



4. Stakeholder engagement



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Cover photograph: Paul Arnold sitting with Yvonne Margarula and Nida Mangarrba in the first Relationship Committee Meeting on Mirarr Country at Djarr Djarr – Image courtesy of Gundjeihmi Aboriginal Corporation

GLOSSARY

Below are key terms that are used in this section.

Key term	Definition
Annual Plan of Rehabilitation	High level plan used to determine the securities amount to be held by the Commonwealth Government for Ranger Mine rehabilitation obligations.
Environmental Requirements	The Ranger Environmental Requirements are attached to the s.41 Authority and set out Primary and Secondary Environmental Objectives, which establish the principles by which the Ranger operation is to be conducted, closed and rehabilitated and the standards that are to be achieved.
Mine Closure Plan	A dynamic plan presenting all past, present and future rehabilitation activities of the Ranger Project Area in order to demonstrate that closure activities will achieve the relevant Environmental Requirements. Submitted annually for approval, the plan provides updates of the preceding year.
Minesite Technical Committee	<p>The Minesite Technical Committee, convened in accordance with Attachment A of the Working Arrangements for the Regulation of Uranium Mining in the Northern Territory dated 30 May 2005, is tasked with:</p> <ul style="list-style-type: none"> • Reviewing proposed and existing approvals and decisions under NT legislation • Reviewing technical information in relation to Ranger Mine, including monitoring data and environmental performance • Collaboratively developing standards for the protection of the environment • Developing strategies to address emerging issues <p>The MTC consists of the representatives of the Department of Industry, Tourism and Trade, the Supervising Scientist, ERA and the Northern Land Council. Representatives of the Commonwealth Department of Industry, Science, Energy and Resources may also attend MTC meetings.</p>
Mirarr	<p>Mirarr is a patrilineal descent group. Descent groups are often called 'clans' in English and kunmokurrkurr in Kundjeyhmi language. There are several Mirarr clans with each one distinguished by the language they historically spoke (e.g. Mirarr Kundjeyhmi, Mirarr Urningangk, Mirarr Erre).</p> <p>The Mirarr are the Traditional Owners of the land encompassing the RPA.</p>
Ranger Project Area	Abbreviated to RPA. The Ranger Project Area means the land described in Schedule 2 to the Commonwealth <i>Aboriginal Land Rights (Northern Territory) Act 1976</i> .
WA mine closure guidelines	Guidance documentation provided by the Western Australia Department of Mines, Industry Regulation and Safety for the development of mine closure plans.

Table of Abbreviations

Below are abbreviations and acronyms that are used in this section.

Abbreviation/ Acronym	Description
ACF	Australian Conservation Foundation
ARRAC	Alligator Rivers Region Advisory Committee
ARRTC	Alligator Rivers Region Technical Committee
ASIC	Australian Securities and Investment Commission
ASNO	Australian Safeguards and Non-Proliferation Office
BPT	Best Practicable Technology
DCM	Department of the Chief Minister
DIIS	Department of Industry, Innovation and Science
DITT	Department of Industry Tourism and Trade
DISER	Commonwealth Department of Industry, Science, Energy and Resources (formally DIIS)
DPIR	Department of Primary Industry and Resources (now DITT)
DPMC	Department of Prime Minister and Cabinet
<i>EPBC Act</i>	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
<i>EPIP Act</i>	<i>Environmental Protection (Impact of Proposal) Act 1974</i>
ER	Environmental Requirements
ERA	Energy Resources of Australia Ltd
GAC	Gundjeihmi Aboriginal Corporation
IAEA	International Atomic Energy Agency
JTDA	Jabiru Town Development Authority
KKN	Key Knowledge Needs
MCP	Mine Closure Plan
MOU	Memorandum of Understanding
MTC	Minesite Technical Committee
NGO	Non-government Organisations
NLC	Northern Land Council
NP	National Park
NT	Northern Territory
NTP	Northern Territory Portion
RCCF	Ranger Closure Consultative Forum
RPA	Ranger Project Area
SIA	Social Impact Assessment



Abbreviation/ Acronym	Description
SSB	Supervising Scientist Branch
TSF	Tailings Storage Facility
WA	Western Australia
WARC	West Arnhem Regional Council

4 STAKEHOLDER ENGAGEMENT

Energy Resources of Australia Ltd (ERA) has a diverse and complex range of stakeholders with interests in specific areas of the closure process or outcomes and/or in the more general closure objectives and successful achievement of the planned post-mining land use. The ERA approach to stakeholder engagement is focused on building enduring relationships based on mutual respect, active partnership, transparency and long term commitment. Throughout the life of the Ranger Mine, ERA has engaged, communicated and consulted with multiple stakeholder groups through various engagement activities (Appendix 4.1) ranging from formal to informal processes. The stakeholder engagement aims to both provide information and to seek feedback on closure plans.

ERA representatives are in frequent, regular contact with the Gundjeihmi Aboriginal Corporation (GAC), Northern Land Council (NLC), the Northern Territory Department of Industry, Tourism and Trade (DITT), Commonwealth Department of Industry, Science, Energy and Resources (DISER) and the Supervising Scientist Branch (SSB), both informally and formally through various stakeholder committees, including the Minesite Technical Committee (MTC). Other stakeholders are listed below (Table 4-1). Figure 4-1 demonstrates the linkages between stakeholders and the ERA. There are documented communications via forums including the Alligator Rivers Region Technical Committee (ARRTC) and Alligator Rivers Region Advisory Committee (ARRAC), which date back to 2001 (Appendix 4.1). Public communication on aspects of mine rehabilitation and closure can be traced back to the first ERA annual report in 1981 (ERA 1981; p 11).

This consultative engagement has covered all key aspects of closure, including:

- engineering and design criteria for technical aspects of closure such as water treatment, landform design, tailings transfers and backfilling of mine pits
- the overall planning process and schedule
- post-mining land use, closure objectives and closure completion criteria
- legal requirements and obligations associated with the various agreements for Ranger Mine operations and Jabiru township, and
- land tenure and governance.

Table 4-1: Ranger Mine closure stakeholders

Stakeholder group	Description
EXTERNAL	
Traditional Owners and local Aboriginal groups	Gundjeihmi Aboriginal Corporation (GAC) Northern Land Council (NLC) Djabulukgu Association Gagudju Association Warnbi Aboriginal Corporation West Arnhem Regional Council (WARC)
Federal Government	Aboriginal and Torres Strait Islander Commission Australian Safeguards and Non-Proliferation Office (ASNO) Australian Securities and Investment Commission (ASIC) Department of Environment Department of Foreign Affairs and Trade Department of Prime Minister and Cabinet (DPMC) Department of Industry, Science, Energy & Resources (DISER) Minister for Industry, Science and Technology Minister for Resources, Water and Northern Australia Parks Australia
Northern Territory Government	Department of Education Department of Health Department of Industry, Tourism and Trade (DITT) Department of Planning and Local Government Department of the Chief Minister (DCM) Minister for Mining and Industry Jabiru Kabolkmakmen Limited Northern Territory Treasury
Northern Territory Local Government	Jabiru Town Development Authority (JTDA) West Arnhem Regional Council
Primary regulatory committee	Minesite Technical Committee (MTC)
Regional scientific overview committee	Alligator Rivers Region Technical Committee (ARRTC)
Regional overview committee	Alligator Rivers Region Advisory Committee (ARRAC)
International agencies	International Atomic Energy Agency (IAEA) European Parliament standing committees World Heritage Committee of UNESCO

Stakeholder group	Description
EXTERNAL	
Other NGOs (non-government organisations)	Amateur Fishermen's Association NT (AFANT) Australian Conservation Foundation (ACF) Environmental Defenders Office NT (EDONT) Minerals Council of Australia - NT Northern Territory Environment Centre World Wildlife Fund
Business community	Rio Tinto Uranium Rio Tinto Limited Shareholders Suppliers
Local community	Jabiru businesses/organisations Jabiru Town Development Authority (JTDA) Local social and recreational groups Residents Tourists
INTERNAL	
ERA Board	Comprises non-executive and an executive director (Chief Executive)
Executive Committee (EXCO)	Chief Executive, Chief Financial Officer, Legal Counsel and Company Secretary, General Manager Operations, General Manager External Relations, General Manager Human Resources
Managers	Manager Business Services, Manager Finance, Manager Health Safety Environment and Communities, Manager Operations, Manager Mining and Infrastructure, Manager Closure, Manager Technical Studies.
Legal team	Legal Counsel and Company Secretary
Employees	ERA employees, partners and dependents
Contractors	ERA long term contractors



ERA

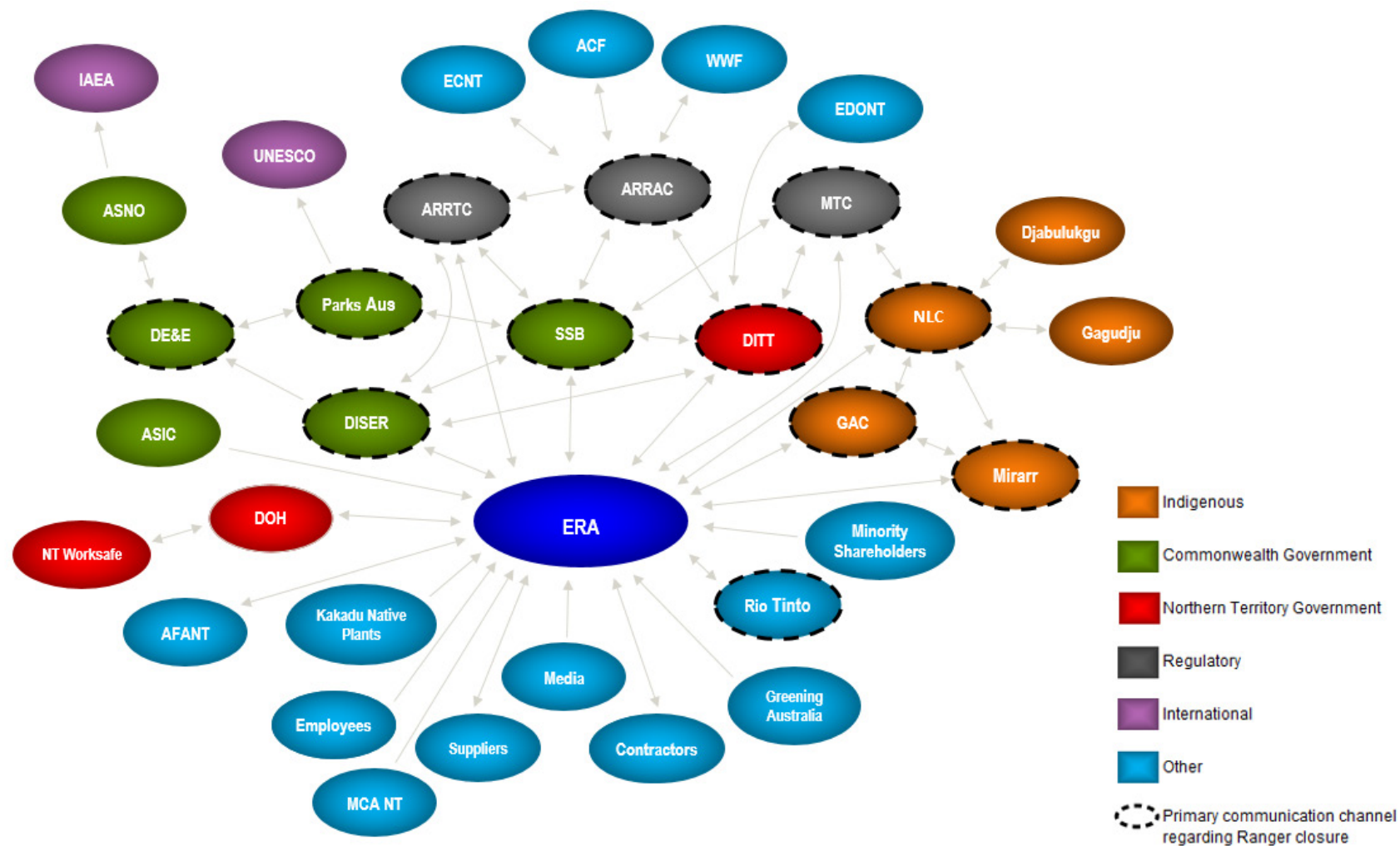


Figure 4-1: Ranger Mine stakeholder matrix

4.1 ERA stakeholder engagement principles

Throughout the life and closure of the Ranger Mine, ERA aims to build enduring and productive relationships with neighbours and local communities and to be responsive to their needs and concerns. To be meaningful for all parties, engagement must be open, inclusive, culturally appropriate and publicly defensible. Community engagement takes place in accordance with the following guiding principles:

- transparent – in order to develop and maintain a relationship of trust, information which is not commercially sensitive will be shared openly and in a timely manner.
- accessible – staff will be available, approachable and accessible and information will be available in a range of formats. Where appropriate and practical, translation into the local language will be provided.
- strategic – engagement will be provided regularly in a coordinated manner by key ERA staff with reference to key messages and issue management, and
- two-way – community stakeholders will be able to participate openly and honestly during engagement with their perspective, feedback and views.



Figure 4-2: Tourist facilities in Jabiru town

Table 4-2: Principles of stakeholder engagement

Principle	Outcome
Purposeful	<p>Commence every engagement with a clear understanding of what ERA wants to achieve</p> <ul style="list-style-type: none"> be aware and acknowledge stakeholders' objectives, perspective, expertise and their level of influence know why we need to engage and what success looks like, makes it easier to conduct focused and meaningful engagements good planning of our communication and managing stakeholder expectations will contribute to building robust relationships with stakeholders as well as developing an understanding of stakeholders ability and desire to engage
Inclusive	<p>Make it easy for stakeholders to engage</p> <ul style="list-style-type: none"> ensure community stakeholders have the ability to participate openly and honestly during engagement with their perspective, feedback and views engagement to be provided regularly in a coordinated manner with reference to key messages and risks identify suitable level of engagement and communication tool appropriate to the stakeholder e.g. meeting, forums, language, culture provide stakeholders with appropriate information in a range of formats that the stakeholders needs to participate in a meaningful way
Timely	<p>Agree on how and when to engage with stakeholders from the beginning</p> <ul style="list-style-type: none"> be available, approachable and accessible where appropriate and practical discuss and negotiate timings/concerns with stakeholders respond to information requests and feedback in a timely manner as agreed with stakeholder record all engagements to ensure actions and commitments are met by agreed timeframes
Transparent	<p>Be open and honest in our engagement and set clear business expectations</p> <ul style="list-style-type: none"> provide relevant information which is not commercially sensitive openly so stakeholders will participate in a meaningful way clearly explain the business's engagement process being taken on the subject matter, the role of stakeholders in the engagement process, and how their input will inform the project
Respectful	<p>Acknowledge and respect stakeholders</p> <ul style="list-style-type: none"> understand that engagement is both one-way (information sharing) and a two-way process (consultation, collaboration) appreciate the benefits of mutual learning by respecting our stakeholder's expertise, perspective and needs recognise the different communication style and engagement needs of stakeholders and try to meet those style and needs wherever possible listen and be open and respectful of stakeholder's alternative views

Engagement activities aim to achieve broad community understanding of the planned activities and scheduling of the closure of the Ranger Mine, and the meeting of closure obligations. This includes working towards ERA being viewed as a trusted active member of the community.

The ERA consultation with stakeholders is undertaken in accordance with an engagement framework consisting of:

- ERA Communities Policy
- ERA Communities and Social Performance Plan
- ERA Communication Standard
- ERA Community and Stakeholder Engagement Plan
- ERA Community Consultation, Engagement and Communication work instruction, and
- a number of existing engagement forums and tools.

ERA engages directly with numerous stakeholders on closure aspects for the Ranger Mine, including communication in the following formats:

- regular updates on key closure activities, including in language for Mirarr members of the Relationship Committee, where possible;
- presentations of new, or updated, information outlining closure strategies, engineering studies, modelling predictions and research and development, as required;
- participation in the development and progress of scientific studies needs identified in forums such as ARRTC;
- site visits to the Ranger Mine to inform progress on closure activities and associated closure studies such as the trial landform; and
- knowledge sharing and peer review of closure strategies, studies and activities through workshops, conferences and scientific publications.

An overview of the engagement forums used to engage with stakeholders on closure is provided below (Table 4-2). The stakeholder consultation register provides an indication of the extensive engagement already undertaken by ERA on closure (Appendix 4.1). It should be noted that the register is not exhaustive and also does not cover social and economic engagements and analyses previously conducted that were not directly related to closure.

**ERA**

Table 4-2: Engagement forums

Engagement forum	Frequency	Comment
Minesite Technical Committee (MTC) meetings	Bi-annually (additional meetings held as required)	The MTC is the formal forum for key advisory and stakeholder groups, including representatives of the Northern Territory Department of Industry, Tourism and Trade (DITT) (Chair), Commonwealth Department of the Agriculture, Water and the Environment, Supervising Scientific Branch (SSB), Energy Resources of Australia Ltd (ERA), Gundjeihmi Aboriginal Corporation (GAC) and the Northern Land Council (NLC), to discuss and resolve technical environmental management matters relating to the operation of the Ranger Mine. The MTC discusses matters relevant to the regulatory functions of the Northern Territory Government and the supervisory and assessment functions of the Supervising Scientist, as well as operational requirements of ERA and the views of the Mirarr and other affected Aboriginal people. In addition, Commonwealth Department of Industry, Science, Energy & Resources (DISER) is an observer to the MTC.
Ranger Closure Consultative Forum	Monthly	The Ranger Closure Consultative Forum (RCCF) is a formal forum for ERA to discuss progress and matters relating to the closure of the Ranger Mine with the key stakeholder group representatives from the DISER, SSB, Northern Territory DITT, and the NLC/GAC. The purpose of the forum is to provide ongoing updates of closure activities; confidence in the closure strategy for achieving environmental requirements; information on upcoming approvals; and to receive feedback from stakeholders on studies, applications and the close-out progress of Key Knowledge Needs (KKNs).
Alligator Rivers Region Technical Committee (ARRTC) meetings	Bi-annually	<p>The ARRTC was established under the Commonwealth <i>Environment Protection (Alligator Rivers Region) Act 1978</i> and reviews the appropriateness and quality of scientific research conducted by Northern Territory and Commonwealth Government agencies, ERA and others relating to protection of the environment from the potential impacts of uranium mining in the Alligator Rivers Region.</p> <p>Members include an independent Chairperson, the Supervising Scientist, independent scientific members, member representing the NLC and a member representing environmental non-government organisations. Non-members typically in attendance include DITT, ERA, other current operator of the Nabarlek Mining Lease and Parks Australia.</p> <p>http://www.environment.gov.au/science/supervising-scientist/communication/committees/arrtc</p>

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Engagement forum	Frequency	Comment
Alligator Rivers Region Advisory Committee (ARRAC) meetings	Bi-annually	<p>The ARRAC was established under the Commonwealth <i>Environment Protection (Alligator Rivers Region) Act 1978</i> and facilitates communication between government, industry and community stakeholders on environmental issues associated with uranium mining in the Alligator Rivers Region. Members include an independent Chairperson, the Supervising Scientist, representatives from several Northern Territory Government departments, Office of the Administrator of the Northern Territory, several Australian government departments, non-government organisations, ERA and other uranium mining/exploration companies that operate in the region.</p> <p>http://www.environment.gov.au/science/supervising-scientist/communication/committees/arrac.</p>
Closure Criteria Working Group	No longer required	<p>The Closure Criteria Working Group was established by the MTC for the purpose of developing the closure criteria for the rehabilitation of the Ranger Mine.</p> <p>The Closure Criteria Working Group also has sub-groups responsible for the development of the technical criteria for each of the following elements: landform, radiation, water and sediment, flora and fauna, soils and cultural.</p> <p>The MTC decided that closure criteria had progressed enough that this working group was no longer required. Rather the specific technical groups would continue to develop criteria and report directly into the MTC.</p>
Ecosystem Restoration Working Group (ERWG)	As required, several per year	Communication and consultation with stakeholders focusing on ecosystem restoration closure criteria and KKNs.
Water and Sediment Working Group (WASWoG)	As required, several per year	Communication and consultation with stakeholders focusing on surface water and sediment closure criteria and KKNs.
Monitoring Evaluation and Research Review Group (MERRG)	As required, several per year	MERRG was formed in response to the submission of the application to progress Pit 1 final landform, in order to further communication and consultation with stakeholders regarding Pit 1 revegetation monitoring activities.
Investor briefings	Bi-annually	Briefings provided by the ERA Chief Executive regarding ERA operations to all company shareholders.
Relationship Committee meetings	Quarterly	The Relationship Committee was established under the Ranger Mining Agreement between ERA and the NLC in 2013. The committee was established to ensure effective information sharing and review processes between ERA and the Mirarr Traditional Owners and their representatives.

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Engagement forum	Frequency	Comment
Jabiru Town Development Authority meetings	Quarterly	Jabiru serves West Arnhem region as a centre for mining, tourism and community services. Membership includes a Northern Territory Government representative (Chair), two ERA representatives, a GAC representative and an elected member of the West Arnhem Regional Council.
Ministerial briefings	Regularly as required	Briefings are provided to both Federal and Northern Territory Ministers and senior advisors on operations of the Ranger Mine, including aspects of closure.
Kakadu Board of Management meetings	Meetings held quarterly ERA update provided bi-annually	Kakadu National Park (NP) is a jointly managed park between Parks Australia and the Traditional Owners of Kakadu. A board of management has been established as part of the governance structure for the park and consists of Commonwealth Government representatives, Park Management and Traditional Owners from each region in the park. ERA provides a regular operations update, including mine closure status, and consults with the broader indigenous population through this forum.
ERA information centre	Ongoing	The centre, located next to a supermarket in Jabiru, displays current information on ERA operations including closure and rehabilitation, with ERA personnel on hand to provide face-to-face interaction.
State of the Nation	Quarterly	Presentation, and question and answer session, provided to all ERA personnel and contractors on ERA operations by either the Chief Executive or General Manager Operations including aspects of closure, Jabiru and stakeholder engagement.

4.2 Managing socio-economic impacts

The extensive engagement with the Traditional Owners (the Mirarr), and the representative groups of the GAC and the NLC, have indicated that the key areas of concern for those stakeholders surround cultural heritage and land management, the incorporation of cultural criteria and requirements into the closure planning process for the Ranger Mine, and the outlook for the local economy and infrastructure after closure.

The legislation, agreements and ERA company processes, which make up the existing Cultural Heritage Management System, are important elements in the planning, execution and assessment of closure outcomes.

The potential socio-economic impacts of the closure of the Ranger Mine have already been the subject of significant engagement with key stakeholders and are reasonably well understood (Section 4.3). However, considerable work remains to be done in planning for the future and agreement on impact mitigation and transition strategies. This is the particular focus of work in the next phase of stakeholder engagement.

