

SODIUM CYANIDE - DECISIONS ON REQUESTS FOR VARIATIONS

Request 1: Peacebus.com

This is the variation I seek in the draft assessment: that it assess the environmental impact of cyanide as the key component in the cyanide leach gold beneficiation process, the supply for which is the major cause of its manufacture and bulk transport.

I want to see an Assessment that researches and reports of the outcomes of the cyanide leach gold beneficiation process in past and present of gold mining operations in Australia and in terms of cyanide tonnages, water use, pits size and management, waste rock tonnage and storage, carbon emissions, TSF volume, toxicity of content and life of the toxicity, and TSF leakage and long term management needs.

Decision 1: Variation partly approved.

NICNAS comments 1: The purpose of this assessment is to identify the potential environmental exposure in Australia from the use of sodium cyanide in mining and other industrial purposes, to characterise the hazards associated with sodium cyanide, and to determine the risk of adverse effects to the environment.

The assessment discusses closure and rehabilitation of TSFs in regard to residues of cyanide products, particularly in the context of groundwater management, revegetation, and legislative requirements. The discussion on closure and rehabilitation in Section 5.2.3 will be strengthened.

Wider issues such as energy and water consumption from mining gold, changes resulting in the landscape from mining and production of wastes other than cyanide products are outside the scope of the review. However, a sentence will be added to the discussion by Mudd (2007) on p 23 (Section 4.4.2) to note that this report included comments on these wider issues.

Request 2.1: Newmont Asia Pacific

Recommendation 3 states that transport of sodium cyanide should be conducted according to best practice principles, it continues to reference the Australian Dangerous Goods Code 7 (NTC, 2007). For clarity is NICNAS stating that the Australian Dangerous Goods Code is recognized as best practice?

Decision 2.1: Variation partly approved

NICNAS comments 2.1: The ADG 7 and other relevant transport requirements, codes and guidance material represents best practice. The Recommendation 3 will be redrafted to make this clear, as follows:

“Transport of sodium cyanide should be conducted according to the requirements specified in the Australian Code for the Transport of Dangerous Goods by Road and Rail (7th edition - ADG7) and the associated State/Territory legislation that gives it effect.

The Australian Dangerous Goods Code, and other relevant transport requirements, codes and guidance material, provide best practice provisions in order to reduce the likelihood of, or lesson the impacts of accidents leading to sodium cyanide release to the environment.

These provisions include the following ...”

Request 2.2: Newmont Asia Pacific

Recommendation 5a: The ICMC states in its Standard of Practice 4.4 that operations should *"Implement measures to protect birds. Other wildlife and livestock from adverse effects of cyanide process solutions"*. It goes further to acknowledge in the guidance that concentrations of 50mg/L WAD Cyanide or lower are typically viewed as being protective of wildlife. As noted by the report there is a lack of empirical data to demonstrate application of a more stringent limit and as such the limit of 50ppm is the most appropriate limit.

Where operations are discharging WAD cyanide at concentrations greater than 50ppm and do not have significant mortalities attributable to cyanide, the Code allows for an operation to demonstrate, via scientific peer review, that protective measures are in place at that specific operation. The NICNAS report does acknowledge salinity as one protective measure but the ICMC does allow operations to demonstrate other protective measures. At It is recommended that the report be adjusted to acknowledge that where operations discharge greater than 50ppm WAD cyanide other protective measures can be demonstrated. This is particularly relevant to the table in Recommendation 5a and should be included in the Strategy column and the Comments column.

Decision 2.2: Variation approved

NICNAS comments 2.2: Text will be added to the preamble of Recommendation 5a to acknowledge that there may be circumstances other than hypersalinity where a WAD CN limit could exceed 50 mg/L without adverse effects to wildlife, following a case-by-case site-specific analysis in consultation with the relevant state or territory regulator.

Text will also be added to the end of Section 5.2.3 to note that in some instances a higher WAD CN concentration than 50 mg/L may be acceptable for reasons other than hypersalinity. The text will cite the site specific example provided by Newmont, where high turbulent flow and suspended solids, and the particular bird species present at site, minimise potential exposure of birds in the vicinity of the discharge spigot.

