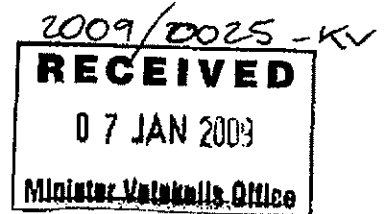




The Honourable Kon Vatskalis MLA
Minister for Primary Industry, Fisheries and Resources
GPO Box 3146
Darwin NT 0801



1 January 2009

Dear Kon

Independent Monitor - Audit Report on the McArthur River Mine

I refer to your letter dated 11 December 2008, in regards to the Independent Monitors audit Report.

McArthur River Mine has provided comments which are attached for your perusal.

The compilation of these comments has been made by my environment staff and an array of consultants that have been employed over the duration of the report period.

McArthur River Mine feels that it is imperative that these comments are taken into consideration in order for the mine to be assessed appropriately against its approved activities.

Whilst McArthur River Mine is supportive of an audit process as part of the Mines approval, it is felt that Environmental Earth Sciences (EES) has not followed audit protocol correctly. In the main they have relied on one piece of documentation, namely the Annual Environmental Report as a source of all environmental data throughout the whole report, when other evidence could have been provided if it was requested.

My other area of concern is the total lack of communication with EES. In the majority of cases my staff have had to follow up EES in order to obtain information on audit criteria, inspection dates and general correspondence which have been the basis for the whole audit process.

For the future, this issue must be alleviated in order to effectively manage the audit process.

Yours Faithfully

A handwritten signature in black ink, appearing to read 'Etienne Moller'.

Etienne Moller
emoller@xstratazinc.com.au
Direct Dial: 08 8975 8263



McArthur River Mining Pty Ltd
PO Box 36821, Winnellie NT 0821, Australia
Tel +61 88975 8179
Fax +61 88975 8170
www.xstrata.com

ABN 90 008 167 815

**MRM Comments on the Independent Audit Report of the McArthur River Mine,
October 2006 – September 2007**

	Page	Para	Comment
1	Ex Sum	4	Audit performance criteria and/or definition of 'significant non-conformance or incomplete conformance' not provided
2	Ex Sum	5	Sampling manual (MRM Environment Technical Manual) available but not requested by EES
3	Ex Sum	6	'Considerable data gaps in the monitoring results provided' . A fundamental flaw in the assessment of performance at MRM is that EES relied heavily on the Annual Environment Report (AER). MRM acknowledge that the Draft AER was inadequate (and was subsequently rejected by DRDPIFR). Furthermore with the exception of surface and groundwater laboratory data (2005-07) no further data were requested by EES to substantiate this statement. The AER was overhauled and re-submitted to DRDPIFR in November, 2008 with significant improvements in both data collation and interpretation
4	Ex Sum	6	'... inadequate, or even in some cases non-existent, interpretation of the monitoring works undertaken, either by MRM internally or by external consultants' . With reference to external consultants this comment is unsubstantiated. External consultant reports are available and MRM question EES' effectiveness in identifying and requesting relevant reports. Furthermore, several reports reviewed as part of the audit detail monitoring undertaken outside of the stated audit period
5	Ex Sum	8	'Recommendations have been provided for adjustments in the analytical suites for surface water and groundwater monitoring programs'. Section 2 of the EES report outlines the audit methodology; which does not include the provision of recommendations
6	6	2	The auditing period is stated as being Oct 2006-Sept 2007. However, the EES report consistently provides comment to monitoring and/or reporting undertaken outside of this period
7	6	3	The role of EES is to undertake an independent assessment of performance and report conformance against approval documentation (i.e. the MRM MMP and PER documentation) and statutory operating conditions. Report findings consistently fall outside of the scope provided in Section 2. Specifically, the authors re-examined approval documentation, often questioned the findings and recommendations of external consultants and go on to make alternative recommendations highlighting additional works that should be undertaken by MRM
8	7	2	Personnel Interviewed. The inference of communication with those listed is misleading. MRM is of the opinion that EES has poorly managed this audit process with insufficient communication between both MRM and EES and ESS and the remaining assessment team (including DRDPIFR). This has resulted in

