Minister of Energy, Mines and Petroleum Resources Annual Report

1979

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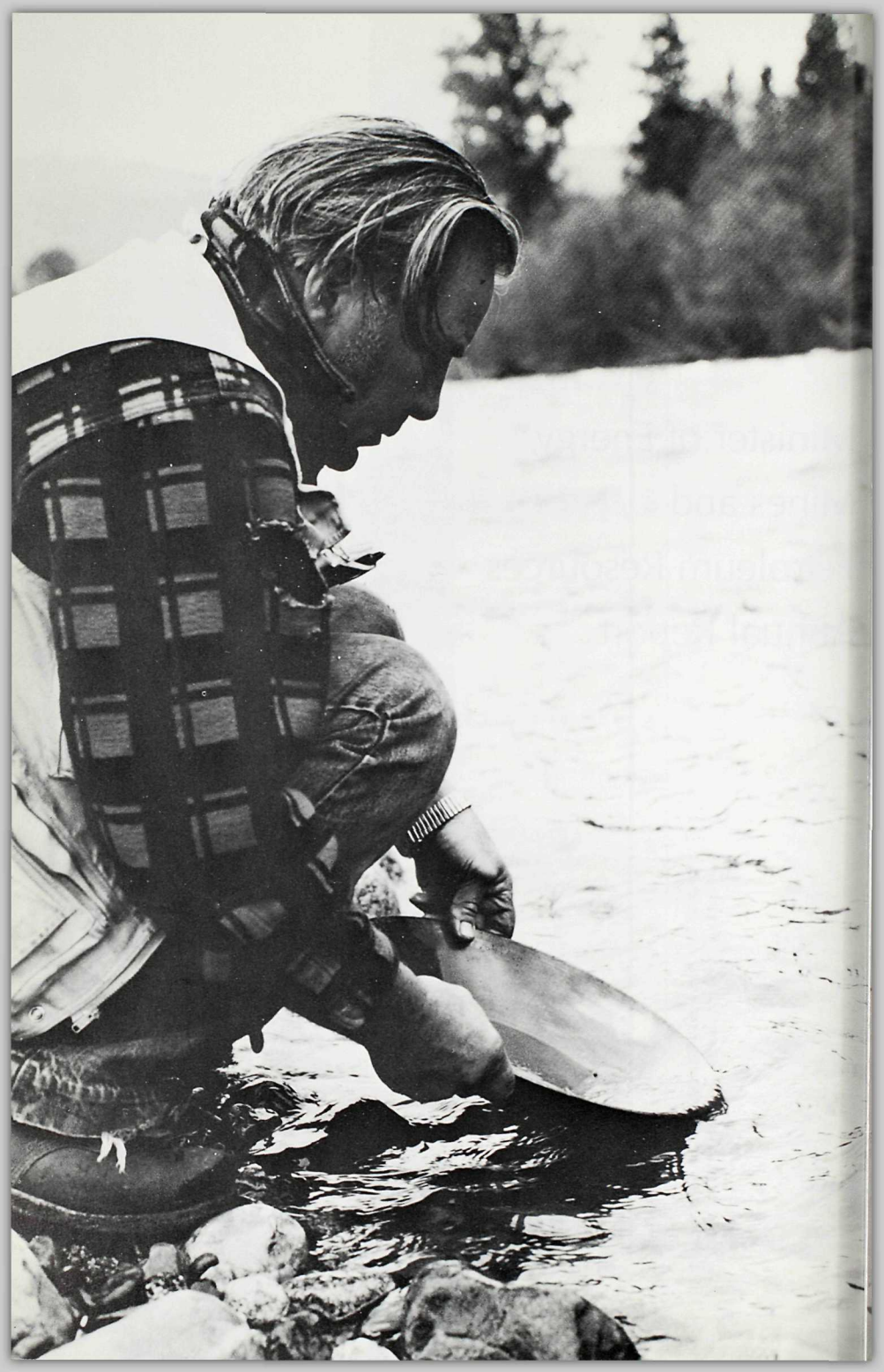

To the Honourable HENRY P. BELL-IRVING, D.S.O., O.B.E., E.D.,
Lieutenant Governor of the Province of British Columbia.

MAY IT PLEASE YOUR HONOUR:

The Annual Report of the Ministry of Energy, Mines and Petroleum Resources is herewith respectfully submitted.

R. H. McCLELLAND
Minister of Energy, Mines and Petroleum Resources

Office of the Minister of Energy, Mines and Petroleum Resources
August 1980

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All photographs by R. E. Player, Engineering Assistant, Geological Division, except plate on page 76, courtesy of British Columbia Hydro and Power Authority.

FOREWORD

The Annual Report of the Ministry for 1979 follows the format of the 1976 Report. Annual Reports have been published since 1874, from that date to 1959 as the Annual Report of the Minister of Mines, and subsequently as the Annual Report of the Minister of Mines and Petroleum Resources. In December 1978 the Ministry was enlarged and a reorganization started so that the report is now that of the Minister of Energy, Mines and Petroleum Resources.

In 1969 geological and technical reports previously published as part of the Annual Report were published separately as *Geology, Exploration and Mining in British Columbia*. Starting in 1975, this technical volume has been divided into separate reports that are issued as they are prepared, and eventually bound together. Detailed information on mine safety, fatal accidents, dangerous occurrences, etc., was included in the Annual Report until 1973, for 1974 was issued separately, and subsequently forms part of the separate volume *Mining in British Columbia*.

The Annual Report for 1979 contains four chapters—a general review of the mineral and petroleum industries, a chapter on the activities of the Ministry, one on the statistics of the mineral industry, and one on the performance of the petroleum industry.

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The Mining and Petroleum Industries in 1979

CHAPTER 1

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INTRODUCTION

By Staff of Mineral Resources Branch

The value of mineral production in British Columbia reached a new record exceeding $2.9 billion, showing 50-per-cent growth over 1978. However, much of the growth was the result of better commodity prices and exchange rates rather than increased production.

The top 10 commodities in 1979 in order of value were natural gas, copper, coal, molybdenum, crude oil, lode gold, silver, lead, cement, and sand and gravel. The value of natural gas has now surpassed the value of copper, this being the only change of position of the top five from 1978, both zinc and asbestos remained outside of the group and lode gold and silver moved up in the ranking reflecting the dramatic and speculative improvement in prices for these precious metals over the year. Natural gas assumed the top place for the second time, previously held in 1977. Structural material commodities—sand and gravel and cement—each moved up. British Columbia is Canada's leading producer of copper, molybdenum, lead, and coal, and a major contributor to Canada's production of natural gas, zinc, asbestos, cement, gold, and silver. The mineral production of 1979 is shown in detail in Table 1-1 compared to 1978, and the production in 1979 is diagrammed on Figure 1-1.

