



# **Submission on the rehabilitation of the former Rum Jungle Mine Site: Draft Environmental Impact Statement**

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**On behalf of the Australian Conservation Foundation,  
Environment Centre NT and the Mineral Policy Institute**

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## Introduction

The Environment Centre NT (ECNT), the Australian Conservation Foundation (ACF) and the Mineral Policy Institute (MPI) welcome the current moves to address unresolved rehabilitation concerns at Rum Jungle. Previous rehabilitation and remediation efforts at the former Rio Tinto operation have failed and there is a compelling need for renewed efforts to reduce the continuing adverse impacts of earlier mining activity.

We note that this is a severely contaminated site in a challenging environmental setting that is of great cultural significance to the Kungarakan and Warai communities. We understand the increase risk of adverse impact posed by the project during construction and active rehabilitation works and how this is countered by the significantly higher risks to the environment and public health if nothing were to be done. We note the cost and risk to workers health and safety, public health and the downstream environment. We acknowledge the need for this work to be done and make this submission to strengthen and support Department of Primary Industry and Resources (DPIR) efforts towards achieving the best possible outcomes with the least adverse impact.

As a matter of pivotal importance, we urge both the Territory and federal Governments to commit to fully funding the project. There is no discussion in the Environmental Impact Statement (EIS) of the anticipated costs. This leaves the planned works lacking both certainty and capacity. We expect that a project of this kind could cost in excess of \$500 million, noting that the current rehabilitation of Rio Tinto's Ranger site in Kakadu will cost at least \$1 billion. We also urge both the Territory and federal governments to take the time needed to develop the best possible designs to minimise the risks of this project. There is a sense of urgency in the EIS that is coupled with an absence of fully designed aspects of the project. The full and proper funding of a well-designed project is the most assured way to realise the best outcomes. We urge the government to commit to fully fund the project and take the time needed to properly design and assess the project with full transparency and strong engagement with community and stakeholders.

We respectfully acknowledge the great contributions to this process by the Kungarakan and Warai community and others in the community. This has been an act of good faith that this work will be funded, advanced and deliver positive environmental and public health outcomes. Our submission details areas of work that require some further investigation and additional resourcing. While we urge active attention to these unresolved matters this should not preclude any commitment to fund the project and see this work progress.

The Draft EIS leaves many aspects of the project open and fluid for further design and input. It is dependent on reaching agreements with several external parties, including the owners of the Browns Oxide mine, Coomalie Community Government Council (CCGC) and Finniss River Aboriginal Land Trust (FRALT). We welcome the inclusion of the Mt Burton and Mt Fitch sites, and call for the scope of the project to incorporate Rum Jungle Creek South and Browns Oxide. It is our view that the downstream recreation area at Rum Jungle Creek South (RJCS) represents a public health risk that warrants attention and further impact monitoring. If not addressed in this specific project this issue should be referred to other agencies in the Northern Territory Government (NTG) for action.

We are concerned that the Minister will be unable to meet requirements under s73 of the Environmental Protection (EP) Act 2019. This section requires the Minister be 'satisfied' that significant impacts have been avoided, mitigated and can be appropriately managed in granting approval for the project. It is our view, in its current form, this Draft EIS does not meet the requirements of the new legislation. There is a continuing high level of uncertainty about final design, key elements of the project have significant risks associated with them for which no alternatives have been considered and mitigation strategies are still being developed. Approving any proposal where so many design aspects are yet to be finalised would be a poor precedent to set given how new the EP Act is and its importance in delivering positive environmental outcomes across the NT. We strongly encourage the NT Environmental Protection Authority (NTEPA) and the Minister, with the support of the Federal Government, to take the time required to finalise designs for the Ministers consideration and complete the necessary public engagement. Getting this project right and implementing it well is much more important than getting it done quickly and poorly.

Further, we maintain that the Browns Oxide site is a significant risk to the successful rehabilitation of the Rum Jungle project and the East Branch Finniss River (EBFR). In reviewing the history of the project and trying to understand the complex corporate structure we would suggest that this project is at high risk of abandonment. After a decade in care and maintenance this project should be considered a legacy mine. Further, access to the Browns site would provide significant cost savings for the Rum Jungle project. We strongly urge the government to discuss, in negotiations with the company, both access to the infrastructure as well as the full rehabilitation of the Browns Oxide site in some cost sharing arrangement.

It makes operational, environmental and financial sense for these issues to be addressed in an expanded scope of works. While there is a workforce, infrastructure and the development of knowledge and learnings about remediation in this area it would add great value to the broader objective of rehabilitation and pollution mitigation to incorporate strategies for the remediation of both RJCS and Browns Oxide.