Request 2.3: Newmont Asia Pacific

Pg xxii states that *"Facilities should aim to achieve maximum WAD CN concentrations below 50mg/L in waters accessible to wildlife by the end of 2012 unless they can demonstrate to the satisfaction of state/territory agencies that local conditions warrant a higher target and that other factors or measures taken adequately prevent exposure of birds and animals to water..."*, it is recommended that the following or similar be included at the end of this statement: *-- or operations be certified to the International Cyanide Management Code*. As already stated the Code requires a scientific peer review process to demonstrate protective measures for discharge >50ppm WAD CN. The Code further requires demonstration of code compliance, including protection of wildlife as part of the third-party re-certification process every 3 years.

Decision 2.3: Variation partly approved

NICNAS comments 2.3: A reference to certification by the ICMC will be added to p xxii (end of first paragraph) as follows: "Subject to agreement by state/territory agencies, this may be adequately demonstrated with certification by the International Cyanide Management Code." It is the relevant state/territory agency that must approve the performance of a facility.

Request 2.4: Newmont Asia Pacific

It is also recommended that the report formally recognize the ICMC as leading practice in the management of cyanide. This would assist both gold mining companies and regulators.

Decision 2.4: Variation partly approved.

NICNAS comments 2.4: The ICMC is designed to set standards of practice for the safe management of cyanide in gold mining. The ICMC is a voluntary initiative and intended to complement an operation's existing regulatory requirements rather than replace them. The report will be updated to indicate that the Code is an excellent initiative to assist in the safe management of cyanide at sites that implement the code.

Request 3.1: International Cyanide Management Institute (ICMI), Washington, DC 20006, USA

(1) We note that the report focuses on a concentration of 50 mg/L WAD cyanide as being generally accepted as protective of wildlife mortality, but expresses concern that lower concentrations may still be harmful. It is our view that in the absence of empirical data to the contrary, this is the appropriate limit for wildlife exposure.

(2) However, it would appear that hypersalinity is not the only situation where higher concentrations do not pose a threat to wildlife, and suggest that gold mines be allowed to present peer-reviewed scientific studies in support of higher levels under site-specific circumstances.

Similarly, where monitoring demonstrates that concentrations below 50 mg/L WAD cyanide are causing wildlife mortality, a lower level should be required.

Decision 3.1: Variations partly approved

NICNAS comments 3.1:

(1) Absence of empirical data are not sufficient to make a judgment that there are no mortalities or other effects in all situations <50 mg WAD CN/L.

Laboratory data indicate the possibility of harmful effects occurring at WAD CN levels below 50 mg/L. Moreover, field data indicate that some deaths occur at WAD CN levels below 50 mg/L. The contribution of cyanide toxicity to the overall deaths at WAD CN levels below 50 mg/L cannot be determined with certainty. The text will therefore be modified where appropriate to note the uncertainty about the causes of mortality in the 10 – 50 mg WAD CN/L range.

(2) Text will be added to Recommendation 5a to acknowledge that there may be circumstances other than hypersalinity where a WAD CN limit could exceed 50 mg/L without adverse effects to wildlife, following a case-by-case site-specific analysis in consultation with the relevant state or territory regulator. In relation to lowering the concentration below 50 mg/L WAD CN based on monitoring, this has been addressed in the second paragraph below dot point iv in Recommendation 5a.

Request 3.2: ICMI, Washington, DC 20006, USA

On page 250 of the report, you have cited some figures regarding the involvement of the Australian gold mining industry in the International Cyanide Management Code. There has been considerable growth in this regard since the report was drafted. At present, a total of 17 operations in Australia are subject to the Code, including 10 gold mines, two cyanide producers and one cyanide transporter. Ten of these mines are now certified in compliance with the Code, as well as both producers and the transporter.

Decision 3.2: Variation approved.

NICNAS comments 3.2: Consultation of the more up to date ICMC website on 20 October 2009 confirms that there are now 10 gold mine operations which have been certified, plus another four where intention to certify has been notified (ie 14 gold mine operations in total). In addition, there are two certified manufacturers and one transporter which have been certified in Australia. The text on p 250 (Section 11.12.4) will be updated accordingly.

