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NOTES AND A BIBLIOGRAPHY ON OIL SHALE

IN AUSTRALIA

by

**BMR  
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**D.L. Gibson & J.A.W. White**

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## INTRODUCTION

This Record provides a brief introduction to oil shale in Australia, and documents its occurrence and distribution. The bibliography (microfiche, in rear pocket) is being revised from time to time, eventually to include all references on oil shale (and shale oil) in Australia, and more important references on oil shale overseas; an updated computer printout can be obtained on request by writing to: The Director, Bureau of Mineral Resources, P.O. Box 378, Canberra City, A.C.T., 2601.

Oil shale is a fine-grained carbonaceous rock in which the organic matter has a low carbon/hydrogen ratio compared with organic matter in other carbonaceous sediments; upon heating in a closed retort, oil shale yields paraffinic oil which after hydrogenation can be processed to conventional petroleum products by refining. The organic matter in oil shale is insoluble in normal petroleum solvents. Many oil shales are thought to have originated by the burial of the remains of hydrocarbon-bearing algae, such as Botryococcus braunii.

### World production

In the past, commercial oil shale mining industries of reasonable size have operated in Australia (closed 1952), France (1957), South Africa (1962), Scotland (1962), Spain (1965), and Sweden (1966). Germany operated oil shale plants during World War II, and New Zealand had a small industry between 1899 and 1903.

However, all these industries were very small compared with those now operating in China (at Fushun in Manchuria and at Maoming in Kwangsi Province) and in the USSR. The oil shale industry in Manchuria was established by the Japanese in the 1930s. Oligocene oil shale about 150 m thick with a yield of 63-100 litres/tonne as well as a thick coal seam under the oil shale is open-cut mined. The Maoming industry is much smaller. Estimates of production in the literature are variable, with reported 1962 production of shale oil ranging from  $1.4 \times 10^6 \text{ m}^3$  (McFadyen, 1966) to about  $2.8 \times 10^6 \text{ m}^3$  (Desprairies, 1978). Smith & Jensen (1977) report a daily output of  $6360 \text{ m}^3$ , implying a yearly output of  $2.3 \times 10^6 \text{ m}^3$ , and Moreira (1979) reports a daily output of about  $8000 \text{ m}^3$ . Gallois (1978) states that shale provides 9 percent of Chinese oil. The World Energy Conference (1974) states that total recoverable oil from shale in China might be as much as  $23 \times 10^9 \text{ m}^3$ .

The main Soviet industry is based in Estonia where Ordovician oil shale (kukersite) of the Baltic Basin is mined. Aggregate thickness of the shale is 3 m, and average yield is about 210 litres/tonne (Smith & Jensen, 1977). Mining in Estonia started in 1916; by 1940 annual production had reached  $19 \times 10^6$

tonnes of oil shale, and  $29 \times 10^6$  tonnes was mined in 1976 (Ratnieks, 1977). 72.5 percent of Estonian oil shale is burnt directly in power stations (all Estonian thermal power stations are oil-shale fired) and 24 percent goes to refineries. Oil shale provides 60 percent of Estonia's fuel (Ratnieks, 1977). There are plans to retort the oil shale, and use the oil in the power houses to increase efficiency and reduce pollution. Oil shale is also mined at Leningrad: 1976 production was  $6.5 \times 10^6$ ; 48 percent of this was burnt directly in power stations (Ratnieks, 1977).

BP (1978) estimates total shale oil in place in the USSR at  $18 \times 10^9$  m<sup>3</sup>, and Ratnieks (1977) implies shale oil resources of the Baltic Basin are  $31.5 \times 10^9$  m<sup>3</sup>.

No commercial oil shale industry exists at present in the market economy countries, although large sums are now being invested in research and development. In USA, several companies and government agencies are running pilot plants (generally about 10 tonnes/day feed capacity) and semi-works plants (up to 1000 tonnes/day), using mainly oil shale mined from the Eocene Green River Formation in the Colorado-Wyoming-Utah area. A batch of 16 000 m<sup>3</sup> of shale oil was prepared for the US Navy during 1976-78 by the Paraho Development Corp. (TRW, 1979).

In Brazil, Petrobras (the Brazilian national oil company) has demonstrated the viability of its oil shale development at several plant stages. Its demonstration plant has a capacity of about 2200 tonnes of shale feed/day, producing about 160 m<sup>3</sup> of shale oil, 36 500 m<sup>3</sup> of fuel gas, and 12 tonnes of sulphur/day (Moreira, 1979). Work is currently under way to build larger retorts, with a total production rate of 8000 m<sup>3</sup>/day.

Undeveloped oil shale deposits are known to exist also in Argentina, Austria, Bulgaria, Burma, Canada, Chile, Czechoslovakia, Israel, Italy, Jordan, Luxembourg, Morocco, Paraguay, Rumania, Thailand, Uruguay, Yugoslavia, and Zaire.

### AUSTRALIAN PRODUCTION (HISTORICAL)

#### New South Wales

The first mining and retorting of oil shale in Australia was at Mount Kembla near Wollongong in 1865. Major early production was from the Joadja and Hartley Vale areas; the shale oil produced was used mainly for lighting. These mines were closed near the turn of the century owing to falling reserves, competition from imported US kerosene, and alternative forms of lighting.



However, other mines, especially in the Newnes, Genowlan, and Murrurundi areas were worked early this century. Between 1940 and 1952 the Federal and NSW Governments sponsored shale oil production at Glen Davis, west of Sydney. All oil shale mined in New South Wales was in thin seams (generally less than 1 m) associated with coal measures in the Sydney and Gunnedah Basins.

Total recorded production for New South Wales is 3 842 371 tonnes of oil shale (Lishmund, 1974); of this, 570 000 tonnes of shale was exported up till 1911 (38 percent of total production to that time), and 1 389 088 tonnes was mined at Glen Davis between 1940 and 1952.

The shale oil from mining at Glen Davis was refined into motor spirit. Maximum annual production was 18 megalitres\* of motor spirit in 1947. In the twelve years of production, a total of 118 megalitres of motor spirit was produced (McFadyen, 1966), probably from about  $230\,000\text{ m}^3$  (230 megalitres) of shale oil (Kraemer & Thorne (1951) imply motor spirit recovery from crude shale oil to be about 52% by volume). As a comparison, 1951 consumption of motor spirit in Australia was 2878 megalitres, and 1977-78 consumption of about 14 400 megalitres.

In 1951, the finished Glen Davis motor spirit had a total production cost of 5/3d per gallon, which included 1/- per gallon for interest charges. This compared with a landed cost of imported motor spirit at the time of 1/5d per gallon, excluding duty. On operating costs alone, the project was losing £300 000/year at the time of the decision to close the plant (McFadyen, 1966). This amounts to several shillings/gallon of motor spirit produced. The decision to close was also influenced by a shortage of mineable shale.

The average oil yield of the shale mined in New South Wales is not known, but assuming 300-400 litres/tonne for shale mined prior to 1940 (estimate based on yields stated by Lishmund, 1974), total recorded production could have yielded  $1.0 - 1.2 \times 10^6\text{ m}^3$  of shale oil.

\* 'Litres', 'kilolitres', etc. (converted from gallons) are used in the industry for liquid petroleum products; ' $\text{m}^3$ ' (as converted from barrels) is used for raw materials, eg. crude oil, shale oil, etc. One megalitre is exactly equivalent to  $1 \times 10^3\text{ m}^3$ .

Tasmania

Many companies operated intermittently between 1910 and 1934 in northern Tasmania near Latrobe and Kimberley. Total production was 42 000 tonnes of oil shale, which yielded about 1600 m<sup>3</sup> of oil (Jennings & others, 1967).

Oil shale has not been mined in other States.

AUSTRALIAN DEPOSITS

There are three basic genetic types of oil shale in Australia ranging in age from Cambrian to Tertiary. Marine deposits, which may be extensive (thousands of square kilometres), are associated with limestone and marine shale. Lake deposits may cover hundreds of square kilometres and may be hundreds of metres thick, but are generally low-grade. Seams of oil shale associated with coal measures laid down in coal swamps have limited lateral extent, but are high-grade.

Australian resources are summarised in Appendix 1.

Cambrian

Cambrian oil shale is known from the Georgina Basin in northwest Queensland. It was first discovered in a water bore in the 1940s, and confirmed by analysis. However, thicknesses were not known (Shepherd, 1945). BMR re-drilled this locality in 1978. Although only very thin (generally less than 10-cm) seams are present in the hole, close study of this occurrence is important as thicker deposits could be present elsewhere in the basin.

Permian

Small high-grade deposits associated with coal measures occur in the Sydney, Gunnedah, and Bowen Basins, and northwest Tasmania as thin seams (generally less than 1 m) extending over several square kilometres. Several deposits have been mined in New South Wales (Lishmund, 1974).

Marine oil shales occur in the Permian of northern Tasmania. Again, the deposits are small and occur as thin seams. The local name tasmanite derives from this shale's rich content of the microfossil Tasmanites punctatus (Jennings & others, 1967). These deposits have been mined to a limited extent (Jennings & others, 1967).

### Jurassic

Thin seams are present in the Jurassic coalfields of southeast Queensland, mainly in the Walloon Coal Measures of the Moreton and Surat Basins. At present these deposits are not considered to be important, although little is known about them (Swarbrick, 1974).

