

Alligator Rivers Region Advisory Committee Meeting 32, 27 August 2009

Minutes

Venue: Jabiru Field Station Conference Room, Jabiru.

| Agenda Item | | Action |
|-------------|---|----------|
| 1 | Welcome | Chair |
| 2 | Apologies and Observers | Chair |
| 3 | Minutes of Meeting 29 | Chair |
| 4 | Action Arising from Meeting 29 | Chair |
| 5 | Supervising Scientist Report | SSD |
| 6 | ERA Ltd Developments – Ranger and Jabiluka | ERA |
| 7 | Dept of Regional Development, Primary Industry, Fisheries and Resources Report | DRDPIFR |
| 8 | Member Reports | |
| | 8.1 Uranium Equities Limited | UEL |
| | 8.2 Cameco Pty Ltd | Cameco |
| | 8.3 AREVA NC Australia Pty Ltd | AREVA NC |
| | 8.4 Northern Land Council | NLC |
| | 8.5 Environment Centre NT | ECNT |
| | 8.6 Australian Radiation Protection and Nuclear Safety Agency | ARPANSA |
| | 8.7 Department of Resources, Energy and Tourism | DRET |
| | 8.8 Parks Australia North | PAN |
| | 8.9 NT Department of Health and Families | DHF |
| | 8.10 NT Department of Natural Resources, Environment, the Arts and Sports | NRETAS |
| | 8.11 West Arnhem Shire Council | WASC |
| | 8.12 Gundjeihmi Aboriginal Corporation | GAC |
| | 8.13 Other stakeholders reports | |
| 9 | Other Business | |
| 10 | Next Meeting | |

1. Welcome

The Chair opened the meeting, welcoming members and observers, and acknowledged the traditional owners. Mr McAllister provided a briefing on SSD facilities and fire evacuation procedures.

2. Apologies and Observers

The Chair noted apologies received from the following members:

Apologies

| Name | Position | Organisation |
|------------------------|-----------------|--|
| Mr Alan Hughes | Ex Officio | Supervising Scientist Division |
| Mr Stephen Baldwin | Deputy Member | West Arnhem Shire |
| Ms Lyn Allen | | Department of Natural Resources, Environment, the Arts and Sport |
| Mr Howard Smith | Member | Northern Land Council |
| Mr Peter Burns | Member | Australian Radiation Protection and Nuclear Safety Agency |
| Dr Richard O'Brien | Deputy Member | Australian Radiation Protection and Nuclear Safety Agency |
| Mr Xavier Schobben | | NT Health and Families |
| Mr Peter Cochrane | Ex Officio | Parks Australia |
| Ms Anne-Marie Delahunt | | Parks Australia North |

The Chair noted the attendance of the following Members, Deputy Members and Observers:

Members/Deputy Members

| Name | Position | Organisation |
|-----------------------|-----------------|---|
| Prof Charles Webb | Chair | Charles Darwin University |
| Mr Dan Janney | Member | Energy Resources of Australia Pty Ltd – Ranger Mine |
| Mr Philippe Portella | Member | AREVA NC Australia Pty Ltd |
| Ms Cathy Waldron | Member | NT Department of Natural Resources, Environment, the Arts and Sport |
| Mr Russell Ball | Member | NT Department of Regional Development, Primary Industry, Fisheries, Mines and Resources |
| Ms Jennifer Parks | Member | Cameco Pty Ltd |
| Ms Sharon Paulka | Member | Uranium Equities Limited |
| Mr Mark Griffioen | Member | West Arnhem Shire Council |
| Mr Russell Robinson | Member | Department of Health and Families |
| Ms Philippa Varris | Deputy Member | Energy Resources of Australia Pty Ltd – Ranger Mine |
| Mr Geoff Kyle | Deputy Member | Gundjehmi Aboriginal Corporation |
| Mr Gary Martin | Deputy Member | NT Department of Regional Development, Primary Industry, Fisheries, Mines and Resources |
| Ms Gillian Jan | Deputy Member | Representing Office of the Administrator NT |
| Mr Justin Tutty | Deputy Member | Environment Centre Northern Territory |
| Mr Richard McAllister | Deputy Member | Supervising Scientist Division |

Observers

| Name | Organisation |
|-------------|---------------------|
|-------------|---------------------|

| | |
|-----------------------|---|
| Ms Nicole Hinton | Department of Resources, Energy and Tourism |
| Ms Natalie Pilon | Department of Regional Development, Primary Industry, Fisheries and Resources |
| Mr Jonas Klein | Uranium Equities Ltd |
| Mr Nehal Ahmed | NT Department of Health and Families |
| Ms Michelle Iles | EWL Sciences Pty Ltd |
| Ms Marissa Taylor | Energy Resources of Australia Pty Ltd – Ranger Mine |
| Mr Steve Winderlich | Parks Australia North – Kakadu National Park |
| Ms Melanie Bradley | Environment Centre of NT |
| Mr John Hughes | Northern Land Council |
| Mr Michael Sheldrick | Department of Resources, Energy and Tourism |
| Ms Neisha Burton | Department Environment, Water, Heritage and the Arts |
| Dr David Jones | Supervising Scientist Division |
| Ms Michelle Bush | Supervising Scientist Division |
| Ms Ewa Madon | Supervising Scientist Division |
| Ms Jenny Brazier | Supervising Scientist Division |
| Ms Krissy Kai-Nielsen | Supervising Scientist Division |
| Ms Chantal Whittaker | Secretariat/Supervising Scientist Division |

3. Draft Minutes – ARRAC31

Professor Webb sought comments on the ARRAC31 minutes and there being no comments the minutes were approved with no changes.

4. Actions Arising – ARRAC31

Nil actions arising.

5. ERA Developments - Ranger and Jabiluka

Mr Dan Janney was welcomed for his first meeting and presented the first half of the ERA presentation.

The following is Mr Janney's General Update section of his presentation to ARRAC.

Organisational changes since last ARRAC meeting in April 2009 – Mr Janney presented a general update on the recent changes in ERA corporate structure. Mr Janney was appointed General Manager Operations as of 1st April 2009. Greg Jackson is the General Manager Major Projects, Steve Thibeault is Chief Financial Officer, Todd Simms is Health and Safety Manager, Ben Milligan is Manager of Mine Operations and Kent Shackel has moved on from Manager Sustaining Capital to his current role as Plant Engineer and Service Manager. Exploration Manager, Greg Rogers, has changed from working under Business Development to Tech Projects.

Safety performance – There has been a trend of improvement which has levelled off over the last couple of years, which means to get below that average is a significant achievement. In comparison with other industries from the Australian Bureau of Statistics 2005-2006 (consisting of Manufacturing, Transport and Storage, Agriculture and Forestry, Construction, Health and Community, Hospitality, Wholesale Trade and Mining) ERA is well below in rates of injury. ERA will continue to push safety performance until they reach nil.

ESH achievements – safety and health – 2008 radiation monitoring showed exposures ALARA, remote sampling to reduce crocodile risk, upgrade to controlled area demarcation, major housekeeping program, weekly targeted nutritionist visits to site. Part of the health program offers

biometric testing for employees. For example one employee had extremely high blood pressure and this gave him the opportunity to realise he had a problem to address.

ESH environment – Some 450 hectares of late wet season burning for weed management - 300% increase on historic input. A map was presented on-screen showing weed density on the RPA to be classified as 'very high' in some of the targeted burn-off areas. There was strong support from Parks Australia North in program. Achievements of an entire 159 km² of RPA and MLN1 weed was mapped for the first time in 2009 and a 22.2ha reduction in weeds achieved. ERAs product stewardship program was recognised as leading practice by independent auditors.

ERA Indigenous employment – In 2009 a target of 20% indigenous employees – figure currently stands at 19%. There are currently over 100 Indigenous employees, including some Mirarr working with ERA via GAC contract. ERA designated by Commonwealth Government as 'Employer of Choice for Women' for the fourth year running. Next week ERA is celebrating their 100th indigenous employee on site.

Production – The uranium market remains robust. China are looking at increasing their power and looking to ERA for uranium production. Climate change and energy security needs drives demand growth. Due to climate change some countries are looking at the low carbon emissions of uranium power. Significant growth in demand in the next decade will come from China. Legacy contracts being replaced by new higher performing contracts which are starting to come in. Ranger Pit 3 is now at -165mRL with cut back at -95mRL.