All major sectors of the mining and petroleum industries experienced substantial growth. The metals sector accounted for the most substantial increase due to significant metal price increases and some production increases during the period. Of the top 10 value-ranked commodities, only copper, molybdenum, and silver showed decreases in production while all 10 showed increases in value. The total value and percentage change for the various sectors are as follows:

	1979 Value $	Change Per Cent
Metals	1 350 776 761	+64.8
Petroleum and natural gas	896 377 125	+57.6
Coal	439 280 152	+15.0
Structural materials	178 539 129	+25.7
Industrial minerals	84 474 280	+42.0

The growth of the mineral industry and the changing proportion contributed by the various sectors is illustrated by two diagrams. Figure 1-2 shows the growth in total value in actual dollars and in deflated dollars. Figure 1-3 shows the relative proportion contributed by the various sectors. In both diagrams these trends are shown in five-year increments to 1970 and yearly thereafter. Comparisons of the figures reveal major shifts in trends and demonstrate growth of specific commodity sectors. The important changes illustrated are as follows:

(1) A dominance of metals throughout the whole period, but a fairly constant decrease in importance since 1935.
(2) The collapse of the coal industry between 1945 and 1970, related significantly to the conversion of railways to oil.
(3) Rapid growth of petroleum and natural gas between 1955 and 1965.
(4) Regeneration of significant coal production related to growth of export markets from metallurgical coals in the early 1970's.
(5) Surge in value of metals related to copper and molybdenum production in 1972 and 1973 when the major porphyry deposit open-pit mines came on stream.
(6) The increase in value of natural gas in 1975 and 1976.
(7) The relative decrease in importance of metals, dropping below 50 per cent of the total for the first time in 1975, and the significant rise in importance in 1979.

Table 1-1—Mineral Production of British Columbia, 1978 and 1979

		1978		1979	
		Quantity	Value	Quantity	Value
Metals	Units		$		$
Antimony	kg	459 521	2 083 895	177 046	916 081
Bismuth	kg	28 172	166 452	33 809	173 667
Cadmium	kg	253 803	1 186 320	239 096	1 417 506
Copper	kg	273 692 676	431 694 395	272 163 001	656 359 923
Gold—placer	g	36 515	295 001	214 106	2 649 918
Gold—lode, fine	g	6 542 332	47 951 880	8 062 810	101 481 156
Iron concentrates	t	615 569	11 597 462	668 026	13 008 475
Lead	kg	81 064 539	51 640 564	84 451 905	88 100 363
Molybdenum	kg	13 055 203	167 714 272	10 766 497	321 228 104
Platinum	g	.....	.....	280	3 793
Silver	g	227 271 890	45 071 509	214 117 518	94 700 656
Tin	kg	261 863	3 675 508	240 984	3 818 948
Zinc	kg	95 618 111	52 048 701	88 418 642	61 890 891
Others		.....	4 652 559	.....	5 027 280
Subtotals		.....	819 778 518	.....	1 350 776 761
Industrial Minerals					
Asbestos	t	68 266	47 066 170	94 286	65 520 069
Diatomite	t	2 184	59 346	1 452	33 025
Fluxes	t	22 475	56 894	27 741	129 035
Granules	t	26 849	1 186 160	30 074	1 458 987
Gypsum and gypsite	t	733 080	3 110 695	722 933	5 155 924
Jade	kg	488 759	1 422 018	258 505	1 325 777
Sulphur	t	322 181	5 647 993	383 724	9 616 390
Others		.....	922 085	.....	1 235 073
Subtotals		.....	59 471 361	.....	84 474 280
Structural Materials					
Cement	t	1 020 065	56 140 564	1 336 080	80 052 461
Clay products		.....	6 282 560	.....	11 744 194
Lime and limestone	t	2 445 053	6 929 484	2 880 138	8 037 476
Rubble, riprap, and crushed rock	t	2 841 920	8 410 065	2 488 389	6 766 665
Sand and gravel	t	38 315 952	64 227 295	46 241 983	71 918 633
Building-stone	t	405	18 030	2 194	19 700
Subtotals		.....	142 007 998	.....	178 539 129
Coal					
Coal—sold and used	t	9 463 920	381 895 241	10 570 370	439 280 152
Total Solid Minerals		.....	1 403 153 118	.....	2 053 119 931
Petroleum and Natural Gas					
Crude oil	m^3	2 004 699	145 005 524	2 139 963	168 928 671
Field condensate	m^3	25 386	1 836 217	32 549	2 569 418
Plant condensate	m^3	155 503	10 269 861	184 398	13 396 500
Subtotals		.....	157 111 602	.....	184 894 589
Natural gas to pipeline	10^3m^3	8 003 029	401 373 236	11 392 641	699 508 127
Butane	m^3	106 580	5 932 766	112 683	7 122 711
Propane	m^3	85 732	4 513 447	84 864	4 851 698
Subtotals		.....	411 819 449	.....	711 482 536
Total petroleum and natural gas		.....	568 931 051	.....	896 377 125
Grand totals		.....	1 972 084 169	.....	2 949 447 447

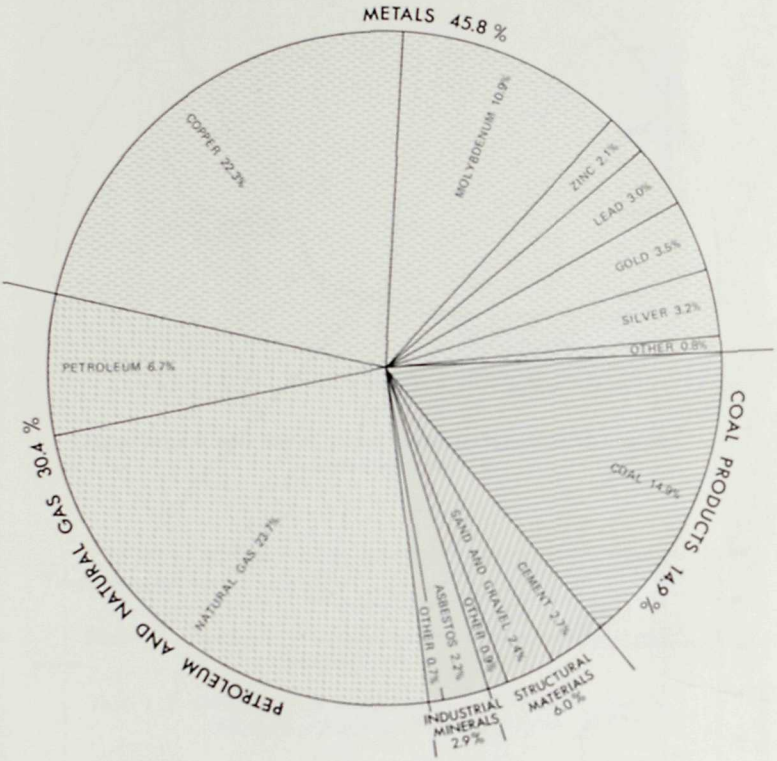


Figure 1-1—Major mineral commodities produced in 1979 by value.

The value of the production of the various sectors is shown throughout their history of production on a log graph, Figure 3-1.

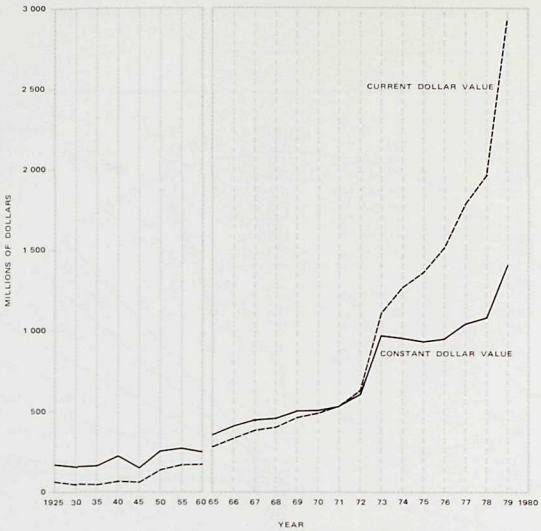


Figure 1-2—Growth of the mineral industry in total value in actual dollars and deflated dollars.