4.3 Ranger Mine closure

The ERA Ranger Mine operations are currently a significant contributor to the socio-economic life of Jabiru, the West Arnhem region and more broadly the Northern Territory (NT) both through economic inputs and social aspects such as its residential workforce and community involvement.

The contributions by ERA are well understood by the company and its stakeholders following the completion of the Jabiru Social Impact Assessment (SIA) in July 2017. ERA has updated the socio-economic baseline with the most recent information so that potential impacts and opportunities associated with closure and the exit by ERA from Jabiru can be accurately assessed.

The ongoing participation in the Jabiru Taskforce by ERA, the outcomes of the Ranger closure feasibility study and the funding commitment from the Commonwealth and Northern Territory Governments to support implementation of the Jabiru Masterplan have contributed to a clearer understanding of ERA's intended contribution to the community through the rehabilitation period and into closure. A Memorandum of Understanding (MOU) on the future of Jabiru Township between the GAC, the Commonwealth and Northern Territory Governments and ERA was signed in August 2019. The MOU commits the signatory parties to support the vision for Jabiru and the contribution each will make, including ERA. ERA will play an important role in the transfer of town assets under a new town head lease, executing such rehabilitation in the town as may be required, and supporting a smooth social transition.

ERA will update the SIA in early 2021 to incorporate both specific information on the cessation of Ranger Mine operations and recent developments around the future of Jabiru.



4.4 References

Energy Resources of Australia Ltd. 1981. *ERA Annual Report 1981* [Online]. Available: <http://www.energyres.com.au/media/1981-annual-report/> [Accessed December 2016].

Energy Resources of Australia (2018) Community and Stakeholder Engagement Plan
(internal document - CDM.03-0000-HV-PLN-00004)



APPENDIX 4.1: RANGER MINE CLOSURE STAKEHOLDER CONSULTATION REGISTER



Date	Description of engagement	Stakeholders	Ranger Mine closure topics	Stakeholder comments	ERA stakeholder response, actions and/or resolution
26/06/20	Casual catch-up	SSB (Kate Tuner)	Non-minuted	Non-minuted	Non-minuted
26/06/20	Pit 3 tailings consolidation	SSB	Pit 3 consolidation	Non-minuted	Non-minuted
25/06/20	KKN Projects	SSB	KKN Projects Close-out timelines	Non-minuted	Non-minuted
25/06/20	Rehabilitation	NLC (Chris Brady)	Discussed ERA ERWG Pit 1 Planning - Reveg Trials (catchup)	Non-minuted	Non-minuted
22/06/20	Rehabilitation	NLC (Chris Brady)	Discussed draft ERA closure criteria	Non-minuted	Non-minuted
19/06/20	Casual catch-up	SSB (Kate Tuner)	Non-minuted	Non-minuted	Non-minuted
18/06/20	MERRG	SSB	Non-minuted	Non-minuted	Non-minuted
16/06/20	Feedback on ERWG	SSB	Landform constraints for ecosystem restoration- feedback on presentation to ERWG	Non-minuted	
15/06/20	Closure criteria	SSB	Non-minuted	Non-minuted	Non-minuted
12/06/20	Pit 3 tailings consolidation	SSB	Pit 3 consolidation	Non-minuted	Non-minuted
12/06/20	Casual catch-up	SSB (Kate Tuner), ERISS (Katherine Smith)	Non-minuted	Non-minuted	Non-minuted
11/06/20	Rehabilitation closure criteria	NLC	Preliminary draft criteria.	Requesting GAC advice on Cultural Key Target Species	Non-minuted
05/06/20	Casual catch-up	SSB (Kate Tuner)	Non-minuted	Non-minuted	Non-minuted
05/06/20	Rehabilitation closure criteria	CDU (Alan Anderson)	Invertebrate criteria, approaches to setting other criteria	Non-minuted	
29/05/20	Pit 3 tailings consolidation	SSB	Pit 3 consolidation	Non-minuted	Non-minuted
29/05/20	RCCF	GAC, NLC, DPIR, SSB	ERA provided updates on: Monthly metrics and monitoring Wet season update Radon exhalation at the TLF Ranger closure radiological impact assessment update Surface water model updates Process water balance: pore water in tailings vs free water above tailings Closure studies monitoring program PFAS SAQP updates Stage 13 preliminary vegetation survival Ecosystem Working group	Non-minuted	Follow up meeting required to discuss pore water versus free water and decide on the best metric to use. ERA to communicate program objectives and activities when scoped and approved. Consider the collection of bone during the fauna sampling project in addition to organs and flesh.
29/05/20	Casual catch-up	SSB (Kate Tuner)	Non-minuted	Non-minuted	Non-minuted

Date	Description of engagement	Stakeholders	Ranger Mine closure topics	Stakeholder comments	ERA stakeholder response, actions and/or resolution
26/05/20	ERWG update for individuals that missed previous meeting	ERWG member, Rio Tinto	Preliminary Pit 1 Revegetation Trail Planning	Non-minuted	Follow-up meeting scheduled.
26/05/20	ERWG	ERWG Members	<p>Potential constraints for ecosystem development across the areas to be rehabilitated on the RPA</p> <p>Potential physical and/or chemical constraints to vegetation establishment and persistence across areas to be rehabilitated: (e.g. PAW, PSD, nutrients, hydrology, substrates).</p> <p>Knowledge of the drivers of ecosystem variability and species tolerances in the surrounding areas.</p> <p>Discussion on approach to linking identified constraints to species and ecosystem tolerance.</p>	Non-minute	Non-minuted
22/05/20	Rehabilitation	SSB	Discussed draft ERA closure criteria (final landform constraints and mine domains)	Non-minuted	Non-minuted
22/05/20	Casual catch-up	SSB (Kate Tuner)	Non-minuted	Non-minuted	Non-minuted
21/05/20	Rehabilitation closure criteria	CDU (John Woinarski)	Preliminary draft criteria	Non-minuted	
20/05/20	MTC	MTC members	<p>ERA provided updates on:</p> <p>Applications</p> <p>Pit 3 commitments</p> <p>Stage 13 revegetation trial update</p> <p>Weed control</p> <p>MCP progress update</p> <p>The committee discussed about:</p> <p>Ranger Authorisation 0108 variation</p> <p>Annual water management plan and groundwater monitoring plan</p> <p>Tailings removal</p> <p>Infrastructure maintenance and inspection regime</p> <p>Radiation team resources</p> <p>Calciner and Product Packing Stack emission testing.</p> <p>Funding issue</p>	<p>The MTC is happy with ERA to use the new guidelines provided this is approved by Ministers.</p> <p>GAC and NLC considers environmental protection of the Alligator Rivers Region a Commonwealth responsibility.</p> <p>DPIR considers funding of the SSB a Commonwealth responsibility.</p>	<p>DPIR to provide draft Authorisation planned to be available for Stakeholder review with a target of 29 May 2020.</p> <p>DPIR to arrange a forum for discussion on the proposed draft of the authorisation prior to 30th June (~15th June).</p> <p>ERA to provide a plan by July, ERA to set up workshop with stakeholders by end of July to discuss how ERA are going to comply with the Environmental Requirements to remove tailings from TSF to place in Pit 3.</p>
18/05/20	Brine Squeezer [Process Water] post-submission meeting	SSB, GAC,DISER	Q&A following submission of application.	Concerns for minor technical clarifications re permeate quality, pH, Mn, bunding and pilot trial. Emphasised need to apply bunding for controlled process water during trials as well as full scale operation.	ERA to provide data comparison of BS process permeate with WTP brine permeate.
18/05/20	Discussion re ERWG	SSB, NLC	The purpose of the ERWG and plans going forward	Non-minuted	Non-minuted
15/05/20	MERRG	SSB	TLF Monitoring Plan	Non-minuted	Non-minuted

Date	Description of engagement	Stakeholders	Ranger Mine closure topics	Stakeholder comments	ERA stakeholder response, actions and/or resolution
15/05/20	Pit 3 tailings consolidation	SSB	Pit 3 consolidation	Non-minuted	Non-minuted
15/05/20	Casual catch-up	SSB (Kate Tuner), ERISS (Katherine Smith)	Non-minuted	Non-minuted	Non-minuted
14/05/20	Rehabilitation	NLC (Chris Brady)	Discussed potential final landform surface preparation	Non-minuted	Non-minuted
12-13/05/20	ARRTC 44	ARRTC Members	ERA and SSB provided updates Joint project list and report on schedule RMCP SSB's assessment report and KKN close outs SSB's initial conceptual reference ecosystem, & development of its Standard and assessment methods ERA's developments towards agreed conceptual reference ecosystem and closure criteria ERA report on closure criteria, vulnerability assessment and sulfate mapping ERA report on ground and surface water modelling. SSB report on its Standards, emerging COPCs, mixtures, CERA2 Stakeholder updates	Non-minuted	No new action raised.
11/05/20	ERA Faunal Study	GAC, NLC	ERA faunal study, approvals required for study	Non-minuted	Non-minuted
08/05/20	Casual catch-up	SSB (Kate Tuner)	Non-minuted	Non-minuted	Non-minuted
07/05/20	Rehabilitation	NLC (Chris Brady)	Discussed potential final landform surface preparation	Non-minuted	Non-minuted
05/05/20	WASWG	NLC, Rio Tinto, GAC, DPIR, SSB	Revise minutes for last meeting. Discussed the ERA-SSB joint project list for ARRTC. Upcoming applications.	Non-minuted.	Advise of any changes to closure criteria table summarising actions and agreements by 8/4/2020. Review ERA response to water and sediment questions on the TSF floor application which will be re-submitted mid-May. Chris Brady to discuss priorities for WASWG re Pit 3 application with Sharon Paulka and Keith Tayler and develop table by next meeting.
05/05/20	ERWG	ERWG members	Pit 1 revegetation trials	Non-minuted	Non-minuted
01/05/20	Casual catch-up	SSB (Kate Tuner)	Non-minuted	Non-minuted	Non-minuted
30/04/20	MERRG	SSB	Regular catch-up	Non-minuted	Non-minuted
30/04/20	Casual catch-up	SSB (Amie Leggett)	SW Uncertainty analysis	Non-minuted	Non-minuted
29/04/20	Rehabilitation	SSB	Discussed TLF Monitoring Plan content	Non-minuted	Non-minuted
24/04/20	Casual catch-up	SSB (Kate Tuner)	Non-minuted	Non-minuted	Non-minuted

Date	Description of engagement	Stakeholders	Ranger Mine closure topics	Stakeholder comments	ERA stakeholder response, actions and/or resolution
23/04/20	Brine Squeezer [Process water] stakeholder update	DPIR, DISER, NLC, ERISS, SSB	Provide an update following risk workshop.	No major concerns.	Planned submission for end of April. Planning for post-submission meeting within two weeks.
20/04/20	MERRG	SSB	Regular catch-up	Non-minuted	Non-minuted
17/04/20	RCCF	SSB, DPIR, GAC	Item discussed: Rehabilitation standards update for water & sediment and landform Wet season update Covid-19 impacts on 2020 dry season projects Water model update Pit 3 underdrain bore and brine injection update Stage 13 revegetation update GW & SW modelling update Working group update	Non-minuted	ERA to come back with suggestions on what is the best Fugro survey and/or tailings monitoring program to inform our environmental studies and the engineering for Pit 1.
17/04/20	Casual catch-up	SSB (Kate Tuner)	Non-minuted	Non-minuted	Non-minuted
16/04/20	North Notch 3 stakeholder meeting	SSB, NLC, DPIR	Post submission briefing on the North Notch 3 application (submitted to stakeholders 2 weeks earlier)	Non-minuted	Stakeholders – continued with review of application ERA – no action
10/04/20	Casual catch-up	SSB (Kate Tuner)	Non-minuted	Non-minuted	Non-minuted
08/04/20	Brine Squeezer stakeholder meeting	DPIR, DISER, NLC, ERISS, SSB	Introduce application for Brine Squeezer process water treatment.	No major issues expressed. Reiterated concerned with failure and risk to environment. Interested in outcomes of the planned risk assessment. Suggested an update meeting post-risk assessment.	Continue to progress with risk assessment. Plan an update meeting for stakeholders post risk assessment.
08/04/20	WASWG meeting	NLC, Rio Tinto, SSB, GAC, DPIR	Item discussed: Closure Criteria ALARA Project tracking	Non-minuted	Chris Brady to draft short statement for content that need to be provided to ARRTC.
08/04/2020	Rehabilitation	SSB	Discussed draft ERA closure criteria	Non-minuted	No action required
03/04/20	Casual catch-up	SSB (Kate Tuner)	Non-minuted	Non-minuted	Non-minuted
01/04/20	Rehabilitation closure criteria	CDU (John Woinarski)	Approach to identifying criteria, main themes to address	Non-minuted	No action required
24/03/20	Rehabilitation	SSB	Discussed draft ERA closure criteria	Non-minuted	Non-minuted
23/03/2020	Rehabilitation	NLC (Chris Brady)	Discussed draft ERA closure criteria	Non-minuted	Non-minuted

Date	Description of engagement	Stakeholders	Ranger Mine closure topics	Stakeholder comments	ERA stakeholder response, actions and/or resolution
20/03/20	RCCF	SSB, GAC, DPIR, NLC, DIIS	<p>Item discussed:</p> <p>SSB presented initial conceptual reference ecosystem and proposed methods for assessing revegetation success</p> <p>Pit 3 underdrain bore update</p> <p>Tailings update, including Pit 3deposition plan, progress, geophysical survey, consolidation model sensitivity analysis, Pit 1consolidation model outcome, and result from Q3 2019 tailing characterisation.</p> <p>Pit 3 process water update</p> <p>TSF Floor</p> <p>Groundwater and surface water model updates</p> <p>Revegetation update for Stage 13 trial and ERA conceptual reference ecosystem</p> <p>Working group updates</p>	Non-minuted	ERA to provide suggestion to decide the best survey/ monitoring program input into environmental studies for Pit 1.
20/03/2020	Casual catch-up	SSB (Kate Turner)	Non-minuted	Non-minuted	Non-minuted
19/03/2019	Rehabilitation	SSB	Discussed draft ERA closure criteria and TLF Monitoring Plan	Non-minuted	No action required
17/03/2020	KNPS contract model	Kakadu Native Plants	KNPs presented with new contract model for approval.	Non-minuted	Greg Williamson to liaise with Peter Christoperson

Date	Description of engagement	Stakeholders	Ranger Mine closure topics	Stakeholder comments	ERA stakeholder response, actions and/or resolution
13/03/20	MTC	MTC Members	<p>ERA presents incident report and Pit 1 pond incident update.</p> <p>Discussion for expected 2020 application and progresses towards them.</p> <p>Pit 3 contaminated waste disposal area investigation progress: Additional monitoring bore has been drilled (P3_05) and increased monitoring frequency of existing bores.</p> <p>ERA provide updates on Pit 3 underdrain bore and weed control.</p> <p>ERA provide short update on Pit 3 deposition progress (Fugro geophysical survey), Pit 3 consolidation model sensitivity analysis, Pit 1 independent tailings consolidation modelling, findings from Q3 2019 in-situ tailings characterisation and tailings consolidation modelling.</p> <p>MCP update.</p> <p>PFAS risk on RPA and Jabiru Airport contaminated site survey.</p> <p>Ranger Authorisation 0108 amendment</p> <p>MCP and MMP relationship discussion</p>	<p>SSB agree with the continued use of the Pit 3 waste disposal site providing it is remediated at closure.</p> <p>The committee agreed that there will be increasing commonality between the MMP and the MCP.</p>	<p>ERA to draft a letter re R3D water levels.</p> <p>DPIR to clarify the process for reporting a notifiable breach.</p> <p>ERA to:</p> <p>Forward on investigation report and additional water management to the RWMP (resubmit update on 16th March).</p> <p>Review implementation of commitments in the RWMP scheduled for May 2020 MTC.</p> <p>Finalise TSF deconstruction application by 20th March</p> <p>Submit North notch 2 application by 20th March.</p> <p>Provide water quality data on brine squeezer next reporting submission.</p> <p>Update the progress of the underdrain bore refurbishment by end of March/early April.</p> <p>SSB to undertake Spigelia weed assessment training.</p> <p>ERA to submit Pit 3 deposition plan, Pit 3 OMM, Fugro survey report, NGI report and CPT report by the end of March.</p> <p>ERA to provide current contaminated site register for airport and develop SAQP for PFAS at the airport.</p> <p>DPIR to review the authorisation in consultation with MTC members.</p> <p>ERA to provide update on the audit actions in the next RPI.</p>
12/03/20	Water and Sediment Working Group	SSB, NLC, GAC, DPIR	<p>Updates on acid sulfate sediment</p> <p>GW background COPC concentration</p> <p>Ecosystem vulnerability to magnesium</p> <p>KKN close out</p> <p>ALARA</p>	Non-minuted	Non-minuted
11/03/20	Climate Change Meeting	SSB, Kakadu Parks, GAC, NLC, DPIR	<p>Item discussed:</p> <p>Mine Closure risk screening</p> <p>SME model scenarios</p> <p>Recommendations for risk mitigation</p>	Non-minuted	No action raised.
10/03/2020	Stakeholder business update	Jabiru Area School personnel	Present an update on key events relating to ERA's operations. This forum is a good opportunity to raise any questions or concerns you have about ERA's operations and the future of Jabiru.	Non-minuted	Non-minuted
09/03/2020	Phone consultation	NLC	Revegetation of the Stage 13.1A	Non-minuted	No action required



ERA

Date	Description of engagement	Stakeholders	Ranger Mine closure topics	Stakeholder comments	ERA stakeholder response, actions and/or resolution
04/03/2020	Rehabilitation	SSB	Discussed TLF Monitoring Plan content	Non-minuted	No action required
5/03/2020	Stakeholder business update	West Arnhem Regional Council personnel	Present an update on key events relating to ERA's operations. This forum is a good opportunity to raise any questions or concerns you have about ERA's operations and the future of Jabiru.	Non-minuted	Non-minuted
5/03/2020	Stakeholder business update	Local businesses/organisations	Present an update on key events relating to ERA's operations. This forum is a good opportunity to raise any questions or concerns you have about ERA's operations and the future of Jabiru.	Non-minuted	Non-minuted
4/03/2020	Introduction to Kakadu Native Plant Services	Kakadu Native Plants	Jacque new to the business required intro and update of KNPs	Formalise future presentation on Ranger rehabilitation/revegetation	
28/02/2020	Volunteer drivers for youth program	Red Lily Public Health	Discussed opportunities around ERA volunteer drivers for Youth program	Non-minuted	Non-required
27/02/2020	ERA Stakeholder Business Update	Jabiru Health Centre and Red Lily Health Program personnel	Present an update on key events relating to ERA's operations. This forum is a good opportunity to raise any questions or concerns you have about ERA's operations and the future of Jabiru.	Non-minuted	Include photo timeline of Pit 1 at the SBU scheduled in the second half of the year
21/02/2020	Casual catch-up	SSB (Kate Turner)	Non-minuted	Non-minuted	Non-minuted
18/02/2020	ERA closure and rehabilitation vendor forum	90 suppliers in the NT and wider	Shared information with suppliers of the complexity of rehabilitation activities and seeking their help in solving some of the challenges and bring innovative solutions within a budget and a tight deadline	Non-minuted	Non-required
10/02/2020	Safety aspects at the Nursery	Kakadu Native Plants	Discussed implementation of safety aspects at the Nursery - monitoring cameras, cyclone action plan, muster point maps, tags for first aid kits and fire extinguishers	Non-minuted	Provide feedback to Peter regarding the safety aspects discussed at the meeting.
6/02/2020	ERA standard operating procedures	Kakadu Native Plants	Initial meeting to clarify safety documents to be provided to KNPS including implementation of safety equipment at the Nursery	Non-minuted	Provide list of standard operating procedures, policies and CRM sheets. Organise meeting with ER Supervisor to look at safety equipment.
5/02/2020	Business dev & safety	Kakadu Native Plants	Brief meeting with KNPs to discuss contracts	Non-minuted	To ensure procurement team meet with KNPS to discuss contract options
3/02/2020	Rehabilitation	SSB	ERA-SSB Ecosystem teams Catch-up	Non-minuted	No action required

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30/01/20	TSF Sub-floor stakeholder engagement	DIIS, NLC/GAC, SSB, DPIR	Provide technical updates re drilling, GW/SW modelling and outcomes of BPT and risk assessment. Confirm format (i.e. notification v application).	Agreed formal application required as linked with TSF deconstruction which is of interest to CWTH. Interested in model assumptions. Difficult to recommend in absence of detail on contamination.	Planned submission in February 2020.
29/01/2020	Business development in Jabiru	GAC	Discuss opportunity for partnership in business dev officer role	Non-minuted	Non-required
23/01/2020	Discuss business development	Trade & Innovation Anne Pearce	Discuss business development officer role	Non-minuted	Determine NTG's appetite for partnership
24/01/20	RCCF	SSB, GAC, DPIR, NLC, DIIS	Item discussed: Contaminated sites and drilling program Closure drilling program Groundwater/surface water studies TSF updates Rehabilitation and Ecology updates: Conceptual reference ecosystem, completion criteria and Stage 13 revegetation trial. Working group updates	Need to demonstrate Stage 13 irrigation can be supplied onsite and will not be impacted by HDS plant's input into water circle.	SSB and ERA to discuss whether aquatic sediment sampling scope needs to be redefined. Provide WABSI Framework to DPIR.ERA to provide 2org report to SSB. ERA to include DPIR into WASWG and MERRG.
13/12/19	North Notch 3 pre-submission stakeholder meeting	NLC, SSB, DPIR	Discussion of environmental risks surrounding further reduction in clay core crest height of TSF	Non-minuted	ERA continued drafting application, taking into account comments provided by stakeholders during the meeting
13/12/19	GW model meeting	ERA (DS, CN), INTERA, SSB (AL), IGS (GH, TL)	Initiative meeting for post closure solute transport modelling with uncertainty analysis. Follow up discussion relating to head recovery modelling and closure monitoring bore design.	IGS raised sought clarity around bore calibration weighting, specifics on handling of climate change, and reporting of model uncertainty. IGS provided comments via email which INTERA and ERA will seek to address during modelling works. Follow up questions relating to head recovery modelling regarding recharge through waste rock. Follow up questions to closure monitoring bore design at Pit 1 and Pit 3. SSB/IGS support Pit 1 closure bore design, request that P3_CL_04 relocated closer to Pit 3.	ERA has received comments via email from IGS for consideration during post closure solute transport modelling. Next meeting 7th Feb 2020 ERA/INTERA to update head recovery modelling with additional detail on recharge through waste rock ERA to relocate closure monitoring bore P3_CL_04 closer to pit, NW of P3-4B.
11/12/19	Collaborative field work	ERA (DS, SV), SSB (AL, JFS field team)	Collaborative field work to install 2 shallow monitoring bores. One located in a potential GW seep to the SW of the CCLAA (GCTS-7), the other halfway between CCLAA and seep (GCTS-11). SSB provided auger and obtained all permits/approvals for installation, ERA provided consumables and resourcing to install.	None-required.	None-required.
09/12/19	TSF Sub-floor stakeholder engagement	SSB & NLC (DPIR not available)	Introduce application for TSF Subfloor material management.	Interested in levels of contamination (drilling results).	Plan an update meeting after BPT UTE's finalised and risk assessment completed.