Current operations overview – A slide was shown containing a satellite map of the mine site. It was pointed out that the slide was out of date. The following points of interest were highlighted within the map: Demonstration/trial landform site, exploration drilling of R3 deeps, shell 50 extension now to -55mRL, process water treatment commissioning commenced, tailings storage facility walls raised to RL54m. The MOL approval is still pending. Mr Janney spoke about a focus on commissioning the process water treatment plant, which is to produce 1 megalitre per day of process water. Also further drilling will be done to explore the south-eastern extension of Orebody 3.

The following section presented by Mr Janney focussed on Ranger heap leach and exploration decline projects.

Overview - Technical studies; Heap Leach project, Ranger 3 Deeps exploration decline. Regulatory processes; Heap Leach project, Ranger 3 Deeps exploration decline.

Heap leach technical studies - Proposed heap leach facility targets 15 to 20,000 tonnes of uranium oxide contained in low grade material. This will be moving into feasibility stage in the next month or two.

PFS is nearing completion, key project elements include: Primary, secondary and tertiary (high pressure grinding rolls) crushing; Agglomeration of fines with coarse heap leach feed; Heap stacking and reclaiming with grasshoppers and mobile conveyors; A 9Mtpa lined dynamic "on-off" heap leach pad comprising 14 lined cells to a height of 4m; Removal of leached material (ripios) from the pad to a surge bin for trucking and final disposal into the mined out Pit 3; Lined leach liquor management and storm surge ponds; Supporting infrastructure.

Heap leach pad and ponds - underlain by low permeability liner system equipped with leak detection.

Design of liner system – based on BPT principles and benchmarking studies of heap leach facilities in high rainfall areas.

Heap leach pad cellular design and integrated leak detection allows for cells to be taken off-line quickly for maintenance and repair.

Water management system incorporates: Storm surge pond and additional contingency for extreme rainfall events allowing leach liquors to be diverted to TSF and / or Pit 3.

Ranger 3 Deeps exploration decline technical studies; status - Exploration decline project would allow ERA to: Conduct close spaced underground exploration drilling and further evaluate the extent and continuity of the Ranger 3 Deeps ore body with a current resource of some 34,000 tonnes of uranium oxide. Studies are continuing on the design of the exploration decline and aerial extent of the Ranger 3 Deeps ore body.

Heap leach project regulatory approvals - 19 May 2009 - ERA announced that following determinations by NT and Commonwealth regulators, that the proposed heap leach project would be subject to environmental assessment under the NT EA Act and Commonwealth EPBC Act at the level of an Environmental Impact Statement (EIS). 15 August - NT and Commonwealth governments advertised draft guidelines for the EIS for public comment. Once public comments have been considered, the NT and Commonwealth governments will finalise the guidelines and provide them to ERA for EIS document preparation.

Ranger 3 Deeps exploration decline project regulatory approvals - 15 April 2009 - ERA announced lodgement of notifications with Commonwealth and NT governments for the proposed exploration decline project. May 2009 - Commonwealth Government determined project to be not a controlled action and therefore not requiring further environmental assessment under the EPBC Act. 11 July 2009 - NT Government notified ERA that exploration decline project would not require formal environmental assessment under the NT EA Act. When technical and engineering studies are sufficiently advanced, ERA will lodge detailed plans and designs with the Supervising Authority for approval to proceed with the project.

The following Environmental update section was presented by Ms Varris.

Water Management – (Chart shown) Below average wet season YTD. WTP1 and OWTP commenced operating Jan 09 through Apr 09. LAAs off since mid Jun 2008, recommenced Aug 09. Pit 3 catchment: Sand remediation area did not perform as well as planned; NE pit rim new sump to reduce ponding. RP1 catchment: TSF northern stockpile – shaping to reduce infiltration; Western stockpile new sump to be installed. Southern stockpile: Southern stockpile reconstruction – had been quarried for TSF lift. Water Management Plan to be submitted earlier from 2009. Work underway to enable commitment to cease unpolished water irrigation from end of 2009.

Water treatment plant - Pond water: Consistent operation; OWTP treated 486 ML pond water YTD; WTP1 treated 312 ML pond water YTD. Process water: Commissioning of HDS (high density sludge) treatment following retrofit of WTP; Unlikely to exceed 1ML/d permeate to GCMBL; Studies continuing.

Process Water Treatment and Disposal - Future process water treatment facility, options assessment completed and 2 options chosen: Covered evaporation pond; Brine concentrator. Brine concentrator: Site pilot completed December 2008; PFS design/cost estimate completed June 2009. Covered evaporation pond: Pilot construction underway at site; PFS for full-scale covered evaporation pond ongoing. Ms Varris stated that at the last meeting 2 options were talked about for future process water treatment. Brine concentrator is now the ERA preference of choice for water treatment. This is being advanced to next level - feasibility study.

Pilot Evaporation Pond Layout – A diagram was shown on-screen of an aerial blueprint of the pilot evaporation pond. Ms Varris explained that water is fed into one end of the channel on a 1 degree slope, air is drawn in either end of the channel through vents as the water goes through. The systems are covered with alsynite roofing systems so ERA can sheet the rainfall run off away from the systems. Pilot facility looked at optimising the ability to operate, commencing October 2009 in time to collect the wet season data. Agriculture systems have achieved something similar.

A diagram was shown on-screen of a cross section blue print of the pilot evaporation pond.

Process Water – Operational efficiencies - Continuing to investigate options to reduce inputs to process water circuit.

- Advanced projects: RP3 redirection completed; TSF sumps permanent redirection system – construction underway; Pit 1 catchment reduction – construction Q4 2009; CRS and POSC2 level control – to be installed 2009; Diverting non-process water streams in plant to pond circuit – feasibility study completed.
- Processing: Phase 2 – maximise use of recycled process water in plant; TSF tailings reclaim and transfer to Pit 3; Waste heat utilisation from power station to enhance evaporation. Other: Continue to use OPSIM and validation to identify opportunities.

Process Water Storage - TSF 54mRL lift completed. ERA seeking approval of MOL Application. Water level currently 48.8mRL. OPSIM predicts MOL exceedance Jan 2010. Pit 1: Monitoring rates of consolidation; Research studies underway as per RL12 approval; Evaluation indicates wick trial of limited value in providing conclusive design data; Proposed new waste dump adjacent to Pit 1 to optimise rock handling in lead up to its closure. Deposition system optimisation evaluation: Semi-automatic deposition system; Has potential to increase tailings settled density.

Process Water Management – Summary - A range of management controls continue to be investigated: Process water treatment; Enhanced evaporation; Improved catchment segregation and water quality management. Complex issue requiring a range of parallel approaches - no silver bullet. OPSIM is a key tool for strategic tailings and water planning and project evaluation. Will continue to update stakeholders as plans evolve.

Climate Change and Energy Efficiency - ERA has submitted National Greenhouse and Energy Reporting Act data to Rio Tinto for submission to Federal Government. Energy Efficiency Opportunities Act projects progressing: GM chaired energy team established; Focus teams working on: HME diesel fuel, power generation and distribution, measurement systems and power demand, awareness and communication. Preparing to update product stewardship – life cycle assessment.

08-09 Wet Season Monitoring – Ranger – Two graphs were displayed on screen detailing filterable uranium levels and electrical conductivity within Magela Creek.

Two graphs were displayed on screen detailing filterable uranium levels and electrical conductivity within Gulungul Creek.

Two graphs were displayed on screen detailing filterable uranium levels and electrical conductivity within Jabiluka Swift Creek.

Demonstration Landform - Tubestock planted Mar 09 – supplementary watering now ceased. Seeding Jul 09 – supplementary watering to simulate rainfall. Sep 09 survey to determine germinant density. Fertiliser to be applied at this time. Weather station now installed. Erosion plots nearing completion. Benchmarks installed. Soil chemistry and PSD.

Seepage from Ranger Tailings Dam - Following a Senate Estimates Committee meeting earlier in 2009, a number of erroneous statements appeared in the media and elsewhere about performance of the Ranger tailings dam. ERA and its consultants have evaluated tailings dam performance (as per Authorisation) over many years - investigating and monitoring seepage and trialling seepage recovery systems. These studies were summarised in the Application to raise the tailings dam walls to RL+54m, and the Application to raise the maximum operating level (MOL) in the dam. Seepage forms a local groundwater 'mound' (marked by elevated concentrations of magnesium and sulphate) which has remained within the vicinity of the structure; raising the walls of the dam or the MOL is unlikely to

significantly change this prior to closure and rehabilitation of the structure; independent reviews (CSIRO, Aquaterra) confirm these data and interpretations but also recommend refinements.

Existing Monitoring Systems – An aerial map of the Ranger Mine was shown detailing the Location of groundwater monitoring bore locations around tailings dam bore. The map included the following detail: bore with no evidence of seepage; bore (RDPIFR) no evidence of seepage; bore affected by seepage; proposed new monitoring bore; mapped fault seepage pathway; mapped fault; seepage path.

