

Resolving long-term issues related to surface water management and monitoring associated with the Ranger Uranium Mine, Northern Territory, Australia

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Conflicts between indigenous people and mining companies have occurred in many countries and over many years, with the pressure for mining companies to improve their performance leading to a growth of corporate social responsibility concepts. Energy Resources of Australia and the Gundjehmi Aboriginal Corporation (representing the Mirarr people) sought to resolve a number of long-standing issues relating to surface water management and monitoring associated with the Ranger Uranium Mine. This article summarises the process adopted and discusses the main factors that underpinned the success of the project.

Keywords: indigenous conflict resolution; surface water management; uranium mining

Introduction

Conflicts between indigenous people and mining companies seeking to exploit their land have occurred in many countries and over many years (Ali & O'Faircheallaigh 2007; Ali 2009; Brereton et al. 2011). This has led to considerable pressure for the mining and minerals industry to improve its social, developmental and environmental performance. Like other parts of the corporate world, mining companies are now more routinely expected to perform to ever higher standards of behaviour, going well beyond achieving the best rate of return for shareholders.

A particularly important initiative in this area was the 2002 Mining Minerals and Sustainable Development Project (MMSD 2002), a project that is widely considered to have been an important policy spring-board for the mining industry globally (Solomon et al. 2008). Both the international report *Breaking New Ground* (MMSD 2002) and the formation of the International Council on Mining and Metals (ICMM) as a global industry representative body drew attention to a range of policy and practice challenges facing the mining industry.

This need for mining companies to improve their social and developmental performance has led to the growth of concepts of corporate social responsibility (CSR) (Ali & O'Faircheallaigh 2007; ICMM 2008; Kemp et al. 2012; Franks & Vanclay 2013). Much of this need for increased focus on social responsibility has now been formalised in

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the requirement for social impact assessments (SIA) to be undertaken, particularly for any new mining development (Esteves et al. 2012). SIA is the process of managing the social issues of development, with Esteves et al. (2012) suggesting the following as characteristics of 'good' SIA practice: it is participatory; it supports affected peoples, proponents and regulatory agencies; it increases understanding of change and capacities to respond to change; it seeks to avoid and mitigate negative impacts and to enhance positive benefits across the lifetime of developments; and it emphasises enhancing the lives of vulnerable and disadvantaged people. This growth in CSR initiatives among mining companies, coupled with the increasing national and international recognition of indigenous rights (O'Faircheallaigh 2012), has significantly improved the ability of indigenous people to negotiate more meaningful agreements, such as community development agreements (O'Faircheallaigh 2013a). However, while supporting this trend in improved CSR, Ali and O'Faircheallaigh (2007) noted that the requirements for CSR can vary significantly depending upon the particular mining operation and the circumstances of the indigenous population. Additionally, even with these improvements, O'Faircheallaigh (2006, 2013b) argues that effective 'political mobilisation' by the indigenous peoples is essential if they are to grasp these opportunities.

Australia has experienced its share of poor relationship between indigenous people and mining companies (Crawley & Sinclair 2003; O'Faircheallaigh 2006; Trebeck 2007; Graetz & Manning 2011; Graetz 2012; Keenan & Kemp 2014). This has been particularly so between uranium companies and the traditional owners of the land containing the uranium.

Graetz and Manning (2011) suggest that the social and environmental legacy of the Ranger Uranium mine in the Northern Territory, Australia, which stems, in part, from the Traditional Owners' experiences of negative social impacts and violations of rights over several decades, has tainted indigenous perceptions of the uranium industry across Australia. Indigenous opposition to uranium developments in South Australia, the Northern Territory and Western Australia has precipitated business risks for companies, including the mothballing of Cameco and Paladin's Angela/Pamela project and the RioTinto-controlled Jabiluka deposit (Trebeck 2007; Graetz 2012; O'Faircheallaigh 2012).

Over the period since the Ranger Uranium Mine commenced in 1980, there has been conflict between Energy Resources of Australia Ltd (ERA), the owner and operator of the mine, and the Mirarr people, the traditional owners of the land upon which the mine is situated. The Mirarr people are represented by the Gundjeihmi Aboriginal Corporation (GAC). The conflict has centred largely on two aspects: (1) the operation of the Ranger mine, particularly the discharge of wastewater from the site to the Magela Creek catchment (which is part of the Kakadu National Park) and (2) development of the Jabiluka deposit (Cherry 2003). Largely as a result of the Mirarr Traditional Owners concerns, a decision was made in 2005 by ERA/RioTinto that the Jabiluka deposit would not be developed unless the Traditional Owners agreed (Trebeck 2007).

