Appendix 4.

Hydrobiology (2016a) *Rum Jungle Impact Assessment - Floodplain Tailings Investigation.* Prepared for the Department of Mines and Energy, Northern Territory Government.

Department of **Primary Industry and Resources**



Rum Jungle Impact Assessment

Floodplain Tailings Investigation

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Rum Jungle Impact Assessment

Floodplain Tailings Investigation

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EXECUTIVE SUMMARY

Background

Hydrobiology was commissioned by the Northern Territory Government (Department of Mines and Energy) to undertake a floodplain coring investigation downstream of the former Rum Jungle mine. The objectives of this study were to:

- Characterise the composition of the historic mine tailings sediments to establish a geochemical fingerprint;
- Undertake a targeted floodplain sediment coring program on the Finniss River Floodplain; and
- Compare the characteristics of floodplain and tailings sediments to determine whether there is evidence of tailings deposition on the floodplain.

Methods

The floodplain coring component of the project focussed on the area in the vicinity of the White Eagle community and an area where community members had previously expressed concern about the possible presence of tailings. This component involved collecting sediment cores from a total of 30 sites situated along five separate transects intersecting the river, with sites located on either side of the river. Samples were taken at three different depths from each core.

Samples of historic mine tailings from the mine lease area, and samples from control sites were collected from near the surface of either the river channel bed or bank.

All samples were analysed for a suite of 60 elements. A multivariate statistical approach was used to identify differences between sites based on their geochemical composition and to identify whether similarities existed between tailings samples and those deposited on the Finniss River floodplain.

Findings

The statistical analyses identified that floodplain samples were largely similar to each other and very different from the tailings samples. Generally, samples from Transect 4 were more similar to the tailings samples than control samples and those from Transects 2, 3, 5 and 6. The analysis identified a small patch where tailings material may have deposited. This patch was located within 250 m of the left bank at Transect 4. It was located on the low-lying inside bank of a large meander bend, which would be a depositional environment. These findings suggest that there was evidence of some overbank deposition of tailings but that it was restricted to a trace amount in most areas and about 50% (at most) in isolated shallow locations near the Florence Creek junction.

Recommendations

Given there is little evidence of tailings deposits on the floodplain within the study area, we do not consider that any further coring work is required in the study area. Any further investigations should await publication of other tailings impact studies currently in press.

Rum Jungle Impact Assessment

Floodplain Tailings Investigation

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1 INTRODUCTION

1.1 Project Background

Hydrobiology was commissioned by the Northern Territory Government (Department of Mines and Energy) to undertake a floodplain coring investigation downstream of the former Rum Jungle Mine. The project was undertaken following the findings of Hydrobiology (2014; 2015) that suggested that, based on concerns raised by Traditional Owners, floodplain deposition of mine tailings sediments may have occurred in the vicinity of the White Eagle Community. The community is located adjacent to Litchfield Park Road in the middle reaches of the Finniss River, about 40 km downstream from Rum Jungle Mine and 80 km upstream from the mouth.

Due to the fact that the concerns were primarily raised by members of the White Eagle community, an assessment was undertaken that focussed on sites identified by the White Eagle community upstream of the Finniss River Coastal Floodplain Site of Conservation Significance (FRCPSOCS). The need for a more expansive survey could then be evaluated based on the results from the initial assessment.

1.2 Tailings Background

The former Rum Jungle Mine was mined in the 1950s-1970s (Hydrobiology, 2014). By the late 1960s, there had been considerable environmental harm reported in the East Branch of the Finniss River and the Finniss River itself downstream of the former mine. While the greatest source of contaminants exiting the Rum Jungle site was probably from waste rock dumps and heap leach piles (Mudd, 2000), tailings disposal also resulted in considerable contaminant releases.

Tailings were initially (1951-1961) discharged into what a gently sloping area immediately north of the site (termed 'Old Tailings Dam') (Richards *et al.*, 1999). Tailings were unconstrained and solids settled out, with acidic liquors draining into Old Tailings Creek and further downstream. Mudd (2000) reported that tailings were not neutralised prior to disposal in Old Tailings Dam. The tailings settled but were easily eroded and transported downstream (~3000 t/year). The major contaminants in the tailings were Copper (Cu), Manganese (Mn) and Sulphate (SO_4).

In 1961, tailings were redirected to Dyson's Open Cut, with spent liquors only released during floods in the Wet Season. The practice was completely abandoned by 1968 when tailings were again redirected, this time to White's Open Cut (Mudd 2000).

As a result of the above impacts, a major rehabilitation program was initiated in the 1980s which included moving the eroding tailings (and subsoils) to Dysons Open Cut, with overburden placed on top of the tailings to ensure permanent containment. Despite short-term improvements initially, monitoring of landform stability and water/sediment quality has shown that contaminants continued to be transported downstream.

Pidsley (2002) noted that 1993 surveys showed that sediments in the East Branch of the Finniss River and downstream of its confluence with Finniss River contained much higher levels of contaminants (Nickel - Ni, Cu, Zinc – Zn, Cobalt – Co, Uranium – U) than upstream of the confluence. Brazier *et al.* (2005) showed similar patterns, with elevated Aluminium (Al), Mn, Co, Cu, Ni, Zn, Cadmium (Cd), Lead (Pb) and U.

Further, Taylor (2007) found that metal concentrations in sediments of the East Branch were highest in the mine area, but that elevated levels extended to the Finniss River downstream, specifically for arsenic, zinc and chromium in the <62.5 μm fraction and arsenic and zinc in the bulk fraction in stream bed sediments, and in bank sediments. There were overall negative correlations of sediment metal concentration with distance downstream, but there was not a simple attenuation with distance, with local hydraulic and geomorphic conditions affecting the patterns of sediment deposition. Taylor (2007) noted that these conditions included local channel gradient, cross-sectional channel shape and floodplain gradient.

Hydrobiology (2015), Jeffree *et al.* (2001) and Robertson GeoConsultants Inc (2010) all supported these findings, showing a decline in metal concentrations with distance downstream, although the extent of elevated concentrations downstream from the mine differed depending on the metal, with high sediment concentrations of Cu and Ni detectable in all reaches to just downstream of the Florence Creek confluence, about 40 km downstream of the mine.

1.3 Objectives

Taylor (2007) noted that the storage of contaminants in floodplains was one of the major issues related to historical metal mining as posed a long-term and ongoing risk to the environment. Given the observed transport of tailings sediments downstream, there was a need to identify whether tailing sediments do exist on the floodplain to understand and evaluate their potential impacts on the receiving environment. As such, the objectives of this study were to:

- Characterise the chemical composition of the mine tailings sediments to establish a geochemical fingerprint for the tailings for comparison with floodplain sediments;
- Undertake a targeted floodplain coring program that focused on reaches of the Finniss River in the vicinity of the White Eagle Community land; and
- Compare the geochemical characteristics of the floodplain sediments with those collected from the mine area to establish whether tailing sediments were present on the floodplain.

2 METHODS

2.1 Field

2.1.1 Timing

The field survey was undertaken between 25th and 29th May. This period was chosen to ensure the river levels had dropped following the wet season and access tracks across the floodplain and off river waterbodies were dry.

2.1.2 Study Area

Figure 2-1 shows the locations of each sampling site. Appendix 1 contains photographs of the sites. There were three distinct sampling areas (and groups of sampling sites) for this project. These were:

- **Tailings Sites –** These sites were located in and around the mine and definitely included tailings deposits and, therefore, were used to characterise tailings-derived sediment;
- **Control Sites –** Those sites located upstream of the mine and did not include tailings;
- **Floodplain Sites –** These sites were all located between FRusFC and FR0 on the Finniss River floodplain in close vicinity to the White Eagle Community within Zones 6 and 7 identified in Hydrobiology (2014).

The process by which the locations were selected is discussed below.

2.1.3 Floodplain Site Selection

Five transects were selected in the vicinity of the White Eagle community. Transects were located between the biology sampling sites FRusFC and FR0 (Figure 2-1), as described by Hydrobiology (2015), and were specifically located in areas where deposition was expected to occur (e.g. waterbodies, low-lying areas, floodplain). Transects were selected to enable an adequate description of the floodplain near the White Eagle Community. A summary of the location of each transect relative to White Eagle Community is shown in Table 2-1.

Sampling sites were selected along each transect at about 50 m, 250 m and 500 m from the top of each bank to ensure a standardised sampling effort. Actual distances from the bank varied if a more suitable sampling location was found during the field inspection. For example, if depositional landscapes feature (e.g. dry waterbody) was located 265 m from the river, this location was chosen as the 250 m sample. This resulted in a total of 30 sampling sites. Figure 2-1 shows the location of the sites. The figure also shows the locations of the 'historical' sampling sites used in the Brazier et al. (2005) and Pidsley (2002) studies.

Site names were developed that represented their transect name, position relative to the channel (left or right), distance from channel (50, 250, 500) and sample number (1, 2, 3). Regardless of exact distance from the channel, the clarifiers shown in brackets above were still used to standardise site names. Sample numbers referred to the depth at which the sample was collected, with depth increasing with sample number. As an example, the surface sample taken 250 m to the right of the channel at Transect 4 would have the site name T4_R250_1. A full list of sites is contained in Table 2-1.

2.1.4 Tailings and Control Site Selection

Tailings site sampling locations were selected along Old Tailings Creek within the mine lease area to ensure they included tailings. Near surface bed samples were collected, with their location based on where there appeared to be surficial expression of tailings sediment. Bank sample locations and depths were also selected based on surficial expression of tailings sediment.

Control sampling locations were selected arbitrarily on the Finniss River, the East Branch of the Finniss River and other source tributaries upstream from the influence of the mine. Near surface bed and bank samples were collected. All tailings and control samples are shown in Figure 2-1.

2.1.5 Floodplain Sampling

At each floodplain sampling site, a single core was collected to a maximum depth of 0.75 m. Cores were collected using a hand auger, as the split tube corer was ineffective in the harder clay deposits. Maximum depth varied according to the competency of material at depth. A maximum of three depth sub-samples were collected from each core.

Where visual inspection of the core suggested a possible layer of tailings (noticeable shifts in sediment colour, particularly those with brass-yellow, grey-white), that layer was sampled. Samples were also collected from above and below the assumed tailings layer. If there was nothing in the core profile to suggest that deposition of tailings had occurred, but the core consisted of several sedimentary layers, then samples were taken from the different layers. If the core was homogeneous with regard to sediment, only two samples were collected – one at the top of the core (near surface) and one at the bottom of the core (depth varied).

2.1.6 Tailings and Control Sampling

Tailings and control samples were collected from either the bed or bank of the watercourse. A stainless steel trowel was used to collect the sample. Surficial sediment was removed and a sample was collected from just below the surface.

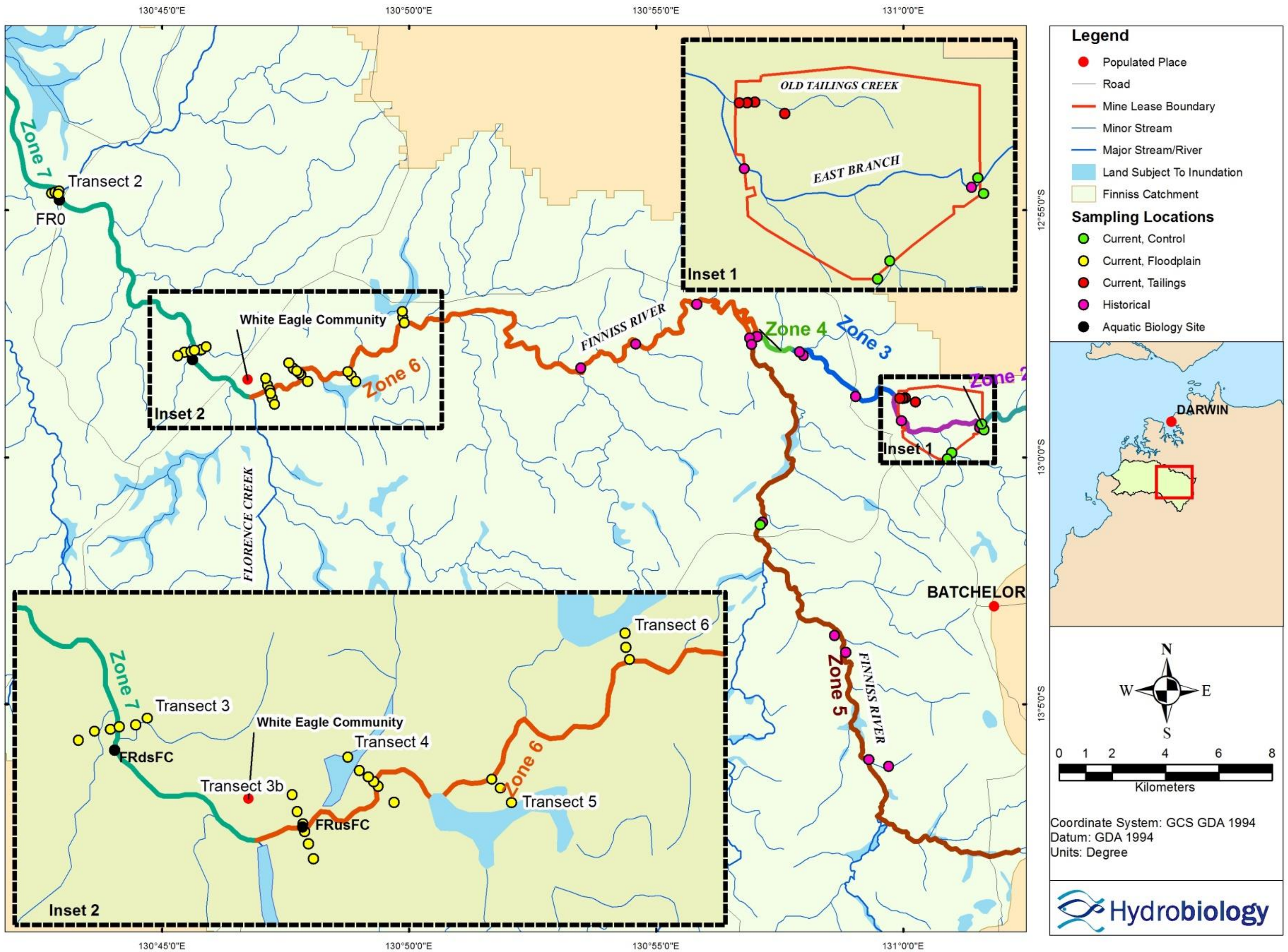

Figure 2-1 Study area and site locations

Table 2-1 Summary of Transect and Site Locations

Transect / Site	Left/Right of Channel	Distance from Bank	Sample IDs	Sample Depths (cm)	Site Type	Latitude (GDA94)	Longitude (GDA94)	Distance from White Eagle Community
Transect 2	Left	50	T2-L050-1, 2 ,3	0-10, 30-40, 55-60	Floodplain	-12.91053	130.71379	12.8 km DS
		250	T2-L250-1, 2, 3	10-15, 35-40, 50-55		-12.91097	130.71267	
	Right	50	T2-R050-1,2	0-10, 30-35		-12.91119	130.71492	
		250	T2-R250-1,2	5-10, 50-55		-12.91024	130.71515	
Transect 3	Left	50	T3-L050-1,2	0-5, 10-15		-12.96427	130.75972	2.7 km DS
		250	T3-L250-1,2,3	0-5, 35-40, 50-55		-12.96455	130.75750	
		500	T3-L500-1,2,3	0-5, 20-25, 45-50		-12.96578	130.75528	
	Right	50	T3-R050-1,2,3	0-10, 25-30, 45-50		-12.96392	130.76092	
		250	T3-R250-1,2,3	0-10, 20-25, 45-50		-12.96363	130.76319	
		500	T3-R500-1,2,3	0-10, 30-35, 45-50		-12.96272	130.76482	
Transect 3b	Left	50	T3b-L050-1,2,3	5-10, 35-40, 55-60		-12.97846	130.78663	1.4 km US
		250	T3b-L250-1,2,3	5-10, 30-35, 50-55		-12.98016	130.78716	
		500	T3b-L500-1,2,3	15-20, 35-40, 50-55		-12.98223	130.78788	
	Right	50	T3b-R050-1,2,3	10-15, 25-30, 50-55		-12.97737	130.78642	
		250	T3b-R250-1,2,3	10-15, 25-30, 45-50		-12.97569	130.78565	
		500	T3b-R500-1,2,3	10-15, 20-25, 50-55		-12.97335	130.78492	
Transect 4	Left	50	T4-L050-1,2,3	5-10, 25-30, 35-40		-12.97154	130.79622	3.2 km US
		250	T4-L250-1,2,3	5-10, 35-40, 45-50		-12.97219	130.79685	
		500	T4-L500-1,2	10-15, 20-25		-12.97438	130.79902	
	Right	50	T4-R050-1,2,3	10-15, 30-35, 55-60		-12.97090	130.79546	
		250	T4-R250-1,2,3	10-15, 30-35, 45-50		-12.97000	130.79426	
		500	T4-R500-1,2,3	5-10, 15-20, 35-40		-12.96814	130.79268	
Transect 5	Left	50	T5-L050-1,2,3	5-10, 25-30, 55-60		-12.97121	130.81263	5.5 km US
		250	T5-L250-1,2,3	5-10, 30-35, 55-60		-12.97243	130.81380	
		500	T5-L500-1,2,3	5-10, 30-35, 55-60		-12.97447	130.81532	
Transect 6	Right	50	T6-R050-1,2,3	5-10, 25-30, 50-55		-12.95462	130.83171	9.1 km US
		250	T6-R250-1,2	0-5, 30-35		-12.95289	130.83119	
		500	T6-R500-1,2	5-10, 15-20		-12.95090	130.83111	
Tailings Site	N/A	N/A	T7-01	Bed Surface	Tailings	-12.98139	131.00413	~40 km US
		N/A	T7-02	Bed Surface		-12.98005	131.00065	
		N/A	T7-03	Bed Surface		-12.98005	131.00065	
		N/A	T7-04	Bed Surface		-12.98008	130.99986	
		N/A	T7-05	Bed Surface		-12.98015	130.99976	
		N/A	T7-06	Bank Surface		-12.98016	130.99890	
Control Site	N/A	N/A	T7-07	Bed Surface	Control	-12.99849	131.01632	~50 km US
		N/A	T7-08	Bed Surface		-12.99070	131.02718	
		N/A	T7-09	Bed Surface		-13.00058	131.01491	
		N/A	T7-10	Bed Surface		-12.98884	131.02651	
		N/A	T7-11	Bed Surface		-13.02290	130.95171	

2.2 Laboratory Analysis

Sediment samples were analysed at ALS Minerals for 60 elements (including rare earth elements), using a combination of Inductively Coupled Plasma Mass Spectrometry (ICP-MS) and Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES) analysis. These are standard laboratory methods. QA/QC documentation is provided in Appendix 2, while laboratory results are provided in Appendix 3.

Metals analysed were:

- **Alkali Metals –** Caesium (Cs), Lithium (Li), Sodium (Na), Potassium (K), Rubidium (Rb);
- **Alkaline-Earth Metals –** Barium (Ba), Beryllium (Be), Calcium (Ca), Magnesium (Mg), Strontium (Sr);
- **Post-Transition Metals –** Aluminium (Al), Bismuth (Bi), Gallium (Ga), Indium (In), Lead (Pb), Thallium (Tl), and Tin (Sn);
- **Metalloids –** Antimony (Sb), Arsenic (As), Germanium (Ge), and Technetium (Te);
- **Other Non-Metals –** Phosphorus (P), Selenium (Se), and Sulphur (S);
- **Transition Metals –** Cadmium (Cd), Chromium (Cr), Cobalt (Co), Copper (Cu), Dysprosium (Dy), Erbium (Er), Europium (Eu), Hafnium (Hf), Iron (Fe), Lawrencium (La), Manganese (Mn), Molybdenum (Mo), Nickel (Ni), Niobium (Nb), Rhenium (Re), Scandium (Sc), Silver (Ag), Tantalum (Ta), Titanium (Ti), Tungsten (W), Vanadium (V), Yttrium (Y), Zinc (Zn), and Zirconium (Zr); and
- **Rare-Earth Metals (Actinoids, Lanthanoids) –** Cerium (Ce), Gadolinium (Gd), Holmium (Ho), Lutetium (Lu), Neodymium (Nd), Praseodymium (Pr),Samarium (Sm),Terbium (Tb), Thorium (Th), Thulium (Tm), Uranium (U), and Ytterbium (Yb).

2.3 Data Analysis

2.3.1 Background

Given the long history of erosion of tailings at the mine and its subsequent rehabilitation, it was decided that the datasets contained within Brazier *et al.* (2005) and Pidsley (2002) could be added to the tailings and control sites to assist in identifying a tailings signature. The 'historical' data in Brazier *et al.* (2005) and Pidsley (2002) consisted of analysis results for the following 10 different elements: Ba, Cd, Co, Cu, Fe, Mn, Ni, Pb, U, and Zn.

The current survey replicated those elements with an additional 50 elements (as described above). Two analyses were performed on the datasets, as described below:

1. **Inclusion of Historical Data (Analysis 1)** – How the samples differed between tailings, floodplain and control samples using all samples and therefore limited to the historical suite of elements described in Brazier *et al.* (2005) and Pidsley (2002) and listed above; and

2. **Exclusion of Historical Data (Analysis 2)** – How the samples differed between tailings, floodplain and control samples using 14 elements that were identified by a Similarity Percentages (SIMPER) analysis as characteristic of the tailings samples collected in the current survey. The SIMPER analysis breaks down the contribution of each element to the observed similarity (or dissimilarity) between samples.

In all cases, data were standardised and depending on subsequent interrogation of the resultant data, subjected to logarithmic transformations to achieve correct relationships between variables and then normalised (Clarke & Gorley, 2006).