This rehabilitation project faces real challenges in managing seasonal extremes of flooding, fires and dry periods over the significant time frames in which potential acid forming (PAF) materials and radiological material pose a threat to the environment. There are significant volumes of acid forming rock, radioactive materials and asbestos. There is also regional weed infestation that threatens the rehabilitation of native flora species and habitat for native fauna and exacerbates fire risks. The EIS generally documents these risks and details a clear strategy for minimising most of these risk factors. However, there are some areas where the mitigation strategy is less developed, criteria are not clear or too low, or further works should be considered in order to realise best project outcomes.

Given that significant further design works need to be developed we suggest and request a formal mechanism to review how the project is tracking against desired outcomes. Our organisations support and would actively engage with a stakeholder reference group with clear review points in order to help provide wider stakeholder confidence and better track and shape project performance.

Environment groups such as the ECNT, ACF and MPI are highly supportive of rehabilitation work at Rum Jungle and of much of the thinking underpinning this approach, including the adoption of a contaminated site framework to the rehabilitation works. However, we remain deeply concerned about the uncertainties and constrained timelines involved in the current approach.

The failure of previous rehabilitation works adds to the imperative that this project is done in a comprehensive and considered way that delivers lasting and positive environmental, cultural and public health outcomes.

## Rehabilitation Proposal

### **Redirecting the creek through the main pit**

We understand a significant aspect of the project is the backfilling of the main pit. The plan, as we understand it, is to cover the tailings / isolate the tailings at the bottom of the pit by covering it with the waste rock from the Main WRD. This waste rock would be treated with lime to neutralise existing acidity and precipitate metals out and be deposited via a floating conveyer belt and barge. This structure relies on 1-2m water cover to exclude oxygen from the waste rock by preventing the oxygen triggering acid forming processes. We are concerned that having the creek diverted through the main pit presents an Acid Mine Drainage risk to the East Branch of the Finnis River (EBFR).

It is predicted that the effect of climate change will not reduce rainfall and there seems to be a level of confidence that the 1-2 m water cover is not a risk. However, elsewhere in the EIS the proponent refers to CSIRO climate change predictions which suggests that the area is likely to experience increased temperatures and increased evapotranspiration which may have a significant impact on the retention of the water cover. As the NT experienced over the 2019/2020 summer the Wet season came later than usual and CSIRO predict this variability is likely to continue with less frequent but more intense rainfall events.

It seems that there is a high-risk period for the maintenance of the water cover late in the Dry season before the Wet season begins where temperatures and evapotranspiration are increasing after a prolonged dry period. An additional threat to the integrity of the water cover is wind which is not mentioned in the EIS. Further analysis and management of these conditions should be considered. This should explore the interaction with groundwater and detail whether the water covering the pit will act as a sink or whether it will drain to groundwater.

There seems to be some gap in understanding about how effective storing tailings beneath the deep-water profile has been. Questions have been raised about sulphide oxidation and generation of AMD. These are issues of fundamental importance to the long-term success of the project and we commend the submission from Dr Gavin Mudd to your attention on this issue.

It is apparent that there is still a significant amount of design work to be undertaken for this aspect of the project. We respect that the Traditional Owners are clear on the need to restore the river flows through the main pit, but it seems that there are a range of options to meet this need that have not yet been considered. For example, the EIS has only considered that the main pit remains as

a pit leaving a lake/ wetland which poses significant management issues. Has there been any consideration of the impacts of completely backfilling parts of the pit, leaving a small channel comparable to the rest of the EBFR as opposed to a lake/wetland? We recommend, if the Traditional Owners are open to other design options, that alternatives to the lake approach be considered while still pursuing the return of flow through the area. We also recommend that during future design work consideration be given to the public safety risks given that there may be formal or informal public access to the site and that water bodies tend to be used for recreation. It also appears that the consideration of alternatives is a requirement under the new Act.

### **The Intermediate Pit and Intermediate and Main WRDs**

The Intermediate Pit is hydro-geologically connected to the EBFR and so any geochemical reaction in the pit may cause contamination to the EBFR. In its final form the intermediate pit is proposed to be used for water polishing before release. This has not been designed yet (EIS p. 7-11) but the proponent has stated that they will engage an appropriately qualified person to support the design. This connectivity to the EBFR raises questions about other aspects of the project which connect with the Intermediate Pit. We would welcome alternatives to be considered, for example completely backfilling the intermediate pit and/or a channel comparable to the EBFR to be constructed.

