Report for Boss Energy on Dinsdales Hill (Area 2 -3) Shallow Resource Areas EL 20/2004

Mike Blake, September 2009

Executive Summary

The following review of shallow resources around Dinsdales Hill (Areas 2 North, Area 2 South, and Area 3 locality of EL20/2004 shows that the potential for expansion of these resources is restricted to 100, 000 tonnes of open-cuttable oil shale at Area 2 North, and less than 50, 000 tonnes at Area 3. The occurrence of shallow oil shale in the resource areas is tightly constrained by topography,geology and previous drilling. Further increases of shallow resources is unlikely. A suggested work program consists of a study of the impact of the underground workings of the Goliath Shale Mine on the Area 2 North shallow resource, and follow up with drilling if warranted.

Introduction

Recently a review has begun of shallow resources across the Latrobe tenement. The intent is to bring Boss Energy's understanding of shale assets up to date, identify any areas of shale potential previously overlooked, and recommend ongoing work programs. The Dinsdales Hill area, shown in Figure 1, is examined here and contains Areas 2 and 3, mentioned in previous work and resource estimations. This document is focused on shallow resources with open cut potential, and does not consider deep resources in these areas. It can be assumed therefore, that deep resources remain unchanged unless some of those resources are shown to be shallow.

Previous resource estimate

Previous resource estimates for areas 2 and 3, to the east and west of the Mersey respectively are shown below in Table 1, taken from Clementson, 1982.
The corresponding area is referred to as West Mersey - Area 3, East Mersey - Area 2 north, and East Mersey - Area 2 South, shown in figures 1 and 5. Calculations were presented as 'order of magnitude' geologically indicated resource potential. Within the framework of The Australian Standard for Coal Resource Assessment, this calculation would fall into the category of inferred inventory coal. Resources quoted by CRAE for all of Area 1 are shown in Table 1 below.

Table 1. CRAE resource figures for Areas 2 and 3.

Locality	**Av Thickness(m)**	**Indicated open cuttable (MT)**	**Indicated Deep (MT)**	**Possible Deep (MT)**
Area 2 North	1.7	?0.45	7.9	?7
Area 2 South	2.05	?0.25	3.69	Nil
Area 3	1.82	0.73	13.8	?10 +

Boss Energy calculations

Boss Energy figures are slightly higher than CRAE figures, due the specific gravity figure used of 2.1 g/cc, instead of 2.0 g/cc, accounting for tonnage increases. The CRAE figures are thus conservative. For interest, a calculation of theoretical oil content and in ground value is shown below in tables 2.1 and 2.2.

Table 2.1

Variables		
Horizon thickness	variable	metres
Horizon Density	2.1	Tonnes per cubic metre (Clementson 1981)
Yield	146	Litres/Tonne (Clementson 1981)
Barrel volume	159	Litres/Tonne
Barrel price	$80	Australian Dollars

Table 2.2

Area	Location	Category	Area Km^2	Shale Tonnes	Barrels	In Ground Value
Area11 North	Dinsdales Hill	<20m depth	0.1366	488,000	448,000	**$35,823,000**
Area 11 South	Dinsdales Hill	<20m depth	0.07019	302,000	277,000	**$22,197,000**
Area 111	Dinsdales Hill	<20m depth	0.2038	779,000	715,000	**$57,219,000**

Geological constraints

The Tasmanite oil shale is known to occur in a sequence of Permian sedimentary rocks which are fairly flat lying, dipping 5-8 degrees towards the north east in the Saggers Hill area (Clementson, 1982). Because of the flat lying nature of the sediments, the depth below surface of the shale horizon can be affected by rise and fall of local topography. Other factors affecting the position and distribution of the shale are local faulting and folding, which is known to shift the shale position up, or down, geological boundaries with rocks which do not contain Tasmanite, intrusive rocks, which displace Tasmanite bearing rocks, and characteristics of the host rock, such as old topographic highs, where Tasmanite was not originally deposited.