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06/12/19	MERRG meeting	ERA (Chris, Sarah, Dave), SSB (Amie)	Discussed: Pit 1 Construction monitoring plan – Amie has issued to her team for feedback Contaminated sites drilling progress – Dave talked through Pit 1 monitoring Status of monitoring frameworks following Ingrid's workshops – agree to focus on Stage 13 monitoring CCLAA monitoring bore installs planned	Amie and team were happy with the contaminated sites SAQP.	Non-minuted
11-13/11/19	ARRTC 43	ARRTC members	Item discussed: ERA provided operation, rehabilitation updates, groundwater modelling and relevant studies to approvals. KKN discussion Joint project list (SSB/ERA) and report on schedule Progressing SSB's Ecosystem Restoration Standard, metrics and application Stage 13 revegetation trial State-Transition modelling update Water and sediment working group and program update Other uranium site Stakeholder updates	SSB note work ahead for ARRTC and the need to be focussed and systematic given the time between now and final rehabilitation is short. The pre-distributed KKN amendments were endorsed by the Committee subject to some minor clarifications and word alterations. The majority of projects were endorsed by the Committee, subject to addressing comments as actions. The Committee recognise that the current SSB and ERA research programs could raise additional questions and there could be a requirement for research from unforeseen eventualities. SSB will look for guidance from ARRTC to finalise SSB Ecosystem Restoration Standard metrics and application.	ERA to provide a summary of research related to the Pit 3 application including learnings from Pit 1 to ARRTC ERA/SSB project description to include intended outcomes and implications, and an indication of resources required. ERA/SSB to improve cross referencing in projects that address multiple KKNs. ERA/SSB to provide summaries of closed projects to ARRTC to detail outcomes and how information will be used. ERA and SSB to consider two additional projects identified by the committee that are required to address KKNs: - (WS2) Identify far field groundwater discharge points - (ESR8) Identify an appropriate fire regime to facilitate the development of a sustainable ecosystem on the rehabilitated landform Paul Brown (ERA) to review Barry Noller's report and provide to ARRTC. A session on monitoring to facilitate adaptive management to be included as an agenda item for the next meeting.
13/11/2019	Rehabilitation	SSB	ERA-SSB Ecosystem teams Catch-up	Non-minuted	No action required
06/11/2019	Site visit by DPIR	DPIR, ERA	Informal site visit by new DPIR representative, Max Smith, Manager Ranger Closure. Meeting with GM for site introduction. Visited Processing area, Pit 1, Pit 3, and TSF.	Follow up emails raised concern regarding: TSF leakage detailed in video produced by GAC in 2013. Safe and secure deconstruction and deposition of industrial infrastructure in Pit 3. Requested to spend time with ERA SME's ahead of approvals and authorisations. Request to further understand groundwater and surface water interactions	ERA to co-ordinate sessions for transfer of important information to DPIR representative.
01/11/2019	Rehabilitation	SSB	Ecosystem Reconstruction monitoring workshop for Pit 1 and Stage 13	Non-minuted	No action required
31/10/2019	Rehabilitation	SSB, CSIRO	Discussion on Ranger state and transition model (collaborative) project	Non-minuted	No action required

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31/10/2019	Rehabilitation	SSB	Ecosystem Reconstruction monitoring workshop for TLF	Non-minuted	No action required
28/10/2019	Rehabilitation	SSB, NLC	Meeting ERA-SSB Ranger Revegetation	Non-minuted	No action required
24/10/2019	Groundwater meeting	ERA (David, Chris, Andrew Nelson), SSB (Amie)	<p>CCLA EC anomaly in creek to the south.</p> <p>Glenn Harrington's feedback forwarded to INTERA</p> <p>Updated conceptual model report send through – SSB to undertake a 'validation' review to check Glenn's comments addressed by INTERA</p> <p>Glenn to review Brian Barnett's assessment against GW modelling guidelines</p> <p>Uncertainty analysis has been received by ERA from INTERA. Will be reviewed prior to issue to SSB</p> <p>General discussion around level of interest in GW – SW interactions and model outcomes. For discussion once SW model report issued</p> <p>TSF solute transport model results in review by ERA, requested further feedback from INTERA. Results will be shared with SSB as updated</p>	Ongoing consultation	ERA and SSB working on plan to auguring in a few shallow monitoring bores south of CCLA (with Andrew Nelson) – target 20/11. Subject to T/O approval (Amie to manage this)
21/10/2019	MERRG meeting	ERA (Chris, Ingrid), SSB (Amie)	<p>Worked through Amie's comments on the Pit 1 Construction monitoring plan</p> <p>Discussed thoughts on a MERRG metric</p> <p>Discussed structure of Pit 1 Closure (rehab) phase / TLF monitoring plan</p> <p>Ingrid discussed expectations for monitoring workshops next week</p>	Ongoing consultation	<p>Chris to finalise construction monitoring plan</p> <p>Chris and Ingrid to finalise structure of Closure phase monitoring plans for Pit 1 and TLF, to issue to stakeholders ahead of workshops</p>
18/10/2019	MTC Meeting 7	ERA, SSB, LC, GAC, DPIR, DIIS	<p>ERA provided:</p> <p>General update on general/water/resourcing activities in Ranger</p> <p>Updates on closure activities including Rehabilitation progress report, tailings dam, Pit 1 and Pit 3 activities, onsite monitoring and rehabilitation, Pit 3 injection/dewatering bore</p> <p>Provided TLF controlled burn report</p> <p>Current approval schedule</p> <p>report on S29 Environmental incident – Exotic species (West Indian Pinkroot)</p> <p>SSB provided updated for ARRTC and Ranger audit.</p> <p>DPIR is conducting a review of Ranger Authorisation.</p> <p>ERA requested to change Annual Groundwater Report and Water Management Plan submission date.</p> <p>DPIR will review S29 reporting threshold.</p>	<p>Stakeholder agreed to change of submission date for Annual Groundwater Report and Water Management Plan.</p> <p>Stakeholder agreed to establish approval schedule and intermittent submission of completed studies prior to submission.</p>	<p>SSB to discuss modelling turbidity in surface water with ERA.</p> <p>ERA to provide MTC with a compilation of reports summarising the progress of tailings consolidation in Pit 1 and Pit 3.</p> <p>DPIR to complete a review of the approvals process and engage with stakeholders.</p> <p>ERA to send a letter formally requesting this change.</p> <p>ERA to update the schedule of applications and consult with stakeholder regarding assessment timeframes.</p> <p>DPIR to clarify S29 reporting requirements by end of November.</p> <p>ERA to provide the Incident Action Plan and Weed Spread Prevention Plan for the Indian Pinkroot to MTC stakeholders.</p>
17/10/2019	Casual catch-up	DPIR Max Smith	Non-minuted	Non-minuted	Non-minuted

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17/10/2019	Rehabilitation	SSB, CSIRO	Discussion on Ranger state and transition model (collaborative) project	Non-minuted	No action required
8/10/2019	RMERRG	SSB	Discussed draft Pit 1 research and monitoring plan document structure.	Decided to create 2x research and monitoring plans for Pit 1: Construction Phase (using existing draft) and Ecosystem Rehabilitation.	No action required
19/09/2020	Rehabilitation	SSB, CSIRO	Discussion on Ranger state and transition model (collaborative) project	Non-minuted	Non-minuted
18/09/2019	ERA Closure update	Red Lily Health Board	Non-minuted	Continued engagement	Non-minuted
13/09/2019	SSB meeting	SSB	Landform modelling approach by SSB Particle size distribution (PSD) scope (ERA) MERRG (monitoring evaluation and research review group)	ERA advised final landform v6.2 is done and won't change unless major issues identified SSB will issue tech memo on initial Pit 3 catchment modelling and provide feedback to ERA SSB approved the proposed PSD methodology MERRG: ERA to translate Pit 1 rehab monitoring framework into monitoring plans for Pit 1 and TLF, plus develop a metric to track progress	No action required

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05/09/2019	Presentation	Conference delegates	Attended Sept. 2019 Perth AGC Closure Conference and presented paper: "Harnessing ecological processes in the Ranger Uranium Mine revegetation Strategy. By P. Lu and I. Meek.	Non-minuted	No action required
22/08/2019	ERA Information Day and mine bus tour	General public	Free public mine tours to learn about ERA's operations and closure projects.	Non-minuted	Non-minuted
14/08/2019	Rehabilitation	SSB/CSIRO	Discussion on Ranger state and transition model (collaborative) project	Non-minuted	Non-minuted
09/08/2019	RCCF	SSB, DPIR, GAC, DIIS, NLC	ERA provided closure updates for Stockpile Particle Sampling Program and Rehabilitation Studies and Land Trials (cool-burn, root excavation, species establishment program and trials). SSB reported study result for aquatic organism community in surrounding groundwater environment. KKN amendments ERA provided information regarding groundwater modelling configuration, calibration and results. ERA provided closure site operation updates.	SSB recommended the following: Large landform not to be disturbed by the plant establishment trials The final concentration in billabong during dry season is contributed by not only evaporation but groundwater contamination input which is not considered in the model. Closer internal communications with all parties to ensure most efficient outcomes. DPIR require updates regarding Pit 3 drilling progresses.	ERA provide report on Stockpile Particle Sampling Program and cool-burn weed control. Investigate any similarities between the aquatic organism community in groundwater and surface water environment. Further discussion for KKN development. Improve groundwater model to incorporate water quality parameters. Agreement on closer internal communications.
30/07/2019	ERWG meeting 4	NLC, ERA, SSB, DPIR, ARRTC	Reiteration of ERWG function and outcomes of meeting to date Update from SSB-ERA meetings regarding reference sites Outcomes from state and transition workshop ERA species establishment program. 2019/20 planned pant establishment trials	Agreement with pit 1 working as a trial for rehabilitation. SSB acknowledge the need to clarify using full distribution data, Stakeholder agree the applicability of the state and transition model. SSB made suggestions on planned establishment trials and would like to see a manual outlining the purpose and methodology.	In next meeting provide: Update of selection of reference sites Update on species list for rehabilitation program Update on Pit 1 trials
25/07/2019	ERA Information Day and mine bus tour	General public	Free public mine tours to learn about ERA's operations and closure projects.	Non-minuted	Non-minuted
23/07/2019	ERA-SSB Ecosystem teams Catch-up	SSB	Non-minuted	Non-mnuted	Non-minuted
24/06/2019	ERA-SSB Ecosystem teams Catch-up	SSB	Non-minuted	Non-minuted	Non-minuted

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20/06/2019	ERA Information Day and mine bus tour	General public	Free public mine tours to learn about ERA's operations and closure projects.	Non-minuted	Non-minuted
11/06/2019	ERA-SSB Ecosystem teams Catch-up	SSB	Non-minuted	Non-minuted	Non-minuted
03/06/2019	ERA Stakeholder Business Update	Parks Australia	Present an update on key events relating to ERA's operations.	Non-minuted	Non-minuted
24/05/2019	MERRG	SSB	Monitoring	Ongoing consultation	No action required
23/05/2019	ERA Information Day and mine bus tour	General public	Free public mine tours to learn about ERA's operations and closure projects.	Non-minuted	Non-minuted
21/05/2019	Rehabilitation	SSB	Discussed draft ERA closure criteria	Non-minuted	
14-15/05/2019	ARRTC meeting 42	ARRTC members	<p>ERA and SSB reported updates on operations and progressive rehabilitation at Ranger.</p> <p>SSB provided update on SSB's research program and wet season monitoring.</p> <p>KKN consolidation and amendments (removal).</p> <p>Updates regarding surface and groundwater COPC guidelines/Standards revisions and mixtures work and CERA2, water quality frameworks, site-wide conceptual model update and calibrated/post-closure groundwater flow models for Ranger Mine, and solute transport model for Pit 3.</p> <p>Ecosystem restoration updates including ERWG progresses and outcomes, Dixon's summary of rehabilitated/legacy mine-site tour, rehabilitation trajectories workshop and status of revised Ranger Revegetation Strategy.</p> <p>Activities on other uranium site</p> <p>CDU's progress report on NESP projects.</p> <p>Stakeholder updates</p>	<p>The Committee noted that the matrix of KKNs and projects is a long list and it is not clear that each KKN has an associated project.</p> <p>The committee has no objections to proceeding with the close-out/removal of few radiation KKNs (RAD3B, RAD3C, RAD4A, RAD4B, RAD4C and RAD6A).</p> <p>The committee queries about the water models' confidence for mixtures prediction.</p> <p>The committee it would be useful to consider likelihood in the context of Ranger revegetation management plan.</p> <p>The committee highlighted key outcomes that the revised strategy would need to achieve that certain assumptions relating to revegetation of the Ranger final landform still need to be substantiated.</p> <p>The committee commented on the role of billabongs as critical habitats for fish or their importance to the TOs and the broader landscape were not mentioned in fish migration studies.</p> <p>The committee mentioned monitoring data interpretation against criteria is worth consideration, and sampling efforts to collect such data would be resource intensive.</p> <p>The committee also noted terrestrial habitat and fauna in the context of the Ranger final landform is not considered.</p>	<p>SSB to work with ARRTC to distil outstanding questions/comments on the RMCP and reconcile with ERA's response previously provided. ERA to respond to outstanding ARRTC questions/comments.</p> <p>SSB to provide a list of all publications (including abstracts) to ARRTC in SSB's report for each meeting.</p> <p>SSB-ERA to provide an update on projects against the KKN project list.</p> <p>ARRTC to review: (i) Secretariat support for future meetings; and (ii) meeting structure to ensure there is sufficient time for consideration of technical and strategic matters in order for the Committee to provide considered advice.</p> <p>ERWG to discuss outcomes of the Review of the Ranger Revegetation Strategy and Supporting Information and provide a summary of the discussion to ARRTC.</p>
09/05/2019	ERA Stakeholder Business Update	Jabiru Health Center	Present an update on key events relating to ERA's operations.	Non-minuted	Non-minuted
09/05/2019	MERRG	SSB	Monitoring	Ongoing consultation	No action required
08/05/2019	ERA Stakeholder Business Update	SSB	Present an update on key events relating to ERA's operations.	Non-minuted	Non-minuted

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02/05/20	ARRAC 51	ARRAC members	<p>ERA provided an update on its operations, including health and safety, environmental performance, water management, closure planning and rehabilitation.</p> <p>SSB provided a strategic overview of SSB's work in stakeholder engagement and the progress of KKNs, mine rehabilitation activities and assessments, monitoring program, supervision activities and external engagement activities undertaken by the SSB.</p> <p>The NT DPIR provided an overview of mining activity in the Alligator Rivers Region.</p> <p>Parks Australia provided update including some background on his role as Assistant Security Kakadu and Strategic Priorities, and an update on the \$216 million funding package for Kakadu National Park and the future of Jabiru.</p>	<p>ECNT noted that there is a need to focus on progress on milestones of assessment timelines and provide details.</p> <p>DPIR noted the importance of having confidence in the scaling of rehabilitation efforts, and the need for early understanding of, and resolution of, critical issues.</p> <p>ECNT and DPIR commented on the incident related to radiation clearance of a crane at Ranger Mine.</p> <p>NTEPA expressed an interest in the RMCP and how rehabilitation works progress through to completion.</p>	ERA committed to providing more details outlining the sufficient assurance for rehabilitation milestones.
30/04/2019	ERA Stakeholder Business Update	Jabiru Area School teaching staff	Present an update on key events relating to ERA's operations.	Non-minuted	Non-minuted
29/04/2019	MERRG	SSB	Monitoring	Ongoing consultation	No action required
29/04/2019	ERA Stakeholder Business Update	West Arnhem Regional Council, local businesses/organisations	Present an update on key events relating to ERA's operations.	Non-minuted	Non-minuted
26/03/2019	ERWG meeting 2	ERWG members	Ecosystem similarity	Species composition discussed.	General agreement that more detailed and clearer information from all parties is required.
15/03/2019	RCCF meeting	ERA, ERM, DPIR, DIIS, GAC NLC, SSB	<p>Findings and proposed method for updating background COPC in groundwater</p> <p>General Ranger update and metrics</p> <p>Pit 3 Subaqueous deposition trial update</p> <p>HDS update</p> <p>Developing a restoration trajectory for Ranger mine</p>	None minuted	<p>Track seed gathering progress against target with information provided in ERA Revegetation Seed Stock documents presented by P Lu.</p> <p>ERA to present closure schedule sections relating to studies and KKNs.</p>
06/03/2019	Presentation to the Darwin Mining Club	Darwin Mining Club	Presentation about ERA's achievements over 40 years and the importance of Ranger rehabilitation as a significant project	No issues identified	No action required
March 2019	Visit by Mirarr Traditional Owners and rangers to the Trial Landform	Traditional Owners and rangers	Non-minuted	None-minuted	Non-minuted

Date	Description of engagement	Stakeholders	Ranger Mine closure topics	Stakeholder comments	ERA stakeholder response, actions and/or resolution
11/02/2019	ERWG meeting 1	ERWG members	Plant available water (PAW) and Pit 1 water balance; Soils and Fauna Revegetation strategy- e.g. single pass establishment or staged.	General consensus around the modelling presented by ERA. The modelling shows that there would be sufficient PAW to support a community similar to the reference with 67% (or less) rock and 4+ m of substrate. However PAW water is likely to be deficient if the substrate is above 72.5% rock. Potential/Planned Future Studies: Additional WAVES modelling. Spatial variability of the fine earth fraction. Sensitivity analysis regarding the rate of weathering. Potential effects of climate change. General consensus that an “incidentally consolidated horizon” is not a barrier to plant roots and may assist in preventing macro- pores and hence is not considered a concern. Pit 1 monitoring details: General consensus around the broad strategy. Agreement from ERA that they are open to input from group members on the detail of monitoring and research methods. Ranger Ecosystem Restoration Trajectory Project: Ecosystem similarity and novel substrate issue can be discussed by this group in a meeting prior to the project workshop 29-30 April. Discussion was held around novel substrate and that there is as yet no evidence it cannot support a community similar to the reference site.	ERA to provide further information– including longer data set and modelling a dry climate scenario. Form a sub-group to discuss what monitoring should be undertaken for Pit1- Committed to undertaking additional work on particle size distribution on the trial landform.
07/02/2019	MTC meeting 1 2019	MTC members	ERA provided an update on closure activities including: Ranger closure schedule Minor project statues Water inventories Site water balance – assumption tracking Activities updates Brine squeezer for process water Pit 1 backfill and tailings consolidation Tailings management Pit 3.	None minuted	No new closure related actions
18/01/2019	RCCF	ERA, ERM, DPIR, DIIS, GAC NLC, SSB	Findings and proposed method for updating background COPC in groundwater General Ranger update and metrics Pit 3 Subaqueous deposition trial update HDS update Developing a restoration trajectory for Ranger mine The nurse and closure schedule were discussed	None minuted	Track seed gathering progress against target with information provided in ERA Revegetation Seed Stock documents presented by P Lu. ERA to present closure schedule sections relating to studies and KKNs.

Date	Description of engagement	Stakeholders	Ranger Mine closure topics	Stakeholder comments	ERA stakeholder response, actions and/or resolution
14/12/2018	MTC Meeting 6 2018	MTC members	ERA provided an update on Current closure activities including: Closure schedule Minor project status Pond and process water management Pit 1 backfill Tailings management Mine Closure Plan Pit 1 final landform application Pit 1 update Pit 3 backfill and tailings deposition ERA provided an update on the subaqueous deposition trail	None minuted	No closure related actions
13 – 14/11/2018	ARRTC meeting 41	ARRTC members and observers	ERA provided an update on the Mine Closure Plan and the Restoration Operational Plan. The Supervising Scientist provided an overview of SSB's mine closure plan assessment report.	The ARRTC noted/queried: The timeline regarding assessment of the 2018 MCP. Whether ERA has considered climate change risk.	A standing agenda item be added to review the status of research, supervision and/or monitoring activities being conducted for other uranium sites in the broader Alligator Rivers Region.
11/10/2018	RCCF meeting	ERA, Rio Tinto, DPIR, DIIS, GAC, NLC, SSB	General update and metrics Feasibility study update FS Demolition and Disposal Seed harvest, Storage and Nursery update Water Flowchart Pit 3 CPT testing update SSB update on current revegetation studies	None minuted	Track seed gathering progress against target with information provided in ERA Revegetation Seed Stock documents presented by P Lu Pit 1 decant geochemistry report (P Brown) to be uploaded to the Ongoing Ranger Closure Workspace when available Contaminated sites and Pit 3 Tailings deposition plan to be discussed in the feasibility update at next forum Water treatment model to be run for a current water treatment scenario (no additional water treatment) vs a planned water treatment scenario Information to be provided on floating pipeline behaviour and design Floating pipeline diameter to be confirmed and sent to DPIR ERA to use CSIRO CFD modelling, CPT test results and bathymetry to assess and validate trial modelling Revegetation to be the theme for the next forum
13/09/2018	AARAC meeting 50	AARAC members	ERA presented a presentation outlining the contents of the MCP and a closure update SSB assessment report on the MCP	None minuted	ARRAC to request AARTC for its consideration of the Ranger Mine Closure Plan.