	Page	Para	Comment
			an erroneous and incomplete assessment of performance
9	10	2	'... the procedural documentation for undertaking this work, that is sampling manuals, training procedures and checking competency of staff, was not evident at the time of inspection '. This documentation is in place and implemented and, if requested, would have been made available to EES
10	10	2	'Procedural documents pertaining to the check-monitoring were provided by DRDPIFR after the inspections and these will be assessed against future check-monitoring events'. Such documents should be reviewed as part of the current event
11	10	4	Monitoring has been undertaken as per approval documentation, which was deemed sufficient and appropriate by both the NT and Commonwealth governments. MRM acknowledge the reporting of monitoring undertaken, in the form of the AER, was previously inadequate which has since been rectified. Section 4.2.2, goes further to provide a literature review of pro-active monitoring, which is irrelevant and it's inclusion inappropriate
12	12	3	' There are no laboratory transcripts, chain of custody forms and quality assurance/control interpretation of the results '. Laboratory transcripts and submission forms (chain of custody) are available and, if requested, would have been made available to EES. Post audit data management has been significantly improved, including the import of data to the electronic database; MonitorPro. QA/QC procedures are currently under review
13	12	3	' There is no record of field observations and measurements including standing water levels (SWLs), pH, EC redox potential, temperature, odour, colour and bore yield '. Field measurements are routinely undertaken with data previously recorded in hardcopy. Data were not presented in the AER due to abundance (2005-08). Hardcopies of field observations, if requested, would have been made available to EES (with only laboratory surface and groundwater data requested post site visit by EES). Field observations are now electronically stored in MonitorPro and will be reported in future AERs
14	12	3	' There are no records of monitoring undertaken on the "T" nomenclature bores... Due to environmental concerns MRM will approach stakeholders on the re-commencement of monitoring these bores'. Unable to re-commence monitoring without TO approval
15	13	1	'... "the rise in groundwater leakage under the embankments..."'. The audit is not an audit of the Draft AER and specific sentences should be reviewed with caution. The groundwater sections of the AER have been updated, with a thorough review of both groundwater levels and quality undertaken
16	13	3	Post audit MRM have re-addressed the monitoring program, including groundwater laboratory analysis, to ensure compliance with the current MMP
17	13	4	There is no requirement, or need, to prepare a separate groundwater monitoring report. Groundwater data will be presented annually in the AER, with operational/management strategies (previously provided in the MMP) to be outlined the newly required Water Management Plan (WMP)
18	13	5	'For the 2006-07 monitoring period...'. Sentence should be in past tense. Significant improvements have been made since 2007
19	14	2	Groundwater and surface water data (level and quality) were used by MRM to determine installation success (discussed in Final AER, 2008). This was not a requirement of the SoilCon Systems reports

