

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

Individual/Organisational name: Cameron Jeffries	
Regulations Chapter 9: Mines	
Part 9.1	
Regulation	Comment
9.1.4 (1)(a)(vii)	<p>It appears that someone has added ionising radiation to this list without giving any consideration to the meaning or appropriateness of doing so. Ionising radiation in relation to NORM in a mining context can never create a risk of multiple fatalities or in fact any fatalities as a result of a single incident or a series of incidents. Ionising radiation is a risk due to chronic exposure over a long period of time. There is an existing nationally uniform legislative framework that is supported by all states and territories to protect against the risks associated with ionising radiation. This existing legislative framework is outlined in the Radiation Protection Series developed by ARPANSA utilising appropriate radiation protection experts and with extensive consultation. Ionising radiation from NORM is not a principal mining hazard as defined and can never be a principal mining hazard. Sub-regulation (vii) should be removed.</p> <p>The WHS regulations only attempts to include ionising radiation. Why not include occupational exposure to ultraviolet radiation?</p>
Part 9.2	
Regulation	Comment
9.2.4(1)(d)	This is unworkable in relation to ionising radiation. Different radiation dose limits are applied to unborn children from those applied to workers. In the case of a pregnant worker it may be necessary to change that worker's work due to radiation monitoring results, in order to comply with the much lower radiation dose limit applicable to the non-worker, unborn child. This situation has absolutely no bearing on the hazard to workers. It does not warrant a review of control measures. The existence of this regulation, which is supposed to apply to ionising radiation, demonstrates an apparent lack of understanding of the international radiation protection system.
9.2.4(3)	As outlined above in relation to 9.2.4(1)(d) and ionising radiation, it may be necessary to change a worker's work to comply with the radiation dose limit for an unborn child. Once a worker declares their pregnancy an employer is required to protect the privacy of the worker in relation to their declaration. It would be inappropriate for the employer to share this information with a health and safety representative to explain why that worker's duties have been changed. There is the potential for considerable waste of effort in this circumstance due to this sub-regulation.
9.2.5(2)	There already exists extensive legislation in Australia for radiation protection. This is contained in the National Directory for Radiation Protection, which is directly linked through to international recommendations, standards and guidelines. Radiation protection regulations have been developed and adopted under a nationally uniform framework that has been accepted by the Commonwealth and all State

	Governments. The existing radiation protection legislation is the primary means of ensuring the health and safety of workers, other people and the environment from ionising radiation. In relation to ionising radiation the Work Health and Safety Regulations are only secondary, especially given the statement that WHS regulations are not intended to duplicate existing regulations. The WHS regulation also appear, in part, to be based only upon a limited application of the National Directory for Radiation Protection to NORM by Western Australia, which does not even cover all aspects of mining radioactive ores.
9.2.10(b)	Requires the Principal Mining Hazard plan to be set out in a way that readily accessible and comprehensible. If we ignore the fact that ionising radiation in a mining context can never be a principal mining hazard as defined. Any appropriate discussion of radiation risk and associated risk assessment that is comprehensible to all intended users of the principal mining hazard plan will not provide adequate technical detail to address the requirements of 9.2.11.
9.2.21(2)(b)	The TWA limit varies depending on shift length; the numbers quoted are not related to a specified time period. The specific numbers should be removed and references added to the appropriate Australian Standards. For example AS2985, AS3640, or relevant exposure standards for Australia or even the ACGIH exposure standards. As soon as the relevant exposure standard changes this regulation as it stands will be out of date.
9.2.22(2)	It is not clear why the regulations would specify quantities of various contaminants instead of referencing already established limits. Is it intended to duplicate the HSIS, for example, in these regulations? This approach will be unworkable for radon, thoron or their decay products.
9.2.26(2)(b)	The meaning of this is unclear. Does it mean that the instrument will be positioned to take a representative sample of the atmosphere experienced by workers? Or does it mean the instrument is positioned so as to complete sampling? I have seen some excellent airborne monitoring equipment that would work to best effect if placed in a crib room. But, unfortunately, would quickly fail if placed to take a real sample of worker exposure.
9.2.27(2)(c), 9.2.28(5)(c)	Radiation monitoring records must be kept for longer than 7 years in some Australian jurisdictions. This requirement in relation to radiation monitoring will lead to confusion.
9.2.28(1)(d)	Must define "contaminated". Radon or thoron will enter all air in an underground mine from all surfaces. The air is effectively contaminated to some extent as soon as it travels through the ore body, potentially including in a vent raise. Without a definition of contaminated this regulation is meaningless in relation to radioactive gases.
9.2.28(2)	This is inconsistent with the requirement in 9.2.28(1)(d) which states that ventilation air must be uncontaminated. The purest source may actually be contaminated. In addition, in relation to radon or thoron the most important consideration is the concentration of these radioactive gases at the ventilated workplace not at the source. There may be case where the purest source of ventilation will result in a higher radon/RDP concentration at the workplace because it has to move over a longer distance and/or through higher ore grade areas. By comparison, a less pure source closer to the workplace might result in a lower concentration of radioactive gas at the workplace. The regulation is unworkable in relation to ionising radiation.
Part 9.3	
Regulation	Comment

