

FINAL REPORT
ON
EXPLORATION ACTIVITIES
EL 2084
TENNANT CREEK, NORTHERN TERRITORY

OPEN FILE

K. McPhee
December, 1981.

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1.0 INTRODUCTION

1.1 LOCATION

Exploration activity undertaken by MPAL and its Joint Venture partners has been on Licences within the Tennant Creek 1:250,000 sheet area bounded by latitudes 19°S and 20°S and longitudes 133°30'E and 135°E (Fig 1-1).

The township of Tennant Creek (population 3000) is located 500 km north of Alice Springs and 1000 km south of Darwin.

1.2 LAND TITLE

Exploration Licence 2084 was granted to Australian Ores and Minerals Ltd. on July 25, 1979. The initial area granted was 74.20 square kilometres however relinquishments under the terms of the Mining Act have reduced this to the current area of 35.49 square kilometres. This Licence was applied for to cover portion relinquished from EL 1389.

During 1979-81 MPAL carried out exploration on behalf of AOM under the terms of a Joint Venture that received Ministerial approval on December 13, 1978.

1.3 REGIONAL GEOLOGY AND MINERALIZATION

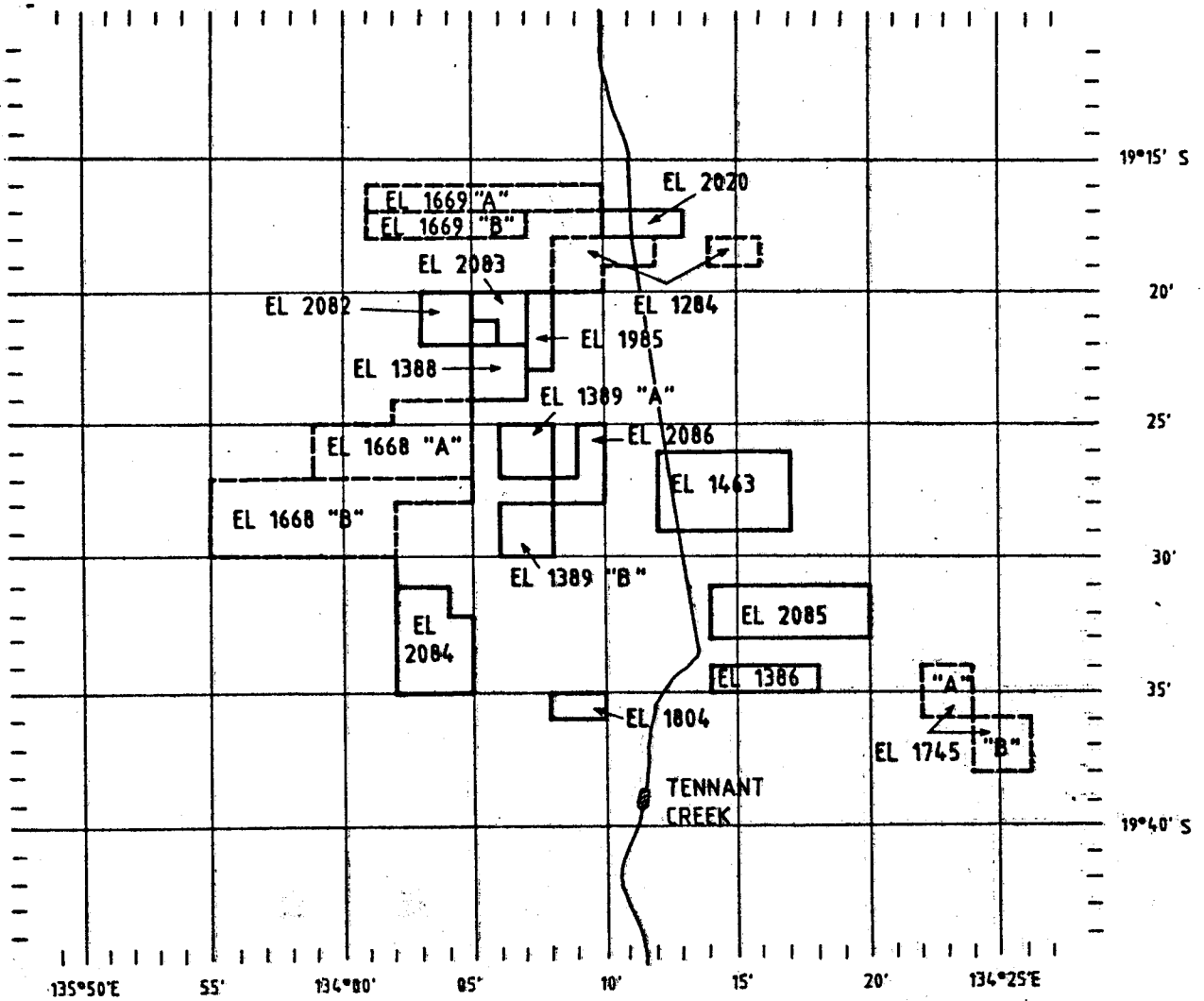
Comprehensive reviews of the geology are given by many authors including Crohn (1965), Large (1975) and Black (1977).