### Cretaceous

Vast amounts of low-grade oil shale are present in the Toolebuc Formation of the Eromanga and Carpentaria Basins, mainly in Queensland, but possibly extending into South Australia and New South Wales. The Toolebuc oil shale is marine, and is interbedded with limestone and shale (Pacminex, 1976). It crops out in the Julia Creek area where Pacminex Pty Ltd (CSR) has several Authorities to Prospect. The Toolebuc Formation is generally about 30 m thick, of which up to 15 m may be oil shale. The oil shale contains up to 0.5% vanadium, and the Toolebuc Formation as a whole exhibits a marked gamma ray anomaly in drill intersections.

### Tertiary

Of the known Australian deposits, by far the most important appear to be a series of Tertiary deposits in southeast Queensland. The oil shale is present in small downfaulted basins which also contain mudstone, sandstone, and minor limestone thought to be lacustrine and fluvial. Although the known oil shale deposits generally do not have large areal extent, they are up to 200 m thick. Rundle is the best known such deposit (Lindner & Dixon, 1976). Most of the others are known only from poor outcrop or sparse drill holes, and in most cases little is known about their size and grade; they include the Duaringa, Byfield, Condor, and Stuart prospects of Southern Pacific Petroleum NL and Central Pacific Minerals NL, the Yaamba, Rossmoya, and Herbert Creek prospects of Peabody Australia Pty Ltd and Central Oil Shale Pty Ltd, the Lowmead and Nagoorin prospects of Esperance Minerals NL and Greenvale Mining NL, and other deposits near Plevna (west of Mackay), Ukalunda (80 km southwest of Collinsville), Cape Hillsborough (28 km northwest of Mackay) and Strathpine (on the



northern outskirts of Brisbane).

Tertiary oil shale present in infilled old drainage courses near Coolgardie in Western Australia (Balme & Churchill, 1959) is considered to have probably little economic potential, but several companies are exploring for larger similar deposits in the area.

#### ECONOMIC SIGNIFICANCE OF AUSTRALIAN DEPOSITS

Australian demonstrated economic resources of recoverable petroleum are about  $320 \times 10^6 \text{ m}^3$ , enough for 9 years' supply for Australia at the current useage rate ( $95 \times 10^3 \text{ m}^3/\text{day}$ ). Present production is about  $68 \times 10^3 \text{ m}^3/\text{day}$  but is expected to fall to less than  $32 \times 10^3 \text{ m}^3/\text{day}$  by 1990 if no new discoveries are made; it is thought most likely that new discoveries will only double this figure. Thus there will still be a significant shortfall in production, and large quantities of oil will need to be imported. Current oil imports now cost Australia about \$4 million/day, and this figure will rise with increased consumption and prices.

Central Pacific Minerals NL and Southern Pacific Petroleum NL claim that it will be possible to produce oil from oil shale at Rundle at a price competitive with OPEC oil, and that reserves at Rundle can supply  $40 \times 10^3 \text{ m}^3/\text{day}$  of shale oil for about 24 years. If the Rundle operation goes ahead, Australia will probably come close to being self sufficient in oil from about 1990, at least in the short term.

However, there are many other oil shale deposits in Australia, some proved to be small, but many whose size and grade are virtually unknown. These deposits could have the potential to supply Australia with a large percentage of its future liquid fuel requirements.

In short, shale oil has the potential to significantly lower Australia's imports bill, and reduce dependence on overseas sources of oil.

## REFERENCES

- BALME, B.E., & CHURCHILL, D.M., 1959 - Tertiary sediments at Coolgardie, Western Australia. Journal of the Royal Society of Western Australia, 42, 37-43.
- BP (BRITISH PETROLEUM), 1978 - Shale oil, for sands and heavy oils. BP Briefing Paper (unpublished).
- DESPRAIRIES, P., 1978 - Worldwide petroleum supply limits. Part three. Unconventional oil reserves and their utilization. In OIL AND GAS RESOURCES, THE FULL REPORTS TO THE CONSERVATION COMMISSION OF THE WORLD ENERGY CONFERENCE. I.P.C. Science and Technological Press.
- GALLOIS, R., 1978 - What price oil shales. New Scientist, 77(1091), 490-3.
- JENNINGS, I.B., NOLDART, A.J., & WILLIAMS, E., 1967 - Geology and mineral resources of Tasmania. Tasmania Geological Survey Bulletin 50.
- KRAEMER, A.J., & THORNE, H.M., 1951 - Oil shale operations in New South Wales, Australia. U.S. Bureau of Mines Report of Investigations 4796.
- LINDNER, A.W., & DIXON, D.A., 1976 - Some aspects of the geology of the Rundle oil shale deposit, Queensland. APEA Journal, 16(1), 165-72.
- LISHMOND, S.R., 1974 - Oil Shale. NSW Geological Survey Mineral Industry No. 30.
- McFADYEN, W.T., 1966 - Oil from oil shales and tar sands. Commonwealth Mining and Metallurgical Congress, 1966, 8th, Publications, Volume 5, Proceedings (Petroleum), 277-84.
- MOREIRA, H.B., 1979 - Shale: an effective contribution to complementing oil production (In Spanish). Technical Magazine of the Parana Engineering Institute, No. 16, June 1979.
- PACMINEX PTY LTD., 1976 - Oil shale deposits of the north Eromanga Basin. In: ECONOMIC GEOLOGY OF AUSTRALIA AND PAPUA NEW GUINEA, 3, Petroleum. Australasian Institute of Mining and Metallurgy, Monograph 7, 517-19.

RATNIEKS, H., 1977 - Oil Shale and the USSR. Geographical Magazine, October 1977, p. 46.

SHEPHERD, S.R.L., 1945 - Cambrian oil shale, Camooweal. Queensland Government Mining Journal, 46, 75-77.

SMITH, J.W., & JENSEN, H.B., 1977 - Oil Shale. In: LAPEDES, D.N. (Ed.) - MCGRAW HILL ENCYCLOPEDIA OF THE GEOLOGICAL SCIENCES. McGraw Hill, New York.

SWARBRICK, C.F.S., 1974 - Oil shale resources of Queensland. Geological Survey of Queensland Report 83.

TRW ENERGY SYSTEMS GROUP, 1979 - Oil shale data book. Unpublished report to the US Department of Energy.

WORLD ENERGY CONFERENCE, 1974 - SURVEY OF ENERGY RESOURCES. US National Committee of the World Energy Conference, New York.

APPENDIX 1. KNOWN AUSTRALIAN DEPOSITS AND MINOR OCCURRENCES

Deposit	1:250 000 Sheet	Age	Tonnes	Yield (litres/tonne or % volatile hydrocarbons)	Oil resource recoverable from in-situ tonnage, assuming Fischer Assay yield. (m <sup>3</sup> ) *	Comments
<u>QUEENSLAND</u>						
Camooweal	Mt. Isa	Cambrian		67-104	Very small?	Thin seams, mostly less than 10 cm, known only from water bore drilled in 1940s, and BMR Mt Isa 1 (1978).
Alpha (a)	Tambo	Permian	2.0 x 10 <sup>6</sup> 3.3 x 10 <sup>6</sup>	408 142	.8 x 10 <sup>6</sup> (d) .5 x 10 <sup>6</sup> (d)	Extensively drilled in 1940s. High yield refers to oil shale, low yield to cannel coal enclosing oil shale deposit.
Carnarvon Creek (a)	Eddystone	Permian	10 <sup>5</sup>	219	.02 x 10 <sup>6</sup> (l)	66-71 cm seam, traceable in outcrop for 680 m. Tonnage estimated by Swarbrick (1974).
Rosella Creek	Bowen?	Permian		?	Very small?	Discovered in 1870s but not relocated. 25-cm seam.
Withcott	Ipswich	Jurassic		22-358	Very small?	Extremely thin seam.
Canungra	Tweed Heads	Jurassic		38 (one sample)	Small?	1.5-m seam.
Oakey-Acland Coalfield	Ipswich	Jurassic		112-242	Very small?	Known from subsurface in Walloon Coal Measures. Very thin seams.
Mimosa Syncline	Taroom	Jurassic		64 (one sample)	Very small?	Thin seams known from drilling in Walloon Coal Measures.
Orallo	Roma	Jurassic		200(one sample)	Very small?	Outcrop discovered in 1926, but not recently relocated. 60-cm
Great Australian Basin (Toolebuc Formation)	Various	Cretaceous	10 <sup>13</sup>	46?	455 000 x 10 <sup>6</sup> (l)	Extremely approximate figure calculated by BMR. Includes all Toolebuc Formation at all depths (up to more than 1000 m).
Julia Creek (a)	Julia Creek	Cretaceous	4000 x 10 <sup>6</sup>	60	238 x 10 <sup>6</sup> (d)	Part of Toolebuc Formation in ATP's held by Pacminex.
Rundle (a)	Rockhampton	Tertiary	4678 x 10 <sup>6</sup>	77	361 x 10 <sup>6</sup> (d)	(Held by Southern Pacific Petroleum (SPP) and Central
Rundle South (Stuart)(a)	Rockhampton	Tertiary		80?	Large	(Pacific Minerals (CPM)).

