



**ANGLO  
AMERICAN**

Suite 1, 16 Brodie Hall Drive  
Bentley, WA, Australia, 6102.  
PO Box 1067  
Bentley, WA, Australia, 6872.  
Tel: +61 8 6250 8100  
Fax: +61 8 6250 8199

**Anglo American Exploration Australia Pty. Ltd.  
A.C.N. 006 195 982**

**EPM 13420 “RIVERDILLA”  
Silvergate Project  
Annual Report for the Period  
5<sup>th</sup> December 2001 to 4<sup>th</sup> December 2002  
Final Report for the Period  
5<sup>th</sup> December 2002 to 13<sup>th</sup> June 2003**

**Volume 1 of 1**

**Tenure Holder: Anglo American Exploration (Australia) Pty Ltd**

**Authors: Stuart McCracken, Stephen Lane & Bronwyn  
Stacey**

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## SUMMARY

EPM 13420 (“Riverdilla”) was granted to Anglo American Exploration (Australia) Pty Ltd (“AAEA”) on 5<sup>th</sup> December 2001 for a period of 5 years. The tenement comprises 29 graticular sub-blocks.

Anglo American Exploration (Australia) Pty Ltd (“AAEA”) entered the area to explore for large base metal deposits under cover following evaluation of and target generation using regional geological and geophysical data sets.

The Riverdilla area is considered to be highly prospective for SEDEX style Zn-Pb-Ag mineralisation of the Mount Isa & Century types. The area is situated to the south of the Grevillea Prospect, in an area of Georgina Basin cover. BHPM flew airborne EM over the area (25 Hz GEOTEM).

TEM across structural targets identified no anomalies. Due to the negative results of the TEM it is recommended that the tenement be relinquished.

No further work was carried out on the tenement between 5<sup>th</sup> December 2002 & 13<sup>th</sup> June 2003.

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## 1. INTRODUCTION

This report details the exploration activities conducted on EPM 13420 (“Riverdilla”), during the first year of tenure from 5<sup>th</sup> December 2001 to 4<sup>th</sup> December 2002. Anglo American Exploration (Australia) Pty Ltd (“AAEA”) acquired the tenement to explore for large base metal deposits under cover.

Riverdilla EPM 13420 is located about 150km northwest of Mount Isa in northwest Queensland on the Camooweal (SE 54-13) 1:250,000 map sheet and Riversleigh and Undilla 1:100,000 map sheets. Access to the project is via the Barkly Highway, the Burketown - Camooweal Road, and several station tracks. Pastoral leases in the region include Undilla and Thornton (see Figure 1).

The area is considered to be highly prospective for SEDEX Zn-Pb-Ag mineralisation of the Mount Isa and Century type. The prospective Proterozoic basement rocks in the region are covered by the Georgina Basin sequence (largely limestone), which varies in depth from several tens of metres to several hundred metres.

AAEA is exploring EPM 13420 as part of the Silvergate Project which includes EPM13296 (Joint Venture with BHP-Billiton).

## 2. TENURE

EPM 13420 was granted to Anglo American Exploration (Australia) Pty Ltd, on 5<sup>th</sup> December 2001 for a period of 5 years. The tenement comprises 29 graticular sub-blocks as detailed below:

BIM	Block	Sub-block
NORM	2964	Q V W
NORM	3035	E K O P T U Y Z
NORM	3036	A B F G L M Q R V W
NORM	3107	D E J K
NORM	3108	A B F G

EPM13420 falls with the Kalkadoon Native Title claim QC99/032(B) (Figure 2).

## 3. REGIONAL GEOLOGY

The Barkly region is situated on the western edge of the outcropping Proterozoic Western Succession of the Mount Isa Inlier. The Proterozoic rocks are covered to the west by flat and shallowly dipping Cambrian limestone and siltstone of the Georgina Basin.

EPM 13420 occurs on the edge of the Georgina Basin, in areas of Proterozoic outcrop and moderately shallow Cambrian cover (up to 300m). Both Proterozoic and Cambrian rocks have been covered in places by Mesozoic, Tertiary, and Quaternary deposits. A simplified geological map of the area is shown in Figure 3.

