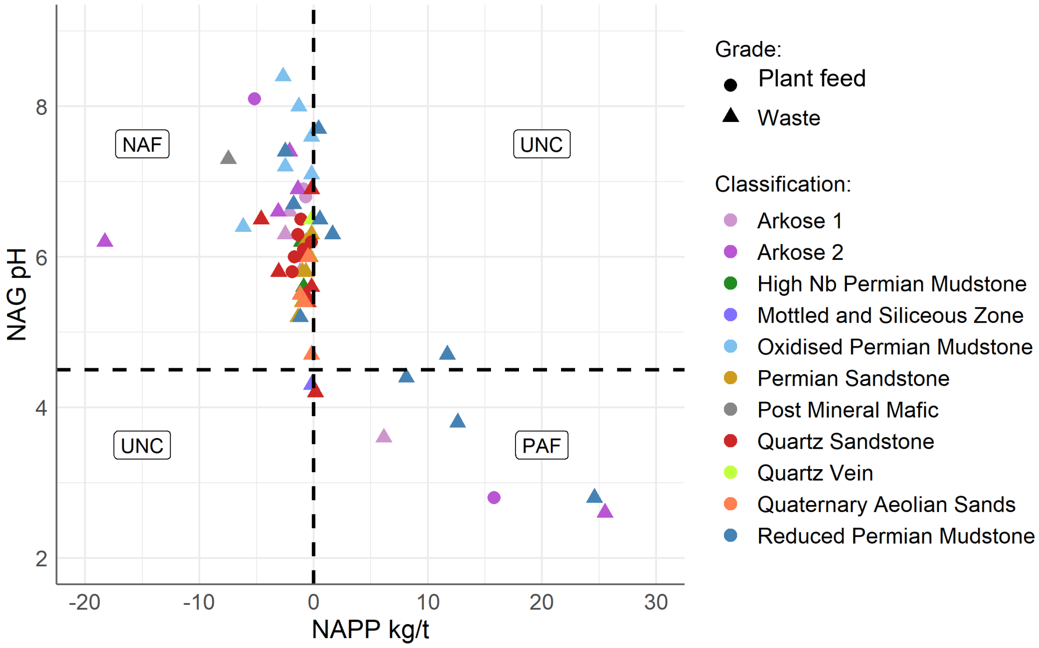

Figure 9: NAPP versus NAG pH value.

A summary of the ABA data discussed for the upper zone samples suggests that the most problematic rock types are the Arkose 2 and reduced permian mudstone lithologies where the lowest average NAPP and NAG pH values were measured (Table 6). Only one of ten potential plant feed samples (10444887, Arkose 2, 0.7% sulfide and 0.2% Cu) was classified as PAF. This sample was at depth (133 m down hole) and may become part of the enriched plant feed.

Table 6: Summary of acid generation capacity for upper zone sample classifications (mean values shown).

Description	n	MPA kg H_2SO_4/t	ANC kg H_2SO_4/t	NAG pH	NAPP kg H_2SO_4/t	PAF	PAF-LC	NAF / Barren
Arkose 1	5	1.7	1.8	4.3	-0.1	0%	20%	80%
Arkose 2	5	5.4	5.3	3.3	0.1	20%	0%	80%
High Nb permian mudstone	2	0.3	1.3	5.8	-1.0	0%	0%	100%
Mottled and siliceous zone	2	0.3	0.6	4.6	-0.2	0%	0%	100%
Plant feed samples	10	2.3	2.1	3.8	0.2	10%	0%	90%
Oxidised permian mudstone	6	0.4	2.6	7.0	-2.2	0%	0%	100%
Permian sandstone	7	0.3	1.1	5.7	-0.8	0%	0%	100%
Post-mineral mafic	1	1.8	9.3	7.3	-7.5	0%	0%	100%
Quartz sandstone	10	0.7	1.8	5.1	-1.1	0%	10%	90%
Quartz vein	1	0.3	0.5	6.5	-0.2	0%	0%	100%
Quaternary aeolian sands	4	0.3	1.0	5.2	-0.7	0%	0%	100%
Reduced permian mudstone	10	8.9	3.5	3.7	5.4	10%	20%	50%

A summary of the upper zone sample locations, where available, classified by NAF/PAF (AMIRA 2002) is given in Figure 10. There appears to be a clear correlation between depth and sample classification. The samples above a relative level of 160 m are all barren or NAF, whereas PAF samples were classified generally below a relative level of 140 m. This supports the statement that deeper samples of the upper zone of the Winu deposit may therefore contain more unoxidised sulfur, which has the potential to generate acid when brought to the surface.

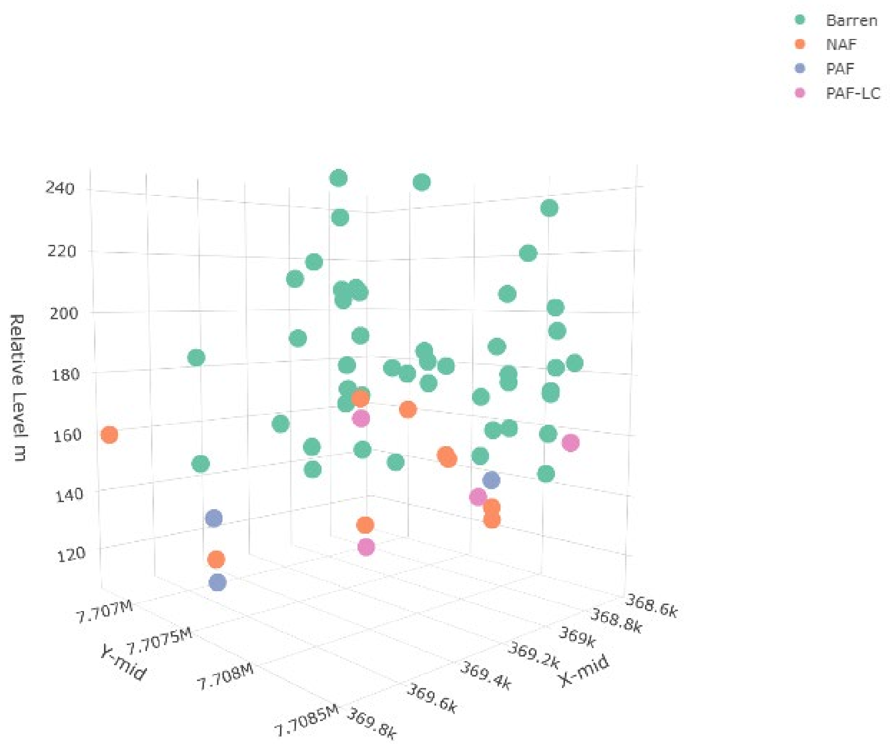

Figure 10: Upper zone samples by sample location classified by NAF/PAF (AMIRA 2002). Some samples not shown due to missing location information.

3.3. SULFUR CUT-OFF FOR PAF SAMPLES

A simple plot of total sulfur against sulfide sulfur for the upper zone samples demonstrates a strong correlation between the two variables (Figure 11). In addition, a rough cut-off for total sulfur of 0.2 wt.% can be applied to the measured samples to aid in classifying the samples as PAF or NAF.

Only one low-capacity PAF sample contains total sulfur less than 0.2 wt.%, and no samples of NAF contain total sulfur greater than 0.2 wt.%. As such, a cut off for sulfur in the geological model of 0.2% is proposed for estimating tonnages of PAF upper zone waste rock at this stage.

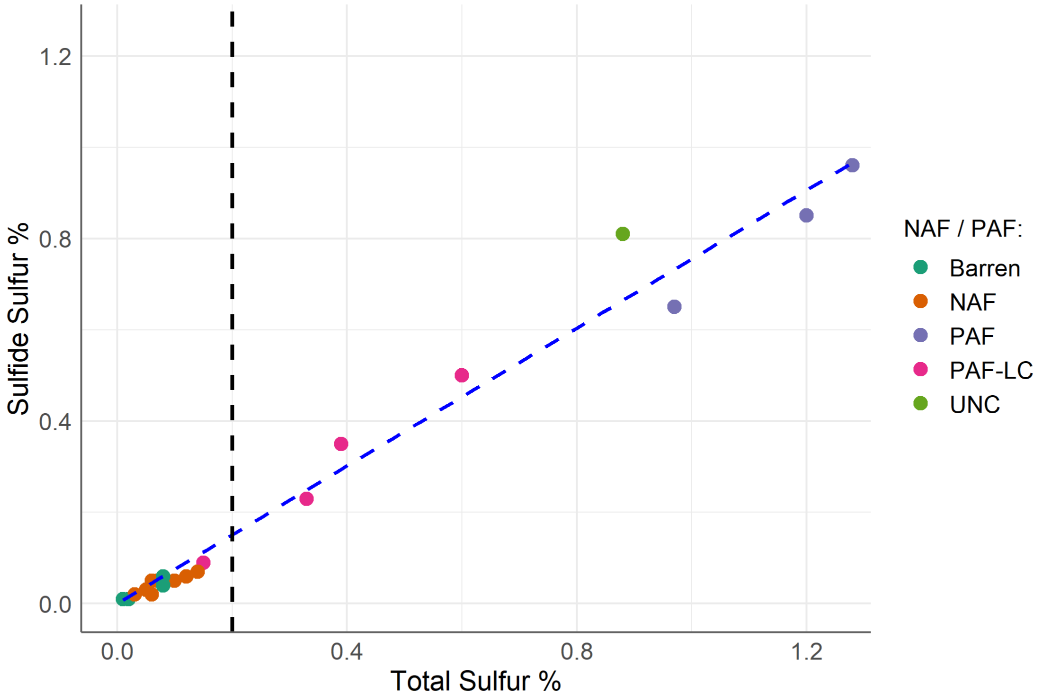

Figure 11: Upper zone waste rock samples classified by NAF/PAF against a 0.2 wt.% sulfur cut-off.

3.4. WHOLE ROCK DIGEST

The majority of the samples evaluated were enriched in Bi, Te and W, with GAI values often exceeding three (Table 7). GAI values for Bi ranged from one to as high as 16. Environmentally sensitive elements typically encountered in sulfide deposits (such as As, Cd, Co, Cr, Hg, Mn, Ni, Pb, Se, Sn, Zn) were not elevated in any of the samples tested. Cu, Au and Ag were, however, occasionally present at elevated concentrations, as would be expected for a copper-gold deposit.

Bismuth, Te and W are typically immobile in meteoric water, hence their persistence in the heavily weathered upper zone. This is supported by mineralogical results, which have shown deportment of these metals in typically immobile phases (inclusions of bismite, bismuth telluride minerals, rutile and wolframite). As such, metal leaching from these samples is unlikely to become a concern.

Ten of the samples collected could potentially be classified as plant feed due to elevated concentrations of Cu (up to 2.3 wt.%) or gold (up to 6.7 mg/kg).

Whole rock digest results for five plant feed composites are given in Table 8. As expected, the plant feed materials are elevated in Ag and Cu. The clay and iron-oxide plant feed composites are also elevated in As (GAI > 6) and sulfur (GAI > 3).

Table 7: Whole rock digest assays coloured by GAI. Yellow represents a GAI of 3-5, red a GAI ≥ 6. Elements with a GAI < 3 for all samples have been excluded from the list.

Sample_ID	Description	Hole	From	To	Ag_ppm	As_pct	Au_ppm	Bi_ppm	Cu_pct	Mo_ppm	Pb_pct	Re_ppm	Sn_ppm	S_pct	Te_ppm	W_ppm	F_ppm
		Average crustal abundance			0.08	0.0002	0.00	0.01	0.01	1.2	0.001	0.001	2	0.04	0.001	1.3	59
10413553	Arkose 1	WINU0004	77	78	0.86	0.0005	0.41	897.0	0.05	7.9	0.003	0.006	19	0.01	12.150	350.0	
10414116	Arkose 1	WINU0007	99	100	0.18	0.0002	0.01	0.8	0.02	1.5	0.004	0.001	7	0.01	0.050	15.2	
10414155	Arkose 1	WINU0007	134	135	0.36	0.0000	0.01	1.7	0.01	3.2	0.003	0.004	18	0.37	0.040	11.4	
10411853	Arkose 1	WINU0008	73	74	0.55	0.0004	0.00	3.3	0.04	1.9	0.001	0.002	4	0.01	0.070	119.5	
10442056	Arkose 1	WINU0009	83	84	0.76	0.0001	0.00	4.6	0.11	1.1	0.001	0.002	10	0.01	0.110	280.0	
10445568	Arkose 1	WINU0014	104	105	1.23	0.0004	0.02	18.9	0.22	3.0	0.002	0.003	8	0.01	3.320	147.0	
10415871	Arkose 1	WINU0015	66	67	0.64	0.0004	0.00	31.5	0.01	0.2	0.001	0.002	12	0.01	2.090	151.5	
10386397	Arkose 2	WINU0001	101	102	3.26	0.0002	0.01	54.5	0.13	5.0	0.001	0.003	17	0.01	3.490	137.5	
10442072	Arkose 2	WINU0009	97	98	0.25	0.0000	0.03	3.4	0.06	0.8	0.001	0.001	9	0.07	0.080	13.0	
10442087	Arkose 2	WINU0009	111	112	7.00	0.0001	0.10	14.0	0.16	2.9	0.009	0.002	21	0.01	0.360	250.0	
10444887	Arkose 2	WINU0039	132	133	1.90	0.0001	0.40	39.9	0.19	1.4	0.001	0.002	9	1.01	1.410	49.6	
10444914	Arkose 2	WINU0039	157	158	0.20	0.0001	0.10	11.0	0.05	0.4	0.003	0.003	11	1.20	0.300	25.5	
10695107	Arkose 2	WINU0339	95	96	1.81	0.0002	0.07	88.4	2.31	1.5	0.009	0.005	54	0.01	3.870	310.0	580
10744999	Arkose 2	WINU0458	77	78	1.13	0.0001	0.13	14.9	0.14	1.3	0.003	0.002	5	0.01	0.757	105.0	310
10442755	High Nb Permian Mudstone	WINU0013	56	57	10.50	0.0000	0.00	0.1	0.00	0.3	0.002	0.002	0	0.01	0.040	52.8	
10443538	High Nb Permian Mudstone	WINU0024	73	74	0.13	0.0001	0.01	28.1	0.01	2.2	0.001	0.001	20	0.01	1.490	136.5	
10384329	Mottled and Siliceous Zone	WB18WIN0002	26	27	0.01	0.0002	0.01	0.2	0.00	2.4	0.001	0.001	2	0.01	0.020	2.5	
10415845	Mottled and Siliceous Zone	WINU0015	43	44	2.29	0.0001	0.00	0.1	0.00	0.5	0.002	0.001	1	0.01	0.020	13.4	
10387328	NA	WIDI0007	6	7	0.03	0.0003	0.01	0.2	0.00	0.9	0.001	0.001	2	0.01	0.040	1.8	
10387402	NA	WIDI0007	72	73	4.45	0.0003	0.78	71.0	0.19	3.3	0.031	0.011	29	0.04	15.400	830.0	
10384543	Oxidised Permian Mudstone	RC18WIN0001	68	69	0.05	0.0007	0.01	0.4	0.00	0.4	0.003	0.001	3	0.01	0.060	3.6	
10410053	Oxidised Permian Mudstone	WINU0003	68	69	0.16	0.0005	0.01	0.4	0.00	0.5	0.003	0.001	5	0.01	0.040	11.5	
10442767	Oxidised Permian Mudstone	WINU0013	67.3	68.9	1.10	0.0012	0.06	0.9	0.09	8.1	0.002	0.002	2	0.01	0.040	136.0	43
10450553	Oxidised Permian Mudstone	WINU0038	106	107	0.06	0.0004	0.00	0.4	0.00	0.4	0.003	0.001	4	0.05	0.020	4.4	
10720487	Oxidised Permian Mudstone	WINU0536	62	63	0.62	0.0008	0.10	0.1	0.01	1.1	0.001	0.002	1	0.01	0.060	9.4	50
10718644	Oxidised Permian Mudstone	WINU0566	62	63	0.28	0.0008	0.01	0.5	0.11	1.0	0.003	0.001	4	0.01	0.050	10.6	200
10414054	Permian Sandstone	WINU0007	43	44	0.04	0.0000	0.01	0.4	0.00	1.7	0.002	0.001	1	0.01	0.020	2.8	
10411821	Permian Sandstone	WINU0008	44	45	0.22	0.0001	0.00	0.0	0.00	1.9	0.003	0.001	2	0.01	0.020	3.1	
10442023	Permian Sandstone	WINU0009	53.3	54	5.51	0.0001	0.00	0.1	0.00	0.7	0.002	0.001	5	0.01	0.070	34.6	
10415331	Permian Sandstone	WINU0010	44	45	0.07	0.0001	0.00	0.9	0.00	0.7	0.002	0.001	2	0.01	0.040	3.4	
10415347	Permian Sandstone	WINU0012	42	43	1.48	0.0000	0.00	15.0	0.00	0.5	0.001	0.001	2	0.01	0.300	9.2	
10388244	Permian Sandstone	WINU0019	48	49	0.04	0.0001	0.00	6.0	0.00	0.5	0.002	0.001	0	0.01	0.130	6.0	
10537974	Permian Sandstone	WINU0344	34	35	0.04	0.0000	0.00	0.1	0.00	0.4	0.002	0.000	3	0.01	0.006	3.7	290

