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CRA EXPLORATION PTY.LIMITED.



OLDINA E.L. 44/82

# EXPLORATION REPORT FOR THE YEAR ENDING 19TH AUGUST, 1984.

## FIRST AND FINAL REPORT



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CONTENTS

## INTRODUCTION

EL 44/82 covers an area of 397sqr km in north west Tasmania, and the eastern boundary of the area is situated 8km west of Burnie. Access to the area is via the Bass and Murchison Highways, and numerous other roads linking Preolenna, Calder, West Takona, Henrietta, Oldina, Mt. Hicks, Yolla and West Ridgley.

The main physiographic feature of the region is a coastal surface dissected by the north flowing Jessie, Inglis, Calder and Cam rivers, whcih in many places have exposed the Parmeener Super Group rocks beneath the younger cover of Tertiary age basalt and sediments.

The area covered by EL 44/82 is almost entirely within the Burnie 1:63 360 scale geological sheet published by the Geological Survey of Tasmanaia, and the western boundary of EL 44/82 adjoins EL 43/70 held by Mineral Holdings Aust. P/L.

Field activities in the EL considered of reconnaissance traverses along public roads, mainly in the western portion of the area.

## EXPLORATION OBJECTIVES

CRAE Pty. Ltd. require a black coal deposit with the following characteristics:

1. An in situ resource of 50 million tonnes;

2. Individual coal seam widths of $\geq$ 1.0m;

3. A depth of overburden sufficiently thin to allow extraction by open pit methods of mining. In effect this means a maximum overburden thickness of $\ll$ 50m.

# COAL POTENTIAL

## A. LOWER MARINE SEQUENCE OF THE PARMEENER SUPER GROUP

### 1. Distribution and Lithologies

The Lower Marine Sequence in the area consists of the Wynyard Tillite, and the Inglis Siltstone.

The Wynyard Tillite is a 250m thick unit of tillite with subordinate sandstone and laminated siltstone/claystone (rhythmites). Immediately south of EL 44/82, Gulline (in Gee 1977), variously described coal or carbonaceous fragments in one of the sandstones associated with rhythmites in the Arthur River.

Within the area of EL 44/82, Gee (1977) recorded several sandstone and rhythmite localities between the Inglis River and Mt. Hicks, (ref. Fig. 1.) At the locality 1.5km south/west of Calder, a rhythmite sequence was seen to consist of laminated siltstone interbedded with a pebbly quartz sandstone.

Further north, at a previously unmapped locality (837 518) near the junction of the West Calder and Zig Zag roads, an interbedded rhythmite and pebbly mudstone (?tillite) sequence was seen in fault contact with a sequence of quartz feldspathic (variably sub lithic) sandstone, and bioturbated pebbly siltstone.

### 2. Coal Potential

All rhythmite and sandstone localities examines were characterised by a lack of lutites, lack of plant fossils, and an absence of carbonaceous or coaly debris.

Although oxidation may account for the absence of coaly debris, the limited duration glacio-fluvial and glacio-lacustrine conditions that existed are considered to have had a low potential to promote the growth of vegetable matter in sufficient volume to produce coal deposits of economic interest.

## B. LOWER FRESHWATER SEQUENCE OF THE PARMEENER SUPER GROUP

### 1. Distribution and Lithologies

The Lower Freshwater Sequence is represented in the Preolenna area by the Preolenna Coal Measures, which crop out in EL 43/70, as shown inFigure 1, (after Gee 1977).

Although the Oldina - Henrietta - Yolla - West Ridgely - Mt. Hicks - Elliott area in the central and eastern parts of the EL are covered by Tertiary basalt, evidence provided by the regional mapping (Gee 1977) and water bore logs (W.L. Matthews, pers. comm.), suggest the above area is underlain by either Precambrian basement, or the basal marine units of the Parmeener Super Group.

The Preolenna Coal Measures were described in detail by Hills (1913), and consist of interbedded quartz/micaceous/carbonaceous sandstone and carbonaceous siltstone, with minor shales and coal seams. The recorded thickness is 65m (Gee 1977), but it may be $\leq$ 140m thick.

### 2. Coal Potential

The salient features of the Lower Freshwater Sequence (LFW) are contained in the Appendix, and the major factors bearing on the coal potential are:

(a) Thickness of the LFW Sequence

(b) Thickness of the contained lutites

(c) The nature and size of the faunizone hiatus

(d) The inferred palaeogeography.