2.3.2 Inclusion of Historical Data (Analysis 1)

A Euclidean distance (ED) similarity matrix was used to carry out an Analysis of Similarity (ANOSIM) test to identify differences between tailings, control and floodplain data as well as between samples. SIMPER analysis identified which elements caused the differences between groups by assessing the average percent contribution of individual elements to the dissimilarity between sample groups (floodplain, control, tailings) in a Bray-Curtis dissimilarity matrix. This allows the identification of elements that are likely to be the major contributors to any difference between site groupings detected by methods such as ANOSIM. These analyses were selected as there are no assumptions about the data which allows for a more robust approach.

In order to visualise the relationship between floodplain and tailings samples, non-metric multidimensional scaling (nMDS) and cluster analyses were used which showed visually how related the different samples were, based on the relative concentrations of different elements. As a parallel to the above analyses, a Principal Components Analysis (PCA) was carried out to identify which elements were responsible for differentiating between groups of samples.

The ED between the floodplain samples and the tailings samples was taken to infer the level of influence of the tailings sediments on those floodplain samples, in conjunction with the relative concentration of the suite of elements at those locations.

2.3.3 Exclusion of Historical Data (Analysis 2)

2.3.3.1 Characterisation of Tailings 'Fingerprint'

Using the full suite of elements, the tailings samples were subjected to a SIMPER analysis that identified how similar those samples were to each other using EDs and ranked the elements based on the percentage contributions to the overall similarity. The elements that contributed the largest individual percentages, and collectively accounted for 50% of the total similarity, were taken to typify the tailings samples and their concentrations in floodplain samples were subsequently used to provide an indication of the influence of the tailings sediments downstream.

2.3.3.2 Assessing Floodplain Deposition

An ED similarity matrix was used to carry out two ANOSIM tests to identify differences between tailings, control and floodplain results as well as between samples. A SIMPER analysis identified which elements caused the differences between groups. Similar to Section 2.3.2, an nMDS and cluster analyses were used to visualise the relationship between floodplain and tailings samples and a PCA was used to identify which elements were responsible for the differences.

The ED between the floodplain and tailings samples was taken to infer the level of influence of the tailings sediments on those floodplain samples, in conjunction with the relative concentration of the suite of elements at those locations.

2.3.3.3 Quantification of Tailings Contribution

Those floodplain sites identified as being more similar to the tailings sites underwent a further comparative assessment to determine the relative contribution of control and tailings sediments to floodplain deposition. The assessment used the following equation:

$$[F] = \frac{V_M[M] + V_C[C]}{V_M + V_C}$$

where,

- [F] = Average concentration of all elements identified in Section 3.2.1 as being characteristic of tailings sites (14 elements) within each floodplain sample;
- V_M = Relative volume (%) of tailings sediment contributing to the floodplain sample;
- V_C = Relative volume (%) of control sediment contributing to the floodplain sample;
- [M] = Average concentration of all elements identified in Section 3.2.1 as being characteristic of tailings sites (14 elements) within the tailings samples; and
- [C] = Average concentration of all elements identified in Section 3.2.1 as being characteristic of tailings sites (14 elements) within the control samples.

The equation was used to determine V_M and V_C from known values for [F], [M] and [C]. It assumed that the only two sources of sediment at the sampled floodplain sites were the waterways sampled as part of the tailings and control sampling effort (i.e. $V_M + V_C = 1$). As such, the values obtained were highly conservative, but gave an indication of the volume of tailings deposited at the sites.

3 RESULTS

3.1 Inclusion of Historical Data (Analysis 1)

The nMDS indicated a clear difference between the floodplain and tailings samples (Figure 3-1). The variation in elemental concentration and composition was much greater in the tailings samples than in the floodplain and control samples. Several locations appeared to resemble the tailings samples more closely in Figure 3-1. These were all near surface (< 0.3 m) samples from Transects 4 and were located closer to the river (within 250 m). Figure 3-1 also shows that all samples taken from around 500 m from the river showed little similarity to the tailings samples.

ANOSIM and SIMPER results (Table 3-1) indicated that no significant difference was apparent between the majority of the floodplain samples while the tailings samples and control samples were different from all other samples. Elevated levels of Zn, Cu, Cd and U distinguished the tailings samples from the others.

Eigen vectors (Figure 3-2) indicated that the majority of variation in the data was explained by changes in Zn, Cd, Cu, Co, Pb, U, Ni and Mn concentrations as they increased across the axis separating floodplain samples from controls. Al and Fe also affected the distribution of samples but in an axis perpendicular to that which separated the two groups indicating that concentrations of these elements varied equally among tailings samples and floodplain samples (Figure 3-2.).

In order to assess which floodplain samples were most similar to tailings, the transects were sequenced along the x-axis in Figure 3-3 based on their ED similarities with the tailings samples (the larger the ED value, the more different that transect was from the tailings samples). The percentage concentrations of the different elements at each sample provided an inference of the levels of tailings sediment accreting at those sites. Although Transect 4 appeared to receive the greatest influence from the tailings, the range of ED values is small, from 46 to 54. This again supports the findings of the nMDS (Figure 3-1).

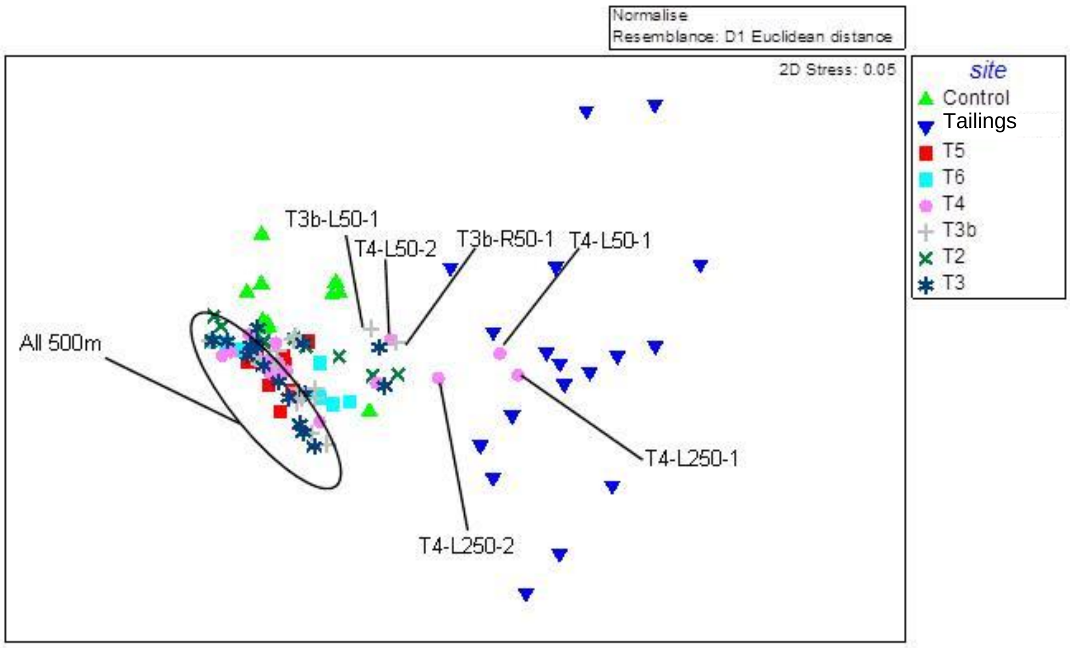

Figure 3-1 nMDS ordination showing distribution of samples based on similarity of elemental composition.

Table 3-1 Comparisons between transects; ANOSIM R-statistics (bold) and four most distinguishing elements identified by SIMPER analysis and their % contributions to the difference between transects.

	Control	Tailings	T6	T5	T4	T3b	T2
Tailings	**0.74** Ni 13.86* U 12.09* Zn 12.05* Co 10.48*	*left #down					
T6	**0.23** Al 41.35* Fe 12.49* Ni 11.64* Cd 9.31*	**0.61** Cu 13.25# Zn 12.7# Cd 12.6# U 10.91#					
T5	**0.22** Al 34.56* Mn 13.81# Ni 12.77* Cd 11.99#	**0.73** Zn 11.69# Cu 11.64# U 11.35# Cd 11.24#	**0.30** Fe 24.37# Al 23.14# Mn 18.73# Pb 8.67#				
T4	**0.13** Al 26.25* Ni 14.72* Cd 10.01# Co 10.63#	**0.62** Zn 13.11# Cu 11.11# U 10.78# Cd 10.59#	**No difference**	**No difference**			
T3b	**0.32** Al 40.77* Ni 13.21* Cd 9.31# Mn 8.77#	**0.78** Zn 12.67# Cd 12.17# Cu 10.85# Pb 10.55#	**No difference**	**No difference**	**No difference**		
T2	**No difference**	**0.67** Zn 11.72# Fe 11.61# Pb 11.38# Ni 11.16#	**No difference**	**0.12** Mn 19.14 * Al 17.6# Co 13.26* Cu 12.04*	**No difference**	**0.16** Al 24.63# Mn 14.83# Co 12.59# Cu 10.42*	
T3	**0.25** Al 40.96* Ni 11.79* Mn 10.19# Cd 8.9#	**0.79** Zn 11.73 Cd 11.34 Cu 10.73 Mn 10.61	**No difference**	**No difference**	**No difference**	**No difference**	**No difference**

** indicates higher concentrations to left hand column and # indicates higher concentrations to bottom row.*

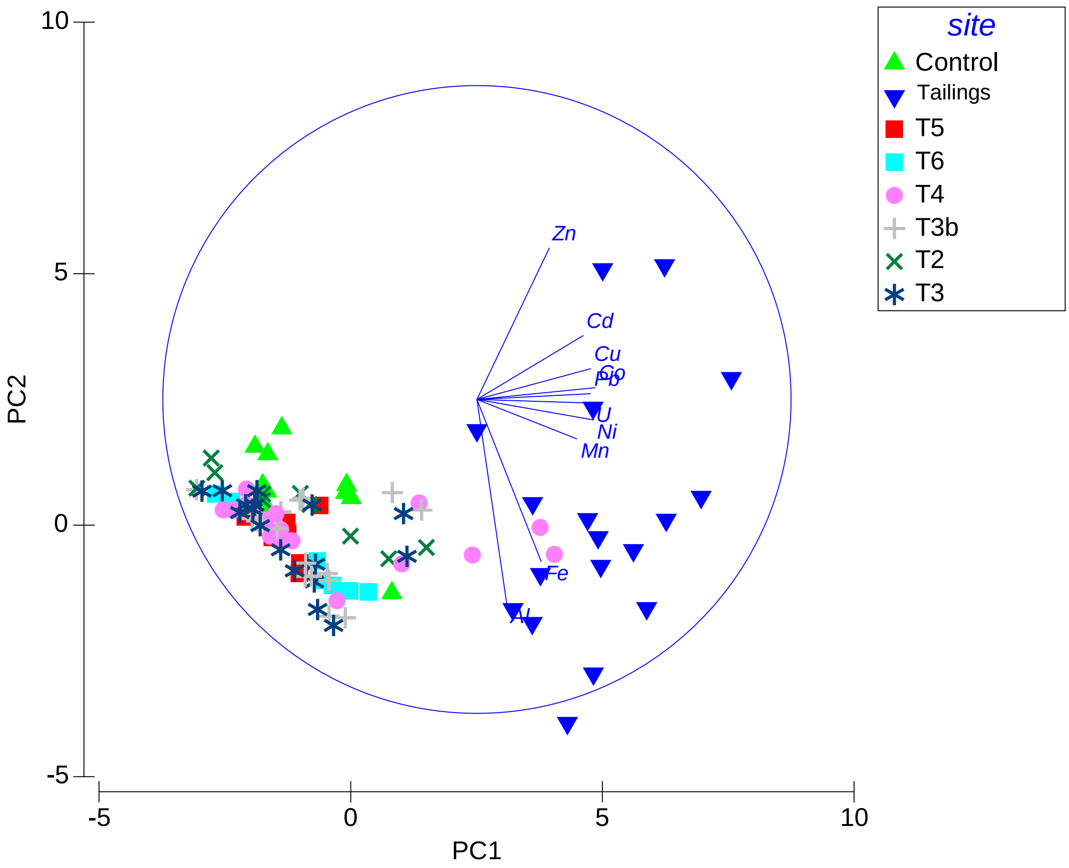

Figure 3-2. Principal Component analysis with eigenvectors representing the influence of different elements on the distribution of samples

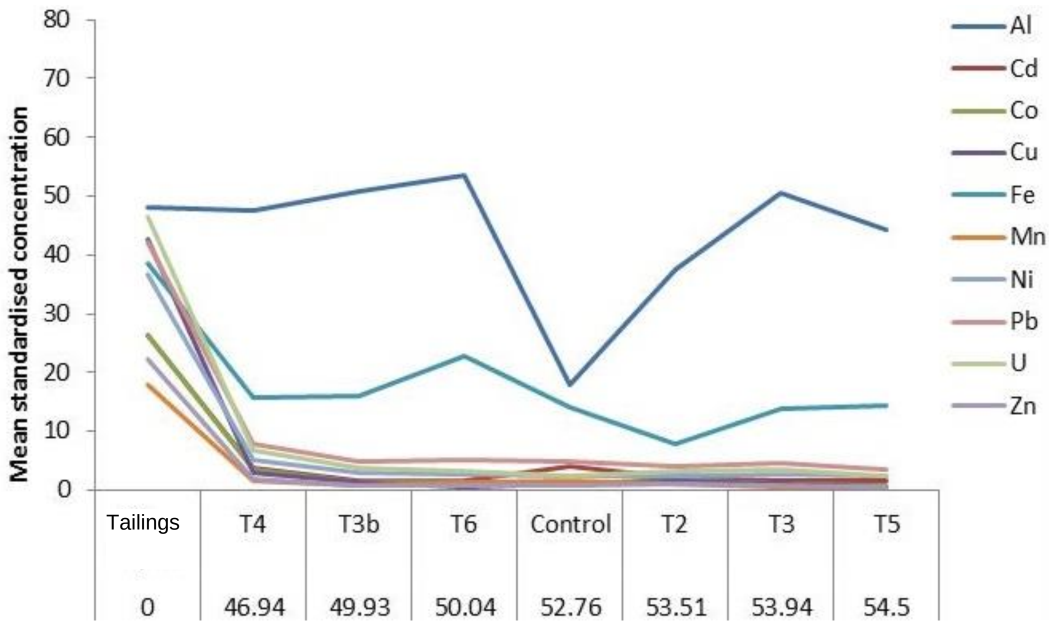

Figure 3-3. Relative concentrations of the different elements at the various locations sampled on the floodplain. Transects are ordered based on ED from tailings samples

3.2 Exclusion of Historical Data (Analysis 2)

3.2.1 Characterisation of Tailings 'Fingerprint'

The SIMPER analysis on only the tailings samples identified 14 elements that were characteristic of the tailings samples (Table 3-2). These 14 elements contributed the first 50% of the mean EDs between the tailings samples and therefore provided a geochemical signature.

3.2.2 Assessing Floodplain Deposition

The nMDS in Figure 3-4 gives a broad indication of the relationship between control, floodplain and tailings samples. There was a clear difference between control samples and tailings samples, with the floodplain samples acting as intermediaries with more similarity to the control samples. As with Analysis 1, samples on Transect 4 were identified as being most similar to the tailings samples. There was little similarity between any sample located at 500 m from the river and tailings samples.

This effect was also reflected in the ANOSIM and SIMPER results listed in Table 3-3. Tailings samples were largely different from all other samples, as were, to a lesser degree, the control samples. Compared with each other, floodplain samples were largely similar. The relationship between control, floodplain and tailings samples was demonstrated by the relationship between different elements (Figure 3-5). The elements Te, S, Cd, Mn, As, Zn and In appeared to drive the separation between tailings and floodplain samples with the remaining elements accounting for variation between samples that were common to both tailings and floodplain samples.

Figure 3-6 shows standardised levels of the 14 elements identified above for tailings, floodplain and control samples. The x-axis sequence of the transects was ordered based on how similar those transects were to the tailings sites based on EDs calculated from their elemental compositions (these were the same EDs used, in part, to position the samples with respect to the multiple axis in the nMDS and PCA plots). Their position along the x-axis is not proportional to their EDs, which were largely similar for the floodplain samples.

3.2.3 Relative Contribution of Tailings

The assessment of relative contribution of tailings was run on the three different depth samples at T4_L050 and T4_L250. These locations were chosen as samples from these locations were shown to be the most similar to the tailings samples. Conservative estimates of the mean contribution of tailings to overall elemental composition are provided in Table 3-4. The results suggested that in the small pocket where similarities with tailings samples were identified, shallow deposits consisted of about 50% tailings, with decreasing contribution with depth. It must be reiterated that these values ignored any other contributing sources, including all other tributaries downstream of the mine shown in Figure 2-1.

Table 3-2 Elements that typify tailings samples identified by their percent contribution to the similarity between tailings samples.

Element	Similarity percentage
Zn	2.97
Mn	2.98
As	3.04
Na	3.08
Th	3.18
In	3.27
Ce	3.62
Rb	3.74
Cd	3.84
S	4.28
Te	4.41
K	4.5
Ba	4.67
Tl	5.19

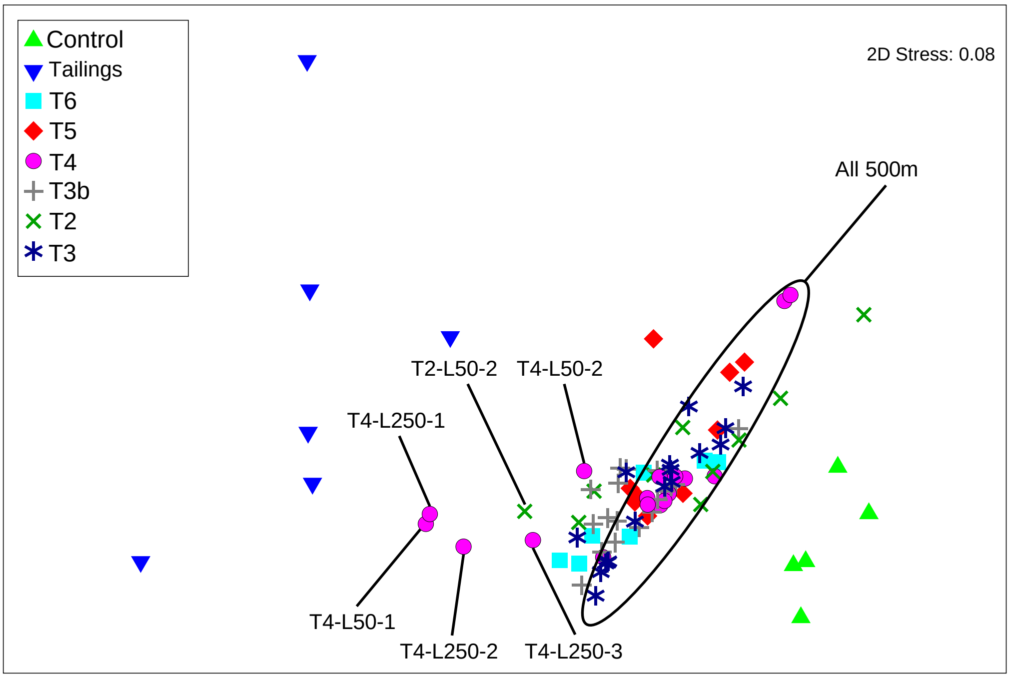

Figure 3-4 nMDS ordination showing distribution of samples based on similarity of elemental composition.

Table 3-3 Comparisons between transects; ANOSIM R-statistics (bold) and four most distinguishing elements identified by SIMPER analysis and their % contributions to the difference between transects.