During construction and for the backfilling of the main pit the proponent has explained they intend to dewater the Intermediate Pit by 8 – 9m. This will create an AMD risk. The proponent describes *“Drawdown of the Intermediate Pit will draw an increased flow of AMD-impacted groundwater into the pit (from the existing WRD) thus deteriorating its water quality. Excessive drawdown of the Intermediate Pit is likely to cause significant deterioration to the Intermediate Pit water quality. The Intermediate Pit is connected by groundwater to the East Branch and water quality of the Intermediate Pit itself can cause impact to the East Branch via groundwater movement. The Intermediate Pit is connected by groundwater to the GDE to the north of the Intermediate Pit. This vine forest would be adversely impacted by excessive drawdown of the Intermediate Pit.”* (EIS p. 7-24)

AMD from the Intermediate Waste Rock Dump is also identified as a key source of pollution, it is described that further investigation is needed to understand the extent and depth of the pollution in the ground water below the EBFR which potentially flows into the Intermediate Pit as this will continue to pose a copper pollution risk to the EBFR.

The mitigation strategy is to treat the water through the Water Treatment Plant, which addresses any overflow issues (EIS p. 10-58), but it is less clear how contaminated water from the Intermediate Pit interacts with the EBFR hydrogeologically and the risks of untreated water reaching the EBFR. Further exploration of this is needed. This should include alternatives or explicitly reflect if an adverse impact is unavoidable and is an environmental sacrifice for the long-term gain. If it is the case, the extent of the damage to the environment from the increase of AMD should be understood, both in the short term and long term.

Figure 7-8 (EIS p. 7-8) shows seepage from the new WSF to the Intermediate pit, this is confusing because the Intermediate pit seems a long way from the proposed new WSF and the main pit is closer to the WSF. It seems strange that this is in the design given the discussion about keeping any contaminants away from the Intermediate pit. It would be good to understand the connectivity between the proposed WSF and the Intermediate pit. Greater clarity is needed around both the environmental impact and purported benefits. This is particularly important as the Intermediate pit is connected to the EBFR.



## Flooding and erosion / Water and Soils

The AMD pollution at the Rum Jungle site is severe. The EIS clearly acknowledges that there are AMD impacts from the site and in groundwater below the WRDs and examines options for capturing and treating this water before release into the EBFR. The extent of the AMD in groundwater and the strategy to capture that water is less clear. We are concerned that the levels for contaminated soil assessment and Locally Derived Water Quality Standards are too high and again commend the submission from Dr Mudd for further details.

We note the following risks associated with water, identified by GHD and shown in an EIS Appendix:

- Flooding of the Main and Intermediate Pits during backfilling due to an extreme flood event that exceeds design criteria and/or poor construction. This could cause overtopping and lead to the transport of contaminants to downstream waters
- Run-off from incomplete/open waste rock dumps or waste storage facilities containing leachable solutes and movement of Acid and Metalliferous Drainage (AMD) and radioactive materials due to rainfall events during earthworks
- Flooding event during Stage 3 that exceeds limitations of creeks, due to larger than expected wet season volumes.
- The start of the Wet season creates a "first flush" rainfall event, causing exceedance of Locally Derived Water Quality Objectives (LDWQO)
- Failure to prepare site for Wet season and/or early onset of Wet season leading to higher rates of erosion and sedimentation than expected
- Uncertainty in the contaminant transport rates in groundwater leading to shorter or longer timeframes and a higher contaminant load
- Formation of hazardous sludge from the water treatment facility that will require appropriate disposal
- Contamination loads in the East Branch Finnis River (EBFR) are not sufficiently reduced, due to continued loads from residual impacted groundwater
- Storage of contaminated surface water at project site

We note that impacts from these events may cause:

- reduced water quality – surface and groundwater/ seepage water quality
- continued degradation of water quality and cumulative impacts in the EBFR through surface water and groundwater
- contamination of waterways with acidity/ metals/ radiation

- increased radiation dose to people and animals
- injury, loss of vegetation and decrease in plant diversity
- reduced habitat quality and fauna diversity
- failure to meet water quality objectives as part of the rehabilitation success
- change in regional groundwater regimes
- inrush of water causing injury/ impacting storage of hazardous materials/ pulse of contamination and sedimentation / increased sediment load
- sludge impact to surface water quality
- changes to flow rates and velocity with resultant impacts on species
- mortality of fauna species through ingestion of contaminated water

We note control measures outlined in the Water Management Plan include a section on sediment and erosion control which adopts sound principles on minimising risks of erosion and sedimentation. Design and scheduling of earthworks and topsoil removal, based on season and climate, appears to be a critical factor in the success of the strategy.

