

DEPARTMENTAL RESPONSE

Independent Monitor
2016 Environmental Performance Report
(2015 Operational Period)

McArthur River Mine

August 2016

Executive Summary

The Department of Mines and Energy (“DME” or “the Regulator”) has undertaken a review of the Independent Monitor’s (IM) 2016 Environmental Performance Report submitted to the Minister for Mines and Energy on 4 August 2016 for the 2015 Operational Period at the McArthur River Mine.

The DME review focused on the compliance and technical issues raised by the IM relating to the environmental condition, management and monitoring of the McArthur River Mine by McArthur River Mining Pty Ltd (“MRM” or “the Operator”), as well as the regulatory overview of the mine by the DME.

In relation to assessing the regulatory performance of the DME, the IM concluded that the change in waste rock classification by MRM in the previous operational year had continued to have a substantial impact on the level of documentation and correspondence between the two parties. The IM noted that during the operational period the DME issued a series of instructions to MRM and a number of these related to requests for further information to assist in the assessment of the revised 2013-2015 MMP or MRM's monitoring data. The IM commended the DME on the level of detail provided to MRM noting the considerable technical knowledge to the challenges posed by the McArthur River Mine.

The IM noted the instructions issued to MRM regarding the appointment of an independent certifying engineer (ICE) and an independent tailings review board (ITRB). The IM was supportive of the engagement of external specialist advice however noted there were areas which could be improved to reduce potential conflicts of interest or to consider opportunities to reduce overlap between the respective appointments.

The IM commended the significant increase in the number of regulatory field inspections of McArthur River Mine conducted during the operational year which were used to inform assessment of the 2013-2015 MMP and subsequent amendments, as well as providing an update to management on the status of operations and assessing compliance with DME conditional approvals.

The following recommendations were made:

- The IM recommended that the DME revise the current MMP review process (including requests for additional information) with the objective of devising a more efficient process and should consider a review of MMP's.
- The IM recommended that instructions issued by the DME could benefit from some type of ranking so that MRM personnel could prioritise their responses.
- The IM recommended that the site visits be used to facilitate the exchange of technical information and minimise misunderstandings between the two parties.
- The IM recommended that DME should promote clarity between the roles of the ICE and ITRB to optimise synergies and to ensure that the maximum benefit is obtained from the engagement of these specialists.

The DME welcomes the recommendations made in the IM's 2016 Environmental Performance Report. The DME is also supportive of the recommendations for further improvement put forward for both the Operator and the Regulator. Information and recommendations included in the 2016 Environmental Performance Report will be used by

the DME in its review of the MRM's upcoming Operational Performance Report (OPR), the future Mining Management Plan (MMP) and the Environmental Impact Statement (EIS) for the Overburden Management Project.

Having reviewed the findings of the 2016 Environmental Performance Report, the DME has already acted on a number of the recommendations generated and will continue to address the other issues identified over the coming months. The DME is aware that MRM has commissioned a significant number of studies to address the issues associated with the change in waste rock classification. The DME will assess these studies to ensure they address the significant risk associated with the design and construction of waste rock dumps which are able to safely encapsulate non-benign material in a stable landform that protects the receiving environment for perpetuity.

The DME will incorporate the IM's recommendations relating to MRM's performance into its regulation of the operation including direction for an action plan from MRM with commitments and timelines for the adoption of the recommendations.

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1 Background

In October 2006 the Northern Territory Government (NTG) approved the open-cut expansion proposal for the McArthur River Mine. A condition of the approval was the appointment of an Independent Monitor (IM) to oversee the environmental performance of the mine. The requirements of the IM are outlined in the Independent Monitoring Assessment Conditions (IMAC), which forms schedule 2 of Mining Authorisation 0059-02.

In accordance with the IMAC, the role of the IM is to assess the environmental performance of the mine by reviewing environmental assessments and monitoring activities undertaken by the mine operator, McArthur River Mining Pty Ltd (“MRM” or “the Operator”) and environmental assessments and audit activities undertaken by the Department of Mines and Energy (“DME” or “the Regulator”). The IM is not responsible for assessing mine safety or social matters regarding the operation.

