

SUMMARY OF SUBMISSIONS AND RESPONSES
DRAFT CODE OF PRACTICE AND SAFETY GUIDE FOR RADIATION PROTECTION AND RADIOACTIVE WASTE MANAGEMENT IN
MINING AND MINERAL PROCESSING

SUBMITTER	GENERAL COMMENT	WORKING GROUP RESPONSE
01 Ian Marshman (Mark Sonter) Senior Radiation Officer Energy Resources of Australia Ltd Ranger Mine Locked Bag 1 Jabiru NT 0886 Australia	<p>Comments on the Regulatory Impact Statement (RIS) for the new Mining and Processing Code, and Errata on the Code</p> <p>Please formally address these comments on the RIS and proposed Errata on the Code.</p>	<p>See responses to RIS comments in “Comments on Regulatory Impact Statement” section below.</p> <p>See responses to comments on Errata on the Code in “Comments on Safety Guide” and “Comments on Schedule 2” sections below</p>
02 Ivan Fetwadjieff Senior Scientific Officer (Radiation) Safety and Health Division Department of Industry and Resources Western Australia	<p>In reply to your invitation to make comment on the above document, I am commenting as the Regulator for Radiation Safety for Western Australian Mining and Mineral Processing. The document is an excellent review of the Code of Practice and its implementation in WA will not be difficult</p> <p>As uranium mining is currently banned in WA, the comments will mainly be in regard to the mining of Mineral Sands and Tantalum.</p> <p>Judging by the commitments made by the WA mining industry radiation players to attend the April Conference, there will be many lively discussions on the new Code.</p>	<p>Comments noted, no action required.</p>
09 Richard Yeeles/Chris Schultz, Principal Environmental Advisor WMC	<p>It is assumed that the Code of Practice and the Safety Guide are the one document, although their front covers suggest different “Series Publication” numbers.</p>	<p>The Code of Practice and the Safety Guide are two parts of the one document, as stated in lines 109 – 118 of Clause 1.2 <i>Structure</i>, which says that “this publication consists of two Parts: Part I – Code of Practice...and Part II – Safety Guide...”.</p>
10 Russell Robinson MARPS Acting Manager Radiation Protection Northern Territory Department Health and Community Services	<p>5. No line</p> <p>I was unable to find any mention of background surveys in the code. I believe that this is very important for the routine operation and rehabilitation for exemption. Background may be normally elevated in a uranium province and a preliminary background survey for gamma and perhaps radon decay products is a very good idea and should be mentioned in the code somewhere. If I missed it, I will apologise but it is important to recommend pre-mining</p>	<p>Safety Guide Clause 3.9, <i>Radioactive Waste Management Plan</i>, has guidance on “baseline” monitoring but as there is no mention of it in the Code, words have been added to Clause 2.8.2(b) (line 348) requiring that “baseline” monitoring be included in the Radioactive Waste Management Plan.</p>

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PO Box 40596 CASUARINA 0811	radiation surveys in the code.	
11 Doug Collier & Frank Harris ANSTO	<p>As you are aware, ANSTO has significant experience in working with the Mining and Mineral Processing industries. For your further background, the ANSTO comments have been primarily compiled by Doug Collier of ANSTO Minerals, who is a specialist in mining and mineral processing, having been involved with numerous industry projects; and Frank Hams, a Senior Health Physicist at ANSTO, who also has a great deal of experience in this area.</p> <p>Our general concern is the potential ambiguity in the application of the code. NORM issues encompass a wide range of industries which may or may not have any knowledge of potential radiological issues. We believe the definitions need to be accurate and consistent with those used in other industries.</p> <p>ANSTO would certainly support the revision and updating of the Code of Practice in order to include more recent developments in radiation protection. However, the integration of radiation protection and waste management may cause some confusion in the application of the Code. We would suggest that guidance on its application will be required to prevent problems in the future.</p> <p>Please do not hesitate to contact us if you require any clarification on the attached. We look forward to participating in the discussions on this subject in Melbourne at the conference in April.</p> <p>1. There is a general lack of clarity throughout the Code regarding what products the Code covers. This is the case with the IAEA where no-one (to this day) is sure what products could be considered as NORM (²²⁶Ra adsorbed onto filter cloths, smelter fumes, U on IX resins used to clean up solutions in base metal refineries etc) in the development of documents. Our concern commences with the use of the term “mineral processing” in the title of this draft Code. This term has a specific meaning to a metallurgist in industry, but apparently a different meaning to the authors (regulators and health physicists) of the Code. There is an attempt to address this in the glossary, where a new definition of mineral processing includes “chemical concentrate”. The IAEA uses the term “Mining and</p>	<p>Comment noted, no action required.</p> <p>The Glossary definition of “mining and mineral processing” has been broadened to include other applicable situations and to identify the materials and activities that the Code covers.</p> <p>Agree and have included extra information on recent developments in radiation protection, including material from IAEA Safety Standards Series No RS G 1.6, <i>Occupational Radiation Protection in the Mining and Processing of Raw Materials</i>, and RS-G-1.7, <i>Application of the Concepts of Exclusion, Exemption and Clearance</i>.</p> <p>Additional guidance on the application of the Code has been included in the Safety Guide.</p> <p>Clause 2.3.2 of the Code and Clause 3.4.1 of the Safety Guide describe and include examples of the products and activities covered by the Code as well as other applicable situations. The Relevant Regulatory Authority may also decide whether an activity is covered by the Code.</p>

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	<p>Processing of Raw Materials” in RS-G-1.6, rather than “mineral processing”. We assume the draft Code covers hydrometallurgy, smelting, refining and other chemical processing of mineral products.</p> <p>A metallurgist could read lines 17, 123, 191 etc and technically, correctly assume that phosphate fertiliser manufacture via phosphoric acid and uranium leaching, solvent extraction etc were not the subject of the Code. Would he suspect that “mineral processing” has been redefined by the regulator?</p> <p>Our preference would be to replace the term “mineral processing” with “mining and Processing of Raw Materials”, as in RS-G-1.6. At the least, the minimal change should be the expansion of the glossary definition to include the processes referred to above, with reference to the glossary throughout the body of the Code.</p>	<p>The Glossary definition of “mining and mineral processing” has been broadened to include other applicable situations and to identify the materials and activities that the Code covers.</p>
<p>14 Dr Barry Chesson Manager - Occupational Hygiene Western Australian Operations Alcoa World Alumina Australia</p>	<p>By way of background, Alcoa is Australia’s largest alumina producer and each year produces almost 8 million tonnes of alumina at our refineries in Western Australia. This represents almost half of Australia’s output and 13 per cent of world demand. Our operations support around 6500 direct jobs and an additional 20,000 indirect jobs, predominantly in regional Australia.</p> <p>Alcoa meets the highest standards of environmental and health performance and has studied and managed radiological aspects of its operations for almost 25 years. Alcoa has conducted comprehensive monitoring of air, water and soil, as well as workforce monitoring. All exposure levels are within internationally accepted guidelines for the workforce and the public.</p> <p>Exposure levels for the Alcoa workforce are below 1 mSv per annum incremental dose level. This is substantially below the accepted international and national level of 20 mSv per annum incremental dose (averaged over five consecutive years) that is applied to occupational situations. Furthermore, levels for the public are estimated to be substantially below the 1 mSv (above background) limit established for the general public.</p> <p>In addition, Alcoa implements programs to manage exposures. In accordance with the As Low As Reasonably Achievable (ALARA) principle, Alcoa limits overtime and operator hours for staff working in close proximity to residue storage operations. Alcoa is also implementing a quality assurance system to</p>	<p>Comment noted, no action required.</p> <p>Comment noted, no action required.</p> <p>Comment noted, no action required.</p> <p>Comment noted, no action required.</p>

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	<p>further improve radiological management. The system will be integrated with Alcoa's environmental and occupational hygiene systems and be ISO-compliant.</p> <p>Our experience leads us to conclude there is no environmental or public health justification for classifying Alcoa's materials as 'radioactive'. Alcoa proposes instead a graded approach to regulation above 1 Bq/g, while acknowledging a 1 Bq/g trigger level. This would involve the conditional exclusion or exemption of low activity materials and processing, where the activity ranges between 1 – 5 Bq/g.</p> <p>Such an approach would protect environmental and public health by focusing on individual exposure risks, while also supporting the long-term sustainability of Australia's aluminium industry.</p> <p>Alcoa World Alumina Australia appreciates the opportunity to provide input on the matters raised in the draft material. Please do not hesitate to contact me if further clarification is required.</p>	<p>1 Bq/g is the internationally accepted exemption level and is taken from the IAEA's <i>International Basic Safety Standards for Protection Against Ionizing Radiation and for the Safety of Radiation Sources</i>, Safety Series No. 115. The Code will only be applied at the discretion of the Relevant Regulatory Authority.</p> <p>Guidance on a graded approach has been provided in Clause 3.5 of the Safety Guide on Exemptions.</p>

INTRODUCTION

SUBMITTER	COMMENT ON INTRODUCTION	WORKING GROUP RESPONSE
02 Ivan Fetwadjieff Senior Scientific Officer (Radiation) Safety and Health Division Department of Industry and Resources Western Australia	<ul style="list-style-type: none"> • Line 122 We appreciate the need to provide a uniform framework for radiation protection. 	Comment noted, no action required.
08 Cameron Jeffries/Andrew Johnston SA EPA	1.1.3 Introduction L 86: Suggest delete the word ‘new’. The Basic Safety Standards are now 9 years old.	The word “new” before Basic Safety Standards in Clause 1.1.3 (Line 86) has been deleted.
09 Richard Yeeles/Chris Schultz, Principal Environmental Advisor WMC	1.1.2 Are the 21 guidelines associated with the Health Code and the Waste Code also going to be updated. If so, when? 1.3.2 For noting only, WMC’s operations at Olympic Dam are regulated by the <i>Roxby Downs (Indenture Ratification) Act</i> and the Indenture Agreement ratified by that Act. The introduction of the new Code and Safety Guide will require amendments to be agreed between WMC and the South Australian Government and then ratified by the South Australian Parliament.	At the present time, the Radiation Health Committee has not considered the review of the guidelines. Comment noted, no action required.
11 Doug Collier & Frank Harris ANSTO	<ol style="list-style-type: none"> 2. Line 86. Delete “new”. It is now 2005. 3. Line 99. A “3” is incorrect as a subscript. 4. Para 1.4.2 should read “Radioactive waste will most likely arise from the mining and processing of uranium and thorium ores, but....”, as virtually all ores contain uranium and thorium, and we are trying to differentiate between U and Th ores, where the ores are processed to recover these elements, and situations with other ores which happen to contain U and Th. 	The word “new” before Basic Safety Standards in Clause 1.1.3 (Line 86) has been deleted. Not a subscript but is a characteristic of the font style used (Georgia). The wording of Clause 1.4.2 has been modified to improve clarity.

COMMENT ON CODE OF PRACTICE

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<p>02 Ivan Fetwadjieff Senior Scientific Officer (Radiation) Safety and Health Division Department of Industry and Resources Western Australia</p>	<ul style="list-style-type: none"> • Line 274. definition of “radioactive waste”. Recently a uranium exploration site was rehabilitated in WA where unprocessed Uranium ore was returned to the slots from where had been dug. By definition, this radioactive ore would be considered “radioactive waste” even though it was natural material. • Line 304 The RPP presented is detailed enough • Line 321 “provision of appropriate equipment, etc...” This has been an ongoing issue with mining companies as to what appropriate means. As the Regulator, we have different expectations as to what is “appropriate” to a company who must fund the provision of the radiation safety measures. This area is usually the first to be reduced when there are financial problems. • Line 332 The RWMP is detailed enough. We will be happy to discuss the key elements of the RPP and RWMP at the April Conference. • Line 430 & 1475 While appropriate expertise is recognised, we also need to agree on competence. • In various parts of the document, words are used that are difficult to interpret when you are a Regulator requiring a definitive value. Examples include “unacceptable health risk”, “significant quantities”, “inherently safe”, “no appreciable likelihood”, “acceptable level of protection”, “adequate staff” 	<p>The definition of “radioactive waste” in Clause 2.5.5 (line 274) is the accepted international definition, as given in the Glossary of the IAEA’s <i>International Basic Safety Standards for Protection Against Ionizing Radiation and for the Safety of Radiation Sources</i>, Safety Series No. 115.</p> <p>Comment noted, no action required.</p> <p>The Relevant Regulatory Authority will decide, in consultation with the Operator, what is “appropriate” equipment.</p> <p>Comment noted, no action required.</p> <p>There is no significant difference between expertise and competence in the context of the Code. It is intended to include competencies for various professions using radiation in future editions of the <i>National Directory for Radiation Protection</i>.</p> <p>It is not possible to find definitive values for these terms that are applicable in all situations. The Relevant Regulatory Authority would interpret the meaning of the terms when applying the Code to a particular situation.</p>
<p>05 John Kabel Senior Inspector of Mines, Electrical Department of Natural Resources & Mines Brisbane Qld 4000</p>	<p>* The second point concerns the requirements in the draft code for the Relevant Regulatory Authority:</p> <ul style="list-style-type: none"> o to provide Approvals and Authorisations (for example under section 2.7 Radiation Protection Plan, lines 308 & 309), o to provide Exemptions (for example under section 3.5.2 Partial Exemptions, lines 741 - 743), o and to undertake extra duties outlined in 3.10.2 Duties of the Relevant Regulatory Authority. 	<p>The way in which the Regulatory Authority implements the Code will be subject to the specific regulatory system of the jurisdiction involved. Lines 308 and 309 of Clause 2.7 relate to the approval of a Radiation Protection Plan. However, Clauses 3.5.2 and 3.10.2 are part of the Safety Guide and are for advice/guidance only and are subject to the regulatory requirements of the relevant jurisdiction.</p>