The Area 2 South shallow resource area is tightly constrained by topography to the north and geological boundaries to the east and west with Pre Cambrian rocks (no Tasmanite). Topography falls to the south to an area of Quaternary cover over likely Pre-Cambrian Basement rocks. These geological constraints mean the possibility of increasing shallow resources is minimal.

The Area 2 North shallow resource is constrained by faulting to the north east, basalt cover to the south and a fall in topography to the west. There is a possibility of an extention to the north, between drillholes showing 15m and 31m shale depth, however the shallow resource area may be impacted by the workings of the Goliath Shale Mine. No mention of depletion of resource by old workings was made in the CRAE resource determination, and no useful maps are at hand showing accurate positioning or extent of workings. The validity of this resource and possible extension should be confirmed by checking against historical mining figures if available.
Topography and geology are indicated in figures 5 and 6 respectively.

The Area 3 shallow resource is bounded to the East by basalt cover and falling topography, and is constrained to the north and south and west by previous drilling. There is a possibility of slight extention to the west, within the Henry Somerset orchid onservation area.

Land tenure

A portion of the Area 2 south and north shallow resources falls within what is now known as the Warrawee State Forest Reserve, administered by Forestry Tasmania. Approximately one third of the area three shallow resource falls within the Henry Somerset Orchid Conservation Area. Exploration and mining are not necessarily excluded within these areas, but would be subject to rigorous review and consultation procedures prescribed under the Regional Forest Agreement Act, 1998, and the Mineral Resources Development Act, 1995. State reserves and conservation areas are shown on the topographic base map in figure 5.

Potential for resource expansion.

There is minimal potential for extending shallow resources in the Dinsdales Hill area. A small area, on the northern end of the Area 2 North shallow resource, may yield an extension between two previous drillholes . There is also a possibility of a small extension to the west of the Area 3 resource, probably in the order of 30, 000 tonnes. Due to the positioning of known drillholes in Area 3, testing for such an extension may have the effect of increasing slightly, or decreasing the interpretable resource. Potential tonnages shown below were calculated using a shale horizon thickness of 1.7 metres, and a specific gravity of 2.1 grammes/cc. The possible resource extension area is indicated in figure 7.

