IN THE MATTER	of the Resource Management Act 1991
AND	
IN THE MATTER	of an application for resource consents by **TIGA MINERALS AND METALS LTD**
AND	
IN THE MATTER	of a submission by the **COAST ROAD RESILIENCE GROUP INC**

Statement of evidence of Brian James Lunt

For COAST ROAD RESILIENCE GROUP INC
Topic Radiation Safety Management & Monitoring

Dated: 25 January 2024

Coast Road Resilience Group Inc
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INTRODUCTION

1. My full name is Brian James Lunt.

2. I hold a Master's degree in Medical Physics from the University of Otago, awarded in 1987. I am a Member Australasian College of Physical Scientists & Engineers in Medicine (ACPSEM) (1987-present), an Accredited Radiology Physicist – Australasian College of Physical Scientists & Engineers in Medicine, the NZ ACPSEM Branch Spokesperson Radiology Physics 2012 – present, a Member International Accreditation New Zealand (IANZ)- Radiology Professional Advisory Panel - 2017 – present, an IANZ Radiology Technical Expert 2015 – present, and the Chairperson of the Radiation Safety Advisory Council (RSAC) 2020 – present. (A statutory appointment under the Radiation Safety Act 2016). I have acted as a technical expert to the International Atomic Energy Agency (IAEA) for Expert Missions to Sri Lanka/Malaysia/Bangladesh/Indonesia/Philippines 1998 – 2009. I am not an expert in mining. (Please note: The opinions expressed in this submission are mine as an independent qualified consultant Medical Physicist and not as a member of either the ACPSEM, IANZ or RSAC).

3. I have the following relevant experience I have worked in radiation safety and been involved in the medical uses of radiation nationally and internationally since 1987, I work as a consultant Medical Physicist involved in radiation safety in medical applications including diagnostic radiology and nuclear medicine. I provide clinical radiation dosimetry services for during the therapeutic use of Lu-177 radioisotope in Te Toka Tumai Auckland – Auckland City Hospital.

4. I have been asked by the Coast Road Resilience Group Inc to provide expert evidence in relation to radioisotope assessment, monitoring and safety associated with the proposed mine.

5. I am familiar with the TIGA application and site having reviewed the resource consent application.

6. In preparing this statement of evidence, I have reviewed the following documents.

    a. TIGA Minerals and Metals Ltd Application for Resource Consent To Grey District Council and West Coast Regional Council Mineral Sand Mining Activities at Barrytown April 2023 and

        i. Attachment P Proposed Conditions of Consent Revised (Amended)

        ii. Attachment T: Radiation Assessment – IHC Robbins

iii. Attachment U: Radiation Dosimeter Results – Radiation Protection Services Ltd.

b. The Statement of evidence of Mitchell Robert Ryan 19 January 2024 *(Note this document is incorrectly dated as 19 January 2023 – but was received January 2024)*

c. The West Coast Regional Council - Section 42A Staff Report for Resource Consent Application RC-2023-0046 By TiGa Minerals and Metals Ltd to Undertake Mineral Sand Mining And Associated Activities at Barrytown, Within Exploration Permit EP51804

7. While this is not an Environment Court hearing, I have read the Environment Court's Code of Conduct for Expert Witnesses 2023, and I agree to comply with it. My qualifications are set out above. I confirm that the issues addressed in this brief of evidence are within my area of expertise.

8. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

9. In providing this expert evidence statement, I recognise that my personal opinion regarding the TIGA application must be put to one side, and my obligation is to impartially assist the hearing panel in relation to the matters which are within my expertise.

SCOPE OF EVIDENCE

10. This evidence covers the adequacy of samples used in drawing conclusions about whether the Radiation Safety Act 2016 applies and appropriate monitoring and management of any radioisotope related hazard.

SUMMARY

11. The analysis of three samples from an aggregated bulk sample in the Resource Consent Application and the results from the RadPro dosimeters are not sufficient to draw the conclusion that the Radiation Safety Act 2016 does not apply.

12. The radiation safety requirements detailed in the Attachment P Proposed Conditions of Consent Revised form a reasonable basis to proceed in the absence of a New Zealand Code of Practice relating to Radiation Safety in mining.

13. There is a lot of detail missing in the Attachment P Proposed Conditions of Consent Revised (para 8.5,8.6) as to exactly how the Consent Holder will meet the requirements of the Australian Code of Practise and who will oversee the appropriateness.

14. It is my opinion that a detailed radiation monitoring plane should be submitted to the Office of Radiation Safety for approval including sampling methods, frequency and locations, and independent oversight be established, including the requirements needed to meet the Proposed Conditions of Consent (para 8.5,8.6), and that this plan is included in any conditions of consent.

EVIDENCE

15. It is acknowledged that two samples of the Heavy Mineral Concentrate (HMC) bulk samples processed and tested by IHC Robbins 6 April 2023 referenced in the initial consent do not meet the definition of a Radioactive Material in the Radiation Safety Act 2016.