*left #right

	Control	Tailings	T6	T5	T4	T3b	T2
Tailings	**0.9** In 12.3* Ce 10.95* S 9.71* Te 9.67*						
T6	**0.78** Ce 29.38* In 16.12* Na 11.64* Th 11.38*	**0.8** S 15.7# Mn 13.04# Te 12.75# Cd 11.09#					
T5	**0.8** Ce 22.03* Na 15.66# K 15.23# In 12.27*	**0.86** Mn 14.62# S 14.58# Te 12.56# Cd 9.96#	**No difference**				
T4	**0.4** Ce 21.53* Na 11.8* In 11.57* Th 8.97*	**0.8** S 13.97# Mn 13.3# Te 12.98# Cd 8.8#	**No difference**	**No difference**			
T3b	**0.9** Ce 30.21* In 14.39* Th 14.15* Na 12.53*	**0.95** S 15.6# Mn 14.99# Te 13.72# Cd 10.55#	**No difference**	**0.19** Na 16.12* K 14.55* Rb 11.01* As 9.1*	**No difference**		
T2	**0.50** Ce 20.7* Na 14.84* K 10.95# In 10.66*	**0.83** Te 12.64# Mn 12.44# S 11.83# A 9.86#	**No difference**	**No difference**	**No difference**	**0.41** Tl 12.02# Rb 11.86# As 8.64# Th 20.41#	
T3	**0.8** Ce 27.31* In 15.52* Na 14.33* Th 8.02*	**0.95** Mn 14.67# S 14.12# Te 13.55# Cd 9.97#	**No difference**	**No difference**	**No difference**	**No difference**	**No difference**

** indicates higher concentrations to left hand column and # indicates higher concentrations to bottom row.*

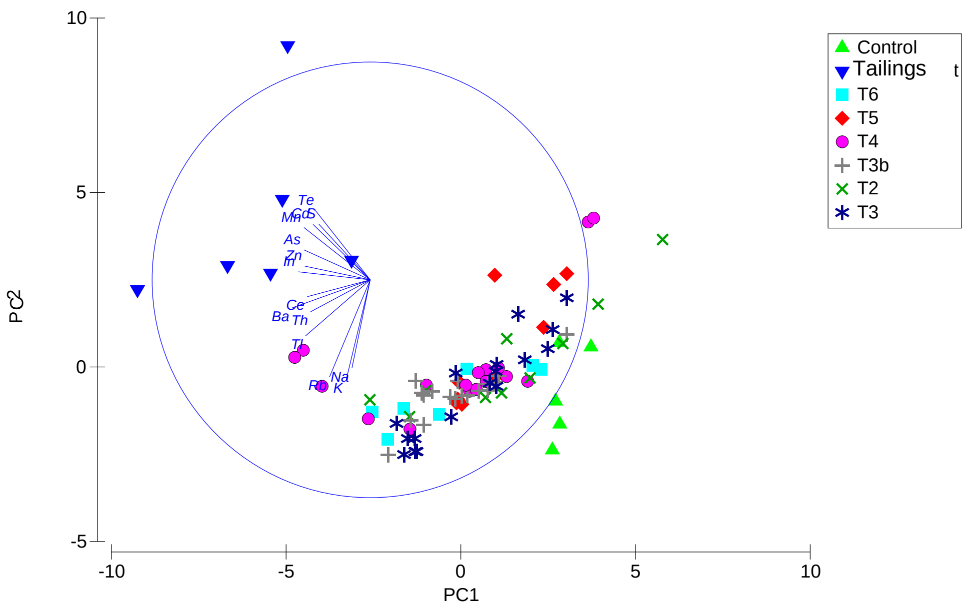

Figure 3-5 Principal Component Analysis with eigenvectors representing the influence of different elements on the distribution of samples

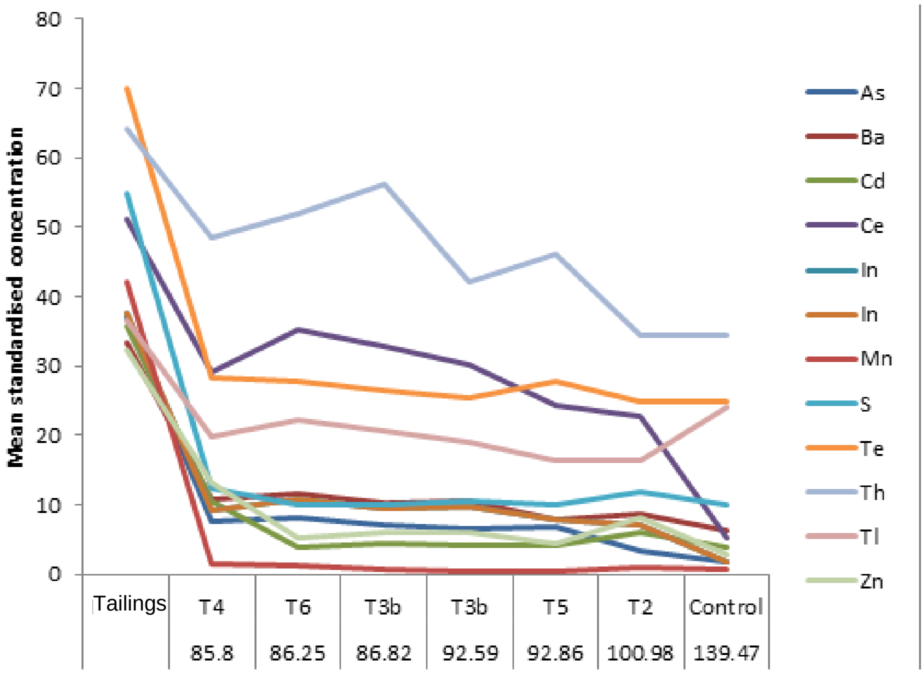

Figure 3-6 Relative concentrations of the different elements at the various locations sampled on the floodplain. Transects are ordered based on ED from tailings samples

Table 3-4 Relative contribution of tailings to deposition at different depths of two sites on Transect 4.

Sample ID	Mean % Contribution of Tailings to Sample
T4_L050_1	49
T4_L050_2	20
T4_L050_3	6
T4_L250_1	53
T4_L250_2	46
T4_L250_3	33

4 DISCUSSION AND RECOMMENDATIONS

4.1 Discussion of Results

Both analyses identified that floodplain samples were largely similar to each other and very different from the tailings samples. Both analyses identified Transect 4 as being more similar to the tailings sediments and is therefore the more likely to have received some tailings sediment than the other locations. Specifically, those samples on Transect 4 located < 250m from the left bank at shallow depths were most similar, but still distinct from the tailings sediment. This section of the river consists of a low-lying, inset floodplain on the inside of a meander bend and would be prone to higher rates of deposition than other sections of the floodplain as it would be wetted more frequently and would generally experience lower velocities.

Analysis 1 demonstrated less difference between the floodplain and tailings samples (smaller ED values) and identified Transect 5 as being the most different from the tailings samples. Analysis 2 demonstrated much more pronounced differences between tailings and floodplain samples (higher EDs) with the control samples being the most different from the tailings samples in terms of elemental composition.

Analysis 1 suggested that Zn, Cd, Cu, Co, Pb, U, Ni, and Mn were the elements that differentiated tailings and floodplain samples. Analysis 2 identified Te, S, Cd, Mn, As, Zn and In as the differentiating elements. Zn, Cd and Mn were common to both analyses.

Based on their similarity with the tailings samples, the sequence of transects from most to least similar using the historical suite of elements was Transect 4, 3b, 6, Control, 2, 3 and 5. Analysis 2 suggested that the sequence from most to least similar was Transect 4, 6, 3b, 3, 5, 2 and Control. These differences between the two datasets are likely due to the fact that the current data provided a more effective characterisation (fingerprint) of the tailings as there were more elements in the characterisation process.

Regardless of which method was used, the results showed there was evidence of some overbank deposition of tailings but that it was restricted to a trace amount in most areas and about 50% (at most) in isolated shallow locations near the Florence Creek junction. This suggests that there are minimal deposits of tailings near the White Eagle Community.

4.2 Recommendations

Given this study has shown that there are only isolated deposits of tailings sediments on the floodplain within the study area, we do not consider that any further coring work is required in the study area. Hydrobiology is aware of several previously unpublished tailings impact studies that are in press at the time of writing. These studies focus on the reaches of Finniss River downstream floodplain. A review of these finding, once available, should be undertaken to inform the need for any further study.

5 REFERENCES

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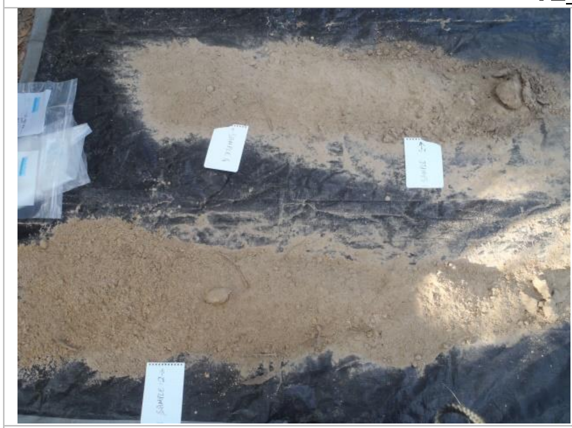
APPENDIX 1 PHOTOGRAPHS


T2_L50


T2_L250


T2_R50



T2_R250

T3_L50

T3_L250

T3_L500


T3_R50


T3_R250


T3_R500


T3b_L50


T3b_L250


T3b_L500


T3b_R50


T3b_R250


T3b_R500


T4_L50


T4_L250


T4_L500


T4_R50


T4_R250


T4_R500


T5_L50


T5_L250


T5_L500


T6_R50

T6_R250


T6_R500

	
	T7_2
	
T7_3	T7_4
	
T7_5	T7_6
	
T7_7	T7_8

APPENDIX 2 QA/QC DOCUMENTATION

ALS Minerals
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Finalized Date: 7-JUL-2015
Account: HYDROB

QC CERTIFICATE BR15083531

Project: 15-014-NTG01

This report is for 85 Soil samples submitted to our lab in Brisbane, QLD, Australia on 9-JUN-2015.

The following have access to data associated with this certificate:

BEN PEARSON

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LEV-01	Waste Disposal Levy
PUL-21	Pulverize entire sample
TRA-21	Transfer sample
LOG-22	Sample login - Rcd w/o BarCode

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
ME-XRF15b	Various elements in ores by fusion XRF	XRF
ME-GRA05	H2O/LOI by TGA furnace	TGA
ME-MS61r	48 element four acid ICP-MS + REEs	

To: HYDROBIOLOGY PTY LTD
ATTN: BEN PEARSON
PO BOX 2050
MILTON QLD 4064

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:

Shaun Kenny, Brisbane Laboratory Manager

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Project: 15- 014- NTG01

QC CERTIFICATE OF ANALYSIS BR15083531

Sample Description	Method / Analyte / Units / LOR	ME- XRF15b Al2O3 % 0.01	ME- XRF15b As % 0.01	ME- XRF15b BaO % 0.01	ME- XRF15b Bi % 0.01	ME- XRF15b CaO % 0.01	ME- XRF15b CeO2 % 0.01	ME- XRF15b Co % 0.01	ME- XRF15b Cr % 0.01	ME- XRF15b Cu % 0.005	ME- XRF15b Fe % 0.01	ME- XRF15b HfO2 % 0.01	ME- XRF15b K2O % 0.01	ME- XRF15b La2O3 % 0.01	ME- XRF15b MgO % 0.01	ME- XRF15b Mn % 0.01
STANDARDS																
AMIS0019		14.55	0.02	0.02	0.01	0.17	0.01	<0.01	0.02	0.034	8.50	<0.01	3.45	<0.01	1.10	0.09
Target Range - Lower Bound		14.20	<0.01	<0.01	<0.01	0.16	<0.01	<0.01	<0.01	0.026	8.37	<0.01	3.28	<0.01	1.08	0.09
Upper Bound		15.40	0.04	0.04	0.03	0.20	0.03	0.02	0.04	0.046	9.09	0.02	3.64	0.02	1.20	0.13
GBM908- 10																
GBM908- 10																
Target Range - Lower Bound																
Upper Bound																
LAT- CS9																
LAT- CS9																
LAT- CS9																
LAT- CS9																
LAT- CS9																
LAT- CS9																
Target Range - Lower Bound																
Upper Bound																
MRGeo08																
MRGeo08																
Target Range - Lower Bound																
Upper Bound																
NCSDC73303		13.85	<0.01	0.06	<0.01	8.87	0.01	0.01	0.01	0.006	9.34	<0.01	2.32	<0.01	7.70	0.13
Target Range - Lower Bound		13.25	<0.01	0.04	<0.01	8.45	<0.01	<0.01	<0.01	<0.005	8.99	<0.01	2.19	<0.01	7.45	0.11
Upper Bound		14.40	0.02	0.08	0.02	9.17	0.03	0.02	0.03	0.015	9.76	0.02	2.45	0.02	8.09	0.15
NCSDC73508		11.10	0.28	0.04	0.01	4.63	0.01	0.01	0.01	1.050	8.11	<0.01	2.99	<0.01	1.30	0.38
Target Range - Lower Bound		10.75	0.24	<0.01	<0.01	4.50	<0.01	<0.01	<0.01	0.992	8.05	<0.01	2.94	<0.01	1.32	0.35
Upper Bound		11.65	0.32	0.02	0.03	4.90	0.02	0.02	0.02	1.105	8.75	0.02	3.27	0.02	1.46	0.41
OGGeo08																
Target Range - Lower Bound																
Upper Bound																
OREAS- 45e																
Target Range - Lower Bound																
Upper Bound																
SARM- 45		26.7	0.01	0.09	<0.01	0.78	0.02	0.01	0.02	<0.005	8.95	<0.01	3.18	<0.01	3.52	0.08
Target Range - Lower Bound		25.2	<0.01	0.08	<0.01	0.74	<0.01	<0.01	<0.01	<0.005	8.45	<0.01	3.01	<0.01	3.24	0.06
Upper Bound		27.3	0.02	0.12	0.02	0.82	0.04	0.02	0.05	0.011	9.18	0.02	3.35	0.02	3.54	0.10

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Account: HYDROB

Project: 15- 014- NTG01

QC CERTIFICATE OF ANALYSIS BR15083531

Sample Description	Method / Analyte / Units / LOR	ME- XRF15b Mo % 0.005	ME- XRF15b Nb % 0.005	ME- XRF15b Ni % 0.005	ME- XRF15b P2O5 % 0.01	ME- XRF15b Pb % 0.005	ME- XRF15b Rb % 0.005	ME- XRF15b S % 0.01	ME- XRF15b Sb % 0.005	ME- XRF15b SiO2 % 0.01	ME- XRF15b Sn % 0.005	ME- XRF15b Sr % 0.01	ME- XRF15b TiO2 % 0.01	ME- XRF15b V % 0.01	ME- XRF15b W % 0.001	ME- XRF15b Y2O3 % 0.005
STANDARDS																
AMIS0019		<0.005	<0.005	<0.005	0.11	0.057	0.022	6.35	0.057	53.3	1.100	0.01	0.63	0.01	0.005	<0.005
Target Range - Lower Bound		<0.005	<0.005	<0.005	0.09	0.052	0.012	6.13	0.047	52.0	1.035	<0.01	0.59	<0.01	0.004	<0.005
Upper Bound		0.010	0.015	0.012	0.13	0.075	0.034	6.79	0.067	56.3	1.155	0.03	0.67	0.03	0.008	0.015
GBM908- 10																
GBM908- 10																
Target Range - Lower Bound																
Upper Bound																
LAT- CS9																
LAT- CS9																
LAT- CS9																
LAT- CS9																
LAT- CS9																
LAT- CS9																
Target Range - Lower Bound																
Upper Bound																
MRGeo08																
MRGeo08																
Target Range - Lower Bound																
Upper Bound																
NCSDC73303		<0.005	0.008	0.016	0.96	<0.005	0.005	<0.01	<0.005	44.2	<0.005	0.11	2.35	0.01	<0.001	<0.005
Target Range - Lower Bound		<0.005	<0.005	<0.005	0.87	<0.005	<0.005	<0.01	<0.005	42.8	<0.005	0.08	2.24	<0.01	<0.001	<0.005
Upper Bound		0.010	0.017	0.024	1.03	0.014	0.010	0.03	0.010	46.4	0.012	0.14	2.50	0.04	0.002	0.010
NCSDC73508		0.008	<0.005	0.006	0.13	2.08	0.013	6.83	0.063	47.1	0.006	0.02	0.53	0.01	0.002	<0.005
Target Range - Lower Bound		<0.005	<0.005	<0.005	0.11	1.910	<0.005	6.39	0.051	46.0	<0.005	<0.01	0.48	<0.01	<0.001	<0.005
Upper Bound		0.012	0.010	0.010	0.15	2.23	0.010	7.09	0.071	49.8	0.012	0.02	0.56	0.03	0.004	0.010
OGGeo08																
Target Range - Lower Bound																
Upper Bound																
OREAS- 45e																
Target Range - Lower Bound																
Upper Bound																
SARM- 45		<0.005	<0.005	0.008	0.08	<0.005	0.016	0.04	<0.005	49.9	<0.005	0.01	1.84	0.02	0.002	0.006
Target Range - Lower Bound		<0.005	<0.005	<0.005	0.06	<0.005	<0.005	0.03	<0.005	47.6	<0.005	<0.01	1.72	<0.01	<0.001	<0.005
Upper Bound		0.010	0.013	0.018	0.10	0.012	0.025	0.07	0.015	51.6	0.011	0.03	1.92	0.05	0.004	0.018

***** See Appendix Page for comments regarding this certificate *****

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Account: HYDROB

Project: 15- 014- NTG01

QC CERTIFICATE OF ANALYSIS BR15083531

Sample Description	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- GRA05	ME- MS61r	ME- MS61r	ME- MS61r	ME- MS61r	ME- MS61r	ME- MS61r	ME- MS61r	ME- MS61r	ME- MS61r	ME- MS61r	ME- MS61r
Analyte	Zn	Zr	Total	LOI	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr
Units	%	%	%	%	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
LOR	0.005	0.01	0.01	0.01	0.01	0.01	0.2	10	0.05	0.01	0.01	0.02	0.01	0.1	1
STANDARDS															
AMIS0019	0.515	0.01	103.85												
Target Range - Lower Bound	0.482	<0.01	<0.01												
Upper Bound	0.543	0.03	0.02												
GBM908- 10					2.87	6.69	57.7	1040	1.45	1.36	3.49	1.65	101.0	26.7	136
GBM908- 10					2.94	7.12	55.1	1110	1.45	1.16	3.79	1.76	104.0	25.2	133
Target Range - Lower Bound					2.69	6.40	51.1	930	1.27	1.12	3.33	1.53	99.0	23.3	125
Upper Bound					3.31	7.84	62.9	1280	1.66	1.39	4.10	1.91	121.0	28.7	155
LAT- CS9				12.70											
LAT- CS9				12.72											
LAT- CS9				12.63											
LAT- CS9				12.89											
LAT- CS9				12.72											
LAT- CS9				12.68											
Target Range - Lower Bound				12.34											
Upper Bound				13.12											
MRGeo08					4.40	6.99	33.3	1040	3.25	0.75	2.69	2.18	75.4	21.2	92
MRGeo08					4.25	7.60	31.4	1080	3.24	0.68	2.70	2.15	75.4	19.3	91
Target Range - Lower Bound					4.00	6.64	29.7	920	2.91	0.62	2.35	2.05	66.7	17.7	81
Upper Bound					4.92	8.14	36.7	1270	3.67	0.78	2.90	2.55	81.5	21.9	102
NCSDC73303	0.014	0.03	96.40												
Target Range - Lower Bound	<0.005	<0.01	<0.01												
Upper Bound	0.025	0.05	0.02												
NCSDC73508	4.26	0.01	106.45												
Target Range - Lower Bound	4.04	<0.01	<0.01												
Upper Bound	4.48	0.02	0.02												
OGGeo08					18.55	6.61	118.0	750	2.94	11.50	2.30	18.65	73.6	98.1	81
Target Range - Lower Bound					18.15	6.07	107.0	700	2.59	9.44	1.98	16.70	64.8	87.2	78
Upper Bound					22.2	7.44	131.0	980	3.27	11.55	2.44	20.5	79.2	107.0	98
OREAS- 45e					0.35	5.61	15.8	230	0.55	0.30	0.05	0.02	22.5	52.4	946
Target Range - Lower Bound					0.27	6.09	14.2	200	0.49	0.24	0.04	<0.02	21.1	51.2	880
Upper Bound					0.35	7.47	17.8	300	0.75	0.32	0.09	0.07	25.9	62.8	1080
SARM- 45	0.007	0.03	100.40												
Target Range - Lower Bound	<0.005	<0.01	<0.01												
Upper Bound	0.017	0.05	0.02												

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Finalized Date: 7-JUL-2015
Account: HYDROB

Project: 15-014-NTG01

QC CERTIFICATE OF ANALYSIS BR15083531

Sample Description	Method / Analyte / Units / LOR	ME-MS61r Cs ppm 0.05	ME-MS61r Cu ppm 0.2	ME-MS61r Fe % 0.01	ME-MS61r Ga ppm 0.05	ME-MS61r Ge ppm 0.05	ME-MS61r Hf ppm 0.1	ME-MS61r In ppm 0.005	ME-MS61r K % 0.01	ME-MS61r La ppm 0.5	ME-MS61r Li ppm 0.2	ME-MS61r Mg % 0.01	ME-MS61r Mn ppm 5	ME-MS61r Mo ppm 0.05	ME-MS61r Na % 0.01	ME-MS61r Nb ppm 0.1
STANDARDS																
AMIS0019																
Target Range - Lower Bound																
Upper Bound																
GBM908-10		3.60	3560	5.16	22.1	0.23	3.6	0.069	2.03	51.3	11.8	1.74	767	63.5	2.03	10.2
GBM908-10		3.70	3750	5.53	21.6	0.28	3.8	0.075	2.08	51.0	11.8	1.79	804	68.8	2.13	10.7
Target Range - Lower Bound		3.44	3380	4.98	18.65	0.18	3.3	0.064	1.87	49.0	9.8	1.61	715	57.9	1.93	9.5
Upper Bound		4.32	3880	6.10	22.9	0.40	4.3	0.092	2.31	61.0	12.4	1.99	885	70.9	2.38	11.9
LAT-CS9																
LAT-CS9																
LAT-CS9																
LAT-CS9																
LAT-CS9																
LAT-CS9																
Target Range - Lower Bound																
Upper Bound																
MRGeo08		12.10	617	3.75	20.9	0.20	3.1	0.169	3.01	36.8	34.5	1.26	535	15.65	1.87	21.6
MRGeo08		11.25	602	3.82	19.40	0.19	3.2	0.164	3.03	36.0	34.4	1.32	540	14.60	1.91	20.4
Target Range - Lower Bound		11.00	587	3.55	17.50	<0.05	2.8	0.161	2.79	31.1	30.4	1.17	497	13.65	1.76	19.0
Upper Bound		13.60	675	4.37	21.5	0.27	3.6	0.207	3.43	39.1	37.6	1.45	619	16.75	2.18	23.4
NCSDC73303																
Target Range - Lower Bound																
Upper Bound																
NCSDC73508																
Target Range - Lower Bound																
Upper Bound																
OGGeo08		10.95	8210	5.04	17.85	0.41	2.8	1.395	2.82	36.2	33.9	1.20	493	874	1.75	17.0
Target Range - Lower Bound		9.85	7800	4.81	16.05	0.25	2.5	1.320	2.59	31.0	29.7	1.11	447	841	1.62	15.4
Upper Bound		12.15	8980	5.91	19.75	0.49	3.3	1.620	3.19	39.0	36.7	1.38	557	1030	2.00	19.0
OREAS-45e		1.23	758	22.5	15.95	0.43	3.1	0.094	0.32	10.2	6.7	0.12	516	2.38	0.06	6.7
Target Range - Lower Bound		1.08	725	21.7	14.80	1.13	2.7	0.084	0.28	9.4	5.7	0.13	490	2.11	0.04	6.0
Upper Bound		1.44	835	26.5	18.20	1.49	3.5	0.114	0.37	12.6	7.4	0.18	610	2.69	0.08	7.6
SARM-45																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS BR15083531