Deposit	1:250 000 Sheet	Age	Tonnes	Yield (litres/tonne or % volatile hydrocarbons)	Oil resource recoverable from in-situ tonnage, assuming Fischer Assay yield. (m <sup>3</sup> ) *	Comments
Plevna	Mackay	Tertiary	0.16 x 10 <sup>6</sup>	81	0.01' x 10 <sup>6</sup> (d)	Oil shale probably 33 m thick. Tonnage estimated by Swarbrick (1974).
Ukalunda	Bowen	Tertiary		54	Very small	5.8-m seam in small outlier of Tertiary sediments.
Cape Hillsborough	Proserpine	Tertiary		27-82	Small?	Seams generally thin.
Condor (a)	Proserpine/ Bowen	Tertiary		65	Large - Very large?	Being prospected by SPP and CPM.
Duaringa (a)	Duaringa	Tertiary		75	Large	Being prospected by SPP and CPM.
Byfield (a)	Port Clinton	Tertiary		63	Large	Being prospected by SPP and CPM.
Lowmead (a)	Bundaberg	Tertiary		133	Large?	Known from shafts and bore sunk in early 1900s.
Nagoorin (includes (a) Littlemore)	Monto	Tertiary		57-262	Large?	Known from outcrop and bores drilled in 1965 and 1979.
Strathpine	Brisbane	Tertiary		104	Large?	Known from several shafts and bores.
Yaamba (a)	Rockhampton	Tertiary		91 (moisture- free basis)	Large	( ( (Discovered recently by company (drilling (Peabody and Central (Oil Shale).
Rossmoya	Rockhampton Port Clinton	Tertiary		probably about 75	Large?	( ( (
Herbert Creek (a)	Port Clinton St. Lawrence	Tertiary		probably about 75	Large?	( ( (
<u>NEW SOUTH WALES</u>						
Abermain Colliery	Singleton	Permian		60-69% v.h.	Very small?	One 18-cm and one 28-cm seam.
Baerami	Singleton	Permian	10.8 x 10 <sup>6</sup> 5 x 10 <sup>6</sup>	258	2.8 x 10 <sup>6</sup> (d) 1.3 x 10 <sup>6</sup>	Inferred resources could be much larger. Mined mainly between 1918 and 1931.
Barigan	Dubbo	Permian		158-533	Small	



Deposit	1:250 000 Sheet	Age	Tonnes	Yield (litres/tonne or % volatile hydrocarbons)	Oil resource recoverable from in-situ tonnage, assuming Fischer Assay <sub>3</sub> yield. (m <sup>3</sup> ) *	Comments
Blackmans Crown	Sydney	Permian		up to 61% v.h.	Small?	1.2-1.4 m seam. Minor production in 1924.
Burraborang	Wollongong	Permian		43% v.h.	Very small	40-cm seam, traceable in outcrop for 1.2 km.
Coolaway	Singleton	Permian		71-78% v.h. (697-770 l/t)	Very small	10-40 cm seam.
Dunns Mountain	Singleton	Permian		68% v.h.	Very small	31-cm seam.
Genowlan	Sydney	Permian		79-542	Very small	30-140 cm seam. Mined out between 1896 and 1910.
Greta	Singleton	Permian		53-78% v.h.	Small	Seams of 30 cm, 15cm, and 91 cm in Greta Coal Measures. Minor mining between 1873 and 1906.
Grose Valley	Sydney	Permian		40% v.h.	Very small	49-cm seam, traceable in outcrop for 0.8 km.
Hartley Vale	Sydney	Permian		226 (average low grade)	Very small	Seam with average thickness of 107 cm. Mined out between 1865 and 1903.
Ilford Range	Dubbo	Permian		678 (average high grade) max. 40% v.h.	Very small	30-100 cm seam.
Joadja	Wollongong	Permian		590?	Very small	Seam with average thickness of 30-60 cm; mined out between 1873 and 1902.
Marangaroo	Sydney	Permian		271	Small	30-180 cm seam. Richest portion assayed at 1072 l/t, the richest ever recorded. Seam traceable for about 1.3 km. Mined mainly between 1943 and 1945.
Mornington	Dubbo	Permian		10-20% v.h.	Small	Seam up to 1.7 m thick.
Mount Kembla	Wollongong	Permian		271	Very small	46-140 cm seam. Mined between 1865 and 1880.

Deposit	1:250 000 Sheet	Age	Tonnes	Yield (litres/tonne or % volatile hydrocarbons)	Oil resource recoverable from in-situ tonnage, assuming Fischer Assay yield. (m <sup>3</sup> ) *	Comments
Mount Victoria	Sydney	Permian		28-67% v.h.	Very small	46-cm seam.
Murrurundi	Tamworth	Permian		20-69% v.h.	Very small?	30-180 cm seam. Mined between 1909 and 1911.
Narrow Neck	Sydney	Permian		50-82% v.h.	Very small	3 seams, 12.5-45 cm, 30 cm, and 20 cm thick; mined out in period 1882-1903.
Newnes-Glen Davis	Sydney	Permian	9 x 10 <sup>6</sup> 11 x 10 <sup>6</sup>	362-478	3.8 x 10 <sup>6</sup> (d) 4.6 x 10 <sup>6</sup> (l)	20-140 cm seam. Mining commenced in 1891. Government sponsored mining and retorting 1940-1952.
Tongbong Mountain	Dubbo	Permian		54% v.h.	Very small	15-cm seam.
Ulan	Dubbo	Permian		68% v.h.	Very small	Seam up to 25 cm thick.
Wollar	Dubbo	Permian		49% v.h.	Small	150-cm seam.

Other localities in New South Wales from which oil shale has been reported are: Aberdare Colliery (Singleton 1:250 000 Sheet), Barraba (Manilla 1:250 000 Sheet), Bega, Berrima, Bellevue Colliery (near Lake Macquarie), Clandulla (Singleton 1:250 000), Clyde River (Ulladulla 1:250 000 Sheet), Grafton, Gulgong, Gunnedah, Morna Point (Newcastle 1:250 000 Sheet), Musswellbrook, Corral, Deepwater, Little Forest (near Ulladulla), Lue, Taree, Moonbi, Nerriga, Nundle, Penrith, Scone, the Goulburn River, and Wanganderry. Resources at these localities are probably all very small.

#### TASMANIA

Latrobe-Railton-Kimberley	Burnie-Launceston	Permian	17.9 x 10 <sup>6</sup>	123	2.2 x 10 <sup>6</sup> (d)	'Tasmanite'. Marine oil shale, in seams up to 1.5 m thick.
Beulah	Burnie	Permian	2.3 x 10 <sup>6</sup>	123	.3 x 10 <sup>6</sup> (d)	as above
Quamby Bluff	Launceston	Permian	3.8 x 10 <sup>6</sup>	123	.5 x 10 <sup>6</sup> (d)	" "
Nook	Burnie	Permian	1.1 x 10 <sup>6</sup>	123	.1 x 10 <sup>6</sup> (d)	Outcrop discovered in 1926, but not recently relocated. 60-cm
Chudleigh	Burnie-Launceston	Permian	6 x 10 <sup>6</sup>	123	.7 x 10 <sup>6</sup> (d)	" " Extremely approximate figure calculated by BMR, includes all Toolebuc Formation at all depths (up to more than 1000 m).
Julia Creek	Julia Creek	Triassic	4000 x 10 <sup>6</sup>	60	230 x 10 <sup>6</sup> (d)	Part of Toolebuc Formation (ATP's held by Pacminex).
Roxburgh	Roxburgh	Triassic	4500 x 10 <sup>6</sup>	67	101 x 10 <sup>6</sup> (d)	held by Southern Petroleum (SPR) and Central Petroleum (CPR).
Boonah	Boonah	Triassic	1000 x 10 <sup>6</sup>	100	100 x 10 <sup>6</sup> (d)	held by Southern Petroleum (SPR) and Central Petroleum (CPR).