The rocks exposed on the western edge of the Proterozoic outcrop consist of various McNamara Group units (Gunpowder Creek to Riversleigh Siltstone Formations). The McNamara units are moderately folded and faulted in this region. Further south, units of the middle to upper McNamara Group dip shallowly to the south-southeast. Major structures observed in the Proterozoic can be extrapolated from the outcropping areas to the covered areas with the aid of regional magnetic and gravity. There is little known about the detailed geology of the Proterozoic units underneath the Cambrian. Significant SEDEX style mineral deposits occur in the region. These include Lady Loretta (Pb-Zn-Ag) and Lady Annie (Cu) to the east, and Grevillea (Zn-Pb-Ag) and Century (Zn-Pb-Ag) to the north of EPM 13296.

#### 4. EXPLORATION RATIONALE

Anglo American Exploration (Australia) Pty Ltd (“AAEA”) commenced a detailed evaluation of the Mt Isa Inlier in 2001 following the release of the government’s Northwest Queensland data package. Using independent consultants, AAEA modified and advanced the structural and stratigraphic interpretations presented in the data package. Targets were selected based on exploration models for Century and McArthur/Isa style sedimentary-hosted massive sulphide mineralisation. The Riverdilla area was targeted for its favourable intersection of prospective structures and stratigraphy and the fact that it had been poorly explored for SEDEX deposits due to the Cambrian limestone cover.

#### 5. PREVIOUS EXPLORATION WORK

The first “modern” exploration work in the Barkly area began in the late 1960’s to early 1970’s. Several companies (eg. IMC Development, Continental Oil, Broken Hill South) were involved in exploration for phosphate within middle Cambrian limestone and siltstone units of the Georgina Basin.

The Cambrian Beetle Creek and Thornton Limestone Formations contain phosphatic horizons, with sub-economic grades of P<sub>2</sub>O<sub>5</sub>. Shallow drilling was carried out over a wide area by these companies with the aim of locating economic phosphate zones. Marginally economic phosphate resources were delineated but none were developed.

During the same period, Placer Prospecting commenced exploration for base metals around the Lady Annie Cu prospect. In 1969, Placer discovered the Lady Loretta prospect, a high-grade, small tonnage Pb-Zn-Ag SEDEX-style deposit. Several other companies (eg. Consolidated Gold Fields, Carpentaria Exploration, International Nickel) also explored for base metals during this time, carrying out extensive geological mapping, geophysical and geochemical programs. Some drilling was carried out to test some of the anomalies found, but little success was achieved.

During the late 1970's, Pacminex commenced exploration for MVT-style Pb-Zn mineralisation in the Cambrian Georgina Basin. Regional stream sediment sampling was carried out but no outstanding anomalies were identified. In the early 1980's, Shell and IMC Development Corp/AFL Holdings commenced base metal exploration in the region. Anomalous geochemical zones and geophysical targets were drill tested, but no significant intersections were encountered. Anomalous base metals were reported close to areas of Cambrian capping. During the same period, Dampier Resources (BHP) commenced exploration for base metals in the Proterozoic packages, and oil shale in bituminous limestone units of the Cambrian Currant Bush Limestone Formation. Eastern Copper Mines were also exploring for oil shale in the area. Drilling results downgraded the potential for oil reserves.

In the mid 1980's Ashton, in joint venture with several other companies, commenced exploration for diamonds. Regional bulk gravel and loam sampling located minor microdiamonds, but failed to locate any potential areas for kimberlite occurrences. This company also carried out exploration for gold. Magnetic surveys, stream sediment and soil sampling identified some gold anomalies, but drilling failed to intersect significant mineralisation. Western Mining Corporation carried out base metal exploration during this time but also failed to identify any mineralisation.

In the late 1980's to early 1990's, CRA Exploration began searching for MVT / Irish style Pb-Zn deposits in the Cambrian limestone units. Regional soil sampling located some anomalies but were interpreted to be coincident with lateritic occurrences. Queensland Octane and MIM also held tenements at that time.

MIM carried out extensive stream sediment sampling in the southern area of the Barkly Project. MIM followed up two stream anomalies with soil sampling (Whistler and Inca Creek Prospects). This was followed by some drill testing of the best anomaly (Inca Creek Prospect). Poor results were achieved and elevated base metals were only encountered at the Proterozoic/Cambrian unconformity, which appears to be a regional phenomenon. MIM also flew 75 Hz GEOTEM, aeromagnetics and radiometrics in this area (south of 7780000 N) but failed to locate any significant anomalies. MIM RAB drilled one minor, shallow EM anomaly but intersected carbonaceous clays near surface.