In 2013, the second five-year contract for the services of an IM was awarded to the ERIAS Group from Adelaide. Due to unforeseen delays in the procurement and tender assessment process, the first annual Environmental Performance Report (2014) from ERIAS covered two operation periods, 2012 and 2013.

The IM has provided the 2016 Environmental Performance Report covering the 2015 operating period of the mine (i.e. October 2014 to September 2015). The report includes information obtained during the IM visit to MRM and to the DME in April 2016. To ensure the report is relevant, it also includes information provided outside the reporting period.

1.1 Objectives

The stated objectives of the IM’s 2016 Environmental Performance Report included:

- Document the review of environmental performance.
- Report on progress from the previous IM assessment.
- Identify any urgent issues that require investigation and reporting.
- Identify areas of MRM’s and DME’s environmental performance that require improvement and recommend actions to address these deficiencies.
- Acknowledge areas where the Operator and the Regulator have performed well.

1.2 Assessment Scope

The IM’s 2016 Environmental Performance Report outlined the scope of the assessment and began with Clause 4.1(a) of the IMAC.

The IM is required to monitor the environmental performance of the mine (including the Bing Bong Port) by reviewing:

- I. Environmental assessments and monitoring activities undertaken by the Operator.
- II. Environmental assessments and audits undertaken by the Regulator.

Issues relating to mine safety, social issues, personnel matters, administration matters or governance arrangements resulting from the operation of the mine in the McArthur River region are not included in the assessment.

The assessment of environmental performance addressed a one-year operating period from October 2014 to September 2015 and included:

- An inception meeting with the Operator and the Regulator in Darwin to discuss the process undertaken during the 2015 review and areas for improvement and the schedule for the 2016 review.
- Reviewing environmental assessments, monitoring activities and reviews undertaken by both MRM and DME.
- Reviewing relevant research required to inform monitoring activities.
- Discussions with DME personnel regarding progress on completion of recommendations from the last IM report.
- Updating the risk assessment and gap analysis (for the 2015 operational period).
- Undertaking a site visit and discussions with MRM personnel and MRM consultants.
- Preparing a report for the Minister for Mines and Energy concerning the environmental performance of the MRM operation (by both the Operator and the Regulator).
- Preparing and distributing a report to the Borroloola community and other key stakeholders concerning the environmental performance of the MRM operation. This includes a community presentation.
- Developing and maintaining a website for the display of the report, the response reports from the operator and regulator, community report and other relevant information.

1.3 Response to the Performance Report

The IM's Environmental Performance Report for the McArthur River Mine over the 2015 operational period was submitted to the NT Government Minister for Mines and Energy on 3 August 2016. The Minister then provided the report to the DME for comment on 4 August 2016. A review of the Environmental Performance Report's findings was undertaken by the DME.

The DME review focused on the compliance and technical issues raised by the IM relating to the environmental condition, management and monitoring of the McArthur River Mine by the Operator as well as the regulatory overview of the mine by the Regulator.

2 Risk Assessment

A risk assessment is performed by the IM each year and was undertaken in accordance with ISO 31000:2009 – Risk Management Principals and Guidelines (SA/SNZ, 2009) to assess the environmental risks associated with MRM’s mining operation.

The stated objectives in the 2016 Environmental Performance Report were to:

- Identify environmental risks.
- Evaluate whether environmental monitoring and assessment practices undertaken by MRM are adequate and appropriate to mitigate the risk of potential environmental impacts.
- Determine if MRM is addressing the risks identified by the IM and if actions are appropriate.

The risk assessment identified a total of 75 risks, of which:

- 2 were **extreme**. Immediate intervention required to eliminate or reduce risk at a senior management/government level.
- 24 were **high**. It is essential to eliminate or reduce risk to a lower level by the introduction of monitoring and assessment measures implemented by senior management.
- 40 were **moderate**. Corrective action required, and monitoring and assessment responsibilities must be delegated.
- 9 were **low**. Corrective action should be implemented where practicable, and risk should be managed by routine monitoring and assessment procedures.

The updated risk register is provided in Appendix 2 of the IM’s 2016 Environmental Performance Report.