The Mirarr people made clear their concerns regarding both surface water and groundwater management at the Ranger Uranium Mine in their submission to a Senate Inquiry held during 2003 into regulating the Ranger, Jabiluka, Beverley and Honeymoon uranium mines (Cherry 2003). And until recently, the Mirarr people were still frustrated that these concerns had not been adequately addressed by ERA.

However, with the prospect of future development of the Ranger Project Area, and particularly the Ranger 3 Deeps project (ERA 2014), there is now sufficient mutual interest between ERA and GAC to try to resolve these outstanding issues. From ERA's perspective, they are unlikely to gain approval for this development without the support of the Mirrar and GAC. For the latter additional mining development requires them to balance on the one hand the benefits the development would provide (e.g. by way of finances and perhaps a Community Development Agreement) and their desire to look after country (O'Faircheallaigh 2006).

In a first step to resolve the outstanding water management issues, ERA and GAC undertook a successful process in 2011 to address groundwater issues associated with the tailings dam (URS 2010).

This article reports on the second step in this process where the focus was on resolving long-standing issues relating to surface water management and monitoring associated with the Ranger Uranium Mine. The process undertaken by ERA and GAC is first summarised and then the main factors leading to the successful outcome of this project are identified and discussed. Hopefully, the information will guide other like projects in the future.

The system

The Ranger Uranium Mine project was formally approved in January 1979 with mining and production of uranium oxide commencing in 1980. The mine has now been operating for more than 30 years in an area that is surrounded by the World Heritage listed Kakadu National Park. The mine is upstream of the Magela Creek floodplain wetlands that are listed under the Convention on Wetlands of International Importance.

The land on which the Ranger Uranium Mine operates, and much of the surrounding land is recognised as part of the traditional estate of the Aboriginal people of the region.

Surface water management is a critical component of the Ranger Uranium Mine operations for two reasons: (1) for on-site operations and planning and (2) because surface water releases are the main pathway for the mine's operations to impact the downstream environment – the latter being of continuing concern to aboriginal people, in particular the Mirrar Traditional Owners.

Operation of the mine, including management and discharge of surface waters, is subject to a robust system of regulation and supervision by the Northern Territory and Federal Governments with advice from the Supervising Scientist Division (SSD), the latter was established by the Federal Government in 1978. Expectations of Ranger's water management system are set in the first instance by the Ranger Environmental Requirements, issued under Section 41 of the *Commonwealth Atomic Energy Act 1953* (Commonwealth of Australia 1999), with operations at Ranger regulated by the Northern Territory Government under Authorisation Number 0108 (currently #16) of the *Northern Territory Mining Management Act, 2001*.

Reflecting the Environmental Requirements, the Authorisation requires the company to manage surface and groundwater 'to be consistent with the ... primary environmental objectives for Kakadu National Park' and for all mining operations to be implemented 'in accordance with best practicable technology ... which produces the minimum environmental pollution and degradation that can reasonably be achieved'.

The requirements on Ranger's operations have been continually evolving as conditions have changed and new knowledge acquired. Changes to the regulations are discussed by the Mine Technical Committee (MTC) and if agreed are recommended to the Supervising Authority (Northern Territory Department of Mines and Energy [DME])

for implementation. Changes to the Authorisation require Northern Territory Ministerial approval. The GAC are represented on the MTC.

The process

Full details of the review of the surface water management and monitoring associated with the Ranger Uranium Mine may be found in Hart and Taylor (2013a, 2013b).

Agreement to undertake review

Discussion between the Chief Executive Officer of ERA and the Executive Officer of GAC resulted in an in-principle decision to undertake an independent review of surface water management at the Ranger Uranium Mine (GAC & ERA 2012). This decision build upon a successful independent review of groundwater issues associated with the Ranger tailings dam completed in 2011 (URS 2010). Together with surface water management, the tailings dam and its influence of the groundwater has been of concern to the Mirarr Traditional Owners for some time.

ERA and GAC agreed to broad Terms of References (ToRs) and announced this new independent surface water study for Ranger Uranium Mine at a joint press release in March 2012 (GAC & ERA 2012). This media statement was important because it signalled to the community a strengthening of the relationships between the Mirarr people and ERA.

