

DEPARTMENT OF PRIMARY INDUSTRIES



Victoria's Minerals, Petroleum and Extractive Industries 2004/05 Statistical Review

Cover photos courtesy of:

Origin Energy: Yolla platform in Bass Strait

Perseverance Corporation: Open-pit development at Fosterville mine

International Power: Hazelwood brown coal open-cut mine

Boral Resources: Lysterfield quarry

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1. Introduction

The Statistical Review provides an overview of Victoria's petroleum, minerals and extractive industries. It includes data on production, exploration and expenditure, as well as licensing and safety performance. This report is the most comprehensive public database available for these sectors in Victoria and is relevant to anyone involved in the petroleum, mining or extractive industries.

Victoria's earth resource industry production includes:

- oil and gas – from onshore and offshore
- brown coal – used almost exclusively for power generation
- gold
- industrial minerals – including gypsum, silica, feldspar, rutile, zircon, ilmenite and kaolin
- rock, sand and clay – used mainly for building and road construction.

2. Summary

Petroleum

Gas production from the offshore Gippsland Basin increased again this year, while crude oil and condensate production is declining (27% during 2004/05), from peak levels in the mid 1980's.

Gas and condensate production from the offshore Otway Basin decreased in 2004/05.

Ten seismic surveys were conducted in 2004/05, an increase from three surveys last year. Seven surveys were collected in the offshore Gippsland Basin, and three surveys collected from the offshore Otway Basin.

Seventeen exploration wells were drilled in 2004/05, an increase from six in the previous year, while the number of development wells drilled remained at similar levels, with a total of 15 wells drilled in 2004/05.

Minerals

Victorian mineral production continues to be dominated by brown coal and gold.

Brown coal production, predominantly from the Latrobe Valley for electricity generation, increased to 67 million tonnes in 2004/05 from a steady annual production of 66 million tonnes during the previous 3 years.

Gold production increased to 123,308 ounces in 2004/05, valued at over \$70 million, reversing the declining trend of recent years. This increase is due to Perseverance Corporation's Fosterville operation starting production in May 2005. Gypsum, kaolin and feldspar are the other significant contributors to mineral production. Both show a high degree of variability in line with seasonal and market factors. Gypsum production, primarily for agricultural uses, has decreased to 346,522 cubic metres, valued at \$4.3 million, in 2004/05 from 2003/04 production of 439,906 cubic metres. In 2004/05 kaolin production showed a significant drop to 189,237 tonnes, valued at \$0.9 million, from previous year record production of 251,392 tonnes which was the highest figure since the 1980s. Feldspar production in Victoria commenced in 1997/98 by Unimin Australia Ltd at Beechworth and has been steadily increasing reaching 75,683 tonnes, valued at \$4.9 million in 2004/05.

Mineral sands (ilmenite, rutile and zircon) production in Victoria commenced in 2000/01 by Murray Basin Titanium Pty Ltd from the Wemen mine in northwest Victoria, increasing each year to 2003/04. The Wemen mine stopped production in January 2004. Significant production is expected from the Iluka Douglas project (currently under construction) in 2006/07.

Extractive Industry

Hard rock, clay, sand and gravel production was reported as 41.7 million tonnes this year, slightly higher than the previous year's production of 38.9 million tonnes, and the highest recorded, since data collection commenced in 1996/97.

Governance

The Department of Primary Industries (DPI) collected a total of \$A25.5 million in form of royalties, rentals and administration fees under the *Mineral Resources Development Act* 1990, the *Extractive Industries Development Act* 1995 and the *Petroleum Act* 1998.

Rehabilitation bonds held by DPI increased from \$A105.9 million in 2003/04 to \$A115.5 million in 2004/05 as a result of bond reviews and the issue of new licences.

In 2004/05, DPI issued 119 explosive use licences, two storage licences and thirteen Quarry Manager certificates.

The mining industry recorded 20 Lost Time Injuries with a Lost Time Injuries Frequency Rate of 5.0 in 2004/05, slightly up from 17 and 4.9 respectively, in 2003/04. The extractive industry recorded an increase in Lost Time Injuries from 22 in 2003/04 to 28 in 2004/05. Corresponding Lost Time Injuries Frequency Rates increased from 7.7 to 8.3 in the same period.

3. Petroleum

Victoria's petroleum industry includes crude oil, liquefied petroleum gas/condensate, natural gas and commercial carbon dioxide.

Production of crude oil and condensate from the offshore Gippsland Basin averaged about 94,000 barrels per day in 2004/05 (declining 27% from previous year's production). Production rates peaked in 1985–86 (450,000 barrels per day). Oil production will continue to decline as the major fields discovered reach advanced stages of maturity and new oil discoveries are not anticipated to replace the drop in current production levels. In Victoria, crude oil production is limited to the offshore Gippsland Basin.

Natural gas production levels, controlled by local market demand, increased again this year in response to access to new markets in South Australia via the Port Campbell–Adelaide SEAGas pipeline completed in December 2004.

Gas from the Gippsland Basin currently account for over 95% of Victorian production and is dominated by the Marlin, Barracouta and Snapper Fields. Condensate production from the onshore Otway Basin decreased from 41,000 barrels in 2003/04 to 10,800 barrels in 2004/05. A strong increase in gas production from the Otway Basin is projected in 2005/06 and beyond as the first offshore fields are brought on stream. The first discovered offshore gas field in the Otway Basin (Minerva Field, 12 km south of Port Campbell) operated by BHP Billiton, commenced production and tied into the SEAGas pipeline in April 2005.

Seismic expenditure was \$A23.8 million. There was a significant increase in the number of seismic surveys undertaken, from three seismic surveys in 2003/04, to ten seismic surveys in 2004/05. The marine surveys undertaken consisted of: six 3-D and one 2-D seismic surveys in the offshore Gippsland Basin, and three 2-D seismic surveys in the offshore Otway Basin.

A total of seventeen exploration/appraisals wells were drilled in Victorian sedimentary basins during 2004/05 with a total expenditure of \$A226 million. During this year, the number of development wells drilled remained at similar levels as year 2003/04.

Definition of Petroleum under *Petroleum Act 1998* (Act No. 96/1998)

(1) Petroleum is:

- (a) any naturally occurring hydrocarbon (whether in a gaseous, liquid or solid state); or
- (b) any naturally occurring mixture of hydrocarbons (whether in a gaseous, liquid or solid state); or
- (c) any naturally occurring mixture of one or more hydrocarbons (whether in a gaseous, liquid or solid state), and one or more of the following: hydrogen sulphide, nitrogen, helium or carbon dioxide.

(2) For the purpose of this Act:

- (a) petroleum includes any petroleum as defined by sub-sections 1(a), (b) or (c), and any petroleum product specified by the regulations for the purposes of this section, that has been returned to a reservoir in Victoria; but
- (b) petroleum does not include any naturally occurring hydrocarbon, or mixture of hydrocarbons, within a deposit of coal or oil shale.

3.1 Petroleum Tenement Activities

Acreage Release

The Commonwealth of Australia and the State of Victoria jointly released two petroleum exploration areas in the offshore Otway Basin. Concurrent with this release, Victoria also released one area in the Otway Basin State waters and three areas in the onshore Murray Basin.

These exploration areas were released based on the six-year work program for offshore area, and five-year work program for onshore area, bidding system.

The released Commonwealth areas in the Otway Basin are designated V04-1 and V04-2 (Victorian Offshore Torquay Sub-basin). The State acreage is designated 04-1(v) for the coastal waters area (Map 3.1).

Commonwealth Area Awards

Offshore Otway Basin:

- V04-1/ VIC/P61 was awarded to Exoil Ltd, Gas Crop. Australia Ltd, Otway Oil & Gas P/L and Southern Energy P/L on February 8, 2005.
- V04-2/ VIC/P62 was awarded to Trident Energy Ltd on September 13, 2005.

State Onshore Area

Onshore Murray Basin:

- VIC/M-04 (1), VIC/M-04 (2) and VIC/M-04 (3); no bids were received.

State Waters Area Awards (three-nautical miles zone)

Offshore Otway Basin:

- 04-1 (v) / VIC/P41 (v) was awarded to Origin Energy Resources Ltd on February 8, 2005.

Retention Leases

- An application for a five-year renewal of VIC/RL1 (Mulloway oil Field) in the offshore Gippsland Basin was assessed and renewed for another five-year term on September 19, 2005.
- An application for five-year renewal of VIC/RL4 (Sunfish oil/gas Field) in the offshore Gippsland Basin is currently under consideration.

Production Licences

- The Basker / Manta Fields development plan, prepared by ANZON Australia Ltd, was approved and a conversion of retention leases of VIC/RL6, VIC/RL9 and VIC/RL10 to a production licence for the Basker-Manta Fields is in progress.
- Application for production licence VIC/L25 (formerly retention lease VIC/RL2) over the Kipper Field in offshore Gippsland is currently under consideration.

3.2 Exploration and Development

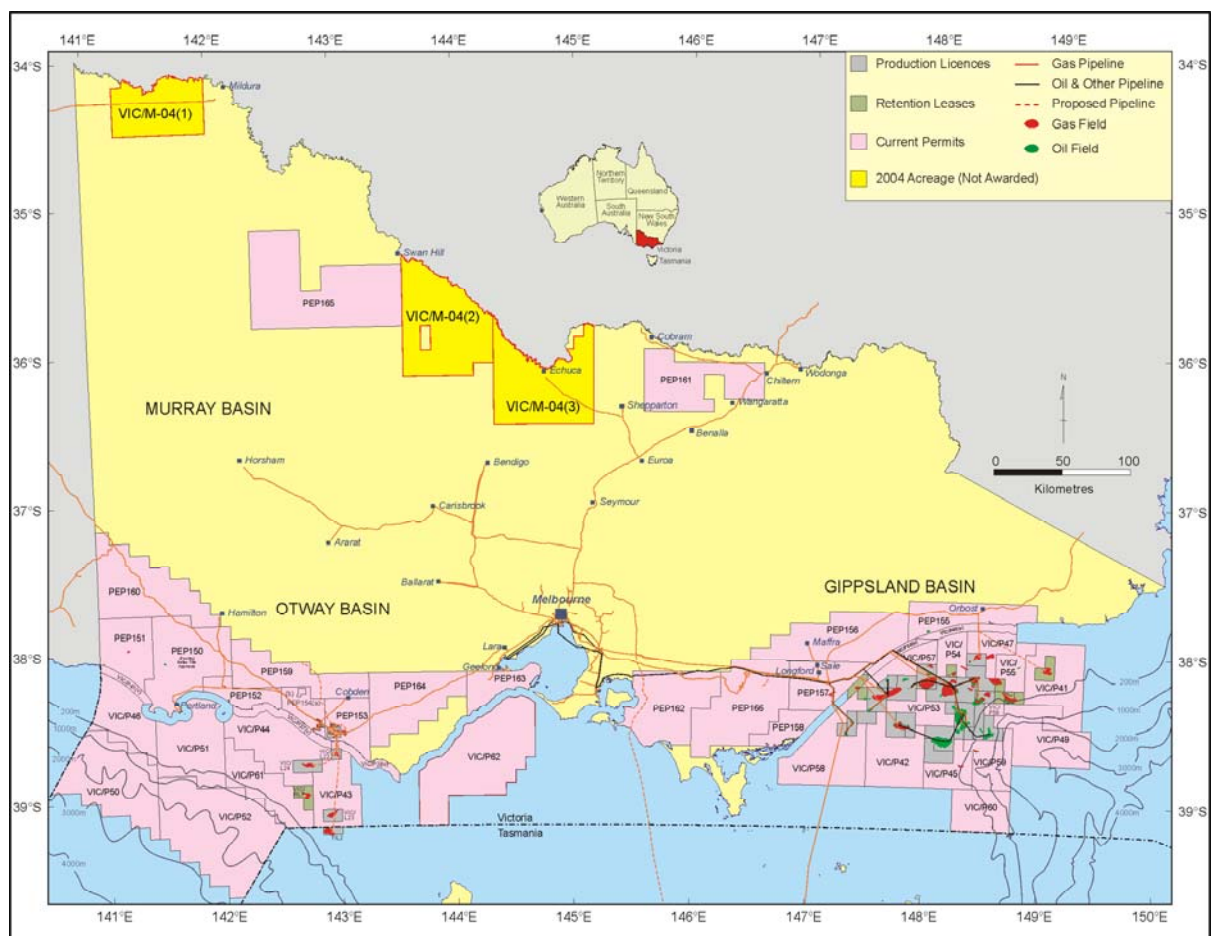
Table 3.1 Seismic Surveys: 2004/05

3D-Seismic							
Region	Basin	Survey Name	Permit	Operator	Start	Area (km ²)	Expenditure (\$A m)
Offshore	Gippsland	GAP04A	VIC/L21	Bass Strait	2/01/2005	18.2	2.5
Offshore	Gippsland	GAP04A	VIC/P55	Bass Strait	2/01/2005	9.4	
Offshore	Gippsland	GAP04A	VIC/P47	Bass Strait	2/01/2005	120.5	
Offshore	Gippsland	GAP04B	VIC/P58	Apache	2/01/2005	1066	9.4
Offshore	Gippsland	GAP04D	VIC/P41	Bass Strait	7/02/2005	575	5.4
Offshore	Gippsland	GAP04E	VIC/P53	Bass Strait	6/03/2005	463.25	4.5
Total						2252.4	21.8
2D-Seismic							
Region	Basin	Survey Name	Permit	Operator	Start	Length (km)	Expenditure (\$A m)
Offshore	Gippsland	GISN05	VIC/P55	Bass Strait	5/02/2005	360	0.4
Offshore	Otway	OEP04	VIC/P50	Santos	10/11/2004	717.9	0.7
Offshore	Otway	OEP04	VIC/P46	Santos	10/11/2004	390.2	0.4
Offshore	Otway	GNE05	VIC/P39(v)	Santos	9/02/2005	261	0.5
Total						1729.1	2.0

Source: DPI

The above figures are collated from reports forwarded to the Department of Primary Industries by the permit holder under the provisions of the *Petroleum Act 1985*

Map 3.1 Victorian Petroleum Permits: June 2005



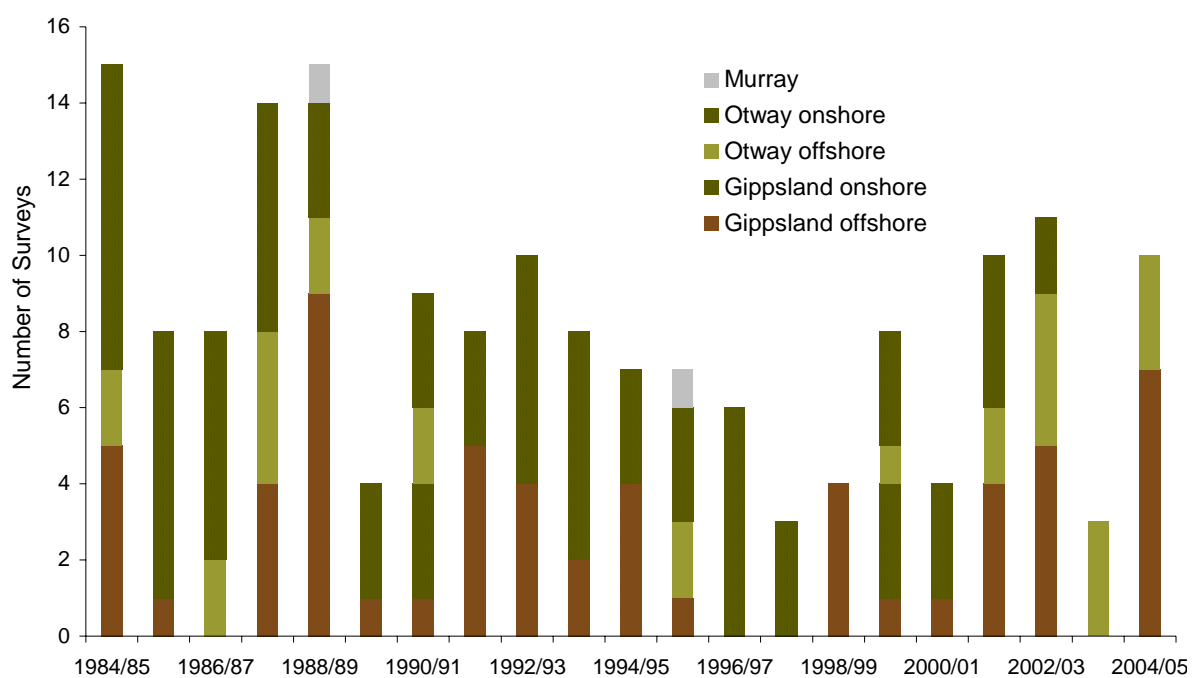
Source: DPI

Table 3.2 Seismic Surveys (by basin): 1984/85 – 2004/05

Year	Offshore Basin		Onshore Basin			Total Number of Surveys
	Gippsland	Otway	Gippsland	Otway	Murray	
Pre 1984	54	23	33	60	0	170
1984/85	5	2	0	8	0	15
1985/86	1	0	1	6	0	8
1986/87	0	2	0	6	0	8
1987/88	4	4	0	6	0	14
1988/89	9	2	0	3	1	15
1989/90	1	0	0	3	0	4
1990/91	1	2	3	3	0	9
1991/92	5	0	0	3	0	8
1992/93	4	0	0	6	0	10
1993/94	2	0	1	5	0	8
1994/95	4	0	0	3	0	7
1995/96	1	2	0	3	1	7
1996/97	0	0	2	4	0	6
1997/98	0	0	0	3	0	3
1998/99	4	0	0	0	0	4
1999/00	1	1	3	3	0	8
2000/01	1	0	1	2	0	4
2001/02	4	2	0	4	0	10
2002/03	5	4	0	2	0	11
2003/04	0	3	0	0	0	3
2004/05	7	3	0	0	0	10
Total	113	50	44	133	2	342