Sample Description	Method	ME- MS61r	ME- MS61r	ME- MS61r	ME- MS61r	ME- MS61r	ME- MS61r	ME- MS61r	ME- MS61r	ME- MS61r	ME- MS61r	ME- MS61r	ME- MS61r	ME- MS61r	ME- MS61r	ME- MS61r
	Analyte	Ni	P	Pb	Rb	Re	S	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Ti
	Units	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.2	10	0.5	0.1	0.002	0.01	0.05	0.1	1	0.2	0.2	0.05	0.05	0.2	0.005
								STANDARDS								
AMIS0019																
Target Range - Lower Bound																
Upper Bound																
GBM908- 10		2230	940	2020	164.5	<0.002	0.36	1.70	19.1	2	3.1	280	0.69	0.08	18.3	0.719
GBM908- 10		2200	990	2040	177.5	<0.002	0.37	1.74	18.7	2	3.3	295	0.80	0.09	17.9	0.703
Target Range - Lower Bound		2030	880	1860	153.0	<0.002	0.33	1.40	17.0	<1	2.7	258	0.68	<0.05	16.4	0.591
Upper Bound		2480	1100	2270	187.0	0.006	0.43	2.01	21.0	4	3.9	316	0.97	0.16	20.4	0.733
LAT- CS9																
LAT- CS9																
LAT- CS9																
LAT- CS9																
LAT- CS9																
LAT- CS9																
Target Range - Lower Bound																
Upper Bound																
MRGeo08		693	990	1070	201	0.009	0.29	4.52	13.5	2	4.0	296	1.49	<0.05	21.8	0.545
MRGeo08		658	1030	1060	211	0.007	0.29	4.51	12.7	2	3.9	305	1.47	0.05	21.4	0.526
Target Range - Lower Bound		622	930	971	173.5	0.006	0.27	3.89	11.1	<1	3.5	277	1.39	<0.05	17.7	0.454
Upper Bound		760	1160	1185	212	0.016	0.36	5.39	13.7	4	4.7	339	1.81	0.14	22.1	0.566
NCSDC73303																
Target Range - Lower Bound																
Upper Bound																
NCSDC73508																
Target Range - Lower Bound																
Upper Bound																
OGGeo08		8640	800	7250	192.5	1.355	2.70	27.4	11.1	11	14.3	246	1.26	0.24	20.1	0.437
Target Range - Lower Bound		8000	760	6520	164.5	1.285	2.51	22.8	9.2	8	12.5	224	1.19	0.09	16.7	0.353
Upper Bound		9770	950	7970	201	1.575	3.09	31.0	11.4	14	15.7	274	1.57	0.31	20.9	0.443
OREAS- 45e		442	310	18.3	20.9	<0.002	0.05	0.99	85.3	3	1.3	15.8	0.56	0.18	11.6	0.501
Target Range - Lower Bound		408	300	15.9	19.0	<0.002	0.02	0.80	83.6	<1	0.9	14.1	0.43	0.07	11.4	0.498
Upper Bound		500	380	20.5	23.4	0.004	0.07	1.20	102.5	5	1.8	17.7	0.69	0.28	14.4	0.620
SARM- 45																
Target Range - Lower Bound																
Upper Bound																

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Project: 15-014-NTG01

QC CERTIFICATE OF ANALYSIS BR15083531

Sample Description	Method	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r
	Analyte	Tl	U	V	W	Y	Zn	Zr	Dy	Er	Eu	Gd	Ho	Lu	Nd	Pr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.1	1	0.1	0.1	2	0.5	0.05	0.03	0.03	0.05	0.01	0.01	0.1	0.03
STANDARDS																
AMIS0019																
Target Range - Lower Bound																
Upper Bound																
GBM908-10		1.27	2.3	131	3.1	36.4	1050	138.5	6.71	3.81	1.70	7.57	1.32	0.56	40.6	10.65
GBM908-10		1.16	2.0	142	3.2	38.4	1070	142.0	7.38	4.20	1.83	8.39	1.49	0.58	40.6	10.45
Target Range - Lower Bound		1.00	2.0	123	2.9	35.2	939	117.5	5.70	3.26	1.57	6.49	1.14	0.42	36.2	9.83
Upper Bound		1.40	2.6	153	4.1	43.2	1155	160.5	7.82	4.48	2.19	8.89	1.56	0.60	49.2	13.35
LAT-CS9																
LAT-CS9																
LAT-CS9																
LAT-CS9																
LAT-CS9																
LAT-CS9																
Target Range - Lower Bound																
Upper Bound																
MRGeo08		1.11	6.0	104	4.7	28.1	805	114.0	5.19	2.96	1.37	5.85	1.01	0.45	32.2	8.29
MRGeo08		0.98	5.1	107	4.6	26.6	769	108.5	4.96	2.90	1.29	5.60	0.99	0.43	29.9	7.69
Target Range - Lower Bound		0.89	4.9	97	4.1	23.8	722	92.2	3.99	2.37	1.12	4.60	0.79	0.32	26.5	7.02
Upper Bound		1.25	6.3	121	5.8	29.3	886	126.0	5.51	3.27	1.59	6.34	1.09	0.46	36.1	9.56
NCSDC73303																
Target Range - Lower Bound																
Upper Bound																
NCSDC73508																
Target Range - Lower Bound																
Upper Bound																
OGGeo08		1.64	5.2	81	4.5	25.7	7270	91.9	4.47	2.57	1.22	5.37	0.89	0.37	30.3	7.99
Target Range - Lower Bound		1.43	4.5	77	3.9	21.1	6500	78.6	3.65	2.03	0.99	4.19	0.70	0.27	24.7	6.61
Upper Bound		1.98	5.8	97	5.4	26.0	7950	107.5	5.05	2.81	1.41	5.79	0.98	0.39	33.7	9.01
OREAS-45e		0.14	2.4	292	1.0	7.5	44	105.0	1.99	1.18	0.54	1.96	0.40	0.20	9.6	2.60
Target Range - Lower Bound		0.10	2.1	289	0.8	7.4	40	93.0	1.69	0.99	0.44	1.64	0.31	0.13	8.0	2.15
Upper Bound		0.21	2.8	355	1.4	9.2	53	127.0	2.41	1.41	0.67	2.34	0.45	0.21	11.1	2.99
SARM-45																
Target Range - Lower Bound																
Upper Bound																

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Project: 15- 014- NTG01

QC CERTIFICATE OF ANALYSIS BR15083531

Sample Description	Method / Analyte / Units / LOR	ME- MS61r Sm ppm 0.03	ME- MS61r Tb ppm 0.01	ME- MS61r Tm ppm 0.01	ME- MS61r Yb ppm 0.03
		STANDARDS			
AMIS0019					
Target Range - Lower Bound					
Upper Bound					
GBM908- 10		7.96	1.12	0.54	3.49
GBM908- 10		8.48	1.25	0.58	3.76
Target Range - Lower Bound		7.02	0.99	0.46	2.83
Upper Bound		9.56	1.37	0.64	3.91
LAT- CS9					
LAT- CS9					
LAT- CS9					
LAT- CS9					
LAT- CS9					
LAT- CS9					
Target Range - Lower Bound					
Upper Bound					
MRGeo08		6.41	0.85	0.42	2.80
MRGeo08		5.96	0.83	0.41	2.72
Target Range - Lower Bound		5.24	0.67	0.32	2.13
Upper Bound		7.16	0.93	0.46	2.95
NCSDC73303					
Target Range - Lower Bound					
Upper Bound					
NCSDC73508					
Target Range - Lower Bound					
Upper Bound					
OGGeo08		6.28	0.80	0.36	2.33
Target Range - Lower Bound		4.89	0.64	0.28	1.83
Upper Bound		6.69	0.90	0.40	2.55
OREAS- 45e		2.25	0.33	0.18	1.26
Target Range - Lower Bound		1.91	0.25	0.13	0.98
Upper Bound		2.65	0.37	0.21	1.40
SARM- 45					
Target Range - Lower Bound					
Upper Bound					

***** See Appendix Page for comments regarding this certificate *****

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Project: 15-014-NTG01

QC CERTIFICATE OF ANALYSIS BR15083531

Sample Description	Method / Analyte / Units / LOR	ME-XRF15b Al2O3 % 0.01	ME-XRF15b As % 0.01	ME-XRF15b BaO % 0.01	ME-XRF15b Bi % 0.01	ME-XRF15b CaO % 0.01	ME-XRF15b CeO2 % 0.01	ME-XRF15b Co % 0.01	ME-XRF15b Cr % 0.01	ME-XRF15b Cu % 0.005	ME-XRF15b Fe % 0.01	ME-XRF15b HfO2 % 0.01	ME-XRF15b K2O % 0.01	ME-XRF15b La2O3 % 0.01	ME-XRF15b MgO % 0.01	ME-XRF15b Mn % 0.01
BLANKS																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
BLANK		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Target Range - Lower Bound		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Upper Bound		0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.010	0.02	0.02	0.02	0.02	0.02	0.02
DUPLICATES																
T5-500L-2		12.65	0.01	0.02	<0.01	0.02	0.01	<0.01	<0.01	0.005	1.03	<0.01	1.27	<0.01	0.25	0.01
DUP		12.70	<0.01	0.02	<0.01	0.01	<0.01	<0.01	<0.01	<0.005	0.99	<0.01	1.27	<0.01	0.22	0.01
Target Range - Lower Bound		12.40	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	0.98	<0.01	1.23	<0.01	0.22	<0.01
Upper Bound		12.95	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.010	1.04	0.02	1.31	0.02	0.25	0.02
T5-250L-1																
DUP																
Target Range - Lower Bound																
Upper Bound																
T2-R50-1		6.82	0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.005	0.99	<0.01	1.34	<0.01	0.16	0.01
DUP		6.78	0.01	0.01	<0.01	0.02	<0.01	<0.01	0.01	<0.005	1.00	<0.01	1.34	<0.01	0.17	0.01
Target Range - Lower Bound		6.65	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	0.97	<0.01	1.30	<0.01	0.15	<0.01
Upper Bound		6.95	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.010	1.02	0.02	1.38	0.02	0.18	0.02
T2-R50-2																
DUP																
Target Range - Lower Bound																
Upper Bound																
T4-250L-1																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS BR15083531

Sample Description	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- XRF15b
Analyte	Mo	Nb	Ni	P2O5	Pb	Rb	S	Sb	SiO2	Sn	Sr	TiO2	V	W	Y2O3
Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
LOR	0.005	0.005	0.005	0.01	0.005	0.005	0.01	0.005	0.01	0.005	0.01	0.01	0.01	0.001	0.005
BLANKS															
BLANK															
BLANK															
BLANK															
Target Range - Lower Bound															
Upper Bound															
BLANK	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	99.0	<0.005	<0.01	<0.01	<0.01	<0.001	<0.005
BLANK	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	99.1	<0.005	<0.01	<0.01	<0.01	<0.001	<0.005
Target Range - Lower Bound	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.01	<0.01	<0.001	<0.005
Upper Bound	0.010	0.010	0.010	0.02	0.010	0.010	0.02	0.010	0.02	0.010	0.02	0.02	0.02	0.002	0.010
DUPLICATES															
T5- 500L- 2	<0.005	<0.005	<0.005	0.02	<0.005	0.011	<0.01	<0.005	78.6	<0.005	<0.01	0.77	<0.01	0.002	<0.005
DUP	<0.005	<0.005	<0.005	0.02	<0.005	0.011	<0.01	<0.005	78.6	<0.005	<0.01	0.78	<0.01	0.001	<0.005
Target Range - Lower Bound	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	77.0	<0.005	<0.01	0.75	<0.01	<0.001	<0.005
Upper Bound	0.010	0.010	0.010	0.03	0.010	0.017	0.02	0.010	80.2	0.010	0.02	0.80	0.02	0.002	0.010
T5- 250L- 1															
DUP															
Target Range - Lower Bound															
Upper Bound															
T2- R50- 1	<0.005	<0.005	<0.005	0.04	<0.005	0.009	0.02	<0.005	83.7	<0.005	<0.01	0.37	<0.01	<0.001	<0.005
DUP	<0.005	<0.005	<0.005	0.04	<0.005	0.009	0.02	<0.005	83.7	<0.005	<0.01	0.37	<0.01	0.001	<0.005
Target Range - Lower Bound	<0.005	<0.005	<0.005	0.03	<0.005	<0.005	<0.01	<0.005	82.0	<0.005	<0.01	0.35	<0.01	<0.001	<0.005
Upper Bound	0.010	0.010	0.010	0.05	0.010	0.010	0.03	0.010	85.4	0.010	0.02	0.39	0.02	0.002	0.010
T2- R50- 2															
DUP															
Target Range - Lower Bound															
Upper Bound															
T4- 250L- 1															
DUP															
Target Range - Lower Bound															
Upper Bound															

***** See Appendix Page for comments regarding this certificate *****

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QC CERTIFICATE OF ANALYSIS BR15083531

Sample Description	ME-XRF15b	ME-XRF15b	ME-XRF15b	ME-GRA05	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r
Analyte	Zn	Zr	Total	LOI	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr
Units	%	%	%	%	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
LOR	0.005	0.01	0.01	0.01	0.01	0.01	0.2	10	0.05	0.01	0.01	0.02	0.01	0.1	1
BLANKS															
BLANK					<0.01	<0.01	<0.2	<10	<0.05	0.01	<0.01	<0.02	<0.01	<0.1	<1
BLANK					<0.01	<0.01	<0.2	<10	<0.05	<0.01	<0.01	<0.02	<0.01	<0.1	<1
BLANK					0.01	0.01	<0.2	<10	<0.05	0.01	<0.01	<0.02	0.01	<0.1	<1
Target Range - Lower Bound					<0.01	<0.01	<0.2	<10	<0.05	<0.01	<0.01	<0.02	<0.01	<0.1	<1
Upper Bound					0.02	0.02	0.4	20	0.10	0.02	0.02	0.04	0.02	0.2	2
BLANK	<0.005	<0.01	99.00												
BLANK	<0.005	<0.01	99.10												
Target Range - Lower Bound	<0.005	<0.01	<0.01												
Upper Bound	0.010	0.02	0.02												
DUPLICATES															
T5-500L-2	<0.005	0.04	99.38		0.04	5.78	2.1	260	1.43	0.46	0.01	<0.02	55.8	9.3	35
DUP	<0.005	0.03	99.31		0.03	5.84	2.0	260	1.53	0.48	0.01	<0.02	59.9	9.6	35
Target Range - Lower Bound	<0.005	0.02	96.85		0.02	5.51	1.7	230	1.36	0.44	<0.01	<0.02	54.9	8.9	32
Upper Bound	0.010	0.05	101.85		0.05	6.11	2.4	290	1.60	0.50	0.02	0.04	60.8	10.0	38
T5-250L-1				3.13											
DUP				3.08											
Target Range - Lower Bound				3.02											
Upper Bound				3.19											
T2-R50-1	<0.005	0.03	99.41		0.04	3.23	2.5	210	1.24	0.96	0.01	0.03	52.7	12.2	21
DUP	<0.005	0.03	99.43		0.04	3.30	2.5	230	1.21	0.98	0.01	0.03	53.9	12.3	22
Target Range - Lower Bound	<0.005	0.02	96.92		0.03	3.09	2.2	190	1.11	0.91	<0.01	<0.02	50.6	11.5	19
Upper Bound	0.010	0.04	101.90		0.05	3.44	2.8	250	1.34	1.03	0.02	0.04	56.0	13.0	24
T2-R50-2				0.66											
DUP				0.68											
Target Range - Lower Bound				0.64											
Upper Bound				0.70											
T4-250L-1					0.30	7.30	16.1	470	3.06	26.9	0.08	0.12	104.5	125.0	61
DUP					0.31	7.30	16.4	470	3.05	27.5	0.09	0.11	104.0	126.0	62
Target Range - Lower Bound					0.28	6.93	15.2	420	2.85	25.8	0.07	0.09	99.0	119.0	57
Upper Bound					0.33	7.68	17.3	520	3.26	28.6	0.10	0.14	109.5	132.0	66

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Project: 15- 014- NTG01

QC CERTIFICATE OF ANALYSIS BR15083531

Sample Description	Method / Analyte / Units / LOR	ME- MS61r Cs ppm 0.05	ME- MS61r Cu ppm 0.2	ME- MS61r Fe % 0.01	ME- MS61r Ga ppm 0.05	ME- MS61r Ge ppm 0.05	ME- MS61r Hf ppm 0.1	ME- MS61r In ppm 0.005	ME- MS61r K % 0.01	ME- MS61r La ppm 0.5	ME- MS61r Li ppm 0.2	ME- MS61r Mg % 0.01	ME- MS61r Mn ppm 5	ME- MS61r Mo ppm 0.05	ME- MS61r Na % 0.01	ME- MS61r Nb ppm 0.1
BLANKS																
BLANK		<0.05	<0.2	<0.01	<0.05	<0.05	<0.1	<0.005	<0.01	<0.5	<0.2	<0.01	<5	<0.05	<0.01	<0.1
BLANK		<0.05	0.2	<0.01	<0.05	<0.05	<0.1	<0.005	<0.01	<0.5	<0.2	<0.01	<5	<0.05	<0.01	<0.1
BLANK		<0.05	<0.2	<0.01	<0.05	<0.05	<0.1	<0.005	<0.01	<0.5	<0.2	<0.01	<5	<0.05	<0.01	<0.1
Target Range - Lower Bound		<0.05	<0.2	<0.01	<0.05	<0.05	<0.1	<0.005	<0.01	<0.5	<0.2	<0.01	<5	<0.05	<0.01	<0.1
Upper Bound		0.10	0.4	0.02	0.10	0.10	0.2	0.010	0.02	1.0	0.4	0.02	10	0.10	0.02	0.2
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
DUPLICATES																
T5- 500L- 2		8.33	13.9	0.87	16.55	0.09	3.5	0.045	0.96	29.9	44.5	0.11	48	0.23	0.05	13.0
DUP		9.02	14.0	0.88	17.45	0.12	3.6	0.049	0.97	32.2	46.9	0.12	47	0.23	0.05	13.6
Target Range - Lower Bound		8.19	13.3	0.82	16.10	<0.05	3.3	0.040	0.91	29.0	43.2	0.10	40	0.17	0.04	12.5
Upper Bound		9.16	14.6	0.93	17.90	0.16	3.8	0.054	1.02	33.1	48.2	0.13	55	0.29	0.06	14.1
T5- 250L- 1																
DUP																
Target Range - Lower Bound																
Upper Bound																
T2- R50- 1		4.59	58.9	0.86	9.11	0.10	2.8	0.028	1.01	26.2	21.7	0.09	54	0.29	0.06	6.5
DUP		4.67	60.0	0.88	9.46	0.11	2.8	0.028	1.04	26.4	21.5	0.09	56	0.33	0.06	6.6
Target Range - Lower Bound		4.35	57.2	0.82	8.77	<0.05	2.6	0.022	0.96	24.5	20.3	0.08	47	0.24	0.05	6.1
Upper Bound		4.91	61.7	0.92	9.80	0.16	3.0	0.034	1.09	28.1	22.9	0.10	63	0.38	0.07	7.0
T2- R50- 2																
DUP																
Target Range - Lower Bound																
Upper Bound																
T4- 250L- 1		7.57	826	2.73	21.6	0.18	3.9	0.066	2.22	49.1	40.1	0.50	435	1.69	0.10	13.7
DUP		7.71	825	2.73	22.0	0.19	4.1	0.066	2.26	49.3	42.0	0.51	428	1.69	0.10	13.5
Target Range - Lower Bound		7.21	796	2.58	20.7	0.13	3.7	0.058	2.12	46.2	38.8	0.47	405	1.56	0.09	12.8
Upper Bound		8.07	855	2.88	22.9	0.24	4.3	0.074	2.36	52.2	43.3	0.54	458	1.82	0.12	14.4

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QC CERTIFICATE OF ANALYSIS BR15083531

