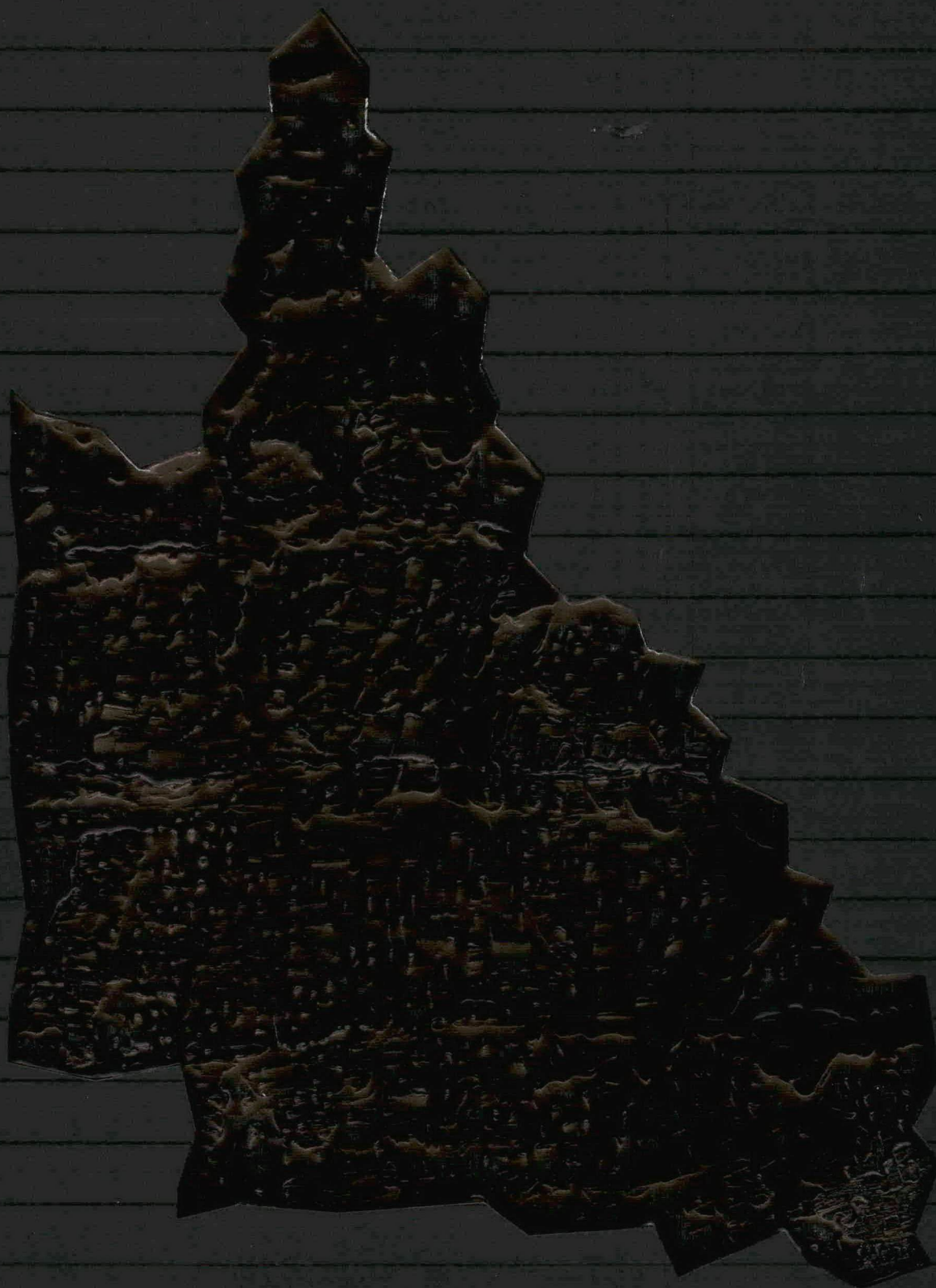




THE QUEENSLAND COAL BOARD
38TH ANNUAL REVIEW 1988 – 89





gjs

Minister for Resource Industries

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1988/89 ANNUAL REVIEW OF THE QUEENSLAND COAL INDUSTRY

As the recently appointed Minister for Resource Industries with ministerial responsibilities that include the Department of Resource Industries (formerly the Department of Mines) and the Queensland Coal Board, I am pleased to enclose the 1988/89 Annual Review of the Queensland Coal Industry. The Annual Review has been produced by the Queensland Coal Board with the assistance of Government Departments, other Statutory Bodies and coal mining companies.

It will be noted that the Queensland Coal Board has reported an optimistic future for Queensland's steaming and coking coals especially with the present world growth in electricity generation and the Japanese growth in steel production.

I am confident that the future of the coal industry of Queensland is assured with the continued involvement and co-operation of all sectors of the industry.

Yours sincerely,

Ken Vaughan
MINISTER FOR RESOURCE INDUSTRIES

14th December, 1989


A LETTER TO THE MINISTER



The Honourable the Minister
for Mines and Energy

Dear Minister,

On behalf of the Members of
The Queensland Coal Board, I herewith
submit the Thirty-Eighth Annual
Review of the Coal Mining Industry for
the financial year 1988-89.



K W Wolff
CHAIRMAN

1st December, 1989

The Queensland Coal Board
7th Floor
61 Mary Street
BRISBANE QLD 4000

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1 ACTIVITIES OF THE BOARD

CONSTITUTION

The Queensland Coal Board is a body corporate constituted under the Coal Industry (Control) Act 1948-1978. The Board is administered through the portfolio of the Minister for Mines and Energy.

The powers and functions of the Board are to include the taking of such action as, in the opinion of the Board, is necessary or desirable:-

- To ensure that coal is produced in the State in such quantities and with such regularity as will meet requirements throughout Queensland and in trade with other States and Territories of the Commonwealth and other countries;
- To ensure that the coal resources of the State are conserved, developed, worked and used to the best advantage in the public interest;
- To ensure that coal produced in the State is distributed and used in such manner, quantities, classes and grades and at such prices as are calculated best to serve the public interest and secure the economical use of coal and the maintenance of essential services and industrial activities;
- To promote the welfare of workers engaged in the coal industry in the State, and
- To encourage the highest degree of co-operation between management and workers so as to ensure maximum efficiency and production.

THE BOARD

The present Board comprises Mr. K.W. Wolff, Chairman (who is also Director-General, Queensland Department of Mines), Mr. W.J. Platt and Mr. M.L. Noume, Members.

The Chairman and Members are appointed by the Governor in Council.

The Chairman's salary is met by the Department of Mines. Mr. W.J. Platt is a full-time salaried officer and Mr. M.L. Noume has been appointed on a part-time basis. No fees are paid to the Chairman and Members for their attendance at meetings.

BOARD MEETINGS

During the year the Board held 11 formal meetings. However, discussions on all matters relative to the coal mining industry were continually held.

FINANCE

The Board's income is derived from contributions by coal mining companies, grants from Consolidated Revenue and interest earnings. The contribution from mining companies is based on manpower required for the production and sale of coal within Australia. No contribution is received from companies which are exclusively exporting coal overseas.

FINANCIAL STATEMENTS

The Board's Financial Statements are prepared in accordance with the Financial Administration and Audit Act and in pursuance of the Minister's Directions. The Financial Statements are certified by the Auditor-General.

STAFF

The Board employs 14 full time officers who are classified as Crown employees. The Secretary, Mr. J.I. Kavanagh and the Fuel Technologist, Mr. P.A. Bennett were appointed by the Governor in Council. The full-time members and all staff contribute to the State Service Superannuation Fund.

COAL MINERS' HEALTH SCHEME

By Order dated 8th December, 1982, the Board instituted the Coal Miners' Health Scheme.

Under the provisions of this scheme, it is compulsory for all persons to be medically examined prior to employment in the coal mining industry. During the year 877 persons underwent the required medical examination.

COLLIERY EMPLOYEES' SEVERANCE PAY FUND

The Board also administers a Severance and Retrenchment Pay Fund for employees in the Queensland coal mining industry.

Contributions are received from those companies which participate in the Scheme.

The present participating companies have mining operations in the West Moreton and Maryborough Districts. During the year 34 employees covered by Agreements were retrenched. Payments totalling \$560 855.60 were made from the fund.

WELFARE FUND

Since its inception the Board has operated a Welfare Fund which promotes the welfare of employees in the industry and communities of persons in coal mining areas. During the year grants and loans totalling \$40100 were provided for a variety of projects.

COAL MARKETING

The promotion of coal as an efficient source of energy at a reasonable cost is a continuing function of the Board. Advice on matters concerning coal combustion and usage is also available to interested parties.

COAL QUALITY CONTROL

The Board employs two coal samplers who regularly visit mines, consumers' premises and stockpile areas to obtain coal samples. During the year the samplers made 465 visits and collected 480 samples for testing and analysis. The samples are prepared for sizing tests and for analysis by the Queensland Government Chemical Laboratory. The Board's Fuel Technologist also monitors complaints by consumers regarding coal quality and sizing.

PRICE OF COAL

Although most of the coal used within the State is now the subject of sales agreements, the Board still has a responsibility for all coal sold. It determines variations in the pithead selling prices of coal supplied to several consumers located in various areas of the State. Price rises are normally occasioned by variations in the Coal Mining Industry Awards, together with escalation of costs of coal production.

Table 1.1 depicts the increases in the average pithead selling price of domestic coal during June 1989, as determined by the Board, compared with the corresponding price during June 1988:

Table 1.1 Price of Coal

District	Average Price \$		Increase	
	June 88	June 89	\$	%
Southern	37.47	38.63	1.16	3.10
Central	21.15	20.87	- 0.28	- 1.32
Northern	44.26	44.77	0.51	1.15

Table 1.1 does not include sales to the Queensland Electricity Commission where the Commission arranges purchases under long term contracts, with the sanction of the Board, with various producers throughout the State.

The Board does not enter price negotiations for coal sold on the export market.

PARTICIPATION ON COMMITTEES

The Board is represented on several Groups and Committees associated with research, coal production, sales, safety matters, etc.

It represents the Queensland Government on the Australian Coal Consultative Council Advisory Committee and its subcommittees, the National Research Group and associated Working Parties.

Likewise it represents the Government on the Queensland Coal Mining Industry Consultative Committee. Representation is similar to A.C.C.C. but at State level with the objective of minimising State industrial problems or potential problems.

The Board also has a place on the Board of the Australian Coal Industry Research Laboratories Ltd. and has ongoing membership of the Queensland Coal Association's Thick Seam Mining Technology Committee, which was originally formed in 1975.

The Board is also included in the Queensland Coal Mines Safety Research Advisory Committee.

The Board provided, as it has done in the past, financial support for mining research and safety programmes.

OVERSEAS TRAVEL

Mr. W. J. Platt, Board Member, attended the 4th Pacific Rim Coal Conference in Cartagena, Colombia, from the 12th to 14th June, 1989, as the official representative of the Queensland Government.

PUBLICATIONS

- 1. The 1987-88 Annual Review of the Queensland Coal Industry**
The Review is a detailed statistical report on the industry. Copies of previous reviews are available.
- 2. Queensland Coals - Typical Physical and Chemical Properties and Classification**
This publication details the physical and chemical properties of 60 product coals throughout the State, as well as typical specifications of all coking and steaming coals presently exported.
- 3. Black Diamonds**
This publication traces the history of coal and mining practices throughout the State. It is prepared for project material

and can be adapted to suit the requirements of primary, secondary and tertiary education levels.

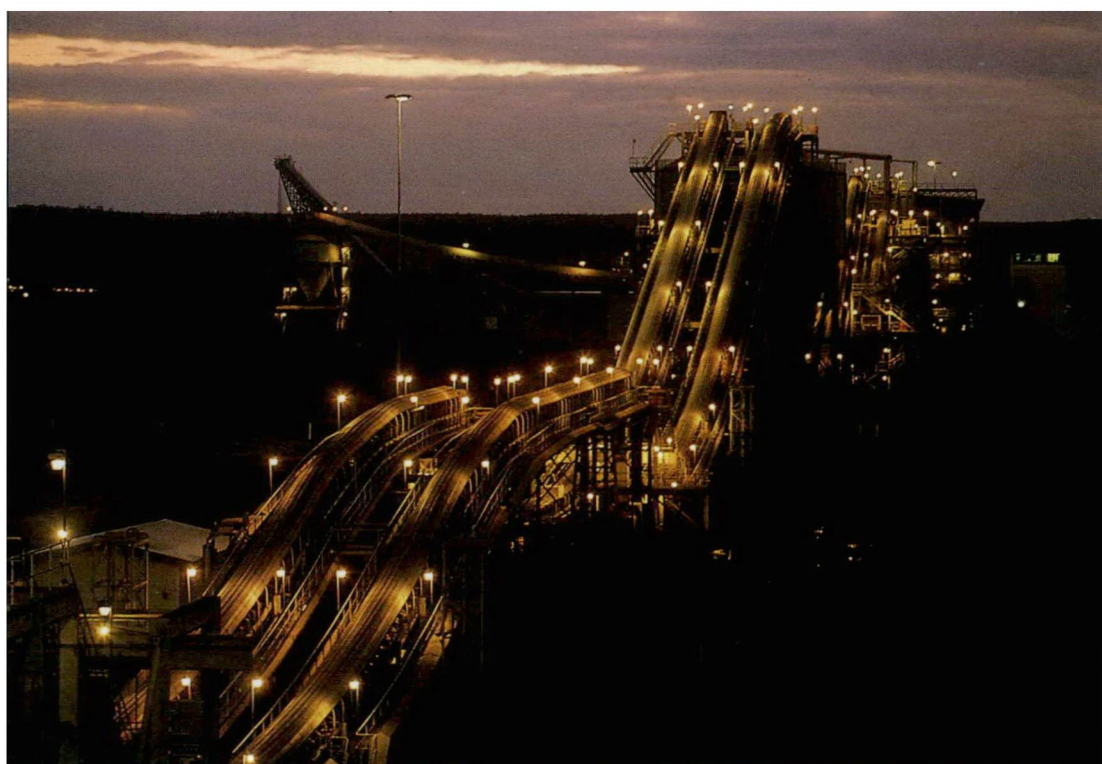
4. Queensland Coal

A special map of Queensland coal resources and information package on coal mining companies, coal specifications, coal ports and other statistical data which has been prepared to support coal companies involved in the export market.

COAL INDUSTRY STATISTICS

The Board receives statistical information from coal mining companies and coal consumers throughout the State. Statistics include raw and nett coal production from each mine; coal usage by each industry in the State; exports from each mine; tonnage shipped from coal ports; the number of persons employed within the industry; productivity; manshifts lost for varying reasons and other data.

Comprehensive data is available in Section 7 of this review, Statistics on the Queensland Industry.



*Preparation Plant at
Newlands Mine.*

IN BRIEF

The Queensland coal industry showed continued growth during the year. A number of records were established in spite of abnormally wet weather and unfavourable dollar exchange rates.

Minor apparent gains were due to a reporting cycle adjustment which resulted in statistics for the year reflecting 53 weeks operations. The following statistics indicate areas in which new records were established.

- Saleable Coal Production - 74.12 million tonnes
- Overseas Exports - 59.03 million tonnes
- Interstate Exports - 1.07 million tonnes
- Coal Used Domestically - 13.01 million tonnes
- Output per manshift - 29.40 tonnes

Employment at 10 028 people, was also higher than in most previous years.

No significant new mine developments were commenced during the year. However, a 13% increase in production over the previous year was attributed to some increased investment in equipment and major changes in work practices. Production from underground longwall operations also increased as newly

installed equipment approached its output potential.

Overseas exports increased by 610 000 tonnes overall with coking coal reaching a record annual level of 40.12 million tonnes.

Interstate sales reached 1.07 million tonnes of which 743 000 tonnes was shipped to South Australia for metallurgical use.

Consumption of coal within Queensland rose by 820 000 tonnes, a 6.7% increase over the previous financial year.

Improved production per manshift was mainly a result of better utilisation of equipment through more flexible shift rostering allowed by the restructuring of the Coal Industry Awards.

All planned rail electrification of the coal haulage routes was completed during the year and with an 86 million tonne combined capacity of coal export ports, the infrastructure is well capable of meeting predicted requirements for another 5 to 10 years.

A degree of optimism over future export sales is evident in the industry especially regarding an anticipated increase in world demand for thermal coal. While Queensland coal remains competitive in world markets, there is some concern over major new overseas suppliers who may enter the market during the next few years influencing growth opportunities and coal prices.

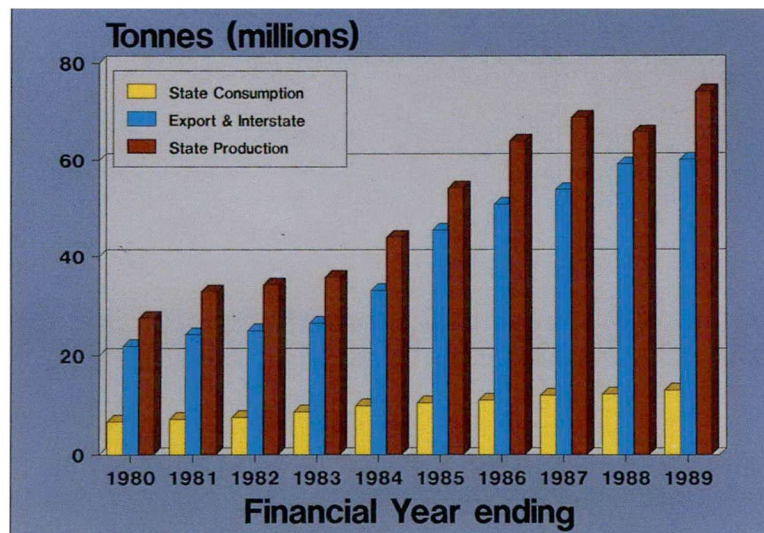


Figure 2.1
Production and
Distribution

COAL PRODUCTION - DISTRICT COMMENTS

Total production for the State reached an all time record with every district showing an increase over the 1987-88 financial year. The 74 million tonnes of saleable coal produced was nearly 13% more than the previous year.

A small portion of the increase was due to an additional week's operations being included in the statistical period. The State production for the year was however reduced by abnormal weather conditions and increased industrial disputation.

Two tropical cyclones in Central Queensland caused widespread flooding over all open-cut mining areas, whilst most work stoppages were connected with the introduction of new work practices.

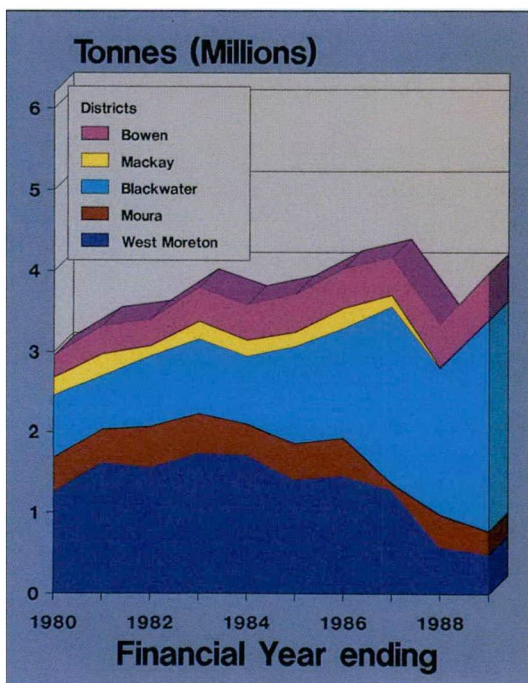


Figure 2.2
Saleable Production
By Districts -
Underground Mines

A Coal Industry Tribunal decision in September 1988, allowed more flexible deployment of the workforce and equipment which contributed to an improvement in efficiency. Output rose from 27.14 tonnes in 1987-88 to 29.40 tonnes per manshift in the year under review.

Employment at the end of the period was 10 028, an increase of 553 on the previous year. The number of persons employed in open-cut operations increased from 8 143 to 8 572.

The total number of manshifts lost decreased from 10.95% to 9.13% of manshifts possible. Shifts lost through industrial disputes was 3.8% of the number of shifts possible, with the majority of these stoppages being a result of disputes arising out of changes to the rostering system.

The total mine site value of coal produced in 1988-89 was AUST \$2.38 billion.

WEST MORETON DISTRICT

Production of saleable coal from the District was 1.09 million tonnes or 46% higher than during the previous year. Open-cut mines produced 66% more than in 1987-88 with a corresponding decline in underground production.

The number of people employed at the financial year end was 232 in underground and 458 in open-cut mines, a total of 60 more than at the end of the previous year. This increase was in spite of the retrenchment of 34 men from the New Hope Group's Number 6 underground colliery in April 1989.

Ready acceptance of coal from this District with overseas users was confirmed by a 7.1% increase in exports over 1987-88. Most exports were to Japan, although some shipments went to Denmark and Taiwan. The Idemitsu Company of Japan demonstrated their confidence in the marketability of coal from the District by acquiring 49% equity in the Ebenezer colliery with negotiations proceeding for the remaining 51%. The company is building a coal preparation plant with an initial 1.5 million tonne capacity increasing to 1.75 million tonnes by 1991.

The Idemitsu Company will also be financing an Amberley spur rail and loading loop which is intended to become a joint facility for Ebenezer, Oakleigh and Jeebropilly export coal.



*Bucyrus - Erie 1370
Walking Dragline
stripping overburden
at Blair Athol*

Shifts lost as a proportion of total shifts possible declined from 8.7% to 5.2% of which industrial stoppages declined from 3.8% to 1.8% of possible shifts.

NANANGO DISTRICT

The Meandu open-cut mine produced 4.86 million tonnes of washed coal for use at the adjacent Tarong power station. This represents a small increase, 1%, over the previous year, while manpower remained unchanged at 242 employees. There were no significant changes from 1987-88 in the number of shifts lost while the number lost through industrial disputes remained below the State open-cut average at 2.3% of shifts possible.

MOURA DISTRICT

There was a 20% improvement in total production from these mines with the open-cut operation producing .655 million tonnes or 28% more than in 1987-88. In spite of a shift towards a higher proportion of open-cut to underground production, employment rose slightly from 623 to 630 men.

Output per manshift at 20.44 tonnes was a significant improvement on the 16.89 tonnes in the previous period. A small decline saw overall exports at 3% less than the previous

year, while stockpiles and interstate sales increased. Export, tonnages to India and Japan also increased. Coking coal accounted for 70% of the 2.611 million tonnes exported.

CALLIDE DISTRICT

Production from the two open-cut mines increased by 7.4% to 3.442 million tonnes. All coal from the District is used within the State, mainly for electricity generation and alumina smelting. Output per manshift rose from 31.76 tonnes in 1987-88 to 34.46 tonnes in 1988-89. The proportion of shifts lost to shifts possible reduced from 10.27% to 8.98% while industrial stoppages were also less frequent, taking up 3.2% of possible shifts compared with 4.87% in the previous year.

BLACKWATER DISTRICT

Production from the eight open-cut mines reached 20 million tonnes, the highest output ever for the District. The four underground mines increased their output dramatically from 1.8 to 2.6 million tonnes, a 44% rise from 1987-88. Much of this increase can be attributed to the longwall units at Cook and German Creek approaching their optimum output.

A new mine Jellinbah East exported a number of sample shipments during the year and

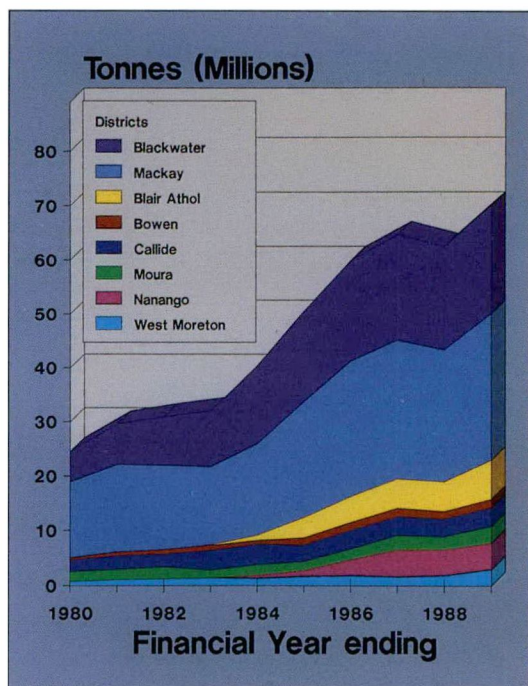


Figure 2.3
Saleable Production
By Districts - Open-
cut Mines

should become fully operational in the next financial year. This mine is expected to produce 600 000 tonnes of steaming coal a year for export markets. This mine intends sharing rail loading facilities with the Yarrabee mine.

Total employment in the District mines rose to 3 251 from 3 120 the previous year.

Ninety per cent of the coal produced in the District is exported. Of the 19.9 million

tonnes despatched to overseas markets 16.8 was coking quality and 3.1 thermal coal.

BLAIR ATHOL DISTRICT

Blair Athol mine is Australia's largest producer and exporter of thermal coal. The annual production rate of this open-cut mine reached 8 million tonnes with a total of 7.13 million tonnes being mined in this financial year. Japan and Denmark were the larger users of the eight countries to which a total of 6.74 million tonnes were exported.

Output of 78.23 tonnes per manshift was 4.6 tonnes per manshift greater than the previous year.

MACKAY DISTRICT

During the financial year the two mines, Riverside and Goonyella, amalgamated to operate under single management, thus the District now comprises no underground and five large open-cut mines.

With a combined production of 27.17 million tonnes, Mackay remains Queensland's largest coal producing District with exports of coking coal totalling 21.78 million tonnes, and thermal coal exports totalling 5.25 million tonnes. The number of employees fell by 23 during the year to 3 446 with an improved output per manshift of 30.68 tonnes.

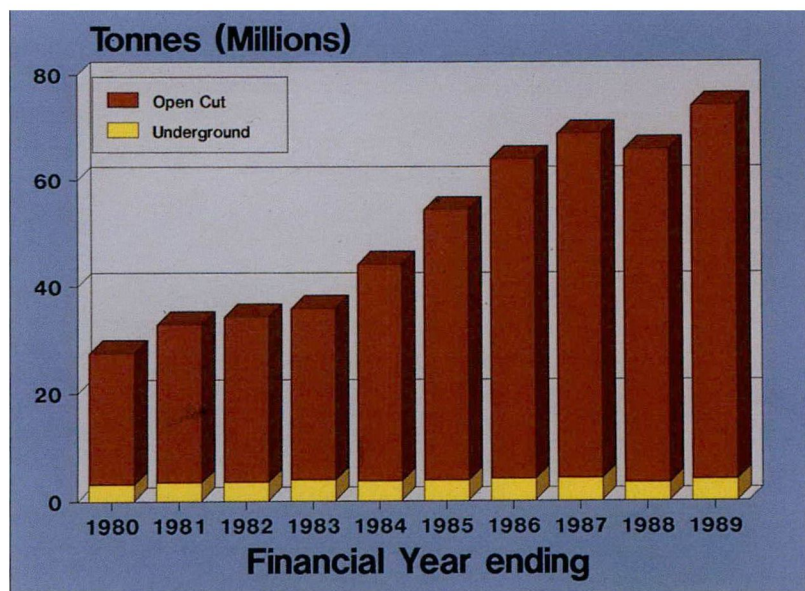


Figure 2.4
Saleable Coal
Production

Table 2.2 Current Export Contracts

Company	Country	Million Tonnes	Period (Years)	Expiry Date
Aberdare Collieries Pty. Ltd.	Japan	2.5	5	1990
Central Queensland Coal Associates	Japan	11	1	1990
	Europe	8	1-3	1992
	Other	22	1-5	1994
Collinsville Coal Company Pty. Ltd.,				
- Coking Coal	Japan	15	15	1999
Curragh Queensland Mining Ltd.	Japan	1.1	1	1990
	Europe	1.2	1-3	1990
	Other	1.1	1	1990
Gregory Joint Venture	Japan	13	7	1995
	Korea	3	7	1995
	Taiwan	2.5	9	1997
Newlands Coal Pty. Ltd.,				
- Thermal Coal	Various	25.17	1-12	2001
Oak Creek Joint Venture	Japan	.9	1	1990
	Europe	19.2	15	1998
	India	6.5	1	1990
	Algeria	1.1	5	1994
Thiess Dampier Coal Pty. Ltd.,				
Moura - Coking Coal	Japan	1	1	1990
- Thermal Coal	Japan	1	1-2	1991
- P.C.I. Coal	Japan	1	1	1990
Riverside - Coking Coal	Japan	45	14.5	1998
- Coking Coal	Other	1	1	1990

India was the next highest importer of Queensland coking coal while the largest importer of thermal coal after Japan, was Taiwan. These countries each imported 10% of the total exports of the respective coal types.

A total of 1685 individual shipments comprised the 59 million tonnes exported during the year.

Exports through Queensland Ports are given in Table 2.3.

Table 2.3 Exports by Queensland Ports

Abbot Point	4 997 689
Brisbane	2 545 898
Dalrymple Bay	15 458 835
Gladstone	16 081 177
Hay Point	19 943 544
TOTAL	59 027 143

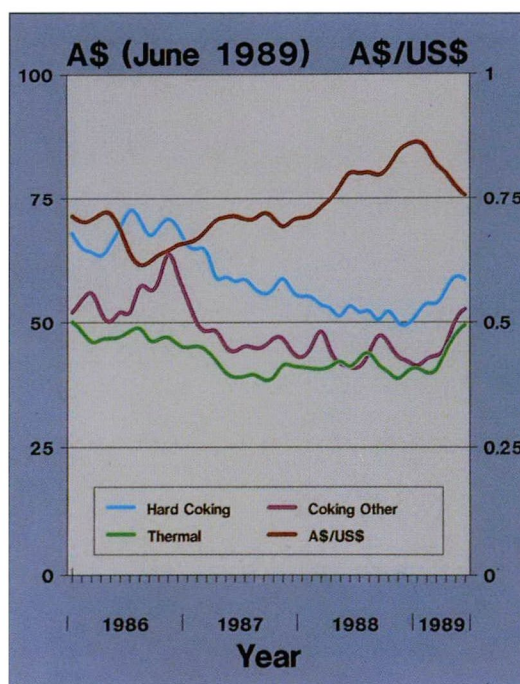


Figure 2.7
F.O.B. Price - Monthly
Average

The proportion of shifts lost to shifts possible for the year was 9.66% and 4.45% for those lost through industrial disputation. This compares with 11.23 and 6.08 respectively in the 1987-88 financial year.

BOWEN DISTRICT

The one open-cut and two underground mines respectively produced 1.61 and 0.59 million tonnes of saleable coal during the year. This represents an overall increase of 11% over the previous year's production from the three mines.

Output per manshift in the underground mines was 40.10 tonnes at the coal face, and 11.37 tonnes overall. Open-cut production was 13.56 tonnes per manshift.

