

The Tasmanite Oil Shale Resource Latrobe-Railton area, Tasmania

A Review
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Introduction

The Latrobe /Railton area, some 12 to 20 kilometres SSE of Devonport, in northern Tasmania hosts most of the significant oil shale deposits in that state. Exploration Licence Application ELA 20/2004 covering the known minable occurrences is held by Daley Resources Pty Ltd and it secures an area of 61 square kilometres within the Launceston 1:250, 000, Latrobe 1:25,000 and Railton 1:25,000 map sheets (Figure 1).

This report is a summary and an up date of a January 2001 report (unpublished) by Wilkinson and Associates titled "Independent Consulting Geologist's Report and Valuation of the Mineral Exploration Assets of Daley Resources Pty".

Review of Data

Tasmanite oil shale is a siltstone rich(10-70%) in the discoidal fossil algal cysts *Tasmanites puntatus*, which are 0.3 to 0.5millimetres in diameter , amber to red in colour, and composed of "kerogen" which yields a variety of oils when heated.

The oil shale is of Late Carboniferous age occurring near the base of a siltstone/mudstone unit of the Quamby Group which outcrops discontinuously

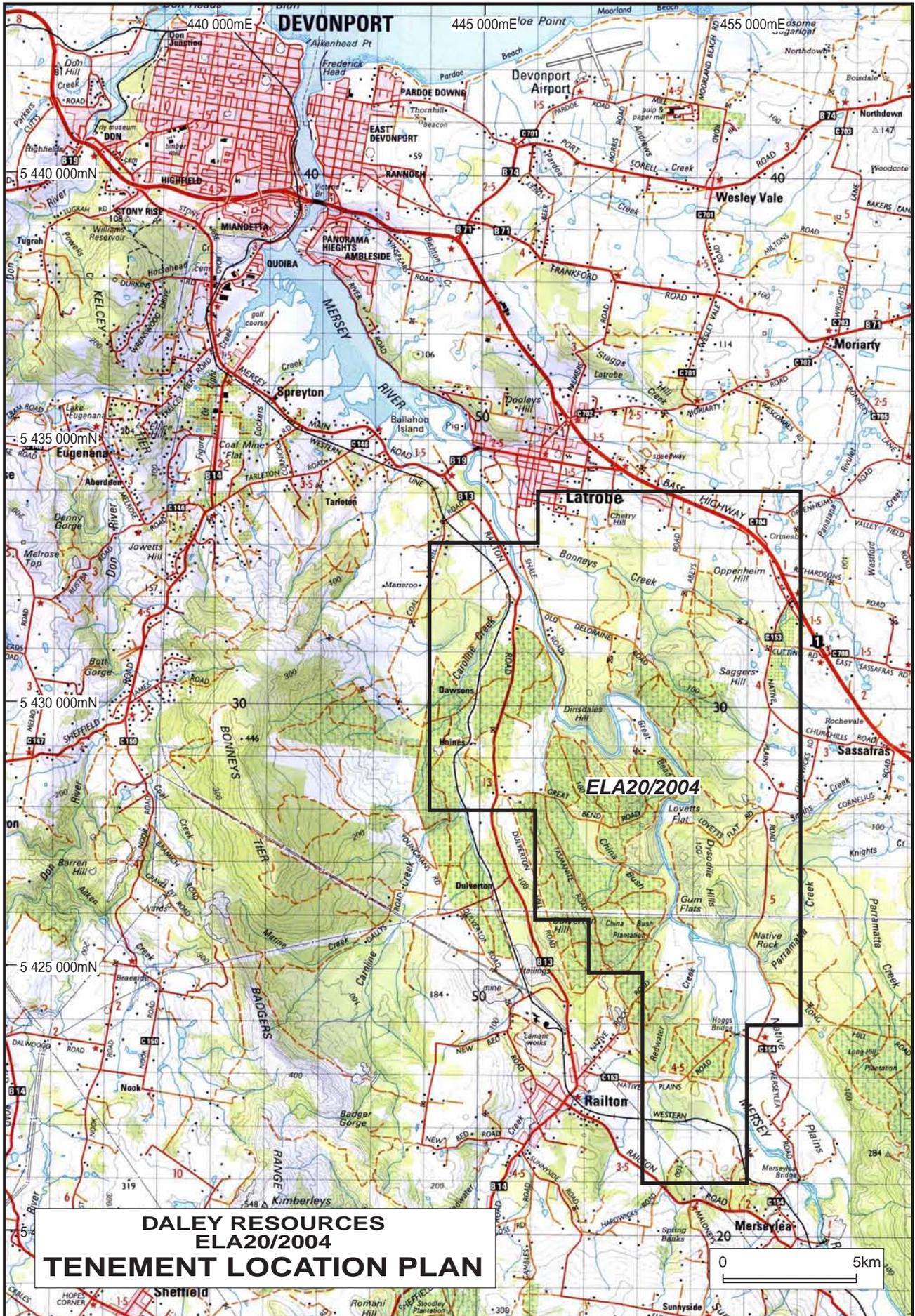


Figure 1

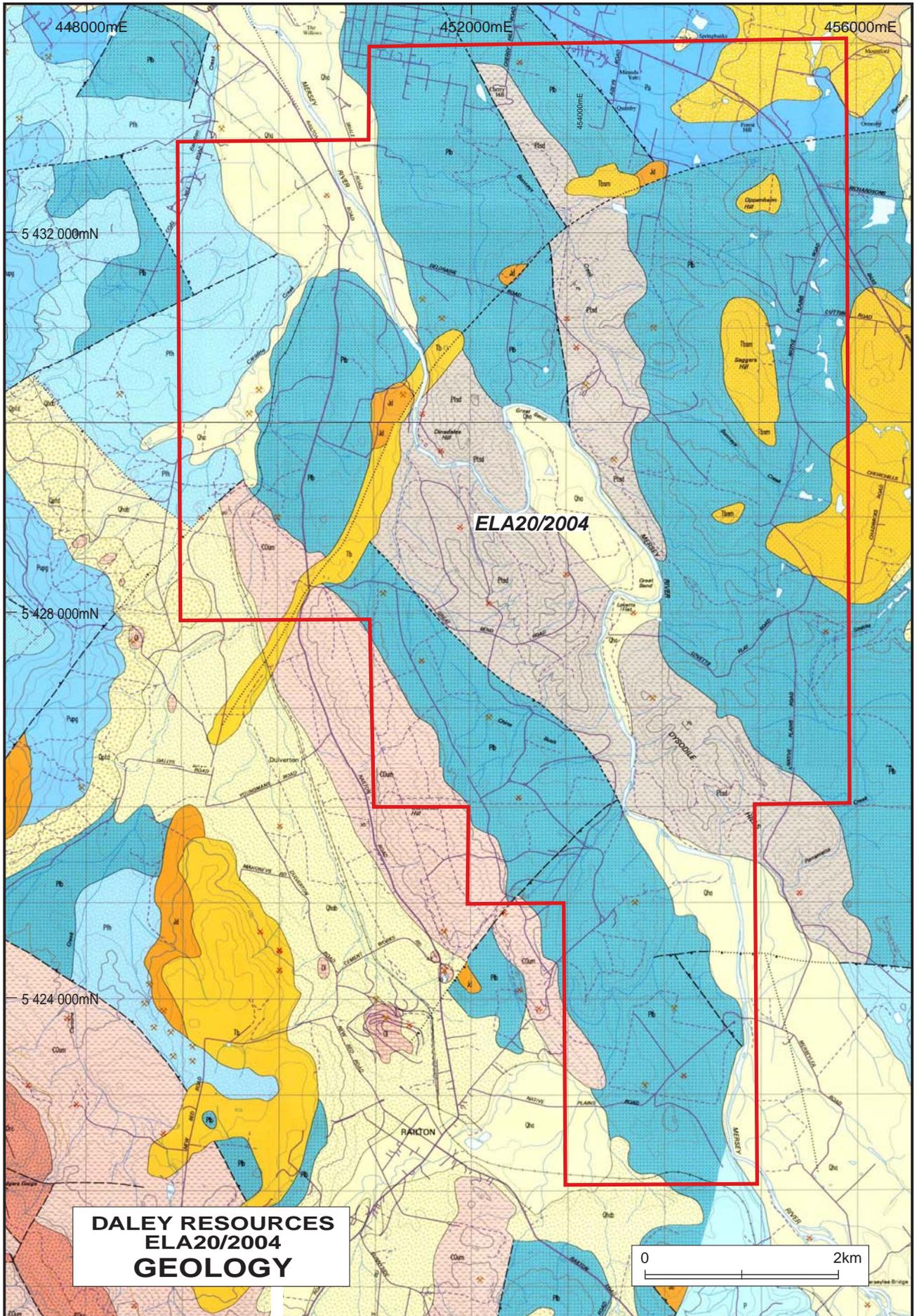
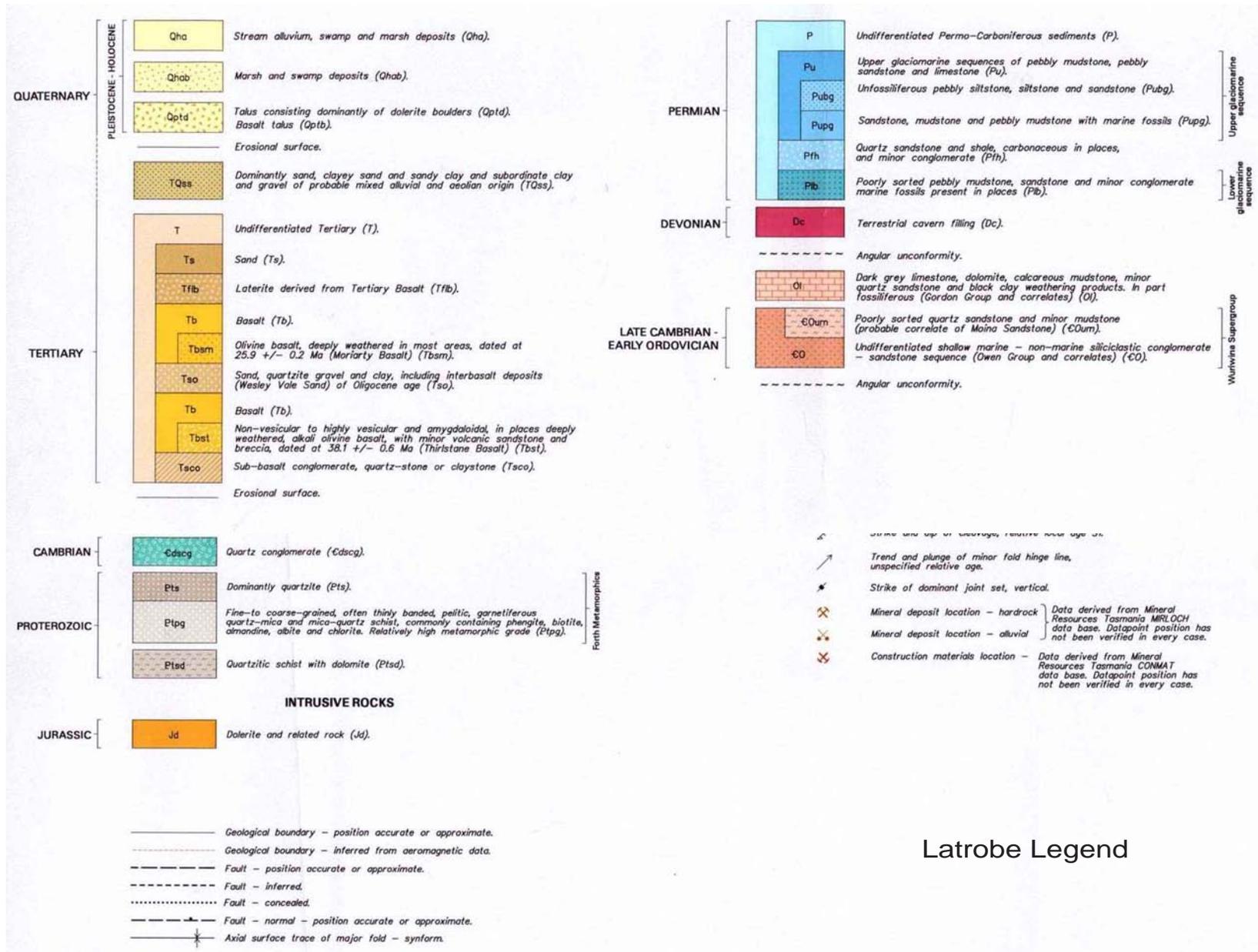


Figure 2a



Latrobe Legend

Figure 2b

along a broad belt for some 48 kilometres from the town of Latrobe to the south-east.(Figures 2a and 2b) The Tasmanite horizon is up to 2 metres thick , averaging 1.5 metres and is generally subdivided by a thin band (10-20 centimetres) of kerogen poor material.

