

Model Work Health and Safety Regulations for Mining - Public Comment Response Form

Individual/Organisational name: Kathryn Taylor, Director - Taylor Radiation Protection	
Regulations Chapter 9: Mines	
Part 9.1	
Regulation	Comment
9.1.4	The inclusion of “ionising radiation” as a “principle mining hazard” is confusing. It is not possible for ionising radiation in a mining environment to 'create a risk of multiple fatalities in a single incident or fatalities in a series of recurring incidents'. The ICRP recognises that exposure to very high levels of ionising radiation may cause significant illness or death, and that long term exposure to ionising radiation may increase the potential for cancer, however the carcinogenic risk is considered extremely low at the levels such as may be encountered through exposure to Naturally Occurring Radioactive Materials (NORM) in mining. Most other principle mining hazards in this list appear to be included as a potentially acute risk - with the possible exception of (v) - and if chronic exposures such as low level radiation are to be considered, then it would seem that the list is not anywhere near as exhaustive as it could, or should be. A more prudent and appropriate resolution, for this and other reasons, would be to remove ionising radiation from this definition, as it is incorrect in this context, and stochastic and deterministic effects are being confused.
Part 9.2	
Regulation	Comment
Schedule 9.2(8)	It would appear that every mine and exploration project in Australia will be now be required to identify all sources of radiation, types of radiation and exposure pathways, as well as determine radiation levels in the workplace and background radiation levels present in the workplace. Whilst my accountant may find this idea appealing, I am afraid that as a professional radiation consultant, I would be likely to personally find the practice of accepting payment for providing a redundant service which delivers no benefit to society or industry, ethically prohibitive. Considering that the vast majority of mines and exploration sites in Australia would not have levels of ionising radiation present in the workplace that would justify the assessments required under this regulation, as there would be no significant risk of exposure present, it is suggested that the scope of this regulation be reviewed. Documents which may assist in this review are the Australian Radiation Protection And Nuclear Safety Agency's (ARPANSA) <i>Safety Guide for the Management of Naturally Occurring Radioactive Materials</i> and the IAEA document on <i>Application of the Concepts of Exclusion, Exemption and Clearance RS-G-1.7</i>
9.2.10	This section requires the operator of a mine to develop a “Principal Mining Hazard Management Plan” (PMHMP). If ionising radiation is in fact classified as a “principal mining hazard”, and an existing Radiation Management Plan and Radioactive Waste Management Plan meeting the requirements of the ARPANSA <i>Code of Practice and Safety Guide for Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing (RPS9) 2005</i> , has been developed by the operator and approved by the appropriate regulatory authority under state legislation, then the requirement for development of a PMHMP under the proposed Code should be negated.
Part 9.3	

Regulation	Comment
Other Comments	
<p>The Issues Paper states that <i>“Further discussions are occurring with ARPANSA to ensure there is no duplication or conflict with their legislation. Rather than a separate Mining Code for Ionising Radiation, amending the current ARPANSA Code to pick up mine-specific issues may be a better way forward.”</i></p> <p>The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) <i>Code of Practice and Safety Guide for Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing (RPS9)</i> is fully focused on “mine specific issues” so this statement is slightly surprising. However I hope the intent is that consideration may be given to reviewing the current ARPANSA RPS9 Code to identify potential gaps and then incorporating those gaps into a new version of the Mining Code, in substitution of the approval and release of the proposed Code of Practice for NORM. If that is the case, then I fully support that approach within the current framework that exists for the development of Codes of Practice relating to radiation protection in Australia.</p> <p>While ARPANSA does not directly regulate mining companies, ARPANSA does have an important role in promoting uniformity of radiation protection policy and practices across the jurisdictions of the Commonwealth, States and Territories in a manner consistent with international best practice, and to provide advice on radiation protection and related issues. The Radiation Protection Series is published by ARPANSA and these documents are routinely and appropriately referred to in licencing conditions issued to mining companies by the relevant state regulatory authorities.</p> <p>This existing radiation protection system is fully aligned with the base data of the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), the recommendations of the International Committee on Radiological Protection (ICRP) and the International Basic Safety Standards published by the International Atomic Energy Agency (IAEA). RPS9 was developed by acknowledged experts from both industry and regulatory authorities and went through an extensive consultative and approvals process.</p> <p>There seems to be no compelling case for a change in regulatory approach and it is questioned whether a proper regulatory impact assessment has been formed to justify and support this new regulation and code of practice for NORM. It is also questioned why there has apparently been no proper consultation with the industry or regulatory authorities that the implementation of this proposed Code would affect. The lack of input to the formulation of this Code by experienced radiation protection professionals, who understand radiation protection issues in mining, is obvious from the final draft of this Code.</p> <p>The proposed draft NORM Code does not add to the current radiation protection system and in fact would likely result in reduced protection of workforces and the public. At best it would cause duplication of work and confusion over the regulatory requirements of ionising radiation. It will likely result in the waste of extremely limited resources in radiation protection within Australia. There are many examples in the proposed Code where it requires practices that would not be considered best practice or where the approach is neither practical nor achievable.</p>	