	Page	Para	Comment
20	14	5	'Surface water monitoring results in Surprise Creek... This reduction in concentrations could be due to higher stream flows during this monitoring period compared to the past, just as easily as a reduction of contaminated groundwater into the Surprise Creek'. Surprise Creek is ephemeral (only runs for a short period of time post rainfall). In addition, a decrease in the total annual rainfall has been observed at MRM since 2005 (representation of rainfall in the Surprise Creek catchment)
21	14	6	The electromagnetic survey will be repeated in 2009 following wet season operation of the TSF recovery bore system (now operational). The cut-off wall and recovery bore system are to be used in conjunction (as recommended by URS), with the latter addressing seepage from/to the underlying siltstone and dolomite and concerns raised by EES in page 14 paragraph 2
22	14	7	Documents reviewed. Incorrect referencing (ANZECC, 2000 and not NEPC, 1999 applicable to surface water)
23	15	2-3	Comments as per Reference 11, 12 and 13
24	15	3	' There are substantial data gaps where there is no record... ' Post audit data management has been significantly improved (as per Reference 12). In addition, the collection of surface water will only be undertaken when creeks/streams are flowing, with field notes taken as to why sampling was not completed on any occasion (e.g. inaccessible)
25	15	4-5	' Furthermore, there are no analytical results or interpretation of results for the potable water, seawater and artificial water monitoring programs '. Monitoring of potable, seawater and artificial water was undertaken; however, EES did not request this data from MRM (with audit findings based solely on the Draft AER)
26	15	6	Post audit MRM have re-addressed the surface water monitoring program, including field and laboratory analysis, to ensure compliance with the current MMP. Recommendations for improvement were cut and paste from surface water
27	16	4	Documents reviewed. Query relates only to dust. Again ANZECC, 2000 missing (in relation to sediment)
28	16	5-6	Dust monitoring. The Final AER, 2008 removes reference to background levels and focuses on spatial and temporal trend analysis (due to insufficient pre-mining data). The AER provides Total Solids, lead and zinc data and interpretation. EES did not request this data from MRM (with audit findings based solely on the Draft AER)
29	17	4	'Observations by the independent monitor...'. Subjective observations of 'significant amounts of dust', in May 2008, should be substantiated with data or removed from the report. Rehabilitation of Cell 1 is now almost complete.
30	17	5	Soil monitoring. The Final AER, 2008 provides cadmium, copper, lead and zinc data and interpretation for all sites sampled at MRM and the Bing Bong Port Facility. EES did not request this data from MRM (with audit findings based solely on the Draft AER)
31	17	6	'Furthermore, the AEMR and MMP uses the NEPM (1999) health based soil investigation levels for commercial/industrial land use as trigger levels for assessing whether "a contaminated site investigation is required"...'. In the absence of Ecological Investigation Levels or site specific trigger values (due to

	Page	Para	Comment
			insufficient pre-mining data) the application of default trigger values, as per the NEPC guidelines, is appropriate. MRM do not consider the application of default trigger values as a 'license to pollute' or an abuse of investigation levels as inferred by the EES report
32	17	7	All soil sampling locations are within the lease and therefore the application of commercial/industrial trigger values is appropriate. Comparison is made to the HIL (E) Parks and recreational open spaces in the Final AER, 2008 with only those sites immediately adjacent to the ROM pad/Pacrim yard reporting metal concentrations above the HIL (E) respective trigger values
33	17	7	The Final AER, 2008 removes reference to background concentrations and focuses on spatial and temporal trend analysis (due to insufficient pre-mining data). MRM envisage site specific remediation criteria will be developed and integrated into closure planning
34	17	8	Sediment monitoring. 'Similar to other sections of the AEMR, page 50 of the AEMR states...'. The Final AER, 2008 has been updated with appropriate comparison and analysis of spatial and temporal trends in sediment quality
35	17	8	'Similar to other sections of the AEMR, page 50 of the AEMR states...'. Throughout the EES report, the application of national, recognised, trigger values is questioned. Until sufficient data can be collated to develop either site or contaminant specific trigger values, MRM will continue to apply default trigger values. Where able, MRM has proactively developed site specific (HMTV's for surface water) or contaminant specific (sulphate trigger values for surface water) trigger values
36	18	3	'Similarly to the soil monitoring, the AEMR provides only data for Pb and Zn...'. EES did not request this data from MRM (with audit findings based solely on the Draft AER)
37	24	3	<p>'Based on the site inspection (refer to photographic evidence in Appendix D), it is evident that the dredge spoil dump at the Bing Bong port facility has not been effectively monitored or managed, with significant amounts of saline dredge spoil observed to be outside the bund walls and fence lines'. This comment is ludicrous. A single photo is not evidence of environmental impact. EES have no data to substantiate this comment. Furthermore EES did not request environmental data from MRM or undertake any independent monitoring. With regards to 'saline dredge spoil' observed to be outside of the bund walls and fence line this is simply incorrect. All material pumped during dredging operations has been successfully placed and contained within the ponds. And with the exception of minor erosion the integrity of the bund walls has remained intact (with no overtopping).</p> <p>The photo is not labeled but from a working knowledge of the site it appears to have been taken from the final pond looking ESE; a naturally low lying area with a significant drainage channel running approximately east to Mule Creek. The chosen photo, taken mid-wet season, misrepresents current status. Furthermore, EES has again diverged from the scope of the audit (reporting period).</p> <p>Finally, if the 'observation' of saline dredge spoil placement refers to 'salt marks', EES would only have to review any of the annual aerial surveys to see the entire area is brackish/saline with ample evidence of natural scarring. Abstract from the Environmental Management Plan (EMP) Bing Bong Swing Basin 2008 Dredging Program: The landscape surrounding the port facility consists of saline tidal flats with scattered chenopod low shrubland (Wilson et</p>