Sample_ID	Description	Hole	From	To	Ag_ppm	As_pct	Au_ppm	Bi_ppm	Cu_pct	Mo_ppm	Pb_pct	Re_ppm	Sn_ppm	S_pct	Te_ppm	W_ppm	F_ppm
		Average crustal abundance			*0.08*	*0.0002*	*0.00*	*0.01*	*0.01*	*1.2*	*0.001*	*0.001*	*2*	*0.04*	*0.001*	*1.3*	*59*
10373518	Post Mineral Mafic	RC17PAW0001	76	77	8.70	0.0001	0.04	1.9	1.42	1.0	0.003	0.001	2	0.20	0.110	681.0	
10444905	Post Mineral Mafic	WINU0039	148	149	0.05	0.0000	0.00	0.1	0.01	0.4	0.000	0.001	1	0.12	0.040	2.2	
10385046	Quartz Sandstone	RC18WIN0003	60	61	0.29	0.0001	0.04	129.0	0.01	2.2	0.000	0.001	14	0.01	5.380	134.5	
10410087	Quartz Sandstone	WINU0003	99	100	0.33	0.0001	0.08	27.0	0.04	2.3	0.001	0.001	9	0.03	1.200	18.7	
10413544	Quartz Sandstone	WINU0004	69	70	0.41	0.0003	0.02	40.1	0.02	2.3	0.003	0.002	11	0.01	3.690	131.0	
10410979	Quartz Sandstone	WINU0006	63	64	0.64	0.0001	5.39	27.9	0.04	2.4	0.002	0.001	11	0.01	1.030	52.7	
10411013	Quartz Sandstone	WINU0006	93	94	2.54	0.0007	6.37	486.0	0.15	19.9	0.002	0.022	61	0.01	9.570	920.0	154
10414104	Quartz Sandstone	WINU0007	88	89	0.63	0.0002	0.05	10.6	0.09	3.6	0.005	0.001	6	0.17	0.320	8.1	307
10414146	Quartz Sandstone	WINU0007	126	127	0.18	0.0001	0.08	42.3	0.02	3.9	0.003	0.001	10	0.08	1.260	12.4	
10411856	Quartz Sandstone	WINU0008	76	77	1.33	0.0003	0.22	53.4	0.05	11.3	0.001	0.001	21	0.01	3.210	94.5	
10411875	Quartz Sandstone	WINU0008	93	94	1.43	0.0002	0.22	23.8	0.05	2.6	0.001	0.002	5	0.01	1.370	126.5	
10442055	Quartz Sandstone	WINU0009	82	83	1.38	0.0001	0.00	1.8	0.22	1.7	0.001	0.004	8	0.01	0.080	450.0	
10414847	Quartz Sandstone	WINU0010	86	87	0.32	0.0002	0.13	461.0	0.01	6.2	0.002	0.001	25	0.01	17.300	61.6	
10415364	Quartz Sandstone	WINU0012	57	58	0.26	0.0002	0.05	149.0	0.00	0.8	0.007	0.002	14	0.01	3.990	108.0	
10415387	Quartz Sandstone	WINU0012	78	79	0.94	0.0004	0.11	117.0	0.02	4.4	0.003	0.002	12	0.01	7.540	88.3	
10443558	Quartz Sandstone	WINU0024	82	83	0.97	0.0002	0.01	44.7	0.01	2.3	0.001	0.001	12	0.01	2.130	59.7	
10722097	Quartz Sandstone	WINU0349	100	100.81	1.04	0.0002	1.01	29.9	0.03	0.8	0.002	0.002	6	0.01	1.320	75.6	50
10722105	Quartz Sandstone	WINU0349	108	109	0.90	0.0008	0.06	47.0	0.04	1.7	0.001	0.000	10	0.01	3.670	32.9	190
10445531	Quartz Vein	WINU0014	70	71	0.70	0.0005	0.02	138.5	0.04	2.1	0.003	0.001	8	0.01	4.160	52.4	
10384984	Quaternary Aeolian Sands	RC18WIN0003	4	5	0.03	0.0003	0.01	0.2	0.00	0.8	0.001	0.001	1	0.01	0.020	1.4	
10388195	Quaternary Aeolian Sands	WINU0019	4	5	0.03	0.0002	0.00	0.1	0.00	0.5	0.000	0.001	1	0.01	0.020	0.7	
10388211	Quaternary Aeolian Sands	WINU0019	18	19	0.01	0.0003	0.00	0.8	0.00	1.8	0.001	0.001	4	0.01	0.020	3.8	
10718244	Quaternary Aeolian Sands	WINU0564	15	16	0.01	0.0002	0.00	0.2	0.00	1.5	0.001	0.001	2	0.01	0.025	2.0	1100
10384555	Reduced Permian Mudstone	RC18WIN0001	79	80	0.07	0.0004	0.01	0.4	0.00	0.6	0.003	0.001	3	0.08	0.040	5.3	
10414096	Reduced Permian Mudstone	WINU0007	81	82	0.09	0.0005	0.00	0.3	0.00	0.5	0.002	0.001	2	0.13	0.050	3.7	
10416993	Reduced Permian Mudstone	WINU0026	100	101	0.07	0.0005	0.00	0.4	0.00	0.4	0.003	0.002	4	0.11	0.050	11.3	
10452961	Reduced Permian Mudstone	WINU0029	118	119	0.06	0.0083	0.00	0.3	0.00	1.2	0.003	0.001	3	1.36	0.020	2.6	438
10452973	Reduced Permian Mudstone	WINU0029	129	130	0.06	0.0007	0.00	0.4	0.00	0.5	0.003	0.001	4	0.15	0.050	2.7	
10452978	Reduced Permian Mudstone	WINU0029	134	135	0.06	0.0004	0.00	0.4	0.00	0.5	0.003	0.001	4	0.06	0.020	3.0	
10453296	Reduced Permian Mudstone	WINU0034	121	122	0.08	0.0005	0.00	0.4	0.00	0.4	0.003	0.001	4	0.08	0.050	4.0	
10687985	Reduced Permian Mudstone	WINU0317	137	137.5	0.05	0.0004	0.00	0.4	0.00	0.7	0.003	0.001	3	0.70	0.025	12.3	330
10751194	Reduced Permian Mudstone	WINU0563	94	95	0.07	0.0026	0.00	0.3	0.00	0.9	0.002	0.001	3	0.40	0.025	2.6	340
10808364	Reduced Permian Mudstone	WINU0623	107	108	0.08	0.0024	0.00	0.5	0.00	0.7	0.003	0.004	3	0.94	0.025	6.0	440

Table 8: Whole rock digest assays for plant feed samples coloured by GAI. Yellow represents a GAI of 3-5, red a GAI ≥ 6. Elements with a GAI < 3 for all samples have been excluded from the list.

Sample_ID	Lithology	Hole	From	To	Ag_ppm	As_pct	Au_ppm	Bi_ppm	Cu_pct	Mo_ppm	Pb_pct	Re_ppm	Sn_ppm	S_pct	Te_ppm	W_ppm	F_ppm
W15 CuOx	Oxide ore (Clay)	W15			4.09	0.0997		67.6	0.65	18.9	0.038	0.002	8	4.89	10.150	164.0	
W332 CuOx	Oxide ore (Malachite)	W332			4.01	0.0003		143.5	0.61	6.2	0.003	<0.002	15	0.02	11.900	143.5	
W81 CuOx	Oxide ore (Chrysocolla)	W81			6.86	0.0004		96.8	1.15	6.5	0.001	<0.002	11	0.02	15.700	151.5	
W81 FeOx	Oxide ore (FeOx)	W81			3.13	0.0380		192.0	0.10	12.3	0.015	0.002	11	1.88	24.900	252.0	
Oxide Pilot	Oxide ore composite				2.24	0.0006		62.3	0.53	2.8	0.004	<0.002	11	0.02	4.450	110.0	

3.5. METAL LEACHING

Fifteen samples of upper zone waste rock were selected for a water leach test to evaluate the potential for neutral drainage and leaching of elements from the waste rock. The physical and chemical conditions of the leach test are not the same as those that will exist in the field (e.g. solubility constraints, liquid to solid ratios, contact time, liquor compositions) therefore the results cannot be directly extrapolated to predict leachate quality in the field. However, the results are useful to provide a first order indication of the readily leachable elements from the sample material.

Samples were chosen based on their elevated levels of Ag, Bi, Cu, Pb and W. In general, metal leaching from the waste rock was low (Table 9). Values for pH were near-neutral (6.5 – 8). Sulfate remained low (< 50 mg/L) for all samples except for those in the permian clays where the higher total sulfur contents resulted in elevated sulfate in the DI leach. Full leachate results are given in Appendix 2.

Fluoride was elevated in the L:S = 2:1 leachate for three of the seven samples. These samples were distributed into either the quartz sandstone or arkose 2 lithologies and roughly correlated with higher K in the samples (Figure 12). Some F release from the upper sandstone materials is therefore possible over the life of the Waste Rock Landform (WRL).

Although F release was only noted from high K bearing samples (> 2 wt.%), no upper zone F bearing minerals were reported in the mineralogical studies and a mechanism for this release remains uncertain. Additional geochemical modelling work by SRK consulting has, however, suggested that the source of F is likely the clay and mica minerals, which is supported by the correlation between F release and K in the solids (SRK 2021).

Salinity values from the 1:2 leachate was assessed against the guidelines for suitability as a soil growth medium (Hunt 1992) based on a 1:5 leachate:

- 0 – 400 µS/cm: suitable for a soil growth medium
- 400 – 1600 µS/cm: suitable for some salt tolerant species
- >1600 µS/cm: may not be a suitable growth medium.

It should be noted that these guidelines are based on crops used in agriculture and for a 1:5 leach rather than a more concentrated 1:2 leach. The comparison is there therefore more conservative and should be used as a guide only.

Electrical Conductivity (EC) was typically low in the 2:1 leach test and only above 400 µS/cm for the mudstone samples and only above 1600 µS/cm for the PAF reduced mudstone sample, due to elevated sulfate concentration. As noted earlier, this sample contains considerably more sulfur than the deposit average (considered an outlier) and is therefore not representative of the lithology as a whole.

Table 9: Results for leachate concentrations from DI water leach tests (L:S = 2:1 for 12 hours) on waste rock for analytes consistently reporting above detection limits. Australian drinking water guidelines provided for reference only – actual trigger values will be site specific and depend on conditions of liquid extract test.

Sample ID	Lithology	EC µS/cm	pH	Total Alkalinity mg CaCO3/L	SO_4 mg/L	Cl mg/L	NO_3 mg N/L	F mg/L	Al mg/L	As mg/L	Ba mg/L	Cu mg/L	Fe mg/L	Mn mg/L	Mo mg/L	Se mg/L	W mg/L	Zn mg/L
Australian Drinking Water Guidelines			*6.5 – 8.5*		*500*	*250*	*50*	*1.5*		*0.01*		*2*			*0.05*	*0.01*		*3*
10386397	Arkose 2	370	7.42	27	11	67	0.12	1.6	0.25	*0.001*	0.484	0.019	0.34	0.016	0.007	*NA*	0.102	0.146
10695107	Arkose 2	49	6.85	6	1	9	1.42	*0.1*	*0.01*	*0.001*	*0.001*	0.02	*0.05*	0.002	*0.001*	*0.01*	0.002	*0.005*
10442767	Oxidised permian mudstone	136	6.81	6	1	37	0.17	0.2	0.38	*0.001*	0.887	0.027	0.28	0.025	0.002	*NA*	0.01	0.151
10720487	Oxidised permian mudstone	926	7.41	37	334	55	1.9	0.5	*0.01*	0.006	0.034	*0.001*	0.05	0.084	0.015	*0.01*	0.003	*0.005*
10537974	Permian sandstone	64	6.38	4	6	10	1.37	*0.1*	*0.01*	*0.001*	0.363	*0.001*	0.47	0.042	*0.001*	*0.01*	*0.001*	0.018
10411013	Quartz sandstone	250	7.55	14	8	52	0.05	1.3	0.92	*0.001*	0.454	0.057	3.06	0.007	0.047	*NA*	0.197	0.107
10414104	Quartz sandstone	268	7.03	14	43	34	0.09	1.4	0.12	*0.001*	0.184	0.023	0.08	0.032	0.018	*NA*	0.003	0.096
10415364	Quartz sandstone	120	6.7	6	1	33	0.41	0.2	0.06	*0.001*	0.504	*0.001*	*0.05*	0.006	*0.001*	*NA*	*0.001*	0.132
10722105	Quartz sandstone	159	7.1	14	18	22	0.66	0.8	0.05	*0.001*	0.029	0.006	*0.05*	0.002	0.005	*0.01*	0.09	*0.005*
10388211	Quaternary aeolian sands	100	6.68	9	1	19	0.4	*0.1*	0.78	*0.001*	1.46	0.002	0.12	0.006	*0.001*	*NA*	0.002	0.336
10718244	Quaternary aeolian sands	197	8.96	95	5	5	0.18	0.3	1.33	*0.001*	0.002	*0.001*	2.31	0.017	0.008	*0.01*	0.002	*0.005*
10416993	Reduced permian mudstone	764	6.69	8	282	30	0.19	0.2	0.01	*0.001*	0.029	0.004	*0.05*	0.24	*0.001*	0.02	*0.001*	0.007
10452961	Reduced permian mudstone	1660	6.81	11	796	61	0.36	0.2	*0.01*	0.002	0.045	*0.001*	*0.05*	0.196	0.005	0.03	*0.001*	*0.005*
10687985	Reduced permian mudstone	117	7.36	20	3	18	0.53	0.8	0.06	*0.001*	0.002	0.091	0.06	0.018	0.002	*0.01*	0.017	*0.005*
10808364	Reduced permian mudstone	101	7.04	16	1	16	1.37	0.8	0.05	*0.001*	*0.001*	0.033	*0.05*	*0.001*	*0.001*	*0.01*	0.055	*0.005*

Selenium not measured for omitted samples.

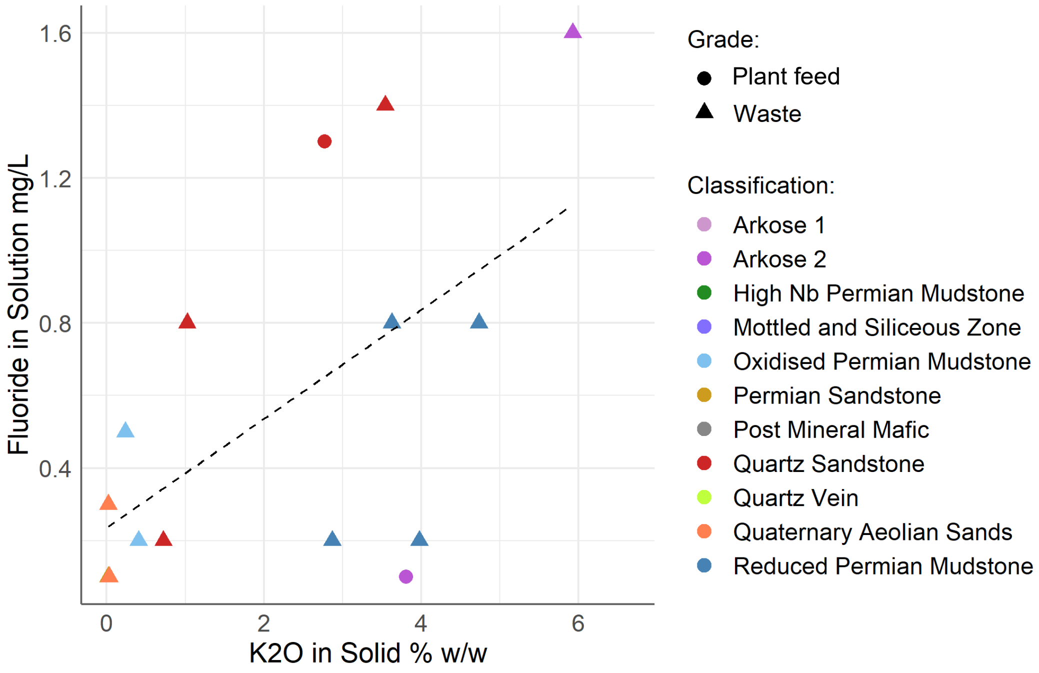

Figure 12: Correlation between F in water leach liquors and K in solid sample.

Barium concentrations were generally low, although one sample classified as sand had slightly elevated soluble Ba. Interestingly, this sample did not have elevated Ba in the solid (GAI of 0). The one leach sample with elevated Ba (post mineral mafic, GAI of 1) resulted in a Ba concentration of only 0.5 mg/L.