Date	Description of engagement	Stakeholders	Ranger Mine closure topics	Stakeholder comments	ERA stakeholder response, actions and/or resolution
12/09/2018	MTC meeting 5 2018	MTC members	ERA provided an update on current closure activities including: Closure critical path Minor project status Pond and process water management Site water balance HDS plant OPSIM assumption tracking Brine management Pit 1 backfill Tailings management Pit 3 bathymetric survey Pit 3 Backfill and Tailings Deposition Update.	The Mine Closure Plan has been reviewed. SSB have made their Assessment Report publicly available on 11 September 2018. SSB explained the rationale for several of their recently distributed Rehabilitation Standards. DIIS stated that they will follow the process outlined in Annex B of the Authorisation to request comment from NLC/GAC. Version 5 Final landform digital elevation model will be provided to SSB on 21 September 2018. SSB expect long term landform modelling to take a few months. SSB will provide further comment to ERA on the Pit 1 application next week.	No new actions were identified
04/09/2018	Ranger Progressive Rehabilitation Monitoring Workshop Meeting	SSB, ERA, DPIR, IGS, UQCLMR, NLC, DIIS	Overview of the Progressive Rehabilitation Schedule. A copy of the rehabilitation schedule and draft execution schedule was provided. Closure criteria themes and associated monitoring commitments. Current operational monitoring includes water (Pit 1, Pit 3, TSF) and sediment, radiation, flora and fauna, soils and cultural heritage.	Monitoring requirements per theme including groundwater, ecosystem restoration, radiation and landform.	Run-off monitoring requirements and methods for Pit 1 should be determined ASAP collaboratively by SSB and ERA to fit into the design. For radiation dose assessment, opportunistic collection and analysis of fruits would be very useful from a stakeholder-assurance perspective. SSB to distribute notes from meeting – both overall and group findings. ERA to use notes as a basis for developing monitoring programs and is encouraged to work collaboratively with SSB as required.
24/08/2018	RCCF meeting	ERA, CSIRO, Rio Tinto, DPIR, DIIS, GAC, NLC, SSB	Topics discussed included: Nursery Pit 1 decant geochemistry report Feasibility Water treatment model Sub aqueous discharge trial Revegetation	None minuted	Track seed gathering progress against target with information provided in ERA Revegetation Seed Stock documents presented by P Lu Pit 1 decant geochemistry report (P Brown) to be uploaded to the Ongoing Ranger Closure Workspace when available Contaminated sites and Pit 3 Tailings deposition plan to be discussed in the feasibility update at next forum Water treatment model to be run for a current water treatment scenario (no additional water treatment) vs a planned water treatment scenario Information to be provided on floating pipeline behaviour and design Floating pipeline diameter to be confirmed and sent to DPIR ERA to use CSIRO CFD modelling, CPT test results and bathymetry to assess and validate trial modelling Revegetation to be the theme for the next forum

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25/07/18	MTC meeting 4 2018	MTC members	<p>ERA provided an update on current closure activities including:</p> <ul style="list-style-type: none"> Tailings dam activity Pit 3 backfill and tailings deposition Closure critical path Minor projects status Pond and process water management Site water volume OPSIM assumptions tracking OPSIM do nothing scenario Volume of brines injected Pit 1 backfill material placement Pit 1 settlement monitoring Pit 1 decant Tailings transfer 	No issues raised	<p>ERA to include future contingencies and mitigations for identified impact resulting from tailings disposal in the Mine Closure Plan and the tailings deposition application.</p> <p>ERA to provide a schedule of all activities related to Pit 3.</p> <p>ERA to provide a presentation of the outcomes of the finalised Feasibility Study.</p> <p>ERA to provide clarification on the calculations for brines volumes.</p> <p>ERA to provide MTC with a compilation of reports summarising the progress of tailings consolidation in Pit 1 and Pit 3.</p> <p>ERA to provide MTC with an application for subaqueous tailings deposition in Pit 3, providing the supporting relevant information progressively prior to the finalised application.</p>
13/06/18	MTC meeting Number 3 2018	MTC members	ERA provided an update on current closure activities.	SSB raised their previous concerns from November 2017 and the January Pit 3 Workshop about the need to update tailings properties in the consolidation modelling to reflect segregated tailings. There was discussion between SSB and ERA about SSB's concerns for resourcing, personnel, and timeframes on this issue (and other environmental management areas like revegetation). NLC and GAC also raised these concerns.	ERA to provide the upper limit of the proposed HDS plants treatment capacity, the capacity of the plant, and the ability to subsequently dispose of the treated water.

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25/05/2018	RCCF meeting	ERA, Rio Tinto, DIIS, DPIR, SSB	<p>Topics discussed included:</p> <p>HDS</p> <p>Magnesium Closure Criteria</p> <p>Nursery</p> <p>TSF Eastern Wall Notch</p> <p>Pit 1 decant geochemistry progress</p> <p>Surface water model</p> <p>Radiation</p>	None minuted	<p>HDS plant restart update to be provided at next forum</p> <p>MI to meet with SSB to discuss HDS approval status, testing and monitoring needs to support notification/proposal prior to restart</p> <p>Knowledge Management Committee being formed as part of Phase 3 of the water quality framework project should be treated as a MTC Technical Working Group.</p> <p>MI to send Phase 3 project proposal to MTC members.</p> <p>MTC to discuss at next meeting.</p> <p>Align framework of Magnesium Closure Criteria project to cumulative surface water risk assessment.</p> <p>Create a metric to track seed gathering and storage</p> <p>MI to load full Paul Brown presentation and relevant references to Ranger Closure SharePoint as way of sharing information on the process water characterisation.</p> <p>Surface water model technical memo to be sent to stakeholders before 23 March 2018. Model runs pending stakeholder response to memo.</p> <p>K Tayler to send ERA an internal SSB internal report on radiation doses to Aboriginal people from the operation of the Ranger uranium mine. Not for distribution outside of ERA.</p>

Date	Description of engagement	Stakeholders	Ranger Mine closure topics	Stakeholder comments	ERA stakeholder response, actions and/or resolution
16 – 17/05/2018	ARRTC meeting 40	ARRTC members	<p>ERA provided an update on its Pit 3 tailings deposition strategy and rehabilitation commitments and schedule. ERA provided a review of its draft closure criteria for flora and fauna, including its justification and rationale for each's outcome and parameter.</p> <p>ERA presented an overview of the key historical work conducted to date on revegetation trials and other related activities informing the key elements of its revegetation strategy.</p> <p>ERA provided an update on, and results of, its research project to investigate plant water use at analogue and waste rock sites and whether the waste rock substrate of the Ranger final landform can supply sufficient plant available water to sustain a local native woodland.</p> <p>ERA updated the ARRTC on: its knowledge related to locations and concentrations of contamination from the decommissioned site; further modelling to improve these predictions; and how the predicted concentrations compare to water quality that has (i) been irrigated on woodland species in the land application areas, and (ii) to which plants at the edge/on bunds of wetland filters, ponds and sumps have been exposed for several decades</p> <p>SSB provided an update on its key tasks and key assessments for 2018, a summary of its 2017-18 wet season water quality and biological monitoring results, a progress report on its 2017-18 research projects, an update on the status of the Supervising Scientist's Rehabilitation Standards, and an outline of its proposed 2018-19 work program.</p> <p>SSB provided an update on the KKNs for groundwater, a comparison of current projects against the related KKNs, and research gaps.</p> <p>SSB provided a briefing on the development of the Supervising Scientist's draft flora Rehabilitation Standard.</p> <p>SSB provided the results of a historical study on the effect of magnesium sulfate on the germination of 20 plant species native to KNP (Malden, J.S. 1995).</p> <p>SSB provided a briefing on SSB's Remote Piloted Aircraft System platforms, and short videos</p>	<p>It was noted by DPIR and ARRTC that the proposed substrate for the final landform is of concern when considering achieving 'an environment similar to the adjacent areas' (ER 2.1), though demonstrated growth of trees on the TLF is encouraging.</p> <p>The ARRTC made the following specific comments on the draft closure criteria:</p> <p>For fauna, that these appear to have been considered belatedly, and are inadequate in their current form. For example, the criteria need more information on specific population demography, density and so on</p> <p>For flora, that these are insufficient and need more information on demonstrating sustainability, e.g. reproduction, prescriptive demographic profiles (including age structure of trees for example).</p> <p>There is a lack of consideration to soil microbiology. ERA pointed out there are nutrient cycling criteria and microbiology is implicit in this.</p> <p>ARRTC requested ERA adopt more explicit (clear) language in its strategy report, and better reference and cite throughout the empirical evidence upon which it is based. ERA stated this information would be provided in the RMCP.</p>	<p>ARRTC to consider the consolidated KKNs and provide any comments or advice on same to the Supervising Scientist by end July 2018.</p> <p>ARRTC to provide ERA with a list of reports it wishes to obtain from ERA on past revegetation trials, for the ARRTC restoration sub-group's consideration, in particular of the scientific evidence underlying ERA's revegetation strategy.</p> <p>ARRTC restoration sub-group to work out what additional information and evidence the ARRTC needs and report back to ARRTC. To do this, the sub-group will:</p> <p>Gather the information it can, and cross-check this with the KKNs, and consider whether any more KKNs (knowledge gaps that must be addressed) should be proposed;</p> <p>Look at the current project list and cross-check this with the KKNs, and proposed any amendments as necessary; and</p> <p>Advise on exactly what specific projects ARRTC thinks are required to address key questions and knowledge gaps</p> <p>ARRTC to provide ERA with a list of its concerns with the PAW project.</p> <p>ERA to provide ARRTC with requested reports related to the project, and ARRTC to provide SSB with its advice on the matter.</p>

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06/04/2018	MTC meeting 2 2018	MTC members	<p>ERA provided an update on the draft mine closure plan and the Pit 3 Tailings Deposition Schedule</p> <p>ERA provided an update on closure activities including:</p> <ul style="list-style-type: none"> BC distillate production; Process water volume balance Dredged tailings movement Pit 1 backfill material placement Pit 1 settlement monitoring Pit 3 MOL OPSIM central estimates Free process water versus total treated water Closure critical path Closure schedule with approvals 	<p>DIIS discussed key closure document (MCP and Annual Plan of Rehabilitation) status / relationship.</p> <p>The MTC agreed that ERA could continue backfill placement using Grade 1s waste rock material until 6Mt remains to be placed for the final landforms per previous conditions. The placement of the final 6Mt is contingent upon resolution of a number of issues including traditional owner aspirations and the ability to support vegetation.</p>	<p>ERA to provide as much detail as possible on OPSIM assumptions.</p> <p>SSB and ERA to organize a workshop to discuss a long-term monitoring plan for revegetation and pit 1.</p> <p>MTC is to review process water levels in Pit 3 at the end of the 2017/18 wet season.</p> <p>ERA to present the value ranges associated with inputs and outputs for OPSIM.</p> <p>ERA to provide definition of post closure monitoring terminology.</p> <p>ERA to provide the new date for the Pit 1 Final Landform application.</p>
16/03/2018	RCCF	ERA, DIIS, DPIR, SSB, GAC, NLC, JRHC	<p>General update and metrics</p> <p>Feasibility study update</p> <p>Air quality and radiation dose assessment</p> <p>Closure plan update</p> <p>Approvals (status):</p> <ul style="list-style-type: none"> Pit 1 Final landform and revegetation plan Pit 3 Sub-aqueous discharge TSF Notch east wall TSF Northern ramp High Density Sludge (HDS) plant Brine squeezer Ranger mine Magnesium closure criteria project phase 3 Rehabilitation - Nursery update Status of KKN's Pit 1 decant geochemistry progress 	None Minuted	<p>HDS plant restart update to be provided at next forum</p> <p>MI to meet with SSB to discuss HDS approval status, testing and monitoring needs to support notification/proposal prior to restart</p> <p>Knowledge Management Committee being formed as part of Phase 3 of the water quality framework project should be treated as a MTC Technical Working Group.</p> <p>MI to send Phase 3 project proposal to MTC members.</p> <p>Align framework of Magnesium Closure Criteria project to cumulative surface water risk assessment.</p> <p>Create a metric to track seed gathering and storage</p> <p>Surface water model technical memo to be sent to stakeholders before 23 March 2018. Model runs pending stakeholder response to memo.</p> <p>K Tayler to send ERA an internal SSB report on Radiation doses to public completed by ERISS as part of a Cancer study. Not for distribution.</p>

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09/02/2018	MTC meeting 1 2018	MTC members	The closure schedule was presented.	<p>SSB queried if the Closure Schedule for revegetation would be completed by 2026, referring to presentation at ARRTC showing understorey planting will occur after 2026.</p> <p>ERA responded that revegetation activities will be occurring post 2026 and terminology used by ERA refers to as "post closure monitoring" includes monitoring, maintenance and revegetation activities. Currently the FS plans for 25 years.</p> <p>ERA will provide the Post Closure Monitoring activities and schedule in The Feasibility Study, due July 2018.</p> <p>Integrated water and tailings study commenced Dec 2018, expected to be a 12-month study. With an aim to increase dredge capacity and productivity.</p> <p>SSB requested ERA highlight changes to the closure schedule in future presentations.</p>	<p>ERA to provide the new date for the Pit 1 Final Landform application.</p> <p>ERA to update graphs for rehabilitation metrics to show a rolling 12 months.</p> <p>ERA to present probability curves for OPSIM.</p> <p>ERA to present the values associated with input and outputs for OPSIM.</p> <p>ERA to provide definitions of Post Closure Monitoring terminology.</p> <p>ERA to highlight changes to the Closure Schedule with Approvals.</p>
5 – 6/12/2017	ARRTC meeting 39	ARRTC members and observers	<p>ERA report and closure update</p> <p>Landform design</p> <p>Environmental outcomes</p> <p>KKNs</p> <p>Tailings deposition</p> <p>Revegetation</p>	<p>Importance of information for reducing uncertainty in relation to KKNs</p> <p>Mechanisms for sharing information with indigenous communities</p> <p>Potential for pit subsidence post-closure- ERA noted consolidation being monitored in pit 1 and shows conformance with the modelling</p> <p>Revegetation, including understory – ERA noted learnings from trial landform revegetation and Jabiluka will be applied to Pit 1 and the monitored and adapted as necessary across site.</p> <p>Deposition method and potential related impacts</p> <p>Consolidation modelling sensitivities</p> <p>Magnesium plume and Magela Creek</p> <p>Groundwater and surface water interactions</p> <p>Landform impacts</p> <p>Runoff and erosion from proposed access tracks</p> <p>Correlation between various closure criteria</p>	<p>ERA to provide ARRTC with its updated hydrogeological report for Pit 3 for comment</p> <p>ERA to provide an update on the Pit 3 tailings deposition strategy and relevant reports</p> <p>ERA to provide backfill cross sections for Pit 1 and Pit 3, which include the nature of layers (rock types) and location of sulphide risks</p> <p>Regarding water balance, ERA to provide advice on root depths of vegetation from the water extraction profile</p> <p>ERA to present to ARRTC its state of knowledge in relation to vegetation recruitment</p> <p>ERA to provide ARRTC with its weed strategy</p>
28/11/2017	MTC meeting 5 2017	Minesite Technical committee	ERA presented an update on the status of Ranger rehabilitation and closure activities, including the current closure schedule for major rehabilitation activities.	SSB reiterated previous advice that closure criteria should be numeric, not a process. SSB would support the use of the process that has been proposed by ERA if it was used to develop specific, numeric closure criteria.	ERA to include tailings pore water volumes in the process water inventory for future presentations
15/09/17	MTC meeting 4 2017	Minesite Technical committee	ERA provided the draft plan on 21/12/2016. SSB provided their initial adequacy review on 7/4/2017. DPIR provided a response letter on initial review and NLC and GAC have provided ERA their initial adequacy response on 26/4/2017. DPIR provided comments on 31/7/2017 and SSB provided their assessment report on this date. NLC/GAC provided further comment on 21/8/2017. The next version of the Plan is hoped to be submitted prior to the end of 2017.	ERA provided the MMP on 16/3/2017. Comments for this plan are due by the extended date of 5/5/2017. Additional information was requested 23/5/2017 and provided on 23/6/2017. This MMP was approved on 23/8/2017.	SSB will circulate a draft attachment to the Authorisation for ERA to periodically report on closure metrics.

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14-09-2017	ARRAC meeting 48	ARRAC members and observers from MTC organisations	ERA report and closure update (including tailings deposition methods)	Queries regarding impact of deposition strategy on closure timeline	ERA to provide an update on the underbed drain and dewatering bore in Pit 3.
16 – 17/05/17	ARRTC meeting 38	ARRTC members and observers from MTC organisations	ERA report and closure update (including tailings deposition methods) CCLAA to Gulungul Creek Upper Tributary groundwater plume delineation GCT2 interception system update Landform flood modelling to inform sediment/erosion management Revegetation research update and Vegetation understorey trial.	Concerns presented by GAC about lack of (i) specific KKNs for cover design parameters to ensure successful revegetation, (ii) detail on same in Ranger Closure Plan, and (iii) recent research and monitoring programs to support design criteria. Support from members and stakeholders for proposed sediment and erosion controls and planned understorey trial.	Minutes of meeting publicly available. Next ARRTC meeting is to focus on these issues.
03 – 05/09/17	(SSB led) groundwater workshop	SSB (and various consultants to SSB: SA Department of Environment, Water and Natural Resources, Office of Water Science, Geoscience Australia; David Jones) GAC, NLC, DPIR, DIIS, ERA and INTERA	Response to stakeholder questions and discussion on the Ranger conceptual model and solute transport (from Pits 1 and 3) models.	Fractures, faults and subsurface pathways, sensitivity of model; geochemical source term, temporal resolution. A summary of the workshop was provided to ARRTC 37	INTERA provided 2.5 days of presentations addressing questions provided in advance and during the meeting. Conceptual Model report updated with response to major concerns raised. Additional work scoped to update solute egress modelling to address outstanding concerns. Scope of works provided to stakeholders for input.
10 – 11/08/17	ARRTC meeting 36	ARRTC members	ERA report and closure update (including tailings transfer from TSF, Pit 1 active rehabilitation) Ranger conceptual model	Issues discussed with inputs and sensitivities of conceptual model and geochemical source term.	SSB convening a groundwater workshop to review Conceptual Model and models of solute transport from the pits.
25/07/17	ERA consultants (BMT WBM) and Closure criteria water and sediment technical working group (TWG)	CCTWG members	Preliminary findings/data of Mg guideline exceedance review and framework for assessing detrimental impact of such exceedances in terms of Environmental Requirements. This work is undertaken by Consultants BMT WBM.	Discussion centred around: The number of water types to be considered the definition of 'different' in the context of biological attributes the use of taxa richness as a measure of environmental impact the definition of detrimental impact level of modelling accuracy	ERA provided a copy of the draft consultant's report to stakeholders for review on 16 August 2017.
16/06/2017	MTC meeting 3 2017	Minesite Technical committee	ERA presented an update on closure activities and a level 1 schedule with a critical path. Progressive rehabilitation metrics were presented. Update was provided on the Osmoflow brine squeezer.	MTC requested ERA provide details of the assumptions of the OPSIM model outputs and include key assumptions as rehabilitation metrics.	SB will circulate a draft attachment to the Authorisation for ERA to periodically report on closure metrics; ERA will provide quarterly updates on OPSIM trace and include actual process water volumes over time and details of key assumptions; and ERA will include details of key OPSIM assumptions in the rehabilitation metrics.

Date	Description of engagement	Stakeholders	Ranger Mine closure topics	Stakeholder comments	ERA stakeholder response, actions and/or resolution
09-10/05/17	ERA consultants (BMT WBM) and Closure criteria water and sediment TWG	SSB, DPIR, GAC	Initial consultation on developing a framework for assessing detrimental impact of guideline value exceedances in terms of Environmental Requirements	Outcomes of these informal discussions were not minuted.	No new actions
03/05/17	Ranger rehabilitation and closure workshop	Representatives from: DIIS, DPIR, NLC, GAC, ERA, SSB, Geoscience Australia	<p>The DIIS presented a draft preliminary framework for the assessment and approval of rehabilitation implementation at Ranger.</p> <p>GAC raise additional matters including: the time-limited nature of the existing regulatory framework and the issue of survivability; critical pathway analysis to track works and contingency; assessment timeframe(s) and facilitation of stakeholder participation.</p> <p>ERA presented on its needs and schedule for decommissioning and rehabilitation, closure strategy for each domain of the RPA and closure objectives.</p> <p>DPIR presented on the parts of the Mining Management Act relevant to rehabilitation and closure.</p> <p>SSB presented on its role in the rehabilitation and closure process. It is aware of time limitations but must ensure that the ERs are not compromised</p>	<p>Emerging issues were broad ranging, including but not limited to:</p> <p>DIIS plans for close-out to be a separate process to rehabilitation approvals.</p> <p>Acknowledgement that the NLC and GAC are consulted throughout the regulatory process via the Minesite Technical Committee.</p> <p>The NLC questioned the robustness of the consultation process if its views could be disregarded under ER 9.4. The resolution of ambiguities in the interpretation and application of ER 9.2 was marked as a critical issue for follow-up.</p> <p>Amendments to the draft rehabilitation applications table to include Ranger 3 Deeps, and approvals timeframes.</p> <p>The level of required technical detail in the separate applications to ensure key elements are adequately addressed.</p> <p>Establishing synergies between the Mining Management Plan and the Mine Closure Plan, as annual updates to both documents is unsustainable.</p> <p>Decision-making process flowchart needs to include a "stop the clock" mechanism. DPIR would be primary approver of any request during assessments.</p> <p>Intergovernmental processes within the framework need to include a set timeframe.</p>	Issues emerging from this workshop particularly relating to the proposed decision-making process, are subject to ongoing stakeholder discussions. The next workshop is scheduled for 13 September 2017.
20/04/2017	ARRAC meeting 47	ARRAC, DPIR, SSB	Rehabilitation and KKNs	Groundwater quality and seepage matters were raised Concern over the future of Jabiru was raised	ERA to provide bore monitoring results
19/04/2017	MTC meeting 2 2017	Minesite Technical committee	ERA provided an update of progressive rehabilitation for Pit 1, Pit 3, dredging and brines injection.	SSB requested confirmation that studies for plant available water are being undertaken for assessment for the final land form. SSB suggested that a clause for ERA to periodically report on closure metrics is to be included in the authorisation.	SSB will circulate a draft attachment to the authorisation for ERA to periodically report on Closure metrics.
10/02/2017	MTC meeting 1 2017	Minesite technical Committee	The Draft Mine Closure Plan was provided on 21/1/2017.	There was discussion regarding the future approach and how the Mine Closure Plan is expected to change and be reviewed over time.	No action required.

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29 – 30/11/16	ARRTC meeting 37	ARRTC members	Groundwater drilling program Surface water model Closure milestones Jabiluka revegetation Trial landform vegetation Final landform version 5 Closure criteria as presented in the Closure Plan	ARRTC noted a lot of the concerns it has raised over the years around groundwater were being addressed; and noted the release of the Ranger Conceptual Model and Ranger Groundwater Workshop as major advances forward in this regard. ARRTC noted there may still not be 100 per cent agreement around certain groundwater issues, but believed there is now a clear and manageable way forward to resolving these. ARRTC commended the work of INTERA on the Ranger Conceptual Model (groundwater). ARRTC sought clarification on the relationship between the SSB's Rehabilitation Standards and ERA's closure criteria. SSB explained that the Rehabilitation Standards represent the Supervising Scientist's view of what is required to achieve the environmental objectives detailed in the Ranger Environmental Requirements. They represent advice and are not mandatory. In contrast, it is ERA's responsibility to propose closure criteria for the rehabilitation, which, once approved by the relevant Minister, become mandatory. ERA may or may not elect to align its closure criteria with the SSB's Rehabilitation Standards. The relevant Minister will make a decision on whether the closure criteria are approved and, as part of this, will consider the advice of the Supervising Scientist	Minutes of meeting publicly available. ERA committed to provide ARRTC with a copy of the draft Closure Plan, which includes closure criteria (Chapter 6), once all feedback was addressed, and invite comments from members. Future work committed to by ERA: Additional work to update groundwater models. Surface water modelling to be undertaken by external experts.
18/11/2016	MTC meeting 5 2016	Minesite Technical committee	Report from Mine Closure working group presented.	No issues raised.	No action required.
11/11/16	CCWG meeting 2016 8	CCWG members	All closure criteria.	Landform: SSB requested validation process for modelling, suspended sediment criteria will only be possible to monitor following the completion of active management as ERA will be actively trapping sediments (therefore turbidity is not a true reflection of erosion). ERA disagreed. Water and sediment: Discussion over the use of decision trees to demonstrate that objectives are met. Fauna and flora: weed criteria wording to be modified. Further work required regarding fauna criteria. SSB is not satisfied with the current wording of ground cover criteria.	Each organisation to send interpretation of ER 1.1(d) and 1.2(d) to DIIS along with any other ER where there is a material difference of interpretation. Email overview of the ERA closure risk assessment to CCWG. ERA to discuss radiation criteria with SSB and finalise.
28/10/16	CCWG meeting 2016 7	CCWG members	Update on development of closure criteria all themes.	Cultural criteria: All the cultural health index criteria have been updated to match that proposed by GAC, the visual connection criteria has been added and a criterion on plant available water has been included in the flora and fauna table. Water criteria: have been modified to include decision trees. The criteria for 'on the Ranger Project Area' have also changed to that requested by SSB in the Sept 30 meeting to be an 'As Low as Reasonably Achievable' (ALARA) assessment. Finally, wildlife drinking water criteria have been removed following a risk assessment process that has been presented in the closure plan.	ERA to meet with GAC and NLC to review criteria proposed by GAC.