Exports of 1.03 million tonnes were 12% lower than the previous year with a higher portion of exports being thermal coal. 90% of coal exported in 1987-88 and 83% in 1988-89 was of coking quality.

At the end of the financial year 221 men were employed in the underground mines and 510 in the open-cut, compared with 203 and 457 at the previous year's end.

PRODUCTION TRENDS

An anticipated upturn in world demand, especially for thermal coal, and consequent rise in price promises increased profitability for some Queensland mines. Many existing producers are expected to take advantage of the new work practices to maximise their output where possible and increase sales in line with market demand at the higher prices now offering.

Considerable potential exists for increased production from existing mines and new developments scheduled for commitment by mining companies.

The increase in world demand is, however, also expected to hasten the development of mines and infrastructure of overseas competitors, particularly those countries requiring to bolster their foreign trade reserves. Faced with these circumstances Queensland mines will need to remain

efficient and price competitive to retain and improve export market share.

EMPLOYMENT 1988-89

Overall employment in Queensland coal mines increased during the year by 5.8% to 10 028. Underground employment gained the largest proportion of employees, 9.3%, while open-cut operations gained 5.3% or 429 people.

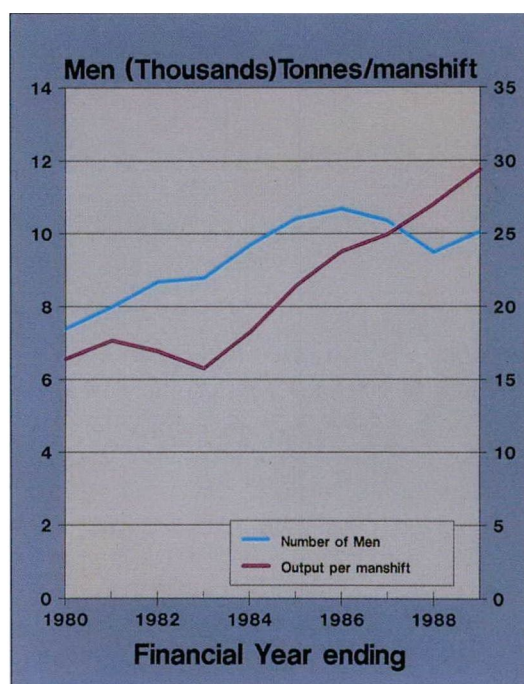
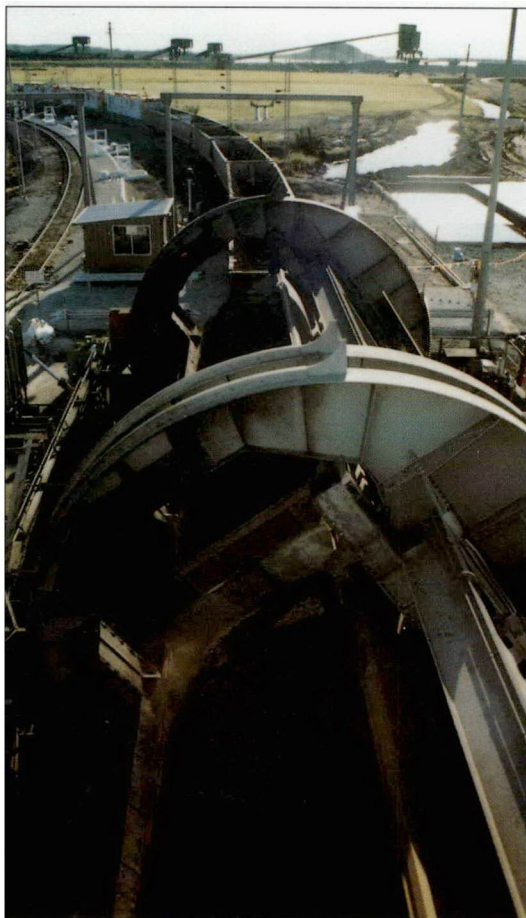


Figure 2.5
Manpower

Underground mines in the West Moreton District showed a 19.4% decline in the number of persons employed while the Blackwater District showed a 20.8% employment increase in underground mining. Thirty four retrenchments due to the closure of the New Hope Number 6 colliery accounted for most of the jobs lost in the West Moreton District.

The decline in West Moreton underground employment was more than offset by a 29.7% or 105 increase in employees in open-cut mines. The growth in employment was mainly as a result of the changed rostering systems which were introduced after September, 1988.



Tippler at Hay Point

Blair Athol, Blackwater and Bowen Districts all had increases of greater than 10 per cent in the number of people employed in open-cut mines.

An analysis of employment by District and type of mining is given in Table 7.8 of the Statistical Section.

FATAL ACCIDENTS

The Board regrets to report that two fatal accidents occurred during the year.

On July 23, 1988, an employee of Oaky Creek died when he was crushed between two vehicles.

On August 18, 1988, an employee of Collinsville Number 2 underground colliery died as a result of a fall of rib coal.

The Board extends sympathy to the families of the deceased men.

COAL EXPORTS 1988-89

While production increased significantly, exports though the highest ever, were only marginally improved over the previous financial year. Excess production was utilised for increased domestic and interstate sales as well as for the replenishment of stockpiles. Details of exports by mine and country are given in Table 7.14 and exports by destination in Table 7.7 of the Statistical Section. Major overseas contacts that are made known to the Board by mining companies are given in Table 2.2.

Table 2.1 Coal Exports 1988-89

	Tonnes
Coking	40 122 966
Thermal	18 904 177
TOTAL	59 027 143

Japan was again the largest recipient of both thermal and coking coal. A record 28.73 million tonnes or 48.67% of Queensland's total exports were shipped to Japan. Sales of coking coal to this country were 17.63 million tonnes which represented 43.94% of total coking coal exports. They also imported 11.10 million tonnes or 58.71% of the State's thermal coal sales to export markets.

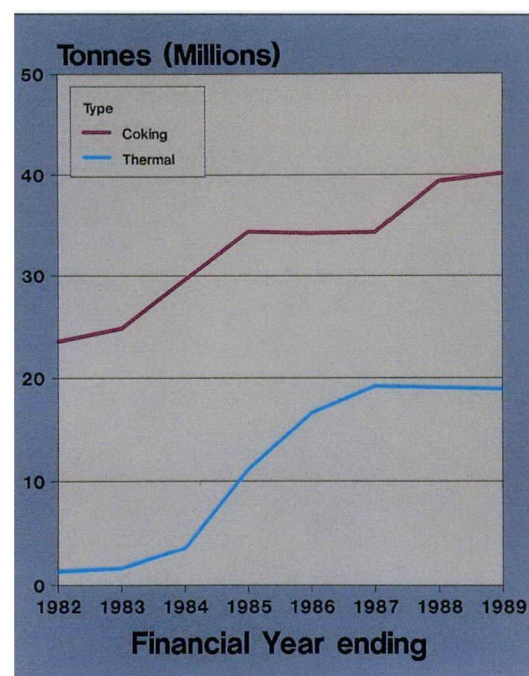


Figure 2.6
Coal Exports By Type

EXPORT COAL PRICES

A comparatively high value of the Australian dollar contributed to a slight decline in the average F.O.B. price (AUST \$), received for coking coal, while a small average price increase was realised for thermal coal. Prices received in June 1989, however, indicate an improvement in the Australian dollar realised for exports of both thermal and metallurgical coal.

Table 2.4 shows the average F.O.B. values received per tonne of Queensland coal during the past two years.

Table 2.4 Average F.O.B. Price

Year	Coking Coal	Thermal Coal
	Aust \$	Aust \$
1988-89	53.57	41.59
1987-88	54.02	39.84

The monthly average F.O.B. values for the last three years are shown in Figure 2.7. In this figure the F.O.B. value was adjusted to the June 1989 value by Implicit Price Deflator (Source A.B.S.) and the exchange rate is as recorded by the ANZ Bank.

COAL CONSUMPTION 1988-89

Table 2.5 shows coal usage in the State for the year 1989 to be 13.01 million tonnes. This is an increase of 6.81% on last year's consumption of 12.18 million tonnes.

Table 2.5 Coal Consumption 1988-89

Industries	Tonnes
Electricity	10 490 594
Metal Processing	1 657 840
Cement Manufacture	290 907
Ships' Bunkers	189 043
Food Processing	131 610
Paper and Board Mills	80 234
Others	166 333
TOTAL	13 006 561

QUEENSLAND ELECTRICITY COMMISSION

Requirements for electricity generation rose by 6.73% to 10.49 million tonnes.

Consumption at the Swanbank power station rose sharply, Tarong and Gladstone stations each showed slight declines in tonnages used. Callide power station consumption increased by 104.86%, due to Callide B coming on line. Table 2.6 shows the coal consumption for the various State power stations.

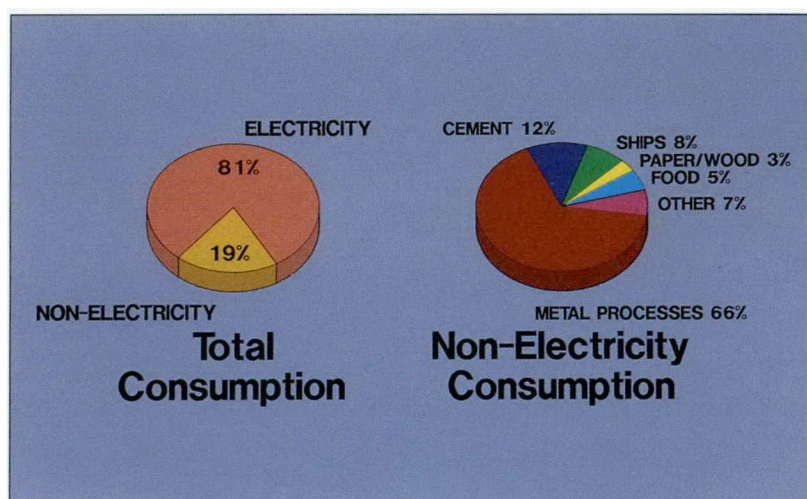


Callide B Power Station

The Queensland Electricity Commission completed construction of Callide B Power Station, 18 kilometres east of Biloela, in early 1989.

The new 700 megawatt power station replaces a much smaller plant which had operated as a baseload station to the State's electricity grid for many years.

One of Queensland's "new generation" power stations, Callide B operates with a staff of fewer than 200 producing about 12% of the State's electricity needs.



*Figure 2.8
Domestic Coal
Consumption -
Consumers For The
Year Ended June 30,
1989.*

Table 2.6 Queensland Electricity Commission

	1988-89 Tonnes	1987-88 Tonnes
Swanbank	407 991	189 063
Tarong	4 687 975	4 857 035
Gladstone	2 926 105	3 352 401
Callide	2 064 412	1 007 723
Mica Creek	399 551	383 532
Collinsville	4 560	38 905
TOTAL	10 490 594	9 828 659

Construction of the \$820 million power station required about eight years from initial planning and played a significant part in the economic development of Biloela in recent years.

At full production, the station each year will burn 2 million tonnes of coal from the nearby Dunn Creek and Trapp Gully open-cut mines, operated by Callide Coalfields Pty. Ltd.

Before work started on Callide B's construction, the site was subjected to an intensive environmental impact assessment

and a range of aboriginal relics was removed to the Queensland Museum.

A Queensland Water Resources Commission requirement to avoid waste water discharges from the site was met by construction of an intricate system of evaporation ponds and a giant ash dam.

These ensure all waste water is disposed of by evaporation so it cannot possibly enter the closed underground aquifer from which Dawson/Callide irrigation farmers pump their water.

OTHER DOMESTIC CONSUMERS

The other major users of coal each showed a slight increase in consumption except for Paper and Board Mills.

Coal consumption at Queensland Nickel's Yabulu Treatment Plant has been progressively increased since 1980 to the current rate of 276 000 tonnes per year. When the Plant Expansion activity is completed, it is expected that coal tonnage used will increase to 450 000 tonnes per year.



*The John Thompson
BMW coal fired
steam boiler at Kilcoy
Pastoral Co.*

3 COAL EXPORT FACILITIES



PORTS

HAY POINT

The facility at Hay Point is owned by Central Queensland Coal Associates Joint Venturers and is operated by its subsidiary - Hay Point Services Pty. Ltd.

The facility located 11 nautical miles south of Mackay Harbour has two berths where ships may be loaded simultaneously. Hourly loading rates are 4 000 tonnes at No. 1 berth and 6 000 tonnes at No. 2.

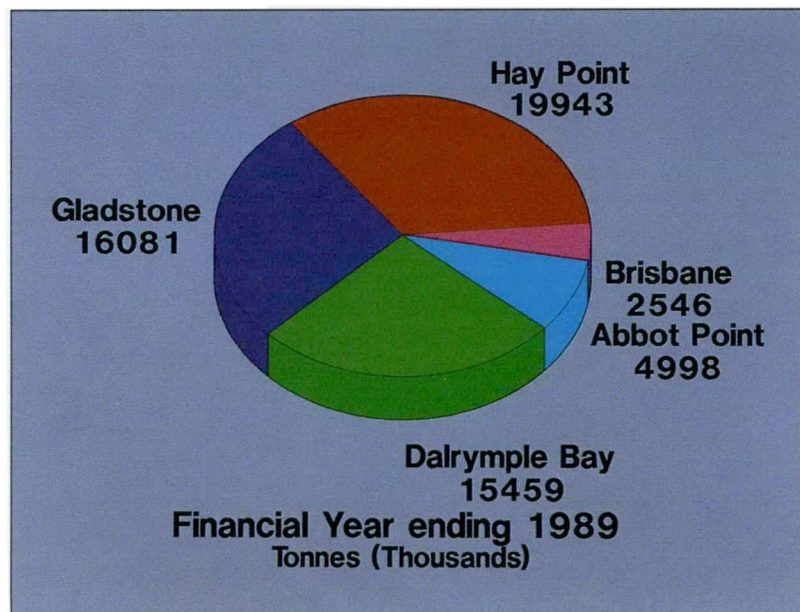
Coal from the Joint Venturers mines at Goonyella, Peak Downs, Saraji, and Norwich Park is railed to Hay Point. The terminal has a designed capacity for exporting in excess of 20 million tonnes of coal per year. Shipments during the year totalled 19.9 million tonnes.

BRISBANE

Queensland Bulk Handling Pty. Limited (QBH) operates the Coal Export Facility at Fisherman Islands, Brisbane. The facility which commenced operations in March, 1983, services the South East Queensland coalfields including the potential Darling Downs coalfields.

Since the commencement of operations coal throughput has been increasing at a steady rate from 800 000 tonnes in 1983-84 to a record throughput of 2 504 619 tonnes in 1988-89.

Coal loading facilities at Abbot Point



*Figure 3.1
Shipments By Port
For The Year Ended
June 30, 1989.*

QBH recorded a total of 90 ships during the year with an average shipment per vessel of 27 829 tonnes.

Shiploading performance continues to improve with average loading rate of 16 000 tonnes per eight hour shift being achieved on the majority of vessels.

During 1987 QBH commissioned blending facilities which enable any two coals to be blended accurately in ratios as low as 1 to 10. With the commissioning of this facility over 50% of coal loaded at QBH has been blended by this facility.

The QBH facility has an installed capacity of 3 million tonnes per annum with expansion options to enable the capacity to increase to 5 million tonnes per annum. The facility is capable of loading vessels within the 10 000 - 80 000 d.w.t. range.

Brisbane Port

The Fisherman Islands Coal Export Facility services the requirements of the West Moreton Coalfields. The facility is owned by Queensland Bulk Handling Pty. Limited (QBH) which is a Queensland incorporated joint venture company owned equally by New Hope Corporation Ltd and TNT Shipping & Development. The company was formed to build and operate the coal export terminal at Fisherman Islands at the Port of Brisbane.

Following a record breaking nine months construction period, the first stage at Fisherman Islands was completed during 1983. The first ship was loaded at the terminal on February 14, 1983, with 62 000 tonnes of West Moreton steaming coal.

The total amount of coal loaded during 1988-89 was 2.55 million tonnes, an increase of 7.14% over the 2.38 million tonnes loaded in 1987-88. Subject to stockpile expansion total annual capacity is 7.5 million tonnes. Maximum vessel size that can be handled at the facility is 80 000 d.w.t.

Routinely, coal is received by rail, or barge. However, trucks can be used under emergency conditions. Unit trains with a

1 800 tonne payload discharge coal into a central underground dump station at the QBH facility. Belt feeders reclaim coal at an operational rate of 2 500 tonnes per hour. The coal is then distributed to individual stockpile areas through overhead enclosed conveyors. As coal is received it is sprayed with dust suppressants which effectively reduce dust at QBH and at the port of destination.

Barge transport involves the use of up to 1 350 tonne barges propelled by diesel-powered tugs. The operation is tidal due to limitations at the loading facility. The barge receival facility is located up stream of the coal berth and uses a crane and grab bucket to hopper. Conveyors feed the coal into the stockpiles. The interim unloading equipment will be replaced by a sophisticated unloading installation as quantities increase.

GLADSTONE

During financial year ended 30 June 1989, the Port of Gladstone handled a record cargo quantity of over 28.96 million tonnes in 575 vessels. This figure exceeded last year's throughput by 800 000 tonnes.

The three coal facilities at Gladstone - Clinton, Barney Point and Auckland Point exported a record total of 16.6 million tonnes of coal from 11 Central Queensland mines.

Harbour Channels

Depths of the inner harbour channels are 15.8 and 16 metres. The outer harbour channel depth is 15.7 metres.

Vessels with a draft of 16.5 metres can depart on any day with a navigable depth of 17.4 metres being available on higher tides. It is the Port's aim to increase daily sailing draft to a minimum of 17.5 metres with drafts exceeding 18 metres on higher tides.

Clinton Coal Facility

Construction of a second berth at Clinton Coal Facility which commenced in August 1988 is nearing its completion date of September, 1989. The additional 358 metre berth will allow two vessels to berth simultaneously, with the second vessel commencing to load while the first is

awaiting a sailing time. Both vessels will be serviced by the existing shiploader on an extended track. The loading rate is 4 000 tonnes per hour. Maximum size of vessels able to be loaded is 220 000+ d.w.t. depending on draft. Depth of berths are 18.8 metres.

Stockpile capacity is 2.5 million tonnes in 9 stockpile areas.

Construction of a second rail unloading station expected to cost \$7 million will commence at the end of the year. This will allow two trains to unload at the same time.

ABBOT POINT

The present port facility, which can accommodate vessels from 15 000 to 165 000 D.W.T., has an annual throughput capacity of 6.5 million tonnes.

During the year nearly 5 million tonnes of coal were exported. If the existing onshore capacity becomes insufficient for demand, the annual capacity may be increased to 16 million tonnes. Further wharf construction

could ultimately increase capacity to 24 million tonnes.

A total of 71 ships visited the Harbour during the year with the largest shipment being 176 106 tonnes on the vessel "Mineral Nippon".

The Abbot Point Coal Facility is owned and administered by The Harbours Corporation of Queensland. However, the day to day management, operation and maintenance of the terminal is undertaken by Abbot Point Bulkcoal Pty. Ltd., a wholly owned subsidiary of MIM Holdings Pty. Ltd.

DALRYMPLE BAY

Dalrymple Bay Coal Terminal is a multi-user facility owned by The Harbours Corporation of Queensland and operated under Licence by Dalrymple Bay Coal Terminal Pty. Ltd., a company comprising representatives of the coal companies exporting through the terminal. Presently they are Capricorn Coal Management Pty. Ltd. (German Creek mine), Mount Isa Mines Limited (Oak Creek mine), Thiess Dampier Mitsui Coal Pty. Ltd.

Table 3.1 Queensland Coal Ports

	Annual Load- ing Capacity (million Tonnes)	Hourly Load- ing Rate (tonnes)	Vessel Size D.W.T.	Dredged Chan- nel Depth (Metres) L.W.D.	Berth Length (Metres)	Berth Depth (metres Low Water)
Brisbane						
Fisherman Islands	3.0	3 000	80 000	12.3	240	13.0
Gladstone						
Auckland Point	5.0	1600	65 000	15.8	259	11.3
Barney Point	8.0	2 000	90 000	15.8	230	15.0
Clinton	20.0*	4 000	220 000	16.0	750**	18.8
Hay Point						
No.1	11.0	4 000	150 000	13.4	343	16.7
No.2	14.0	6 000	200 000	13.4	366	17.0
Dalrymple Bay	18.00	7 000 (max)	200 000	13.4	254	20.0
Abbot Point	6.5	4 600 (max)	165 000	17.2	264	19.2

* (After completion No.2 wharf)

** (No. 1-380m)
(No.2 - 370m)

(Riverside mine) and Blair Athol Coal Pty. Ltd. (Blair Athol mine).

During the year over 15.3 million tonnes of coal were exported by a total of 237 vessels with the largest shipment being 158 092 tonnes on the vessel "Century Iris".

The existing Stage 1 facility has a throughput capacity of 18 million tonnes per annum. However, future plans allow for staged expansion to a possible capacity of 37 million tonnes per annum. This would involve the effective duplication of the present onshore and shiploading facilities.

RAILWAYS

MAIN LINE ELECTRIFICATION

Queensland Railways has now completed a A\$1075 million project to electrify 2100 single track kilometres of mainline track for the haulage of coal and grain in Central Queensland and the haulage of mixed freight and passenger services along the North Coast Line between Rockhampton and Brisbane.

Main Line Electrification is the single largest upgrading and investment project ever undertaken by Queensland Railways. It ensures that it is capable of efficiently and economically transporting Queensland's huge stocks of export coal, general freight, and passengers well into the 21st century.

The project is made up of 4 stages as follows:-

Stages 1 and 2 provides electrification of the major coal transport railways from the Bowen Basin coal mines centred around Blackwater and Moranbah to the export coal ports of Gladstone, Hay Point and Dalrymple Bay.

Stage 3 of the project provides electrification west from Blackwater to Emerald as well as additional track to increase the efficiency of grain transport to the coast.

Stage 4 of the project links the existing Brisbane City and suburban electrified network with the Central Queensland coal network and provides for the electric transport of freight and passengers on the most heavily utilised section of Queensland Railways' northern trunk route.

Completion of the Main Line Electrification Project, together with the existing electrified suburban network, means Queensland Railways has electrified 25% of its total 10 200 km system over the past 10 years, an electrified network which will carry 99% of passenger traffic and 75% of gross freight tonnage.

COAL RAILWAY ROUTES

The Newlands Line

This line runs 170 km from the Newlands mine through Collinsville to Abbot Point north of Bowen. This line can carry 80 tonnes gross wagon loads and is not electrified.

The Goonyella Line

This is the major coal hauling sub-network connecting the central Bowen Basin mines to the Dalrymple Bay and Hay Point ship loading facilities south of Mackay. There are three tributary lines in the system - from Goonyella/Riverside in the north, Blair Athol in the south west and, Oaky Creek, German Creek, Norwich Park, Saraji and Peak Downs in the south. This system is fully electrified and capable of carrying 90 tonnes gross weight wagons.

The Moura Line

This line enables 71 tonne wagons to be hauled by diesel locomotive from Kiangarra Moura, Callide and Boundary Hill to the port of Gladstone.

The Central Line

The Gregory, Curragh, Yarrabee, South Blackwater, Cook and Blackwater mines are served by this fully electrified line. Coal is hauled in 71 tonne gross weight wagons to the port of Gladstone.

The West Moreton Line

This is a 57 km line from the Ipswich/West Moreton collieries to the port of Brisbane (Fisherman Islands) loader. It is not electrified and carries 63 tonne gross weight wagons.

4 QLD COAL RESOURCES

PERMIAN AND MESOZOIC COAL RESOURCES

Queensland Department of Mines estimates of proven black coal resources in Queensland as at December 1988 amount to 37 300 million tonnes in situ of which some 15 150 million may be classified as coking coal.

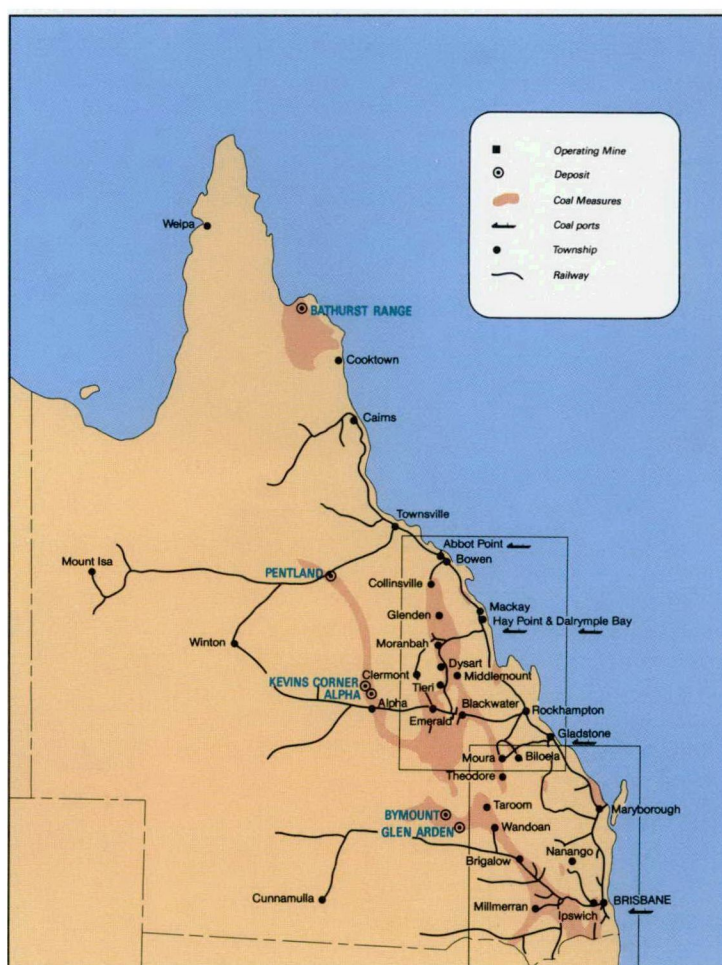
This assessment of Queensland's resources of black coal has been prepared by the Coal and Oil Shale Resources Assessment and Development Subprogram, Queensland Department of Mines, in accordance with the "Code for Reporting of Identified Coal Resources and Reserves" by A.G. Galligan and D.C. Mengel. Since publication (QGMJ, May 1986), these guidelines have been adopted as the national code.

In the accompanying tables for the Permian and Mesozoic basins (Tables 4.2 and 4.3), respectively), only demonstrated resources of

measured or indicated categories have been included. Resources quoted are in millions of tonnes of raw coal in situ with no allowances having been made for potential losses from mining or beneficiation. Allowances have been made for depletion due to actual mining operations as at December 1988, where applicable.

The information in the data columns is arranged to emphasise the potential mining method (opencut or underground) rather than the level of exploration (measured or indicated). Standardised notes are used where further qualification is necessary.

The division between coking and non-coking coals is placed at a Crucible Swelling Number of 4 for the raw coal. However, many coals categorised as non-coking can be washed to produce a coking fraction, while some coals designated as coking are currently being marketed as non-coking coals. Ultimately



Queensland Coal Areas

market demands will determine the actual end use of these coals.

Nominal limits of 60 m of overburden for opencut resources and a 1.5 m minimum seam thickness for all resources normally apply. Those instances where current or anticipated mining practice indicates more appropriate parameters, or where criteria such as overburden to coal ratios have been used to determine resource limits are noted accordingly.

Individual deposits are identified by name in alphabetical order, with the principal titleholder or operator indicated by a three letter abbreviation. The abbreviations used are listed in Table 4.1 along with the titleholder's or operator's full title. The locations of the named deposits are shown on the accompanying maps. The deposit names as recorded by the Department of Mines may not correspond directly with those shown in Section 6.

Table 4.1 Company Abbreviation

Abbreviations	Company
AQC	Allied Queensland Coalfields Ltd.
AQM	Advance Queensland Resources and Mining Pty. Ltd.
AQP	AQC - Pacific Pty. Ltd.
BAR	Baralaba Coal Pty. Ltd.
BCL	Bluff Collieries Pty. Ltd.
BDG	Bridge Oil Ltd.
BPA	BP Australia Ltd.
BRG	Brigalow Mines Pty. Ltd.
BUC	BHP - Utah Coal Ltd.
CAP	Capricorn Coal Management Pty. Ltd.
CLE	Clermont Coal Mines
COM	Curragh Queensland Mining Ltd.
CRQ	Coal Resources of Queensland Ltd.
GCM	Gordonstone Coal Management Pty. Ltd.
HCV	Hail Creek Joint Venture
HKW	Hancock Prospecting Pty. Ltd.
	Wright Prospecting Pty. Ltd.
IDM	Idemitsu Queensland Pty. Ltd.
MAR	Marathon Petroleum Australia Ltd.
MEM	Mobil Energy Minerals Australia Inc.
MIL	Millmerran Coal Pty. Ltd.
MIM	Mount Isa Mines Ltd.
NHC	New Hope Collieries Pty. Ltd.
OCL	Oakleigh Colliery Pty. Ltd.
PAC	Pacific Coal Pty. Ltd.
QEC	Queensland Electricity Commission
RNV	Rhonvale Pty. Ltd.
RPR	Redbank Plains Resources
SBM	South Blackwater Mines Ltd.
SHL	The Shell Company of Australia Ltd.
TDM	Thiess Dampier Mitsui Coal Pty. Ltd.
THS	Thiess Brothers Pty. Ltd.
TMO	TMOC Resources Pty. Ltd.