Discovered and documented in 1851, outcropping on the banks of the Mersey River, the Tasmanite oil shale was commercially worked by small companies and syndicates from 1910 to 1935 which mined the shale from shafts, crushed it, then heated the ore in a variety of retorts designed to distil oil from the hot gases (Figures 3,4,5,6,7,and 8). When the Commonwealth Government offered a reward of 10,000 Pounds in 1920, eager entrepreneurs created “The Mersey Valley oil boom of the 1920’s”.

It is reported that a total of 1.6 million litres of shale oil was extracted up to the mid 1930’s.

The resource has undergone five drilling programmes between 1925 and 1941,after which interest waned until Endeavour Resources Ltd took out Exploration Licence EL4/74 which conforms with the current ELA 20/2004 .Endeavour drilled 46 holes, totaling 1,041 metres, then in joint venture with CRA Exploration, the latter drilled 5051metres in 135 holes to test the resource(Figure 9).

Many of these recent holes were cored and wireline logged. This CRA programme was conducted in 1981 and 1982 and after proximate analysis and Fischer assay of Tasmanite oil content, CRA concluded that the indicated resource totaled 42 million tonnes, of which 6 million tonnes could be open cut, plus inferred reserves of 30 million tonnes.(Figure 10)

Oil content was measured at 5-300 litres per tonne, with an average of 130 litres per tonne.(Figure 11))

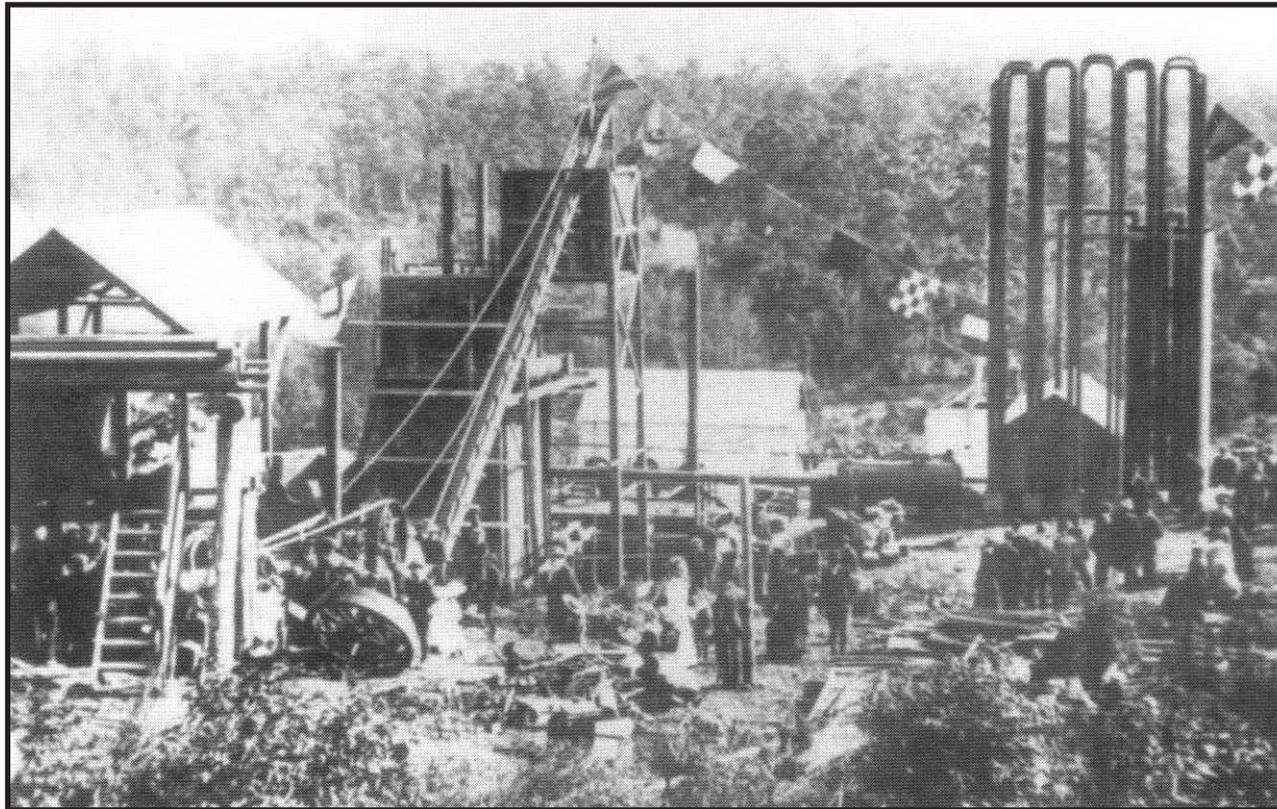
Additional exploration drilling is necessary to prove up the inferred resources. At an average density of oil of 0.934t/cubic metre, the indicated resource has an in-situ oil content of 5.1 million tonnes or 34 million barrels (5460 megalitres).



Prospecting for shale 1910.
Windlass operators are Jimmy Kirkwood (on right) and his son Alan.



Start of first tunnel, shale work, 1910.



Opening day at the Latrobe Shale and Oil Company's plant 1912. This plant was on the east bank of the Mersey at the end of Shale Road and operated till circa 1930. There were two other plants. Old hands remember the extraction process for its unforgettable odour.

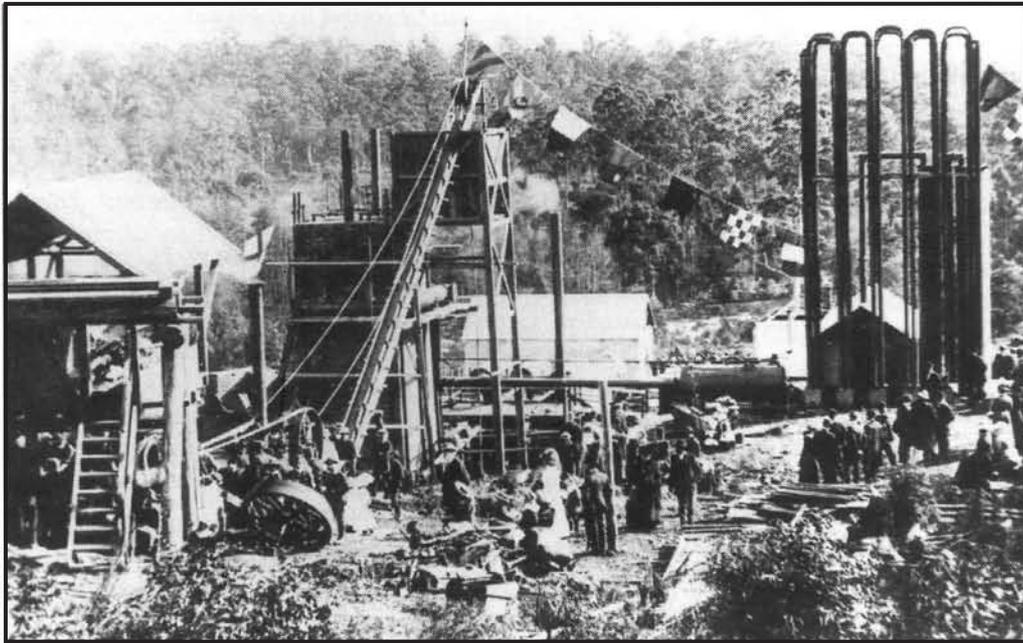


Plate 1

Opening day at the shale works on the eastern side of the Mersey River, 1912

(Latrobe Museum Historical Collection)



