

ALLIGATOR RIVERS REGION TECHNICAL COMMITTEE

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TENTH MEETING, DARWIN, WEDNESDAY 9-10 SEPTEMBER 2002 SUMMARY RECORD

Members present

Prof. Barry Hart (Chair)	Independent science member
Mr Ray Evans	Independent science member
Ms Jill Fitch	Independent science member
Dr Carl Grant	Independent science member
Dr Terry Hillman	Independent science member
Prof. Douglas Holdway	Independent science member
Prof. Gerald Nanson	Independent science member
Mr Mark Foy	Northern Land Council
Dr Arthur Johnston	Supervising Scientist
Mr Tony McGill	NT Department of Business, Industry and Resource Development
Dr Tony Milnes	EWL Sciences, representing Energy Resources of Australia
Mr Peter Wellings	Parks Australia North

Apologies

Mr Shane Maraldo	Pioneer International Ltd (representing Queensland Mines Pty Ltd)
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Secretariat

Mr Gary Whatman	Secretariat
Ms Pam Fielding	Secretariat

Advisers

Mr Alex Zapantis	Office of the Supervising Scientist
Dr Max Finlayson	Environmental Research Institute of the Supervising Scientist
Dr Chris Humphrey	Environmental Research Institute of the Supervising Scientist
Dr Ken Evans	Environmental Research Institute of the Supervising Scientist
Dr Paul Martin	Environmental Research Institute of the Supervising Scientist
Dr Peter Bayliss	Environmental Research Institute of the Supervising Scientist
Dr Bob Pidgeon	Environmental Research Institute of the Supervising Scientist
Mr Julian Barry	Parks Australia North
Dr Rod Kennett	Parks Australia North
Dr David Klessa	Energy Resources of Australia
Mr Geff Cramb	Northern Land Council

1. Welcome

Barry Hart opened the meeting and welcomed members and advisers. He outlined the structure of the agenda and asked members to declare any conflicts of interest. No members declared any conflicts of interest.

2. Minutes from previous meeting (25 February 2002)

Ray Evans pointed out that the second last sentence under Welcome and Overview referred to a meeting with Traditional Owners that did not take place.

Ray also made the point that there are two kinds of out of session work but the previous minutes did not distinguish. This issue is discussed further under Other Business. The Summary Record of the previous meeting was accepted with minor clarifying amendments to address Rays observations [moved – Gerald Nanson, seconded - Doug Holdway].

Research

3. Parks Australia North research program

Barry Hart told members that this presentation was for information as PAN's research is assessed by the Kakadu Research Advisory Committee but ARRTC may be able to identify ways to strengthen linkages between Parks Australia and other relevant research organisations including *eriss*.

Peter Wellings provided background information. PAN does not have the resources of state park agencies and therefore relies on consultancies. Early work was mainly to obtain baseline information and to respond to particular issues. In 1995 a consultant was engaged to overcome Traditional Owner concerns that research was too western oriented. The consultant identified ways of better engaging the Traditional Owners. The more recent focus has been on performance management. Linkages have historically been with CSIRO but this connection has waned in recent years. PAN works closely with *eriss* on some research issues.

Rod Kennett then outlined research carried out by or on behalf of PAN. The most significant project involving *eriss* is the Boggy Plains Project, on responses of floodplain vegetation to fire. Inputs include Traditional Owner views on management of the floodplain. *eriss* will provide expertise in remote sensing and the knowledge gained should be able to be transferred to mining issues on Magela.

There was a lengthy discussion on the research program. Some of the points made were:

- Traditional owners have a significant influence on decision making. Some members wondered how TOs would respond to big issues like global warming or to threats from things of which they have little experience, such as salvinia.
- In this era of knowledge based management, TOs require information like everyone else.
- One of the biggest issues facing Kakadu is saltwater intrusion. *eriss* is helping to map salinity levels using satellite imagery. Landscape changes are potentially large.
- Increased number of pigs may be due to fewer buffalo.
- Research tends to be inventory, interactions and impacts but these are not being integrated.
- The aim is to protect world heritage values but this could be difficult in situations like the increase in woody weeds.
- A new plan of management is required in 2004, involving considerable consultation.

It was generally agreed that the hydrology of the floodplain and its interaction with the ecosystems present was not well understood. Gauging stations were a good source of hydrological data but it was noted that stations are being closed by the NT Government due to cost constraints. It was considered that the current network of gauging stations needs to be reassessed.