	Nil
Other Comments	
<p>General Comment: Before developing the WHS regulations was there any consultation with those agencies that currently regulate radiation protection matters at mining operations in Western Australia, South Australia, Northern Territory, Victoria, New South Wales or Queensland? Inclusion of ionising radiation as a principal mining hazard appears to have been little consideration of what is involved in protecting people from ionising radiation. These regulations duplicate existing radiation safety regulations that have been implemented by the National Directory for Radiation Protection, which is supported by all States and Territories. Such duplication will reduce the effectiveness of, and lead to inefficiencies in, radiation protection in the mining and mineral processing sectors. All reference to ionising radiation should be removed from the regulations.</p> <p>Schedule 9.2 (5)(a) – naturally occurring asbestos? Suggest removing “naturally occurring”. All asbestos in air is hazardous regardless of source.</p> <p>Schedule 9.2 (8) – This should be removed from the schedule. If not it must be extensively reviewed and rewritten by someone who has expertise in the system radiation protection.</p> <p>Schedule 9.3 – What is the purpose of this schedule? Explain why it is left blank.</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
General	<p>This document duplicates existing areas of radiation protection regulations in Australia. The existing Radiation Protection Series of documents and specifically the multiple existing Codes of Practice and Safety Guides related to mining, mineral processing, NORM and transport of radioactive materials were developed using a full process of appropriate consultation. This included drafting by experts from industry and regulatory authorities, extensive consultation and review, approval via a nationally coordinated process and eventual publication. The existing Radiation Protection Series is heavily supported by industry and can be directly linked to international standards, recommendations and guidelines. There is no advantage in having another code of practice that will give rise to confusion and regulatory inefficiency. The degree of consultation and peer review undertaken seems to be limited at best. It is noted that there are examples in the text that do not appear to reflect current or best practice in the mining industry as well as containing fundamental errors.</p> <p>It is recommended that rather than create a new and somewhat confusing code SafeWork acknowledge the existing proven system for</p>