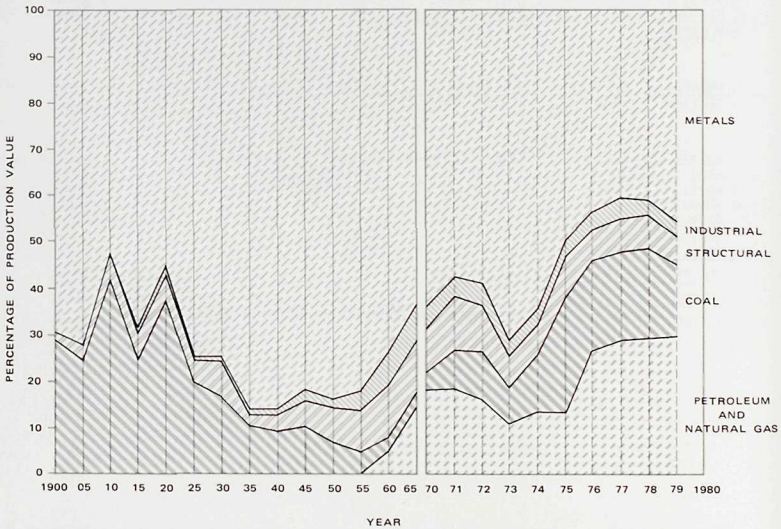


Figure 1-3—Percentage value of mineral industry sectors.

REVENUE TO THE CROWN

Direct revenue to the provincial government in 1979 from the mining and petroleum industries is as shown on Figure 1-4.

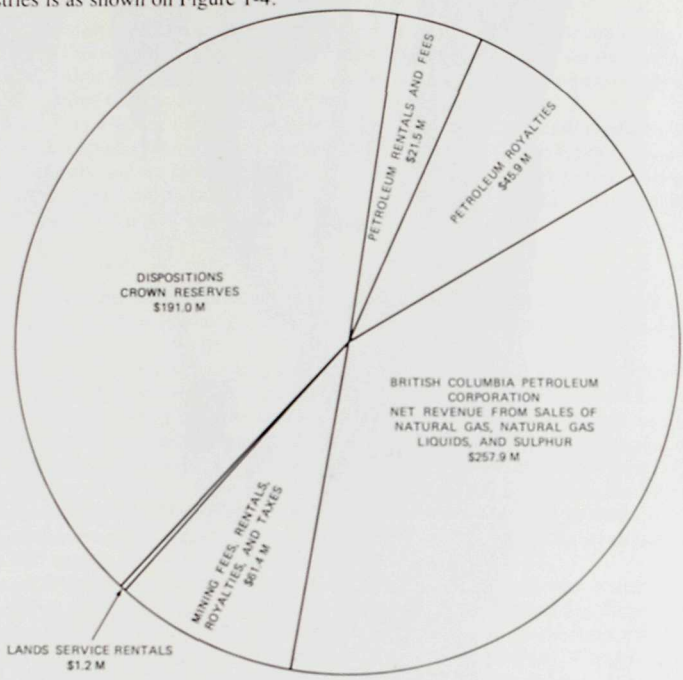


Figure 1-4—Direct revenue to the provincial government from the mineral and petroleum industries, 1979.

Table 1-2—Direct Revenue to the Provincial Government from the Mineral and Petroleum Industries, 1979

	$
Petroleum Industry—	
Crown reserves—disposition	191 041 605
Rentals and fees	21 474 579
Crown royalties	45 935 056
British Columbia Petroleum Corporation—	
Net revenue from sales	257 875 000
Mining Industry—	
Claims, fees, and rentals	4 728 366
Royalties	4 401 036
Mineral taxes	52 306 415
Lands Service—	
Rentals and royalties on structural materials	1 198 090
Total	578 960 147

THE MINING INDUSTRY IN 1979

By A. Sutherland Brown and F. C. Basham

The total value of solid minerals set another new record, $2.1 billion, up 46.3 per cent from 1978. This was achieved in the face of slight declines in output of some major metals. Increased commodity prices, favourable currency exchange rates, and increases in coal production more than made up the difference.

Table 1-1 and Figure 1-1 show the quantity and value of solid minerals produced in 1979 and the table compares these with production in 1978. The ratios of the various sectors of the mining industry are as follows: metals, 65.8 per cent; coal, 21.4 per cent; structural materials, 8.7 per cent; and industrial minerals, 4.1 per cent. The only significant change from 1978 was a dramatic increase in the share of metal value.

Metals

The growth and long-term trends of the quantities of major base metals produced are shown on Figure 1-5 on a linear graph. These, plus gold and silver, are shown on a log graph on Figure 3-2.

Lead and zinc production advanced sharply in the period 1920 to 1943, thereafter starting a slow decline, a feature dependent principally on the production history of the Sullivan mine. In contrast, copper production remained at a modest level until the onset of major porphyry copper production in the late sixties. Molybdenum production also started its growth in this period, related principally to mining of porphyry deposits. Precious metals are not shown on Figure 1-5 but are on Figure 3-2. Their history since the decline in the forties increasingly has been related to by-product origin related to production of base metals at massive sulphide and porphyry deposits. However the sharp rise in precious metals prices will quickly return gold and silver mining to prominence.

In 1979 conditions for copper producers continued an improvement started in 1978. Copper price, having been low since the sharp peak of 1974, advanced significantly during the year. Favourable currency exchange rates and a lowering of world copper stocks also added to the improved market and the increased value of production. Copper, at $656.4 million, contributed 48.6 per cent of the value of the metals produced and 32.0 per cent of the value of solid minerals. The quantity of production was down because of the closure of the Granduc mine in mid-1978 and a prolonged strike at the Gibraltar mine that started May 26, 1978, and continued into 1979.

Molybdenum markets continued to be very strong, and the value of production in British Columbia rose 91.5 per cent to $321.2 million, despite the protracted strike at Endako. The quantity produced, however, was down 2.3 million kilograms or 17.5 per cent due again to the strike at Endako.

Zinc production was also down 7.5 per cent, however, the value at $62 million was up 18.9 per cent due to increased price from an average of 54 cents per kilogram to 70 cents per kilogram.

Lead fell to eighth position, with a value of $88.1 million, well ahead of zinc. Unlike some of the other major metals, production quantity was up 4.2 per cent and, with markets continuing fairly strong from the preceding year and with the price rising, the value was up 70.6 per cent.

Gold (lode) surpassed silver in value for the second time since 1960, to become the third most valuable metal. Production was up 23.2 per cent to 8 062 810 grams with a value of $101.5 million. This resulted largely from the sizeable new production from Afton mine. In addition, the average price of gold advanced from $7.33 per gram to $12.58 per gram with the result that the value of production was up 111.6 per cent to $101.5 million.