We note that in the risk matrix provided by GHD, with controls in place, the risk ranking for many of the risk and impact factors are medium, without controls the risk ranking is high and in some cases the consequences are 'catastrophic' or 'major' and the likelihood 'almost certain' or 'likely'. We acknowledge the seriousness of these risks and the need for remedial work to be undertaken which will increase some risks temporarily in order to reduce risks in the long term. We urge the routine application of highest control and care standards in the course of the operation.

## Waste Storage

We note the proposal includes the construction of two Waste Storage Facilities (WSF) East WSF capacity 3.786Mm<sup>3</sup> and West WSF capacity 3.223Mm<sup>3</sup>. These are new facilities and the West WSF overlaps the existing area with the bulk of radioactive soils. Materials that will be stored in the WSF's include radiological soils and materials from Dyson's and Burtons Waste Rock Dump (WRD).

We understand that waste rock will be stored in Main Pit, East WSF and West WSF. It is understood that material from the Main Waste Rock Dump (WRD) will backfill the main pit, remaining waste will go to the East and or West WSF and that the small WRD at Mt Fitch will be relocated into the Mt Fitch Pit.

The proponent describes *"The purpose of the WSF cover system is to exclude, as far as practicable, the diffusion of oxygen into the waste rock mass, the net percolation of rainfall and to provide a sufficient matrix for development of shrubs and grasses"* and lists factors to help achieve this purpose. However, there is no discussion about the volumes of rainfall the system needs to be able to withstand. As far as practicable is an insufficient measurement to assess whether these structures are going to, within a margin of error, be able to prevent AMD. We note from the Bureau of Meteorology data that the area in recent times has experienced upwards of 700 millimetres in one month and with the median rainfall for December – March being between 210 – 287 millimetres. Additional information on the management of high rain fall periods is needed in future management plans.

We are concerned that the post rehabilitation monitoring is only scheduled for 5 years. We know from other rehabilitation programs, including that undertaken by Rio Tinto at Rum Jungle and also at Rio Tinto's former Mary Kathleen site in Queensland, that over a short time period rehabilitation works may appear to have been successful but then major pollution problems, including AMD, emerge ten or fifteen years post rehabilitation. We note that the standard applied to the Ranger Uranium mine, under that projects Environmental requirements mean that tailings must be physically isolated from the environment for not less than 10,000 years.

At Rum Jungle the earlier rehabilitation works in 1984 – 1985 were deemed successful. However, the EIS Appendix titled "Determination of the reasons for deterioration of the Rum Jungle Waste Rock Cover," shows that failure of the waste rock cover wasn't evident until ten years post rehabilitation

works. “For 10 years after emplacement, the covers met the specifications for water infiltration. Since then, monitoring has shown that water infiltration has increased.”

Considering the time frame that the pollutants at the Rum Jungle site will remain an environmental hazard. We strongly urge that resources be allocated to manage and monitor the Rum Jungle site at least 50 years after the completion of the current planned rehabilitation project. Continued monitoring into the future is needed to identify any problems and generate an opportunity to remedy those issues before there are major pollution consequences. This additional measured work of monitoring and maintenance post rehabilitation is both necessary to achieve best standards and outcomes and could create significant employment opportunities for a local work force.

## Revegetation Borrow Pits and Weeds

Re-establishing diverse native vegetation cover is critical for stabilising soils, reducing erosion and sedimentation movement. This helps protect water systems and aquatic ecosystems and provides habitat that supports diversity. The major risk to the success of revegetation identified in the EIS is the threat of weeds, in particular Gamba grass. A clear pathway for Gamba grass contamination is through material from borrow pits, especially as Gamba grass and other weeds are already onsite.

To complete the works at the Main Pit and the East and West WSF it is estimated that 385,000 m<sup>3</sup> of low permeability material and 3.3Mm<sup>3</sup> of growth material is required. Two offsite borrow areas have been identified, one is on CCGC land and has been described in the EIS as being heavily infested with Gamba grass (see Figure 14-13). Gamba grass infestation is identified as a critical risk to the project. The Management Strategy identified in Chapter 14.4.2 is to spray the borrow pit material before moving on to the Rum Jungle site.

Gamba grass is a critical threat not just to Rum Jungle but also to the wider regional environment. It is a critical risk factor impacting the severity of fires across the NT and loss of habitat and local flora and fauna species. It is listed as a Weed of National significance (WoN) and requires national attention. The federal and NT governments and other academic and research institutions have a unique opportunity to partner to study Gamba grass at the Rum Jungle sites in order to increase knowledge about the management of Gamba grass.