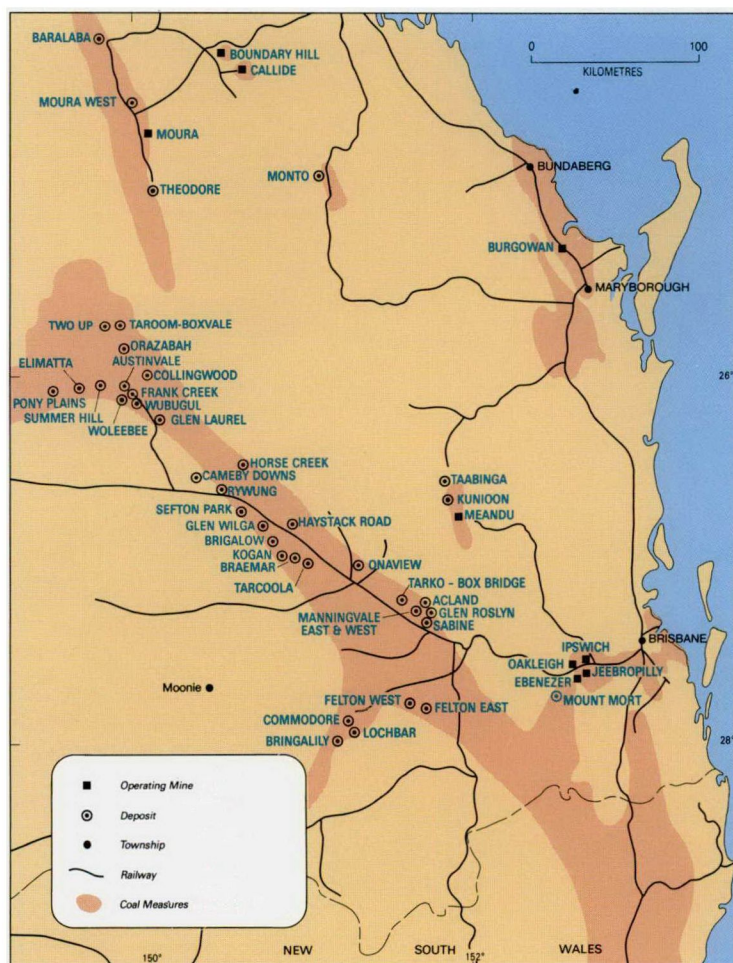


Table 4.2 Permian Resources

Coking Coal																	Non-Coking Coal																
			Opencut			Underground			Opencut			Underground			Notes																		
Area	Title	Holder/ Operator	M	I	M+I	M	I	M+I	M	I	M+I	M	I	M+I	Total																		
Bowen Basin																																	
Baralaba	MLs, AP257C	BAR	0	0	0	0	0	0	12	2	14	65	55	120	134	T																	
Bee Creek	ML368	TDM	0	0	0	0	0	0	21	0	21	55	55	110	131	S																	
Blackwater	MLs	BUC	310	20	330	165	220	385	44	4	48	19	85	104	867	DT																	
Blair Athol Bluff	ML303																																
	ML315	PAC	0	0	0	0	0	0	285	0	285	0	0	0	285	P																	
	MLs	BCL	0	0	0	0	0	0	0	0	0	0	10	10	10																		
Burton Downs	AP190C	THS	0	0	0	0	0	0	0	9	9	0	0	0	9																		
	---	---	0	45	45	0	70	70	0	0	0	0	0	0	115																		
Caledonia	AP369C	QEC	0	0	0	0	0	0	0	0	0	0	690	690	690	C																	
Capella	AP418C	PAC	0	0	0	0	0	0	205	14	219	0	0	0	219	CDP																	
Clermont	ML1874	CLE	0	0	0	0	0	0	250	0	250	0	0	0	250	DPR																	
Collinsville	MLs	MIM	29	0	29	70	13	83	30	0	30	65	36	101	243	P																	
Cook	MLs	CRQ	0	0	0	210	530	740	0	0	0	0	0	0	740																		
Cullinlaringo	---	---	0	0	0	0	0	0	0	0	0	0	120	120	120	P																	
Curragh	MLs	CQM	55	0	55	13	0	13	85	0	85	14	0	14	167	S																	
Curragh East	AP369C	QEC	20	0	20	17	0	17	27	0	27	18	0	18	82	S																	
Curragh Nth	AP369C	QEC	0	0	0	0	0	0	40	0	40	0	100	100	140	CS																	
Daunia	ML244	BUC	135	0	135	28	0	28	0	0	0	0	0	0	163	D																	
Eastern Creek	ML381, ML382	MIM	0	0	0	0	0	0	15	0	15	0	0	0	15	P																	
Ensham	AP426C	AQP	0	0	0	0	0	0	90	55	145	330	1030	1360	1505	CPT																	
German Creek	ML1306	CAP	70	3	73	215	280	495	0	25	25	0	0	0	593	PT																	
German Creek East	AP414C	CAP	0	0	0	0	0	0	50	5	55	60	305	365	420	CP																	
Goonyella	ML127	BUC	290	55	345	1100	190	1290	0	0	0	0	0	0	1635	DT																	
Gordonstone	AP389C	GCM	0	0	0	360	50	410	0	0	0	35	135	170	580	P																	
Gregory	ML259	BUC	65	0	65	75	12	87	0	0	0	0	0	0	152	DT																	
Lilyvale	ML2098	BUC	2	2	4	125	29	154	0	0	0	0	0	0	158	DT																	
Liskeard	AP442C	BUC	4	0	4	0	0	0	0	0	0	0	0	0	4	PST																	
Hail Creek - Lake	ML312	HCV	160	15	175	0	635	635	0	0	0	0	0	0	810																		
Elphinstone	---	---																															
Havilah	AP253C	MIM	0	0	0	0	0	0	0	30	30	0	0	0	30	P																	
Jellinbah	---	---																															
Jellinbah East	AP449C	AQM	0	0	0	0	0	0	90	35	125	65	30	95	220																		
Jellinbah Station	AP369C	QEC	0	0	0	0	0	0	0	20	20	0	415	415	435	C																	
Kemmis - Walker	ML367	TDM	0	0	0	0	0	0	130	0	130	0	270	270	400	D																	
Lake Lindsay	AP12CR	GCM	27	8	35	55	55	110	40	30	70	55	0	55	270	C																	
Lake Vermont	---	---	0	0	0	0	0	0	110	0	110	165	0	165	275	C																	
Lancewood	ML370	TDM	0	0	0	0	75	75	0	0	0	0	0	0	75																		
Mavis	---	---																															
Downs	ML412	TDM	0	0	0	0	0	0	4	0	4	0	5	5	9	S																	
Middlemount	AP10CR	CAP	4	3	7	5	4	9	20	0	20	95	30	125	161	P																	
Minyango	AP441C	CRQ	0	0	0	0	265	265	0	0	0	0	15	15	280																		
Morambah	MLA44	TDM	0	0	0	0	0	0	6	0	6	7	0	7	13	S																	
Moranbah - Peak Downs	---	---	0	40	40	0	2960	2960	0	0	0	0	0	0	3000	T																	
Moura	SCMLs	TDM	60	0	60	745	0	745	65	0	65	170	0	170	1040	PS																	
Moura West	---	---	0	0	0	0	365	365	0	0	0	0	0	0	365																		
Newlands	ML365	MIM	0	0	0	0	0	0	90	0	90	80	95	175	265	P																	
Norwich Park	---	---																															
Saraji	ML245	BUC	295	190	485	120	210	330	0	0	0	0	0	0	815	DT																	
Oaky Creek	AP408C	MIM	90	0	90	310	145	455	0	0	0	0	0	0	545	PT																	
Peak Downs - Isaac River - Saraji	ML1315																																
	ML210	BUC	630	105	735	855	345	1200	0	0	0	0	0	0	1935	DT																	
Poitrel	ML366	TDM	22	0	22	0	0	0	85	0	85	0	0	0	107	D																	
Riverside	ML152, ML310	TDM	75	0	75	0	0	0	0	0	0	0	0	0	75	D																	
Rolleston	AP7CR	BRG	0	0	0	0	0	0	275	0	275	0	0	0	275	DT																	
Rugby	---	---	0	0	0	0	0	0	0	0	0	0	180	180	180																		
Sirius Creek	MLs	SBM	0	0	0	105	385	490	0	0	0	0	0	0	490																		
South Blackwater	MLs, AP2CR, AP261C	SBM	80	22.05	102.05	190	265	455	150	41	191	220	310	530	1278	DT																	

Table 4.2 Permian Resources *Continued....*

Coking Coal									Non-Coking Coal							Notes
			Opencut			Underground			Opencut			Underground			Total	
Area	Title	Holder/ Operator	M	I	M+I	M	I	M+I	M	I	M+I	M	I	M+I		
Bowen Basin Continued...																
Suttor Creek	MLA411	TDM	7	0	7	0	0	0	38	0	38	90	65	155	200	S
Taroborah	---	---	0	0	0	0	0	0	0	15	15	0	110	110	125	
North Theodore	AP202C	SHL	0	0	0	0	0	0	70	0	70	260	255	515	585	T
South Theodore	AP202C	SHL	0	0	0	0	0	0	0	0	0	375	360	735	735	
Togara	---	---	0	0	0	0	0	0	0	0	0	0	2295	2295	2295	
Wards Well	ML260	TDM	0	0	0	340	0	340	0	0	0	0	0	0	340	
Winchester	ML261	TDM	9	2	11	0	0	0	11	0	11	0	0	0	22	C S
South Winchester	AP352C	BPA	0	0	0	0	0	0	75	0	75	65	0	65	140	
Wotonga	MLA410	TDM	0	0	0	0	0	0	9	0	9	0	0	0	9	
Yarrabee	ML196	THS	0	0	0	0	0	0	24	0	24	0	0	0	24	
	AP123C	BRG	0	0	0	0	0	0	0	15	15	0	0	0	15	
TOTAL			2439	510	2949	5103	7103	12206	2446	300	2746	2308	7056	9364	27265	
Galilee Basin																
Alpha	AP245C	BDG	0	0	0	0	0	0	1235	0	1235	0	0	0	1235	DP D DR
Ke vins Corner	AP244C	HKW	0	0	0	0	0	0	280	630	910	0	0	0	910	
Pentland	AP1CR	SHL	0	0	0	0	0	0	380	175	555	0	0	0	555	
TOTAL			0	0	0	0	0	0	1895	805	2700	0	0	0	2700	
TOTAL - PERMIAN BASINS			2439	510	2949	5103	7103	12206	4341	1105	5446	2308	7056	9364	29965	

M - measured I - indicated

EXPLANATION OF NOTES

C = a coking fraction may be obtainable from the non-coking resource.

D = opencut resources include some coal deeper than 60m.

P = provisional estimate.

S = opencut limit less than 60m.

T + includes some resources in seams less than 1.5m thick.

Table 4.3 Mesozoic Resources

Non-Coking Coal										
			Opencut			Underground				
Area	Title	Holder/ Operator	M	I	M+I	M	I	M+I	Total	Notes
Callide Basin										
Boundary Hill	MLs,	SHL	32	0	32	23	13	36	68	D
Callide	AP188C		115	26	141	360	9	369	510	D
TOTAL			147	26	173	383	22	405	578	
Ipswich Basin										
Ipswich - North	MLs	NHC	0	0	0	18	0	18	18	
Ipswich - East	MLs,	RNV	0	3	3	42	5	47	50	
Ipswich-Central	MLs	AQC	7	0	7	42	0	42	49	
	MLs	RNV	4	0	4	50	0	50	54	
	MLs	RPR	0	0	0	32	43	75	75	
Ipswich - West	MLs	RNV	0	0	0	62	4	66	66	
	MLs	RNV	0	0	0	155	0	155	155	
Ipswich - South	MLs,	NHC	1	0	1	75	45	120	121	
	AP221C									
TOTAL			12	3	15	476	97	573	588	
Mulgildie Basin										
Monto	AP11CR	BRG	55	55	110	0	0	0	110	DT
TOTAL			55	55	110	0	0	0	110	
Surat - Moreton Basin										
Acland Mine	MLs	SHL	0	50	50	0	0	0	50	T
Austinvale	AP157C	BRG	110	45	155	0	0	0	155	T
Box Ridge	---	---	0	40	40	0	0	0	40	T
Boxvale	AP432C	SHL	0	10	10	0	0	0	10	T
Braemar	AP6CR	MAR	95	20	115	0	0	0	115	
Brigalow	AP5CR	TMO	115	100	215	0	0	0	215	RT
Bringalily	AP9CR	MIL	0	235	235	0	0	0	235	DPR
Bymount	---	---	0	20	20	0	0	0	20	
Cameby Downs	---	---	0	55	55	0	0	0	55	
Collingwood	AP13CR	TMO	85	30	115	0	0	0	115	RT
Commodore	AP9CR	MIL	175	15	190	0	0	0	190	DPR
Ebenezer	AP424C	IDM	14	10	24	0	0	0	24	RT
Elimatta	AP433C	SHL	0	115	115	0	0	0	115	T
Felton East	AP203C	MIL	0	465	465	0	0	0	465	DPR
Felton West	AP203C	MIL	0	770	770	0	0	0	770	DPR
Frank Creek	AP433C	SHL	65	10	75	0	0	0	75	T
Glen Arden	---	---	0	45	45	0	0	0	45	RT
Glen Laurel	AP433C	SHL	20	0	20	0	0	0	20	T
Glen Roslyn	AP4CR	SHL	120	125	245	0	0	0	245	D
Glen Wilga	AP8CR	MEM	120	80	200	0	0	0	200	P
Haystack Road	AP8CR	MEM	200	0	200	0	0	0	200	P
Horse Creek	AP6CR	MAR	0	295	295	0	0	0	295	T
Jeebropilly	MLs,	NHC	23	17	40	0	0	0	40	DT
	AP437C									
Kogan	AP6CR	MAR	90	35	125	0	0	0	125	
Lochbar	AP9CR	MIL	45	0	45	0	0	0	45	DPS
Manningvale	AP4CR	SHL	0	60	60	0	0	0	60	T
East Manningvale	AP205C	SHL	0	110	110	0	0	0	110	T
West Mount Mort	AP424C	IDM	21	0	21	0	0	0	21	T
Oakleigh	MLs	OCL	0	0	0	10	1	11	11	O
Onaview	AP205C	SHL	0	140	140	0	0	0	140	T
Orazabah	AP432C	SHL	0	45	45	0	0	0	45	T
Pony Plains	AP433C	SHL	0	55	55	0	0	0	55	T
Rosewood	MLs,	NHC	11	5	16	0	0	0	16	T
	AP437C									
Rywang	AP431C	SHL	30	45	75	0	0	0	75	
Sabine	AP4CR	SHL	0	105	105	0	0	0	105	DT
Sefton Park	AP431C	SHL	25	5	30	0	0	0	30	
Summer Hill	AP157C	BRG	0	120	120	0	0	0	120	T
Tarcoola	AP6CR	MAR	80	65	145	0	0	0	145	
Tarko	---	---	0	30	30	0	0	0	30	T
Taroom	ML52,	SHL	115	55	170	0	0	0	170	DRT
	AP189C									
Two Up	---	---	0	85	85	0	0	0	85	DT
Woleebee	AP157C	BRG	250	45	295	0	0	0	295	T
Wubagul	AP433C	SHL	45	25	70	0	0	0	70	T
TOTAL			1854	3582	5436	10	1	11	5447	

COAL DRILLING

SUMMARY OF COAL EXPLORATION 1988-89

Coal exploration drilling by the Queensland Department of Mines recommenced in July 1988, following the suspension of drilling operations in May 1987.

Drilling throughout the year was confined to the Cullin-la-ringo area, south of Emerald, where a single rig was engaged to drill ten holes totalling 3 296.58 m, including 3 194.19 m of cored section.

SOUTH WEST BOWEN BASIN

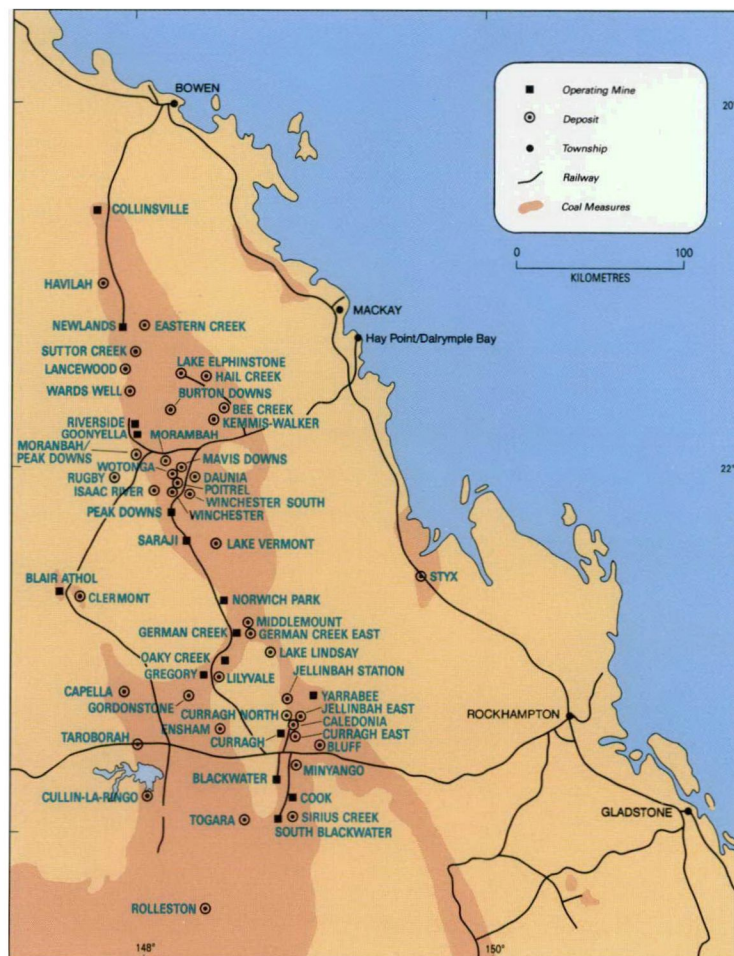
Cullin-la-ringo Area

A total of nine holes were completed during the year to June 30 1989, and one further hole was in progress at the year's end. The holes were designated Denison 233 to Denison 242. Completion of the tenth hole will finalise the

Department's exploration drilling in the Cullin-la-ringo area. A report detailing results of drilling and coal analysis is scheduled for completion by the end of September 1989.

The current program of drilling augments information gained from earlier work by the Department of Mines in the area, and has allowed more accurate interpretation of the limits of the deposit. All but one hole encountered significant coal, with several seams in excess of 4 metres thickness, and one 11.5 m intersection in the southern part of the area. The most attractive resource appears to lie in the north, where basalt cover is generally thin and a number of thick, clean seams were intersected at relatively shallow depths.

Much of the coal is of exceptionally high quality with very low ash and high volatile matter content, making it a most attractive prospect for the export thermal coal market.



Resources have not been quantified, but are very large.

The deposit appears to be suited to multi-seam extraction by efficient shallow underground mining methods. However considerably more exploration will be required to assess geological structure and seam geometry in potential mining areas, as well as to prove resources.

The results at Cullin-la-ringo enhance the prospects for further significant discoveries in the Reids Dome province, between Capella and Rolleston.

(By Courtesy - Energy Resources Development and Utilisation Program, Department of Mines)



Previously mined area at Blair Athol being rehabilitated using vegetation suitable for both the climate and environment

5 COAL RESEARCH ACTIVITIES

SIMTARS

The Safety in Mines Testing and Research Station (SIMTARS) at Redbank is a multi-million dollar commitment by the Queensland Government to position the State in the forefront of safety, research, development and testing services. The Station provides a range of services not collectively available elsewhere in Australia.

SIMTARS has been awarded accreditation from the National Association of Testing Authorities, Australia (NATA). Accreditation allows SIMTARS to provide essential calibration, chemical and safety compliance testing and development services to the mining, manufacturing and other industries.

Testing is undertaken to confirm compliance with the relevant Australian Standards or other national standards or to an agreed program of tests for development purposes.

Since opening in September, 1988 SIMTARS has implemented some significant programs:-

- An emergency response program has been established to provide for gas analysis at coal mines utilising a SIMTARS computer-assisted mine gas analysis system (CAMGAS) which provides clients with a daily chromatographic calibration control and interpretation service through modem links. The CAMGAS system, developed by SIMTARS, is installed at two underground operations and will be extended to three additional mines during the first half of 1989-90.
- SIMTARS initiated occupational hygiene surveys in which analytical methods, developed by SIMTARS and using Fourier Transform Infra-Red Spectrometry, permit rapid analysis of respirable dust levels.
- Research into subsidence monitoring at several mines in the Ipswich district, west of Brisbane, using a computer model to predict surface ground movements above extracted areas.
- Undertaken four major research projects funded by the National Energy Research



Development and Demonstration Program (NERDDP), with mining industry support. Further applications for research grant support are awaiting final approval.

Construction of the Station began in April 1985 after extensive planning and design which incorporated selected features observed in mining research facilities in Australia, West Germany, Belgium, Great Britain and the United States.

SIMTARS expertise includes physicists and scientists, applied chemists, occupational hygienists, and mining, mechanical, electrical and electronic engineers, computer scientists and other professional officers with a wide range of mining and general industrial experience.

SIMTARS' goal is to improve safety and health in hazardous industries and enhance the development and application of new technologies, primarily in mining but also other relevant industries.

Fee for services include:-

- A wide range of electrical equipment for hazardous locations, including, flameproof enclosures, dust-excluding ignition proof enclosures, increased safety apparatus, pressurised enclosures, intrinsically safe apparatus, encapsulated apparatus, non-sparking apparatus and special protection.

Analysing air samples from a coal mine for fire indicators (carbon monoxide) at SIMTARS

- The calibration laboratory supports the testing and research activities at SIMTARS and provides these services to other users.
- Laboratory and field-based occupational hygiene services have been designed to assist the mining and other industries to minimise environmental problems, and to reduce health hazards through technical advice. The SIMTARS chemical laboratory is NATA accredited and registered and is able to monitor exposure to dust, noise, a range of toxic chemicals, and mine gases.
- In addition the SIMTARS facility carries out investigations connected with accidents and inquiries, chemical testing and extensive data analysis services.

Future projects may include joint research in conjunction with the Julius Kruttschnitt Mineral Research Centre (JKMRC), in the area of explosives analysis and quality control, and with the Queensland University of Technology, ACIRL and Londonderry in other areas of mine safety research.

Another possible future project is the construction of a physical model of a typical mine ventilation network with the capability of simulating a mine fire and its effect on mine ventilation air flow, varying pressure and quantity of air flow.

THE JULIUS KRUTTSCHNITT MINERAL RESEARCH CENTRE

The Julius Kruttschnitt Mineral Research Centre - a division of the University of Queensland's Department of Mining and Metallurgical Engineering - conducts fundamental and applied research in mining and in mineral processing, including coal preparation.

The JKMRC, located at the University's experimental mine site at Indooroopilly, developed from a research group founded in 1962 by the Centre's present Director, Professor Alban Lynch.

The Centre's research mission is two fold:

- research and development for the mining industry
- training of postgraduate students in an industrial context.

These objectives are achieved principally through industry funded research programs, in which students undertake development work in the mines and plants of the sponsoring companies which numbered 68 in 1988. Specific operational problems can be addressed, and at the same time a creative and collaborative research environment is promoted for the general advance of the technology.

JK Tech, the commercial division of the JKMRC, provides consulting services and software packages to the industry at large.

COAL MINING RESEARCH

Nine major open-cut coal mining companies are sponsors (in conjunction with 30 other mining and explosives companies) of the "Advanced Blasting Technology" Project. This project is conducted by the JKMRC in association with the Australian Mineral Industries Research Association (AMIRA). Investigations include:

- the development of numerical models for the prediction of fragmentation, surface vibration and muckpile profile shape and the development of computerised blast design tools
- the evaluation and control of blast damage (including damage to coal and coal loss)
- the measurement and evaluation of the performance of explosives
- the measurement and control of surface vibrations from blasting and their effects on structures.

In addition, a NERDDC program is being undertaken entitled "*The Selection of Explosives to Optimise Blasting Operations in Coal Overburden*". The goal of this project is to develop a set of tools that engineers at an open-cut coal mine can use to design safer and more efficient blasts for the preparation of overburden and coal for excavation.

COAL PREPARATION RESEARCH

In coal preparation the JKMRC has particular expertise in;

- ash monitoring,
- assessment of plant performance including the use of density tracers,
- modelling of comminution and classification operations dense medium baths and cyclones jigs raw coal distribution systems,
- automatic process control,
- simulation, both steady-state and dynamic, of coal preparation for circuit design, optimisation and control.

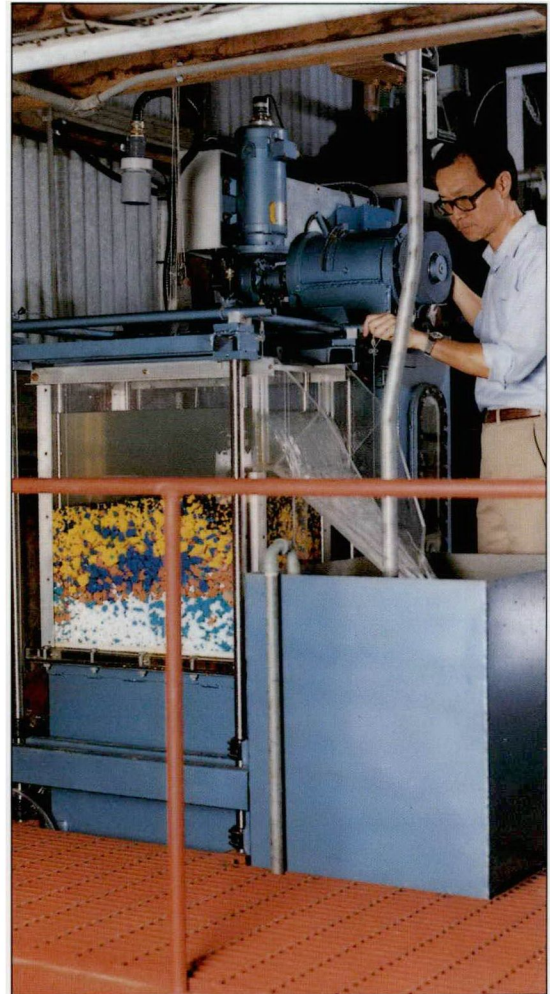
The Centre's achievements in this area include many successful case studies and commercial products such as:

- JKSImMet - one of the world's most advanced, interactive, graphics-based mineral processing simulators. Used for process design and optimisation, and marketed by JK Tech.
- The Coalscan 4500 Ash Monitor - developed in collaboration with the CSIRO and now commercialised and sold internationally by Mineral Control Instrumentation Limited (MCI).

The JKMRC's core project in coal preparation is an on-going program, currently sponsored by eight Australian coal producers through AMIRA. Present topics of investigation include dense medium separation, raw coal distribution, spirals and other matters relevant to plant performance simulation and control.

Other current activities include:

- A NERDDC-funded project wherein the JKMRC, as sub-contractor to Newlands Coal Pty. Ltd., is making a fundamental study of the partitioning mechanism in jigs and developing novel instrumentation and control techniques



- A collaborative project with Curragh Queensland Coal and the University of Queensland Department of Mining and Metallurgical Engineering to develop and evaluate geostatistical procedures for prediction of the washability of raw coal entering a preparation plant
- An ARC project using tomography techniques to determine medium density profiles in a dense medium cyclone
- Continuing development of on stream analysis and control systems for coal flotation.

Further information on the JKMRC's coal-related activities may be obtained from:

Andrew Scott - Mining Project Leader or
Julius Kruttschnitt Mineral Research Centre,
Brisbane, Qld 4068.

*JKMRC's Physical
Model of a Jig used
in coal preparation.*

COAL RESEARCH IN ACIRL

MINE SITE TECHNOLOGY SURFACE MINING GROUP

The Surface Mining Group is located at ACIRL's Rockhampton and Maitland Laboratories. The Group comprises four professional personnel and their support staff. Experience gained through a variety of research projects can be grouped into the following areas;

- New equipment appraisal and operating method assessment.
- Continuous haulage of coal and overburden through steep angle and combined dragline/hopper/crusher conveyor concepts.
- Dragline monitoring and operation analysis. Slope and floor stability in coal strip mines.

The following surface mining projects were completed or are on-going for financial year 1988-89.

Floor Stability in Deep Open Cut Mines

This completed project (July, 1989) was funded by the Australian Coal Association.

The primary failure mechanism of massive spoil slope failures involves multiple active and passive spoil wedges forming on a solid basal foundation. The primary determinants of these massive failures are;

1. Basal shear strength.
2. Floor dip.

Low basal shear strength is normally due to either of the following causes.

(a) Weak spoil or sludge on the pit floor.

This cause can readily be rectified at relatively low cost by employing thorough pit floor clean up practices.

(b) Weak pit floor.

Weak pit floor can be due to the presence of distinct weakness planes or the generally weak nature of the floor material. This cause is a bigger problem

than (a) with higher cost and operational constraints associated with remedial works.

This project addressed the second of the above causes of spoil slope instability.

A number of minesites which have encountered floor instability have been studied to identify floor types causing slope failure and assess current remedial measures.

A detailed study was conducted on Newlands Mine to monitor floor failure mechanisms and the performance of key cuts in the pit floor as a remedial measure.

The UDEC blocky model was successfully applied to the mathematical modelling of stresses in the floor with and without key cuts. Displacements of floor blocks have been used to assess potential for floor heave. Also a cost ranking study was performed on the following alternate remedial measures; key cut, cross pit buttressing, hybrid buttressing, artificial reinforcing and blast disruption. It was concluded that buttressing was the most cost effective remedial measure for the case studied.

Limit equilibrium methods were also used for design of remedial measures. A method allowing non-vertical slices (SARMA) has been found useful in this area, in conjunction with 2 wedge methods.

Dragline Monitoring and Analysis

The National Energy Research Development and Demonstration Council (NERDDC) project titled "Improved Utilisation of Dragline Monitoring Systems and Generated Data" was completed in March, 1989.

This project resulted from the development on a previous research project of a computer based on-board dragline production monitor. Experience with this monitor, as well as industry wide experience with similar monitoring systems, has indicated a serious shortage of suitable software for processing the very large quantities of data being produced by current dragline production monitors.

The completed project aimed to address this problem by examining the types of analyses which can be performed, implementing these in an operational mine, and establishing a set of design specifications which would enable monitors to meet the operational requirements of open-cut coal mines well into the next century.

The report outlined ways of utilising this data in the following areas:

(a) **Optimising operating efficiency.**

A number of possible analysis methods utilising the available data were identified. These methods included the interface of dragline cycle data with survey data to calculate the amount of rehandle and seam uncover rate.

(b) **Quantitative feedback on overburden blast effectiveness.**

Forces applied to the bucket were analysed in detail for individual cycles. Diggability factors were reviewed and compared for deviation in constant digging conditions, and sensitivity to changing digging conditions.

(c) **Measurement of structural fatigue damage.**

Critical structural points were instrumented and monitored for fatigue damage. Mechanical monitoring equipment was interfaced with an operations monitor to supply machine stress indices for every machine cycle.

(d) **Calibration of dragline simulation models.**

Potential uses of data from on-board monitors for the calibration of computer based simulation models were identified.

Computer software to allow graphical summary and analysis of the cycle data was developed. The analysis software is structured around a common database which can be loaded by data from different sources.

Continuous Surface Mining of Coal & Parting

This NERDDC funded project was completed in January 1989.

The areas addressed in the study included;

1. Identifying and assessing existing and prototype Continuous Surface Miners (CSM).
2. Review of CSM operational history in Australia and elsewhere.
3. Conventional thin seam/parting operating review.
4. Mine planning effects of the introduction of CSM's into the operations of Mt. Thorley, Howick and Ebenezer Open-Cuts.
5. Mining control of CSM's.
6. Industrial relations aspects of CSM's.

