Before the Hearing Commissioners
Appointed by the Grey District Council
and West Coast Regional Council

Under	the Resource Management Act 1991
In the matter of	Resource consent applications by TiGa Minerals and Metals Ltd to establish and operate a mineral sands mine on State Highway 6, Barrytown (RC-2023-0046; LUN3154/23)

Supplementary Statement of Mitchell Ryan

19 March 2024

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1 My name is Mitchell Ryan.

2 I have been asked to provide additional information regarding the results of the Barrytown drill sample programme in order to allow an assessment of the ore's radiological variability to be made, and to confirm that there are low levels of monazite and other radioisotope-bearing minerals.

Radiological sample size

3 Since my evidence statement made on 05/02/2024, I have received and reviewed the individual results from the drill sample programme as conducted by NZIMMR in conjunction with RSC (data attached in Appendix 1). In total, 2,274 ore samples including QA/QC duplicates and repeats were analysed by a handheld XRF device for their elemental constituents. Thorium (Th) was measured, however Uranium (U) was not, so while a reliable radioactivity (Bq/g) reading cannot be inferred from these assays, the current focus is on the variability of radioactivity expected within the concentrated HMC. This can be provided by the Thorium assay. Uranium and Thorium typically scale together.

4 It should be noted that the Uranium was not measured by the handheld XRF device during the drill programme as determining radioactivity was not a major objective of the study. These handheld XRF devices are capable of measuring Uranium, as required by Condition of Consent 8.8.

5 From the 2,274 samples measured, the Thorium assays are summarised as per Table 1 below. The standard deviation (average variance) was ±13 ppm, or ±50%, of the average Thorium reading. The maximum Thorium reading in the ore was 2.8 times higher than the average measurement. For context, the average grade Barrytown ore bulk sample assayed at 26 ppm U+Th. The HMC produced from this measured at 0.70 ± 0.11 Bq/g. This would require an increase of approximately 14x in order to reach the 10 Bq/g level to be classed as radioactive by the New Zealand Radiation Safety Act (2016).

6 Table 1 – Thorium summary from Barrytown Project drill programme

Metric	Thorium (ppm)
Average	26
95th Percentile	51
Maximum	73
Standard Deviation	13

7 The drill sample data confirms the ore to have consistently low Thorium levels, with low variance throughout the resource. These levels of Thorium in the drill samples

(26ppm average) are consistent with the levels of Thorium measured in the average and high grade bulk sample ores (24ppm and 66ppm, respectively), confirming that the bulk samples are representative of the Barrytown resource.

8 Monazite mineral is the predominant carrier of Uranium and Thorium isotopes in the Barrytown ore. The low levels of Thorium in the drill sample dataset indicate very low levels of monazite in the Barrytown ore. This is confirmed by the average and high grade bulk sample ore and HMCs measuring monazite at below QXRD detection limits (<1%).

9 The individual drill samples with slightly higher levels of Thorium typically correlate to samples with high levels of heavy mineral content (see Figure 1). This confirms that it is more so the amount of heavy mineral in the ore that is affecting the U+Th levels in the ore, rather than a varying HM mineralogy. This means that once concentrated, the HMC will exhibit even less variance than the ore in terms of U+Th, because the concentration process achieves a consistent product, in terms of HM content, for the market.

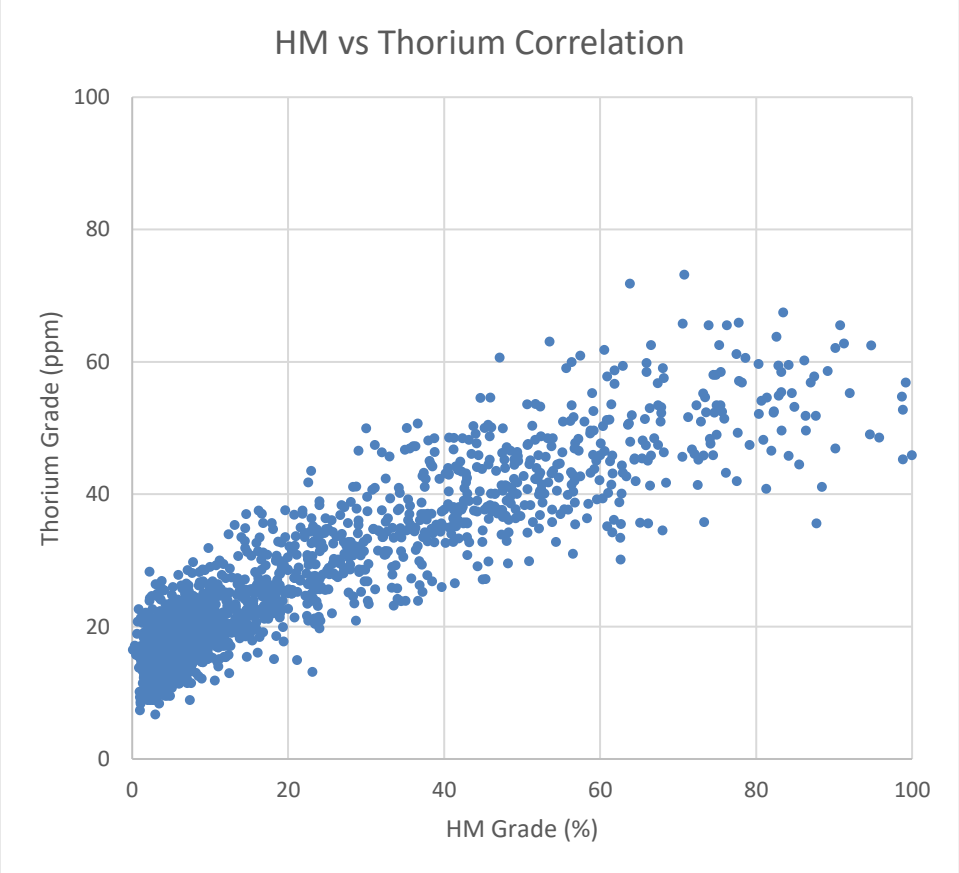

Figure 1 - Thorium and HM content for 2,274 Barrytown ore samples

10 The Australian Fingerboards Project was referenced by Michael Garry Hill on 09/2/2024 for its more rigorous radiation monitoring regime. Rare earth minerals (e.g. monazite) are a target commodity for this resource and as a result the ore has

naturally higher radiation levels. The HMC produced from the Fingerboards ore was measured to be 8.46 – 9.48 Bq/g as stated in the August 2020 Environment Effects Statement. This is 10-15x more radioactive than the Barrytown HMC, and so in the case of the Fingerboards Project, the extensive radiation monitoring regime is justified.

11 Based on the extensive XRF data available, which demonstrates that there are not any significant anomalies found in the Barrytown ore, it is my view that further sampling for radiation levels prior to mining is not required. The drill sample XRF data provides certainty about the representativeness of the radiation levels in previous bulk samples, and demonstrates that there is no risk that the ore or HMC would breach New Zealand legislative limits.

Mitchell Ryan

Dated this 13th day of March 2024.

Appendix 1: Barrytown Drill Programme XRF data