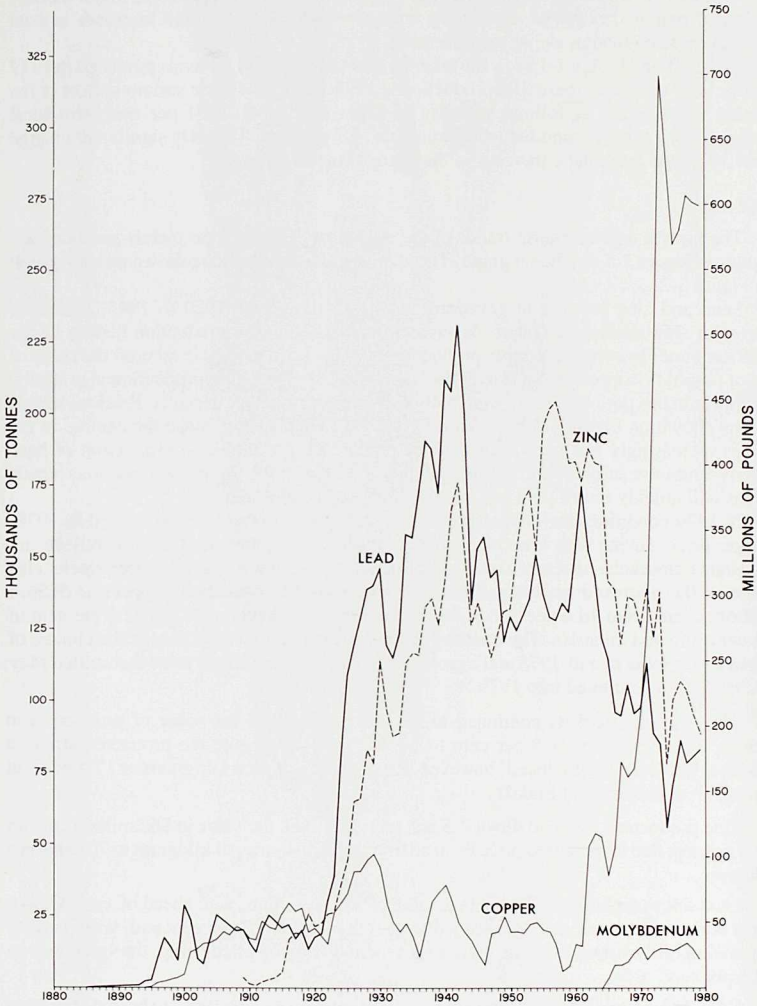


Figure 1-5—Quantities of major metals produced, 1885–1979.

Silver value was up 110.1 per cent to $94.7 million although production was down 5.8 per cent. This resulted from the significant price increases during the year from $6.25 (U.S.) per ounce in January to $21.79 (U.S.) in December.

Iron concentrate production was up 8.5 per cent over 1978. This was a significant portion of the production of former years, although now almost entirely the product of one mine, Tasu (Wesfrob). The value of production was $13.0 million.

Of the minor metals, tin production fell 8 per cent below 1978 to 240 984 kilograms with an increased value of $3.8 million; bismuth production was up but both antimony and cadmium were down.

Coal

Coal was ranked third in value after natural gas and copper. Production was up 11.7 per cent to 10.6 million tonnes and value was up 15.0 per cent to $439.3 million.

Industrial Minerals

Production value of industrial minerals increased by 42.0 per cent to $84.5 million. Asbestos production was 94 286 tonnes compared to 68 266 tonnes in 1978.

Sulphur production quantities were up with a value of $9.6 million in 1979.

Structural Materials

Value of most structural materials was up significantly for the eleventh year in a row, with the total value of $178.5 million being up 25.7 per cent over 1978. Production of all commodities were up except rubble, riprap, and crushed rock. Sand and gravel at $71.9 million and cement at $80.0 million, the two most important structural materials, were both up significantly. They advanced to become respectively ninth and tenth most valuable commodities in the province, following lead and ahead of zinc for the second time.

PROVINCIAL REVENUE FROM MINING COMPANIES

Direct revenue to the provincial government in 1979, derived from the mining sector of the mineral industry, is shown in Table 1-3. The amount for mineral royalties shown is the amount collected after adjustments for 1978. For coal licences and rentals, the amount shown includes cash paid in lieu of work, some of which may be refundable. The rentals and royalties on industrial minerals and structural materials were collected by the Lands Service of the Ministry of Environment. The total revenue is about $62.6 million compared to $39.7 million in 1978.

Table 1-3—Revenue from Mineral Resources, 1979

	$
Claims	1 985 509
Coal licence fees and rentals collected	2 742 857
Coal royalties	4 235 987
Iron ore royalties	161 312
Mineral land taxes	9 887 110
Mineral resource taxes	23 779 286
Mineral royalties	3 734
Mining taxes	18 640 019
Rental and royalties on industrial minerals and structural materials (Lands Service)	1 198 090
Total	62 633 904

EXPENDITURES BY MINING COMPANIES

Major expenditures in 1979 by companies involved in exploration, development, and mining of metals, minerals, and coal are shown in Table 1-4.

Table 1-4—Expenditures (Mining Companies), 1979

	$	$
Capital expenditures	192 152 327	
Exploration and development	167 768 513	
		359 920 840
Mining operations (metals, minerals, coal)		515 930 264
Mining operations (structural materials)		76 462 348
Repair expenditures		173 136 225
Total		1 125 449 677