During the early 1990's, BHPM began exploration in the western regions of the Mount Isa Inlier for base metal deposits (SEDEX and Mt Isa Cu-style). BHPM held a number of tenements as part of their Lady Loretta Project, mainly to the east and south of the Barkly area. Soil, stream sediment and rock chip sampling was carried out over many tenements. GEOTEM (75Hz) was flown over some tenements and regional magnetic and radiometric data was assessed. Follow-up drilling at a number of anomalies failed to intersect any significant mineralisation. In 1993, Aberfoyle acquired tenements to the west of the Barkly area (Urandangi Project). The tenements were later joint-ventured with BHPM as part of the Urandangi JV Project. Airborne EM was flown over the Urandangi tenements (25 Hz GEOTEM) and several EM anomalies were tested with ground EM and drilling. Drilling failed to intersect any significant mineralisation.

In 1996, BHPM was granted seven tenements (EPM's 10893, 10950, 11099, 11133, 11136, 11168, and 11434) immediately east of the Urandangi JV Project and named this area the Barkly Project (all of these tenements have since been surrendered). BHPM carried out open file research work and documented all previous exploration work. During July 1997, Geotrex flew a 25 Hz GEOTEM airborne EM survey over the entire Barkly area.

## 6. CURRENT ACTIVITIES

As a result of Native Title access restrictions fieldwork was restricted to the last few months of the year.

AAEA approached the Kalkadoon people (Native Title Claim QC99/032(B)) to formulate an access agreement. AAEA had been a participating observer in the Kalkadoon Explorers Reference Group ("KERG") negotiations and had developed good rapport with the Kalkadoon people.

AAEA negotiated for almost 12 months to obtain an access agreement for EPM 13420.

### **Geophysics**

#### ***Introduction***

A TEM program was conducted over the Riverdilla tenement in NW QLD from the 14<sup>th</sup> October 2002 – 12<sup>th</sup> November 2002. 9.8Km of TEM was acquired over the Riverdilla EPM13420. The locations of the TEM lines are shown in Figure 1.

The aim of the TEM program was to identify bedrock conductors in a structural target area determined from aeromagnetic data interpretations.

Fugro Ground Geophysics (Fugro) was contracted to collect the TEM survey data. The survey configuration used a 200m-loop size and moves. All lines were collected with an In loop configuration. Fugro acquired the survey data using a ZT30 Transmitter, Smartem receiver and RVR sensor.

A frequency of 8.333 Hz was used, as the project area was strongly resistive. Due to the strong resistivity Sirotem composite window times were chosen to allow a range of early and late time information to be recorded.

#### ***Production***

For the duration of the TEM survey the Field crew was based in the AAEA Silvergate camp. Travel time from the camp to the survey area was short averaging approximately half an hour each way.

Fugro acquired the survey data with the Smartem Rx set up in the centre of the loop using the sync method until problems with the Fugro Smartem receiver required the Smartem to be used next to the Tx with the direct triggering method. The direct triggering method is associated with more noise than the syncing method of data collection due to the long cable required between the Rx and Sensor.

Although the data collected contains a moderate level of noise from both the survey geometry and the presence of cultural features. It is not expected that this amount of noise would be sufficient to mask any significantly conductive features.

### ***Data Processing***

The TEM data was acquired using a gain of 1.0 with each reading repeated at every station. The repeat stations were merged and this data is provided in Appendix 2. EM inversions were performed on the line data using Emax software. The Inversion data is provided in Appendix 2.

### ***Interpretation***

Lines 2000, 3000, 4000 and 5000 were designed to test a NE/SW trending structural corridor identified by AAEA geologists. The profile and inversion responses are shown in Appendix 1. There were no conductive responses identified on these lines.

## **7. CONCLUSION AND RECOMMENDATIONS**

TEM lines across the most favourable structural position produced no significant anomalies and can be considered to have tested for the conductive Riversliegh Siltstone, the most likely host to any significant base-metal mineralisation.

No further work was undertaken during the period 5<sup>th</sup> December 2002 to 13<sup>th</sup> June 2003.

A complete review of all data collected has been undertaken. AAEA believes there is no residual opportunity within the tenement for a large base metal deposit, therefore it is recommended that the tenement be relinquished.

# Appendix 1

## Geophysics – TEM

# Appendix 2

## Geophysics – EMAX

*Data on CD*