There is a great opportunity to study and control revegetation and weed management during Stage 3 of the rehabilitation project. This could be extended through Stage 4, although five years is not a sufficient time period to effectively monitor and maintain the revegetation work and weed control. We strongly urge that Stage four of the project be extended to fifty years. Developing new knowledge and understanding about the management of Gamba grass could contribute to its management and control in impacted regions in the NT and Queensland. Further, the learning from revegetation work will also be valuable to other regional revegetation projects and contribute greatly to the knowledge of the workforce who can then go on to work on other critical revegetation projects in the NT. If so desired, the ongoing monitoring and management and weed control could provide a long term economic and employment opportunity for Aboriginal Ranger groups in the region.

## Transparency & Risk Management

The Rum Jungle Rehabilitation Project Draft EIS is in a state of flux. Significant aspects of the project like the final form, the Diversion Creek or the flood plan for the Main Pit require final design and planning. In the interest of transparency and consultation we request that future plans are released for public comment before any formal adoption.

The GHD Risk Register identified several controls to reduce risk, although many of the risk factors remain uncomfortably high. The risk matrix is a useful way of documenting and tracking the proposed activities, the risk from those activities and understanding the impacts and documenting the mitigation strategies. Adapting the risk matrix to include the proposed management activities and mitigation strategies would be a useful way to communicate to communities, the wider public, the workforce and regulators information about the plan and would also increase project transparency and accessibility. Once approved this could be adapted further to include any conditions or trigger levels set for specific aspects of the project.

The following management plans have been identified as being in need of further development or articulation:

**Erosion and Sediment Control Plan (ESCP)** included in the Water Management Plan and discussed in 9.3.1.

- **Air and Dust Management Plan (ADMP)** – Chapter 9.3.1 identifies that they will develop an ADMP as well as a Vegetation Clearing Procedure. These will be particularly important given that the risk rating identified by GHD is extreme, with the likelihood ‘almost certain’ and the consequence ‘catastrophic’.
- **Emergency Response Plan (EMP)** Section 13.3.3 describes that this plan will be developed.
- **Fire Management Plan (FMP)** Section 8.3.5 describes that this plan will be developed.
- **Water Management Plan** (Water Management Plan for Stage 3 is included in Appendix)
- **Radiation Management Plan** (included in Appendix)
- **Transport Management Plan:** We couldn’t identify in the Appendix or in Part 1 or 2 of the EIS, or any mention of such a plan being developed
- **Excavation Management Plan:** We couldn’t identify in the Appendix or in Part 1 or 2 of the EIS, or any mention of such a plan being developed. 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.

- **Construction Weed Management Plan:** Chapter 14 has significant detail on weed management, but there is no discrete Weed Management Plan
- \* **Weed and Feral Animal management plan.** (not in the GHD matrix\*) Pg. 7-35 identifies that weed and feral animal management plans will play a strong role in the fauna restoration, some management and mitigation and monitoring outlined for weeds in Chapter 14. There is some discussion on pests in the bio-region but no comprehensive management plan or mitigation/monitoring is proposed.
- **Cultural Heritage Management Plan:** Section 8.3 is a section on Mitigation and Management following section 8.1 & 8.2 which identify the values and risks.
- **Stakeholder Engagement and Communications Plan.** Chapter 13-3-4 states that a “Stakeholder Communication and Engagement Strategy will be developed once project funding is approved for use throughout the Construction and Post-construction Stabilisation and Monitoring phases.” This important area directly relates to our proposed stakeholder reference group initiative.
- **Traditional Owners Plan:** In Chapter 13 states that an “Indigenous Development Plan and Industry Participation Plan will be required of contractors” 13-11 also states that the proponent will develop a Local Industry Participation Plan.
- **Land Use Plan:** Frequently referenced as something that will be developed.

We request that all future and final Management Plans are made publicly available. Best industry practise and environmental outcomes are likely to be better realised if drafts are made available for public comment and consultation before being finalised and approved.

Where there is no intention to produce management plans, we suggest that the proponent adapt the GHD risk matrix to include greater detail on what controls will be taken to reduce risk. This would be of benefit to communicating the risks and management strategies to the community and may also assist staff on site responsible for managing the risk. We found the risk matrix useful in understanding the risks, though not so clear on how those risks will be managed as the detail is in the EIS and in various management plans. This approach makes cross-referencing a complicated process and could be better codified and simplified.