Request 3.3: ICMI, Washington, DC 20006, USA

You also cite on page 250 the continuing progress that is being made in the adoption of the Code in Australia, but further note that while about 65 percent of the gold produced in Australia is from mines implementing the Code, a large number of mines have yet to formally adopt it. One way to achieve broader adoption would be for the Australian government to formally recognize the Code as an instrument of leading practice that can provide some of the environmental protection otherwise required under its laws and regulations. This would both encourage mines to implement the Code as well as reducing the burden on the mines.

Decision 3.3: Variation partly approved.

NICNAS comments 3.3: The ICMC is designed to set standards of practice for the safe management of cyanide in gold mining. The ICMC is a voluntary initiative and intended to complement an operation's existing regulatory requirements rather than replace them. The report will be updated to indicate that the Code is an excellent initiative to assist in the safe management of cyanide at sites that implement the code.

Request 4.1: Minerals Council of Australia (MCA)

Accompanying the draft NICNAS report is the NICNAS Existing Chemicals Information Sheet, 11 September 2009. This document summarises the findings of the draft NICNAS report. It states on page 1, para 2, line 2, "The assessment findings indicate ... (with) implementation of existing Commonwealth and state/territory legislation and voluntary measures result in low risks to the environment."

This finding needs to be clearly articulated in the Overview of the draft NICNAS report.

Decision 4.1: Variation partly approved

NICNAS comments 4.1: The Overview of the report will be updated to include the following text (second last paragraph):

The assessment findings indicate that for a number of steps in the supply chain (for manufacture, storage, release of cyanide during gold ore beneficiation use, base metal floatation and minor industrial uses), implementation and monitoring of compliance with

existing Commonwealth and state/territory legislation and voluntary measures results in low risks to the environment. However, to manage risks to the environment, NICNAS recommends compliance with best practice principles for transport of sodium cyanide and a framework approach to minimise the risks to wildlife at TSFs and heap leach facilities where sodium cyanide is used are recommended.

Request 4.2: MCA

Overview - pages ix to xxix:

(1) The 20-page Overview is essentially an executive summary to the 280-page document. Consequently, it is likely the only section to be read completely. The tone, arguments and findings are determined and provided in this section. An overview must only include matters of fact, findings, recommendations and limitations. The inclusion in the second sentence of “reports of mass bird poisons”, which is anecdotal information, is contrary to the findings of low environment risks, page 1, para 2 of NICNAS Existing Chemicals Information Sheet, Sodium Cyanide, 11 September 2009.

The continual reference of anecdotal “mass wildlife deaths” information worded as fact distracts from the objectiveness of the Overview and needs correction.

(2) On assessing the draft NICNAS report, the findings of low environment risk are valid for those operations that adhere to legislative and voluntary guideline requirements. The Overview does not state this finding.

Decision 4.2: Variations partly approved

NICNAS comments 4.2:

(1) Paragraph 1 of the Overview will be amended to indicate that reports of mass bird poisoning occurred prior to 1999. The second paragraph will be amended to note that the purpose of the assessment is to test the validity and impact of the issues raised during declaration of sodium cyanide as a PEC. Sodium cyanide was nominated for consideration as a Priority Existing Chemical in 1999. One of the reasons for declaration of sodium cyanide for assessment was mass bird deaths incidents reported prior to that time, most particularly the incident at Northparkes gold mine in NSW in 1995, which has been well documented. The anecdotal nature of other, earlier reports, and the fact that no major incidents have been reported in more recent years will be made clear in the Overview, and where discussion of mass bird deaths incidents arises elsewhere in the report.

(2) The Overview will be amended to include:

The assessment findings indicate that for a number of steps in the supply chain (for manufacture, storage, release of cyanide during gold ore beneficiation use, base metal floatation and minor industrial uses), implementation and monitoring of compliance with existing Commonwealth and state/territory legislation and voluntary measures results in low risks to the environment. However, to manage risks to the environment, NICNAS recommends compliance with best practice principles for transport of sodium cyanide and a framework approach to minimise the risks to wildlife at TSFs and heap leach facilities where sodium cyanide is used are recommended.