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	<p>The latest Queensland mine safety legislation was drafted by tripartite legislation development groups, representing industry, unions and regulators. This resulted in the introduction of the Mining and Quarrying Safety and Health Act 1999 and the Coal Mining Safety and Health Act 1999. This contemporary, risk-based, non-prescriptive legislation does not grant regulators the power to approve, vary or to grant exemptions, which would appear to be at odds with the requirements of the draft code.</p> <p>Once again, the opportunity to provide comments from a regulator's viewpoint is appreciated. The importance of industry input to such a document is something you have also hopefully addressed, including through industry representative bodies such as the Queensland Resources Council, etc.</p>	
<p>06 Mark McCallum Director Industry Operations Australian Petroleum Production & Exploration Association Limited</p>	<p>The Australian Petroleum Production & Exploration Association (APPEA) appreciates the opportunity to comment on the above document.</p> <p>Although the document refers to the mining and mineral processing industries, the Safety Guide indicates that it could be applied to Naturally Occurring Radioactive Material (NORM) from the oil and gas industry. It states that the oil and gas industry operations “produce relatively small quantities of wastes containing significant radionuclide concentrations that may require control” (page 5).</p> <p>The levels of radiation and radioactivity typically associated with NORM are low and occupational NORM exposures in the petroleum industry do not represent a high risk. APPEA has developed our own guidelines on monitoring, management of occupational radiation exposures and decision making regarding NORM waste disposal.</p> <p>The regulatory burden imposed on this industry by the proposed Code would be out of proportion to the level of risk.</p> <p>We recommend a clear and unambiguous statement in the document that this Code does not apply to the petroleum industry.</p>	<p>Note: The quote is actually from Paragraph 4 on Page 5 of the Regulatory Impact Statement and not the Safety Guide.</p> <p>The Code applies to uranium and thorium ores and would only be applied subject to the Relevant Regulatory Authority considering the need and following further consultation with the industry.</p> <p>A statement of the type requested cannot be included in the Code (see above).</p>
<p>07 Keith Terry Radiation Wise Pty Ltd</p>	<p>1. Currently in WA we are required to prepare a single comprehensive Radiation Management Plan for a mineral sands operation covering aspects of occupational, environmental and waste disposal. In the proposed Radiation Protection Plan and Radioactive Waste Management Plan the Environment appears to have been forgotten.</p>	<p>Clause 2.8.2, subsections (b), (d), (e) and (f), of the Code provide requirements of a Radioactive Waste Management Plan with respect to the Environment. Guidance on protection of the Environment is given in Clause 3.6.6 of the Safety Guide, <i>Radiological Protection of the Environment</i>.</p>

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	<p>In particular, there is no mention of a pre-mining (or baseline) radiation monitoring programme prior to commencement of site works, or on-going environmental radiation monitoring and reporting. The environment is affect by mining and processing operations, not only by waste disposal.</p> <p>2. It is assumed that control measures to limit occupancy come under “provisions of...operational procedures” in section 2.7.2 of the Draft Code. It would be appropriate to define the radiation parameters for Controlled and Supervised Areas in the Safety Guide. In WA we currently use gamma radiation levels of 4 $\mu\text{Gy h}^{-1}$ and 1 $\mu\text{Gy h}^{-1}$ for controlled and supervised areas, respectively.</p>	<p>Safety Guide Section 3.9, <i>Radioactive Waste Management Plan</i>, has guidance on “baseline” monitoring but as there is no mention of it in the Code, words have been added to Clause 2.8.2(b) (line 348) requiring that “baseline” monitoring be included in the Radioactive Waste Management Plan.</p> <p>Clause 3.8.1(b) of the Safety Guide discusses control measures for limiting radiation exposures. In particular, Line 1046 refers to Controlled and Supervised Areas. As the dose limits for Controlled and Supervised Areas differ from jurisdiction to jurisdiction it is not intended to define them numerically.</p>
<p>08 Cameron Jeffries/Andrew Johnston SA EPA</p>	<p>2.3.4 Application L 226: Insert words “or abandoned prior to the time of implementation of this code”.</p> <p>2.7.2 Radiation Protection Plan Part (f) mentions ‘emergencies’. An emergency has not been defined in the glossary and it is difficult to imagine what might constitute a radiation emergency in the mining industry.</p> <p>2.9 Approval and Authorisations Suggest inserting an extra clause to require approval to relinquish site following rehabilitation. See comments at 3.7.5 below.</p> <p>2.9.4 Suggest that this is changed to read ...must not commence decommissioning or rehabilitation of an part...</p> <p>2.10.1 Operator/Employer Part (i) the current Codes contain a similar requirement concerning defects likely to result in a significant radiation exposure. The mining companies have asked the regulator to provide guidance on what constitutes a significant radiation exposure. Given this history it might be worthwhile to provide</p>	<p>As there are difficulties with abandoned sites in defining who is the operator, Clause 2.3.4 (Line 226) will be left as is.</p> <p>The dictionary meaning of “emergency” is used in Clause 2.7.2(f) and refers to a situation where an emergency in the operation may involve exposure to radiation rather than a radiation emergency. Therefore the term “emergency” does not need to be included in the Glossary. The term “radiation emergency” has not been used in the document.</p> <p>The relinquishment of a site after rehabilitation is beyond the scope of this Code.</p> <p>Agreed and wording of Clause 2.9.4 has been modified as suggested.</p> <p>It is not possible to find a definitive value for the term “significant radiation exposure” that is applicable in all situations. The Relevant Regulatory Authority would interpret the meaning of the term when applying the Code to</p>

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	guidance on what is a significantly increased radiation exposure.	a particular situation.
<p>09 Richard Yeeles/Chris Schultz, Principal Environmental Advisor WMC</p>	<p>2.5.5 In the interests of uniformity and consistency, it is suggested that a more specific definition be given to ‘radioactive waste’ based on its radioactivity.</p> <p>2.6.2 It is suggested that the power to impose ‘dose constraints, discharge limits or other requirements’ be subject to proper notice, consultation and approval processes.</p> <p>2.7.2 (f) It is questioned whether the term ‘emergencies’ is necessary in this context on the basis that ‘incidents’ and ‘accidents’ already cover all anticipated circumstances.</p> <p>2.8.2 (h) It is suggested that for long life operations, it is not practical to require a decommissioning plan in an initial RWMP. The requirement at the commencement of operations should be to rehabilitate the area to an agreed standard.</p> <p>2.9.2 to 2.9.5 (inclusive) The code should clarify a regulator’s scope of action because an operator requires some greater assurance that if there is a commitment to investment at the stage of approval to construct, approval to operate will not be unreasonably withheld.</p> <p>It is suggested that the process should specifically contemplate amendment to an existing RWMP as well as the establishment of new RWMPs.</p>	<p>The definition of “radioactive waste” in Clause 2.5.5 (line 274) is the accepted international definition, as given in the Glossary of the IAEA’s <i>International Basic Safety Standards for Protection Against Ionizing Radiation and for the Safety of Radiation Sources</i>, Safety Series No. 115.</p> <p>The way in which the Relevant Regulatory Authority imposes dose constraints is subject to the specific regulatory system of the jurisdiction involved and cannot be specified in this Code.</p> <p>The dictionary meaning of “emergency” is used in Clause 2.7.2(f) and refers to a situation where an emergency in the operation may involve exposure to radiation rather than a radiation emergency or an incident or accident involving radiation.</p> <p>An extra line of explanation has been added to the end of the first paragraph of Clause 3.9 of the Safety Guide to say that the Radioactive Waste Management Plan should include the conceptual, rather than detailed, decommissioning and rehabilitation plan and the “proposed” final deposition of waste. Also, an extra dot point of guidance has been added to Clause 3.9.1 explaining that the Radioactive Waste Management Plan may include an outline of proposed decommissioning concepts, rather than exact details.</p> <p>The Code is not able to specify provisions of this type.</p> <p>The words “and revise them as required” have been added to Clause 2.10.1(k).</p>

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	<p>2.10 Is it contemplated that any penalties would attach to non-compliance by employees with the Code?</p> <p>2.10.1 (h) It is suggested that ‘any unauthorised effluent discharges’ requires further definition to give clarity to the reporting requirements and to eliminate uncertainty. Clarification should define the areas to which the requirement does and does not apply, and to the activity limits of a discharge.</p>	<p>The Code does place obligations on employees but it is up to the Regulatory Authority of the particular jurisdiction to decide how the Code is to be implemented.</p> <p>It is intended that the definition of such incidents will be included in the provisions of <i>National Directory for Radiation Protection</i>.</p>
<p>10 Russell Robinson MARPS Acting Manager Radiation Protection Northern Territory Department Health and Community Services PO Box 40596 CASUARINA 0811</p>	<p>6. Line 290 It would be better to refer to the standard for radiation dose limits without a year. It is always the current version that is relevant and we know that the system of dose limitation does evolve.</p>	<p>For legal reasons it is necessary to refer to a specific document.</p>
<p>11 Doug Collier & Frank Harris ANSTO</p>	<p>5. Para 2.3.1 should be rewritten for two reasons. Firstly, in practice one doesn't usually refer to uranium concentrates, and secondly there is an <u>unnecessary</u> highlighting of the heavy minerals industry. Suggested rewording would be “The provisions of this Code apply to the mining and processing of ores for the recovery of uranium and thorium, and the recovery of other valuable minerals and metals in the presence of uranium and thorium.”</p> <p>6. Line 217. Should read “...but which contains significant concentrations of naturally occurring radionuclides.”, because a lot of waste will contain radionuclides, but the Code is only relevant if concentrations are significant with respect to Code definitions of radioactive material.</p> <p>7. Line 247. Should read “...is less than 10 microsieverts per annum; or...” or the “and” should be removed and a fourth point (d) begin in line 250 after the “or” in 249.</p>	<p>The expression “uranium concentrates” is a commonly used term so will be left as is. Clause 2.3.1 will not be changed because the mining and processing of ores for the production of uranium concentrates, and the separation of heavy minerals from mineral sands ores, are the two types of operations to which the Code was intended to apply.</p> <p>The paragraph prior to line 217 in Clause 2.3.2 of the Code and the accompanying guidance in Clause 3.4.1 already mention that the the Relevant Regulatory Authority would only apply the Code to other mining and mineral processing operations if radiation exposures and quantities were significant.</p> <p>These lines in Clause 2.4 have been replaced by a new section on Exemptions, which evolved from an agreed approach at the National Conference, and is consistent with the provisions in the <i>National Directory for Radiation</i></p>

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	8. Line 302 "...exposure to ionizing radiation..."	<p><i>Protection</i> and international practice.</p> <p>Agreed and wording of line 302 has been modified as suggested.</p>
<p>12 Colin Bwye Doral Mineral Sands Pty Ltd</p>	<p>1. Currently in WA we are required to prepare a single comprehensive Radiation Management Plan for a mineral sands operation covering aspects of occupational, environmental and waste disposal. In the proposed Radiation Protection Plan and Radioactive Waste Management Plan the Environment appears to have been forgotten.</p> <p>In particular, there is no mention of a pre-mining (or baseline) radiation monitoring programme prior to commencement of site works, or on-going environmental radiation monitoring and reporting. The environment is affect by mining and processing operations, not only by waste disposal.</p> <p>2. It is assumed that control measures to limit occupancy come under "provisions of ... operational procedures" in section 2.7.2 of the Draft Code. It would be appropriate to define the radiation parameters for Controlled and Supervised Areas in the Safety Guide. In WA we currently use gamma radiation levels of 4 $\mu\text{Gy h}^{-1}$ and 1 $\mu\text{Gy h}^{-1}$ for controlled and supervised areas, respectively.</p>	<p>Clause 2.8.2, subsections (b), (d), (e) and (f), of the Code provide requirements of a Radioactive Waste Management Plan with respect to the Environment. Guidance on protection of the Environment is given in Clause 3.6.6 of the Safety Guide, <i>Radiological Protection of the Environment</i>.</p> <p>Safety Guide Clause 3.9, <i>Radioactive Waste Management Plan</i>, has guidance on "baseline" monitoring but as there is no mention of it in the Code, words have been added to Clause 2.8.2(b) (line 348) requiring that "baseline" monitoring be included in the Radioactive Waste Management Plan.</p> <p>Clause 3.8.1(b) of the Safety Guide discusses control measures for limiting radiation exposures. In particular, Line 1046 refers to Controlled and Supervised Areas. As the dose limits for Controlled and Supervised Areas differ from jurisdiction to jurisdiction it is not intended to define them numerically</p>
<p>13 Uma Rajappa Assistant Director Radiation Health, Queensland</p>	<p>1. It is noted that the draft Code is appropriately seeking to raise the standard of radiation safety and protection in the mining and mineral processing industries. The strategies used in the draft Code are sound and likely to improve the standard of radiation safety to the people and the environment in the not too distant future if it able to be implemented appropriately.</p> <p>2. In Queensland, the mining and mineral processing industry is impacted by a number of pieces of legislation, for example the <i>Coal Mining Safety and Health Act 1999</i>, <i>Mineral Resources Act 1989</i>, <i>Mining and Quarrying Safety and Health Act 1999</i>, <i>Environmental Protection Act 1994</i>. Furthermore, these pieces of legislation are administered by different Government agencies such as the Environmental Protection Agency and the Department of Natural Resources and Mines. Additionally, the <i>Radiation Safety Act 1999</i> does not cover the material extracted from a mine when the</p>	<p>Comment noted, no action required.</p> <p>Comment noted, no action required.</p>