	Page	Para	Comment
			al. 1990). These saltflat communities have developed where tidal inundation is infrequent and evaporation causes high salinity levels (Hollingsworth, Dames & Moore, 1992). Baseline surveys conducted during the Environmental Impact Statement (EIS) determined that the soils on the chenier plains and relict dune systems at Bing Bong were alkaline (pH values 8-9.5) and saline with Electrical Conductivity (EC) values up to 5.4 mS/cm (Hollingsworth Dames & Moore, 1992)
38	24	4	'We note that on-ground works for a rehabilitation research project started in February 2008... this does not detract from the current condition of the dump'. The area is called the 'dredge spoil stockpile' and should be referenced as such. The choice of the word 'dump' is inappropriate
39	25	2-3	'During the site inspections...'. Inclusion unnecessary as outside of audit reporting period
40	25	4	'The target Factor of Safety (FoS) for each of the cases presented at the TSF...'. Inclusion unnecessary as outside of scope of audit (re-interpretation of external consultant reports reviewed and approved as part of the PER)
41	26	2-3	'We note that the model assessed by AWA...'. Inclusion unnecessary as outside of scope of audit (re-interpretation of external consultant reports reviewed and approved as part of the PER)
42	26	4-7	Inclusion inappropriate as outside of scope of audit (recommendations, opinion and/or re-interpretation of external consultant reports). Furthermore, omitted details or further information was not requested with no opportunity given to MRM (or external consultants) to address gaps/assumptions.
43	27	2	'The AEMR does not provide any detailed information on the total extent of disturbance and/or rehabilitation...' . Although this is not a current requirement the Final AER, 2008 provides the annual disturbed area (hectares)
44	27	4	Section 6 of the Final AER, 2008 provides detailed information to the rehabilitation undertaken along Barney Creek and initial, and proposed, rehabilitation undertaken along the McArthur River.
45	27 28	5 1-4	Monitoring of Barney Creek rehabilitation success was undertaken by CDU in June and Oct, 2008. A provisional data summary was provided to MRM in November with a Draft report expected in late Dec/Jan, 2009. However, this monitoring clearly lies outside of the audit scope (reporting period). Success was determined against agreed criteria provided in the approval documentation (i.e. the MRM MMP and PER). Furthermore, EES did not request this data from MRM (with audit findings based solely on the Draft AER)
46	28	5	Conclusions. The conclusions/Exec Summary are a cut and paste
47	29	5	MRM monitoring. A separate groundwater and surface water monitoring report is not required. The final AER, 2008 includes a detailed interpretation of data
48	29	5	Significant improvements in MRM data collection, management and reporting will ensure data gaps are understood and justified
49	30	1	'implement a more stringent monitoring and management system for the Bing Bong dredge spoil dump, particularly considering that further dredging works are imminent' . As above, there is no evidence of environmental impact. MRM will comply with the approved EMP

	Page	Para	Comment
50	30	1	'Explicitly provide corrective actions or rectifications...'. The final AER, 2008 includes clarification to the application of triggers. The newly required WMP will also include the application of trigger values and action(s) to be undertaken in the event of consecutive events