Much of the available Australian and overseas (up to eight (8) years continuous production history) data is readily adaptable for input into mine planning and operational feasibility studies of existing and proposed open-cut mines.

The preliminary data that is available concludes that reductions in coal loss and waste dilution levels of around 50% have resulted through the use of surface attack continuous miners.

Potential for increases in product tonnage of around 9% from thin multi-seam areas was demonstrated.

Allied to coal quality effects are washplant recoveries/throughputs which result in large cost centre savings/differentials. Increases in CPP by-pass coal tonnage of 30 to 50% for some multi-seam areas could be achieved.

Mining costs for CSM and conventional methods are of the same order, with CSM methods being moderately less than conventional mining methods. However the increase in by-pass tonnage, and improvements in CPP recovery can reduce product tonne unit costs by up to 28%.

Preliminary investigations have shown decided advantages of CSM (surface attack)

technology over conventional mining methods for thin coal seam recovery and waste parting removal.

For working thicknesses less than 1m, the unit cost of mining by conventional methods increases rapidly as seam thickness is reduced.

The cost of mining thin seams with a thickness of 0.2m using conventional methods can be 1.85 times that for CSM's.

Steep Angle Conveying of Coal

This on-going NERDDC project (commenced March, 1989) titled "Extended Utilisation of Draglines for Steep Angle Conveying" arose out of a previous research study that examined steep angled conveying concepts for the Australian mining industry. It was apparent that for the open cut coal industry, a mobile, low capital cost and medium capacity unit i.e. 1000-1500 t/hr was required. This project is therefore about investigating the technical feasibility and economic rationale of combining a disused dragline (to act as the mobile platform) and a catenary pocket belt that is supported at the feed and discharge ends to elevate coal from the pit floor to the working dragline bench level.

Phase 1 of the project will be completed by the end of July, 1989. Phase 1 will include a mine site case study, mechanical and dynamic assessment of catenary behaviour as well as a technical review of existing catenary belt installations and a catalogue of disused and decommissioned draglines Australia wide.

COAL WASTE DISPOSAL AND REHABILITATION

Work started in February, 1989, and is currently underway. Initially a survey was conducted in the Hunter Valley to establish current practices and the relative costs, where available. The variety of disposal methods being employed supports the contention that the traditional methods are not universally accepted. Laboratory work has passed the design stage and construction of both the laboratory and field models will commence soon. Work is also underway to enable the

results, obtained from trials with the laboratory and field models, to be analysed.

UNDERGROUND MINING

Underground Diesel Vehicle Safety by Using On-Board Exhaust Gas Detection

The project aims to:

1. Improve diesel vehicle operator safety by monitoring the inhaled atmosphere for exhaust gas constituents.
2. Build a device to continuously monitor exhaust gas levels on-board diesel vehicles.

Australian mines have a relatively high density of diesel vehicles including Load-Haul-Dump vehicles, man transporters and locomotives. Statutory bodies require that these vehicles be continually checked to ensure exhaust gas concentrations are not exceeded and thus minimise the risk to employees. The device proposed could be retrofitted to detect gas concentrations in the operator's cabin atmosphere.

Proposed Queensland legislation would force vehicle operators to identify where hazards exist and install instrumentation to suit. The proposed device would satisfy this legislation.

To date a system has been put together using propriety devices to investigate exhaust gas levels in the inhaled atmosphere while the prototype is being developed.

Reducing Noise in Underground Coal Mines

The research objectives of this project are to:

1. Reduce noise output of a pneumatic roof bolter.
2. Investigate the initial feasibility of quietening large underground machinery.

The pneumatic roof bolter is the main focus of this project because the noise it produces not only causes the most significant amount of hearing damage but makes "roof talk" (noise made by the roof prior to roof falls occurring) difficult to hear even when personnel are not wearing hearing protection. Other devices could also directly benefit from the retrofits developed for the roof bolter including borers, chainsaws, hoists, etc.

Background work will also be carried out on the feasibility of reducing the noise on larger machines, particularly continuous miners and LHD's. These larger machines are seen as being much more difficult to modify and trial both in terms of expenditure required and project logistics.

To date a suitable roof bolter has been obtained from CRAM Engineering, and Robert Fitzell Acoustics have been engaged to carry out detailed noise assessments.

The Introduction of Systematic Safety Assessment Techniques to the Australian Coal Industry

Systematic Safety Assessment (SSA) is a generic term encompassing a large number of investigative techniques such as MORT (Management Oversight and Risk Tree), HAZOP (Hazard and Operability), FME (Failure Mode and Effect), Fault Tree etc. Such techniques originated in petrochemical, nuclear and space industries and are rarely used in the Australian coal mining industry. The introduction of SSA techniques is put forward as a vital step towards cost efficient risk management at mine sites. Voluntary introduction of such technology is also seen as a method of preventing additional legislation in an industry which is already heavily regulated by State and Federal authorities.

To demonstrate the benefits of selective use of appropriate techniques, five collieries are being used for pilot studies. In each colliery a different operation or event is analysed with the appropriate techniques. The first such operation is a methane drainage system from coal face to exhaust stack.

GAS DETECTORS TO REPLACE THE FLAME SAFETY LAMP

Investigations following the 1986 Moura explosion revealed certain conditions in which a Flame Safety Lamp (FSL) could ignite mixtures of methane and coal dust. Based on this finding the Departments of Mines in Queensland and New South Wales moved to restrict the use of the FSL. A review of the FSL by ACIRL and various other bodies has since been underway. A survey was

undertaken to determine the size of the market and operator's needs. This survey found that the long term goal is a multigas detector, worn on the belt and capable of operating for about 10 hours.

A series of combined laboratory and underground tests was carried out on instruments either purchased or on loan. All test instruments were intrinsically safe to Australian or overseas standards and about 55% had Australian Mines Approvals.

The instruments were classified into 3 groups:

- (a) Single gas instruments.
- (b) Multi-gas instruments with limited features.
- (c) Multi-gas instruments with extensive features.

The second of the above classes was chosen as the most suitable as a long term FSL replacement, in that instruments within it offered the essential protection and continuous operation without complicating features. Of the 35 instruments reviewed, eight fitted this classification and are thus nominated as the most viable alternatives at present.

A series of criteria was put forward as utopian specifications for an FSL replacement.

PROCESS TECHNOLOGY

Coal Preparation

ACIRL's Coal Preparation Section has been further strengthened over the past year with the appointment of three senior coal preparation engineers and the further improvement of the Coal Preparation Research plants at Maitland and Rockhampton. The Maitland research plant has had further instrumentation added during the year and additional equipment is planned. Equipment improvements to the plant include auto-controlled weigh feeder systems for main plant feed and for fine coal. Central to the running of the plant is the data logging and control activity which is computer connected to a programmable convertor. Data from plant investigation runs are stored on disc and can be transferred to

other computers for report preparation and detailed statistical analyses.

The Coal Preparation Group at Rockhampton has been increased to a team of three experienced coal process engineers with two support technicians. Activities for the year have been concentrated on research and commercial projects for both coal and other minerals. The coal preparation pilot plant at Rockhampton has been upgraded with particular attention to the dense medium circuit.

Further development and equipment additions to the Rockhampton station over the next year will allow greater flexibility to process large quantities of slurry for detailed flotation testwork and filtration trials.

In addition, feasibility studies to install a dense medium bath to process coarse coal and minerals are well advanced. Some of the Rockhampton plant has been modularised and as a result some components have been located to various mine sites for field testwork during the year.

Carbonisation

Carbonisation research is currently focusing on two project areas:

- (1) **Reactivity of Australian Cokes.** Studies are concentrating on the effect of the organic inerts (inertinite) in coal on the reactivity of the coke. Coke reactivity and coke strength after reaction have become of prime importance to blast furnace operators and it is important that coal marketers appreciate the contribution of their particular coal to coke reactivity. ACIRL employs the NSC coke reactivity test procedure.
- (2) **High temperature coke strength determination.** Recent research indicates that the Japanese Steel Industry are increasingly concerned with coke strength in the lower (bosh) region of the blast furnace where temperatures exceed 1400°C. In turn other coking coal consumers are likely to take an interest and coke hot strength may become a determinant of coking coal quality and

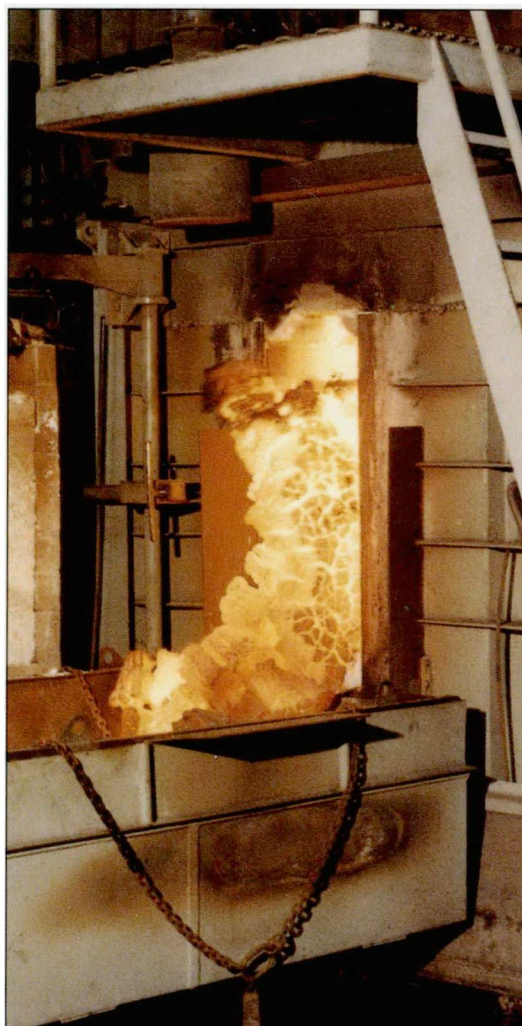
value, possibly complementing the coke reactivity index.

ACIRL has constructed a high temperature slot oven in which 10 kg of blast furnace coke can be heated and/or reacted prior to strength testing in a tumble drum.

Coal Petrography and Mineralogy

Fluorescence photometry is a new technique for characterising coking coals. The relationship between fluorescence intensities of the macerals in Australian and Northern Hemisphere coals and their caking properties and coke quality has been studied.

In a joint project ACIRL and CSIRO Division of Coal Technology are examining the structural basis for the differences in carbonisation behaviour of maceral types in coals of different origin, using a CJ1,(21) infra-red microscope to obtain FTIR spectra of



Coal Evaluation in ACIRL's 500kg pilot coke oven.

individual macerals, without recourse to physical separations.

ACIRL's petrography and mineralogy group continues to offer the conventional analyses of maceral composition and vitrinite reflectance and also a range of research microscopy services.

Transport and Storage

ACIRL's engineers have experience in the coal-specific problems of bulk materials handling viz. dust control, prediction and mitigation of spontaneous combustion, and size degradation, and can offer a range of specific coal tests which can define the relative propensity of a coal to give these problems.

Coal Processing

ACIRL is conducting a study of low-ash coal-water mixture fuel production from Australian coals, including combustion tests.

ACIRL now offers an evaluation service to the industry which includes fine coal washability determinations, coal-water mixture formulation and rheology studies, and combustion characteristics of CWM prepared from a specific coal.

ACIRL has also studied the coal quality requirements of alternative steelmaking processes to the conventional coke oven/blast furnace route. These processes include pulverised coal injection, direct reduction in shafts and rotary kilns and coal gasification in an iron bath.

LABORATORY SERVICES

In addition to its North Ryde headquarters, ACIRL maintains in five strategic locations, Australia's largest national network of operating centres specifically devoted to serving the Australian coal industry. These are:-

Queensland

- Rockhampton
- Ipswich

New South Wales

- Maitland
- Bellambi

Western Australia

- Collie

At each site the Laboratory Services Group is represented along with judiciously selected groups from other ACIRL divisions in order to supply a complete service.

In particular the Coal Preparation Group is strongly represented at Rockhampton, Ipswich and Maitland and is working closely with laboratory staff to provide an effective service in coal quality monitoring, efficiency testing and plant troubleshooting.

Capabilities

ACIRL laboratories are equipped and staffed to undertake commissioned studies for the coal industry into quality related matters at all stages of the coal chain, from exploration, mining and preparation through to transportation, handling, marketing and utilisation.

Provision of these services assists the coal industry in satisfying statutory requirements in maintaining quality and efficiency and in meeting environmental standards. Services include stockpile, truck, wagon sampling; strip and channel sampling; preparation plant sampling (product refuse, and slurry streams) for plant efficiency audits; laboratory evaluation of coking and thermal coals of all rank (borecore, production and marketing samples); mine air analysis, water analysis, diesel exhaust gas analysis (using mobile laboratory facilities), and atmospheric dust sampling and analysis.

Minesite Online Data System (MODS)

ACIRL Laboratories have recently developed and implemented a computerised reporting system based on a coal database stored on our interconnected VAX 6310 network. The new system has led to efficiencies and cost savings in the operation of our laboratories but, most importantly, has also led to the following new benefits to our clients.

Computer generated (MODS) hard copy reports are based on a spreadsheet format which makes them easier to use - NATA has endorsed these new ACIRL reports.

Coal quality data, whether it be borecores, production samples or whatever, are provided in a digital record (disc or tape) which is compatible with the coal company's own in-house database - thus saving time and eliminating error in the transcription of data.

Electronic data transfer (EDT) using a telephone modem is also offered to those clients requiring a rapid report turnaround time.

Provision of Emergency Gas Analysis Facilities

ACIRL Rockhampton laboratory has an agreement with the Central Queensland Mines Rescue Brigade (CQMRB) to provide an on site gas analysis service on the affected mine site in the event of an emergency. This service is available to all mines in the Bowen Basin and is operated for the Queensland Department of Mines Safety in Mines Testing and Research Station Program based at Redbank (South East Queensland).

CQMRB owns the gas analysis equipment i.e. oxygen and carbon monoxide monitors and gas chromatograph. ACIRL maintains the equipment in good repair and calibrated for immediate use, as well as providing three professionally qualified officers, each of whom undergoes regular training in the use of the equipment and is on call 24 hours a day.

Should an emergency situation arise the operators would pack, transport and commission the equipment and be in a position to provide gas analysis data after the shortest possible elapsed time.

(By Courtesy - Australian Coal Industry Research Laboratories Ltd. (A.C.I.R.L.), Sydney)



COAL RESEARCH IN CSIRO

OVERVIEW

CSIRO's mission is to help increase efficiency in the production, utilisation and marketing of Australian coal, and to generate value-added products, with due regard to protection of the environment and the processing/utilisation of by-products. CSIRO is active in all areas of coal research. All the research is application-oriented, with programs being a balance of medium to longer term research for future processes and applications, and short to medium term research aimed at currently-defined problems. CSIRO interacts with industry through consultancy, confidential contract research, longer term collaborative research (often through NERDDP) and joint development/commercialisation. The Division of Coal Technology is currently involved in five joint ventures - AUSCOAL (superclean and ultraclean coal and slurry fuels), AIRTRAK (photochemical smog monitor), ASHUT (ash utilisation), BIOCOAL (coal-waste briquettes) and COAL PROCESSING CONSULTANTS. The latter combines the innovative skills of CSIRO and the practical approach and large scale facilities of ACIRL to tackle industry problems. The Division of Mineral and Process Engineering is also closely involved with the coal industry and has joint ventures or licensing arrangements for on-line instrumentation and control techniques, advanced analytical equipment and fluidised bed combustion technology. The Division of Geomechanics works with mine operators, through projects on mine design, equipment and strata monitoring, mine structure and geological features, and new mining equipment.

CSIRO IN QUEENSLAND

The CSIRO Institute of Minerals, Energy and Construction (IMEC) is to have a significantly enhanced presence in Queensland. All CSIRO Divisions involved in coal research are part of IMEC. The Division of Geomechanics, specialising in mining, will have its headquarters in Brisbane. The Divisions of Coal Technology (DCT) and Mineral and

*A Mine Emergency
Survey Vehicle
(Numbat)*

Process Engineering (DMPE) are to establish research teams in Brisbane. DCT will emphasize collaboration with industry on research to improve conventional preparation and enhance utilisation of coal, to apply new methods of beneficiation and to make new products from coal. Research and development will also be carried out on increased environmental control of coal beneficiation, handling and utilisation. DMPE's plans include establishing groups for QEM*SEM and advanced process control, including the possibility of a National Centre for Process Control.

All CSIRO services and expertise, irrespective of location, are available to the Queensland coal industry. Coal research is organised into five programs and a broad summary of research activities, expertise and facilities is as follows.

COAL MINING

This program is directed to improving safety and efficiency in Australian coal mines, by improving mine design, the understanding of the geological conditions, monitoring of equipment and strata, and the development of new equipment. Activities comprise:

Geological Controls on Mining focuses on the prediction of geological structures, sedimentary features and intrusions, and combines regional and local geophysics, remote sensing, field mapping and computer modelling techniques.

Mine Design Techniques use two and three dimensional computer modelling techniques to predict the performance of mine configurations and pillar dimensions. Strata Control Instrumentation and Roof Support Systems are providing new instrumentation and communications for continuous monitoring of mine stress and deformations, and equipment such as long wall supports, extending to the identification of appropriate roof support techniques.

A Mine Emergency Survey Vehicle (NUMBAT) for remotely controlled evaluation of physical and atmospheric conditions in mines.

Coal Seam Methane drainage techniques covering the distribution of gas and coal permeabilities, permeability enhancement techniques with hydraulic fracturing and gas production development procedures.

In-Situ Density Monitor enables continuous or periodic monitoring of density in mine roof and floors to indicate mine deformation progress.

COAL CHARACTERISATION AND TESTING

This program aims at understanding coal and its behaviour in processing and utilisation, the development of improved test procedures to determine coal quality and assess utilisation characteristics. Specific activities comprise:

Characterisation of Minerals, Macerals and Trace Elements in Coal and Ash using a range of chemical, geochemical, microscopic and spectroscopic techniques.

Combination Ash, Density and Lithology Probe using natural gamma and gamma/gamma detectors which provide real time assays of ash and density for use in exploration, and coal preparation cycles.

Proton Magnetic Resonance Thermal Analysis (PMRTA) for testing fusibility and thermoplasticity of bituminous coals and for assessing the coking behaviour of coal blends; a prototype commercial instrument has been developed (with the Joint Coal Board).

Maceral Reactivity in Combustion, Pyrolysis, and Coking using a laser microreactor, Fourier transform infra-red (FTIR) spectroscopy, thermal analysis, and other techniques to examine, for example, the reactivity of inertinites in Australian coals.

Spontaneous Heating of Coal Stockpiles using laboratory tests and computer models to predict self heating propensity and determine control strategies.

Coal Information System providing a relational data base for coal research and marketing support, and a vehicle for more accurate and objective coal testing parameters.

Coal Value Model developed (with the Joint Coal Board) to assess the monetary value of thermal coals with a wide range of different characteristics.

COAL PREPARATION AND VALUE-ADDED PROCESSING

The objective is to help increase the quantity and enhance the quality of coal recovered in preparation plants and to generate new and improved products from coal, particularly for export and import-substitution. Current and planned activities cover:

Liberation and Washability Fingerprinting for increasing coal recovery without generating excessive fines (including selective breakage techniques), enhancing coal quality, improving the ratio of primary to secondary products, assessing fine and ultrafine coal preparation options, and performance.

Beneficiation - extension of dense medium (magnetite) techniques to low density; alternative dense media; classification and density separation of fine and ultrafine coal; dry beneficiation techniques generally, and dry electrical separation of fine and ultrafine coal at low E_p values; chemical demineralisation and selective mineral removal using mild dissolution and/or strong leaching processes.

Coal Fragment Size Determination using real time image analysis techniques, to continuously monitor coal size through the coal preparation cycle.

On-Line and Bulk Analysis involving a wide range of nuclear and non-nuclear gauges and associated electronic instrumentation for measuring and monitoring ash, moisture in coal and cokes, specific energy, slurry solids content, coal coking properties, oxidation, rank parameters, carbon in fly ash, pulverised coal mass flow and borecore washability.

Advanced Process Control based on the gauges and instrumentation together with control strategies and software for improving the performance of coal washeries by maximising yields and controlling ash to ensure consistency of product quality, with particular reference to dense medium circuits

and (in the future) flotation circuits, and other applications to power station operations.

Dewatering - development of 'combined field' vacuum and compression filters with electric field for improved dewatering of fine and ultrafine coal and tailings.

Superclean (1-5% ash) and Ultraclean (0.1-1% ash) Coal and Coal-Water Mixtures at the laboratory and pilot scale, as oil replacements, premium thermal and coking coals, and precursors to industrial carbon products.

Agglomeration/Briquetting to utilise coal fines and tailings and generate smokeless fuels, including the fabrication and characterisation of Yontan briquettes for Asian and other markets and bio-coal briquettes from coal and organic wastes.

Industrial Carbon Products either directly from coals or from intermediate products such as tars, including activated coke and chars, active carbons, anode carbons, humic acids from brown coals, chemicals, polymers and pitches.

COAL UTILISATION

This program is aimed at combustion and carbonisation in relation to improving efficiency in electricity generation and metal production, and at advanced utilisation processes for coal and coal-derived products.

Current and planned activities include:

Low Volatile Coal Combustion in support of export and domestic marketing of Australia's extensive reserves of low volatile coal.

Fluidised Bed Combustion for utilisation of coal wastes and low quality coals, better control of gaseous emissions, elimination of ash slagging and for the production of carbons from brown coal.

Ash Formation and Fouling using combustion furnace, NMR, IR, SEM and QEM*SEM techniques, leading to improvements in boiler design and operation and assisting the marketing and utilisation of high-salt coals.

Coal in Metallurgy - pulverised coal injection into blast furnaces, combustion and gasification reactivity of coal, cokes and chars.

Coal Pyrolysis and Liquefaction - oil and chemical production, and novel catalyst development.

Superclean and Ultraclean Coal and Slurry Fuels - behaviour in combustion, carbonisation and advanced power cycles.

Utilisation of Carbon Products - active carbons, anode carbons and carbon fibres.

Utilisation of Fly Ash and other coal by-products.

ENVIRONMENTAL PROTECTION

The objective is to assess, model, predict and control the effect on land, water resources and the atmosphere of particulate, dissolved and gaseous pollutants arising from the power, mining and related industries, and to quantify the benefits arising from improved preparation and more efficient utilisation technologies. Expertise and current work includes:

Electrostatic Precipitation of Fly Ash for the efficient design of power station precipitators and to predict the characteristics of coal and coal blends for export markets, thereby supporting steam coal marketing.

General Air Quality - urban haze, photochemical smog, impact of power station emissions and mine atmosphere monitoring.

Plume Dispersion by airborne and ground-based tracking of pollutant transport, and chemical transformations; chimney height predictions.

Smog Monitor - techniques and model incorporated in the AIRTRAK device now being marketed internationally.

Acid Gases - NO_x and SO_x emissions and control.

Greenhouse Effect - data collection and interpretation, and co-ordination of national effort.

Industrial Water Management involving field, laboratory and modelling studies applied to the supply, treatment and discharge of water used in industrial operations in general and in the mining and coal utilisation industries in particular.

Land Environment - dewatering of tailings, slimes and sludges by conventional and electro-dewatering techniques.

(By Courtesy - CSIRO Division of Coal Technology, Sydney)



CSIRO Geologists evaluating geological structures and their effect on mining.

6 MINE AND COMPANY INFORMATION

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Table 6.1 Capital Expenditure By Some Companies - 1988-89

Company	Mines Including Plant Equipment & Development	Power & Water	Road Rail And Port Facilities	Towns	Other Capital Expenditure
	\$'000	\$'000	\$'000	\$'000	\$'000
Blair Athol Coal Project	6 699	-	20 777	6 705	-
Central Queensland Coal Associates	35 772	-	1 574	404	-
Collinsville Coal Company Pty. Ltd.	4 452	-	-	710	-
Curragh Queensland Mining Limited	11 589	-	-	775	-
Gregory Joint Venture	1 313	-	-	571	-
Newlands Coal Pty. Ltd.	1 394	-	7 621	23	-
Oaky Creek Coal Pty. Ltd.	5 881	-	935	45	-
Tarong Coal	3 432	-	-	-	-
Thiess Dampier Coal Pty. Ltd.					
Moura	4 304	-	76	306	-
Riverside	980	-	204	-	-

Table 6.2 Some Reported Shareholdings In Certain Coal Mines and Projects

AGIP COAL AUSTRALIA PTY. LTD.		COAL CLIFF COLLIERIES PTY. LIMITED	
Ensham	19%	Blair Athol	50.22%
ALLIED QUEENSLAND COALFIELDS PTY.LTD.		CRA LIMITED	
Baralaba	85%	Tarong	100%
AMAX PACIFIC ENERGY LTD		CSR LIMITED	
Commodore & Felton West	65.625%	Boundary Hill & Callide - each	55%
AMP SOCIETY		Rolleston, Wandoan - each	50%
Boundary Hill & Callide - each	33.3%	Surat Basin	42.67%
Blackwater, Goonyella, Gregory, Norwich Park, Peak Downs, Saraji - each	7.75%	DAMPIER COAL (QUEENSLAND) PTY. LTD.	
ARCO COAL AUSTRALIA INC.		Moura, Nebo, Riverside - each	80%
Cook	100%	DOMER MINING CO. PTY. LTD.	
Gordonstone	50%	Jeebropilly and New Hope	15.3%
Curragh	60%	ESSO EXPLORATION & PRODUCTION AUST. INC.	
Blair Athol	15.39%	Hail Creek	25%
BHP-UTAH COAL LIMITED		FARJOY PTY. LTD.	
Gregory	52.25%	Jeebropilly and New Hope	15.3%
Blackwater	43.5%	IDEMITSU QUEENSLAND PTY. LTD.	
Goonyella, Norwich Park, Peak Downs, Saraji - each	40.25%	Ensham	28.5%
BELL RESOURCES LTD.		Ebenezer	49%
Blackwater, Goonyella, Gregory, Norwich Park, Peak Downs, Saraji - each	10%	JOHN HOLLAND HOLDINGS LIMITED	
BLIGH COAL LIMITED		South Blackwater & Laleham	49%
Ensham	28.5%	HINCH COAL MINING COMPANY	
BOND CORPORATION LTD.		Gordonstone	22.5%
Rhondda	100%	MARATHON OIL COMPANY	
BRITISH COAL		Macalister	100%
German Creek	10.77%	MILLER R.W. & CO	
		Curragh	30%
		MILLMERRAN COAL PTY. LIMITED	
		Commodore & Felton West	20%

Table 6.2 Some Reported Shareholdings In Certain Coal Mines and Projects *Continued....*

M.I.M. HOLDINGS LTD.		PENNANT HOLDINGS LIMITED	
Collinsville, Newlands - each	100%	South Blakwater & Laleham	51%
Oaky Creek	79%	QUEENSLAND COAL TRUST	
Rolleston, Wandoan - each	50%	Goonyella, Gregory, Norwich Park,	25%
Surat Basin	42.67%	Peak Downs, Saraji - each	
MITSUBISHI DEVELOPMENT PTY. LTD.		Blackwater	21.75%
Clermont	45%	RESOURCE MANAGEMENT & MINING PTY. LTD.	
Blackwater, Goonyella, Norwich Park,	12%	Yarrabee	100%
Peak Downs, Saraji - each		RUHRKHOLE AG (WEST GERMANY)	
MITSUBISHI MINING & CEMENT CO. LTD.		German Creek	10.77%
Jeebropilly and New Hope	12.8%	SHELL COMPANY OF AUSTRALIA	
MITSUI COAL DEVELOPMENT (AUSTRALIA) PTY LTD.		German Creek	38.08%
Curragh	10%	Boundary Hill & Callide - each	66.7%
Commodore & Felton West	9.375%	Bowenville	50%
MITSUI & CO. LTD. (JAPAN)		SUNCORP INSURANCE & FINANCE	
Moura, Nebo, Riverside - each	13.3%	Gordonstone	22.5%
MITSUI & CO. (AUSTRALIA) LTD.		SUPERANNUATION FUND INVESTMENT TRUST	
Moura, Nebo, Riverside - each	6.7%	German Creek	13.03%
NATIONAL MUTUAL LIFE ASSOCIATION OF AUSTRALASIA		WASHINGTON SOUL PATTINSON & CO. LTD.	
German Creek	26.06%	Jeebropilly and New Hope	50.2%
PACIFIC COAL PTY. LTD.		WHITE INDUSTRIES	
Hail Creek	25%	Clermont	55%
Ensham	15%	Wm. McQUEEN & CO. PTY. LTD.	
Meandu	100%	Surat Basin	14.66%
PANCONTINENTAL MINING LIMITED			
Gregory	5%		
Blackwater, Goonyella, Norwich Park,	5%		
Peak Downs, Saraji - each			

Table 6.3 - Operating Coal Mines - June 30, 1989

Company	Address	Mine	Operation
Allied Queensland Coalfields	GPO Box 1692 BRISBANE QLD 4001	New Whitwood Nos. 3,8/2 & 9	Open-cut
BHP-Utah Coal Ltd.	GPO Box 1389 BRISBANE QLD 4001	Goonyella	Open-cut
		Moura No. 2	U\ground
		Moura	Open-cut
		Riverside	Open-cut
Blair Athol Coal Project	GPO Box 391 BRISBANE QLD 4001	Blair Athol	Open-cut
Burgowan Collieries Pty. Ltd.	Gympie Street TORBANLEA QLD 4662	Burgowan No. 12	U/ground
Callide Coalfields Pty. Ltd	PO Box 428 BILOELA QLD 4715	Boundary Hill	Open-cut
		Callide	Open-cut
Capricorn Coal Management Pty. Limited	GPO Box 1410 BRISBANE QLD 4001	German Creek Southern	U/ground
		German Creek Central	U/ground
		German Creek	Open-cut
Central Queensland Coal Associates	GPO Box 1389 BRISBANE QLD 4001	Blackwater	Open-cut
		Norwich Park	Open-cut
		Peak Downs	Open-cut
		Saraji	Open-cut
Coal Resources of Queensland Pty. Ltd.	PO Box 10 BLACKWATER QLD 4717	Cook	U/ground
Collinsville Coal Company Pty. Ltd.	GPO Box 1433 BRISBANE QLD 4001	Bocum	U/ground
		No. 2	U/ground
		Central No. 3/Garrick West & Scott Denison	Open-cut
Curragh Queensland Mining Limited	GPO Box 807 BRISBANE QLD 4001	Curragh	Open-cut
Gregory Joint Venture	GPO Box 1389 BRISBANE QLD 4001	Gregory	Open-cut
Idemitsu South Queensland Coal Pty Ltd	Level 14 Riverside Centre 123 Eagle Street BRISBANE QLD 4000	Ebenezer	Open-cut
Jeebropilly Collieries Pty. Ltd.	PO Box 47 IPSWICH QLD 4305	Jeebropilly	Open-cut
New Hope Collieries Pty. Ltd.	PO Box 47 IPSWICH QLD 4305	Western Leases 1 & 2	U/ground
		New Hope No. 358	Open-cut
Newlands Coal Pty. Ltd.	GPO Box 1433 BRISBANE QLD 4001	Newlands	Open-cut
Oakleigh Colliery Pty. Ltd.	PO Box 25 ROSEWOOD QLD 4350	Oakleigh No. 3	U/ground
		Oakleigh	Open-cut
Oaky Creek Coal Pty. Ltd.	PO Box 1 TIERI QLD 4709	Oaky Creek	Open-cut
Pacific Coal Limited	GPO Box 391 BRISBANE QLD 4001	Meandu	Open-cut
Rhondda Collieries Pty. Ltd.	PO Box 109 IPSWICH QLD 4305	M.W. Haenke No. 2	U/ground
		Wattle Glen Extn.	Open-cut
		Box Flat No. 2	Open-cut
South Blackwater Mines Ltd	PO Box 201 TOOWONG QLD 4066	South Blackwater No. 1	U/ground
		South Blackwater	Open-cut
Yarrabee Coal Co. Pty. Ltd	PO Box 173 BLACKWATER QLD 4717	Yarrabee	Open-cut

DEVELOPED MINES

BLACKWATER, GOONYELLA, NORWICH PARK, PEAK DOWNS AND SARAJI

CENTRAL QUEENSLAND COAL ASSOCIATES BHP-Utah Coal Ltd.