The Early Proterozoic Warramunga Group forms a large portion of the Tennant Creek Block. It has been subdivided into:-

the Whippet Formation, a sequence of shallow water quartzose sandstones;

the Bernborough Formation, a series of rhyolitic extrusives and intrusives; and

the Carraman Formation, consisting of shale, lithic sandstone and local tuff levels. The Carraman Formation hosts all the known mineralization in the area.



LEGEND

- MPAL-AOM Participation
- - - MPAL-UAL Participation

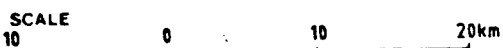
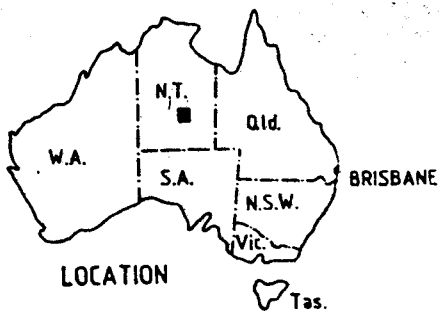


FIGURE I-1
MARATHON PETROLEUM AUSTRALIA, LTD.
 BRISBANE AUSTRALIA
 Tennant Creek Northern Territory

TENNANT CREEK PROJECT
TENEMENT SITUATION TO DEC. '81

Drawn by J. Andrews

Plan No. C1 G2

Date Nov. '81

[REDACTED]

Carpentarian shallow water sediments of the Hatches Creek Group in the south and Tomkinson Creek Beds to the north unconformably overlie the Warramunga Group.

Mineralization in the Carraman Formation consists primarily of gold-copper-bismuth assemblages hosted in "ironstones", a local term used to describe the hematite + magnetite + quartz + chlorite gangue mineralogy. The major orebodies mined to date are described as pipe-like or pod-like in form.

2.0 WORK UNDERTAKEN

Work undertaken by MPAL on EL 2084 has included a photogeological study, an evaluation of available geophysical data, geological mapping, a geochemical study, a sedimentological study and rotary percussion drilling.

In 1978 Marathon Petroleum Australia, Ltd. commissioned Loxton, Hunting and Associates to undertake a photogeological study of part of the Tennant Creek area. This study covered the area under title as EL 2084.

In 1979 R.K. Jones of Loxton, Hunting and Associates undertook an evaluation and interpretation of the aeromagnetic and airborne spectrometer data available for EL 2084. This data was obtained in 1978 when Geometrics Inc., on behalf of Australian Ores and Minerals Ltd., flew a low-level airborne magnetic and spectrometer survey over portion of the Tennant Creek area (and therefore included EL 2084). The southern portion of EL 2084 covers an area of high total magnetic intensity that can be seen to belong to an elongate zone some 70km x 12km. It is within this magnetic zone (and probably a sub-basin within the Tennant Creek 'basin') that much of the economic mineralization has been discovered.