Review of
Environmental Earth Sciences: IM Audit Report 1 December 2008

by

Professor David Parry

I have not been provided with the whole report and therefore my Review is limited to the material contained on pages 19 to 21 sections 4.2.6.a to 4.2.6.d, which relates specifically to work carried out by my team at Charles Darwin University. I will provide comment on each section:

Section 4.2.6.a *Metal pollution impacts on migratory birds*

While my team was not involved in the migratory bird project the IM has referred to our work in relation to this project. I have not read the Garnett and Coe (2007) report however I assume they are referring to our work on metals in sediments of the McArthur River and estuary. I do not understand how our findings on metal levels in these sediments relates to our pilot DGT study (Munksgaard and Parry, 2007b in IM report). The DGT study was an investigation of the utility of DGTs for monitoring metals in the water column in the swingbasin and immediately adjacent to the channel. How the fact that metal levels in the McArthur River show no mining derived impact is “not consistent with recent conclusions by their colleagues at CDU...” (the DGT study at Bing Bong) completely escapes me?. The IM authors also claim that we “noted increased zinc and leadin the water column” which is an incorrect interpretation of our DGT report.

Section 4.2.6.c (I assume it should be b?) *Metal concentrations and Pb isotope ratios in beach sediments.*

Page 19 para 4 line 1: We did not “note a build up of beach sediments to the west of Bing Bong Swing basin”. We did note elevated levels of Pb and Zn to the west.

Page 19 para 4 line 3: aqua regia (not regis) is not perchloric acid/nitric acid (which is what we use) it is in fact hydrochloric/nitric acid.

Page 19 para 5 line 4: “A greater rate.....occurs on the west side...” There is no measure of rates from our data sets. It is simply that the concentrations are elevated to the west compared to the east side of the swing basin.

Page 19 para 7 line 2: aqua regia

Page 19 para 7 line 3: our acid extraction (and aqua regia) does not extract metals from all silicates, HF extractions do.

Page 19 para 7 line 4: I do not know what is the relevance of the sentence: “ This needs to be understood when trying to.....”

Page 20 para 1: The zinc/lead ratios do vary at some sites, however these ratios need to be considered together with the Pb IR data which is in fact far more sensitive at detecting anthropogenic sources of lead than simple concentration measures. As we have discussed in our report the metal levels are influenced by systematic variations in the sand and clay content which affects the precision of any estimation of contaminant levels based solely on metal concentrations. For example there are two sites in the TA transect that have higher metal concentrations than any of the other TA sites however they are clay dominated as shown by the high Al, Fe and Mn concentrations and the PbIRs for these sites are within the range of modern day average crustal lead i.e background ratios. This is clearly the case for the TA, TD and TE sites and we did in fact identify that TB9-13 and TC sites do have elevated Pb and Zn concentrations and/or elevated PbIRs.

Page 20 para 2 line 3: The core data does not show substantive differences between layers and in fact in some cases there is little if any difference and in the TD core the highest Zn concentration was at the 20-25cm depth.

Page 20 para 3: The IM may disagree with our conclusion that the TA, TD and TE sediments “constitute local background levels”, but the data clearly shows it is the case. The contention of the IM that these core samples show “discernable impacts from ore derived concentrate” is not sustainable. The metal concentrations show no systematic variation with depth, particularly no clear increase with depth, the highest metal concentrations are clearly associated with sections showing higher clay content and all core sections show natural background PbIRs.

Page 20 para 4: The temporal data does not show any increasing trends in metal concentrations over the period 1996 to 2007 for sites west of the swing basin. The concentrations have remained relatively constant. Therefore it does not follow that the ANZECC (2000) ISQG would be exceeded within 10 years.

Page 20 para 5: I agree with the IM that it is not appropriate to use Guideline values in such a way as to allow contamination to build up to the guideline level. The Annual marine monitoring reports contain the temporal trends data to identify these types of situations.

Page 20 para 6: I do not believe the report “underestimated the degree of impact...” as demonstrated in the responses in the paragraphs above. The data clearly allows the identification of the degree of impact as contained in the report.

