

13 October 2023



The Department of Mines, Industry Regulation and Safety
100 Plain St
East Perth WA 6004

Sent via email: safetycomms@dmirs.wa.gov.au

Dear Mining and Petroleum Advisory Committee,

INDUSTRY FEEDBACK: DRAFT MANAGING NATURALLY OCCURRING RADIOACTIVE MATERIAL (NORM) IN MINING AND MINERAL PROCESSING: GUIDE

The Chamber of Minerals and Energy of Western Australia (CME) is the peak representative body for the resources sector in Western Australia (WA). CME is funded by member companies responsible for more than 86 per cent of the WA's mineral workforce employment,¹ ranging from mining to manufacturing² and support services across over a hundred sites and a dozen commodities from exploration to production and closure.

The resources sector significantly contributes to local, state and Australian economies. In 2021-22, the WA resources industry generated \$186.8 billion in gross value added, accounting for almost half of WA's economic activity.³ The industry's exports totalled \$233.6 billion, accounting for 95 per cent of WA goods exports and 66.1 per cent of national resources exports.⁴

The resources industry is also directly and indirectly responsible for a large share of employment in WA and the nation. In 2022-23, the WA resources industry employed 166,000 people, equivalent to 10.8 per cent of total employment in WA and 53.4 per cent of national mining employment.⁵ Employment in the WA resources industry grew by 40 per cent between February 2020 (pre-COVID) and May 2023, accounting for around 70 per cent of growth in national resource sector employment.⁶ Modelling based on CME's 2021-22 Economic Contribution Survey indicates spending by the WA resources industry supports at least 493,235 additional full-time jobs across Australia, including 259,959 full-time jobs in the state.⁷

Summary of recommendations:

CME appreciates the chance to offer feedback on the draft Managing naturally occurring radioactive material (NORM) in mining and mineral processing: Guide (the NORM-II Guide). A summary of recommendations is included below, with specific comments also detailed below. In summary:

- CME recommends that the Department of Mines, Industry Regulation and Safety (DMIRS) continue the comprehensive consultation process throughout the development of future NORM Guides.
- CME welcomes the introduction of a tiered approach for (radiation management plan) RMPs acknowledging its ability to provide a tailored framework, adapted to suit operational needs.
- CME recommends that the language utilised in the NORM-II Guide should be updated to align with mandatory and non-mandatory terminology used in similar safety documents. These updates must be made to enable the benefits of the tiered approach and support its application across the diverse operations within of the resources sector.
- CME recommends exploring standardised mentorship formats and continuous education initiatives within the industry. This includes the adaptation of the tiered approach to support incoming registered safety officers (RSO).

¹ Government of Western Australia, [2022 Economic indicators resources data](#), full-time equivalents onsite under State legislation, Department of Mines, Industry Regulation and Safety (DMIRS), 21 April 2023.

² Mining includes mineral and petroleum commodities, whilst manufacturing includes alumina production, basic inorganic chemicals (lithium), basic non-ferrous metals (silicon), concrete and fertiliser explosives.

³ 47.8 per cent. [Australian Bureau of Statistics \(ABS\), Cat 5220](#) Table 6.

⁴ DMIRS, [WA Mineral and Petroleum Statistics Digest 2021-22](#), [ABS, Cat 5302](#) Table 21; [Cat 5368](#) Table 32a; [Cat 5220](#) Table 6.

⁵ May 2023 reference period. ABS, [Cat 6291.0.55.001 Labour Force, Australia, Detailed](#) Table 5.

⁶ Ibid.

⁷ CME, [2021/22 Total direct economic contribution to Australia](#), published June 2023.

- CME recommends reviewing information sheets to ensure coherence, minimise confusion, and facilitate effective decision-making in the industry.
- CME recommends the NORM-II Guide refers to the ARPANSA Code to ensure a comprehensive approach to radiation safety in the resources sector, safeguarding both workers and the environment.