In commenting on the announcement, the Executive Officer of GAC noted ‘We are pleased that ERA are listening and is working together with us. These initiatives reflect the Mirarr people’s overriding concern to protect their country’.

We have noted above that with the prospect of future development of the Ranger 3 Deeps project, both ERA and GAC had a major incentive to resolve these outstanding issues. The GAC Executive Officer comments above make clear the major concern of the Mirarr Traditional Owners, and hence the focus on issues related to water management.

Establishment of a working group

ERA and GAC agreed to establish an Independent Surface Water Working Group (ISWWG) to undertake an expert review of the surface water management, monitoring, and compliance systems associated with release of water from the Ranger Uranium Mine site, with particular focus on the concerns of the Mirarr Traditional Owners who are represented by GAC. The objective of the ISWWG was: *to use existing data and knowledge to conduct an independent expert review of surface water management and monitoring associated with the Ranger Mine site, with particular focus on the concerns of the Mirarr Traditional Owners, and to make recommendations for changes or actions as required.*

In establishing the ISWWG, a number of important decisions needed to be made, in particular about representation and independence. Given the Working Group objective, it was decided membership should be confined to GAC, ERA, SSD – a division of the Australian Government Department of the Environment¹ – and the Northern Land Council (NLC).² The Northern Territory DME was invited to join as an observer. DME has statutory responsibility for regulating the Ranger Uranium Mine, and given that it was thought possible the Working Group would recommend changes to the statutory monitoring regime, it was considered prudent that DME was not involved directly in the establishment of such recommendations.

Additionally, the independence of the Working Group was strengthened by the involvement of two credible and well-respected scientists, one serving as the Independent Chair (BTH) and the other as the Independent Science Advisor (MPT).

The role of the Independent Chair was to: (1) organise and ensure the effective running of all ISWWG meetings in accordance with the agreed TORs, (2) ensure that a positive outcome results from ISWWG's deliberations, (3) develop a set of draft ToRs for the ISWWG to discuss, modify and agree to at the first meeting, (4) ensure that all briefing papers for ISWWG meetings contain sufficient information to enable ISWWG members to make decisions about what reviews and studies need to be undertaken, (5) ensure that project briefs are prepared for all reviews and studies agreed by ISWWG and that these are conducted effectively and reports delivered on time and within budget, and (6) ensure that all reports for ISWWG are peer reviewed by the Independent Science Advisor and that these peer reviews are made available to ISWWG.

The role of the Independent Science Advisor was defined to include: (1) provide independent expert advice to ISWWG, particularly through: initial discussions on what reviews and studies need to be undertaken; comments and discussions on detailed project briefs for all reviews and studies agreed by ISWWG; and peer reviewing all (or selected) reports for ISWWG and providing summary advice to the ISWWG, (2) overseeing and if necessary directing the work of independent experts commissioned by the ISWWG, (3) attending all ISWWG meetings and contributing independent expert advice in all discussions, and (4) preparing a final report to the ISWWG, including recommendations, assessing the work conducted under its direction and progress made against the TORs.

Given that ERA and Environmental Research Institute of the Supervising Scientist (ERISS) had over 30 years of surface water quality data and research information, which they brought to the table to assist this review, it was not considered that any new or additional field investigations or monitoring would be needed to complete the review.

Identification of the issues

Considerable time and effort was spent in discussing and then articulating the major issues GAC had regarding surface water management at the Ranger Uranium Mine. This was a particularly important exercise, because without a clear and agreed articulation of the issues from the Traditional Owners viewpoint, it would have been all too easy for the ISWWG to have undertaken reviews of issues that were not important to the Traditional Owners or to have missed reviewing issues that were of importance to them.

Initially, the list of issues was developed between GAC and the Independent Chair, with the list finally agreed to at the first meeting of the ISWWG.

Four broad categories of concerns/issues emerged, these being:

- (1) surface water management and releases,
- (2) existing monitoring practices, compliance framework and management responses in relation to surface waters,
- (3) downstream monitoring to provide confidence that the environment is being protected and
- (4) the integrity and reporting of, and stakeholder access to, relevant data.

For each of these categories, the issue(s) was documented, with the wording agreed by all parties (summarised in [Table 1](#)). Subsequently, a set of ToR was developed for each of the

Table 1. Surface water management issues and ToRs.