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	<p>material is still on a mining lease. This highlights the current fractionated approach and the operational difficulties that may need to be overcome/managed to ensure the smooth implementation of the requirements of the Code in Queensland.</p> <p>3. The <i>Mining and Quarrying Safety and Health Act 1999</i>, requires compliance with the dose limits stated in schedule 1 of the National Standard for Limiting Occupational Exposure to Ionising Radiation [NOHSC:1013(1995)]. This approach of radiation safety of workers on a mine site operating under a mining lease is consistent with the radiation health goals of the National Directory.</p> <p>4. To strengthen the regulatory requirements with respect to radiation safety and protection it may be more appropriate to include section 3.7 <i>Approvals and Authorisations</i> in the Code of Practice rather than the Safety Guide. This will then enable a more structured system of assessment and approval of the Radiation Protection Plan and the Radioactive Waste Management Plan.</p> <p>5. To streamline operational issues, the granting of Approvals and Authorisations specified in the Code may be tied to the granting of other approvals relating to mining and mineral processing, e.g. approval of a mining lease.</p>	<p>Comment noted, no action required.</p> <p>The provisions in Clause 3.7 of the Safety Guide, <i>Approvals and Authorisations</i>, are not in the Code because they are advisory only as they depend on the regulatory system of the relevant jurisdiction involved and the level of understanding between departments.</p> <p>Comment noted, no action required.</p>

COMMENT ON SAFETY GUIDE

SUBMITTER	COMMENT ON SAFETY GUIDE	WORKING GROUP RESPONSE
<p>01 Ian Marshman (Mark Sonter) Senior Radiation Officer Energy Resources of Australia Ltd Ranger Mine Locked Bag 1 Jabiru NT 0886 Australia</p>	<p>Safety Guide, 3.5.5: Critical Group</p> <p>In the Code, we purposely omitted any discussion of Critical Group, because there are alternative approaches that a regulator may wish to use to assess doses to Members of the Public, eg., dose to Maximally Exposed person; or alternatively ‘fenceline dose’. We do not believe the approach requiring assessment of dose to critical groups should be specifically highlighted, even in the Safety Guide.</p>	<p>Note: The Critical Group section of the Safety Guide is actually Clause 3.6.5 and not 3.5.5.</p> <p>“Critical Group” is not discussed in the Code. However, the Working Group (including the submitter of these comments) decided that the Clause 3.6.5, <i>Critical Group</i>, should remain in the Safety Guide.</p>
<p>02 Ivan Fetwadjieff Senior Scientific Officer (Radiation) Safety and Health Division Department of Industry and Resources Western Australia</p>	<ul style="list-style-type: none"> • Line 533 There needs to be a consistency between the oil industry and the mining industry. Between offshore petroleum (NOPSA) and onshore petroleum (WA DOIR) • Line 556 WA has recently introduced “Contaminated Sites Legislation” which impacts on radioactive waste management. • Line 679 This section should include some examples of low level contaminants including quantities and activities. • Line 691 How is the risk HAZOP calculated for an exemption? How is a Quantative Risk Accessment to be undertaken? 	<p>Comment noted. This is not an issue that can be dealt with in the Code but is an issue that may need to be resolved by the particular jurisdiction’s Regulatory Authorities.</p> <p>Comment noted, no action required.</p> <p>This paragraph, the last paragraph of Clause 3.4.5, has been modified and some examples have been provided. However, the Working Group considers that the level of detail requested is not warranted.</p> <p>Some additional information on risk assessment has been included in Clause 3.5 on Exemptions.</p>
<p>08 Cameron Jeffries/Andrew Johnston SA EPA</p>	<p>3.4.5 Application of Other Codes</p> <p>An aspect of waste management requiring more attention is the on-site disposal of miscellaneous radioactive wastes (contaminated plant and equipment, contaminated soil etc). Long-term mining projects have the ability to generate large amounts of miscellaneous waste requiring long-term disposal appropriate to the levels of hazard.</p> <p><i>The Code of practice for the near surface disposal of radioactive waste in Australia (1992)</i> applies to waste arising from processing of minerals remote from any mine site and where disposal at the mine site is inappropriate. The Near Surface Code outlines in some detail the requirements for the disposal of</p>	<p>Comment noted.</p> <p>Comment noted, no action required.</p>

SUBMITTER	COMMENT ON SAFETY GUIDE	WORKING GROUP RESPONSE
	<p>Category A and C materials away from a mine site. Should not the same materials be treated with similar care on a mine site, where they presumably represent the same level of long-term hazard and are disposed of in a purpose built repository on that site?</p> <p>This section of the draft Code should be clearer in addressing this issue. The Code appears to be saying, that it does not apply where the Near Surface Code applies...however, the Near Surface Code might apply at the discretion of the regulatory authority.</p> <p>Can basic aspects of the Near Surface Code be considered ‘generic’ requirements for the purpose of on-site disposal so as to achieve a standard national approach? If so, can these be defined in some way, in this Safety Guide?</p> <p>3.5 Exemptions L 720: The National Directory does not specify the number of people exposed.</p> <p>L 719: It may be difficult for the relevant regulatory authority to obtain information from a practice that is not subject to regulation in order to demonstrate exposure exceeds the values on which exemption levels are based.</p> <p>3.6.6 Radiological Protection of the Environment This statement does not seem strong enough in reflecting the objective of the Code which is to ‘... manage the protection of workers, members of the public <u>and the environment</u> from the harmful effects of radiation exposures...’.</p> <p>3.7 Approvals and Authorisations L 858: Should this sentence be made clearer? The mention of other legislative measures implies that in granting approvals and authorisations, it is up to the regulatory authority to ensure there are no conflicting requirements on the operator.</p> <p>3.7.3 Authorisation to Operate Suggest this section be clearly divided into a (optional) Commissioning stage and then a Routine Operation stage. This would be consistent with the format of 3.9.2 in the Safety Guide.</p>	<p>Clause 3.4.5 has been modified to make the application of the Near Surface Code clearer.</p> <p>The requirements for on-site disposal are beyond the scope of this Code. It would be a task for the Working Group revising the Near Surface Code.</p> <p>Clause 3.5 on Exemptions has been modified and no longer contains references to the <i>National Directory for Radiation Protection</i>.</p> <p>The wording of Clause 3.6.6 is considered adequate as guidance.</p> <p>Agree that Line 858 implies that regulatory authorities need to ensure that there are no conflicting requirements on the operator. Therefore modification of Lines 858 is not needed.</p> <p>The second paragraph of Clause 3.7.3 sufficiently describes the division of the stages required to obtain an authorisation to operate.</p>

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	<p>3.7.5 Authorisation to Rehabilitate L 991: At this point the Guide states that generally the requirements for relinquishing responsibility for a site will be set in legislation. It may not be safe to assume this.</p> <p>Approval to Relinquish Responsibility for Site Suggest consideration be given to a final stage of the process where the regulatory authority signs off on completion of the rehabilitation program and formally ends the Code requirements. At this time the regulatory authority states that the operator has met the obligations under the Code and then clearly specifies any outstanding issues to be addressed following relinquishment such as land use restrictions, ongoing surveillance, ongoing monitoring and responsibility for remedial actions, etc.</p> <p>This means that relinquishment by the operator cannot occur until the regulatory authority is satisfied with the outcome of rehabilitation and has reached agreement on any outstanding issues.</p> <p>3.7.6 Variations There is an inconsistency in use of the word ‘significant’.</p> <p>This section defines ‘significant changes’ which may increase exposure of workers etc. Such changes must be notified under 2.9.5 and the implication is that any increase in exposure is a notifiable change.</p> <p>Under 2.10.(g) the operator must also give notification of any changes in operation, or operating conditions which is likely to ‘significantly’ increase radiation exposures to workers or members of the public.</p> <p>3.8 RPP L 1012: Suggest replace the word ‘direction’ with ‘focus’ or ‘relevance’.</p> <p>3.8.1 Development of Plan Part (d): Change title to Decommissioning and Rehabilitation.</p>	<p>No modification to the wording of Clause 3.7.5 is considered necessary as the information is provided for guidance and provides an example of who may be likely to set requirements for relinquishing responsibility for a site after rehabilitation.</p> <p>The way in which the Relevant Regulatory Authority signs off on completion of the rehabilitation program is subject to the specific regulatory system of the jurisdiction involved and cannot be specified in this Code.</p> <p>Comments noted. No changes to Clauses 2.10.1(g) or 3.7.6 are considered necessary.</p> <p>Agreed. The word “direction” in Line 1012 has been replaced by the word “relevance”.</p> <p>Note: Actually Clause 3.9.2 not 3.8.1. Agreed. The title of Clause 3.9.2(d) has been changed to Decommissioning and Rehabilitation.</p>

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	<p>3.8.3 Quality Assurance L 1190: To be consistent with 3.8.3 (a) below, suggest ‘...including traceability <i>where possible</i> of all radiation measurements to Australian metrological standards’.</p> <p>3.8.5 Accidents and Incidents L 1234: Suggest ‘ All radiological incidents and resulting doses received, should be recorded and reported as required...’</p> <p>3.10.2 Relevant Regulatory Authority L 1503: The requirement for the RA to be responsible for auditing compliance (as opposed to just the operator demonstrating compliance) may result in increased regulation costs. This will be borne by the operator via licence fees etc.</p> <p>L 1511: As above, any additional costs must be factored into licence fees etc.</p> <p>L 1515: As above</p>	<p>Agreed. The words “where possible” have been added to the end of the first sentence of Clause 3.8.3.</p> <p>Agreed. The words “and resulting doses received” have been added to Line 1234.</p> <p>This is an administrative requirement set by the Relevant Regulatory Authority and therefore cannot be specified in this Code or Safety Guide.</p> <p>This is an administrative requirement set by the Relevant Regulatory Authority and therefore cannot be specified in this Code or Safety Guide.</p> <p>This is an administrative requirement set by the Relevant Regulatory Authority and therefore cannot be specified in this Code or Safety Guide.</p>
<p>09 Richard Yeeles/Chris Schultz, Principal Environmental Advisor WMC</p>	<p>3.2 It is stated that ‘the information within this Safety Guide is intended to be advisory only, and does not form part of the requirements of the Code.’ Does this mean that any non-compliance with the Safety Guide cannot be used as a ground for prosecution by a regulator. Is it considered by regulators that this Safety Guide proposes the minimum acceptable standards?</p> <p>3.6.4 Why is this section still included if relaxation of dose limitation requirements is not proposed.</p> <p>3.7.2 Is there a template that could be proposed to deal with this process? Because of the potential large number of regulatory agencies involved, it will be important</p>	<p>As the Safety Guide is advisory only it will therefore not be used for prosecution by regulators.</p> <p>Clause 3.6.4 is included for consistency with ARPANSA Radiation Protection Series Publication (RPS) No.1 and so that mining operators and employees are aware that the relaxation of the occupational dose limits is no longer recommended.</p> <p>As the regulatory processes vary from jurisdiction to jurisdiction, the consistency of the approvals process is an</p>

SUBMITTER	COMMENT ON SAFETY GUIDE	WORKING GROUP RESPONSE
	<p>to avoid duplication in the approvals process.</p> <p>3.8.2 Reference is made to integration of the RRP with OHS management and management of a site as a whole. This is not repeated in the RWMP section. This requirement should be reinforced so that documents and procedures are not applicable in isolation but rather are seen to be part of a site management system as a whole. Specific reference limited to OHS management is not appropriated.</p> <p>3.9.1 See comment for 3.8.2. The RWMP needs to draw on other documents already developed for a site to prevent duplication, especially where such documents have been developed as part of another regulatory process.</p> <p>3.9.3 Is ISO certification seen to be the minimum acceptable standard. The wording implies this.</p> <p>3.9.4 Olympic Dam already reports on radiation management protection as part of its annual Environment Management Program report to the South Australian Government. Is it contemplated that there should now be a separate report on performance under the RWMP. Is it possible to utilise existing reporting processes where they are deemed satisfactory? There is a need for efficient reporting, whether within existing reporting processes or the submission of one report to meet all of the requirements under the Code.</p> <p>3.10.1 This appears to imply some lessening of the requirement for experience to become an RSO. The current requirement is for a minimum of five years experience.</p>	<p>issue that could be taken up with the Relevant Regulatory Authority.</p> <p>Agreed. The second paragraph of Clause 3.9, <i>Radioactive Waste Management Plan</i>, has been modified to include the need for integration of the plan with overall project environmental management plan.</p> <p>Agreed. See previous response.</p> <p>Clause 3.9.3 is advisory only and was not intended to be used as a minimum acceptable standard but to provide information regarding which Australian Standard might be used as guidance when developing a quality assurance program.</p> <p>The use of existing reporting processes, rather than drafting an additional report on performance under the Radioactive Waste Management Plan, is an issue that could be taken up with the Relevant Regulatory Authority.</p> <p>The information in Clause 3.10.1 is advisory only and there was no intention to reduce the current requirement of experience to become an RSO. It is intended to include competencies for various professions using radiation, including RSOs, in future editions of the <i>National Directory for Radiation Protection</i>.</p>
10	7. Lines 1081 to 1089	