Deposit	1:250 000 Sheet	Age	Tonnes	Yield (litres/tonne or % volatile hydrocarbons)	Oil resource recoverable from in-situ tonnage, assuming Fischer Assay yield. (m <sup>3</sup> ) *	Comments
Preolenna	Burnie	Permian		?	Very small	(Oil shale associated with coal measures. Resources small (compared with tasmanite occur- rences.
Bam Bluff-Mt Pelion	Burnie- Queenstown	Permian		?	Very small	
<u>SOUTH AUSTRALIA</u>						
Coorong	Barker	Quaternary			Very small	Thin encrustations of rubbery substance. Of scientific interest only as a possible modern analogue of oil shale.
<u>WESTERN AUSTRALIA</u>						
Coolgardie	Kalgoorlie	Tertiary		135 (26% v.h.) av.	Medium?	Details of deposit confused; could be up to 80 m thick, in basin of area less than 1 km <sup>2</sup> .
					610.91 x 10 <sup>6</sup> m <sup>3</sup> (d) 455 866.12 x 10 <sup>6</sup> m <sup>3</sup> (i)	

(a) - ATP held by exploration company  
(b) - demonstrated  
(i) - inferred

\* Where figures are not given, estimates of resources are:

	very small <	1 x 10 <sup>6</sup> m <sup>3</sup>
1 x 10 <sup>6</sup> m <sup>3</sup> <	small <	10 x 10 <sup>6</sup> m <sup>3</sup>
10 x 10 <sup>6</sup> m <sup>3</sup> <	medium <	100 x 10 <sup>6</sup> m <sup>3</sup>
100 x 10 <sup>6</sup> m <sup>3</sup> <	large <	1000 x 10 <sup>6</sup> m <sup>3</sup>
1000 x 10 <sup>6</sup> m <sup>3</sup> <	very large <	

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Bibliography on Oil Shale

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BIBLIOGRAPHY ON OIL SHALE:1979

790001

1967: TIXIER M.P. CURTIS M.R.  
Oil shale yield predicted from well logs  
WORLD PETROLEUM CONGRESS 7th, Mexico City. Proceedings V.3 p.713-715  
S622.32WOR

790002

1963: BARDSLEY S.R. ALGERMISSEN S.T.  
Evaluating oil shales by log analysis.  
JOURNAL OF PETROLEUM TECHNOLOGY V.15 p.81-84  
COLORADO SCHOOL OF MINES QUARTERLY V.58 no.4 p.178-184

790003

1943:  
Expansion of oil shale industry in Australia depends on lend-lease aid.  
OIL AND GAS JOURNAL V.43 no.34 p.142,p.145-6  
S622.320IL

790004

1962: JAFFE F.C.  
Oil shale. I. Nomenclature, uses, reserves, and products.  
COLORADO SCHOOL OF MINES, MINERAL INDUSTRY BULLETIN V.5 no.2  
S622.2COL

790005

1944: ANTILL J.M.  
The Shale oil industry in New South Wales  
CHEMICAL ENGINEERING AND MINING REVIEW V.37 NO.433 P.10-18  
BAS.H8AUS

790006

1958: AUSTRAL MINING (QLD)  
Plevna oil shale basin - Eungella, Queensland  
UNPUB REP., GEOLOGICAL SURVEY QUEENSLAND LIBRARY (C.R.191)  
\*\*

790007

1978: BALFE P.E.  
Stratigraphic Drilling Report - GSO Manuka 1.  
QUEENSLAND GOVERNMENT MINING JOURNAL V.79 NO.919 P.258-70  
S622(943)QUE

790008

1913: BALL L.C.  
Kerosene shale in Queensland, occurrence below the Toowoomba Range  
QUEENSLAND GOVERNMENT MINING JOURNAL V.14 P.188  
S622(943)QUE

790009

1916: BALL L.C.  
Lowermead No.1 Bore, and the Tertiary oil shales of Baffle Creek  
QUEENSLAND GOVERNMENT MINING JOURNAL V.17 P.13-16  
S622(943)QUE



BIBLIOGRAPHY ON OIL SHALE:1979

790010

1946: BALL L.C.

Oil shales and coal, Acland

QUEENSLAND GOVERNMENT MINING JOURNAL V.47 P.358-362

S622(943)QUE

790011

1946: BALL L.C.

Oil shale at the Narrows, Central Queensland

QUEENSLAND GOVERNMENT MINING JOURNAL V.47 P.176-9

S622(943)QUE

790012

1927: BALL L.C.

Oil shale in the Eungella District

QUEENSLAND GOVERNMENT MINING JOURNAL V.28 P.306

S622(943)QUE

790013

1945: BALL L.C.

Oil Shale in Queensland

QUEENSLAND GOVERNMENT MINING JOURNAL V.46 P.74-5

S622(943)QUE

790014

1932: BALL L.C.

Shale oil near Strathpine

QUEENSLAND GOVERNMENT MINING JOURNAL V.33 P221-222

S622(943)QUE

790015

1914: BALL L.C.

Tertiary oil shales of the Narrows, Port Curtis district

QUEENSLAND GOVERNMENT MINING JOURNAL V.15 P.73-76

S622(943)QUE

790016

1962: BANKS M.R.

Geology of Tasmania

JOURNAL GEOLOGICAL SOCIETY OF AUSTRALIA V.9 NO.2 P.194-197,204-205

S551(94)GEO

790017

1945: BEASLEY A.W.

The petrology of some Queensland oil shales

QUEENSLAND MUSEUM MEMOIRS V.12 NO.3 P.124-333

S5QUE

BIBLIOGRAPHY ON OIL SHALE:1979

790018

1976: BEMBRICK C.S. LONERGAN A.D.  
Sydney Basin  
AUSTRALASIAN INSTITUTE OF MINING AND METALLURGY MONOGRAPH NO.7 P.426-438  
553.98(94+95)AUS

790019

1976: BURT D.  
Final report, Authorities to Prospect 1426M-1432M  
SHELL DEVELOPMENT (AUST) PTY. LTD. UNPUBLISHED REPORT. QUEENSLAND  
GEOLOGICAL SURVEY LIBRARY (CR5536)  
\*\*

790020

1908: CARNE J.E.  
Geology and mineral resources of the Western Coalfield  
N.S.W. GEOLOGICAL SURVEY MEMOIRS NO.3  
S551(944)NEW

790021

1903: CARNE J.E.  
The Kerosene Shale Deposits of New South Wales.  
N.S.W. GEOLOGICAL SURVEY MEMOIRS  
S551(944)NEW

790022

1919: CARNE J.E.  
Notes on the occurrence of coal and kerosene shale in Baerami and Widdon  
valleys Goulburn River district  
N.S.W. DEPARTMENT OF MINES ANNUAL REPORT 1918 P.155-56  
S622(944)NEW

790023

1970: CARPENTARIA EXPLORATION  
Annual report, 1969, ATP 558M  
UNPUBL REPORT GEOLOGICAL SURVEY QUEENSLAND LIBRARY (CR3388)  
\*\*

790024

1976: FARMER N. CLARKE M.J. GULLINE A.B.  
Oil shale in Tasmania  
AUSTRALASIAN INSTITUTE OF MINING AND METALLURGY MONOGRAPH NO.7 P.524  
553.98(94+95)AUS

790025

1866: CLARKE W.B.  
On the occurrence and geological position of oil-bearing deposits in New  
South Wales  
GEOLOGICAL SOCIETY OF LONDON JOURNAL V.22 NO.1 P.439-48  
S551(410)GEO

BIBLIOGRAPHY ON OIL SHALE:1979

790026

1964: CONNAH T.H.  
Torbanite deposit - Alpha  
QUEENSLAND GEOLOGICAL SURVEY REPORT NO.3  
S551(943)QUE

790027

1950: DAVID T.W.E.  
The Geology of the Commonwealth of Australia Vol.II  
LONDON, ARNOLD (CHAPTER 37)  
S51DAV

790028

1943: DENMEAD A.K.  
Carnarvon oil shale  
QUEENSLAND GOVERNMENT MINING JOURNAL V.44 P.70  
S622(943)QUE

790029

1978: DJURICIC M.V.  
Relationship between the bitumen and kerogen of an Australian torbanite.  
ORGANIC GEOCHEMISTRY V.1 NO.2 P.79-84  
S550.4ORG

790030

1943: DULHUNTY J.A.  
Classification of torbanites and relations to associated carbonaceous  
sediments in New South Wales  
LINNEAN SOCIETY N.S.W. PROCEEDINGS V.68 P.187-206  
S5LIN

790031

1941: DULHUNTY J.A.  
Notes on the measurement of some physical and optical properties of the  
New South Wales torbanites  
LINNEAN SOCIETY N.S.W. PROCEEDINGS V.66 NO.3-4 P.169-177  
S5LIN

790032

1944: DULHUNTY J.A.  
The origin of the New South Wales Torbanites  
LINNEAN SOCIETY N.S.W. PROCEEDINGS V.69 NO.1-2 P.26-48  
S5LIN

790033

1939: DULHUNTY J.A.  
The torbanites of New South Wales Part 1. The essential constituents and  
their relations to physical properties  
ROYAL SOCIETY OF N.S.W. JOURNAL AND PROCEEDINGS V.72 P.179-198  
S5ROY

BIBLIOGRAPHY ON OIL SHALE:1979

790034

1948: HANLON F.N.  
Geology of the North-Western Coalfield Part III. Geology of the Murrumbidgee-Termi District  
ROYAL SOCIETY OF N.S.W. JOURNAL AND PROCEEDINGS V.81 NO.4 P.292-97  
S590Y

790035

1907: HARPER L.F.  
Kerosene shale, Joadja district.  
N.S.W. DEPARTMENT OF MINES ANNUAL REPORT 1906 P.171  
S622(944)NEW

790036

High hopes for Rundle shale tests (Queensland)  
MINER NEWSPAPER (SYDNEY) V.2 NO.3 1979 P.11  
MIN-ECS SECTION

790037

1905: JAQUET J.B. HARPER L.F.  
The geology of the Permo-Carboniferous rocks in the south-eastern portion of New South Wales.  
N.S.W. GEOLOGICAL SURVEY RECORDS V.8 NO.2 P.67-94  
S551(944)NEW

790038

1967: JENNINGS I.B. NOLDART A.J. WILLIAMS E.  
Geology and mineral resources of Australia  
TASMANIA GEOLOGICAL SURVEY BULLETIN NO.50  
S551(946)TAS