The committee found it difficult to determine which of the PAN research projects were a high priority. It was considered that the growing collaboration with *eriss* should be encouraged and that the landscape-scale project could be relevant to both park management and mining impact assessment. The landscape-scale project undertaken by *eriss* will complement the park reporting and monitoring project (see summary record of ninth meeting of ARRTC).

4. *eriss* research program

Max Finlayson presented information on the *eriss* workplan for 2002-03. He said that there has been an attempt to integrate mining and non-mining activities through the landscape-scale project. Max said that the two main themes were research (and monitoring) of impacts of mining on people and the environment in the ARR and research on ecology and conservation of tropical wetlands.

Mining related research can be divided into three broad categories:

- Baseline analysis and description of ecosystem features.
- Operational issues and on-going monitoring.
- Rehabilitation issues and monitoring immediate and long-term success.

One area that is increasing is the use of remote sensing. ARRTC asked for a scoping paper to be prepared on remote sensing.

The new environmental radionuclide laboratory on the Darwin premises will not be seeking NATA certification as it is too small and another person would need to be employed. A quality management system will be established instead. ARRTC discussed this extensively and questioned whether or not the decision may need to be reassessed in the future.

Jill Fitch was interested in the project on Aboriginal diet and food preparation. It was noted that obtaining details on diet is difficult because it tends to intrude on people's lives, but information gathered elsewhere, eg in Arnhem Land, may prove useful.

Barry Hart queried the fifty person weeks to establish the radiological laboratory and wondered how it assisted the research program. Ray Evans thought that *eriss*'s commercial analyses of Radium for ERA and DBIRD were an opportunity cost because the expertise is being taken from other projects. Arthur Johnston stated that income from these analyses completely paid for the position established to undertake the analyses and the commercial analyses provide additional expertise to *eriss* rather than taking it from other projects. These points led to a discussion on the level that ARRTC should be considering *eriss*'s research program, ie at the strategic level or detail level? It was agreed that ARRTC as a whole should provide advice on strategic issues but more detailed advice on annual plans and projects would come from individual members interacting with the researchers and then reporting back to ARRTC.

ARRTC had some concerns regarding the potential conflict of interest regarding the commercial radioactivity measurement laboratory - but also was aware of the lack of any other high quality commercial analytical facilities. Arthur Johnston said that he would prefer that *eriss* not do the analyses for ERA and NTBIRD but there was no practical alternative. The committee recommended that the situation be reviewed.

Doug Holdway asked why there were two different sampling methods for macroinvertebrates and whether the results can be compared. Max said there were historical reasons for the differences and the earlier methods used at Ranger were valid and had not been changed as the large effort to compare newer techniques was not warranted.

Gerald Nanson thought that the title of the Hydrological and Ecological Processes program gave the wrong message as there appeared to be little ecological content. Gerald also considered that the program should have a greater focus on geological and geomorphologic aspects of rehabilitation. Arthur Johnston replied that there has been a lot of good work done on geomorphic stability at Ranger.

Barry Hart said that three staff working on Swift Creek might be excessive. Arthur stated that there had been a three year intensive program. *eriss* intends to complete the projects currently underway in Swift Creek and then reduce its effort in this area. The results of the program are being used to ensure a high degree of reliability for the monitoring program.

Tony McGill queried the need for geomorphic work, given the predicted very low erosion rate of the tailings cap. Ken Evans replied that the research would be useful for determining trends. Gerald thought that the effects of long term landscape changes, such as change in sea level, should be modelled. ARRTC would like to see a conceptual model of the system developed, with transport pathways clearly shown and best estimates of the loads/fluxes of contaminants shown.

Members thought there was a lack of clarity on the linkages between the actual projects and the program goals. There are many projects in each program but it was difficult to determine their relative priority or the process in deciding priorities. One member questioned the use of a PhD student for a major project. It was also unclear how the knowledge being generated was being synthesised to address key issues (e.g. surface and groundwater pathways, solute and SPM transport).

Ray Evans questioned why the Hydrology program was not involved in assisting with interpretation of the solute fluxes by Chris Humphries' program. He highlighted the lack of coordination and synthesis between programs. Comment was also made regarding the knowledge of the overall catchment hydrology and how this related to mining-related activities at the two sites. Specifically, it was asked whether a catchment hydrology model might be a useful piece of information in understanding mining-related impacts. Barry Hart asked Gerald Nanson and Ray Evans to provide some broader justification to why a hydrology program may require more data to supplement existing efforts.

eriss will maintain its ecotoxicity laboratory for pre-release testing. ARRTC requested information on the future of this work and resource implications.