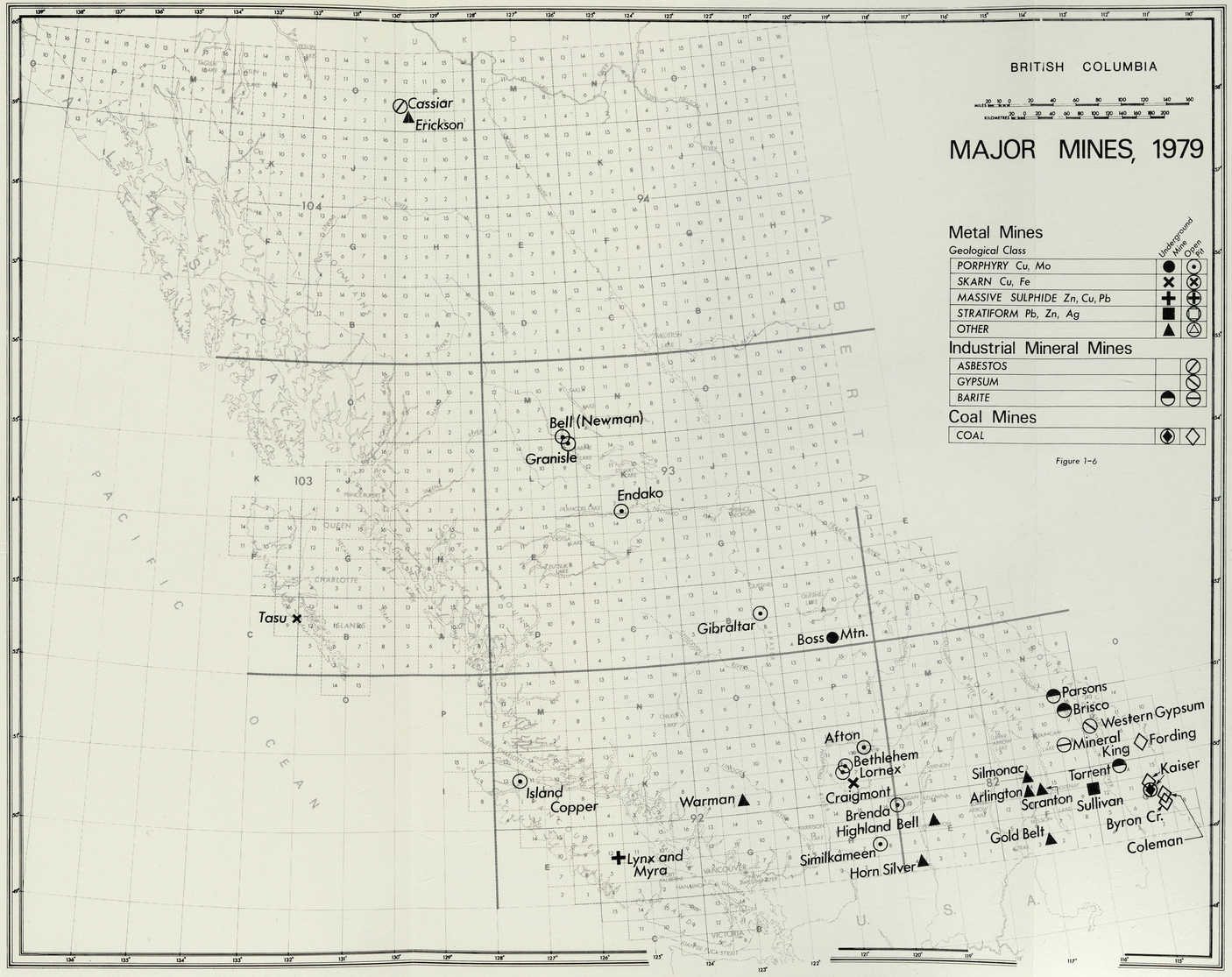


Figure 1–6

Mines in British Columbia Which Produced More Than 1 000 Tonnes of Ore in 1979

Name of Mine	Products	NTS Location	Rated Capacity of Mill/Cleaning Plant (Tonnes/Day)	Mine[1] Type	Name of Company	Company Address	Mine Address
Metal Mines							
Horn Silver	Ag, Pb, Zn, Cu	82E/4E	140	U	Dankoe Mines Ltd.	2002, 1177 W. Hastings St., Vancouver V6E 2L6	Box 190, Keremeos.
Highland Bell	Ag, Zn, Pb, Au, Cd	82E/6E	110	U	Teck Corp. Ltd.	1199 W. Hastings St., Vancouver V6E 2K5	Beaverdell V0H 1A0.
Gold Belt	Au, Ag, Cu, Pb, Zn	82F/3E	.....	U	Goldbelt Mines Inc.	507, 318 Homer St., Vancouver V6B 2V3	Box 549, Salmo V0G 1Z0.
Scranton	Au, Ag, Pb, Zn	82F/14E	.....	U	David Minerals Ltd.	1020, 475 Howe St., Vancouver V6C 2B3	Box 634, Kaslo.
Arlington	Au, Ag, Cu, Pb	82F/14W	.....	U	Edward Shukin	Box 247, Slocan V0G 2C0	Slocan.
Silmonac	Zn, Pb, Ag, Cd	82F/14	140	U	Kam-Kotia Mines Ltd. and Silmonac Mines Ltd.	420, 475 Howe St., Vancouver V6C 2B3	Box 189, New Denver.
Sullivan	Zn, Pb, Ag, Cd	82G/12W	9 500	U	Cominco Ltd. (Sullivan mine)	200 Granville Square, Vancouver V6C 2R2	Box 2000, Kimberley V1A 2G3.
Lynx, Myra	Zn, Cu, Ag, Pb, Au, Cd	92F/12E	900	O	Western Mines Ltd.	1103, Box 49066, 595 Burrard St., Vancouver V7X 1C4	Box 8000, Campbell River.
Similkameen	Cu, Ag, Au	92H/7E	13 600	O	Similkameen Mining Co. Ltd.	14th Floor, 750 W. Pender St., Vancouver V6C 1K3	Box 520, Princeton V0X 1W0.
Brenda	Cu, Mo, Ag	92H/16E	22 000	O	Brenda Mines Ltd.	Box 420, Peachland V0H 1X0	Box 420, Peachland V0H 1X0.
Craigmont	Cu	92I/2W	4 860	U	Craigmont Mines Ltd.	700, 1030 W. Georgia St., Vancouver V6E 3A8	Box 3000, Merritt.
Lornex	Cu, Mo, Ag, Au	92I/6E	40 900	O	Lornex Mining Corp. Ltd.	510, 580 Granville St., Vancouver V6C 1W8	Box 1500, Logan Lake V0K 1W0.
Bethlehem	Cu, Ag, Au	92I/7W	16 800	O	Bethlehem Copper Corp.	2100, 1055 W. Hastings St., Vancouver V6E 2H8	Box 520, Ashcroft.
Afton	Cu	92I/10E	6 350	O	Afton Mines Ltd.	1199 W. Hastings St., Vancouver V6E 2K5	Box 937, Kamloops.
Warman	Au, Ag	92J/3E	426	U	Northair Mines Ltd.	333, 885 Dunsmuir St., Vancouver V6C 1N5	Squamish.
Island Copper	Cu, Mo, Ag, Au	92L/11W	34 500	O	Utah Mines Ltd.	1600, 1050 W. Pender St., Vancouver V6E 3S7	Box 370, Port Hardy V0N 2P0.
Boss Mountain	Mo	93A/2W	1 590	U	Noranda Mines Ltd. (Boss Mt. Div.)	1050 Davie St., Vancouver V6B 3W7	Hendrix Lake.
Gibraltar	Cu, Mo, Ag	93B/9W	36 330	O	Gibraltar Mines Ltd.	700, 1030 W. Georgia St., Vancouver V6E 3A8	Box 130, McLeese Lake V0L 1P0.
Endako	Mo	93K/3E	24 500	O	Placer Development Ltd. (Endako Div.)	800, 1030 W. Georgia St., Vancouver V6E 3A8	Endako.
Granisle	Cu, Ag, Au	93L/16E	12 260	O	Granisle Copper Ltd.	17th Floor, 1050 W. Pender St., Vancouver V6E 2H7	Box 1000, Granisle.
Bell (Newman)	Cu, Au	93M/1E	11 800	O	Noranda Mines Ltd. (Bell Copper Div.)	1050 Davie St., Vancouver V6B 3W7	Box 2000, Granisle.
Tasu	Fe, Cu	103C/16E	7 300	O	Wesfrob Mines Ltd. (Tasu)	500, 1112 W. Pender St., Vancouver V6E 2S3	Tasu.
Erickson	Au, Ag	104P/4E	136	U	Erickson Gold Mining Corp.	203, 1209 E. Fourth St., North Vancouver V7J 1G8	Cassiar.
Industrial Mineral Open Pits and Quarry							
Torrent	Barite	82G/13W	.....	U	Mountain Minerals Ltd.	Box 700, Lethbridge, Alta.	Box 603, Invermere.
Western Gypsum	Gypsum	82J/5W	2 450	O	Westroc Industries Ltd.	Box 5638, Postal Station A, Calgary, Alta. T2H 1Y1	Box 217, Invermere V0A 1K0.
Mineral King	Barite	82K/8W	Small	O	Mountain Minerals Ltd.	Box 700, Lethbridge, Alta.	Box 603, Invermere.
Brisco	Barite	82K/16W	.....	U	Mountain Minerals Ltd.	Box 700, Lethbridge, Alta.	Box 603, Invermere.
Parsons	Barite	82N/2E	.....	U	Mountain Minerals Ltd.	Box 700, Lethbridge, Alta.	Box 603, Invermere.
Cassiar	Asbestos	104P/5W	3 630	O	Cassiar Asbestos Corp. Ltd.	2000, 1055 E. Hastings St., Vancouver V6E 3V3	Cassiar V0C 1E0.
Coal Mines							
Bryon Creek (Corbin)	Coal	82G/10E	1 700	O	Byron Creek Collieries Ltd.	Box 270, Blairmore, Alta.	Box 270, Blairmore, Alta.
Kaiser (Harmer Ridge; Balmer North and Hydraulic)	Coal	82G/10, 15	28 000	O, U	Kaiser Resources Ltd.	1500 W. Georgia St., Vancouver V6G 2Z8	Box 2000, Sparwood.
Fording (Clode Creek and Greenhill)	Coal	82J/2W	17 000	O	Fording Coal Ltd.	200, 205 Ninth Ave. SE., Calgary, Alta. T2G 0R4	Box 100, Elkford V0B 1H0.
Coleman (Tent Mountain)	Coal	82G/10W	.....	O	Coleman Collieries Ltd.	Box 640, Coleman, Alta.	Tent Mountain T0K 0M0.