Source: DPI

Graph 3.1 Seismic Surveys (by basin): 1984/85 – 2004/05



Source: DPI

Table 3.3 Exploration / Appraisal Wells: 2004/05

Region	Basin	Well Name	Start Date	Operator	Tenement	Status	Total Depth (m)
Onshore	Gippsland	Megascolides-1	17-Nov-04	Karoo Gas	PEP-162	Plugged and Suspended	2000
Onshore	Gippsland	Echidna High-1	26-Feb-05	Lakes Oil	PEP-157	Plugged and Abandoned	1868
Offshore	Gippsland	Turrum Loc. 6	12-Jul-04	Esso	VIC/L-4	Oil Discovery	3051
Offshore	Gippsland	Turrum Loc. 4	03-Aug-04	Esso	VIC/L-4	Oil Discovery	3248
Offshore	Gippsland	Moby-1	06-Oct-04	Bass Strait	VIC/P-47	Gas Discovery	625
Offshore	Gippsland	Long Tom-2	10-Nov-04	Apache	VIC/P-54	Gas Discovery	2422
Offshore	Gippsland	Grayling-1 , 1A	24-Dec-04	Apache	VIC/P-54	Non Economic Gas Discovery	2944
Offshore	Gippsland	W.Moonfish-1	05-Jan-05	Esso	VIC/RL-10	Gas Discovery	3369
Offshore	Gippsland	Zane Grey-1	29-Jan-05	Bass Strait	VIC/P-42	Non Economic Oil & Gas Discovery	3675
Offshore	Gippsland	Barracouta-A4A	07-Sep-04	Esso	VIC/L-2	Gas Discovery	2385
Offshore	Otway	Callister-1	12-Oct-04	Santos	VIC/P-51	Plugged and Abandoned	3914
Offshore	Otway	Martha-1	21-Oct-04	Santos	VIC/P-44	Non Economic Gas Discovery	1878
Offshore	Otway	Trefoil-1*	29-Oct-04	Origin	T/18 P	Plugged and Abandoned	3545
Offshore	Otway	Amrit-1	19-Nov-04	Santos	VIC/P-52	Plugged and Abandoned	2979
Offshore	Otway	Halladale-1DW1	22-Mar-05	Origin	VIC/P-37(V)	Gas Discovery	1867
Offshore	Otway	Halladale-1DW2	11-Apr-05	Origin	VIC/P-37(V)	Gas Discovery	1941
Offshore	Otway	Halladale-1DW3	21-Apr-05	Origin	VIC/P-37(V)	Gas Discovery	1969

Source: DPI

*Located within Tasmanian waters

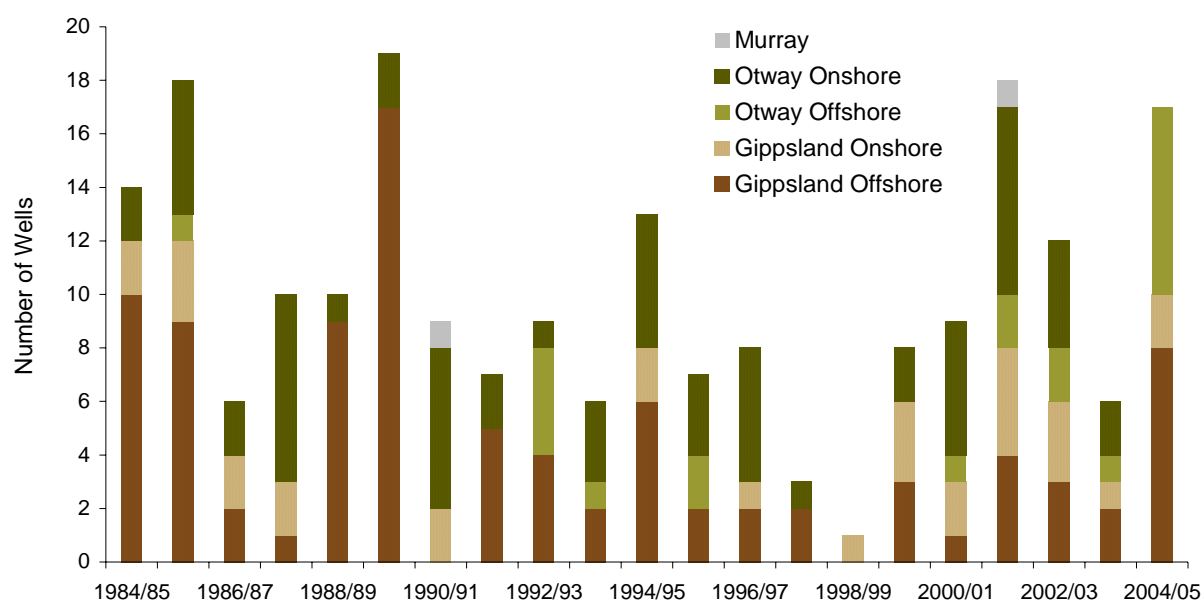
Table 3.4 Historical Petroleum Exploration/Appraisal Wells: 1984/85 – 2004/05

Year	Offshore		Onshore			Total wells	Total drilled (m)
	Gippsland	Otway	Gippsland	Otway	Murray		
Pre 1984						381	
1984/85	10	0	2	2	0	14	29,223
1985/86	9	1	3	5	0	18	36,925
1986/87	2	0	2	2	0	6	9,282
1987/88	1	0	2	7	0	10	13,839
1988/89	9	0	0	1	0	10	29,871
1989/90	17	0	0	2	0	19	51,941
1990/91	0	0	2	6	1	9	9,893
1991/92	5	0	0	2	0	7	14,953
1992/93	4	4	0	1	0	9	21,255
1993/94	2	1	0	3	0	6	12,682
1994/95	6	0	2	5	0	13	27,563
1995/96	2	2	0	3	0	7	16,281
1996/97	2	0	1	5	0	8	17,112
1997/98	2	0	0	1	0	3	6,518
1998/99	0	0	1	0	0	1	1,743
1999/00	3	0	3	2	0	8	10,745
2000/01	1	1	2	5	0	9	17,712
2001/02	4	2	4	7	1	18	28,208
2002/03	3	2	3	4	0	12	17,463
2003/04	2	1	1	2	0	6	11,321
2004/05	8	7	2	0	0	17	43,680
Total	92	21	30	65	2	591	428,210

Source: DPI

Note: Including Trefoil-1 well in Tasmanian waters

Graph 3.2 Exploration Wells: 1984/85 – 2004/05



Source: DPI

Table 3.5 Petroleum Exploration/Appraisal Expenditure: 1984/85 – 2004/05

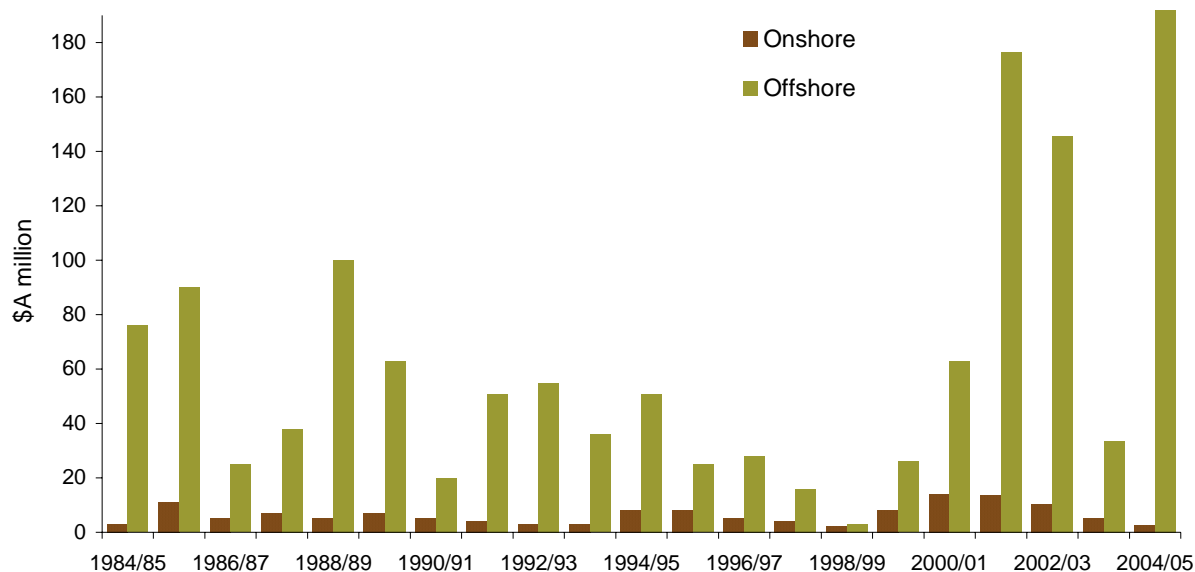
Year	Onshore Expenditure (\$A million)	Offshore Expenditure (\$A million)	Total Expenditure (\$A million)
1984/85	3	76	79
1985/86	11	90	101
1986/87	5	25	30
1987/88	7	38	45
1988/89	5	100	105
1989/90	7	63	70
1990/91	5	20	25
1991/92	4	51	55
1992/93	3	55	58
1993/94	3	36	39
1994/95	8	51	59
1995/96	8	25	33
1996/97	5	28	33
1997/98	4	16	20
1998/99	2	3	5
1999/00	8	26	34
2000/01	14	63	77
2001/02	13	177	190
2002/03	25	131	156
2003/04	5	34	39
2004/05	3	193	195

Source: DPI

Over the last decade annual petroleum expenditure has fluctuated significantly, with peaks of over \$A100 million per annum in the 1980's. The average annual expenditure in the 1990's has been \$A39 million.

Petroleum exploration (wells and seismic acquisition) and appraisal drilling expenditure in Victoria in 2004/05 was \$A226 million. During the year a total of 17 exploration wells have been drilled, with 2 wells drilled onshore, in the Gippsland Basin, and 15 wells drilled offshore, 8 in the Gippsland Basin and 7 in the Otway Basin. Data acquisition in offshore Gippsland Basin comprises 2252 km² 3D and 360 km 2D seismic data, as well as 1369.1 km 2D seismic data in offshore Otway Basin (Port Campbell Region).

Graph 3.3 Petroleum Exploration/Appraisal Expenditure: 1984/85 – 2004/05



Source: DPI

Table 3.6 Development Wells (Offshore): July 2004 – June 2005

Region	Well	Field	Spud Date	Operator	Licence	Total Depth (m)
Onshore Gippsland	Wombat-3	WOMBAT	24-Sep-04	Lakes Oil	PEP-157	2,178
Offshore Gippsland	Baleen-4	BALEEN	7-Sep-04	OMV	VIC/RL-21	2,290
Offshore Gippsland	Tuna-A15A	TUNA	23-Nov-04	Esso	VIC/RL-9	3,283
Offshore Gippsland	Tuna-A31A	TUNA	1-Jan-05	Esso	VIC/L-9	3,048
Offshore Gippsland	Tuna-A3A	TUNA	6-Feb-05	Esso	VIC/RL-4	2,262
Offshore Gippsland	Tuna-A14A	TUNA	3-Mar-05	Esso	VIC/L-4	3,142
Offshore Gippsland	Flounder-A3	FLOUNDER	25-Apr-05	Esso	VIC/L-11	848
Offshore Gippsland	Flounder-A10A	FLOUNDER	1-May-05	Esso	VIC/L-11	4,515
Offshore Gippsland	Bream-A10A	BREAM	1-May-05	Esso	VIC/L-13	3,381
Offshore Gippsland	Flounder-A3A	FLOUNDER	15-May-05	Esso	VIC/L-11	5,267
Offshore Gippsland	Bream-A5A	BREAM	10-Jun-05	Esso	VIC/L-13	2,810
Offshore Otway	Yolla-4*	YOLLA	17-Jun-04	Origin	T/L1	3,235
Offshore Otway	Yolla-3*	YOLLA	8-Aug-04	Origin	T/L1	3,497
Offshore Otway	Casino-4	CASINO	16-May-05	Santos	VIC/P-44	2,404
Offshore Otway	Casino-5	CASINO	16-Jun-05	Santos	VIC/P-44	1,806
Total						43,966

Source: DPI

* Located within Tasmanian waters

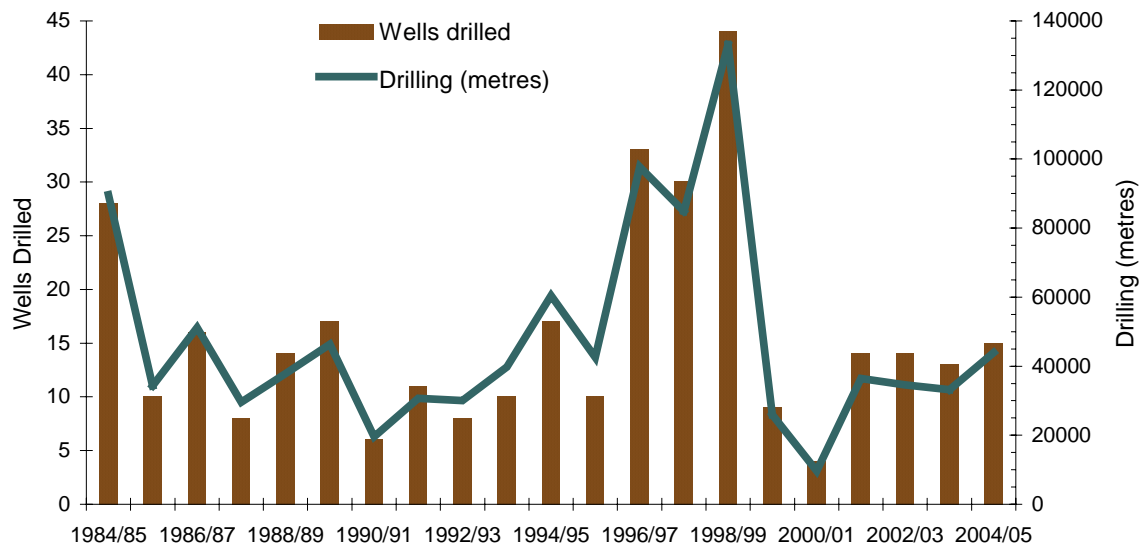
Table 3.7 Development Wells: 1984/85 – 2004/05

Year	Number of Wells Drilled	Annual Drilling (metres)
Pre 1984	499	N/A
1984/85	28	89,664
1985/86	10	34,320
1986/87	16	51,221
1987/88	8	29,613
1988/89	14	37,783
1989/90	17	46,369
1990/91	6	19,551
1991/92	11	30,664
1992/93	8	30,021
1993/94	10	39,810
1994/95	17	60,469
1995/96	10	42,519
1996/97	33	97,678
1997/98	30	84,823
1998/99	44	133,166
1999/00	9	25,915
2000/01	4	9,644
2001/02	14	36,429
2002/03	14	34,600
2003/04	13	33,220
2004/05	15*	43,966
Total	815	967,479

Source: DPI

* Including the Yolla-3 and Yolla-4 wells in Tasmanian waters

Graph 3.4 Development Wells: 1984/85 – 2004/05



Source: DPI

Note: Many fields were being developed between 1996 and 1999, and as a result of infill drilling operations there was an increase of development wells drilled.

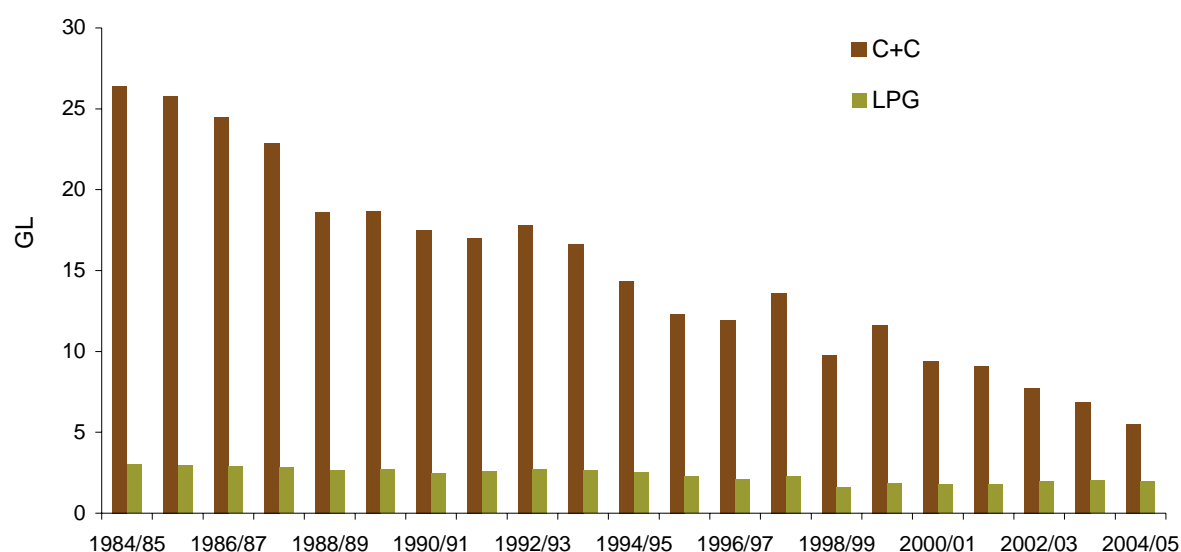
3.3 Production and Revenue

Table 3.8 Annual Gippsland Basin Petroleum Production: 1968 – 2004/05

Year	Bass Strait Annual Petroleum Production		
	C+C (GL)	LPG (GL)	Gas (Gm ³)
Prior 1984	290.20	34.30	51.20
1984/85	26.40	3.00	6.00
1985/86	25.78	2.97	5.79
1986/87	24.44	2.88	5.69
1987/88	22.87	2.83	5.65
1988/89	18.61	2.68	5.91
1989/90	18.68	2.69	6.71
1990/91	17.48	2.50	6.01
1991/92	16.97	2.57	6.26
1992/93	17.80	2.74	6.14
1993/94	16.60	2.66	6.05
1994/95	14.35	2.56	6.77
1995/96	12.26	2.25	6.65
1996/97	11.93	2.12	6.01
1997/98	13.56	2.29	6.12
1998/99	9.73	1.63	5.66
1999/00	11.60	1.89	5.56
2000/01	9.40	1.75	6.44
2001/02	9.06	1.80	6.49
2002/03	7.70	1.97	6.57
2003/04	6.83	2.04	7.67
2004/05	5.46	1.98	7.93
Total	607.72	84.10	183.62

Source: Esso/BHP-Billiton, OMV Australia Pty Ltd

Graph 3.5 Gippsland Basin Historical Petroleum Production (excluding gas): 1984/85 – 2004/05



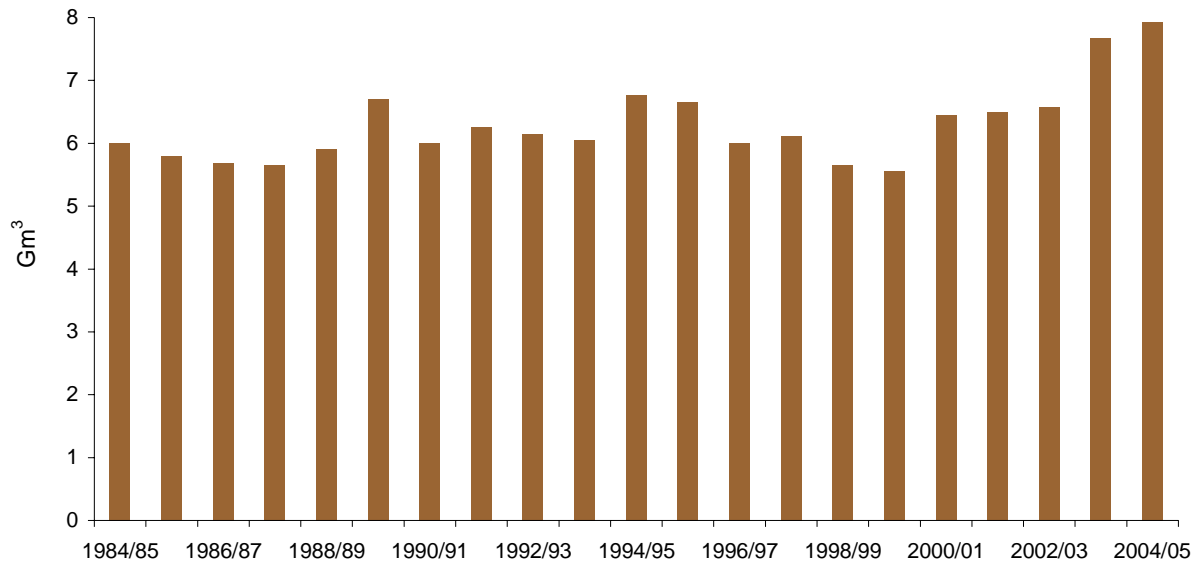
Source: DPI

Notes: 1998/99 – Longford gas plant incident.