790039

1926: JENSEN H.I.  
Geological reconnaissance between Roma, Springsure, Taroom, and Tambo  
QUEENSLAND GEOLOGICAL SURVEY PUBLICATION NO.277 P.160-161  
S551(943)QUE

790040

1939: KENNY E.J.  
The Baerami-Widdin oil-shale deposit  
N.S.W. DEPARTMENT OF MINES ANNUAL REPORT 1938 P.100-102  
S622(944)NEW

790041

1951: KRAEMER A.J. THORNE H.M.  
Oil shale operations in New South Wales, Australia  
U.S. BUREAU OF MINES REPORT OF INVESTIGATIONS NO.4796  
S622(73)UNI

BIBLIOGRAPHY ON OIL SHALE:1979

790042

1950: KENNY E.J.  
Airly oil-shale  
N.S.W. DEPARTMENT OF MINES ANNUAL REPORT 1939-1945, P.108-109  
S622(944)NEW

790043

1950: KENNY E.J.  
America Creek, Mount Kembla oil-shale  
N.S.W. DEPARTMENT OF MINES ANNUAL REPORT 1939-1945 P.116  
S622(944)NEW

790044

1950: KENNY E.J.  
Barigan oil-shale  
N.S.W. DEPARTMENT OF MINES ANNUAL REPORT 1939-1945 P.106-107  
S622(944)NEW

790045

1950: KENNY E.J.  
Crown Ridge oil shale  
N.S.W. DEPARTMENT OF MINES ANNUAL REPORT 1939-1945 P.107  
S622(944)NEW

790046

1950: KENNY E.J.  
Marangaroo oil-shale  
N.S.W. DEPARTMENT OF MINES ANNUAL REPORT 1939-1945 P.105-106  
S622(944)NEW

790047

1950: KENNY E.J.  
Marangaroo oil-shale supplementary report  
N.S.W. DEPARTMENT OF MINES ANNUAL REPORT 1939-1945 P.106  
S622(944)NEW

790048

1950: KENNY E.J.  
Oil shale at Joadja and Reedy Creek  
N.S.W. DEPARTMENT OF MINES ANNUAL REPORT 1939-1945 P.104-105  
S622(944)NEW

790049

1940: KENNY E.J.  
The oil-shale resources of New South Wales  
N.S.W. GEOLOGICAL SURVEY REPORT GS 1940/048  
S551(944)NEW

790050

1950: KENNY E.J.  
Wondo or Cottage Rock oil shale  
N.S.W. DEPARTMENT OF MINES ANNUAL REPORT 1939-1945 P.108  
S622(944)NEW



# BIBLIOGRAPHY ON OIL SHALE:1979

790051

1951: KRAEMER A.J. THORNE H.M.  
Oil Shale operations in New South Wales  
U.S. BUREAU OF MINES REPORT OF INVESTIGATIONS NO.4796  
S622(73)UNI

790052

1934: KURTH E.E.  
The oil shale of Tasmania and New South Wales  
UNPUBLISHED DSC THESIS, UNIVERSITY OF TASMANIA  
\*\*

790053

1956: LEVINGTON K.R.  
Oil shale occurrence, Ukalunda  
QUEENSLAND GOVERNMENT MINING JOURNAL V.57 P.37-38  
S622(943)QUE

790054

1976: LINDNER A.W. DIXON D.A.  
Some aspects of the geology of the Rundle Oil Shale Deposit, Queensland  
APEA JOURNAL V.16 PART 1 P.165-172  
S622.32APEA

790055

1974: LISHMUND S.R.  
Oil shale, N.S.W.  
N.S.W. GEOLOGICAL SURVEY MINERAL INDUSTRY NO.30  
DUP.ST.F6

790056

1968: MATVEYEV A.K.  
Ugcl'nye mestorozhdeniya zanubezhnykh stran Avstraliya:Okeaniya (coal  
deposits of foreign countries Australia and Oceania)  
NEDRA PRESS, MOSCOW  
\*\*

790057

1922: MORRISON M.  
The occurrence of oil shale in the Joadja Valley  
N.S.W. DEPARTMENT OF MINES ANNUAL REPORT 1921 P.66-69  
S622(944)NEW

790058

1936: MORRISON M. KENNY E.J.  
Oil-shale, Warland's Creek, Murrurundi district  
N.S.W. DEPARTMENT OF MINES ANNUAL REPORT 1935 P.87  
S622(944)NEW

BIBLIOGRAPHY ON OIL SHALE:1979

790059

1929: MORRISON M.  
"Oil Shale" in the Wollar district  
N.S.W. DEPARTMENT OF MINES ANNUAL REPORT 1928 P.110  
S622(944)NEW

790060

1927: MORRISON M.  
Suggested site for the establishment of a State coal mine on Tong Bong  
Mountain  
N.S.W. DEPARTMENT OF MINES ANNUAL REPORT 1926 P.97-98  
S622(944)NEW

790061

1933: MORRISON M. KENNY E.J.  
The Baerami-Widdin oil-shale deposits  
N.S.W. DEPARTMENT OF MINES ANNUAL REPORT 1932 P.82-86  
S622(944)NEW

790062

1932: MORRISON M. KENNY E.J.  
The Coolaway oil-shale deposit  
N.S.W. DEPARTMENT OF MINES ANNUAL REPORT 1931 P.78  
S622(944)NEW

790063

1932: MORRISON M. KENNY E.J.  
Oil-shale, Upper Burragorang  
N.S.W. DEPARTMENT OF MINES ANNUAL REPORT 1931 P.78  
S622(944)NEW

790064

1931: MORRISON M. KENNY E.J.  
Reedy Creek oil-shale and coal prospects  
N.S.W. DEPARTMENT OF MINES ANNUAL REPORT 1930 P.77  
S622(944)NEW

790065

1934: MORRISON M. KENNY E.J.  
Wollar oil-shale  
N.S.W. DEPARTMENT OF MINES ANNUAL REPORT 1933 P.80-81  
S622(944)NEW

790066

1950: MULHOLLAND C.S. MULHOLLAND J.  
Baerami-Widdin Brook oil-shale deposits  
N.S.W. DEPARTMENT OF MINES ANNUAL REPORT 1939-1945 P.109-115  
S622(944)NEW

BIBLIOGRAPHY ON OIL SHALE:1979

1934:NEWNES INVESTIGATION

Report on the Newnes-Capertee Shale Oil Project  
GOVERNMENT PRINTER SYDNEY  
622.327NEW

790068

1941: REID J.H.

Oil shale deposit, Drummond Range  
QUEENSLAND GOVERNMENT MINING JOURNAL V.42 P.73  
S622(943)QUE

790069

1942: REID J.H.

The Tertiary oil-shales of Plevna-Eungella District  
QUEENSLAND GOVERNMENT MINING JOURNAL V.43 NO.43 P.2-4  
S622(943)QUE

790070

1945: SHEPHERD S.R.L.

Cambrian oil shale Canoonweal  
QUEENSLAND GOVERNMENT MINING JOURNAL V.46 P.75-77  
S622(943)QUE

790071

1972: SMART J.

The terms Toolebuc Limestone and Kamileroi Limestone  
QUEENSLAND GOVERNMENT MINING JOURNAL V.73 NO.849 P.280-286  
S622(943)QUE

790072

1971: SWARBRICK C.F.J.

Oil shale in Queensland  
AUSTRALASIAN INSTITUTE OF MINING AND METALLURGY MONOGRAPH NO.7 P.519-524  
553.98(94+95)AUS

790073

1974: SWARBRICK C.F.J.

Oil Shale Resources of Queensland  
QUEENSLAND GEOLOGICAL SURVEY REPORT NO.83  
S551(943)QUE

790074

1919: TRICKETT O.

Bibliography of the Economic Minerals of New South Wales  
N.S.W. GEOLOGICAL SURVEY MINERAL RESOURCES NO.28  
S551(944)NEW

790075

1911: THELVETREES W.H.

The tasmanite shale fields of the Mersey district  
TASMANIA GEOLOGICAL SURVEY BULLETIN NO.11  
S551(946)TAS

BIBLIOGRAPHY ON OIL SHALE:1979

790076

1956: WHITING J.W. RELPH R.E.  
The geology of part of the South Western Coalfield  
N.S.W. GEOLOGICAL SURVEY REPORT GS A56/044  
S551(944)NEW

790077

1971: CARPENTARIA EXPLORATION  
Final report, ATP558M  
UNPUBL REPORT GEOLOGICAL SURVEY QUEENSLAND LIBRARY (CR3589)  
\*\*

790078

1934: MORRISON M. KENNY E.J.  
Barigan oil shale  
N.S.W. DEPARTMENT OF MINES ANNUAL REPORT 1933 P.81-82  
S622(944)NEW

790080

1979:  
Israeli breakthrough in laser technology (for development of oil shales)  
MINER NEWSPAPER (SYDNEY) V.2 NO.3 P.10  
MIN.ECS.SECTION

790081

1975: DECORA A.W.  
The outlook and status of in-situ oil shale research.  
AMERICAN NUCLEAR SOCIETY TRANSACTIONS V.22 P.1  
\*\*

790082

1975: CARPENTER H.C.  
In-situ oil shale processing research in the Rock Springs, Wyoming area.  
AMERICAN NUCLEAR SOCIETY TRANSACTIONS V.22 P.1-2  
\*\*