## Climate Change

We note the information in the EIS outlining climate models from the CSIRO in 2014 and 2016 identifies key changes, including:

- average temperatures will continue to increase in all seasons with increased evapotranspiration
- despite natural variability remaining the major driver of rainfall changes over the next few decades, there will be an increase in the intensity of extreme rainfall events and increased flooding risk
- fire frequency will remain unchanged but when fires do occur their behaviour will be more extreme
- rising sea levels
- fewer but more intense tropical cyclones

Two of the major risks to the project are the movement of contaminated soils through dust and water and the stability of the wastes stored in the Main Pit. These risks are exacerbated by an increase in evapotranspiration and flooding. These climate related threats may have a greater than anticipated impact on the project. The more extreme nature of fire has a dual risk of impacting on flora and fauna as well as cultural heritage linked to flora and fauna. Climate change has been acknowledged but there is little analysis about the different environmental conditions that the area is likely to experience and the impact this will have on the design features of the rehabilitation project or how changes to external conditions have been incorporated into the project design. In particular, we note that the highest ARI for rainfall considered in the EIS is ten years. While the project life is ten years, the design of the rehabilitation project should be aiming to contain the radioactive materials and PAF materials for no less than 10,000 years. Such an approach would be consistent with the regulatory requirement at Rio Tinto's Ranger mine site which is also currently undertaking extensive rehabilitation works.



## Radiological Conditions

There are broad discussions in the EIS on the radiological conditions at Rum Jungle and downstream environments eg. radiation hot spots. However, we remain concerned that there are not specific details about both radiological conditions associated with specific sites within Rum Jungle or the setting of radiological limits as part of outcomes for the rehabilitation project. These limits are needed for a range of materials including gamma radiation, radon flux and activity and uranium in surface waters. We again draw your attention to the submission from Dr Gavin Mudd on this issue.

### Public Health risk - Radiation Uptake in Flora and Fauna

The Radiological Hazard Assessment Report by EcoOz Environmental Services includes flora and fauna in the risk assessment and notes that contaminated or irradiated flora and fauna being consumed by Traditional Owners is an extreme high risk. This means this is both likely and risks catastrophic consequences. The report identifies that there is a knowledge gap on radiological information on bushfoods at the Rum Jungle site. Without this information it is hard to make credible assumptions about potential dose intake from ingestion. Eco OZ recommend further studies and work on this area.

In the Radiation Management Plan (Appendix) it is recommend workers don't consume bushfoods. The Radiation Management Plan is currently only relevant for workers and needs further detail and a broadened scope.

Other groups of people including Traditional Owners, neighbours and the public are identified but there is no clear plan for mitigating the risks to these groups. Details about risks and pathways for ingesting or inhaling radiation are discussed in Chapter 16 and consider different phases of the project and there is some mention of bush foods. There is a specific plan for residents near Mt Burton that they may be advised to leave the area while works at the Mt Burton site are undertaken. Chapter 16 also references the development of a Stakeholder Engagement and Communications Strategy in Chapter 13 to best communicate the radiological risks to Traditional Owners, residents and the public.

Chapter 13 identifies that some people may not want to work at the site because of the perceived radiation risks. The language around radiation risks throughout Chapter 13 describes the risk as 'perceived' which is quite different from the language in the Radiological Hazard Assessment Report which uses the language high, extreme and catastrophic in terms of describing the risk. The

proponent describes that *“The project Stakeholder Communication and Engagement Strategy will provide regular communication around milestones that are likely to have minor impacts to amenity and will target those most affected by the construction work. This will include the Mt Burton landowner, property owners adjacent to Rum Jungle and Litchfield Park Roads, Traditional Owners, CCGC and the Browns Oxide Mine, adjacent to the Rum Jungle site.”*

Given the seriousness of the public health risk associated with various pathways to ingest contaminated or irradiated flora and fauna we look forward to understanding more about how these risks will be accurately and regularly communicated to different stakeholders to minimise risks of exposure. The public health risk should also be monitored, and detailed reports made public. We strongly advocate for a public health monitoring program and urge the proponent to engage and make resourcing provisions for the Department of Health NT and health providers like the Batchelor Community Health Centre, local GPs and the Adelaide River Community Health Centre to help monitor and identify any public health or workers health issues that may be a response to the rehabilitation works. Clearly, any such increased role from these and other agencies and health professionals would need to be met with a commensurate increase in resources and capacity.

#### Rum Jungle Creek South and downstream environs

We note that the EIS excludes the RJCS stating that *“Rum Jungle Creek South (RJCS), an additional satellite site in the Rum Jungle Uranium Field, is currently held by Coomalie Community Government Council (CCGC) and is excluded from the project as no future rehabilitation works are currently planned for this site”* (EIS 1-2).