Petroleum production has been declining for the last several years as the offshore Gippsland Fields are in the depletion stage.

Gas production has been increasing for the last few years to meet demand.

Graph 3.6 Gippsland Basin Historical Gas Production: 1984/85 – 2004/05



Source: Esso/BHP-Billiton, OMV Australia Pty Ltd

Notes: 1998/99 – Longford gas plant incident.

Gas production has been increasing for the last few years to meet demands.

Table 3.9a Gross Gippsland Basin Petroleum Production – Esso/BHP Billiton Fields:
2003/04 – 2004/05

ESSO / BHP Billiton Fields	2003/2004			2004/2005		
	C+C (GL)	LPG (GL)	Gas (Gm ³)	C+C (GL)	LPG (GL)	Gas (Gm ³)
Barracouta	0.067	0.132	0.757	0.069	0.145	0.800
Blackback	0.086	0.014	0.040	0.042	0.007	0.020
Bream	0.662	0.302	1.119	0.698	0.314	1.056
Cobia	0.385	0.024	0.004	0.305	0.019	0.003
Dolphin	0.153	0.010	0.006	0.052	0.004	0.002
Flounder	0.621	0.221	0.429	0.478	0.219	0.506
Fortescue	0.295	0.019	0.003	0.212	0.014	0.002
Halibut	0.573	0.035	0.006	0.450	0.027	0.006
Kingfish	0.438	0.039	0.020	0.344	0.031	0.016
Mackerel	0.176	0.022	0.003	0.143	0.019	0.003
Marlin	0.443	0.587	2.331	0.424	0.588	2.284
Moonfish	0.061	0.003	0.013	0.053	0.002	0.011
Perch	0.015	0.000	0.000	0.027	0.000	0.001
Seahorse	0.018	0.001	0.000	0.018	0.001	0.000
Snapper	0.321	0.365	2.582	0.338	0.381	2.620
S. Mackerel	0.000	0.000	0.000	0.000	0.000	0.000
Tarwhine	0.060	0.019	0.009	0.054	0.017	0.008
Tuna	0.986	0.106	0.183	0.601	0.073	0.166
Turrum				0.001	0.000	0.000
W. Kingfish	0.487	0.051	0.022	0.411	0.045	0.019
W. Tuna	0.987	0.090	0.066	0.737	0.071	0.058
TOTAL	6.835	2.041	7.594	5.458	1.978	7.581

Source: Esso/BHP Billiton

Notes: Bream and Flounder gas injection has been subtracted from the production volume.

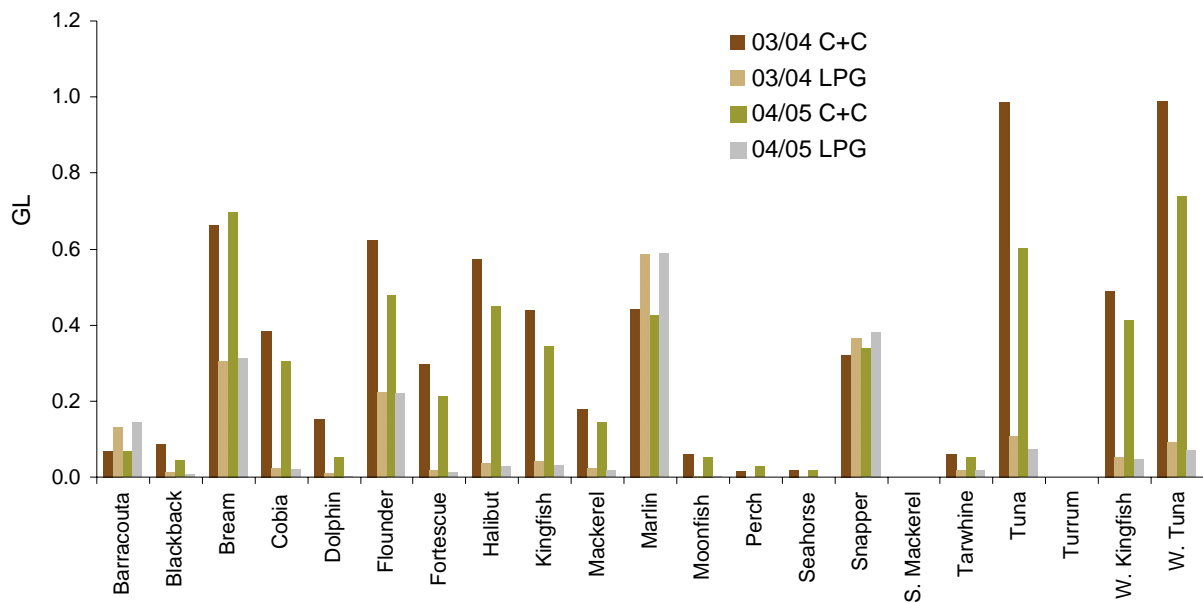
The major oil and condensate producers in 2004/05 were West Kingfish, Snapper, Kingfish, Marlin, Bream, West Tuna and Halibut. These seven fields are now responsible for more than 77% of liquid production from the Gippsland Basin. Although production from the major fields is declining, infill drilling, development and work-over activities continued during 2004/05.

Table 3.9b Gross Gippsland Basin Petroleum Production – OMV Australia Field: 2003/04 – 2004/05

OMV Australia Pty Ltd Field	2003/2004			2004/2005		
	C+C (GL)	LPG (GL)	Gas (Gm ³)	C+C (GL)	LPG (GL)	Gas (Gm ³)
Baleen / Patricia	-	-	0.35	-	-	0.35

Source: OMV Australia Pty Ltd

Graph 3.7 Gross Gippsland Petroleum Production (excluding gas) – Esso/BHP Billiton Fields: 2003/04 – 2004/05

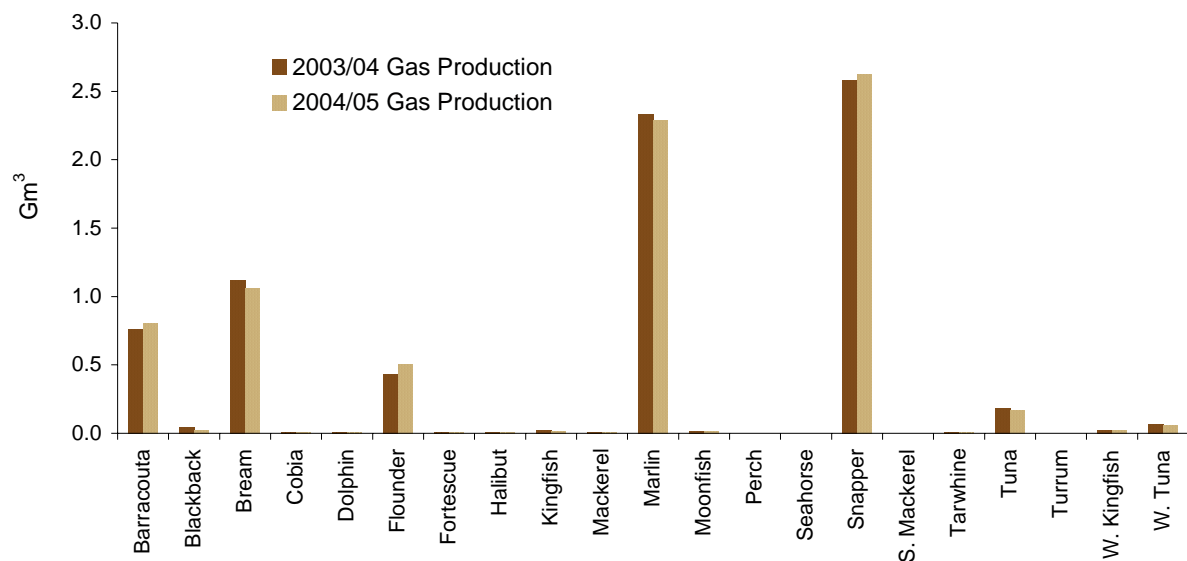


Source: Esso/BHP Billiton

Notes: In general, the Gippsland Basin's crude production is in declining phase.

The increase in production from the Bream and Snapper fields is due to infill drilling (ie field development)

Graph 3.8 Gross Gippsland Gas Production – Esso/BHP Billiton Fields: 2003/04 – 2004/05



Source: Esso/BHP Billiton

Notes: In general, the Gippsland Basin's gas production is in declining phase.

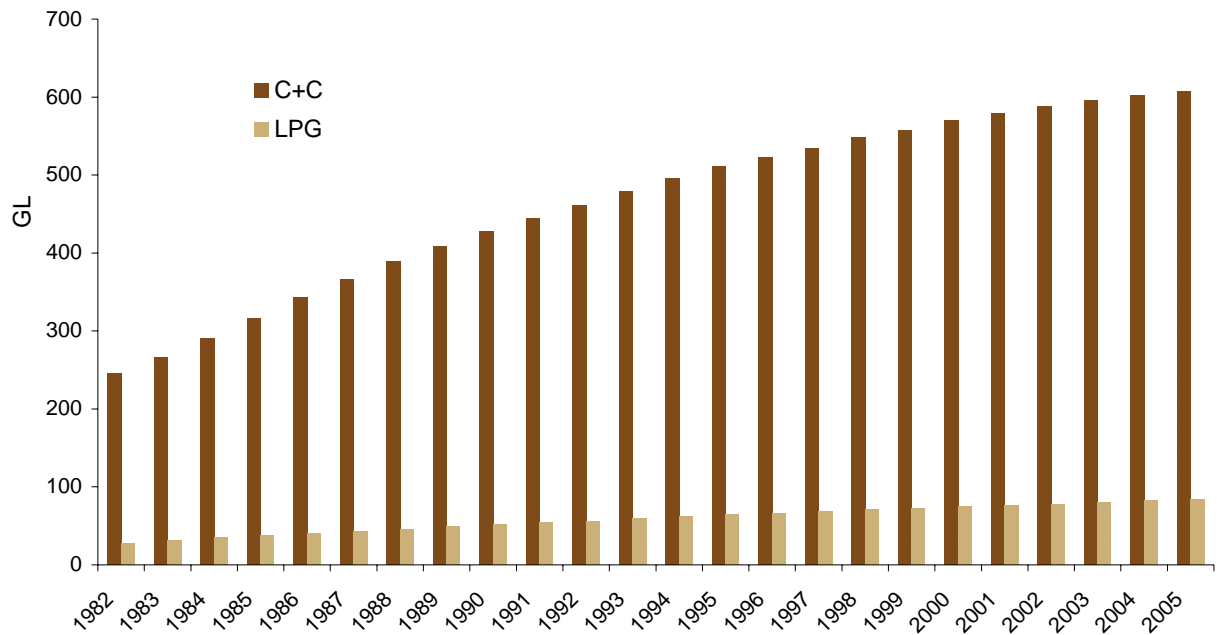
The increase in production from the Barracouta, Flounder and Snapper fields is due to infill drilling (ie field development)

Table 3.10 Gippsland Basin Cumulative Production and Remaining Reserves

Esso / BHP Billiton	Initial Recoverable Reserves			Cumulative Production			Remaining Reserves		
	Year	C+C (GL)	LPG (GL)	Gas (Gm ³)	C+C (GL)	LPG (GL)	Gas (Gm ³)	C+C (GL)	LPG (GL)
1982	498.00	88.20	220.90	246.00	28.10	38.90	252.00	60.10	182.00
1983	499.10	81.70	224.20	266.30	31.10	44.90	232.80	50.60	179.30
1984	502.60	81.40	212.90	290.20	34.30	51.20	212.40	47.10	161.70
1985	520.40	82.30	213.60	316.60	37.30	57.20	203.80	45.00	156.40
1986	520.40	82.30	213.60	342.38	40.27	62.99	178.02	42.03	150.61
1987	549.70	89.10	227.50	366.82	43.15	68.68	182.88	45.95	158.82
1988	566.20	91.70	232.40	389.69	45.98	74.33	176.51	45.72	158.07
1989	579.50	95.90	247.70	408.30	48.66	80.24	171.20	47.24	167.46
1990	579.10	96.20	250.20	426.98	51.35	86.95	152.12	44.85	163.25
1991	580.00	96.40	250.50	444.46	53.85	92.96	135.54	42.55	157.54
1992	581.80	96.40	250.30	461.43	56.42	99.22	120.37	39.98	151.08
1993	585.20	96.20	250.50	479.23	59.16	105.36	105.97	37.04	145.14
1994	608.60	98.30	252.70	495.83	61.82	111.41	112.77	36.48	141.29
1995	620.20	99.30	253.50	510.18	64.38	118.18	110.02	34.92	135.32
1996	632.60	100.10	255.60	522.44	66.63	124.83	110.16	33.47	130.77
1997	640.60	101.10	261.50	534.37	68.75	130.84	106.23	32.35	130.66
1998	647.60	105.30	272.30	547.93	71.04	136.96	99.67	34.26	135.34
1999	647.60	105.30	272.30	557.69	72.67	142.60	89.91	32.63	129.70
2000	647.60	105.30	272.30	569.29	74.55	148.15	78.31	30.75	124.15
2001	647.60	105.30	272.30	578.66	76.31	154.62	68.94	28.99	117.68
2002	647.60	105.30	272.30	587.72	78.11	161.11	59.88	27.19	111.19
2003	647.60	105.30	272.30	595.43	80.08	167.76	52.17	25.22	104.54
2004	647.60	105.30	272.30	602.26	82.12	175.69	45.34	23.18	96.61
2005	647.60	105.30	272.30	607.72	84.10	183.62	39.88	21.20	88.68

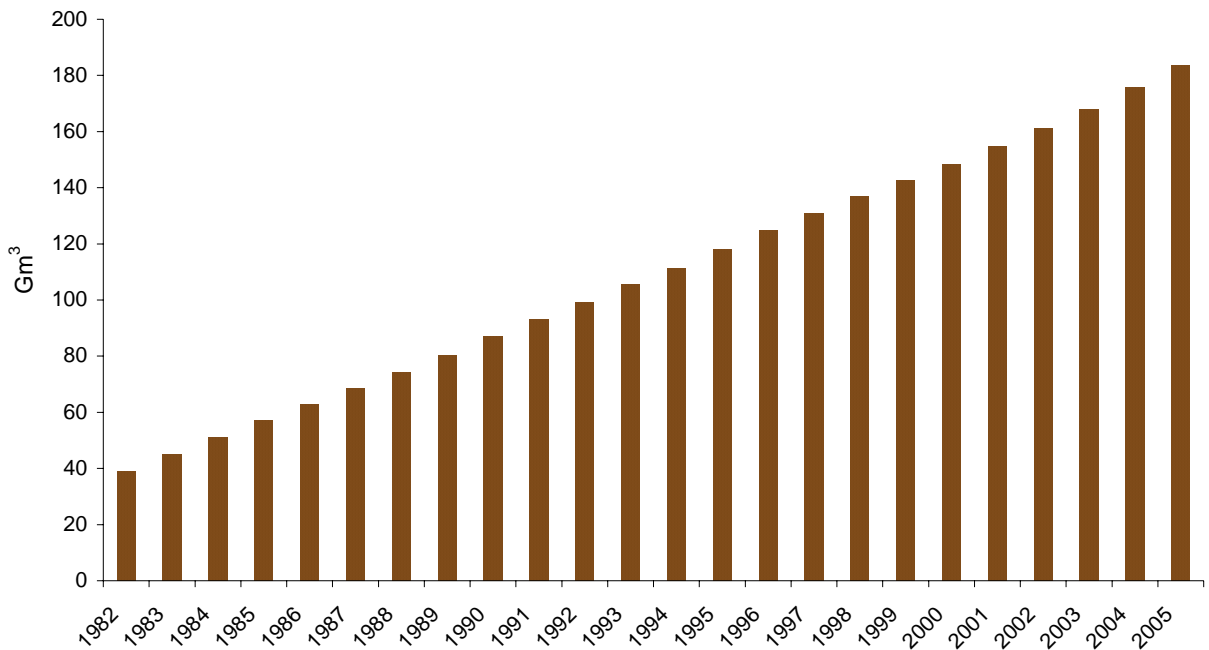
Source: DPI

Graph 3.9 Gippsland Basin Cumulative Petroleum Production (excluding gas): 1982 – 2005