	ensuring radiation safety. The draft SafeWork Code should be withdrawn as it currently stands. If SafeWork thinks there are gaps in the existing ARPANSA system, it is suggested that they carry out a gap analysis to identify those areas, which can then be submitted for incorporation into the existing ARPANSA system by reviewing and updating the National Directory for Radiation Protection and related documents.
Scope and Application	In relation to Transport of Radiation Material, the SafeWork code does not achieve any of the things claimed in this section. It is not aligned with the IAEA on Transport by any stretch of the imagination. There is an existing Code of Practice for the Safe Transport of Radioactive Material, Radiation Protection Series No.2; This existing Code of Practice directly adopts the Standards of the IAEA and has been adopted across all of Australia.
Scope and Application	The alignment of the SafeWork code with the ICRP, IAEA and ARPANSA is minimal at best. As noted, in some areas it is contradictory. The SafeWork code would greatly benefit from redrafting and peer review by suitable experts in radiation protection; if the prudent step of abandoning the code isn't taken.
Scope and Application	Radiation Protection Series (RPS) No.9 is a Code of Practice, it is not a "booklet". This statement suggests an apparently lack of understanding of the system of radiation protection in National Directory for Radiation Protection developed by ARPANSA.
Scope and Application	If this code is truly aligned with the ARPANSA system of radiation protection then it must also refer to the following Radiation Series Documents, instead of just RPS No.9. RPS No.1, RPS No.6, RPS No.9.1, RPS No.15, RPS No.16 and RPS No.20.
Scope and Application	The system of radiation protection does not use the term "As Low As Reasonably Practicable". I am not aware of anyone in the radiation industry who uses this term either. Use of this term suggests a lack of alignment with ICRP, IAEA and ARPANSA as claimed in this section.
Scope and Application	Use of the term "As far as reasonable practicable", as described, implies a less rigorous standard than that used in the system of radiation protection. In which case, RPS No.9 will take precedent and make this code somewhat redundant.
1.1 Definition of NORM	If NORM may result in a relative increase in radiation exposure to the public and the environment, only. Why is SafeWork trying to regulate occupational exposure? In other words the definition does not include occupational exposure, this suggests a lack of understand of the subject.
1.2	<p>The current definition in the WHS regulation does not identify ionising radiation as a principal mining hazard. Since ionising radiation is not a principal mining hazard as defined in the WHS regulation there seems to be no point in discussing a principal mining hazard management plan.</p> <p>Suggest that all refer to principal mining hazards is deleted and appropriate acknowledgement of the requirements of the National Directory for Radiation Protection is added to the section</p> <p>There is a fundamental misunderstanding of the application of the ARPANS Act in this section.</p>
2.1	This is so confused and limited it is of little practical use. Strongly suggest review by a qualified expert in radiation protection.
2.2 First dot point	This code is specifically about NORM, it also excludes application to sealed sources of radiation. In this context it is not clear which manufactured sources need to be considered. The dot point also seems to confuse sources of ionising radiation and sources of radioactive material. Monitoring equipment will only contain sealed sources, which are outside the scope of this code, delete from this list.
2.2 third dot point	<p>Radiation risk considers the levels of radiation excluding background radiation</p> <p>Inclusion of background radiation here suggests limited involvement of expert advice in drafting the code and a lack of appropriate input to</p>

	the drafting of this code.
3	<p>If this chapter is aligned with RPS No.9 it might be a good idea to properly reference that document.</p> <p>It is not clear why the discussion then turns to ICRP and selectively picks out bits of ICRP.</p> <p>Medical exposure is not relevant – it is not clear why this is even mentioned.</p> <p>It claims that the code is primarily concerned with occupational exposure, yet NORM is defined as something that may results in increase radiation exposure to the public and environment, only.</p> <p>Overall this chapter is confusing in purpose.</p>
3.1	<p>It is hard to know how to comment on this section. The principles of radiation protection absolutely cannot be equated to the hierarchy of controls. It is clear that there is not demonstrated understanding of the principles of radiation protection in this section.</p> <p>ALARP is not part of the international system of radiation protection.</p>
3.1 and 3.2	<p>There is no clear statement of the hierarchy of controls throughout these sections. Maybe this arises because of the inappropriate way of attempting to equate the principles of radiation protection with the hierarchy of controls. It is strongly recommended that the 2 concepts are separated. Then go back to the beginning and realise that the accepted hierarchy of controls is Eliminate, Substitute, Engineered Controls, Administrative Controls and then PPE. The fact that this discussion skips 2 of those controls demonstrates that there is something fundamentally wrong with the discussion.</p>
3.2 third paragraph	<p>As RPS No.9 takes precedence over this code, the approved radiation management plan will suffice to demonstrate that an operator is minimising radiation risk. Further, the radiation management plan is approved by another regulatory under separate legislation, therefore it is not appropriate for this code to specify the review period. As noted that is determined under separate legislation not under any risk assessment undertaken under the WHS regulation. Again it should be remembered that ionising radiation from NORM is not a principal mining hazard as defined under the WHS regulation.</p>
3.2 Principles of Radiation Design	<p>I don't even know what this means – It is simply confusing concepts and ideas between Safety and Radiation Protection. Delete and start again.</p>
3.3	<p>See earlier comments. A confusing mess without any clear message. For a start optimisation could include any number of the hierarchy of controls, as could the radiation protection principle of limitation. In fact, some of the administrative processes listed might even be considere for justification.</p>
3.3 Classification of workplaces	<p>Repeat early comments about confusion between radiation protection principles and hierarchy of controls.</p>
3.3 Classification of restricted areas	<p>Restricted Areas are not in the current ARPANSA Code of Practice on mining. It is only used by one state in Australia on a limited basis. Clearly this is not a nationally uniform approach</p> <p>“Say 15 mSv” Really? 15 mSv, is the point that SafeWork would recommend designating a restricted area? What is the basis for that number?</p>
3.3 Classification of supervised areas	<p>Last Paragraph – The term ALAP has now been introduced. Why?</p> <p>The statement “knowledge of any elevated exposure levels can eliminate unnecessary exposure” is not clear. Knowledge by who? How doe that know eliminate unnecessary exposure? By restricting access to the area? How is that access restricted by knowing that there are elevated exposure areas? How does this knowledge relate to the statement in 3.1 last paragraph that “One of the most effective ways to control radiation risks is to ‘engineer out’ radiation hazards to the greatest extent feasible.” Why engineer out radiation hazards if unnecessa</p>