Ongoing Monitoring and Evaluation - New bores proposed. ERA to progressively convert to micro purging array –will parallel monitor during conversion. Monitoring program incorporated in annual WMP. Data and evaluations to be reported annually. Ground-based EM surveys have located seepage pathways. New airborne EM surveys to attempt to ‘map’ seepage - planned for early September. Refinements in 3D modelling underway.

Exploration – An aerial was map shown on screen highlighting anomaly 4, R18 S, R1 Deeps. Exploration plan submitted to MTC approved in July. Magela land application area /Ranger 3 deeps exploration area under remediation: Causeway material being excavated; Historic bores to be grouted.

Jabiluka Monitoring and Remediation - AAPA permit issued for access to Mine Valley: Install approved groundwater monitoring bores; Complete rehabilitation activities to historic drilling sites. Scope and details being finalised for work program: Formal risk assessment completed; Focus on boundary and remote area risks. Work program to be completed in 2009.

Incidents

Incident: Land clearing without ERA approvals (3 Jun 09). An area inspection identified grading had occurred without internal approvals. Re-grading of existing tracks and grading of a new firebreak resulted in 0.3 Ha of ground disturbance. Procedures not followed.

Actions: Area survey confirmed clearing occurred in areas where cultural heritage surveys completed and no cultural heritage sites / objects were disturbed. Land disturbance permit system upgrade underway. Intervention process with contractor. Area recovery / rehabilitation being monitored.

Incident: ADU in air line water trap (11 Jul 09). ADU found in a water trap unit at an extremity of the process air network. Air network unaffected. Previous incident.

Actions: Unit immediately isolated and disconnected. All other traps in SX inspected by RSOs and confirmed as unaffected. Review of trap, surrounding area and drawings suggested presence of ADU related to 2004 incident. The unit was likely not identified at the time and subsequent extensive system clean out and review (completed under supervision of SSD and DBIRD) as the unit does not appear on the plant drawings. ERA has completed a review to confirm that 2004 commitment to “review maintenance planning to ensure all non-return valves are checked on a routine basis” has occurred. Additionally, ERA had brought forward the scheduled change out for these valves.

Incident: Potable water supply EC alarm (2 Aug 09). High conductivity alarm triggered. Standard response followed including notification of work force. Issue resolved within an hour. Conductivity probe transmitter intermittent fault.

Actions: Standard response procedure followed. Laboratory sampling confirmed water within acceptable range. Electrical inspection determined intermittent fault with transmitter most likely from loose ribbon cable. Transmitter replaced. Review of EC probe type to be completed. Review completed to confirm faulty probes fail safe.

Discussion

Mr Tutty asked about questioned the process water treatment facility. Ms Varris described how the system works as a high density sludge plant. Ms Varris stated the front end part of the plant is softening system. Goes into micro-filtration then to reverse osmosis. ERA have commissioned the softening part of the system. That water which is going into the first part of filtration working well. The reverse osmosis plant is still not commissioned. Process water is still heading to the pilot facility to produce permeate, which will be used in ecotox testing with SSD. The treatment capacity is not quite as high as expected (max of 1.1ML per day), due to maintaining a high water quality. ERA will wait for improved permeate quality before finalising commissioning of the reverse osmosis plant. This is similar to the lime silo issue which delayed the commissioning. The water treatment process doesn't work without lime.

Mr Tutty asked Ms Varris if capacity was not what they were after. Ms Varris said that the treatment capacity is not quite as high as expected (a maximum of 1.1ML per day), however it was hoped more could go through that system as had been forecasted with stakeholders. Ms Varris said that ERA expected it to function as intended but water quality would not remain optimised. It is possible to put more water through the reverse osmosis facility but the same quality water output would not have been achieved.

Mr Tutty asked about the life cycle assessment. Ms Varris explained that the lifecycle assessment is where you look at all of the inputs as well as outputs. You explore from cradle to converter. The assessment includes all energy, for example, the fuel that is used by the truck in Asia as it drives to the acid plant. Every single input is included as well as all of outputs, including emissions to land, water and air. Out of this a report card is created for your product. This report card can then be used to look for opportunities in that report to make improvements in your product. It can also be used for marketing purposes. ERA will be working with suppliers and customers to identify areas of improvement using internationally recognised standards to benchmark against other companies who produce uranium oxide, or other suppliers. There will be a comparison versus other renewables or non-renewables. Lifecycle of Uranium will even include the energy used for creating the mill balls. The information from the converter onwards will be under strict security controls. There will be no ability to access that information except for customers who access converters.

Mr Tutty questioned the maximum operating level of the tailings storage facility because water levels seemed lower than at last presentation. Ms Varris clarified that the lower water level was due to evaporation.

Mr Tutty questioned the tailings storage facility seepage monitoring, especially about the locations in the south. Ms Iles stated that there is a range of monitoring locations that had been developed with the Stakeholders (not including the public). There will be 15 new bores, 8 nested (shallow and deep). The lack of monitoring bores in the south is due to the presence of the creek tributaries which due to the ground/surface water interactions there would be evidence of any seepage in the surface waters of these tributaries.

Mr Kyle asked why they were exploring out from some affected bores and not the others, how was it decided which bores to use?

Ms Iles stated that they were not using all the bores on site. There are 120 monitoring bores on site with two teams of two people who monitor the bores all the time. Those that have been chosen just highlight the ones close to the facilities. All consultants agree that seepage is restricted to that area.

Mr Tutty asked if there was anything to be learnt by going further south. Ms Iles explained that further south there are surface water monitoring sites on tributaries.

Mr Tutty asked if ERA are exploring using new bores or proposing a new look at the existing bores. Ms Iles stated that ERA would be drilling 16 new bores.

Mr Tutty asked a question regarding the Wet season report. ERA receives feedback from stakeholders and then updates the Wet Season Report to to reflect feedback. After this, then can the Environment Centre see the report? Ms Varris said that she can't see why not, and that all the data is available.

Mr Kyle asked if ERA were engaging a contractor for the monitoring. Mr Kyle raised concerns that ERA may be proceeding with these new monitoring sites before the recommendations of the a study by EWLS, NLC, GAC, ERA and several independent experts from outside this industry are determined. Ms Varris stated that ERA had been transparent about running these processes in parallel. ERA intend to continue with the monitoring processes because even though they overlap they identify some different things.

Mr Kyle stated that ERA having a contractor already mobilised for this project was a surprise to him.

Mr Ball - Yes. have looked at what would be a reasonable monitoring program to be put in place.

Mr Tutty stated that he was not clear on why isn't there a path in relation to the red dot [bore] in the south. Ms Varris said that it was because that area is structurally controlled geologically.

Mr Tutty questioned what impact an increase in the MOL would have on seepage? Ms Varris indicated there is an existing elevated seepage mound immediately beneath the tailings dam and studies have been undertaken by CSIRO and Aquaterra to identify the seepage paths and expected changes in seepage due to the TSF lift. Studies were done on the basis of a 2D modelling system. Mr McAllister added that the rate of seepage will likely increase in a linear fashion in response to an increase in water depth in the TSF. The SSD independent review by Aquaterra confirmed the findings of the CSIRO study indicating seepage rates would likely increase in line with the increase in water depth but that there were no indications that rates would increase beyond this due to preferential pathways or breakthrough.

Mr Tutty requested that the NT Environment Centre obtain copies of the 2 independent groundwater studies commissioned by ERA and by SSD.

ARRAC32 Action 5.1 SSD and ERA to provide to the Environment Centre NT a copy of the Aquaterra and CSIRO reports.

Mr Tutty asked if Supervising Scientist Division hired an independent consultant. Ms Varris said that CSIRO was commissioned by EWL for ERA in November 2008 to completely review hydrology studies to identify knowledge gaps being progressed in the model. The model was quite good but had to be progressed into a 3D model. New monitoring bore arrays will provide data for that as well. The SSD independent study was completed May/June by Aquaterra.

Mr Kyle asked for more information on the concept of not drilling bores to the south because of the surface water. Mr Kyle asked why ERA only looking at surface water run off at RB21A and RB20 but not vertical seepage and why aren't ERA looking beneath the surface of those bores? Mr Kyle stated that in the past they have shown interesting data which may be relevant. Mr Kyle asked why ERA think drilling won't show anything? Mr Kyle made the point that now is a good time to drill those bores before expanding the tailings storage facility.