This is a slight decrease in the total number of risks compared to the 2015 IM Performance Report where a total of 78 risks were identified. A comparison between the results of the 2012, 2014, 2015 and 2016 risk assessments (Table 1) shows an increase in the number of risks identified between 2012 and 2015 and a similar number of risks for 2016.

Table 1 Comparison of Risk Assessment Results from the 2012, 2014, 2015 and 2016 IM Performance Reports

Risk Rating	2012 IM Assessment	2014 IM Assessment	2015 IM Assessment	2016 IM Assessment
Extreme	2	1	2	2
High	13	31	25	24
Medium	36	29	38	40
Low	19	7	12	9
Total	70	68	78	75

A significant driver behind the increase in the number of risks is over the 2012 to 2016 period was the change to MRM's waste rock classification system introduced in late 2013 and the implications this had for the management of waste rock across the site.

The former waste rock classification system had two categories; Non Acid Forming (NAF) (benign waste rock) and Potentially Acid Forming (PAF) (non-benign waste rock). The majority of the authorised infrastructure and management processes for waste rock were designed based on this two category system.

The new classification system recognises that not all of the NAF waste rock is actually benign and that a significant portion of this NAF waste rock can produce environmentally harmful metalliferous and saline drainage at circum-neutral pH values. Over 89% of the total waste rock mined is now considered non-benign and may produce runoff with concentrations of contaminants harmful to the receiving environment. As a consequence there is insufficient benign waste rock to construct the waste rock dump, as per authorised designs, to effectively encapsulate the non-benign waste rock (including final cover and landform design) for the long-term. For example, the 2012 ANCOLD Guidelines on Tailings Dams assigned "long term" a nominal period of 1000 years.

The significant change in waste rock classification triggered referral of the 2013-18 MMP to the Northern Territory Environment Protection Authority (NT EPA). Following assessment of the document, the NT EPA determined in March 2014 that an Environmental Impact Statement (EIS) for the long-term management of acid and metalliferous drainage (AMD) would be required. This EIS is referred to as the "Overburden Management Project". Effectively, the EIS requires MRM to redesign the waste rock dumps and determine both the short and long term impacts associated with these new designs.

Under the Terms of Reference for the EIS, MRM are limited to the type of waste rock they handle and the locations they can place non-benign waste rock. The DME has worked closely with MRM to facilitate the continued operation of the mine site whilst ensuring that financial and environmental risks are effectively managed. There are a substantial number of significant investigations underway to inform the EIS and are directly related to the risks associated with the mine site.

Overall, the DME agrees with the output from the IM risk assessment and has undertaken actions in response to many of these risks, as detailed in subsequent sections of this response report.

3 Gap Analysis

Gap analysis was undertaken as per previous assessments undertaken by the IM.

A total of 84 gaps were identified in the 2016 IM Environmental Performance Report, 22 more than the 2015 IM review:

- **20 Category 1 gaps.** Monitoring to mitigate potential associated environmental risk is not undertaken.
- **43 Category 2 gaps.** Monitoring is undertaken, but is not sufficient in design— that is, frequency, location, type and so on, is insufficient to identify or quantify potential environmental risks.
- **21 category 3 gaps.** Monitoring is undertaken and is appropriate in design; however data/output information is not adequately assessed, interpreted or managed to appropriately mitigate potential environmental risks.

The DME agrees with the gaps identified by the IM and has undertaken actions in response to these, as detailed in later sections of this response report.

4 Review of the Regulator, Department of Mines and Energy

The IM reviewed DME's performance in regulating the McArthur River Mine site under the *Mining Management Act* and regulations over the 2015 operational period which included a review of:

- Assessments and inspections to evaluate the environmental performance of the mine;
- DME's assessment of the 2013-2015 revised interim MMP and several MMP amendments;
- Third party expert advice commissioned by the DME (e.g., Independent Tailings Review Board (ITRB), Robertson GeoConsultants);
- Instructions in relation to conditional acceptance of the central west area (CWNOEF) of the Northern Overburden Emplacement Facility (NOEF) and the western PAF run-off dam (WPROD);
- Several Investigations initiated by DME (e.g., heavy metal bioaccumulation in aquatic biota);
- Tracking of recommendations made by the Independent Monitor regarding DME performance; and
- DME procedures and manuals.

