



NT Environmental Protection Authority  
GPO Box 3675  
Darwin NT 0801

July 2020

To the NT Environmental Protection Authority,

**Re: Rum Jungle Supplementary**

Thank you for the opportunity to comment on the Rum Jungle EIS supplementary. The following letter has been prepared by Mia Pepper, A/Prof Gavin Mudd, Shar Molloy and Dave Sweeney on behalf of the Mineral Policy Institute, Environment Centre NT and the Australian Conservation Foundation.

Our organisations have some ongoing concerns about the long-term success of the project, these are outlined in the letter below. As we made clear in our submission on the draft EIS Addressing our concerns should not preclude government action to commit funding and commence the essential and overdue remediation of the site. We strongly support the project and the need for complete and ongoing funding.

Our comments on the supplementary are under the following headings

*Post closure monitoring and maintenance*

*Funding*

*East Branch of the Finniss River – restoring flows*

*Waste Storage Facility - continuous revision & improvement*

*Monitoring Plan*

*Flora & Fauna*

*Water Treatment*

*Climate change and data gaps (receiving environment)*

*Radiation communication*

*Additional Management Plans and Transparency*

In addition to these comments, we would like to reiterate that we view the existing Browns project and the potential for the future approval of development across the Browns and Rum Jungle sites (i.e. the 'sulphide mega-project') as a major threat to the important rehabilitation works at Rum Jungle. If future expansion of Browns were to be approved, this would undermine significant public funding and public good will and the environmental values and restoration of the catchment – put simply, expansion of Browns would re-open the potential for extreme acid mine drainage affecting the Finniss River ecosystem and its environmental and cultural values.

Outcomes for the Rum Jungle Rehabilitation Project which incorporate the rehabilitation of the Browns oxide and prevent future mining (i.e. the sulphide mega-project) in this area are our strongly preferred outcome. This area is significantly impacted from mining and unlikely to ever be considered pristine, and the pollution threat from this area on downstream environments and communities is a public health and environmental risk that is unacceptable and must be addressed.

Regards,

A/Prof. Gavin Mudd, MPI, Chairperson  
Mia Pepper, MPI, Deputy Chairperson  
Shar Malloy, ECNT Director  
Dave Sweeney, ACF Nuclear Free Campaigner

### Post closure monitoring and maintenance

We understand the proponent intends to have a 20-year period of monitoring and maintenance post closure. It is our strong view that this period should be extended to at least 50 years, acknowledging the seriousness and extent of contamination at the site and the extensive periods that acid mine drainage and radiation remain a threat. Problems can take decades to emerge - as we have seen through previous attempts to remediate Rum Jungle and other uranium mine sites where rehabilitation efforts have largely failed.

As suggested by the NT EPA, there should be a clear set of rehabilitation criteria that need to be met and a post closure monitoring and maintenance<sup>1</sup> program in place. It is our view that this monitoring and maintenance program should be flexible in its longevity and but should be anticipated to be in place for no less than 50 years. This may involve some scaling back of monitoring and maintenance, but that there should be an active program in place to identify any structural failures well into the future. The plan should also allow for a change of activity at the earliest signs of failure of the stability and structure of the Main and Intermediate pit, Dysons backfill and the WSFs and any subsequent flow of pollutants through the restored flows to the EBFR. Mt Burton (included in the current project), Mt Fitch and Rum Jungle Creek South (both excluded in the current project) should also be included in a post closure monitoring and maintenance programme.

We note comments from the proponent that this work would be done following a commitment to fund stage 3 works and outlines that existing monitoring may be applied to a post closure monitoring and maintenance plan. It is our view that monitoring during rehabilitation works are quite different to post closure monitoring and maintenance. See comments in the section below on monitoring which argues the need for the operational monitoring plan to incorporate a comprehensive monitoring plan for soils and materials in

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<sup>1</sup> The NT EPA used the term Care and Maintenance, which is a term that is used for mines which have temporarily closed and where there is an intention to re-open. Rum Jungle is being permanently closed and therefore, post closure works should be referred to as 'monitoring and maintenance.'

each of the areas of the site during movements and placement (some of this detail is provided in section 3 of the Supplementary – but should be incorporated into a comprehensive monitoring plan and follow advice from consultants) in addition to the existing plans for monitoring of environmental receptors.