Work by Jones (1980) led to the selection of one aeromagnetic target within EL 2084. This was drill tested by one profile of five holes aggregating 243 metres. No lithological explanation can be offered for the magnetic feature.

A sedimentological study of the Tennant Creek area was commenced in early 1980 and investigations continued until late 1981. The southern portion of the Licence is inferred to be part of a sub-basin within the Tennant Creek 'basin' and sedimentation in this area appears to have taken place on the mid- and lower-fan facies of a turbidite sequence. The facies in the northern portion of the Licence area is predominantly pelitic with fine grained arenaceous interbeds.

In mid-1980 a "base of slope" geochemical sampling programme collected composite rubble samples from breaks in topographic depressions along both sides of ridges near the Ivanhoe Mine turnoff. In August 1980, Rockdril Contractors Pty. Ltd. of Brisbane drilled a profile of fourteen holes aggregating

722 metres in a profile across an area of no outcrop.

No active field work was undertaken during 1981 however a re-evaluation of all the available data was completed.

Details of all phases of exploration undertaken by Marathon Petroleum Australia, Ltd. are available from the company office in Brisbane or the files of the NTDME in Darwin (see attached list of references).

3.0

EXPENDITURES

A total of \$31,444.93 has been expended on EL 2084 as a direct exploration cost from 01/01/79 to 31/12/81.

A tabulation of these expenses appears as Table 3-1.

TABLE 3-1
STATEMENT OF EXPENDITURE
EL 2084 IVANHOE
FOR PERIOD 01.01.79 TO 31.12.81

	\$
SALARIES	1,761.81
GENERAL BUSINESS EXPENSES	400.72
CAR RENTAL EXPENSES	597.02
COMMERCIAL TRANSPORTATION	307.59
OFFICE SUPPLIES	81.57
DRAFTING SUPPLIES	13.00
COMMUNICATIONS	113.48
GEOLOGICAL SERVICES	128.77
AUTOMOTIVE EXPENSES	301.05
FIXED WING AVIATION EXPENSES	206.50
HELICOPTER AVIATION EXPENSES	395.79
MISCELLANEOUS	9.00
TECHNICAL INFORMATION	345.75
CONTRACT SERVICES	414.58
OUTSIDE REPRODUCTION	229.00
FREIGHT	481.49
DENVER RESEARCH CENTRE	33.00
ROADS & SITES	151.20
CAMP COSTS	92.30
MATERIALS & SUPPLIES	618.12
EQUIPMENT EXPENSES & RENTALS	221.80
CAMP FOOD	333.27
CAMP SHELTER	459.00
CAMP EQUIPMENT & SUPPLIES	292.29
CAMP FUEL	24.00
CONTRACT GEOLOGICAL	2,219.75
CONTRACT GEOCHEMICAL	171.50
GEOCHEMICAL ANALYSIS	1,843.47
GEOPHYSICAL CONSULTING	171.43
GRAVITY SURVEYS	526.00
CONTRACT DRILLING	15,738.16
EQUIPMENT RENTAL	19.00
ACCRUED COSTS	1,450.00
ADMINISTRATIVE SERVICES	<u>1,293.52</u>
TOTAL EXPENDITURE	<u>31,444.93</u>

REFERENCES

Listed below are the relevant reports compiled by MPAL geologists outlining, in detail, the work and results from exploration within EL 2084:-

- McPHEE, K.A. (1980) "Annual Report of Exploration Activities within EL's 2082, 2083, 2084, 2085 and 2086 in the Tennant Creek Area, Northern Territory: for the period 25th July, 1979 to 24th July, 1980"; unpubl. report by MPAL to NTDME.
- McPHEE, K.A. (1981) "Annual Report on Exploration Activities for Exploration Licence 2084 Tennant Creek: for period July 25, 1980 to June 19, 1981"; unpubl. report by MPAL to NTDME.