The balance and resource use between wetlands and mine related research was unclear.

There was some confusion over the resources being put to monitoring and those to research. ARRTC suggested that they may need to be better separated, even as separate programs.

ARRTC supported the focus on ecological risk assessment. ARRTC requested a short paper outlining *eriss*'s assessment on how and where this technique will be used in the future.

5. ERA research program

Tony Milnes presented a summary of ERA's 2002-03 research plan. At this stage research is focused on the mine site and closure and rehabilitation issues. Priorities include process water treatment, tailings densification, application to deposit tailings above RL0 in Pit#1 and long-term care and maintenance at Jabiluka.

Ray Evans asked whether knowledge of the size of the irrigation footprint at Jabiluka was an issue. Tony thought not, in the short term.

Peter Wellings asked whether Ranger Retention Pond 2 water was likely to be treated. Tony thought that irrigation areas could be decommissioned if water treatment is successful. Peter was also interested in the use of minesite water by fauna but only little is known about this.

Carl Grant wanted to know about the mine closure criteria and the process for sign off. Tony said that the Minesite Technical Committee approves the plans. Tony McGill informed the committee that closure would be subject to the Commonwealth *Atomic Energy Act*, the *Environment Protection and Biodiversity Conservation Act* and the Commonwealth Environmental Requirements. He said that after numerous reports on planning and rehabilitation it would not be reasonable for key decision makers (NLC and Traditional Owners in this case) to ask for something different now.

Carl was concerned that there seemed to be insufficient information to base a revegetation program on. Tony Milnes considered that enough research has already been carried out for successful revegetation. There was a suggestion that *eriss* conduct further research into this area but following a lengthy discussion it was decided that Carl would consider the issue further with EWL Sciences and report back.

Terry Hillman asked whether the ecosystem monitoring project was able to discriminate between affected and unaffected land. It was agreed that Terry would discuss the matter further with EWL Sciences and report back.

6. Landscape scale analysis project

Max Finlayson described progress on this project. Useful discussions have been held with Parks Australia North.

Arthur asked ARRTC for advice on whether the project is justified considering the resources required (\$2.5 million over five years) and the broader context, ie it puts mining into perspective.

Members tended to support the project because it puts mining in context and it is also a good use of previous research results. They considered the potential impacts on the park due to mining small in comparison to other pressures. Arthur said that there would be additional funding if the project goes ahead.

Ray Evans thought that a framework (which developed the concepts of what the term landscape meant in a functional sense across all the issue/themes, rather than a spatial sense) should be developed first, rather than embarking on a work program focussed on synthesising data at pre-determined scales. Max replied that a conceptual framework would likely have some scientific value but may not be seen as that useful by local landowners. He stressed the need to have a balance between traditional scientific approaches and the operational interests of Traditional Owners, and added that cultural perspectives were being included.

The project received broad support from ARRTC who recommended that the projects contained in the *eriss* 2002-03 Workplan proceed. Members considered the link between *eriss* and PAN was an important one to be developed. The committee asked for a status report next meeting, including further information on internal projects.

7. Review of mine-related research in the Alligator Rivers Region 1978-2002

This review was tabled at the last meeting and members were requested to provide comments by 30 September so that it can be finalised.

8. Strategic research plan in ARR

Barry Hart considered it useful for ARRTC to think about knowledge needs for the next five years. In this context Ray Evans said that it would be beneficial to receive more information on research and mining issues.

Arthur Johnston said that the review of mine related research in the ARR (item 7), by Arthur and Tony Milnes, also includes information needs of the future. He suggested that it could be a basis for a strategic plan for research.

It was agreed that Tony Milnes, Arthur Johnston and Barry Hart would produce a summary of the major issues in the review paper provided to ARRTC at its November 2001 meeting, followed by a discussion with the seven Independent members.

Monitoring

9. DBIRD monitoring program

Barry Hart indicated that ARRTC should assess the monitoring programs of all three organisations to determine whether they are consistent with best practice and that they provide the community with confidence that the mines are being monitored appropriately.

Tony McGill presented DBIRD's check monitoring program. He said that the number of monitoring sites will be reduced to reflect points of exit of contaminants from the site. Samples are taken at the same location as ERA but less frequently. Laboratory samples are blind coded. Wet season samples at Nabarlek and Jabiru are very expensive to obtain because of access. Helicopter is often required.