As mentioned previously, the Preolenna Coal Measures may be $<$ 140m thick, with an estimated shale thickness of $>$ 3m; Hills (1913) recorded four coal seams, ranging from 0.47m to $>$ 1.07m in width, with a cumulative width of 2.86m. The coal is sapropelic and contains lenses of oil shale; it is characterised by high volatiles and low ash, and further details are given in the Appendix.

Coal also occurs just outside EL 44/82 in the Relapse Sandstone, where McNeil (1961) and Hughes (1962) reported coal in Relapse Creek at 370 400E, 5441 700N, and 371 800E, 5441 800N respectively. Analysis of this coal suggests it is part of the Preolenna Coal Measures.

EL 44/82 lies within the prospective faunizone 1 - 8 hiatus, and the inferred palaeogeography of the area includes lagoons and embayments associated with a delta plain environment.

The Preolenna Coal Measures represent the most significant development of coal and oil shale known in the LFW Sequence, and they are inferred to occur beneath Tertiary basalt (after Gee 1977) in two localities along the western margin of the EL, as shown in Figure 1.

The northern locality surrounds Preolenna and is $\simeq$ 3sqr km in extent, while the southern locality near West Takone is $\simeq$ 6sqr km in extent.

If it is assumed that the four coal seams merge to a single seam 2.5m thick

(with RD of 1.3), the in situ coal resources would be ≒ 10 million and ≒ 20 million tonnes in the northern and southern areas respectively.

Alternatively, an in situ resource of 50 million tonnes would require respective seam widths of 12.8 and 6.4m for the two localities.

Consequently, irrespective of overburden thickness considerations, because the probability of either a 6.4 or a 12.8m coal seam occuring in these areas is very low, the most likely in situ coal resource in the Preolenna area is ≒ 10 million tonnes, and in the West Takone area ≒ 20 million tonnes. Both values are appreciably less than the objective tonneage.

## C. UPPER FRESHWATER SEQUENCE OF THE PARMEENER SUPER GROUP

### 1. Distribution and Lithologies

The UFW Sequence in the Preolenna area is represented by the Flowerdale Sandstone, which Bravo (in Gee, 1977) suggested was ≒ 200m thick, consisting of two units:

(a) A lower unit, ≪ 50m thick, of fine grained quartz sandstone(micaceous) with minor siltstone;

(b) An upper unit, ≫ 150m thick, of coarse grained quartz sandstone.

The lower unit indirectly overlies an unnamed portion of the Upper Marine Sequence, and would appear to be the litho correlate of the Permian age Cygnet Coal Measures, while the upper unit may be the litho correlate of the Triassic

age Ross Sandstone.

A small area of Flowerdale Sandstone crops out in the west of EL 44/82 (Figure 2).

## 2. Coal Potential

The lower unit contains two coal seams of average width 0.31m and 0.46m, characterised by 2.3% moisture, 20.5% volatiles, 49.3% fixed carbon, and 27.7% ash.

The Flowerdale Sandstone is inferred to lie beneath Tertiary age basalt near Preolenna (after Gee 1977), of which ≒ 1 sqr km occurs within EL 44/82 (Figure 1).

If it is assumed that either or both seams attain a width of 1m near Preolenna, the in situ coal resource present (RD of 1.5) would be ≒1.5 million tonnes.

Variation of seam thickness to meet the required tonneage results in an unrealistic value.

The upper unit (?Ross Sandstone lithocorrelate ) would appear to have a zero coal potential.

## CONCLUSIONS AND RECOMMENDATIONS

1. Lower Marine Sequence rocks have a zero potential for the coal target as defined.

2. Lower Freshwater Sequence rocks, if present in EL 44/82, have a good coal potential; however, the objective coal tonneage cannot be realistically anticipated in view of the inferred extent of the host rocks.

3. Upper Freshwater Sequence rocks of ?Permian age, if present in EL 44/82, have a moderate coal potential, but the chance of required coal tonneage being present is unlikely.

4. Upper Freshwater Sequence rocks of ?Triassic age, if present in EL 44/82, have a zero coal potential.

5. Within the context of the exploration objectives, it is recommended that EL 44/82 be relinquished.

References

Gee, R.D., 1977: Burnie, Explan. Rep. Geol. Surv. Tas.

Hills, C.L., 1913: The Preolenna Coalfield and the Geology of the Wynyard District. Geol. Surv. Tas. Bull. 13.

Hughes, T.D., 1962: Coal at West Takone. Dept Mines Tas. Tech. Rep. 6.

McNeil, R.D., 1961: Geological reconnaissance of part of the Arthur River area; Dept Mines Tas., Tech. Rep. 5.