790083

1977: HOSKINS W.  
A technical and economic study of candidate underground mining systems  
for deep, thick oil shale deposits  
U.S. BUREAU OF MINES OPEN FILE REPORT 1977/9  
\*\*

790084

1977: CARTER W.  
Explosively produced fracture of oil shale.  
NEW MEXICO, LOS ALAMOS SCIENTIFIC LABORATORIES (NTIS REPORT RNO. LA-703  
1-PR)  
\*\*

BIBLIOGRAPHY ON OIL SHALE:1979

790085

1974: FINDLEY J.E. APPLEMAN M.D. YEN T.F.  
Degradation of oil shale by sulfur-oxidizing bacteria  
APPLIED MICROBIOLOGY V.28 NO.3 P.460-464  
\*\*

790086

1974: COOK E.W.  
Oil shale technology  
FUEL V.53 P.146-151  
\*\*

790087

1971: PRIEN C.H.  
Current developments in world oil shale technology  
SYMPOSIUM ON SCIENCE AND TECHNOLOGY OF SHALE, REPRINT. BRAZILIAN ACADEMY  
OF SCIENCES, AURITIBA, PARANA, BRAZIL  
\*\*

790088

1974: KATELL S. WELLMAN P.  
An economic analysis for oil shale operations featuring gas combustion  
retorting  
U.S. BUREAU OF MINES TECHNICAL PROGRESS REPORT NO.81  
S622(73)UNI

790089

1974: FLUOR ENGINEERS & CO (INC.)  
Oil shale processing technology  
PAM FLU

790090

1964: EAST J.H. GARDNER E.D.  
Oil shale mining, Rifle, Colorado  
U.S. BUREAU OF MINES BULLETIN NO.611  
S622(73)UNI

790091

1971: HUBBARD A.B.  
Method of reclaiming waste water from oil-shale processing  
AMERICAN CHEMICAL SOCIETY DIVISION OF FUEL CHEMISTRY PREPRINTS V.15 NO.1  
P.21024  
\*\*

790092

1970: BURWELL E.L.  
Shale oil recovery by in situ retorting - a pilot study  
JOURNAL OF PETROLEUM TECHNOLOGY V.22 P.1520-1524  
S622.32JOU

# BIBLIOGRAPHY ON OIL SHALE:1979

790093

1978: COLE R.D.  
Iron partitioning in oil shale of the Green River Formation, Colorado:  
a preliminary Mossbauer study  
FUEL (GUILDFORD) V.59 NO.9 P.514-520  
\*\*

790094

1968: COFFER H.J. HIGGINS G.H.  
Nuclear explosives for oil and gas stimulation and oil shale recovery  
PAM COF

790096

1976: YEN T.F.  
Science and technology of oil shale  
ANN ARBOR, MICH ANN ARBOR SCIENCE (PUBLISHERS INS)  
622.337SC1

790097

1976: WEBER J. H.  
Oil shale processing technology above ground and below ground  
(NTIS SERIES CONF-760602)  
SAMPLING STRATEGY AND CHARACTERISTIC POTENTIAL EMISSIONS FROM SYNFUEL  
PRODUCTS SYMPOSIUM WORKSHOP, AUSTIN TEX.8-10 JUNE 1976 PROCEEDINGS P.43-4  
\*\*

790098

1977: SCHORA F.C. TARMAN S.B. FELDKIRCHNER H.L.  
State-of-the-Art-above ground shale processing  
HYDROCARBON PROCESSING V.56 NO.2 P.113-119  
\*\*

790099

1978: VITOROVIC D.  
Analysis of the organic matter of oil shales by nuclear magnetic  
resonance  
ORGANIC GEOCHEMISTRY V.1 NO.2 P.89-92  
S.50.40RG

790100

1974: MCCARTHY H.E.  
Shale from oil shale economically.  
CONF OF POWER TECHNOLOGY CONFERENCE 7TH, STILLWATER, 9-10 OCT. PROCEEDINGS  
PER 15. OKLAHOMA STATE UNIVERSITY EXT., COLLEGE OF ENGINEERING  
\*\*

790101

1976: YEN T.F.  
Recovery of hydrocarbons from microbial attack on oil-bearing shales  
GENESIS OF PETROLEUM AND MICROBIAL MEANS FOR ITS RECOVERY. INSTITUTE OF  
PETROLEUM, LONDON  
\*\*

BIBLIOGRAPHY ON OIL SHALE:1979

790102

1944: ANTILL J.M.

The shale oil industry of New South Wales  
CHEMICAL ENGINEERING & MINING REVIEW V.37 NO.433 P.10-18  
BAS.H7-9

790103

1922: FELL D.A.

Development of the Australian oil shale industry  
COLORADO ENGINEER V.18 P.102-105

\*\*

790105

1978: KEHRER P.

World energy resources: limits from today's geological standpoint  
NATURAL RESOURCES FORUM VOL.2 NO.2 P.157-169

\*\*

790107

1976: MUSSER W.N. HUMPHREY J.H.

In situ combustion of Michigan oil shale: current field studies  
INTER-SOCIETY ENERGY CONVERSION ENGINEERING CONFERENCE 11TH STATE LINE. N  
NEV., SEPT. 12-17 1976 V.1 P.341-348

\*\*

790108

1976: COWLES J.O. BOUGHTON E.M.

In situ recovery of oil and minerals from Piceance Creek basin oil shale  
INTER-SOCIETY ENERGY CONVERSION ENGINEERING CONFERENCE 11TH STATE LINE.  
NEV. SEPT. 12-17, 1976 V.1 P.336-340

\*\*

790109

1976: ASH J.L. STONE R.B. CRAIG W.E. ENGLER M.R.

Technical and economic study of the modified in situ process for oil  
shale: volume I, Investigation and results  
U.S. NATIONAL TECHNICAL INFORMATION SERVICE REPORT NO. PB-26- 547/5WN

4

\*\*

790110

1976: ASH J.L. STONE R.B. CRAIG W.E. ENGLER M.R.

Technical and economic study of the modified in situ process for oil  
shale: volume II, appendices  
U.S. NATIONAL TECHNICAL INFORMATION SERVICE REPORT NO. PB-260 548/3WN

\*\*

790111

1976: BANSK C.E. FRANCISCOTTI B.C.

Resource appraisal and preliminary planning for surface mining of oil  
shale. Piceance Creek Basin, Colorado

BIBLIOGRAPHY ON OIL SHALE:1979

COLORADO SCHOOL OF MINES QUARTERLY V.71 NO.4 P.257-285  
S622(788)COL

790112

1976: YEN T.F. CHILINGARIAN G.V.  
Oil shale  
AMSTERDAM, ELSEVIER

\*\*

790113

1975: DUNNING H.N.  
Petroleum, natural gas, and oil shale technology  
ENERGY TECHNOLOGY CONFERENCE PROCEEDINGS NO.2 P.40-49

\*\*

790114

1947:  
Oil Shale Demonstration Plant  
PETROLEUM ENGINEER INTERNATIONAL V.18 NO.11 P.87,90,92,95,98-99

\*\*

790115

1972: ZAMBAS P.G. HAWORTH G.R. BRACKEBUSCH F.W. SELLERS J.B.  
Large-scale experimentation in oil shale  
SOCIETY OF MINING ENGINEERS AIME TRANSACTIONS V.252 NO.3 P.283-289  
S622AME

790116

1930: CUTTER P.F.  
The Economics of the Mining of Colorado Oil Shale  
MASTER'S (THESIS) CASE SCHOOL OF APPLIED SCIENCE

\*\*

790117

1956: RUARK J.R. BERRY K.L. GUTHRIE B.  
Description and operating of the N-T-U retort on Colorado oil shale  
U.S. BUREAU OF MINES REPORT OF INVESTIGATIONS NO.5279  
S622(73)UNI

790118

1951: ROBINSON W.E. HUBBARD A.B.  
Study of preheating Colorado oil shale  
U.S. BUREAU OF MINES REPORT OF INVESTIGATIONS NO.4787  
S622(73)UNI

790119

1952: HUBBARD A.B. SMITH H.N. HEADY H.H.  
Method of concentrating kerogen in Colorado oil shale by treatment with  
acetic acid and gravity separation  
U.S. BUREAU MINES REPORT OF INVESTIGATIONS NO.4872

\*\*



# BIBLIOGRAPHY ON OIL SHALE:1979

790120

1930: GAVIN M.J. DESMOND J.S.  
Construction and operation of the Bureau of Mines Experimental Oil-Shale  
Plant, 1925-27  
U.S. BUREAU OF MINES BULLETIN NO.315  
S622(73)UNI

790121

1953: WRIGHT F.C. BURGH E.E. BROWN B.C.  
Blasting research at the Bureau of Mines oil-shale mine  
U.S. BUREAU OF MINES REPORT OF INVESTIGATIONS NO.4956  
S622(73)UNI

790122

1952: WELLS W.E. RUARK J.R.  
Pilot-plant retorting of Colorado oil shale  
U.S. BUREAU OF MINES REPORT OF INVESTIGATIONS NO.4874  
S622(73)UNI

790123

1948: ERTL TELL.  
Mining of Colorado oil shale  
PURDUE UNIVERSITY LAFAYETTE ENGINEERING BULLETIN V.32 NO.11 P.8-9  
\*\*