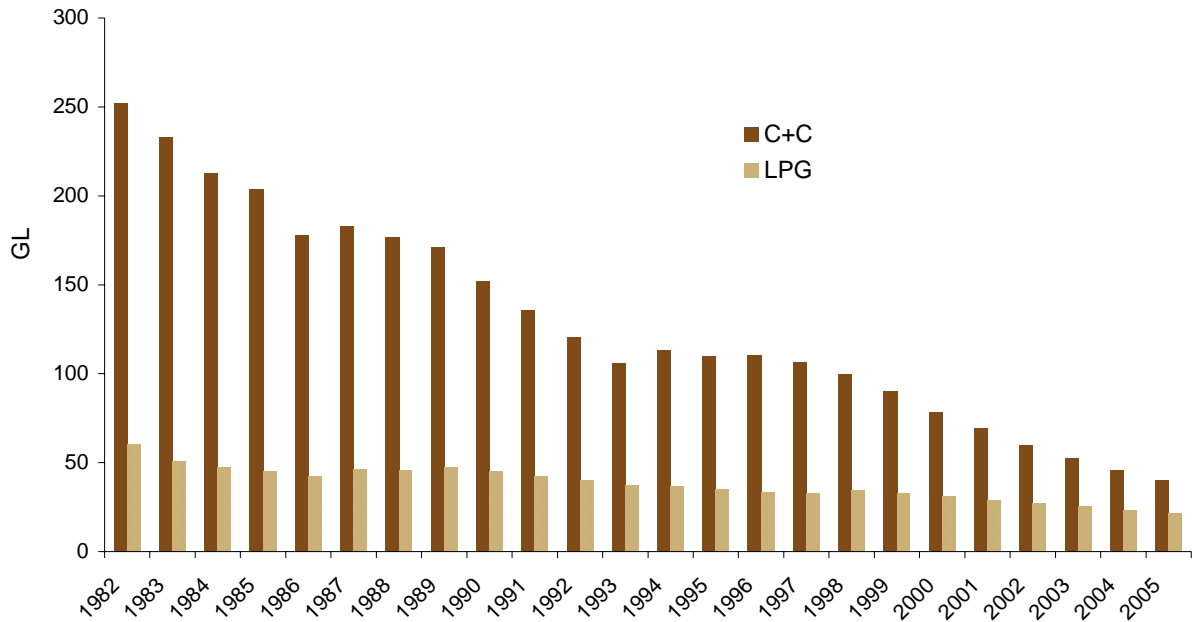
Source: DPI

Graph 3.10 Gippsland Basin – Cumulative Gas Production: 1982 – 2005



Source: DPI

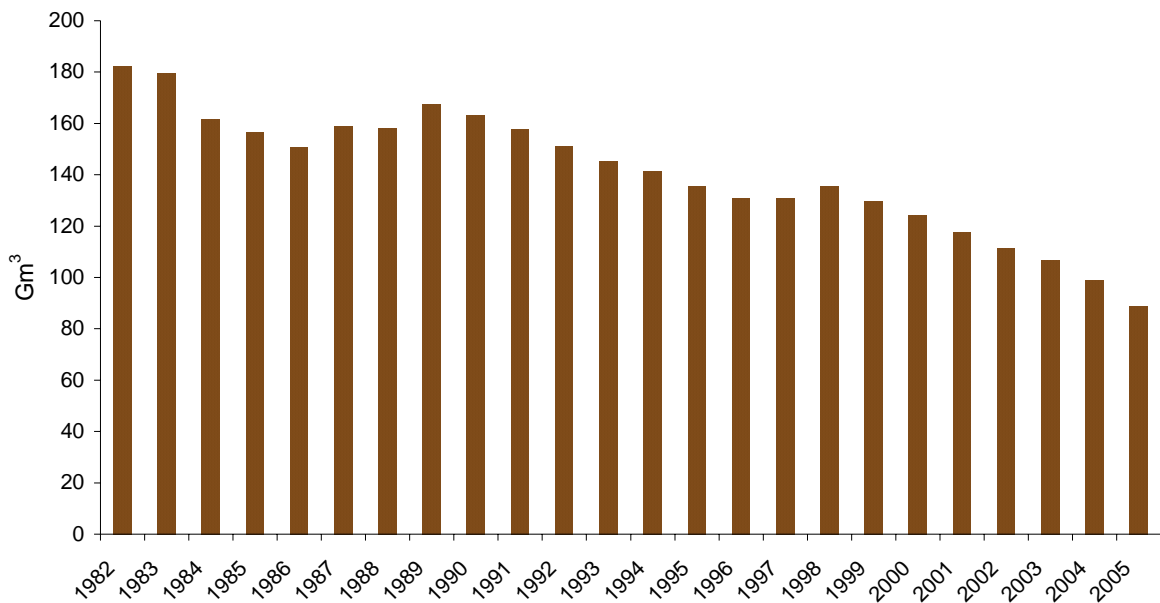
Graph 3.11 Gippsland Basin – Remaining Petroleum Reserves (excluding gas): 1982 – 2005



Source: DPI

Note: Petroleum reserves have been declining since 1996 as the Gippsland Basin is in the depletion phase.

Graph 3.12 Gippsland Basin – Remaining Gas Reserves: 1982 – 2005



Source: DPI

Note: Gas reserves have been declining since 1998 as the Gippsland Basin fields currently in production are in the depletion phase.

Table 3.11 Offshore Gippsland Oil and Gas Value: 1995 – 2005

Year	Oil Production Rate (bbl/d)	Oil Yearly Production (Mbbbl)	Oil Price (\$US/bbl)	Exchange Rates (\$A)	Oil Price (\$A/bbl)	Oil Value (\$m)	Gas Production Rate (Mcf/d)	Gas Yearly Production (Bscf)	Gas Price (\$A/GJ)	Gas Value (\$m)	Oil and Gas Value (\$m)
1995	247743	90.43	15.00	0.76	19.66	1,777.91	680.19	248.27	2.70	737.36	2,515.27
1996	210908	76.98	17.00	0.78	21.78	1,676.42	683.31	249.41	2.70	740.74	2,417.17
1997	205339	74.95	20.00	0.68	29.52	2,212.46	665.83	243.03	2.70	721.80	2,934.25
1998	233481	85.22	18.00	0.62	28.81	2,455.56	687.70	251.01	2.70	745.50	3,201.06
1999	168113	61.36	13.00	0.63	20.80	1,276.23	544.84	198.87	2.70	590.64	1,866.87
2000	200054	73.02	17.00	0.53	31.98	2,335.27	538.78	196.66	2.70	584.07	2,919.34
2001	161896	59.09	20.00	0.52	38.13	2,253.20	623.62	227.62	3.00	751.14	3,004.35
2002	156175	57.00	25.00	0.59	42.46	2,420.58	628.27	229.32	3.00	756.75	3,177.33
2003	132755	48.46	28.57	0.67	42.68	2,068.08	635.63	232.00	3.00	765.62	2,833.69
2004	117786	42.99	32.00	0.71	45.07	1,937.65	734.73	268.18	3.00	884.99	2,822.64
2005	94053	34.33	50.00	0.75	66.23	2,273.73	733.49	267.72	3.00	883.49	3,157.22

Oil Price Source:

1995 to 2002 – BP Statistical Review (www.bp.com statistical review)

2003 – Australia Bureau of Agricultural and Resources Economics, Australian Commodity Statistics

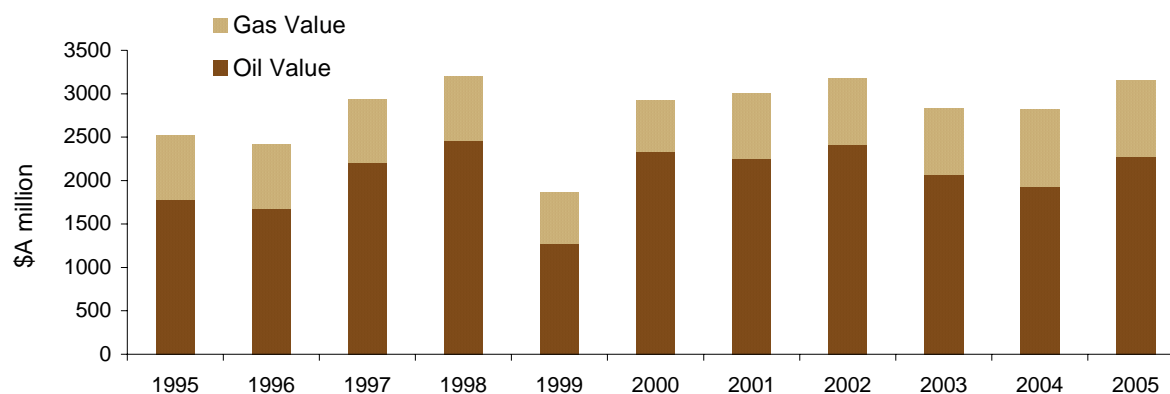
2004 – Estimated from South East Asia: www.aseanenergy.org (Australian 42);

2005 – WTRG Economics

Exchange Rates Source:

http://www.rba.gov.au/Statistics/Bulletin/index.html#table_f

Notes: The revenue figures are estimates based on the value of the petroleum using reference prices multiplied by production. They are not used for taxation purposes

Graph 3.13 Offshore Gippsland Oil and Gas Value (1995 – 2005)

Source: DPI

Table 3.12 Onshore Otway Gas, Condensate and CO₂ Revenue: 2002 – 2005

Year	Gas Production (Mm ³)	Condensate Production (kL)	Sales Gas (Mm ³)	CO ₂ Production (Mm ³)	Revenue (Royalty) (\$A)
2002	304.9	11650.7	274.4	17.7	2,359,763.90
2003	445.0	13590.8	400.5	19.2	2,695,411.10
2004	377.8	6515.8	340.0	19.8	1,579,184.51
2005	239.8	1728.4	215.8	19.2	809,338.00

Source: DPI

Production – TXU and Origin Energy Resources (Natural Gas), BOC (CO₂)

Table 3.13 Onshore Otway Basin Annual Production: 1986/87 - 2004/05

Year	Fenton Creek		Dunbar		Pentryn		Mylor		Wild Dog Road		Skull Creek		Wallaby Creek		Iona	
	cond (kL)	Gas (Mmm ³)	cond (kL)	Gas (Mmm ³)	cond (kL)	Gas (Mmm ³)	cond (kL)	Gas (Mmm ³)	cond (kL)	Gas (Mmm ³)	cond (kL)	Gas (Mmm ³)	cond (kL)	Gas (Mmm ³)	cond (kL)	Gas (Mmm ³)
1986/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987/88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988/89	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989/90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1990/91	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1991/92	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1992/93	-	-	-	-	-	-	-	-	-	-	-	-	-	-	244.9	10.7
1993/94	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1088.7	49.0
1994/95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1568.1	63.8
1995/96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1771.6	72.9
1996/97	-	-	-	-	-	-	-	-	-	-	0.0	0.0	836.0	49.6	672.7	24.7
1997/98	-	-	-	-	-	-	-	-	-	-	0.0	19.1	466.7	30.7	335.6	16.3
1998/99	-	-	-	-	-	-	-	-	-	-	-	-	1881.2	88.1	-	-
1999/00	1601.9	26.6	-	-	-	-	6146.8	77.1	32.9	6.4	-	-	1879.0	90.1	4248.1	205.0
2000/01	1605.1	34.5	121.0	3.9	258.0	8.8	7249.6	108.0	57.3	13.6	-	-	719.5	36.5	2634.0	106.8
2001/02	1046.7	21.1	215.0	9.2	2254.1	38.1	1853.1	27.8	-	-	-	-	99.7	6.0	335.6	77.3
2002/03	2.1	0.1	-	-	589.1	10.9	0.9	0.0	-	-	-	-	-	-	-	69.0
2003/04	93.5	2.2	-	-	281.3	4.8	933.6	15.91	-	-	-	-	-	-	-	174.9
2004/05	-	-	-	-	-	-	909.7	14.71	-	-	-	-	-	-	-	189.0
Total	4349.4	84.5	336.0	13.0	3382.5	62.6	17093.6	243.4	90.2	20.0	0.0	19.1	5882.1	301.0	12899.3	1059.4

Source: DPI

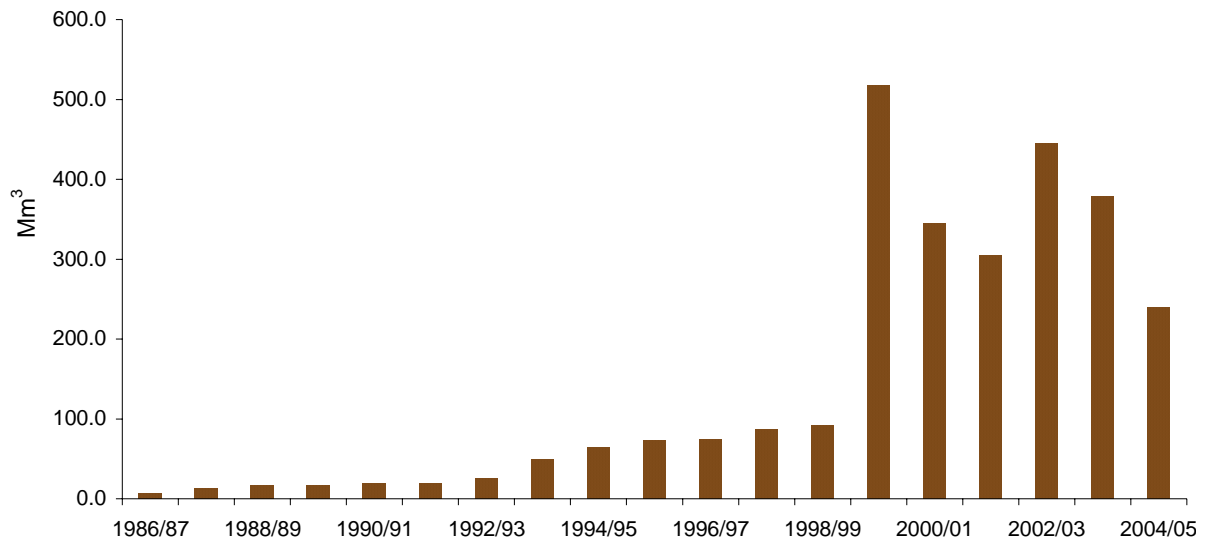
Note: * Bogaav Creek is primarily a CO₂ producer

Table 3.13 Continued

Year	North Paaratte		Boggy Creek *		Seamer		Croft		Naylor		McIntee		Tregony		Total annual production	
	cond (kL)	Gas (Mm ³)	cond (kL)	Gas (Mm ³)	cond (kL)	Gas (Mm ³)	cond (kL)	Gas (Mm ³)	cond (kL)	Gas (Mm ³)	cond (kL)	Gas (Mm ³)	cond (kL)	Gas (Mm ³)	cond (kL)	Gas (Mm ³)
1986/87	108.9	6.4	-	-	-	-	-	-	-	-	-	-	-	-	108.9	6.4
1987/88	203.8	12.4	-	-	-	-	-	-	-	-	-	-	-	-	203.8	12.4
1988/89	274.3	16.5	-	-	-	-	-	-	-	-	-	-	-	-	274.3	16.5
1989/90	271.8	17.0	-	-	-	-	-	-	-	-	-	-	-	-	271.8	17.0
1990/91	300.3	19.0	-	-	-	-	-	-	-	-	-	-	-	-	300.3	19.0
1991/92	290.7	19.2	-	-	-	-	-	-	-	-	-	-	-	-	290.7	19.2
1992/93	220.7	14.6	-	-	-	-	-	-	-	-	-	-	-	-	465.7	25.3
1993/94	0.0	0.1	-	-	-	-	-	-	-	-	-	-	-	-	1088.7	49.0
1994/95	0.0	0.0	0.1	3.4	-	-	-	-	-	-	-	-	-	-	1568.2	63.8
1995/96	0.0	0.0	4.1	10.7	-	-	-	-	-	-	-	-	-	-	1775.7	72.9
1996/97	0.0	0.0	5.8	13.8	-	-	-	-	-	-	-	-	-	-	1514.5	74.3
1997/98	328.3	19.9	7.5	14.5	-	-	-	-	-	-	-	-	-	-	1138.1	86.0
1998/99	56.3	3.8	7.1	11.8	-	-	-	-	-	-	-	-	-	-	1944.6	91.9
1999/00	405.3	112.6	7.4	16.0	-	-	-	-	-	-	-	-	-	-	14321.5	517.9
2000/01	383.6	30.5	9.6	19.7	-	-	-	-	-	-	-	-	-	-	13147.2	344.4
2001/02	55.3	5.1	10.4	17.7	-	-	409.4	8.5	258.5	4.8	973.6	36.8	109.5	2.0	11650.7	304.9
2002/03	-	-	9.6	19.2	0.0	16.2	4607.6	104.8	3227.1	66.4	2890.7	130.8	2263.6	46.9	13590.8	445.0
2003/04	-	-	9.6	19.8	-	29.7	134.0	2.8	2101.5	40.6	2085.2	89.5	877.1	17.3	6515.8	377.8
2004/05	-	-	9.6	19.2	-	10.8	53.5	1.2	254.7	5.2	500.1	18.9	0.8	0.0	1728.4	239.8
Total	2790.3	270.7	80.8	165.8	0.0	56.7	5204.5	117.3	5841.8	117.0	6449.6	276.0	7390.3	136.4	71899.3	2783.6

Source: DPI

Note: * Boggy Creek is primarily a CO₂ producer

Graph 3.14 Victorian Otway Basin Historical Gas Production: 1986/87 – 2004/05

Source: DPI

Notes: 1999/2000 production increased dramatically from previous years as Wild Dog Road, Mylor and Fenton Creek discoveries commenced production.

2002/03 production increased from previous years as McIntee, Naylor and Croft fields reached their highest production levels.