Ms Varris agreed it would be possible in future to have a southern site and that site is currently under consideration as part of the EIS studies. Ms Varris stated that when the guidelines are finalised ERA will have clear understanding of the site and that the ground water studies will be part of that. Mr Kyle stated that he's seen the planning for the expansion and that ERA need to put the bores there now before a dam is put there.

Mr Kyle questioned why there were no bores in the in the north of the tailings storage facility particularly given the results from OB43A. There could be vertical seepage into deeper aquifers

Ms Varris stated that the site is still under assessment, ERA will be seeking input from stakeholders and studies will be undertaken in the future to identify potential bore sites. Up to the north there is discontinuity there such that the groundwater doesn't go as far as RP1 so that's what we've been indicating in our report: that it reaches a discontinuity not to carry groundwater to RP1.

Mr Kyle asked why is there no proposal to put more bores further down the eastern side of RP1 - 41, 42 – are they also not showing any effect from the surface water? Ms Varris said that they are groundwater bores not showing evidence. Mr Kyle stated that ERA indicated they were not putting anymore bores down and that there should be more sites drilled and studied.

Mr Kyle asked if the location of bore sites are dependent on the location of a potential dam site.

Ms Iles stated that the proposed electromagnetic flight survey studies will identify new positions for new bores and the currently proposed bores are not an exhaustive list. The electromagnetic studies are aiming to help get the information on conductivities below the surface to place the bores in the correct positions.

Mr Kyle stated that it wasn't exhaustive list but that the proposed EM survey allayed some of his concerns.

Ms Iles stated that ERA are mobilising the drillers - they will be doing other drilling around the site but they are not working on these bores at the moment.

Alligator Rivers Region Advisory Committee broke for morning tea.

On return from morning tea there were no more questions for ERA so the Chair moved on to the Supervising Scientist report.

6. Supervising Scientist Report

Audit and Inspection Overview - Ms Bush presented the OSS Audit and Inspection overview. Ms Bush advised a number of audits and inspections had been undertaken in 2009.

The Ranger mine Annual Environmental Audit Review - was conducted on the 11-14 May 2009 by Keith Tayler and Michelle Bush (OSS), Gary Martin (DRDPFIFR) and Howard Smith (NLC). In order to verify the audit findings the audit team inspected areas related to water management across the site, including:

- Retention Ponds 1, 2 & 3
- Corridor Creek and RP1 wetland filters
- Tailings storage facility
- Bore fields
- Sumps and sediment traps

There were 72 commitments of Water Management Plan audited with one finding ranked Category 2 non-conformance and 6 conditional findings.

Category 2 non-conformance - The audit team inspected the pipeline bund and sleeve secondary containment and found that the sleeve on the tailings delivery pipeline did not cover the pipe completely to the bunded area (a photo was shown on-screen). This was ranked as a category 2 non-conformance as it is recognised as an isolated lapse in control and presents a low risk of impact to the receiving environment in the event of pipeline failure (due to the presence of additional controls).

Contingency Management: Tailings delivery or return water pipeline fails

- Pipeline bund and sleeve secondary containment
- Corridor Road bund tertiary containment
- Flow alarm to be installed in 2009

Conditional: Release from RP1 to Magela Creek during adequate flow - The audit team viewed RP1 discharge records which showed that discharge via siphon and pump occurred on two occasions in January 2009 when flow in the creek measured 8 m³/s and 6 m³/s respectively. The commitment in the Water Management Plan refers to discharge when there is 'adequate' flow in Magela Creek. ERA provided the 2008/09 wet season rainfall chart to compare the level of rainfall at the times of discharge from RP1 (DOC 37). The audit team is not satisfied that 8 m³/s and 6 m³/s constitutes adequate flow. It has previously been agreed that ERA will bring a proposal to the MTC detailing how manual discharge from RP1 will be managed. This criteria was ranked as conditional on ERA bringing such a proposal to the MTC (i.e. action to meet this commitment is not yet finalised).

Conditional: Unlabelled boot wash - It was found that significant progress has been made towards achieving the commitments stated in criteria 10 however a potable water fitting without a non-return valve was located near the lime silos and some of the new boot washes (all connected to the potable water system) were unlabelled. The audit team reviewed the boot wash permit to work order (DOC 35). This criteria was ranked conditional on ERA completing all the required labelling and installing a NRV on the potable water line identified above.

Conditional: Definition of 'pooling' in Land Application Areas - The audit team viewed a datasheet covering the periods 1-5 June 2008 and datasheets for November and December for irrigation of waters to the Corridor Creek Land Application Area (DOC 17). The datasheet showed maximum volumes of water applied to land application areas. ERA informed the audit team that staff conducting checks of the land application areas now record all data in 'toughbook' notebooks to improve efficiency, as the data goes straight into the electronic system (rather than being transposed from a hand-written sheet to the electronic system). The audit team saw that disposal rates were pre-calculated in the datasheets and application rates were less than 9mm/day. The datasheets (DOC 17) showed that pooling was observed in the land application areas on several days when the irrigation system was operating. The audit team noted that on days immediately following observations of pooling, the irrigation system was switched off to prevent further pooling and overland flow. This criteria was ranked as conditional as it appeared unclear as to how different ERA staff were defining 'pooling' of irrigated waters.

Conditional: Groundwater sampling procedures - The audit team viewed the following standard operating procedures:

- EVP002 Surface water sample collection (DOC 20)
- EVP003 Handling and storage of water samples (DOC 21)
- EVP007 Ground water sampling (DOC 22)
- EVP020 Calibration and use of Mettler (DOC 23)
- EVP049 Metals Standards – Preparation and Storage (DOC 24)
- EVF0006 Groundwater monitoring
- EVF0006 includes the purge times for all bores which were shown as 5-10minutes, maximum 20 minutes.

ERA stated that their groundwater sampling program aligns with the requirements of the Australian Standard with the exception of low recharge bores which may require micropurging. Due to this deviation, this criteria was ranked as conditional on ERA implementing necessary changes to achieve alignment with the relevant Australian Standard.

Conditional: EC alarm at GCMBL - The audit team inspected the continuous monitoring equipment installed at GCMBL. An EC trigger had not been set for GCMBL although all required telemetry is place. This criteria is conditional upon the installation of the EC trigger in the REM system.

Conditional: LAA bunding in WMP - The commitment in the Water Management Plan implies that bunding exists on the borders of all land application areas. ERA informed the audit team that bunding isn't required on all land application areas. This criteria was ranked as conditional on ERA updating the Water Management Plan to correctly reflect the requirements for each LAA. (ERA stated that bunding is required when Jabiru East, Magela and Djalkmara Land Application Areas are operational).

Jabiluka – Was audited 13-14 May. There were 29 commitments audited from application to prepare Jabiluka for long-term care and maintenance, with 2 conditional findings.

Conditional: Vent rise converted to a sampling point - The audit team viewed photos taken 12/05/09. ERA has previously indicated that work is underway to convert the vent rise to a sampling point. This criteria has been ranked conditional on ERA completing this work.

Conditional: Capping of redundant bore holes - ERA informed stakeholders that approval has been granted from GAC, and more recently the AAPA, to access the bore sites in Mine Valley. ERA has previously notified the audit team (via MTCs) of work that has progressed towards meeting this commitment, however the physical rehabilitation works are yet to be completed. This criteria is ranked conditional on ERA completing the rehabilitation works in the 2009 dry season.

Ranger routine periodic inspections - Four were held during the reporting period to follow up on incidents, inspect areas under development on site and conduct a routine inspection of site infrastructure.

Jabiluka routine periodic inspections - The following areas were inspected: Access road, hardstand, revegetation, IWMP, Helipad. (Photo shown by Ms Bush on-screen of Jabiluka hardstand revegetation 18 August 2009).

Narbalek –

The most recent inspection of the site was undertaken on 17 June. It was noted that there are new areas that have restricted access following an inspection by NT Work Safe. A number of areas across the site were inspected, including

Two new revegetation plots

Grading and recontouring of former pond area

Increased road network across the site

Radiologically anomalous area

(Photo shown of Nabarlek revegetation plot 17 June 2009)

South Alligator Valley - Supervision and Assessment inspected 30 June 2009. The following areas were inspected: Saddle Ridge, Battery Bund, El Sherana, Rockhole tailings, Rockhole Mine Creek adit, Containers, SAV containment.

The ongoing works at the new containment facility were inspected. SSD will continue to have an ongoing presence in the SAV throughout this construction period.

(Photos shown on-screen of the site dated June and August 2009)

Ms Bush handed over to Ms Brazier who provided an update on Ranger and Jabiluka off-site surface water quality. All aspects of the off-site surface water quality monitoring program were presented.