Company Information

Central Queensland Coal Associates (CQCA) is a joint venture between the participants shown in Table 6.4.

Table 6.4 Central Queensland Coal Associates

	CQCA except Blackwater	CQCA Blackwater
BHP-Utah Coal Limited	40.25%	43.5%
Queensland Coal Trust	25%	21.75%
Mitsubishi Development Pty Ltd	12%	12%
Bell Resources Ltd.	10%	10%
Australian Mutual Provident Society	7.75%	7.75%
Pancontinental Mining Limited	5%	5%

Negotiations for the sale of Bell Resources Ltd interest to the other Joint Venture partners is being undertaken.

CQCA also owns the coal terminal at Hay Point, 40 km south of Mackay. The Central Queensland Coal Associates Joint Venture is managed by BHP-Utah Coal Limited.

Location Open-cut Mines

Blackwater mine is situated 216 km west of Rockhampton and 315 km by rail from Gladstone.

Goonyella is approximately 225 km south-west of Mackay and 198 km by rail from Hay Point. Peak Downs and Norwich Park are south from Goonyella on another railway line. Norwich Park is the southern most mine and is 256 km from Hay Point.

Operations

The following mines are operated as open-cuts with designed annual production

of coking coal (in millions tonnes) as indicated - Blackwater 4, Goonyella 5.5, Peak Downs 5.4, Saraji 4.7 and Norwich Park 4.3.

The Blackwater mine has a steaming coal production capacity of 2.6 million tonnes per year.

Employees at the mines totalled 3 509 at June 30, 1989, including manning for Goonyella and Riverside which, for operational purposes, were amalgamated under one management structure during March 1989.

Coal Quality

Blackwater, Goonyella and Peak Downs coals are medium volatile, while Saraji and Norwich Park are low volatile. The coals are hard coking with International Standard Classifications 434. Typical washed coal analyses are given in Table 6.5.

Table 6.5 Typical Washed Coal Analyses

	Black- water	Goon- yella	Peak Downs	Saraji	Nor- wich Park
Total Moisture (a.s%)	10.0	10.0	10.0	10.0	10.0
Moisture (ad%)	2.0	1.3	1.0	1.0	1.0
Volatile Matter (ad%)	27.0	25.5	21.0	19.0	17.2
Fixed Carbon (ad%)	63.2	65.2	68.5	70.7	71.3
Ash (ad%)	7.8	8.0	9.5	9.3	9.5
Total Sulphur (ad%)	0.5	0.5	0.55	0.55	0.6
C.S.N.	6	8	9	9	9
Specific Energy MJ/kg	32.06	32.94	32.69	32.69	31.9

A total of 23 large dragline are used at the open-cuts to strip overburden from above the coal seams. Coal is extracted using electric shovels and/or front end loaders with 110 to 200 tonnes capacity bottom-dump coal haulers. After crushing in rotary breakers, the coal is processed to customer specifications in mine preparation plants using heavy medium cyclones for the coarse coal fractions and froth flotation for the fine coal product. Both coarse and fine coal are combined and conveyed to a radial stacker for stockpiling prior to riling.

Port of Shipment

Coal from four northern mines is shipped from Hay Point. The Hay Point facilities have loaded ships of 200 000 tonnes capacity. The port is designed for an annual loading in excess of 20 million tonnes. Blackwater coal is shipped through the Clinton loading facility at Gladstone.

Townships

Blackwater mine employees and their families live in the town of Blackwater which has a population of around 8 000 people. Employees at Goonyella and Peak Downs live in Moranbah, which has a population of approximately 8 000. Dysart is the centre for Saraji and Norwich Park employees, and has a population exceeding 4 000.

General Information

Prior to the April, 1984 reorganisation, CQCA was authorised to export a total of 457.2 million tonnes of coking coal from its Special Coal Mining Lease areas with the provision that should exports exceed 20.3 million tonnes in any one year, the excess will be mined from depths greater than 200 feet (approximately 60 metres). An additional 101.6 million tonnes may be exported provided it is mined from depths greater than 200 feet. CQCA is also authorised to export a total of 101.6 million tonnes of coking coal from its Blackwater leases.

Japan is still the major customer for coal from the CQCA mines, although marketing diversification in recent years has resulted in increased sales to Europe as well as South Korea, Taiwan, India, Brazil, Argentina and others.

BLAIR ATHOL

BLAIR ATHOL COAL PROJECT Pacific Coal Pty. Ltd.

Company Information

Current interests in the project are - The Coal Cliff Collieries Pty. Limited 50.22%; Arco Coal Australia Inc. 15.39%; ARCO Resources Limited 12.195%; Bundaberg Sugar Company Limited, Millaquin Sugar Company Pty. Limited, and Gibson and Howes Pty. Limited 12.195%; and EPDC The Project Manager is

Pacific Coal Pty. Limited (a subsidiary of CRA Limited)

Location

The Blair Athol coal field, located 22 kms from the township of Clermont, is contained within an isolated sub-basin on the western margin of the Bowen Basin. Blair Athol is about 280 kms south-west of Mackay.

Reserves

Recoverable reserves are estimated to 240 million tonnes of good quality steaming coal.

Coal Quality

The typical coal quality is indicated in Table 6.6.

Table 6.6 Typical Analysis of Blair Athol

Moisture (ad%)	7.5
Volatile Matter (ad%)	27.2
Fixed Carbon (ad%)	57.3
Ash (ad%)	8.0
Total Sulphur (ad%)	0.3
Specific Energy (at 7.5% moisture) MJ/kg	27.25

Export Operations

The present open-cut mine was opened in 1984. The initial capacity was 5 million tonnes per year and the coal is being exported chiefly to power utilities in Japan.

Development of the project included a major mining facility, railway construction, electricity reticulation and building of houses in Clermont for the mines workforce.

Present annual production rate is around 7.5 million tonnes with a workforce of 350. An expansion project has been committed and is expected to bring the mine to an 8 million tonnes per year rate by 1990.

BOUNDARY HILL AND CALLIDE

CALLIDE COALFIELDS

Company Information

Callide Coalfields is owned by The Shell Company of Australia Limited 66.7% and Australian Mutual Provident Society 33.3%.

The managing company is Callide Coalfields Pty. Limited a wholly owned subsidiary of Shell Australia Limited.

Location

The Callide coal field is located 140 km west south-west of the port of Gladstone, and 15 km east of Biloela.

Operation

The current annual production rate from the Callide Coalfields is approximately 3.6 million tonnes from two open-cut mines. The Callide mine is based on the Dunn Creek/Trap Gully area in the southern end of the field and the Boundary Hill mine is located at the northern end. The mines are designed to produce 4.2 million tonnes per year. At June 30, 1989, 410 people were employed at the mines.

Coal Quality

Callide Coalfields produces a sub-bituminous coal with excellent combustion characteristics, which has generally been used for steam raising. Coal from Boundary Hill mine is highly reactive to carbon dioxide, making it suitable for a range of metallurgical processes. Typical analyses are given in Table 6.7.

Table 6.7 Typical Analyses of Boundary Hill and Callide

	Callide	Boundary Hill
Moisture (ad%)	9.6	12.5
Ash (ad%)	17.0	12.5
Volatile Matter (ad%)	25.0	25.0
Fixed Carbon (ad%)	49.7	50.4
Specific Energy MJ/kg	21.9	21.7

Remarks

Callide mine uses a 1350 dragline to remove overburden. Preparatory prestripping and removal of inter bands is carried out by front end loader and dump trucks.

At the Boundary Hill mine a 24 cubic metre face shovel and a fleet of 154 tonne rear dump trucks are used to remove overburden in a series of benches down to the coal stem.

Major customers are the Callide 'B' Power Station adjacent to the Callide Mine, and the Queensland Alumina Refinery at Gladstone.

The coal is also used to bunker the coal fired ships on the Weipa/Gladstone bauxite run.

Transport

The coal is delivered FOR (Free On Rail) at loading facilities at Callide Mine and Boundary Hill Mine and onto a 1.5 km overland conveyor from the Callide Mine to the Queensland Electricity Commission's Callide 'B' Power Station.

Potential Expansion

To increase saleable coal production to 6 million tonnes per annum in line with expanding demand. This increased production will require additional dragline and support equipment.

COLLINSVILLE

COLLINSVILLE COAL COMPANY PTY. LTD.

Company Information

This company is a wholly owned subsidiary of M.I.M. Holdings Limited.

Mines

NO. 2 MINE UNDERGROUND

BOCUM MINE UNDERGROUND

OPEN-CUT MINES

Location

These mines are located at Collinsville, 105 km by rail south-west of the port of Abbot Point and 86 km by road from Bowen.

Coal Resources

Recoverable in situ R.O.M.

Resources/Reserves are given in Table 6.8.

Table 6.8 Reserves of Collinsville

	Million Tonnes
Mineable Reserves	97.300
Measured Resources	90.450
Indicated Resources	49.000
Inferred Resources - Class 1	32.718
Total In situ Reserves	269.468

Coal Quality

Collinsville Coals are medium volatile bituminous in rank. Products range from

washed high quality export coking coal to unwashed domestic thermal coal. A variety of qualities are produced from the working seams due to vertical and lateral quality variations within each seam. Product quality is controlled largely by the mining horizon within each seam blending and coal preparation. The Bowen seam, for instance, can produce both thermal and domestic coking quality coal. Raw Sulphur contents vary from 0.6% to 2.3%. Sulphur is generally concentrated in the top of the seams.

Thermal Coal

Typical raw coal analyses are given in Table 6.9.

Table 6.9 Typical Analyses of Collinsville Products

	Thermal	Thermal	Coking
	Bowen Central open-cut R.O.M.	Blake Central open-cut R.O.M.	Scott Denison and Garrick
Moisture (ad%)	1.5	1.5	1.5
Volatile Matter (ad%)	22.2	18.6	26.0
Fixed Carbon (ad%)	63.0	56.5	63.5
Ash (ad%)	13.3	23.4	9.0
Total Sulphur (ad%)	0.8	0.8	0.9
C.S.N.	3.5	1.0	6-7
Specific Energy MJ/kg	29.8	25.9	-

Coking Coal

The Scott, Denison and Garrick seams are blended and washed to produce coking quality coal for export. Typical washed product qualities for a 4:1 blend of Scott Denison seam and Garrick seam are given in Table 6.9.

Sales Contracts

Domestic sales are controlled by the Queensland Coal Board allocation and sales contracts. Export includes a 15 year contract for 1 million tonnes per annum to supply Japanese Steel Mills with hard coking coal until 1998.

Remarks

The Collinsville mines are part of the Newlands/Collinsville/Abbot Point (NCA) project which included the up-grading of the

railway and extending the line from Collinsville another 85 kilometres to Newlands. A new port was built and Abbot Point ships up to 5 million tonnes per annum but has the capacity to increase. This is the closest Australian coal port to Asia.

Approximately 761 people are employed at the mines.

COOK

COAL RESOURCES OF QUEENSLAND PTY. LTD.

Company Information

This company is a subsidiary of Arco Coal Australia Inc.

Mine

COOK COLLIERY

Location

The Cook underground mine is located 216 km west of Rockhampton and 29 km south of Blackwater. Coal mined at Cook is hauled 14 km to the preparation plant and rail loadout. The product coal is railed 300 km in 5 000 tonne capacity trains to the Clinton Estate and Auckland Point coal loading facilities, Gladstone.

Operation

The programme of upgrading has continued with a \$40 million major expansion programme involving installation of a longwall mining unit, a new haul road from Cook Colliery to the Washery and a doubling of the existing washery capacity, involving a combination of Jig, H.M. Cyclones and Spirals.

At June 30, 1989, 330 employees were engaged at the mine.

Coal Quality

There are two coal products:

- a high grade coking coal (7% Ash, 0.4% Sulphur, 27.5% Volatiles, CSN 7-8)
- a high ash thermal coal (13.2% Ash, 0.35% Sulphur, 24.5% Volatiles, Specific Energy 29.5 MJ/kg Air Dried)

Markets

Coking coal has been exported to Romania, India, Korea, Japan and Taiwan. Thermal coal is sold into the Korean, Japanese and Taiwanese markets plus local cement industries and meatworks.

CURRAGH

CURRAGH QUEENSLAND MINING LIMITED (CQML)

Company Information

CQML operates the Curragh Mine on behalf of a co-venture comprising Arco Coal Australia Inc 60%; R.W. Miller & Company Pty. Limited 30%; Mitsui Coal Development (Australia) Pty. Ltd. 10%

Location

10 kms north of Blackwater in Central Queensland.

Operation

The Curragh mine produces a number of products.

- Domestic steam coal is supplied under a long term contract to the Queensland Electricity Commission. The 20 year contract is for a total of 66.4 million tonnes of coal for use at Gladstone and for the new power house to be built at Stanwell near Rockhampton.
- Hard coking, other metallurgical coals and high energy export steam coal.

Coking and steaming coals are exported to the specifications given in Table 6.10.

Table 6.10 Typical Analyses of Curragh

	Coking Coal	Steaming Coal
Total Moisture (a.s.%)	10 max.	10 max.
Volatile Matter (ad%)	23 max.	19 approx.
Ash (ad%)	7 max.	13 max.
Total Sulphur (ad%)	0.6 max.	0.65 max.
CSN	6 ¹ / ₂ -9	-
Gross CV (ad)	-	7300 kcal/kg
HGI	-	80 approx.

In situ measured surface mine coal reserves within the lease area are in the order of 160 million tonnes.

Mine Development

The Curragh mine capacity is now 5.3 million tonnes per annum split approximately 50% coking type coal and 50% steam coal. Production will increase in line with the Electricity Commission's coal supply agreement for 4 million tonnes of steam coal and approximately 3 million tonnes of coking coal.

Port

Export coal is shipped through the Gladstone Harbour Board Clinton Estate Facility. Curragh has two stockpile areas each of 300 000 tonnes capacity.

Town

Curragh developed housing and associated infrastructure for the mine workforce of 450 in Blackwater.

Marketing

A contract has been signed for the supply of 1.1 million tonnes of coking coal per annum to the Japanese Steel Mills. The balance of the production is being sold to markets in Asia, Europe and the Middle East.

EBENEZER

IDEMITSU SOUTH QUEENSLAND COAL PTY. LTD.

Company Information

Idemitsu South Queensland Coal Pty. Ltd. is a fully owned subsidiary of the Idemitsu Kosan Company Limited of Japan.

Location Open-Cut Mines

Ebenezer Mine is located in south-east Queensland approximately 50 km and 20 km by road south-west from Brisbane and Ipswich respectively.

Operations

Ebenezer Mine is a multi-seam open-cut mine with a planned annual output of some 1.48 million ROM tonnes of raw coal and 990 000 tonnes of washed product coal in 1989-90.

Coal and overburden are currently mined on a contract basis from up to 39 discrete coal seams.

A total of six overburden and coal removal units consisting of 2 CAT 245ME excavators, 1 CAT 992C and 4 CAT 998B front end loaders are used for overburden and coal removal. A fleet of 18 trucks consisting of 4 Terex and 10 Aveling Barford rear dump trucks of 50 tonne capacity and 4 CAT 777 rear dump trucks of 85 tonne capacity is used to haul overburden and coal.

A fleet of 3 graders and 5 tractor/dozers consisting of 2 CAT D9, 2 CAT 10 and 1 CAT D7, are used extensively for ripping of thin non coal midburdens and partings, ripping of coal and top of coal and clean up. The coal is currently processed to customer specifications through the Box Flat and Aberdare Coal Preparation Plants. The Ebenezer Coal Preparation Plant will be commissioned during October/November 1989, and consists of a Baum Jig to effect high gravity separation, and dense medium cyclones to effect low gravity separation of the coarse coal fractions and spirals for the fine coal fractions.

The workforce for the Open-cut, Coal Preparation Plant and Administration Office will consist of approximately 150 persons.

Coal Quality

Ebenezer coal is a typical per hydrous Walloon coal and is classified as a marginal high volatile A to high volatile B bituminous coal on the ASTM SYSTEM.

A typical washed product coal for export sale is a moderate ash, low sulphur, moderate calorific value coal which would be within the specification range in Table 6.11.

Table 6.11 Typical Analysis of Ebenezer

Total Moisture (a.s.%)	10.0
Moisture (ad%)	3.0
Volatile Matter (ad%)	37.9-42.2
Fixed Carbon (ad%)	39.0-45.7
Ash (ad%)	13.4-15.3
Total Sulphur (ad%)	0.41-0.60
Specific Energy MJ/kg	28.05

Port of Shipment

Coal is shipped from the Port of Brisbane Fisherman Islands Terminal. The port has provision for expansion to 5 million tonnes loading capacity. Capricorn Coal Management Pty. Ltd.

GERMAN CREEK

CAPRICORN COAL DEVELOPMENTS JOINT VENTURE

Capricorn Coal Management Pty. Ltd.

Company Information

The owners of the Capricorn Coal Developments Joint Venture are:- The Shell Company of Australia Ltd. 38.08%; National Mutual Life Association of Australasia 26.06%; Superannuation Fund Investment Trust 13.03%; British Coal 10.77%; Ruhrkohle AG (West Germany) 10.77%; and Commercial Union Assurance Company Ltd. 1.29%.

Location

The mine is located approximately 180 km from the Central Queensland Coast and is 275 km and 302 km by road from Mackay and Rockhampton respectively.

Operation

The total production from German Creek is currently 3.8 million tonnes per year although with 7 day underground working it will be possible to increase output to 4 million tonnes by 1990/91. The open-cut operation utilises four large draglines and mines several seams. Central Colliery underground mine commenced production in 1984 and introduced the first longwall face in Queensland in 1986. A second underground mine, Southern Colliery commenced development in late 1987 and is expected to commission a longwall face in late 1989.

All coal mined is processed in a coal handling and preparation plant which employs dense medium cyclones, spirals and froth flotation equipment to produce a high quality export metallurgical coal.

Reserves

The main coking coal reserves are contained in three major seams, i.e. German Creek, Tieri and Aquila. These seams vary in average

thickness from 1.7 m to 2.5 m. Other thin seams are also mined.

Total coking coal resources exceed 1 billion tonnes in-situ. Open-cut reserves have been measured at 34 million tonnes whilst underground reserves are over 200 million tonnes.

Coal Quality

Coking coal produced from German Creek is of the quality given in Table 6.12.

Table 6.12 Typical Analysis of German Creek

Total Moisture (a.s.%)	9.0
Volatile Matter (ad%)	20.0-22.0
Ash (ad%)	8.5
Total Sulphur (ad%)	0.8
C.S.N.	8-9

Railway

Exports of German Creek coal are shipped through Dalrymple Bay Coal Terminal near Mackay.

Township

The company has established the town of Middlemount, 25 km from the mine, to accommodate over 800 employees and their families. The town has been designed to accommodate a population of 3 400 with provision for future expansion.

Marketing

German Creek Coal Pty. Ltd. which has a similar shareholding to Capricorn Coal Management Pty. Ltd. is responsible for marketing all coal produced by the Joint Venturers.

Longwall Mining

Since the start of mining in 1986, the Central Colliery longwall has demonstrated the potential of this technique to produce high output from underground operations. World record productivities have been established, although new technology has been introduced to overcome the interception of igneous intrusives and increasing seamgas.

Southern Colliery

Construction of Southern Colliery commenced in late 1987 and as at June, 1989, development of the first longwall block was

well advanced. A longwall face similar in design to that at Central Colliery will commence production in October 1989. To assist in progress of roadway development, Capricorn Coal Management Pty. Ltd., has invested in continuous haulage technology, a relatively new technique to improve productivity. Coal production from Southern Colliery will augment supply from Central Colliery and the open-cut mine. A production in excess of 2 million tonnes per year of raw coal is planned.

GREGORY

THE GREGORY JOINT VENTURE BHP-Utah Coal Ltd.

Company Information

The Gregory Joint Venture comprises - BHP 52.25%; Queensland Coal Trust 25%; Bell Resources Ltd. 10%; Australian Mutual Provident Society 7.75%; Pancontinental Mining Limited 5%.

Negotiations for the sale of Bell Resources Ltd interest to the other Joint Venture partners is being undertaken.

The Gregory mine is managed by BHP-Utah Coal Limited.

Location

The Gregory open-cut mine is located 60 km north-east of Emerald.

Operation

Gregory mine has a production capacity of 3 million tonnes of coking coal a year. A single seam, known as the Lilyvale seam, which forms part of the German Creek coal measures, is mined.

Employees at the mine as at June 30, 1989, totalled 430.

Coal Quality

Typical washed coal analyses for Gregory mine are given in Table 6.13.

Table 6.13 Typical Analysis of Gregory Washed Coal

Total Moisture (a.s.%)	8.0
Moisture (ad%)	2.0
Volatile Matter (ad%)	32.5
Ash (ad%)	8.0
Sulphur (ad%)	0.65
C.S.N.	9

Exports

The majority of Gregory coal is exported to Japan. During 1988-89 sales were also made to customers in Brazil, Taiwan, several European countries and Hong Kong.

JEEBROPILLY AND NEW HOPE

NEW HOPE CORPORATION LIMITED

Company Information

The shareholders of New Hope Corporation Limited are - Washington Soul Pattinson & Co. Ltd. 50.2%; Domer Mining Co. Pty. Ltd. 15.3%; Farjoy Pty. Ltd. 15.3%; Mitsubishi Mining & Cement Co. Ltd. 12.8% and Taiheiyo Kouhatsu Inc. 6.4%.

Location

New Hope Corporation Limited operates two underground and two open-cut mines in the West Moreton District of South-East Queensland in close proximity to the City of Ipswich.

Operations

The mining operations employ approximately 200 people, and produces 1.5 million tonnes per annum of washed steaming coal for domestic and export markets.

The mine capacities are - Jeebropilly Open-cut 1.2 million tonnes per annum and New Hope Underground Collieries - 0.3 million tonnes per annum.

Coal Quality

The typical coal quality is indicated in Table 6.14.

Table 6.14 Typical Analyses of Jeebropilly and New Hope

	Bremer Coal	Tivoli Coal
Total Moisture (a.s.%)	9.0	10.0
Moisture (ad%)	4.0	6.0
Volatile Matter (ad%)	32.0	39.0
Fixed Carbon (ad%)	47.0	40.0
Ash (ad%)	16.5	15.0
Total Sulphur (ad%)	0.4	0.65
Specific Energy (Kcal/kg)	6500	6500

Port of Shipment

New Hope Corporation Limited holds a 50% equity in Queensland Bulk Handling Pty. Ltd. which operates the coal export terminal on Fisherman Islands in the Port of Brisbane.

This facility is a modern coal loading and handling system capable of loading vessels up to 80 000 DWT at up to 3 000 tonnes per hour. Annual throughput is currently 2.6 to 3.0 million tonnes.

LALEHAM AND SOUTH BLACKWATER

SOUTH BLACKWATER MINES LTD.

Company Information

The South Blackwater mines are owned by South Blackwater Mines Ltd., which was owned 50% by Pennant Holdings Limited and 50% by John Holland Holdings Limited. As part of a reorganisation on July 25, 1989, 49% of John Holland's share was sold to Garswood Pty. Ltd. and 1% to Pennant Holdings, thereby giving Pennant a total shareholding of 51%.

Location

The mines are located 225 km west of Rockhampton and 345 km by rail from the Port of Gladstone.

Operation

The operations have a production capacity currently in excess of 2 million tonnes per year. Approximately 60% of production is very low ash hard coking coal and 40% high energy thermal, PCI, semi soft coking and briquetting coal.

Open-cut overburden is removed in a conventional strip mining operation by two Bucyrus Erie 1370W draglines, with some pre-stripping by an O & K 120C shovel and Caterpillar 785 trucks.

Approximately one third of production is from the Laleham No. 1 colliery where coal is mined by the bord and pillar method using continuous miners and shuttle cars.

Following a reduction in output early in 1988, and takeover of the operation by new owners in August 1988, production was gradually returning to the 2 million tonne production level in 1989. Studies on the expansion of operations by development of longwall operations and development of new open cut areas are underway.

At June 30, 1989, 302 employees were engaged at the mines.

Coal Quality

A major upgrade of the coal preparation plant was completed in September, 1987. Coals of the specifications given in Table 6.15 are now produced.

Table 6.15 Typical Analyses of Laleham and South Blackwater

	Coking Coal	Thermal Briquetting/PCI
Moisture (ad%)	2.0	1.5-2.5
Volatile Matter (ad%)	28.8	25.0-26.5
Fixed Carbon (ad%)	63.0	59.5-61.5
Ash (ad%)	6.2	9.5-13.5
Total Sulphur (ad%)	0.45	0.65
C.S.N.	7	1.0-2.5
Specific Energy MJ/kg	32.24	29.8-30.4

Markets

Coking coal is supplied under annual contracts to the Japanese Steel Mills which in the fiscal year 1988-89 amounted to 600 000 tonnes of hard coking coal. Coking coal is also currently supplied to the Indian, European, and Taiwanese markets. Thermal coal is exported principally for power generation in Taiwan. Other markets supplied in 1988-89 were Europe and the South Pacific area.

MOURA

THIESS DAMPIER MITSUI COAL PTY. LTD.

BHP-Utah Coal Ltd.

Company Information

Thiess Dampier Mitsui Coal Pty. Ltd. is a consortium comprising - Dampier Coal (Queensland) Pty. Ltd. (BHP) 80%; Mitsui & Co. Ltd. - Japan 13.3%; Mitsui & Co. (Australia) Ltd. 6.7%.

Moura mine is managed by BHP-Utah Coal Limited.

Mines

MOURA UNDERGROUND NO. 2

OPEN-CUT MINES

Location

The open-cut and underground coal mining operations are located in the south-east flank of the Bowen Basin of Central Queensland.

Operation

OPEN-CUT coal mine operations utilise four draglines. The run of mine coal is transported by conveyor from the surface of the mine to the coal preparation plant.

UNDERGROUND - An underground mine, Moura No. 2, is worked in the northern part of the mining lease. Entry is from the high wall of previously strip-mined areas. Continuous miners are used to mine the coal which is transported by conveyor belts to the preparation plant.

Coal Preparation

The minus 125 mm raw coal is delivered to the washplant feed stockpile via a 16 km, 2 000 tph overland conveyor system. Four dump stations/stockpiling installations are located along this conveyor to receive and crush run-of-mine coal to a topsize of 125 mm. Processing is via a heavy media bath, heavy media and water-only cyclones, and froth flotation. Nominal output is 2.8-3.0 million tonnes per annum.

Railway

Coal is railed 184 km to the Port of Gladstone.

Port of Shipment

Moura coal is shipped through both the Barney Point and Clinton coal loading facilities at Gladstone. The former is owned by Thiess Dampier Mitsui Coal Pty. Ltd.

Coal Quality

The Moura operations mine medium volatile and high volatile coals from several locations. These coals are blended in specific proportions to produce a coking coal for the steel industry. Medium volatile hard coking coal is produced from the underground mines and open-cut pits in the north of the mining area.

Open-cut coals of lesser coking properties are washed to produce a steaming coal of high energy value. A low ash content variant of this blend is also marketed as non-coking coal for use for briquetting or blast furnace pulverised coal injection purposes.

The specification of Moura coal is given in Table 6.16.

Table 6.16 Typical Analyses of Moura			
	Coking Coal	Non-Coking	Energy Coal
Total Moisture (a.s.%)	9.5	9.0	10.0
Moisture (ad%)	2.0	2.0	2.5
Volatile Matter (ad%)	27.5	30.0 approx.	29.0-32.0
Ash (ad%)	7.7	8.0	10.0 approx.
Total Sulphur (ad%)	0.40	0.4	0.55 max.
C.S.N.	8	3-5	-
Specific Energy MJ/kg	-	-	30.1

Markets

The majority of Moura coal is exported to Japan. During 1988-89 sales were also made to customers in India, Australia and Egypt.

NEWLANDS

NEWLANDS COAL PTY. LTD.

Company Information

This company is a wholly owned subsidiary of Mount Isa Mines Limited. The sale of a

25% interest is presently being negotiated with AGIP Coal Australia.

Location

The field occurs within the Newlands Lease, M.L.'s 365, 381 and 382, and is situated 129 km west of Mackay and 89 km south of Collinsville.

Reserves

The quoted reserves contained in the Upper Newlands seam of 6.8 m average thickness, within M.L. 365 are given in Table 6.17.

Table 6.17 Reserves of Newlands		
	Measured Million Tonnes	Indicated Million Tonnes
In situ Resources	155.0	138.0
Recoverable Reserves	203.9	-
Marketable Reserves	175.4	-

Coal Quality

Typical analysis for washed coal product is given in Table 6.18.

Table 6.18 Typical Analysis of Newlands	
Total Moisture (a.s.%)	8.0
Ash (ad%)	15.0
Volatile Matter (ad%)	26.2
Total Sulphur (ad%)	0.5
Specific Energy MJ/kg	28.32
Ash Fusion Temperature C	+1600
Hardgrove Grindability Index	54

Operation

The mine produces steaming coal at an annual rate of 4.8 million tonnes exclusively for the export market.

The coal is railed to the Port of Abbot Point, north of Bowen. The Port and rail facilities were constructed by M.I.M. and are dedicated to the Newlands and Collinsville mines.

During 1988-89, 4 million tonnes of steaming coal were exported. The product is sold to markets in Japan, South-East Asia and Europe.