ARRTC considered the water quality monitoring program to be sound.

10. ERA monitoring program

David Klessa presented ERA's compliance monitoring program. ERA has just completed a review of the monitoring program at Ranger that is being considered by the Minesite Technical Committee. There will be a greater emphasis on 'points of exit' in the statutory program and improved early warning capability to the statutory and operational monitoring. Groundwater monitoring in the operational program will be better targeted.

The weekly and quarterly reports will be replaced with stakeholder access (view and download) to statutory data via the Internet and the Ranger Laboratory Information Management System (LIMS), subject to approval by the Minesite Technical Committee.

The chemistry content of the annual environmental report (October) will be replaced with a Wet Season Report (30 June) that will determine whether ERA has met receiving water standards. The trigger value concept is preferred over the maximum allowable additions.

The proposal to change the monitoring program will be reviewed by the Minesite Technical Committee and an application for the 2002-03 wet season will be submitted.

ARRTC considered that the revisions are sensible and appropriately rigorous.

11. Supervising Scientist monitoring program

Arthur Johnston informed the committee that the Supervising Scientist's monitoring program commenced in 2001 following the 2000 tailings leak. It was considered necessary by the government that the community be provided with additional assurances that the environment is being protected from mining. The program tries to minimise duplication with ERA and DBIRD and focuses on off-site environmental protection.

Chris Humphrey described the program in more detail. The management goals of the program are to ensure that biological diversity of aquatic ecosystems downstream of Ranger are not being changed, and ensuring that early warning systems are in place. There is agreement among stakeholders that fish and macroinvertebrates are the most useful surrogates of biological diversity.

The early detection of change is through pre-release laboratory toxicity testing prior to any release of water, chemical water quality monitoring and creekside biological monitoring. Detection of longer term impacts or trends is through water/sediment chemistry, bioaccumulation studies, and community structure monitoring at sites along disturbance gradients (on/off-site).

Biological monitoring occurs at sites downstream of Ranger and Jabiluka. Macroinvertebrate communities are measured at Ranger at the end of the wet season when sites are accessible, and at Jabiluka, monthly in Ngarradj and control stream, and in four streams at the end of the Wet. Fish community structure is measured at Ranger at the end of the wet season, and Jabiluka, twice per wet season.

Water chemistry is spot sampled every week.

Wet season monitoring (water chemistry, creekside) is not continuous but the end of wet season sampling of biodiversity is used to integrate Wet season events. Therefore a weight-of-evidence approach is used by the Supervising Scientist to determine if there has been any environmental impact downstream of the mine.

The weight-of-evidence approach includes:

- multiple indicators,
- good experimental data linking major contaminants (U, Mg) to biological responses (lab and creekside test species),
- highest U concentrations in receiving waters are an order of magnitude lower than values

known to result in biological effects (lab and creekside test species),

- past experience.

ARRTC considered that the experimental design is appropriate and regarded the program as best national and international practice and has a high level of confidence that the downstream aquatic environment is being protected. The committee recommended that SSD keep a watching brief on national and international developments and revise the program as appropriate.

ARRTC considered that the combined chemical sampling and biological creekside testing result in an adequate early warning system.

Ray Evans observed that the presentations dealt only with monitoring related to the aquatic environment and groundwater. It was suggested that ARRTC needed to be aware of other monitoring programs and requirements. A review of radiological monitoring and assessment programs was requested for the next meeting.

Operational mining issues

12. Review of Supervising Scientist report 'Investigation of the Stockpiling and Reporting Incidents at Ranger and Jabiluka 2002'

Aspects of the stockpiling report were discussed. Arthur Johnston replied to criticisms of there being no macroinvertebrate data by saying that the weight of evidence approach required a short report. Arthur agreed that detailed information could have been made available in a technical report or appendix and will consider that option in future.

Arthur said that the community expected the Supervising Scientist to make an unambiguous statement that the environment has been protected if he believes it has been. To qualify such a statement would confuse people.

It was generally agreed that event based monitoring was unsuitable for offsite protection studies but could be useful in early warning programs, especially in a diagnostic role, and was being planned by ERA.

It was agreed that the ARRTC's review would be modified by the Chair in light of explanations provided by SSD and then finalised out of session.

13. Review of water management at Jabiluka

Ray Evans sought feedback on a paper on load limits in relation to land application at Jabiluka.

David Klessa pointed out that some information had not been available to Ray at the time.