Codes of Practice	
Roads and Other Vehicle Operating Areas	
Section/page number	Comment
Managing Naturally Occurring Radioactive Materials in Mining	
Section/page number	Comment
Scope and Application	Everything contains NORM. Therefore all mines and exploration sites in Australia will be required to consider this proposed Code. Please see above comment next to Schedule 9.2(8)
Scope and Application	The term “without risks to health and safety” is inappropriate. There will always be risk present in any activity. This should be amended to a more realistic terminology to recognise this.
Scope and Application	The proposed Code states that it aligns the Workplace Health and Safety standards governing mining with the system of radiation protection as recommended by the ICRP, IAEA and ARPANSA. There are many instances in the document, which make it difficult to ascertain how, and where this has actually occurred. Examples to name a few, include: the clear misinterpretation of the fundamental principles of the ICRP of Justification, Optimisation and Limitation; the use of the term ALARP instead of (the succinctly defined) ALARA; the incorrect classification of work areas and designated workers; and the application of dose constraints.
Scope and Application	<p>It is stated that the ARPANSA Code RPS9 (2008) will take precedence over the proposed Code in the event of any conflict. This process is a distinction often utilised when there are two separate instruments available that may have a slight overlap resulting in contradictory advice (e.g. Australian Dangerous Goods Code and the ARPANSA Code of Practice for the Safe Transport of Radioactive Material (RPS2) 2005), however the proposed Code seems to be for the most part, a poor duplication - and not a very useful or comprehensible one - of the existing ARPANSA RPS9 Code.</p> <p>There seems to be little justification of the introduction of the proposed Code when existing guidelines are already in place that are adopted throughout Australia, meet the objective of National Uniformity, and are understood and applied by regulators and industry.</p>
Section 1	The inclusion of transport in this section, and indeed in the scope of this Code is inappropriate. Transport of radioactive material is regulated through alternative existing legislative instruments in each state and there is an existing ARPANSA <i>Code of Practice for the Safe Transport of Radioactive Material (RPS2)</i> , which has been adopted throughout all States and Territories in Australia for this purpose.
Section 1.2	The words “where no ionising radiation hazard is present whatsoever” is nonsensical, particularly in this context. Asking mining or exploration companies to “write a simple statement indicating the reasons for holding such a view” is unhelpful practically.
Section 2.1	This entire section must be rewritten. The text is not directly relevant to the heading. How does one define a “hazardous contaminant”? What is an “undesired contaminant”? At what point in the “process” does one “test” for “elevated concentrations”. Elevated from what? The text is vague at best.

