AFMECO MINING AND EXPLORATION PTY LTD

Exploration Licences 2505, 2506, 2507, 2516, 2517, 7029 and 9354
Arnhem Land, Northern Territory
TIN CAMP CREEK JOINT VENTURE

RELINQUISHMENT REPORT
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SUMMARY

1. INTRODUCTION
2. TENURE
3. GEOLOGY
4. AIRBORNE GEOPHYSICAL SURVEY (1996)
5. STREAM SEDIMENT GEOCHEMISTRY (1996-1998)
   6.1 South Horn area (EL 2506)
   6.2 EL 2507
7. DIAMOND DRILLING (1998)
8. DIAMOND EXPLORATION (1997)
9. CONCLUSIONS
LIST OF FIGURES

1. Tin Camp Creek joint venture - Tenement location map
2. Tin Camp Creek EL’s – Blocks relinquished 2000
3. West Arnhem Land – Solid Geology
4. Correlation chart for Proterozoic rocks of the East Alligator River areas
5. Location plan of airborne radiometric anomalies
6. Location plan of stream sediment samples
7. Location plan of surface sandstone samples – South Horn area
8. Location plan of surface sandstone samples – EL 2507
9. Location plan of diamond drillhole
10. Location plan showing diamond exploration sampling in EL 2507

LIST OF TABLES

1. Airborne radiometric anomalies
2. Stream sediment survey – analytical results
3. Diamond drillhole summary sheet
4. Sandstone composite analytical results
5. Sandstone XRD mineralogy
6. Downhole PIMA results
7. Soil geochemistry analytical results

LIST OF APPENDICES

2. Diamond drillhole log
3. Petrographic report – diamond drillhole core
4. Heavy mineral data sheets
5. Stream sediment Geochemistry (data)
SUMMARY

The Tin Camp Creek tenements are located in Arnhem Land about 250 kilometres east of Darwin. Exploration is being conducted by a joint venture which consists of AFmeco Mining and EXploration Pty Ltd (operator), Cameco Australia Pty Ltd, SAE Australia Pty Ltd and West Arnhem Corp Pty Ltd.

This report describes the exploration work conducted on the areas relinquished at the end of the fifth year of tenure.

An airborne geophysical survey was flown over the tenements in 1996. The survey acquired EM, radiometric and magnetic data. A number of radiometric anomalies occur in the relinquished blocks.

A regional stream sediment survey was completed in 1996 and 1997. Some further stream sediment sampling was undertaken in 1998 as follow-up to the original survey.

Surface sandstone samples from the South Horn area and the eastern part of EL 2507 were analysed with a PIMA instrument.

Some reconnaissance exploration was carried out for kimberlite pipes in EL 2507. No indications were found.

One diamond hole was drilled in EL 2507 to determine the thickness of the Kombolgie sandstone and the lithology of the underlying metamorphic strata. The basement in this hole was granite probably of the Nimbuwah Complex. No indications of uranium mineralisation were intersected.
1. INTRODUCTION

The tenements included in the Tin Camp Creek joint venture are shown on figure 1. All of the tenements are located within the Arnhem Land Aboriginal Reserve.

This report details the exploration work completed on those areas relinquished on 12th September 2000 at the end of tenure year 5, see figure 2.

2. TENURE

Exploration licences 2505, 2506, 2507, 2516, 2517, 7029 and 9354 were granted to Queensland Mines Pty Ltd on 12th September 1995 for a period of six years. The tenements are currently being explored in joint venture by AFmeco Mining and EXploration Pty Ltd – operator (24.5%), Cameco Australia Pty Ltd (49%), S.A.E Australia Pty Ltd (24.5%) and West Arnhem Land Corporation Pty Ltd (2%).

Reductions were waived at the end of years 2 and 3 of tenure. A reduction was carried out at the end of the fourth year. The blocks relinquished at the end of the fifth year of tenure are shown in figure 2. Forty-three blocks have been relinquished and 98 blocks have been retained.

3. GEOLOGY

The regional geology of West Arnhem Land is shown in figure 3 and a correlation chart for the stratigraphy of the area is shown in figure 4.

The oldest rocks exposed in the area are gneisses belonging to the Mount Howship Gneiss of the Kakadu Group of lower Palaeoproterozoic age. Further to the west in the Alligator Rivers uranium field, similar rocks overlie the Archaean Nanambu complex. The Mt Howship Gneiss is overlain by the Kudjumarndi Quartzite which is one of the main marker horizons in the region.

The psammitic rocks of the Kakadu Group are overlain by the Cahill Formation also of lower Palaeoproterozoic age, which is the host of the main uranium ore bodies in the area. The lower Cahill Formation consists of a basal calcareous unit which is overlain by a sequence of pelitic schists, meta-arkose and amphibolite. A well defined amphibolitic unit at the top of the lower Cahill Formation hosts the Nabarlek uranium deposit. The upper Cahill Formation and Nourlangie Schist consist of a monotonous sequence of meta-arkose, schist and amphibolite.

East and south of the area of the Palaeoproterozoic sediments lie the granitoid rocks of the Nimbuwah complex. These granitoids were extensively migmatised during the Top End Orogeny which is dated at about 1800my. The relationship between the Cahill Formation and the Nimbuwah Formation is problematical as the contact zone has not been seen.
Later post-orogenic Proterozoic granites have intruded the meta-sediments in the east of the area.

