INSPECTION AND SAFETY BRANCH
INSPECTION OF WATER RETAINING STRUCTURES
ALLIGATOR RIVERS REGION
MAY 1985

W H TINKER & J G BASTIAS

DEPARTMENT OF MINES AND ENERGY
Dear Sir

Please find enclosed our report for May 1985 on water retaining structures inspections on the two operating uranium mines in the Alligator Rivers Region. They were carried out in terms of the Mines Safety Control Act to verify compliance with Section 392 of the Regulations.

Approval to use the structures is given on the basis of previous inspections, design reports, associated approved works and this report, and is subject to the carrying out of the recommendations in this report.

Yours faithfully

R J KING
Chief Government Mining Engineer
Inspection of dams in terms of the Mines Safety Control Regulations Section 392 paragraph 3 should be carried out by the Company. Consequently it must be noted that these inspections in no way relieve the management of Ranger and Nabarlek from their responsibilities to ensure the dams are safe.
We certify that the nominated dams in the Nabarlek and Ranger mine site were inspected in accordance with the check list contained in the Appendix of this report. Within the limits of our visual inspection no major structural defects occur and in our opinion the dams were safe as at 28 and 29 May 1985 respectively.

It is felt that with the general upgrading of water retaining structures that have taken place, 6 monthly inspections are no longer necessary and an annual inspection as called for by the Mines Safety Control Act would be more appropriate.

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INSPECTION OF RETAINING STRUCTURES AT NABARLEK MINE

An inspection was made on the 28 May, 1985 by Messrs Tinker and Bastias of the following structures.

No. 1. Evaporation Pond (EPI)
No. 2. Evaporation Pond (EP2)
Stockpile Run-off Pond (SPROP)
Plant Run-off Pond (PROP)
Airport Run-off Drains

All the embankments and failsafe spillways were in good order and the crest of the dams had recently been graded.

Whilst there was an accumulation of water adjacent to the toe of the North wall of EP2, there was no evidence of seepage or greeness of vegetation associated with seepage in this wall.

Due to the intensity of rain associated with Cyclone Gretel, the water level in the SPROP became abnormally high and it has been lowered by pumping into EPI. Also water from the pit as, a result of the change of authorisation No. 7 referring to sub-aerial deposition of tailings, is now being pumped to EPI.
All silt traps and the airport drains were in good order. Work on bunding for the extension of the tailings pipe line was in hand.

An island of tailings was already apparent in the pit but it still appeared very wet. The water level was RL 60.7 metres.

Rehabilitation of the site of the old waste rock run-off pond is estimated to be 70% complete.

It is apparent that the water management system coped well with the rainfall associated with Cyclone Gretel.

The inspection procedures for the four Flyght pumps at the plant run-off ponds were checked and found to be in order.

INSPECTION OF RETAINING STRUCTURES AT RANGER MINE

An inspection was made on the 29 May, 1985 by Messrs Tinker and Bastias of the following structures.

No. 1 Retention Pond (RP1)
No. 2 Retention Pond (RP2)
No. 3 Retention Pond (RP3)
No. 4 Retention Pond (RP4)
Plant Run-off Pond PROP
Tailings Dam
Tailings Dam Seepage Collector Sumps
Tailings Pipeline Corridor

All the embankments are in good order as too are the lead in spillways and failsafe spillways.

At RP1 the sagging gabions reported previously have now been secured by five bolts and stakes. The concrete wings of the spillways have been gunnitted again. The reinforcing mesh of the base of the spillway is showing and the need for concreting should be investigated.

At RP2, water is still evident at the downstream toe of the north wall. Ranger are investigating the source of this water. At the completion of grouting of the North Wall, Ranger reported this dam to be safe. The water level on the day of inspection was RL 18.48 metres.

At RP4 the level of water was RL 17.35 metres. The size of this pond is being progressively reduced by the dumping of waste rock. The delivery pipeline from RP4 to Magela creek has been broken and blank flanged off.

At the tailings dam, work has started for stage 3 construction to rise the wall to RL 41 metres.
Experimental covering of a section of the downstream face of the North wall is still in place. The water level in the dam was RL 35.67 metres. The seepage collector sumps were in good order and the water levels low.

At the tailings pipeline corridor the drain adjacent to the pipes has been upgraded and the vegetation and rubbish from there dumped in the tailings dam.

Repairing of the concrete lining of the collector sump is in hand. The discharging channels have been repaired but one has broken again and needs fresh repair.
APPENDIX A

TERMS OF REFERENCE FOR PERIODIC SURVEILLANCE INSPECTIONS OF WATER RETAINING STRUCTURES IN THE ALLIGATOR RIVERS REGION

1. The ultimate responsibility for the operation, maintenance, monitoring surveillance and safety of the water management system and structures rests with the mining company holding a Special Mineral Lease under the Mining Act or an Authority under Section 41 of the Atomic Energy Act.

2. During the operational, decommissioning and rehabilitation phases of the mining operation, periodic surveillance inspections will be carried out on mine site water management structures by the Department of Mines and Energy assisted by the other Supervising Authorities.

3. As far as practicable, the safety and surveillance team shall include at least one Engineer experienced in modern dam technology and a hydrogeologist.

4. Where necessary, the services of an experienced geologist, soils engineer or other specialist may be utilised to assist with surveillance inspections.

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5. The mine operators shall compile a record of data obtained in the operation of the water management system which shall include:

- observations on conditions of water management structures;
- any repairs carried out on water management structures;
- rainfall, pan evaporation and meteorological data;
- use of water from various structures;
- water levels in all storages;
- water quality in all storages;
- water levels in observation bore holes;
- quality of water from bore holes;
- quality and quantity of water from leakages;
- accurate pumping rates for each unit;
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• total dry weight of tailings placed and total volume of tailings held;

• dry densities of tailings at various tailings depth;

• findings of resistivity surveys if carried out;

• established availability and quality of earth and rock materials for new construction and/or repair and maintenance for existing works.

6. A technical representative of the mine operator shall accompany the team during all site inspections and provide additional information as required.

7. Periodic surveillance inspections shall include assessments on the following aspects of each water retaining structure:

• Upstream Faces of all embankments
  - stability
  - erosion
  - face protection;

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- Downstream Face of all embankments
  - structural integrity - face
  - leakage, seepage and damp spots
  - erosion
  - condition of protecting material
  - structural integrity - downstream toe
  - seepage
  - toe erosion or undercutting
  - vegetative cover;

- Crest of all embankments
  - general condition
  - roadway condition
  - drainage
  - if no roads - vegetative cover;

- Spillways
  - general condition
  - apron condition
  - wingwall condition
  - weep drains;

- Culverts and other structures
  - general condition
  - inlet and outlet condition
  - seepage;

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. Drainage
  - silt accumulation
  - vegetative growth
  - general condition;

. Assessment
  - condition and effectiveness of previous
    repairs and maintenance
  - redesign proposals or modifications.

8. After each inspection, the Department of Mines and
   Energy will report to the Periodic Surveillance
   Committee on its assessment of each water
   retaining structure including:

. the overall safety of the structures
. the remedial action proposed to remedy any
  faults or deficiencies
. recommendations for any action which may be
  necessary to ensure the continued safety of
  the structures
. recommendations for any changes in the
  surveillance procedure
. other relevant comments and conclusions.

9. Surveillance inspections shall be carried out each
   April and October and reports presented to the
Periodic Surveillance Committee within two weeks or such further period as becomes necessary.

10. Where an unusual event occurs at a mine site in relation to the water retaining structures the Periodic Surveillance Committee may request the Department of Mines and Energy to inspect the site and evaluate and report on that event.