Section 2.2	What is “radiation work”? Why are “manufactured sources” mentioned in a Code of Practice for NORM? The statement “training of persons at risk of exposure to radiation” is ill defined.
Section 3	The ARPANSA <i>Code of Practice and Safety Guide for Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing</i> is incorrectly referenced. Neither is it a “booklet” . And this chapter in the proposed Code is not “aligned with” the Principles contained within it. The proposed Code misinterprets the Principles contained in the ARPANSA Code (2008), and further, misinterprets the Principles contained in ICRP Recommendations. This is of serious concern. The summary of ICRP principles is not useful and is incorrect.
Section 3.1 Hierarchy of Controls	<p>The ICRP system is the internationally recognised and accepted system of radiation protection and the proposed Code does not seem to understand this. This section confuses ICRP Principles by attempting to equate them with the “hierarchy of controls”. They are separate functions and cannot be equated in this manner. This must be deleted. What is the “lowest feasible level”? This lacks any definition. This section discusses a “commonly referred to” “as low as reasonably practical (ALARP) principle”. Presumably this is being confused with the ALARA Principle as defined by the ICRP. The ALARA Principle does not “broadly equate” to the ALARP Principle as defined in the WHS Act as stated.</p> <p>Risk management does not “coordinate” the system of radiation protection.</p> <p>Discussion of radiation controls is confusing in this section.</p> <p>The statement that “Administrative controls should only be used to control residual risk when all other control measures have been utilised” is absolutely incorrect. Administrative controls are an effective and proven means of ensuring successful radiation management, when utilised as part of a comprehensive radiation protection management system. Although it is well understood that elimination and engineering controls should be adopted first, administrative controls still remain one of the major ways in which exposures are optimised to levels far below limitation or regulatory concern. Delete this comment.</p>
3.2	The language and intent in this section is incomprehensible. The statements are factually incorrect. Under the heading “Principles of best practicable technology”, the text appears to be unrelated to the heading.
3.3 General	<p>The section under “classifying work conditions” is in contradiction to the ARPANSA Code (RPS9).</p> <p>This entire section uses redundant and inflexible definitions to define areas (e.g 5mSv/y for a controlled area), uses generic language, and is written extremely poorly. It is overly prescriptive without clearly describing objectives. Why does a laundry need to be located inside a controlled area? Why would there be a requirement to have disposable or waterproof garments for instances where “personal contamination cannot be engineered out of a task”? What is “personal contamination”. How does one “engineer it out of a task”?</p> <p>This section appears to have jumbled together a number of different documents and extracted an odd combination of random sentences from them, in addition to new ones like “The <i>a priori</i> assignment of a worker as a designated worker is necessary as this group of workers requires personal monitoring, which will necessitate the planning of adequate resources and possibly work activities”. Really?</p> <p>Words and phrases like “unusually high”, “non-routine measurement results” and “mean contamination results” have no definition or meaning.</p>

	<p>What are “personal contamination levels”? What is a “special exposure”?</p> <p>It should be completely rewritten and most of the detail excluded.</p>
3.3 Classification of restricted areas.	The postulation that ore grade can directly inform a decision regarding classification of areas without any other considerations being given to the decision is alarming.
3.3 Areas outside supervised areas	The random mentioning of AMAD for Members of the Public is confusing because of the lack of context regarding this, and the fact that no other consideration of AMAD is provided for workers in any other section.
3.3 Classification of workers and dose constraints	The section on dose constraints should not be in the same place as classification of workers. The use of dose constraints is not in line with the most recent ICRP recommendations, which discuss choosing the dose constraint based on the specific sources. A default figure will be counterproductive and actual dose constraints need to be set based on the details of the source and also on the site specific factors.
3.3 Establishing triggers for action and control	The regulator must first approve removal of any component of an individual's dose assessment, either from the individual's dose assessment itself, or from the workgroup average (e.g in the case of proven error).
4 PHMP for Exploration	<p>This entire section is overly prescriptive, not relevant to exploration activities, and most detail should be removed. Measured doses from exploration activities do not warrant the requirements outlined.</p> <p>Exposure pathways are incorrectly defined. Identified means of control are simplistic and inaccurate through their being selective.</p> <p>Makes assumptions regarding the required detail of a principal mining hazard management plan, which are not justified.</p>
4.1 Considerations when developing a PMHMP	<p>The discussion regarding disequilibrium is largely irrelevant for this document.</p> <p>The requirements for core and sample storage are inappropriate. Why must core be stored somewhere with a roof, or on a concrete pad with different coloured paint? Cores are extremely low risk in terms of potential for exposure and utilising standards more often associated with nuclear reactors is completely unjustified. The recommendations in this draft code are not commensurate with the potential risk and would</p>