The upper Palaeoproterozoic Kombolgie Formation overlies the older rocks unconformably. This formation consists of sandstones with a prominent basaltic horizon (Nungbalgarri Volcanic Member). The flat-lying sandstones form the Arnhem Land escarpment.

The Oenpelli Dolerite (1700my) intrudes the lower Palaeoproterozoic metasediments and the Kombolgie sandstone, and forms large lopolithic bodies. It is the youngest Precambrian rock outcropping in the area.

4. AIRBORNE GEOPHYSICAL SURVEY (1996)

An airborne geophysical survey was carried out over the tenements during July 1996. The logistics report for this survey is presented in appendix 1.

The survey employed a DIGHEM electromagnetic system, a gamma ray spectrometer and a cesium vapour magnetometer. The instruments were mounted in a helicopter. Flight lines were orientated north-south with a line separation of 150 metres. The helicopter flew at an average airspeed of 100km/h at a nominal altitude of 60 metres above ground.

The locations of the airborne radiometric anomalies within the relinquished blocks are shown on figure 5 and details are given in table 1.

5. STREAM SEDIMENT GEOCHEMISTRY (1996-1998)

A stream sediment geochemistry survey was conducted over the tenements during 1996 and 1997. Some additional follow-up sampling was done in 1998. The sample locations within the relinquished blocks are shown in figure 6. Sixty samples were collected.

The samples collected in 1996 were analysed for As, Au, Co, Cu, Mo, Ni, Pb, Pt, Th, U, V and Zn. The samples collected in 1997 and 1998 were analysed for the same suite of elements except for As, Mo, and Pt. All of the samples were sieved to –80# on site and then analysed by Ultratrace using an aqua-regia extraction and determination by ICP–MS/OES. The analytical results are presented in table 2 and digital data can be found in appendix 5.


Surface sandstone samples were collected in two areas and were analysed with a PIMA spectrometer to determine their clay mineralogy. Changes in the clay mineralogy of the Kombolgie sandstone may be caused by hydrothermal activity often related to underlying uranium mineralisation.
The PIMA II spectrometer measures the spectra of samples in the short wavelength infrared band from 1300 to 2500nm. When a sample is illuminated by the PIMA instrument certain wavelengths of light are absorbed by the minerals in the sample. These absorption features are represented in the reflectance spectrum as troughs and are characteristic of the minerals present.

Most of the absorption features in the PIMA spectra are caused by the presence of the following ions in the specimen: Hydroxyl (OH), Carbonate (CO3), and Ammonia (NH4); water is also important. Minerals that PIMA can detect include: phyllosilicates (clays and chlorite), hydroxylated silicates (epidote and amphibolite), sulphates (alunite, jarosite and gypsum) and carbonates (calcite etc.). The main minerals of interest in the Kombolgie sandstone are the phyllosilicates such as sericite, kaolinite and chlorite.

6.1. South Horn area (EL 2506)

The South Horn area was sampled in 1998 and 1999. Most of the samples were collected using a helicopter. A total of 34 samples were taken on a nominal 500 metre grid pattern within the relinquished blocks (see figure 7).

The results show that dickite, sericite and paragonite are the dominant clay minerals in the southern sandstone block.

6.2. EL 2507

The eastern part of EL 2507 was sampled on a 500 metre grid using a helicopter. Twenty-nine samples were collected and the results are shown on figure 8.

The dominant clay mineral in this area is kaolinite, with minor paragonite and sericite

7. DIAMOND DRILLING (1998)

One diamond drillhole was drilled on EL 2507 during July 1998. The area was not accessible by road and the drilling was completed by using a helicopter portable drillrig provided by Century Drilling Ltd. A location map is shown in figure 9.

Drillhole KPE 01 was completed at a depth of 308.5 metres in granite, which is probably part of Nimbuwah Complex. The unconformity at the base of the Kombolgie sandstone was intersected at 244.8 metres. No anomalous radioactivity or uranium mineralisation was found. A summary sheet for the drillhole is shown in table 3. The drillhole log is presented in appendix 2. A number of samples were taken for petrographic description and the report on this work is in appendix 3.
8. DIAMOND EXPLORATION (1997)

Initial processing of the 1996 airborne survey outlined two coincident magnetic-EM-potassium anomalies within EL 2507 which were thought to be possible kimberlite pipes. The anomalies were located at 329000E 8596000N and 328800E 8595900N, see figure 10.

A geochemical programme consisting of soil and stream sediment sampling was carried out over the airborne anomalies.

A total of thirty seven –80# soil samples were collected over the peak of the airborne anomaly. These samples were analysed by ALS for a suite of elements commonly associated with kimberlite pipes. The results and locations of the samples are shown in table 7.

Heavy mineral samples were collected from seven creeks draining the anomalous area. In addition thirteen loam samples were collected from directly over the airborne anomalies. The samples were analysed by Independent Diamond Laboratories and the results are shown in appendix 4.

Although three chromite grains were observed in the heavy mineral samples no other indications of kimberlite pipes were discovered.

9. CONCLUSIONS

The relinquished blocks have been explored by a combination of airborne geophysics and stream sediment geochemistry. Certain areas have been tested with surface sandstone sampling and diamond drilling.

No indications of uranium mineralisation have been found and the relinquished areas have been adequately explored.