2003/04 low production was due mainly to the Croft field's low production

Table 3.14 Gross Onshore Otway Basin Gas/Condensate Production: 2003/04 – 2004/05

Field	2003/2004		2004/2005	
	Gas (Mm ³)	Condensate (kL)	Gas (Mm ³)	Condensate (kL)
Iona*	174.9	0.0	189.0	0.0
Mylor	15.9	933.6	14.7	909.7
Penryn	6.1	281.3	0.0	0.0
Fenton Creek	2.2	93.5	0.0	0.0
Tregony	17.3	877.1	0.0	0.8
McIntee	89.5	2085.2	18.9	500.1
Naylor	40.6	2101.5	5.2	254.7
Croft	2.8	134.0	1.2	53.5
Seamer	29.7	0.0	10.8	0.0
Total	379.1	6506.2	239.8	1718.8
Boggy Creek**	19.8	9.6	19.2	9.6

Sources:

Santos for: Mylor, Fenton Creek and Penryn fields

Western Underground Gas Storage for: Iona, North Paaratte and Wallaby Creek fields –

Origin for: Skull Creek, Wild Dog Road and Dunbar Fields –

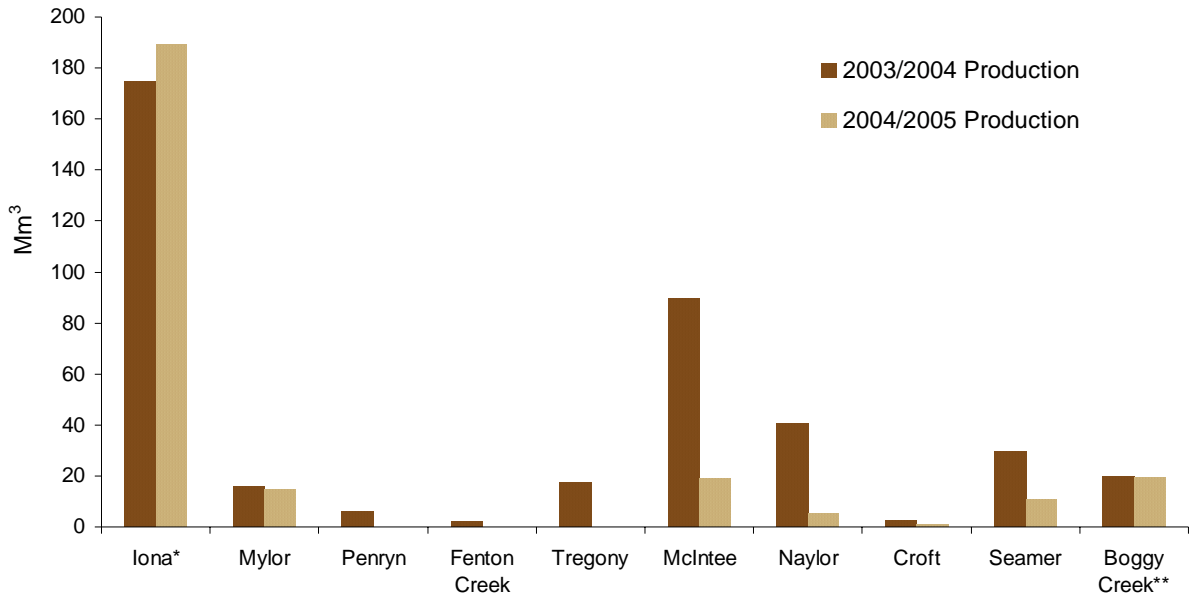
British Oxygen Company (BOC) for: Boggy Creek

Notes: The Wallaby Creek field came on stream in September 1996. Mylor and Fenton Creek came on stream in August 1999, Wild Dog Road in January 2000 and Seamer in April 2003.

*Iona – Underground Storage

** Boggy Creek is primarily a CO₂ producer

Graph 3.15 Victorian Otway Basin Gas Production: 2003/04 – 2004/05



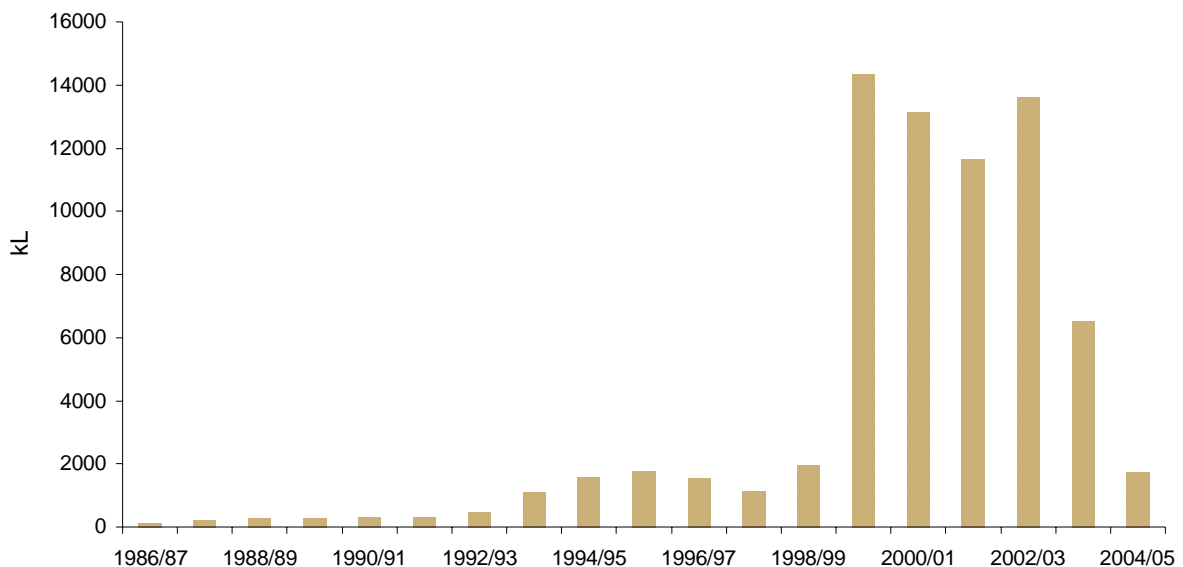
Source: DPI

Notes:

*Iona–Underground Gas Storage–not primary production

** Boggy Creek is primarily a CO₂ producer

Graph 3.16 Victorian Otway Basin Historical Condensate Production: 1986/87 – 2004/05



Source: DPI

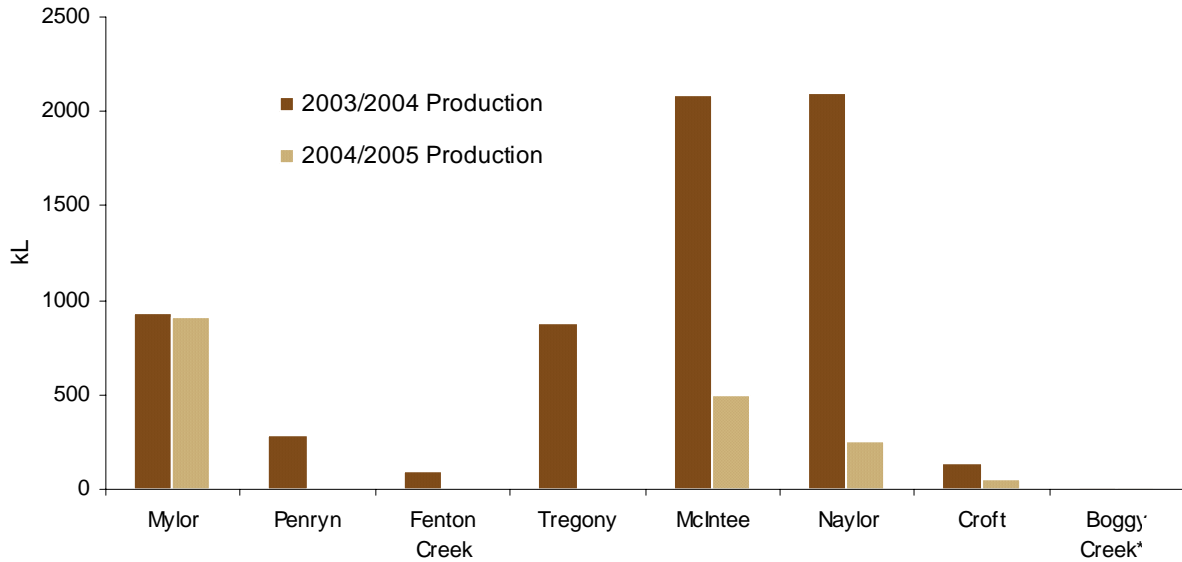
Notes:

1999/2000–production increased dramatically from previous years as Wild Dog Road, Mylor and Fenton Creek discoveries commenced production.

2002/03–production increased from previous years as the McIntee, Naylor and Croft fields reached their highest production levels.

2003/04–rapid reduction in McIntee, Naylor and Seamer production levels.

Graph 3.17 Victorian Otway Basin Condensate Production: 2003/04 – 2004/05



Source: DPI

Note: * Boggy Creek is primarily a CO₂ producer.

Table 3.15 Onshore Otway Basin Sales Gas Reserves Status: June 2005

Licence Area	Initial Reserves (Mm ³)	Cumulative Production (Mm ³)	Remaining Reserves (Mm ³)
H/C gas in Port Campbell area	2919.9	2783.6	136.3
Boggy Creek (CO ₂ Producer)*	396.4	165.8	230.6

Source: DPI

Notes: Producing fields in the Port Campbell area consist of Boggy Creek, Tregoney, McIntee, Croft, Seamer and Naylor.

The newly discovered Lavers Field in the onshore Port Campbell region is not in production yet.

The total gas in-place for undeveloped offshore gas fields – excluding Tasmanian fields – (Minerva, La Bella, Casino-1 and Geographe) is estimated at about 1269 billion cubic feet (Bcf) or 35.94 billion cubic metres (Bm³), and including Tasmania fields (Thylacine and Yolla) 2369 Bcf or 67.1 Bm³.

*Boggy Creek is primarily a CO₂ producer.

4. Minerals

Victorian mineral production continues to be dominated by brown coal and gold.

Brown coal production, predominantly from the Latrobe Valley for electricity generation, increased to 67 million tonnes in 2004/05 from a steady annual production of 66 million tonnes during the previous 3 years.

Gold production increased to 123,308 ounces in 2004/05, valued at over \$70 million, reversing the declining trend of recent years. This increase is due to Perseverance Corporation's Fosterville operation starting production in May 2005. Gypsum, kaolin and feldspar are the other significant contributors to mineral production. Both show a high degree of variability in line with seasonal and market factors. Gypsum production, primarily for agricultural uses, has decreased to 346,522 cubic metres, valued at \$4.3 million, in 2004/05 from 2003/04 production of 439,906 cubic metres. In 2004/05 kaolin production showed a significant drop to 189,237 tonnes, valued at \$0.9 million, from previous year record production of 251,392 tonnes which was the highest figure since the 1980s. Feldspar production in Victoria commenced in 1997/98 by Unimin Australia Ltd at Beechworth and has been steadily increasing reaching 75,683 tonnes, valued at \$4.9 million in 2004/05.

Mineral sands (ilmenite, rutile and zircon) production in Victoria commenced in 2000/01 by Murray Basin Titanium Pty Ltd from the Wemen mine in northwest Victoria, increasing each year to 2003/04. The Wemen mine stopped production in January 2004. Significant production is expected from the Iluka Douglas project (currently under construction) in 2006/07.

Definition of Minerals under the *Mineral Resources Development Act 1990*

'Mineral' means any substance which occurs naturally as part of the earth's crust

(a) including:

(i) oil shale and coal; and

(ii) hydrocarbons and mineral oils contained in oil shale or coal or extracted from oil shale or coal by chemical or industrial processes; and

(iii) Bentonite, fine clay, Kaolin, Lignite, minerals in alluvial form including those of titanium, zirconium, rare earth elements and platinoid group elements, Quartz crystals and Zeolite.

(b) excluding water, stone, peat or petroleum.

4.1 Exploration and Mining Tenements

In 2004/05, 139 new and renewal applications were received for mining and exploration licences, with about 71% of these being for exploration licences. 143 mining and exploration licences were granted or renewed, with about 66% of these being exploration licences. No new licences were granted for coal, although interest in Victorian brown coal is increasing.

Table 4.1 New and Renewal Applications for Mining and Exploration Licences: 2004/05

	Received	Granted	Withdrawn	Refused	Invalid
New Mining Licence Applications	16	20	2	4	0
Renewal Mining Licence Applications	25	29	0	1	0
Total Mining Licence Applications	41	49	2	5	0
New Exploration Licence Applications	56	38	8	1	0
Renewal Exploration Licence Applications	42	56	1	0	0
Total Exploration Licence Applications	98	94	9	1	0

Source: DPI

Table 4.2 Mining and Exploration Licences – Granted and Renewed: 1998/99 – 2004/05

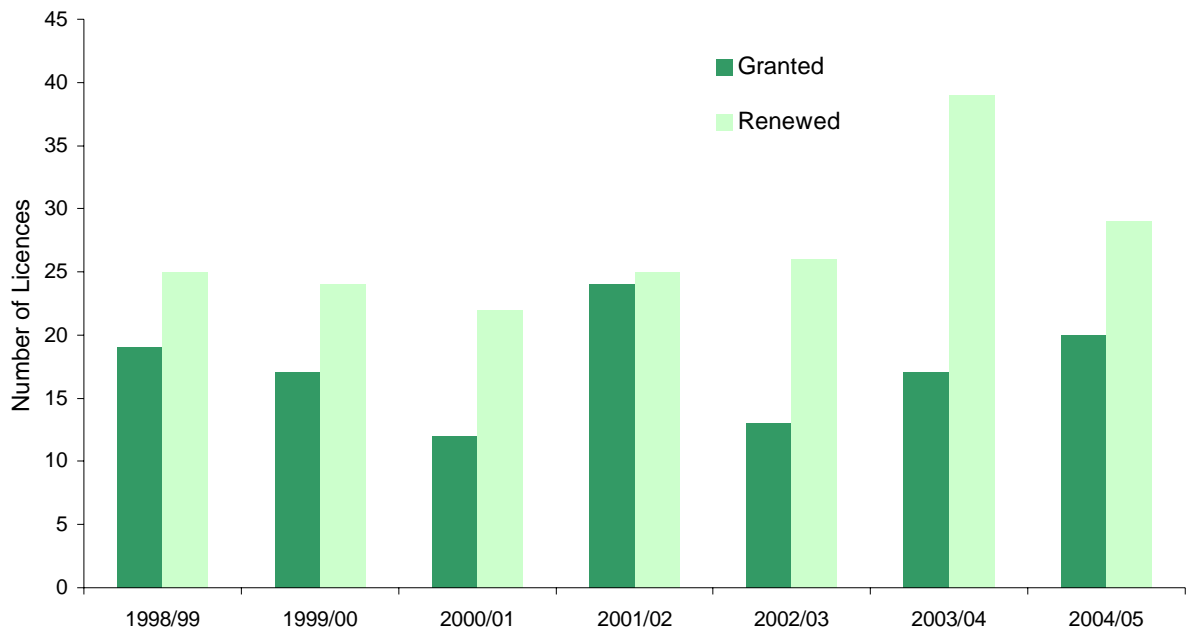
	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05
Granted	19	17	12	24	13	17	20
Renewed	25	24	22	25	26	39	29
Total Mining Licences Granted and Renewed	44	41	34	49	39	56	49
Granted	77	39	39	45	55	83	38
Renewed	82	100	63	49	47	49	56
Total Exploration Licences Granted and Renewed	159	139	102	94	102	132	94

Source: DPI

The total number of exploration and mining licences granted is a broad indicator of exploration and mining activity.

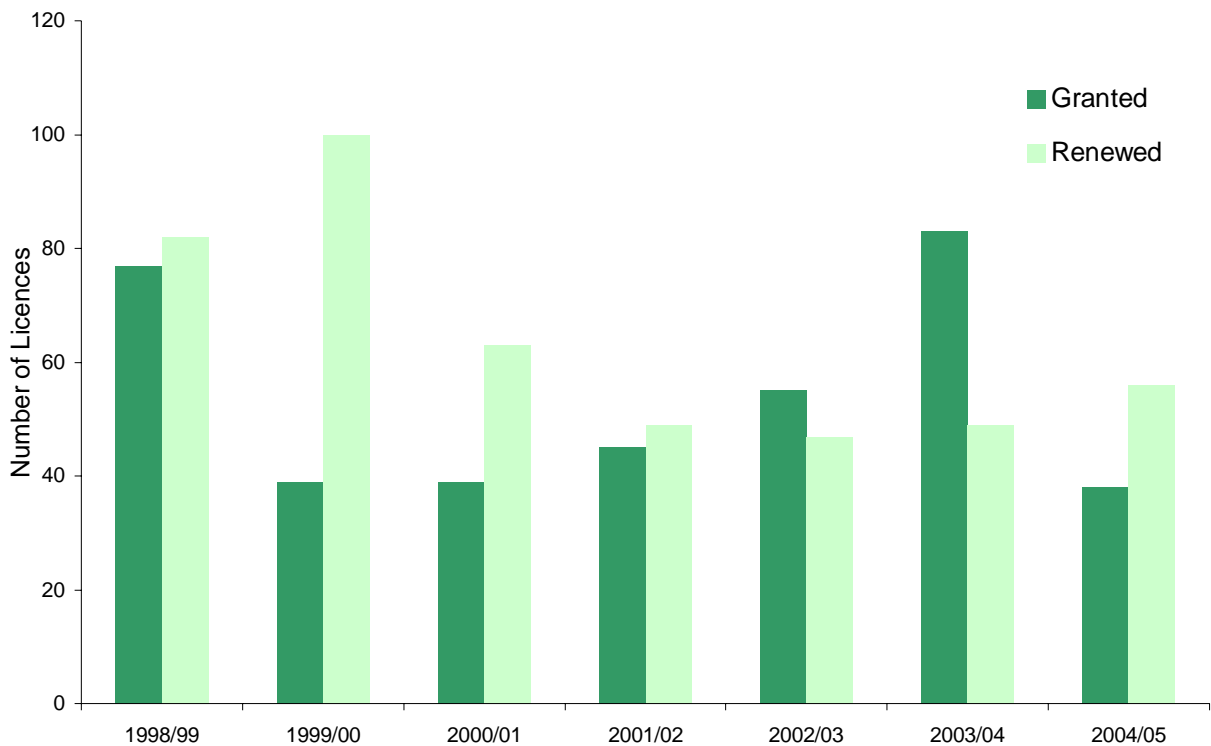
The total number of exploration and mining licences granted since 1998 has been variable, with a marked drop in exploration licences granted in 2004/05 of 94, down from 132 licences granted in 2003/04. The total number of mining licence grants also decreased in 2004/05, due to decreasing mining licence renewals in the same period.