4.1 Compliance Auditing and Site Visits

The IM noted that no formal audit of the operation was carried out during 2015. The IM did however include an assessment of the November 2014 audit which was reported by the IM in the 2015 Report. The IM did note the significant increase in the number of site visits conducted by the DME during 2015. The comments of note by the IM include:

- DME conducted a site inspection in November 2014, which fell outside of the reporting period, however was included in this IM review. The IM believes that recommendation for a final report within six weeks of an audit remains valid for site inspection reports and noted that the field inspection report was not finalised for five months following the site inspection;
- The IM commended the DME on undertaking the increased number of site visits and noted that such visits should be used to facilitate the exchange of technical information and minimise misunderstandings between the two parties. The IM encouraged the conduct of regular site visits by DME technical personnel and the availability during these visits of relevant MRM staff; and
- The IM recognises the demands that these visits place on all involved but recognises the opportunity to facilitate the approvals process and improve relationships.

The IM recommended:

- The IM did not provide a formal recommendation however does note that actions arising from the site visits should be documented in a register, together with MRM's responses and relevant dates.

The DME provides the following comments regarding its compliance auditing at the McArthur River Mine Site:

- An audit of the mine site was not undertaken during the 2015 operational period. The 2013-2015 MMP remained under assessment during 2015 with multiple requests for further information made to the operator. Several amendments to the approved MMP were assessed. Owing to these significant changes on the site, an audit against the authorised MMP (2012-2013 MMP) would have provided limited benefit to the operation. The regulatory effort was focused on the assessment of the MMP and changes to the site. The DME increased the number of field inspections in response to the significant changes to the operation prompted by the new waste rock classification system, and developments on the site;
- The DME prioritises tasks based on risk, the urgency for MRM and resource availability that facilitates a sustainable mining industry while minimising the risk to the receiving environment;
- In 2015 the DME provided a response to the IM's concerns regarding the time taken to finalise the November 2014 inspection report for the November 2014 compliance audit, this issue had been raised in the previous performance report for the 2014 operational report. The DME reiterates that the delayed report did not influence the ability of DME or MRM to address the issues identified during the site inspection as an instruction to the Operator was made within 10 days of the inspection, and;
- The DME is committed to providing the shortest practical turnaround on all reporting and assessments and since the previous IM report has made a significant effort to ensure multiple field inspection reports are completed within 6 weeks. The changes have meant that the detailed field inspection reports are generally completed within 4 weeks under normal circumstances and in most instances much sooner.

4.2 Assessment of the Mining Management Plan

The IM reviewed the assessments of the 2013-2015 (revised interim) MMP undertaken by the DME. The comments of note by the IM include:

- Following the withdrawal of the 2013-2018 MMP, MRM submitted to DME on 2 May 2014 an updated MMP covering an interim period of operations from 2013 to 2015 (to enable operations to continue while further assessment was undertaken via the environmental assessment process), i.e., the 2013-2015 MMP referred to as the interim 2013-2015 MMP. The interim 2013-2015 MMP comprised two volumes;
- Under DME instruction, MRM also prepared a supplementary monitoring report (MRM, 2015c) that addressed environmental monitoring data collected between 1 July and 30 November 2014. Key actions regarding assessment of the interim 2013-2015 MMP were summarised in the previous IM report, which also comments on the above process; and
- The revised interim MMP was prepared in response to the DME's instruction on 12 December 2014. This direction reflected the DME's view that MRM's ongoing submission of additional information in relation to the CWNOEF, and the significance of the changes to the information being supplied, rendered the interim MMP

obsolete. The revised interim 2013-2015 MMP was approved by the DME on 23 December 2015.

The IM recommended that:

- Notwithstanding the complexity of the issues being addressed, a better process is required around the submission and approval of MRM's MMPs; and
- There is an opportunity to review the assessment processes to determine if there is a more efficient process to assess, request additional information and understand information submitted by MRM that would result in a more rapid approval of the MMP.