Secton 4.2.6.c *Element concentrations in seawater, sediment and oysters*

Page 20 para 7: This was the first study of this type in the Sir Edward Pellew Islands area and as such the use of ANZECC (2000) marine water and sediment quality guidelines is appropriate. It is exactly the intended application of the ANZECC (2000) guidelines. Once more data is obtained spatial and temporal trends can be identified and site specific trigger values could be derived. However, I would strongly argue that the use of the Guidelines is not “a poor measure of impact”.

Page 21 para 1 line 3: “...without noting that there is a trend above background” That is because there was not such a trend for Pb or any other metals. What it does show is that PbIR is an extremely sensitive method for detecting sources of Pb. An assessment of the Pb concentration data alone would show no indication that there was any potentially mine derived lead.

Page 21 para 2: I do not believe it is possible to conclude that there is “recent impact of the water column by mining activities.....” for the reasons discussed in the report, mainly that there is no background data on which to make an assessment.

Section 4.2.6.d Diffusion *gradients in thin-film (DGT) devices to monitor bioavailability of metals in seawater*

Page 21 para 3: This is an extremely over simplified summary of the findings. In particular:

- the elevated metal levels were largely confined to the sites within the swing basin;
- “typical sediment geochemistry will prevent metal bioavailability having an adverse impact” makes no sense. I assume what the authors are trying to say (and what we have said in the report) is that the geochemical processes should limit metal bioavailability and therefore reduce the potential for biological impact.
- “...it is noted that mussels ...” This was a typo in the Executive Summary and should have been molluscs (*Telescopium* and *Terebrallia*) which was in the actual Discussion.

Page 21 para 4: perhaps the use of the term “general port facility” was not completely appropriate, but again there is no reason not to compare the data to the ANZECC (2000) marine water quality guideline values. The swing basin would certainly be classified as a moderately disturbed system and therefore the use of the 95% protection level is appropriate, however one could use the 99% protection level (applicable to pristine environments) and all the metals measured were substantially below that level (except for Co). There is no evidence from any of our data that there is “incremental deposition ...occurring at Bing Bong.”

Page 21 para 6: Has MRM justified emissions at Bing Bong “...as considered to be equivalent to the average industry performance of general port facilities...”?

Conclusion

The IM has assessed any measure of metal above background as being an impact. We have used analytical methods which are extremely sensitive in measuring very low metal concentrations and the use of PbIRs. The more relevant question is whether the elevated metal concentrations and/or PbIRs measured in these studies would have a biological and/or ecological impact. A weight-of-evidence approach i.e. metal concentrations and PbIRs in seawater, sediment, seagrass and oysters, would suggest there should be no biological impact.

It is critical how impact is being defined, is it simply a physicochemical impact or is it based on aquatic ecosystem protection which depends on biological, processes and quality (water, sediment and biota) objectives.

Further Comment by Professor Stephen Garnett based on section 4.2.6a of the Independent Monitor report.



Charles Darwin University
Darwin, NT 0909 Australia
www.cdu.edu.au
ABN 54 093 513 649
CRICOS 00300K

Gary Taylor

*Health, Safety and Environment Manager
McArthur River Mine*

Dear Mr Taylor

I am writing in response to the independent consultant's comments on the report by Garnett and Coe (2007) on wading birds at the Bing Bong Loading Facility. These comments appear to contain a misunderstanding of the information provided in that report. The independent consultant quotes figures on heavy metal levels that were provided to us as part of our terms of reference and which were accurate at the time of the consultancy. We undertook no other measures of heavy metal concentrations in sediment. Rather we counted birds along the coast to determine the significance of the coastline immediately adjacent to the Bing Bong facility and the global significance of the region. Thus any perception that we differ from our colleagues at CDU is incorrect – we have neither the data nor the expertise to comment on the metal loads at the Bing Bong facility and believe our report to have been misinterpreted.

Yours sincerely

Stephen

Professor Stephen Garnett

Director
School for Environmental Research