Issue category	Issues	ToRs
Surface water management and releases	<p>GAC is concerned about the effectiveness of the current Ranger surface water management plan and would like to see a comprehensive conceptual model developed which focuses on the transport of contaminants (conductivity, pH, major ions, heavy metals and radionuclides) from the Ranger Uranium Mine to the Magela Creek system. They would also like to be independently reassured that the Ranger surface water management plan is ‘fit for purpose’ and is the best (leading) achievable practice for the Ranger uranium mine, and if not how it might be improved</p> <p>GAC acknowledges that ERA has developed a decision support tool (the Release Plan Calculator [RPC]) to assist in the decision-making with respect to when and where to release stored water from the Ranger Uranium Mine site. However, they are concerned that the structure and accuracy of the RPC have not been independently assessed and validated, and that all water sources on the lease are not captured by the RPC. These concerns include the load of contaminants reaching the mine site via natural processes as well as those transported from upstream</p>	<p>ToR #1a: To review the effectiveness of the current Ranger surface water management plan, and assess whether the current plan is ‘fit for purpose’ and is the best (leading) achievable practice for the Ranger Uranium Mine, and if not how it might be improved</p> <p>ToR #1b: To review the basis of ERAs Release Plan Calculator (RPC), assess its effectiveness for operational decision-making, and make recommendations, as necessary, for modifications to the RPC to improve its effectiveness and accuracy</p>
Existing monitoring practices, compliance and management responses	<p>GAC is concerned about the adequacy and representativeness of the existing statutory compliance sampling strategy that relies on a single weekly grab sample taken by ERA at MG009. Additionally, they are concerned that the current monitoring system that relies on the calculation of the total loads of ‘filterable’ metals transported may be inadequate for assessing the impacts of metals downstream of the Ranger Mine. They suggest the compliance should be based on ‘total’ metal loads as well as ‘filterable’ metal loads</p> <p>GAC would like to see the information from the in situ monitoring, currently being undertaken in both Magela and Gulungul Creeks, included in statutory compliance assessment.^b Ideally, GAC would like ERA to continue to use existing in situ sites on Magela Creek (i.e. those that are additional to those</p>	<p>ToR #2a: To assess the adequacy of the current compliance monitoring and management response framework^a with respect to providing assurance of adequate downstream environmental protection, and to make recommendations on possible improvements to the monitoring, compliance and response framework</p> <p>ToR #2b: To assess whether the continuous and event-triggered monitoring approach, being employed by SSD across and beyond the mine lease site, is ‘fit for purpose’ and is the best (leading)</p>

Table 1 (Continued)

Issue category	Issues	ToRs
Downstream monitoring	<p>used in the statutory compliance system), to conduct internal monitoring and trace unexpected contamination events</p> <p>GAC is also concerned that the current compliance monitoring system only assesses the loads (and concentrations) of contaminants transported by Magela Creek at MG009. Further, the GAC are concerned that the current compliance regime does not include loads (or concentrations) contributed via the Gulungul Creek system</p> <p>GAC is concerned that the loads and concentrations of contaminants are not reported and accounted for as 'total' (i.e. unfiltered) as well as 'filterable' (i.e. <0.45 µm) components. GAC sees the inclusion of total metals as a necessity for a 'best practice' approach with respect to more comprehensive environmental protection.^c Further, the GAC have also contended that all contributions to the downstream environment should be assessed and included in a revised definition of compliance</p> <p>GAC is concerned that the link between compliance monitoring to specific management responses are: not articulated adequately, not transparent and are slower than desirable. To strengthen the link between monitoring and response may require the following: reporting of trigger level exceedances, events that triggered (auto) sample collection and related investigations, response times for water quality analysis, and reporting of event-related management actions and outcomes</p> <p>GAC is concerned that previous annual monitoring of water and sediment quality in downstream water bodies (e.g. Mudginberri, Island [Mula], Coonjimba, Jabiluka, Djarr Djarr and Nankeen Billabongs) is no longer occurring, and that there is now no regular assessment undertaken by ERA of possible mine-related impacts in these systems.^{d,e}</p>	<p>achievable practice for the Ranger Uranium Mine, and could supplement or replace the existing monitoring, compliance and response framework</p> <p>ToR #3: To assess whether the reintroduction of an annual sediment monitoring program, or introduction of an annual metals in bushtucker biota sampling program, would strengthen the capacity of the current downstream monitoring program^f to identify change</p>

Table 1 (*Continued*)