We note that the RJCS site was mined as part of the Rum Jungle project, and while the site may be held by CCGC, the legacy issues at the site are a direct result of the past mining activities as part of the Rum Jungle project. While the pollution issues at the site are deemed less dangerous than those at the main Rum Jungle site, there is an extremely high risk at the RJCS site because of public access to the site including swimming and camping. In September 2019 former Minister for Resources, Matt Canavan, allocated \$1.9 million to the maintenance of the site. It is expected this kind of maintenance will be repeatedly required in the absence of a complete and comprehensive rehabilitation. While there is expertise in the region facilities and infrastructure to complete the rehabilitation, we recommend and urge that the rehabilitation of RJCS be incorporated into the current Rum Jungle Rehabilitation project and be fully funded.

Figure 6-13 (EIS p. 6-19) shows an anomaly in Zone 6 for levels of uranium in the water. This is described as counter to logic that uranium would be diluted and this increase in uranium may be due to additional sources of uranium or an evapo-concentration cycle. Further investigation on potential additional sources or evapo-concentration cycle should be considered, whether as part of this EIS process or as a public health issue taken up by the NTG.

## Browns Oxide Project - in care and maintenance

This Browns project has a complex foreign corporate structure and has been in care and maintenance since 2009. It is our understanding that projects that have been idle for more than a year or so are likely to face prohibitive restart costs. This is largely due to the cost of restarting machinery which is likely to have suffered over time from being inactive and may or may not be redundant by new processing technology. While the Browns resource remains largely untouched and so is likely to still have book value, financial constraints and market conditions may prevent this mine from ever re-opening despite the intention of the company. We know from Rum Jungle that the risks from this type of project to the environment and downstream systems are extensive, difficult to protect and manage and have intergenerational consequences.

It is our understanding that there is a statutory environment requirement under the *Mining Management Act* detailed in the *Mining Management Plan Structure Guide for Care and Maintenance Operation* (DPIR 2017) for companies in care and maintenance to have a Care and Maintenance Management Plan (CMMP). We were unable to find one for the Browns Oxide Project and suspect that there is not an active CMMP.

We note that the company are operating to a current Exploration Mining Management Plan (EMMP) but the tenements covered in the EMMP are predominantly outside the Browns project area. The exploration activities and the potential of mining in areas that may impact on the Rum Jungle Rehabilitation Project and the EBFR are of serious concern. It is our strong view that exploration licenses not be renewed or approved for areas over the Rum Jungle Rehabilitation Project or areas upstream of the EBFR.

Within the EMMP the Browns Project is described as being in care and maintenance and treated as a separate project. We maintain that there should, under the Mining Management Act (MMA), be a current CMMP given that managing the care and maintenance site and infrastructure is a distinctly different set of activities to exploration. With the development of a CMMP the government may have increased procedural opportunities to negotiate with the company over temporary use of the Water Treatment Plant (WTP), offices, ablutions, bulk fuel and reagent storage and source of potable water and water for dust suppression.

Project use of the water treatment plant at the Browns site would significantly reduce costs and would have a net environmental benefit by reducing requirements for raw materials to reconstruct a new WTP. DPIR identifies this environment gain by stating *“the option to utilise the existing facilities at Browns Oxide Mine would have significant ecologically sustainable development gains for the Project as the lease of already existing facilities greatly reduces the need for capital expenditure, for resources in construction and subsequent decommissioning.”*

To the best of our ability we found that the Browns Oxide project is operated by Northern Territory Mineral Pty Ltd, that Cove House is the holding company for the Joint Venture (JV) project with Hunan Non-Ferrous Metals Corporation (HNC). It is unclear who the company directors are for Cove House or HNC which raises serious concern about chain of custody and the environment legacy at the site. The Browns Oxide site poses a high risk to the environment and a high risk of being abandoned. It further threatens to compromise the rehabilitation efforts at the Rum Jungle site. It is our view that the site should also be closed and remediated at the expense of the project’s JV partners or alternatively that some negotiation and separation of rehabilitation aspects of the Browns project be divided between the JV partners and the DPIR.

## Funding – supporting a strong local workforce & cleaning up the environment

In a DPIR presentation to the community about the Rum Jungle EIS and rehabilitation project there is a clear statement that “currently no guarantee of funding or timing of potential funding to deliver State 3 works – dependent on government expenditure priorities”. Given the information contained in the EIS and associated studies and reports there is clear evidence that the pollution from this site urgently requires effective remedial action and that this needs a commitment to funding. The Rum Jungle site is one of Australia’s worst mining legacies. Unlike many other legacies this project was government owned and there is a clear government responsibility for action. This clear connection to the federal government highlights the clear responsibility to ensure funding is made available to restore the environment.