Request 4.3: MCA

The draft NICNAS report suggests a 2012 phase-in (page xxii, para 1) by industry and regulatory authorities. It is extremely important that the 'other measure' available to control exposure are not unnecessarily limited, as technological advances and scientific understanding improves, new more efficient techniques will develop through time.

Decision 4.3: Variation approved

NICNAS comments 4.3: Note that the start of the first paragraph on p xxii already states "This framework could be enhanced in the light of further laboratory data, field evidence and experience." The example of peer-reviewed scientific studies which show that WAD CN concentrations exceeding 50 mg/L may be acceptable for a specific site-for reasons other than hypersalinity will be added to this paragraph.

Request 4.4: MCA

Quantifying Risk to Wildlife - Risk Quotient Modelling, Section 10.2 - A risk quotient model has been used in an attempt to quantify a toxicity threshold for birds and mammals. Such a model produces risk quotient values (RV) where an acceptable low risk provides a RV value of 1. Input values, the mathematics modelling or which risk quotient model used are not provided.

The risk quotient model requires the following input: laboratory acute oral exposure (hazard); and drinking volumes (dosage). As the draft NICNAS report itself states, 10.2.1 page 195, para 1, "there are various deficiencies...to drink (volume) water studies". The risk model used an assessment factor (AF) of 10, essentially a precautionary principle safety factor to address incomplete and uncertain data inputs. Consequently, the risk quotient model determined that an acceptable toxicity threshold is ≤ 1 mg/L WAD cyanide concentration at discharge to a Tailings Storage Facility (TSF).

The uncertainty of data, particularly how much birds drink at a TSF solution pond is variable, uncertain and actually unknown (section 9.2.1).

Other uncertainties are: pH value of gastric juices of wildlife (section 9.2.3); chemistry of tailings solutions are different to NaCN, which is administered to wildlife in laboratories; and different wildlife species (see also page 197).

The uncertainties are stated within the draft NICNAS report. The modelling outcome reflects the uncertainty of input data and produced a nonsensical outcome in conflict with field-based observational literature (see page 190 para 3). However, the draft NICNAS report needs to clearly state this to avoid misinterpretation of the numerical model finding.

The outcome of this exercise illustrates the difficulty in determining toxicity thresholds with this issue and is reflected in recommendation 5 through the emphasis on improved monitoring, data collection and reporting.

A contentious issue of sub-lethal impacts at below 50 mg/L WAD cyanide has been raised in the report. There is limited laboratory or field data to make an assessment of this issue however it is likely to be an identified risk in future work.

Decision 4.4: Variation partly approved.

NICNAS comments 4.4: Environmental risk assessment of industrial chemicals in Australia is conducted according to the "Environmental Risk Assessment Guidance Manual for Industrial Chemicals", available at <http://www.ephc.gov.au/taxonomy/term/75>.

The manual has been endorsed by the Environment Protection and Heritage Council (EPHC) and accords to international best practice. This text will be added to the report. As explained in this document, in the deterministic risk assessment approach used in Australia, the primary outcome of quantitative risk characterisation for a chemical is the calculation of the risk quotient (RQ) determined from the outcomes of the exposure and effects (hazard) assessments ($RQ = PEC/PNEC$).

For sodium cyanide, the most reliable laboratory data available at the time of the assessment were used to determine the PNEC, using an assessment factor, as described in the Risk Assessment Manual. A probabilistic approach was considered for calculation of the PNEC, but there were insufficient data for this to be warranted. The methodology in Australia is to consider the worst-case exposure conditions when modelling from laboratory data, then mitigate as appropriate, including the consideration of other data. Thus the report has initially considered the risks using a RQ approach, and recognising the uncertainties in exposure has then examined available field data (see response to 4.6 – 19).