[1] O—Open pit. U—Underground.

MINING AND TREATMENT

METAL MINES

Metal mining prospered more in 1979 than for a considerable period previously because world stockpiles were reduced, over capacity was largely eliminated so that prices rose as a result. In addition, Canada's relative position was enhanced by favourable currency exchange with our metal trading partners. Almost all metals participated in the strengthening of markets. However, a number of factors held production of many metals to about what they were in 1978. Nevertheless, the dollar value of metals produced rose 64.8 per cent during the year to a new record of $1.35 billion.

In 1979, 62 mines produced an aggregate of 85 410 000 tonnes of ore which was concentrated or shipped directly to a smelter (*see* Tables 3-12 and 3-13). This contrasts with 42 mines in 1978 which produced 87 724 973 tonnes of ore. Thus aggregate tonnage was reduced by 2.4 per cent in 1979. Of the 62 mines, 23 produced more than 1 000 tonnes and these are shown on Figure 1-6 classified as to product, geological type, and whether open pit or underground.

In 1979, 13 mines produced more than 1 million tonnes. These large mines produced an aggregate of 84 441 335 tonnes or 98.9 per cent of the ore mined. Ten of the large mines are open-pit operations, including in order of output, Lornex, Island Copper, Gibraltar, Brenda, Similkameen, Bethlehem, Bell, Endako, Granisle, and Afton. The three others, Sullivan, Tasu, and Craigmont, are underground mines. In aggregate these underground mines produced almost 5 million tonnes or 5.8 per cent of the total tonnage. In regard to geological type, all 10 large open-pit mines are porphyry deposits of copper and/or molybdenum. Of the large underground mines, the Sullivan is a silver-lead-zinc mine of stratiform type whereas Craigmont and Tasu are copper-iron and iron-copper skarn deposits respectively.

Two intermediate mines operated in 1979, each of which produced between 100 000 and 1 000 000 tonnes. These are the Lynx and Myra and Boss Mountain mines, both chiefly underground operations. Lynx and Myra is a massive sulphide deposit, and Boss Mountain a porphyry molybdenum deposit with some open-pit production. The aggregate tonnage to medium mines was 762 985 tonnes or 0.89 per cent of the total.

There were eight small mines with production between 1 000 and 100 000 tonnes a year. These are all underground mines producing from vein deposits whose principal values are in silver or gold and silver with by-product base metals. The mines in order of production tonnage are the Warman (Northair), Highland Bell, Erickson, Horn Silver, Silmonac, Scranton, Arlington, and Gold Belt, producing a total of 201 197 tonnes.

Changes during 1979 included the start of shipping from Erickson gold mine near Cassiar.

Concentrating

In 1979, 31 concentrators operated (*see* Table 3-12). Four treated copper ore, five copper-molybdenum, 15 lead-zinc (silver-gold), two molybdenum, two copper-iron, one copper-lead-zinc, and two gold-silver ores. Many of the lead-zinc-silver concentrators are old ones in the Slocan area with a small throughput.

Smelting, Refining, and Destination of Concentrates

Most of the lead-zinc concentrates produced in the province are smelted and refined here as well as some from outside the province, but, for the first time since the closure of the Anyox smelter in 1933, copper was smelted within British Columbia. In March 1978 the Afton rotary top-blown converter started continuous operations and produced 19 827 tonnes of blister copper in 1979. This unique smelter near Kamloops is operated by Teck Corporation in conjunction with the Afton porphyry copper mine which produces low sulphur concentrates. The Trail lead-zinc smelter and refinery of Cominco Ltd. continued its

modernization to improve environmental aspects and productivity. Molybdenum concentrates are processed at Endako where both molybdic trioxide and ferromolybdenum are also produced.

The smelter at Trail received concentrates and scrap from a number of sources—principally company mines within the province (Sullivan), and the Pine Point in the Northwest Territories, and custom sources both inside and outside the province. The smelter received 142 223 tonnes of lead concentrates and 130 152 tonnes of zinc concentrates from the Sullivan mine and 10 953 tonnes of lead concentrates and 16 230 tonnes of zinc concentrates from other British Columbia mines. The total value of concentrates, including by-product metal from British Columbia treated at Trail, was $209 150 106 or 15.5 per cent of metal production of the province in 1979.

Endako shipped products containing 3 738 530 kilograms of molybdenum from 12 tonnes of molybdenite concentrates, 6 205 tonnes of molybdic trioxide, and 104 tonnes of ferromolybdenum.

The proportions of the total value of metal production going to the various destinations are not known accurately but are approximately as follows: smelted or treated in British Columbia, $281.9 million (20.9 per cent); shipped to other parts of Canada, $87.9 million (6.5 per cent); exported to Japan, $574.4 million (42.6 per cent); exported to the United States, $128.4 million (9.5 per cent); exported to Europe, $253.6 million (18.8 per cent); other or unattributed, $24.4 million (1.8 per cent).

The destination of concentrates of the major metals is as discussed following and shown in Tables 3-13A and 3-13B.

Copper concentrates produced in British Columbia were shipped to the following destinations: Canada, 77 960 tonnes; the U.S.S.R., 74 541 tonnes; Japan, 651 199 tonnes; Spain, 43 478 tonnes; elsewhere, 80 228 tonnes.

Details of the disposition of molybdenum (10 766 497 kilograms valued at $321 228 104) are not precisely ascertainable but from known sales, 42 per cent of the total was shipped to Europe, and about 27 per cent to the United States and about 24 per cent to Japan. The balance was disposed of to many other countries and eastern Canada.

Zinc concentrates, produced but not smelted in British Columbia, totalled 21 519 tonnes, all of which were shipped to the United States.

Iron concentrates produced in British Columbia were sold to the following markets: Japan, 362 224 tonnes; the United States, 202 525 tonnes; Australia, 24 893 tonnes; Canada, 78 384 tonnes.

All lead concentrates produced in British Columbia in 1979 were smelted in the province.

Non-metallic Mines

Industrial minerals in British Columbia with production value greater than $1 million include asbestos, sulphur, gypsum, jade, barite, and granules (*see* Table 1-1). Asbestos is by far the most important, its production value of $65.5 million represents 78 per cent of the total for all industrial mineral production. Asbestos production is entirely from the Cassiar mine. Sulphur is produced entirely as a by-product, chiefly from Cominco Ltd.'s roasting operations, but also from sour gas production in the Peace River. Gypsum is produced chiefly at the Windermere quarry at Westroc Industries Limited (722 933 tonnes). Granules are produced in many small quantities but production was dominated by the International Marble & Stone Company Ltd. with a plant at Sirdar near Creston. In 1979 production of jade again exceeded $1 million. Production came from many sources but the main mines are working *in situ* nephrite at Provencher Lake (Primex Exploration Ltd.) and east of Dease Lake (Cry Lake Minerals Ltd.).

Barite, an important industrial mineral, not specifically listed in Table 1-1, was produced by Mountain Minerals Limited from three small underground mines near Brisco,

Parson, and Torrent and tailings from the Mineral King mine at Toby Creek, all in the East Kootenays.

The dominant structural materials produced are sand and gravel, cement, limestone, clay products, and riprap, crushed rock, and building-stone. Individual mines and quarries are not shown on Figure 1-6. Many of these products are produced at a large number of small quarries, some of which have very intermittent production. Limestone production is dominated by four mines (Ideal, Imperial, Vananda, and Domtar) on Texada Island. The Cobble Hill quarry (British Columbia Cement Company Limited) on Vancouver Island is being phased out. Significant operations are also located at Harper Ranch near Kamloops (Canada Cement Lafarge Ltd.), Ptarmigan Creek near Quesnel (Quesnel Redi-Mix Cement Co. Ltd.), and Pavilion Lake (Steel Brothers Canada Limited).