Plate 2

Southern Cross Motor Fuels Ltd oil shale mine near Latrobe, 1923

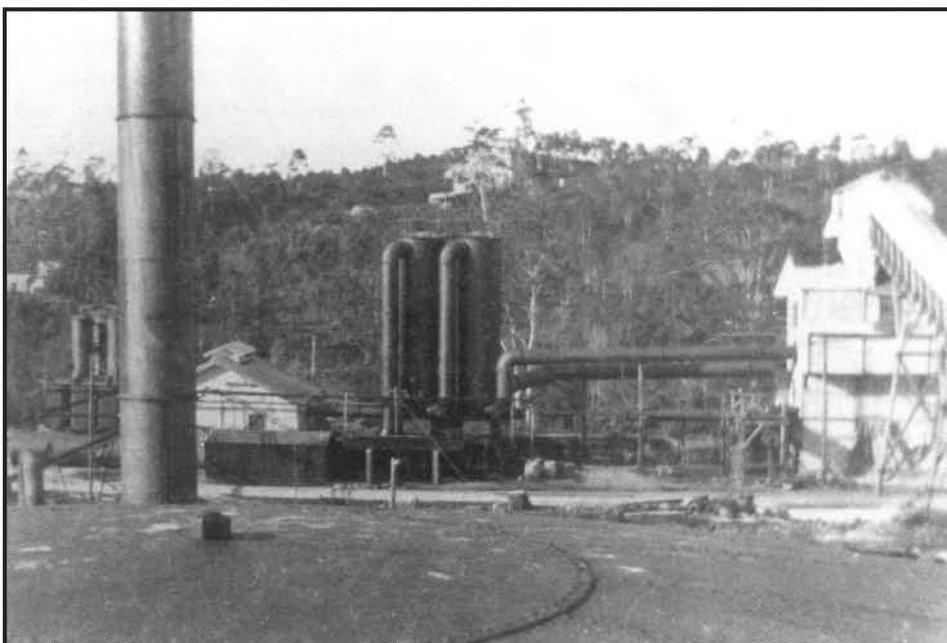
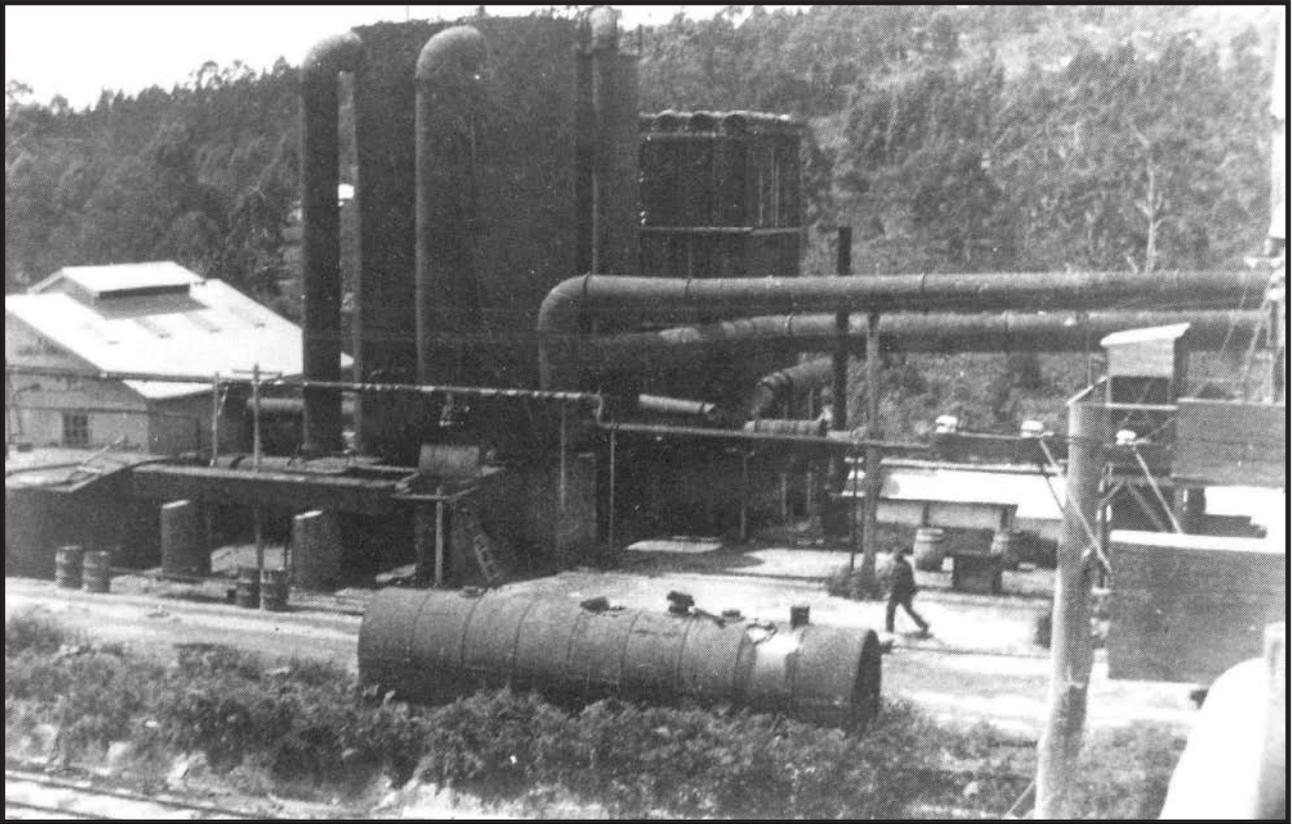