Date	Description of engagement	Stakeholders	Ranger Mine closure topics	Stakeholder comments	ERA stakeholder response, actions and/or resolution
13/10/16	CCWG meeting 2016 6	CCWG members	<p>Interpretation of ER 1.1(d) and 1.2d.</p> <p>Update on development of flora and fauna criteria.</p> <p>Update on development of landform criteria.</p> <p>Interpretation of ER 1.1(d) and 1.2 (d) is ongoing regarding the definition of detrimental impact.</p>	<p>Interpretation of ER 1.1(d) and 1.2d: Each organisation to send interpretation of ER 1.1(d) and 1.2d to DIIS along with any other ER where there is a material difference of interpretation.</p> <p>Update on development of landform criteria: generally accepted by all present</p>	Two new cultural criteria added. These relate to plant/water holding capacity and soil edaphic features.
30/09/16	CCWG meeting 2016 5	CCWG members	<p>Uncertainty in construction of the landform</p> <p>Update on water and sediment closure criteria – health, ecosystem protection on and off the RPA, wildlife drinking water.</p> <p>Update on cultural closure criteria</p>	<p>Uncertainty in construction of the landform: uncertainty in the landform construction is approximately 1-2 metres. This uncertainty relates to the swell factor that will occur during reclamation and placement of waste rock. Uncertainty may require small changes to topography that will be made in areas that will not impact on the drainage or erosion characteristics.</p> <p>Update on water and sediment closure criteria:</p> <p>Health – accepted as a good framework for progression. Noted that some metals are already higher than tolerable intake levels via natural processes</p> <p>ecosystem protection off the RPA –confusion existed over the interpretation of the outcome. Disagreement between SSB and ERA as to the location where the highest level of protection is applied, the confluence of Magela and Gulungul Creeks or the section of Gulungul Creek between the Gulungul Creek lease boundary and the confluence.</p> <p>Ecosystem protection on the RPA - Disagreement between SSB and ERA reading the application of ALARA to species protection on the RPA</p> <p>wildlife drinking water- discussion regarding the purpose for the criteria on wildlife drinking water.</p>	All to review proposed cultural criteria and provide comments back to GAC
15/09/16	CCWG meeting 2016 4	CCWG members	<p>Closure plan progress update and content review</p> <p>Best Practicable Technology (BPT) overview</p> <p>Criteria for each theme</p> <p>Groundwater abstraction restrictions</p>	<p>Criteria: general discussion on each criterion</p> <p>Radiation - Clarification needed on screening levels vs final value for assessment; SSB to finalise.</p> <p>Landform – what is the acceptable level of error for landform execution, centimetres or metres? ERA to clarify.</p> <p>Water and sediment – discussion around the wording and effects to wildlife from sumps. SSB request that there is no detrimental affect however ERA state that this is not possible.</p> <p>Flora and fauna: further work required on the impact of fire.</p> <p>Soils: noted that soils criteria only apply to contaminated soils. Nutrient cycling and other soil properties pertaining to the development of a sustainable ecosystem are included in flora and fauna criteria</p> <p>Cultural criteria: GAC to review and provide comments.</p>	<p>ERA to discuss radiation closure criteria with SSB and finalise</p> <p>ERA to clarify the uncertainty in landform construction that is likely and place this into the landform CC</p> <p>ERA to present on the status of water and sediment closure criteria at the next meeting.</p> <p>ERA to present on the status of Flora and Fauna closure criteria at the next meeting.</p>

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08/09/2016	ARRAC meeting 46	ARRAC members	ERA presented an overview of closure planning and stages.	The drivers of rehabilitation relate to the things that are protected in the Alligator Rivers Region. Surface water is the main pathway of contamination so a set of water quality limits have been established to denote levels of contaminants that are considered acceptable. Considerable additional work is also occurring on predicting the effects of the rehabilitated landform on the surrounding environment. Groundwater is the main pathway in the situation and modelling have been focusing on Pit tailings and peak solute loads. The models apply for ten thousand years but become quite coarse the further out you go, so more detailed modelling is current ion development to show how ground and surface water will interact. Closure criteria describe a target. More challenging ids describing the pathway to that target, how the landform will perform and the implications for vegetation etc. SSB's entire focus is now on these matters.	No closure related actions.
01/09/16	CCWG meeting 2016 3	CCWG members	Closure risk assessment presentation Closure strategy and schedule Objectives and outcomes all closure themes Reporting of closure activities	Closure Risk Assessment Presentation: high risks (Class 3) highlighted. Some risks required further studies as the controls are ranked as less effective. Closure strategy and schedule: general discussion regarding the extent that the closure plan covers all closure applications and approvals. Issue to be raised with MTC. Objectives and outcomes all closure themes: Objectives for each theme were discussed. To avoid duplication, tailings outcomes are to be reviewed for incorporation into other outcomes. Flora and fauna outcomes have been changed to align to the ER objective Soils are to follow the general NEPM process Outcomes for the cultural criteria have been taken from the Murray Garde report and cultural health indices. Cultural criteria will be a subjective, not objective measure. Reporting of closure activities: ERA to provide regular update on closure progress, with parameters, to the MTC.	Findings from the closure feasibility study scheduled to commence in September 2017, will be incorporated into future iterations of the Ranger Mine Closure Plan. The Ranger Mine Closure Plan, provides a table of additional closure applications and approvals appended to Chapter 1. Chapter 6, provides the most up-to-date view based on current knowledge, studies and stakeholder feedback.
09/09/2016	MTC meeting 4 2016	Minesite Technical committee	Report from Mine Closure working group presented.	Supervising scientist is drafting Rehabilitation Standard for Ranger. SS is also drafting an associated Communication Strategy. There was discussion of the roles of SS and other stakeholders regarding the final approval for closure by the Australian Government under the <i>Atomic Energy Act 1953</i> (Cth). There was also discussion on the process to review future closure plans and site relinquishment.	It was proposed to rename the overarching Closure Criteria Working Group. This will require a change in the terms of Reference of the working group. GAC to consider the issue further and report back.

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19/08/16	CCWG meeting 2016 2	CCWG members	Closure plan review and update Update on progress of criteria development SSB rehabilitation standard	Closure plan: outline of plan presented with a matrix of closure milestones. ERA seeking endorsement of the steps listed in the milestone matrix. General discussion around the feasibility study, scheduled to commence 2017. Closure Criteria development: Most TWGs are progressing well. SSB rehabilitation standards: Draft of SSB rehabilitation standards are being progressed, due in September 2016.	Closure plan: The closure feasibility study is scheduled to commence September 2017. Findings of the feasibility study to be incorporated into later iterations of the closure plan. Closure criteria development: The Ranger Mine Closure Plan, Chapter 6, provides the most up-to-date view based on current knowledge, studies and stakeholder feedback. SSB rehabilitation standards: Draft rehabilitation standards for radiation dose (humans), radiation dose (environment), magnesium, uranium and manganese surface water were issued to stakeholders for initial feedback on 1 August 2017.
05/08/16	Flora and fauna TWG	FFTGW members	Discussion on the flora and fauna closure criteria, particularly species composition, canopy architecture, tree distribution, weed composition and abundance, and fauna	Species composition: Requires further discussion with run further scenarios given <i>Eucalyptus miniata</i> does not have a high success rate on TLF but <i>Corymbia foelschiana</i> fills the niche. Canopy architecture: Needs to include a canopy cover and ground cover index within the range of the natural analogue sites. Dependent on the water retention in the soils. Weeds: Needs to include introduced species not just declared spp. For example, annual <i>Pennisetum sp.</i> and red natal <i>Melinis repens</i> are both major issues on the RPA, but neither are declared species. Fauna: Presence/absence is not strong enough. TWG must be able to established measurements.	These emerging issues are addressed in the Ranger Mine Closure Plan, Chapter 6, Section 6.5.
26/06/16	Closure criteria water and sediment TWG meeting 2016-02	CCTWG members	Magnesium field effects data to set closure criteria Guideline values for drinking water, wildlife, recreation and livestock Science supporting local toxicity guideline values	Magnesium field effects data to set closure criteria: SSB have not yet delivered their SSB Mg field effects paper. Guideline values for drinking water, wildlife, recreation and livestock: All guideline values are compared against all water types. Suggestions put forth to improve the closure plan in regards to water. Science supporting local toxicity guideline values: SSB to supply information on ecotoxicology guideline values and confidence intervals from the species sensitivity distribution curves and assess what information can be supplied on the confidence in field threshold effects GV	Emerging issues continue to be addressed in iterations of the Ranger Mine Closure Plan. The Ranger Mine Closure Plan, Chapter 6, Section 6.4 provides the most up-to-date view based on current knowledge, studies and stakeholder feedback.

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06/06/16	Closure criteria water and sediment TWG meeting 2016-01	CCTWG members	Develop a report for each COPC for which closure criteria are being recommended. Relevance of KKNs to closure criteria. Potential generation of acid sulfate sediments and subsequent environmental consequences Nutrients from tailings/ process water (NH ₃) and explosive residues in waste rock (NO ₃). Herbicides, hydrocarbons and other metals.	Magnesium in surface waters: Discussion on use of field and laboratory tests to derive a guideline value for ecosystem protection for magnesium in surface waters. SSB to provide a report of science underpinning Mg closure criterion. Uranium in surface waters: Discussion on appropriate U limit for surface waters taking into account the binding nature of dissolved organic carbon and expectations of traditional owners. SSB to provide report on science underpinning proposed uranium closure criterion. Total Ammonia Nitrogen: Discussion on need for closure criterion for TAN given its high variability in nature. SSD to provide finalised paper to TWG. Turbidity: Discussion on the use of drinking water guidelines to devise a limit for turbidity. Stakeholders also provided comment on nutrients from tailings and metals	Emerging issues continue to be addressed in iterations of the Ranger Mine Closure Plan. The Ranger Mine Closure Plan, Chapter 6, Section 6.4 provides the most up-to-date view based on current knowledge, studies and stakeholder feedback. Nutrients from tailings: ERA to assess and report on eutrophication risks from mine derived nutrients and suitable criteria/guidelines for preventing eutrophication if required. Metals: ERA to calculate and report on predicted metal concentrations transported to surface waters from tailings and process water in closed pits.
27/05/2016	MTC meeting 3 2016	Minesite Technical committee	An update on the Closure criteria Development Process was presented.	No issues raised.	ERA to schedule a Mine Closure Criteria working group. ERA to assemble a schedule of expected notifications and applications for closure activities.
24/05/16	Landform TWG meeting	CCTWG members	Development of suspended sediment parameters.	No minutes available	No minutes available
06/05/16	Flora and fauna TWG closure criteria workshop	CCTWG members	Reporting on revegetation species list Use of dissimilarity matrix to assess revegetation's similarity to analogue sites. Presentation and discussion on draft closure criteria. Reports on trajectory work. Discussion on closure criteria for fauna.	No minutes available	No minutes available
28/04/2016	ARRAC meeting 45	ARRAC , SSB, NTDME, ERA	Closure criteria	No issues raised	No closure related actions
08/04/2016	MTC meeting 2 2016	Minesite Technical committee	Report from Mine Closure working group presented. ERA provided an updated on the Closure Criteria Development process.	SS requested that ERA ensure the closure and operational activities are closely aligned. ERA noted.	No action required.

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04/03/16	CCWG meeting 2016 1	CCWG members	Proposed changes to closure criteria objectives. Update on progress of closure criteria development.	Cultural criteria: discussion held about the proposed cultural criteria and appropriateness as a measure of final close out. Consensus could not be reached. Flora and Fauna criteria: GAC requested the inclusion of edaphic criteria as an indicator of successful rehabilitation. Flora and fauna group to consider edaphic criteria. SSB noted that the weeds criteria needed simplification Guidance and focus for TWGs: SSB asked for TWGs to focus on the purpose of the technical groups as: Set the end state or target for the objective Develop the monitoring program or measurement method Develop the method to reach the end state Expectations on closure criteria: SSB notified the group that they are firming up their position on what it expects for closure criteria.	ERA to update Landform, Flora and Fauna and Radiation objectives and report back to technical groups. ERA to check with ERISS to determine what depth should apply to radiation criteria and update parameter description. ERA to consult with GAC on the draft cultural health indices to determine how they would like them applied and request that Murray Garde be allowed to present on the proposed program. ERA to request that the flora and fauna group consider edaphic criteria.
23/02/16	Landform TWG workshop	Landform TWG members	Setting allowable gully size for the various erosion zones. Setting criteria for other parameters. Review of landform evolution modelling results to identify areas of potential erosion and agreement on the erosion zones for monitoring and criteria setting.	Agreement could not be reached regarding allowable gully size. Two options were debated: Some gully erosion is acceptable. Use modelling to determine gully formation location and size and then this would be the basis for the criteria and monitoring program; or No gully erosion is acceptable.	No new actions.
12/02/2016	MTC meeting 1 2016	Minesite Technical committee	No meetings of the Mine Closure working group had been held. A flora and fauna closure had been held. A radiation landform closure criteria working group meeting was held.	No issues raised.	Closure criteria working group meeting scheduled for March 2016.

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11/12/15	Landform TWG meeting	Landform TWG members	<p>ERA presentation on current proposed landform and general closure planning</p> <p>ERA overview of proposed landform criteria</p> <p>Discussion on the proposed measurement endpoints (outcomes or targets)</p> <p>Discussion of parameters of relevance to targets</p> <p>Agreement on actions to progress</p>	<p>General agreement that landform objectives were appropriate.</p> <p>Objective 1: Maintain a stable landform that will not expose tailings through erosion processes for at least 10000 years</p> <p>Outcomes identified to address Objective 1:</p> <p>Gully erosion: Landform Evolution Model to be used to identify locations of potential gully erosion and a monitoring program then developed for these areas.</p> <p>Land Slip: Agreement that risk is low due to flat terrain however a risk assessment will be undertaken and a monitoring program developed.</p> <p>Movement of Magela creek impacting toe of landform: this may cause mass movement therefore it was incorporated into the risk assessment for land slip.</p> <p>Objective 2: Erosion characteristics of the rehabilitated landform, as far as can reasonably be achieved do not vary significantly from comparable landforms in surrounding undisturbed areas</p> <p>Outcomes identified to address Objective 2:</p> <p>Sediment loads: Post-mining suspended sediment loads will temporally and spatially decrease to match background rates of the surrounding areas</p> <p>Bedload: Sediment or sand does not cause the accelerated infilling of billabongs with sand and silt</p> <p>Denudation: Erosion/denudation rate is comparable to background erosion rates in 10,000 years.</p>	No actions minuted
30/11/15	CCWG meeting 2015 3	CCWG members	<p>Overview of landform v5.</p> <p>Discussion around CCWG setting the closure criteria objectives.</p>	None minuted.	<p>Species list needs to be agreed</p> <p>Review and endorse analogue work subject to timeframe</p> <p>Agreed to use analogue approach with variability shown by Renee work</p> <p>Identify the likely vegetation communities on site (3?)</p> <p>Structure, function, resilience - measurement parameters, then numerical values</p> <p>Weeds in KNP and ferals</p> <p>Fauna criteria</p> <p>Preliminary work on trajectories for next meeting</p>
30/11/15	Flora and fauna TWG closure criteria workshop	Flora and fauna TWG members	<p>ERA presentation on the status of current closure planning.</p> <p>ERA presentation on ecosystem re-establishment and species list.</p> <p>Discussion on proposed measurement endpoints.</p> <p>Identification of future actions to obtain agreement on measurement endpoints.</p>	No emerging issues were raised by stakeholders on the topics presented.	No action required.

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23 – 25/11/15	ARRTC meeting 35	ARRTC members	<p>INTERA update on groundwater modelling and response to the perceived knowledge gaps in groundwater research.</p> <p>Outline of the current closure schedule.</p> <p>Development of cultural health indices criteria</p> <p>Ranger post closure land use statement</p> <p>Coonjimba Billabong ASS risk assessment 2015 sampling analysis of U concentration in LAAs</p> <p>collation and description of water quality re-vegetation monitoring.</p> <p>Summary of the KKN requirements for the critical and high risks for the ecological risk assessment.</p>	<p>INTERA update: SSB agreed to consider making surface flow and water quality data sets available to INTERA subject to a formal request from ERA.</p> <p>Magela Creek: Addressed by INTERA in the site wide model due for completion in early 2016. It was also noted that INTERA have reported that sensitivity studies indicate that the current model is insensitive to changes in the hydraulic conductivity of the Magela sand bed. Ongoing from ARRTC 32.</p> <p>Seismic events: Minutes from FEPS workshop indicated there had been a discussion which had led to agreement that seismic events were not an issue for Ranger rehabilitation.</p> <p>ARRTC suggested work should be done to quantify the risk based on historical records and given the mine is sitting on the edge of a regional fault zone and seismic activities have potential to influence overland and sub-surface flows; then note that seismic events cannot be mitigated.</p> <p>ERISS advised that the conceptual models for the risk assessment had captured seismic events.</p>	<p>Seismic Events: ERA noted that the issue of seismic events was assessed as "low" in the context of the disposal of tailings in Pit 3. Tailings were being buried in a pit, and an assessment had identified this as best practice and the Ranger Authorisation had been updated to require this. The landform will be built to the required standards; ERA queried the justification for doing additional work to quantify the risk of an earthquake when there are no additional mitigations that can be adopted to protect against such an event.</p> <p>ERA advised that a 1997 study had looked at extreme events in the ARR. The relevant section of the report would be provided to ARRTC members. Ongoing.</p>
13/11/2015	MTC meeting 7 2015	Minesite Technical committee	No meetings of the Mine Closure working group had been held.	<p>Supervising scientist requests that ERA reconvene working groups with more project management, resources and personnel assigned.</p> <p>There was discussion on the process of producing closure criteria and the requirement of working groups and closure criteria. One day workshops are proposed for each working group prior to closure.</p>	Two workshops are proposed prior to the end of December 2015.
10/09/2015	MTC meeting 6 2015	Minesite Technical committee	Report from Mine Closure working group presented.	No issues raised.	No action required.

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09/09/15	ARRAC meeting 44	ARRAC members	<p>Overview of \$400 M spent on rehabilitation to date, including:</p> <p>Installation and commissioning of the brine concentrator.</p> <p>Outline of the \$30 M rehabilitation spend forecasted for 2015.</p> <p>Transfer line for tailings from the mill to Pit 3.</p> <p>Pumping system for dewatering of Pit 3.</p> <p>Progress on the Pit 1 capping – the majority of the pit has a lateritic cover, remainder of capping within the next two months; bulk backfill and subsequent revegetation will commence in 2017, pending approvals.</p> <p>Completion of civil works in Pit 3 to allow the pit to receive tailings and process water, including the installation of a horizontal bore that will be used to extract seepage and the installation of reinjection bores for storage of process water brines.</p> <p>Impending commissioning of brine injection bores.</p> <p>Launch of tailings dam dredge; now in the commissioning phase. These accomplishments collectively form the last steps towards implementation of the ITWC management processes that will be required for mine closure. The dredge is estimated to move 5-6 Mt of tailings each year to 2020, which will enable final consolidation of material in Pit 3 prior to closure and rehabilitation.</p>	Minutes not available.	No actions required.
12/08/15	CCWG meeting 2015 2	CCWG members	Discussion on ERA proposed closure criteria.	No emerging issues were raised by stakeholders on the topics presented.	No actions required.
17/07/15	CCWG meeting 2015 1	CCWG members	Update on plan to progress closure criteria.	<p>Tier 2 project: SSB announced it will be setting up a Tier 2 project on Ranger Closure. Tier 2 is a mid-level project that requires regular reporting to the Executive Board. SSD will be getting a resource to establish this project. It will be requiring regular updates from ERA on the progress of closure criteria development.</p> <p>New purpose for TWGs: Agreement that the TWGs would now be used for the review of tabled criteria.</p> <p>Coonjimba billabong: KT noted that SS has some questions about the fate of Coonjimba billabong. It has been historically subjected to sedimentation during construction and is now a lot shallower than pre-mining and there are notable acid events. The question was asked if GAC could provide feedback as to what would be an acceptable state for this billabong on closure.</p>	<p>Prepare SOW for TWG and circulate before next CCWG meeting</p> <p>Obtain clarification from SS of the questions to be asked regarding the billabong then organise appropriate consultation with the Mirarr (through Murray Guard if needed)</p>
10/07/2016	MTC meeting 5 2015	Minesite Technical committee	Report from Mine Closure working group presented.	No issues raised.	No actions required.
22/05/2016	MTC meeting 3 2015	Minesite Technical committee	Report from Mine Closure working group presented.	No issues raised.	No actions required.