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<p>Russell Robinson MARPS Acting Manager Radiation Protection Northern Territory Department Health and Community Services PO Box 40596 CASUARINA 0811</p>	<p>This is a useful and practical paragraph. I hope this stays in the final draft.</p>	<p>Comment noted. The paragraph will remain in the final draft.</p>
<p>11 Doug Collier & Frank Harris ANSTO</p>	<p>9. Line 577. Not “uranium and thorium concentrates”. Suggest “marketable uranium intermediates and thorium bearing mineral concentrates”. Once again why do we single out the heavy mineral industry (Ta/Nb etc)? Suggest ...”the separation of valuable minerals and metals in the presence of significant concentrations of uranium and thorium.”</p> <p>10. Line 594 ...”some tens of microsieverts”.</p> <p>11. Line 620. What does “over a timescale to be <u>determined by the relevant regulatory authority</u>” mean?</p> <p>12. Lines 707-710. Would not <u>measured</u> doses be better than calculated doses?</p> <p>13. Line 725. “of the Directory also make it clear...”</p> <p>14. Line 727. Should read “...in proportion to the degree of risk...”</p> <p>15. Line 732. Should read “...on the application of the concepts as established in the BSS...”</p> <p>16. Line 735 should clarify in footnote or somewhere how much “bulk”</p>	<p>The expression “uranium or thorium concentrates” is the commonly used term so will be left unchanged. The mining and processing of ores for the production of uranium or thorium concentrates, and the separation of heavy minerals from mineral sands ores, are the two types of operations to which the Code was intended to apply. Therefore Line 577 will also remain unchanged.</p> <p>Line 594 has been changed to “some tens of microsieverts” as suggested.</p> <p>It means that as the regulatory system varies from jurisdiction to jurisdiction, the Regulatory Authority responsible for an existing operation will determine the timescale for compliance with the Code.</p> <p>This paragraph has been reworded.</p> <p>Clause 3.5 on Exemptions has been modified and no longer contains references to the <i>National Directory for Radiation Protection</i>.</p> <p>Clause 3.5 on Exemptions has been modified so Line 727 no longer exists as it has been deleted.</p> <p>This paragraph has now been deleted.</p> <p>This paragraph has now been deleted.</p>

SUBMITTER	COMMENT ON SAFETY GUIDE	WORKING GROUP RESPONSE
	<p>means e.g. greater than one tonne, as used elsewhere by IAEA.</p> <p>17. Line 823 “a properly managed operation” should be reworded, keeping the ALARA concept in mind.</p> <p>18. Line 840 “specific additional control measures” is vague (as is the international ICRP/IAEA position on this as yet) and should be reworded.</p> <p>23. Section 3.4.5. This section is very confusing, and repeated references to “the Code” whilst discussing another Code (near surface disposal) almost makes it unintelligible. However the <u>major</u> concern is the statement:</p> <p><i>The near surface disposal Code is intended to apply to disposal of contaminated plant and equipment resulting from handling or processing of naturally occurring materials which contain radioactive contaminants in low but non-trivial amounts (for example, gypsum, phosphate, natural gas and crude oil), and to waste arising from processing of minerals remote from any mine site and where disposal at the mine site is inappropriate.</i></p> <p>This statement is potentially very dangerous for industries covered by this Code, as it indicates that disposal of contaminated plant and equipment should be under the near surface code. This is totally impractical at a mine where some waste is under the new mining and milling Code and some is under the near surface code. The use of “low <i>but</i> not-trivial amounts” is not defined and in fact is misleading, as the waste from the oil and gas industry has typically thousands of times higher specific activity than uranium mining wastes. Clearer separation of the two codes is needed.</p>	<p>The wording of Line 823 has been changed to “properly managed and optimised operation”.</p> <p>Unable to reword Line 840 until the ICRP/IAEA provides further guidance.</p> <p>Clause 3.4.5, <i>Application of Other Codes</i>, has been reworded for clarity.</p>
<p>13 Uma Rajappa Assistant Director Radiation Health, Queensland</p>	<p>6. The Safety Guide should include suite of skills and competency of persons that may be considered suitable to perform the duties of a Radiation Safety Officer on a mine site. It is also suggested that qualifications, skills and competency requirements for persons who may be appointed as external auditors be included in the Safety Guide.</p>	<p>It is intended to include competencies for various professions using radiation, including RSOs, in future editions of the <i>National Directory for Radiation Protection</i>.</p>

COMMENT ON SCHEDULE 1

SUBMITTER	COMMENT ON SCHEDULE 1	WORKING GROUP RESPONSE
07 Keith Terry Radiation Wise Pty Ltd	4. It would be preferable for the dose to pregnant women be kept to a monthly pro-rata of the annual public limit, rather than the full annual limit for the remainder of the pregnancy. The employer does not know at what stage during the pregnancy it is declared to them.	The dose limit for a pregnant female employee is taken from ARPANSA Radiation Protection Series Publication (RPS) No.1 and is consistent with the ICRP Publication 60 recommendations.
12 Colin Bwye Doral Mineral Sands Pty Ltd	4. It would be preferable for the dose to pregnant women be kept to a monthly pro-rata of the annual public limit, rather than the full annual limit for the remainder of the pregnancy. The employer does not know at what stage during the pregnancy it is declared to them.	The dose limit for a pregnant female employee is taken from ARPANSA Radiation Protection Series Publication (RPS) No.1 and is consistent with the ICRP Publication 60 recommendations.

COMMENT ON SCHEDULE 2

SUBMITTER	COMMENT ON SCHEDULE 2	WORKING GROUP RESPONSE
<p>01 Ian Marshman (Mark Sonter) Senior Radiation Officer Energy Resources of Australia Ltd Ranger Mine Locked Bag 1 Jabiru NT 0886 Australia</p>	<p>Errata in New Mining Code</p> <p>In Schedule 2, page 47:</p> <p>Part A:</p> <ol style="list-style-type: none"> 1. The “Factors for Inhalation” values should be given not for an AMAD of 1 µm but for an AMAD of 5 µm. The figure of 1 µm for mechanically created dusts and for calcined flocculated precipitates is unrealistically low and is also not supported by the advice of IAEA Safety Guide RS-G-1.6, Occupational Radiation Protection in the Mining and Processing of Raw Materials, 2004, which should be quoted here. Incidentally, why don’t we use the normal terminology, namely ‘Dose Conversion Factor’? 2. The values for AMAD and DCFs should be those given in IAEA RS-G-1.6. This document assumes secular equilibrium in ore dust, and the chemical form for each radionuclide corresponding to the slowest absorption class (and therefore the highest DCF) and gives a default Dose Conversion Factor for ore of 3.5 µSv/αdps, which compares closely with the present approved Ranger DCF of 5.7 µSv/αdps. 3. Correction for loss of radon from ore dust is reported in IAEA to increase the DCF from 3.5 µSv/αdps to (at worst, for 100% Rn loss) 5.6 µSv/αdps. This again confirms the present conservative usage at Ranger. 4. Ranger’s approved figures for product dust and tailings dust are 6.2 and 5.3 µSv/αdps respectively. The Code figures for product dust and tailings dust should also be recalculated. <p>Part B:</p> <ol style="list-style-type: none"> 5. “Rn-222 daughters: Factor: 1.2×10^3 mSvJ “ does not make sense, either numerically or dimensionally. 	<p>“Factors for Inhalation” will be given for an AMAD of 5 µm as well as 1 µm in the table in Part A. The wording of Lines 1100 to 1108 of Clause 3.8.1 has been modified to indicate consistency with the recommendations of IAEA Safety Standards Series No. RS-G-1.6 and ICRP Publication 66.</p> <p>IAEA Safety Standards Series No. RS-G-1.6 recommends the use of an AMAD of 5µm. The Dose Conversion Factors for 5µm AMAD have been calculated and included in the third column of the table, resulting in a DCF for ore dust of 3.5×10^{-3} mSv/αdps for 5µm AMAD.</p> <p>A note has been added to the table to advise that the quoted Dose Conversion Factors assume no loss of radon occurs. Also, words have been added to Clause 3.8 to advise that corrections may need to be applied for dissolution behaviour of inhaled particulates in the lung, departure from equilibrium and loss of radon from dust samples.</p> <p>The Dose Conversion Factors for product dust and tailings have been recalculated.</p> <p>The unit of the Dose Conversion Factors in the table in Part B have been changed from mSvJ to mSv/mJ and an extra column has been added to the table to provide factors in units</p>

SUBMITTER	COMMENT ON SCHEDULE 2	WORKING GROUP RESPONSE
	<p>I suggest you quote IAEA, again, stating that exposure for 2000 hours per year at $7 \mu\text{J}/\text{m}^3$ (giving total alpha energy exposure of $14 \text{ mJ}\cdot\text{hr}/\text{m}^3$) is taken to be equivalent to 20 mSv using the ICRP ‘dose conversion convention’. (And at the same time, add the figure for thoron daughters, being $42 \text{ mJ}\cdot\text{hr}/\text{m}^3 = 20 \text{ mSv}$.)</p> <p>Alternatively the Dose Conversion Convention for radon daughters for Workers can be expressed as 1.43 mSv per $\text{mJ}\cdot\text{hr}\cdot\text{m}^{-3}$.</p> <p>For Members of the Public, the Dose Conversion Convention is 1.1 mSv per $\text{mJ}\cdot\text{hr}\cdot\text{m}^{-3}$, and this should be included (See ICRP 65, Table 7)</p>	<p>of $\text{mSv}/\text{mJ}\cdot\text{h}\cdot\text{m}^{-3}$.</p> <p>The values in the table in Part B, containing Dose Conversion Factors for inhaled radon decay products, have been derived and recalculated from IAEA Safety Standards Series No. RS-G-1.6. This reference will be added in a footnote to this table.</p> <p>Wording has been added to Clause 3.8.1 to indicate that the Dose Conversion Factors for radon decay products are different for members of the public. It is not intended to provide numerical values for members of the public.</p>
<p>02 Ivan Fetwadjieff Senior Scientific Officer (Radiation) Safety and Health Division Department of Industry and Resources Western Australia</p>	<ul style="list-style-type: none"> Line 1558 Schedule 2 - I would like to see $5\mu\text{m}$ and $10\mu\text{m}$ particle size dose conversion factors for dust added to the table. 	<p>“Factors for Inhalation” will be given for an AMAD of $5 \mu\text{m}$ as well as $1 \mu\text{m}$ in the table in Part A but it is not intended to have factors for $10 \mu\text{m}$.</p>
<p>03 Nick Tsurikov Radiation Safety Officer – Iluka Resources Limited Eneabba, Mid-West Operations</p>	<p>The Safety Guide</p> <p>1. Schedule 2. Dose conversion factors, page 47, lines: 1567-1569</p> <p>The most conservative dose conversion factors were picked up for the table. An amendment is required to ensure that an operator is aware of the fact that these values are not final and can be changed, depending of the dust particle size in a particular operation.</p>	<p>It is stated in Clause 3.8.1 “If more accurate dose assessments are required, dose conversion factors appropriate to the operation can be used”. Also, the tables in Schedule 2 have been transferred to Clause 3.8.1 of the Safety Guide. As the Safety Guide is advisory only, the values in the tables are to be used as guidance examples and therefore can be changed if required.</p>
<p>07 Keith Terry Radiation Wise Pty Ltd</p>	<p>3. Why are the dose conversion factors in Schedule 2 quoted for a $1 \mu\text{m}$ AMAD? In WA we currently use the $5 \mu\text{m}$ AMAD default value, whilst measured AMAD’s in the mineral sands industry typically are in excess of $15 \mu\text{m}$.</p>	<p>“Factors for Inhalation” will be given for an AMAD of $5 \mu\text{m}$ as well as $1 \mu\text{m}$ in the table in Part A.</p>
<p>10</p>	<p>1. page 47, part B, line 1582</p>	