	exposure can be eliminated by knowledge of elevated exposure levels?
3.3 Areas outside supervisor	Why is a term like AMAD introduced at this point and in such a limited manner?
3.3 Classification of designated workers	Last paragraph – remove. It is not appropriate to pre-determine the designation status of particular workgroups. This will vary based on a range of factors and depending on the individual workplaces.
3.3 Criteria for prediction of designated workers	It is not clear that SafeWork has the required expertise to determine such criteria. Delete.
3.3 Dose constraint for office, support and service staff	Why is there a need to discuss a dose constraint for these workers when the code already applied the member of the public dose limit to determine the areas that those workers predominately occupy?
3.3 Establishing triggers for action and control	It is not clear why there is a focus on personal contamination levels here and yet there is no mention of radon or dust monitoring. Remember this code has to apply to all mining and mineral processing. It is also unclear how workplace averages are relevant to personal contamination and gamma monitoring. Workplace averages are not likely to impact on exposure estimates based on personal monitoring.
4	Why is 25% of this document related to exploration? That is totally disproportionate compared to the very low level of radiation exposure involved. Overall, the section is far too detailed and risks limiting the response to any assessment of the risks related to ionising radiation.
4.1 Minimum standards for radiation controls and monitoring	Dust monitoring must be carried out according to Australian Standards. Again ALARP is not used in the system of radiation protection. This code cannot set disposal criteria for drill cuttings. It must be based on a range of site specific factors and must not just be set as 1m of cover. The ability to monitor radiation does not mean that control measures are not required. This statement highlights an apparent lack of basic radiation safety knowledge. The use of hooks for storage of TLD is far too prescriptive. The current radiation protection system in place in Australia keeps radiation exposure in mineral exploration well below the public dose limit. A principle mining hazard management plan, well designed or otherwise, will do nothing to reduce radiation exposures any further than already achieved by existing regulations.
4.1 Core and Sample Handling	The rules listed here are far too detailed for such a code of practice. Such controls should be informed by the risk assessment process and not predetermined by the code of practice.
4.1 Contaminated Equipment	What is the basis for this determination of surface contamination? A target level for cleaning to “background radiation” is meaningless.
4.1 Waste Management	It is inappropriate for this code to determine what is required by other regulations. Doing so creates confusion.
4.1 Critical Group	Critical group is no longer current.

5	As with section 4 there are a number of statements about radiation in this chapter that are simply wrong. The document urgently needs to be rewritten by people who have expertise in radiation protection and subjected to peer review, followed by extensive consultation.
Appendix A	A vast number of publications must be added to this appendix. I've have listed a number of relevant ARPANSA Codes of Practice. There are also ICRP publications i.e. publication 103, and IAEA publications i.e. Basic Safety Standards. I'm sure other comments will provide a wide range of appropriate publications to include.
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