Sample Description	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r
Analyte	Ni	P	Pb	Rb	Re	S	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Ti
Units	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
LOR	0.2	10	0.5	0.1	0.002	0.01	0.05	0.1	1	0.2	0.2	0.05	0.05	0.2	0.005
BLANKS															
BLANK	<0.2	<10	<0.5	<0.1	<0.002	<0.01	0.06	<0.1	<1	<0.2	<0.2	<0.05	<0.05	<0.2	<0.005
BLANK	<0.2	<10	<0.5	0.1	<0.002	<0.01	<0.05	<0.1	<1	<0.2	<0.2	<0.05	<0.05	<0.2	<0.005
BLANK	<0.2	<10	0.9	0.2	<0.002	<0.01	0.05	<0.1	<1	<0.2	<0.2	<0.05	<0.05	<0.2	<0.005
Target Range - Lower Bound	<0.2	<10	<0.5	<0.1	<0.002	<0.01	<0.05	<0.1	<1	<0.2	<0.2	<0.05	<0.05	<0.2	<0.005
Upper Bound	0.4	20	1.0	0.2	0.004	0.02	0.10	0.2	5	0.4	0.4	0.10	0.10	0.4	0.010
BLANK															
BLANK															
Target Range - Lower Bound															
Upper Bound															
DUPLICATES															
T5-500L-2	18.8	60	19.7	85.3	<0.002	0.01	0.95	10.2	1	4.0	13.4	1.49	<0.05	21.3	0.437
DUP	20.1	60	19.9	89.4	<0.002	0.01	0.61	10.5	1	4.1	14.2	1.29	<0.05	21.9	0.456
Target Range - Lower Bound	18.3	50	18.3	82.9	<0.002	<0.01	0.67	9.7	<1	3.6	12.9	1.27	<0.05	20.3	0.419
Upper Bound	20.6	70	21.3	91.8	0.004	0.02	0.89	11.0	2	4.5	14.7	1.51	0.10	22.9	0.474
T5-250L-1															
DUP															
Target Range - Lower Bound															
Upper Bound															
T2-R50-1	15.5	140	17.9	71.5	<0.002	0.02	0.67	6.0	1	2.6	13.6	0.65	<0.05	13.1	0.219
DUP	16.3	150	19.2	73.1	<0.002	0.02	0.70	6.1	1	2.7	13.7	0.72	<0.05	13.9	0.210
Target Range - Lower Bound	14.9	130	17.1	68.6	<0.002	<0.01	0.58	5.6	<1	2.3	12.8	0.60	<0.05	12.6	0.199
Upper Bound	16.9	160	20.0	76.0	0.004	0.03	0.79	6.5	2	3.0	14.5	0.77	0.10	14.4	0.230
T2-R50-2															
DUP															
Target Range - Lower Bound															
Upper Bound															
T4-250L-1	157.0	800	240	149.0	0.002	0.03	2.34	14.9	2	4.2	26.8	1.18	0.10	24.0	0.389
DUP	158.0	800	241	150.0	<0.002	0.03	2.39	15.3	2	4.3	27.0	1.25	0.10	25.5	0.397
Target Range - Lower Bound	149.5	750	228	142.0	<0.002	0.02	2.14	14.2	<1	3.8	25.4	1.10	<0.05	23.3	0.368
Upper Bound	165.5	850	253	157.0	0.004	0.04	2.59	16.0	3	4.7	28.4	1.33	0.16	26.2	0.418

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QC CERTIFICATE OF ANALYSIS BR15083531

Sample Description / Method / Analyte / Units / LOR	ME-MS61r Tl ppm 0.02	ME-MS61r U ppm 0.1	ME-MS61r V ppm 1	ME-MS61r W ppm 0.1	ME-MS61r Y ppm 0.1	ME-MS61r Zn ppm 2	ME-MS61r Zr ppm 0.5	ME-MS61r Dy ppm 0.05	ME-MS61r Er ppm 0.03	ME-MS61r Eu ppm 0.03	ME-MS61r Gd ppm 0.05	ME-MS61r Ho ppm 0.01	ME-MS61r Lu ppm 0.01	ME-MS61r Nd ppm 0.1	ME-MS61r Pr ppm 0.03
BLANKS															
BLANK	<0.02	<0.1	<1	<0.1	<0.1	<2	<0.5	<0.05	<0.03	<0.03	<0.05	<0.01	<0.01	<0.1	<0.03
BLANK	<0.02	<0.1	<1	0.1	<0.1	<2	<0.5	<0.05	<0.03	<0.03	<0.05	<0.01	<0.01	<0.1	<0.03
BLANK	<0.02	<0.1	<1	<0.1	<0.1	<2	<0.5	<0.05	<0.03	<0.03	<0.05	<0.01	<0.01	<0.1	<0.03
Target Range - Lower Bound	<0.02	<0.1	<1	<0.1	<0.1	<2	<0.5	<0.05	<0.03	<0.03	<0.05	<0.01	<0.01	<0.1	<0.03
Upper Bound	0.04	0.2	2	0.2	0.2	4	1.0	0.10	0.06	0.06	0.10	0.02	0.02	0.2	0.06
BLANK															
BLANK															
Target Range - Lower Bound															
Upper Bound															
DUPLICATES															
T5-500L-2	0.55	3.3	40	2.5	14.3	9	116.5	2.76	1.57	0.72	3.48	0.54	0.26	22.8	6.27
DUP	0.55	3.4	40	2.5	15.3	9	129.0	2.78	1.60	0.73	3.51	0.54	0.26	23.8	6.51
Target Range - Lower Bound	0.49	3.1	37	2.2	14.0	7	116.0	2.51	1.44	0.64	3.18	0.49	0.23	21.5	5.88
Upper Bound	0.61	3.6	43	2.8	15.6	11	129.5	3.03	1.73	0.81	3.81	0.59	0.29	25.1	6.90
T5-250L-1															
DUP															
Target Range - Lower Bound															
Upper Bound															
T2-R50-1	0.35	6.4	21	1.8	11.0	18	101.0	2.08	1.09	0.62	3.03	0.39	0.17	20.8	5.73
DUP	0.36	6.5	22	1.9	11.1	19	95.2	2.21	1.15	0.66	3.21	0.41	0.18	21.7	5.96
Target Range - Lower Bound	0.31	6.0	19	1.6	10.4	16	92.7	1.93	1.01	0.56	2.84	0.36	0.15	19.6	5.38
Upper Bound	0.40	6.9	24	2.1	11.7	21	103.5	2.36	1.23	0.72	3.40	0.44	0.20	22.9	6.31
T2-R50-2															
DUP															
Target Range - Lower Bound															
Upper Bound															
T4-250L-1	0.79	76.0	83	2.5	25.4	102	147.5	5.11	2.67	1.33	6.51	0.95	0.40	38.5	10.35
DUP	0.83	78.2	83	2.7	25.4	102	145.0	5.17	2.68	1.38	6.64	0.96	0.41	38.7	10.45
Target Range - Lower Bound	0.73	73.1	78	2.3	24.0	95	138.5	4.70	2.44	1.22	6.03	0.87	0.36	35.6	9.59
Upper Bound	0.89	81.1	88	2.9	26.8	109	154.0	5.58	2.91	1.49	7.12	1.04	0.45	41.6	11.20

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QC CERTIFICATE OF ANALYSIS BR15083531

Sample Description	Method / Analyte / Units / LOR	ME- MS61r Sm ppm 0.03	ME- MS61r Tb ppm 0.01	ME- MS61r Tm ppm 0.01	ME- MS61r Yb ppm 0.03
BLANKS					
BLANK		<0.03	<0.01	<0.01	<0.03
BLANK		<0.03	<0.01	<0.01	<0.03
BLANK		<0.03	<0.01	<0.01	<0.03
Target Range - Lower Bound		<0.03	<0.01	<0.01	<0.03
Upper Bound		0.06	0.02	0.02	0.06
BLANK					
BLANK					
Target Range - Lower Bound					
Upper Bound					
DUPLICATES					
T5- 500L- 2		4.43	0.49	0.23	1.60
DUP		4.47	0.50	0.23	1.59
Target Range - Lower Bound		4.09	0.45	0.20	1.45
Upper Bound		4.81	0.54	0.26	1.74
T5- 250L- 1					
DUP					
Target Range - Lower Bound					
Upper Bound					
T2- R50- 1		3.97	0.40	0.15	1.06
DUP		4.23	0.43	0.16	1.17
Target Range - Lower Bound		3.76	0.37	0.13	1.00
Upper Bound		4.44	0.46	0.18	1.23
T2- R50- 2					
DUP					
Target Range - Lower Bound					
Upper Bound					
T4- 250L- 1		7.50	0.90	0.37	2.44
DUP		7.70	0.92	0.38	2.55
Target Range - Lower Bound		7.00	0.83	0.34	2.28
Upper Bound		8.20	0.99	0.41	2.71

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QC CERTIFICATE OF ANALYSIS BR15083531

DUPLICATES

Sample Description	ME- XRF15b Al2O3 % 0.01	ME- XRF15b As % 0.01	ME- XRF15b BaO % 0.01	ME- XRF15b Bi % 0.01	ME- XRF15b CaO % 0.01	ME- XRF15b CeO2 % 0.01	ME- XRF15b Co % 0.01	ME- XRF15b Cr % 0.01	ME- XRF15b Cu % 0.005	ME- XRF15b Fe % 0.01	ME- XRF15b HfO2 % 0.01	ME- XRF15b K2O % 0.01	ME- XRF15b La2O3 % 0.01	ME- XRF15b MgO % 0.01	ME- XRF15b Mn % 0.01
T4- 500L- 1															
DUP															
Target Range - Lower Bound															
Upper Bound															
T3b- L50- 2	5.59	0.01	0.02	<0.01	0.02	0.01	<0.01	<0.01	<0.005	1.18	<0.01	1.72	<0.01	0.17	0.02
DUP	5.55	<0.01	0.02	<0.01	0.03	<0.01	<0.01	<0.01	<0.005	1.18	<0.01	1.72	<0.01	0.18	0.02
Target Range - Lower Bound	5.45	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	1.15	<0.01	1.67	<0.01	0.16	<0.01
Upper Bound	5.69	0.02	0.03	0.02	0.04	0.02	0.02	0.02	0.010	1.21	0.02	1.77	0.02	0.19	0.03
T3b- 50R- 1															
DUP															
Target Range - Lower Bound															
Upper Bound															
T3b- 500R- 2															
DUP															
Target Range - Lower Bound															
Upper Bound															
T3- L50- 1	6.42	0.01	0.02	<0.01	0.03	0.01	<0.01	<0.01	0.005	1.18	<0.01	1.38	<0.01	0.18	0.02
DUP	6.36	0.01	0.02	<0.01	0.03	<0.01	<0.01	<0.01	0.006	1.18	<0.01	1.37	<0.01	0.19	0.02
Target Range - Lower Bound	6.25	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.005	1.15	<0.01	1.33	<0.01	0.17	<0.01
Upper Bound	6.53	0.02	0.03	0.02	0.04	0.02	0.02	0.02	0.010	1.21	0.02	1.42	0.02	0.20	0.03
T3- R50- 1															
DUP															
Target Range - Lower Bound															
Upper Bound															
T3- R50- 2															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															

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QC CERTIFICATE OF ANALYSIS BR15083531

Sample Description	Method / Analyte / Units / LOR	ME-XRF15b Mo % 0.005	ME-XRF15b Nb % 0.005	ME-XRF15b Ni % 0.005	ME-XRF15b P2O5 % 0.01	ME-XRF15b Pb % 0.005	ME-XRF15b Rb % 0.005	ME-XRF15b S % 0.01	ME-XRF15b Sb % 0.005	ME-XRF15b SiO2 % 0.01	ME-XRF15b Sn % 0.005	ME-XRF15b Sr % 0.01	ME-XRF15b TiO2 % 0.01	ME-XRF15b V % 0.01	ME-XRF15b W % 0.001	ME-XRF15b Y2O3 % 0.005
							DUPLICATES									
T4-500L-1																
DUP																
Target Range - Lower Bound																
Upper Bound																
T3b-L50-2		<0.005	<0.005	<0.005	0.03	<0.005	0.009	<0.01	<0.005	87.7	<0.005	<0.01	0.48	<0.01	0.002	<0.005
DUP		<0.005	<0.005	<0.005	0.03	<0.005	0.009	<0.01	<0.005	87.7	<0.005	<0.01	0.48	<0.01	0.001	<0.005
Target Range - Lower Bound		<0.005	<0.005	<0.005	0.02	<0.005	<0.005	<0.01	<0.005	85.9	<0.005	<0.01	0.46	<0.01	<0.001	<0.005
Upper Bound		0.010	0.010	0.010	0.04	0.010	0.010	0.02	0.010	89.5	0.010	0.02	0.50	0.02	0.002	0.010
T3b-50R-1																
DUP																
Target Range - Lower Bound																
Upper Bound																
T3b-500R-2																
DUP																
Target Range - Lower Bound																
Upper Bound																
T3-L50-1		<0.005	<0.005	<0.005	0.02	<0.005	0.008	0.01	<0.005	85.6	<0.005	<0.01	0.55	<0.01	0.002	<0.005
DUP		<0.005	<0.005	<0.005	0.03	<0.005	0.008	<0.01	<0.005	85.3	<0.005	<0.01	0.55	<0.01	0.002	<0.005
Target Range - Lower Bound		<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	83.7	<0.005	<0.01	0.53	<0.01	<0.001	<0.005
Upper Bound		0.010	0.010	0.010	0.04	0.010	0.010	0.02	0.010	87.2	0.010	0.02	0.57	0.02	0.003	0.010
T3-R50-1																
DUP																
Target Range - Lower Bound																
Upper Bound																
T3-R50-2																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS BR15083531

Sample Description	Method / Analyte / Units / LOR	ME- XRF15b Zn % 0.005	ME- XRF15b Zr % 0.01	ME- XRF15b Total % 0.01	ME- GRA05 LOI % 0.01	ME- MS61r Ag ppm 0.01	ME- MS61r Al % 0.01	ME- MS61r As ppm 0.2	ME- MS61r Ba ppm 10	ME- MS61r Be ppm 0.05	ME- MS61r Bi ppm 0.01	ME- MS61r Ca % 0.01	ME- MS61r Cd ppm 0.02	ME- MS61r Ce ppm 0.01	ME- MS61r Co ppm 0.1	ME- MS61r Cr ppm 1
DUPLICATES																
T4- 500L- 1					2.24											
DUP					2.21											
Target Range - Lower Bound					2.16											
Upper Bound					2.29											
T3b- L50- 2		<0.005	0.04	99.47												
DUP		<0.005	0.04	99.41												
Target Range - Lower Bound		<0.005	0.03	96.94												
Upper Bound		0.010	0.05	101.95												
T3b- 50R- 1					3.54											
DUP					3.47											
Target Range - Lower Bound					3.41											
Upper Bound					3.60											
T3b- 500R- 2						0.06	7.47	13.0	380	2.81	0.62	0.02	<0.02	85.7	10.3	63
DUP						0.07	7.54	13.0	380	2.87	0.65	0.02	<0.02	86.1	10.3	61
Target Range - Lower Bound						0.05	7.12	12.2	340	2.65	0.59	<0.01	<0.02	81.6	9.7	58
Upper Bound						0.08	7.89	13.9	420	3.03	0.68	0.03	0.04	90.2	10.9	66
T3- L50- 1		<0.005	0.04	99.80												
DUP		<0.005	0.04	99.43												
Target Range - Lower Bound		<0.005	0.03	97.11												
Upper Bound		0.010	0.05	102.10												
T3- R50- 1					3.72											
DUP					3.81											
Target Range - Lower Bound					3.66											
Upper Bound					3.87											
T3- R50- 2						0.04	2.40	2.5	170	0.82	0.47	0.01	<0.02	50.8	8.0	14
DUP						0.04	2.34	2.5	130	0.81	0.46	0.01	<0.02	51.2	8.3	14
Target Range - Lower Bound						0.03	2.24	2.2	130	0.72	0.43	<0.01	<0.02	48.4	7.6	12
Upper Bound						0.05	2.50	2.8	170	0.91	0.50	0.02	0.04	53.6	8.7	16
ORIGINAL						0.05	5.12	<0.2	490	1.60	0.01	7.15	0.06	44.6	9.0	70
DUP						0.04	5.11	0.4	480	1.59	0.01	7.19	0.06	44.8	9.1	72
Target Range - Lower Bound						0.03	4.85	<0.2	440	1.47	<0.01	6.80	0.04	42.5	8.5	66
Upper Bound						0.06	5.38	0.4	530	1.72	0.02	7.54	0.08	46.9	9.6	76

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DUPLICATES

Sample Description	Method / Analyte / Units / LOR	ME- MS61r Cs ppm 0.05	ME- MS61r Cu ppm 0.2	ME- MS61r Fe % 0.01	ME- MS61r Ga ppm 0.05	ME- MS61r Ge ppm 0.05	ME- MS61r Hf ppm 0.1	ME- MS61r In ppm 0.005	ME- MS61r K % 0.01	ME- MS61r La ppm 0.5	ME- MS61r Li ppm 0.2	ME- MS61r Mg % 0.01	ME- MS61r Mn ppm 5	ME- MS61r Mo ppm 0.05	ME- MS61r Na % 0.01	ME- MS61r Nb ppm 0.1
T4- 500L- 1																
DUP																
Target Range - Lower Bound																
Upper Bound																
T3b- L50- 2																
DUP																
Target Range - Lower Bound																
Upper Bound																
T3b- 50R- 1																
DUP																
Target Range - Lower Bound																
Upper Bound																
T3b- 500R- 2		9.65	22.0	5.73	22.8	0.19	4.0	0.078	1.52	43.2	46.4	0.18	76	1.06	0.07	15.6
DUP		9.69	22.5	5.79	22.8	0.23	4.2	0.082	1.53	43.9	45.5	0.18	77	1.06	0.07	15.8
Target Range - Lower Bound		9.14	21.3	5.46	21.6	0.15	3.8	0.071	1.44	40.9	43.5	0.16	68	0.96	0.06	14.8
Upper Bound		10.20	23.2	6.06	24.0	0.27	4.4	0.089	1.61	46.2	48.4	0.20	85	1.16	0.08	16.6
T3- L50- 1																
DUP																
Target Range - Lower Bound																
Upper Bound																
T3- R50- 1																
DUP																
Target Range - Lower Bound																
Upper Bound																
T3- R50- 2		2.77	33.7	0.83	6.28	0.12	3.3	0.018	0.81	23.2	16.6	0.07	127	0.22	0.06	5.4
DUP		2.84	34.7	0.80	6.57	0.14	3.1	0.021	0.80	23.5	16.5	0.07	124	0.23	0.06	5.6
Target Range - Lower Bound		2.61	32.8	0.76	6.05	0.07	2.9	0.014	0.75	21.7	15.5	0.06	114	0.16	0.05	5.1
Upper Bound		3.00	35.6	0.87	6.80	0.19	3.5	0.025	0.86	25.0	17.6	0.08	137	0.29	0.07	5.9
ORIGINAL		0.75	14.0	4.42	14.50	0.19	2.8	0.137	1.27	19.8	40.0	5.06	659	<0.05	1.95	33.3
DUP		0.76	12.6	4.44	14.20	0.16	2.8	0.143	1.25	19.8	38.0	5.09	671	<0.05	1.96	33.1
Target Range - Lower Bound		0.67	12.6	4.20	13.60	0.12	2.6	0.128	1.19	18.3	36.9	4.81	627	<0.05	1.85	31.4
Upper Bound		0.84	14.0	4.66	15.10	0.23	3.0	0.152	1.33	21.3	41.2	5.34	703	0.10	2.06	35.0

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QC CERTIFICATE OF ANALYSIS BR15083531

Sample Description	Method / Analyte / Units / LOR	ME- MS61r Ni ppm 0.2	ME- MS61r P ppm 10	ME- MS61r Pb ppm 0.5	ME- MS61r Rb ppm 0.1	ME- MS61r Re ppm 0.002	ME- MS61r S % 0.01	ME- MS61r Sb ppm 0.05	ME- MS61r Sc ppm 0.1	ME- MS61r Se ppm 1	ME- MS61r Sn ppm 0.2	ME- MS61r Sr ppm 0.2	ME- MS61r Ta ppm 0.05	ME- MS61r Te ppm 0.05	ME- MS61r Th ppm 0.2	ME- MS61r Ti % 0.005
								DUPLICATES								
T4- 500L- 1																
DUP																
Target Range - Lower Bound																
Upper Bound																
T3b- L50- 2																
DUP																
Target Range - Lower Bound																
Upper Bound																
T3b- 50R- 1																
DUP																
Target Range - Lower Bound																
Upper Bound																
T3b- 500R- 2		21.3	80	28.3	147.0	<0.002	0.01	2.52	14.5	1	5.3	20.6	1.47	0.05	28.8	0.428
DUP		21.6	70	28.7	144.0	<0.002	0.01	2.63	14.5	1	5.1	20.7	1.48	0.05	29.3	0.447
Target Range - Lower Bound		20.2	60	26.6	138.0	<0.002	<0.01	2.33	13.7	<1	4.7	19.4	1.35	<0.05	27.4	0.411
Upper Bound		22.7	90	30.4	153.0	0.004	0.02	2.82	15.3	2	5.7	21.9	1.60	0.10	30.7	0.464
T3- L50- 1																
DUP																
Target Range - Lower Bound																
Upper Bound																
T3- R50- 1																
DUP																
Target Range - Lower Bound																
Upper Bound																
T3- R50- 2		8.0	90	10.5	52.5	<0.002	0.01	3.28	3.9	1	1.9	11.3	0.73	<0.05	12.9	0.180
DUP		8.7	100	10.5	54.4	<0.002	0.01	3.12	3.9	1	1.9	11.8	0.78	<0.05	12.7	0.180
Target Range - Lower Bound		7.7	80	9.5	50.7	<0.002	<0.01	2.91	3.6	<1	1.6	10.8	0.67	<0.05	12.0	0.166
Upper Bound		9.0	110	11.5	56.2	0.004	0.02	3.49	4.2	2	2.2	12.3	0.84	0.10	13.6	0.194
ORIGINAL		19.3	2100	1.2	26.5	<0.002	<0.01	0.24	36.1	2	2.0	269	2.00	<0.05	2.0	1.290
DUP		19.9	2130	1.3	25.8	<0.002	<0.01	0.22	36.1	2	2.1	269	2.01	<0.05	2.0	1.290
Target Range - Lower Bound		18.4	2000	0.7	24.7	<0.002	<0.01	0.16	34.2	<1	1.7	255	1.85	<0.05	1.7	1.220
Upper Bound		20.8	2230	1.8	27.6	0.004	0.02	0.30	38.0	3	2.4	283	2.16	0.10	2.3	1.360

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QC CERTIFICATE OF ANALYSIS BR15083531