Background & Context:

The WA resources sector is steadfast in its application of best practice to reduce worker exposure to radiation. We note the regulatory landscape governing risk management for NORM is complex, enshrined across multiple legislative instruments, and necessitates the involvement of multiple regulators including the Department of Mines, Industry Regulation and Safety (DMIRS), the Department of Water and Environmental Regulations and a number of federal agencies including the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA). Of particular relevance to mining operations are the obligations within the WA Work Health and Safety (Mines) Regulations 2022 (the Mines Regulations) which establish requirements for the management of NORM and the responsibilities for Persons Conducting a Business or Undertaking (PCBUs).⁸ These requirements include the preparation of a Radiation Management Plan (RMP) for exploration projects and mine operations with potential radiological hazards.

We understand the purpose of the NORM-II Guide is to provide mine operators with guidance on the legislative requirement to develop and implement an appropriate RMP to minimise the potential exposure of naturally occurring radionuclides. Industry understands that the management of NORM exposure is crucial to safeguarding the health of workers and collaborates regularly to share best practice and lessons learned. This is evidenced by the Radiation Management Network (RMN), where CME provides secretariat support. RMN is a technical forum for WA Radiation Safety Officers (RSOs), serving as a platform for discussions on radiation related issues and opportunities to mentor those who have recently entered the industry.

In preparing this submission, CME has sought feedback from RMN members. While RMN members generally expressed positive feedback on the NORM-II Guide, there are areas that require further clarification to avoid ambiguity and misinterpretation. The below submission provides themed feedback to the NORM-II Guide, with specific feedback also outlined below.

CME has appreciated the active involvement of the regulator and applauds the DMIRS for their commitment to ensuring a fair and transparent consultation process. The consultation timeframe has also been appropriate which has enabled deeper discussions with our members, allowing for more substantial and valuable feedback.

CME recommends that DMIRS continue the comprehensive consultation process throughout the development of future NORM Guides.

Tiered Approach

The NORM-II Guide introduces a five-tiered approach for RMPs, according to NORM risk exposure. This approach organises NORM management measures into distinct levels or tiers based on the varying risks posed by different operations. Each tier represents a specific level of risk or complexity. CME has previously provided feedback recommending a similar approach be taken to address the shortage of RSO's in WA and commends DMIRS for employing this strategy. By implementing a tiered system, companies can streamline the process for operations. Allowing for a more tailored and nuanced approach to ensure that RMPs are appropriate for different types of operations. A notable advantage of this approach is the clearly defined expectations for each level which increases transparency and compliance efforts. CME believes the tiered approach, when coupled with comprehensive training and mentoring programs, could enhance industry's overall radiation safety practices, fostering a safer and more informed sector.

CME welcomes the introduction of a tiered approach for RMPs acknowledging its ability to provide a tailored framework, adapted to suit operational needs.

Language and Regulatory Concerns

CME is concerned that the language used in sections of the NORM-II Guide presents regulatory uncertainty and leaves little room for flexibility to accommodate the diverse needs and unique landscape of the resources sector. While the NORM-II Guide is a guidance document, some of the terminology used may be indicative

⁸ *Work Health and Safety (Mines) Regulations 2022 (WA)*. Reg 641N.

of a legal requirement. For example, the mine operator must ensure that appropriate expertise in radiation protection is available and appoint an RSO who has qualifications and experience acceptable to the regulator. This means that it may be admissible in court proceedings and could be regarded as evidence concerning what is known about a hazard, risk or control. In the same way DMIRS approaches Codes of Practice, there needs to be a high level of scrutiny to the language employed. Some of the language used through the NORM-II Guide requires further clarification on its intent to establish and ensure a consistent understanding of the compliance expectations.

CME recommends that the language utilised in the NORM-II Guide should be updated to align with mandatory and non-mandatory terminology used in similar safety documents. These updates must be made to enable the benefits of the tiered approach and support its application across the diverse operations within of the resources sector.