Tungsten in solution was measured above 0.1 mg/L for one arkose and one quartz sandstone sample, both of which had elevated W in the solid. Interestingly, the other sample with elevated W in the solid (136 mg/kg) did not release significant W into the leach solution (only 0.01 mg/L). The alkalinity of the sandstone sample was lower than for the two other samples (6 mg/L compared with 14 – 27 mg/L). This may have contributed to the difference in W leaching, but mineral liberation and identity could also attribute to this difference.

Apart from W, Bi and Te were the other two elements deemed to be ‘enriched’ from the whole rock assay. Bismuth in the leach solution was only above detection limits (0.001 mg/L) for one sample and is not considered a concern. Tellurium in solution was not detected above the limit of detection (0.005 mg/L) for any samples tested.

3.5.1. *MULTIPLE LEACH EXTRACTS*

The MEP leaches were primarily used to investigate the amount of constituent release over multiple contacts with leachant (DI water). All ten contacts were analysed for only three samples of waste rock (10534953, 10689905, 10689927) and five plant feed composite samples – for the remaining 14 samples of waste rock only five leaches were analysed. Full analytical results are provided in Appendix 2.

The release of salts from all samples decreased exponentially over successive MEP leachates with EC values falling to below 100 µS/cm by the third contact for most samples (Figure 13 and Figure 14, cumulative L/S = 6). One sample of reduced permian mudstone (10751194) and one sample of oxidised permian mudstone (10694797) generated high EC values that did not drop below 100 µS/cm in leach three, aligning with the 2:1 leach result.

In general, the EC value correlates well with sulfate concentration, which was particularly high for some samples in the initial flush (e.g. 106895107, Arkose 2, 851 mg/L) but was very low for the remaining contacts on all samples. For four of the samples, the initial sulfate concentration was very high (> 2000 mg/L) despite low EC values (< 250 µS/cm). In these cases, the initial ion balance was also skewed strongly towards anions and removing the sulfate from the solution balanced the charges. It is possible that for these four samples the turbidimetric quantification of sulfate (via precipitation of barium sulfate) was skewed to higher values due to an interference. In these cases, the low EC is taken to be indicative of low salinity.

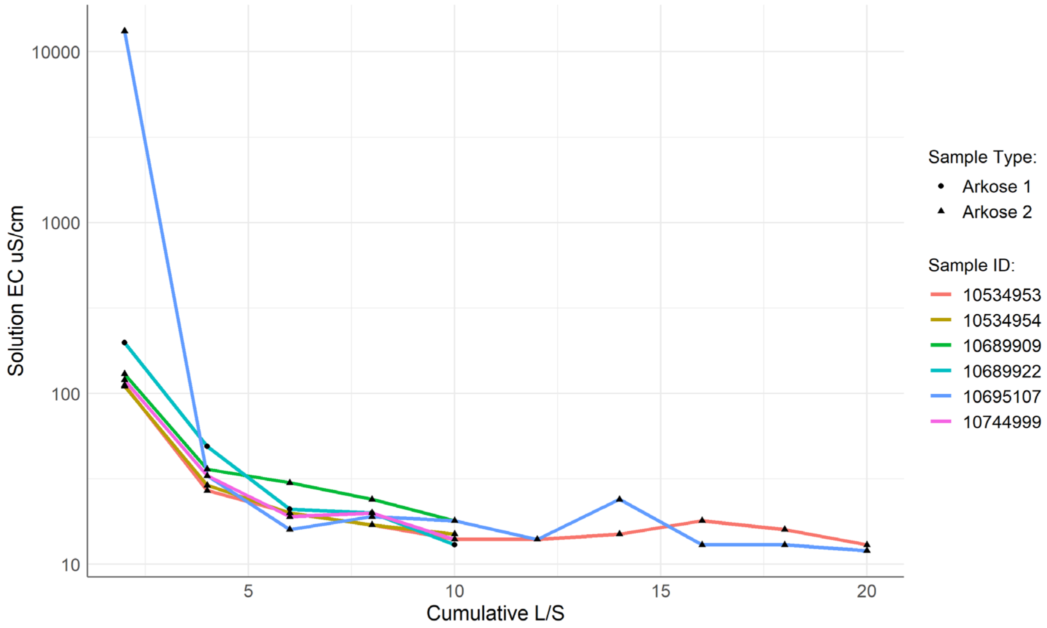

Figure 13: EC of each extract by cumulative L/S ratio (L/S of 2 for each contact) for Arkose samples.

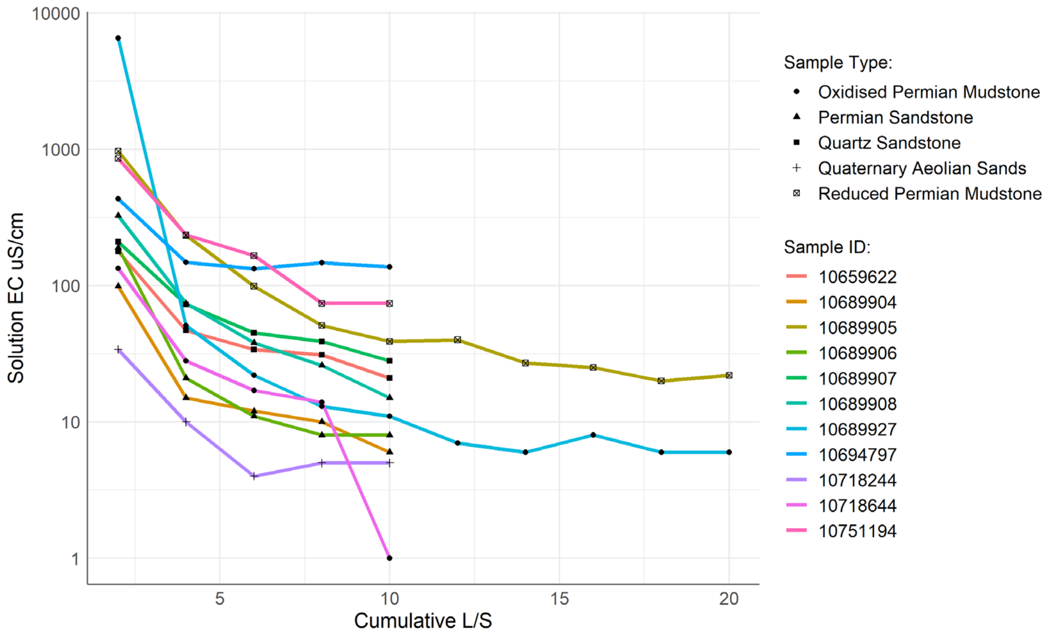

Figure 14: EC of each extract by cumulative L/S ratio (L/S of 2 for each contact) for non-Arkose samples.

Fluoride release from the MEP leachates was typically low (near to detection limit of 0.1 mg/L or a release of 0.2 mg/kg). For the two samples with the highest initial F release rates (10534953 and 10689909 – both arkose 2) the F appeared to be flushed from the samples, with all subsequent leaches reporting F at only 0.2 mg/L, just above detection. This effect is further illustrated by comparing the concentration of F by each successive leach where the concentration drops down to near detection after leach in all cases (Figure 16).

Sustained F release, although only just above detection in leaches six to ten, was observed for one oxidised permian mudstone sample (10689927, noted on graphs). Contrary to the other samples tested, F was not flushed immediately from this sample during the first leach; higher concentrations (up to 0.9 mg/L) were noted only from leach two.

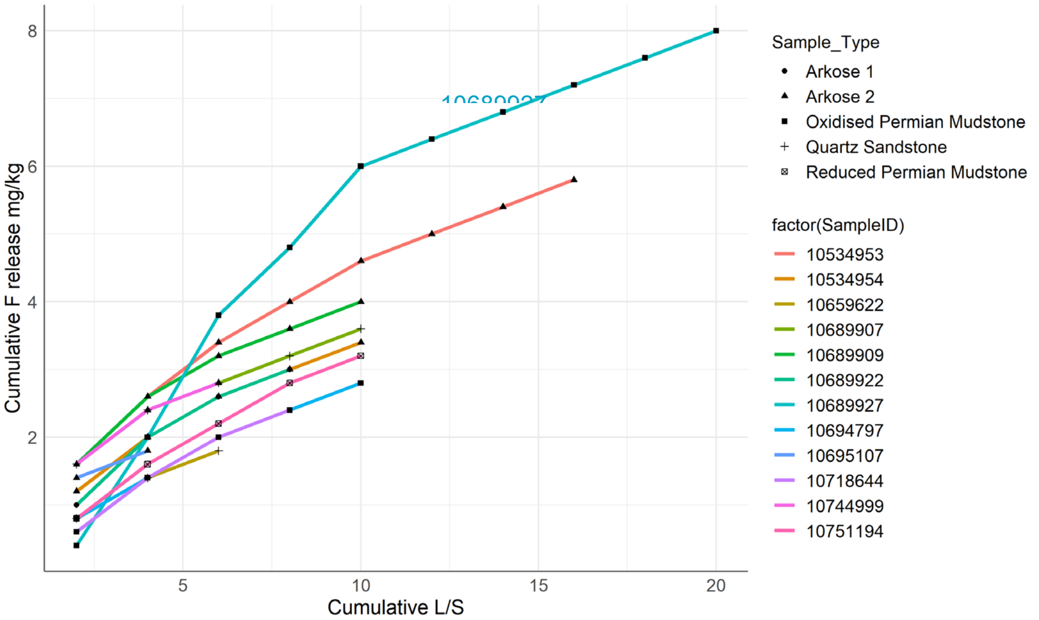

Figure 15: Cumulative F release from samples.

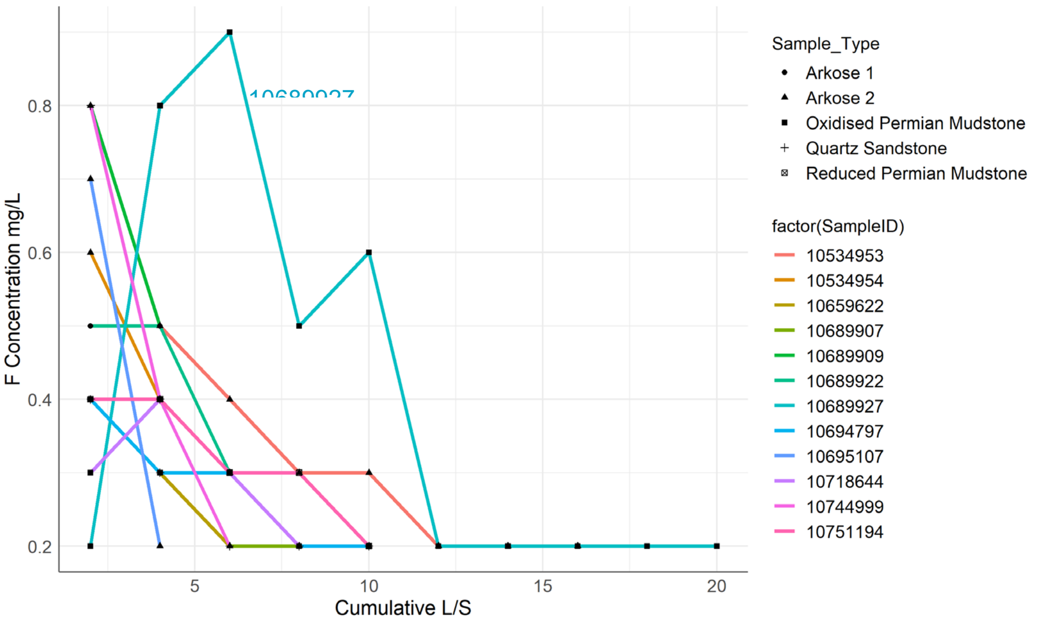

Figure 16: F concentration in each successive leachate from the MEP test.

For all remaining elements and samples of waste rock, elements were flushed out of the sample during the first few contacts to either very low concentrations or to below detection limits – with the exception of Cu from plant feed samples. Copper release from sample 10534953 (arkose 2) increased with successive flushes (Figure 17). Although Cu release is still increasing, dissolution in each MEP leachate is still low (a maximum of 0.13 mg/L, Figure 18). This sample is a copper oxide plant feed sample (0.35 wt.%).

The other arkose 2 sample 10695107 in Figure 17 is a NAF copper oxide plant feed sample (2.3 wt.% Cu). This sample exhibited a large jump in Cu release in leach five (11.2 mg/L) after four previous leaches with relatively low Cu dissolution. Although the trend did not continue (and could be an anomaly), the ultimate jump was accompanied by a jump in pH to 8.2 – aligning with the final NAG pH for this sample.

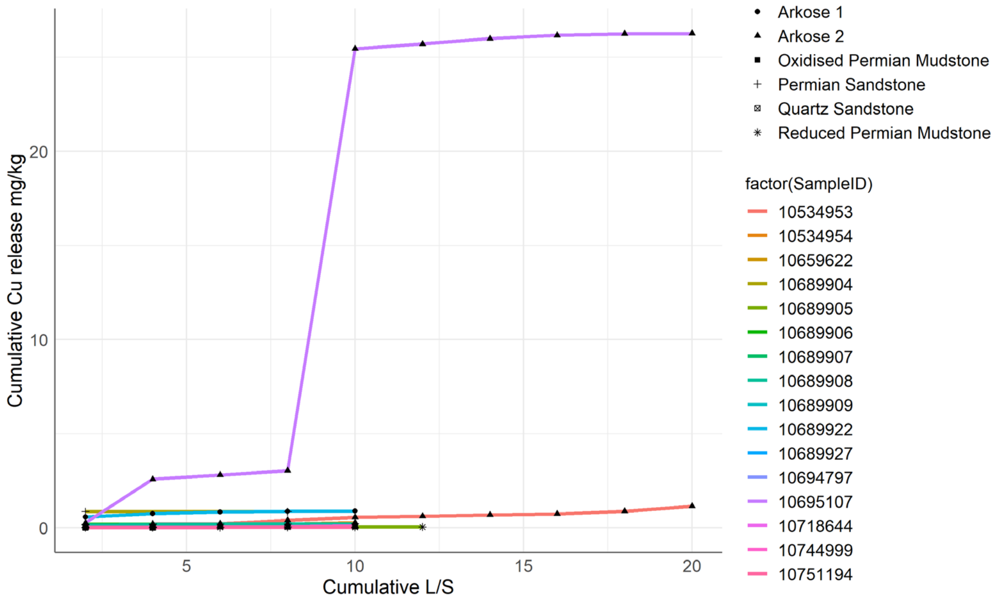

Figure 17: Cumulative Cu release from samples.

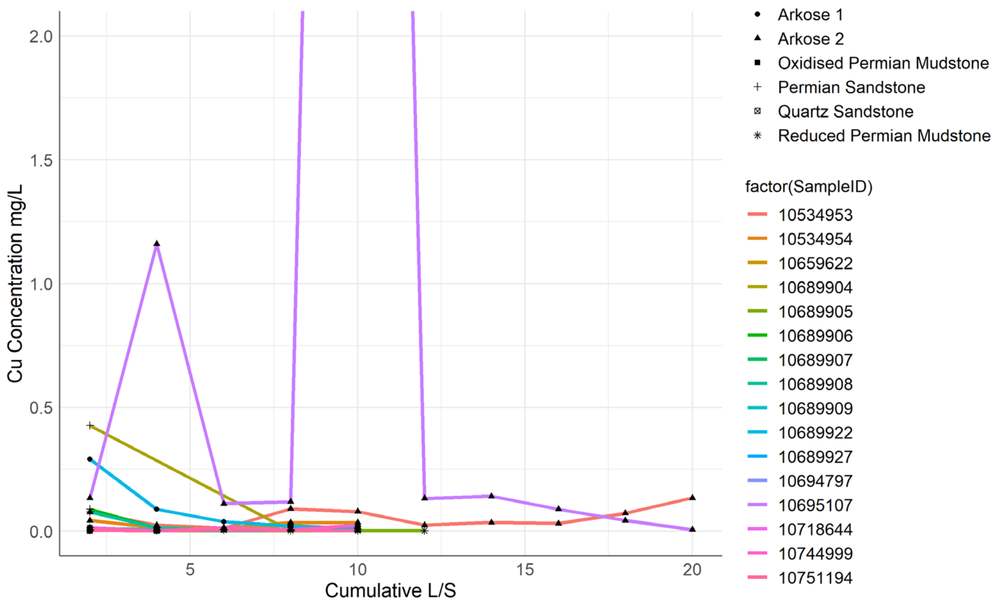

Figure 18: Cu concentration in each successive leachate from the MEP test (value out of range is 11.2 mg/L).

Due to the higher Cu release from sample 10695107 and increasing release from 10534953, five additional plant feed composites were tested using the MEP procedure to further investigate Cu leaching from oxide plant feed material. In the tests already discussed, metal concentrations are measured from leachate filtered at 0.45 µm. To further reduce the effect of potentially fine Cu and Fe bearing clays reporting to the filtrate, leachates from copper oxide plant feed composites were filtered at 0.2 µm.