Sample Description	Method / Analyte / Units / LOR	ME-MS61r Tl ppm 0.02	ME-MS61r U ppm 0.1	ME-MS61r V ppm 1	ME-MS61r W ppm 0.1	ME-MS61r Y ppm 0.1	ME-MS61r Zn ppm 2	ME-MS61r Zr ppm 0.5	ME-MS61r Dy ppm 0.05	ME-MS61r Er ppm 0.03	ME-MS61r Eu ppm 0.03	ME-MS61r Gd ppm 0.05	ME-MS61r Ho ppm 0.01	ME-MS61r Lu ppm 0.01	ME-MS61r Nd ppm 0.1	ME-MS61r Pr ppm 0.03
DUPLICATES																
T4-500L-1																
DUP																
Target Range - Lower Bound																
Upper Bound																
T3b-L50-2																
DUP																
Target Range - Lower Bound																
Upper Bound																
T3b-50R-1																
DUP																
Target Range - Lower Bound																
Upper Bound																
T3b-500R-2		0.72	6.3	95	3.3	21.3	13	139.0	4.47	2.52	1.08	5.69	0.86	0.38	33.0	8.93
DUP		0.73	6.6	97	3.3	21.8	13	142.5	4.60	2.57	1.11	5.61	0.86	0.39	33.7	9.09
Target Range - Lower Bound		0.65	6.0	90	3.0	20.4	10	133.0	4.14	2.32	0.98	5.18	0.79	0.35	30.7	8.30
Upper Bound		0.80	6.9	102	3.6	22.7	16	148.5	4.93	2.77	1.21	6.12	0.93	0.42	36.0	9.72
T3-L50-1																
DUP																
Target Range - Lower Bound																
Upper Bound																
T3-R50-1																
DUP																
Target Range - Lower Bound																
Upper Bound																
T3-R50-2		0.24	2.8	17	1.3	8.8	12	113.5	1.90	1.00	0.52	2.83	0.35	0.16	18.5	4.98
DUP		0.24	2.8	17	1.3	9.0	12	113.5	1.89	0.96	0.51	2.71	0.33	0.16	18.0	4.89
Target Range - Lower Bound		0.20	2.6	15	1.1	8.4	9	107.5	1.70	0.88	0.45	2.51	0.30	0.14	16.8	4.53
Upper Bound		0.28	3.0	19	1.5	9.4	15	119.5	2.09	1.08	0.58	3.03	0.38	0.18	19.7	5.34
ORIGINAL		0.11	1.4	230	22.0	39.3	51	118.0	7.35	4.27	2.15	7.83	1.47	0.58	25.7	5.66
DUP		0.11	1.4	232	22.6	37.5	52	111.0	7.42	4.21	2.17	7.79	1.48	0.59	26.7	5.82
Target Range - Lower Bound		0.08	1.2	218	20.5	36.4	47	108.5	6.78	3.89	1.97	7.17	1.35	0.53	24.1	5.28
Upper Bound		0.14	1.6	244	24.1	40.4	56	120.5	7.99	4.59	2.35	8.45	1.60	0.64	28.3	6.20

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Sample Description	Method / Analyte / Units / LOR	ME- MS61r Sm ppm 0.03	ME- MS61r Tb ppm 0.01	ME- MS61r Tm ppm 0.01	ME- MS61r Yb ppm 0.03
DUPLICATES					
T4- 500L- 1					
DUP					
Target Range - Lower Bound					
Upper Bound					
T3b- L50- 2					
DUP					
Target Range - Lower Bound					
Upper Bound					
T3b- 50R- 1					
DUP					
Target Range - Lower Bound					
Upper Bound					
T3b- 500R- 2		6.60	0.79	0.36	2.44
DUP		6.66	0.82	0.36	2.43
Target Range - Lower Bound		6.10	0.73	0.32	2.22
Upper Bound		7.16	0.88	0.40	2.65
T3- L50- 1					
DUP					
Target Range - Lower Bound					
Upper Bound					
T3- R50- 1					
DUP					
Target Range - Lower Bound					
Upper Bound					
T3- R50- 2		3.66	0.36	0.15	1.00
DUP		3.61	0.36	0.14	1.10
Target Range - Lower Bound		3.33	0.32	0.12	0.94
Upper Bound		3.94	0.40	0.17	1.16
ORIGINAL		6.69	1.19	0.59	3.78
DUP		6.93	1.17	0.59	3.79
Target Range - Lower Bound		6.27	1.08	0.54	3.47
Upper Bound		7.35	1.28	0.64	4.10

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QC CERTIFICATE OF ANALYSIS BR15083531

Sample Description	Method / Analyte / Units / LOR	ME-XRF15b Al2O3 % 0.01	ME-XRF15b As % 0.01	ME-XRF15b BaO % 0.01	ME-XRF15b Bi % 0.01	ME-XRF15b CaO % 0.01	ME-XRF15b CeO2 % 0.01	ME-XRF15b Co % 0.01	ME-XRF15b Cr % 0.01	ME-XRF15b Cu % 0.005	ME-XRF15b Fe % 0.01	ME-XRF15b HfO2 % 0.01	ME-XRF15b K2O % 0.01	ME-XRF15b La2O3 % 0.01	ME-XRF15b MgO % 0.01	ME-XRF15b Mn % 0.01
								DUPLICATES								
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method / Analyte / Units / LOR	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- XRF15b	ME- XRF15b
	Analyte	Mo	Nb	Ni	P2O5	Pb	Rb	S	Sb	SiO2	Sn	Sr	TiO2	V	W	Y2O3
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.005	0.005	0.005	0.01	0.005	0.005	0.01	0.005	0.01	0.005	0.01	0.01	0.01	0.001	0.005

DUPLICATES

Sample Description	
ORIGINAL	
DUP	
Target Range - Lower Bound	
Upper Bound	

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QC CERTIFICATE OF ANALYSIS BR15083531

Sample Description	Method	ME-XRF15b	ME-XRF15b	ME-XRF15b	ME-GRA05	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r	ME-MS61r
	Analyte	Zn	Zr	Total	LOI	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr
	Units	%	%	%	%	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOR	0.005	0.01	0.01	0.01	0.01	0.01	0.2	10	0.05	0.01	0.01	0.02	0.01	0.1	1
DUPLICATES																
ORIGINAL					7.64											
DUP					7.66											
Target Range - Lower Bound					7.45											
Upper Bound					7.85											

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QC CERTIFICATE OF ANALYSIS BR15083531

Sample Description	Method / Analyte / Units / LOR	ME- MS61r Cs ppm 0.05	ME- MS61r Cu ppm 0.2	ME- MS61r Fe % 0.01	ME- MS61r Ga ppm 0.05	ME- MS61r Ge ppm 0.05	ME- MS61r Hf ppm 0.1	ME- MS61r In ppm 0.005	ME- MS61r K % 0.01	ME- MS61r La ppm 0.5	ME- MS61r Li ppm 0.2	ME- MS61r Mg % 0.01	ME- MS61r Mn ppm 5	ME- MS61r Mo ppm 0.05	ME- MS61r Na % 0.01	ME- MS61r Nb ppm 0.1
								DUPLICATES								
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method Analyte Units LOR	ME- MS61r Ni ppm 0.2	ME- MS61r P ppm 10	ME- MS61r Pb ppm 0.5	ME- MS61r Rb ppm 0.1	ME- MS61r Re ppm 0.002	ME- MS61r S % 0.01	ME- MS61r Sb ppm 0.05	ME- MS61r Sc ppm 0.1	ME- MS61r Se ppm 1	ME- MS61r Sn ppm 0.2	ME- MS61r Sr ppm 0.2	ME- MS61r Ta ppm 0.05	ME- MS61r Te ppm 0.05	ME- MS61r Th ppm 0.2	ME- MS61r Ti % 0.005
							DUPLICATES									
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Finalized Date: 7- JUL- 2015
Account: HYDROB

Project: 15- 014- NTG01

QC CERTIFICATE OF ANALYSIS BR15083531

Sample Description	Method / Analyte / Units / LOR	ME- MS61r Tl ppm 0.02	ME- MS61r U ppm 0.1	ME- MS61r V ppm 1	ME- MS61r W ppm 0.1	ME- MS61r Y ppm 0.1	ME- MS61r Zn ppm 2	ME- MS61r Zr ppm 0.5	ME- MS61r Dy ppm 0.05	ME- MS61r Er ppm 0.03	ME- MS61r Eu ppm 0.03	ME- MS61r Gd ppm 0.05	ME- MS61r Ho ppm 0.01	ME- MS61r Lu ppm 0.01	ME- MS61r Nd ppm 0.1	ME- MS61r Pr ppm 0.03
							DUPLICATES									
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

***** See Appendix Page for comments regarding this certificate *****

ALS Minerals
Australian Laboratory Services Pty. Ltd.
32 Shand Street
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Brisbane QLD 4053
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Finalized Date: 7- JUL- 2015
Account: HYDROB

Project: 15- 014- NTG01

QC CERTIFICATE OF ANALYSIS BR15083531

Sample Description	Method Analyte Units LOR	ME- MS61r Sm ppm 0.03	ME- MS61r Tb ppm 0.01	ME- MS61r Tm ppm 0.01	ME- MS61r Yb ppm 0.03
		DUPLICATES			
ORIGINAL					
DUP					
Target Range - Lower Bound					
Upper Bound					

***** See Appendix Page for comments regarding this certificate *****

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Project: 15- 014- NTG01

QC CERTIFICATE OF ANALYSIS BR15083531

CERTIFICATE COMMENTS

ANALYTICAL COMMENTS

REE's may not be totally soluble in this method.

Applies to Method: ME- MS61r

LABORATORY ADDRESSES

Processed at ALS Brisbane located at 32 Shand Street, Stafford, Brisbane, QLD, Australia.

Applies to Method:

