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OUTOKUMPU EXPLORATION AUSTRALIA PTY LIMITED

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ANNUAL REPORT TO 20 JULY, 1990
EL 14/85 - MT CATTLEY
Summary of Results and Interpretations
1989-90 Exploration Programme

For: Outokumpu Exploration Australia Pty Limited
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1. INTRODUCTION

Exploration Licence 14/85, Mt Cattley, covering 47 sq km (recently amended to 50 sq km) was granted to Pancontinental Mining Limited on 20 August 1985 and has been renewed by the Outokumpu Exploration Pty Limited/ Pancontinental Mining Limited Joint Venture.

This report covers exploration undertaken and results obtained on EL 14/85 during the twelve months to 20 July 1990.

2. WORK COMPLETED

An agreement was made in August 1989 between the Tasmanian Department of Mines (now Resources & Energy) and the Outokumpu/Pancontinental Joint Venture as part of the Department's sub-Tertiary basalt drilling programme, which has been designed to improve the stratigraphic and structural interpretation and exploration significance of andesitic-basaltic volcanics previously intersected by the Joint Venturer's drilling between Middlesex and Beecroft Roads. The Department agreed to drill a deep stratigraphic hole through the volcanics and the Joint Venturers agreed to fund the supervision, logging, assaying and the downhole geophysics of the hole.

During September, 1989, the Department of Resources & Energy drilled an inclined percussion/diamond hole near the previous drillhole MCPD-1, for the purpose of obtaining oriented core (from the greywacke-siltstone unit previously intersected in MCPD-1) to elucidate the basement structure and assist in siting of a deep stratigraphic hole. This first hole was collared on grid line 12000N about 40m east of MCPD-1, inclined at 70 deg. to the west and drilled to a depth of about 140m. It intersected an exactly similar sequence to that of MCPD-1 and confirmed that:

- * amygdaloidal andesites, megascopically similar to those of MCPD-2, overlie the greywacke siltstone unit here,
- * sedimentary layering in the greywacke-siltstone unit is upright and dips at about 40 deg. to the south east.

On the basis of the southeasterly dip at MCPD-1 and the southwesterly dip of the sequence intersected by MCDD-4 it was interpreted that these holes were located on opposite limbs of a SSW plunging synclinal structure with the axis trending approximately through MCPD-2 and possibly continuous with that running along the Leven River north of North Cobbers Road.

The andesite/greywacke contact at MCPD-1 was taken to be the base of the mafic volcanics which were thus interpreted to be restricted to a tight crescent shaped area to the south (Figure 2).

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Accordingly, Messrs. Corbett and Pemberton of the Department decided to collar the deep stratigraphic hole at 399600E / 5404600N (AMG) and drill a steeply inclined hole in a NNE direction. This siting was finalised in October 1989 but due to drill equipment and personnel priorities the hole was not collared until March 1990. The hole was advanced to about 80m by open hole percussion drilling.

Coring was commenced in late April and by the second week in May had penetrated the base of the Tertiary basalt at 184.6m downhole. The depth of the hole is currently at 565m and progressing in good ground conditions although cold weather has caused some delays. The rig in use is a Longyear 38 and estimated to be of adequate power for about 850m depth.

The core has been logged to a depth of 416.5m (on 6/6/90) and information since then has come, via the Department, from Andrew McNeill of Aberfoyle Exploration, who is also monitoring the progress of the hole.

A summary Geological Log of the hole to date is as follows:

Collar co-ords: AMG 399600E, 5404600N (approx)

Azimuth: 035 deg.(T) Inclination: -70 deg.

| | |
|---------------|---|
| 0 - 184.6m | Tertiary basalt and associated breccias |
| 184.6 - 225.2 | Interbedded greywacke and siltstone |
| 225.2 - 292.4 | Dolerite |
| 292.4 - 301.5 | Pumiceous felsic epiclastic breccia |
| 301.5 - 305.0 | Mixed felsic epiclastic and black shale |
| 305.0 - 352.6 | Black shale |
| 352.6 - 355.5 | Felsic/mafic lithic epiclastic breccia |
| 355.5 - 565 ? | Pillowed amygdaloidal basalt |

A single core orientation survey taken at 214.5m has indicated that the bedding is upright and dipping at about 40 deg. to the southwest.

3. GEOLOGICAL INTERPRETATION

The sequence intersected thus far bears a close resemblance, sequentially and megascopically (according to McNeill, op cit) to the hanging wall sequence overlying the Que River and Hellyer deposit host rocks.

The ~50m thick black shale unit is uniformly black, variably massive to thinly laminated and is generally weakly pyritic at about 2% Py ranging up to 5% Py near the upper and lower contacts. It is considered likely to be a correlate of the "Que River Shale".

The dolerite may be akin to the dolerites (of uncertain age but possibly magmatically related to the Que-Hellyer basalts and andesites) which intrude the Que River Shale in several places in the Hellyer - Mt Charter area.