Clay and shale production in British Columbia is dominated by Clayburn Industries Ltd.'s pit and plant near Abbotsford, with lesser production by Haney Brick and Tile Limited, east of Haney.

Coal Mines

Coal is the third most valuable mineral commodity in British Columbia, following natural gas and copper, and improved its position *vis-à-vis* these products in 1979. Although coal is widely distributed in the province, the major producing mines are at present concentrated in the Crowsnest Coalfield of southeast British Columbia. They are represented by five symbols on Figure 1-6 for (1) Fording Coal Limited's two open pits, (2) Kaiser Resources Ltd.'s open-pit complex (Harmer Ridge), (3) Kaiser's two underground mines (Balmer North and Hydraulic), (4) Coleman Collieries Limited's Tent Mountain open-pit mine, and (5) Byron Creek Collieries Limited's open pit. The only other producing coal mine is Bulkley Valley Collieries Limited's mine at Telkwa which was a very minor producer of thermal coal. The Sukunka colliery of BP Minerals Limited near Chetwynd operated to test mining methods during part of the year. Production for Kaiser's and Fording's mines are consolidated in Table 3-8B so that only five operations are shown. Kaiser Resources Ltd. and Fording Coal Limited produced 89 per cent of the coal mined in the province in 1979.

Some salient facts about coal production in 1979 are as follows:

(1) Coal production was up significantly to 10 570 370 tonnes, a new record, 11 per cent above 1978.
(2) Clean coal output was up 16 per cent to 10 583 650 tonnes.
(3) The value of coal sold and used was $439 280 152, up 15 per cent to a new record.
(4) About 94 per cent of raw coal produced in 1979 comes from surface mining operations, virtually unchanged since 1978.
(5) About 92 per cent of raw coal produced was metallurgical coal.
(6) The percentage of clean to raw coal was 72 per cent.

The diversification of markets started in 1977 and has continued. Although coal sales to Japan increased to over 7.9 million tonnes, up 12.7 per cent, they now represent only 71 per cent of total production. Major shipments were as follows:

	Tonnes
Korea	798 097
Brazil	254 684
Spain	153 569
Denmark	133 413
Italy	115 421
Mexico	59 999
Taiwan	57 227
Greece	49 665
Chile	49 315
Sweden	49 218

Shipments in Canada were up 66.6 per cent, with 667 807 tonnes to Ontario and 46 102 tonnes to Manitoba. Use in British Columbia was down with 159 737 tonnes used for coke, a decrease of 45.3 per cent while other uses dropped about 5 per cent to 59 337 tonnes.

EXPLORATION

Total exploration during 1979 showed nearly 50-per-cent increase over 1978 because metal exploration was up significantly. In contrast exploration for coal was down slightly and for non-metallic minerals down significantly.

Table 1-5—Indices of Metal Exploration

	1975	1976	1977	1978	1979
	$	$	$	$	$
Exploration expenditure[1]	22 100 000	27 183 927	26 177 389	29 475 341	53 810 829
Claims recorded	11 751*	28 970*	37 151*	37 242*	55 252*
Certificates of work	39 403	36 729	39 711	65 705	76 233
Free miners' certificates—					
Individual	8 484	7 826	7 566	9 444	14 591
Companies	562	555	520	531	643
Number of properties	409	433	564	647	781
Total drilling (metres)[2]	92 802	97 277	110 303.6	154 177	216 962
Total geophysical surveys (kilometres)[2]	4 835	4 267	14 623.5	9 135.5	27 520

* Unit modified grid system.
[1] Compiled by Economics and Planning Division.
[2] Compiled by Geological Division.

METALLIC MINERALS

The indices of metal exploration indicated in Table 1-5 all show accelerated exploration effort. Total expenditure was up 80 per cent, claims recorded were up 48 per cent, certificates of work up 16 per cent, free miners' certificates up 54 per cent, number of properties receiving work up 21 per cent, total drilling up 41 per cent, and total geophysical surveys up 200 per cent. That exploration programs were more mature than previous years is shown by the ratio of money spent per property.

Metal exploration in 1979 was more broadly based and widely distributed than in recent years. Major increases in exploration occurred in the southern Kootenay region, the southern Interior, southwestern Cariboo, the Queen Charlotte Islands, and the eastern fringe of the northern Coast Mountains. A great variety of metal received major exploration effort but emphasis was on pure molybdenum deposits and precious metals. Nevertheless for the first time in years there was a major exploration for lead-zinc-silver that was rewarded with considerable success. The pattern of recent years in regard to copper continued —marginal levels of effort in porphyry deposits but a considerable effort in regard to massive sulphides, principally in the Omineca Belt.

The strong market outlook for molybdenum sparked an intense exploration effort for pure molybdenum, molybdenum-tungsten, and copper and molybdenum porphyries. In the Coast Tectonic Belt major molybdenum projects include Omni, Redbird (Craigmont Mines Ltd.), and Salal Creek (BP Minerals Limited). In the Intermontane Belt, the principal molybdenum exploration property is Glacier Gulch (Climax Molybdenum Corporation of British Columbia, Limited) at which a further underground drilling program was conducted. In the Omineca Belt, Boya (Texasgulf Inc.), Trout Lake (Newmont Exploration of Canada Limited and Esso Resources Canada Limited), Butters Creek (Noranda Exploration Company, Limited and Amax of Canada Limited), and Carmi (Union Oil Company of Canada Ltd.) are the principal sites with Trout Lake starting an underground exploration and drill program. Butters Creek is a new discovery made as a result of the Uranium Reconnaissance Program's regional geochemical survey.

Gold and silver deposits were the targets of major effort shown by programs widely distributed in all but the Eastern Marginal Belt. Major exploration included the Babe (Consolidated Cinola Mines Ltd.) and Court and Buckhorn (Chevron Canada Limited) in the Queen Charlotte Islands; Morris Summit (Scottie Gold Mines Ltd.) and Big Missouri (Western Mines Limited) in the Stewart area; Spectrum (Consolidated Silver Ridge Mines Ltd.) and Chappelle (Du Pont of Canada Exploration Limited) in the north-central Intermontane Belt; Capoose (Granges Exploration Aktiebolag) and Black Dome Mountain (Barrier Reef Resources Ltd.) in the southern Intermontane Belt; Hanna Gold (United Hearne Resources Ltd.) and Vollaug (Silver Standard Mines Limited) in the northern Omineca Belt near Cassiar.

Most of these are vein deposits of modest size but a few, such as the Babe, propose bulk mining. Many of these properties were assisted by the Ministry's program of mineral exploration incentive in 1978 or 1979.

One of the most important developments has been the discovery of significant zinc-lead-silver-barite shale-hosted deposits in the Liard Trough extension of the Selwyn basin, that is, the Northwestern Rockies. Here many showings have been discovered in the favourable Devonian Gunsteel Formation. The principal discovery so far is the Cirque deposit of Cyprus Anvil Mining Corporation and Hudson's Bay Oil & Gas Company Limited with reserves defined to date of 15 million tonnes of 2.3 per cent lead, 6.9 per cent zinc, and 49 grams per tonne silver. The potential exists for considerably more at this deposit and the nearby Elf, Fluke, Pie (Rio Tinto Canadian Exploration Limited), and Driftpile (North Gataga Joint Venture). These appear to be the most important lead/zinc discoveries in British Columbia since that of the Sullivan mine in 1892. In addition, a major deposit of barite-lead-zinc-silver in the same stratigraphic interval has been identified at Mount Alcock within Kwadacha Wilderness Provincial Park.