LEV- 01	LOG- 22	ME- GRA05	ME- MS61r
ME- XRF15b	PUL- 21	TRA- 21	WEI- 21

APPENDIX 3 METALS RESULTS

Site	Site Type	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Ce ppm	Co ppm	Cr ppm	Cs ppm	Cu ppm	Fe %	Ga ppm	Ge ppm	Hf ppm	In ppm	K %	La ppm	Li ppm	Mg %	Mn ppm	Mo ppm	Na %	Nb ppm	Ni ppm	P ppm	Pb ppm	Rb ppm	Re ppm	S %	Sb ppm	Sc ppm	Se ppm	Sn ppm	Sr ppm	Ta ppm	Te ppm	Th ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Y ppm	Zn ppm	Zr ppm	Dy ppm	Er ppm	Eu ppm	Gd ppm	Ho ppm	Lu ppm	Nd ppm	Pr ppm	Sm ppm	Tb ppm	Tm ppm	Yb ppm
T2-L250-1	Floodplain	0.02	3.26	1.40	230.00	1.24	0.94	0.01	0.02	53.10	6.80	19.00	4.37	40.70	0.54	10.30	0.09	3.10	0.03	1.11	26.30	22.20	0.09	43.00	0.14	0.08	7.20	10.10	90.00	15.90	77.60	0.00	0.01	0.61	5.80	1.00	2.80	15.70	0.73	0.05	12.70	0.23	0.39	4.50	20.00	1.80	9.90	11.00	113.00	2.01	0.97	0.57	2.95	0.36	0.16	20.30	5.40	3.84	0.38	0.14	0.98
T2-L250-2	Floodplain	0.02	2.51	1.40	180.00	0.73	0.29	0.01	0.02	45.20	2.90	15.00	3.05	6.60	0.53	7.42	0.07	2.50	0.02	0.88	22.70	17.00	0.06	40.00	0.13	0.06	5.90	5.10	50.00	9.70	56.00	0.00	0.01	0.59	4.10	1.00	2.10	12.30	0.74	0.05	11.80	0.18	0.29	2.10	18.00	1.40	7.80	8.00	92.30	1.74	0.80	0.47	2.44	0.30	0.13	17.20	4.78	3.32	0.31	0.12	0.83
T2-L250-3	Floodplain	0.09	6.22	5.60	370.00	2.61	1.34	0.02	0.02	83.70	44.70	38.00	9.44	178.50	2.08	18.35	0.15	3.30	0.06	1.73	40.60	41.60	0.18	619.00	0.46	0.10	10.50	27.40	210.00	27.90	137.00	0.00	0.01	0.91	11.50	1.00	5.00	20.60	1.08	0.05	20.30	0.30	0.69	8.70	44.00	2.90	17.90	39.00	113.50	3.41	1.80	1.03	4.78	0.65	0.28	33.10	9.01	6.33	0.65	0.26	1.71
T2-L050-1	Floodplain	0.05	3.97	2.40	290.00	1.34	2.63	0.01	0.02	52.00	11.30	25.00	5.54	77.60	0.77	12.15	0.09	2.60	0.04	1.35	25.70	28.00	0.12	45.00	0.28	0.09	7.70	17.50	110.00	32.00	92.40	0.00	0.01	0.88	7.10	1.00	3.40	18.20	0.76	0.05	12.20	0.23	0.45	7.40	28.00	2.20	10.30	19.00	94.30	2.12	1.05	0.59	2.99	0.37	0.17	19.80	5.34	3.84	0.40	0.15	1.04
T2-L050-2	Floodplain	0.05	6.68	5.50	430.00	2.49	2.81	0.04	0.08	84.10	60.00	43.00	9.37	122.50	1.94	19.20	0.15	3.60	0.06	1.97	42.20	40.10	0.23	332.00	0.41	0.10	11.90	40.90	280.00	43.20	148.50	0.00	0.02	1.57	12.60	1.00	5.00	24.20	1.12	0.05	21.80	0.34	0.74	14.10	48.00	3.00	19.40	52.00	126.00	3.57	1.89	1.02	4.94	0.68	0.30	32.10	8.90	6.22	0.68	0.27	1.85
T2-L050-3	Floodplain	0.06	5.23	4.70	340.00	2.17	0.55	0.01	0.05	77.60	25.80	33.00	7.32	38.70	1.76	15.90	0.13	3.50	0.05	1.54	37.60	35.50	0.15	437.00	0.33	0.09	9.50	19.90	170.00	19.00	112.50	0.00	0.01	0.66	9.30	1.00	4.00	19.30	0.93	0.05	18.00	0.27	0.59	5.10	36.00	2.50	15.40	29.00	125.00	3.05	1.54	0.89	4.48	0.56	0.25	30.60	8.09	5.86	0.58	0.22	1.53
T2-R250-1	Floodplain	0.03	2.74	3.00	290.00	0.92	0.38	0.02	0.02	82.80	7.20	17.00	3.38	14.30	1.04	7.39	0.12	4.00	0.02	1.39	38.70	14.10	0.09	123.00	0.30	0.10	8.20	10.10	100.00	15.60	77.50	0.00	0.01	0.64	4.40	1.00	1.80	18.40	1.03	0.05	23.00	0.30	0.38	3.50	19.00	1.60	13.80	15.00	134.50	2.75	1.45	0.86	4.10	0.50	0.23	32.80	8.99	6.14	0.55	0.20	1.40
T2-R250-2	Floodplain	0.03	1.76	1.90	140.00	0.55	0.53	0.01	0.02	38.60	3.40	11.00	2.01	24.90	0.47	5.17	0.07	2.30	0.02	0.66	18.60	13.00	0.04	35.00	0.15	0.05	4.30	5.00	50.00	10.20	39.40	0.00	0.01	0.61	2.90	1.00	1.40	10.20	0.60	0.05	9.80	0.15	0.19	2.80	12.00	1.00	6.70	7.00	84.50	1.39	0.68	0.41	2.06	0.25	0.12	15.10	4.12	2.89	0.26	0.10	0.70
T2-R050-1	Floodplain	0.04	3.23	2.50	210.00	1.24	0.96	0.01	0.03	52.70	12.20	21.00	4.59	58.90	0.86	9.11	0.10	2.80	0.03	1.01	26.20	21.70	0.09	54.00	0.29	0.06	6.50	15.50	140.00	17.90	71.50	0.00	0.02	0.67	6.00	1.00	2.60	13.60	0.65	0.05	13.10	0.22	0.35	6.40	21.00	1.80	11.00	18.00	101.00	2.08	1.09	0.62	3.03	0.39	0.17	20.80	5.73	3.97	0.40	0.15	1.06
T2-R050-2	Floodplain	0.02	0.91	1.20	70.00	0.39	0.81	0.01	0.02	24.00	3.10	7.00	1.19	25.90	0.31	2.49	0.05	1.10	0.01	0.35	11.40	7.70	0.03	27.00	0.12	0.03	3.60	4.90	40.00	10.30	21.80	0.00	0.01	0.28	1.40	1.00	0.90	4.90	0.37	0.05	10.30	0.05	0.11	3.40	7.00	0.50	4.80	5.00	33.70	0.98	0.50	0.26	1.46	0.18	0.08	10.10	2.76	2.06	0.19	0.07	0.49
T3b-L250-1	Floodplain	0.06	6.34	9.20	310.00	1.55	0.62	0.02	0.02	93.30	11.70	47.00	6.82	31.70	3.06	17.55	0.15	4.20	0.05	1.37	41.20	30.70	0.15	175.00	1.18	0.06	13.20	24.60	170.00	20.80	129.50	0.00	0.01	15.65	10.70	2.00	3.80	19.20	1.23	0.06	27.80	0.41	0.55	6.30	58.00	2.30	18.30	20.00	147.50	3.76	2.08	0.93	4.90	0.71	0.34	31.20	8.40	5.97	0.69	0.30	2.06
T3b-L250-2	Floodplain	0.04	6.71	11.60	290.00	1.48	0.56	0.01	0.02	90.50	11.90	50.00	7.63	25.40	3.27	21.20	0.18	4.30	0.06	1.40	46.30	32.40	0.14	119.00	1.37	0.05	13.10	27.70	110.00	22.60	133.00	0.00	0.01	1.22	12.90	2.00	3.90	19.50	1.21	0.08	26.40	0.43	0.64	7.90	65.00	2.40	19.80	14.00	152.00	3.94	2.15	1.03	5.21	0.75	0.36	35.80	9.59	6.67	0.70	0.32	2.21
T3b-L250-3	Floodplain	0.04	6.71	9.20	300.00	1.54	0.50	0.01	0.02	96.20	8.90	42.00	7.01	23.40	3.01	19.05	0.17	4.10	0.06	1.43	50.10	30.50	0.14	84.00	1.16	0.05	12.50	24.80	110.00	20.20	127.50	0.00	0.01	0.98	12.30	1.00	3.80	18.60	1.27	0.06	25.60	0.38	0.55	6.40	61.00	2.30	20.70	14.00	142.50	4.29	2.30	1.09	5.82	0.80	0.36	38.20	10.30	7.11	0.78	0.33	2.26
T3b-R250-1	Floodplain	0.04	4.46	3.90	270.00	1.30	0.45	0.01	0.02	69.30	7.80	32.00	5.47	16.90	1.61	14.15	0.14	3.50	0.04	1.19	35.00	22.20	0.11	69.00	0.53	0.06	14.00	14.80	70.00	17.90	104.50	0.00	0.01	0.95	8.60	1.00	3.20	17.10	1.24	0.05	20.90	0.46	0.52	4.60	39.00	2.10	16.60	10.00	136.50	3.31	1.77	0.79	4.02	0.63	0.28	27.00	7.31	5.09	0.57	0.27	1.74
T3b-R250-2	Floodplain	0.04	5.07	4.20	290.00	1.46	0.46	0.01	0.02	69.40	8.60	35.00	6.17	14.50	1.83	14.35	0.13	3.50	0.04	1.28	35.60	24.20	0.12	65.00	0.57	0.05	13.50	17.10	70.00	19.10	110.00	0.00	0.01	0.83	9.80	1.00	3.50	15.80	1.29	0.05	26.90	0.45	0.55	4.80	45.00	2.20	17.30	10.00	120.50	3.19	1.80	0.83	4.07	0.62	0.29	28.00	7.71	5.40	0.58	0.26	1.84
T3b-R250-3	Floodplain	0.04	5.80	9.70	300.00	1.64	0.48	0.01	0.02	66.60	10.70	46.00	6.69	17.10	3.03	17.85	0.15	3.80	0.05	1.39	34.30	28.10	0.13	67.00	1.17	0.05	13.60	19.80	100.00	20.60	123.50	0.00	0.01	1.11	10.60	2.00	3.60	17.50	1.24	0.05	24.40	0.44	0.61	7.60	62.00	2.40	16.30	11.00	138.50	3.14	1.76	0.75	3.93	0.60	0.29	25.60	7.00	4.80	0.55	0.26	1.78
T3b-L500-1	Floodplain	0.03	3.78	3.60	280.00	1.00	0.35	0.01	0.02	67.70	4.70	27.00	3.76	10.90	1.41	10.70	0.13	3.30	0.03	1.20	31.30	16.40	0.10	76.00	0.44	0.06	11.00	10.60	70.00	15.60	86.60	0.00	0.01	2.48	6.40	1.00	2.40	16.80	1.10	0.05	20.70	0.37	0.41	3.50	31.00	1.70	13.60	8.00	113.50	2.92	1.59	0.74	3.71	0.56	0.26	24.10	6.53	4.77	0.52	0.24	1.64
T3b-L500-2	Floodplain	0.03	3.64	3.70	260.00	0.93	0.38	0.01	0.02	65.30	6.30	27.00	3.70	13.40	1.30	11.10	0.12	3.30	0.03	1.19	31.90	16.80	0.08	57.00	0.47	0.05	13.00	12.00	60.00	15.60	83.90	0.00	0.01	1.44	6.60	1.00	2.20	16.30	2.20	0.05	20.40	0.37	0.43	3.90	31.00	1.70	13.40	8.00	114.50	2.89	1.53	0.71	3.72	0.53	0.26	24.50	6.57	4.89	0.51	0.24	1.60
T3b-L500-3	Floodplain	0.04	4.00	4.10	270.00	1.19	0.35	0.01	0.02	63.90	5.70	26.00	3.76	11.70	1.52	11.00	0.13	3.30	0.03	1.19	30.10	17.90	0.09	54.00	0.52	0.06	10.60	12.60	80.00	16.00	84.70	0.00	0.01	1.66	6.60	1.00	2.30	15.90	1.12	0.05	25.20	0.35	0.42	3.80	35.00	1.70	13.30	9.00	110.50	2.85	1.56	0.71	3.70	0.54	0.25	23.50	6.49	4.59	0.52	0.23	1.60
T3b-R500-1	Floodplain	0.04	7.15	6.30	380.00	2.59	0.59	0.02	0.02	89.00	9.60	52.00	9.64	20.80	2.64	21.10	0.16	4.10	0.07	1.53	46.10	46.90	0.18	67.00	0.51	0.07	16.60	21.10	80.00	24.70	144.00	0.00	0.01	1.18	14.10	1.00	5.20	21.10	1.55	0.05	27.90	0.46	0.72	5.10	66.00	3.40	22.50	14.00	141.50	4.68	2.52	1.19	6.09	0.89	0.39	35.30	9.56	7.16	0.86	0.36	2.46
T3b-R500-2	Floodplain	0.06	7.47	13.00	380.00	2.81	0.62	0.02	0.02	85.70	10.30	63.00	9.65	22.00	5.73	22.80	0.19	4.00	0.08	1.52	43.20	46.40	0.18	76.00	1.06	0.07	15.60	21.30	80.00	28.30	147.00	0.00	0.01	2.52	14.50	1.00	5.30	20.60	1.47	0.05	28.80	0.43	0.72	6.30	95.00	3.30	21.30	13.00	139.00	4.47	2.52	1.08	5.69	0.86	0.38	33.00	8.93	6.60	0.79	0.36	2.44
T3b-R500-3	Floodplain	0.07	9.71	7.00	450.00	3.22	0.72	0.03	0.02	122.00	19.00	62.00	13.55	30.20	3.19	31.40	0.18	3.90	0.08	1.80	40.20	60.00	0.25	81.00	0.75	0.09	17.00	37.20	60.00	32.70	189.50	0.00	0.01	0.99	18.40	1.00	6.60	26.30	1.47	0.05	27.10	0.45	1.12	5.90	78.00	3.70	21.50	19.00	141.50	4.84	2.61	1.25	6.01	0.90	0.42	37.50	9.77	7.60	0.85	0.38	2.53
T3b-R050-1	Floodplain	0.13	3.78	7.90	320.00	1.43	6.80	0.04	0.03	111.00	49.10	26.00	4.30	280.00	1.47	10.55	0.16	4.00	0.03	1.46	50.70	20.50	0.18	265.00	0.65	0.10	8.90	48.10	220.00	67.90	89.90	0.00	0.01	3.33	6.50	1.00	2.20	19.80	0.92	0.05	29.20	0.31	0.45	19.50	36.00	1.50	15.90	36.00	143.50	3.50	1.73	1.08	5.62	0.67	0.26	40.10	10.95	7.62	0.68	0.24	1.71
T3b-R050-2	Floodplain	0.05	2.96	4.30	280.00	1.12	0.92	0.02	0.02	119.50	11.80	18.00	3.48	52.40	1.10	8.09	0.18	4.80	0.02	1.32	53.50	16.60	0.10	133.00	0.26	0.10	8.80	13.80	130.00	19.50	77.10	0.00	0.01	3.23	4.70	1.00	1.70	18.20	0.97	0.05	28.90	0.31	0.36	5.00	22.00	1.30	14.50	23.00	168.50	3.34	1.57	1.05	5.62	0.58	0.25	42.40	11.50	8.01	0.66	0.24	1.62
T3b-R050-3	Floodplain	0.03	3.36	4.90	290.00	1.22	0.51	0.02	0.02	113.00	9.50	22.00	4.02	18.60	1.42	9.04	0.17	5.00	0.03	1.33	50.80	18.60	0.11	107.00	0.30	0.09	9.20	14.90	120.00	16.20	81.00	0.00	0.01	0.68	5.30	1.00	2.00	18.20	1.19	0.05	32.70	0.31	0.40	4.30	26.00	1.50	15.50	21.00	170.50	3.46	1.78	1.10	5.74	0.62	0.28	43.50	11.40	8.20	0.70	0.25	1.70
T3b-L050-1	Floodplain	0.07	2.87	4.60	280.00	1.08	2.52	0.03	0.04	80.30	37.10	20.00	3.51	258.00	1.15	8.81	0.16	3.50	0.02	1.37	38.00	15.30	0.11	328.00	0.43	0.10	7.70	22.30	160.00	32.40	84.00	0.00	0.01	0.94	5.00	1.00	1.90	20.20	0.80	0.05	22.30	0.28	0.39	17.30	23.00	1.30	14.80	22.00	134.00	3.11	1.51	0.87	4.53	0.55	0.25	30.80	8.24	5.89	0.55	0.22	1.48
T3b-L050-2	Floodplain	0.04	2.73	3.00	280.00	0.99	0.81	0.02	0.02	76.80	13.10	19.00	3.64	47.50	1.06	8.03	0.14	3.40	0.02	1.33	36.70	15.50	0.09	155.00	0.29	0.10	8.20	15.80	110.00	18.10	76.00	0.00	0.01	0.81	4.40	1.00	1.80	18.80	0.87	0.05	20.20	0.27	0.37	5.30	20.00	1.30	12.60	18.00	135.00	2.49	1.30	0.73	3.70	0.45	0.21	27.60	7.54	5.18	0.48	0.18	1.27
T3b-L050-3	Floodplain	0.03	2.38	2.10	130.00	0.73	0.27	0.01	0.02	52.80	2.80	14.00	2.95	5.80	0.72	6.63	0.08	2.60	0.02	0.82	24.90	14.70	0.06	45.00	0.12	0.06	5.60	5.00	50.00	9.20	52.30	0.00	0.01	0.65	4.20	1.00	2.00	11.30	0.73	0.05	12.60	0.18	0.26	2.20	16.00	1.30	9.40	7.00	91.70	1.89	0.93	0.59	2.89	0.34	0.15	21.60	5.88	4.15	0.37	0.13	0.87
T3-L250-1	Floodplain	0.03	3.29	5.20	240.00	1.63	0.53	0.01	0.02	64.80	5.30	20.00	4.47	14.00	1.09	9.39	0.13	3.70	0.03	1.06	30.40	26.30	0.08	146.00	0.36	0.08	9.40	7.30	120.00	13.90	81.20	0.00	0.01	10.55	5.40	1.00	3.70	15.20	1.52	0.05	16.30	0.29	0.38	3.20	23.00	2.50	11.80	11.00	128.00	2.75	1.38	0.63	3.54	0.47	0.21	22.30	6.13	4.39	0.48	0.19	1.38
T3-L250-2	Floodplain	0.03	3.64	4.70	240.00	1.48	0.52	0.01	0.02	63.40	4.30	21.00	5.18	11.10	1.23	10.75	0.14	3.60	0.03	1.11	29.40	31.10	0.08	62.00	0.31	0.09	9.90	7.60	80.00	14.40	89.00	0.00	0.01	3.81	6.20	1.00	4.20	14.90	1.50	0.05	17.20	0.30	0.43	3.30	26.00	2.80	11.90	10.00	122.00	2.71	1.35	0.63	3.65	0.50	0.23	22.40	6.03	4.45	0.50	0.19	1.36
T3-L250-3	Floodplain	0.02	2.32	3.10	180.00	1.13	0.35	0.01	0.02	51.90	2.40	16.00	3.11	5.50	0.82	6.92	0.09	3.00	0.02	0.87	24.80	18.60	0.05	57.00	0.26	0.07	7.10	4.50	50.00	11.20	59.30	0.00	0.01	3.07	4.10	1.00	2.70	11.70	1.09	0.05	12.70	0.22	0.32	2.60	17.00	1.80	9.80	6.00	106.00	2.17	1.09	0.58	3.10	0.41	0.17	20.80	5.58	4.04	0.40	0.16	1.14
T3-L500-1	Floodplain	0.02	2.92	3.60	180.00	2.40	0.37	0.03	0.02	78.60	7.00	24.00	4.17	11.10	1.21	8.31	0.16	4.00	0.03	0.67	37.20	31.20	0.07	101.00	0.48	0.06	13.40	10.40	140.00	14.10	49.40	0.00	0.02	14.25	6.00	1.00	3.30	17.10	1.46	0.05	17.40	0.47	0.24	3.10	21.00	2.30	16.10	9.00	145.50	3.38	1.70	0.76	4.39	0.61	0.28	27.20	7.30	5.24	0.61	0.25	1.71
T3-L500-2	Floodplain	0.02	2.06	5.80	160.00	3.27	0.29	0.01	0.02	56.40	6.90	17.00	2.91	6.40	1.39	6.01	0.13	3.30	0.02	0.57	26.70	25.70	0.05	36.00	0.16	0.05	10.10	6.00	60.00	13.10	36.60	0.00	0.01	2.86	5.00	1.00	2.20	11.80	1.07	0.05	13.40	0.34	0.18	2.70	30.00	1.70	12.00	4.00	118.50	2.59	1.32	0.60	3.35	0.47	0.22	19.90	5.44	4.04	0.47	0.20	1.44
T3-L500-3	Floodplain	0.04	8.15	7.20	480.00	5.67	0.60	0.01	0.02	208.00	21.30	45.00	11.60	18.60	2.11	25.00	0.22	3.90	0.07	1.80	78.90	82.90	0.30	42.00	0.21	0.13	14.10	25.90	50.00	23.30	164.50	0.00	0.01	0.49	16.00	1.00	6.30	26.20	1.33	0.05	19.50	0.43	0.78	6.30	53.00	3.90	23.30	13.00	140.00	5.17	2.45	1.72	8.01	0.91	0.37	64.50	17.15	11.30	0.99	0.34	2.32
T3-L050-1	Floodplain	0.05	3.31	4.00	240.00	1.01	1.49	0.02	0.02	69.80	14.70	23.00	3.55	63.60	1.13	9.44	0.12	4.00	0.03	1.07	31.00	18.20	0.10	119.00	0.43	0.07	9.30	17.40	110.00	21.20	71.70	0.00	0.01	4.72	5.90	1.00	2.70	17.30	1.02	0.05	17.90	0.33	0.33	5.90	26.00	1.90	13.40	17.00	142.50	2.80	1.48	0.69	3.74	0.50	0.25	24.00	6.46	4.75	0.52	0.22	1.51
T3-L050-2	Floodplain	0.04	4.44	4.60	250.00	1.14	0.46	0.01	0.02	68.70	6.90	27.00	4.95	15.10	1.51	12.10	0.15	3.70	0.04	1.21	32.70	23.20	0.09	53.00	0.49	0.07	10.00	11.70	90.00	14.30	88.30	0.00	0.01	3.48	7.40	1.00	3.40	17.10	1.13	0.05	18.80	0.33	0.41	4.00	35.00	2.30	13.90	11.00	125.00	3.05	1.56	0.78	4.26	0.58	0.25	26.30	7.11	5.20	0.58	0.23	1.58
T3-R250-1	Floodplain	0.09	6.82	6.50	450.00	2.89	4.95	0.02	0.03	90.80	25.60	44.00	8.61	239.00	2.08	20.00	0.18	3.70	0.06	1.90	41.70	40.60	0.22	140.00	0.64	0.11	13.50	39.50	220.00	57.40	144.00	0.00	0.01	2.70	13.40	1.00	5.00	25.00	1.33	0.06	22.40	0.40	0.66	21.10	57.00	3.30	19.60	40.00	123.50	4.10	2.17	1.09	5.49	0.77	0.33	32.20	8.56	6.37	0.76	0.31	2.09
T3-R250-2	Floodplain	0.06	6.83	5.20	460.00	2.54	1.02	0.01	0.02	87.60	9.20	45.00	8.97	39.00	2.16	21.60	0.16	3.70	0.06	2.07	43.40	37.20	0.18	76.00	0.50	0.12	14.30	16.90	110.00	28.80	153.50	0.00	0.01	0.91	13.30	1.00	5.50	25.70	1.32	0.05	23.10	0.41	0.76	7.20	55.00	3.70	19.00	21.00	134.00	4.04	2.06	1.09	5.36	0.72	0.32	34.90	9.31	6.69	0.73	0.30	2.03
T3-R250-3	Floodplain	0.05	6.97	5.30	460.00	2.92	0.53	0.01	0.02	92.40	7.30	45.00	9.34	19.40	2.39	20.40	0.18	4.10	0.07	2.03	44.50	42.60	0.18	72.00	0.50	0.13	14.70	15.20	100.00	23.40	151.50	0.00	0.01	3.87	13.60	1.00	5.90	24.80	1.43	0.05	23.80	0.45	0.68	5.20	57.00	3.60	19.10	19.00	139.50	4.12	2.13	1.06	5.41	0.75	0.32	32.50	8.74	6.47	0.75	0.30	2.05
T3-R500-1	Floodplain	0.03	5.79	4.80	350.00	1.62	0.61	0.01	0.02	79.30	6.00	41.00	6.59	18.00	1.91	16.65	0.17	4.20	0.05	1.53	38.30	33.20	0.14	64.00	0.47	0.08	14.50	14.80	100.00	19.60	123.50	0.00	0.01	2.43	11.20	1.00	4.20	20.30	1.43	0.05	23.80	0.45	0.54	5.10	49.00	2.90	17.10	11.00	143.50	3.71	1.94	0.92	4.73	0.68	0.32	28.90	7.96	5.82	0.68	0.28	1.95
T3-R500-2	Floodplain	0.05	8.41	10.70	420.00	2.63	0.61	0.01	0.02	79.20	9.20	56.00	10.70	21.30	4.10	24.30	0.19	4.20	0.07	1.82	37.90	55.60	0.19	49.00	1.09	0.09	15.50	25.40	100.00	23.90	166.50	0.00	0.01	2.82	15.00	2.00	5.80	22.40	1.53	0.05	24.50	0.46	0.74	7.10	77.00	3.70	17.90	13.00	140.50	3.85	2.13	0.95	4.87	0.73	0.34	29.90	7.92	5.97	0.69	0.31	2.09
T3-R500-3	Floodplain	0.05	8.81	13.90	440.00	2.70	0.64	0.01	0.02	70.30	10.80	65.00	11.50	22.80	5.02	26.10	0.20	4.30	0.08	1.88	34.00	56.80	0.20	52.00	1.27	0.09	15.60	28.70	120.00	26.90	172.00	0.00	0.01	2.42	15.00	2.00	6.10	22.00	1.52	0.05	24.00	0.46	0.77	8.60	92.00	3.80	17.30	15.00	143.50	3.63	1.99	0.89	4.59	0.69	0.34	27.80	7.40	5.43	0.65	0.30	2.08
T3-R050-1	Floodplain	0.09	4.11	6.20	280.00	1.59	5.62	0.03	0.03	69.40	40.70	27.00	4.76	190.00	1.35	11.60	0.14	3.70	0.04	1.29	32.00	26.40	0.17	238.00	0.55	0.08	8.40	39.00	230.00	56.20	86.90	0.00	0.01	2.89	7.70	1.00	3.00	17.00	0.97	0.05	17.40	0.28	0.43	15.90	36.00	1.90	13.20	36.00	129.50	2.77	1.45	0.74	3.86	0.50	0.22	24.00	6.54	4.77	0.53	0.20	1.43
T3-R050-2	Floodplain	0.04	2.40	2.50	170.00	0.82	0.47	0.01	0.02	50.80	8.00	14.00	2.77	33.70	0.83	6.28	0.12	3.30	0.02	0.81	23.20	16.60	0.07	127.00	0.22	0.06	5.40	8.00	90.00	10.50	52.50	0.00	0.01	3.28	3.90	1.00	1.90	11.30	0.73	0.05	12.90	0.18	0.24	2.80	17.00	1.30	8.80	12.00	113.50	1.90	1.00	0.52	2.83	0.35	0.16	18.50	4.98	3.66	0.36	0.15	1.00