Issue category	Issues	ToRs
Data integrity, reporting and stakeholder access (communication aspects)	GAC is concerned that some data and reports relevant to their capacity/ability to assess possible impacts from the Ranger Uranium Mine on the downstream environment are not available. They want all monitoring data consolidated and made readily available to stakeholders. Additionally, they have concerns about ERA's attention to, and understanding of, standard laboratory and field practices. Consequently, they contend that it would be timely to re-examine ERA's sampling and laboratory QC/QA protocols, as well as their data interpretation, data storage and data access (internal and external) procedures, as well as the means by which they communicate the results to stakeholders	and the potential environmental and human health impacts related to the mine. ToR #4: To assess the reliability of ERA's point source and continuous monitoring data acquisition (sampling, analysis and QA/QC protocols) and data storage arrangements, the adequacy of stakeholder access to relevant data, and the completeness and timeliness of reports to stakeholders

^aIn particular, ISWWG seeks assessment and review of the use of the 'filterable' vs. 'total' heavy metal fraction in surface waters, the adequacy of the weekly grab sample taken at MG009, the need for information on heavy metal 'loads', and the lack of site-specific compliance requirements for Gulungul Creek.

^bContinuous in situ monitoring of EC, turbidity and pH is now being undertaken by ERA at 10 sites along Magela and Gulungul Creeks, which are impacted by releases and run off from the Mine lease. GAC would like to see data from Magela Creek Upstream, Magela Creek at 009 (MG009 – all three channels or a flow-weighted average across the stream profile), Gulungul Creek Control and Gulungul Creek at the Highway used for statutory compliance.

^cNote: The concentration (of the filterable fraction) is used to assess the possible aquatic ecological impact by comparing with ecotox-derived trigger values. The total loads relate more to the global potential for impact on the downstream environment, including concentrations of heavy metals in bushtucker.

^dSSD runs an integrated monitoring program that aims to identify mine-related change and potential environmental and human health impacts downstream of the mine. This involves an annual program of sampling of mussels from Mudginberri Billabong to analyse the edible flesh for heavy metals and radionuclides. Radium is the primary focus since mussels bioaccumulate radium to levels that make the consumption of mussels by the Mudginberri community the single largest source of radionuclide exposure, albeit very small in the context of international exposure guidelines. The purpose of this sampling is to provide annual assurance to the community that the ingestion of this bushtucker will not cause adverse exposures.

^ePreviously, SSD also sampled fish annually until it became apparent that the levels being measured were so low as to not warrant this level of monitoring effort. Limited fish sampling is still done on an occasional basis to maintain a watching brief.

^fSSD currently conducts an annual program of sampling of mussels from Mudginberri Billabong to analyse the edible flesh for heavy metals and radionuclides. Radium is the primary focus since mussels bioaccumulate radium to levels that make the consumption of mussels by the Mudginberri community the single largest source of radionuclide exposure, albeit very small in the context of international exposure guidelines. The purpose of this sampling is to provide annual assurance to the community that the ingestion of this bushtucker remains acceptable.

issue categories to assist in focusing the various independent reviews that were undertaken (Table 1).

The ISWWG spent considerable time and effort in specifying the ToRs to ensure that the issue(s) would be comprehensively addressed by the selected independent reviewers (consultants).

Program of independent studies

After the first meeting of ISWWG, where the issues and ToRs were agreed, a set of four project briefs were prepared, one for each issue category. Independent reviewers (consultants) were invited to submit proposals, these were assessed and contracts awarded to the successful reviewers. All reviews were undertaken between August and October 2012. The four consultant reports can be found in Hart and Taylor (2013b).

Review of independent studies

All four consultant reports were reviewed by the Independent Science Advisor. The role of the Science Advisor is provided above and his full review report can be found in Hart and Taylor (2013b).

The Independent Science Advisor was appointed by GAC, as it was considered important that the Science Advisor be agreed by the indigenous representatives and was seen as independent.

Agreement on action plan

At its second meeting, the Working Group considered the 60 recommendations from the four independent consultant reports. These were discussed in detail and consolidated into 15 recommendations for action, with most of these being directed to ERA (Table 2).

Outputs

There were two main outputs from this project: (1) a main report that contained the findings and recommendations for change or actions by ISWWG (Hart & Taylor 2013a) and (2) a second report containing the four consultant reports and the report by the Independent Science Advisor (Hart & Taylor 2013b).