Copper concentrations in all oxide plant feed composites plateaued at a constant release of about 0.1 mg/L after the second contact (Figure 19). The two samples with substantial distribution of Cu to kaolinite clay, and also the highest Cu grades (W15 CuOx and W81 CuOx), resulted in the highest cumulative release of Cu over the ten leaches (Figure 20).

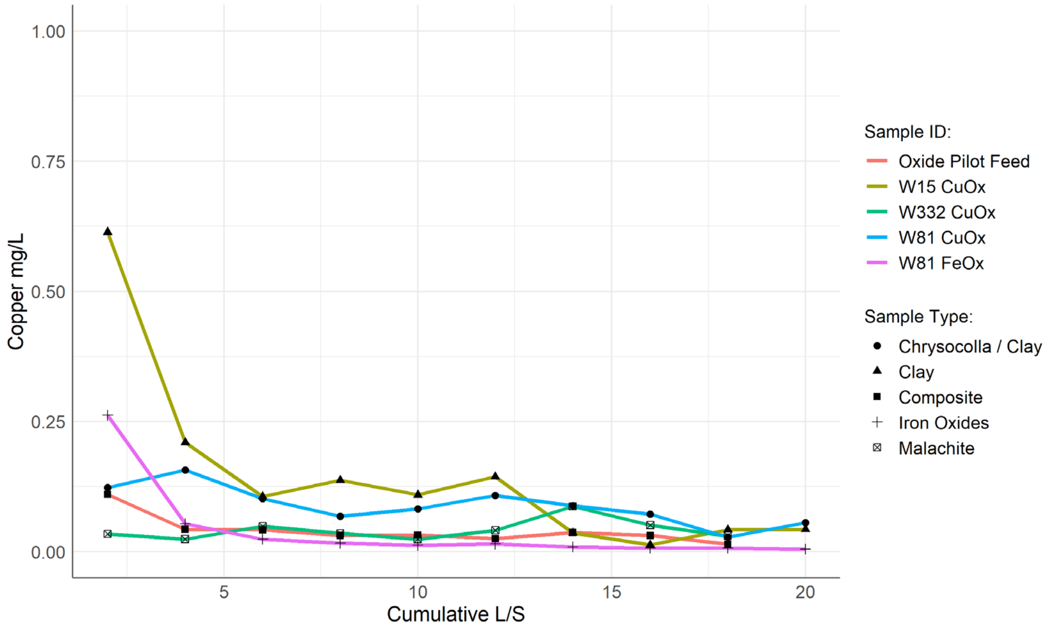

Figure 19: Cu concentration in each successive leachate of plant feed composites from the MEP test.

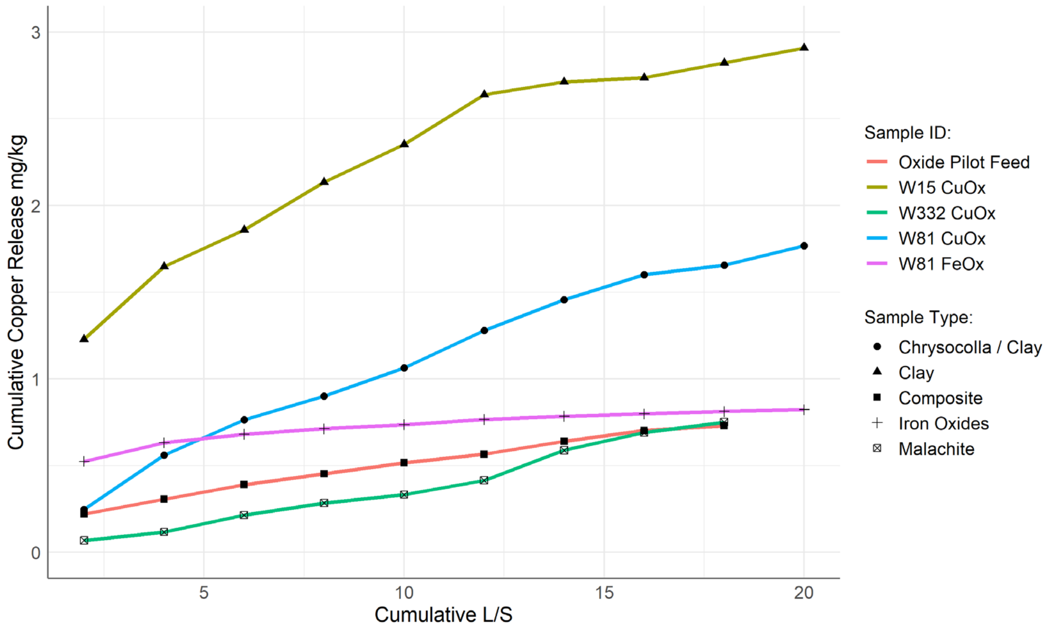

Figure 20: Cumulative Cu release by cumulative L/S for plant feed composites leached via the MEP test.

The final Cu concentration measured in leach ten (L/S = 20) for oxide pilot feed (excluded from graph) was anomalously high (1.1 mg/L). This corresponded with an increase in both Al and F for this sample. These elements would all be associated with fine clays, and it is suspected there was a filtration error for this sample allowing some fine clays to report to the final sample that was preserved with acid before analysis.

Apart from some low Cu release, there was minimal metals release during the MEP leaches on the oxide plant feed composites. Although W was consistently released from the plant feed composites, the concentrations decayed over successive contacts to approach detection limits (0.001 mg/L) for all samples. Similarly, F, Cl and sulfate release was typically below detection limits; bicarbonate was the only anion consistently detected in solution.

Geochemical modelling completed by SRK Consulting suggested that Cu concentrations leaching from oxide material are controlled by solubility of oxy-hydroxides or carbonate phases (SRK 2021). Therefore, there is minimal risk of Cu mobilisation from oxide ores in isolation.

3.5.2. *SEQUENTIAL LEACH EXTRACTS*

The interpretation of sequential extraction results below was adapted from analysis provided by Claire Linklater (SRK Consulting).

In general, the major elements are distributed within the scheme as would be expected. For all samples, Al, Si, Ca and K (key constituents of the silicate minerals present) did not leach significantly during Steps one to seven and reported mostly to the residual fraction (Figure 21 – Figure 23).

Calcium was distributed amongst several steps, with relatively high leaching during Step two (exchangeable) for all samples, and, during Step three (carbonate) and Step four (amorphous Fe and Mn oxide) for the reduced clay sample.

Iron and Mn predominantly reported to Step four and five (targeting Fe/Mn oxides). Sample 10689927 (permian clay oxidised) had a particularly high Mn content, which mostly leached during Step four (amorphous Fe / Mn). No Mn minerals were detected in mineralogical assays for any of the samples.

Step five (crystalline Fe/Mn) leached significant Mg and noticeable Al and K, possibly indicating that one of the silicates (potentially clinochlore) was leaching during this step.

Only the reduced clay sample (10689905) contained detectable sulfur (0.12 wt%), which leached in Step one (water extractable) and Step six (easily oxidisable), indicating the presence of water soluble oxidation products as well as sulfide minerals.

3.5.2.1. Trace Element Leaching

In most of the samples, trace element leaching is mostly associated with Steps four and five, interpreted as an association with Fe and Mn oxides. Cu and Co also leached in many of the other steps:

- In sample 10534953 (arkose 2), significant Cu leached in the exchangeable fraction. In the oxide zone, Cu is often found associated with clays and this method of Cu dissolution is consistent with this observation.
- Copper and Co leach in Step three (carbonate fraction), which was particularly noticeable in the arkose 2 sample (10534953).

For some trace elements, significant mass remains un-leached after Step seven, reporting to the residual fraction (e.g. Cr, Pb, Sn, Ti, Sb, Ba, Sr). These trace metals are therefore likely associated with silicates or any possibly unreacted crystalline oxide content, or insoluble secondary minerals.

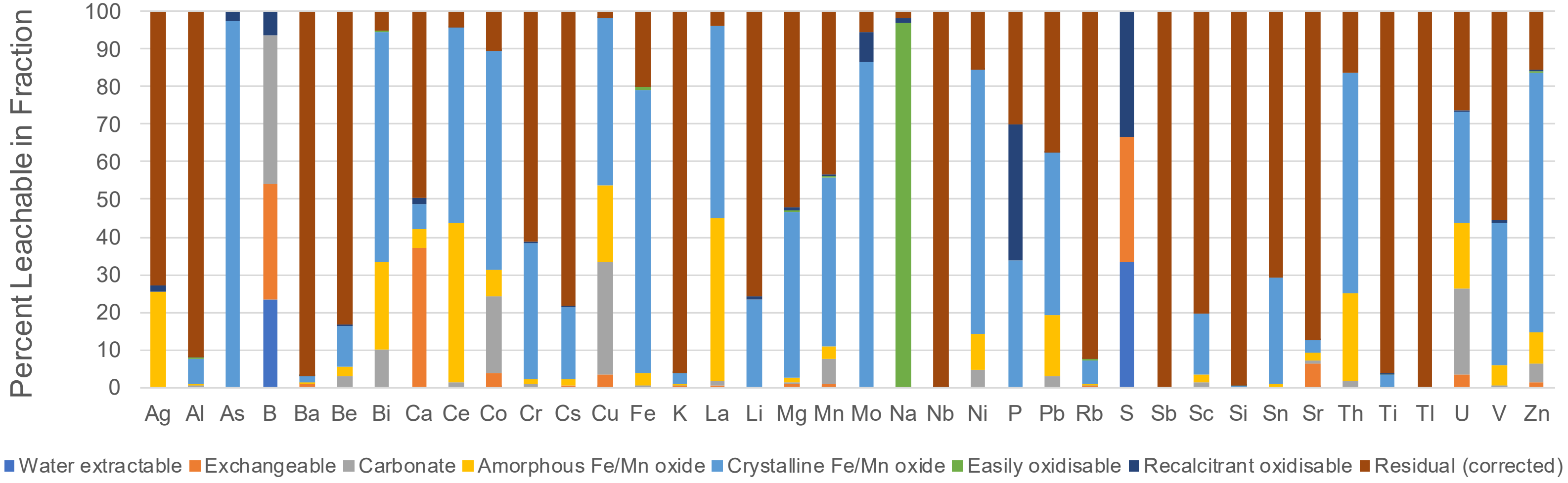

Figure 21: Sequential leach test results for arkose 2 sample 10534953.

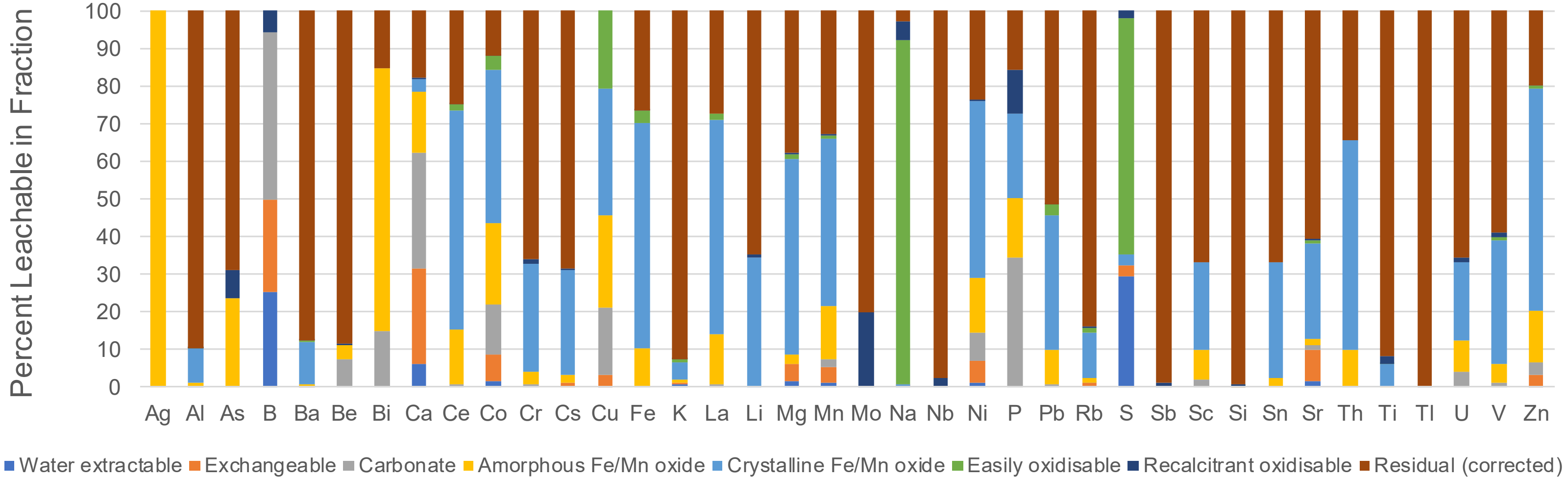

Figure 22: Sequential leach test results for permian clay reduced sample 10689905.

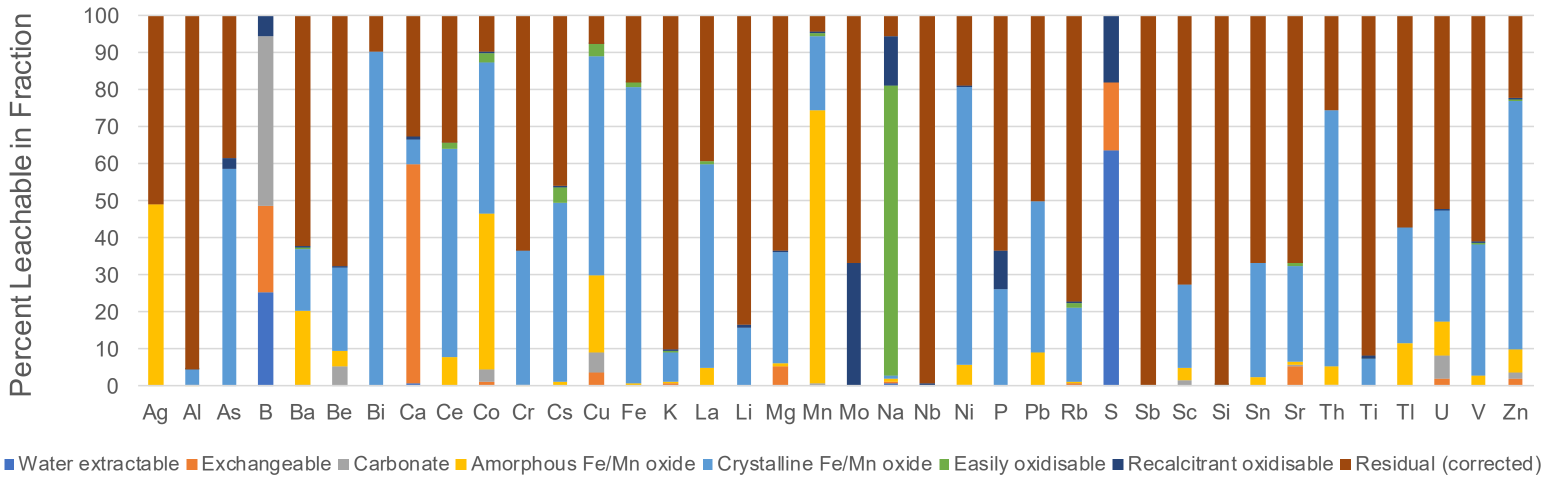

Figure 23: Sequential leach test results for permian clay oxidised sample 10689927.

3.5.2.2. Implications for Management

In the context of plant feed stockpiles or WRL, conditions are generally expected to be unsaturated and oxic. If placed as pit backfill and below the elevation of the long-term water table, waste rock may become saturated and anoxic post-closure (as water levels rebound and inundate the waste).

Direct correlation between the test results and the plant feed stockpiles/WRL are tenuous as the reagents used for Steps two to five are unlikely to be encountered. Steps six and seven represent contact with strong oxidants (stronger than would be encountered in the field). While sulfide minerals in the materials could be expected to oxidise, the rate of oxidation would not be reflected in sequential extraction test outcomes. Kinetic testing is therefore required to provide a more appropriate basis for establishing release rates and potential constituent concentrations.

The results for samples from oxide and overburden zones indicate that a significant proportion of trace element content is associated with Fe and Mn oxide (amorphous and crystalline) and residual mineral content. Noting that amorphous mineral content is not quantified, sample mineralogy (XRD, Table 5) indicated that hematite and magnetite (crystalline Fe oxides) comprised around 1 wt% of the samples, and silicates (residual mineral content) comprised 98-99 wt%. Leaching potential related to these mineral fractions is therefore low. The Fe and Mn oxide content, especially if crystalline, is expected to be unreactive unless conditions become either strongly acidic, or strongly reducing.

In general, oxide and overburden zone rocks are classed as NAF. Only relatively few atypical samples were classed as PAF (including the reduced clay sample). The likelihood of acidic conditions developing within a WRL or stockpile is considered low, and development of strongly acidic conditions is unlikely. Strongly reducing conditions are not considered likely unless a reducing agent is introduced (e.g. decomposing organic matter).