The DME provides the following comments regarding its assessments:

- The DME acknowledges the comments by the IM regarding the assessment of the MMP and multiple MMP amendments. McArthur River Mine is a large and complex mining operation which has the potential to have a significant impact on the receiving environment. The assessment of the 2013-2015 MMP was complicated by MRM's change in waste rock classification and the ongoing challenges this poses for the operation. The change in classification has significant implications on how non-benign waste rock is handled and managed. The increase in risk posed by the change necessitated a greater level of oversight, which in turn generated a significant volume of correspondence between the DME and MRM;
- The DME remains committed to working with MRM to facilitate the ongoing operation at MRM in a sustainable manner that does not compromise the environment. Whilst the DME recognises the regulatory burden placed on the operation it is of the opinion that the level of oversight used is required and proportionate to the risk posed by the operation;
- The DME recognises that significant studies are underway at MRM to inform the Overburden Management EIS which is due for submission in late-2016. The DME has instructed MRM to submit an OPR in place of an MMP during 2016 in order to reduce the regulatory burden. The OPR will provide details on MRM's performance over the previous 12 months through submission of a review of monitoring data and the actions undertaken based on a review of that data;

4.3 Review of Instructions

The IM noted that in the operational period the IM reviewed a number of instructions issued by the DME in relation to the assessment of the 2013-2015 MMP as requests for additional information and those issued in response to MRM's monitoring data. The comments of note by the IM include:

- Commendation on the level of detail provided in the DME's various comments and responses attached to the various instructions, noting the application of considerable technical knowledge to the challenges posed by MRM;
- The requests would benefit from some type of ranking so that MRM personnel could prioritise their responses;

- Consideration should be given to a forum whereby a number of the information gaps and inconsistencies could be readily addressed by direct discussion between DME and MRM technical staff;
- The IM also notes that a register of instructions issued by the DME to MRM was not available for review. This should be developed including additional information such as the status of MRM's response and key dates; and
- The IM suggests that, where relevant, the recommendations relating to the assessment of the MMP be applied to the OPR.

The DME provides the following comments regarding the issuing of instructions for the McArthur River Mine Site:

- The mining operation at MRM has the potential to cause a significant impact on the environment if not managed appropriately. It is important therefore that the DME undertakes detailed assessments of approvals documentation submitted to the DME to ensure that mining proposals are designed with suitable levels of environmental protection. The DME is committed to continuing to provide detailed correspondence on the technical proposals and issues assessed by the DME and as a result of frequent inspections of the operation;
- The DME generates instruction letters as a result of issues observed on site or through documentation submitted to the DME. The DME does not rank the instructions directly by allocating a ranking however the due dates for completing the actions are assigned by the relative risk or importance of the issue requiring action;
- The DME remains committed to open dialogue with MRM and has participated in several meetings with MRM personnel in relation to mining related proposals during the period under review. The DME remains focused on working with MRM to ensure changes in operations at MRM are consistent with best-practice environmental standards; and
- The DME has adopted the IM's recommendation and has established a database register of instructions issued to MRM and responses received by the operator.

4.4 Review of Incidents

The IM reviewed a number of incidents reported by MRM to the DME during the operational period. The comments of note by the IM include:

- The documentation reviewed from the initial notification of the incident and the subsequent requests for additional information appear satisfactory however there was little acknowledgement from the DME that subsequent actions were appropriate and the matter could be considered closed.
- The number of incidents and near misses for an operation of this size appears to be low and the IM recommends that DME investigates how incidents and near misses are reported, and ensure that they are appropriately closed out with relevant actions being captured in the incident register.

The DME provides the following comments regarding the review of incidents at McArthur River Mine Site:

- The DME acknowledges the IM's comments regarding the follow-up of incidents by notifying MRM of the DME's acceptance of the actions undertaken by the operator. The DME will endeavour where appropriate to provide further acknowledgement of acceptance of MRM's actions in relation to the close-out of incidents which have occurred on the site.
- The DME notes the IM's concerns regarding the number of incidents recorded on the site during the operational period. The DME will undertake a review of the incident reporting and management procedures as part of the routine inspections and formal regulatory audits of the site in future.