SSD and ERA will respond to the paper and then Ray will complete it.

To help keep members informed between meetings David Klessa offered to email them the ERA annual environmental report. Alex Zapantis also offered to email members the SSD six monthly reports to ARRAC.

14. Proforma for reviews of future applications and approvals

Alex Zapantis described the proforma. Tony McGill said that there was already a procedure for applications. Arthur Johnston noted that only significant applications and approvals would be referred to ARRTC for consideration.

Members thought that if a summary of titles of applications were provided then decisions could be made to request more details. In these situations the proforma would be useful.

General

15. ARRTC Business Plan

Barry Hart explained that a business plan would force the committee to think about what they are doing, how and why? Comments from members are to be provided to Barry by 11 October 2002.

16. NGO representative on ARRTC

Barry Hart recalled that at the last meeting members had no in-principle objection to an NGO member being appointed but believed that the appointment of a member from conservation NGO would not significantly enhance the standing of the Committee. He informed the committee that the Minister had decided to appoint an NGO member.

Arthur Johnston said that the Minister wrote to six national conservation organisations, and the ECNT, requesting up to two nominations each of people with appropriate skills. A reply had been received from the National Environmental Consultative Forum (NECF) secretariat explaining that it was its role to advise the Minister on issues like membership of committees and that the NECF will provide a nomination. At this stage the Minister had not responded.

Tony Milnes thought it might be useful to have someone with cultural or social skills.

If possible, nominations received will be referred to ARRTC for comment out of session.

17. South Alligator Valley

Julian Barry provided an update on rehabilitation work associated with abandoned mine-sites and associated infrastructure in the Gunlom Land Trust Area, Kakadu National Park.

There are two parts to the rehabilitation plan, depending on radiological significance.

Part A sites are those without significant radiological contamination (El Sherana Camp, Sleisbeck and Guratba/Coronation Hill). An advanced draft plan is complete. ARPANSA and OSS have reached agreement on proposed radiological standards for the rehabilitation plan. In-principle approval has been obtained from Traditional Owners. All works must be complete by 2015, with a possible start next dry season.

Part B sites are those with significant radiological contamination (Gunlom tailings, El Sherana West and El Sherana core sheds). This part is only at the preliminary planning stage. ARPANSA and OSS have reached agreement on proposed radiological standards and key parameters for site selection and construction of a containment facility. Potentially suitable areas for a containment facility within the South Alligator Valley are being investigated for discussion with Traditional Owners.

Alex Zapantis advised that OSS undertakes a full radiological survey every three years.

Jill Fitch asked for more details on the standards.

ARRTC asked for a progress report at each meeting.

18. Senate inquiry into Environmental Regulation of Uranium Mining

Barry Hart informed the committee that he wrote to the Chair of the Senate committee advising him of ARRTC's role.

19. Preparation for meeting with Traditional Owners (Wednesday)

There was a brief discussion on arrangements for the meeting of the seven independent ARRTC members with TOs.

20. Other Business

20.1. Third International Symposium on the Protection of the Environment from Ionising Radiation (SPEIR 3).

Arthur Johnston briefed the committee on the recent conference in Darwin. OSS and the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), in cooperation with the International Atomic Energy Agency (IAEA), organised SPEIR 3. It was held in Darwin from 22 to 25 July with a field tour to Ranger mine on 26 July. Approximately 100 delegates from all over the

world attended.

The conference addressed the issue of the effects on, and protection of, the environment from ionising radiation, which is a breakthrough since there has been a long held view among many in the radiation field that protection of people is adequate to protect the environment. ARPANSA, SSD and ANSTO will now discuss the development of a program to address this issue in Australia.

20.2. ARRTC annual reports

Barry Hart sought opinions on whether ARRTC should prepare an annual report. Arthur Johnston said that the SSD annual report always contains a section on ARRTC operations. The question was whether a separate (independent) report should be written and where would it be published (one option would be as an appendix to the SSD report).

Barry Hart will prepare a brief report next year and a decision will be made on publication.

20.3. Social research

At its February meeting ARRTC decided that social research was important but outside of the committee's scope. Arthur Johnston said that no progress had been made with social research monitoring. Julian Barry said that the debate within the Kakadu Board of Management at the moment is about futures and little has been done to implement the social research monitoring. Mark Foy thought it was up to the ATSIC minister.

Peter Wellings was requested to report on progress on KRSIS implementation at the next meeting.

