



## CONTENTS

LIST OF FIGURES	3
LIST OF TABLES	3
LIST OF APPENDICES	3
<b>SUMMARY</b>	<b>4</b>
<b>1. INTRODUCTION</b>	<b>5</b>
<b>2. LOCATION AND ACCESS</b>	<b>5</b>
<b>3. TENURE</b>	<b>5</b>
<b>4. GEOLOGY</b>	<b>6</b>
<b>5. PREVIOUS WORK</b>	<b>7</b>
<b>6. WORK COMPLETED DURING 2000/2001</b>	<b>7</b>
<b>6.1 Airborne Geophysics</b>	<b>7</b>
<b>6.1.1 Airborne magnetic and radiometric survey</b>	<b>8</b>
<b>6.1.2 Airborne electromagnetic survey (TEMPEST)</b>	<b>8</b>
<b>7. CONCLUSIONS</b>	<b>8</b>

## **LIST OF FIGURES**

1. [Tenement location Map](#)
2. [West Arnhem Land – Solid Geology](#)
3. [Correlation chart for Proterozoic rocks of the East Alligator Rivers areas](#)
4. [EL 3589 Work Program 2001](#)

## **LIST OF TABLES**

1. [EL 3589 Airborne magnetic and radiometric survey - Parameters](#)
2. [EL 3589 Airborne electromagnetic \(TEMPEST\) survey - Parameters](#)

## **APPENDICES**

1. [EL 3589 Expenditures 2000 - 2001](#)
2. [EL 3589 Expected Expenditures 2001 - 2002](#)
3. [Proposed Work program 2001 – 2002](#)
4. [2001 TEMPEST airborne survey digital data](#)

## SUMMARY

Exploration Licence 3589 is 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), SAE Australia Pty Ltd and Macapa Pty Ltd.

This report describes the results of the fourth year of exploration for unconformity-related uranium deposits on the tenement.

A radiometric/magnetic and an electromagnetic (TEMPEST) airborne geophysical survey were completed in the dry season of 2001. Due to a number of delays the data for the radiometric/magnetic survey had not been received at the end of the reporting period. However a first interpretation of some of the TEMPEST data seems to indicate targets worthwhile to follow up with further exploration work in the 2002 season.

## **1. INTRODUCTION**

The exploration licence EL 3589 is being explored in joint venture by AFmeco Mining and EXploration Pty Ltd (operator), SAE Australia Pty Ltd and Macapa Pty Ltd.

This report details the work carried out during 2000/2001.

## **2. LOCATION AND ACCESS**

The tenement is located in West Arnhem Land about 250 km east of Darwin in the Northern Territory of Australia, [Figure 1](#).

Access to the Myra base camp is either by air to the Nabarlek airstrip, or by road via the Arnhem Highway to Jabiru and then via Cahills Crossing and unsealed roads within Arnhemland.

The tenement itself is mainly located in sandstone escarpment country and is only accessible by helicopter or on foot.

## **3. TENURE**

The exploration licence EL 3589 was granted on 18<sup>th</sup> November 1997 for a period of six years. The tenements are currently being explored in joint venture by AFmeco Mining and EXploration Pty Ltd – operator (37.5%), S.A.E Australia Pty Ltd (37.5%) and Macapa Pty Ltd (25%). Aboriginal Land Corporations will hold a 2% interest when incorporated.

EL 3589 covers an area of 99 sq km and consists of 30 blocks. The tenement had been granted a waiver of reduction in area for year 3.

#### **4. GEOLOGY**

The regional geology of West Arnhem Land has been described in detail in many previous reports and only a brief overview will be given here. The regional geology is shown on [Figure 2](#) and a stratigraphic chart is shown on [Figure 3](#).

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. The Cahill Formation 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 partially migmatized during the Top End Orogeny, which is dated at about 1800my. The relationship between the Cahill Formation and the Nimbuwah Formation is complex, being migmatic and gradational in nature 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 Mid - Proterozoic 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 (1720my) intrudes the early Palaeoproterozoic metasediments and the Kombolgie sandstone, and forms large lopolithic bodies. It is the youngest Precambrian rock outcropping in the area.

## **5. PREVIOUS WORK**

The ground covered by the tenement had not previously been explored prior to the EL being granted in 1997.

Work completed in the previous three years of tenure has included airborne geophysical surveys, helicopter-assisted diamond drilling and ground reconnaissance. Details of this work may be found in the annual reports submitted to the Mines Department.

## **6. WORK COMPLETED DURING 2000 - 2001**

Work completed in the fourth year of tenure has included (for the costs of the 2001 exploration work see [Appendix 1](#)):

### **6.1 Airborne Geophysics**

During the 2001 field season two different airborne geophysical surveys were completed over the area. Universal Tracking Systems (UTS) flew a fixed wing radiometric and high resolution magnetic survey over the tenement, totaling 200

line km, figure 4. Fugro Airborne Surveys completed an electromagnetic survey with the fixed wing TEMPEST system, covering an area of some 99 km<sup>2</sup>, [Figure 4](#).

### **6.1.1 Airborne Radiometric - Magnetic Survey**

Universal Tracking Systems (UTS) were contracted to fly a fixed wing airborne magnetic and radiometric survey over the EL 3589 area, see [Figure 3](#). Due to a number of reasons beyond the control of AFMEX the start up of the survey was delayed by several months. This survey commenced on August 29th however the completion was delayed by bush fires until the end of September. No data had been received at the end of the reporting period. All reporting on this survey will be in the subsequent annual report. For the technical parameters of the survey, see [Table 1](#). The data for the UTS radiometric/magnetic survey had not been received at the end of the reporting period and will be included in the next annual report.

### **6.1.2 Airborne Electromagnetic Survey**

Fugro Airborne Surveys were contracted to fly a TEMPEST airborne electromagnetic survey for Afmeco Mining and Exploration, see [Figure 4](#). The data was acquired over the area in mid July 2001 after a serious delay due to technical problems with the system. TEMPEST digital time domain electromagnetic system characteristics are detailed in [Table 2](#). Preliminary data received in the last days of the reporting period indicate that the TEMPEST system is able to penetrate thick sandstone cover and possibly map the unconformity depth. Results will be listed in the forthcoming annual report. The digital 2001 TEMPEST survey data can be found in Appendix 4.

## **7. CONCLUSIONS**

Further exploration work is required on EL 3589. Work completed to date has found that the area is underlain by the Cahill Formation a highly prospective lithologie for uranium mineralization. The TEMPEST airborne system has demonstrated that it is capable of penetrating thick sandstone cover and can provide a picture of the depth of the unconformity and potential structures. The data

for the UTS survey has however not been received yet. A possible scenario for the 2002 budget and program is given in [Appendix 2](#) and [Appendix 3](#) respectively.

The final 2002 budget and program will however depend on the completion of the evaluation and interpretation of the exploration data particularly of all of the 2001 airborne surveys. The evaluation was still on-going at the end of the reporting period.