Discussion

All stakeholders agreed that this was a successful project. Importantly, letters from both ERA and GAC supporting the process, agreeing with the 15 recommendations and agreeing to work together to address the recommendations, were published as a forward to the main report (Hart & Taylor 2013a).

Here, we discuss the key factors that we believe underpinned the success in this project.

Mutual benefit

As noted above, with the prospect of future development of the Ranger 3 Deeps project, both ERA and GAC had a major incentive to resolve these outstanding surface water issues. ERA's incentive was obvious – to mine an additional major uranium resource that would significantly benefit their shareholders. However, without the support of the Mirrar and GAC, ERA is unlikely to gain approval for this development. The incentive for the

Table 2. Summary of ISWWG recommendations.

Issue	ISWWG recommendation
Updating the Authorisation	#1: All statutory and compliance monitoring requirements be consolidated into a single (statutory) document that is reviewed annually and updated as necessary
	#2: Changes to the current statutory compliance monitoring program occur in three areas: (a) introduce compliance values for Gulungul Creek, (b) introduce total (unfiltered) heavy metal concentrations in the statutory compliance monitoring program in place of filterable metal concentrations, (c) change the current statutory monitoring program requirement for weekly grab samples to one based on continuous and event triggered data collection
Downstream monitoring	#3: A review be undertaken of the need for:
	(a) Mine-derived metal loads and balances, (b) Annual additional load limits, (c) Additional WQ indicators
On-site water management	#4: In light of the changes highlighted as a result of this independent review, the MTC consider recommending that changes be made to update the Authorisation
	#5: A sediment monitoring program be re-introduced. In doing so due consideration needs to be given to the technical challenges in designing a program to reliably evaluate possible adverse environmental impacts during the operational phase of the mine, while providing benchmark data to detect possible impacts after closure
	#6: A routine ‘metals (including radionuclides) in bush tucker’ monitoring program be re-introduced, with ERA and GAC to provide details on the scope and objectives for such a program, and SSD to review existing ‘metals in bush tucker’ data base and provide advice on program design
Flow measurements	#7: SSD note and consider recommendations related to downstream radionuclide monitoring for future implementation
	#8: ERA investigate and implement opportunities to simplify the on-site water management system and align changes in operations and requirements/expectations with the water management plan through a regular review process
ERA sampling and analysis	#9: ERA consider and report on recommendations regarding: (1) improved planning (pre-season and day-to-day) for releases, (2) managing water quality at MG009, (3) managing releases from RP1 and (4) operating rules and practice, and implement a modified water management system
	#10: ERA improve on-site and off-site flow measurements to establish accurate hydrographic data
ERA sampling and analysis	#11: ERA implement the additional sampling, laboratory analysis and QA/QC procedures recommended

Table 2 (Continued)

Issue	ISWWG recommendation
ERA reporting to stakeholders	#12: ERA consider and report on recommendations regarding the implementation of additional staff training programs to further improve staff capacity to identify issues related to water quality and to interpret laboratory and field water quality data #13: ERA consider and report on how best to give effect to the recommendations related to aligning reporting requirements with operational and stakeholder/regulatory expectations and improving the reporting to stakeholders, in particular the weekly water quality reporting which should include continuous monitoring data, increased interpretation of results and a reporting schedule where investigations are involved
Other recommendations Reviewing progress	#14: SSD considers other recommendations related to their business #15: ERA establish a mechanism for regular reporting progress on projects to address the ISWWG recommendations to stakeholders, particularly GAC

indigenous people was the additional financial and community benefits the new development would provide. However, they were concerned to balance this development with their desire to look after country.

Goodwill on behalf of all parties to make the project work

All parties, and particularly ERA and GAC, were committed to making this project a success. It was particularly important that the indigenous view were respected and that every effort was made to consider actions that would reduce the potential for downstream ecological and human health effects to occur.

This goodwill manifested itself in the cooperative conduct of the ISWWG and the very professional way the 60 consultant recommendations were consolidated into the 15 final recommended actions.