4.5 Review of Expert Advice

The IM reviewed the DME's appointment of technical experts for the review of documentation relating to approvals for mining infrastructure on the site. The comments of note by the IM include:

- The IM endorses the DME requirement that MRM appoint an Independent Certifying Engineer (ICE) to oversee quality control of construction works at the Tailings Storage Facility (TSF) and the Overburden Emplacement Facilities (OEF's);
- The IM notes that potential deficiencies associated with the construction of TSF Cell 2 Raise 3 and the CWNOEF represents a potential conflict of interest between the appointment of GHD as the designer and ICE for the construction works and recommends that the DME facilitates the resolution of the potential conflicts of interest between its two functions;
- The IM endorses the DME's requirement that an independent tailings review board (ITRB) be appointed to provide ongoing technical review of the TSF;
- Whilst the IM supports the appointment of the ICE and the ITRB it recommends their respective roles be better defined to ensure clarity and encourage potential synergies and maximal benefit from their engagement; and
- The IM supports the appointment of other external technical experts particularly where the consultants are engaged directly by the DME.

The DME provides the following comments regarding the appointment of technical experts in relation to the regulation of McArthur River Mine:

- The DME remains committed to the ongoing requirement for third-party assessment and validation of high-risk infrastructure on the McArthur River mine site to ensure environmental values are protected. The DME appoints world-class experts to ensure regulatory decision making is based on sound technical advice.
- The DME notes the IM's recommendations regarding potential conflicts of interest between the role of MRM's consultant as both designer and as the ICE. The DME will

work with MRM to ensure these roles are better defined to eliminate potential conflicts of interest.

4.6 Environmental Monitoring Unit Check Monitoring

The IM noted that no report from the DME Environmental Monitoring Unit (EMU) was available for the review period. The IM did not make formal recommendations but did note that a monitoring schedule would be beneficial to allow objectives of the check monitoring and criteria for assessment of performance to be documented.

4.7 Action and Tracking of IM Recommendations

The IM reviewed the progress of addressing recommendations made during the review of the 2012, 2013 and 2014 operational periods and presented the data in tabular format within the report. These recommendations are summarised below:

- Ensure that MMP commitments (and OPR commitments where applicable) are reduced and collated into a single list contained within the main MMP document and follow the SMART format;
- Ensure that a convention is adopted with regard to a consistent method for referring to the dates of correspondence/documents. Ideally, reference should be the date of correspondence/document;
- Revise the current MMP review process so as to improve its efficiency;
- Prepare a schedule for EMU's check monitoring, review EMU procedures and include content on the purpose and objectives of the check monitoring site visit;
- Prepare a field report for the check monitoring site visit that is provided to MRM. The report should clearly document the objectives of the check monitoring and provide an analysis of the results (in the context of MRM's monitoring results);
- Review its compliance audit protocol to include as part of its assessment of MMP compliance whether the operator is also complying with guidelines; and
- Define and document 'best practice' for specific areas of the operation and include this as part of the DME audit protocol and establish a goal that audit reports are finalised within six weeks.

The DME provides the following comments on the progress against the IM report recommendations:

- The OPR is a document which reviews the operational performance of the mine during the previous 12 months; it would not ordinarily include a collated list of the commitments requested by the IM. Furthermore the DME instructed MRM of the contents required in the OPR in January 2016. The DME will however require that future versions of the MMP include the collated list of commitments as per the IM's recommendation.
- The DME has recently reviewed and updated the naming convention used for documents submitted by operators under the MMA. The documents are allocated a unique reference generated by the DME's document management system. Dates referred to are based on the date the relevant letter was signed not received.

- The DME is committed to ensuring MMPs are reviewed in an efficient manner however section 36(5) of the Mining Management Act (MMA) requires the Minister to be satisfied that the details within the plan are appropriate for the mining activities described, protect the environment and are in accordance with good industry practice. The length of time for assessment is dependent on the risk associated with the activities proposed and the level of information provided for review when seeking approval. When reviewing MMP's and amendments an operator must provide sufficient detail for assessment and the DME must be satisfied that the proposed actions are appropriate for the activities in the plan, can effectively protect the environment and are in line with best industry practice. In situations where these criteria are not met additional requests for additional information are made, resulting in a longer period before approvals are granted.
- The DME will adopt the IM's recommendation about seeking an action plan for addressing the IM recommendations.