## 6. KEYWORDS

Coal-Sub-bituminous, Permian, Reconnaissance

## 7. LOCATION

Burnie SK55-3

## 8. LIST OF PLANS

| | | |
|---|---|---|
| 1. | Oldina EL 44/82 Distribution of Lower Freshwater Sequence Permeener Super Group | TASh 1793 |
| 2. | Oldina EL 44/82 Distribution of Upper Freshwater Sequence Permeener Super Group | TASh 1794 |

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TERTIARY BASALT, MINOR SAND / GRAVEL

JURASSIC DOLERITE

PARMEENER SUPER GROUP

LOWER FRESHWATER SEQUENCE - BENEATH UPPER MARINE AND UPPER FRESHWATER SEQUENCE

LOWER FRESHWATER SEQUENCE - AS ABOVE, AND/OR JURASSIC DOLERITE AND TERTIARY BASALT

LOWER MARINE SEQUENCE ( Ⓡ = RHYTHMITE )

PRECAMBRIAN METASEDIMENTARY ROCKS

OUTCROP BOUNDARY - POSITION APPROXIMATE

SUBCROP BOUNDARY - POSITION INFERRED

F —— F FAULT - POSITION APPROXIMATE

F — — F FAULT - POSITION INFERRED

5 cm

WYNYARD

BASS HIGHWAY

SOMERSET

Mt. Hicks

FLOWERDALE RIVER

INGLIS RIVER

CALDER

BREOLENNA

INGLIS

CALDER

OLDINA

HIGHWAY

ELLIOT

CAM RIVER

MURCHISON RIVER

YOLLA

WEST RIDGLEY

JESSIE RIVER

HENRIETTA

TAKONE

WEST TAKONE

HIGHCLERE

OONAH

5 460 000 mN

5 450 000 mN

5 440 000 mN

370 000 mE

380 000 mE

390 000 mE

400 000 mE

COMPILATION BY T.G. SUMMONS, JUNE 1984.
MODIFIED FROM R.D. GEE, 1977 ( BURNIE SHEET ).

( Figure 1 )

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OLDINA E.L. 44/82
DISTRIBUTION OF
LOWER FRESHWATER SEQUENCE
PARMEENER SUPER GROUP

| | | | |
|---|---|---|---|
| REF. | SK55 - 3 | | |
| SCALE | 1 : 100.000 | DRAWN | R.T. |
| AUTHOR | T.G.S. | REPORT No. | 12769 |
| DATE | 29 - 6 - 1984 | PLAN No. TASh | 1793 |

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TERTIARY BASALT, MINOR SAND / GRAVEL

JURASSIC DOLERITE

UPPER FRESHWATER SEQUENCE - OUTCROP

UPPER FRESHWATER SEQUENCE - BENEATH JURASSIC DOLERITE, AND/OR TERTIARY BASALT.

LOWER MARINE SEQUENCE ( R = RHYTHMITE )

PRECAMBRIAN METASEDIMENTARY ROCKS

OUTCROP BOUNDARY - POSITION APPROXIMATE

SUBCROP BOUNDARY - POSITION INFERRED

F — F FAULT - POSITION APPROXIMATE

F — — F FAULT - POSITION INFERRED

5 cm

WYNYARD

BASS HIGHWAY

SOMERSET

5 460 000 mN

5 450 000 mN

5 440 000 mN

370 000 mE

380 000 mE

390 000 mE

400 000 mE

FLOWERDALE RIVER

INGLIS RIVER

CALDER RIVER

JESSIE RIVER

HURDISON RIVER

CAM RIVER

PREOLENNA

CALDER

OLDINA

Mt. Hicks

ELLIOT

YOLLA

WEST RIDGLEY

HENRIETTA

TAKONE

WEST TAKONE

OONAH

HIGHCLERE

COMPILATION BY T.G. SUMMONS, JUNE 1984.
MODIFIED FROM R.D. GEE, 1977 ( BURNIE SHEET ).

( Figure 2 )

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**OLDINA E.L. 44/82**
**DISTRIBUTION OF**
**UPPER FRESHWATER SEQUENCE**
**PARMEENER SUPER GROUP**

| | | | |
|---|---|---|---|
| REF. | SK55 - 3 | | |
| SCALE | 1 : 100.000 | DRAWN | R.T. |
| AUTHOR | T.G.S. | REPORT No. | 12769 |
| DATE | 29 - 6 - 1984 | PLAN No. TASh | 1794 |