A measure of the success of the project from the indigenous viewpoint is provided by the letter of support provided by the CEO of GAC at the completion of the project (Hart & Taylor 2013a). In this he said:

On behalf of the Mirarr Traditional Owners and the Gundjeihmi Aboriginal Corporation (GAC) I would like to formally acknowledge the excellent work of the Independent Surface Water Working Group (ISWWG) in reviewing the surface water management and monitoring associated with the Ranger Uranium Mine. The degree of cooperation from ERA and regulatory authorities has exceeded our expectations and, I believe, set a new standard for transparency and inclusion in such matters. The GAC has long advocated such cooperation and has traditionally been frustrated at the extent of co-option and 'regulatory capture' all-too-evident in Australia's mining industry. In this instance, subject to the final outcomes of the process, we believe we have side-stepped that dynamic and hopefully achieved a lasting benefit to the environment in Kakadu and the culture of the Mirarr people.

Adequate funding

ERA agreed to provide the necessary funding to allow the review to proceed. This involved funding the ISWWG Chair, the ISWWG secretariat, the four consultants, and through GAC the Independent Science Advisor. In situations such as discussed here, where the issues and solutions are quite technical, adequate funding is essential, because without it, it would not be possible to engage the required quality of technical experts.

An important issue in these cases where the company provides all or the major part of the funds is the independence (real or perceived) of those receiving these funds. Initially, the GAC were concerned about this aspect and sought to provide a mechanism (an Independent Science Advisor) to ensure there was an independent peer review of both the process and the consultant reports. More on this is detailed below.

Identification and agreement on the issues

As noted above, considerable time and effort was spent in discussing and then articulating the major issues GAC had regarding surface water management at the Ranger Uranium Mine. It can be seen that the issues listed in [Table 1](#) are very detailed and specific, and provide an indication of the level of professional understanding of the Ranger Uranium Mine operations in general, and the surface water management and monitoring processes in particular, by GAC and the Traditional Owners. The Mirarr Traditional Owners employ their own scientific advisor (GK), a situation that is rather rare for indigenous groups.

The clear and agreed articulation of the issues from the Traditional Owner viewpoint was vital since without it, it would have been all too easy for issues that were not important to the Traditional Owners to have been addressed, or to have missed reviewing issues that were of importance to them.

Addressing the issues

Independent expert consultants were chosen to review the four identified issues. Importantly, ISWWG spent considerable time in defining clear and focused ToRs for each review. The ToRs are listed in [Table 1](#).

ISWWG decided that the reviews should be undertaken by an individual consultant chosen for his/her known expertise and experience, and not by larger consulting company where it is difficult to identify the actual individual(s) who produce the review.

All consultants visited the Ranger Uranium Mine site at Jabiru to ensure they were familiar with the operation and had time for discussion with key personnel from GAC, ERA and SSD.

All consultant reports were peer reviewed by the Independent Science Advisor.

Independent peer review

As noted above, the Independent Science Advisor peer reviewed the consultant reports and the ISWWG process. GAC, and not ERA, appointed the Independent Science Advisor, which contributed to the confidence of the Mirarr Traditional Owners in the review process.

This independent review of the reports and the ISWWG process was important to ensure that the information used to recommend changes and actions to the surface water management and monitoring program was robust and credible.

Conclusion

This article has summarised the process undertaken by ERA and the GAC to resolve a number of long-standing issues relating to surface water management and monitoring associated with the Ranger Uranium Mine in the Northern Territory, Australia.

The main factors that were instrumental in the success of this project have been identified and discussed, including: the mutual benefits to GAC and ERA, the goodwill of the parties, adequate funding, agreement on the issues, addressing the issues, and an independent peer review process. It is expected that this information will be a useful guide for others seeking to resolve issues between indigenous land owners and mining companies.

Of course, the overall success of this project cannot be claimed until the actions recommended by the ISWWG are completed to the satisfaction of the Traditional Owners. The recommendations are currently being addressed by a sub-committee of the MTC.

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Disclosure statement

No potential conflict of interest was reported by the authors.

Notes

1. The ERISS conducts environmental monitoring and research on the protection of people and the environment from uranium mining.
2. The Mirarr people have legal representation through the NLC under the Aboriginal Land Rights Act.