## Funding

We understand the proponent found that the Detailed Business Case (DBC) for the project was outside the scope of the ToR's for the EIS and that the proponent is currently developing a DBC. A transparent DBC is crucial for public confidence – especially given the failure of the previous taxpayer funded rehabilitation works. Given the high level of public interest in this project and the various options for rehabilitation works at Rum Jungle that will be presented in a DBC we strongly request that the DBC be made publicly available and open for public comment when it is complete. Again, we reiterate that there should be a commitment to fully fund this project by the federal government and that this funding provides for the full costs of the whole project to achieve the best possible outcome. As a national mine rehabilitation project, it remains a crucial case study to achieve success – hence the need to ensure it is funded fully and to the best possible standard, not the cheapest. Indeed, part of the failure of the previous rehabilitation works was a constrained budget which limited engineering options during the works (e.g. borrow pits for suitable cover soils, cover thickness, etc). If this project fails, there will come a time when the federal government will have to repeat this process for a third time. It is therefore in everyone's interest that this project is of the highest calibre and with the strongest commitment to fund it and ensure its success. We are strongly supportive of the best possible outcome and would greatly appreciate the opportunity to view and comment on the various options that will be presented in the DBC.

## East Branch of the Finnis River – restoring flows

A cautious approach to the restoration of flows to the EBFR should be taken. This should be dependent on the outcomes of monitoring and evaluation of the rehabilitation work. Noting that the literature suggests that riparian zones take at least 10 years to become established and at this stage revegetation works are expected to take between 5 – 8 years. We would support a more comprehensive process that relied on a number of criteria being met before flows could be restored including the establishment of the riparian zone (see Appendix 17).

We support recommendations from Hydrobiology to review studies on tailings deposition in the Finnis River downstream Floodplain as they become available, noting that there are a number of studies in press and should be published soon, if not already. The findings should inform need for further studies on tailings mobility and restorative work.

## Waste Storage Facility (WSF) - continuous revision & improvement

Appendix 20 described that there were criteria for selecting the best site for the WSF include :

- Are not prone to flooding in a 1:1,000 Average Recurrence Interval (ARI) event;
- Have suitable foundation geotechnical stability;
- Require minimal clearing of established vegetation;
- Minimise re-handling of radiological soils by covering the major remnants in situ;
- Do not disturb Aboriginal places, objects or artefacts; and
- Do not present unacceptable visual amenity impacts

However, it is not so clear which of the above criteria the two sites for WSF met. Which criteria apply to the two WSF sites selected? Were compromises made, what risks are associated with these compromises and how will they be managed?

Appendix 10 offers advice that the slope and WSF design be refined during the project as more and new information is available about soils and revegetation opportunities and barriers. We want to note and support this call for caution and continuous improvement in the design and implementation of the project and support continuous and rigorous testing of materials to both ensure the structural integrity of the WSF to give the project the best chance of success, which we all understand is not a certainty. We also strongly support ongoing transparency about evolving risks and changing plans. (Appendix 10)

We support the calls in Appendix 12 for stringent testing and monitoring of the waste placement and lime mixing methods to prove the concept in early stages. There is still so much uncertainty about the proposal that continuous monitoring and revision of the data to improve the planning and the methods is critical to the success of the project. We support calls in Appendix 8 for field testing of PAF II and PAF III materials.

We also urge the rehabilitation project team to read the numerous reports available from the Independent Monitor for the McArthur River zinc mine. The extensive sulphide oxidation occurring at this site forced a radical re-think of mining and dumping practices for waste rock – such as changing from 10 m dump faces to <2 m dump faces followed by immediate covering by clay soils. Given the ongoing reactivity of the Rum Jungle waste, it appears to us that the highly detailed approach of McArthur River offers much in terms of waste rock assessment and management.

Appendix 14 and 20 also suggest there is further work to be done to assess the soil material and its chemical composition and erosion properties across all locations in the project area - again suggesting that monitoring and evaluating the WSF during all phases will be critical in the success of the WSF.

We note that much of this testing is outlined in Section 3.5 of the Supplementary report, a comprehensive plan for all types of monitoring should be incorporated into a monitoring plan.