Shortage of RSOs and mentoring

The Mines Regulations provide the following eligibility requirements for a person to be appointed as an RSO:

- an undergraduate degree in science, technology, engineering or mathematics; and
- meets the eligibility requirements for a mine air quality officer under clause 4(3); and
- successful completion of a course about radiation protection from naturally-occurring radioactive material that is approved by the regulator
- working for at least 12 months under the supervision of a radiation safety officer
- successful completion of an approved WHS risk management unit for radiation safety officers
- passing an applicable legislation examination for radiation safety officers.⁹

These requirements, when combined with the increase of mining exploration operations, have created a bottleneck effect, where the demand for RSOs exceeds the available supply. The most significant concern being the requirement for radiation mentoring, which presents significant challenges to the resources sector. To address this skills shortage, companies may have to utilise consultants, without a succession plan, sometimes resulting in a reactive approach to recruitment instead of a proactive one. Moreover, the practical execution of mentoring initiatives is far more complex than it appears, due to the lack of resources and ongoing support which may create gaps in knowledge transfer.

The tiered approach in the NORM-II Guide presents an opportunity to address these issues. This may include the exploration of standardised mentorship formats and ongoing education efforts within the industry. For example, the distribution of information to employers and decision-makers to engage them in understanding the importance of mentorship could pave the way for a more effective and sustainable mentoring system.

CME recommends exploring standardised mentorship formats and continuous education initiatives within the industry. This includes the adaptation of the tiered approach to support incoming RSOs.

Data Analysis Understanding

Navigating the complexities of data analysis within the context of exemption systems in the sector presents challenges. Fluctuations in exemption limits necessitate a meticulous examination of every isotope once equilibrium is disrupted. The rationale behind these changes, particularly regarding exposure to isotopes, remains unclear, leading to the establishment of conservative exemption limits, notably impacting rare earth operations, where limits may be tenfold higher.

CME believes there is a need for transparency and coherence between guidelines, notably those set by the Radiological Council and DMIRS. The lack of alignment between these entities may increase confusion for companies, especially concerning exemptions for specific elements like Rubidium, where the risk is minimal due to a tiny dose conversion factor. The lack of clarity and standardised protocols may hamper effective decision-making in the field. RMN members believe establishing transparent information sheets would be beneficial.

CME recommends reviewing information sheets to ensure coherence, minimise confusion, and facilitate effective decision-making in the industry.

⁹ *Work Health and Safety (Mines) Regulations 2022* (WA). Reg 675ZP.

Waste Management and Environment

A radiation waste management plan (RWMP) describes how radioactive waste, will be managed and is mandated under ARPANSA's *Code of Practice and Safety Guide for Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing (The ARPANSA Code)*. The code establishes requirements for radiation protection in mining and mineral processing industries, for the protection of human health and the environment from the effects of radioactive waste.¹⁰ RMN members acknowledge that the RWMP is a crucial and specialised component within an RMP in WA. It ensures a cohesive and well-coordinated approach to radiation safety, promoting both regulatory compliance and overall safety to not only workers, but to the public.

RMN members note the exclusion of waste management and environmental considerations from the NORM-II guide may create a disconnect between health and environmental management of NORM within the mining industry. Environmental and waste management form a critical component of NORM management and to be excluded from a holistic RMP for a mining, exploration or rehabilitation operation is likely to create a potential risk for mismanagement. However, there is no reference to the disposal of waste and environmental remediation within the NORM-II Guide.

CME recommends the NORM-II Guide refers to the ARPANSA Code to ensure a comprehensive approach to radiation safety in the resources sector, safeguarding both workers and the environment.