Monitoring overview: Ranger off-site surface water quality

- Weekly water chemistry grab sampling
 - Magela and Gulungul Creeks
- Continuous data collection
 - Magela Creek - pH, EC, turbidity, temp., DO (SSD), flow (NRETA)
 - Gulungul Creek - pH, EC, turbidity, temp., DO, flow (SSD)
 - RP1 & GC2 – pH, EC,, flow (ERA)
- Field toxicity Magela Creek (every second week)
 - In situ monitoring of snail egg production
- Community studies
 - Macroinvertebrates
 - Fish – channel and shallow billabong
- Bioaccumulation - mussels

2008 – 2009 Wet season - Ms Brazier showed a chart of annual rainfall at Jabiru airport 1971-72 to 2008-09. Pointed out was that the last 5 years have had close to average or well above average rainfall. The recent season has had well below average rainfall.

2008-09 Sampling season - There were no problems in catching the commencement of flow with continuous and grab chemistry and in situ toxicity commencing without any hitches. This season was shorter than the last few seasons, finishing about a month earlier than last year which also meant the fish and macroinvertebrate community studies started a number of weeks earlier than in recent years.

Magela Creek EC 2005-09 - Magela Creek in terms of continuous EC was well within the range experienced in previous seasons. Discharge was low this year compared to the last 3 seasons.

Magela Creek – Discharge and EC 2008-09 - The 2008-09 wet season was characterised by a number of controlled releases by ERA at the RP1 weir. Some of these releases coincided with low flow in Magela Creek. Grab sampling days are shown by the green circles and coincided with two of these EC peaks. Samples were also collected by the autosampler for the majority of these EC peaks. All of the EC events can be explained by controlled releases from RP1 either by pumping, siphoning or release over the weir. There was one EC event in April which was the result of release via GCMBL into the Corridor Creek catchment.

Magela Creek - Magnesium - Ms Brazier produced a chart showing magnesium results for SSD, ERA and NT DRDPIFR. Prior to any RP1 releases the 3 agencies data agree well, giving confidence in each others sampling programs. Again, later in the season, once RP1 stops having any influence in Magela, the data sets agree again. Since SSD monitor the west channel of Magela, and RP1 and discharge during low flow periods preferentially hug the west channel, it is not surprising that SSD measures more elevated Mg at the downstream site compared to ERA during periods of RP1 release into Magela. Ms Brazier pointed out that the chart also shows why joining the dots for grab sample data can be very misleading though helpful in tracking the different samples. The grab sampling

magnesium values suggest not much as happened in this period (circled) while the continuous monitoring confirms that this was a period of higher salt contribution.

Magnesium solute load – Mine and Magela - There was less magnesium released from the mine site compared to previous seasons and overall less magnesium from the upstream control site (result of less rainfall in the upper catchment) and therefore the overall magnesium solute load at the downstream site is lower than the previous three seasons. GC2 load higher this year due to increased input from dry season surface flows from Pit 1 catchment works and 7.05ML of RP1 water pumped into the upper corridor creek catchment.

Magela Creek - Uranium - Uranium shows the same level of agreement between SSD, ERA and NT government for periods where RP1 is not discharging into Magela Creek. All uranium concentrations measured are well below the uranium limit of 6 ug/L set for Magela Creek. Samples collected by the autosampler also show uranium concentrations well below 6ug/L.

Radium-226 in Magela Creek 2001-09 - Radium remains comparable with previous seasons and well below the 10mBq/L wet season median difference trigger set for Magela Creek.

Magela Creek in situ toxicity monitoring (snails) - Statistically comparing the 2008-09 difference data with all data from previous seasons (for both creek side and in situ toxicity monitoring) show that there are no significant differences between years.

In situ toxicity (snails) and Mg - Three of the in situ toxicity tests occurred during times of significant EC pulses. The grey boxes show no change in the in situ test results for difference data for mean eggs/snail pair (US – DS) for these periods and shown overlaid with the EC profile, giving reassurance that the environment has remain protected.

Magela Creek – monitoring and the way forward - During 2008/09 Wet season; Samples were collected automatically, based on EC and turbidity changes; Unfiltered, filtered (<0.45 um) water analysed for Al, Fe, Mn, U, Ca, K, Na, Mg and SO₄; QA/QC also conducted based on changes on standing. September/October – data review; Data review outcome - Can auto-sampling based on EC or turbidity events enhance the monitoring of water chemistry in Magela Creek compared to grab sample monitoring? Increase *in situ* snail toxicity monitoring to run end-on-end - Magela Creek and potentially Gulungul Creek in the future.

Mg toxicity & continuous monitoring - It is important that any magnesium toxicity trigger values derived for Magela Creek are well understood in terms of the derived continuous Mg profiles that are observed. Currently, magnesium trigger values have been derived for chronic toxicity triggers. To interpret the chronic magnesium guidelines value appropriately, then it is valid to convert the derived instantaneous Mg values into a moving average that covers the period that the chronic trigger values have been derived for. This is an accepted USEPA approach for interpreting chronic toxicity values. Therefore if the chronic toxicity tests average 72 hours for the range of aquatic species tested, then it would be acceptable to convert the instantaneous toxicity data to a moving 72 hour average and then apply the trigger values.

Mg and continuous monitoring - The interim Mg guideline value that has been presented at previous ARRAC meetings is around 4 mg/L. If we apply this guideline to the moving 72 hr average rather than the instantaneous plot, then no guideline exceedences have occurred, implying that the aquatic ecosystem has remained protected. (This makes sense with respect to the results from the SSD biological monitoring program). However, before accepting the 72 hour moving average profile and interpreting any Mg triggers against this, it is also critical that any pulse toxicity implications are well understood. The eriss ecotoxicology program is currently investigating Mg toxicity based on single episode pulse events of different concentrations and duration (4 hour to 48 hour). Multiple pulse events will then be investigated to understand frequency issues. Results for 3 species known to be

highly sensitive to Mg (green hydra, duckweed and a cladoceran) exposed to a single 4 hour pulse of Mg show that toxicity for all species was lower than when the organisms were continuously exposed to Mg. Even the most sensitive test, where the cladoceran was exposed at the onset of reproductive maturity, the concentration that caused a 10% inhibition of the test endpoint (considered an acceptable level of effect) of 208mg/L was still approximately 20x higher than the reported maximum Mg concentration (11 mg/L).

Gulungul Creek – EC and discharge - The 2008/09 wet season is quite distinct with observed low discharge compared to recent years. The overall magnitude of EC measured is well within the range observed in the last three years.

Gulungul Creek – EC and discharge 2008-09 - Looking at the 2008/09 season more closely, there is a period of about a month coinciding with increased discharge in Gulungul where EC is marginally higher at the downstream site than the upstream sites. Again, the grab sample results in green circles are overlaid onto the EC continuous trace. It is possible that this salt contribution at the downstream site is from run off from the additions to the TSF wall. However, the overall magnitude of the highest EC peaks is still well under 40 uS/cm.

Gulungul Creek – Magnesium and EC - This chart presents the combined ERA and SSD dataset for Mg (ERA data downstream data points coincide with the upstream data points – SSD did not monitor upstream). Mg increases at the downstream site during the same period of observed higher EC.

Gulungul Creek – Sulfate, Magnesium & EC - Sulfate also increases for the same period (but not at the upstream site). The green triangles show the sulfate to magnesium ratio. A ratio close to 4 indicates pure MgSO₄. Since the SO₄:Mg ratio is increasing during the period of higher EC at the downstream site, then this suggests that a component of the Mg is present as MgSO₄.

Gulungul Creek – uranium 2008-09 - Uranium data again shows good agreement between SSD, ERA and DRDPIFR early and late in the wet season. DRDPIFR measure the highest uranium concentration for the season at around 1 ug/L. Overall, uranium levels remain within the range seen in recent years.

Mussels - Radium - At ARRAC 31, I presented results from a study conducted in 2007 that the difference in radium bioaccumulation between Sandy Billabong and Mudginberri Billabong is a result of natural catchment differences rather than mine site inputs. Visual comparison of radium in mussels from the October 2008 collection with previous years for both Billabongs show little variation, giving reassurance that the environment has remained protected.

Mussels - Uranium - Uranium in mussels from the 2008 collection remain similar to previous years.

Macroinvertebrate communities - Paired upstream-downstream dissimilarity values - These dissimilarity indices are a measure of the extent to which macroinvertebrate communities of the two sites differ from one another. A value of zero percent indicates macroinvertebrate communities identical in structure, while a value of 100 percent indicates totally dissimilar communities, sharing no common taxa. Burdulba and Nourlangie samples from the 2009 collection are still being processed. However visual comparison of the dissimilarity value for the 2009 collection at Gulungul and Magela Creek with previous years show no obvious changes. The overall interactions between all four creeks will be presented at the next ARRAC.