## Monitoring Plan

In supplementary studies/appendix, there are significant recommendations about monitoring, collecting data, additional studies, ongoing surveying, assessment and analysis. This detail is not currently reflected in the monitoring plan. Many of the supplementary appendix (eg. appendix 8, 10, 12, 14, 17, 20) have specific recommendations about monitoring and continuous testing. For example, Appendix 14 section 1.7 offers specific advice for managing growth material which includes significant monitoring efforts. These suggestions predominantly relate to the stage 2 construction monitoring plan. In addition to the existing objectives for the Construction Monitoring Plan (Appendix 1 – section 2) the proponent should include an objective to *ensure a continuous revision of existing threats and revise and update plans and activities to respond to new information about changes to those threats.*

The assessment of materials going into the WSF and backfilling is critical to effectively treat that material and ensure the structural integrity of those landforms. This monitoring and evaluation work is highly recommended throughout the supplementary studies but does not yet seem to be captured in any management plan. There is some explanation of this in section 3.5 of the supplementary as an extract from Appendix 20 describing the PAF management and testing regime, this should be incorporated into the existing Construction Monitoring Plan and through a “**Planning Construction Soil (Growth Material) Management plan**” as recommended in Appendix 14. The point is that continual monitoring of the materials on site is an important layer of the work and yet the necessary planning for this monitoring and continual improvement of plans is yet to be clearly articulated in a management plan.

The final monitoring plan should incorporate all the various monitoring and testing requirements recommended through all the various studies and plans. This is critical to developing the understanding of the contaminants across the site and the effective management of that material. It is so important to have consistency across the project and careful management of data to inform the development of the project. There is much that is yet to be understood about the contaminants at the site and this will continue to unfold as works begin, in this context monitoring and evaluation will be critical to the success of the project.

## Flora & Fauna

We strongly support calls in Appendix 27 that the development of flora and fauna management plans incorporate and are consistent with National Recovery Plans for threatened and endangered species. There is yet to be an alignment of plans.

## Water Treatment

The Water Treatment Plant is said to be needed for ten years. Once the infrastructure is in place, either through Browns or a new facility developed at Rum Jungle it should be considered that the plant may be required for longer than ten years. Groundwater

monitoring and pumping may be required for longer than anticipated, beyond 9.5 years. Consideration could be given to interim uses of the water treatment plant to keep it available for any potential future needs at Rum Jungle. This should be considered in choosing the water treatment plant and considered in planning (refer to Appendix 19).

We note that the intermediate pit “water polishing” design features is to be developed. We would welcome an opportunity to see those plans as they are developed.

We understand that it is proposed that there will be a release of water from the intermediate pit into the EBFR during the Wet season which will require licensing and need to demonstrate that the water release will meet water quality standards. We are interested to understand what contingency there is if the water in the intermediate pit cannot meet these requirements. If the water quality in the intermediate pit is so poor that licensees are not granted how will the proponent manage the excess water? What compromises could be anticipated in releasing water that does not meet water quality?

We also want to reiterate our concern at some of the derived water quality objectives which will guide water management for the project. For the upstream site, statistically-derived background values should be used (which we suspect would arrive at a value in the of 5-20 mg/L for SO<sub>4</sub>) and not extrapolation of ecotoxicity-derived values. After all, the whole purpose of the rehabilitation project is to return the Finniss River system to something as close as possible to a natural state – but a criteria of 594 mg/L for SO<sub>4</sub> is clearly far from this objective, especially since it could allow the direct discharge of AMD pollution.

## Main Pit

The proposal to re-direct the Finniss River back through its original course across the Main pit is an outcome we support in principle in concert with Kukaran and Warai cultural interests. However, we believe the design concept is still poorly explained and justified. After further engagement with DPIR staff (acknowledging their time to engage with our concerns), we believe that the overall design approach needs to be communicated more clearly – especially the technical basis of the water table and the water levels in Main pit. Whilst this is complex, the approach should be made clear to all – this requires further details to be assessed and communicated.

For example, the original EIS failed to include a detailed hydrogeological assessment of the design in its main report and the extent to which the technical appendices delivered this assessment also remains arguable. Further, the supplement still fails to include clear communication of the overall design approach to the backfill of Main pit and redirection of the Finniss River back through its original course in this area. We remain concerned that the technical issues are not resolved to a level of reasonable certainty for such a critical rehabilitation project (e.g. groundwater-surface water interactions, climate change issues), and encourage the proponent to devote significant efforts to addressing this area of weakness. The backfill of Main pit, establishment of a large permanent wetland and redirection of the Finniss River back close to its original course are absolutely crucial –

arguably the most important aspects of the whole project – so they cannot afford to fail. As part of this process, we expect that the proponent will ensure transparency with all stakeholders and make available all information and reports at the appropriate time – especially as plans move beyond conceptual to final engineering designs (including ~ 50 year monitoring plans).