	result in considerable cost to industry with no significant improvement in safety.
4.1 Minimum standards for radiation controls and monitoring	<p>The assertion that dust is the major pathway for exposure is incorrect. Other pathways are often the major contributor to dose. It is dependent on site specific factors such as ore grade, mining type and environmental factors. This section is overly prescriptive and the recommendations will not always be suitable (not all workers will be required to wear TLD Badges, not every person working on a drill rig will be required to wear a dust pump every day). Detail like issuing each worker a hook for their TLD badge has no place in a Code of Practice.</p> <p>The statement that “gamma radiation does not generally require any active control measures as it can be monitored” is incorrect. Gamma exposure can and has been subject to control measures such as having drill pads made of inactive materials.</p>
4.1 Core Sample and Storage/Core and sample handling	<p>A type H vacuum cleaner is not required and would be useless in most core yards. Additionally the specification of a P3 mask is far in excess of the level of protection required for the low level of risk associated with core handling. If workers doing core handling were required to use P3 masks the resulting impact on heat stress would be incredibly large without a net benefit.</p> <p>This type of over-conservatism is ubiquitous in the proposed code and is of significant concern, as it makes compliance with the code unachievable and increases both regulatory functions and industry burden, without any realised increase in safety.</p>
4.1 Waste management	Arbitrary values should not be mentioned in the proposed Code. Details like “one metre of soil cover” are not warranted as specific requirements to meet an objective will be site specific. It is recommended that objectives be outlined so that operators may decide how to best meet them.
4.2 Contents of the PMHMP	Again, this is incredibly prescriptive and contains far too much detail. This is not appropriate for a Code of Practice.
4.2 Critical group information	Why are environmental impacts such as the identification of reference plants and animals being discussed in a paragraph about critical groups? These are two completely different topics. In the most recent recommendations of the ICRP (ICRP 103) the term critical group has been removed and replaced by representative person. The draft code should reflect this current approach.
4.2 Worker Training	<p>There appears to be an unnecessary overuse of obscure Latin phraseology in the proposed Code.</p> <p>Please define “workers whose work may impact on the levels of radiation exposure”.</p>
4.2 Transport of radioactive material	Transport should not be within the scope of this document.
4.2 Waste Management System	“Wastes should be treated as though they contain deleterious levels of NORM's until there is evidence to the contrary.” This statement requires clarification and justification.

Section 5	<p>Again this entire section is overly prescriptive, not relevant to most mine sites in Australia (there is no deminimus level stated anywhere in this proposed Code), and is mostly a repeat of Section 4. Where there are real potential risks from NORM in Mining, the ARPANSA Code (RPS9), provides a far more comprehensive, proven and rigorous means of managing and assessing these risks and complying with relevant regulatory requirements.</p> <p>The majority of material in this Section is not suitable for a Code of Practice.</p>
The Mine Records	
Section/page number	Comment
WHS Management Systems in Mining	
Section/page number	Comment
Inundation and Inrush Hazard Management	
Section/page number	Comment
Emergency Response in Australian Mines	
Section/page number	Comment
Strata Control in Underground Coal Mines	
Section/page number	Comment
Ventilation of Underground Mines	
Section/page number	Comment
Survey and Drafting Directions for Mine Surveyors	

Section/page number	Comment
Health Monitoring	
Section/page number	Comment
Mine Closure	
Section/page number	Comment
Ground Control in Open Pit Mines	
Section/page number	Comment
Ground Control for Underground Mines	
Section/page number	Comment
Underground Winding Systems	
Section/page number	Comment