Potential Expansion

Mining of satellite deposits and development of underground mine by mid 1990's. The

mine has the potential to expand to over 6 million tonnes per year.

Township

The township of Glenden is located approximately 32 km south of the mine site and accommodates mine personnel and their families.

OAKLEIGH

OAKLEIGH COLLIERY PTY. LTD.

Company Information

Oakleigh Colliery Pty. Ltd. is a private company wholly owned by members of the Rule family, one of the few remaining family owned coal mines operating in Australia. The company operates both an underground and an open-cut mine. It supplies coal to the domestic and the export markets.

Location

Both mines are situated at Perry's Knob siding 4.5 kms north of the town of Rosewood and 60 kms west of Brisbane.

Operations

The underground mine is worked by the bord and pillar method using continuous miners and shuttle cars. The open-cut is worked by dump trucks and wheel loaders for both overburden and coal removal. Selective mining is practiced enabling very thin plies of coal to be won. Interburden and overburden are used as backfill within the cut.

The capacity of the preparation plant is presently 300 000 tonnes of saleable coal per annum.

Employees at both mines totalled 85 at June 30, 1989.

Coal Quality

The Rosewood-Walloon coal is used primarily for steam generation. It is described as very high volatile bituminous, low-rank, per-hydrous, canneloid and weakly coking. Typical washed coal analysis (export) is given in Table 6.19.

Table 6.19 Typical Analysis of Oakleigh

Total Moisture (a.s.%)	10.0
Moisture (ad%)	5.0
Volatile Matter (ad%)	38.0
Fixed Carbon (ad%)	39.0
Ash (ad%)	14.0-18.0
Total Sulphur (ad%)	0.5
CSN	1
Specific Energy MJ/Kg	27.2

Port of Shipment

Coal from Oakleigh is shipped from Fisherman Islands Terminal at the Port of Brisbane. The coal is transported by road from the colliery to the Park Head coal loading facility to be railed to the Terminal.

General Information

For the year ended June 30, 1989, 35% of total production was exported to Japan and 65% was directed to the domestic market. The domestic market consists of a number of small consumers involved in various types of industry.

On present rate of production Oakleigh colliery has sufficient reserves of coal to enable it to supply its consumers well into the next century.

OAKY CREEK

OAKY CREEK COAL PROJECT - JOINT VENTURE Mount Isa Mines Ltd.

Ownership

The joint venturers in the Oaky Creek mine comprise the following - Mount Isa Mines Limited 79%; Hoogovens Delfstoffen B.V. 8.5%; Fincoal (Australia) Pty. Ltd. 7.5% (a wholly owned subsidiary of M.I.M. Holdings Limited); Empresa Nacional Siderurgica (S.A.) 5%.

Oaky Creek Coal Pty. Ltd., a wholly owned subsidiary of M.I.M. Holdings Limited, operates the Oaky Creek mine on behalf of the Manager of the Joint Venture, Mount Isa Mines Limited.

Location

Oaky Creek is located 50 km north-east of Capella, which is 366 km by road north-west of Rockhampton.

Coal Quality

The coal is medium volatile coking coal with typical analysis as given in Table 6.20.

Table 6.20 Typical Analysis of Oaky Creek

Total Moisture (a.s.%)	9.5
Volatile Matter (ad%)	28.9
Ash (ad%)	8.0
Total Sulphur (ad%)	0.8
C.S.N.	8-8 ¹ / ₂
Specific Energy MJ/kg	32.82
Fluidity ddpm	5000-7000

Reserves

The quoted reserves are contained in the German Creek, Corvus, Aquila and Tieri seams within ML 315, Clermont Mining District, and are given in Table 6.21.

Table 6.21 Reserves of Oaky Creek

	Mineable Reserves Measured Insitu Million Tonnes	Resources Measured In Situ Million Tonnes
Open-cut	61	91
Underground	55	214

Additional Reserves are contained within Authority to Prospect 408C.

Operation

The mine produces hard coking coal at an annual rate of 2.6 million tonnes exclusively for the export market. Mine capacity is to be expanded to 4 million tonnes in 1989-90 by introduction of underground longwall mining. The coal is railed to Dalrymple Bay south of Mackay. M.I.M. is a shareholder in the port facilities.

Township

The township of Tieri is located 13 km west of the mine site and accommodates personnel and their families.

RHONDDA

RHONDDA COLLIERIES PTY. LTD.

Company Information

Pacific Copper Ltd is the holding company of Rhondda Collieries Pty. Ltd.

Pacific Copper Ltd is owned 100% by Bond Corporation Ltd.

Showa Coal Australia Ltd have a 20% interest in Rhondda Collieries Wattle Glen Open-cut and are 50% Joint Venture partners in Box Flat/Westfalen Collieries.

Location

Rhondda Collieries is situated at Blackstone, Ipswich. Ipswich being approximately 50 km from Brisbane and 55 km from the Port of Brisbane.

Operation

Rhondda Collieries operates both an open-cut and an underground operation. The open-cut mine being called the Wattle Glen and the underground mine is the M.W. Haenke No. 2 mine.

Together they produce approximately 600 000 tonnes per year of saleable coal. 250 000 tonnes being sold to the local power station and 350 000 tonnes being exported as 16% ash steaming coal to Japan.

Coal Quality

A typical specification of export steaming coal is given in Table 6.22.

Table 6.22 Typical Analyses of Rhondda

	As Received	Air Dried
Total Moisture (%)	9.0	..
Moisture (%)	..	2.5
Volatile Matter (%)	28.9	31.0
Fixed Carbon (%)	47.1	50.5
Ash (%)	14.9	16.0
Total Sulphur (max) (%)	0.4	0.4
Hardgrove Index (%)	..	50.5
Specific Energy (Kcals)	6250	6700

Washing

All coal is washed through a modern 300 tph Dense Medium Cyclone Preparation Plant.

Reserves

Insitu Reserves at Rhondda Collieries total 102 million tonnes.

Insitu Reserves at Box Flat/Westfalen Collieries total 110 million tonnes.

Mining Operation

Truck and shovel operation in open-cut. Bord and pillar mining operation underground using continuous miners and shuttle cars.

General Information

Rhondda Collieries is an operation that has been established since 1900 and can offer a high quality range of products to customers both in Australia and overseas.

RIVERSIDE

THIESS DAMPIER MITSUI COAL PTY. LTD. BHP-Utah Coal Ltd.

Company Information

Thiess Dampier Mitsui Coal Pty. Ltd. is a consortium comprising - Dampier Coal (Queensland) Pty. Ltd (BHP) 80%; Mitsui & Co. Ltd. - Japan 13.3%; Mitsui & Co. (Australia) Ltd 6.7%.

Riverside mine is managed by BHP-Utah Coal Limited.

Mine

RIVERSIDE OPEN-CUT

Location

The Riverside area is immediately west of and adjacent to CQCA's Goonyella mine. Most of the reserves occur in the Goonyella Lower seam some 8 m thick though nominal tonnages occur in the overlying Goonyella Middle seam which outcrops in three localities in the eastern part of the area.

Reserves

Marketable open-cut reserves are 45.7 million tonnes.

Mining Method

Conventional open-cut strip mining utilising three draglines each with 49 m³ buckets is used to uncover the coal. After drilling and blasting, the exposed coal is loaded by electric shovel or front end loader into 136 tonne bottom dump trucks for haulage to the dump station. There the coal is crushed to 45 mm by rotary breaker and stacked in one of two 50 000 tonne raw coal stockpiles prior to being fed to the preparation plant.

Coal Preparation

The 1350 raw tph preparation plant washes 50 x 0.5 mm coal via 0.71 m diameter heavy medium cyclones and -0.5 mm material via froth flotation. To optimise recovery of -0.5 mm material alternative processing via water only cyclones is available. For ease of maintenance the plant is divided into six modules of equal capacity.

Coal Quality

Riverside product coal is medium volatile prime coking coal with good plastic properties and blendability characteristics. The specification of Riverside coking coal is given in Table 6.23.

Table 6.23 Typical Analysis of Riverside

Total Moisture (a.s%)	9.5
Volatile Matter (ad%)	23.5
Ash (ad%)	9.4
Total Sulphur (ad%)	0.50
C.S.N.	7.5

Railway

The train loading facility at Riverside has a capacity of 2 500 tonnes per hour and the coal is railed to the port in unit trains each carrying 6 600 tonnes.

Port

Riverside coal is shipped via the port at Dalrymple Bay.

Remarks

The majority of Riverside coal is sold under long term contract to Japan. During 1988-89 sales were also made to customers in Europe and India

TARONG

TARONG COAL Pacific Coal Pty. Ltd.

Company Information

Tarong Coal is owned and managed by Pacific Coal Pty. Limited, a wholly owned subsidiary of CRA limited.

Mine

MEANDU OPEN-CUT

Location

South of Kingaroy, about 180 kms north-west of Brisbane.

Reserves

In excess of 180 million tonnes within usual open-cut depths have been defined within the Meandu lease area. In addition, 190 million tonnes of open-cut potential occur within an Authority to Prospect held by the Company.

Coal Quality

The specification of Meandu coal after washing is given in Table 6.24.

Table 6.24 Typical Analysis of Tarong

Total Moisture (ad%)	14.0
Ash (ad%)	28.0
Specific Energy MJ/kg	19.38

Remarks

The Meandu mine was developed to supply coal to Tarong Power Station.

A contract with the Queensland Electricity Commission provides for the supply of 66 million tonnes from July 1, 1984.

Deliveries to the Power Station during 1988-89 were 4.8 million tonnes of coal. A coal preparation plant was commissioned in 1986 to ensure that coal quality meets the contract specifications of the Queensland Electricity Commission.

Coal is transported to the power station by an overland conveyor which is 2 kms in length.

Housing has been established in the nearby towns of Yarraman, Nanango and Kingaroy.

YARRABEE

YARRABEE COAL COMPANY PTY. LTD.

Company Information

The Yarrabee mine is operated by Yarrabee Coal Company Pty. Ltd., a wholly owned subsidiary of Resource Management and Mining Pty. Ltd.

Location

The mine is located approximately 40 km north of Blackwater and 280 km from Gladstone.

Reserves

Measured and indicated reserves of coal stand at 27 million tonnes. Measured reserves total 14 million tonnes.

Coal Quality

Yarrabee coal ranges from semi-anthracite to anthracite. A high energy and carbon content makes it suitable for a wide range of processes including steam raising, briquetting and for use in the carbide cement and ferro-alloy industries and metallurgical and electrode manufacturing and calcination. It is also suitable for blending with high volatile coking coal for use in steel making. The coal is low volatile, sub-hydrous and non-coking.

Several coal qualities can be produced; typical analyses are given in Table 6.25.

Table 6.25 Typical Analyses of Yarrabee

	Low Ash	Medium Ash
Moisture (ad%)	1.5	1.5
Volatile Matter (ad%)	9.5	10.0
Fixed Carbon (ad%)	78.0	69.0
Ash	10.5	18.0
Total Sulphur (ad%)	0.85	0.85
Specific Energy MJ/kg	31.19	28.47

Operation

The mine is an open-cut operation with the capacity to produce 350 000 tonnes per year. The coal is crushed and screened to specification and is sold as unwashed product.

POTENTIAL MINES

ACLAND

A. to P. 4CR

THE SHELL COMPANY OF AUSTRALIA LIMITED

Location

The Acland Retention Authority to Prospect 4CR comprises 39 sub-blocks, and is located 35 km north-west of Toowoomba.

Reserves

Surface mineable measured in situ reserves with overburden to coal ratios better than 5:1 m³/tonne amount to 186 million tonnes in the Glen Roslyn deposit. More than 250 million tonnes of in situ resources are indicated at similar ratios in adjacent deposits.

Coal Quality

In the principal deposit the aggregate thickness of workable coal within a 20 m thick seam interval averages 10 m to 12 m. A selectively mined coal from this interval would have an ash content of approximately 33% and specific energy of 19.2 MJ/kg. A significantly cleaner product could be produced by selective washing of the coal seams.

The quality of Acland coal is per-hydrous, high volatile, bituminous, with a high reactivities content and low Hardgrove grindability index.

Remarks

Mining studies have indicated the feasibility of a truck/shovel based mining operation in the Glen Roslyn deposit. Product coal would ideally be supplied at 30% ash, 10% moisture and 19.6 MJ/kg specific energy (as received basis) to an electricity generating facility constructed locally.

Resource development is contingent on the availability of a suitable market. The Acland reserves are large, shallow and strategically located, and offer a relatively low-cost source of energy for power generation or, in the longer term, gasification or conversion.

BARALABA

A. to P. 257C, M.L.'s 54, 70, 77, 107 & 166, Mount Morgan Mining District

BARALABA COAL PTY. LTD.

Company Information

Baralaba Coal Pty. Ltd. is a wholly owned subsidiary of Allied Queensland Coalfields Limited, Brisbane. Winton Oil N.L. holds a 15% in this project.

Mine

DAWSON VALLEY MINE, BARALABA

Location

At Baralaba in the Dawson River Valley, 157 km by road south-west of Rockhampton and 257 km by rail west of Gladstone.

Reserves

Detailed drilling has defined the structure in three areas referred to as the Mine Lease Area, Southern Area and North Western Area. The bulk of coal reserves in each of these areas occur in plunging synclines generally separated by thrust faulting. Measured reserves are given only for the Mine Lease Area where the average drill hole spacing is around 250 m.

In situ coal reserves total 439.55 million tonnes of which 176.74 million tonnes are placed in the measured and indicated categories. Measured and indicated reserves of 21.97 million tonnes occur at a depth of less than 60 m.

Coal Quality

The coal at Baralaba is low volatile, semi-anthracite, ortho-hydrous, feebly caking and non-coking. It is suitable for steam raising, ore smelting, briquette manufacture and blending into coking coals.

Seams of prime importance are Boyd, Cameron, Reid, Doubtful, Dawson, Dunstan and Coolum Seams, for which the specifications given in Table 6.26 on an air dried basis could be expected.

Table 6.26 Typical Analyses of Baralaba

	Raw Coal	Clean Coal
Moisture (ad%)	1.0-2.0	1.4-1.7
Volatile Matter (ad%)	10.9-12.9	9.8-12.0
Fixed Carbon (ad%)	73.0-79.0	78.0-82.0
Ash (ad%)	9.0-12.0	6.0-7.0
Total Sulphur (ad%)	0.5-0.9	0.4-0.7
Specific Energy MJ/kg	30-31.8	32.7-33.9

Remarks

AQC is investigating methods of adding value to this anthracite coal through briquetting processes.

The company has located a number of potentially large customers interested in sourcing their future supply from the mine, mainly because of its high quality coal.

BOWENVILLE

A. to P. 205C and 14CR

SHELL-OILMIN JOINT VENTURE
Shell Company of Australia Ltd.
Ownership

Entitlement over the Bowenville deposit is held by a joint venture comprising the Shell Company of Australia Limited (50%) and TMOG Resources Limited in the form of Authority to Prospect 205C (Ownaview) and Retention Authority to Prospect 14CR (Manningvale West).

Location

Authority to Prospect 205C includes 14 sub-blocks north of Dalby and Retention Authority to Prospect 14CR includes 8 sub-blocks north of Jondaryan.

Reserves

Surface mineable in situ resources occurring at overburden to coal ratios of up to 3.5:1 are estimated at 134 million tonnes in the Ownaview deposit. In situ coal of 30 million tonnes is available at ratios up to 3:1 m³/tonne in the Manningvale West deposit.

Coal Quality

The raw coal is typically high in ash and volatiles, low in sulphur and strongly per-hydrous. However, it is readily washable to lower ash levels at acceptable yields.

A typical product coal quality (as received) could be 28% ash, 12% moisture, 37% volatiles, 0.4% sulphur and 19.6 MJ/kg specific energy.

CLERMONT

M.L.'s 1874 and 1980, Clermont Mining District

THE CLERMONT COAL PROJECT
Clermont Coal Mines Ltd.
Company Information

Clermont Coal Mines Ltd. is a joint venture between White Industries Ltd. - 55% and Mitsubishi Development Pty. Ltd. - 45%.

Exploration

An Authority to Prospect was awarded to White Industries (Qld) Pty. Limited. The prospect area covered 614 square kilometres within which 5 sedimentary basins were delineated, all of which showed varying degrees of coal deposition.

Major economic reserves were shown to exist in the Wolfgang Basin and it is in this area that exploration was concentrated.

Wolfgang Basin Reserves

The drilling and core logging programme has defined six seams within the basin, with total reserves in excess of 263 million tonnes.

The deposit is readily accessible to open-cut mining operations. Overburden to coal ratios, including ramps and batters, is less than 4.0 BCM overburden:1 tonne of saleable coal.

Of the reserves nominated in the open-cut area, some 99% are contained in the main Wolfgang Seam, which has an average thickness of 38 metres, in the initial mine area. In certain areas it is greater than 50 metres thick and is of remarkably consistent quality throughout the deposit.

Coal Quality

The indicated product coal specification is given in Table 6.27.

Table 6.27 Typical Analysis of Clermont

Moisture (ad%)	5.0
Ash (ad%)	9.5 (± 0.5)
Volatile Matter (ad%)	27.5
Fixed Carbon (ad%)	58.0
Total Sulphur (ad%)	0.40
Specific Energy MJ/kg	27.84

Because of the depth of overburden and the consequent cost of obtaining bulk samples, use was made of core recovery from the thick seam to obtain sufficient coal for testing and analysis.

Combustion testing and analysis has been carried out on core samples from 50 mm and 200 mm diameter cores located across the coalfield, giving a truly representative sample of about 30 tonnes.

The product specification can be achieved without washing.

Mine Planning

Feasibility studies for the development of an open-cut mine operation, employing inpit crushers and shovels (for overburden and coal) have been completed and detail design work is well advanced.

Production from the open-cut operation is planned to commence in early 1990's at a capacity of some 6 million tonnes per year.

Railway

A 10 kilometre spur to connect the Clermont Mine rail loop to the Blair Athol/Dalrymple Bay rail link has been designed and its construction approved by the Government. Where necessary, duplication and upgrading of the existing track will be carried out to handle the additional traffic.

Port

It is proposed that product coal from Clermont Coal Project will be loaded through the Dalrymple Bay Coal Terminal.

Workforce

The projected workforce is 380 persons.

COMMODORE AND FELTON WEST

A's. to P. 203C, 9CR

AMAX-MITSUI-PICON MILLMERRAN JOINT VENTURE Amax Pacific Energy Ltd.

Company Information

Amax Pacific Energy Ltd 65.625%; Millmerran Coal Pty. Limited 20%; Mitsui Coal Development (Australia) Pty. Limited 9.375%; Picon Explorations Pty. Limited 5%.

Location

A. to P. 203C and A. to P. 9CR are situated south of Pittsworth and Millmerran 160 km and 230 km respectively west of Brisbane.

Resource

Within A. to P. 9CR and A. to P. 203C there are five deposits, the resources of which are given in Table 6.28.

Table 6.28 Resources of Commodore and Felton West

	Measured Resources (Mt)	Indicated Resources (Mt)	Total Resources (Mt)
A. to P. 9CR			
Commodore	185	15	200
Lochbar	52	0	52
Bringalily	190	100	290
A. to P. 203C			
Felton West	338	132	470
Felton East	420	130	550
TOTAL	1 185	377	1 562

Coal Quality

The coal is per-hydrous and is suitable for use as a steaming coal. It could be beneficiated by conventional methods to the coal quality given in Table 6.29.

Table 6.29 Typical Analysis of Commodore and Felton West

Moisture (ad%)	5.0
Volatile Matter (ad%)	42.0
Ash (ad%)	18.0
Total Sulphur (ad%)	0.5
Specific Energy MJ/kg	25.5

Remarks

A trial box-cut has been established on the Commodore deposit and numerous samples have been taken for test work.

Testing of coal samples using alternate coal preparation technology has resulted in a product coal with significantly lower ash levels and high energy values at equivalent product yields than those achieved by conventional washing. The coal is reliably suited for domestic power stations feedstock. Successful revegetation of the box-cut spoil has been achieved.

ENSHAM

A. to P. 426C, M.L.A. 2797, Clermont Mining District

ENSHAM COAL PROJECT AQC Pacific Pty. Ltd.

Company Information

The Ensham Coal Project is a joint venture comprising - Bligh Coal Limited 28.5%; Idemitsu Queensland Pty. Limited 28.5%; Pacific Coal Pty. Limited 19%; Agip Coal Australia Pty. Ltd. 19%; Lucky-Goldstar International (Australia) Pty. Ltd. 5%.

A.Q.C. - Pacific Pty. Ltd. is the operator.

Location

The Ensham Authority to Prospect is situated in central Queensland, between Emerald and Comet, about 220 km west of Rockhampton. The open-cut area lies near the eastern boundary of the Authority to the north-west of Comet.

Geology

The coal occurs in the Bowen Basin in the Rangal Coal Measures of late Permian age. Most of the reserves in the open-cut deposit occur where the Aries 2 and Castor seams coalesce to form a 5.5 m thick seam.

Reserves

Estimates for the open-cut mineable in situ reserves in the measured category are given in Table 6.30.

Table 6.30 In Situ Reserves of Ensham

	Million Tonnes
To 60 m	95
60 m to 100 m	117

Extensive underground reserves also occur within the Authority to Prospect.

Coal Quality

The raw coal is classified as high volatile bituminous coal of moderate ash suitable for power generation and with the capacity to produce a low ash soft coking coal. Typical coal quality is given in Table 6.31.

Table 6.31 Typical Analyses of Ensham

	Steaming Coal (F1.60)	Soft Coking Coal (F1.37)
Total Moisture (a.s.%)	10.0	10.0
Moisture (ad%)	3.2	3.5
Ash (ad%)	9.0-11.0	5.0
Volatile Matter (ad%)	26.5-27.8	30.5
Fixed Carbon (ad%)	59.3-59.9	61.0
Specific Energy MJ/kg	28.7-29.1	30.0
Total Sulphur (ad%)	0.4-0.5	0.4
CSN	-	5

Remarks

A detailed feasibility study has been completed. MLA 2797 covers part of the shallow coal deposit.

GORDONSTONE

A. to P. 389C, M.L.A. 2251, Clermont Mining District

GORDONSTONE COAL ASSOCIATES Gordonstone Coal Management Pty. Ltd.

Company Information

Gordonstone Coal Associates is a joint venture comprising - ARCO Coal Australia Inc. 50%; Hinch Coal Mining Company 22.5%; Suncorp Insurance and Finance 22.5%; Lend Lease Resources Pty. Ltd. 5%.

Gordonstone Coal Management Pty. Ltd., (Gordonstone), a subsidiary of ARCO Coal Australia Inc., manages the project on behalf of the Joint Venturers.

The Gordonstone Coal Associates Joint Venture was awarded an Authority to Prospect for coal at Gordonstone (formerly Gregory South) in Central Queensland in March 1982. Since that time Gordonstone has carried out a programme of exploration, coal and coke testing, engineering and market studies to assess the feasibility of an underground coal project in the region.

Location

Gordonstone is situated within the Bowen Basin of Central Queensland. Distance by rail to the major coal port at Gladstone is 365 km. The tenement area comprises some 26 000 hectares and the mine site area is about 40 km by sealed road to the towns of Emerald and Capella.

Reserves

The Joint Venture has applied for a mining lease covering 5 840 hectares with an in situ reserve of approximately 200 million tonnes of coal. The balance of the Gordonstone deposit continues to be held by the Joint Venture under an Authority to Prospect.

Exploration work has proved over 900 million tonnes of in situ coal. The reserves in the lease would yield 120 million tonnes of raw coal, sufficient for a mine life of 20 years at an annual clean coal output in excess of 5 million tonnes.

The reserves are located in a physical environment that will enable the German Creek Seam to be exploited by a conventional but flexible underground mine development.

The seam section and adjacent strata are amenable to the application of longwall retreat extraction systems giving high capacity and high productivity operations.

Gordonstone coal properties will enable the production of a low ash premium grade coking coal together with an attendant high quality steam coal. The preparation plant has been designed with this inbuilt flexibility.

Coal Quality

Gordonstone coal is a high volatile, low ash, strongly caking coal ideally suited for metallurgical coke blends. Laboratory analyses of bore coal samples have been used to predict the quality of the product coals.

Target Contract Specifications are given in Table 6.32.

Table 6.32 Target Contract Specification of Gordonstone

	Coking Coal	Steaming Coal
Total Moisture (a.s.%)	9.0	8.0
Ash (ad%)	6.0-6.5	13.0
Volatile Matter (ad%)	33.0-35.0	31.0
Total Sulphur (ad%)	0.7	0.7
CSN	7-9	-
Specific Energy (Gross Air Dried) Kcal/kg	-	7000

Mine and Surface

The mine and design criteria which have been adopted recognise the market requirement for a competitively priced, high quality coal product while maintaining an economically viable project. The German Creek seam is extensively worked in the Bowen Basin area of Queensland and its washability characteristics are well known and understood. Beneficiation would be carried out by dense medium baths and cyclones and by froth flotation.

Railway and Port

Product coal will be transported from the mine to port at Gladstone by the Government Railways system which will be connected to the mine via a spur and loadout loop. Overhead supplied electric unit trains of 5 400 tonne capacity will haul the coal to the Clinton Coal Facility at Gladstone.

Employment

The mine will employ 350 to 400 persons.

Remarks

An exploration drift to access the German Creek Seams is underway and scheduled for completion by the end of 1989. Bulk coal samples will be procured for testing and marketing.

HAIL CREEK

M.L. 312, Mackay Mining District

HAIL CREEK PROJECT Hail Creek Coal Pty. Ltd.

Company Information

The Hail Creek Project is a joint venture between - CSR Limited (interest held by Associated Petroleum Limited, a wholly owned subsidiary of The Australian Gas Light Company, pending sale) 44%; Esso Exploration & Production Australia Inc. (a subsidiary of Exxon Corp.) 25%; Pacific Coal Pty Limited (a wholly owned subsidiary of CRA Limited) 25%; Marubeni Coal Pty Limited (a subsidiary of Marubeni Corporation) 4% and Sumisho Coal Development Pty Ltd (a subsidiary of Sumitomo Corp.) 2%.

Hail Creek Coal Pty Limited, a wholly owned subsidiary of CSR Limited, is Operator for the Joint Venture and Sales Representative for each of the Joint Venturers.

Reserves

The Hail Creek coalfield contains 740 million tonnes of coal. Measured reserves are 158 million tonnes and Indicated reserves are 582 million tonnes. Approximately 90% of the measured reserves are considered to be amenable to open-cut mining.

Drilling has indicated a further 96 million tonnes of coal at Lake Elphinstone.

Coal Quality

Earlier development proposals have envisaged Hail Creek coal being washed to a 10.5% ash coking coal. Current studies are directed towards washing selectively sized coal to a 7% ash coking coal and a 15-16% ash steaming coal, as shown in Table 6.33.

Table 6.33 Typical Analyses of Hail Creek

	Coking Only	Coking and Steaming	
Yield %	70.0	48.0	27.0
Moisture (ad%)	1.0	1.2	1.2
Ash (ad%)	10.5	7.0	15.4
Volatile Matter (ad%)	19.9	21.0	18.5
Fixed Carbon (ad%)	68.6	70.8	64.9
Total Sulphur (ad%)	0.38	0.29	0.32
Phosphorus %	0.068	-	-
CSN	6-7	7.5	1
Fluidity DDPM	60	-	-
Ro (max.)	1.30	1.29	-
Specific Energy MJ/kg	-	-	29.6
Initial Deformation Temp.(reducing atmosphere)C	-	-	1250

Development

Development proposals for an annual production of 4.5 million tonnes of 10.5% ash coking coal already exist. Studies and investigations of the coking and steaming coal product mix alternative are progressing.

JELLINBAH EAST PROJECT

A. to P. 449C, M.L.A. 2866, Clermont Mining District

QUEENSLAND COAL MINE MANAGEMENT PTY. LIMITED Advance Queensland Resources & Mining Pty. Limited.

Company Information

The Jellinbah East Project is wholly owned by Queensland Coal Mine Management Pty. Limited.

Advance Queensland Resources & Mining Pty. Limited is appointed to represent the project owner.

Location

The Jellinbah East deposit is located about 20 kms north west of Bluff in Central Queensland and about 280 kms by rail to the port of Gladstone.

Geology

The coal deposit is of Permian Age and is part of the Rangal coal measures situated on the eastern flank of the Bowen Basin.

The principal seams of economic interest are the Aries, Castor and Pollux seams.

Significant reserves are contained in the eight (8) metre thick Pollux seam.

Reserves

Open-cut in situ reserves are estimated as in Table 6.34.

Table 6.34 In Situ Reserves of Jellinbah East

	Measured (Mt)	Inferred (Mt)	Total (Mt)
60 m	93.1	32.7	125.8
60 - 90 m	63.9	30.8	94.7
TOTAL RESERVES	157.0	63.5	220.5

Coal Quality

The raw coal is classified as a low volatile bituminous coal of moderate ash content suitable for general industry, blending for power utilities and potential pulverised coal injection use. A moderate ash semi-soft coking coal can also be produced. Typical coal quality is given in Table 6.35.

Table 6.35 Typical Coal Quality of Jellinbah East

	Thermal Coal	Semi-Soft Coking Coal
Total Moisture (a.s.%)	8.0	8.0
Moisture (ad%)	1.5	1.5
Ash (ad%)	10.0	8.5
Volatile Matter (ad%)	14.5	15.5
Fixed Carbon (ad%)	74.0	74.5
Total Sulphur (ad%)	0.6	0.5
Specific Energy MJ/kg	31.4	31.8
CSN	-	3

Development Programme

The Authority to Prospect was granted in October, 1988. Following exploration, a bulk sampling programme was commenced with the delivery of trial shipments to customers commencing in April, 1989.

The Mining Lease Application is expected to be granted later this year.

It is the company's intention to ultimately develop a 600 000 tonne per annum mine in line with market demand.

MACALISTER

A. to P. 6CR

MARATHON PETROLEUM AUSTRALIA, LTD.

Company Information

Marathon Petroleum Australia, Ltd. is a wholly owned subsidiary of the Marathon Oil Company of the U.S.A., which is wholly owned by the United States Steel Corporation.

Location

Macalister is 40 km north-west of Dalby, and about 250 km west of Brisbane.

Reserves

The reserves are typically contained in 3 to 6 seams up to 12 metres thick. The average thickness of coal over the deposits is in excess of 8 metres.

Over 440 million tonnes of reserves with less than 60 metres overburden have been delineated.

The status of the reserves is given in Table 6.36.

Table 6.36 Typical Analysis of Macalister

	Million Tonnes
Measured	265
Indicated Class 1	157
Indicated Class 11	18
TOTAL	440

Coal Quality

The Macalister coal is a typical per-hydrous Walloon coal suitable for steam raising or as a feedstock for coal conversion.