The proponent has a high level of confidence in continued sufficient rainfall and integrity of the 4m water layer, we would be grateful for more information. Appendix 3 suggests the increased intensity of rainfall and risks associated with increased water, conversely Appendix 17 suggests less rainfall. Further details on how the design of the 4m will fair in a scenario of prolonged Dry season over many years which exceed rates found in historical data would be appreciated. We remain concerned that the layer could fail under future unpredictable and potentially more intense Dry seasons induced by climate change across the Top End.

### Climate change and data gaps (receiving environment)

The Appendix 3 report on downstream environmental values explains “Of some concern was the finding that rainfall has steadily increased over the period of record, and that climate change predictions suggest that the intensity of climatic events will also increase. As surface and groundwater flows are the key transport mechanisms for mine contaminants, it may reasonably be expected that the rate of contaminant transport and mixing in both the East Branch and Finniss Rivers will increase, with ecological consequences. Therefore, it is important that steps are taken (via revised/expanded monitoring and further data analysis) that will allow the information gaps to be filled, and thereby better inform the ongoing rehabilitation that will be necessary in order for the WQOs to be achieved.”

Appendix 17 which considers flooding has contrary findings, suggesting that “The release of the revised Australian Rainfall and Runoff in 2016 (Ball, J., Babister, M., Nathan, R., Weeks, W., Weinmann, E., Retallick, M., & Testoni, I., 2019) saw a reduction in rainfall intensities in the Batchelor region of up to 39% compared to the design estimates in Australian Rainfall and Runoff in 2013 used in the Water Technologies study.”

Given that two scenarios with significantly different implications for the long-term management of the site have been described we suggest that greater detail and consideration be given to different climatic scenarios. Greater detail on modelling the climate change risks to the project works and post closure monitoring and maintenance, particularly the threats to the integrity of the project from flooding, evapotranspiration and fires, is recommended.

As we know at Ranger and other uranium mines, the structural integrity of rehabilitation works needs to take much longer periods into account. For example, the requirement at Ranger is to isolate tailings from the environment for not less that 10,000 years. How such time frames have been factored into the design at Rum Jungle remains unclear.

We are also concerned about the impacts from increased frequency and intensity of fires and the interaction between fires and the proliferation of weeds as a critical aspect of the stability of features of the post closure site.

### Radiation communication

We are concerned about the radiological risks and how those will be communicated. We strongly urge a revision of the Radiation Management Plan to effectively describe the plan to communicate radiological risks from the site during the various staged works to the wide range of local and downstream residents, visitors and health organisations. This may also appear in the “stakeholder and engagement communications plan” that is yet to be developed. We raise this as an aspect of the project and one with a significant risk to public health. We look forward to an opportunity to review the final Radiation Management Plan & Stakeholder Engagement Communication Plan, which incorporates a detailed plan for communicating risks under different scenario’s to downstream communities, residents, visitors and workers

The NT EPA requested information about how information requirements on radiation exposure will be met. The proponent response does not explain what the radiological issues are that will be examined or what the objective of the radiation monitoring program will be. The existing objective in the Monitoring Plan is to improve site radiological conditions. Really the objectives here should include to monitor and limit exposure, ensure a safe work environment and monitor, and to inform workers and the public about radiological hazards and changes to those hazards as information becomes available through rigorous monitoring.

We note that through the EPBC Act Review 2020 there was a suggestion to develop ARPANSA national standards on radiation safety that would meet international best practice standards on radiation safety. We strongly recommend consultation with ARPANSA to develop and implement this highest worker safety standards at the site, noting that workers will be exposed to radiation and every effort to reduce that exposure, communicate the risks to workers and uphold the highest culture of safety is critical.

### Additional Management Plans and Transparency

We welcome the commitment to the development of the following management plans, outlined in the supplementary document and that align with advice from GHD and commitments made in the EIS.