SUBMITTER	COMMENT ON SCHEDULE 2	WORKING GROUP RESPONSE
<p>Russell Robinson MARPS Acting Manager Radiation Protection Northern Territory Department Health and Community Services PO Box 40596 CASUARINA 0811</p>	<p>The term daughters should not be used in this context. A better term is potential alpha energy from radon decay products or something similar.</p> <p>2. page 47, part B, line 1584 The critical group generally requires a different factor for radon decay products because of the presence of younger people.</p> <p>3. page 47, part B, line 1584 The unit appears to be wrong and should be mSv per J or the reciprocal. The factor should also be checked. It is cleaner to have Sv/J with no power of 10 in the factor.</p> <p>4. page 47, part A, line 1563 The assumptions in this table are OK but it is certain that the authorised radiation dose coefficient will be different from these values. The appropriate authority could be mentioned here as providing the authority to use a different coefficient.</p>	<p>The term “radon daughters” has been changed to “inhaled radon decay products”.</p> <p>A footnote has been added to the table of Dose Conversion Factors for radon decay products to say that the factors are for adult workers.</p> <p>The unit of the Dose Conversion Factors in the table in Part B have been changed from mSvJ to mSv/mJ and an extra column has been added to the table to provide factors in units of mSv/mJ.h.m⁻³.</p> <p>It is stated in Clause 3.8.1 “If more accurate dose assessments are required, dose conversion factors appropriate to the operation can be used”. Also, the tables in Schedule 2 have been transferred to Clause 3.8.1 of the Safety Guide. As the Safety Guide is advisory only, the values in the tables are to be used as guidance examples and therefore can be changed if required.</p>
<p>11 Doug Collier & Frank Harris ANSTO</p>	<p>24 In Schedule 2, there is a potential problem with the dose conversion factors quoted for inhalation. The values assume that there is no loss of radon but the practicalities of air sampling (thin sample of small particles) means that this is probably not true. Loss of radon means that there will be fewer alpha particles for the same activity of the parent radionuclides, which means that the dose conversion factors may be significantly underestimated. This should be examined in line with the methods of air sampling used in industry.</p>	<p>A note has been added to the table to advise that the quoted Dose Conversion Factors assume no loss of radon occurs. Also, words have been added to Clause 3.8 to advise that corrections may need to be applied for dissolution behaviour of inhaled particulates in the lung, departure from equilibrium and loss of radon from dust samples.</p>
<p>12 Colin Bwye Doral Mineral Sands Pty Ltd</p>	<p>3. Why are the dose conversion factors in Schedule 2 quoted for a 1 µm AMAD? In WA we currently use the 5 µm AMAD default value, whilst measured AMAD's in the mineral sands industry typically are in excess of 15 µm.</p>	<p>“Factors for Inhalation” will be given for an AMAD of 5 µm as well as 1 µm in the table in Part A.</p>

COMMENT ON GLOSSARY

SUBMITTER	COMMENT ON GLOSSARY	WORKING GROUP RESPONSE
<p>08 Cameron Jeffries/Andrew Johnston SA EPA</p>	<p>Glossary The Glossary needs revision. For example, the definition of Relevant Regulatory Authority bears no connection to the regulation of mineral processing activities or the implementation of this Code. The term ‘Emergency’ is used in 2.7.2 (f) but there is no definition in the Glossary.</p>	<p>The definition of Relevant Regulatory Authority has been amended. The dictionary meaning of “emergency” is used in Clause 2.7.2(f) and refers to a situation where an emergency in the operation may involve exposure to radiation rather than a radiation emergency. Therefore the term “emergency” does not need to be included in the Glossary. The term “radiation emergency” has not been used in the document.</p>
<p>09 Richard Yeeles/Chris Schultz, Principal Environmental Advisor WMC</p>	<p>Glossary Suggest include ‘potential’ after ‘highest’ in line 1735.</p>	<p>The definition of Critical Group in the Glossary is consistent with the IAEA definition and the definition in ARPANSA Radiation Protection Series Publication (RPS) No.1 so will be left unchanged.</p>
<p>11 Doug Collier & Frank Harris ANSTO</p>	<p>19. Line 1851, definition of mineral processing, should be expanded as discussed above. 20. Line 1897-1899. My understanding is that internationally there is a move not to use “specific activity” to mean concentration of radioactivity per mass of material and to keep this term for the property of a specific radionuclide as determined by its half life and atomic mass - see IAEA Glossary of terms.</p>	<p>The Glossary definition of “mining and mineral processing” has been broadened to include other applicable situations and to identify the materials and activities that the Code covers. The definition of “specific activity” has been deleted from the Glossary.</p>
<p>13 Uma Rajappa Assistant Director Radiation Health, Queensland</p>	<p>7. The definition of term <i>Relevant Regulatory Authority</i> should be corrected in the Glossary.</p>	<p>The definition of Relevant Regulatory Authority has been amended.</p>

SUBMITTER	COMMENT ON TABLE A2 : REGULATORY AUTHORITIES	WORKING GROUP RESPONSE
08 Cameron Jeffries/Andrew Johnston SA EPA	<p>This table may not serve a useful purpose, as there can be many regulatory authorities. In South Australia, various aspects of ‘mining and mineral processing’ are regulated by Primary Industries and Resources SA (under two Acts), the Environment Protection Authority (under two different Acts), Department for Administrative and Information Services (under two Acts), etc..</p> <p>Suggest list only the authorities in Table A1 that directly implement the Code.</p>	<p>Will keep both tables but the wording at the beginning of Table A2 has been changed to “....may regulate various radiological aspects of mining and mineral processing” rather than “....regulate various aspects of mining and mineral processing” so that it is clear the regulatory authorities listed are those that deal with radiation issues and not just any regulatory issue.</p>

COMMENT ON REGULATORY IMPACT STATEMENT

SUBMITTER	COMMENT ON REGULATORY IMPACT STATEMENT	ARPANSA SECRETARIAT RESPONSE
<p>01 Ian Marshman (Mark Sonter) Senior Radiation Officer Energy Resources of Australia Ltd Ranger Mine Locked Bag 1 Jabiru NT 0886 Australia</p>	<p>Comments on the Regulatory Impact Statement (RIS) for the new Mining and Processing Code, and Errata on the Code</p> <p>Please formally address these comments on the RIS and proposed Errata on the Code.</p> <p>The new code is intended to replace and simplify two previous codes, referred to as the “Health” and “Waste” codes. The “Health” code was first published in 1975, and then revised in 1980 and 1987. The “Waste” code was published in 1982 and has not previously been revised. Both the Waste Code and the Health Code and its revisions had stakeholder input at time of preparation.</p> <p><u>Necessity for a RIS?</u> The primary reason for developing the new code was that the international advice on radiation protection (from the ICRP and IAEA) upon which the earlier codes were based have been updated, the National Standards for radiation protection (RHS #39 / RPS #1) have consequently been updated, and therefore the code needed to be updated also. This is a perfectly adequate reason for the code rewrite, and it ought not to be necessary to require a RIS to support such a rewrite of an already-extant code, which has been in effect (and periodically updated) since 1975.</p> <p>Assumption that new code will result in dose reductions</p> <p>It is not realistic to try to justify the new code on the basis of an assumed achievement of a reduction in doses to workers or member of the public. The RIS relies on this argument, and it is (we believe) not supportable.</p> <p>Individual doses to workers involved in mining and processing of radioactive ores are already quite low, averaging only a few mSv per year. These doses are already indicative of good control systems, and would not be expected to reduce in any measureable way with the new Code. Indeed, doses are so low that any further decrement can only be small. This is because the average doses are comparable with natural background (eg., say, 2 mSv/yr from work on top of (say) 2 mSv/yr from Mother Nature).</p>	<p>Comment noted.</p> <p>The Council of Australian Governments (COAG), in its <i>Principles and Guidelines for National Standard Setting and Regulatory Action by Ministerial Councils and Standard Setting Bodies 2004</i>, requires a Regulatory Impact Statement (RIS) process for the analysis of any proposed national regulatory action.</p> <p>It is acknowledged that doses are below the limits, but the Regulatory Impact Statement argues that the Code will lead to further improvements.</p>

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	<p>No new obligations on operators</p> <p>The new Code does not introduce any new obligations for companies mining or processing radioactive ores, but merely updates and simplifies them. It is therefore unclear as to why a RIS is necessary. The obligations (to provide radiation protection to workers and members of the public) are already in place, via state radiation control or mining regulations, which generally implement the present codes' requirements, either by incorporation into regulation, or by paraphrasing in regulation, or by citing the codes as licence conditions.</p> <p>No change in existing dose limits already imposed under state regulations</p> <p>Dose limits in place throughout Australia have already, state-by-state, been brought into line with the ICRP 60 (1991) recommendations, namely 20 mSv for workers and 1 mSv for MoP as annual limits. So the new code does not impose reductions in limits compared with what is already in place.</p> <p>Inasmuch as the aim of the new code was to simplify the proposed regulatory regime, partly by amalgamating the two previous applicable codes, and to clarify that which was required by collecting all requirements into two 'top documents' titled a Radiation Management Plan and a Radioactive Waste Management Plan, the new code represents a simplification and clarification of the previous regulatory requirements and hence should give cost savings, by reducing the paperwork burden for both operational RSOs and regulators.</p> <p>Cost-benefit justification is weak and controversial</p> <p>The RIS seeks to quantify the <u>costs</u> of implementing the Code. As discussed above, all of these costs are already being borne by operators. New operations already know they have obligations under the present regime.</p> <p>The RIS seeks to quantify the <u>benefits</u> of the Code on the basis of assigning a</p>	<p>COAG requires a Regulatory Impact Statement to be developed (see above). Further reference to State/Territory requirements will be included in the Regulatory Impact Statement, as appropriate.</p> <p>The comparison of dose limits in the RIS is between the previous Health and Waste Codes and the introduction of a new Mining Code, which is to replace both of them. The previous Health and Waste Codes quoted a dose limit to workers of 50 mSv whereas the new Mining Code has 20 mSv, as per ARPANSA RPS 1 and ICRP 60. As most of the States/Territories already have a dose limit for workers of 20 mSv in their regulations the impact of the new Mining Code will be small.</p> <p>Agreed.</p> <p>Agreed that the costs will be small. Will include a statement that industry believes that the costs identified in the Regulatory Impact Statement are already being borne.</p> <p>The Regulatory Impact Statement only claims a small</p>

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	<p>dollar cost to total (collective) dose saved. As discussed above, dose savings are likely to be minimal, because good regulatory control, and ALARA, is already applied. As discussed below, both costs and benefits are very poorly assessed in the RIS.</p> <p>I believe the cost-benefit approach to justification presented in the RIS is both hypothetical (for the reasons given above) and unnecessarily controversial (for the reasons given below).</p> <p>We should avoid relying on the unnecessarily controversial aspects associated with justification arguments that use collective dose and which rely on assigning a value of alpha (\$/Sv). (Even if we did believe there would be a measureable dose decrement.) This is because (a) the value of alpha is debateable; (b) the argument <u>depends</u> on the assumption of LNT, and on the quantitative accuracy of various factors, including radiation weighting factor for alphas, tissue weighting factors, biokinetic modelling and hence dose conversion factors, all of which cast doubt on the numerical accuracy of the dollar cost applied to the (hypothetical) dose saved.</p> <p>The better justification for the new Code is surely that it is meant to enhance the effectiveness and rigorousness of the operation's Total Safety and Risk Management System. Inasmuch as this is the case, the true benefit of the new code would be in reduction of frequency of mishaps due to better, clearer, management plans and better, more thoughtful auditing of results. The benefit of avoiding a couple of days' shutdown due to a 'radiation incident' could mean a cost saving of perhaps $\\$2 \times 10^6$.</p> <p>So both philosophically, and in terms of a robust supporting argument for the new code, I believe the cost-benefit justification approach taken in the RIS is barking up the wrong tree.</p> <p>Incorrect or uninterpretable data</p> <p>The data for both cost and dose used in the RIS are wrong, misleading, or incapable of clear interpretation. See below:</p> <p><u>Quantification of costs.</u> Costs to develop a RMP (Radiation Management Plan) are not new, as the</p>	<p>reduction in occupational doses.</p> <p>The Regulatory Impact Statement process requires that costs and benefits be quantified as far as possible.</p> <p>The costs associated with a shutdown due to a radiation incident will be included in the final Regulatory Impact Statement.</p> <p>The Regulatory Impact Statement does note that Radiation</p>

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	<p>totality of requirements under the present code do in fact comprise a radiation management plan.</p> <p>These costs can vary greatly from project to project, and from jurisdiction to jurisdiction. For example, a simple open cut mineral sand mining operation with a wet concentrator should require only a minimal RMP, whereas an underground high grade uranium mine with onsite processing plant would require a much more explicit and extensive study and plan. Similarly, the task of ‘shepherding through’ an application for approval of an RMP would be much easier in a jurisdiction which is familiar with the industry and the code, and which has technically competent officers, but would be near-impossible in a jurisdiction unfamiliar with the industry and without technically-competent officers. We all know of examples of each jurisdiction.</p> <p>Costs to develop a Radiation Management Plan will be very significantly higher than suggested in the RIS. Assume as a minimum for the simplest cases, 1 week of consultant’s time, which equates to approx \$ 7000.00. If done in-house, assume half of that, at an hourly chargeout rate for in-house RSO of \$75 per hour (rather than, as quoted in the RIS, “in the range \$25 to \$50”). Assume similar hours for regulator’s review.</p> <p>Quantification of dose savings</p> <p>As discussed above, <i>we do not think there will be</i> any measurable reduction in dose following introduction of new code, because ‘ALARA’ is already in place, dose reduction by design and by operational control is already effective, and doses are consequently already low.</p> <p>Lack of clarity in the reported ‘typical’ dose figures</p> <p>The dose figures presented in the RIS as ‘typical’ are clearly only a subset of the totality of radiation results from the industry. The numbers in Table 2 are clearly not of the whole industry workforce, and we cannot determine just which operations or parts of operations they come from.</p> <p>They are a subset, and the subset is almost certainly not representative, except in the broad sense that all workers’ doses are known to be only a small fraction of the limit. The reason that they are not representative is because ‘miners’</p>	<p>Management Plans are already in place in many mining operations.</p> <p>The original figures were provided by Working Group members but will be adjusted in the final Regulatory Impact Statement.</p> <p>While it is acknowledged that doses are generally low, the Regulatory Impact Statement argues that a small improvement is possible through uniform application of the radiation protection measures in the Code.</p> <p>As indicated, the figures were derived from dose data provided by ARPANSA’s Personal Radiation Monitoring Service, WMC Olympic Dam Corporation, ERA Ranger Mine and WA Department of Industry and Resources, and were not intended to identify particular operations.</p>