T3-R050-3	Floodplain	0.04	3.09	2.80	210.00	1.06	0.31	0.01	0.02	53.50	6.40	18.00	3.85	12.60	1.07	8.36	0.13	3.50	0.03	1.01	25.00	20.00	0.09	99.00	0.25	0.08	6.60	9.00	90.00	11.30	67.70	0.00	0.01	2.44	5.00	1.00	2.70	13.30	0.81	0.05	13.10	0.21	0.32	2.70	23.00	1.70	9.90	15.00	123.50	2.20	1.15	0.59	3.13	0.40	0.19	19.90	5.37	3.94	0.42	0.17	1.20
T4-L250-1	Floodplain	0.30	7.30	16.10	470.00	3.06	26.90	0.08	0.12	104.50	125.00	61.00	7.57	826.00	2.73	21.60	0.18	3.90	0.07	2.22	49.10	40.10	0.50	435.00	1.69	0.10	13.70	157.00	800.00	240.00	149.00	0.00	0.03	2.34	14.90	2.00	4.20	26.80	1.18	0.10	24.00	0.39	0.79	76.00	83.00	2.50	25.40	102.00	147.50	5.11	2.67	1.33	6.51	0.95	0.40	38.50	10.35	7.50	0.90	0.37	2.44
T4-L250-2	Floodplain	0.25	7.13	6.50	550.00	3.09	2.50	0.07	0.15	105.50	75.00	49.00	9.63	208.00	2.77	21.60	0.17	3.20	0.06	1.87	52.50	42.30	0.27	860.00	0.56	0.10	12.00	65.50	540.00	44.30	160.00	0.00	0.02	1.05	13.50	2.00	4.40	26.20	1.05	0.05	22.90	0.34	0.80	14.10	56.00	2.50	22.60	121.00	114.00	4.68	2.32	1.26	6.35	0.84	0.36	40.70	10.75	7.76	0.83	0.33	2.21
T4-L250-3	Floodplain	0.13	6.68	5.50	480.00	3.08	1.18	0.08	0.05	107.50	30.80	46.00	9.07	85.00	2.68	19.60	0.18	3.70	0.06	1.83	51.30	40.40	0.26	678.00	0.52	0.11	12.70	34.10	420.00	30.90	159.50	0.00	0.01	3.15	12.50	1.00	4.40	27.60	1.19	0.05	23.50	0.36	0.72	8.70	54.00	2.60	21.90	69.00	121.50	4.56	2.36	1.20	6.14	0.83	0.36	37.90	10.15	7.39	0.83	0.33	2.25
T4-R250-1	Floodplain	0.03	4.06	3.50	230.00	1.02	0.44	0.01	0.02	68.30	6.10	29.00	4.60	16.50	1.42	12.50	0.14	3.20	0.03	0.96	34.00	19.60	0.09	68.00	0.54	0.05	11.60	13.30	70.00	16.60	81.10	0.00	0.01	0.85	7.50	1.00	2.60	13.90	1.07	0.05	21.80	0.39	0.44	3.90	34.00	1.70	14.70	9.00	121.00	2.91	1.54	0.72	3.68	0.55	0.26	25.10	6.82	4.78	0.51	0.23	1.56
T4-R250-2	Floodplain	0.04	4.71	4.20	240.00	1.17	0.46	0.01	0.02	70.70	7.20	33.00	5.37	15.70	1.68	14.70	0.14	3.40	0.04	1.03	35.90	24.30	0.10	63.00	0.63	0.04	13.00	16.50	80.00	17.50	90.80	0.00	0.01	0.91	9.20	1.00	3.10	14.50	1.22	0.05	22.60	0.45	0.49	4.50	40.00	2.00	15.40	10.00	124.50	3.14	1.69	0.75	3.99	0.59	0.28	26.50	7.18	5.09	0.55	0.25	1.70
T4-R250-3	Floodplain	0.05	5.05	5.10	250.00	1.35	0.48	0.01	0.02	67.90	8.10	35.00	5.75	16.10	1.84	15.80	0.13	3.50	0.04	1.05	34.60	25.30	0.11	57.00	0.73	0.04	12.70	17.80	80.00	18.70	93.80	0.00	0.01	0.93	9.70	1.00	3.30	14.50	1.21	0.05	23.60	0.42	0.53	4.80	43.00	2.10	15.70	10.00	125.50	3.17	1.74	0.80	4.05	0.60	0.29	27.30	7.38	5.16	0.57	0.26	1.78
T4-L500-1	Floodplain	0.03	2.04	11.00	80.00	0.61	0.26	0.01	0.02	35.30	3.30	34.00	2.22	8.50	2.82	6.48	0.09	1.60	0.02	0.36	16.90	12.20	0.03	52.00	0.72	0.02	5.00	9.80	120.00	10.20	27.40	0.00	0.01	1.14	3.10	1.00	1.10	6.10	0.68	0.07	9.60	0.17	0.17	1.90	46.00	0.90	6.20	5.00	57.60	1.36	0.66	0.38	1.85	0.24	0.11	13.20	3.58	2.55	0.25	0.10	0.70
T4-L500-2	Floodplain	0.04	2.05	12.60	80.00	0.62	0.26	0.01	0.02	35.90	3.30	32.00	2.24	8.40	2.72	6.59	0.09	1.60	0.02	0.35	15.10	12.40	0.03	71.00	0.80	0.02	5.10	9.60	100.00	12.40	26.50	0.00	0.01	2.32	3.40	1.00	1.10	5.60	0.87	0.06	11.70	0.17	0.16	2.30	53.00	0.80	6.40	5.00	58.40	1.34	0.68	0.36	1.75	0.25	0.12	12.10	3.30	2.34	0.24	0.10	0.72
T4-R500-1	Floodplain	0.02	3.32	2.00	260.00	1.12	0.48	0.01	0.02	65.60	4.30	29.00	4.71	11.00	0.84	9.90	0.10	3.90	0.03	1.04	32.70	29.30	0.09	75.00	0.27	0.06	16.30	7.40	60.00	18.90	76.10	0.00	0.01	0.81	7.80	1.00	3.10	16.30	1.57	0.05	22.40	0.53	0.40	3.70	32.00	2.60	16.80	6.00	132.00	3.12	1.80	0.78	3.90	0.61	0.31	25.90	7.18	4.98	0.57	0.27	1.89
T4-R500-2	Floodplain	0.05	4.59	4.50	320.00	1.61	0.49	0.01	0.02	63.50	6.50	37.00	6.85	11.90	2.20	13.80	0.10	3.60	0.05	1.18	31.80	50.30	0.12	56.00	0.33	0.06	16.20	11.10	50.00	23.80	94.40	0.00	0.01	0.72	9.70	1.00	3.70	16.60	1.54	0.05	22.40	0.50	0.51	4.20	63.00	2.70	16.30	7.00	127.50	3.04	1.72	0.78	3.76	0.58	0.29	24.70	6.88	4.89	0.56	0.25	1.77
T4-R500-3	Floodplain	0.04	7.68	10.20	480.00	3.21	0.65	0.01	0.02	87.20	14.40	60.00	10.55	21.20	4.14	25.40	0.16	3.90	0.08	1.50	33.40	87.50	0.21	65.00	0.62	0.08	17.80	25.50	60.00	35.10	143.00	0.00	0.01	1.14	15.90	1.00	5.30	20.60	1.59	0.05	27.40	0.51	0.82	8.90	90.00	3.50	18.80	11.00	142.50	3.98	2.13	1.04	4.81	0.75	0.36	29.70	7.78	6.10	0.71	0.32	2.25
T4-L050-1	Floodplain	0.17	6.01	9.00	440.00	2.70	7.47	0.12	0.27	109.50	210.00	46.00	7.21	463.00	2.34	18.65	0.18	3.90	0.06	1.86	51.40	36.90	0.33	988.00	0.76	0.11	12.50	118.00	350.00	87.70	134.00	0.00	0.02	1.98	11.90	1.00	3.80	27.00	1.11	0.08	23.00	0.36	0.74	37.90	54.00	2.30	23.80	121.00	141.50	4.73	2.41	1.26	6.33	0.86	0.37	39.40	10.65	7.68	0.86	0.36	2.24
T4-L050-2	Floodplain	0.09	3.75	4.70	340.00	1.50	3.53	0.05	0.07	82.30	47.10	26.00	4.28	227.00	1.46	10.30	0.12	3.30	0.03	1.51	39.50	19.20	0.16	353.00	0.47	0.11	8.70	35.70	190.00	43.40	95.30	0.00	0.01	0.75	6.80	1.00	2.20	20.70	0.87	0.05	21.20	0.30	0.46	15.60	30.00	1.40	16.30	37.00	109.50	3.20	1.71	0.93	4.70	0.60	0.26	32.50	8.75	6.35	0.63	0.23	1.61
T4-L050-3	Floodplain	0.03	2.16	1.80	260.00	0.63	0.29	0.02	0.02	53.00	6.90	12.00	1.92	11.30	0.74	5.60	0.08	2.60	0.01	1.31	25.20	9.30	0.06	112.00	0.21	0.10	5.70	9.00	80.00	13.10	66.10	0.00	0.01	0.53	2.90	1.00	1.20	17.90	0.58	0.05	16.40	0.20	0.30	2.70	14.00	1.00	9.50	13.00	92.90	1.84	0.94	0.59	2.81	0.34	0.16	20.90	5.81	4.01	0.35	0.14	0.98
T4-L050-1	Floodplain	0.04	3.26	3.40	290.00	0.83	0.47	0.02	0.02	78.60	6.20	24.00	3.24	18.30	1.31	8.97	0.13	3.90	0.03	1.21	36.90	15.30	0.09	216.00	0.39	0.07	10.40	11.50	120.00	16.20	86.60	0.00	0.01	0.89	5.40	1.00	2.00	17.80	1.08	0.05	23.40	0.36	0.34	3.70	27.00	1.50	14.10	10.00	133.50	3.10	1.59	0.77	4.05	0.56	0.27	28.00	7.56	5.35	0.56	0.23	1.64
T4-R050-2	Floodplain	0.06	4.14	4.70	280.00	1.04	0.45	0.01	0.02	80.60	6.40	31.00	4.44	15.50	1.88	11.30	0.13	3.90	0.03	1.28	39.30	18.10	0.10	101.00	0.63	0.06	11.10	16.20	100.00	18.30	99.10	0.00	0.01	0.85	7.20	1.00	2.50	16.90	1.13	0.05	26.90	0.38	0.44	4.60	36.00	1.70	17.00	12.00	132.50	3.23	1.80	0.90	4.48	0.63	0.30	32.20	8.81	6.08	0.61	0.26	1.85
T4-R050-3	Floodplain	0.04	4.68	7.10	280.00	1.32	0.45	0.01	0.02	70.70	8.40	38.00	4.86	18.90	2.36	14.15	0.17	3.80	0.04	1.28	35.40	21.50	0.11	80.00	0.76	0.05	11.90	18.20	110.00	18.00	103.50	0.00	0.01	1.24	8.50	1.00	2.80	17.40	1.15	0.05	23.40	0.41	0.50	5.80	45.00	1.90	15.60	12.00	144.50	3.06	1.69	0.77	4.02	0.58	0.28	27.40	7.40	5.08	0.55	0.25	1.74
T5-L250-1	Floodplain	0.02	2.85	5.60	120.00	0.74	0.34	0.01	0.02	44.70	5.90	29.00	3.31	11.40	1.67	8.18	0.08	2.40	0.03	0.44	21.70	20.00	0.06	57.00	0.54	0.02	7.50	11.30	70.00	11.70	44.80	0.00	0.01	0.54	5.10	1.00	1.80	7.60	0.74	0.05	14.70	0.25	0.25	2.90	31.00	1.20	9.90	6.00	79.80	2.03	1.04	0.59	2.71	0.36	0.17	19.40	5.20	3.85	0.36	0.15	1.06
T5-L250-2	Floodplain	0.02	3.46	5.60	130.00	0.89	0.32	0.01	0.02	46.60	5.90	30.00	3.90	10.50	1.83	9.54	0.09	2.20	0.03	0.49	22.10	22.90	0.07	44.00	0.61	0.02	7.80	13.10	80.00	11.60	48.20	0.00	0.01	0.69	6.40	1.00	2.10	7.40	0.80	0.05	16.70	0.26	0.28	3.20	35.00	1.30	10.40	7.00	73.90	1.99	1.11	0.61	2.85	0.38	0.18	20.00	5.44	3.96	0.38	0.17	1.11
T5-L250-3	Floodplain	0.03	4.77	17.50	120.00	1.38	0.45	0.01	0.02	45.50	7.30	54.00	4.44	16.50	5.31	13.15	0.11	2.50	0.04	0.57	22.50	26.30	0.08	49.00	1.63	0.03	7.30	16.60	240.00	20.10	56.60	0.00	0.01	1.17	8.70	2.00	2.40	8.60	0.79	0.10	20.70	0.24	0.32	6.80	84.00	1.40	10.70	8.00	82.90	2.02	1.19	0.59	2.77	0.40	0.20	19.80	5.43	3.82	0.38	0.17	1.20
T5-L500-1	Floodplain	0.03	3.72	1.70	180.00	0.99	0.38	0.01	0.02	53.30	6.50	27.00	5.23	17.00	0.69	10.15	0.08	3.20	0.03	0.65	27.00	26.80	0.08	75.00	0.27	0.04	10.70	11.60	70.00	12.90	54.20	0.00	0.01	0.73	6.60	1.00	2.60	10.60	1.12	0.05	16.90	0.38	0.33	3.00	25.00	1.70	13.20	7.00	114.50	2.42	1.33	0.66	3.23	0.49	0.22	21.70	5.93	4.29	0.44	0.20	1.36
T5-L500-2	Floodplain	0.04	5.78	2.10	260.00	1.43	0.46	0.01	0.02	55.80	9.30	35.00	8.33	13.90	0.87	16.55	0.09	3.50	0.05	0.96	29.90	44.50	0.11	48.00	0.23	0.05	13.00	18.80	60.00	19.70	85.30	0.00	0.01	0.95	10.20	1.00	4.00	13.40	1.49	0.05	21.30	0.44	0.55	3.30	40.00	2.50	14.30	9.00	116.50	2.76	1.57	0.72	3.48	0.54	0.26	22.80	6.27	4.43	0.49	0.23	1.60
T5-L500-3	Floodplain	0.02	6.38	9.00	290.00	1.83	0.52	0.01	0.02	64.90	11.00	44.00	9.59	17.30	2.25	19.05	0.12	3.60	0.06	1.04	35.40	47.00	0.13	79.00	0.46	0.06	13.90	21.60	70.00	22.70	96.90	0.00	0.01	0.47	12.00	1.00	4.30	15.00	1.55	0.05	22.40	0.44	0.60	4.30	69.00	2.70	16.20	9.00	123.50	2.97	1.69	0.80	3.80	0.57	0.27	26.20	7.20	4.94	0.54	0.24	1.68
T5-L050-1	Floodplain	0.06	3.31	3.20	320.00	1.11	0.94	0.02	0.03	85.70	13.70	22.00	3.93	46.60	1.26	9.23	0.11	3.90	0.03	1.43	39.80	16.90	0.11	194.00	0.34	0.10	9.10	16.60	130.00	21.50	89.20	0.00	0.01	0.74	5.80	1.00	2.10	19.60	1.09	0.05	24.30	0.31	0.45	5.60	25.00	1.50	15.60	20.00	135.50	2.99	1.63	0.88	4.35	0.57	0.25	31.70	8.82	6.07	0.56	0.23	1.58
T5-L050-2	Floodplain	0.06	3.85	3.70	320.00	1.32	0.45	0.02	0.02	83.70	7.70	26.00	4.51	17.90	1.56	10.85	0.11	4.00	0.03	1.41	38.40	20.10	0.12	149.00	0.35	0.09	9.60	14.10	120.00	19.00	94.80	0.00	0.01	0.84	6.70	1.00	2.30	19.10	1.09	0.05	23.50	0.32	0.49	4.70	30.00	1.60	16.20	18.00	136.50	3.16	1.72	0.91	4.48	0.59	0.29	31.60	8.60	6.07	0.59	0.25	1.72
T5-L050-3	Floodplain	0.04	4.49	4.60	310.00	1.28	0.45	0.01	0.02	88.30	7.40	29.00	5.28	16.90	1.84	12.50	0.12	4.00	0.04	1.41	43.60	22.30	0.13	118.00	0.47	0.08	10.20	15.60	120.00	19.50	101.50	0.00	0.01	0.68	7.60	1.00	2.70	19.00	1.03	0.05	23.20	0.35	0.50	4.80	36.00	1.70	17.30	19.00	138.50	3.35	1.82	0.99	4.76	0.64	0.30	35.00	9.63	6.66	0.62	0.27	1.81
T6-R250-1	Floodplain	0.01	3.10	2.00	230.00	1.02	0.34	0.01	0.02	52.10	4.80	37.00	4.28	7.90	0.83	9.25	0.09	2.70	0.03	0.97	26.60	18.70	0.07	56.00	0.18	0.07	9.80	8.90	60.00	13.80	67.50	0.00	0.01	0.60	5.90	1.00	2.00	15.40	0.89	0.05	16.10	0.33	0.34	2.70	27.00	2.30	11.80	6.00	95.40	2.12	1.20	0.62	2.97	0.41	0.19	20.50	5.74	4.00	0.40	0.17	1.17
T6-R250-2	Floodplain	0.03	3.88	8.60	310.00	2.21	0.39	0.01	0.02	86.50	16.70	34.00	5.17	11.80	4.53	12.40	0.13	2.70	0.04	1.09	30.10	21.50	0.10	370.00	0.38	0.07	10.00	10.70	60.00	19.40	81.90	0.00	0.01	0.91	7.50	1.00	2.50	15.60	0.90	0.05	18.60	0.32	0.43	5.90	66.00	1.80	14.50	7.00	97.90	2.81	1.54	0.79	3.74	0.54	0.24	25.80	6.97	5.10	0.53	0.23	1.57
T6-R500-1	Floodplain	0.04	2.70	1.20	250.00	0.81	0.32	0.01	0.02	54.30	2.90	22.00	3.48	7.10	0.64	7.49	0.08	3.00	0.02	1.05	27.80	18.10	0.06	59.00	0.16	0.07	11.00	5.60	50.00	14.80	66.90	0.00	0.01	0.67	5.30	1.00	2.00	15.40	1.08	0.05	16.30	0.38	0.30	2.50	23.00	1.70	12.10	5.00	96.20	2.47	1.38	0.65	3.33	0.47	0.23	22.30	6.08	4.27	0.47	0.20	1.39
T6-R500-2	Floodplain	0.04	5.70	8.80	400.00	2.44	0.45	0.01	0.02	53.60	15.30	49.00	7.76	16.70	4.42	16.20	0.11	3.10	0.06	1.45	26.00	35.80	0.14	151.00	0.68	0.09	12.30	17.10	60.00	24.70	125.50	0.00	0.01	1.02	10.80	1.00	3.70	18.20	1.07	0.05	26.20	0.35	0.59	5.30	81.00	2.40	15.50	9.00	108.00	2.90	1.62	0.77	3.62	0.56	0.27	22.50	6.05	4.59	0.53	0.24	1.68
T6-R050-1	Floodplain	0.05	6.71	9.60	370.00	2.05	0.63	0.01	0.02	86.70	12.30	55.00	9.61	24.50	3.67	18.80	0.14	3.90	0.06	1.63	40.70	33.10	0.15	169.00	0.96	0.08	12.70	23.10	190.00	25.90	141.00	0.00	0.01	0.99	12.20	1.00	4.00	21.40	1.15	0.07	25.80	0.38	0.71	6.50	62.00	2.40	18.50	20.00	134.50	3.59	1.97	1.02	4.98	0.69	0.32	33.40	9.12	6.42	0.69	0.28	1.95
T6-R050-2	Floodplain	0.06	6.84	11.10	390.00	2.13	0.67	0.01	0.02	173.00	22.70	57.00	9.91	28.60	3.85	22.40	0.14	4.30	0.07	1.83	42.00	35.80	0.16	379.00	0.93	0.07	14.00	27.20	180.00	42.00	155.00	0.00	0.01	1.04	14.10	1.00	4.70	22.70	1.27	0.07	28.00	0.41	0.76	7.80	74.00	2.90	19.40	21.00	142.50	3.71	2.02	0.98	4.72	0.72	0.35	32.70	9.09	6.29	0.68	0.30	2.13
T6-R050-3	Floodplain	0.05	7.40	9.10	410.00	2.37	0.72	0.01	0.02	133.00	16.10	52.00	9.66	28.10	3.34	23.30	0.15	4.60	0.07	1.98	48.50	34.30	0.19	183.00	0.56	0.08	14.90	26.80	150.00	36.10	156.00	0.00	0.01	1.16	15.40	1.00	5.00	24.30	1.40	0.05	30.50	0.44	0.84	7.70	69.00	3.10	22.70	22.00	148.50	4.30	2.50	1.19	5.66	0.86	0.41	38.90	10.90	7.40	0.80	0.36	2.52
T7-01	Tailings	0.10	5.07	32.70	380.00	3.64	1.29	0.23	0.50	150.50	201.00	224.00	1.51	2680.00	12.00	19.25	0.14	2.10	0.15	0.16	27.90	28.80	0.28	3740.00	3.63	0.01	5.20	208.00	720.00	173.50	13.90	0.00	0.02	1.85	13.00	1.00	2.00	14.90	0.42	0.20	20.60	0.18	0.27	25.30	179.00	2.70	21.70	251.00	72.20	3.91	2.24	1.00	4.57	0.78	0.31	22.40	6.20	4.78	0.68	0.31	2.03
T7-02	Tailings	0.13	5.28	87.30	2930.00	4.79	3.07	0.06	0.10	260.00	147.50	76.00	2.69	587.00	13.30	18.70	0.18	2.80	0.22	1.01	64.50	26.60	0.24	16150.00	4.25	0.05	6.80	152.00	470.00	75.20	77.30	0.00	0.02	1.34	11.10	1.00	1.90	30.50	0.58	0.16	34.90	0.19	2.55	23.20	159.00	2.20	21.00	24.00	89.40	4.30	2.47	1.23	5.42	0.85	0.43	39.20	12.05	7.20	0.82	0.36	2.62
T7-03	Tailings	0.07	3.84	9.60	290.00	1.75	3.37	0.16	0.21	52.60	171.50	34.00	1.56	1090.00	2.61	10.00	0.08	1.70	0.05	1.20	21.90	15.90	0.58	1460.00	0.84	0.08	5.10	112.50	330.00	96.50	72.90	0.00	0.07	0.74	6.10	1.00	1.60	19.00	0.44	0.07	14.70	0.17	0.39	18.10	39.00	1.00	14.60	109.00	58.60	2.49	1.47	0.67	3.10	0.51	0.21	16.90	4.69	3.33	0.45	0.20	1.36
T7-04	Tailings	0.06	5.39	32.10	850.00	3.19	0.84	0.04	0.10	192.50	78.10	99.00	3.25	388.00	9.46	18.20	0.13	2.60	0.08	0.99	47.30	21.50	0.19	4000.00	3.23	0.04	7.10	82.00	290.00	68.60	81.80	0.00	0.05	1.46	9.50	1.00	1.90	16.50	0.57	0.13	36.50	0.22	1.05	18.90	129.00	1.70	15.60	48.00	88.80	3.13	1.87	0.89	4.01	0.61	0.31	30.00	8.95	5.32	0.60	0.27	1.88
T7-05	Tailings	0.11	6.50	25.30	600.00	3.01	3.42	0.14	0.03	103.50	33.70	74.00	4.71	733.00	6.25	20.50	0.11	3.20	0.07	1.13	46.10	27.70	0.31	1080.00	2.41	0.05	9.10	61.90	2170.00	81.20	101.00	0.00	0.10	1.39	13.00	1.00	2.60	18.50	0.79	0.20	44.30	0.31	0.68	170.00	84.00	1.90	17.70	20.00	105.50	3.54	1.91	0.98	4.50	0.68	0.30	28.00	8.36	5.52	0.66	0.27	1.89
T7-06	Tailings	0.10	8.52	6.80	800.00	4.64	0.71	0.06	0.13	36.90	65.10	46.00	6.17	138.00	13.35	25.30	0.32	2.80	0.45	0.44	35.40	66.10	0.24	14400.00	3.50	0.03	7.90	263.00	250.00	18.70	67.10	0.00	0.07	1.14	12.20	1.00	3.30	15.30	0.69	0.08	19.80	0.27	0.64	39.20	59.00	1.60	27.00	36.00	95.60	5.64	3.22	1.48	6.94	1.13	0.45	36.10	9.60	7.33	1.00	0.43	2.79
T7-07	Control	0.01	2.58	1.70	250.00	0.62	0.17	0.02	0.02	14.35	5.50	9.00	0.44	60.20	0.77	6.79	0.05	1.00	0.01	2.65	6.60	1.70	0.02	113.00	0.63	0.21	3.10	5.60	50.00	17.30	137.00	0.00	0.01	0.17	0.80	1.00	0.50	13.20	0.31	0.05	9.20	0.03	0.58	3.60	16.00	0.40	3.30	6.00	27.80	0.53	0.37	0.10	0.56	0.11	0.08	3.70	1.17	0.65	0.09	0.06	0.45
T7-08	Control	0.01	2.67	1.60	60.00	0.55	0.14	0.01	0.02	13.30	4.70	9.84	0.44	60.90	0.74	6.92	0.05	1.09	0.01	1.04	5.60	1.70	0.20	122.00	0.72	0.03	2.80	5.70	50.00	18.90	58.30	0.00	0.01	0.82	0.90	1.00	2.50	12.90	0.25	0.04	24.30	0.03	0.53	3.90	14.00	1.70	16.00	7.00	30.50	0.50	0.30	0.82	2.86	0.26	0.29	18.60	6.52	4.26	0.08	0.21	1.11
T7-09	Control	0.01	2.70	1.50	240.00	0.69	0.17	0.01	0.02	12.07	5.80	9.08	0.44	54.00	2.58	7.76	0.05	0.95	0.01	1.77	6.00	1.70	0.18	97.00	0.67	0.08	3.00	4.80	40.00	15.80	130.30	0.00	0.01	0.62	0.90	1.00	1.30	12.40	0.32	0.04	12.60	0.18	0.69	4.10	15.00	0.40	12.30	6.00	29.60	0.54	0.35	0.65	3.21	0.37	0.11	12.40	4.30	3.65	0.10	0.16	1.69
T7-10	Control	0.01	3.08	1.50	210.00	0.63	0.17	0.01	0.02	14.30	5.40	7.64	0.46	55.40	1.26	7.80	0.04	0.83	0.01	2.98	6.50	1.50	0.03	98.00	0.71	0.01	3.30	4.50	80.00	18.70	44.20	0.00	0.01	0.16	0.80	1.00	4.00	11.70	0.35	0.06	21.30	0.02	0.60	3.50	16.00	0.80	8.60	5.00	30.10	0.47	0.31	0.21	3.80	0.59	0.26	22.30	2.65	0.92	0.09	0.32	1.99
T7-11	Control	0.01	2.29	1.70	160.00	0.61	0.17	0.01	0.02	15.57	5.40	9.34	0.43	69.30	0.87	7.22	0.04	0.84	0.01	2.44	6.90	1.70	0.17	95.00	0.55	0.07	3.70	5.90	50.00	19.00	110.10	0.00	0.01	0.91	0.80	1.00	0.80	15.30	0.34	0.06	9.10	0.03	0.68	2.90	16.00	1.20	4.40	12.00	26.80	0.53	0.40	0.61	1.10	0.41	0.31	8.40	1.19	3.64	0.08	0.11	0.82