The IM provided a collated a list of new recommendations which were discussed in previous sections of this report; the DME should:

- Request that MRM submits an action plan detailing how the high priority recommendations will be addressed and provide quarterly updates to the DME on progress towards implementation;
- Continue the regular site visits that were undertaken in the second half of 2015 and use these to facilitate the exchange of technical information, address information gaps and inconsistencies, and minimise misunderstandings between the two parties. The DME should also ensure that field inspection reports adopt a consistent approach including recommendations and required actions;
- Establish a database or register that captures instructions issued to MRM, and similar actions. This should include the date of the instruction, key points, status of MRM's response, and key dates;
- Investigate how incidents and near misses are reported, and ensure that incidents and near misses are appropriately closed-out with relevant actions being captured in the database referred to above; and
- Facilitate the resolution of GHD's potential conflict of interest given that GHD is both the ICE and TSF design engineer, promote clarity of roles between the ICE and ITRB and encourage MRM to explore possible synergies to ensure that maximum benefit is obtained from their engagement.

5 Review of the Operator, McArthur River Mining

The IM has detailed a total of 75 recommendations in the 2016 Environmental Performance Report. This is a decrease from the 78 recommendations in 2015. Recommendations are categorised as extreme, high, moderate and low with extreme and high recommendations considered a priority and relate to the more significant risks and information deficiencies. The numbers of recommendations are summarised in Table 2.

Table 2 Comparison of risk assessment results from recent Performance Reports

Category	2012 Performance Report	2014 Performance Report	2015 Performance Report	2016 Performance Report
Extreme	2	1	2	2
High	13	31	25	24
Moderate	36	29	38	40
Low	19	7	12	9
Total	70	68	78	75

The number of risks (and therefore recommendations generated) identified in the report remains at similar levels with near identical numbers of extreme and high risks being identified in the 2016 and 2015 performance reports.

The DME will consider all recommendations included in the 2016 Environmental Performance Report which will be used in DME's review of MRM's future reporting. In some circumstances, the DME had already begun to address items associated with the recommendations.

5.1 Mine Site Water Balance

The DME has continued to work with MRM during the development of a new mine site water balance based on the recommendations of the 2015 IM report. The DME welcomes the continued development and refinement of the water balance and notes the IM's concerns identified during the review.

At the time of writing this report, MRM are due to submit a fully revised version of the water balance as part of the OPR in advance of the upcoming wet season. All recommendations, including those not addressed by MRM to date will be considered by the DME during its review of the new mine site water balance as part of the OPR submission.

5.2 Surface Water Quality

During the last 12 months the DME has required that MRM lodge their monitoring data with the DME on a monthly basis, previously this had been quarterly. This increased oversight covers all monitoring data and not just monitoring taken as per the approved monitoring program. This ensures that DME's understanding of on-site conditions is as up-to-date as possible, and this covers additional monitoring undertaken by MRM outside of the authorised monitoring program in response to emerging issues.

The DME endorses the IM's recommendations in relation to surface water management and in particular the recommendations regarding improved in-situ monitoring and risk

assessments and ongoing reviews of data for surface monitoring sites. The DME will consider issuing instructions associated with both the high and medium priority recommendations.

The DME agrees with the IM that understanding mine-derived contaminant loads is an important aspect of monitoring and will contribute significantly to understanding the risks posed by the mine on the receiving environment. The DME has instructed MRM to install continuous monitoring points at locations both upstream and downstream of the mine site to assist with this determination.

5.3 Diversion Channel Hydraulics

The DME shares similar views to the IM on erosion of the mine levee and the diversion channel in a number of areas following site inspections in 2015 and 2016. The DME endorses all of the recommendations made by the IM particularly relating to the geotechnical assessment of the flood protection levee. The DME will consider issuing instructions associated with both the high and medium priority recommendations within the coming weeks.

5.4 Groundwater

The risk to groundwater is considered to be one of the most significant risks from operations at McArthur River Mine particularly from the TSF and the NOEF. The DME has recently instructed MRM to undertake an independent investigation into the NOEF to better understand its potential impacts on groundwater and then to identify and implement measures which mitigate pathways for contamination to impact the receiving environment. This investigation is currently underway and the review has already identified improvements in relation to the monitoring of groundwater surrounding the NOEF.