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	<p>have quite different exposure circumstances depending on whether they are at Olympic Dam, or Ranger, or a mineral sand mine. Plant (mill) operators are also exposed to quite different situations, depending on whether they work at Olympic Dam (where smelter is different from SX is different from concentrator is different from refinery) or at Ranger, or Beverley (in-situ leach circumstance is different again) or at a mineral sand dry separation plant which is different again. Since we do not know where these ‘typical’ TLD results (and annual total dose results) came from, then we do not know what they mean.....</p> <p>The data in Table 2 and Table 3 do not appear to agree. The reason presumably lies in the workplace differences discussed above. The data appear to raise more queries than they answer.</p> <p>Inaccurate dishonest and misleading text</p> <p>The “tone” and editing of some parts are highly questionable. See Externalities, item 18:</p> <p>After stating that “<i>remediation ... can be costly and these costs are generally borne by governments and society</i>”, the text immediately quotes the cases of the rehabilitation of Mary Kathleen, costing \$19 million in dollars of the day, and Nabarlek, costing one third of that. The text does NOT say that these costs were borne by the operators, NOT by the government, but a person reading the text who was not aware of the facts would immediately assume that the costs were indeed borne by governments and society. <u>The wording of the text is thus plainly dishonest.</u></p>	<p>The doses are understood to be representative of the situations described.</p> <p>Tables 2 and 3 are from different sources and industries and would not be expected to necessarily agree.</p> <p>It will be clarified in the final Regulatory Impact Statement that these will be costs to industry.</p>
<p>03 Nick Tsurikov Radiation Safety Officer – Iluka Resources Limited Eneabba, Mid-West Operations</p>	<p>Regulatory Impact Statement</p> <p>1. Page 3, para 3: Monazite, one of the heavy minerals in mineral sands, contains thorium but is no longer produced in Australia.</p> <p>It is suggested that the words “no longer” are replaced by “currently”. The fact that it is not produced at the moment does not mean that it will not be produced in the future.</p>	<p>Agreed and will replace the words “no longer produced” with “currently not produced”.</p>

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	<p>2. Page 13, para 41 3. Page 22, para 81 4. Page 24, para 88</p> <p>The comment about the costs of producing radiation protection plans seems to be irrelevant as all relevant mining/processing operations already have one and it will be only a matter of updating a document, not writing a completely new one.</p> <p>5. Page 20, para 69</p> <p>Given the small number of mines covered by the proposed Code — three uranium mines and six mineral sands mines — the direct health and safety benefits are limited to a small number of workers. The statement seems to be not entirely accurate - there are many other industries, to which the Code will apply – all oil and gas exploration and production, tantalum, fertiliser and other industries can be mentioned; and the possibility of exposure to radon in all underground mines should not be discarded.</p>	<p>The costs are relevant for new mining operations.</p> <p>Possible application of the Code to other industries may be the subject of consideration by regulators and consultation with relevant industries.</p>
<p>04 Philip Crouch Papari Radiation Services</p>	<p>Unfortunately this document shows a lack of understanding of the regulatory regimes applying to the radiological aspects of mining and mineral processing in Australia.</p> <p>Regulation of radiation sources and exposures, including those from mining and mineral processing is the responsibility of the States (with a few exceptions). The RIS does not appear to understand this. There is no discussion of the States’ role in the implementation of the Code, or of the other radiation legislation that impacts (heavily) on the radiological aspects of mining and mineral processing.</p> <p>For example, while para 12 discusses the ARPANSA RPS 1 recommendations, it does not acknowledge that this document has no regulatory standing of its own. It is only when the various States’ radiation legislation incorporates it that it is legally binding (again in most cases). Similarly the (current) Codes have no real regulatory standing of their own, it is only when implemented under State law that they are enforceable. [Although compliance with them may be required under other (Commonwealth) legislation, the Commonwealth does not administer the implementation, and such requirements generally apply only to uranium mining, not other activities to which the Code may apply.]</p>	<p>The proposed Code is a national Code, for adoption in all jurisdictions. However, it is agreed that some further reference to State and Territory regulatory systems is required.</p> <p>This is the case for all of the Radiation Protection Series Codes. It is not intended that the Commonwealth administer implementation.</p>

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	<p>So when for instance the case for not having a Code is discussed, there is no mention at all of the fact that there would still be State legislation that applies to the radiological aspects of mining and mineral processing. That legislation addresses most of the requirements in the Code – requirements to have plans for radiation management and radioactive waste management, a radiation safety officer, monitoring plans, compliance with limits and many others. These exist whether or not there is a Code. One of the Code’s main functions is to draw these requirements together in a uniform, consistent manner that is relevant to the special situation of mining and mineral processing.</p> <p>Without this understanding, the discussion of options is virtually worthless. The “Self- Regulation” option notes the existence of “general occupational health and safety and environmental regulatory controls”, but seems oblivious to radiation legislation. “Self-regulation” would only be possible within the fairly narrow bounds of what is prescribed by the existing radiation legislation.</p> <p>There is also considerable discussion of the change from an annual limit of 50mSv in the old Code to 20mSv in the new. Again this is quite irrelevant – States adopted a general 20mSv limit some years ago, and this will continue irrespective of what the Codes may say.</p> <p>As a further example, para 23 states “the mining and mineral processing sector will continue to be governed by the Health Code and the Waste Code, which now form part of the Australian Radiation Protection and Nuclear Safety Regulations 1998”. I do not believe that these regulations have any force in any non-Commonwealth jurisdiction.</p> <p>Finally, I would like to make a plea for the elimination of jargon from this document – particularly the terms “externalities” and “information asymmetry”. I have not met anyone from the mining industry who has the faintest idea what they mean. Presumably “externalities” means matters external to something. But what? – External to mining and mineral processing? The Code? Radiation protection? Or what? It is just plain silly to include jargon that an important part of the audience simply does not understand. It reduces the likelihood that there will be useful comments on the proposals, and creates an impression that the authors are completely removed from those who will be affected by the Code. If it can’t be said in plain</p>	<p>Not all of these provisions exist in all jurisdictions. It is agreed that the Code will draw requirements together in a uniform, consistent manner.</p> <p>Comment noted. Further reference to State and Territory regulatory systems will be included in the final Regulatory Impact Statement.</p> <p>Agreed and paragraph 23 will be amended.</p> <p>The terms are commonly used in regulatory impact assessment and are well understood in economic analysis.</p>

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	English, then it is probably not worth saying.	
08 Cameron Jeffries/Andrew Johnston SA EPA	<p>There seems to be a consistent failure to recognise the state regulatory systems during the preparation of the RIS. As a result, some of the discussion in the RIS relates to requirements of the existing codes that have been modified by other requirements of the state legislation that implements those codes. Detailed comments are provided in the table below.</p> <p>Table 2 The information in this table is incorrect. For example the maximum gamma dose for uranium mine workers may be at least 6 mSv with >1000 wearers during that period.</p> <p>Table 3 An electrician is part of the Maintenance workgroup. This information should not be listed separately but included with the relevant Mine or Mill workgroup.</p> <p>Paragraph 16 and Table 5 The relevance of this comparison is unclear. In South Australia uranium mines are regulated under the Radiation Protection and Control Act. The uranium mines are already subject to the dose limits in RPS No. 1 under the requirements of this state legislation.</p> <p>Paragraph 18 This could also include discussion of the cost of cleaning up the South Alligator River Region and potential costs of rehabilitation of Port Pirie and Radium Hill sites in South Australia. But what is the point of the 'Externalities' section?</p> <p>Paragraph 23 Radiation Protection and radioactive waste management in mining and mineral processing is not governed by the Health Code and Waste Code by virtue of the ARPANS Regulations. The existing codes will only continue to apply if called up by State regulatory controls.</p> <p>Paragraph 26 This comparison is of limited value as average doses depend on the make-up of individual work groups. For example, the average dose for mine maintenance</p>	<p>Comment noted. Further reference to State and Territory regulatory systems will be included in the final Regulatory Impact Statement.</p> <p>The information in Table 2 was sourced from Table 5 of ARPANSA Technical Report No. 139, <i>Personal Radiation Monitoring Service and Assessment of Doses Received by Radiation Workers (2004)</i>, but it was later found that the numbers for Mine and Mill workers had been transposed. Table 2 will be amended in the final RIS.</p> <p>The data was not available in that form.</p> <p>The comparison is with the earlier Health and Waste Codes, and the Regulatory Impact Statement addresses the national situation, not only South Australia.</p> <p>The point is to describe any problems relevant to the analysis.</p> <p>Comment noted and paragraph 23 will be amended.</p> <p>Comment noted.</p>

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	<p>workers should be higher with the inclusion of the dose results for mine electricians.</p> <p>Paragraph 27 In South Australia the exposure limit in the Health Code no longer applies. The dose limits are set under state legislation and the 20 mSv per year limit applies to uranium mines.</p> <p>Paragraph 31 This paragraph is a continuation of the discussion in paragraph 30 on incident involving worker exposure. The note from the Senate inquiry was concerned with environmental incidents such as spills and is not relevant.</p> <p>It is worth noting, that in South Australia there is no uncertainty as to what constitutes an incident for the regulators. The South Australian Government has implemented the recommendations of the Bachmann inquiry, which clearly defines an incident and requires written reporting and recording. The Senate inquiry also recommended adopting the Bachmann reporting procedure.</p> <p>Paragraph 41 The Waste Code requires a radioactive waste management plan. The cost for this should also be included in this option.</p> <p>Paragraph 45 The Health Code exposure limits do not apply in South Australia.</p> <p>Paragraph 52 Under the Self-regulation model mining companies would still be required to develop plans for their internal systems at the very least. The Self-regulation model outlined in Table 6 shows that the firm is to establish a regulatory structure and make rules and that this may be subject to regulatory approval. There is also government monitoring of rule enforcement. It is hard to see that a company could establish a regulatory structure that is approved and monitored by government without making a plan.</p> <p>Paragraph 53 This seems to be discussing a Cost rather than a benefit</p>	<p>Comment noted.</p> <p>Environmental incidents are relevant.</p> <p>Comment noted.</p> <p>The discussion assumes a joint plan as the Health and Waste Codes have been combined.</p> <p>Comment noted.</p> <p>Comment noted.</p> <p>It discusses a possible reduction in costs to industry, i.e. a benefit.</p>

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	<p>Paragraph 62 While this discussion concerns average doses, maximum doses will also increase. The maximum dose as detailed in Table 3 is 9 mSv, a 100 per cent increase results in 18 mSv. It is hard to see that this is significantly below the current or proposed exposure limits. In South Australia the current exposure limits is 20 mSv per year.</p> <p>Paragraph 68 Dot point 1 South Australian legislation already stipulates an exposure limit based on RPS No. 1</p> <p>Paragraph 68 Dot point 4 The Waste Code already requires the preparation of a radioactive waste management plan.</p> <p>Paragraph 70 The Health Code and Waste Code already require the preparation of a radiation management plan and radioactive waste management plan. It is unclear that there is any major new requirement on developing plans.</p> <p>Paragraph 75 South Australia has already adopted the exposure limits in RPS No. 1 and applied them to uranium mining.</p> <p>Paragraph 76 The Waste Code already requires a radioactive waste management plan. This is not a new requirement and regulatory staff, in South Australia already vet such plans.</p> <p>Paragraphs 78 and 79 As noted in Paragraph 7 the waste and health codes have been incorporated into legislation as conditions of licence and/or registration. It is suggested that the cost of amending licence or registration conditions is significantly less than that proposed.</p> <p>Paragraph 81</p>	<p>The word “significantly” will be deleted, but the point of the paragraph does not change.</p> <p>Comment noted.</p> <p>Comment noted. Paragraph 68 will be modified.</p> <p>Comment noted. However, the cost of developing plans is indicated should it be required at some sites.</p> <p>Comment noted.</p> <p>Comment noted, but the Regulatory Impact Statement is national in focus.</p> <p>A note to this effect will be included in the final Regulatory Impact Statement.</p>