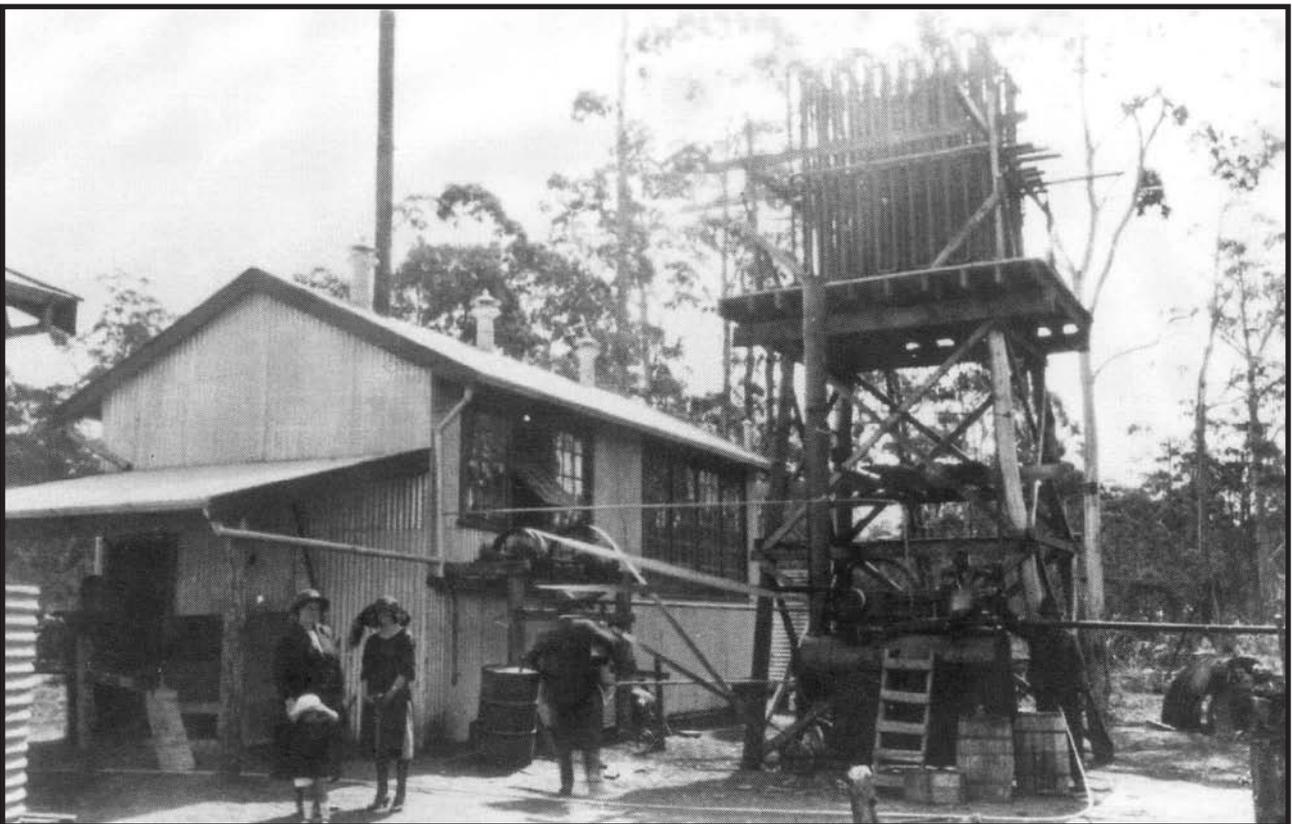
Plate 3

Australian Shale Oil Company plant, showing retort, condenser and storage tank (ca. 1926-1931)

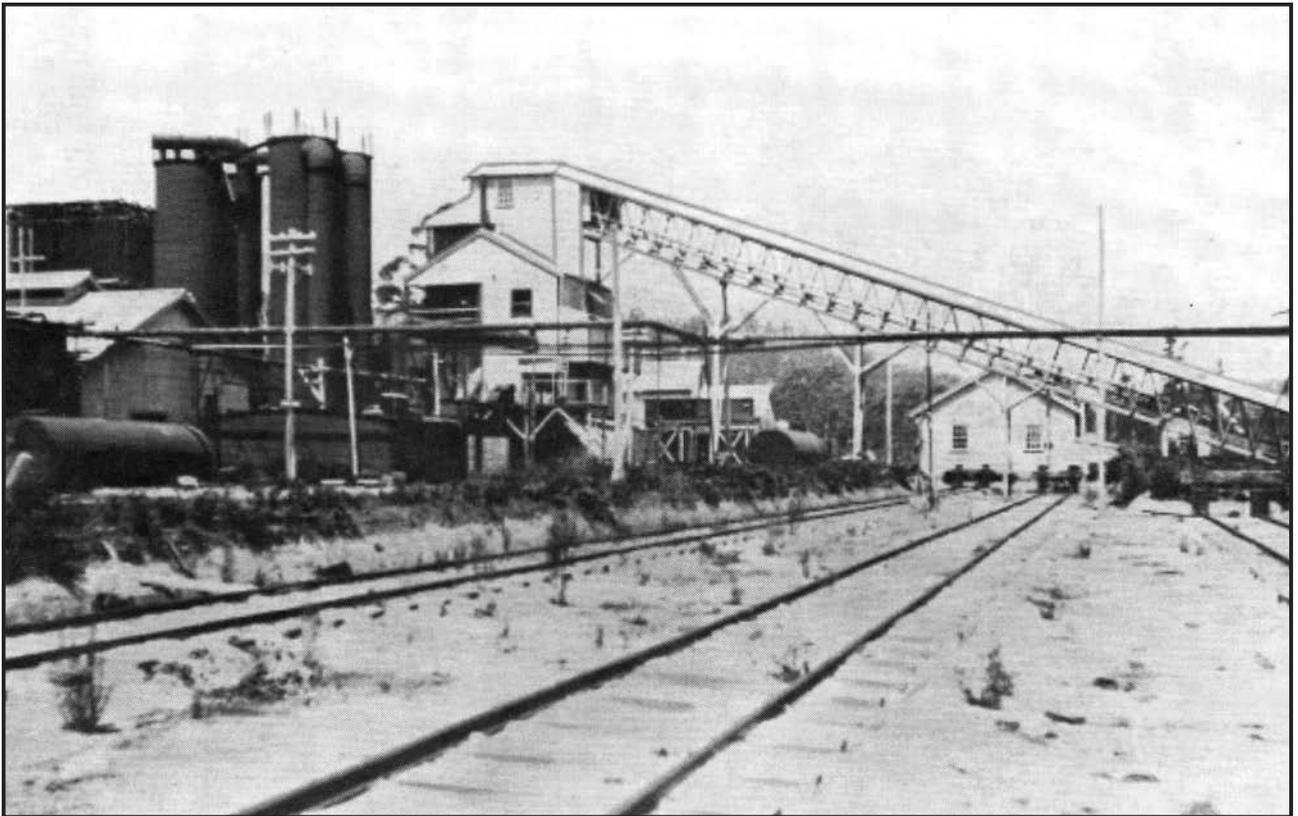
(Latrobe Museum Historical Collection)