The underlying basalt is variably pale grey to dark greenish grey, generally fine grained and conspicuously amygdaloidal, locally brecciated by late stage hydraulic brecciation and commonly pillowed with thin interpillow zones of dark, pyritic cherty sediment. In general, the basalt does not appear to be strongly altered. The basalt is likely to be a correlate of the "Upper basalts and andesites" of the Que-Hellyer volcanics.

4. CONCLUSIONS

In the Hellyer-Charter area the upper basalts are of the order of 90-220m, and locally up to 300m thick. If the thicknesses are comparable here, one would anticipate intersecting the position of the ore deposit hosting "mixed sequence" at no greater than ~650m downhole (Figure 3).

The sub basalt surface traces of the black shale and "lower andesite"/greywacke contact shown on Figure 2 are speculative and the structural picture is poorly constrained. Nevertheless, preliminary inferences may be drawn as follows:

1. There appears to be potential for several kilometres of strike length of sub Tertiary basalt trace of the Que-Hellyer volcanics within this south western part of EL 14/85.
2. Approximately two thirds of this strike potential has already been covered by the 1987 EM-37 survey.
3. The EM-37 survey also covered most of the inferred trace of the 50m thick black shale unit and one would expect a response from it. It is worthwhile, on the basis of this new information to review the data of the previous EM surveys to determine if any anomalies can be resolved over the inferred traces of the black shale and (hypothetical) "mixed sequence". If none exist, we should attempt to resolve the question of why the black shale did not give an EM response.
4. The interpretation portrayed in Figures 2 and 3 implies that MCDD-4 is in the footwall to the mafic volcanics in a position equivalent to the Animal Creek Greywacke of the Hellyer-Charter area; recent conversations with J.Pemberton have revealed that this unit (in the Hellyer-Charter area) locally contains considerable felsic tuffaceous members and even lavas. Although Pemberton's previous interpretation was that rocks in MCDD-4, SBDP-14 on Beecroft Road and the felsic sequence between the Leven River and Cattley Range were all correlates of the Southwell Subgroup (which overlies the Que River Shale), this is now in doubt. The rocks in SBDP-14 and at Two Hummocks may in fact be equivalents of the Central Volcanic Complex (which underlies the Animal Creek Greywacke) but to date Pemberton has been cautious about this and has referred to them as "the felsic part of the Animal Creek Greywacke". The possibility of a Henty type (west side over) steep reverse fault, trending approximately along the Leven River, remains credible.

5. EXPENDITURE

| | |
|---------------------------|-----------------|
| CONSULTANTS - Geological | \$1620 |
| CONSULTANTS - Geophysical | \$4978 |
| CONTRACTORS - Assaying | \$1135 |
| Technical | \$406 |
| Overheads | \$780 |
| Administration | <u>\$2211</u> |
| TOTAL | <u>\$11,130</u> |

The Joint Venturers have been awaiting completion of the Department's drilling, which was delayed during 1990. An estimated \$15,000 will be spent on the project in 1990, following the completion of drilling.

6. PROPOSED PROGRAMME

Detailed geophysical, petrophysical and geochemical studies of the drill core will be carried out by the Joint Venturers upon completion of the diamond drilling.

Downhole EM will be completed on the drill hole.

Reinterpretation of the previous EM-37 data will be carried out and consideration given to drilling the shallow EM targets if warranted.

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M. A.S.L.

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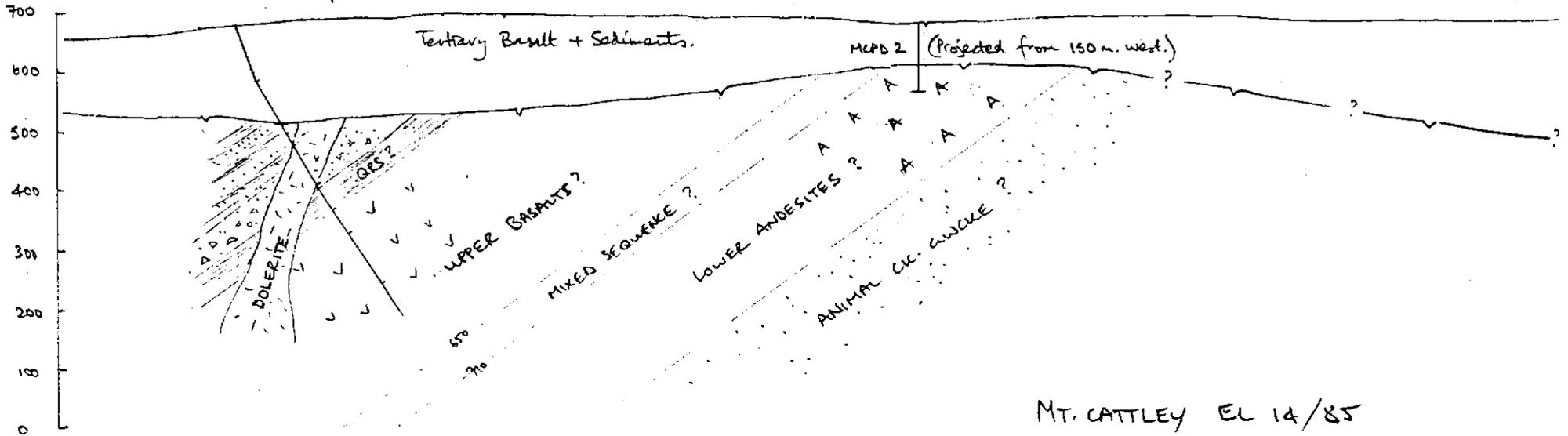
NNE