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18 – 20/05/15	ARRTC meeting 34	ARRTC members	ITCW closure roadmap including information on 8 closure strategies and 4 main options. Update on the installation of the wicks in Pit 1 and preloading. Update on the arrival of the tailings dredge. Pit 3 rehabilitation and the construction of the underfill. Progress of the tailings and brine management project and various strategies. Outcomes based on 113 years of climate data on soil water deficit and plant available water. Closure/rehabilitation related knowledge requirements and outline of the current closure schedule. Outcomes of the environmental risk assessment.	Regional groundwater: Supervising Scientist and ERA to ensure the regional groundwater context is explicitly addressed and considered as part of proposed review of KKNs next meeting Magela Creek subsurface profile: Supervising Scientist and ERA to keep ARRTC informed on identification of appropriate methodologies to investigate subsurface profile of Magela Creek sand channels and assess potential for solute migration. Seismic events.	Regional groundwater: Completed. Magela Creek subsurface profile: ERA advised the report is still in draft but the recommendations had been considered as part of recent sediment work. Report to be circulated once finalised. Ongoing. Seismic events: ERA to provide ARRTC with the basis on which seismic events were excluded from the risk assessment process. See response under ARRTC 35.
21/04/15	ARRAC meeting 43	ARRAC members	Pit 1 closure works, including rock preload and laterite capping, prior to bulk backfill, landform shaping and rehabilitation. Pit 3 closure preparation works, including backfilling and related civil works to enable tailings deposition.	GAC sought 'stronger' reassurance from ERA regarding the security of future funding for rehabilitation of Ranger.	Since 2012, ERA has invested over \$425 m in rehabilitation and water management projects, to meet statutory mine closure requirements and stakeholder expectations.
10/04/2015	MTC meeting 2 2015	Minesite Technical committee	Report from Mine Closure working group presented.	Discussion was on the objectives and priorities of various closure criteria.	No actions required.
13/02/2015	MTC meeting 1 2015	Minesite Technical committee	Report from Mine Closure working group presented. Update on Pit 1 and Pit 3 presented.	No issues raised.	ERA to provide DME with further information on mine closure criteria working group
10/12/14	Closure criteria water and sediment TWG meeting 2014-05	CCTWG members	Discussion paper on detrimental impact. Update on diet review Update on cultural values and criteria. Discussion paper on the recommended closure criteria for Objective 3 for water and sediment theme. Drinking water, recreation and wildlife drinking water criteria.	Detrimental Impact: presentation by SSB on the term 'detrimental impact'. SSB position is that any change detected in the biological program is a detrimental change. To be applied outside of the RPA. All TWG members to review paper. Discussion paper – closure criteria for water and sediment theme: Discussion paper supplemented with a presentation on turbidity criteria. Discussion revolved around monitoring frequency. Frequency will be informed by modelling predictions. Turbidity pH and sedimentation in Coonjimba Billabong	Detrimental Impact: Definition is currently being addressed by consultants BWT WBM. Turbidity criteria to be developed for sediment load and turbidity in the water column in billabongs and creeks. ERA and SSB to compile information on Coonjimba Billabong water quality. MI to follow up with Murray to prioritise sharing updated diet information earlier than report finalisation.
07/11/2014	MTC meeting 6 2014	Minesite Technical committee	Report from Mine Closure working group presented. Update on Pit 1 and Pit 3 presented. Murray Garde has completed consultation with Mirarr and will submit a report in December 2014. Flora and fauna technical working group to commence prior to 2015.	No issues raised.	No actions required.

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04 – 06/11/14	ARRTC meeting 33	ARRTC members	<p>Updates on the following ERA and collaborative closure studies:</p> <p>Overview of CCWG recent work and outputs.</p> <p>Status of groundwater solute transport modelling indicating negligible flow going through the deep bedrock system, suggesting no need for concern that linear faults with enhance transport of solutes.</p> <p>5th year of erosion and chemistry studies on the trial landform confirming rapid decline in material leaving the site post construction.</p> <p>Revised direction and work plan for aquatic ecosystem establishment.</p> <p>Outline of the key 14 steps associated with Ranger's revegetation strategy, and the learnings and risks associated with each of the 14 steps.</p>	No emerging issues were raised by stakeholders on the topics presented.	Mon minuted
03/11/14	Closure criteria water and sediment TWG meeting 2014-04	CCTWG members	<p>Technical presentations including:</p> <p>Review of operational water quality monitoring parameters, method and trigger values.</p> <p>Parameter review, predicted metal loads from Pit 3.</p> <p>Annual additional load limits (AALL) and dietary intake review for metals.</p> <p>Sediment baseline review.</p> <p>Water quality closure criteria.</p> <p>Toxicity and guideline values for U in billabong sediments.</p> <p>Toxicity of NH₃ in local freshwater biota.</p>	<p>Additional Annual Load Limits (AALL) and dietary intake review for metals:</p> <p>All agreed that the 1985 approach for diet assessment and AALL for metals and radionuclides is no longer appropriate</p> <p>Concentration criteria appear to be more restrictive than AALL except for manganese. Supervising Scientist agreed to remove or review the diet based AALL in the Authorisation.</p> <p>Query raised as to whether the background diet for the BRUCE database is not influenced by mining in last 30 years. Evidence required that this is the case.</p> <p>Toxicity and guideline values for uranium in billabong sediments.</p> <p>Discussion paper to be produced describing the data and providing recommendation on approach and value to adopt for interim closure criteria.</p>	No new actions
17/10/14	CCWG meeting 2014 2	CCWG members	<p>TWG updated on landform.</p> <p>Water and sediment TWG update.</p>	Landform TWG proposed to separate two distinct phases in landform objectives into two criteria, landform design based criteria and landform monitoring based criteria.	No new actions.
12/09/2014	MTC meeting 5 2014	Minesite Technical committee	<p>Report from Mine Closure working group presented.</p> <p>Update on Pit 1 and Pit 3 presented.</p>	No issues raised.	No actions required.
09/09/14	ARRAC meeting 42	ARRAC members	<p>Closure planning update:</p> <p>Pit 3 initial backfill is nearing completion: 8.3 Mt of waste material moved during the first half of 2014 taking the total to 31.1 Mt at end of June 2014.</p> <p>Tailings management work progressing on schedule and budget.</p> <p>Brine concentrator meeting water quality specifications and throughput has progressively increased.</p>	No responses or emerging issues from stakeholders.	Non minuted.

Date	Description of engagement	Stakeholders	Ranger Mine closure topics	Stakeholder comments	ERA stakeholder response, actions and/or resolution
15/08/14	Closure criteria water and sediment TWG meeting 2014-03	CCTWG members	<p>Defining terms such as parameter, measurement endpoint, criteria.</p> <p>Report on all candidate ecological processes (from world literature).</p> <p>Defining “change”.</p> <p>Considering water quality measures and points – e.g. spatial variations billabong v creek.</p>	<p>Defining change: TWG reminded that change definitions are covered in the discussion paper Acceptable Limits of Change/Detrimental Impact that was previously distributed to the TWG. TWG has been asked to use the Limits of Acceptable Change approach when developing criteria.</p> <p>Water quality comparative measures: spatial and temporal differences discussed such as stream vs billabong and wet season vs dry season. Measurement methods of concentration vs load were discussed.</p> <p>Water quality values: discussion regarding the information to be compiled in table format to assist in the decision-making process on water quality criteria.</p> <p>COPC from tailings and brine: Current solute transport models for the tailings and brine do not include predicted loads and concentrations of metals. ERA to calculate the predicted loads and concentrations from the pit tailings and brines based on current solute models. Compare the predicted concentrations and loads to ecosystem protection data and appropriate health limits.</p>	<p>SI to check with SP if Murray Guard is asking TOs about drinking water sources.</p> <p>Road test approach on Mg from Pit modelling.</p> <p>ERA to consult an expert on Manganese dietary risks</p> <p>ERA to provide predictions of loads and concentrations of the metals that are identified (Brown et al 1985) as being of mill or ore origin and compare the prediction concentrations and loads to ecosystem protection data and appropriate health limits.</p> <p>Communicate compiled information supporting the biological effects data and recommendations for criteria.</p>
14/08/14	CCWG meeting 2014 1	CCWG members	<p>Industry comments on closure criteria objectives and agreement on changes to <i>"Detrimental Environmental Impact"</i> paper.</p> <p>Acceptance of report as starting point for progression by the TWG closure criteria report.</p> <p>Update on TWGs; presentations from water and sediment TWG.</p>	<p>Detrimental Environmental Impact: ERA presented a paper proposing the use of the RAMSAR wetland “limits of acceptable change” as a way to incorporate the scientific and cultural/social aspects into a measurable outcome. Paper put forward as a ‘starting point’ and referred to the water and sediment TWG for progression.</p> <p>Closure Criteria Report: Discussion surrounding the need for groundwater criteria and a groundwater monitoring program.</p> <p>Water and Sediment Group points of discussion:</p> <p>Natural acid events in creeks and billabongs mobilising solutes stored in sediments originating from the rehabilitated landform</p> <p>The use of load limits or concentrations to enable comparison between modelling output</p>	<p>Update the closure objectives to include comments from Industry.</p> <p>Final comments on the detrimental impact paper to be sent to ERA.</p> <p>Incorporate relevant cultural criteria work conducted by Murray Guard into the detrimental impact paper before finalising.</p> <p>update the closure criteria report to include more details on groundwater being used as a means to confirm that model predicted are on the predicted trajectory.</p> <p>Assess potential for impact of water quality from sediment loads form the landform.</p> <p>Update last water and sediment objective to replace "ecosystem function" with a more appropriate term.</p> <p>Review the diet implications for the AALL suit, including historically removed values, to be in line with the most recent diet and data collected by ERISS</p> <p>Conduct more research into the Mn human health effects to obtain a better indication of risk.</p>

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14/07/14	Closure criteria water and sediment TWG meeting 2014-02	CCTWG members	Standardisation of ecological nomenclature. Preparation of recommended interim water quality criteria for Magela Creek and Coonjimba Billabong. Seeking feedback on acceptable limits of change discussion paper. Review of risk assessment models an output for Pit 3 closure interim criteria. Review of constituents of potential concern (COPC) 1985 to present.	Water quality limits and contaminants of concern for Magela Creek were presented to group by ERA	Standardisation of ecological nomenclature referred to CCTWG for interpretation.
11/07/2014	MTC meeting 4 2014	Minesite Technical committee	Report from Mine Closure working group presented. Update on Pit 1 and Pit 3 presented.	No issues raised.	No actions required.
17/06/14	Closure criteria water and sediment TWG meeting 2014-01	CCTWG members	Kick-off meeting for the TWG outlined 6 objectives and 7 specific tasks. Agreement on endpoints, interpretation of ERs, for example on quality of rehabilitation of the site needed for inclusion into KNP, evidence of decisions to support recommendations to the CCWG and MTC.	Discussion of closure and approvals timelines relevant to water and sediment criteria. Interpretation of environmental requirements including the spatial extent to which the criteria will apply. All members to review the Limits of Acceptable Change paper which includes the spatial context of interpreting the ERs TWG agreed on the following priority tasks in order to progress the Pit 3 application. These were: Determining measurement endpoints Setting parameter values and trajectories	Inconsistent terms used in the objectives eg: “ecological values” in Objective 3 versus “ecological function” in Objective 6 (slide 6). Seek direction from CCWG on interpretation of these terms. Prepare presentation recommending interim WQ closure criteria for Magela Creek and CB billabong. Include references and rationale in notes panel of presentation so it can act as a standalone report. Review risk assessment models and outputs when developing presentation for Pit 3 closure interim criteria for next meeting.
09/05/2014	MTC meeting 3 2014	Minesite Technical committee	Report from Mine Closure working group presented. Draft version of detrimental impact was sent out to MTC members.	No issues raised.	MTC to respond with comments to the draft version of detrimental impact definition.

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07 – 08/05/14	ARRTC meeting 32	ARRTC members	<p>Updates on the following ERA and collaborative closure studies:</p> <p>ITWC study including: Pit 1 preload and capping; outcomes of the monitoring of the barrier integrity.</p> <p>Prioritisation of key environmental studies to inform closure criteria.</p> <p>Interpreting “detrimental environmental impact”.</p> <p>Rehabilitation-closure risk assessment outcomes and initial implications for KKN revisions.</p> <p>Water retention capacity of waste rock substrate to support a functional tropical woodland.</p> <p>Natural colonisation and seasonal responses of emergent aquatic plant in constructed sumps.</p>	<p>Magela Creek: appropriate methodologies to investigate subsurface profile of Magela Creek sand channel and assess potential for solute migration. Also discuss rationale and recommendations with SSB.</p> <p>Groundwater modelling: sensitivity</p> <p>Pit 3 closure</p> <p>Water retention of waste rock</p> <p>Emergent aquatic plants: ERA/SSB to run a workshop prior to ARRTC 33 to determine the types of water bodies that need to be assessed, what are the risks, what is known, what are the knowledge gaps and the applicability of the sumps to studies.</p> <p>Risk assessment: ERA to run a qualitative risk assessment process for decommissioning.</p>	<p>Magela Creek: ERA to identify appropriate methodologies to investigate subsurface profile of Magela Creek sand channel and assess potential for solute migration. Also discuss rationale and recommendations with SSB. Addressed during ARRTC meeting 35 – INTERA presentation.</p> <p>Groundwater modelling: ERA to advise if modellers are exploring the sensitivity of the model to geological structures using broad (i.e. hydro stratigraphic unit wide) variations in hydraulic conductivity, or are they looking at preferential flow through linear structures as well? If not, what has been done to systematically assess the presence and characteristics of linear geological structures to act as a potential transport pathway for contaminants to the surface? Completed and addressed further with presentation by INTERA during ARRTC meeting 33.</p> <p>Pit 3 closure: ERA to draft and distribute a table of contents for Pit 3 tailings application in addition to making early input data available to members. Completed.</p> <p>Water retention of waste rock: : ERA to provide update on the implications of eco-hydrology study for Pit 1, including advice on how to explore lessons for Pit 1's future. Completed. Addressed during ARRTC meeting 34 via ERA presentation.</p> <p>Emergent aquatic plants: completed prior to ARRTC meeting 33.</p> <p>Risk assessment: Ongoing ARRTC meeting 34.</p>
09/04/14	ARRAC meeting 41	ARRAC members	<p>Closure planning update:</p> <p>Progress on the backfilling of Pit 3 ahead of schedule.</p> <p>Completion of the ITWC study which outlines the optimal rehabilitation plan for the RPA.</p>	<p>GAC and NLC comfortable with statuses of Pit 1 rehabilitation.</p> <p>Australian Conservation Foundation sought clarification regarding a statement in the ERA 2013 Annual Report that was interpreted as linking approval of R3D as a prerequisite for rehabilitation of the RPA.</p> <p>GAC and Environment Centre NT (ECNT) queried sufficiency of funding for rehabilitation.</p> <p>ECNT tabled report titled ‘Reconsidering Ranger – a brief on social, environmental and economic cost of uranium mining in Kakadu’.</p>	<p>R3D Statement: The wording of the statement interpreted to link R3D approval to successful rehabilitation could not be clarified during the meeting. However, the Ranger 3 Deeps project and infrastructure was placed into care and maintenance in June 2015, following the ERA board decision that the project should not proceed to final feasibility study in the current operating environment.</p> <p>Rehabilitation Funds: Commonwealth Department of Industry and NT Department of Mines and Energy responded to bond queries. The different types of bonds were clarified and assurances provided to GAC that the departments were satisfied with the value of the bonds.</p>

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28/03/2014	MTC meeting 2 2014	Minesite Technical committee	Report from Mine Closure working group presented. Update on Pit 1 and Pit 3 presented.	No issues raised.	Draft version of detrimental impact definition has been completed – ERA will circulate to MTC. MTC to respond with comments to the draft version of detrimental impact definition.
17/02/2014	MTC meeting 1 2014	Minesite Technical committee	Report from Mine Closure working group presented. Update on Pit 1 presented.	No issues raised.	Draft version of detrimental impact definition has been completed – ERA will circulate to MTC.
27 – 28/11/13	ARRTC meeting 31	ARRTC members	<p>Updates on the following ERA and collaborative closure studies:</p> <p>Status of ITWC study activities for 2014, including: Pit 3 initial fill, tailings transfer and brine management, Pit 3 preload, seepage studies and associated engineering designs, progressive rehabilitation works on LAAs.</p> <p>Status of Pit 1 preload and validation of consolidation predictions, and wick performance.</p> <p>Status of the Pit 3 underfill for subsequent brine management.</p> <p>Tailings and brine management project- Phase 1.</p> <p>Update on Phase 1 (problem formulation) of the ecological risk assessment.</p> <p>Water quality closure criteria (for natural water bodies) adjacent to Ranger.</p> <p>Revegetation focussing on MLAA's remediation strategies.</p> <p>Groundwater and solute modelling around Pit 1 and Pit 3.</p> <p>Implications for surface water from the Pit 3 groundwater modelling.</p> <p>Key findings of the Pit 1 contaminant transport modelling.</p> <p>Status of planning and scientific knowledge for development of closure criteria and trajectories.</p>	Closure criteria	ERA and SSD to provide an update on the status of the development of closure criteria (including trajectories). Addressed during ARRTC meeting 32.
15/11/2013	MTC meeting 5 2013	Minesite Technical committee	Report from Mine Closure working group presented.	No issues raised	No actions required.
03/10/13	CCWG meeting 2013 4	CCWG members	<p>Final comments and agreement on closure criteria objectives</p> <p>Final comments and issues of TWG scope of works.</p> <p>Update of closure project priorities.</p>	<p>Closure criteria objectives</p> <p>Phrasing of water and sediment objectives discussed particularly in reference to the risks to fauna when drinking on site water and the impact of creek and billabong sediment loads on ecological function.</p> <p>Cultural objectives require further consultation.</p>	<p>It was agreed that SP will update and send out the objectives for final agreement out of session, this item will all be progressed under the current open action items.</p> <p>the SOW document will be updated and sent out with a table of comments received and how they have been addressed.</p> <p>Final comments and confirmation on both the objectives and SOW required in 2 weeks to enable the TWG to start work.</p> <p>CH to provide further details of higher level information required to be included in the scopes of work.</p>

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17/05/2013	MTC meeting 3 2013	Minesite Technical committee	Report from Mine Closure working group presented.	No issues raised.	No action required.
06/09/2013	MTC meeting 4 2013	Minesite Technical committee	Report from Mine Closure working group presented. The working group has developed the scope of work for the technical working groups for each theme.	No issues raised.	No action required.
05/09/13	ARRAC meeting 40	ARRAC members	Closure planning update (Pit 1): Preload of rock fill has been approved but the final height of consolidation is still to be determined. Preload will assist with model validation and enable a better understanding of how closely current models are representing reality. ERA is strongly committed to determining a final consolidation level which is acceptable to stakeholders. Pit 1 rehabilitation marks the beginning of a broader scale rehabilitation approach across the site.	No responses or emerging issues from stakeholders.	No action required.
16/07/13	CCWG meeting 2013 3	CCWG members	Update on closure criteria objectives, including risk assessment conceptual models. Update of closure project priorities; outline of the scope of works for the TWGs. Update on ecosystem trajectories.	Water and sediment objectives: Drinking and recreational water use values used instead of ecological values as drinking and recreation will also be values applicable to the area. Fauna objectives: recommendation from SSB to reference stock drinking water values. Radiation objectives: recommendation from SSB that wording is changed to clarify that radiation exposure is ALARA rather than applying dose limits. Closure project priorities: general consensus with draft outline. TWG: technical working groups to be kept small. Ecosystem trajectories: SSB clarified the two types of ecosystem trajectories as: Management trajectory to track progress towards achieving criteria. Trajectory to track progress to a point before achieving the objective as the final objective will not be achieved within a reasonable timeframe Definition for ecosystem trajectories are to be developed by ERA.	Include explanation of water and sediments objectives (as discussed at meeting) in technical working group SOW Provide comments on the objectives and SOW to ERA in 2 weeks Update project list with comments from meeting and add conditional formatting to highlight lagging projects. Develop project Gant chart for closure projects. Develop definition of trajectories and other higher level issues for inclusion in SOW

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21 – 22/05/13	ARRTC meeting 30	ARRTC members	<p>Update on ITWC study looking at the best options for solving tailings and water disposal and mitigating associated impacts; preparation of Pit 3 for the successful rehabilitation of the tailings dam.</p> <p>Update on research informing the development of closure criteria for agreed themes: Landform, radiation, water and sediment, flora and fauna and soils.</p> <p>Update on aquatic ecosystem proposal.</p> <p>Status of Pit 1 rehabilitation and final landform.</p> <p>Outcomes of the collaborative Ranger closure ecological risk assessment workshop.</p>	<p>ITWC PFS: ARRTC commended ERA on the high quality of their scientific work and presentations to this meeting.</p> <p>Ecological risk assessment: ARRTC requested that a status report (including the results from the screening phase) be provided to next meeting.</p> <p>Groundwater: ERA asked to provide an update on groundwater modelling activities (including associated boundary conditions) to next meeting.</p> <p>Revegetation: ERA asked to present on the eco-hydrology research, status (and scientific basis for) the proposed vegetation strategy and closure trajectories.</p> <p>Landform: ERA and SSD asked to provide an update on the status of erosion modelling for Ranger.</p>	Completed. Addressed at ARRTC meeting 31.
02/05/13	Technical workshop	MTC members, CSIRO, Geoscience Australia, ATC Williams, Rio Tinto T&I	Technical workshop on Pit 1 closure and subsequent submission of a notification on 17/05/13 for the Pit 1 preload phase.	DPIR (former DME and supervising authority) could see no obvious show stoppers with pre-loading.	Consensus from the technical workshop attendees that the pre-loading phase for Pit 1 should proceed.
24/04/13	CCWG meeting 2013 2	CCWG members	<p>Update on closure project priorities</p> <p>Update on the composition of proposed technical working groups (TWGs) for each closure criteria theme.</p>	<p>Review of changes suggested for the closure criteria report:</p> <p>Groundwater abstraction: agreement by all that groundwater abstraction must be prohibited in certain areas across site</p> <p>Cultural aspects of landform: agreement by all to reword Objective 8 to reflect cultural aspects of water bodies, namely the requirement to ensure that the number of water bodies on site after rehabilitation be the same as before mining.</p> <p>Sentinel wetlands: agreement by all to remove the term 'sentinel wetland' from the plan due to confusion as to its definition.</p>	<p>Include as task in the Flora and Fauna technical working group scope of works to define what is meant by "local native plant species". Also include any information received back from Ping Lu and Steve Winderlich.</p> <p>Review closure objectives to include Assessment Endpoints from conceptual model.</p> <p>Include words in the report to highlight the need for capturing the historical mining heritage and keep heritage as a theme out of scope.</p> <p>Reword landform objectives to include links to cultural aspects.</p> <p>Remove the term "sentinel wetland" from the glossary and record this decision in Appendix C</p> <p>ERA to review the project priority list with regards to U in sediment to determine if criteria will be required for Pit 1 approvals or if some modelling can be done to demonstrate these criteria will not be required</p>
22/03/13	ARRAC meeting 39	ARRAC members	<p>Backfilling of Pit 3 and the ITWC PFS progressing.</p> <p>Rehabilitation of the Magela LAA and adjoining borrow pit is scheduled to commence this year.</p> <p>Planning for Pit 1 rehabilitation well advanced; over 7,000 wicks installed and preparatory works are expected to be completed by the time Pit 3 backfill is completed.</p>	No responses or emerging issues from stakeholders.	No action required.