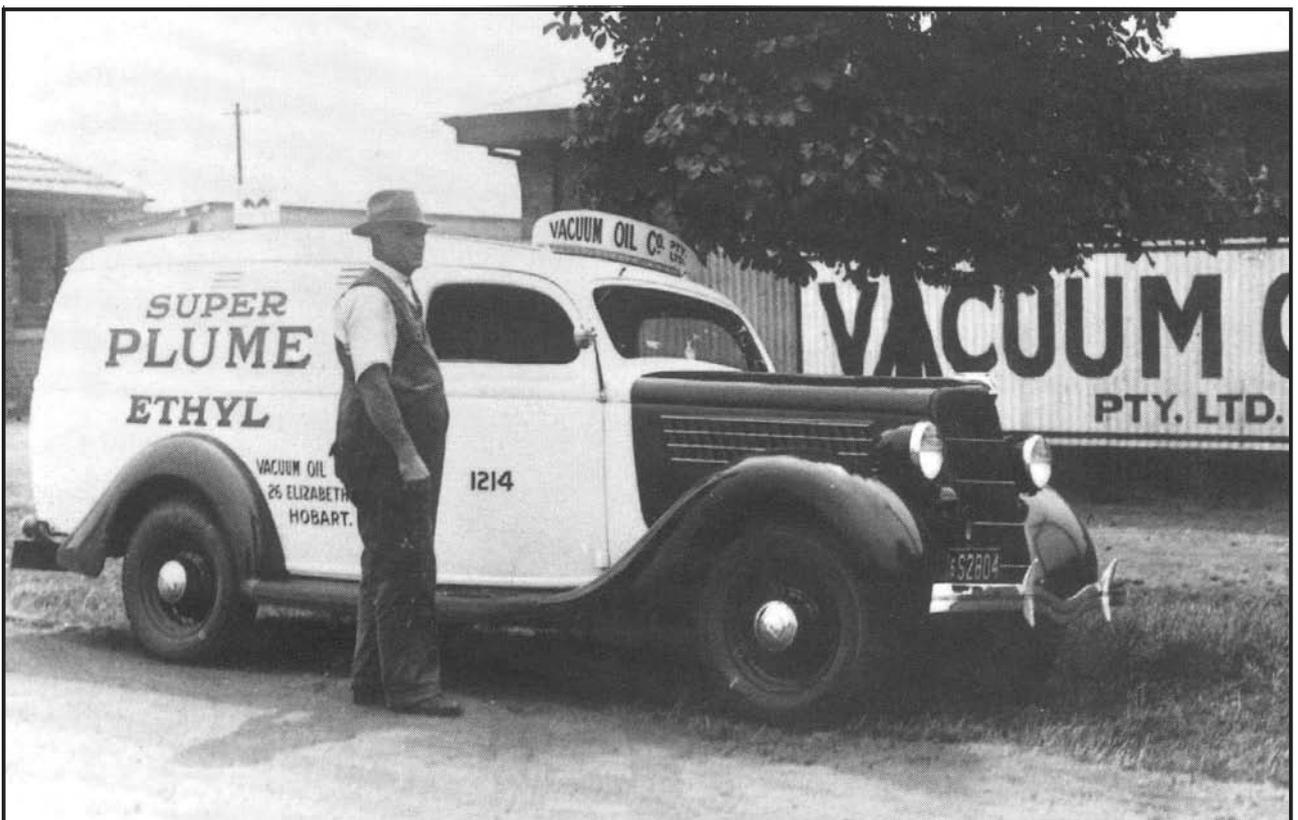
Australian Shale Oil Company condensing plant (ca. 1926-1931)
(Latrobe Museum Historical Collection)



Condensing plant near Mersey River, date unknown.
(Latrobe Museum Historical Collection)



Australian Shale Oil Company works near Latrobe, 1928



Vacuum Oil Company vehicle, late 1930's
(Queen Victoria Museum and Art Gallery QVM:1991:P:127)

Combined Indicated and Inferred resources have an in-situ oil content of about 59 million barrels (9360 megalitres).

Endeavour Resources and CRA commissioned a number of studies into the properties and utilization of the Tasmanite resource, including a year long research project by CSIRO (1979) which evaluated the chemistry, petrology, pyrolysis, beneficiation and uses of Tasmanite and its derived products.

Another report by Messrs Bujtor and Waldram in 1982 evaluated the feasibility of a 50,000 tonnes per year bitumen plant from open cut and underground mining costing an estimated \$344 to \$433 per tonne, however the prevailing price was \$269/tonne in Tasmania, (compared to the June 2004 price of \$450/tonne) and the market penetration issues appeared difficult.

The most recent and comprehensive investigation of the potential of the Tasmanite resource is contained in a paper titled "Liquid Fuels from Oil Shale in Tasmania, September 1987, by the Hydro-Electric Commission, Planning and Public Affairs Group (HEC). The Commission has statutory responsibility for assessing the extent of energy resources in Tasmania and for ascertaining the feasibility of developing such resources.

This study looked at underground mining of an assumed recoverable oil shale resource of 40 million tonnes over 20 years at a rate of 2.35 million tonnes per year (run of mine, including dilution). The oil shale would then be retorted using the Lurgi-Ruhrgas retort process to yield 260 megalitres of shale oil per annum. As the shale oil is deficient in hydrogen compared to crude oil for refining purposes it would need to be then need Hydrotreating in a separate plant built near the retort. The output from this plant was designed to produce 257 megalitres or 232,000 tonnes of synthetic crude oil per year plus associated gases. This is about 1.65 million barrels of synthetic crude oil per year.

A small 200,00 tonnes per year refinery was designed to locally process the synthetic crude and added to the cost estimates as were land acquisition and infrastructure costs.

The range of petroleum products available from the selected refinery process were LPG, motor spirit (petrol), jet fuel and diesel fuel.

This project was designed to produce liquid hydrocarbon products which were considered to be vital for the Tasmanian economy.

The economics involved the interest rates, oil price and company tax rate, most of which are vastly different today. Nevertheless, product costs of 66 cents to 95 cents(AUD) per litre were predicted in this report..