In the case of the copper oxide plant feed sample, there is some indication that significant Cu (and Co) is associated with the carbonate fraction. Mineralogical data has identified siderite at low levels (1 wt.%) but copper carbonates (malachite) may also be present. Under neutral pH conditions, carbonates are sparingly soluble but could be expected to react with contacting percolates releasing low quantities of any incorporated trace metal content.

Overall, if the materials will be managed to mitigate risk of acid onset, the leaching potential is low.

3.6. QUALITY ASSURANCE / QUALITY CONTROL

Data quality assurance and quality control was completed by assessing known correlations in the data received and comparing results from repeat sample submissions. In general, the data received from the laboratory was of good quality and can be used for generating defensible conclusions.

The total sulfur assays for the waste rock characterisation programme were consistent with the RTX assay results (Figure 24).

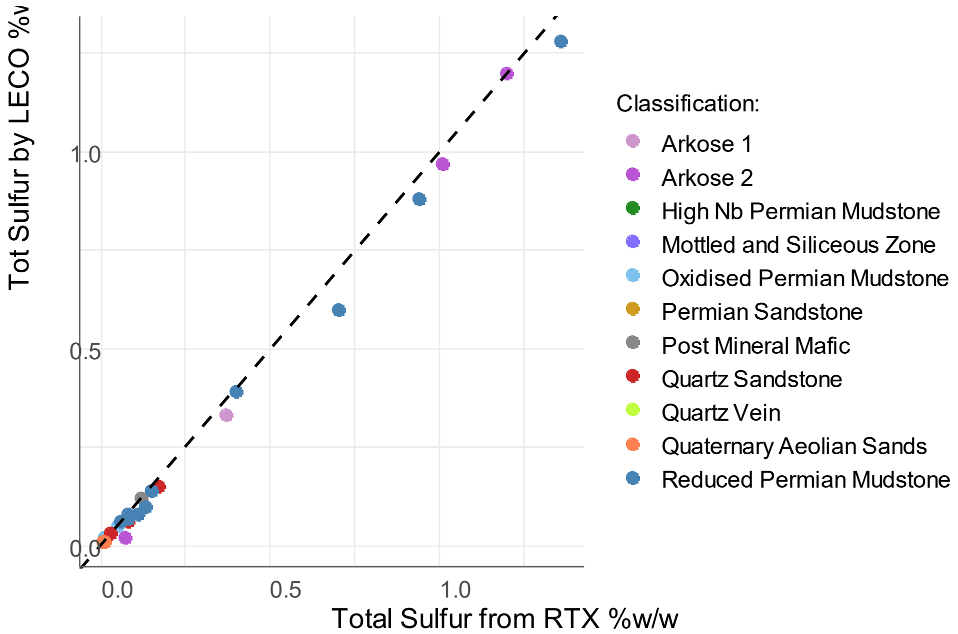

Figure 24: Total sulfur from RTX database and as reported by ALS.

Repeat ABA analysis of two of the samples tested demonstrated generally good repeatability of the assay results (Table 10). Occasional Relative Percentage Differences (RPD) were calculated to be above an acceptable limit (15%), but as these results were all relatively close to the detection limits, the higher error is considered acceptable.

As for the ABA analysis, QA/QC for the water leach tests was acceptable. The RPD on the charge contribution from major cations and major anions was less than 15% in all cases. A duplicate leach test for sample 10414104 was also completed. The pH of the leachate was much higher in the repeat compared with the original sample (7.87 compared with 7.03), corresponding with an increase in alkalinity (14 to 23 mg/L as $CaCO_3$). As a result, the concentrations of iron and aluminium were higher in the repeated sample (> 100% RPD). At the very low levels measured for these elements (< 1 mg/L), however, the differences were not considered to be of concern. The remaining differences between the elemental results were either below 15% RPD, or at low enough concentrations that the differences were not considered a concern (Table 11).

Table 10: Comparison of repeat assay results for ABA tests.

Value	10384555	10384555b	10442072	10442072b
Total S wt.%	0.07	0.07	0.02	0.02
RPD	0%		0%	
Sulfide S wt.%	0.05	0.04	0.01	0.01
RPD	22%		0%	
Total C wt.%	1.01	1.01	0.01	0.01
RPD	0%		0%	
Organic C wt.%	0.43	0.43	0.01	0.01

Value	10384555	10384555b	10442072	10442072b
RPD	0%		0%	
ANC kg/t	5.8	6.0	2.7	2.0
RPD	3%		30%	
NAG (pH 7) kg/t	0.2	0.01	3.7	3.3
RPD	181%		11%	

Table 11: Comparison of repeat assay results for metal leaching test.

Value	10384555	10384555b
Ba, mg/L	0.18	0.41
RPD	76%	
Cu, mg/L	0.02	0.03
RPD	33%	
Pb, mg/L	0.001	0.002
RPD	67%	
Ti, mg/L	0.01	0.02
RPD	67%	
W, mg/L	0.003	0.004
RPD	29%	
Zn, mg/L	0.1	0.12
RPD	25%	

Two samples of oxide zone were additionally re-analysed as fresh core cut from the other side of the cut core at a different laboratory (Chemistry Centre). The comparative results for these samples are shown in Table 12. Given the differences between the samples, the results are close enough in general to support the validity of the ALS analysis program. The lower ANC values in each case support the comment in the ABA section that the ALS AMIRA (2002) method for determining ANC overestimates available ANC in Winu samples.

Table 12: Results from re-analysis of the other side of a core sample at a different laboratory.

Sample ID	ANC kg H_2SO_4/t	NAG pH 7 kg H_2SO_4/t	NAG pH	Total S %	Sulfide S %
10410053 original	2.8	< 0.1	7.2	< 0.01	< 0.01
10410053 fresh	< 0.5	< 0.5	5.8	< 0.01	< 0.01
10414096 original	4.8	1.7	5.2	0.1	0.05
10414096 fresh	< 0.5	1.3	4.0	0.12	0.08

One standard reference material sample (CRL NAF-1904-002) was submitted to ALS for confirmation of laboratory accuracy using the AMIRA (2002) test methods. The comparison of ALS results to certified result is shown in Table 13.

Table 13: Comparison of ALS laboratory results with certified standard.

Analyte	Unit	NAF-1904-002 Certified Range	ALS Result
Paste pH	-	7.91 – 8.3	6.7
Total S	wt.%	0.31 – 0.33	0.32
ANC	kg H_2SO_4/t	54.98 – 57.92	55.9
NAG pH	-	8.29 – 10.45	8.2

4. SUMMARY

Sixty three waste and plant feed samples were characterised from the upper zone. On average, the Winu oxide and overburden waste rock is not expected to be acid generating. Seven of the samples tested from the upper portion of the Winu deposit were classified as PAF (four of these as PAF-LC). One sample was classified as uncertain and the remaining 55 samples in the upper zone were classified as NAF or barren and exhibited negligible ANC. As a result, it is unsuitable material for neutralising acid that may be generated from waste rock from other portions of the Winu deposit. From the data collected, the reduced permian mudstone appears to be the most likely lithology to generate acid, with 13% of drill holes exceeding 0.2% total sulfur (however the 95% percentile is still relatively low at 0.42%).

In general, metal leaching from the upper zone was negligible and where noted, mostly occurred from the arkose 2 lithology. Apart from F, none of the elements of concern were noted as being mobile in the short term DI water leach. Fluoride was flushed from samples during the multi leach extract tests and Cu release from plant feed samples was low. Salinity was typically low in 2:1 leach test.

5. KEY REFERENCES

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APPENDIX 1 – SAMPLE INFORMATION

Sample ID	Lithology	Depth m	Total S %	Sulfide %	MPA (Sulfide) kg H_2SO_4/t	Total C %	TIC %	ANC kg H_2SO_4/t	ANC_{TIC} kg H_2SO_4/t	NAPP kg H_2SO_4/t	NPR	NAF/PAF
10413553	Arkose 1	177	0.01	0.01	0.306	0.03	0.00	1.1	0.0	-0.8	3.59	Barren
10414116	Arkose 1	159	0.01	0.01	0.306	0.02	0.00	4.0	0.0	-3.7	13.07	Barren
10414155	Arkose 1	129	0.33	0.23	7.038	0.07	0.06	6.6	4.9	0.4	0.94	PAF-LC
10411853	Arkose 1	181	0.01	0.01	0.306	0.01	0.00	1.3	0.0	-1.0	4.25	Barren
10442056	Arkose 1	177	0.01	0.01	0.306	0.01	0.00	4.2	0.0	-3.9	13.73	Barren
10445568	Arkose 1	153	0.01	0.01	0.306	0.02	0.00	1.0	0.0	-0.7	3.27	Barren
10415871	Arkose 1	191	0.01	0.01	0.306	0.01	0.00	1.5	0.0	-1.2	4.90	Barren
10386397	Arkose 2	156	0.01	0.01	0.306	0.01	0.00	2.4	0.0	-2.1	7.84	Barren
10442072	Arkose 2	165	0.02	0.01	0.306	0.01	0.00	2.7	0.0	-2.4	8.82	Barren
10442087	Arkose 2	153	0.01	0.01	0.306	0.01	0.00	3.4	0.0	-3.1	11.11	Barren
10444887	Arkose 2	132	0.97	0.65	19.89	0.01	0.00	4.1	0.0	15.8	0.21	PAF
10444914	Arkose 2	110	1.2	0.85	26.01	0.01	0.00	0.5	0.0	25.5	0.02	PAF
10695107	Arkose 2	155	0.01	0.01	0.306	0.07	0.00	7.4	0.0	-7.1	24.18	NAF
10744999	Arkose 2	173	0.01	0.01	0.306	0.06	0.00	0.5	0.0	-0.2	1.63	Barren
10442755	High Nb permian mudstone	195	0.02	0.01	0.306	0.16	0.04	1.4	3.3	-1.1	4.58	Barren
10443538	High Nb permian mudstone	183	0.01	0.01	0.306	0.02	0.00	1.2	0.0	-0.9	3.92	Barren
10384329	Mottled and siliceous zone	219	0.01	0.01	0.306	0.26	0.13	0.5	10.6	-0.2	1.63	Barren
10415845	Mottled and siliceous zone	211	0.01	0.01	0.306	0.05	0.00	0.6	0.0	-0.3	1.96	Barren
10384543	Oxidised permian mudstone	184	0.01	0.01	0.306	0.07	0.05	4.0	4.1	-3.7	13.07	Barren
10410053	Oxidised permian mudstone	185	0.01	0.01	0.306	0.05	0.02	2.8	1.6	-2.5	9.15	Barren
10442767	Oxidised permian mudstone	184	0.02	0.01	0.306	0.01	0.00	3.0	0.0	-2.7	9.80	Barren
10450553	Oxidised permian mudstone	159	0.05	0.03	0.918	0.39	0.00	7.1	0.0	-6.2	7.73	NAF
10720487	Oxidised permian mudstone	184	0.01	0.01	0.306	0.06	0.01	1.6	0.8	-1.3	5.23	Barren
10718644	Oxidised permian mudstone	188	0.01	0.01	0.306	0.1	0.00	1.8	0.0	-1.5	5.88	Barren
10414054	Permian sandstone	208	0.01	0.01	0.306	0.03	0.02	0.8	1.6	-0.5	2.61	Barren
10411821	Permian sandstone	206	0.01	0.01	0.306	0.03	0.00	0.9	0.0	-0.6	2.94	Barren
10442023	Permian sandstone	202	0.01	0.01	0.306	0.03	0.00	1.0	0.0	-0.7	3.27	Barren
10415331	Permian sandstone	208	0.01	0.01	0.306	0.01	0.00	1.0	0.0	-0.7	3.27	Barren

Sample ID	Lithology	Depth m	Total S %	Sulfide %	MPA (Sulfide) kg H_2SO_4/t	Total C %	TIC %	ANC kg H_2SO_4/t	ANC_{TIC} kg H_2SO_4/t	NAPP kg H_2SO_4/t	NPR	NAF/PAF
10415347	Permian sandstone	207	0.01	0.01	0.306	0.04	0.00	0.6	0.0	-0.3	1.96	Barren
10388244	Permian sandstone	204	0.01	0.01	0.306	0.06	0.04	1.3	3.3	-1.0	4.25	Barren
10537974	Permian sandstone	216	0.01	0.01	0.306	0.07	0.01	1.2	0.8	-0.9	3.92	Barren
10373518	Post Mineral Mafic	180	0.2	0.01	0.306	0.09	0.03	*NA*	2.5	*NA*	*NA*	*NA*
10444905	Post Mineral Mafic	118	0.12	0.06	1.836	1.83	1.80	12.8	147.1	-11.0	6.97	NAF
10385046	Quartz sandstone	188	0.01	0.01	0.306	0.06	0.04	1.1	3.3	-0.8	3.59	Barren
10410087	Quartz sandstone	157	0.03	0.02	0.612	0.03	0.00	5.2	0.0	-4.6	8.50	NAF
10413544	Quartz sandstone	185	0.01	0.01	0.306	0.01	0.00	0.8	0.0	-0.5	2.61	Barren
10410979	Quartz sandstone	190	0.01	0.01	0.306	0.01	0.00	0.5	0.0	-0.2	1.63	Barren
10411013	Quartz sandstone	164	0.01	0.01	0.306	0.01	0.00	1.1	0.0	-0.8	3.59	Barren
10414104	Quartz sandstone	169	0.15	0.09	2.754	0.01	0.00	2.7	0.0	0.1	0.98	PAF-LC
10414146	Quartz sandstone	136	0.06	0.05	1.53	0.04	0.02	10.4	1.6	-8.9	6.80	NAF
10411856	Quartz sandstone	178	0.01	0.01	0.306	0.02	0.00	2.2	0.0	-1.9	7.19	Barren
10411875	Quartz sandstone	163	0.01	0.01	0.306	0.01	0.00	2.0	0.0	-1.7	6.54	Barren
10442055	Quartz sandstone	178	0.01	0.01	0.306	0.03	0.02	1.2	1.6	-0.9	3.92	Barren
10414847	Quartz sandstone	171	0.01	0.01	0.306	0.03	0.00	0.5	0.0	-0.2	1.63	Barren
10415364	Quartz sandstone	193	0.01	0.01	0.306	0.01	0.00	0.8	0.0	-0.5	2.61	Barren
10415387	Quartz sandstone	173	0.01	0.01	0.306	0.02	0.00	1.0	0.0	-0.7	3.27	Barren
10443558	Quartz sandstone	175	0.01	0.01	0.306	0.02	0.00	1.0	0.0	-0.7	3.27	Barren
10722097	Quartz sandstone	155	0.01	0.01	0.306	0.03	0.00	0.5	0.0	-0.2	1.63	Barren
10722105	Quartz sandstone	148	0.01	0.01	0.306	0.03	0.00	3.2	0.0	-2.9	10.46	Barren
10445531	Quartz vein	183	0.01	0.01	0.306	0.01	0.00	0.5	0.0	-0.2	1.63	Barren
10384984	Quaternary aeolian sands	241	0.01	0.01	0.306	0.1	0.03	0.5	2.5	-0.2	1.63	Barren
10388195	Quaternary aeolian sands	243	0.01	0.01	0.306	0.12	0.07	0.8	5.7	-0.5	2.61	Barren
10388211	Quaternary aeolian sands	231	0.01	0.01	0.306	0.24	0.12	1.5	9.8	-1.2	4.90	Barren
10718244	Quaternary aeolian sands	235	0.01	0.01	0.306	0.1	0.02	3.1	1.6	-2.8	10.13	Barren
10384555	Reduced permian mudstone	173	0.07	0.05	1.53	1.01	0.58	5.8	47.4	-4.3	3.79	NAF
10414096	Reduced permian mudstone	175	0.1	0.05	1.53	0.21	0.07	4.8	5.7	-3.3	3.14	NAF