Graph 4.1 Mining Licence Grants: 1998/99 – 2004/05



Source: DPI

Graph 4.2 Exploration Licence Grants: 1998/99 – 2004/05



Source: DPI

Table 4.3 Current Mining and Exploration Licences at 30 June each year: 1999 – 2005

	1999	2000	2001	2002	2003	2004	2005
Mining Licences	341	320	312	305	279	264	266
Exploration Licences	245	274	209	170	184	207	203
Totals	586	594	521	475	463	471	469

Source: DPI

In 2003/04 the total areas covered by current mining and current exploration licences were 570 km² and 97,000 km² and in 2004/05 the areas covered by current licences were 650 km² and 87,100 km² respectively. The number of current mining licences has steadily fallen over the last seven years. A significant number of amalgamations have contributed to the lower number of current mining licences. The total number of current exploration and mining licences has remained fairly steady, averaging about 470 from 2002/03 to 2004/05.

Graph 4.3 Current Mining and Exploration Licences as at 30 June each year (1999 – 2005)

Source: DPI

4.2 Exploration

The Australian Bureau of Statistics (ABS) reports quarterly on private mineral exploration for all states. Victorian mineral exploration and mining expenditure is also reported by a requirement of the *Mineral Resources Development Act 1990* (MRDA). The ABS exploration expenditure statistics can vary significantly from expenditure reported under the MRDA. However, the ABS statistics are the only basis for comparison of Victorian expenditure with that of other States and are generally preferred as a guide to exploration trends.

Table 4.4 Expenditure on Mineral Exploration and Mining Development (\$A million): 1994/95 – 2004/05

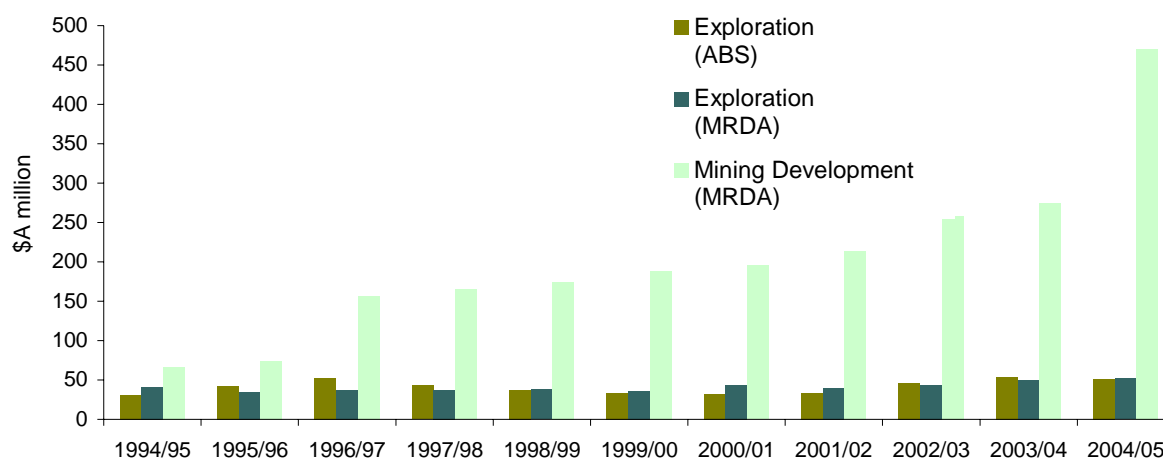
	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05
Exploration (ABS)	31.2	42.6	52.3	43.1	37.0	33.8	32.7	33.9	46.2	53.5	51.5
Exploration (MRDA)	41.1	35.1	37.6	36.9	38.0	35.8	43.4	39.3	43.3	50.2	52.2
Mining Development (MRDA)	66.7	73.8	156.8	165.2	174.0	188.3	195.5	213.5	258.2	274.4	469.9

Source: Figures collated from six monthly reports forwarded to DPI required by the MRDA, and ABS: Actual and Expected Private Mineral Exploration (Catalogue No. 8412.0).

Notes: The MRDA mining expenditure figures represent total expenditure; ie capital and operating; by commercial entities engaged in exploration and mining activity during the relevant periods.

The MRDA exploration expenditure figures include exploration expenditure on mining and exploration licences.

Graph 4.4 Expenditure on Mineral Exploration and Mining Development (\$A million): 1994/95 – 2004/05



Source: DPI

Mineral exploration expenditure is a lead indicator of mineral industry activity. ABS data shows the strong growth trend of the exploration expenditure since 2001/02, with a slight decline in 2004/05. Victoria's mineral exploration expenditure is 5% of Australia's total.

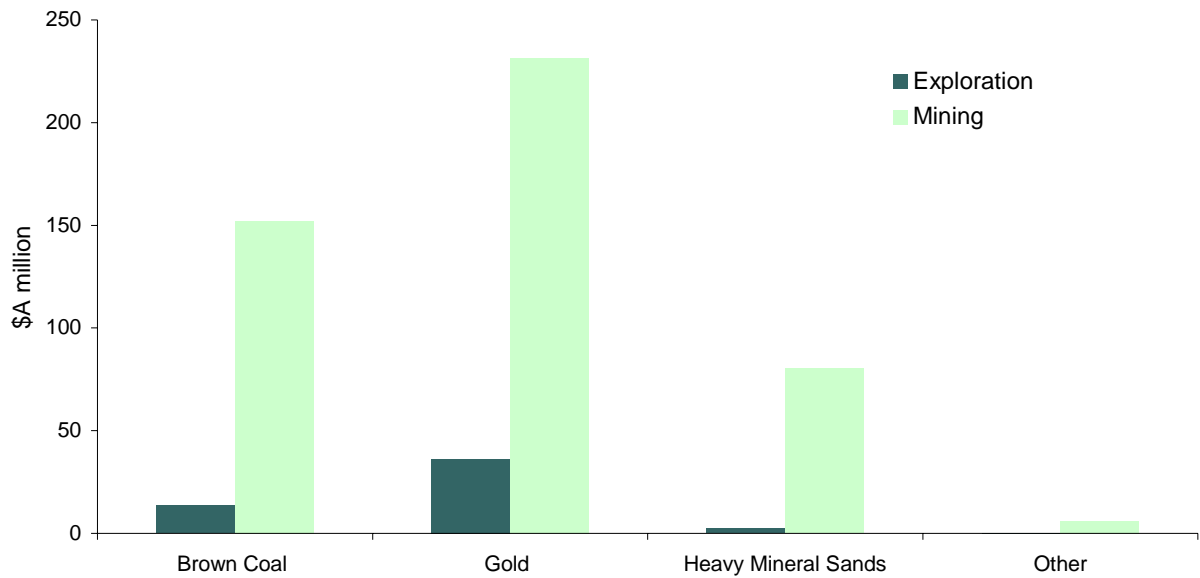
Expenditure on mine development was boosted by the inclusion of expenditure reported by brown coal mines in the Latrobe Valley for the first time since 1996/97. The upward trend has continued and showed further significant growth in 2004/05 largely due to the construction phase of gold mines including Perseverance Corporation's Fosterville mine, Bendigo Mining's New Bendigo project, Ballarat Goldfields Ballarat East project, TRUenergy's East Field brown coal development and Iluka's Douglas mineral sands project.

Table 4.5 Mineral Exploration and Mining Development Expenditure by Sector (\$A million): 2004/05

Sector	Exploration (\$A million)	Mining (\$A million)
Brown Coal	13.6	152.2
Gold	36.1	231.4
Heavy Mineral Sands	2.4	80.2
Other	0.1	6.1
Total	52.2	469.9

Source: DPI

Graph 4.5 Mineral Exploration and Mining Development Expenditure by Sector (\$A million): 2004/05



Source: DPI

4.3 Production

Table 4.6 Mineral Production: 1983/84 – 2004/05

Year	Fuel Minerals	Metallic Minerals				Industrial Minerals					
	Brown Coal ('000 tonne)	Gold (kg)	Gold (oz)	Copper Concentrate (tonne)	Zinc Concentrate (tonne)	Zircon (tonne)	Rutile (tonne)	Ilmenite (tonne)	Feldspar (tonne)	Gypsum (cubic metre)	Kaolin (tonne)
1983/84	33,198	150	4,823	-	-	-	-	-	-	207,400	83,700
1984/85	38,379	902	29,004	-	-	-	-	-	-	247,300	88,100
1985/86	36,069	1,272	40,901	-	-	-	-	-	-	138,800	35,900
1986/87	41,806	1,179	37,911	-	-	-	-	-	-	187,700	41,100
1987/88	44,288	1,719	55,274	-	-	-	-	-	-	203,100	100,800
1988/89	48,653	2,512	80,773	-	-	-	-	-	-	241,400	117,300
1989/90	45,960	3,515	113,025	-	-	-	-	-	-	301,500	168,900
1990/91	49,388	4,863	156,370	-	-	-	-	-	-	49,200	145,800
1991/92	50,717	3,346	107,591	-	-	-	-	-	-	53,100	87,800
1992/93	47,898	3,993	128,395	-	-	-	-	-	-	180,200	114,600
1993/94	49,683	3,917	125,960	16,287	1,012	-	-	-	-	176,800	105,400
1994/95	49,922	4,319	138,876	13,163	5,947	-	-	-	-	193,100	79,500
1995/96	54,281	4,838	155,550	1,338	6,384	-	-	-	-	198,667	55,065
1996/97	60,795	4,710	151,229	nil	nil	-	-	-	-	501,495	114,778
1997/98	65,274	4,979	160,122	nil	nil	-	-	-	25,703	479,820	166,100
1998/99	66,648	4,947	159,088	nil	nil	-	-	-	45,293	404,917	180,634
1999/00	67,363	4,790	154,043	nil	nil	-	-	-	46,162	462,806	201,436
2000/01	64,958	3,814	122,632	nil	nil	1,307	5,921	-	53,148	437,694	203,753
2001/02	66,661	3,492	112,283	nil	nil	4,043	21,328	30,627	56,757	600,931	202,370
2002/03	66,809	3,345	107,544	nil	nil	10,841	28,329	50,984	68,198	420,293	248,692
2003/04	66,343	3,240	104,188	nil	nil	4,645	11,239	19,978	69,552	439,906	251,392
2004/05	67,152	3,835	123,308	nil	nil	nil	nil	nil	75,683	346,522	189,237

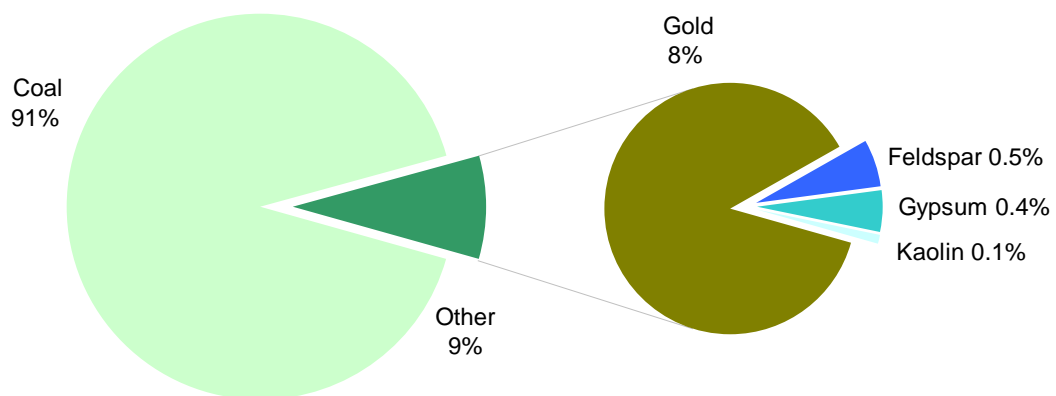
Source: DPI – statutory returns under the MRDA.

Table 4.7 Mineral Production Values: 2004/05

Mineral	Value (\$A million)
Coal	843.4
Gold	70.3
Feldspar	4.9
Gypsum	4.3
Kaolin	0.9
Total	923.8

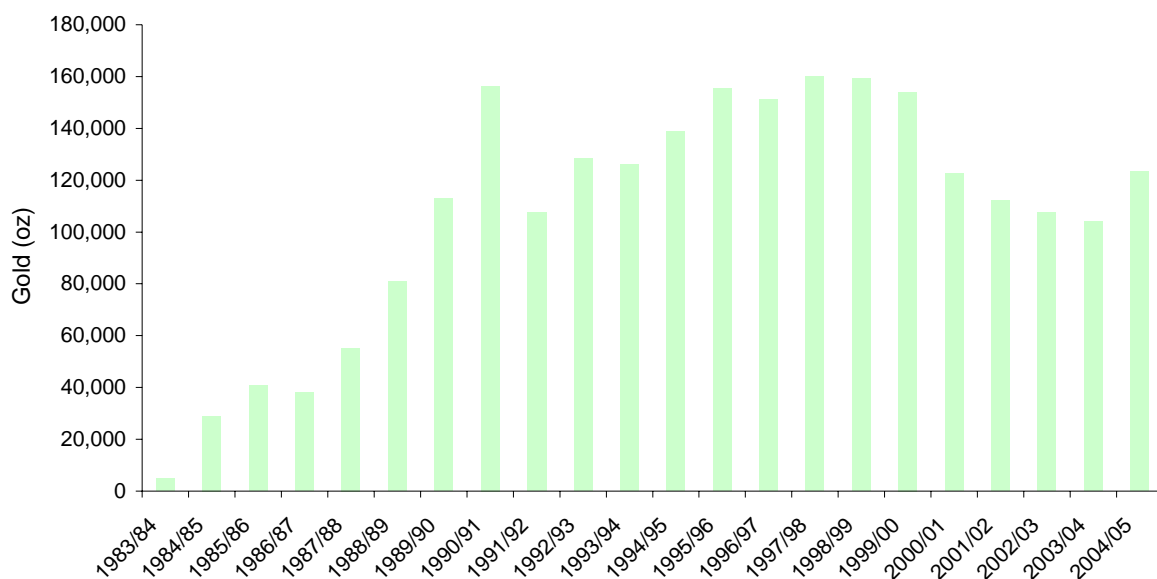
Source: DPI

Graph 4.6 Mineral Production Values: 2004/05



Source: DPI

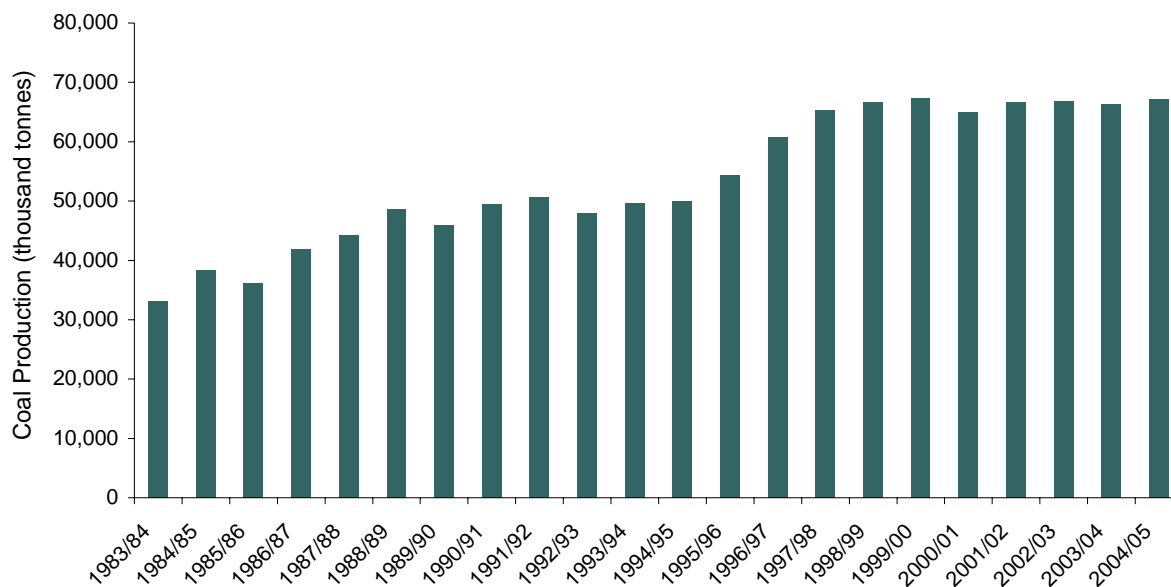
Graph 4.7 Gold Production: 1983/84 – 2004/05



Source: DPI

Since 1998/1999, gold production in Victoria was in a decline for several years. However, with increased production at Stawell and Fosterville, gold production in 2004/05 increased by 18% over the previous year to 123,308 ounces. This upward trend is expected to continue in 2005/06.

Graph 4.8 Brown Coal Production: 1983/84 – 2004/05



Source: DPI

Table 4.8 Gold Producers (Production more than 100kg): 2004/05

Producer	Location	Licence	Production (kg)	Production (oz)	Estimated Value (\$A)
Stawell Gold Mines	Stawell	MIN 5260	3,700	118,985	67,821,450
Perseverance Exploration Pty Ltd	Fosterville	MIN 5404	112	3,590	2,046,300
	Total		3,812	122,575	69,867,750
		OTHER	23	733	417,810
	TOTAL PRODUCTION		3,835	123,308	70,285,560

Source: DPI – statutory returns under the MRDA

Notes: Estimated value \$A570/oz

Gold production is dominated by one mine, with many smaller companies and individuals producing small amounts. The large part of Victoria's gold production is from Stawell Gold Mines Pty Ltd at Stawell. The other key producer in 2004/05 was Perseverance Exploration Pty Ltd, at Fosterville.

Table 4.9 Brown Coal Production (thousand tonnes): 1982/83 – 2004/05

YEAR	Maddingley Brown Coal Company Bacchus Marsh	Alcoa Anglesea	SECV	Loy Yang	Yallourn	Hazelwood	Annual Total	Production Value* (\$A)
1982/83	83	1,210	33,415	-	-	-	34,708	-
1983/84	80	1,066	32,052	-	-	-	33,198	-
1984/85	89	1,205	37,085	-	-	-	38,379	-
1985/86	60	1,119	34,890	-	-	-	36,069	-
1986/87	43	1,272	40,491	-	-	-	41,806	-
1987/88	45	1,173	43,070	-	-	-	44,288	-
1988/89	47	1,253	47,353	-	-	-	48,653	-
1989/90	22	1,067	44,871	-	-	-	45,960	-
1990/91	40	1,179	48,169	-	-	-	49,388	-
1991/92	40	1,175	49,502	-	-	-	50,717	-
1992/93	36	1,084	46,778	-	-	-	47,898	-
1993/94	31	1,093	48,559	-	-	-	49,683	-
1994/95	43	1,162	48,717	-	-	-	49,922	-
1995/96	40	836	-	25,000	17,460	10,945	54,281	434,248,000
1996/97	39	1,005	-	27,808	17,083	14,860	60,795	486,360,000
1997/98	28	1,030	-	29,766	17,924	16,525	65,274	522,192,000
1998/99	22	1,091	-	30,510	17,350	17,675	66,648	533,184,000
1999/00	4	926	-	30,865	16,098	19,470	67,363	538,904,000
2000/01	11	963	-	28,686	16,234	19,063	64,958	519,664,000
2001/02	10	1,069	-	30,949	15,650	18,982	66,661	533,287,000
2002/03	15	1,051	-	29,017	17,515	19,210	66,809	534,472,000
2003/04	18	1,107	-	29,577	16,585	19,056	66,343	530,744,000
2004/05	19	943	-	29,826	17,663	18,701	67,152	843,429,000

Source: DPI

* Estimated value of \$8/tonne has been used until 2003/04. In 2004/05 this value was re-assessed as \$12.56/tonne.