References

- Ali, SH 2009, *Mining, the environment and indigenous development conflicts*, University of Arizona Press, Tucson.
- Ali, SH & O’Faircheallaigh, C 2007, ‘Extractive industries, environmental performance and corporate social responsibility’, *Greener Management International*, vol. 52, pp. 5–16.
- Brereton, D, Pesce, D & Abogabir, X (eds.) 2011, *Proceedings of the first seminar on social responsibility in mining*, Satiago, Chile.
- Cherry, J 2003, *Regulating the Ranger, Jabiluka, Beverley and Honeymoon uranium mines*, Report of the Senate Committee on Environment, Communications, Information Technology and the Arts Legislation, Parliament House, Canberra.
- Commonwealth of Australia 1999, *Environmental requirements of the Commonwealth of Australia for the Operation of Ranger Uranium Mine* <www.environment.gov.au/ssd/about/legislation/pubs/ranger-ers.pdf>.
- Crawley, A & Sinclair, A 2003, ‘Indigenous human resources practice in Australian mining companies: towards an ethical model’, *Journal of Business Ethics*, vol. 45, pp. 361–373.
- Esteves, AM, Franks, D & Vanclay, F 2012, ‘Social impact assessment: the state of the art’, *Impact Assessment and Project Appraisal*, vol. 30, pp. 34–42.
- ERA 2014, Viewed 9 March 2015 <http://www.energyres.com.au/media/38_media_releases_3064.asp>.
- Franks, DM & Vanclay, F 2013, ‘Social impact management plans: innovation in corporate and public policy’, *Environmental Impact Assessment Review*, vol. 43, pp. 40–48.
- GAC & ERA 2012, *Media statement – ERA and the GAC agree on important water initiatives* <http://www.energyres.com.au/documents/20120301_GAC_ERA_Media_Release_Water_Initiatives.pdf>.
- Graetz, G 2012, *Uranium mining and indigenous people: the role of SIA*, In IAIA12 Conference Proceedings Energy Future: The Role of Impact Assessment, Portugal.
- Graetz, G & Manning, H 2011, *The politics of uranium mining in Australia's uranium trade: the domestic and foreign policy challenges of a contentious export*, Ashgate, Surrey, UK, pp. 137–163.
- Hart, BT & Taylor, MP (eds.) 2013a, *Review of the surface water management and monitoring associated with the Ranger Uranium Mine*, Volume 1 – Main Report, Report of the Independent Surface Water Working Group, Energy Resources of Australia Ltd, Darwin, January 2013, Northern Territory, Australia.
- Hart, BT & Taylor, MP (eds.) 2013b, *Review of the surface water management and monitoring associated with the Ranger Uranium Mine*, Volume 2 – Consultant Reports, Report of the Independent Surface Water Working Group, Energy Resources of Australia Ltd, Darwin, January 2013, Northern Territory, Australia.
- ICMM 2008, *Mining and indigenous peoples issues roundtable*, International Council on Mining and Minerals, Sydney.
- Keenan, JC & Kemp, DL 2014, *Mining and local-level development: examining the gender dimensions of agreements between companies and communities*, Centre for Social Responsibility in Mining, The University of Queensland, Brisbane.
- Kemp, D, Owen, JR & van de Graaff, S 2012, ‘Corporate social responsibility, mining and ‘audit culture’’, *Journal of Cleaner Production*, vol. 24, pp. 1–10.

- MMSD 2002, *Breaking new ground: mining, minerals and sustainable development: the Report of the Mining, Minerals and Sustainable Development (MMSD) Project*, Earthscan for International Institute for Environment and Development (IIED) and World Business Council (WBC), London.
- O'Faircheallaigh, C 2006, 'Aborigines, mining companies and the state in contemporary Australia: a new political economy or 'business as usual'? *Australian Journal of Political Science*, vol. 41, pp. 1–22.
- O'Faircheallaigh, C 2012, 'International recognition of indigenous rights, indigenous control of development and domestic political mobilisation', *Australian Journal of Political Science*, vol. 47, pp. 531–545.
- O'Faircheallaigh, C 2013a, 'Community development agreements in the mining industry: an emerging global phenomenon', *Community Development*, vol. 44, pp. 222–238.
- O'Faircheallaigh, C 2013b, 'Extractive industries and indigenous peoples: a changing dynamic?' *Journal of Rural Studies*, vol. 30, pp. 20–30.
- Solomon, F, Katz, E & Lovel, R 2008, 'Social dimensions of mining: research, policy and practice challenges for the minerals industry in Australia', *Resources Policy*, vol. 33, pp. 142–149.
- Trebeck, KA 2007, 'Tools for the disempowered? Indigenous leverage over mining companies', *Australian Journal of Political Science*, vol. 42, pp. 541–562.
- URS 2010, *Independent hydrogeological review of the tailing storage facility at the Ranger Uranium mine*, Final report by URS Australia Pty Ltd to Energy Resources of Australia Ltd, Darwin, October 2010.