Fish communities – Channel Billabongs: Mudginberri v Sandy Billabong - From 2001 through to 2006, there was a significant decrease in the dissimilarity value, which at first was thought to be as a result of changes in methods used. However, since 2006, this dissimilarity value is increasing – though still within the range seen previously. Preliminary evidence suggests that the changes in the dissimilarity index through the years is more likely due to effects of discharge and rainfall on fish abundance and migration patterns - influences unrelated to Ranger mine.

Fish Communities – Shallow lowland Billabongs - The paired-site dissimilarities shown average between 40 and 60% indicating fish communities in each of the billabongs comprising a site pairing are quite different from one another. It was also identified in previous reports that the particularly high dissimilarity values observed in the Coonjimba-Buba pairing for 2002 and 2007, and the Gulungul-Wirmuyurr site pairing for 2002 were attributable to high densities of particular aquatic plant types in one or both of the billabongs. Excessive plant densities are unfavourable for fish communities as fish movement, and hence residency, is physically prevented. The influence of aquatic plants on fish community structure is further supported by the slightly increased dissimilarity observed in the Georgetown-Sandy Swamp pairing in 2009. The increased dissimilarity appears to be related to an increase in the density of the emergent aquatic plant, *Eleocharis* sp, in Georgetown Billabong, combined with reduced plant density (dominated by emergent lilies), in Sandy Billabong. The divergence in aquatic plant habitats between the two billabongs appears to have resulted in reduced similarity (increased dissimilarity) in fish community structures between these locations. During the previous community study, an increase over time was observed in the paired Coonjimba-Buba billabong dissimilarity values, irrespective of the removal of years 2002 and 2007 for which high values are associated with unusually high aquatic vegetation density in one or other of the billabongs. However, the reduced dissimilarity found for 2009 has allayed concerns of increasing dissimilarity over time, as a weak relationship only is now present when the years 2002 and 2007 are included in data analysis ($p = 0.03$).

Radiation Monitoring - Jabiru and Jabiru East - The majority of the dose limit to members of the public is from radon daughter products rather than from long lived alpha activity from dust. This graph shows the radon daughter products measured by ERA and SSD at Jabiru and Jabiru East. There is good agreement (given that the sampling periods are slightly different). Overall there is negligible contribution from mining.

Radiation monitoring: 4 Gates Road station – near Mudginberri - This graph shows the measurement of RDP and LLAA with only a very small portion of the total effective dose derived from LLAA. Overall only a small fraction (<0.1%) is mine derived.

Discussion

Regarding grab sampling, Mr Tutty asked if SSD will be placing the continuous monitoring on the internet, such as toxicity sensitivity of snails, or 72 hr moving average. Ms Brazier stated regarding the 72 hour moving average it is still to go to the MTC and there are other tests are to occur. Mr Tutty asked if a 72 hr moving average will be applied to other analytes. Mr Jones stated no because only Mg shows such a strong relationship with EC. Ms Brazier confirmed that the coinciding peaks of the grab sampling and the continuous monitoring was in fact a coincidence.

Mr Tutty questioned the increase in snail toxicity monitoring. Mr Jones stated that snails have highest sensitivity in species. A change in snail egg production would give a good understanding of the environment. If snails do something unexpected then we know something else is happening as well.

Mr Tutty questioned the timeline of the MTC review exploration decline. Ms Bush explained the process of EPBC referral, and stated that it is a standard process as per any other application process.

Mr Tutty questioned the status of the MOL application. Mr McAllister stated it was currently dependent on the outcomes of the annual tailings storage facility inspection, and awaiting the post inspection data before recommending a decision to the regulator.

Mr Tutty inquired about details of the TSF inspection. Mr McAllister stated the inspection occurs as prescribed in the Authorization and its purpose is to examine structural and engineering elements of

the tailings storage facility and not particularly about seepage issues. ERA have to undertake inspection process every year. The inspection looked at water management around dam and how that was going to be operated. SSD use the inspection to query the design engineer and reports and information before completing our reports.

Mr Tutty requested again that the Environment centre could obtain a copy of the Aquaterra report..

Mr Tutty questioned the Rum Jungle rehabilitation efforts. Mr Jones stated it was funded by Commonwealth to conduct studies on the current state of the site, which will in the future determine what works need to be done. It will take 3 years to determine a rehabilitation strategy and SSD is acting in a technical advisory role.

Mr McAllister thanked Ms Brazier for all her contributions to ARRAC and SSD and wished her all the best for the future.

7. Department of Regional Development, Primary Industry, Fisheries and Resources Report

Mr Martin presented the DRDPIFR Environmental Surveillance Monitoring Report 58 for the period February 2009 to August 2009. He advised the report provides a Summary of approvals given during the reporting period, a summary of safety and environmental incidents which occurred during the reporting period, ground water comparison for sites sampled during the reporting period for Ranger, Jabiluka and Nabarlek, and a summary of data collected around the Ranger Tailings Storage Facility.

Minesite Technical Committees Meetings - Mr Martin advised there was one Ranger MTC and Jabiluka MTC meeting conducted concurrently on 7 May 2009. There was no meeting of the Nabarlek MTC held during the reporting period. The minutes of the MTC meetings are in Appendix A of SMR 58.

Variations and Authorisations – Mr Martin advised there were no variations to the Ranger, Jabiluka or Nabarlek Authorisations during the reporting period. The current Authorisation remain 0108-10, 0140-05 and 0435-01 respectively.

Environmental and safety incidents – Over the reporting period, Mr Martin advised there were a total of 36 reported incidents, 2 of which were safety incidents reported to NT WorkSafe. The full list of incidents is in the DRDPIFR report, commencing at page 6 of SMR 58.

Operational approvals – There were no approvals granted by the MTC during the period; however, the following statutory reports were approved:

- Ranger Weekly Water Reports;
- Ranger Annual Wet Season Report;
- Ranger Quarterly Radiation Report;
- Jabiluka Annual Wet Season Report; and,
- Nabarlek Mine Management Plan.

Groundwater check monitoring at Ranger Mine – Mr Martin advised the check was conducted in March and April 2009. Samples were taken at 2 Statutory Bores; 83/1 Deep, and OB 27.

Statutory bores – Mr Martin presented a map depicting DRDPIFR Environmental Monitoring Unit monitor surface water and ground water at the Ranger sites. As previously agreed, SSD will present surface water data and DRDPIFR will present the ground water. There are 2 statutory bores monitored at Ranger by DRDPIFR; Bore 83/1 situated in the Djalkmara Catchments east of Pit #3, and; Bore OB27 in the Georgetown Creek Catchments.

Monitoring results – Mr Martin advised that samples are taken at different times therefore there is a slight difference in results. Generally the data shows good conformance between DRDPIFR and ERA. The exception is EC where DRDPIFR data is higher than ERA. A comparison of field calibration and sampling procedures should address this. Mg also shows a discrepancy with DRDPIFR data lower than expected in short term data but good conformance in the long term.

Bore 83/1 Deep long term EC trends – Mr Martin presented data of bore 83/1 Deep which shows the long term trend in EC by DRDPIFR and ERA. This shows good conformity between datasets the discrepancies are expected to be due to the samples being taken at different times during the evapo-expiration and dilution cycle within the aquifer. Complete details of the short and long term trends can be found in Appendix C.

Bore 83/1 Deep long term Mg trends - Mr Martin presented data of bore 83/1 Deep showing the long term trend in Mg and SO₄ by DRDPIFR and ERA. It shows good conformity between datasets any discrepancies are expected to be due to the samples being taken at different times. Complete details of the short and long term trends can be found in Appendix C.

Groundwater monitoring around the Ranger TSF – Mr Martin stated following concerns raised at the April 2009 ARRAC about seepage from the TSF at Ranger DRDPIFR undertook a study of data collected from bores located around the TSF to determine if there was evidence of seepage in these bores and if the seepage has had any effect on the environment outside the Ranger Project Area. Data from 9 bores around the TSF that were being monitored by DRDPIFR was selected and reviewed. Analytes studied included pH, EC, SO₄, Mg, Mn, U and 226 Ra. The bores were located North, West and South of the TSF, most of the Eastern side of the TSF is under the stockpiles so no samples were available from this area. Bores were both deep and shallow and gave a good spread of data around the TSF.

Summary – Mr Martin summarised that the data shows that samples from bores to the North, West and South of the TSF were stable and gave results that were representative of those expected from deep aquifers. These bores had a magnesium Bicarbonate signature that is typical of deep bores. Shallow bore chemistry was stable with bores in the South and West indicating a possible increase in Sulfate and Magnesium concentration indicating a flow of solutes in groundwater recharge. pH and EC was generally stable in most bores.