Specific feedback

- **1.1 Radioactive material** - CME requests clarification to confirm if the limit for Ra-226 and Ra-228 is now reduced to 1 Bqg-1. This is a shift from the previous limit of 10 Bqg-1.
- **1.1 Radioactive material** - CME questions if there has there been consideration to removing the 1 Bq/g criterion to the potassium-40 and rubidium-87 radionuclides. The *Radiation Protection and Safety of Radiation Sources: International Basic Safety Standard* (the Standard) specifies that the 1 Bq/g limit applies only to radionuclides in the uranium or thorium decay chains.¹¹ The limit for potassium-40, in the Standard is 10 Bq/g, and 1000 Bq/g for rubidium-87.
- **1.3 Mining operations that do not meet the relevant mine criteria** – If a mine can demonstrate that it does not meet the relevant mine criteria, will an exemption still be required. CME seeks clarification on this matter, and this presents a situation when a mine site may have never met the criteria. For example, if the mine fails to meet the 'Relevant mine' requirements (awaiting evidence), will an exemption be required for employers.
- **1.4 Relationship with other legislative requirements** - CME recommends including a clear statement, specifying that the NORM-II Guide is applicable exclusively to NORM, as this could prevent confusion.
- **1.4 Relationship with other legislative requirements** - CME believes this process could be simplified by consolidating gauges into a single RMP.
- **2.1 Duties** - CME recommends including "and approval" into the paragraph. For example, "the measures to be implemented are submitted for consideration *and approval* by the regulator in the form of an RMP".
- **2.8 Incidents to be notified to the regulator** - CME notes that the requirement to notify the Regulator of an incident currently exists in *WHS (mines) Regulations 2022*.¹² Therefore, it is recommended that the quote "RPS-9 (p. 43) defines an incident as:" be removed. T
- **2.8 Incidents to be notified to the regulator** - CME believes consideration should be given to how this paragraph regarding accidents, unexpected events and malicious acts that result in radiation exposure could be rephrased or elaborated upon. The use of the term "emergency exposure situation" may not be theoretically feasible in the context of NORM and should be reviewed.

¹⁰ Australian Radiation Protection and Nuclear Safety Agency. [Code of Practice and Safety Guide for Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing](#). 2005.

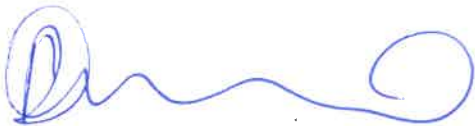
¹¹ International Atomic Energy Agency. [Radiation Protection and Safety of Radiation Sources: International Basic Safety Standard](#). 2014.

¹² *Work Health and Safety (Mines) Regulations 2022* (WA). Reg 641N

- **3 Risk-based radiation management plans** - RMN members note that radon exposure is usually above 0.5 mSv/a from natural sources. Meeting the criteria may prove difficult if RSO's are unable to subtract natural exposure from the occupational dose assessment.
- **4.2 Details required in an advanced exploration RMP (Tier 1)** - RMN members request clarification if a calibration certificate is required to perform a baseline gamma survey.
- **4.2 Details required in an advanced exploration RMP (Tier 1)** - Consideration should be given to expanding the estimate of average and maximum internal doses arising from inhalation of dust at concentrations from 1 milligram per cubic metre (mg/m³) and 3 mg/m³ to 0.5 and 5.0 mg/m³, to cover for all possibilities.
- **5.8 Appointment of contracted radiation safety officers to relevant mines** - Consideration should be given to potential scenarios where a site is unable to appoint its Radiation Safety Officer after four months. CME seeks clarification on what course of action will be necessary, and if the operation will need to shut down.
- **Appendix 3 Decision matrix** - CME seeks clarification on if intra-state transport for ports shipping been considered. Further, CME notes a potential omission of the measurement Bqg-1 at the end of the ports shipping bullet point.

CME and our member companies remain committed to radiation safety within our sector. We would welcome the opportunity to discuss these matters further. In the meantime, if you would like to discuss the above or require any further information, please do not hesitate to contact me on 0439 843 968 or n.plummer@cmewa.com.

Yours sincerely



Rebecca Tomkinson
Chief Executive Officer