Brown coal production is dominated by the electricity generation companies in the Latrobe Valley – International Power Hazelwood, Loy Yang Power Management Pty Ltd and TRUenergy Ltd. The largest producer is Loy Yang followed by Hazelwood and TRUenergy.

The other major brown coal miner is Alcoa of Australia Ltd, which produces brown coal at Anglesea to generate electricity for its Point Henry aluminium smelter. The Maddingley Brown Coal Company produces a very small amount of coal at Bacchus Marsh, mainly for fuel and soil conditioning.

5. Extractive Industry

Extractive industries provide the raw materials for building and construction, which is vital to the State's development. The industry operates quarries that produce a range of hard rock, clay, sand and gravel.

There are 856 operating quarries operated under the *Extractive Industry Development Act* 1995 in Victoria. A total of 515 of these reported a production of 41.7 million tonnes in 2004/05. This is higher than the previous year's production of 38.9 million tonnes and the highest recorded since data was collected in 1996/97. This is possibly a reflection of improved reporting rather than an increased demand for the extractive materials.

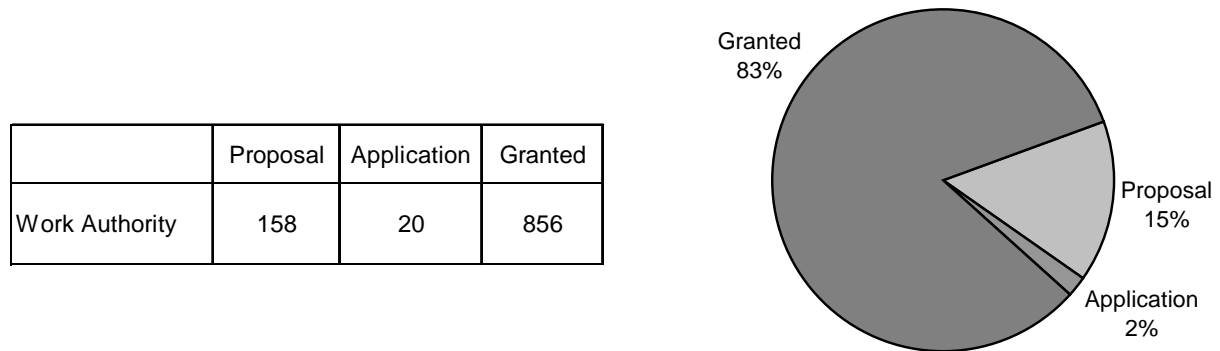
Definition of the Extractive Industry under the *Extractive Industries Development Act* 1995

"Extractive industry" means the extraction or removal of stone from land if the primary purpose of the extraction or removal is the sale or commercial use of the stone or the use of the stone in construction, building, road or manufacturing works and includes:

- (a) the treatment of stone or the manufacture of bricks, tiles, pottery or cement products on or adjacent to land from which the stone is extracted; and
- (b) any place, operation or class of operation declared by the Minister, by notice published in the Government Gazette, to be an extractive industry for the purposes of this Act.

5.1 Work Authorities

Table and Graph 5.1 Status of Current Extractive Industry Work Authorities at 30 June 2005



Source: DPI

Notes: A Work Authority is granted under the *Extractive Industries Development Act 1995*

5.2 Production

Table 5.2 Victorian Extractive Industries Production and Sales by Rock Type: 2004/05

Product Group	Product Type	Sales - volume (tonne)	Sales - value (\$A)
Hard Rock	Basalt	15,183,176	202,320,947
	Dolerite	897,144	9,959,260
	Gneiss	14,903	111,784
	Granite	2,366,500	30,490,635
	Hornfels	4,903,997	69,659,031
	Quartzite	177,334	1,343,088
	Rhyodacite	996,179	19,718,230
	Schist	180,663	2,723,466
	Sedimentary	1,038,805	6,884,736
	Slate	3,362.00	377,000
Hard Rock Total		25,762,063	343,588,177
Soft Rock	Clay & clay shale	1,425,921	5,864,158
	Limestone	2,006,114	23,615,921
	Sand & gravel	11,493,575	136,125,283
	Scoria	436,506	6,235,021
	Soil	25,885	289,656
	Tuff	549,608	2,715,956
Soft Rock Total		15,937,609	174,845,995
GRAND TOTAL		41,699,672	518,434,172

Source: DPI – statutory returns under the *Extractive Industries Development Act 1995*

Notes: An estimated value is used where no data is supplied by the operator.

Only operations reporting under the *Extractive Industries Development Act 1995*, are included in these figures.

Table 5.3 Victorian Extractive Industries Production and Sales by Product: 2004/05

Product Group	Product Type	Sales - volume (tonne)	Sales - value (\$A)
Single size products	Aggregate	10,470,738	171,616,267
	Armour	205,674	2,785,214
Single size products total		10,676,412	174,401,481
Multi size products	Road base	5,800,931	74,519,199
	Road sub-base	7,822,847	66,446,469
	Fill	1,862,151	11,589,566
Multi size products total		15,485,929	152,555,234
Sand products	Concrete sand	5,042,631	75,491,473
	Foundry sand	28,000	574,000
	Fine sand	2,021,643	18,542,020
	Industrial	79,344	842,070
	Glass sand	456,794	4,569,740
Sand products total		7,628,412	100,019,303
Limestone Products	Cement	573,322	4,706,974
	Agriculture	505,581	8,891,462
	Lime	53,984	3,568,321
Limestone products total		1,132,887	17,166,757
Clay products	Brick	1,057,473	4,936,185
	Firebricks	300	2,400
	Stoneware	1,390	20,850
	Tile/pipe	59,085	255,815
Clay products total		1,118,248	5,215,250
Miscellaneous	Dimension stone	18,226	1,389,664
	Unspecified	5,639,559	67,686,486
Miscellaneous total		5,657,785	69,076,150
GRAND Total		41,699,673	518,434,175

Source: DPI – Statutory returns under the *Extractive Industries Development Act 1995*

Notes: Only operations reporting under the *Extractive Industries Development Act 1995*, are included in tables 5.2 and 5.3.

Table 5.4 Victorian Dimension Stone Production: 1991/92 – 2004/05

	1994/95 (tonne)	1995/96 (tonne)	1996/97 (tonne)	1997/98 (tonne)	1998/99 (tonne)	1999/00 (tonne)	2000/01 (tonne)	2001/02 (tonne)	2002/03 (tonne)	2003/04 (tonne)	2004/05 (tonne)
Basalt	11,845	10,065	2,000	6,060	0	19,063	20,868	18,803	12,419	13,864	13,875
Granite	5,213	5,516	4,405	1,821	2,572	3,462	943	1,058	1,993	1,600	879
Sandstone	902	196	1,400	256	1,295	343	103	492	185	258	1090
Slate	780	730	977	1,130	1,058	538	938	613	617	548	2,382
TOTAL	18,740	16,507	8,782	9,267	4,925	23,406	22,852	20,966	15,214	16,270	18,226

Sources: Operators, DPI records and statutory returns under the *Extractive Industries Development Act 1995*

Dimension stone production in 2004/05 showed a slight increase from the previous year largely due to improved reporting.

6. Governance

DPI collected a total of \$A25.5 million in royalties, rentals and administration fees in 2004/05 under the *Mineral Resources Development Act 1990*, the *Extractive Industries Development Act 1995* and the *Petroleum Act 1998*.

Rehabilitation bonds held by DPI increased from \$A105.9 million in 2003/04 to \$A115.5 million in 2004/05, as a result of bond reviews and the issue of new licences.

Inspectors from DPI's Minerals and Petroleum Regulation Branch provide Statewide safety and health coverage of the mining, quarrying and upstream petroleum industries.

Minerals and Petroleum Regulation Branch Inspectors operate under the following Acts:

- *Mineral Resources Development Act 1990*
- *Extractive Industries Development Act 1995*
- *Petroleum (Submerged Lands) Act 1967* (as Designated Authority under this Commonwealth Act)
- *Petroleum (Submerged Lands) Act 1982*
- *Petroleum Act 1998*
- *Pipelines Act 1967*
- *Occupational Health and Safety Act 1905* (for Offshore Petroleum sites)
- *Dangerous Goods Act 1985* (for offshore Petroleum sites and explosives on mining and extractive sites) and the associated regulations.

The Inspectors, by agreement with the Victorian Workcover Authority, are also inspectors under the *Occupational Health and Safety Act 1985* for the Mining, Onshore Petroleum and Extractive Industries.

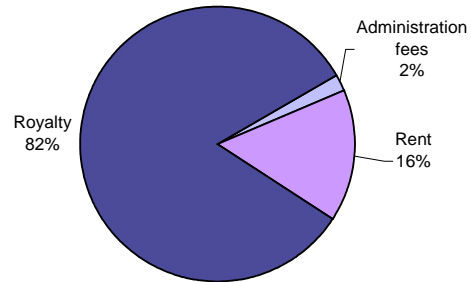
The Department issued 119 licences to use explosives, two storage licences and thirteen Quarry Manager certificates in 2004/05.

The mining industry recorded 20 Lost Time Injuries with a Lost Time Injuries Frequency Rate of 5.0 in 2004/05, slightly up from 17 and 4.9 respectively, in 2003/04. The extractive industry recorded an increase in Lost Time Injuries from 22 in 2003/04 to 28 in 2004/05. Corresponding Lost Time Injuries Frequency Rates increased from 7.7 to 8.3 in the same period.

6.1 Regulation, Revenue and Enforcement

Table and Graph 6.1 Minerals, Extractive and Petroleum Revenue: 2004/05

Revenue Stream	Revenue (\$A million)
Administration fees	0.51
Rent	3.98
Royalty	20.98
Total	25.47

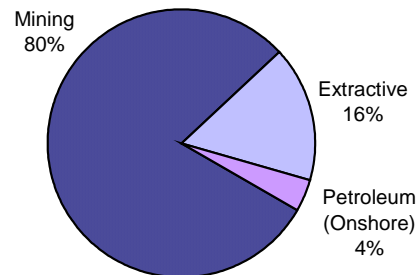


Source: DPI

Note: Royalty collected for the production/sales reported in the year ending 30/6/05.

Table and Graph 6.2 Minerals, Extractive and Petroleum Royalty – by Sector: 2004/05

Sector	Revenue (\$A million)
Mining	16.75
Extractive	3.42
Petroleum (Onshore)	0.81
Total	20.98



Source: DPI

Notes:

Offshore petroleum production is subject to Resource Rent Tax, which was phased in from 1987–92.

Includes some calendar year payments

Table 6.3 Rehabilitation Bonds by Sector – Value (\$A million): June 1999 – June 2005

Date	Mineral Exploration	Mining	Extractive	Total
Jun-99	1.50	53.15	20.20	74.86
Jun-00	1.28	53.26	22.78	77.32
Jun-01	1.23	57.43	31.39	90.06
Jun-02	1.13	57.46	34.54	93.13
Jun-03	1.13	57.05	37.52	95.69
Jun-04	1.15	65.59	39.17	105.91
Jun-05	1.75	66.28	47.50	115.53

Source: DPI

Table 6.4 Rehabilitation Bond Reviews: 2004/05

Number of Bonds Reviewed	Result of Bond Review		
	Bond Increase	No Change	Bond Decrease
344	99	238	7

Source: DPI

Notes: DPI has a program of regular bond review for active sites. Bonds are reviewed every one to six years depending on the risk associated with the operation.

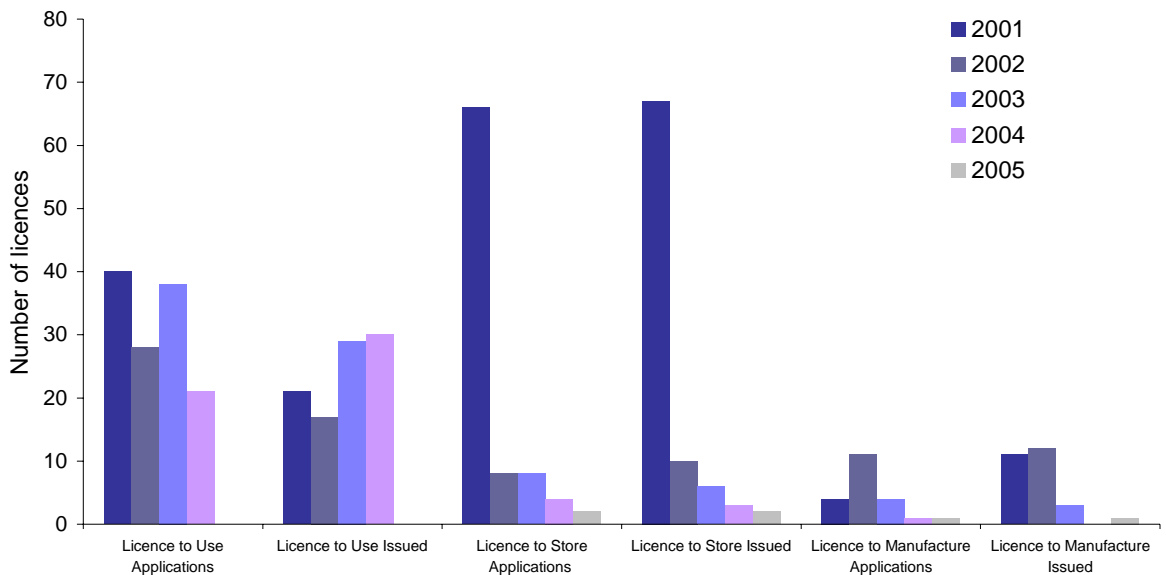
Table 6.5 Mines and Quarries Explosive Licences Applications and Grants: 1999 – 2005

	1998	1999	2000	2001	2002	2003	2004	2005
Licence to Use Applications	13	12	35	40	28	38	21	164*
Licence to Use Issued	42	25	11	21	17	29	30	119*
Licence to Store Applications	87	83	79	66	8	8	4	2
Licence to Store Issued	82	74	74	67	10	6	3	2
Licence to Manufacture Applications	0	0	8	4	11	4	1	1
Licence to Manufacture Issued	0	0	0	11	12	3	0	1

Source: DPI

*Include a number of licences renewed under the new *Dangerous Goods (Explosives) Regulations 2000* (reg. 704)

Graph 6.3 Explosives Licences Mines and Quarries: 2001 – 2005



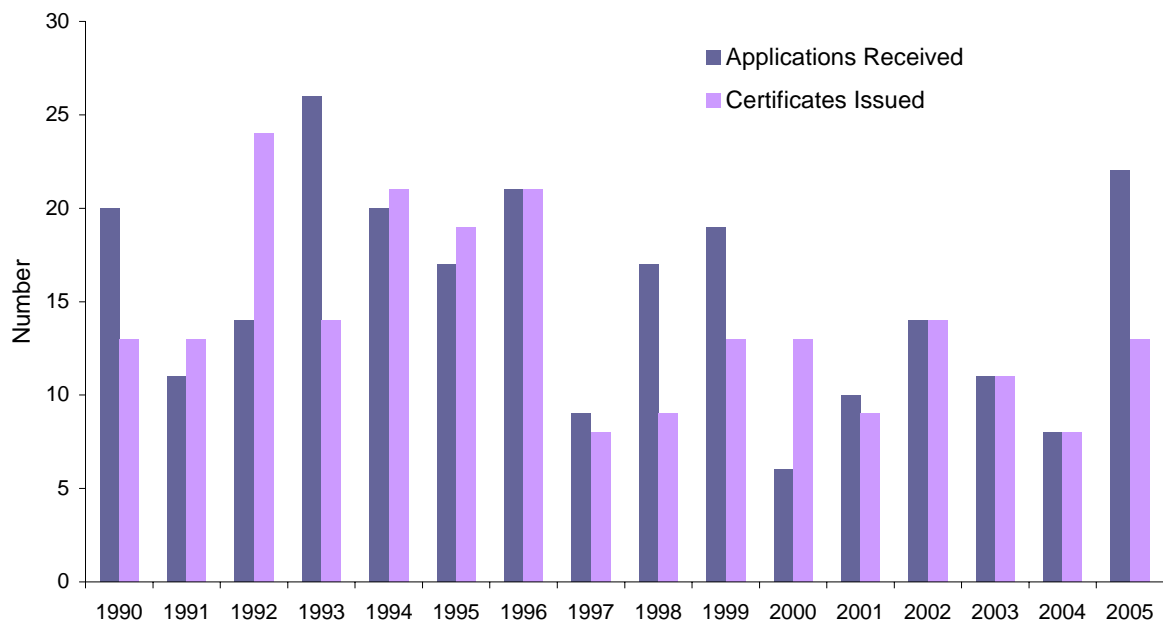
Source: DPI

Notes: Figures indicate industry demands for various type of explosives licences

Table 6.6 Quarry Manager Certificates Applications and Grants: 1990 – 2005

Year Ending	Applications Received	Certificates Issued
Dec 1990	20	13
Dec 1991	11	13
Dec 1992	14	24
Dec 1993	26	14
Dec 1994	20	21
Dec 1995	17	19
Dec 1996	21	21
Dec 1997	9	8
Dec 1998	17	9
Dec 1999	19	13
Dec 2000	6	13
Dec 2001	10	9
Dec 2002	14	14
Dec 2003	11	11
Dec 2004	8	8
Dec 2005	22	13
Total	245	223

Source: DPI

Note: Quarry Manager Certificates are no longer required under the *EIDA* 1995, in line with other states.Graph 6.4 Quarry Managers Certificates issued under the *Extractive Industries Development Act* 1995

Source: DPI

Table 6.7 Enforcement 2005

Compliance Audits	90
Inspections	311
Site Visits	697
Complaints Received	150
Investigations Initiated	39
Explosives Licences Issued	122
Prohibition Notices Issued	20
Improvement Notices Issued	141
Dangerous Goods Directions Issued	16
MRDA Notices Issued	17
MRDA Infringement Notices Issued	7
EIDA Notices Issued	95
EIDA Infringement Notices Issued	21
Total Bond Reviews Completed	344
Total of Regulatory Activities	2070

Source: DPI

Notes:

Notices/Directions and Improvement Notices: Legal directions issued to an employer (operator), that require actions to be undertaken within a specified time

Infringement Notices: Issued to persons that have committed an infringement against a relevant Act or Regulations. They include a financial penalty.