Whilst this project was uneconomic at a time when petrol prices were about 51 cents(AUD) per litre, both technology in oil shale processing ,and the current concept that the oil price will remain high by previous levels, make the Tasmanites deposit of Northern Tasmania an interesting project in 2004.

Conclusions

The Hydro- Electric Commission compared the properties of various Australian and US raw shale oils and determined that the Tasmanite derived shale oil is at least equal to shale oils such as Julia Creek and Rundle which have been extensively tested and found suitable for processing to transport fuels. Low nitrogen and high hydrogen content indicate that the shale oil would hydrotreat relatively easily to synthetic crude oil suitable for refining into transport fuels.

Since 1986, developments in oil shale processing technologies have progressed. Many analysts have concluded that high oil prices are here to stay, and with more significant terrorist activity in the Middle East, may increase substantially.

In recent literature (2003) available on the internet, the National Energy Research Centre of Jordan, a non oil producing country with large oil shale reserves have conducted many test programs with expert companies from Europe ,North America and Asia. All of these trials were reported to be positive with shale oil costs of US\$11 -25 per barrel.

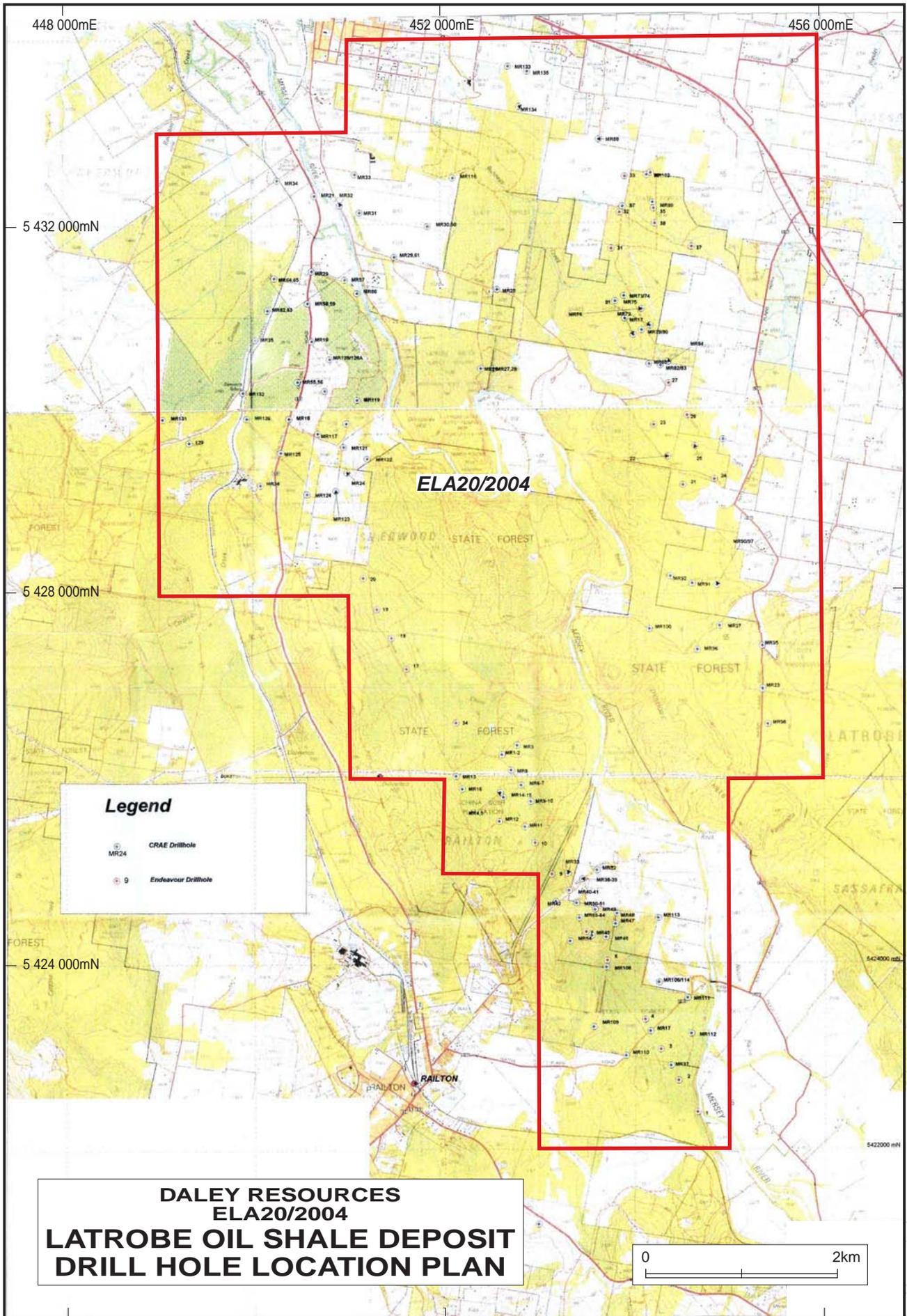


Figure 9

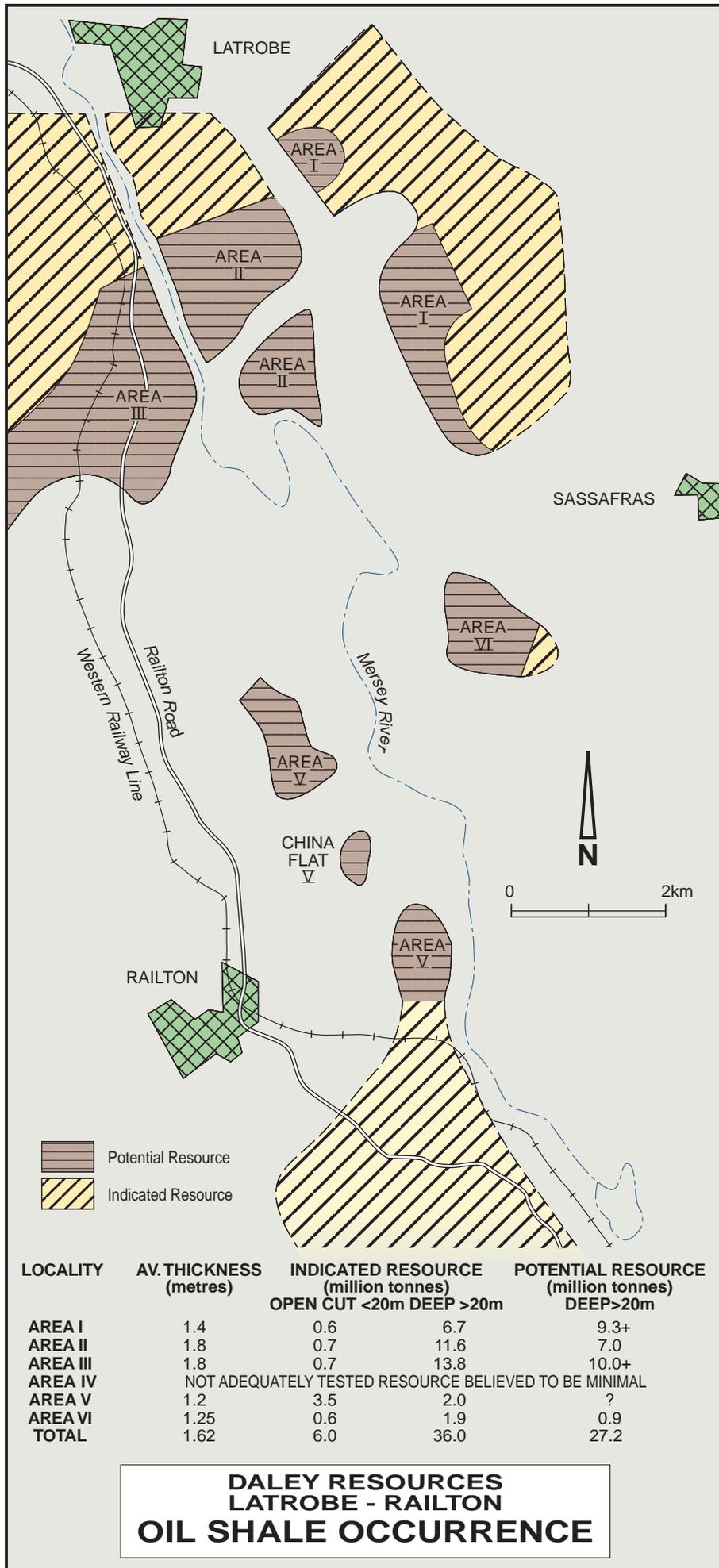


Figure 10

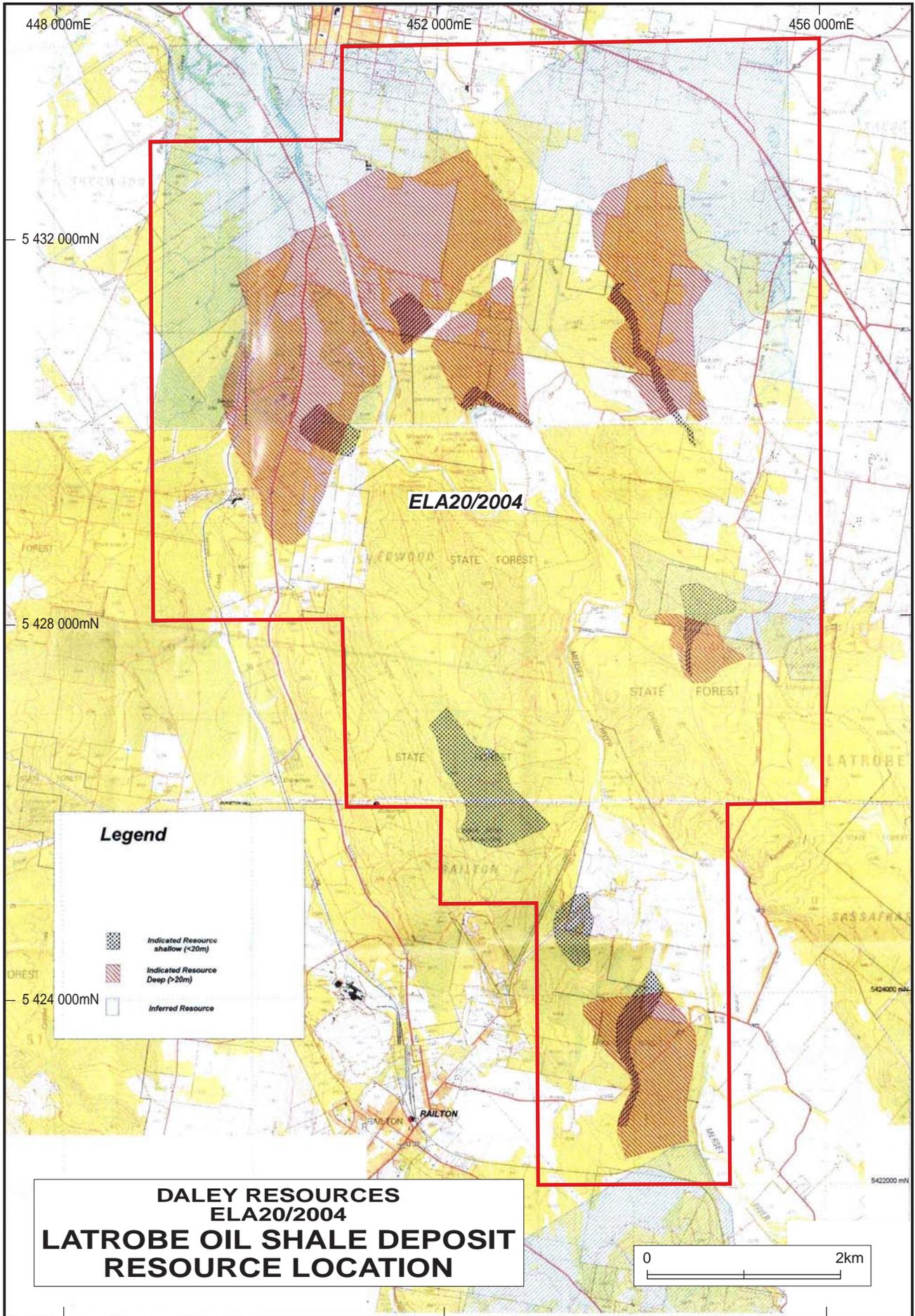


Figure 11

Feasibility studies and retorting test programmes were carried out successfully with Klockner/Lurgi of Germany ; Sinopec of China using the “Fushun” type retort and Suncore of Canada using the “Alberta-Taciuk” retort which is currently in commercial operation making synthetic crude oil on a large scale from the Canadian Tar Sands.

Recently, in November 2002, a worldwide Symposium on Oil Shale was held in Tallin, Estonia, a country which has commercially used oil shales for power generation for decades. In a paper titled “Synthesis of the Symposium on Oil Shale”, Dr K. Brendow of the World Energy Council states:

” Crude Oil prices above US\$25/ barrel appear to render shale oil production viable”.

14 June 2004

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