The flow on economic and intellectual ramifications from the project should be considered as having a broader benefit to the local and regional economy and environment. Contributing to a skilled workforce on rehabilitation and management of serious pollution issues will advance the critical knowledge and skills required at many mine sites across Australia. The benefit of contributing to building up this workforce and these skills will have greater environmental benefits at some of the 50,000 other abandoned or un-remediated sites across Australia (Unger 2014). Along with the overall environmental and public health benefits of removing pollution and restoring the environment at Rum Jungle, the contribution of building up a skilled workforce should be a key consideration for the Federal Government in prioritising the funding of this work.

In the EIS the DPIR suggest that the total rehab liabilities for the NT is \$1billion. A more recent figure from Jan 2020 revised this to \$1.3 billion this only accounts for nine mine projects and yet there are over 300 mine sites across the NT alone. Looking to the future the rehabilitation of these sites will be critical for restoring safe ecosystems and a healthy environment and there is significant funding required from the mining companies involved. There is the potential for a rehabilitation economy in the NT, with government funding for the Rum Jungle project including strong local procurement conditions provides an important platform to build a strong and skilled Territory workforce.

## Conclusion and Recommendations:

The ECNT, ACF and MPI are highly supportive of rehabilitation work at Rum Jungle but remain deeply concerned about the uncertainties and constrained timelines involved in the current approach. The failure of previous rehabilitation works adds to the imperative that this project is done in a comprehensive and considered way that delivers lasting and positive environmental, cultural and public health outcomes. We urge your adoption of the following recommendations in order to increase the likelihood of realising lasting and effective project outcomes.

- That priority be given to developing the design and mitigation strategy rather than getting works started quickly. This scope of works is needed and welcome but should be done well rather than speedily – considerably more development work is required.
- That the RJCS site be incorporated into the Rum Jungle Rehabilitation Project given the significant public health risk and financial and environmental synergies. A partnership with the Coomalie Community Government Council should be developed to achieve this.
- The Government initiate negotiations with the owners of the Browns Oxide project to facilitate using infrastructure at the site for the Rum Jungle rehabilitation works and for the inclusion and complete rehabilitation of the Browns Oxide site in a broadened project scope.
- That both the federal and NT Governments commit to fully funding the project and an enhanced post rehabilitation monitoring program.
- That post rehabilitation monitoring be extended from 5 years to 50 years.
- That project alternatives to the Main Pit final form be considered through engagement with Kungakaran and Warai, specifically considering returning a river structure as opposed to a wetland/ lake structure and/or other alternative approaches.
- That a stakeholder reference group be established to track performance and compliance and review key project developments
- That there be resourcing for public health impact monitoring in downstream communities from the Rum Jungle site and workers.
- That regional public health agencies and providers be resourced to assist in addressing public health issues and responses
- That exploration activity at the Rum Jungle Rehabilitation Project and upstream of the EBFR be halted and any future exploration activity prevented.

We strongly support the rehabilitation of Rum Jungle. To do this we encourage the Federal Government to both commit to the funding of the rehabilitation and enable the NT Government to

take the time needed to finalise design aspects to the best possible standards in proper consultation with the Kungarakan and Warai and other engaged stakeholders including ACF, ECNT and MPI. We would also encourage both the Federal and Territory governments to actively progress the incorporation of Rum Jungle Creek South and Browns Oxide into the rehabilitation project. Public engagement and transparency in the completion of the design and throughout the project is paramount to the success and urge the NT government to establish a stakeholder reference group to facilitate this.



## Glossary

ACF - Australian Conservation Foundation  
AMD – Acid Metalliferous Drainage  
ARI – Average Recurrence Interval  
CCGC - Coomalie Community Government Council  
C&M – Care and Maintenance  
CMMP - Care and Maintenance Management Plan  
CSIRO – Commonwealth Scientific and Industrial Research Organisation  
DPIR - Department of Primary Industry and Resources  
EBFR – East Branch Finniss River  
ECNT - Environment Centre NT  
EIS – Environmental Impact Statement  
EMMP- Exploration Mining Management Plan  
EP Act – Environmental Protection Act  
FRALT - Finniss River Aboriginal Land Trust  
GDE – Groundwater Dependent Ecosystem  
GHD - GHD Group Pty Ltd  
HNC - Hunan Non-Ferrous Metals Corporation  
JV – Joint Venture  
LDWQO - Locally Derived Water Quality Objectives  
MPI - Mineral Policy Institute  
NTEPA – NT Environmental Protection Authority  
NTG - Northern Territory Government  
PAF – Potential Acid Forming  
RJCS – Rum Jungle Creek South  
WRD – Waste Rock Dump  
WSF – Waste Storage Facility  
WTP – Water Treatment Plant