Sample ID	Lithology	Depth m	Total S %	Sulfide %	MPA (Sulfide) kg H_2SO_4/t	Total C %	TIC %	ANC kg H_2SO_4/t	ANC_{TIC} kg H_2SO_4/t	NAPP kg H_2SO_4/t	NPR	NAF/PAF
10416993	Reduced permian mudstone	161	0.08	0.06	1.836	0.9	0.40	4.3	32.7	-2.5	2.34	Barren
10452961	Reduced permian mudstone	141	1.28	0.96	29.376	0.72	0.30	4.8	24.5	24.6	0.16	PAF
10452973	Reduced permian mudstone	131	0.14	0.07	2.142	0.57	0.04	6.3	3.3	-4.2	2.94	NAF
10452978	Reduced permian mudstone	127	0.06	0.02	0.612	0.37	0.04	8.9	3.3	-8.3	14.54	NAF
10453296	Reduced permian mudstone	147	0.08	0.04	1.224	0.72	0.19	4.3	15.5	-3.1	3.51	Barren
10687985	Reduced permian mudstone	136	0.6	0.5	15.3	0.52	0.19	13.0	15.5	2.3	0.85	PAF-LC
10751194	Reduced permian mudstone	156	0.39	0.35	10.71	1.09	0.76	0.5	62.1	10.2	0.05	PAF-LC
10808364	Reduced permian mudstone	*NA*	0.88	0.81	24.786	1.27	0.72	13.1	58.8	11.7	0.53	UNC
10387328	*NA*	241	0.07	0.05	1.53	1.01	0.58	*NA*	47.4	*NA*	*NA*	*NA*
W15 CuOx	Oxide plant feed (Clay)		0.01	0.006	0.192	0.02	0.02	0.6	1.6	-0.41	3.13	Barren
W332 CuOx	Oxide plant feed (Malachite)		0.01	0.009	0.288	0.04	0.02	0.5	1.6	-0.21	1.74	Barren
W81 CuOx	Oxide plant feed (Chrysocolla)		0.02	0.012	0.384	0.03	0.02	0.5	1.6	-0.12	1.30	Barren
W81 FeOx	Oxide plant feed (FeOx)		0.01	0.009	0.288	0.02	0.02	0.5	1.6	-0.21	1.74	Barren
Oxide Pilot	Oxide plant feed (Composite)		0.07	0.016	0.512	0.04	0.04	3.3	3.3	-2.79	6.45	Barren

Complete Whole Rock Digest Results

Sample_ID	Description	Hole	From	To	Ag_ppm	Al2O3_pct	As_pct	Au_ppm	BaO_pct	Be_ppm	Bi_ppm	CaO_pct	Cd_ppm	Ce_ppm	Co_ppm	Cr_ppm	Cs_ppm	Cu_pct	Fe2O3_pct	Ga_ppm	Ge_ppm	Hf_ppm	In_ppm	K2O_pct	La_ppm	Li_ppm	MgO_pct	MnO_pct	Mo_ppm	Na2O_pct
				Average crustal abundance	*0.08*	*15.6*	*0.0002*	*0.00*	*0.05*	*2.8*	*0.01*	*5.81*	*0.15*	*66.5*	*25.0*	*102*	*3.0*	*0.01*	*8.0*	*19*	*1.50*	*3.0*	*0.25*	*2.5*	*39*	*20*	*3.86*	*0.12*	*1.2*	*3.18*
10413553	Arkose 1	WINU0004	77	78	0.86	10.9	0.0005	0.41	0.02	1.2	897.0	0.03	0.00	79.2	21.0	64	2.2	0.05	2.1	14	0.18	2.7	0.87	1.0	34	27	0.17	0.02	7.9	0.04
10414116	Arkose 1	WINU0007	99	100	0.18	16.0	0.0002	0.01	0.08	2.4	0.8	0.07	0.14	70.9	23.4	76	23.4	0.02	5.4	24	0.17	3.9	0.05	5.8	33	53	1.69	0.03	1.5	0.11
10414155	Arkose 1	WINU0007	134	135	0.36	18.3	0.0000	0.01	0.18	2.4	1.7	0.52	0.29	67.0	25.2	82	17.1	0.01	4.8	23	0.13	3.9	0.03	5.6	28	57	1.87	0.04	3.2	0.72
10411853	Arkose 1	WINU0008	73	74	0.55	14.3	0.0004	0.00	0.09	2.2	3.3	0.03	0.00	92.0	11.8	62	17.3	0.04	5.4	21	0.24	4.1	0.03	3.9	44	27	0.45	0.01	1.9	0.09
10442056	Arkose 1	WINU0009	83	84	0.76	14.6	0.0001	0.00	0.14	1.9	4.6	0.08	0.00	103.0	27.3	67	47.7	0.11	8.4	19	0.15	3.3	0.03	6.4	62	49	1.13	0.03	1.1	0.17
10445568	Arkose 1	WINU0014	104	105	1.23	16.4	0.0004	0.02	0.05	2.3	18.9	0.01	0.04	93.5	4.3	89	6.3	0.22	2.3	22	0.17	3.6	0.24	2.7	38	29	0.32	0.01	3.0	0.06
10415871	Arkose 1	WINU0015	66	67	0.64	17.8	0.0004	0.00	0.06	2.0	31.5	0.03	0.00	130.0	3.4	80	3.1	0.01	1.0	29	0.10	3.8	0.15	3.1	43	51	0.36	0.01	0.2	0.11
10386397	Arkose 2	WINU0001	101	102	3.26	12.8	0.0002	0.01	0.14	1.9	54.5	0.04	0.02	35.0	32.2	74	12.5	0.13	5.1	17	0.15	4.2	0.14	5.9	13	28	0.56	0.05	5.0	0.10
10442072	Arkose 2	WINU0009	97	98	0.25	15.3	0.0000	0.03	0.11	3.0	3.4	2.07	0.08	90.4	39.8	73	14.3	0.06	5.8	24	0.19	4.5	0.04	5.9	43	64	2.26	0.05	0.8	0.62
10442087	Arkose 2	WINU0009	111	112	7.00	11.3	0.0001	0.10	0.23	2.4	14.0	0.07	0.07	27.6	27.7	53	11.2	0.16	9.4	13	0.15	3.3	0.37	6.6	13	31	0.75	0.02	2.9	0.16
10444887	Arkose 2	WINU0039	132	133	1.90	14.1	0.0001	0.40	0.04	3.4	39.9	0.66	0.70	91.3	136.0	82	10.7	0.19	7.7	21	0.23	5.9	0.05	2.9	43	40	1.71	0.04	1.4	0.67
10444914	Arkose 2	WINU0039	157	158	0.20	16.4	0.0001	0.10	0.03	4.2	11.0	0.06	0.06	116.5	96.5	87	6.1	0.05	2.0	23	0.16	5.9	0.03	1.8	60	47	0.27	0.01	0.4	0.04
10534953	Arkose 2	WINU0091	85	86																										
10695107	Arkose 2	WINU0339	95	96	1.81	17.4	0.0002	0.07	0.05	2.3	88.4	0.06	0.00	66.3	9.8	88	7.2	2.31	1.9	28	0.11	5.7	0.73	3.8	29	46	0.73	0.01	1.5	0.10
10744999	Arkose 2	WINU0458	77	78	1.13	10.2	0.0001	0.13	0.06	1.7	14.9	0.06	0.00	56.3	26.6	41	19.1	0.14	4.4	14	0.11	3.8	0.05	3.6	27	28	0.75	0.02	1.3	0.09
10442755	High Nb Permian Mudstone	WINU0013	56	57	10.50	2.6	0.0000	0.00	0.01	0.2	0.1	0.01	0.01	27.3	0.5	7	0.1	0.00	0.6	2	0.03	0.9	0.01	0.0	19	13	0.02	0.01	0.3	0.07
10443538	High Nb Permian Mudstone	WINU0024	73	74	0.13	28.4	0.0001	0.01	0.05	2.3	28.1	0.01	0.00	11.3	1.9	103	4.5	0.01	1.1	40	0.10	4.7	0.17	4.3	3	62	0.55	0.01	2.2	0.12
10384329	Mottled and Siliceous Zone	WB18WIN0002	26	27	0.01	1.2	0.0002	0.01	0.00	0.1	0.2	0.01	0.00	3.9	0.9	27	0.1	0.00	1.7	3	0.03	5.4	0.02	0.0	2	3	0.02	0.01	2.4	0.02
10415845	Mottled and Siliceous Zone	WINU0015	43	44	2.29	0.2	0.0001	0.00	0.01	0.1	0.1	0.01	0.00	18.1	1.1	42	0.1	0.00	0.5	2	0.07	1.9	0.01	0.0	12	4	0.01	0.01	0.5	0.04
10387328	NA	WIDI0007	6	7	0.03	7.1	0.0003	0.01	0.00	0.4	0.2	0.01	0.00	21.7	3.2	46	0.8	0.00	2.3	9	0.06	2.8	0.04	0.1	7	9	0.03	0.01	0.9	0.01
10387402	NA	WIDI0007	72	73	4.45	13.9	0.0003	0.78	0.05	2.3	71.0	0.04	0.01	167.0	58.4	80	1.7	0.19	6.9	24	0.21	7.8	0.62	0.4	108	22	0.07	0.07	3.3	0.04
10384543	Oxidised Permian Mudstone	RC18WIN0001	68	69	0.05	15.0	0.0007	0.01	0.13	3.8	0.4	0.11	0.14	88.2	18.1	64	9.6	0.00	7.5	21	0.27	3.7	0.06	2.6	41	36	0.85	0.22	0.4	0.08
10410053	Oxidised Permian Mudstone	WINU0003	68	69	0.16	14.4	0.0005	0.01	0.13	3.8	0.4	0.07	0.13	88.0	25.9	57	10.0	0.00	5.3	19	0.15	4.1	0.06	2.0	46	35	0.53	0.10	0.5	0.06
10442767	Oxidised Permian Mudstone	WINU0013	67.3	68.9	1.10	7.4	0.0012	0.06	0.05	1.3	0.9	0.04	0.09	165.5	46.7	38	2.0	0.09	6.6	10	0.41	3.2	0.02	0.4	156	22	0.08	0.18	8.1	0.04
10450553	Oxidised Permian Mudstone	WINU0038	106	107	0.06	15.2	0.0004	0.00	0.06	3.0	0.4	0.41	0.05	97.6	15.9	73	9.2	0.00	4.5	21	0.17	3.9	0.08	3.8	49	49	1.81	0.03	0.4	0.13
10720487	Oxidised Permian Mudstone	WINU0536	62	63	0.62	8.8	0.0008	0.10	0.02	1.3	0.1	0.04	0.07	78.8	40.4	17	0.5	0.01	1.5	9	0.20	2.9	0.02	0.2	57	17	0.07	0.04	1.1	0.03
10718644	Oxidised Permian Mudstone	WINU0566	62	63	0.28	14.6	0.0008	0.01	0.10	5.4	0.5	0.08	0.03	139.0	13.5	63	8.0	0.11	4.8	21	0.22	4.2	0.06	1.8	61	39	0.53	0.02	1.0	0.05
10414054	Permian Sandstone	WINU0007	43	44	0.04	4.1	0.0000	0.01	0.01	0.2	0.4	0.03	0.00	12.5	2.0	26	0.1	0.00	0.5	3	0.03	1.3	0.01	0.0	9	6	0.02	0.01	1.7	0.03
10411821	Permian Sandstone	WINU0008	44	45	0.22	2.7	0.0001	0.00	0.01	0.1	0.0	0.01	0.00	15.5	3.2	26	0.1	0.00	0.4	2	0.03	1.0	0.01	0.0	11	5	0.02	0.00	1.9	0.02
10442023	Permian Sandstone	WINU0009	53.3	54	5.51	0.4	0.0001	0.00	0.01	0.1	0.1	0.01	0.00	18.5	7.7	11	0.1	0.00	0.7	1	0.05	1.5	0.01	0.0	11	5	0.01	0.01	0.7	0.03
10415331	Permian Sandstone	WINU0010	44	45	0.07	3.8	0.0001	0.00	0.01	0.2	0.9	0.03	0.00	16.6	2.5	16	0.1	0.00	0.5	4	0.06	1.6	0.01	0.0	12	6	0.02	0.01	0.7	0.03
10415347	Permian Sandstone	WINU0012	42	43	1.48	2.7	0.0000	0.00	0.00	0.3	15.0	0.01	0.01	12.4	3.2	11	0.1	0.00	0.7	2	0.03	1.1	0.01	0.0	9	13	0.02	0.01	0.5	0.03
10388244	Permian Sandstone	WINU0019	48	49	0.04	2.9	0.0001	0.00	0.01	0.2	6.0	0.01	0.00	14.6	0.5	9	0.1	0.00	0.4	3	0.03	1.5	0.02	0.0	11	5	0.02	0.01	0.5	0.01
10537974	Permian Sandstone	WINU0344	34	35	0.04	4.5	0.0000	0.00	0.01	0.2	0.1	0.03	0.00	17.5	7.2	9	0.1	0.00	0.2	5	0.03	1.5	0.02	0.0	11	7	0.02	0.00	0.4	0.03
10373518	Post Mineral Mafic	RC17PAW0001	76	77	8.70	27.1	0.0001	0.04	0.97	0.1	1.9	0.15	0.25	72.8	11.0	100	1.6	1.42	2.4	30	2.50	4.1	0.08	0.9	70	70	0.12	0.01	1.0	0.07
10444905	Post Mineral Mafic	WINU0039	148	149	0.05	13.9	0.0000	0.00	0.02	1.6	0.1	6.67	0.10	23.2	96.9	122	1.2	0.01	19.1	17	0.22	2.0	0.04	1.0	12	18	4.26	0.39	0.4	1.50
10385046	Quartz Sandstone	RC18WIN0003	60	61	0.29	10.4	0.0001	0.04	0.01	0.6	129.0	0.01	0.00	23.8	1.7	23	1.4	0.01	0.6	11	0.05	4.3	0.35	0.7	15	25	0.10	0.01	2.2	0.03
10410087	Quartz Sandstone	WINU0003	99	100	0.33	8.9	0.0001	0.08	0.12	1.3	27.0	0.15	0.18	41.1	24.4	57	9.4	0.04	3.0	11	0.13	3.0	0.02	4.2	19	31	1.04	0.03	2.3	0.20
10413544	Quartz Sandstone	WINU0004	69	70	0.41	24.8	0.0003	0.02	0.04	2.8	40.1	0.03	0.00	66.5	8.0	81	7.3	0.02	1.3	34	0.17	5.2	0.41	3.2	31	52	0.48	0.01	2.3	0.06
10410979	Quartz Sandstone	WINU0006	63	64	0.64	2.2	0.0001	5.39	0.00	0.5	27.9	0.01	0.00	29.7	2.3	31	0.5	0.04	1.2	3	0.05	0.9	0.27	0.1	12	6	0.02	0.01	2.4	0.02
10411013	Quartz Sandstone	WINU0006	93	94	2.54	4.5	0.0007	6.37	0.12	1.4	486.0	0.01	0.32	16.4	57.3	37	3.1	0.15	14.1	6	0.24	1.3	1.87	2.8	7	7	0.10	0.01	19.9	0.07
10414104	Quartz Sandstone	WINU0007	88	89	0.63	7.3	0.0002	0.05	0.06	0.9	10.6	0.04	0.38	39.6	17.6	42	8.9	0.09	3.0	9	0.15	3.5	0.06	3.5	21	21	0.66	0.04	3.6	0.08
10414146	Quartz Sandstone	WINU0007	126	127	0.18	11.0	0.0001	0.08	0.08	1.8	42.3	0.62	0.20	48.3	20.9	62	9.0	0.02	3.3	14	0.26	5.2	0.02	4.3	21	46	1.48	0.04	3.9	0.77
10411856	Quartz Sandstone	WINU0008	76	77	1.33	9.9	0.0003	0.22	0.13	2.6	53.4	0.01	0.00	72.1	45.9	66	9.4	0.05	9.7	14	0.16	3.1	0.29	4.3	39	35	0.50	0.02	11.3	0.11
10411875	Quartz Sandstone	WINU0008	93	94	1.43	5.0	0.0002	0.22	0.04	0.8	23.8	0.03	0.01	48.9	36.8	29	8.5	0.05	5.1	7	0.11	2.2	0.06	2.2	25	12	0.30	0.01	2.6	0.06
10442055	Quartz Sandstone	WINU0009	82	83	1.38	9.6	0.0001	0.00	0.11	2.3	1.8	0.04	0.00	56.0	14.9	44	22.3	0.22	11.8	13	0.11	2.7	0.02	4.7	28	23	0.41	0.01	1.7	0.11
10414847	Quartz Sandstone	WINU0010	86	87	0.32	8.8	0.0002	0.13	0.01	0.7	461.0	0.01	0.00	29.7	1.3	34	1.6	0.01	0.8	11	0.06	2.7	0.48	0.6	27	22	0.10	0.01	6.2	0.03
10415364	Quartz Sandstone	WINU0012	57	58	0.26	8.2	0.0002	0.05	0.01	0.7	149.0	0.01	0.00	56.6	1.0	26	2.1	0.00	0.3	10	0.07	5.6	0.31	0.7	54	23	0.12	0.01	0.8	0.02
10415387	Quartz Sandstone	WINU0012	78	79	0.94	6.7	0.0004	0.11	0.01	0.7	117.0	0.01	0.00	48.7	1.5	32	1.1	0.02	0.9	8	0.06	2.4	0.19	0.6	20	16	0.08	0.01	4.4	0.02
10443558	Quartz Sandstone	WINU0024	82	83	0.97	9.0	0.0002	0.01	0.00	0.6	44.7	0.01	0.00	39.7	1.6	25	1.6	0.01	0.6	10	0.09	2.7	0.22	0.5	10	18	0.08	0.00	2.3	0.04
10722097	Quartz Sandstone	WINU0349	100	100.81	1.04	8.5	0.0002	1.01	0.01	1.1	29.9	0.01	0.02	43.2	1.3	25	2.8	0.03	1.3	9	0.09	4.3	0.19	0.8	27	21	0.13	0.00	0.8	0.02
10722105	Quartz Sandstone	WINU0349	108	109	0.90	4.7	0.0008	0.06	0.01	0.9	47.0	0.01	0.00	30.2	8.1	19	2.3	0.04	3.2	7	0.08	1.6	0.44	1.0	11	15	0.18	0.01	1.7	0.02
10445531	Quartz Vein	WINU0014	70	71	0.70	1.9	0.0005	0.02	0.01	0.6	138.5	0.03	0.09	19.2	55.3	163	1.4	0.04	3.0	3	0.08	0.4	0.14	0.5	5	7	0.10	0.03	2.1	0.03
10384984	Quaternary Aeolian Sands	RC18WIN0003	4	5	0.03	4.5	0.0003	0.01	0.00	0.2	0.2	0.01	0.00	10.0	2.2	46	0.6	0.00	2.3	6	0.10	2.8	0.03	0.1	5	8	0.02	0.01	0.8	0.01
10388195	Quaternary Aeolian Sands	WINU0019	4	5	0.03	3.5	0.0002	0.00	0.00	0.2	0.1	0.01	0.00	6.8	1.2	32	0.5	0.00	1.4	5	0.07	1.4	0.01	0.0	4	5	0.02	0.01	0.5	0.01
10388211	Quaternary Aeolian Sands	WINU0019	18	19	0.01	15.0	0.0003	0.00	0.01	0.1	0.8	0.06	0.01	5.6	1.3	59	0.3	0.00	1.8	22	0.03	4.8	0.08	0.0	2	9	0.07	0.00	1.8	0.04
10718244	Quaternary Aeolian Sands	WINU0564	15	16	0.01	9.3	0.0002	0.00	0.02	0.1	0.2	0.04	0.01	5.6	1.4	41	0.2	0.00	1.3	13	0.03	3.6	0.05	0.0	3	11	0.03	0.00	1.5	0.03
10384555	Reduced Permian Mudstone	RC18WIN0001	79	80	0.07	14.1	0.0004	0.01	0.06	2.6	0.4	0.20	0.08	89.9	17.0	52	7.0	0.00	6.6	19	0.31	3.8	0.05	2.1	42	44	1.29	0.09	0.6	0.09
10414096	Reduced Permian Mudstone	WINU0007	81	82	0.09	11.0	0.0005	0.00	0.06	1.7	0.3	0.20	0.03	62.3	11.5	39	4.6	0.00	3.3	13	0.18	3.9	0.03	2.8	32	31	0.93	0.04	0.5	0.09
10416993	Reduced Permian Mudstone	WINU0026	100	101	0.07	13.6	0.0005	0.00	0.06	2.7	0.4	0.27	0.15	90.3	18.5	55	7.8	0.00	6.0	18	0.26	4.3	0.07	2.9	46	51	1.38	0.09	0.4	0.12
10452961	Reduced Permian Mudstone	WINU0029	118	119	0.06	13.3	0.0083	0.00	0.06	2.3	0.3	0.38	0.06	74.3	16.3	61	8.4	0.00	8.1	19	0.11	3.6	0.05	4.0	38	45	1.91	0.10	1.2	0.17
10452973	Reduced Permian Mudstone	WINU0029	129	130	0.06	13.7	0.0007	0.00	0.07	2.5	0.4	0.35	0.09	93.1	11.6	55	8.2	0.00	4.9	17	0.17	4.3	0.06	4.0	46	52	1.84	0.05	0.5	0.22
10452978	Reduced Permian Mudstone	WINU0029	134	135	0.06	14.5	0.0004	0.00	0.07	2.6	0.4	0.50	0.06	91.2	12.2	67	9.2	0.00	5.1	19	0.18	3.8	0.06	4.4	45	53	2.07	0.05	0.5	0.19
10453296	Reduced Permian Mudstone	WINU0034	121	122	0.08	15.1	0.0005	0.00	0.07	3.4	0.4	0.36	0.11	102.5	18.0	67	11.6	0.00	6.0	21	0.17	4.3	0.07	4.3	52	65	2.06	0.08	0.4	0.15
10687985	Reduced Permian Mudstone	WINU0317	137	137.5	0.05	13.7	0.0004	0.00	0.07	2.9	0.4	0.41	0.05	81.5	12.7	60	9.4	0.00	7.5	19	0.17	3.3	0.06	4.7	41	49	2.22	0.11	0.7	0.18
10751194	Reduced Permian Mudstone	WINU0563	94	95	0.07	12.1	0.0026	0.00	0.05	2.3	0.3	0.35	0.07	80.6	11.3	46	6.4	0.00	9.3	15	0.21	3.9	0.05	3.2	40	37	1.51	0.18	0.9	0.15
10808364	Reduced Permian Mudstone	WINU0623	107	108	0.08	14.3	0.0024	0.00	0.07	3.1	0.5	0.53	0.09	98.9	30.7	65	10.0	0.00	10.7	21	0.18	3.7	0.07	3.6	48	48	2.02	0.18	0.7	0.12