Exceptions – Mr Martin stated exceptions to the stable trends were in; RN23568 that showed an increase in Mn and SO₄, and; RN23566 which shows an increase in EC and SO₄. All data was compared with the ANZECC 2000 99% ecosystem protection trigger levels all analytes assessed were well below these guidelines.

RN23568 rise in Mg and SO₄ – Mr Martin presented data of RN23568, a 5 metre deep bore approximately 400 m South West of the TSF. Mg and SO₄ have remained relatively stable but have increased markedly in 2009. Data is limited therefore more studies are needed including ICPMS *Inductively Coupled Plasma Mass Spectrometry*, to determine the cause of the increase.

RN23566 rise in EC - Mr Martin presented data of bore RN23566 is a 5.9 m bore located 700m East of the TSF wall. The data shows a relatively stable pH however there is a marked increase in EC over the past two years. The cause for this increase is not clear at this stage.

RN23566 rise in Sulfate and Magnesium - Mr Martin presented data of bore RN23566. This increase suggest a possible intrusion of seepage from the TSF however the results are inconclusive and need further investigation.

Conclusion - The data studied did not indicate any environmental effect from TSF seepage. Current data suggest that any TSF seepage remains within the Ranger Project Area and there would be no environmental effect. Data collected has been compared with the ANZECC 2000 99% ecosystem protection trigger level and has been found to be below these guidelines.

Jabiluka - Jabiluka is under long term care and maintenance by ERA. Surface water monitoring at Jabiluka is conducted by ERA, SSD and DRDPIFR. By agreement surface water data is presented by SSD. Groundwater monitoring is conducted by ERA and DRDPIFR and is presented in Appendix D of SMR 58.

Check Monitoring at Jabiluka Mine – Mr Martin stated that DRDPIFR ground water sampling was conducted at Jabiluka on 14 January 2009. Three bores are monitored, JDGB4S, JDGB4d and JDGB7. DRDPIFR data generally shows good conformity with ERA in U, Mg and SO₄. Exceptions are EC and pH believed to be attributed to different calibration and purge times in field sampling. Mr Martin presented a slide depicting part of the Jabiluka lease with the Interim Water management Pond and the access road. The three groundwater monitoring bores are indicated; JDGB4 Shallow, JDGB4 Deep, JDGB7. Groundwater data generally shows good conformity between ERA and DRDPIFR data in U, Mg, Mn and So₄. The main exceptions are in pH and EC where the differences are suspected to be associated with instrument calibration and differences in field procedures and bore purge times.

Water storage pond – Mr Martin presented a map slide showing part of the Jabiluka lease with the Interim Water management Pond and the access road. The three groundwater monitoring bores are indicated; JDGB4 Shallow, JDGB4 Deep, JDGB7. Groundwater data generally shows good conformity between ERA and DRDPIFR data in U, Mg, Mn and So₄. The main exceptions are in pH and EC where the differences are suspected to be associated with instrument calibration and differences in field procedures and bore purge times.

EC and Mg in Jabiluka Bores – Mr Martin presented a graph representation of the variation between ERA and DRDPIFR pH data and a graph of the same bore showing the EC levels. Overall results are still below significant levels for pH and EC in ground water.

Nabarlek – Mr Martin stated that DRDPIFR continues to monitor ground water at three ground water bores and surface water at Cooper Creek and Kadjirikamarnda Creek. UEL has also provided monitoring data for these sites. In April 2008, UEL purchased the Nabarlek mine site and mineral lease MLN962. Since this time UEL has conducted drilling programs, weed management and rehabilitation works on site. RDPIFR undertook surface water and groundwater sampling from 26-29 June 2009. Water samples from each bore were also collected on behalf of ERISS for radionuclide analysis. Groundwater samples were also collected for stable lead isotope ratio analysis to be analysed at Charles Darwin University.

Nabarlek lease outline - Mr Martin presented a slide showing the Nabarlek lease with the outline of the back filled pit shown, filled in early 1980's. Ground water sampling sites at Nabarlek are;

- OB 25 is a deep bore (76m) and is located approximately 270m to the east of the former pit
- OB 1D is a shallow bore (10m) located adjacent to the former ROM pad and plant area
- OB 47 is a relatively shallow bore (22m) located between the former evaporation ponds and Kadji creek in the opposite side of the mine access road.

Surface water is monitored on Kadji Creek (KC) downstream of the irrigation area and on Cooper Creek at the Murganella Road Crossing.

Bore OB25 – Mr Martin presented DRDPIFR data for this bore which has observed a pronounced increase in electrical conductivity between 2005 and 2007. Levels have remained stable at this higher level, with recent data from May 2009 recorded at 1775 µS /cm. The pH at this site has also remained stable, at pH 6.7. RN23021 / OB25 is a deep bore (76m depth) and is located approximately 270m to the east of the former pit.

Magnesium concentrations remain in the higher concentration range observed since 2007, Sulfate shows a significant increase in concentration, with a similar trend to EC, since 2007. This bore lies in a zone of chloritised schist surrounding the orebody and background water chemistry was typically high in magnesium and hydrogencarbonate. The increased concentrations of magnesium and hydrogencarbonate together with the greatest increase observed for sulfate may indicate the influx of a suspected contaminated plume. The marked increase in sulfate together with uranium could be indicative of groundwater which has come into contact with in-pit tailings materials. Stable lead isotope ratio analysis may assist in identifying the source of the contamination.

OB1D – Mr Martin presented data on bore OB1D. Magnesium concentrations remain stable. Sulfate shows an increase in concentration, since 2007. A change in the ratio of anions for this groundwater bore and the ratio of sulfate/hydrogencarbonate and chloride/hydrogencarbonate show similar declines as hydrogencarbonate concentrations have increased and if they are indicative of a contamination front.

Cooper Creek – Mr Martin presented data on Cooper Creek. Electrical conductivity (EC) at Cooper Creek remains stable. Manganese concentrations remain low and Uranium concentrations are close to or below detection limits. Magnesium and sulfate remain very low in concentration.

Kadjirikamarnda Creek – Mr Martin presented data on Kadjirikamarnda Creek. Electrical conductivity (EC) at Kadjirikamarnda Creek remains stable. The pH at this site has shown some fluctuations, typical of ephemeral flowing NT rivers. Manganese concentrations remain low and shows good conformance between DRDPIFR and UEL data. Magnesium and sulfate show relatively stable concentrations since 2006.

Discussion

Ms Iles pointed out that the figure in report showing ERA versus DRDPIFR data for EC in Gulungul was showing the wrong site for the ERA data and that ERA would provide the correct data to DRDPIFR for this site.

ARRAC32 Action 7.1 ERA to provide correct information for Gulungul to DRDPIFR.

Mr Tutty asked how building a residue dam in south and SW of the TSF would impact monitoring of seepage? Mr Ball stated he believes that understanding will be increased

Mr Tutty – Stated that in his opinion further investigations were required - how is our understanding about the seepage impact on the construction of a new tailings storage facility? ERA will need to make sure those things are nailed down in advance otherwise he can't see it being approved.

8. Member Reports

8.1 Uranium Equities Limited

Ms Paulka provided a brief overview of Uranium Equities Limited operations. She noted the EUL restructure including a new Managing Director. The previous chairman had been acting MD until the new one stepped in. Ms Paulka noted that she is now a consultant 2 days per week. She noted that Jonas was the environment technician, employed casually.

Nabarlek update headwater project joint venture with Cameco – Ms Paulka stated that drilling on the Nabarlek site had been delayed due to the economic downturn but there is plans to start drilling mid September, targeting the northern extension of Nabarlek, and the approvals are in place for that program already.

Rehabilitation of Legacy Areas - Ms Paulka noted that characterisation of RAA had been carried out, results pending. There are plans to complete this in 2010. Trenches had been dug and there was a clean up of the asbestos in the old camp area. Quotes were being obtained for the old camp cleanup, may be complete in 2009.

Weed management program - Ms Paulka showed aerial photos from May 2009. She noted the weed management program photos show areas that used to be 100% Mission grass are cleaner. Ms Paulka pointed out that the old camp area completely sprayed and burnt.

Headwaters Grant – Ms Paulka presented a map outlining the land areas granted. She noted EL25220 was granted and consent was given for EL24711 – 13, proceeding to grant. Ms Paulka noted that the blue area on the map is area not granted due to aboriginal grants.