16. It is also acknowledged that the additional bulk sample processed and tested in the Mitchell Robert Ryan 19 January 2024 Statement of Evidence did not meet the definition of a Radioactive Material in the Radiation Safety Act 2016.

17. There were repeated assertions in the application and supporting documents that as no component of the three bulk samples tested exceeded the definition of a Radioactive Material in the Radiation Safety Act 2016, that the provisions of the Act did not apply.

18. Three aggregate samples do not constitute a statistically meaningful sample size.

19. The sample size of three should be contrasted with the IHC Mining test work programmes as part of the current Barrytown feasibility studies including approximately 1,500 aircore drill samples analysed to support the geological and geographical definition of the orebody and to understand the heavy mineral grade distribution throughout.

20. The mine owner and operators' obligations under the Radiation Safety Act cannot be discharged based simply on the radioactive concentrations in three samples falling below the activity concentration limits in the Radiation Safety Act 2016. A rigid application of the Act would indicate if any subsequent sample met the definition of a Radioactive Material the Radiation Safety Act would apply.

21. Ambient radiation doses referenced in the consent were obtained from devices supplied by RadPro. The type of dosimeters advertised by RadPro are not suitable for dose monitoring of airborne risk from alpha and beta emitting isotopes such as those typically associated with an HMC mine. High-volume air sampler would typically be more representative of the isotope inhalation risk.

22. Consequently, the RadPro dose records are not likely to represent the actual radiation risk to a person at the same location.

23. New Zealand does not currently have a Code of Practice for mining issued under the Radiation Safety Act and so it is unclear what ongoing commitment is expected of the Consent Holder.

24. As the hearing panel and the mine owner do not have the benefit of a New Zealand Code of Practice to guide them on the specific technical details of what the mine owner may need to do to meet their obligations under the Act, it would be advisable to look at international practice, and more locally at Australian practice as a guide to what a reasonable and responsible course of action may look like.

25. The activity concentrations of 1 Bq/g is currently the internationally accepted level for defining the scope of regulation for naturally occurring materials containing uranium and thorium as defined in the International Atomic Energy Agency (IAEA) Safety Standards Series No. RS-G-1.7 (IAEA 2004b), Application of the Concepts of Exclusion, Exemption and Clearance.

26. Australia has a more detailed regulatory framework covering radiation safety for mining activities including a mining code of practice(a). The Australian regulations(b) also use the same 10 Bq/g radioactivity threshold as in the New Zealand Act for the definition of thorium as a regulated radioactive material. Even so, the Australian Code uses the lower concentration of 1 Bq/g as the threshold for defining whether bulk mining materials need regulatory oversight.

27. If the Radiation Safety Act 2016 cannot be invoked, then as indicated in The West Coast Regional Council - Section 42A Staff Report for Resource Consent [Paragraphs 42] suggests that as a contaminant the radioisotope oversight this could be managed under a consent.

28. In the absence of an Office of Radiation Safety Code of Practice for mining, the "Attachment P TiGa Minerals and Metals Ltd – Proposed Conditions of Consent" (para 8.5,8.6) and the references to the equivalent Australian document provide a reasonable starting point for monitoring and managing the radiation safety in and around the proposed mine.

29. The conditions of consent are however missing significant details, for example what methodology to use for monitoring airborne activity.

30. It is not stated in the conditions of consent what independent oversight for example in confirming compliance with the "Radioactive Waste Management in Mining and Mineral Processing Code of Practice and Safety Guide" referenced in the conditions of consent is to be applied.

CONCLUSION

31. The limited aggregated sample size and sample methodology do not allow the conclusion to be drawn that the Radiation Safety Act 2016 does not apply.

32. It is my opinion that the radiation safety requirements detailed in the Attachment P Proposed Conditions of Consent, is a reasonable basis to proceed in the absence of a New Zealand Code of Practice relating to Radiation Safety in mining.

33. There is a lot of operational and technical detail not included in the Attachment P Proposed Conditions of Consent as to exactly how the Consent Holder will meet the requirements of the Australian Code of Practise and who will oversee the appropriateness.

34. It is my opinion that a detailed radiation safety plan should be submitted to the Office of Radiation Safety for approval including sampling methods, frequency and locations, and that independent oversight be established, including the requirements needed to meet the Attachment P Proposed Conditions of Consent paragraphs 8.5 and 8.6, and that this approved plan is included in any conditions of consent.

Brian James Lunt
25 January 2024

REFERENCES

New Zealand Radiation Safety Act 2016

ARPANSA Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing (2005)

International Atomic Energy Agency (IAEA) Safety Standards Series No. RS-G-1.7 (IAEA 2004b), Application of the Concepts of Exclusion, Exemption and Clearance.