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15/03/2013	MTC meeting 2 2013	Minesite Technical committee	Report from Mine Closure working group presented. The group has prioritised the formation of technical working groups for theme, with Georgetown Billabong criteria and radiological criteria as being identified as being required initially to fit in with the timeframe for projected works on site.	No issues raised.	No action required.
07/03/13	CCWG meeting 2013 1	CCWG members	Discussion on CCWG planning for the year. Discussion on closure ecological risk assessment and development of conceptual models.	Detrimental Impact: definition provided by SSD that there should be no observable biological effect as determined by an appropriately designed monitoring program. This raised further questions surrounding the definition of 'biological effect'. Technical working groups: agreement that these groups need to be formed within the next month. Key tasks include finalising objectives, reviewing the list of environmental studies and doing a gap analysis, commenting on the proposed time lines to determine if they are achievable, documentation of baseline conditions or how they can be calculated and developing the methods for determining closure criteria. Ecological risk assessment and conceptual models: presentation given by ERA summarising recent workshop in conceptual models. Outcomes of risk assessments to be provided to the technical working groups.	Technical working groups were established and have contributed significantly to the closure criteria outlined in the Ranger Mine Closure Plan, Chapter 6. The definition of detrimental impact is currently being addressed by consultants BMT WBM. Ecological risk assessment and conceptual models were developed by SSB in collaboration with stakeholders. No new actions identified
08/02/2013	MTC meeting 1 2013	Minesite Technical committee	Report from Mine Closure working group presented.	No issues raised.	ERA to nominate closure criteria meeting schedule for 2013 (carried over from last meeting).
07/12/2012	MTC meeting 7 2012	Minesite Technical Committee	Report from Mine Closure working group presented.	No issues raised.	ERA to nominate closure criteria meeting schedule for 2013.
05 – 06/12/12	ARRTC meeting 29	ARRTC members	Current status of studies on radiation protection of the environment (non-human biota). Recommendations from the independent surface water working group. Status of the trial rehabilitation in the Magela LAAs. Soil erosion and water quality on the trial landform. Radon exhalation from the trial landform. Update on the characterisation of groundwater flows and associated solute source strength and duration, from Pit 3 solutes to Magela Creek. Systems analysis of Ranger closure process. Developing billabong closure criteria for solutes. Potential integration of aquatic ecosystem establishment into the broader rehabilitation/closure process. Overview of progressive rehabilitation pilot projects on the RPA 2012 – 2017.	Pit 1 Aquatic ecosystems: ARRTC requested that a more detailed project proposal be provided to next ARRTC meeting. Closure criteria: ERA to provide further information on the status of research informing the development of closure criteria for Ranger to next meeting.	ERA to provide a presentation on Pit 1 rehabilitation status and proposed final landform to next meeting. Completed. Addressed at ARRTC meeting 30.
05/10/2012	MTC meeting 6 2012	Minesite Technical committee	Report from Mine Closure working group presented.	No issues raised.	No action required.



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05/10/12	CCWG meeting 2012 5	CCWG members	Discussion on the post closure land use; defining "detrimental impact".	Detrimental Impact: SSD provided summary of their interpretation of the definition of 'detrimental impact'. Notes that a scientific view of impact may differ from the traditional owner's perspective. SSD will provide a written interpretation for review by the working group. Technical working groups: General discussion held regarding the development of technical working groups for each closure theme.	Prepare a list of proposed members for each of the technical working groups and circulate to CCWG members. Prepare a paper outlining the scope of works for the technical working groups and send out for review by the CCWG out of session. Then form the technical working groups to commence work. Identify appropriately qualified personnel in the NT government that will be used by DME to review the technical working group findings. These people will then be added to the consultation list to make sure they are satisfied with the progress.
06/09/12	ARRAC meeting 38	ARRAC members	Progressive rehabilitation discussed including installation of wicks in Pit 1 and application of trial landform rehabilitation successes across site. ERA presented a conceptualisation of the Pit 3 brine injection and tailings management closure strategy.	The resistance of wick installation at a depth of 20 m was discussed.	In 2012, ERA successfully installed 7,554 prefabricated vertical wick drains into Pit 1, to assist with dewatering the pit, ahead of capping and rehabilitation. The wicks were installed within the top 40 m of the tailings mass in Pit 1. The purpose of the wicks is to dewater the upper level of the tailings and promote tailings consolidation, thus establishing a stable surface upon which to commence backfill activities.
27/08/12	CCWG meeting 2012 4	CCWG members	Discussion on the post closure land use; defining "detrimental impact".	Definition of 'detrimental impact' taken from the ERs and added to the closure criteria report. SSD to review and provide a position paper. Post-closure land use document tabled by GAC for review by next meeting.	ERA to continue the update of table 10.1 priorities and include the entire list of project required for closure criteria. All to review entire CC document and provide feedback by next meeting Update the "Post Closure land use" document and circulate for CCWG members for comment SSD have tabled some words to interpret what is meant by the Detrimental Impact definition in the ER's. All groups to go away and review these words and either provide comment or their own interpretation for discussion at the next meeting Complete Radiation section on closure criteria derivation method and circulate to working group for review and agreement. Once agreed this will then be distributed to each ERA closure criteria theme owner as the template to be used as information required.

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23/07/12	CCWG meeting 2012 3	CCWG members	<p>Ongoing discussion and progression of closure criteria for the RPA.</p> <p>Emphasis on a review of the terms of reference and the closure criteria report.</p> <p>General discussion on the structure of closure criteria.</p>	Discussed inclusion of Parks NT in CCWG meetings and the structure of closure criteria discussed.	<p>Parks invited to attend meetings. Attendance began in March 2013.</p> <p>Review and provide feedback on the “Rehabilitation and Closure Objectives” section of the CC report in order to reach agreement at next meeting.</p> <p>Inform the ISWWG of the CCWG need to determine the most appropriate location for post closure monitoring</p> <p>ERA to meet with Parks (Anna Morgan) to provide context on the CCWG and discuss their attendance at future meetings and general involvement in the development of closure criteria.</p> <p>Add a new section to the Closure Criteria report that outlines the specific areas of concern for closure.</p> <p>Provide the updated “Post Closure land use” section to the CCWG at the next meeting.</p> <p>Expand Section 7.1 (Objectives for closure) to include the ERs word for word and then put ERA’s interpreted objectives underneath the relevant heading.</p> <p>Review and provide feedback on the updated objectives to reach agreement.</p> <p>Put together a closure criteria priorities table and include at an appropriate location within the document.</p> <p>ERA to liaise with CH about the timeline for producing a document for comment on the development of billabong water criteria.</p> <p>Cross channel Magela Creek channel analysis being done by Kate Turner to be presented at the next meeting.</p>
20/07/2012	MTC meeting 5 2012	Minesite Technical Committee	Report from Mine Closure working group presented.	No issues raised.	No action required.
01/06/2012	MTC meeting 4 2012	Minesite Technical Committee	Report from Mine Closure working group presented.	No issues raised.	No action required.

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17 – 18/04/12	ARRTC meeting 28	ARRTC members	<p>Current status of Pit 3 and expected completion of mining. Status of tailings dam groundwater monitoring program to improve the understanding of hydrogeology of the mine site in inform rehabilitation planning.</p> <p>Update on Phase I of the ITWC project, including tailings reclamation and dredge transfer to Pit 3; proposed Pit 3 backfill strategy; closure criteria update; Pit 3 tailings and brine disposal options; Pit 1 closure.</p> <p>Status of the CCWG which held its first meeting in December 2011.</p> <p>Presentation on deriving background concentrations of COPC in groundwater and soils to establish background water quality in the three aquifers.</p> <p>Investigation into potential seed provenance for Ranger's revegetation.</p> <p>Update on the status of various groundwater studies at Ranger, including groundwater investigations and modelling.</p>	<p>ITWC PFS: Emerging issues acknowledged by ERA included: how to optimise Pit 3 backfill to maximise consolidation (taking into account seepage control and settlement), identifying the best strategies for: placing material into the Pit, reclaiming the tailings dam, managing the underlying groundwater, closing Pit 1, implementing incremental brine concentrator treatment capacity to reduce the process water inventory to zero, storing the salt from the brine concentrator, achieving site infra-structure synergies (e.g. power and water systems) and demolition/removal of the plant.</p> <p>Decommissioning and rehab: risk based framework for prioritising the KKNs associated with the decommissioning and rehabilitation phases at the Ranger mine. ARRTC members will be involved where possible.</p>	<p>ITWC PFS: Closure has to be completed by 2026 in accordance with the Section 41 Authority. Any decisions regarding an extension would be subject to outcomes of discussions with stakeholders. However, even if after extensive discussions all stakeholders agreed, the process would take some time due to the legal complexity involved.</p> <p>ERA outlined the integrated elements of the PFS strategy for Pit 3 closure and associated activities, and how these relate to the KKNs.</p> <p>Seed provenance: NB: On 12/8/15 GAC Board endorsed the proposed seed collection zone with KNP, based on local provenance study presented at ARRTC.</p> <p>Decommissioning and rehab: ERA and SSD should undertake further work as part of the proposed risk assessment process to draft a risk based framework for prioritising the KKNs associated with the decommissioning and rehabilitation phases at the Ranger mine. Completed.</p>
04/04/12	ARRAC meeting 37	ARRAC members	<p>Status of the ITWC study: still in definition stage until May 2012, then engineering design will commence focusing on closure issues and progressive rehabilitation. Key focus on salt management; Pit 3 backfill strategy optimisation; tailings dam reclamation and decommissioning; demolition and infrastructure scheduling; risk mitigation work; and, water treatment strategies.</p> <p>Status of wick installation in Pit 1.</p>	No responses or emerging issues from stakeholders.	Minuted
05/04/2012	MTC meeting 3 2012	Minesite Technical Committee	Report from Mine Closure working group presented.	No issues raised.	No action required.
03/04/12	CCWG meeting 2012 2	CCWG members	Ongoing discussion and progression of closure criteria for the RPA.	<p>ERISS identified that old ERISS infrastructure was noted for removal during site rehabilitation. ERISS requested that this infrastructure remain.</p> <p>Closure criteria report almost ready for review, draft criteria to be circulated for review and finalisation.</p>	<p>GK requested a copy of the landform slide to provide to Mirrar to show progress. NJ to progress this with GK outside of the meeting.</p> <p>NJ committed to consulting with eriss on infrastructure to be removed prior to completing this project.</p>
08/03/12	CCWG meeting 2012 1	CCWG members	ERA discussed the development of broad ranging closure criteria as a journey for ERA and its stakeholders.	No responses or emerging issues from stakeholders.	No action required.
20/01/2012	MTC meeting 01 2012	Minesite Technical Committee	ERA proposes to hold special MTC meeting to discuss closure.	No issues raised.	ERA to arrange and host closure special meeting.

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13/12/11	CCWG meeting 2011 1	CCWG members	The purpose of this meeting was to restart the closure criteria process.	<p>Agreement to review all KKNs so that they are more specific to the particular needs of closure and criteria development.</p> <p>Definition of 'detrimental impact' questioned. The need to define detrimental impact was added to the agenda for future meetings.</p> <p>SSD requested that ERA add "decision points" on the PFS schedule document for the various criteria. This way all are aware of when criteria need to be developed by and will provide us with a priority list. It was agreed that 6 months would be allowed on top of all "decision points" to allow for the approvals process.</p> <p>Agreement to prioritise groundwater criteria to allow Pit 1 closure.</p> <p>Agreement that ERA were the owners of the closure criteria and should be the main drivers.</p> <p>Discussion was held regarding the under-resourcing of NLC.</p>	<p>ERA to develop a plan for progressing cultural criteria and engaging traditional owners.</p> <p>Definition for 'detrimental impact' remains outstanding.</p> <p>ERA to update the chart with decision points.</p> <p>ERA to consider reinstating the old Jabiru Area Manager position that funded a mining officer position in the Jabiru Regional office.</p>
29 – 30/11/11	ARRTC meeting 27	ARRTC members	<p>Overview of the ERA integrated process water, tailings and closure (ITWC) pre-feasibility study Phase 1, looking at technologies and science.</p> <p>Overview of the Pit 1 closure wicks project.</p> <p>Overview of the Pit 3 tailings deposition strategy.</p> <p>Update on groundwater monitoring and modelling.</p> <p>Gulungul Creek catchment review.</p> <p>Update on the status of the trial landform, including the revegetation strategy, flowering and fruiting species.</p> <p>Update on the LAA rehabilitation studies.</p>	<p>ITWC PFS: ARRTC agreed that the KKNs (and projects under each KKN) should be prioritised based on current mine closure and rehabilitation timeframes.</p> <p>ARRTC requested an update on the current closure schedule components, and the relative priority and status of research addressing these, under each relevant KKN.</p>	ITWC PFS: ERA advised the process water, tailings and closure strategy has 4 phases and the PFS is focused on phases 3 and 4. The PFS comprises a large number of integrated elements, and as part of the baseline strategy to 2026 decisions need to be made on when to cease milling as this creates process water that needs to be managed. ERA outlined the various concurrent stages of the PFS up until April 2013 and advised further consultation with stakeholders and the MTC would be required.
08/09/11	ARRAC meeting 36	ARRAC members	Update on brine disposal options under consideration, including crystalliser and deep well injection of brine in Pit 1 or Pit 3.	GAC raised concerns regarding the slow rate of progress in planning for closure.	No closure related actions.
07 – 08/04/11	ARRTC meeting 26	ARRTC members	<p>Trial landform update.</p> <p>Ecohydrology at analogue sites.</p>	ERA staff commended on the quality of their presentations and thanked for providing the opportunity for ARRTC to visit Ranger.	Minuted
28/03/11	ARRAC meeting 35	ARRAC members	Status report on Pit 1 closure activities.	GAC raised concerns regarding the slow rate of progress in planning for closure.	No closure related actions.
11/11/10	CCWG meeting	CCWG members	<p>Feedback on the use of sentinel wetlands post closure.</p> <p>Defining the meaning of culture.</p> <p>Defining how feedback on closure criteria is updated in relevant documents.</p> <p>Pit 1 closure.</p> <p>Agree on appropriate closure criteria for: Water, radiation; and soil sediment.</p>	No responses or emerging issues from stakeholders.	No closure related actions.

Date	Description of engagement	Stakeholders	Ranger Mine closure topics	Stakeholder comments	ERA stakeholder response, actions and/or resolution
09/09/10	CCWG meeting	CCWG members	Information on the types of acceptable sentinel wetlands post closure. Defining the meaning of culture. Rio Tinto stewardship principles and IAEA sources for consideration. Inclusion of glossary in closure documents. Pit 1 closure. Provision of surface water datasets to CCWG and review of threshold criteria for groundwater release. Agree on appropriate radiation closure criteria. Agree on appropriate soil sediment closure criteria.	No responses or emerging issues from stakeholders.	No closure related actions.
25/08/10	ARRAC meeting 34	ARRAC members	Status on the closure of Pit 1, including future installation of wicks (Q4 2010) to promote consolidation of the tailings for final bulk backfill and pit closure.	No responses or emerging issues from stakeholders.	Minuted
08/07/10	CCWG meeting	CCWG members	Feedback on the use of sentinel wetlands post closure. Defining the meaning of culture. Inclusion of Rio Tinto stewardship principles in closure documentation. Pit 1 closure. Radiation closure criteria. Draft soil sediment closure criteria.	No emerging issues were raised by stakeholders on the topics presented.	Closure document updated with Rio Tinto principles of stewardship. Water closure criteria: Criteria amended to read "groundwater release ("seepage") from the final landform will not induce flow to Magela Creek".
21/04/10	ARRAC meeting 33	ARRAC members	ERA presented an overview of the process water management strategy, which is a long term strategic plan, highlighting elements of water management.	Water management plan requested by the Environment Centre (NT).	ERA advised that the report would be provided at the ERA presentation later in the year.
07 – 08/04/10	ARRTC meeting 25	ARRTC members	Conceptual rehabilitation options for the Ranger LAAs, including preliminary dose estimates for LAAs. Groundwater flow and tailings consolidation modelling, Pit 1 closure. Update on trial landform monitoring results. Hydrochemical considerations relating to process water treatment and salt management.	No emerging issues were raised by stakeholders on the topics presented.	ERA advised that a Pit 1 consolidation model report would be completed in a few months. Updates on the trial landform would continue. Update on LAAs provided.

Date	Description of engagement	Stakeholders	Ranger Mine closure topics	Stakeholder comments	ERA stakeholder response, actions and/or resolution
04 – 05/11/09	ARRTC meeting 24	ARRTC members	<p>Trial landform construction, planting and ongoing management and monitoring.</p> <p>Characterisation of catchments in the Ranger region.</p> <p>Development of complex surface water models to understand fate and behaviour of process water permeate in the system.</p> <p>Ongoing collection of ecophysiology and soil-moisture monitoring data at the Corridor Creek analogue site.</p> <p>Assessing the extent of radiological contamination in the LAAs.</p> <p>Evaluation of catchment issues and hydrological-hydrochemical behaviours in the RP1 catchment.</p> <p>Pit 1 closure studies (incl. surface water – ground-water interactions in the Corridor Creek catchment).</p>	No emerging issues were raised by stakeholders on the topics presented.	<p>Pit 1: ERA to present on the current status of Pit 1 closure issues and planning at the next meeting.</p> <p>LAAs: ERA to present the conceptual rehabilitation plan for the LAAs at the strategic level at the next meeting. ERA to outline what makes that plan robust and check the science is there etc.</p> <p>Trial landform: ERA to provide six-monthly updates on both the trial landform and the eco-hydrology analogue site study.</p>
22/10/09	CCWG meeting	CCWG members	<p>Presentation given on developing cultural closure criteria in tropical Australia.</p> <p>Key assumptions available for comment - ongoing.</p> <p>Water modelling to determine trajectory and impacts of ground water on environment.</p> <p>Feedback on the use of sentinel wetlands post closure.</p> <p>Initial flora and fauna criteria.</p> <p>Identify land use and vegetation types.</p> <p>Identify criteria for Gulungul Creek.</p>	Meeting adjourned to Nov 2009.	No actions required
27/08/09	ARRAC meeting 32	ARRAC members	Closure planning update on development of the trial landform.	Method of operation of process water treatment questioned.	Method of operation described by ERA representatives during the meeting.
07/05/09	CCWG meeting	CCWG members	<p>Draft statement of next land use attributes to developed using existing documents.</p> <p>Key assumptions available for comment.</p> <p>TOR updated.</p> <p>Consider how to incorporate other water bodies into closure criteria - ongoing.</p> <p>Land zonings as controls for locations that are not suitable for uses above the identified beneficial use - ongoing.</p> <p>Groundwater trajectory modelling as closure criteria – ongoing.</p> <p>Closure criteria water model forwarded to CCWG for feedback.</p>	<p>Djalkmarra Billabong will need to have a closure criteria quality, which can be determined through water modelling to determine the trajectory and impact of ground water on the environment.</p> <p>Traditional owners' view is that there should be no new water bodies on site.</p>	No closure related actions

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07/04/09	ARRAC meeting 31	ARRAC members	Commencement of active process water treatment and disposal options, including bench scale testing in the brine concentrator to make distilled water. Examination of passive process water treatment and disposal options, including evaporation ponds. Trial landform progress, including: Installation of soil moisture probes; planting of tubestock in Mar 09; near completion of 1 of 4 erosion plots; and, partial installation of watering system over 2.67 ha.	Method for long term isolation of tailings requested. The complexity of accelerated evaporation ponds was highlighted for ERA's consideration.	Ranger Authorisation specifies tailings must be placed back in pits. Complexity of evaporation ponds was noted.
18 – 20/03/09	ARRTC meeting 23	ARRTC members	Pit 1 hydrogeological conceptualisation and initial calibration solute transport model Reaching of agreement by CCWG on the terms of reference; progress on the trial landform Revision of the closure model; assessment of radiological contamination levels in LAAs Pit 1 geochemical studies	Pit 1: ERA commended on its comprehensive forward program for the two Pit 1 closure studies and endorsement of the proposed approach. LAAs: ARRTC member noted the work appears to be covering the key issues and the key issues are not so much the actual values being measured but the difference between pre-mining and present. Trial landform: Delays in progressing the construction of the trial landform and management of the proposed irrigation regime.	ERA to arrange for progress reports on the WRL and CSIRO work on hydrology and tailings modelling to be provided to ARRTC member. Trial landform: ERA stressed the importance of gaining knowledge and experience regarding irrigation during the dry season, as it may be a vital strategy in order to complete revegetation within the planned timeframe.
16/02/09	CCWG meeting	CCWG members	Develop a draft statement of next land use attributes. Review and add to list of key assumptions. Incorporate other water bodies into closure criteria. Land zonings as controls for locations that are not suitable for uses above the identified beneficial use. Appropriateness of groundwater trajectory modelling as closure criteria. Distribution of Ranger closure criteria water model to CCWG.	Land use should use existing document sources, such as: Closure model, NLC traditional land use, environmental requirements. Water quality criteria will need to be met; Djalkmarra Billabong will need to have a closure criteria quality. This can be determined through water modelling to determine the trajectory and impact of ground water on the environment and other. Traditional owners' view is that there should be no new water bodies on site. Agreed that modelling should be used to determine trajectories for impact on the environment.	NLC and GAC to engage with stakeholders for feedback on sentinel wetlands ERA identify existing bores and how they may be used to identify areas for groundwater modelling.
09/12/08	CCWG meeting	CCWG members	Develop a draft statement of next land use attributes. Stakeholders to review and add to the list of key assumptions. Review KKNs and provide feedback. Agree timeline for closure criteria. Incorporate water bodies into closure planning. Ensure safe future use of groundwater and surface water; reduce risk to future users of the land.	Key assumptions for progressing closure and closure criteria.	Additional agreed key assumption all other infrastructure removed from site. (NB: this can be in the form of infrastructure removed from the surface and buried in the pits.)

Date	Description of engagement	Stakeholders	Ranger Mine closure topics	Stakeholder comments	ERA stakeholder response, actions and/or resolution
10/11/08	CCWG meeting	CCWG members	Stakeholders to start documenting a list of key assumptions. ERA to commence a list of assumptions and send to stakeholders. Compare themes with Key Knowledge Needs.	Key assumptions for progressing closure and closure criteria.	CCWG agreed the following key assumptions: Next land use statement developed to define post closure land use. Jabiru East airport and associated tourist infrastructure will remain post closure (Jabiru town out of scope). New power supply for Jabiru established. Ranger power station removed. Jabiru East camps removed. Public access road decommissioned back to a nominal point (i.e. airport turnoff). Access to site maintained as track. RPA boundary fencing removed. Tracks decommissioned except where access required for monitoring. Minor post-closure infrastructure retained at agreed location on lease. All services currently supplied to Jabiru East will be supplied from Jabiru, i.e. Power, Water. ERA's mining operations end at 2020, with lease expiry in 2026.
22 – 24/10/08	ARRTC meeting 22	ARRTC members	ERA update on a number of closure studies, including: Evaluation of Pit 1 closure strategies; solute transport modelling; geochemical behaviour of tailings; establishment of the MTC CCWG and draft terms of reference.	No emerging issues were raised by stakeholders on the topics presented.	Minuted
01/10/08	CCWG meeting	CCWG members	Discuss future land use by traditional owners as a basis for deciding closure criteria themes. Set themes, priorities and future actions.	Key assumptions for progressing closure and closure criteria.	CCWG agreed the following key assumptions: Scope of closure criteria working group to be focussed on RPA. Jabiru East airport will remain post closure.
19/08/08	CCWG meeting	CCWG members	ERA to update on TOR as part of 1.a with assumptions. Ranger Environmental Requirements to be discussed within the context of closure. Issue paper on traditional ecological knowledge to be distributed to members.	Groundwater abstraction post closure.	CCWG agreed that a constraint on groundwater abstraction from Ranger operational area and some surrounds will be needed to prevent bores being sunk in areas where water will be unsuitable for use.