Prohibition Notices: Legal directions issued to an employer, prohibiting specified activity until issue is remedied.

6.2 Occupational Health and Safety

Fatal Injuries

Twelve fatalities were recorded by the Australian minerals industry in 2002/03 and in 2003/04. There were no fatalities in Victoria in the same period.

The risk of fatalities is measured by the Fatal Injury Frequency Rate (FIFR – the number of fatal injuries per million hours worked). Victoria's FIFR of 0.04 is well below the 10 year national average of 0.08 (MCA, Health and Safety Performance Report 2003–2004).

Lost Time Injuries

Over the last decade the number of lost time injuries in the mining sector across Australia has decreased by 70% from 5,128 to 1520 (MCA, Health and Safety Performance Report 2003–2004). The Victorian minerals sector has achieved similar improvements in the reduction of lost time injuries.

The Lost Time Injury Frequency Rate (LTIFR– number of lost time injuries per million hours worked) is a measure of the risk of lost time injuries. The LTIFR decreased in Victoria from 19.5 in 1994/95 to 6.8 in 2004/05.

The mining industry recorded 20 Lost Time Injuries with a Lost Time Injuries Frequency Rate of 5.0 in 2003/04, slightly up from the previous year's records of 17 and 4.9 respectively. The extractive industry recorded an increase in Lost Time Injuries from 22 in 2003/04 to 28 in 2004/05. Corresponding Lost Time Injuries Frequency Rates increased from 7.7 to 8.3 in the same period.

In Victoria for each lost time injury, an average of 12.7 days absence was recorded for the year 2004/05 this is a big improvement from 24.6 recorded in 2003/04. For the year 2004/05, 83 days were lost per million man hours worked, close to half the rate recorded in 2003/04.

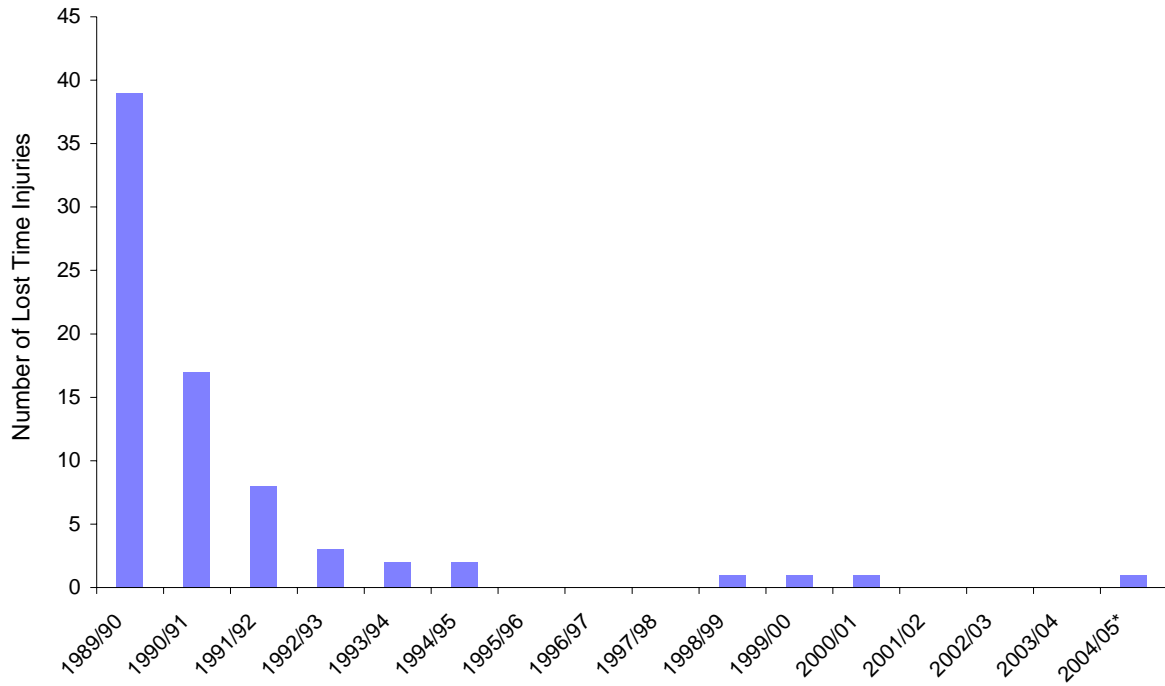
Table 6.8 Offshore Petroleum Safety Statistics: 1989/90 – 2004/05

Year	Lost Time Injuries
1989/90	39
1990/91	17
1991/92	8
1992/93	3
1993/94	2
1994/95	2
1995/96	0
1996/97	0
1997/98	0
1998/99	1
1999/00	1
2000/01	1
2001/02	0
2002/03	0
2003/04	0
2004/05*	1

Source: DPI

*As of 31st December 2004

Graph 6.5 Offshore Petroleum Safety Statistics: 1989/90 – 2004/05



Source: DPI

*As of 31st December 2004

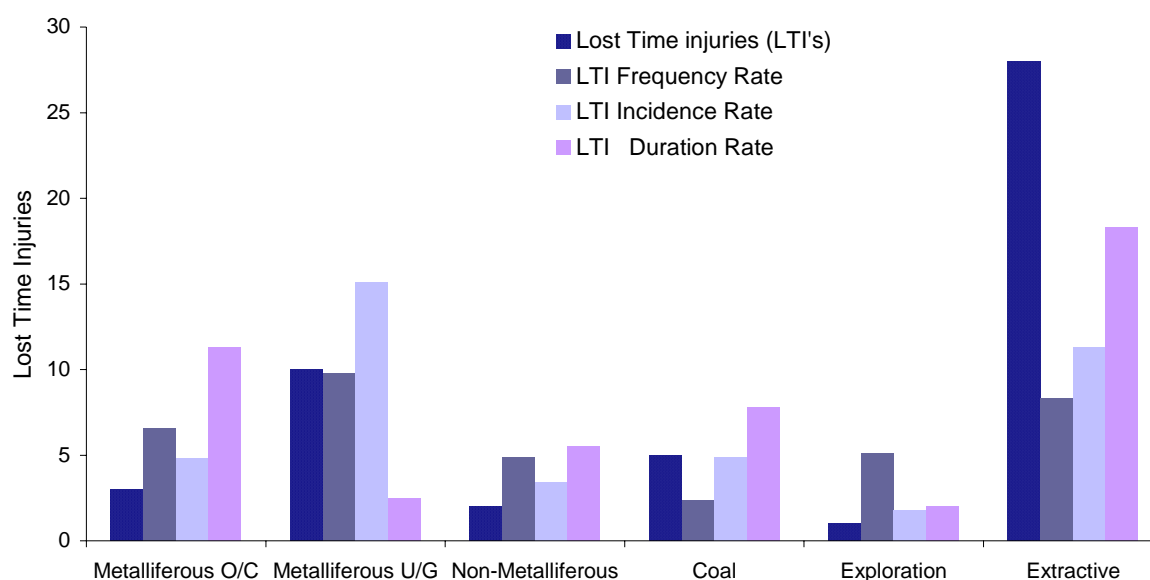
Table 6.9 Safety Statistics by Sector: 2004/05

Sector	Employed*	Hours Worked	Days Lost	Lost Time injuries (LTI's)	LTI Frequency Rate	LTI Incidence Rate	LTI Duration Rate	Severity Rate	Fatalities
Metalliferous O/C	624	457,374	34	3	6.6	4.8	11.3	74.4	nil
Metalliferous U/G	665	1,017,801	25	10	9.8	15.1	2.5	24.6	nil
Non-Metalliferous	585	406,381	11	2	4.9	3.4	5.5	27.1	nil
Coal	1,026	2,108,875	39	5	2.4	4.9	7.8	18.5	nil
Exploration	572	192,579	2	1	5.1	1.8	2.0	10.8	nil
Extractive	2,472	3,381,214	512	28	8.3	11.3	18.3	151.4	nil
Total	5,944	7,564,224	623	49	6.5	8.2	12.7	82.4	nil

Source: DPI – returns made under the MRDA

Notes: * Annual average number of person employed as reported.

The extractive and metalliferous underground operations were the main contributors to LTI counts for the mining industry in 2004/05, followed by coal and metalliferous open-cut operations. The highest LTI Frequency Rate for the year was recorded for metalliferous underground operations.

Graph 6.6 Safety Statistics by Sector: 2004/05

Source: DPI – returns made under the MRDA

Notes: Annual average number of persons employed as reported.

Table 6.10 Mining Safety Statistics: 1993/94 – 2004/05

Operation	Lost Time injuries (LTI's)	Employed*	Days Lost	LTI Frequency Rate	LTI Incidence Rate	LTI Duration Rate	Severity Rate	Fatalities
1993/94	36	-	-	35.0	-	-	-	2
1994/95	24	-	-	18.7	-	-	-	0
1995/96	26	-	-	20.0	-	-	-	0
1996/97	50	-	-	16.0	-	-	-	0
1997/98	45	-	612	14.1	23.4	13.6	192.2	0
1998/99	34	1782	444	10.2	19.0	13.0	133.1	0
1999/00	28	1742	474	9.4	16.1	16.9	158.0	0
2000/01	27	2365	537	8.8	11.4	19.9	176.4	1
2001/02	22	2175	176	6.1	10.1	8.0	48.7	0
2002/03	27	1855	440	8.0	14.6	16.3	130.6	0
2003/04	17	2395	482	4.9	7.1	30.1	144.0	0
2004/05	20	2902	109	5.0	6.9	5.5	27.3	0

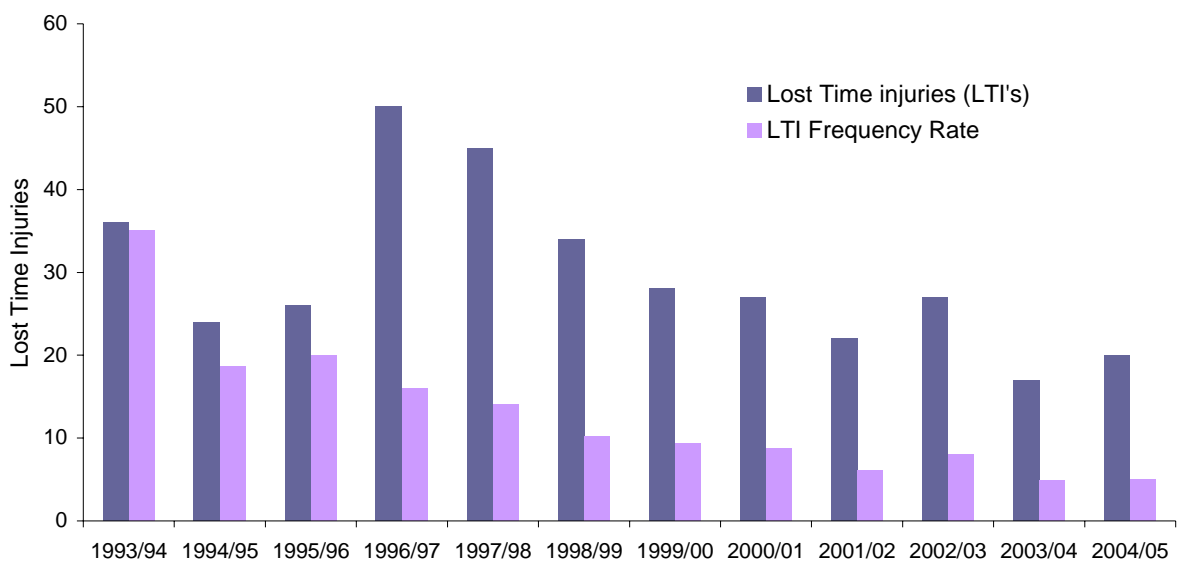
Source: DPI – returns made under the *Mineral Resources Development Act 1990*

Notes:

* Annual average number of persons employed as reported.

The total number of Lost Time Injuries (LTI) reported in the mining industry increased, from 17 in 2003/04 to 20 in 2004/05. Due to increased employment, the LTI Frequency Rate has remained fairly steady: 4.9 in 2003/04 and 5.0 in 2004/05. There were no fatalities in 2004/05.

Graph 6.7 Mining Safety Statistics: 1993/94 – 2004/05



Source: DPI

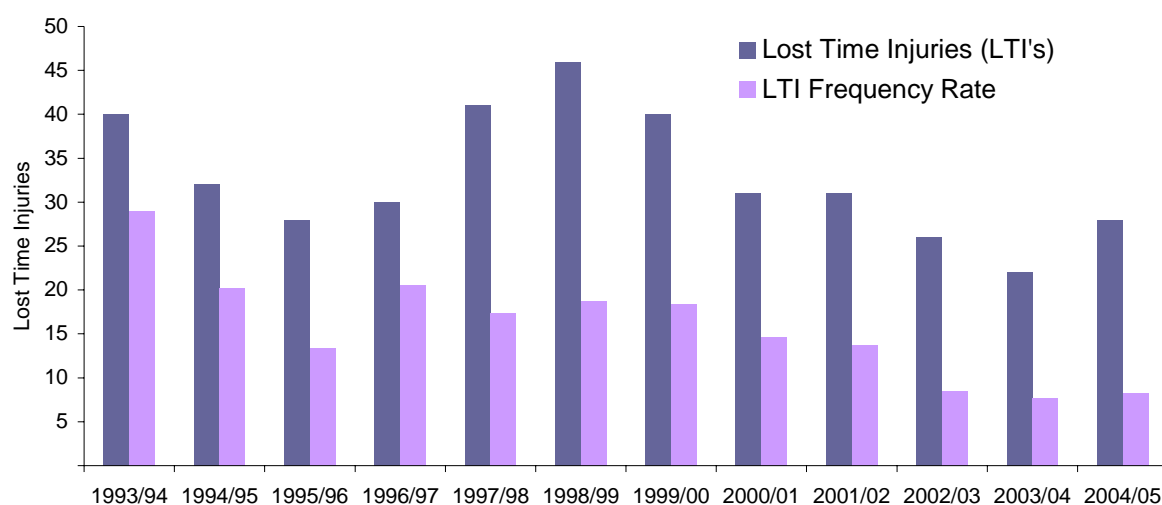
Table 6.11 Extractive Industry Safety Statistics: 1993/94 – 2004/05

Year	Lost Time injuries (LTI's)	Employed*	Days Lost	LTI Frequency Rate	LTI Incidence Rate	LTI Duration Rate	Severity Rate	Fatalities
1993/94	40	-	-	29	-	-	-	nil
1994/95	32	-	-	20.2	-	-	-	nil
1995/96	28	-	-	13.4	-	-	-	nil
1996/97	30	-	-	20.6	-	-	-	nil
1997/98	41	-	710	17.3	26	17.3	282	nil
1998/99	46	1542	550	18.7	29.8	11.9	223.7	nil
1999/00	40	1520	436	18.4	26.3	10.9	200.8	nil
2000/01	31	1741	597	14.6	17.8	19.3	281.2	nil
2001/02	31	1690	355	13.7	18.3	11.5	156.5	nil
2002/03	26	2096	417	8.5	12.4	16	137.2	1
2003/04	22	2218	475	7.7	9.9	21.6	165.7	nil
2004/05	28	2472	512	8.3	11.3	18.3	151.4	nil

Source: DPI

Notes: * Annual average number of person employed as reported.

The total number of Lost Time Injuries (LTI) in the extractive industry increased to 28 in 2004/05 from previous year's figure of 22. The LTI Frequency Rate has also increased from 7.7 to 8.3 in 2004/05. There were no fatalities in 2004/05.

Graph 6.8 Extractive Industry Safety Statistics: 1993/94 – 2004/05

Source: DPI

Appendix A: Glossary

ABS: Australian Bureau of Statistics

EIDA: *Extractive Industries Development Act 1995*

Employment: Annual average of number of person employed as reported by title holders

Lost Time Injuries (LTI): Occurrences that resulted in a fatality, permanent disability or time lost from work of one day/shift or more

Lost Time Injury Frequency Rate (LTIFR): The number of occurrences of lost time injury for each one million hours worked

Lost Time Injury Incidence Rate: The number of lost time injuries per thousand employees

Lost Time Injury Duration Rate: The average days lost for every lost time injury

MRDA: *Mineral Resources Development Act 1990*

OHS 1985: *Occupational Health and Safety Act 1985*

PSLA 1967: *Petroleum (Submerged Lands) Act 1967 (Commonwealth)*

PSLA 1982: *Petroleum (Submerged Lands) Act 1982 (Victoria)*

Severity Rate: The number of days lost for each one million hours worked

Work authority: A title granted under the *Extractive Industries Development Act 1995*

Appendix B: Abbreviations, Symbols and Conversions

\$A	dollar (Australian)
\$/GJ	dollar (Australian) per gigajoule
\$m	million dollars (Australian)
\$US	dollar (United States)
bbl	barrel (42 US Gallons; 158.987 L)
bbl/d	barrels per day
Bm³	billion (10 ⁹) cubic metres
Bscf	billion (10 ⁹) cubic feet (0.0283 Gm ³)
C+C	crude oil and condensate
cond.	condensate
GL	gigalitre (10 ⁹ L)
Gm³	billion (10 ⁹) cubic metres
kL	kilolitre (10 ³ L)
L	litre
LPG	Liquefied petroleum gas
ML	megalitre (10 ⁶ L)
Mbbl	million barrel
Mcf/d	Million cubic feet per day
MIN	Mining licence granted under the <i>Mineral Resources Development Act 1990</i>
Mm³	million cubic metres
oz	Troy ounce (31.1 g)