The text in the Overview relating to risk assessment will be amended (third paragraph under ‘Risk characterisation and management’) to make it clear that the contribution of cyanide toxicity to the overall deaths at WAD CN levels below 50 mg/L cannot be determined with certainty.

The framework in Recommendation 5a takes into account ongoing monitoring data for the individual site and allows a lower concentration level to be put in place if harmful effects were to arise at the concentration control level in place. The framework is intended to be flexible and adaptable and can be enhanced in the light of further laboratory data, field evidence and experience.

Request 4.5: MCA

(1) Recommendation 5a - Differentiation of category 1 and 2 is not necessary and is poorly developed from the risk assessment. This is not necessarily a practical issue but an academic one.

Decision 4.5: Variation approved.

NICNAS comments 4.5: Category 1 in the framework will be clarified and more clearly related to assessment outcomes. While the main purpose of the framework is to protect avian and mammalian wildlife, it also includes strategies to protect aquatic organisms.

Request 4.6: MCA

Specific changes requested to the report and how these will be addressed, are provided in the following table.

	Comment	NICNAS response on variation
1	Page ix, para 1, line 2, page ix, para 7, line 5, “reports of mass bird poisonings”, and page 181, para 4, line 1, p182, para 4 line 1, are anecdotal and should not be reported as fact.	Partly approved. The use of the term ‘anecdotal’ indicates the nature of the evidence. However, each incidence of the word ‘anecdotal’ will be checked to ensure it is used accurately and appropriately. The Northparkes Gold Mine mass bird death incident in NSW in 1995, prior to nomination of sodium cyanide for review in 1999, is well documented (see Section 9.9.2). The fact that no major incidents have been reported in more recent years will be made clear in the Overview, and the anecdotal nature of other reports will be clarified where discussion of mass bird deaths incidents arises elsewhere in the report. - see comments 4.2 and 5.3. Some changes will be made to the paragraphs noted on p 181 and 182 – see items 14 and 15 below.
2	Page x, para 2, line 9, “Some forms of cyanide, such as weak metalocyanide complexes, may contribute to toxicity to wildlife.” This is inaccurate. Weak metalocyanide complexes in TSFs increase the bioavailability of cyanides to wildlife, not toxicity. WAD cyanide is not more or less toxic than free cyanide.	Partly approved. The text will be amended to make this clear by adding – ... may increase bioavailability, to contribute to increased toxicity to wildlife.
3	Page x, para 3, line 9, “WAD cyanide concentration in TSFs vary widely from ~1 – 10 mg WAD CN/L where cyanide has been largely destroyed.” This assumption is inaccurate. TSFs with low metalocyanide complex concentrations are often below 10 mg irrespective of treatment or detoxification. TSFs that contain cyanides > 50 mg/L are usually the result of high concentrations of metalocyanide complex formation.	Approved. The text will be amended to make this clear.
4	Page x, para 5, line 5, “wildlife may be exposed to residues (of cyanide) in water at TSFs and heap leach facilities”. Wildlife is more likely to be exposed with the application of cyanides (not residues) on heap leach facilities.	Approved. The text will be replaced with separate sentences discussing heap leach and TSF facilities so the distinction between free CN and WAD CN is clear.