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	<p>The Waste and Health Codes already require reviews of plans to be undertaken as determined by the regulatory authority. This is not a new requirement</p> <p>Paragraph 82 - Dot point 1 South Australia has already implemented the lower exposure limits set out in RPS No. 1. It is probably the same case in all jurisdictions. There should be no additional resource requirement</p> <p>Paragraph 82 - Dot point 3 These plans are already reviewed on an ongoing basis. There should be little additional resource requirement</p> <p>Paragraph 83 The 20 mSv per year limit is already required in South Australia under the legislation. This is probably the case in all jurisdictions.</p> <p>Paragraph 85 Given that most states have implemented the lower dose limit under state legislation most companies are already complying with the exposure limits in the new code.</p> <p>Paragraph 87 The Waste code already requires a radioactive waste management plan. This should not be an extra cost over the status quo option.</p> <p>Paragraph 88 The industry already have to prepare a plan to demonstrate the capacity to manage radiation protection and radioactive waste under the Waste and Health Codes. The cost of initial preparation should be low.</p> <p>Paragraph 89 - Dot point 2 Many mining companies already bear the costs of developing radiation management and radioactive waste management plans and these are not expected to change greatly.</p> <p>The cost of changing a clause in regulations, licence or registration conditions should be fairly low.</p>	<p>Paragraph 81 concludes that the cost of reviewing plans is small.</p> <p>A note to this effect will be included in the final Regulatory Impact Statement.</p> <p>A note to this effect will be included in the final Regulatory Impact Statement.</p> <p>Comment noted.</p> <p>Agreed and as already noted in paragraph 85.</p> <p>Comment noted. However, the plan requirement is now clearer and updated.</p> <p>Comment on costs noted for inclusion in final Regulatory Impact Statement.</p> <p>Comment noted.</p> <p>A note to this effect will be included in the final Regulatory Impact Statement.</p>
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<p>Richard Yeeles/Chris Schultz, Principal Environmental Advisor WMC</p>	<p>Background – add ‘s’ to ‘Mine’ at end of second line.</p> <p>Paragraph 4 – add ‘potentially’ between ‘wastes’ and ‘containing’ in second last line.</p> <p>Paragraph 11 – remove ‘levels of’ from second line. Suggest remove all of third sentence or provide amend it as follows – ‘It is claimed that an example of the resulting health hazard has been an elevated incidence of lung cancers in the population of uranium miners, especially those from some underground mining operations conducted in the 1940s and 1950s, virtually all of them countries other than Australia.’</p> <p>Paragraph 13– the word ‘incidents’ needs to be defined to relate specifically to safety incidents resulting in an increase in worker dose. It is suggested that the locality of each incident referred to should be identified.</p> <p>Paragraph 14 – It is suggested that ‘but are outdated’ be omitted from first line and that it be recast to read – ‘The Waste and Health Codes do not have expiry dates. They were published in 1982 and 1987 respectively.’</p> <p>The paragraph contains assertions about the lack of specific Australian guidance with no clear statement about why such guidance is required rather than continuing the current reliance on international codes and standards. The option of continuing to use international codes and standards instead of developing specific Australian codes is not explored.</p> <p>Paragraph 18 – It is suggested that the first and second sentences be re-cast to read ‘Wastes arise from mining and processing of ores containing naturally occurring radioactivity. If not adequately managed on-site, such wastes have the potential to cause harm to humans or to the environment external to the mining site.’</p> <p>The paragraph contains assertions that the cost of remediation of loosely regulated sites is born by governments and society in general, creating an adverse perception of the mining industry when it is required to make significant provision for rehabilitation and ultimate remediation of a site. It is suggested that to encourage an objective understanding of the points being</p>	<p>Agreed and will amend.</p> <p>Agreed and will amend paragraph 4.</p> <p>Agreed and will remove “levels of” from second line of paragraph 11.</p> <p>Disagreed. Original wording preferred.</p> <p>Paragraph 13 describes existing incidents in the Australian Radiation Incidents Register.</p> <p>Disagreed.</p> <p>International Codes and Standards are used to develop local requirements rather than being directly adopted in regulation.</p> <p>Agreed and will modify the wording paragraph 18.</p> <p>The final Regulatory Impact Statement will make clear that the costs of remediation were borne by industry.</p>

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	<p>made in this paragraph, further background should be given to the Mary Kathleen and Rum Jungle operations, emphasising in particular that they commenced in the 1950s when standards were different to those currently applying, and in relation to Rum Jungle in particular, the Federal Government had a significant role in starting and running the operation.</p> <p>Paragraph 20 – As referred to in paragraph 14, this does not canvass the option of use of existing international codes and practices.</p> <p>Paragraph 25 – the footnote 12 for this paragraph needs to be brought back from the subsequent page.</p> <p>Paragraph 26 – There should be greater clarity given to the reference – ‘In the area of uranium mining and mineral processing’ so that it is clear that this refers to the direct area of operation and not the surrounding area.</p> <p>Paragraph 28</p> <p>It is suggested that this be re-cast as follows – ‘It is reasonable to conclude that the <i>Health Code</i> and the <i>Waste Code</i> have helped in achieving low levels of exposure. It is also clear that operators have adopted a very cautious approach to radiation protection in mining and mineral processing, adopting compliance with regulatory requirements as the minimum and working to achieve much lower limits than those prescribed.’</p> <p>Paragraph 31 – It is suggested that the first sentence be re-cast as follows – ‘While the number of incidents may be low relative to other sectors, there is some concern held by regulators that the requirement to report incidents is not clear in all cases.’</p> <p>In the last sentence of this paragraph, it is suggested that ‘contamination’ be replaced by ‘impact’ and that ‘hundreds of’ be omitted.</p> <p>Paragraph 45 – it is suggested that ‘relies on out-dated’ be omitted from the last sentence, and replaced by ‘does not use the most recent’.</p> <p>Paragraph 58 – The Senate Committee did not make a conclusion about self-regulation. It merely referred to different views about its outcomes.</p>	<p>Comment noted.</p> <p>Comment noted and will amend final Regulatory Impact Statement.</p> <p>Agreed and will make clearer.</p> <p>Prefer existing wording.</p> <p>Agreed and will modify wording of paragraph 31.</p> <p>Existing wording is more consistent with the referenced Senate Report.</p> <p>Agreed and will modify wording of paragraph 45.</p> <p>Comment noted.</p>

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	<p>Paragraph 59 – It is asserted that workers in high risk areas have preferred dose limits to be well defined and enforced. No evidence is cited to support such an assertion.</p> <p>Paragraph 60 – There is an implication that operations in remote location, by virtue of their location, will be lax in their radiation protection and management practices because of the difficulty of scrutiny. It is submitted that this is an adverse reflection on current operators that is not warranted by their performance.</p> <p>Paragraphs 65 and 66 – It is not made clear how security arrangements would change under self-regulation as both the Health Code and the Waste Code currently do not contain any information regarding standards for security. These paragraphs imply that self-regulation will lead to an increased security risk without defining how this would occur.</p> <p>Paragraph 70 – omit ‘though’ from first line</p> <p>Paragraph 71 – Suggest re-cast the first two sentences as follows – ‘Given the extent to which worker dose levels are already well below the regulatory requirements, it may be difficult to establish a quantifiable benefit for workers from the proposed Code. For the community more broadly however, it will take only a small decrease in the average annual effective dose rate from diagnostic medical x-rays for large benefit to be achieved.’</p> <p>Remove ‘If’ from start of last sentence.</p> <p>Paragraph 79 – substitute ‘as’ for ‘the’ in fourth line.</p> <p><u>ISSUES ON WHICH ARPANSA HAS SOUGHT FEEDBACK</u></p> <p>WMC believes that there would be little, if any, reduction in compliance costs as a result of self-regulation.</p>	<p>Comment noted.</p> <p>Comment noted.</p> <p>Paragraph 65 indicates that security risk may increase for several reasons.</p> <p>Agreed and will omit the word “though” from first line of paragraph 70.</p> <p>Agreed and will modify wording of paragraph 71.</p> <p>Agreed and will remove the word “if” from the start of the last sentence of paragraph 71.</p> <p>Will amend the fourth line of paragraph 79 to include the words “as the”.</p> <p>Noted for comment in final Regulatory Impact Statement.</p>

SUBMITTER	COMMENT ON REGULATORY IMPACT STATEMENT	ARPANSA SECRETARIAT RESPONSE
	<p>At Olympic Dam, WMC operates to a worker dose limit far below the proposed 20 mSv/year. It regards the regulatory requirement as the minimum standard to achieve. Accordingly, WMC does not believe that there would be any increase in effective dose to workers from self-regulation.</p> <p>WMC does not believe that the new code is likely to further reduce the risk of incidents or the dose to workers because both are already at very low levels.</p>	<p>Noted for comment in final Regulatory Impact Statement.</p> <p>Noted for comment in final Regulatory Impact Statement.</p>
<p>11 Doug Collier & Frank Harris ANSTO</p>	<p>21. RIS para 69 “small number of mines”. There are many mines with process streams containing >1 Bq/g of specific radionuclides, but maybe the comment is based on the expected number of mines (covered by the Code) which will not be exempt after dose scenarios/doses are taken into consideration? Not clear.</p>	<p>Other mines will only be covered following decisions of regulatory authorities and consultation with affected industries.</p>

COMMENT ON NATIONAL DIRECTORY – PROTOCOL FOR APPLICATION OF EXEMPTION PROVISIONS

SUBMITTER	COMMENT ON NATIONAL DIRECTORY – PROTOCOL FOR APPLICATION OF EXEMPTION PROVISIONS	ARPANSA SECRETARIAT RESPONSE
<p>03 Nick Tsurikov Radiation Safety Officer – Iluka Resources Limited Eneabba, Mid-West Operations</p>	<p>Protocol for Application of Exemption Provisions for Radioactive Material</p> <p>1. Page 4 (7. The Graded Approach)</p> <p>This comment is based on the paper presented at ARPS-2004 Conference in Adelaide last year:</p> <p>The main potential problem for mining and minerals processing is associated with public perception and not with the actual implementation of the radiation protection measures. To overcome this difficulty it is proposed to introduce a concept of “supervised” (“classified”, “controlled”) material into the National Directory.</p> <p>The proposal is based on the IAEA Safety Standard RS-G-1.7 (Graded Approach, paragraphs 5.11 – 5.13), which allows an exemption from regulation for the material with activity concentration exceeding the specified values “up to ten times” (14). However, the exemption of the material containing just under 10 Bq/g of Th232 or U238 could be problematic due to potential for a significant radiation exposure of both workers and members of general public; and could be used in exceptional circumstances only.</p> <p>Therefore, the following is proposed for mining and minerals processing:</p> <ul style="list-style-type: none"> · A material that contains radionuclides in excess of IAEA Basic Safety Standards levels (for example, 1 Bq/g for a parent isotope – Th232 or U238, but less than 5 Bq/g) will be identified as “supervised material”; · A material for which this value exceeds the BSS one by five times (above 5 Bq/g) will be identified as “radioactive material”; · Ideally, exactly the same radiation protection principles and regulations will apply to both kinds of material – the only proposed change is in the name of the material. The details will be determined by a relevant regulatory authority, on the ‘case by case’ basis. 	<p>These comments relate to the Exemption Provisions of the <i>National Directory for Radiation Protection</i> (NDRP) rather than the Mining Code and will be dealt with separately. A proposal relating to Exemption Provisions for the NDRP was also discussed at the National Conference.</p>

SUBMITTER	COMMENT ON NATIONAL DIRECTORY – PROTOCOL FOR APPLICATION OF EXEMPTION PROVISIONS	ARPANSA SECRETARIAT RESPONSE
08 Cameron Jeffries/Andrew Johnston SA EPA	<p>Part 5 – Exemption on the basis of optimisation (3.2.3)</p> <p>The difficulty with the proposal is cost recovery by the regulatory authority. The proposal is an exemption may be subject to monitoring or reporting conditions, which would require on going oversight by the regulator. However, there is no provision for cost recovery as the practice is not licensed or registered.</p>	<p>These comments relate to the Exemption Provisions of the <i>National Directory for Radiation Protection</i> (NDRP) rather than the Mining Code and will be dealt with separately. A proposal relating to Exemption Provisions for the NDRP was also discussed at the National Conference.</p>
11 Doug Collier & Frank Harris ANSTO	<p>22. Protocol for Application of Exemption</p> <p>Sections 3 and 4, Exemption on basis of Schedule 4 and trivial dose - “moderate quantities” and trivial dose < 10 µSv/y is not intended for application to NORM. This relates to artificial radioactivity.</p> <p>There is no clear basis for exemption based on measured doses for all possible scenarios. This would seem to be the real issue.</p>	<p>These comments relate to the Exemption Provisions of the <i>National Directory for Radiation Protection</i> (NDRP) rather than the Mining Code and will be dealt with separately. A proposal relating to Exemption Provisions for the NDRP was also discussed at the National Conference.</p>

Summary of Issues Raised at National Mining Conference and Workshop 11-13 April 2005