Location	Category	Area Km^2	Shale Tonnes
Area 2 North	<20m	0.2855	101924

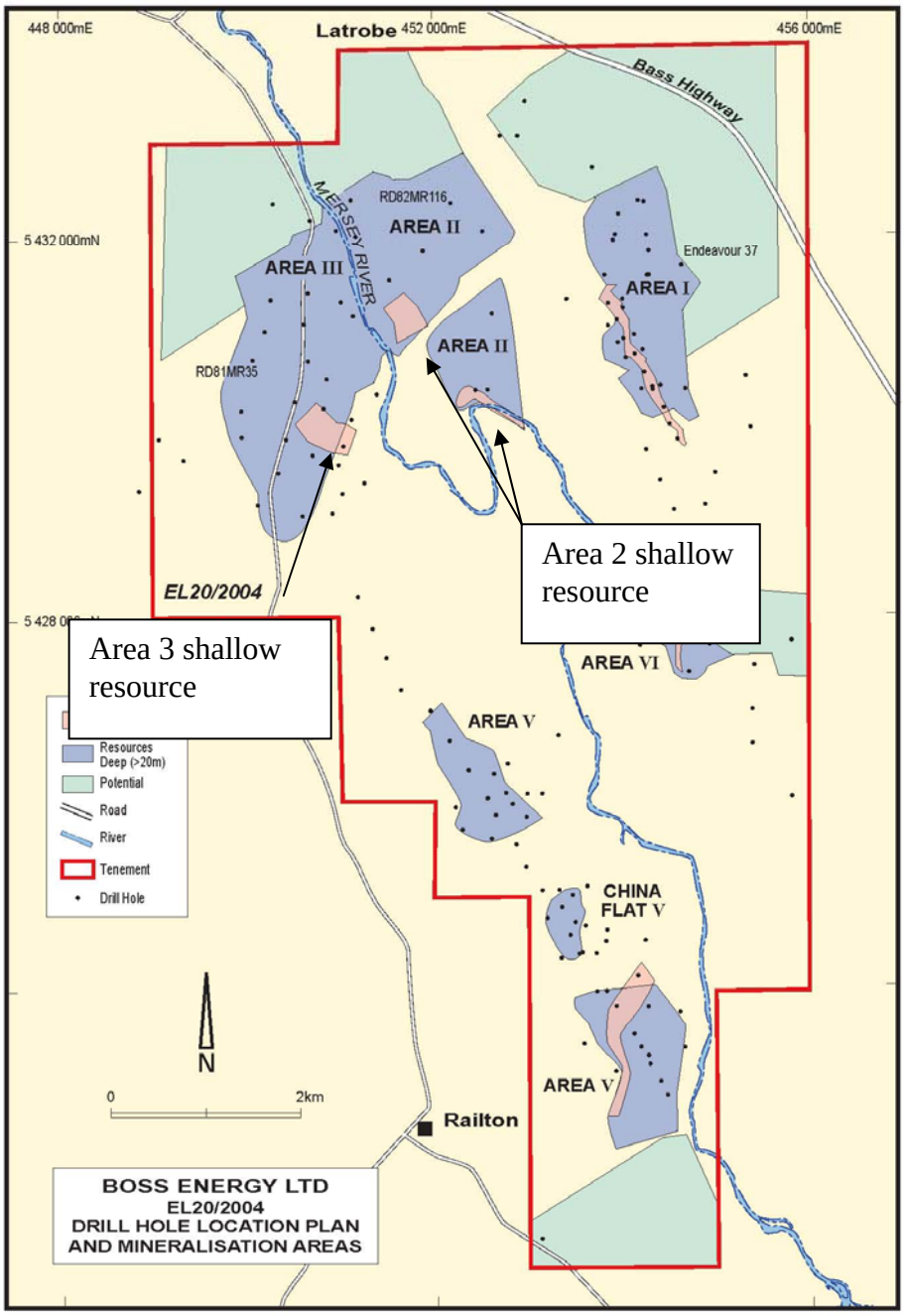


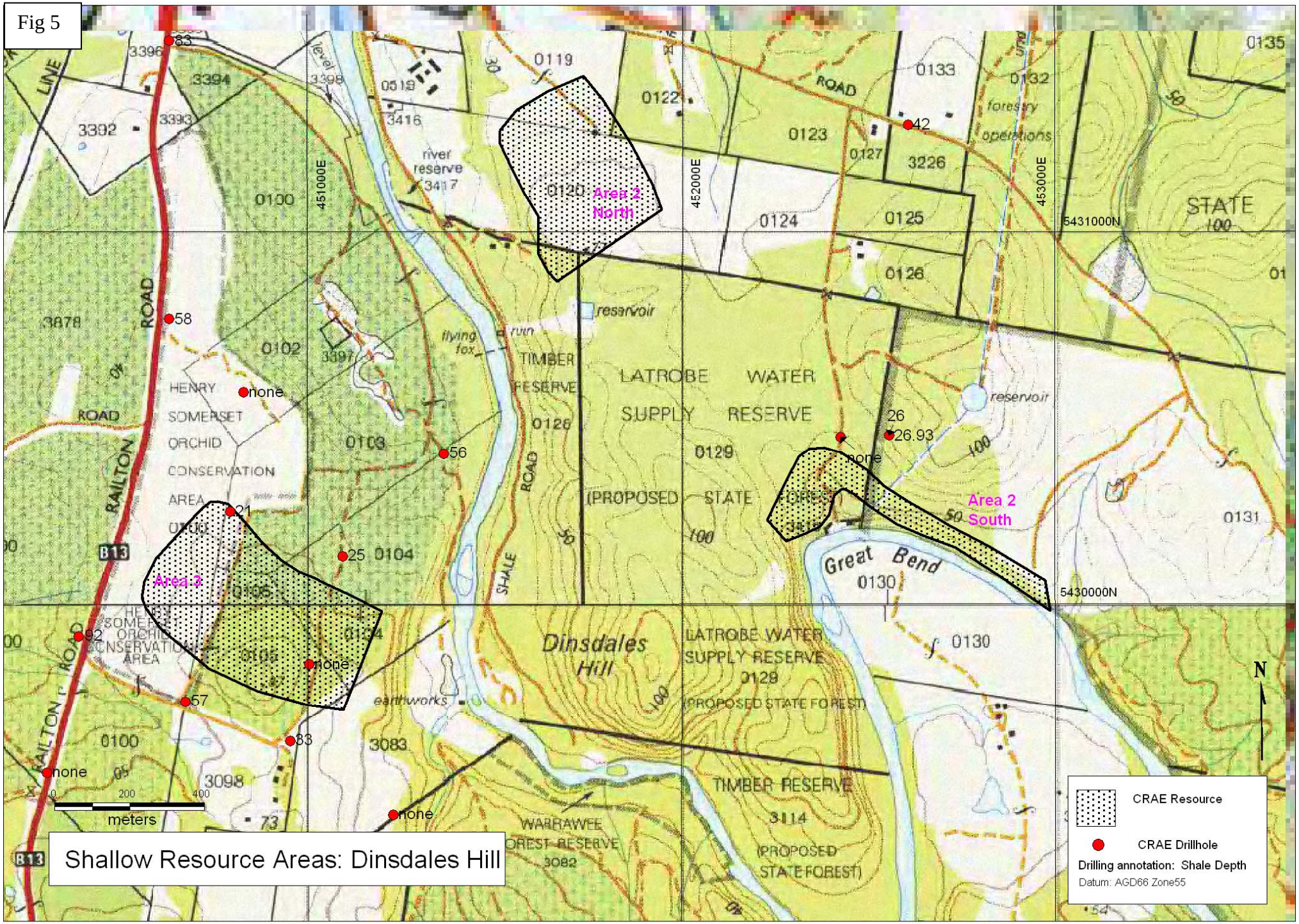
Figure 1. Area one locality map

Fig.2 Resource area looking south. Photo P1.

Fig.3 Sorthern end of resource area, looking north. Photo P5.