Date	Description of engagement	Stakeholders	Ranger Mine closure topics	Stakeholder comments	ERA stakeholder response, actions and/or resolution
07/08/08	ARRAC meeting 30	ARRAC members	Planning for the trial landform, which will confirm ecosystem re-construction strategies; and behaviour of rehabilitated landforms at Ranger prior to closure Progressing evaluation of Pit 1 closure strategies – e.g. CSIRO solute transport modelling; and CSIRO geochemical behaviour of tailings. Establishment of a MTC CCWG – draft TOR with stakeholders for comment; and meetings to initially finalise TOR and working arrangements, and then commence development of final closure criteria set for 19 Aug 08. Ongoing field investigations of LAAs, ahead of preparation of rehabilitation plans.	Laterite use in trial landform queried. No responses provided for other topics.	Response regarding laterite experiments provided during the meeting.
18/03/08	ARRAC meeting 29	ARRAC members	Oct 07 evaluation of closure implications completed for Shell 50 extension. Substantially revised Ranger Closure Model (v3) submitted to stakeholders for comment in Nov 07. Planning for construction of a demonstration (final) landform in 2008 – progressing. Establishment of a MTC CCWG, TOR paper in preparation - planned for Apr 08.	Use of Shell 50 and its implications for closure was questioned No responses provided for other topics.	Response to Shell 50 queries provided during meeting.
06 – 07/03/08	ARRTC meeting 21	ARRTC members	ERA update on Ranger operations including the preparation for the closure of Pit 1. ERA presentations on the following: Assessment of radiological condition in the land application areas (LAAs) and rehabilitation planning; update on the Ranger surface water – groundwater interaction study; status of planning for the trial landform. Other closure activities covered included: An update on the development of closure criteria – e.g. derivation of water quality closure criteria for Georgetown and Coonjimba Billabongs; analysis of soils from analogue sites; and the status of the ecological risk assessment of the Magela Floodplain. The requirement to define the baseline data/ reference state that existed at the Ranger site prior to development. This will inform the process of the development of closure criteria, which is compatible with the ERs.	LAAs: Traditional owners requested scraping of the top 10 cm of the whole MLAA and are highly concerned about the status of the other LAAs. General ARRTC support for ERAs project on the radiological characterisation of the LAAs. Trial landform: ARRTC stressed the need to maximise opportunities from the trial. ARRTC noted ERA's proposed approach for the landform planning, and was fully supportive of progress so far. ARRTC requested they be formally consulted by ERA in relation to the design and implementation of the trial landform.	LAAs: The definition of radiation exposure pathways in the LAAs and the estimation of radiation doses to the critical group using a Dose Model will determine the level of rehabilitation that ERA will need to undertake. Trial landform: ERA noted the need to also keep the trial simple; that the key is to lock in a species list as soon as possible and then have further discussion on how to measure turbidity in runoff and other details.

Date	Description of engagement	Stakeholders	Ranger Mine closure topics	Stakeholder comments	ERA stakeholder response, actions and/or resolution
08 – 10/10/07	ARRTC meeting 20	ARRTC members	<p>Discussion on the estimated timeframe for closure of Ranger, in particular the closure of Pit 1 and Pit 3.</p> <p>ERA presentations on:</p> <p>Environmental tracers in modelling groundwater recharge/discharge at Ranger</p> <p>overview of the status of the trial landform and understanding plant-water relationships, erosion rate, and natural diversity accumulation</p> <p>the status of closure planning and geotechnical investigations around Pit 3</p> <p>an outline of the various water management strategies/ scenarios to minimise water inventory, including restoring catchments, use of rock lined channels and evaporation basins.</p>	<p>Trial landform: ARRTC to comment on the initial design of the trial landform to be provided by ERA.</p> <p>Stakeholder engagement: No defined process for stakeholder engagement on closure issues over the preceding 18 months.</p> <p>Pit 1: Potential to delay closing Pit 1 if ERA intended to use the pit for additional tailings storage.</p>	<p>Stakeholder engagement: ERA stressed the need to adopt a flexible approach which provides for addressing stakeholder input, otherwise the process may be perceived as being a rubber-stamping process.</p> <p>Pit 1: ERA commenced tailings deposition in the pit in August 1996. In May 2005, ERA submitted a second application to the MTC, to increase the tailings deposition level in the pit to an interim 12 mRL, which was approved by the Minister in August 2005.</p>
21/08/07	ARRAC meeting 28	ARRAC members	<p>Drafting update to Closure Model for issue in September. Trial landform construction planned before year end.</p> <p>Pit 1 tailings modelling completed, proposed schedule:</p> <p>Installation of wick drains 2009;</p> <p>Pit kept open as potential contingency for process water / tailing storage;</p> <p>Backfilling scheduled for 2012 / 2013</p> <p>Water balance model completed and in use for developing both short and long term water strategies.</p> <p>Next phase to address development of closure criteria and associated studies</p>	The use of Pit 1 and Pit 3 as tailings repositories was queried.	The Ranger Authorisation specifies tailings must be placed back in pits.
12/04/07	ARRAC meeting 27	ARRAC members	Closure planning update on decommissioning of the acid plant.	Clarification sought as to whether the acid plant would be removed as part of decommissioning.	Acid plant was decommissioned as part of the construction of the brine concentrator.
08 – 09/03/07	ARRTC meeting 19	ARRTC members	<p>ERA presentations on:</p> <p>Vegetation types and environmental trends in Ranger analogue areas</p> <p>Ranger landscape design and reconstruction</p> <p>update on land management projects at Ranger and the drafting of an issues paper on ecosystem closure criteria</p> <p>site-wide hydrological characterisation of the Ranger mine.</p>	<p>ARRTC requested a copy of the ERA vegetation criteria report.</p> <p>ARRTC expressed interest in commenting on the experimental design document for the trial landform and to visit the site in the future.</p>	ERA agreed to provide a copy of the requested report and engage further with ARRTC on the design of the trial landform.
Mar 07	Kakadu Board of Management (KBM) meeting	KBM members	<p>Discussion on ERA's planning for the eventual closure of the Ranger mine. This included an outline of ERA's 3-stage closure program:</p> <p>Development of initial closure strategy, which defines the current knowledge base and identifies gaps to be filled.</p> <p>Development of a detailed closure strategy which includes determining the best options to close the Ranger site.</p> <p>Addressing knowledge gaps and developing detailed project implementation plans.</p>	No emerging issues were raised by stakeholders on the topics presented.	ERA agreed to continue to provide regular updates to board members.

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Nov 2007	Issue of Ranger Closure Model	MTC members	Closure model document (v2007) was circulated to stakeholders, which elicited feedback from SSB.	Feedback on closure model provided by SSB.	Feedback from SSB was incorporated into 2010 closure model.
15/11/06	Meeting with traditional owners at Manabadurma (Mula II)	Mirarr, GAC Members, NTDPIFM, OSS, ERISS, NLC, ERA	Discussion took place on the following: Reoccupation of traditional lands. The closure schedule. Similarity of the final landform to the pre-mining landscape. Remediation of the tailings dam. Clean soil and edible bush tucker.	Main issues raised at the meeting included: Fire Weeds – use of aerial herbicide spraying and ongoing weed management. The size of rocks on the surface of the final landform. Mirarr want to see rock sizes like the natural sizes that exist in undisturbed places. Access to riparian areas of the RPA as early as possible post-closure for the purpose of teaching their children traditional values and practices. Concern that extensions to Pit 3 and potential underground mining will delay rehabilitation and closure. Underground access to R3D and possible leakage to the environment. The performance of the Pit 1 barrier. Clean up of riparian zones, and other places on the RPA identified by Mirarr.	Fire and weeds: The plan is to exclude fire from revegetated areas for several years until the new plants have become established. After that, traditional fire management would be introduced progressively on those areas. A fire management plan was being developed for use as a weed management tool instead of relying on aerial herbicide spraying. ERA looking at the best methods of controlling weeds. ERA requested TO advice on their traditional fire management practices, weed management techniques, fruit and tucker species for inclusion in the revegetation mix, and distinction between “weeds” and useful plants, whether native or introduced. Revegetation: ERA noted that seedlings are more expensive than seeds, but can have higher success rates. Surface of final landform: Rock size was acknowledged as requiring attention. Land access: ERA supported Mirarr requirements in respect of land access once it knows what those requirements are. Pit 1 barrier: Currently working as predicted. 2026: ERA confirmed its intention to rehabilitate and close the RPA by the statutory date of January 2026.
17 – 18/10/06	ARRTC meeting 18	ARRTC members	ERA presentation on long term closure planning at Ranger including: Background, outline, objectives and key stages of the closure process.	No emerging issues were raised by stakeholders on the topics presented.	No actions required
22/08/06	ARRAC meeting 26	ARRAC members	Feedback from GAC on the “first pass” draft closure model 2005.	Traditional owners were pleased with many aspects of the model but had reservations on some aspects, which would be outlined in their response.	Traditional owner expectations to be progressed at the next consultation – Mula II on 15 November 2006 and include the following topics: The GAC has suggested 25 years of monitoring following this date, 5 years not considered long enough. Incorporation of RPA into KNP – ideal outcome. Change vs impact.
Jul 2006	15 th Australian Weeds Conference	Peer review	Paper presented on developing closure criteria for weeds on Ranger mine	N/A	No actions required
04/04/06	ARRAC meeting 25	ARRAC members	Closure planning update including overview of infill planting at Jabiru East and MBL bund on RPA.	No responses or emerging issues from stakeholders.	No actions required
Mar 2006	Issue of Ranger Draft Closure Model	MTC members	Closure model document was circulated to stakeholders, which elicited a detailed response from tradition owners on final landform issues.	Extensive stakeholder feedback on the closure model.	Stakeholder feedback considered in ongoing iterations of the model/ plan.

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27 – 28/02/06	ARRTC meeting 17	ARRTC members	Discussion on grade 2 and 3 ore and implications for backfill during the rehabilitation phase. Status of investigation and modelling for approval to deposit tailings in Pit 3.	No emerging issues were raised by stakeholders on the topics presented.	No actions required
06/12/05	ARRAC meeting 24	ARRAC members	Life of mine update including overview of key assumptions outlined in the “first pass” Ranger closure model, completed June 05.	No responses or emerging issues from stakeholders	No actions required
02/12/05	Technical workshop	MTC members, Charles Darwin University, External consultant	Landform workshop, focussing the selection and analysis of analogue landforms which have similar geomorphological and hydrological characteristics to that likely to occur on the rehabilitated landform. The concept for the rehabilitated landform is based on: design rules radiation protection seepage/hydrology controls The general concepts for the landform should not be affected significantly by any changes to the life-of-mine-plan; on the basis of current knowledge that there are not likely to be large waste rock volume changes.	Tailings dam: What’s planned for the tailings dam in terms of rehabilitation and final landform construction? How will the dam core be dealt with? A question was raised about the fate of the groundwater mound. The matter of catchments reconstruction was raised – should surface drainage (and seepage) be directed towards Coonjimba or Djalkmarra? What’s the timing for removal of the mine access road? If landform stockpile covers are used, what purpose does a cover serve (for example, erosion protection, radiation suppression, ecosystem support)? What designs are needed? The geotechnical stability of the final stockpile landform should be addressed. The impact of extreme events on the stability-behaviour-geomorphic evolution of the final landform is an issue to be addressed. Have off-site hydrogeological assessments been considered? What about flows from seepage into (through) sentinel wetlands?	ERA plans to have a first draft of the final landform concept to the MTC in December 2005 or early 2006. The design of the final landform should be approved as soon as possible, and well before mining in Pit 3 ceases at Ranger. This will enable the construction of the landform to commence as soon as possible after this event, depending on detailed scheduling of operations.

16/11/05	Meeting with GAC at Mula	NLC, Mirarr, former DIPM, ERA, Office of the Supervising Scientist, and ERISS	Discussion on final land use objectives, including aspects of final landform scheduling, backfilled pit landforms, land surface rockiness, tailings storage facility rehabilitation and water course reinstatement.	<p>Rock size: The size of the rocks left on the surface outside of the pits –exposed rock should be no larger than golf-balls to allow easy foot access across the site.</p> <p>Erosion: The potential for erosion of the finer materials to expose such rocks outside of the pits – the brown rocks and soils may wash away and expose larger or contaminated material.</p> <p>Land access: The length of time required before access to the land would be available for access.</p> <p>Radiation levels: Material high in radioactivity may remain on the surface.</p> <p>Seepage from pits: May impact upon useable water supplies downstream at Mudginberri.</p> <p>Flow of contaminated water into the reconstructed Djalkmarra Billabong: Considerable concern over the potential for flow of contaminated water into this creek.</p> <p>The future of RP1: Mirarr discussed three options for RP1; retain it, remove it or reshape it into a smaller wetland.</p> <p>Safety of food sources: Concern that geese and fish using RP1 may be contaminated and that this may occur in other areas where water pools on the rehabilitated site. Similar concerns about native fruits and transient animals, as these are important for hunting and gathering by their descendants. Mirarr believe that if revegetation is done properly then animals would return naturally to the site.</p> <p>Open woodlands of woollybutt, stringybark moving to pandanus and melaleuca would be acceptable.</p> <p>Speargrass and natural djilli djilli would be acceptable to promote the return of wallaby and goanna species, allowing for resumption of normal hunting patterns.</p> <p>Planting of edible native fruits is expected: Return of an environment containing green plums, red apple, white apple and yams is essential to allow resumption of normal gathering practices in the future.</p> <p>Rain halted discussions.</p>	<p>Rock size: ERA indicated that larger rocks are required for stability, but that the top 5 metres in the pits would consist mainly of brown, weathered rocks mixed with some larger rocks. It should be feasible to meet small size requirements for surface rocks, but this would need to be further investigated.</p> <p>Erosion: The weathered rocks are suitable for tree growth and would be utilised wherever possible to ensure a stable, vegetated surface. A low, flat contour would also assist. Use of imported soils could be considered, but this could lead to a significant increase in the presence of weeds.</p> <p>Land access: ERA indicated it will take several years to refill Pits 1 and 3 and the ultimate fate of the tailings dam needs to be carefully considered as it will seep contaminated water for a while after removal. Monitoring is expected to cease around 2030, so it is expected that full access would not be recommended for ten to fifteen years after closure.</p> <p>Radiation: Supervising Scientist indicated burial of the most highly radioactive material along with tailings at the bottom of the pit would significantly reduce the amount of radiation and other associated chemicals that could be transported to the surface.</p> <p>Seepage from pits: ERA indicated that groundwater flows off-lease are not yet well known and that more work tracking them is required.</p> <p>Flow of contaminated water to reconstructed Djalkmarra Billabong: ERA suggested that a sharp rise on this side of reclaimed Pit 3 may be required to direct water flow inwards to wetland Filters and the re-established Coonjimba Creek bed. A wetland filter in this location may be required to manage water coming from the site of the resumed tailings dam and direct it into Coonjimba for final polishing.</p> <p>Future of RP1: The main aim is to ensure that the smallest amount of water possible is allowed to pool on the rehabilitated pit area. The preference would be to remove RP1 and place the mud into the Pit. However, this may not be possible as RP1 may be the last part to be rehabilitated. Further thought is needed, but Mirarr indicated a preference for removal of RP1.</p> <p>Safety of food sources: ERISS have been testing these species for radiation contamination and that there have not been any indications so far of serious problems. Mussels that live inside the mud of RP1 may be contaminated as they bio-accumulate chemicals easily. ERISS are continuing with testing for contaminants in edible fruits collected from Nabarlek site. Animals tested so far</p>
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					do not indicate any signs of contamination, but further tests could be done.
04 – 05/10/05	ERA Ranger Weed Workshop	Representatives of KNP, ERISS, GAC,NLC, former NRETA Weeds Branch, DME, CDU, former DEH, and ERA	Establishment of a shared vision for weed thresholds upon closure of the Ranger mine. Identification of key knowledge gaps and ways in which these knowledge gaps can be closed.	The group developed a shared vision for the long-term management of weeds on the Ranger Project Area and identified actions needed to meet that vision.	Minuted meeting. Ongoing stakeholder collaboration. A draft list of weed species was prioritised for management, and ways to better manage these species were also discussed.
31/08 – 02/09/05	ARRTC meeting 16	ARRTC members	Update on ERA closure projects including Landform design ecosystem establishment groundwater dispersion water treatment and landform monitoring	ARRTC noted the need to consider higher resolution data to predict extreme rainfall events.	Minuted meeting with no closure related actions.
16/08/05	ARRAC meeting 23	ARRAC members	Closure planning update with briefing on the Ranger mine closure model, including life-of-mine decommissioning and rehabilitation; first pass assessment of full closure; and status of different assumptions.	Minutes not available.	N/A
28/02 – 01/03/05	ARRTC meeting 15	ARRTC members	Update on developing a framework for surface water quality closure criteria for the RPA. Assessment of the state of the irrigation areas and fate of contaminants and linkages with radiation does from the final landform. Update on the Ranger final landform design issue, noting the relationship between the land and the plant community on the land.	Main issues regarding surface water quality pertained to potential sulphate loads estimates. Stakeholders noted that the decommissioning of LAAs requires consideration of movement of contaminants through groundwater. General satisfaction with LAA (irrigation area) work. General satisfaction with final landform design project.	Minuted meeting ERA recommended a mixing model be adopted, incorporating a broader range of factors to assist with determining surface water quality closure criteria.
13 – 15/09/04	ARRTC meeting 14	ARRTC members	Update on ERA project funding and expected timeframes to address priority KKNs. ERA presented a paper <i>Hydrological and mining influences on solute flux in creeks flowing within the Ranger Lease – Phase 1: Concentration variation and solute loads in Magela Creek</i> . The study also described issues related to the Corridor Creek system which feeds into the Magela Creek system.	Further update on Magela Creek solutes loads requested.	ERA to provide an update paper and presentation on the Magela Creek work at the next ARRTC meeting.
15 – 16/03/04	ARRTC meeting 13	ARRTC members	Discussion around the timeframe for Ranger rehabilitation – e.g. whether it was realistic or indicative. ERA presentations on Ranger final landform design and Ranger revegetation strategy.	Questions raised by ARRTC members covered the following topics: landform slope ratios traditional owner input into landform design and floristic species composition current iteration of the landform design – i.e. first cut or pre-design species presence/absence versus species abundance.	Minuted meeting All issues raised were addressed during the presentations. ERA noted that (floral) community structure was based on initial species, and should be regarded as a first pass approach and is not a quantitative ecological examination. ERA also noted at traditional owners were being engaged on all aspects of closure.

Date	Description of engagement	Stakeholders	Ranger Mine closure topics	Stakeholder comments	ERA stakeholder response, actions and/or resolution
15 – 17/09/03	ARRTC meeting 12	ARRTC members	ERA gave a presentation on mine closure criteria and paper, focussing on mine closure goals, the primary ERs, the closure philosophy, closure planning and the draft final landform.	Divergence in potential long-term revegetation research strategies between ERA and an ARRTC member. ARRTC: Noted Ian Hollingsworth's presentation on mine closure criteria; Endorsed the approach Expressed concern about whether a functional ecosystem could be reinstated, and The need to start canvassing social values.	Minuted meeting ERA indicated they did not need to agree with all feedback by ARRTC members on revegetation research and success. CSIRO undertook an assessment of ERA revegetation strategy in October 2002, which indicated "in principle" agreement with ERA's proposed revegetation strategy. The Key Knowledge Needs document to be finalised and provided to ARRTC.
17 – 19/02/03	ARRTC meeting 11	ARRTC members	ERA advised that closure criteria is an emerging issue and solicited members' views as to the processes that might be used to develop criteria. ERA outlined its process of developing a series of criteria for closure, with radiological, geomorphic, geotechnical and target ecosystems all being issues. Key areas of discussion included: the development of credible scientific models; the need to benchmark the surrounding region; the division of ERs into specific criteria with specifications/ numbers for each criterion; stakeholder communication; and developing workable closure criteria for progressing the landform.	Emerging issue was the process for developing and establishing closure criteria. ARRTC independent science member gave a presentation on the current gaps and potential process for development of a successful revegetation strategy. ARRTC members were solicited for their views on developing closure criteria. Conceptual model of ecosystem processes and pathways for pollutant/propagule transport in the environment of the Alligator Rivers Region' to be developed further; ARRTC members agreed that closure criteria would be discussed at the next meeting, with a concept paper (looking at the broad parameters) being provided to that meeting; and ARRTC asked for a single EWLS/ERISS paper on radiological monitoring to be produced for the next ARRTC meeting.	Minuted meeting. No response from ERA required
16/10/02	Ranger site visit and traditional owner consultation	NLC, GAC and 17 traditional owners.	Site visit to Georgetown analogue area to discuss the broad vision for landscape reconstruction.	No issues	No action required
09 – 11/09/02	ARRTC meeting 10	ARRTC members	ERA focus on generating knowledge required for closure and rehabilitation of the Ranger mine site, including: process water treatment, tailings densification, and the deposition of tailings in Pit 1 above RL0.	Stakeholder responses were directed at understanding broader mine closure aspects such as the legislative approval process and mine closure criteria closure process and revegetation.	Minuted – offline discussion between EWL Sciences and ARRTC independent science member regarding the development of a successful revegetation strategy to address emerging issues.
25 – 27/02/02	ARRTC meeting 9	ARRTC members	Pit 1 closure studies including: engineering behaviour of unconsolidated material; interaction between pore water and upper layers; interaction between pore water and other aquifers; integrity of sealing following consolidation; and subsidence with consolidation. Final landform construction including: Capped and revegetated pits; reformed tailings dam; and reformed waste stockpiles. Reconstruction of surface catchments.	No issues	No action required

Date	Description of engagement	Stakeholders	Ranger Mine closure topics	Stakeholder comments	ERA stakeholder response, actions and/or resolution
Nov 2001	ARRTC meeting 8	ARRTC members	ERA presentation "designing landforms to achieve ecologically sustainable outcomes". Objective was to achieve stakeholder agreement on the habitat targets for the final landform.	No issues	No action required