Sample_ID	Description	Hole	From	To	Nb_ppm	Ni_pct	P2O5_pct	Pb_pct	Pd_ppm	Pt_ppm	Rb_ppm	Re_ppm	Sb_ppm	Sc_ppm	SiO2_pct
				Average crustal abundance	*20.0*	*0.008*	*0.24*	*0.001*	*0.015*	*0.005*	*90*	*0.001*	*0.20*	*22*	*60*
10413553	Arkose 1	WINU0004	77	78	9.6	0.001	0.04	0.003	0.001	0.002	95	0.006	0.73	14	66
10414116	Arkose 1	WINU0007	99	100	13.4	0.005	0.02	0.004	0.001	0.002	439	0.001	0.12	17	57
10414155	Arkose 1	WINU0007	134	135	16.8	0.004	0.09	0.003	0.001	0.002	330	0.004	0.15	19	
10411853	Arkose 1	WINU0008	73	74	12.2	0.001	0.04	0.001	0.001	0.002	268	0.002	0.03	16	58
10442056	Arkose 1	WINU0009	83	84	11.5	0.004	0.05	0.001	0.002	0.002	500	0.002	0.11	16	49
10445568	Arkose 1	WINU0014	104	105	8.5	0.001	0.02	0.002	0.004	0.002	225	0.003	0.19	15	53
10415871	Arkose 1	WINU0015	66	67	16.1	0.001	0.03	0.001	0.001	0.002	174	0.002	0.06	23	61
10386397	Arkose 2	WINU0001	101	102	12.0	0.002	0.01	0.001	0.008	0.002	403	0.003	0.55	14	65
10442072	Arkose 2	WINU0009	97	98	14.8	0.005	0.08	0.001	0.001	0.002	490	0.001	0.12	18	55
10442087	Arkose 2	WINU0009	111	112	9.5	0.003	0.09	0.009	0.001	0.002	403	0.002	0.59	11	60
10444887	Arkose 2	WINU0039	132	133	14.6	0.009	0.11	0.001	0.001	0.004	285	0.002	0.08	16	55
10444914	Arkose 2	WINU0039	157	158	17.1	0.007	0.04	0.003	0.001	0.002	176	0.003	0.07	18	63
10534953	Arkose 2	WINU0091	85	86											
10695107	Arkose 2	WINU0339	95	96	16.6	0.002	0.02	0.009	0.004	0.002	342	0.005	0.40	24	51
10744999	Arkose 2	WINU0458	77	78	8.6	0.001	0.03	0.003	0.001	0.002	310	0.002	0.11	10	67
10442755	High Nb Permian Mudstone	WINU0013	56	57	3.4	0.000	0.02	0.002	0.001	0.002	1	0.002	0.05	1	88
10443538	High Nb Permian Mudstone	WINU0024	73	74	20.2	0.002	0.01	0.001	0.001	0.002	264	0.001	0.17	29	46
10384329	Mottled and Siliceous Zone	WB18WIN0002	26	27	16.2	0.000	0.01	0.001	0.001	0.002	1	0.001	0.32	2	96
10415845	Mottled and Siliceous Zone	WINU0015	43	44	9.9	0.000	0.01	0.002	0.001	0.002	1	0.001	0.12	2	101
10387328	NA	WIDI0007	6	7	10.5	0.001	0.01	0.001	0.001	0.002	8	0.001	0.29	5	79
10387402	NA	WIDI0007	72	73	33.9	0.003	0.14	0.031	0.011	0.002	47	0.011	0.34	33	57
10384543	Oxidised Permian Mudstone	RC18WIN0001	68	69	13.9	0.004	0.12	0.003	0.001	0.002	149	0.001	0.48	13	62
10410053	Oxidised Permian Mudstone	WINU0003	68	69	13.9	0.005	0.12	0.003	0.001	0.002	124	0.001	0.42	12	67
10442767	Oxidised Permian Mudstone	WINU0013	67.3	68.9	11.8	0.001	0.08	0.002	0.001	0.002	22	0.002	0.13	5	65
10450553	Oxidised Permian Mudstone	WINU0038	106	107	15.2	0.004	0.17	0.003	0.001	0.008	170	0.001	0.49	14	64
10720487	Oxidised Permian Mudstone	WINU0536	62	63	6.1	0.001	0.03	0.001	NA	NA	13	0.002	0.40	5	NA
10718644	Oxidised Permian Mudstone	WINU0566	62	63	15.1	0.006	0.17	0.003	NA	NA	110	0.001	0.47	14	NA
10414054	Permian Sandstone	WINU0007	43	44	3.4	0.000	0.01	0.002	0.001	0.002	2	0.001	0.03	1	90
10411821	Permian Sandstone	WINU0008	44	45	2.9	0.000	0.01	0.003	0.001	0.002	1	0.001	0.04	1	95
10442023	Permian Sandstone	WINU0009	53.3	54	6.3	0.000	0.01	0.002	0.001	0.002	1	0.001	0.07	1	98
10415331	Permian Sandstone	WINU0010	44	45	5.0	0.000	0.00	0.002	0.001	0.002	1	0.001	0.06	1	90
10415347	Permian Sandstone	WINU0012	42	43	3.5	0.000	0.01	0.001	0.001	0.002	1	0.001	0.06	1	92
10388244	Permian Sandstone	WINU0019	48	49	6.9	0.000	0.00	0.002	0.001	0.002	1	0.001	0.10	1	94
10537974	Permian Sandstone	WINU0344	34	35	4.5	0.000	0.01	0.002	0.001	0.002	2	0.000	0.03	1	77
10373518	Post Mineral Mafic	RC17PAW0001	76	77	7.1	0.005	0.02	0.003	0.001	0.001	47	0.001	0.14	71	56
10444905	Post Mineral Mafic	WINU0039	148	149	4.7	0.012	0.10	0.000	0.001	0.002	38	0.001	0.04	43	41
10385046	Quartz Sandstone	RC18WIN0003	60	61	6.1	0.001	0.01	0.000	0.001	0.002	52	0.001	0.23	7	75
10410087	Quartz Sandstone	WINU0003	99	100	6.5	0.004	0.07	0.001	0.001	0.002	304	0.001	0.15	7	69
10413544	Quartz Sandstone	WINU0004	69	70	18.2	0.001	0.03	0.003	0.001	0.002	290	0.002	0.58	30	50
10410979	Quartz Sandstone	WINU0006	63	64	1.6	0.000	0.01	0.002	0.001	0.002	9	0.001	0.09	3	90
10411013	Quartz Sandstone	WINU0006	93	94	3.4	0.005	0.05	0.002	0.001	0.002	152	0.022	0.60	6	72
10414104	Quartz Sandstone	WINU0007	88	89	6.0	0.002	0.02	0.005	0.001	0.002	233	0.001	0.14	6	74
10414146	Quartz Sandstone	WINU0007	126	127	10.8	0.003	0.08	0.003	0.001	0.002	275	0.001	0.08	12	
10411856	Quartz Sandstone	WINU0008	76	77	8.3	0.006	0.08	0.001	0.001	0.002	298	0.001	0.14	11	62
10411875	Quartz Sandstone	WINU0008	93	94	3.8	0.002	0.05	0.001	0.001	0.002	166	0.002	0.12	3	74
10442055	Quartz Sandstone	WINU0009	82	83	6.0	0.002	0.08	0.001	0.004	0.002	330	0.004	0.13	9	54
10414847	Quartz Sandstone	WINU0010	86	87	4.0	0.001	0.01	0.002	0.001	0.002	48	0.001	0.22	5	80
10415364	Quartz Sandstone	WINU0012	57	58	7.8	0.001	0.03	0.007	0.001	0.002	73	0.002	0.11	7	73
10415387	Quartz Sandstone	WINU0012	78	79	3.7	0.000	0.01	0.003	0.001	0.002	45	0.002	0.21	5	76
10443558	Quartz Sandstone	WINU0024	82	83	5.0	0.001	0.00	0.001	0.001	0.002	55	0.001	0.13	6	70
10722097	Quartz Sandstone	WINU0349	100	100.81	5.6	0.001	0.02	0.002	0.001	0.002	84	0.002	0.14	6	70
10722105	Quartz Sandstone	WINU0349	108	109	2.7	0.001	0.01	0.001	0.001	0.002	93	0.000	0.68	4	82
10445531	Quartz Vein	WINU0014	70	71	1.0	0.004	0.00	0.003	0.005	0.002	42	0.001	0.30	2	79
10384984	Quaternary Aeolian Sands	RC18WIN0003	4	5	9.4	0.001	0.01	0.001	0.001	0.002	7	0.001	0.29	4	84
10388195	Quaternary Aeolian Sands	WINU0019	4	5	6.8	0.000	0.01	0.000	0.002	0.002	4	0.001	0.18	2	86
10388211	Quaternary Aeolian Sands	WINU0019	18	19	24.3	0.001	0.01	0.001	0.001	0.002	2	0.001	0.46	8	60
10718244	Quaternary Aeolian Sands	WINU0564	15	16	17.7	0.001	0.00	0.001	NA	NA	2	0.001	0.31	5	NA
10384555	Reduced Permian Mudstone	RC18WIN0001	79	80	14.3	0.003	0.12	0.003	0.001	0.002	149	0.001	0.45	12	65
10414096	Reduced Permian Mudstone	WINU0007	81	82	10.2	0.002	0.11	0.002	0.001	0.002	112	0.001	0.27	9	70
10416993	Reduced Permian Mudstone	WINU0026	100	101	15.7	0.003	0.12	0.003	0.001	0.002	142	0.002	0.44	13	62
10452961	Reduced Permian Mudstone	WINU0029	118	119	13.9	0.003	0.13	0.003	0.001	0.002	168	0.001	1.39	11	62
10452973	Reduced Permian Mudstone	WINU0029	129	130	15.2	0.002	0.11	0.003	0.001	0.002	165	0.001	0.49	12	60
10452978	Reduced Permian Mudstone	WINU0029	134	135	14.0	0.003	0.10	0.003	0.001	0.002	181	0.001	0.45	14	59
10453296	Reduced Permian Mudstone	WINU0034	121	122	16.9	0.003	0.11	0.003	0.003	0.002	188	0.001	0.47	15	65
10687985	Reduced Permian Mudstone	WINU0317	137	137.5	12.8	0.003	0.12	0.003	0.001	0.002	181	0.001	0.45	12	58
10751194	Reduced Permian Mudstone	WINU0563	94	95	11.8	0.003	0.09	0.002	NA	NA	135	0.001	0.74	10	NA
10808364	Reduced Permian Mudstone	WINU0623	107	108	13.9	0.005	0.23	0.003	NA	NA	168	0.004	1.22	14	NA