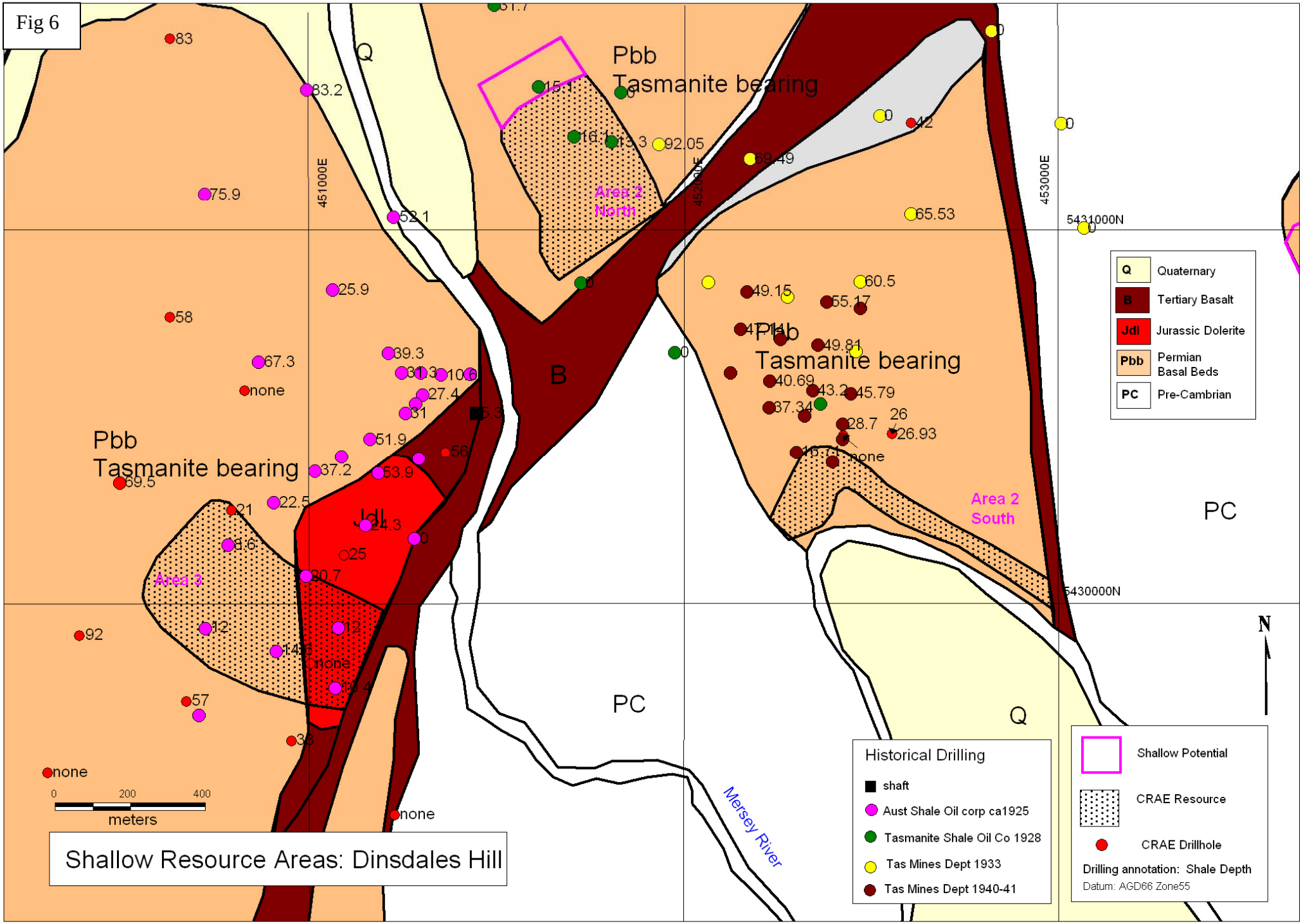
Fig.4 Southern resource area looking north. Photo P6.