COMMENT	WORKING GROUP RESPONSE
<p>General Comments</p> <ul style="list-style-type: none"> • The Code needed to be aligned with international requirements/standards. • The Code puts the onus of <i>Optimisation</i> on the operator via the Radiation Protection Plan/Radioactive Waste Management Plan but perhaps there was a need for further guidance on optimisation. • As low as reasonably achievable (ALARA) needs to be dealt with in the Code. • The Scope of application of the Code is unclear, both with respect to material and site. Therefore, modifications are needed to the definition in the Glossary of “mining and mineral processing” to identify what materials and activities are covered, and to Sections 1.4 <i>Scope</i> and 2.3 <i>Application</i>, describing that the Code applies to activities including exploration and downstream processing. WA Mining legislation has a definition of “mining and mineral processing” that could be used in the Glossary. • The term “Heavy minerals” should be defined and the definition added to the Glossary. • The Code may need some words on abandoned sites. • The definition of <i>Relevant Regulatory Authority</i> in the Glossary needs to be amended. • The regulatory authorities listed in Table A2 need to be checked with each jurisdiction to establish who is appropriate. 	<p>The Code has been aligned with international requirements/standards by including additional recommendations/requirements from IAEA Safety Standards Series Nos RS-G-1.6, RS-G-1.7 and WS-R-3, ICRP Publications 60 and 66, and IAEA <i>International Basic Safety Standards for Protection Against Ionizing Radiation and for the Safety of Radiation Sources</i>, Safety Series No. 115.</p> <p>Further guidance from IAEA Safety Standards Series No RS-G-1.7 on Optimization has been added to the Safety Guide.</p> <p>Guidance on a graded approach to risk and ALARA has been added to Clause 3.5 of the Safety Guide on Exemptions.</p> <p>Words of guidance have been added to Clause 3.4.3 of the Safety Guide on the application of the Code to exploration activities.</p> <p>The Glossary definition of “mining and mineral processing” has been broadened to include other applicable situations and to identify the materials and activities that the Code covers.</p> <p>Examples of heavy minerals are given in Clause 3.4.1 of the Safety Guide.</p> <p>As there are difficulties with abandoned sites in defining who is the operator, no additional words can be added.</p> <p>The Glossary definition of Relevant Regulatory Authority has been amended.</p> <p>The correct entry or entries for in Table A2 will be confirmed and included in the final version of the Mining Code and Safety Guide.</p>

COMMENT	WORKING GROUP RESPONSE
<p>Section 1: Introduction</p> <ul style="list-style-type: none"> The references in Sections 1.4.5 and 3.4.5 to the <i>Code of Practice for the near surface disposal of radioactive waste in Australia (1992)</i> may be too restrictive. Therefore, the wording of Sections 1.4.5 and 3.4.5 requires modification. <i>The Code of Practice for the near surface disposal of radioactive waste in Australia (1992)</i> needs to be revised and ARPANSA’s draft publication <i>Classification and Disposal of Radioactive Waste in Australia – Consideration of Criteria for Near surface Burial in an Arid Area</i> needs to be finalised. Clarification is needed of non-bulk wastes, such as equipment and pipes containing radioactive material. In the last dot point of Section 1.3.1, clarification is needed of the meaning of “provision of independent regulatory functions”. 	<p>Clauses 1.4.5 and 3.4.5 have been modified to make the application of the Near Surface Code clearer.</p> <p>The revision of the Near-surface Code is not in the Scope of this Code but is an issue that could be raised with the Radiation Health Committee. References to the draft near-surface burial publication have been deleted.</p> <p>Words have been added to Clause 3.4.5 to clarify non-bulk wastes and other operational wastes.</p> <p>The words “provision of independent regulatory functions” in Clause 1.3.1 have been changed for clarity to “provision for independent regulatory audit and inspection”.</p>
<p>Section 2: Code of Practice</p> <ul style="list-style-type: none"> In Section 2.3, <i>Application</i>, words on heavy minerals, exploration and downstream processing need to be added. The references to the <i>National Directory for Radiation Protection</i> in Section 2.4 and subsection 2.9.7 need to be modified so they don’t become outdated when future editions are published. Section 2.4, <i>Exemptions</i>, requires revision to be consistent with IAEA Safety Standards Series No. RS-G-1.7, <i>Application of the Concepts of Exclusion, Exemption and Clearance</i>, the Protocol for Exemption in the <i>National Directory for Radiation Protection</i>, and other recent developments. The title of Section 2.7 needs to be changed from Radiation “Protection” Plan to Radiation “Management” Plan to be consistent with other ARPANSA Radiation Protection Series publications. This section of the Code needs to specify that a description of the operation under consideration is required in a Radiation Management Plan. The corresponding section of the Safety Guide needs to point out that for some operations the Radiation Management Plan and the Radioactive Waste Management Plan could be combined. Section 2.9, <i>Approvals and Authorisations</i>, may need modification to account for samples being taken to other sites for testing/analysis. 	<p>Heavy minerals, exploration and downstream processing are mentioned in Clause 2.3 and examples are given in Clause 3.4.1 of the Safety Guide.</p> <p>Clauses 2.4 and 2.9.7 have been modified and no longer contain references to the <i>National Directory for Radiation Protection</i>.</p> <p>Clause 2.4 has been replaced by a new section on Exemptions, which evolved from an agreed approach at the National Conference, and is consistent with the provisions in the <i>National Directory for Radiation Protection</i> and international practice.</p> <p>The title of Clause 2.7, as well as any associated references, has been changed to Radiation Management Plan (RMP). A requirement that the RMP include a description of the operation to which it applies has been added to Clause 2.7.2 of the Code. The second paragraph of Clause 3.9, <i>Radioactive Waste Management Plan</i>, has been modified to include the need for integration of the Radioactive Waste Management Plan with the Radiation Management Plan and the overall project environmental management plan.</p> <p>Some words have been added to Clause 3.8.1(b) regarding the development of procedures for transporting radioactive materials off site.</p>

COMMENT	WORKING GROUP RESPONSE
<p>Section 3: Safety Guide</p> <ul style="list-style-type: none"> • Some words need to be added to Section 1.2, <i>Structure</i>, to advise that the Safety Guide is not regulatory in nature but provides guidance on how the objectives and requirements of the Code can be met. • Section 3.4.3 needs some clarification as to what is meant by “radioactive mineralisation”. • Section 3.5, <i>Exemptions</i>, needs to be rewritten to be consistent with the Code. • The Australian Standards quoted in subsections 3.8.3 and 3.9.3 should be put in a Bibliography. • The duties of a Radiation Safety Officer need to be identified and be consistent with the <i>National Directory for Radiation Protection</i>. • It is unclear where the Dose Conversion Factors in Schedule 2 come from. It needs to be stated that these Dose Conversion Factors are site specific and that they are intended as guidance only. 	<p>It is already stated in Clause 1.2 that the Safety Guide “provides further information and guidance to assist in meeting the objectives and requirements of the Code” and Clause 3.2 of the Safety Guide advises that “the information within this Safety Guide is intended to be advisory only, and does not form part of the requirements of the Code.” Therefore, it is not considered that any further advice is required.</p> <p>Clause 3.4.3 has been modified to improve clarity.</p> <p>Clause 3.5 on Exemptions has been rewritten to be consistent with the Code.</p> <p>The Australian Standards quoted in Clauses 3.8.3 and 3.9.3 will be put in a Bibliography.</p> <p>A description of the duties of a Radiation Safety Officer has been added to Clause 3.10.1.</p> <p>The Dose Correction Factor tables in Schedule 2 have been amended and transferred to Clause 3.8.1 of the Safety Guide. As the Safety Guide is advisory only, the values in the tables are to be used as guidance examples and therefore can be changed if required. Also, it is already stated in Clause 3.8.1 “If more accurate dose assessments are required, dose conversion factors appropriate to the operation can be used”.</p> <p>The first table, for mixtures of inhaled radionuclides, has a footnote that the factors in were derived from IAEA Basic Safety Standard No. 115. However, a footnote will be added to the second table, for inhaled radon decay products, to indicate that the factors were derived from IAEA Safety Standards Series No. RS-G-1.6.</p>

Submission received post National Mining Conference

SUBMITTER	COMMENT	WORKING GROUP RESPONSE
<p>A01 Cameron Jeffries SA EPA</p>	<p>Draft Mining and Milling Code - Comment on use of Near Surface Code (NSC)</p> <p>There are a couple of problems associated with the reference to the NSC in the current draft of the Mining Code.</p> <p>1. Logic</p> <p>The NSC states (in Section 1.2) that it is not intended to apply to the management of specific types of waste covered by other Commonwealth Codes of Practice, such as the Code of Practice on the Management of Wastes arising from the Mining and Milling of Radioactive Ores 1982. On the face of it, the NSC cannot be applied where the Mine Waste Code of 1982 applies.</p> <p>However, the revised Mining Code of 2005 has expanded the scope of its application-</p> <p>The Code 2.3.1 It was the wish of the conference that the definition of mining and mineral processing clearly includes the petroleum industry and ISL mining etc in addition to the production of uranium or thorium concentrates and mineral sand mining.</p> <p>In addition, Clause 2.3.2 expands the possible application of the Code to include wastes from a range of other operations as directed by the regulatory authority.</p> <p>The Guide 3.4.1 The Guide reinforces this by stating that the Code may also be applied to processing of phosphate ores, tin tantalum and other non-ferrous ores coal, and oil and gas extraction.</p> <p>So, the Code and the associated Guide clearly state the revised Code <u>may</u> apply to the sorts of waste materials also covered within the scope of the Near Surface Code described in 1.2.(b) and (c).</p>	<p>The Glossary definition of “mining and mineral processing” has been broadened to include other applicable situations.</p>

SUBMITTER	COMMENT	WORKING GROUP RESPONSE
	<p>Unfortunately, the Guide goes on to state (3.4.5) in effect, that the Code does not apply to the very same wastes as covered by the NSC</p> <p>2. Intent</p> <p>As noted above, the NSC does not apply to <u>specific</u> types of wastes covered by the 1982 Mining Code. The term ‘specific’ is not defined but it implies wastes specific to the mining operations covered by the Mining Code such as tailings, bulk materials and liquids (mullock, ISL liquid wastes etc) and all the other wastes proposed to be caught by the detailed definition of ‘mining and mineral processing’ discussed at the conference.</p> <p>So, presumably the NSC cannot be directly applied to the specific wastes generated by operations caught by the Mining Code.</p> <p>But what about ‘<u>non-specific</u>’ or miscellaneous wastes which are common to the majority of such operations across Australia? (Category A or C materials).</p> <p>Is it the intention of Clause 1.4.5 of the revised Code to suggest the NSC process may actually be applied to the management of the miscellaneous (or other) wastes commonly associated with such operations in Australia?</p> <p>Or not?.</p> <p>The intention of the 2nd para in Clause 3.4.5 is not at all clear and depending on the interpretation it could lead to answers of yes and no to the question above.</p> <p>It is very confusing to note the NSC in the Introduction and then have the Guide deem it to be not relevant in 3.4.5.</p> <p>The reference to the NSC, in its present form, cannot provide any useful guidance for managing the type of wastes generated by operations described or inferred by the revised Code.</p> <p>Suggest:</p> <ol style="list-style-type: none"> 1. Remove reference to the NSC in Clause 1.4.5 of the Code. 	<p>The wording of Clause 1.4.5 has been changed to highlight</p>

SUBMITTER	COMMENT	WORKING GROUP RESPONSE
	<p>2. 2nd para of Clause 3.4.5. If this is the intent of the code, delete all but the first two lines and retain - <i>‘The Code is intended to apply to the management of all radioactive wastes generated by operations to which the Code applies.’</i></p> <p>3. Delete the 4th para of the Clause 3.4.5 as the ‘Consideration of Criteria...’ does not actually exist in its final form.</p> <p>4. Para 5: Suggest delete the last sentence – this comment does not add anything to the meaning of the Code.</p> <p>5. Para 7: - change 2nd sentence to read; <i>‘An example is miscellaneous wastes, or waste arising from handling naturally occurring materials which contains low levels of radioactive contaminants, particularly smaller quantities (eg. equipment from the oil or gas industries or from the fertiliser industry containing radioactive scale).</i></p> <p>Change the 3rd sentence to read: <i>Such waste material may be managed on-site under the provisions of the Code, and guidance on its disposal may be found in the near surface disposal Code (NHMRC 1992).</i></p> <p>Revise the NSC to make it of more explicit use to the Code in dealing with certain wastes on-site associated with mining and mineral processing, as well as useful in locating and operating an isolated repository off-site.</p>	<p>that all radioactive waste generated on a mine or mineral processing site should be managed and disposed of according to the provisions of the Mining Code.</p> <p>The paragraphs of Clause 3.4.5 that refer to the User Disposal Code have been either deleted or modified to make its application clearer. References to the draft near-surface burial publication have been deleted. Clause 3.4.5 has also been modified to make the application of the Near Surface Code clearer.</p> <p>The fourth paragraph of Clause 3.4.5 has been deleted.</p> <p>The whole of the fifth paragraph of Clause 3.4.5 has been deleted.</p> <p>The seventh paragraph of Clause 3.4.5 has been modified such that this sentence no longer exists.</p> <p>The seventh paragraph of Clause 3.4.5 has been modified such that this sentence no longer exists.</p> <p>Much of this submission relates to the Near Surface Code. The revision of the Near-surface Code is not in the Scope of this Code but is an issue that could be raised with the Radiation Health Committee.</p>