790124

1978: STRAUSS O.P. LOWE E.M.  
Oil shale and oil  
VERLAG CHEMIS INTERNATIONAL  
\*\*

790125

1975: BOND H.E.  
Oil shale - the dawn of a new U.S. energy industry.  
WORLD PETROLEUM CONGRESS 9th V.5 P.41-50  
S622.32WOR

790126

1976: COLORADO DEVELOPMENT CORPORATION  
Shale oil production costs and the need for incentives for pioneer plant  
construction  
MIMEO  
\*\*

790127

1977: MAUGH III J.H.  
Oil shale : prospects on the upswing again.  
SCIENCE V.198 (December 9, 1977) P.1023-1027  
S5SCI

BIBLIOGRAPHY ON OIL SHALE:1979

790128

:  
Shale Oil - the problems and the prospects  
OIL AND GAS JOURNAL V.62 NO.10 9 March, P.65-80  
S622.3201L

790129

1973: U.S.DEPARTMENT OF THE INTERIOR  
Final environmental statement for the prototype oil shale leasing  
programme  
WASHINGTON V.6  
622.337UNI

790130

1978: ERICSSON N. MORGAN P.  
The economic feasibility of oil shale, an activity analysis  
BELL JOURNAL OF ECONOMICS V.9 NO.2 P.457 - 487  
IN PROCESS

790131

1972: U.S. DEPARTMENT OF THE INTERIOR  
An economic analysis of an oil shale  
BUREAU OF MINES MORGANTOWN, WEST VIRGINIA  
\*\*

790132

: U.S.DEPARTMENT OF THE INTERIOR  
Shale oil : 100,000 barrels per day  
BUREAU OF MINES, MORGANTOWN, WEST VIRGINIA  
\*\*

790133

:  
SYMPOSIUM ON OIL SHALE, 1ST-5TH (1964-68)  
Proceedings  
GOLDEN, COLORADO SCHOOL OF MINES 1975 (?)  
S621(788)SYM

790134

1974: U.S.HOUSE OF REPRESENTATIVES  
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS, SUBCOMMITTEE ON MINES AND  
MINING  
Spent oil shale  
WASH.D.C. U.S. GOVERNMENT PRINTING OFFICE  
\*\*

790135

1974: U.S. FEDERAL ENERGY AGENCY  
Project independence : potential future role of oil shale : projects and  
constraints

BIBLIOGRAPHY ON OIL SHALE:1979

FINAL TASK FORCE REPORT (1974a) AND APPENDIX M (1974b)

\*\*

790136

1976: U.S. SENATE  
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS, SUBCOMMITTEE ON MINERALS AND  
FUELS  
Oversight: prototype oil shale leasing  
WASH., D.C. U.S. GOVERNMENT PRINTING OFFICE

\*\*

790137

1972: WINSON W.  
Growth, energy and oil shale.  
OIL DAILY FORUM N.Y. MAY 4, 1972

\*\*

790138

1978: ECKSTEIN L.  
EPA program status report: oil shale Denver, Colo. Cameron Engineers Inc.  
C.  
U.S. NATIONAL TECHNICAL INFORMATION SERVICE REPORT PB-284 480/1GA

\*\*

790139

1973: CAMERON R.J.  
Economic variables in production of oil from oil shale [abstr]  
AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS BULLETIN V.57 NO.4 P.772  
5553.982AME

790140

1973: CULBERTSON W.C. PITMAN JANET K.  
Oil shale.  
U.S. GEOLOGICAL SURVEY PROFESSIONAL PAPER NO.820 P.497-503  
5551(73)UNI

790141

1975: MACLEOD MATHEWS A.F.  
U.K. oil shale. Past and possible future exploitation  
GREAT BRITAIN DEPT. OF ENERGY. ENERGY PAPER NO.1

\*\*

790142

1950:  
Oil shale and Cannel Coal Conference, 2nd London, July, 1950.  
Proceedings  
LOND., INSTITUTE OF PETROLEUM

\*\*

# BIBLIOGRAPHY ON OIL SHALE:1979

790143

1972:

Oil shale: a stateside answer to petroleum shortage.  
MINING ENGINEERING V.24 NO.10 P.95-98 1972  
BAS.N16-17MIN

790144

1967: MCKELVEY V.

Occurrence and prospects of oil shales  
WORLD PETROLEUM CONGRESS 7TH V.3 P.657-730  
S622.32WOR

790145

1977: WEST J.

Obstacles to limit U.S. shale production  
OIL AND GAS JOURNAL/PETROLEUM 2000 V.75 NO.35 P.522-525  
S622.32OIL

790146

1976: HEMMING D.F.

Energy analysis and oil shale reserves.  
OPEN UNIVERSITY, MILTON (G.B.) ENERGY RESEARCH GROUP.(U.S.NATIONAL  
TECHNICAL INFORMATION SERVICE REPORT NO.N78-31584/3GA)  
\*\*

790147

1962: JAFFE F.C.

Oil shale - pt. 1, nomenclature, uses, reserves and production  
COLORADO SCHOOL OF MINES MINERAL INDUSTRIES BULLETIN V.5 NO.2  
S622.2COL

790148

:

Commercial oil from shale "is close".  
MINER NEWSPAPER V.2 NO.3 1979 P.10  
MIN.ECS. SECTION

790149

1921: CRANS'IAW H.B.

Oil shales  
Lond. John Murray  
\*\*

790150

1948: BELL H.S.

Oil shales and shale oils.  
N.Y. VAN NOSTRAND  
622.337BEL

790151

:

U.N.DEPARTMENT OF ECONOMIC AND SOCIAL  
AFFAIRS  
Utilization of oil shale : progress and prospects

BIBLIOGRAPHY ON OIL SHALE:1979

N.Y. (ST/ECA/101)  
1967  
S33WOR

790152

1975:

Environmental Oil Shale Symposium  
Proceedings  
GOLDEN, COLORADO SCHOOL OF MINES 1975 (QUARTERLY OF THE COLORADO SCHOOL  
OF MINES V.70 NO.4 OCT. 197V)  
565

790154

1976:

Symposium on Oil Shale Tar Sands, and related materials - production and  
utilization of syntfuels, San Fransisco 29 Aug.-3 Sept. 1976.  
AMERICAN CHEMICAL SOCIETY, DIVISION OF FUEL CHEMISTRY PREPRINTS V.21 NO.  
6  
\*\*

790155

1976: SMITH JOHN WARD

Oil shale and tar sands  
AMERICAN INSTITUTE OF CHEMICAL ENGINEERS SYMPOSIUM SERIES V.72 NO.155  
\*\*

790156

1977:

Symposium on Oil Sand and Oil Shale, Montreal 29 May-2 June 1977  
[Papers]  
WASH., AMERICAN CHEMICAL SOCIETY 1977  
\*\*

790157

1976: SCHORA F.C.

Hydrocarbon fuels from oil shale  
INTER SOCIETY ENERGY CONVERSION ENGINEERING CONFERENCE 11TH 1976 PROCEEDI  
NGS V.1 N.Y. AICHE 1976 P.331-335  
\*\*

790158

1976: WELLMAN PAUL

Oil shale development  
INTER SOCIETY ENERGY CONVERSION CONFERENCE 11TH, 1976. PROCEEDINGS V.1 N.  
Y. AICHE, 1976 P.331-335 (SOCIETY OF AUTOMOTIVE ENGINEERS PAPER NO.76905)  
\*\*

790159

1977: UPADHYAY RAJA P.

Economic evaluation of oil shale mining in Colorado using sensitivity  
and risk analysis

BIBLIOGRAPHY ON OIL SHALE:1979

APPLICATIONS OF COMPUTER METHODS IN THE MINERAL INDUSTRY PROCEEDINGS OF  
THE SYMPOSIUM 14TH 1976 N.Y. AIME, SOCIETY OF MINERAL ENGINEERS P.950-96  
518.5:622.2INT

790160

1974: NATIONAL SCIENCE FOUNDATION

Disposal and environmental effects of carbonaceous solid wastes from  
commercial oil shale operations  
commercial oil shale operations  
WASH. U.S. NATIONAL TECHNICAL INFORMATION SERVICE PB-231 796

\*\*

790161

1974: RUSSELL PAUL L.

Some environmental aspects of large shale oil shale mining  
RAPID EXCAVATION AND TUNNELLING CONFERENCE, SAN FRANCISCO, 24-27 JUNE,  
PROCEEDINGS V.1 N.Y. SOCIETY OF MINING ENGINEERS AIME P.861-73

\*\*

790162

1975: LEWIS ARTHUR E.

Outlook for shale oil  
AMERICAN ASTRONAUTICAL SOCIETY SCIENCE AND TECHNOLOGY SERIES V.35(ENERGY  
SYMPOSIUM: ENERGY DELTA/SUPPLY VS DEMAND 140 PAPER AA 74-017 P.241-59)

\*\*

790163

1974: STONE REID JOHNSON HARRY

Oil shale development and its environmental considerations.  
AMERICAN CHEMICAL SOCIETY DIVISION OF PETROLEUM CHEMISTRY PREPRINTS V.19  
NO.3 P.510

\*\*

790164

1976: WHITCOMBE J.A.