Sample_ID	Sn_ppm	S_pct	Sr_ppm	Ta_ppm	Te_ppm	Th_ppm	TiO2_pct	Tl_ppm	U_ppm	V_ppm	W_ppm	Y_ppm	Zn_pct	Zr_ppm	Hg_ppm	Se_ppm	B_ppm	Cl_ppm	F_ppm
Average crustal abundance	*2*	*0.04*	*370*	*2.0*	*0.001*	*9.6*	*0.94*	*0.9*	*2.7*	*120*	*1.3*	*33*	*0.01*	*165*	*0.085*	*0.05*	*1.00*	*15*	*59*
10413553	19	0.01	17	0.8	12.150	16.7	0.49	0.4	3.0	91	350.0	15	0.00	92					
10414116	7	0.01	30	1.3	0.050	24.0	0.71	2.3	4.2	101	15.2	24	0.02	138					
10414155	18	0.37	88	1.6	0.040	26.9	0.72	3.0	4.0	104	11.4	22	0.02	131					
10411853	4	0.01	23	1.1	0.070	22.2	0.64	1.5	4.0	92	119.5	35	0.01	146					
10442056	10	0.01	67	1.0	0.110	22.4	0.60	4.0	4.6	89	280.0	47	0.03	115					
10445568	8	0.01	17	0.7	3.320	21.1	0.47	1.0	4.1	101	147.0	22	0.00	132					
10415871	12	0.01	17	1.3	2.090	22.0	0.78	0.6	3.6	115	151.5	31	0.00	136					
10386397	17	0.01	50	1.1	3.490	18.8	0.60	2.5	2.3	68	137.5	25	0.01	142					
10442072	9	0.07	74	1.4	0.080	22.7	0.71	2.3	3.0	86	13.0	34	0.01	159					
10442087	21	0.01	110	0.9	0.360	16.6	0.48	2.0	3.3	49	250.0	28	0.04	115					
10444887	9	1.01	52	1.4	1.410	24.4	0.78	1.9	4.1	77	49.6	35	0.03	207					
10444914	11	1.20	20	1.6	0.300	27.1	0.85	3.2	4.7	98	25.5	49	0.04	202					
10534953																			
10695107	54	0.01	18	1.5	3.870	25.4	0.85	1.2	4.8	129	310.0	28	0.01	190	0.010			40	580
10744999	5	0.01	54	0.8	0.757	15.3	0.49	2.3	3.5	63	105.0	18	0.01	124	0.010			40	310
10442755	0	0.01	16	0.2	0.040	3.1	0.13	0.0	0.4	6	52.8	1	0.00	31					
10443538	20	0.01	6	1.7	1.490	15.5	1.01	0.8	3.3	149	136.5	10	0.00	164					
10384329	2	0.01	2	1.0	0.020	4.5	0.99	0.0	1.2	21	2.5	5	0.00	160					
10415845	1	0.01	9	0.6	0.020	4.3	0.45	0.0	0.8	9	13.4	3	0.00	67					
10387328	2	0.01	8	0.9	0.040	11.0	0.56	0.1	1.0	47	1.8	6	0.00	98					
10387402	29	0.04	86	2.2	15.400	18.0	3.03	0.9	7.0	304	830.0	43	0.01	323					
10384543	3	0.01	147	1.1	0.060	18.3	0.65	1.3	2.6	92	3.6	30	0.01	126					
10410053	5	0.01	112	1.2	0.040	17.8	0.64	0.8	3.0	81	11.5	46	0.01	133					
10442767	2	0.01	70	0.9	0.040	8.4	0.52	1.2	3.5	48	136.0	45	0.01	112					43
10450553	4	0.05	67	1.3	0.020	18.0	0.65	0.8	3.3	92	4.4	33	0.01	132					
10720487	1	0.01	12	0.5	0.060	7.7	0.27	0.5	2.7	31	9.4	52	0.00	97	0.010			30	50
10718644	4	0.01	164	1.2	0.050	19.5	0.66	0.8	3.7	94	10.6	82	0.01	139	0.010			50	200
10414054	1	0.01	12	0.2	0.020	3.1	0.14	0.0	0.4	7	2.8	1	0.00	40					
10411821	2	0.01	12	0.2	0.020	3.3	0.11	0.0	0.3	5	3.1	1	0.00	32					
10442023	5	0.01	8	0.4	0.070	4.6	0.26	0.0	0.5	6	34.6	2	0.00	55					
10415331	2	0.01	13	0.4	0.040	5.0	0.23	0.0	0.5	9	3.4	3	0.00	50					
10415347	2	0.01	13	0.3	0.300	3.0	0.14	0.0	0.5	6	9.2	2	0.00	36					
10388244	0	0.01	11	0.4	0.130	5.4	0.28	0.1	0.5	8	6.0	2	0.00	48					
10537974	3	0.01	11	0.3	0.006	4.9	0.18	0.0	0.5	7	3.7	2	0.00	46	0.010			60	290
10373518	2	0.20	46	0.6	0.110	8.1	1.44	0.0	8.1	446	681.0	65	0.02	187					
10444905	1	0.12	191	0.2	0.040	3.7	0.75	0.3	0.7	230	2.2	21	0.04	78					
10385046	14	0.01	5	0.6	5.380	11.2	0.36	0.2	1.7	40	134.5	6	0.00	132					
10410087	9	0.03	60	0.6	1.200	11.3	0.39	1.5	2.7	45	18.7	13	0.01	108					
10413544	11	0.01	21	1.7	3.690	24.7	0.89	1.3	3.1	140	131.0	18	0.00	180					
10410979	11	0.01	6	0.2	1.030	3.9	0.09	0.1	1.1	14	52.7	3	0.00	32					
10411013	61	0.01	37	0.3	9.570	5.4	0.18	0.8	1.6	21	920.0	13	0.02	49					154
10414104	6	0.17	34	0.5	0.320	13.0	0.34	1.2	2.1	38	8.1	11	0.01	111					307
10414146	10	0.08	78	1.1	1.260	19.4	0.59	1.5	3.8	67	12.4	19	0.01	199					
10411856	21	0.01	44	0.7	3.210	14.7	0.45	1.4	3.5	56	94.5	37	0.02	109					
10411875	5	0.01	36	0.3	1.370	7.3	0.22	1.2	2.1	23	126.5	13	0.01	77					
10442055	8	0.01	40	0.5	0.080	13.2	0.33	2.3	3.3	51	450.0	28	0.02	90					
10414847	25	0.01	9	0.4	17.300	7.0	0.24	0.2	2.7	37	61.6	7	0.00	82					
10415364	14	0.01	14	0.9	3.990	14.5	0.45	0.3	3.4	31	108.0	12	0.00	197					
10415387	12	0.01	4	0.4	7.540	9.2	0.22	0.2	2.8	30	88.3	6	0.00	79					
10443558	12	0.01	4	0.5	2.130	6.7	0.29	0.2	1.8	25	59.7	6	0.00	89					
10722097	6	0.01	12	0.6	1.320	11.9	0.34	0.3	2.6	34	75.6	9	0.00	129	0.010			20	50
10722105	10	0.01	2	0.3	3.670	5.1	0.14	0.4	1.9	36	32.9	4	0.00	55	0.010			40	190
10445531	8	0.01	4	0.1	4.160	3.0	0.05	0.3	2.9	17	52.4	10	0.01	14					
10384984	1	0.01	6	0.8	0.020	8.3	0.52	0.0	0.7	41	1.4	4	0.00	87					
10388195	1	0.01	5	0.5	0.020	5.5	0.39	0.0	0.5	28	0.7	2	0.00	49					
10388211	4	0.01	11	1.9	0.020	21.5	1.30	0.1	1.6	64	3.8	6	0.00	171					
10718244	2	0.01	8	1.4	0.025	17.7	0.92	0.1	1.0	46	2.0	4	0.00	117	0.010			20	1100
10384555	3	0.08	67	1.1	0.040	15.8	0.60	0.7	3.4	76	5.3	26	0.01	131					
10414096	2	0.13	67	0.8	0.050	11.0	0.48	0.6	1.8	57	3.7	19	0.00	128					
10416993	4	0.11	49	1.2	0.050	15.3	0.62	0.7	3.7	77	11.3	25	0.01	141					
10452961	3	1.36	56	1.1	0.020	15.6	0.60	2.7	2.4	80	2.6	24	0.01	126					438
10452973	4	0.15	58	1.2	0.050	16.8	0.68	0.8	2.9	77	2.7	25	0.01	151					
10452978	4	0.06	61	1.2	0.020	17.2	0.64	0.8	2.5	86	3.0	24	0.01	124					
10453296	4	0.08	65	1.3	0.050	18.9	0.73	1.0	3.5	94	4.0	27	0.01	141					
10687985	3	0.70	58	1.0	0.025	16.3	0.60	0.9	3.1	86	12.3	22	0.01	117	0.010			70	330
10751194	3	0.40	49	1.0	0.025	15.8	0.53	1.3	2.6	60	2.6	23	0.01	137	0.030			70	340
10808364	4	0.94	65	1.2	0.025	18.4	0.64	1.3	4.1	98	6.0	36	0.02	133	0.050			100	440

Complete 2:1 Deionised Water Leach Results

Sample_ID	Description	Zone	Hole	From	To	AQ_Acid_mgCaCO3/L	AQ_Cl_mg/L	AQ_NH3_mg/L	AQ_NO3_mg/L	AQ_NO2_mg/L	TKN_mg/L	AQ_F_mg/L	AQ_Hg_mg/L	AQ_HCO3_mg/L	AQ_CO3_mg/L	AQ_Tot_Alk_mg/L	AQ_EC_uS_cm_mg/L	AQ_pH_mg/L	AQ_Ag_mg/L	AQ_Al_mg/L	AQ_As_mg/L	AQ_Ba_mg/L	AQ_Bi_mg/L	AQ_Ca_mg/L	AQ_Cd_mg/L	AQ_Co_mg/L	AQ_Cr_mg/L	AQ_Cu_mg/L
10687985	Reduced Permian Mudstone	Oxide	WINU0317	137	137.5	5	41	1.33	1.15	0.01	3.2	0.1	0.0001	76	1	76	1450	6.53	0.001	0.01	0.001	0.036	0.001	77	0.0001	0.007	0.001	0.001
10695107	Arkose 2	Oxide	WINU0339	95	96	6	16	0.07	1.37	0.14	4.6	0.8	0.0001	16	1	16	101	7.04	0.001	0.05	0.001	0.001	0.001	1	0.0001	0.001	0.005	0.033
10718244	Quaternary Aeolian Sands	Oxide	WINU0564	15	16	9	10	0.14	1.37	0.07	3.8	0.1	0.0001	4	1	4	64	6.38	0.001	0.01	0.001	0.363	0.001	2	0.0001	0.001	0.001	0.001
10722097	Quartz Sandstone	Oxide	WINU0349	100	100.81	6	9	0.17	1.42	0.06	0.9	0.1	0.0001	6	1	6	49	6.85	0.001	0.01	0.001	0.001	0.001	1	0.0001	0.001	0.001	0.02
10722105	Quartz Sandstone	Oxide	WINU0349	108	109	5	18	0.19	0.53	0.01	0.8	0.8	0.0001	20	1	20	117	7.36	0.001	0.06	0.001	0.002	0.001	1	0.0001	0.005	0.001	0.091
10744999	Arkose 2	Oxide	WINU0458	77	78	5	22	0.25	0.66	0.01	4.2	0.8	0.0001	14	1	14	159	7.1	0.001	0.05	0.001	0.029	0.001	1	0.0001	0.001	0.001	0.006
10751194	Reduced Permian Mudstone	Oxide	WINU0563	94	95	4	55	1.11	1.9	0.03	5.9	0.5	0.0001	37	1	37	926	7.41	0.001	0.01	0.006	0.034	0.001	34	0.0001	0.001	0.001	0.001
10411013	Leached Cap	Oxide	WINU0006	93	94		52		0.05	0.01		1.3	0.0001	14	1	14	250	7.55	0.001	0.92	0.001	0.454	0.027	1	0.0001	0.002	0.002	0.057
10415364	Leached Cap	Oxide	WINU0012	57	58		33		0.41	0.02		0.2	0.0001	6	1	6	120	6.7	0.001	0.06	0.001	0.504	0.001	1	0.0002	0.001	0.001	0.001
10386397	Leached Cap	Oxide	WINU0001	101	102		67		0.12	0.01		1.6	0.0001	27	1	27	370	7.42	0.001	0.25	0.001	0.484	0.001	2	0.0002	0.001	0.001	0.019
10414104	Leached Cap	Oxide	WINU0007	88	89		34		0.09	0.01		1.4	0.0001	14	1	14	268	7.03	0.001	0.12	0.001	0.184	0.001	3	0.0002	0.002	0.001	0.023
10416993	Clay	Oxide	WINU0026	100	101		30	1.57	0.19	0.01		0.2	0.0001	8	1	8	764	6.69	0.001	0.01	0.001	0.029	0.001	27	0.0001	0.004	0.001	0.004
10452961	Clay	Oxide	WINU0029	118	119		61	2.36	0.36	0.01		0.2	0.0001	11	1	11	1660	6.81	0.001	0.01	0.002	0.045	0.001	82	0.0001	0.003	0.001	0.001
10442767	Tillite	Oxide	WINU0013	67.3	68.9		37		0.17	0.01		0.2	0.0001	6	1	6	136	6.81	0.001	0.38	0.001	0.887	0.001	1	0.0002	0.001	0.002	0.027
10388211	Arkose	Oxide	WINU0019	18	19		19		0.4	0.02		0.1	0.0001	9	1	9	100	6.68	0.001	0.78	0.001	1.46	0.001	2	0.0004	0.001	0.001	0.002

Sample_ID	Description	Zone	Hole	From	To	AQ_Fe_mg/L	AQ_K_mg/L	AQ_Mg_mg/L	AQ_Mn_mg/L	AQ_Mo_mg/L	AQ_Na_mg/L	AQ_Ni_mg/L	AQ_P_mg/L	AQ_Pb_mg/L	AQ_Sb_mg/L	AQ_Si_mg/L	AQ_Sr_mg/L	AQ_SO4_mg/L	AQ_Te_mg/L	AQ_Th_mg/L	AQ_V_mg/L	AQ_W_mg/L	AQ_Zn_mg/L	AQ_B_mg/L	AQ_Se_mg/L	AQ_Tl_mg/L	AQ_U_mg/L
10687985	Reduced Permian Mudstone	Oxide	WINU0317	137	137.5	0.05	50	50	0.301	0.001	151	0.043	0.01	0.001	0.001	7.61	0.862	679	0.005	0.001	0.01	0.001	0.005	0.16	0.03	0.001	0.001
10695107	Arkose 2	Oxide	WINU0339	95	96	0.05	5	1	0.001	0.001	20	0.001	0.04	0.001	0.001	14.5	0.001	1	0.005	0.001	0.01	0.055	0.005	0.07	0.01	0.001	0.001
10718244	Quaternary Aeolian Sands	Oxide	WINU0564	15	16	0.47	1	1	0.042	0.001	9	0.001	0.01	0.001	0.001	20.4	0.041	6	0.005	0.001	0.01	0.001	0.018	0.1	0.01	0.001	0.001
10722097	Quartz Sandstone	Oxide	WINU0349	100	100.81	0.05	6	1	0.002	0.001	6	0.001	0.01	0.001	0.001	11.2	0.003	1	0.005	0.001	0.01	0.002	0.005	0.05	0.01	0.001	0.001
10722105	Quartz Sandstone	Oxide	WINU0349	108	109	0.06	22	1	0.018	0.002	10	0.001	0.01	0.001	0.001	8	0.003	3	0.005	0.001	0.01	0.017	0.005	0.07	0.01	0.001	0.001
10744999	Arkose 2	Oxide	WINU0458	77	78	0.05	18	1	0.002	0.005	22	0.001	0.02	0.001	0.001	9.28	0.008	18	0.005	0.001	0.01	0.09	0.005	0.06	0.01	0.001	0.001
10751194	Reduced Permian Mudstone	Oxide	WINU0563	94	95	0.05	62	31	0.084	0.015	67	0.003	0.01	0.001	0.003	11.3	0.345	334	0.005	0.001	0.01	0.003	0.005	0.14	0.01	0.001	0.001
10411013	Leached Cap	Oxide	WINU0006	93	94	3.06	36	1	0.007	0.047	26	0.003	0.02	0.001	0.001	8.88		8	0.005		0.01	0.197	0.107				
10415364	Leached Cap	Oxide	WINU0012	57	58	0.05	10	1	0.006	0.001	13	0.001	0.01	0.001	0.001	8.99		1	0.005		0.01	0.001	0.132				
10386397	Leached Cap	Oxide	WINU0001	101	102	0.34	51	1	0.016	0.007	34	0.001	0.01	0.001	0.001	6.4		11	0.005		0.01	0.102	0.146				
10414104	Leached Cap	Oxide	WINU0007	88	89	0.08	42	3	0.032	0.018	14	0.003	0.01	0.001	0.001	4.77		43	0.005		0.01	0.003	0.096				
10416993	Clay	Oxide	WINU0026	100	101	0.05	50	20	0.24	0.001	71	0.007	0.01	0.001	0.001	13.5		282	0.005		0.01	0.001	0.007	0.12	0.02	0.001	0.001
10452961	Clay	Oxide	WINU0029	118	119	0.05	96	74	0.196	0.005	106	0.007	0.01	0.001	0.001	14.2		796	0.005		0.01	0.001	0.005	0.21	0.03	0.001	0.001
10442767	Tillite	Oxide	WINU0013	67.3	68.9	0.28	2	1	0.025	0.002	29	0.001	0.01	0.001	0.001	11.6		1	0.005		0.01	0.01	0.151				
10388211	Arkose	Oxide	WINU0019	18	19	0.12	1	1	0.006	0.001	23	0.003	0.01	0.001	0.001	19.6		1	0.005		0.01	0.002	0.336				

APPENDIX 2 – ANALYTICAL RESULTS

Oxide ABA COA.pdf

Oxide ANC-NAG COA.PDF

Oxide Leaching COA.PDF

NMD_1_COA.pdf

NMD_2_COA.pdf

NMD_3_COA.pdf

NMD_4_COA.pdf

Ore NMD (unfiltered).pdf

Ore NMD (filtered).pdf

2020_analysis_1.pdf

2020_analysis_2.pdf