20.4. Membership of ARRTC

Doug Holdway said that he felt caught between two worlds – he wants to continue being a member of the committee but doesn't want to be out of pocket by paying \$1500 towards the airfare from Canada. Arthur Johnston advised that the original ISP recommendation was that there be two international experts on the committee but the Australian government made a decision to only include Australian residents. He noted that Doug was an Australian resident when appointed.

Some members considered it unreasonable that Doug should be out of pocket.

Barry Hart agreed to seek a decision from the minister.

20.5. Out of session work

Ray Evans raised the issue of payment for out of session work. Barry Hart reminded members that sitting fees include two additional days for preparation but recognised that more than two days work may sometimes be required. Barry agreed to discuss the issue with Arthur Johnston and report back within a couple of weeks.

21. Discussion on key points to report in Letter to Minister

No discussion

22. Next Meeting

February 2003, probably the third week. The venue will be advised.

Documents tabled or distributed to committee members

- Agenda 10 September 2002
- AARTC Review of stockpile report
- ARRTC Summary Record 25-27 February 2002
- ARRTC draft Business Plan
- *eriss* Workplan 2002-03

- Landscape-scale project
- Approaches adopted under the Water Management Review to determining criteria for land application of wastewater at Jabiluka
- Letter from environment minister to ARRTC chair re NGO representation
- Letter from ARRTC chair to chair of Senate committee inquiring into uranium mining regulation
- SSD monitoring program
- Excerpt from SSD submission to Senate inquiry into regulation of uranium mining
- Application pro-forma
- SS monitoring program
- SAV rehabilitation presentation
- DBIRD Monitoring presentation
- SSD Response to ARRTC Stockpile Comments
- PAN research, surveys and monitoring
- Research in Kakadu National Park
- Quantifiable Paths for Uranium Movement
- Wetland filter research at Ranger
- Overview of environmental R & D Project, Ranger and Jabiluka, 2002-2003
- ERA's environmental restructure
- NTDBIRD program of research and monitoring in the ARR
- Jabiru long-term environmental care

Action Items

ARRTC asked for a scoping paper to be prepared on remote sensing (What is currently being done by eriss and why? What is the scope for future applications in the ARR and what are the knowledge gaps? What are the resource implications if expanded?) This may need to be modified in light of comments after the meeting, vis-à-vis ensuring the paper canvassed the reasons why the remote sensing was required, rather than detailing what remote sensing could do.

ARRTC recommended that the situation of the commercial radioactivity measurement laboratory be reviewed.

ARRTC would like to see a conceptual model of the system developed, with transport pathways clearly shown and best estimates of the loads/fluxes of contaminants shown.

ARRTC requested information on the future of ecotoxicity testing and resource implications.

ARRTC asked Gerald Nanson and Ray Evans to develop reasons for the collection of hydrological data in the ARR.

ARRTC requested a short paper on *eriss*'s assessment on how and where ecological risk assessment will be used in the future.

Carl Grant to discuss the revegetation at Ranger with EWL Sciences and report back

Terry Hillman to discuss the whole ecosystem monitoring project further with EWL Sciences and report back

The committee asked for a status report on the landscape-scale project next meeting, including further information on internal projects.

Members to provide comments on the Review of mine-related research in the Alligator Rivers Region 1978-2002 by 30 September.

Tony Milnes, Arthur Johnston and Barry Hart to produce a summary of the major issues in the paper Review of mine-related research in the Alligator Rivers Region 1978-2002, and then discuss at a meeting with the seven Independent members - time and place to be decided.

A review of radiological monitoring and assessment programs was requested for the next meeting.

ARRTC's review of the Supervising Scientist's stockpiling report to be modified by the Chair in

light of explanations provided by SSD and finalised out of session.

SSD and ERA to provide comments on Ray Evans' paper on water management at Jabiluka and Ray will then complete the report before next meeting.

David Klessa to email members the ERA annual environmental report. Alex Zapantis to email members SSD six monthly reports to ARRAC.

Comments from members on the ARRTC Business Plan to be provided to Barry Hart by 11 October 2002.

Jill Fitch to be provided with details on the radiological standards for South Alligator Valley rehabilitation.

A progress report on SAV rehabilitation to be provided at each meeting.

Peter Wellings to report on progress on KRSIS implementation at the next meeting.

Barry Hart to write to the minister about funding of Doug Holdway's continuing membership.

Barry Hart to discuss payment of out of session work with Arthur Johnston and report back within a couple of weeks.