Oil shale development, status and prospects  
JOURNAL OF PETROLEUM TECHNOLOGY V.28 JAN. 1976 P.16-20  
S622.32JOU

790165

1971: HUTCHINS J. KRECH W. KRECH W.

Environmental aspects of a commercial oil shale operation  
ENVIRONMENTAL QUALITY CONFERENCE FOR THE EXTRACTIVE INDUSTRIES WASH. 7-9  
JUNE 1971. AMERICAN INSTITUTE OF MINING, METALLURGICAL AND PETROLEUM EN

\*\*

790166

1969: PADULA V.J.

Oil shale of the Permian Irati Formation, Brazil.  
AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS BULLETIN V.53 P.591-602  
S553.982AME

BIBLIOGRAPHY ON OIL SHALE:1979

790167

1963: BARDSLEY A.R. ALGERMISSEN S.J.  
Evaluating oil shale by log analysis  
COLORADO SCHOOL OF MINES QUARTERLY V.58 NO.4 P.175-184  
S622(788)COL

790168

1940: DOWN A.L. HIMUS G.W.  
Classification of oil shales and cannel coals  
INSTITUTE OF PETROLEUM JOURNAL V.26 P.329-333  
S622.32INS

790169

1979: BERGSTROM R.E. SHIMP N.F.  
Geologic and geochemical studies of the New Albany Group (Devonian black shale) in Illinois to evaluate its characteristics as a source of hydrocarbons:quarterly progress report October 1 - December 31,1977  
SPRINGFIELD VA. U.S. NATIONAL TECHNICAL INFORMATION SERVICE (ORO-5203-3)  
\*\*

790170

1975: PERRINI E.  
Oil from Shales and tar sands  
PARK RIDGE, N.J. NOYES DATA CORPORATION, 1975  
553.984PER

790171

1976: CHILINGARIAN G.E. YEN T.F.  
Oil shale  
AMSTERDAM, ELSEVIER 1976  
552.578OIL

790172

1964: BRADLEY W.H.  
Geology of the Green River Formation and associated Eocene rocks in southwestern Wyoming and adjacent parts of Colorado and Utah.  
U.S. GEOLOGICAL SURVEY PROFESSIONAL PAPER NO.496-A  
S551(73)UNI

790173

1960: SWANSON V.E.  
Oil yield and uranium content of black shales.  
U.S. GEOLOGICAL SURVEY PROFESSIONAL PAPER NO.356-A  
S551(73)UNI

790174

1973: BALOGH B. WILSON D.M. CHRISTIANSEN P.  
Hopane identified in oil shale of the Green River Formation (Eocene) by Carbon-13 NMR.  
NATURE V.242, NO.5400 P.603-605  
S5NAT

BIBLIOGRAPHY ON OIL SHALE:1979

790175

1965: ROBINSON W.E. CUMMINS J.J. DINNEEN G.U.  
Changes in the Green River oil-shale paraffins with depth  
GEOCHEMICA ET COSMOCHIMICA ACTA V.29 P.249-258  
S550.4GE

790176

1978: CAMERON I. MCADAM A.  
Oil-shales of the Lothians Scotland present resources and former  
workings  
GREAT BRITAIN INSITUTE OF GEOLOGICAL SCIENCES REPORT 78/28  
S551(410)GRE

790177

1974: MATVEYEV A.K.  
Oil Shales outside the Soviet Union  
DEPOSITS OF FOSSIL FUELS VOL.4 BOSTON, G.K. HALL, 1974  
S553.9DEP

790178

1976: CHILINGARIAN G.V. YEN T.F.  
Oil shale  
AMSTERDAM ELSEVIER 1976  
552.5780IL

790179

1974: SLADEK T.A.  
Recent trends in oil shale Part 1 : History, nature and reserves  
COLORADO SCHOOL OF MINES MINERAL INDUSTRY BULLETIN V.17 NO.6  
S622.2COL

790180

1965: DUNCAN D.C. SWANSON V.E.  
Organic-rich shales of the United States and world land areas  
U.S. GEOLOGICAL SURVEY CIRCULAR NO.523  
S551(73)UNI

790181

1943: DULHUNTY J.A.  
Classification of Torbanites and relation to associated carbonaceous sed-  
iments in N.S.W.  
LINNEAN SOCIETY OF N.S.W. PROCEEDINGS V.68 P.187-206  
S5L IN

790182

1935: MIKHAYLOV V.N. POPOV N.M.  
Goryuchie slantsy. Atlas energeticheskikh resursov SSSR  
OIL SHALES. ATLAS OF THE ENERGY RESOURCES OF THE USSR V.1 PART 2 ONTI  
PRESS MOSCOW-LENINGRAD

\*\*



BIBLIOGRAPHY ON OIL SHALE:1979

790183

1948: CANE R.F.

The chemistry of the pyrolysis of torbanite  
ROYAL AUSTRALIAN CHEMICAL INSTITUTE PROCEEDINGS V.15 P.62-68  
\*\*

790184

1920: BROUGHTON A.C.

Coorongite  
ROYAL SOCIETY OF SOUTH AUSTRALIA TRANSACTIONS AND PROCEEDINGS  
V.44 P.386  
S5ROY

790185

1943: CANE R.F.

A rich torbanite from Marangaroo  
AUSTRALIAN JOURNAL OF SCIENCE V.5 P.156-157  
S5AUS

790186

1971: CANE R.F. ALBION P.R.

The phytochemical history of torbanites  
ROYAL SOCIETY OF N.S.W. JOURNAL AND PROCEEDINGS V.104 P.31-37  
S5ROY

790187

1973: CANE R.F. ALBION P.R.

The organic chemistry of torbanite precursors  
GEOCHIMICA ET COSMOCHIMICA ACTA V.37 P.1543-49  
S550.4GEO

790188

1889: DAVID T.W.E.

Note on the origin of kerosene shale  
LINNEAN SOCIETY OF N.S.W. PROCEEDINGS V.4 NO.2 P.483-500  
S5LIN

790189

1965: DUNCAN D.C. SWANSON V.E.

Organic rich shale of the United States and world land areas  
U.S. GEOLOGICAL SURVEY CIRCULAR NO.523 30PP.  
S551(73)UNI

790190

1976: EXON N.F. SENIOR B.R.

The cretaceous of the Eromanga and Surat Basins  
BMR JOURNAL OF GEOLOGY AND GEOPHYSICS V.1 P.33-50  
S55AUS

BIBLIOGRAPHY ON OIL SHALE:1979

790191

1965: SCHRAMM L.W. LANKFORD J.D.  
Oil shale  
MINERAL FACTS AND PROBLEMS. U.S. BUREAU OF MINES BULLETIN NO.630 P.631-6  
S622(73)UNI

790192

1959: SMITH H.N. SMITH J.W. KOMMES W.C.  
Petrographic examination and chemical analysis for several foreign oil  
shales  
U.S. BUREAU OF MINES REPORT OF INVESTIGATIONS NO.5504  
S622(73)UNI

790193

1978: VITOROVIC D.  
Analysis of the organic matter of oil shales by nuclear magnetic  
resonance  
ORGANIC GEOCHEMISTRY V.1 NO.2 P.89-92  
S550.4ORG

790194

1978: BUGLE R.C. OSTERYOUNG R.A.  
Heteroaromatic moieties in Green River oil shale kerogen.  
ORGANIC GEOCHEMISTRY V.1 NO.2  
S550.4ORG

790195

1877: JOHNSTON R.M.  
Tasmanite or Mersey "Yellow Coal"  
PRIVATE PRINTING HOBART 8P.  
\*\*

790196

1854: CHURCH A.H.  
On Tasmanite : a new mineral of organic origin  
PHILOSOPHICAL MAGAZINE NO.28 P.465-470  
\*\*

790197

1958: FORSMAN J.P. HUNT J.M.  
Insoluble organic matter (kerogen) in sedimentary rocks of marine origin  
HABITAT OF OIL - A SYMPOSIUM, TULSA, OKLA., AMERICAN ASSOCIATION OF  
PETROLEUM GEOLOGISTS P.747-778  
S53.98WEE

790198

1978: GALLOIS R.  
A pilot study of oil shale occurrences in the Kimmeridge Clay  
GREAT BRITAIN INSTITUTE OF GEOLOGICAL SCIENCES REPORT 78/13  
S551(410)GRE

BIBLIOGRAPHY ON OIL SHALE:1979

790199

1978:

Shales a kerogen-rich sediment with potential economic value

PETROLEUM FORMATION AND OCCURRENCE BY B.P. TISSOT AND D.H. WELTE,  
BERLIN, SPRINGER-VERLAG. CHAP.8 P.223-236  
553.98TIS

790200

1973: BRADLEY W.H.

Oil shale formed in desert environment, Green River Formation.  
WYOMING GEOLOGICAL SOCIETY OF AMERICA BULLETIN V.84 NO.4 P.1121-1123  
S551(73)GE

790201

1959: SMITH H.M.

Petrographic examination and chemical analysis for several foreign oil  
shales  
U.S. BUREAU OF MINES REPORT OF INVESTIGATIONS NO.5504  
S622(73)UNI

# BIBLIOGRAPHY ON OIL SHALE:1979

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