An indicative specification for a washed product is given in Table 6.37.

Table 6.37 Typical Analysis of Macalister

Moisture (ad%)	8.0
Volatile Matter (ad%)	40.3
Fixed Carbon (ad%)	40.2
Ash (ad%)	11.5
Total Sulphur (ad%)	0.35
Specific Energy MJ/kg	26.4

Remarks

The tenement is now managed by Macalister Mining Pty. Ltd. which is also investigating a smaller alternative project based on existing infrastructure.

Detailed engineering studies have been completed of projects for both export and domestic markets at various production levels up to 8 Mtpa. A trial pit has been excavated to provide bulk samples for further evaluation.

Regional Infrastructure

The mine workforce will be housed at Dalby which will be expanded to provide for the additional population. It is proposed to develop a flood harvesting scheme on the Condamine River to provide water for the mine.

Transport

Detailed evaluations of both railway and slurry pipeline transport systems to port sites in southern Queensland have been completed.

NEBO RESOURCE AREA

**THIESS DAMPIER MITSUI
COAL PTY. LTD.
BHP-Utah Coal Ltd.**

Company Information

This company is a consortium comprising - Dampier Coal (Queensland) Pty. Ltd. (BHP) 80%; Mitsui & Co. Ltd. - Japan 13.3%; Mitsui & Co. (Australia) Ltd. 6.7%.

The project is managed by BHP-Utah Coal Limited.

Location

Six mineable coal deposits (Nebo Resource Area) have been delineated on both limbs of the North Bowen Basin some 140 km to 210 km by road west of the coastal city of Mackay.

These areas designated Wards Well, Poitrel, Kemmis Walker, South Walker, Bee Creek and Suttor Creek are collectively known as the Nebo Resource Area, the name being derived from the adjacent Nebo township. All deposits except Wards Well may be mined by open-cut methods, and all except Suttor Creek are held under Mining Leases. Suttor Creek being a Mining Lease Application, has been heard by the Mining Warden's Court.

Coal Quality

The virgin deposits of the Nebo Resource Area are able to be geared to meet changing consumer demands in the future due to large reserves and the vast range of coal quality from one field to another. Coal quality and rank include medium volatile metallurgical blend coals, high medium and low volatile energy coals and high rank semi-anthracites.

Successive developments of these coal fields for the extraction of both energy coal and metallurgical blend coal may take place when market conditions improve.

Reserves

Raw coal reserves amount to 1 242 million tonnes of which 334 million tonnes are mineable by open-cut methods and 908 million tonnes by underground methods.

NORTH GOONYELLA

A. to P. 453C

**NORTH GOONYELLA COAL
PROPERTIES LTD.
Sedgman & Associates Pty. Ltd.**

Company Information

The North Goonyella coal reserves are held under an Authority to Prospect by North Goonyella Coal Properties Ltd., a joint venture of White Industries (Australia) Ltd. and Sedgman & Associates Pty. Ltd.

Coal Seams

Seam 2 (Goonyella Upper)

Seam 2 (Goonyella Upper) is continuous throughout the area. It varies from 3.0 - 4.3 m (ave. 3.3m) thick and is lower in rank and higher in ash than Seams 4 and 5 (Goonyella Middle and Lower).

The seam is able to be accessed at depths of less than 30 m, but it will provide a secondary product of lower quality than the premium coal from Seams 4 and 5.

Seam 4 (Goonyella Middle)

Seam 4 (Goonyella Middle) is also continuous throughout the area and seam thickness ranges from 5.2 - 7.6 m. Coal quality improves from top to bottom and although the full seam section is high quality and of commercial quality, a higher ash top ply which increases the product ash is nearly always present. A planned Longwall mining height of 4.0 to 4.5 m will leave the high ash top ply as a coal roof.

Seam 5 (Goonyella Lower)

Seam 5 (Goonyella Lower) is 8.5 - 9 m thick at Riverside mine and 5 - 7 m thick at Wards Well but splits into between three and five seams in the intervening area which includes most of North Goonyella.

Quality

The coal specification for the export product is given in Table 6.38.

Table 6.38 Typical Analysis of North Goonyella

Sizing	50 mm x 0
Total Moisture (a.s.%)	10.0
Moisture (ad%)	1.5
Ash (ad%)	8.0
Volatile Matter (ad%)	24.0
Fixed Carbon (ad%)	66.5
Total Sulphur (ad%)	0.50
Phosphorous	0.015
CSN	8
Specific Energy MJ/kg	33.0

Remarks

The joint venturers have assessed the property in detail, and are proceeding with a rapid development of the high quality coking coal which is mineable at high volume. The final stages of exploration and evaluation are in progress, and final mine planning will be completed in 1989. Negotiations have commenced with the Queensland Government for transport and infrastructure facilities.

The North Goonyella mine will produce over 3 million tonnes of hard coking coal, which is generally equivalent in quality to coal from the adjacent Goonyella mine.

PENTLAND

A. to P. 1CR

THE SHELL COMPANY OF AUSTRALIA LIMITED

Location

The Pentland Retention Authority to Prospect 1CR comprising 32 sub-blocks is located 250 km to the south-west of Townsville on the Flinders Highway and the Townsville-Mount Isa railway. The area is located near the north-eastern margin of the Galilee Basin.

Reserves

The coal measure sequence, the Betts Creek Beds, contain two groups of coal seams. The Upper Pentland group of seams is 10 m to 20 m thick, and is of limited economic significance. The Lower Pentland group has a thickness range of 20 m to 80 m, including up to 30 m of coal.

A. to P. 1CR contains the Ellimeek and Lauderdale deposits. Drilling has so far established in situ resources of 389 million tonnes measured and indicated at Ellimeek, and 191 million tonnes measured at Lauderdale. Stripping ratio of overburden to coal is less than 6:1 m³/tonne and 52 million tonnes in the Lauderdale deposit is at a ratio of less than 4:1 m³/tonnes.

Coal Quality

The coal is high volatile bituminous, of low rank and with a high inherent ash. Typical raw coal quality is given in Table 6.39.

Table 6.39 Typical Analysis of Pentland Raw Coal

Moisture (ad%)	8.0
Volatile Matter (ad%)	22.0
Fixed Carbon (ad%)	40.0
Ash (ad%)	30.0
Total Sulphur (ad%)	0.3
Specific Energy MJ/kg	18.4
HGI	63

Remarks

The coal resources in the Pentland A. to P. represent a very large energy resource suitable for power generation and industrial use in the region.

ROLLESTON

A. to P. 7CR

BRIGALOW MINES PTY. LTD.**Company Information**

Brigalow Mines Pty. Ltd. is owned jointly by Thiess Bros. Pty Limited, a wholly owned subsidiary of CSR Limited, and Mount Isa Mines Limited. It is anticipated that Agreements will be signed in the very near future for the purchase by MIM of the 50% interest now held by Thiess. Bros. Pty Limited.

Location

The Rolleston Coal Project is in the Bowen Basin, 350 km due west of Gladstone.

Resources

Measured and indicated resources total 310 million tonnes, of which 274 million tonnes are at depths of less than 80 m.

Coal Quality

Rolleston coal is suitable for electricity generation. It can be marketed with the typical analyses given in Table 6.40.

Table 6.40 Typical Analysis of Rolleston

Total Moisture (a.s.%)	15.0
Moisture (ad%)	11.0
Ash (ad%)	10.1
Volatile Matter (ad%)	28.7
Fixed Carbon (ad%)	50.2
Total Sulphur (ad%)	0.5
Specific Energy MJ/kg	25.29

Remarks

Feasibility studies have been completed for supply to both domestic and export markets.

SURAT BASIN

A. to P. 450C

**SURAT COAL JOINT VENTURE
M.I.M. Limited****Company Information**

The Joint Venture comprises CSR Limited 42.67%; Mount Isa Mines Limited 42.67%; and Wm McQueen & Co Pty Ltd. 14.66%. It is anticipated that Agreements will be signed in the very near future for the purchase by MIM of a further 42.67% in the project, bringing its total interest in the Joint Venture to 85.34%.

Location

The A to P contains 16 deposits, namely,

Chinchilla Area -

Sefton Park, Rywung

Wandoan Area -

Frank Creek, Wubagul/West Wubagul, Woleebee Extended, Paradise Downs, Burunga, Glen Laurel, Stanley Park, Elimatta, Pony Plains, Spion Kop

Taroom Area -

Cowangah, Cattle Creek, Boxvale, Orazabah

The deposits occur in the Surat Basin, 320-450 km north west of Brisbane.

Resources

Measured and indicated resources are given in Table 6.41.

Table 6.41 Measured and Indicated Resources of Surat Basin

	Measured (Mt)	Indicated (Mt)	Total (Mt)
Chinchilla Area	97	40	137
Wandoan Area	134	374	508
Taroom Area	39	196	235
TOTAL	270	610	880

All resources occur at depths of less than 80 m.

Coal Quality

The coal is suitable for electricity generation and conversion to synfuels. Prefeasibility studies have been completed for Sefton Park and Frank Creek.

Typical proximate analyses of the washed coal given in Table 6.42.

Table 6.42 Typical Analyses of Surat Basin		
	Sefton Park	Frank Creek
Moisture (ad%)	6.0	9.4
Ash (ad%)	14.0	11.4
Volatile Matter (ad%)	40.5	39.5
Fixed Carbon (ad%)	39.5	39.7
Total Sulphur (ad%)	0.41	0.3
Specific Energy MJ/kg	26.2	25.12

TAROOM

A. to P. 189C, M.L. 52, Roma Mining District

THE SHELL COMPANY OF AUSTRALIA LIMITED

Location

Taroom is in the Surat Basin, 250 km south-west of the Port of Gladstone.

Resources

Measured and indicated resources are 230 million tonnes, of which 195 million tonnes are at depths of less than 60 m.

Coal Quality

The coal has good combustion properties and is suitable for power generation in Queensland or overseas. It is also suitable for conversion to synfuels. A typical analysis is given in Table 6.43.

Table 6.43 Typical Analyses of Taroom		
	Raw Coal	Washed Coal
Moisture (ad%)	8.0	7.6
Volatile Matter (ad%)	38.0	43.1
Fixed Carbon (ad%)	33.0	36.7
Ash (ad%)	21.0	12.6
Total Sulphur (ad%)	0.31	0.33
Specific Energy MJ/kg	22.5	26.0

Remarks

Feasibility studies have been completed for the production of coal for both domestic and export markets.

Development of the project is dependent on the emergence of suitable markets for the coal.

THEODORE

A. to P. 202C, M.L. 385, Mount Morgan Mining District

THE SHELL COMPANY OF AUSTRALIA LIMITED

Reserves

This area contains 1 340 million tonnes of measured and indicated Class 1 bituminous coal, of which 250 million tonnes are capable of being won by open-cut mining. The coal is low in ash and sulphur and ideally suited for steam raising.

Coal Quality

In situ analysis are given in Table 6.44.

Table 6.44 In Situ Analyses of Theodore		
	Theodore North	Theodore South
Moisture (ad%)	4.6	6.5
Volatile Matter (ad%)	30.9	32.0
Fixed Carbon (ad%)	50.6	52.0
Ash (ad%)	13.9	9.5
Total Sulphur (ad%)	0.5	0.4
CSN	1	1/2
Specific Energy MJ/kg	27.3	27.5

Development

Planning for the development of 4.5 million tonnes a year open-cut mining operation at Theodore North has been undertaken. The opening of mines at Theodore South could increase total production from Theodore to 9 million tonnes a year. A decision to proceed with construction of the Theodore North mine is primarily dependent on securing sales contracts.

WANDOAN

A. to P. 157C

BRIGALOW MINES PTY. LTD.

Company Information

Brigalow Mines Pty. Ltd. is owned jointly by Thiess Bros Pty Limited, a wholly owned subsidiary of CSR Limited, and Mount Isa Mines Limited. It is anticipated that Agreements will be signed in the very near future for the purchase by MIM of the 50%

interest presently held by Thiess Bros. Pty. Limited.

Location

The Wandoan Coal Project is located in the Surat Basin, 375 km south-west of Gladstone.

Resources

Measured and indicated resources total 805 million tonnes of coal at depths less than 80 m.

Coal Quality

Wandoan coal is suitable for electricity generation and conversion to synfuels.

Proximate analyses are given in Table 6.45.

Table 6.45 Typical Analyses of Wandoan

	Raw Coal	Washed Coal
Moisture (ad%)	8.9	7.9
Ash (ad%)	23.6	10.7
Volatile Matter (ad%)	35.0	40.5
Fixed Carbon (ad%)	32.5	40.9
Total Sulphur (ad%)	0.32	0.28
Specific Energy MJ/kg	21.23	26.17

Remarks

Feasibility studies have been completed for supply to both domestic and export markets for electricity generation.

The high quality and low mining cost of the very large resource is the basis for a number of overseas studies of coal conversion technology, notably the Imhausen Coal Conversion Study in the early 1980's and current studies by Japan's New Energy Development Organisation.

7 STATISTICS ON THE QUEENSLAND INDUSTRY

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Table 7.1 - Queensland Coal Industry 10 Year Summary

Financial Year	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89
Mines Operating	45	46	48	50	54	52	49	41	46	39
No. Of Employees	7 374	7 965	8 664	8 773	9 674	10 393	10 676	10 342	9 475	10 028
Manshifts Worked As Percentage Of Manshifts Possible	86.06	85.27	87.39	93.15	93.05	90.16	90.75	92.27	89.05	90.86
NET PRODUCTION '000 TONNES BY DISTRICTS										
UNDERGROUND MINES										
West Moreton	1 252	1 611	1 555	1 727	1 701	1 400	1 448	1 282	576	488
Darling Downs	9	9	10	12	10	3	-	-	-	-
Maryborough	21	18	13	16	17	12	16	20	16	17
Moura	430	423	512	507	395	461	485	87	406	294
Blackwater	762	681	883	927	852	1 208	1 362	2 193	1 824	2 620
Mackay	245	258	125	218	196	177	245	143	16	-
Bowen	271	350	329	418	446	471	493	468	531	591
TOTAL	2 990	3 350	3 427	3 825	3 617	3 732	4 049	4 193	3 369	4 011
OPEN CUT MINES										
West Moreton	715	1 065	1 210	1 354	1 236	1 590	1 745	1 538	1 765	2 938
Nanango	-	-	-	-	603	1 154	2 974	4 991	4 803	4 855
Moura	1 742	1 838	2 094	1 396	1 856	1 558	1 842	2 567	2 309	2 964
Callide	2 086	2 444	2 313	3 542	3 737	3 002	3 403	3 362	3 203	3 442
Blackwater	5 626	7 416	8 918	10 309	14 547	16 833	18 692	19 473	19 040	19 999
Blair Athol	111	100	96	132	934	3 668	4 718	5 398	5 442	7 129
Mackay	13 850	15 968	15 425	14 288	16 761	21 384	25 067	25 654	24 434	27 169
Bowen	390	668	793	966	745	1 367	1 507	1 644	1 454	1 611
TOTAL	24 520	29 499	30 849	31 987	40 419	50 556	59 948	64 627	62 450	70 107
State Total	27 510	32 849	34 276	35 812	44 036	54 288	63 997	68 820	65 819	74 118
% Increase	2.12	19.41	4.34	4.48	22.96	23.28	17.88	7.54	4.36	12.61
NET SALEABLE OUTPUT										
(a) Tonnes Per Employee	3 731	4 124	3 956	4 082	4 552	5 224	5 994	6 654	6 946	6 991
(b) Tonnes Per Working Days Possible	119 607	142 204	114 015	147 983	184 251	228 102	268 893	287 950	276 335	305 014
(c) Per Manshift Worked										
Underground										
Face	21.66	22.71	21.95	22.70	24.45	25.18	28.32	30.25	29.42	34.61
Overall	6.11	6.01	6.03	6.53	7.05	7.59	7.95	8.67	9.70	11.09
Opencut										
Overall	20.69	22.69	21.14	18.99	21.27	24.76	28.52	28.44	29.94	32.47
State Total	16.43	17.66	16.93	15.78	18.25	21.43	23.81	24.98	27.05	29.40

Table 7.1 Queensland Coal Industry 10 Year Summary *Continued....*

Financial Year	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89
COAL CONSUMPTION '000 TONNES										
Areas										
Brisbane Metropolitan	468	462	490	473	503	409	267	208	156	221
Southern Queensland	1 856	1 703	1 539	1 441	1 943	2 681	3 689	5 274	5 201	5 245
Central Queensland	3 652	4 218	4 600	5 649	6 315	6 211	6 040	5 503	5 867	6 574
North Queensland	653	735	869	1 053	1 070	1 146	975	966	956	966
State Total	6 629	7 118	7 498	8 616	9 831	10 447	10 971	11 951	12 180	13 006
Industry										
Electricity	4 882	5 346	5 653	6 709	7 636	8 240	8 672	9 535	9 829	10 491
Metal Processing	1 256	1 261	1 201	1 224	1 437	1 439	1 489	1 634	1 616	1 658
Building Materials	283	266	362	357	274	314	321	259	233	310
Paper Pulp and Board	61	61	77	80	81	80	87	87	92	80
Coke Works	53	66	53	66	67	62	79	68	74	76
Food Processing	51	74	103	102	107	103	111	123	123	131
Miscellaneous	43	44	49	78	229	209	212	245	213	260
State Total	6 629	7 118	7 498	8 616	9 831	10 447	10 971	11 951	12 180	13 006
% Increase	7.74	7.38	5.34	14.91	14.10	6.27	5.02	8.93	1.92	6.78
EXPORTS AND INTERSTATE SALES '000 TONNES										
Interstate Sales	579	497	128	91	15	18	91	421	777	1 068
Overseas Countries	21 296	23 727	24 862	26 405	33 095	45 504	50 798	53 525	58 422	59 027
State Total	21 875	24 224	24 990	26 496	33 110	45 522	50 889	53 946	59 199	60 095
% Increase	13.82	10.74	3.16	6.03	24.96	37.49	11.79	6.01	9.74	1.51

Table 7.2 Exports - Coking And Thermal Coal - '000 Tonnes

Year	Coking	Steaming	Total
1979-80	20 954	341	21 295
1980-81	22 586	1 141	23 727
1981-82	23 559	1 303	24 862
1982-83	24 829	1 576	26 405
1983-84	29 622	3 473	33 095
1984-85	34 382	11 122	45 504
1985-86	34 226	16 572	50 798
1986-87	34 324	19 201	53 525
1987-88	39 367	19 055	58 422
1988-89	40 123	18 904	59 027

Table 7.3 - Raw Coal Produced And Discard 1988-89 - Tonnes

Mines	Raw	Discard	Saleable	% Discard
WEST MORETON DISTRICT				
Underground				
New Hope	447 364	196 401	250 963	43.90
M.W. Haenke No. 2	314 790	172 800	141 990	54.89
Oakleigh No. 3	173 571	78 356	95 215	45.14
TOTAL	935 725	447 557	488 168	47.83
Opencut				
Box Flat	341 906	189 713	152 193	55.49
Ebenezer	808 732	335 108	473 624	41.44
Jeebropilly	1 916 041	871 686	1 044 355	45.49
New Hope	313 276	195 359	117 917	62.36
New Whitwood	1 330 374	737 157	593 217	55.41
Oakleigh	203 870	57 110	146 760	28.01
Wattle Glen Ext.	868 267	458 163	410 104	52.77
TOTAL	5 782 466	2 844 296	2 938 170	49.19
MARYBOROUGH DISTRICT				
Underground				
Burgowan No. 12	21 403	4 292	17 111	20.05
NANANGO DISTRICT				
Opencut				
Meandu	6 211 524	1 356 434	4 855 090	21.84
MOURA DISTRICT				
Underground				
Moura No. 2	584 885	290 537	294 348	49.67
Opencut				
Moura	4 327 637	1 363 552	2 964 085	31.51
CALLIDE DISTRICT				
Opencut				
Boundary Hill	1 385 894	-	1 385 894	0.00
Callide	2 055 666	-	2 055 666	0.00
TOTAL	3 441 560	-	3 441 560	0.00
BLACKWATER DISTRICT				
Underground				
Cook	1 506 878	306 503	1 200 375	20.34
German Creek Central	1 316 169	323 409	992 760	24.57
German Creek Southern	210 455	50 158	160 297	23.83
South Blackwater No. 1	306 384	39 631	266 753	12.94
TOTAL	3 339 886	719 701	2 620 185	21.55

Table 7.3 - Raw Coal Produced And Discard 1989-89 - Tonnes *Continued*

Mines	Raw	Discard	Saleable	% Discard
BLACKWATER DISTRICT <i>Continued....</i>				
Opencut				
Blackwater	6 217 224	632 876	5 584 348	10.18
Curragh	6 141 534	817 779	5 323 755	13.32
German Creek	2 685 989	637 287	2 048 702	23.73
Gregory	4 165 109	615 605	3 549 504	14.78
Oaky Creek	3 095 565	605 550	2 490 015	19.56
South Blackwater	1 010 974	130 020	880 954	12.86
Yarrabee	121 661		121 661	0.00
TOTAL	23 438 056	3 439 117	19 998 939	14.67
BLAIR ATHOL DISTRICT				
Opencut				
Blair Athol	7 129 219	-	7 129 219	0.00
MACKAY DISTRICT				
Opencut				
Goonyella/Riverside	2 946 749	890 847	2 055 902	30.23
Goonyella	5 499 692	1 219 444	4 280 248	22.17
Newlands	4 853 500	774 039	4 079 461	15.95
Norwich Park	5 540 268	1 371 524	4 168 744	24.76
Peak Downs	9 204 389	3 594 401	5 609 988	39.05
Riverside	3 454 797	971 770	2 483 027	28.13
Saraji	5 887 376	1 395 848	4 491 528	23.71
TOTAL	37 386 771	10 217 873	27 168 898	27.33
BOWEN DISTRICT				
Underground				
Bocum	229 779	71 483	158 296	31.11
Bowen No. 2	420 186	12 928	433 114	3.08
TOTAL	649 965	58 555	591 410	9.01
Opencut				
Bowen Central No. 3	2 232 406	621 153	1 611 253	27.82
STATE TOTAL				
Underground	5 531 864	1 520 642	4 011 222	27.49
Opencut	89 949 639	19 842 425	70 107 214	22.06
State	95 481 503	21 363 067	74 118 436	22.37

Table 7.4 - Production Of Saleable Coal By Individual Mines - Tonnes

Mines	1984-85	1985-86	1986-87	1987-88	1988-89
WEST MORETON DISTRICT					
Underground					
Box Flat No. 8	102 695	58 750	3 796	-	-
Box Flat No. 9	186 773	255 961	243 774	-	-
M. W. Haenke No. 1	122 405	103 628	54 784	-	-
M. W. Haenke No. 2	143 228	213 998	236 651	163 074	141 990
New Hope	362 369	372 270	332 111	285 795	250 963
Oakleigh No. 3 and 5	115 980	99 268	106 510	89 511	95 215
Rhondda No. 1	41 184	66 074	142 878	35 171	-
Rhondda No. 5	125 873	66 585	-	-	-
Southern Cross No. 12	1 521	-	-	-	-
Southern Cross No. 15	28 497	-	-	-	-
Westfalen No. 3	169 182	211 559	161 331	2 429	-
TOTAL	1 399 707	1 448 093	1 281 835	575 980	488 168
Opencut					
Blackheath	1 186	-	-	-	-
Bogside Extd.	6 672	25 746	791	-	-
Box Flat No. 2	139 117	104 200	86 418	4 051	152 193
Ebenezer	-	-	133 869	426 717	473 624
Jeebropilly	525 166	603 861	515 266	593 044	1 044 355
New Hope	146 564	110 628	715	12 154	117 917
New Whitwood	496 936	591 116	479 255	367 367	593 217
Oakleigh	71 789	129 416	119 059	101 436	146 760
Rhondda Rob Roy	5 948	-	-	-	-
Southern Cross No. 3	59 443	-	-	-	-
Wattle Glen					
Wattle Glen Extd.	137 784	173 702	177 748	258 853	410 104
Westfallen No. 1	-	6 190	24 556	1 164	-
TOTAL	1 590 605	1 744 859	1 537 677	1 764 786	2 938 170
District Total	2 990 312	3 192 952	2 819 512	2 340 766	3 426 338
DARLING DOWNS DISTRICT					
Underground					
Acland No. 3	3 104	-	-	-	-
NANANGO DISTRICT					
Opencut					
Meandu	1 153 474	2 973 813	4 991 406	4 803 531	4 855 090

Table 7.4 - Production Of Saleable Coal By Individual Mines - Tonnes *Continued....*

Mines	1984-85	1985-86	1986-87	1987-88	1988-89
MARYBOROUGH DISTRICT					
Underground					
Burgowan No. 12	11 767	15 849	19 632	15 591	17 111
MOURA DISTRICT					
Underground					
Moura No. 2	309 712	321 455	64 289	406 263	294 348
Moura No. 4	151 501	163 270	22 436	-	-
TOTAL	461 213	484 725	86 725	406 263	294 348
Opencut					
Moura	1 558 166	1 842 033	2 567 330	2 308 951	2 964 085
District Total	2 019 379	2 326 758	2 654 055	2 715 214	3 258 433
CALLIDE DISTRICT					
Opencut					
Boundary Hill	1 341 687	1 719 363	1 459 819	1 469 839	1 385 894
Callide	1 659 955	1 683 235	1 901 820	1 733 599	2 055 666
TOTAL	3 001 642	3 402 598	3 361 639	3 203 438	3 441 560
BLAIR ATHOL DISTRICT					
Opencut	3 667 935	4 717 932	5 397 856	5 441 933	7 129 219
BLACKWATER DISTRICT					
Underground					
Cook	668 842	646 456	741 740	542 394	1 200 375
German Creek Central	163 562	214 897	1 015 476	926 012	992 760
German Creek Southern	-	-	-	17 635	160 297
South Blackwater No. 1	376 170	501 054	436 269	337 679	266 753
TOTAL	1 208 574	1 362 407	2 193 485	1 823 720	2 620 185
Opencut					
Blackwater	3 791 857	4 393 972	4 820 034	4 592 030	5 584 348
Curragh	3 405 797	4 082 686	4 395 629	4 826 851	5 323 755
Dawson Valley	-	-	78 370	67 322	-
Ensham	-	-	-	10 816	-
German Creek	2 601 639	2 533 525	2 261 537	2 038 799	2 048 702
Gregory	2 894 097	3 188 472	3 401 478	3 474 717	3 549 504
Oaky Creek	2 534 903	2 640 952	3 042 431	2 994 504	2 490 015
South Blackwater	1 372 982	1 494 848	1 157 845	818 910	880 954
Yarrabee	231 373	357 870	316 051	216 413	121 661
TOTAL	16 832 648	18 692 325	19 473 375	19 040 362	19 998 939
District Total	18 041 222	20 054 732	21 666 860	20 864 082	22 619 124

Table 7.4 - Production Of Saleable Coal By Individual Mines - Tonnes *Continued....*

Mines	1984-85	1985-86	1986-1987	1987-88	1988-89
MACKAY DISTRICT					
Underground					
Harrow Creek	176 652	244 576	143 482	15 807	-
Opencut					
Goonyella/Riverside	-	-	-	-	2 055 902
Goonyella	3 743 740	4 473 736	4 371 168	4 555 459	4 280 248
Newlands	3 745 681	4 249 256	4 517 817	4 191 916	4 079 461
Norwich Park	2 720 203	4 148 713	4 307 230	4 164 241	4 168 744
Peak Downs	3 986 964	4 362 655	4 527 028	3 951 286	5 609 988
Riverside	3 053 853	3 344 010	3 569 874	3 196 793	2 483 027
Saraji	4 133 891	4 488 415	4 360 747	4 373 818	4 491 528
TOTAL	21 384 332	25 066 785	25 653 864	24 433 513	27 168 898
District Total	21 560 984	25 311 361	25 797 346	24 449 320	27 168 898
BOWEN DISTRICT					
Underground					
Bocum	2 648	126 672	89 319	160 605	158 296
No. 2	311 275	350 006	378 486	370 750	433 114
No. 3	157 309	16 412	-	-	-
TOTAL	471 232	493 090	467 805	531 355	591 410
Opencut					
Bowen Central No. 3	477 039	554 343	849 397	1 454 029	1 611 253
Garrick West S/D	890 172	953 214	650 143	-	-
Garrick Central No. 3	-	-	144 452	-	-
TOTAL	1 367 211	1 507 557	1 643 992	1 454 029	1 611 253
District Total	1 838 443	2 000 647	2 111 797	1 985 384	2 202 663
STATE TOTAL					
Underground	3 732 249	4 048 740	4 192 964	3 368 716	4 011 222
Opencut	50 556 013	59 947 902	64 627 139	62 450 543	70 107 214
TOTAL	54 288 262	63 996 642	68 820 103	65 819 259	74 118 436

Table 7.5 - Average Daily Output Saleable Coal - Tonnes (Per 243 Working Days Possible)

Mines	1986-87	1987-88	1988-89
WEST MORETON DISTRICT			
Underground			
Box Flat No. 8	16 *	-	-
Box Flat No. 9	1 020	-	-
New Hope	1 390	1 196	1 033
Oakleigh	446	375	392
Rhondda No. 1	598	147 *	
M. W. Haenke No. 1	229	-	-
M. W. Haenke No. 2	990	682	584
Westfalen No. 3	675	10 *	-
TOTAL	5 364	2 410	2 008
Opencut			
Bogside Extd.	3 *	-	-
Box Flat No. 2	362	17 *	626
Ebenezer	560 *	1 785	1 949
Jeebropilly	2 156	2 481	4 298
New Hope	3 *	51	485
New Whitwood	2 005	1 537	2 441
Oakleigh	498	425	604
Wattle Glen Ext.	744	1 083	1 688
Westfalen No. 1	103 *	5 *	-
TOTAL	6 434	7 384	12 091
MARYBOROUGH DISTRICT			
Underground			
Burgowan No. 12	82	65	70
NANANGO DISTRICT			
Opencut			
Meandu	20 885	20 098	19 980
MOURA DISTRICT			
Underground			
Moura No. 2	269 *	1 600	1 211
Moura No. 4	94 *		
TOTAL	363	1 600	1 211
Opencut			
Moura	10 742	9 661	12 198

Table 7.5 - Average Daily Output Saleable Coal - Tonnes (Per 243 Working Days Possible)
Continued....

