TECHNICAL REPORT

No. 1496

TITLE
EXPLORATION LICENCE No. 4746 "TWIN PEAKS" NORTHERN TERRITORY

ISSUING
DEPARTMENT
EXPLORATION

AUTHOR
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INVESTIGATIONS
CONDUCTED BY
C.E.C. DARWIN STAFF

SUBMITTED BY
A. D. MUNT

DATE
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EXPLORATION LICENCE No.4746 "TWIN PEAKS" NORTHERN TERRITORY

SECOND ANNUAL REPORT: YEAR ENDED JULY 1st, 1987

1. INTRODUCTION

Exploration Licence No. 4746 "Twin Peaks" is located about 150km south of Darwin, in the Northern Territory.

The licence was acquired principally to search for gold, with platinum group minerals as a secondary target. An extensive helicopter-borne stream sediment sampling programme was carried out over the whole E.L. during the first year, the results of which are given in the first annual report. Analysis of heavy mineral concentrates from streams draining restricted areas of basic and ultrabasic rocks did not show any PGM anomalies.

Anomalous cerium, lanthanum, titanium and other elements were found in streams in the western portion of the Licence, after examining a report by BHP of earlier work in the region. Some investigations were made of this area during the second year of tenure of EL 4746, but more work remains to be done. Discussions were held with another company with a view to arranging a farm-in to pursue the rare earth anomalies, but no agreement was reached.

2. LOCATION AND ACCESS

E.L.4746 is centred approximately 150km south of Darwin, N.T., on the south side of the Daly River, and can be reached from Darwin in about three hours drive. Within the Licence area itself, most parts have to be reached by driving across country. The Port Keats road and the north-south graded track into the Fletcher's Gully area, further to the south, provide initial access to most parts of the E.L.
3. TENURE

E.L.4746 initially covered 270 sq.km (84 blocks), and was applied for on January 23, 1985. It was granted on July 2, 1986. The expenditure commitment for the first and second years of tenure was set at $10,000 per annum.

At the end of the second year the area was halved, as required under the Mining Act. The area nominated for retention during the third year is shown on the included map.

No special conditions apply to the Licence.

4. GEOLOGY

The Licence area lies across the boundary between the Litchfield Complex and the Pine Creek Geosyncline.

The area retained for the third year of tenure lies mostly within the Litchfield Complex and contains scattered areas of Archaean or Early Proterozoic Hermit Creek Metamorphics, intruded by the Early Proterozoic Wangi Basic and (later) granites. The eastern half of the original Licence area contained Early Proterozoic Burrell Creek Formation (Pine Creek Geosyncline) with a wedge of Mulluk Mulluk volcanics in the north. The Giant's Reef Fault runs in a NNE direction through the region.

5. PREVIOUS EXPLORATION

The exploration work carried out by several companies prior to the current tenure by Mount Isa Mines is summarised in the first year's report, and will not be repeated here.

6. WORK BY CARPENTARIA EXPLORATION COMPANY Pty Ltd

An extensive helicopter borne stream sediment sampling survey was carried out in the first year, but no worthwhile anomalies were found, despite the following up of a number of gold (by bulk cyanide leach) anomalies and/or arsenic anomalies. Also in the first year, some concentrates from streams and gullies draining the basic and ultrabasic intrusions were assayed for platinum group elements, but without success.
MOUNT ISA MINES LIMITED

EXPLORATION LICENCE No. 4746 "TWIN PEAKS" N.T.

EL 4746
AREA TO BE RETAINED FOR THIRD YEAR (42 BLOCKS)

AREA TO BE RELINQUISHED AS FROM 2-7-87

14°00'

MAP SHOWING AREA OF E.L. 4746 TO BE RETAINED FOR THIRD YEAR.
During the second year, attention was focussed on the rare earth, titanium, uranium and other element anomalies occurring in the central part of the Licence area. These anomalies were first brought to notice from reading a report by BHP Minerals Limited, on diamond search within former EL 4070. Later analysis of samples collected by Carpentaria during the 1985 stream sediment survey confirmed the nature of the BHP results.