Fig 5



Shallow Resource Areas: Dinsdales Hill

Fig 6



Shallow Resource Areas: Dinsdales Hill

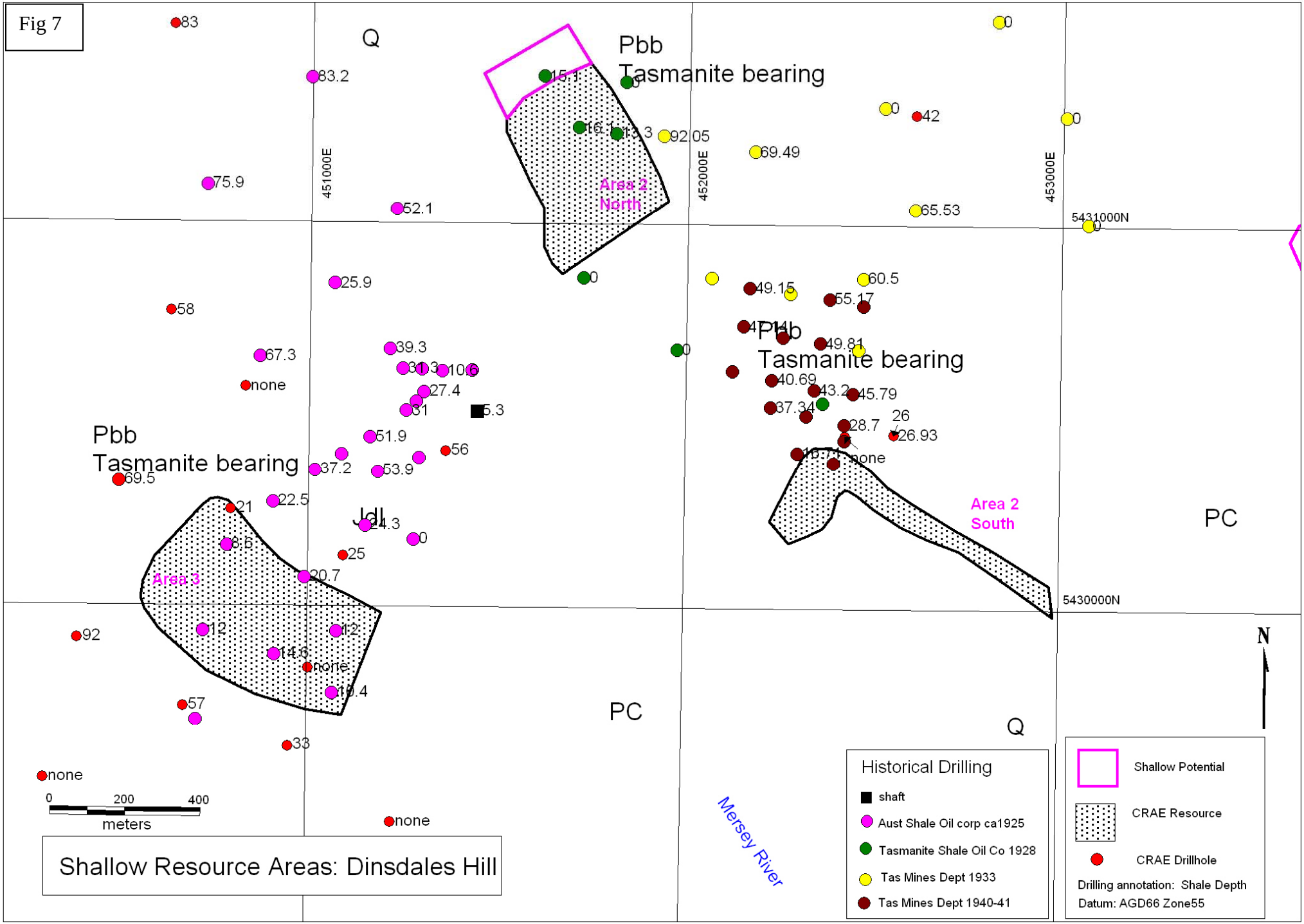


Fig 7
Q
Pbb
Tasmanite bearing
Area 2
North
451000E
452000E
453000E
5431000N
5430000N
Pbb
Tasmanite bearing
Area 2
South
Pbb
Tasmanite bearing
Area 3
Jdl
PC
PC
Q
Mersey River
N
0
200
400
meters
Historical Drilling
shaft
Aust Shale Oil corp ca1925
Tasmanite Shale Oil Co 1928
Tas Mines Dept 1933
Tas Mines Dept 1940-41
Shallow Potential
CRAE Resource
CRAE Drillhole
Drilling annotation: Shale Depth
Datum: AGD66 Zone55
Shallow Resource Areas: Dinsdales Hill

Suggested work program

A background study of the impact of workings of the Goliath Shale Mine on the Area 2 North resource should be carried out. A follow up drilling program to potentially increase the known resources in this area would probably consist of 2 drill holes in the Area 2 North zone.

Preliminary Cost Estimate

Calculations shown in Table 4 are based on a drilling rate of $48 per metre, and average drilling depth of 30 metres. Mobilization, consumables,estimated supervision costs and 15% contingency are also included. If combined with drilling in other areas, costs would be reduced.

Table 4. Drill program cost estimate

zone	Drillholes	Cost estimate
A	2	$7,000

References

Australian guidelines for estimating and reporting of Inventory Coal, Coal Resources and Coal Reserves, prepared by The Coalfields Geology Council of New South Wales and the Queensland Mining Council.

Clementson, I.M., 1982, *Railton EL 4/74 Final report on 1982 drilling*, CRA Exploration PTY. LTD., MRT report 82_1789