- Erosion and Sediment Control Plan
- Air and Dust Management Plan
- Emergency Response Plan
- Fire Management Plan
- Water Management Plan
- Radiation Management Plan
- Weed and Feral Animal management plan.
- Cultural Heritage Management Plan:



- Stakeholder Engagement and Communications Plan.
- Traditional Owners Plan.
- Waste Management Plan
- Vegetation Clearing Procedure
- Hazardous Materials Management Plan
- Local Industry Participation Plan
- Accommodation Plan
- Traineeship Program
- Opportunity Plan for Traditional Owners
- Feral Animal Management Plan

Of these we are particularly interested in the weed and feral animal management plans and the fire management plan as these are critical to success of the revegetation which in turn is critical to the success of the WSF structures. We are very interested in the radiation management plan and in concert the air and dust management plan, erosion and sediment control plan and the stakeholder engagement and communications plan given the high risks and the high probability of radiation exposure. We look forward to the opportunity to view these additional plans and comment.

We would like to formally request that the proponent make updated plans and reports available to the public, continue to engage with stakeholders through roundtable briefings and make commitments to annual reporting.

*We would also like to note that the following plans were recommended by GHD or referenced in the EIS and in Supplementary Appendix but do not appear in the list of commitments for future development of management plans.*

**Land Use Plan:** This was frequently referenced as something that will be developed in the EIS. In the supplementary Appendix 20 on monitoring the development of a **Land Management and Use Plan** was again mentioned and appears it will be developed after Stage 3 works by the Contaminated Sites auditor? We would welcome clarification about whether or not either of these plans will be developed.

**Transport Management Plan:** We couldn't identify any mention of such a plan being developed in the Appendix or in Part 1 or 2 of the EIS. We support the recommendation in "Appendix 16 Traffic Impact Assessment" to develop a Road use Management Plan and Traffic Management Plan (as required when there is an impact on public roads). This plan seems particularly important given the need to restrict the movement and transportation of radiological material and contaminated equipment. (see Appendix 20 pg 31). The establishment of a "Public Access zone" and a "Construction Only Access Zone" requires careful management to effectively control the movement of contaminated equipment and limit the decontamination work. This will of course interact with the Radiation Management Plan and other management plans, but it is none the less important in managing the movement of vehicles and materials and contaminants on and off site and throughout the project area. The issues of decontamination were not raised in the Traffic Impact

Assessment, and we strongly advocate for the inclusion of radiological aspects of transport and traffic to be included in a future management plan.

**Excavation Management Plan:** We couldn't identify any mention of such a plan being developed in the Appendix or in Part 1 or 2 of the EIS. We note in Chapter 7 there was some description on the proposed staging of excavation and construction, however this was not as thorough as a management plan.

While we could find no reference to the excavation management plan in the supplementary we did identify in Appendix 14 advice that a **Planning Construction Soil (Growth Material) Management plan** be developed noting the importance of constant analysis of soils in concert between a soil scientist and geotechnical engineer to *"to ensure greatest possible success with identifying and confirming suitable soil layer materials and ensuring grading and stockpiling are performed as required."* We strongly support and would welcome a commitment from the proponent to develop and implement such a plan to make the most of significant opportunities during the project to generate organic material manage weeds and get the best possible soil layer for growth, this could perhaps be included in the Monitoring Plan in stage 2 construction monitoring.

## Conclusion

In summary we advocate for:

- A commitment to fully fund the project and the public release of the Detailed Business Case for the Rum Jungle Rehabilitation project and that this funding provide capacity for the ongoing monitoring and maintenance for no less than 50 years.
- A monitoring and maintenance program be adopted for no less than 50 years post closure.
- The review and analysis of the risks of the 4m water layer on the main pit failing. This would include reviewing all existing data on rainfall, evapotranspiration, groundwater flows and possible scenarios of prolonged dry seasons.
- That future management plans be made available to the public for review and comment
- A commitment to continuous stakeholder engagement
- Engagement with ARPANSA on implementing the highest possible worker safety standards for radiation
- The inclusion of a detailed plan to communicate the radiation risks at various times and under various scenarios with communities, residents, visitors and workers
- Further details about contingency options and alternatives to managing water from the water treatment plant during periods where water quality targets are not met and licenses for water release are not granted.
- A more thorough and comprehensive monitoring plan which incorporates a more stringent soil monitoring and evaluation protocols for waste placement and in each area of the site.
- That the flora and fauna management plan be consistent with national recovery plans for threatened species



- The development of future management plans as committed to, and additional management plans be addressed – either developed or explained why they are not needed and where that information may be captured.

We look forward to future release of information, ongoing discussions and the commitment to fully fund this project.