5	Page xiii, para 4, line 4, “adequate indicator of the toxicity of contaminated water to birds”, should read “adequate indicator of concentration of contaminated water to birds”. Free and WAD cyanide are measures of concentration and bioavailability, not toxicity.	Approved. The text will be amended appropriately.
6	Page xiii, para 7, line 6, “On this basis, the risk assessment indicated a highly conservative WAD CN concentration in water of ≤ 1 mg/L”, should read “On this basis, the model indicated...”. The model developed a concentration ≤ 1 mg/L, but the risk assessment produced an equivalent management concentration of < 50 mg/L. This is an important distinction and needs correction.	Partly approved. The text relates to risk assessment based on an RQ approach and the remainder of this paragraph then goes on to discuss risk assessment based on field studies. The text will be amended to make this more transparent. (See comments to 4.4)
7	Page xxiii, Table 5a, column 4, row 3, a definition of hypersalinity is required here.	Approved. A definition will be included in Column 1, row 3
8	Page xxiv, Table 5a, column 2, row 3, replace “satisfactory” with “consistently”.	Approved. The word will be replaced as proposed under Category 2, column 2.
9	Page xxiv, Table 5a, category 1, should include management of TSF as low wildlife visitation system as a contingency precaution if cyanide concentration increases, for example, by detoxification malfunction. This approach of reducing exposure is consistent with risk assessment principles.	Approved. The framework table will be amended to note under comments for Category 1 that as a contingency precaution it is still necessary to have steps in place to minimise wildlife visitation and for monitoring, e.g. in the event of detoxification malfunction.
10	Page xxvi, para 6, line 3, “monitoring of birds”, replace with “monitoring of wildlife”.	Approved. The word will be replaced as proposed.
11	Page 94, para 2, line 7, should read “much less so over the TSFs”.	Approved. The text will be corrected as proposed.
12	Page 97, para 2, line 9, heap leach facilities were not studied by Adams et al. (2008 a,b,c).	Approved. The text will be removed.
13	Page 176, para 4, line 4, the reports of carcasses found and subsequent cyanide concentrations collected do not equate to toxic threshold. Cyanide concentrations prior to observed deaths can be used to infer toxicity thresholds. This qualification is necessary (see page 200, para 4, line 6).	Approved. The text will be amended to note the uncertainty in exposure and cause of death of the mouse as well as the dead bird referred to in the same paragraph.
14	Page 180, para 2, line 5 and page 181, para 4, line 5, Ryan and Shanks reports are anecdotal and should be stated as such.	Partly approved. The text on p 180 will be amended to indicate that this report is anecdotal, with no source indicated and no further details provided. The text on p 181 will be amended to indicate that the paper cited a letter from the Office of the

		Supervising Scientist as a source for this report.
15	Page 182, para 4, the ERA questionnaire is not a systematic causal study of cyanide concentration and wildlife deaths and any inference of toxicity thresholds from this data is erroneous and should be removed. This limitation should be clearly stated in Table 9.17 (page 183) (see section 9.9.3 for such limitations).	Approved. The nature of this information will be made clearer and cross reference made to Section 9.9.3.
16	Page 200, para 5, line 3, Estrildid finches are only likely to drink from the TSF if there is vegetative cover to do so. This was not the case in the study by Donato (1999).	Approved. The interpretation of the data on Estrildid finches will be clarified in the report. Spelling of the word Estrildid will also be corrected.
17	Page 201, para 3, line 6, background mortality exists on all water bodies and TSFs irrelevant of cyanide concentrations. Background mortality is one source of wildlife deaths at TSFs that operate below 50 mg/L WAD cyanide concentration.	Approved. A comment will be added to note that the contribution of cyanide toxicity to the overall deaths at WAD CN levels below 50 mg/L cannot be determined with certainty.
18	Page 201, para 4, line 8, the draft NICNAS report needs to clearly state that the 50 mg/L threshold is a guideline (ICMI 2006) and part of the risk-based framework, and not viewed as a toxicity threshold or “safe level”. This needs to be accurately reflected throughout the document (see also page 204, para 5, line 8 and page 244, para 1, line 5).	Partly approved. The words on p 201 are discussing risk assessment, specifically to make the point that there may be impacts below 50 mg WAD CN/L. Text discussing the ICMC 50 mg WAD CN/L threshold will be adjusted to make it clear that the ICMC threshold is considered a guideline for risk management and is not intended to be viewed as a toxicity threshold or safe level.
19	Page 204, para 6, line 3, should read “with some theoretical mortality possible”.	Partly approved. The paragraph will be amended to indicate that the risk quotient based assessment approach used laboratory data.

Additional comment from MCA

The implementation of recommendations 5 and 6 would be a significant technological and management investment by many second-tier and smaller operations. As per the COAG commitments outlined above, regulatory impact statements should consider these costs if the recommendations are adopted via regulatory means.

Comment noted. Decisions regarding the need to prepare regulatory impact statements will be the responsibility of individual states/territories, which have responsibilities for implementing the recommendations.