Discussion

Ms Waldron asked if sites had been identified for the waste asbestos. Ms Paulka stated that NT Worksafe had conducted an inspection. They requested we look at on site burial rather than trucking it to an offsite area. There is the potential of trucking the waste to Jabiru or Darwin but Worksafe said that wasn't viable because of the risk of transport outweighed the risk with burying the asbestos on site. Mr Griffioen advised Darwin City Council probably wouldn't accept asbestos outside of Darwin city council area. Ms Waldron noted that the jurisdiction over the burial was not under NRETA legislation.

Mr Tutty asked about rehabilitation bonds. Ms Paulka explained the process of how rehabilitation bonds are calculated and that \$1.8 million is held for the Nabarlek site. Further rehabilitation work may reduce the cost of this bond. Mr Ball clarified that any reduction has to go through a securities assessment. He stated that the amount of bond held by previous owners was not sufficient for rehabilitation. Mr Ball noted that bond should be sufficient for 100% rehabilitation of the site. Under the current circumstances, there is a separate calculation every year of rehab liability. Not inclined to reduce it without it going through supervisory assessment board. Don't have capacity to reduce or remove it. Mr McAllister stated that SSD has reviewed the mine management plan and was satisfied with what is put in place there. Mr Ball directed Mr Tutty to the website regarding fairly detailed securities bonds. Mr Tutty commented that it's the Environment Centres view that it is not the best solution to get a new operator to fix a previous operators rehabilitation problem.

8.2 Cameco Pty Ltd

Ms Parks provided a brief report on the Cameco Joint Venture with Uranium Equities Limited in the Arnhem Land operational areas at King River Camp and Myra Camp. Ms Parks advised the current infrastructure at King River Camp consist of transportable offices, tent and donga accommodation and core racks.

2009 Drilling Programmes - Ms Parks advised the work program for 2009 comprised of ~ 12 core holes for ~ 3500m, 7 heli-supported core holes for 1300m, 2,300m RC, 8,600m aircore and core/rc.

Environmental actions – Ms Parks noted that weed management was the biggest issue. In the southern areas there are no weeds and Cameco are doing their best to ensure they don't get there. There are plans to start working with the rangers in the wet for weed management.

2009 incidents – Ms Parks advised there had been one LTI of a finger crush on a Stiltsons core rig. Worksafe were to inspect the incident but had not yet arrived. There were 2 LTIs involving a heat stroke affected drill contractor and another pulled muscle. Ms Parks confirmed that there has been no night time heli-drilling. This was due to the dangers of getting help to someone at night on a heli-rig if necessary.

8.3 AREVA NC Australia Pty Ltd

Mr Portella presented a brief overview of AVEVA status on Koongarra and Arnhem Land applications. He indicated that negotiations on Koongarra had resulted in the lease being placed back in to moratorium. Other activities in the Arnhem region were limited.

Discussion

Mr Tutty made the point that the SSD report indicated that the Koongarra lease was still under negotiation and that in fact it had been placed back in to Moratorium and that the report should be amended. Ms Bush stated that SSD had approached the NLC for updated info on the issue and that we were still waiting on this information. The report for next ARRAC would reflect the changed circumstances

8.4 Northern Land Council

Mr Hughes introduced himself as the new head of the NLC mining section - nil to report.

8.5 Environment Centre NT

Mr Tutty introduced Ms Melanie Bradley and explained that she has a background in landscape ecology. Mr Tutty noted that Ms Bradley will be addressing the EIS and will be taking over the role of Uranium Policy Officer. Nil to report.

8.6 Australian Radiation Protection and Nuclear Safety Agency

Nil to report.

8.7 Australian Government - Department of Resources, Energy and Tourism

Tim J. provided a brief update on the implementation of the uranium industry framework - currently reviewing terms of reference with the intention to keep it running over next few years whilst streamlining. Looking at streamlining groups underneath. NT SA, WA joined. Review of regulatory efficiency and uranium mining to be released. Working on recommendations brought forward from that report. Not sitting idle.

Mr Sheldrick explained that there is work being done on National Australian Radiation Dose Register. At the moment one issue is around working through the privacy act to store and share that information as people move through the country with different operations. Comments have been provided to ARPANSA and we are currently seeking legal comments.

Mr Sheldrick noted the Radiation handbook had been completed and was available on the website. There is a DVD nearly completed, draft version had been shown to an indigenous working group in Darwin in August. Mr Sheldrick thanked GAC, SSD, Cameco and ERA for their support and it is expected to go out in the next few weeks.

Mr Sheldrick stated a uranium royalty bill legislation was passed last year but still to go though the Senate. CPRS bill going through DRET confident it will get up shortly.

8.8 Parks Australia North

Mr Winderlich Presented the following update on the Gunlom rehabilitation program.

In 2007 PAN successfully implemented Part A of the Gunlom Rehabilitation Plan, involving the rehabilitation of Guratba (Coronation Hill), Sleisbeck and El Sherana Mining Camp, on time and on budget.

Part B of the Gunlom Rehabilitation Plan (dealing with containment of radiologically contaminated material) was completed in early 2009. Its implementation was approved by the NLC, traditional owners and the Kakadu Board of Management, and was deemed a non-controlled action after being referred to the Minister. ARPANSA has approved an amendment to PANs Prescribed Radiation Facility licence to allow for its implementation. The Aboriginal Areas Protection authority has issued a work site clearance under the Sacred Sites Act (NT).

The construction and earthworks for the implementation of Part B of the Gunlom Rehabilitation Plan were placed on Austender in May. The successful tenderer was T.H.E. Mining, a local company with a long history in mining-related earthworks, including rehabilitation works at the former Nabarlek uranium mine near Gunbalanya. The tender price was approximately \$2.7m. Site establishment began on 29 June and excavation for the new containment began on 4 July. The works are expected to be completed by mid November 2009.

On site, the project is overseen by Site Superintendent Mike Fawcett of Fawcett Mine Rehabilitation Services. Containment construction, movement of contaminated material and site clearance is being overseen by Dr Thorsten Reszat of O'Kane Consultants, designer of the containment. Radiation safety procedures and issues are being overseen by a Radiation Safety Officer from Western Radiation Services.

As at 26 August, all radiologically contaminated tailings residues and soil above $1.25 \mu\text{Svhr}^{-1}$ have been removed from the area below the Rockhole Mill processing plant, from around the El Sherana and Palette Mines, and from the Weighbridge hardstand area, and transported to the new containment on the long disused El Sherana Airstrip, and a start has been made on excavating the interim containment trench at the former South Alligator Village site.

Significantly more radioactive tailings material was found at the Rockhole Mill area and near the Palette Mine than had previously been identified. Most of this was in a washout gully downstream of the Rockhole tailings to a depth of 3 m and was typically in the range of $5\text{-}6 \mu\text{Svhr}^{-1}$. Several deep lenses of such material in other parts of the area were also found. These new finds have added significantly to the volume needing to be moved, adding to the cost, however the prudently conservative containment design volume, which allowed extra space for such contingencies, is unlikely to require modification to accept the revised volume of material.

At the completion of works, all disturbed areas will be shaped to minimise erosion, ripped and revegetated with seed of local provenance collected by members of the Werenbun Aboriginal Corporation.

Discussion

Mr Tutty asked what the role of SSD is in the Rehabilitation Plan for abandoned mine sites and associated infrastructure, such as Gunlom Land trust, Kakadu?

Dr Jones stated that SSD were providing technical advice to PAN on the project as well as providing radiation checks and routine inspections of sites within the valley.

8.9 NT Department of Health and Families

Mr [redacted] stated the Radiation Protection Act 2004 will commence soon after 4 October 2009. This Act replaces the current Radiation (Safety Control) Act. All licenses and registrations issued under this

current Act will continue when the new legislation takes effect. These authorities provide for the control of the use of radiation sources (radiation apparatus or radioactive material). Activity and activity concentrations below exemption levels are taken from the National Directory for Radiation Protection. This is currently edition 1.0. The National Standard for Limiting Occupational Exposure to Ionizing Radiation (1995) is adopted and both documents are referenced in Radiation Protection Regulations. Mr Robinson confirmed the radiation plan will cover transport.

8.10 NT Department of Natural Resources, Environment, the Arts & Sport

Ms Waldron advised the draft guidelines are out close on Monday on website once comments come in will be incorporate in guideline issued to ERA on 14 September – 28 day viewing public review standard process.

8.11 West Arnhem Shire Council

Nil to report.

8.12 Gundjeihmi Aboriginal Corporation

Nil to report.

8.13 Other members reports

Not applicable.

9. Other Business

Not applicable

10. Next meeting

It was agreed the next meeting would be held in March 2010.

The meeting was closed at 1:30pm.