Mines	1986-87	1987-88	1988-89
CALLIDE DISTRICT			
Opencut			
Boundary Hill	6 108	6 150	5 703
Callide	7 957	7 254	8 460
TOTAL	14 065	13 404	14 163
BLACKWATER DISTRICT			
Underground			
Cook	3 103	2 269	4 940
German Creek Central	4 249	3 875	4 085
German Creek Southern	-	74	660
South Blackwater No. 1	1 825	1 413	1 098
TOTAL	9 177	7 631	10 783
Opencut			
Blackwater	20 169	19 214	22 981
Curragh	18 392	20 196	21 908
Dawson Valley	328 *	282 *	-
Ensham	-	45 *	-
German Creek	9 462	8 530	8 431
Gregory	14 232	14 539	14 607
Oaky Creek	12 730	12 529	10 247
South Blackwater	4 845	3 426	3 625
Yarrabee	1 322	906	501
TOTAL	81 480	79 667	82 300
BLAIR ATHOL			
Opencut			
Blair Athol	22 585	22 770	29 338
MACKAY			
Underground			
Harrow Creek	600	66 *	-
Opencut			
Goonyella	18 289	19 060	17 614 *
Goonyella/Riverside	-	-	8 461 *
Newlands	18 903	17 539	16 788
Norwich Park	18 022	17 424	17 155
Peak Downs	18 941	16 533	23 086
Riverside	14 937	13 376	10 218
Saraji	18 246	18 300	18 484
TOTAL	107 338	102 232	111 804

Table 7.5 - Average Daily Output Saleable Coal - Tonnes (Per 243 Working Days Possible)
Continued....

Mines	1986-87	1987-88	1988-89
BOWEN			
Underground			
Bocum	374	672	651
No. 2	1 584	1 551	1 782
TOTAL	1 958	2 223	2 433
Opencut			
Bowen Central No. 3	3 554	6 084	6 631
Garrick West S/D	2 720	-	-
Garrick/Central No. 3	604	-	-
TOTAL	6 878	6 084	6 631
STATE TOTAL			
Underground	17 544	13 995	16 505
Opencut	270 407	261 300	288 505
TOTAL	287 951	275 295	305 010
* Not Producing for full year			

Table 7.6 - Overseas Shipments By Ports - '000 Tonnes

Year	Abbot Point	Brisbane	Dalrymple Bay	Gladstone	Hay Point	Total
1979-80	-	33	-	7 064	14 751	21 848
1980-81	-	383	-	8 438	15 077	23 898
1981-82	-	510	-	9 109	15 082	24 701
1982-83	-	787	-	11 087	14 508	26 382
1983-84	480	804	4 174	11 982	15 655	33 095
1984-85	4 361	1 376	11 258	12 825	15 686	45 506
1985-86	5 073	1 460	13 503	14 247	16 515	50 798
1986-87	5 720	1 595	13 900	14 768	17 542	53 525
1987-88	5 942	2 377	15 876	16 168	18 059	58 422
1988-89	4 998	2 546	15 459	16 081	19 943	59 027

The port of Bowen, which ceased shipments in 1983, is not included.

Table 7.7 - Exports By Destinations - '000 Tonnes

Financial Year	1984-85	1985-86	1986-87	1987-88	1988-89
Country					
Algeria	340	285	284	454	460
Argentina	-	65	181	242	466
Austria	64	-	66	-	-
Belgium	190	112	200	811	648
Brazil	997	877	1 299	1 354	1 360
Chile	98	198	162	241	274
China	194	268	322	147	140
Denmark	841	1 299	2 006	1 122	1 292
Egypt	264	308	256	316	370
Fiji	17	20	16	11	5
Finland		434	63	62	-
France	2 636	2 744	2 890	2 441	2 163
Germany F.R.	86	107	166	99	-
Greece	299	852	347	587	-
Hawaii	22	27	85	25	-
Hong Kong	641	999	1 130	1 170	1 884
India	551	1 762	2 204	3 193	4 259
Indonesia	280	1 012	577	913	594
Iran	336	362	320	284	128
Israel		133	281	267	-
Italy	2 309	2 213	2 507	2 250	1 353
Japan	24 595	23 661	22 740	25 763	28 731
Korea	1 905	2 796	2 487	2 715	3 252
Lebanon	-	-	70	-	-
Malaysia	62	40	66	141	128
Mexico	-	-	60	-	-
Morocco	-	-	38	37	-
Netherlands	3 132	2 304	3 461	2 651	2 111
Philippines	407	124	171	248	196
Portugal	-	-	35	65	-
Romania	1 040	985	1 360	1 803	1 581
Spain	1 160	1 736	1 475	1 008	863
Sweden	71	346	708	485	785
Switzerland	27	27	27	-	-
Taiwan	1 773	2 343	2 322	3 018	3 261
Thailand	-	-	104	219	145
Turkey	430	510	1 031	2 187	836
United Kingdom	733	1 526	1 629	1 870	1 426
Yugoslavia	-	267	379	163	316
Other	4	50	-	60	-
TOTAL	45 504	50 792	53 525	58 422	59 027

Table 7.8 - Exports By Mines - '000 Tonnes

Financial Year	1984-85	1985-86	1986-87	1987-88	1988-89
Blackwater	2 942	3 350	3 426	3 729	3 798
Blair Athol	3 437	4 745	5 076	6 125	6 742
Box Flat	103	169	125	-	-
Burgowan	-	5	5	-	-
Collinsville	784	1 024	1 235	1 163	1 026
Cook	609	549	735	501	938
Curragh	1 859	2 504	2 579	3 562	3 648
Dawson Valley	-	-	48	95	-
Ebenezer	-	-	91	428	414
Ensham	-	-	-	10 *	-
German Creek	2 832	2 664	2 757	3 741	3 139
Goonyella	4 083	4 133	4 676	4 455	4 480
Goonyella/Riverside	-	-	-	-	2 247
Gregory	2 856	3 275	3 352	3 602	3 436
Harrow Creek	183	234	161	26	-
Jeebropilly	360	521	439	567	766
Moura	1 739	2 380	2 693	3 019	2 929
New Hope	178	173	260	335	261
New Whitwood	595	443	475	596	565
Newlands	3 577	4 049	4 486	4 779	3 972
Norwich Park	2 966	3 789	4 021	3 913	3 905
Oakleigh	9	52	62	53	81
Oaky Creek	2 712	2 842	2 818	3 254	2 456
Peak Downs	3 969	4 003	4 675	4 276	5 564
Rhondda	131	103	133	266	458
Riverside	3 126	3 251	3 299	3 540	2 446
Saraji	4 485	4 356	3 974	4 892	4 423
South Blackwater	1 717	1 886	1 629	1 196	1 107
Westfalen	-	-	9	133	-
Yarrabee	252	297	286	166	226
TOTAL	45 504	50 797	53 525	58 422	59 027
* Trial Shipment					

Table 7.9 - Output Of Saleable Coal Per Man Year - Tonnes

District	1984-85	1985-86	1986-87	1987-88	1988-89
UNDERGROUND MINES					
West Moreton	1 684	1 790	1 826 *	2 079	2 104
Darling Downs	517	-	-	-	-
Maryborough	905	1 132	1 636	1 299	1 425
Moura	2 078	2 037	471	2 727	1 886
Blackwater	1 897	1 960	2 960 *	2 639	3 137
Mackay	2 677	3 706	4 484	2 635 *	-
Bowen	1 939	2 163	2 293	2 618	2 676
Underground average	1 855	1 975	2 236	2 529	2 754
OPEN-CUT MINES					
West Moreton	6 797	6 166	6 175	4 999	6 415
Nanango	8 544	14 869	20 290	19 768	19 498
Moura	2 393	2 896	4 481 *	4 871	6 253
Callide	7 716	8 528	8 300	7 929	8 374
Blackwater	5 818	6 540	6 653	7 070	7 473
Blair Athol	14 272	16 730	18 236	17 331	20 486
Mackay	6 301	7 091	7 071	7 043	7 884
Bowen	3 194	3 482	3 694	3 182	3 159
Opencut average	6 032	6 950	7 370	7 669	8 179
State average	5 224	5 994	6 466	6 947	7 391

* Average number of men for the year used due to depreciation of staff at end of financial year.

Table 7.10 - Output Of Saleable Coal Per Manshift Worked - Tonnes

District	1984-85	1985-86	1986-87	1987-88	1988-89
<i>UNDERGROUND MINES</i>					
<i>West Moreton</i>					
Face	19.38	20.42	22.93	24.23	20.92
Overall	6.49	6.89	7.18	7.78	7.07
<i>Darling Downs</i>					
Face	10.70	-	-	-	-
Overall	2.80	-	-	-	-
<i>Maryborough</i>					
Face	9.77	11.34	13.48	11.63	11.08
Overall	4.67	5.76	6.93	5.91	5.92
<i>Moura</i>					
Face	24.12	45.17	14.76	38.40	101.08
Overall	8.92	8.39	13.30	10.22	7.95
<i>Blackwater</i>					
Face	27.82	26.30	34.87	28.23	35.73
Overall	8.23	8.07	22.73	9.98	13.06
<i>Mackay</i>					
Face	46.49	54.52	54.16	65.59	
Overall	11.39	15.28	12.80	11.04	
<i>Bowen</i>					
Face	57.87	54.41	47.63	38.09	40.10
Overall	8.10	9.13	9.05	11.34	11.37
Face	25.18	28.32	30.25	28.17	34.61
Overall	7.59	7.95	8.67	9.30	11.09
<i>OPEN-CUT MINES</i>					
West Moreton Overall	28.08	23.21	19.60	20.72	22.38
Nanango Overall	41.29	75.05	81.08	79.76	77.73
Moura Overall	9.57	11.40	17.17	19.08	24.23
Callide Overall	30.03	32.96	32.64	31.76	34.46
Blackwater Overall	23.82	25.03	25.49	28.00	30.89
Blair Athol Overall	67.79	75.44	75.78	73.63	78.23
Mackay Overall	25.72	28.21	27.37	28.45	30.68
Bowen Overall	13.36	14.97	15.43	13.74	13.56
Overall	24.76	27.52	28.44	29.94	32.46
State					
Overall - All Mines	21.43	23.81	24.98	27.05	29.40

Table 7.11 - Employment

Year Ended June 30	West Moreton	Mary- borough	Nanango	Moura	Callide	Black- water	Blair Athol	Mackay	Bowen	Total
UNDERGROUND MINES										
<i>Below Ground-Coal Face</i>										
1985	332	6	-	40	-	201	-	18	39	636
1986	314	6	-	45	-	222	-	17	46	650
1987	146	6	-	-	-	270	-	7	49	478
1988	105	6	-	12	-	268	-	-	49	440
1989	83	6	-	12	-	292	-	-	49	442
<i>Below Ground-Elsewhere</i>										
1985	195	2	-	96	-	228	-	31	102	654
1986	207	2	-	107	-	265	-	34	101	716
1987	121	2	-	116	-	245	-	14	88	586
1988	66	2	-	37	-	196	-	-	87	388
1989	56	2	-	96	-	250	-	-	105	509
<i>Above Ground-General</i>										
1985	177	3	-	64	-	79	-	4	49	376
1986	172	3	-	64	-	63	-	3	35	340
1987	105	2	-	50	-	61	-	2	36	256
1988	57	2	-	91	-	76	-	-	37	263
1989	53	2	-	37	-	89	-	-	37	218
<i>Above Ground-Administrative and Clerical</i>										
1985	127	2	-	22	-	129	-	13	53	346
1986	116	3	-	22	-	145	-	12	46	344
1987	82	2	-	18	-	154	-	9	31	296
1988	49	2	-	9	-	151	-	-	30	241
1989	40	2	-	11	-	204	-	-	30	287
UNDERGROUND MINES-ALL CATEGORIES										
1985	831	13	-	222	-	637	-	66	243	2 012
1986	809	14	-	238	-	695	-	66	228	2 050
1987	454	12	-	184	-	730	-	32	204	1 616
1988	277	12	-	149	-	691	-	-	203	1 332
1989	232	12	-	156	-	835	-	-	221	1 456
OPEN-CUT MINES										
<i>General</i>										
1985	221	-	77	476	294	2 122	185	2 530	320	6 225
1986	268	-	125	454	301	2 068	207	2 656	321	6 400
1987	226	-	167	377	308	2 152	218	2 733	343	6 524
1988	322	-	168	422	307	1 739	237	2 685	343	6 223
1989	420	-	172	414	312	1 943	264	2 770	389	6 684

Table 7.11 - Employment *Continued....*

Year Ended June 30	West Moreton	Mary- borough	Nanango	Moura	Callide	Black- water	Blair Athol	Mackay	Bowen	Total
<i>Administrative and Clerical</i>										
1985	13	-	58	175	95	771	72	864	108	2 156
1986	15	-	75	182	98	790	75	879	112	2 226
1987	23	-	79	153	97	775	78	895	102	2 202
1988	31	-	75	52	97	690	77	784	114	1 920
1989	38	-	77	60	99	733	84	676	121	1 888
<i>OPEN-CUT MINES-ALL CATEGORIES</i>										
1985	234	-	135	651	389	2 893	257	3 394	428	8 381
1986	283	-	200	636	399	2 858	282	3 535	433	8 626
1987	249	-	246	530	405	2 927	296	3 628	445	8 726
1988	353	-	243	474	404	2 429	314	3 469	457	8 143
1989	458	-	249	474	411	2 676	348	3 446	510	8 572
<i>UNDERGROUND AND OPEN-CUT MINES</i>										
1986	1 092	14	200	874	399	3 553	282	3 601	661	10 676
1987	703	12	246	714	405	3 657	296	3 660	649	10 342
1988	630	12	243	623	404	3 120	314	3 469	660	9 475
1989	690	12	249	630	411	3 511	348	3 446	731	10 028

Table 7.12 - Manshifts Worked And Lost And Reasons For Loss

								Reasons for Loss									
Manshifts Possible		Manshifts Worked		Manshifts Lost		Industrial Disputes		Sickness		Compensation		Absenteeism		Other Causes		Year	
Possible		Possible	% of Number	Possible	% of Number	Possible	% of Number	Possible	% of Number	Possible	% of Number	Possible	% of Number	Possible	% of Number		
District UNDERGROUND MINES																	
West Moreton																	
1986-87	197 230	178 500	90.50	18 730	9.5	3 451	1.75	6 307	3.2	5 786	2.93	2 623	1.33	563	0.29	1986-87	
1987-88	84 562	74 032	87.55	10 530	12.45	3 217	3.8	2 236	2.64	3 820	4.52	1 180	1.4	77	0.09	1987-88	
1988-89	75 660	69 054	91.27	6 606	8.73	1 699	2.2	1 692	2.2	2 457	3.2	758	1	-	-	1988-89	
Maryborough																	
1986-87	3 052	2 831	92.75	221	7.24	8	0.26	55	1.8	142	4.65	5	0.17	11	0.36	1986-87	
1987-88	2 884	2 640	91.53	244	8.47	74	2.57	72	2.5	23	0.8	75	2.6	-	-	1987-88	
1988-89	3 004	2 892	96.27	112	3.73	41	1.4	42	1.4	9	0.3	20	0.7	-	-	1988-89	
Moura																	
1986-87	57 217	50 049	87.47	7 168	12.53	885	1.55	2 636	4.61	1 124	1.96	1 727	3.02	796	1.39	1986-87	
1987-88	46 158	39 771	86.16	6 387	13.84	2 206	4.78	2 069	4.48	863	1.87	1 249	2.71	-	-	1987-88	
1988-89	43 255	37 041	85.63	6 214	14.37	1 975	4.6	2 005	4.6	1 088	2.5	1 146	2.6	-	-	1988-89	
Blackwater																	
1986-87	213 349	189 339	88.75	24 010	11.25	7 332	3.44	8 930	4.19	3 769	1.76	3 573	1.67	406	0.19	1986-87	
1987-88	210 774	182 751	86.71	27 993	13.29	12 743	6.05	8 408	3.99	4 342	2.06	2 500	1.19	-	-	1987-88	
1988-89	224 403	200 571	89.38	23 832	10.62	9 102	4.1	8 441	3.8	3 720	1.7	2 569	1.1	-	-	1988-89	
Mackay																	
1986-87	13 082	11 207	85.67	1 875	14.33	1 073	8.20	363	2.77	212	1.62	185	1.42	42	0.32	1986-87	
1987-88	1 621	1 432	88.33	189	11.67	23	1.42	105	6.48	40	2.47	21	1.30	-	-	1987-88	
1988-89			-	-	-	-	-	-	-	-	-	-	-	-	-	1988-89	
Bowen																	
1986-87	58 428	51 697	88.48	6 731	11.52	1 147	1.96	2 779	4.76	928	1.59	1 743	2.98	134	0.23	1986-87	
1987-88	55 920	46 851	83.79	9 069	16.21	3 470	6.21	2 217	3.96	634	1.13	2 748	4.91	-	-	1987-88	
1988-89	60 367	52 031	86.19	8 336	13.81	2 739	4.50	2 258	3.70	646	1.1	2 693	4.50	-	-	1988-89	
UNDERGROUND TOTAL																	
1986-87	542 358	483 623	89.17	58 735	10.83	13 896	2.56	21 070	3.89	11 961	2.2	9 856	1.82	1 952	0.36	1986-87	
1987-88	401 889	347 477	86.46	54 412	13.54	21 733	5.41	15 107	3.76	9 722	2.42	7 773	1.93	77	0.02	1987-88	
1988-89	406 689	361 589	88.91	45 100	11.09	15 556	3.83	14 438	3.55	7 920	1.95	7 186	1.77	0	-	1988-89	
OPEN-CUT MINES																	
West Moreton																	
1986-87	80 299	78 444	97.69	1 855	2.31	503	0.63	551	0.69	384	0.48	151	0.18	266	0.33	1986-87	
1987-88	89 817	85 172	94.82	4 645	5.18	3 409	3.80	742	0.83	303	0.34	117	0.13	74	0.08	1987-88	
1988-89	135 699	131 305	96.76	4 394	3.24	2 204	1.60	1 000	0.70	444	0.30	424	0.30	-	-	1988-89	

Table 7.12 - Manshifts Worked And Lost And Reasons For Loss *Continued....*

								Reasons for Loss									
Manshifts Possible		Manshifts Worked		Manshifts Lost		Industrial Disputes		Sickness		Compensation		Absenteeism		Other Causes		Year	
Possible		Possible	% of Number	Possible	% of Number	Possible	% of Number	Possible	% of Number	Possible	% of Number	Possible	% of Number	Possible	% of Number		
Nanango																	
1986-87	64 519	61 565	95.42	2 954	4.58	730	1.13	1 151	1.78	99	0.15	816	1.27	158	0.25	1986-87	
1987-88	64 552	60 227	93.30	4 325	6.70	2 216	3.43	1 686	2.61	303	0.47	120	0.19	-	-	1987-88	
1988-89	66 524	62 459	93.89	4 065	6.11	1 526	2.30	1 808	2.70	552	0.80	179	0.30	-	-	1988-89	
Moura																	
1986-87	165 492	149 544	90.36	15 948	9.64	1 884	1.14	5 996	3.62	1 735	1.05	4 136	2.50	2 197	1.33	1986-87	
1987-88	137 004	121 021	88.33	15 983	11.67	7 029	5.13	5 040	3.68	1 173	0.86	2 741	2.00	-	-	1987-88	
1988-89	135 042	122 345	90.60	12 697	9.40	4 747	3.50	4 323	3.20	1 264	0.90	2 363	1.70	-	-	1988-89	
Callide																	
1986-87	113 604	102 985	90.65	10 619	9.35	4 560	4.01	3 012	2.65	1 034	0.91	1 769	1.56	244	0.22	1986-87	
1987-88	112 165	100 878	89.93	11 287	10.07	5 457	4.87	3 240	2.89	670	0.60	1 908	1.70	12	0.01	1987-88	
1988-89	109 707	99 859	91.02	9 848	8.98	3 461	3.20	3 640	3.30	636	0.60	2 074	1.90	20	-	1988-89	
Blackwater																	
1986-87	823 642	763 881	92.75	59 761	7.25	20 282	2.46	224 429	2.96	4 588	0.56	9 371	1.14	1 091	0.13	1986-87	
1987-88	753 460	680 018	90.25	73 442	9.75	39 230	5.21	21 833	2.90	4 362	0.58	8 017	1.06	-	-	1987-88	
1988-89	703 960	647 497	91.98	56 463	8.02	23 670	3.40	20 316	2.90	2 751	0.40	9 726	1.40	-	-	1988-89	
Blair Athol																	
1986-87	76 162	71 235	93.53	4 927	6.47	1 143	1.50	2 340	3.07	196	0.26	1 075	1.41	173	0.23	1986-87	
1987-88	81 996	73 907	90.14	8 089	9.86	3 921	4.78	2 877	3.51	388	0.47	903	1.10	-	-	1987-88	
1988-89	99 823	91 132	91.29	8 691	8.71	4 120	4.10	2 806	2.80	516	0.50	1 249	1.30	-	-	1988-89	
Mackay																	
1986-87	1 000 169	937 250	93.71	62 919	6.29	17 644	1.77	26 647	2.66	6 629	0.66	10 562	1.06	1 437	0.14	1986-87	
1987-88	967 417	858 764	88.77	108 653	11.23	58 081	6.08	30 121	3.11	7 288	0.75	12 436	1.29	-	-	1987-88	
1988-89	980 491	885 692	90.33	94 799	9.67	43 637	4.50	33 456	3.40	4 914	0.50	12 792	1.30	-	-	1988-89	
Bowen																	
1986-87	119 508	106 535	89.14	12 973	10.86	1 781	1.49	5 073	4.24	1 071	0.90	4 787	4.01	261	0.22	1986-87	
1987-88	124 166	106 832	85.32	18 334	14.77	6 767	5.45	4 415	3.56	754	0.61	6 388	5.14	10	0.01	1987-88	
1988-89	136 031	118 856	87.37	17 175	12.63	5 566	4.10	4 644	3.40	1 125	0.80	5 840	4.30	-	-	1988-89	
OPEN-CUT TOTAL																	
1986-87	2 443 395	2 271 439	92.96	171 956	7.04	48 527	1.99	69 199	2.83	15 736	0.64	32 667	1.34	5 827	0.24	1986-87	
1987-88	2 330 577	2 085 819	89.51	244 758	10.49	126 837	5.44	69 954	3.00	15 241	0.65	32 630	1.40	96	-	1987-88	
1988-89	2 367 277	2 159 145	91.21	208 132	8.79	88 931	3.76	71 993	3.04	12 202	0.52	34 647	1.46	20	-	1988-89	
STATE TOTAL																	
1986-87	2 985 753	2 755 062	92.27	230 691	7.73	62 423	2.09	90 269	3.02	27 697	0.93	42 523	1.43	7 779	0.26	1986-87	
1987-88	2 732 466	2 433 296	89.05	299 170	10.95	148 570	5.44	85 061	3.11	24 963	0.91	40 403	1.48	173	0.01	1987-88	
1988-89	2 773 966	2 520 734	90.87	253 232	9.13	104 487	3.77	86 431	3.12	20 122	0.73	41 833	1.51	20	-	1988-89	

Table 7.13 - Coal Consumption By Consumer Groups In State Areas -'000 Tonnes

CONSUMER GROUP	1986-87					1987-88					1988-89				
	Metropolitan	South	Central	North	Total	Metropolitan	South	Central	North	Total	Metropolitan	South	Central	North	Total
ELECTRICITY															
Power Stations	45	5 129	3 912	449	9 535	-	5 046	4 360	423	9 829	-	5 096	4 991	404	10 491
METAL PROCESSING															
Alumina Refining	-	-	1 252	-	1 252	-	-	1 227	-	1 227	-	-	1 246	-	1 246
Lead Smelting	-	-	-	92	92	-	-	-	104	104	-	-	-	109	109
Nickel Refining	-	-	-	290	290	-	-	-	285	285	-	-	-	303	303
BUILDING MATERIALS															
Cement Works	63	-	125	54	242	62	-	100	55	217	120	-	114	57	291
Bricks and Pottery	5	10	2	-	17	3	11	2	-	16	3	13	3	-	19
PAPER PULP AND BOARD															
Paper & Hardboard Mills	-	87	-	-	87	-	92	-	-	92	-	80	-	-	80
FOOD PROCESSING															
Meat and Bacon	13	14	17	3	47	13	18	16	2	49	15	23	14	2	54
Sugar Mills	14	10	2	2	28	14	9	2	3	28	16	8	2	4	30
Dairy Products	-	7	-	-	7	-	7	-	-	7	-	6	-	-	6
Canneries	12	-	-	-	12	13	-	-	-	13	13	-	-	-	13
Breweries	16	-	-	-	16	14	-	-	-	14	16	-	-	-	16
Margarine & Edible Oils	8	5	-	-	13	8	4	-	-	12	9	3	-	-	12
COKE MAKING															
Coke Works	-	-	-	68	68	-	-	-	74	74	-	-	-	76	76
MISCELLANEOUS															
Hospitals	27	6	-	-	33	26	7	-	-	33	27	7	-	-	34
Ships' Bunkers	-	-	183	-	183	-	-	153	-	153	-	-	189	-	189
Sundry	5	6	10	8	29	3	7	7	10	27	2	9	15	11	37
STATE TOTAL	208	5 274	5 503	966	11 951	156	5 201	5 867	956	12 180	221	5 245	6 574	966	13 006

Table 7.14 - 1988-89 Exports by Mines to Major Overseas Destinations - Part 1

	Coking Coal		Thermal Coal							
	Japan	India	Taiwan	Korea	France	Nether-lands	Hong Kong	Romania	UK	Brazil
Blackwater	1 150 980		236 295	90 254	261 319	29 465				451 768
				119 742	146 551		493 597			
Blair Athol										
	3 852 195	102 832		138 679			643 746			
Collinsville	682 367	144 841								
	90 720		4 640			65 544				
Cook	131 666	268 170		156 526						
	120 351	65 294		196 393						
Curragh	1 899 712		47 449							
	511 132				16 600	68 159			64 770	
Ebenezer										
	414 463									
German Creek	933 683	367 182	489 773	246 249					353 132	325 077
Goonyella Riverside	1 375 030	245 621	143 379	106 693	65 337	76 698			16 837	
Goonyella	1 697 199	887 988	174 860	321 940	120 193	33 310			134 847	253 317
Gregory	1 684 820		329 240	190 797	444 068					32 994
	455 160						164 531			
Jeebropilly										
	766 195									
Moura	1 814 474	306 021								
	796 567									
New Hope										
	260 751									
New Whitwood										
	523 714									
Newlands										
	1 403 020	32 963	556 896	251 107		833 840	582 418			
Norwich Park	43 891	11 811	296 129	670 582	670 900	107 008			397 641	118 983
	1 196 939									65 979
Oakleigh										
	81 368									
Oaky Creek	910 192	486 119	43 999	41 103		199 088				59 544
Peak Downs	2 081 662	446 072		689 218	275 364	172 251		1 268 886		
Rhondda										
	458 128									
Riverside	1 532 869	744 805				36 716		58 023		
	18 975									
Saraji	1 221 228		458 807		117 455	488 971		254 490	458 528	52 303
South Blackwater	472 206	148 885	76 074							
			403 435							
Yarrabee										
	148 310			32 884	45 086					
Coking Coal	17 631 979	4 057 515	2 296 005	2 513 362	1 954 636	1 143 507		1 581 399	1 360 985	1 293 986
Thermal Coal	11 097 988	201 089	964 971	738 805	208 237	967 543	1 884 292		64 770	65 979
TOTAL	28 729 967	4 258 604	3 260 976	3 252 167	2 162 873	2 111 050	1 884 292	1 581 399	1 425 755	1 359 965

Table 7.14 - 1988-89 Exports by Mines to Major Overseas Destinations - Part 2

	Coking Coal		Thermal Coal							
	Italy	Denmark	Spain	Turkey	Sweden	Belgium	Indonesia	Argentina	Algeria	Egypt
Blackwater				95 375	171 064					312 318
				24 893						
Blair Athol										
		1 292 143			10 997		593 690			
Collinsville										
Cook										
Curragh										
	52 532		187 688	290 288						
			193 613							
Ebenezer										
German Creek										
				42 532		137 623		115 507		
Goonyella/Riverside										
					53 894	71 643		59 356		
Goonyella										
					127 270	304 128		291 230		45 847
Gregory										
				31 542	71 015	23 915				
				8 297						
Jeebropilly										
Moura										11 692
New Hope										
New Whitwood										
					41 279					
Newlands										
Norwich Park										
	149 948		175 313							
Oakleigh										
Oaky Creek										
	207 424		132 574	94 426					227 516	
Peak Downs										
				248 835		111 034			232 244	
Rhondda										
Riverside										
					54 281					
Saraji										
	943 014		173 465		255 309					
South Blackwater										
Yarrabee										
Coking Coal	1 352 918		669 040	802 998	732 833	648 343		466 093	459 760	369 857
Thermal Coal		1 292 143	193 613	33 190	52 276		593 690			
TOTAL	1 352 918	1 292 143	862 653	836 188	785 109	648 343	593 690	466 093	459 760	369 857

Table 7.14 - 1988-89 Exports By Mines To Major Overseas Destinations - Part 3

<div><div></div> Coking Coal</div> <div><div></div> Thermal Coal</div>									
Yugoslavia	Chile	Philippines	Thailand	China	Malaysia	Iran	Fiji	TOTALS	
	68 614		36 509				2 903 961	3 797 574	Blackwater
			108 830				893 613		
							0	6 741 601	Blair Athol
	107 319						6 741 601		
				25 216			852 424	1 025 509	Collinsville
		12 181					173 085		
							556 362	938 400	Cook
							382 038		
315 922							2 793 591	3 647 865	Curragh
							834 274		
							0	414 463	Ebenezer
							414 463		
						127 975	3 138 733	3 138 733	German Creek
							0		
	32 754						2 247 242	2 247 242	Goonyella/Riverside
							0		
	65 578			22 507			4 480 214	4 480 214	Goonyella
							0		
							2 808 391	3 436 379	Gregory
							627 988		
							0	766 195	Jeebropilly
							766 195		
							2 132 187	2 928 754	Moura
							796 567		
							0	260 751	New Hope
							260 751		
							0	564 993	New Whitwood
							564 993		
							0	3 972 180	Newlands
	183 641				128 295		3 972 180		
							2 642 206	3 905 124	Norwich Park
							1 262 918		
							0	81 368	Oakleigh
							81 368		
				54 459			2 456 444	2 456 444	Oaky Creek
							0		
				38 216			5 563 782	5 563 782	Peak Downs
							0		
							0	458 128	Rhondda
							458 128		
							2 426 694	2 445 669	Riverside
							18 975		
							4 423 570	4 423 570	Saraji
							0		
							697 165	1 105 925	South Blackwater
							5 325 408 760		
							0	226 280	Yarrabee
							226 280		
315 922	166 946		36 509	140 398		127 975	40 122 966		Coking Coal
	107 319	195 822	108 830		128 295		5 325 18 904 177		Thermal Coal
315 922	274 265	195 822	145 339	140 398	128 295	127 975	5 325 59 027 143	59 027 143	TOTAL

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NOTES

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