Request 5.1: Anglogold Ashanti Australia

The Preface/overview is the most important section of this report. This will be the key area that most readers will focus on to obtain the overall outcome. I note that hyper-salinity is a key protective mechanisms provided both by chemical and ecological. Therefore there needs to be a section in the Preface/Overview on this topic.

Decision 5.1: Variation approved.

NICNAS comments 5.1: The importance of hypersalinity is recognised, and will be addressed in a separate paragraph along with other site specific environmental conditions.

Request 5.2: Anglogold Ashanti Australia

Throughout the report it is unsure whether the reference is made to a ‘fresh’ or hyper-saline environment. Be specific and clear.

Decision 5.2: Variation approved.

NICNAS comments 5.2: A sentence defining the ranges of dissolved salts pertaining to fresh, saline and hypersaline water will be added to Section 7.3.1. The type of water will be qualified as fresh, saline, hypersaline or unknown where relevant in the discussion of wildlife mortality data.

Request 5.3: Anglogold Ashanti Australia

Anecdotal Evidence –

(1) The assessment report still repeatedly refers to ‘anecdotal information’ of mass wildlife deaths. This provides the impression to the reader that massive wildlife deaths are typical of operating tailings dams today. This is not correct. The use of the word ‘Anecdotal’ is throughout the document and should not be used in a scientific review unless it can be referenced.

(2) There are few reported wildlife deaths in the literature and the draft paper is more accurate in referring to the lack of transparency regarding the reporting of wildlife deaths. It should also note that the International Cyanide Management Code (Code) compliant gold mining operations do not have wildlife deaths and a system of Code governance and transparency does exist.

(3) The draft paper makes the mistake of referring to anecdotal information of some wildlife deaths below 50 mg/L WAD cyanide as fact and incorporates this into the decision making process (and risk quotient model). Wildlife deaths on tailings dams at below 50mg/L have not been confirmed as cyanosis deaths.

Decision 5.3: Variations partly approved.

NICNAS comments 5.3:

(1) The use of anecdotal evidence indicates the nature of the evidence. However, each incidence of the word ‘anecdotal’ will be checked to ensure it is used accurately and appropriately.

(2) The available information on wildlife deaths have been reviewed and included in the assessment. However, the extent of monitoring and reporting of wildlife deaths is unclear.

(3) The discussion regarding field studies in Sections 9.9, 10.2.3 and 12, and in the Overview and introductory text to Recommendation 5a will be amended to make it clear that the cause of deaths at cyanide concentrations below 50 mg/L is unclear, and the contribution of cyanide toxicity cannot be determined with certainty.

Request 6: NSW Department of Environment, Climate Change and Water

1) Page 211, 4th paragraph – remove ‘by the relevant Minister’

Decision: Variation approved.

NICNAS comments: The text referred to will be removed.

2) Page 214, Table 11.1 – Road and Rail Transport (Dangerous Goods) Act (1997); Road Transport Reform (Dangerous Goods Regulations (1998); Road & Rail Transport (Dangerous Goods) (Road) Regulation (1998); Road & Rail Transport (Dangerous Goods) (Rail) Regulation (1999) - replace with Dangerous Goods (Road and Rail Transport) Act 2008; Dangerous Goods (Road and Rail Transport) Regulation 2009.

Decision: Variation approved.

NICNAS comments: The table will be updated as indicated.

3) Page 216, paragraph 3 – remove ‘the risk of violent reaction or explosion’. This is not consistent with the text in the ADG Code.

Decision: Variation partly approved.

NICNAS comments: The text regarding the meaning of the HAZCHEM and HIN descriptors has been reworded to ensure the meaning is clear.

4) Page xxiv, second column on the last row - Add: See Recommendations Section 4. The table entitled: ‘Recommendation 5a: Framework for management of risks to wildlife from sodium cyanide use in gold mining’ does make it clear that effluent containing less than 10 mg/L CN cannot be discharged directly to the environment. A link is needed to the relevant part of the discussion relating to Recommendation 4.

Decision: Variation approved.

NICNAS comments: The table will be amended to include ‘see Recommendation 4’.