A tabulation of the analytical results of two samples from the two strongest anomalies is given on the following page of this report. The sample sites are approximately four kilometres apart, and their locations are shown on drawing no. 32580 in the first annual report. The area was investigated briefly by vehicle during the second year and bulk samples taken from site 472593. Two samples of this material were sent to Central Mineralogical Services in Adelaide for microscope examination and comment. The mineralogist's report on these samples is submitted as the appendix to this report. A ground search was made at the time these samples were collected, but no source was found.

Data tapes of the NTGS 1984 airborne magnetic and radiometric survey over the Daly River 1:100 000 scale sheet were purchased. Processing of the data was carried out by Image Processing Services in Brisbane, employing various pseudocolour presentations of the magnetics and the different radiometric channels, as a means of identifying regional structures and perhaps local sources related to the area of anomalous geochemistry. This work is continuing.

7. CONCLUDING COMMENTS

Further ground investigation is needed to find the cause of the geochemical anomalies in this Licence. Pegmatites in the local granite are a likely source, perhaps with contributions from other lithologies. It is planned to do the necessary fieldwork in the remaining part of the 1987 dry season.

P.G. Simpson
MOUNT ISA MINES LIMITED

EXPLORATION LICENCE NO.4746 "TWIN PEAKS"

STATEMENT OF EXPENDITURE FOR YEAR ENDED JULY 2, 1987

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<td><strong>TOTAL - THIS PERIOD</strong></td>
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Previously Reported Year Ended July 2, 1986  
$46,651

Total Project Expenditure to Date  
$56,379

A.E. Covacich  
Administration Superintendent
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<th>Element</th>
<th>472203 (NORTH)</th>
<th>472593 (SOUTH)</th>
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<td>Fe</td>
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<td>Au</td>
<td>0.2 ppb</td>
<td>1.1 ppb (Bulk cyanide leach)</td>
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Central Mineralogical Services

Mr. P. Simpson
Carpentaria Exploration Co. Pty. Ltd.
P.O. Box 21
BERRIMAH / N.T. 5788

29th August, 1986

REPORT CMS 86/8/12

YOUR REFERENCE: QP 33638
Letter dated 18.8.1986

DATE RECEIVED: 20th August, 1986

SAMPLE NOS.: QP 33638 QP 33639

SUBMITTED BY: P. Simpson

WORK REQUESTED: Mineralogy

H.W. Fander, M. Sc.
SAMPLE REPORT (Mineralogy, Petrology, Ore Microscopy)

Job No. CMS 86/8/12 Date Received: 20.8.1986
Reference QP 33638
Sample No. QP 33638, QP 33639
Nature of Sample: 

a. Hand Specimen:

b. Microscopic:
QP 33638

This was screened on 18 mesh (850 μ); the -18 # fraction was separated in TBE (S.G. = 2.95) to produce a heavy mineral fraction (3.95 %) which was examined. The +18 # fraction was scanned under a stereobinocular microscope.

The -18 mesh heavy fraction consists dominantly of ilmenite, subordinate garnet (almandine), very minor monazite and sillimanite, and a trace of rutile.

The +18 mesh material consists of quartz, a few fragments of granitoid rocks, quartz-feldspar-mica gneisses (occasionally with sillimanite), rare graphic quartz-feldspar, and abundant pisolitic goethite. No unusual rock types or minerals were detected, but this method of examination is necessarily fairly superficial. The goethite undoubtedly carries the anomalous base metal values.

QP 33639

A heavy-liquid separation was carried out and yielded a concentrate comprising 22.6 % of the sample. This consisted dominantly of ilmenite, with conspicuous (10-15 %) monazite, minor garnet, sillimanite, and traces of rutile and zircon. The paucity of zircon in both samples is unusual; it may have been lost in fine material.

The monazite, though abraded, has retained some crystal faces, suggesting that its source was fairly close-by, since it is easily abraded; this applies to some extent to the ilmenite also.

H.W. Fander, M. Sc.