MIDDLESEX ROAD STRATIGRAPHIC HOLE
391600E/5404600N

11000 N / ~ 10240 E

12000 N

13000 N



Mt. CATTLEY EL 14/85

GEOLOGICAL SECTION

MIDDLESEX ROAD STRATIGRAPHIC HOLE

SCALE 1:10000

Section Azimuth ~ 020°. (T)

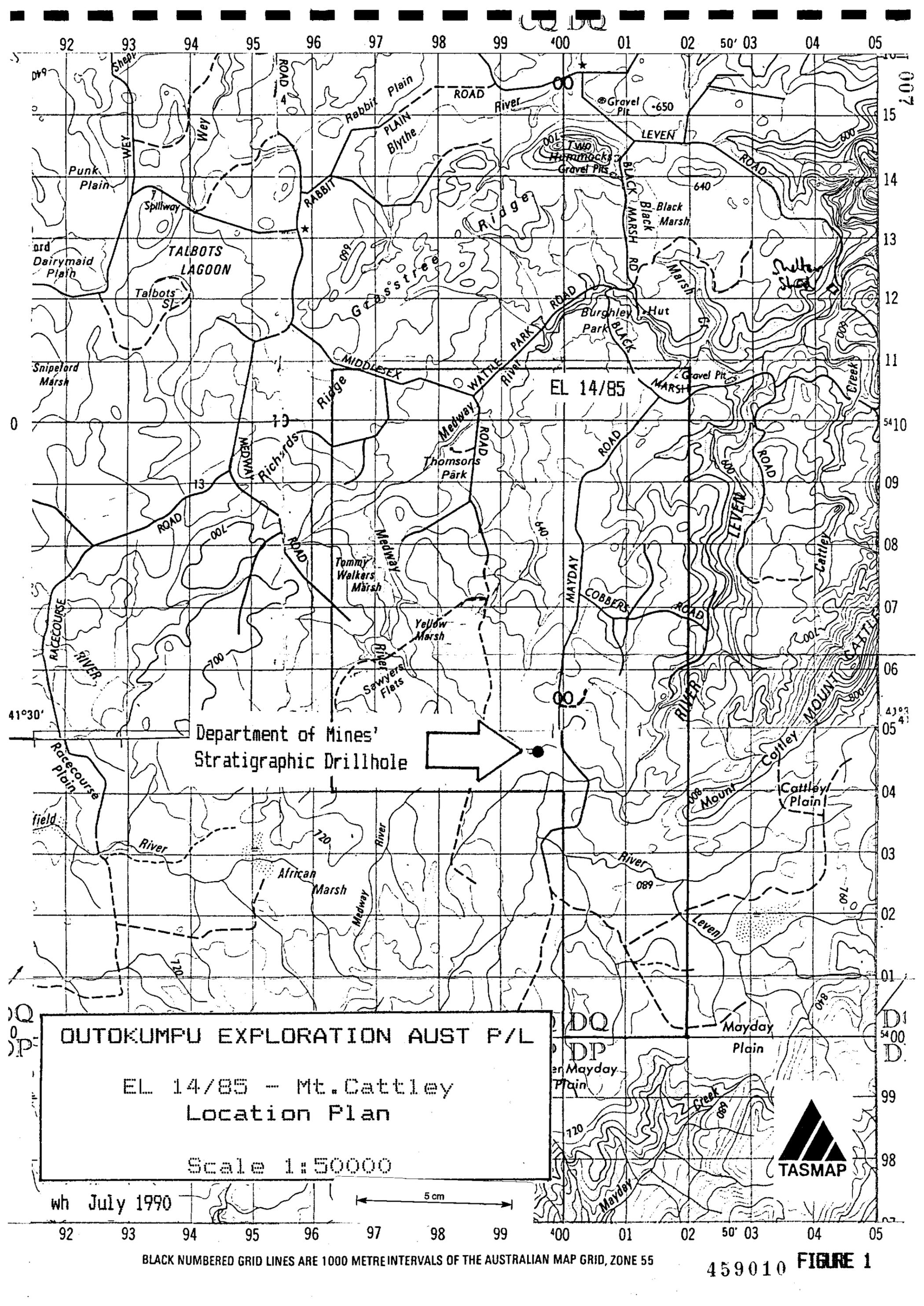
W. HERRMANN

13 July 1990.

FIGURE 3

5 cm

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OUTOKUMPU EXPLORATION AUST P/L

EL. 14/85 - Mt. Cattley
Location Plan

Scale 1:50000

wh July 1990

5 cm



BLACK NUMBERED GRID LINES ARE 1000 METRE INTERVALS OF THE AUSTRALIAN MAP GRID, ZONE 55

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