The DME understands that significant investigations have been undertaken on site to better understand groundwater flow and quality with recent drilling between the flood protection levee and the McArthur River Diversion Channel. The DME will review data collected from the additional bores and consider whether or not further instruction is required based.

The DME supports the IM's recommendations and will consider issuing instructions associated with both the high and medium priority recommendations within the coming weeks.

5.5 Geochemistry

The DME agrees with the IM's recommendations in relation to the significant geochemical risks on the site. The DME is aware that a substantial number of investigations are underway on the site to inform the management and mitigation strategies for geochemical issues which are the subject of the Overburden Management EIS due for submission in late-2016.

The DME will follow up on the recommendations covered in the IM report and will consider issuing instructions associated with both the high and medium priority recommendations within the coming weeks.

5.6 Geotechnical

The DME endorses the recommendations made by the IM in relation to the geotechnical risks on the site. The most significant risk from current operations relates to the operation of the TSF. In order to mitigate the risk the DME has imposed ongoing strict conditions for the modification and ongoing management of the TSF. These include the requirement for oversight of construction by an ICE, the requirement that construction meets the ANCOLD 2012 guidelines and the continued appointment and oversight by an ITRB to review the Tailings Dam designs and construction QA/QC and make recommendations for the future operation and expansion of the TSF.

The DME recognises the potential conflict of interest by MRM's appointment of GHD as both the designer and ICE for key items of infrastructure and will seek to clarification of roles from MRM. The appointment of the ITRB will provide an additional layer of protection in relation to the risk posed by the TSF and the DME is committed to maintaining this ongoing requirement.

5.7 Closure Planning

The DME continues to work with MRM on an acceptable closure plan for its operations. A significant number of investigations relating to closure are underway as part of the overburden management EIS due for submission in late 2016.

The recommendations of the IM will be considered during future reviews of the updated closure plan.

5.8 Terrestrial Ecology

The DME endorses the IM's recommendations and will consider issuing instructions associated with both the high and medium priority recommendations within the coming weeks.

5.9 Aquatic Ecology

The DME continues to believe that the MMPs and OPRs are the forum in which to review and synthesise monitoring programs. MRM should detail the review of the monitoring undertaken for all disciplines and provide feedback to the mining management teams and review planning for future operations.

The DME's requests for further information have tried to ensure MRM not only presents the data collected over the reporting period but also provide detailed analysis of the data and a description of how the trends identified are acted on as part of the review of the management system.

The DME continues to have concerns regarding the potential seepage from unlined infrastructure such as the Eastern Levee Storage (ELS) and the Rice Paddy area and the impacts that these areas may have on the Diversion Channel.

The DME generally endorses the IM's other recommendations and will consider issuing instructions associated with both the high and medium priority recommendations within the coming weeks.

5.10 Marine Ecology

The DME expects that long term datasets for marine seagrass and Diffusive Gradient Thin Film (DGT) monitoring will be included within the forthcoming OPR. The DME supports the IM's further recommendation regarding the additional monitoring of marine species which may be impacted by ore handling operations at Bing Bong.

5.11 Soil and Sediment Quality

The DME endorses all of the IM's recommendations in relation to the monitoring of soil and sediment. The issues raised by the IM require further work by MRM and the DME will consider issuing instructions associated with both the high and medium priority recommendations within the coming weeks.

5.12 Dust

The DME fully endorses the recommendations by the IM in relation to the management and monitoring of dust on the site. The DME has recently instructed MRM to review and refine the dust management plan for processes which generate dust on the site. The DME expects that a review of the site wide dust management plan will occur during 2016.

The DME will consider issuing instructions associated with both the high and medium priority recommendations within the coming weeks.

6 Conclusions

The DME welcomes the recommendations made in the IM's 2016 Environmental Performance Report. The DME is supportive of the recommendations for further improvement put forward for both the Operator and the Regulator. Information and recommendations included in the 2016 Environmental Performance Report will be used by the DME in its review of the Operator's future reporting.

Having reviewed the findings of the 2016 Environmental Performance Report, the DME has already acted on a number of the recommendations generated and will continue to address the other issues identified over the coming months. The DME will promote the adoption of the IM's recommendations relating to MRM's performance and will seek an action plan from MRM with commitments and timescales for the adoption of the recommendations.