Copper has continued to be sought in polymetallic massive sulphide deposits but only in a minor way in porphyries. The largest new program is Craigmont's Chu Chua near the North Thompson River where the deposit occurs in the upper felsic portion of the Mississippian Fennell greenstone. It has reserves of about 2 million tonnes of 2-per-cent copper plus some zinc-gold-silver. The Kutcho deposit in the northern Omineca is continuing to be explored by Sumitomo Metal Mining Canada Ltd. and Esso Resources. The only new porphyry copper deposit extensively explored is 20th Century Energy Corporation's deposit on Gambier Island in Howe Sound near Vancouver.

Uranium exploration was greatly reduced in 1979 with only six or seven moderate drill programs and only a major one by PNC Exploration Ltd. at Fuki, Donen, and other nearby claims.

Major Exploration Activity

The major increase in mature exploration programs is shown best by the fact that 16 properties were reported as completing programs exceeding 3 000 metres of drilling or 300 metres of underground development. This contrasts with nine properties in 1978. These nonproducing properties, defined as conducting major exploration by the previously mentioned criteria, are listed following.

TROUT LAKE (Newmont Exploration of Canada Limited and Esso Resources), 82K/12E—molybdenum in stockwork within a small granodiorite plug intruding argillite, phyllite, siliceous schists, and carbonates; 15 diamond-drill holes, 6 987 metres, and 197 metres of adit development.

ALEY, BEAR (Cominco Ltd.), 82L/4W—molybdenum in quartz veinlets in a quartz porphyry stock and copper in pyroxenite; 37 percussion holes, 2 683 metres, and 3 diamond-drill holes, 805 metres.

MAPLE LEAF (Banbury Gold Mines Ltd.), 92H/8E—gold in quartz stringers in diorite; 8 diamond-drill holes, 3 084 metres.

KEYSTONE, JULIE, WHAT, MAG (Western Mines Limited), 92H/11E—molybdenum in stockwork in a quartz diorite stock (Tertiary); 3 NQ-BQ diamond-drill holes, 3 611 metres.

OK, ALWIN (DeKalb Mining Corporation), 92I/6E—copper, gold, and silver along shear zones in Bethsaida granodiorite; 1 464 metres of decline and level development and 1 581 metres of underground drilling.

JERSEY PIT AREA (Bethlehem Copper Corporation), 92I/7W—27 diamond-drill holes, 7 320 metres.

RAINBOW (Seadrift Resources Ltd.), 92I/9W—copper in fault zone and tectonic breccia at the contact between two phases of intrusive rocks; 10 diamond-drill holes, 3 070 metres.

POISON MOUNTAIN (Long Lac Mineral Exploration Ltd.), 92O/2E—copper, molybdenum, gold, and silver in fractures associated with feldspar porphyry intrusive rocks (Tertiary ?) and sedimentary rocks (Jurassic/Cretaceous); 6 diamond-drill holes, 1 235 metres, and 22 percussion holes, 2 023 metres.

CHU CHUA (Craigmont Mines Ltd.), 92P/8E, 9W; 82M/5W, 12W—numerous small massive sulphide deposits in mafic and felsic volcanic rocks; 22 diamond-drill holes, 3 475 metres.

REDBIRD (Craigmont Mines Ltd.), 93E/6E—molybdenum and copper in stockwork at the periphery of a quartz monzonite stock (Tertiary); 35 diamond-drill holes, 9 060 metres.

NED, D (Granges Exploration Aktiebolag), 93F/6—zinc, lead, silver, and gold in rhyolite; 12 diamond-drill holes, 1 787 metres, and 36 percussion holes, 1 615 metres.

CHAPPELLE (Du Pont of Canada Exploration Limited), 94E/6E—gold and silver in quartz vein system; 39 diamond-drill holes, 3 500 metres, and 240 metres of underground development.

BABE (Consolidated Cinola Mines Ltd.), 103F/9E—gold in volcanic and sedimentary rocks cut by the Sandspit fault system; 48 diamond-drill holes, 8 840 metres.

MORRIS SUMMIT (Scottie Gold Mines Ltd.), 104B/1E—gold in fractured sedimentary and volcanic rocks; underground development, 325 metres, and 14 diamond-drill holes, 855 metres.

JEFF (Esso Resources Canada Limited), 104I/1W, 2E—massive sulphide deposits in volcanic rocks; 29 diamond-drill holes, 6 852 metres.

ADANAC (Placer Development Limited), 104N/11W—molybdenum in fractures and quartz veins in members of the Surprise Lake batholith; 49 diamond-drill holes, 5 775 metres.

The following properties recorded continued (Stage I and/or II) development with the Metal Mines Steering Committee:

AURUM, IDAHO, PIPESTEM (Carolin Mines Ltd.)—development of haulage adits, tailings, and environmental studies.

KUTCHO CREEK (Esso Minerals Canada Limited)—access road and environmental studies.

DOLLY VARDEN (Dolly Varden Resources Limited)—tailings disposal study.

ADANAC (Placer Development Limited)—tailings and townsite studies.

VALLEY COPPER (Cominco Ltd.)—this deposit is being reconsidered in light of a possible smelter operation.

GOLDSTREAM (Noranda Exploration Company, Limited)—feasibility studies and production decision.

KITSAULT (Climax Molybdenum Corporation of British Columbia, Limited)—plant and townsite reconstruction studies.

NON-METALLIC MINERALS

Exploration for non-metallic minerals in 1979 decreased significantly to $284 193 from the very high levels of 1978 and 1977. It was however double what it was in 1976 and previously.

Major projects involving barite, both as a main mineral or by-product of lead-zinc mineralization, took place in the Northwestern Rocky Mountains. Exploration drilling for jade took place on several locations in the area east of Dease Lake. Activity continued on the mica property near Valemount and the talc claims on Nahatlatch River. Smaller projects involved asbestos, building-stone, chromite, fluorspar, and silica.

COAL

Coal Resources

The coal of British Columbia falls into four main age groups:

(1) Early Lower Cretaceous coals of the Rocky Mountains and Foothills and Groundhog.
(2) Late Cretaceous coals of Vancouver and Queen Charlotte Islands and Peace River plains.
(3) Early Tertiary coals of numerous small basins in the Intermontane Belt.
(4) Late Tertiary coals and lignites of the Skonun basin of northeastern Queen Charlotte Islands.

The Lower Cretaceous coals of the Elk River, Crowsnest, and Flathead Coalfields, as well as the Peace River Coalfield, are essentially medium volatile bituminous metallurgical coal (an estimated 15 per cent of which is oxidized and best suited for thermal purposes). The rest of the coal scattered throughout the province vary from a sub-bituminous lignite at Hat Creek and Princeton through high volatile bituminous B and C to a semianthracite at Groundhog.

Coal Exploration

Coal exploration continued at a high level, augmented to some degree by the need to fulfill work commitments related to the issuance of new licences following the lifting of the moratorium in February 1978. However the total cost of coal exploration at $17 839 029 was down 10 per cent from 1978. In 1979, 925 coal licences were granted covering an area of 253 708 hectares, bringing the total area under active exploration to about 1 000 000 hectares, treble the area held during the moratorium. These figures provide the most significant indicator of the intensity of coal exploration in the province.

The major new development in 1979 was the extension of the search from the traditional stratigraphic interval of Lower Cretaceous Gething and Gates coals of northeast British Columbia. Exploration extended out into the plains region with an important rotary drilling program by Gulf Canada Resources Inc. of the uppermost Cretaceous Wapiti Group.

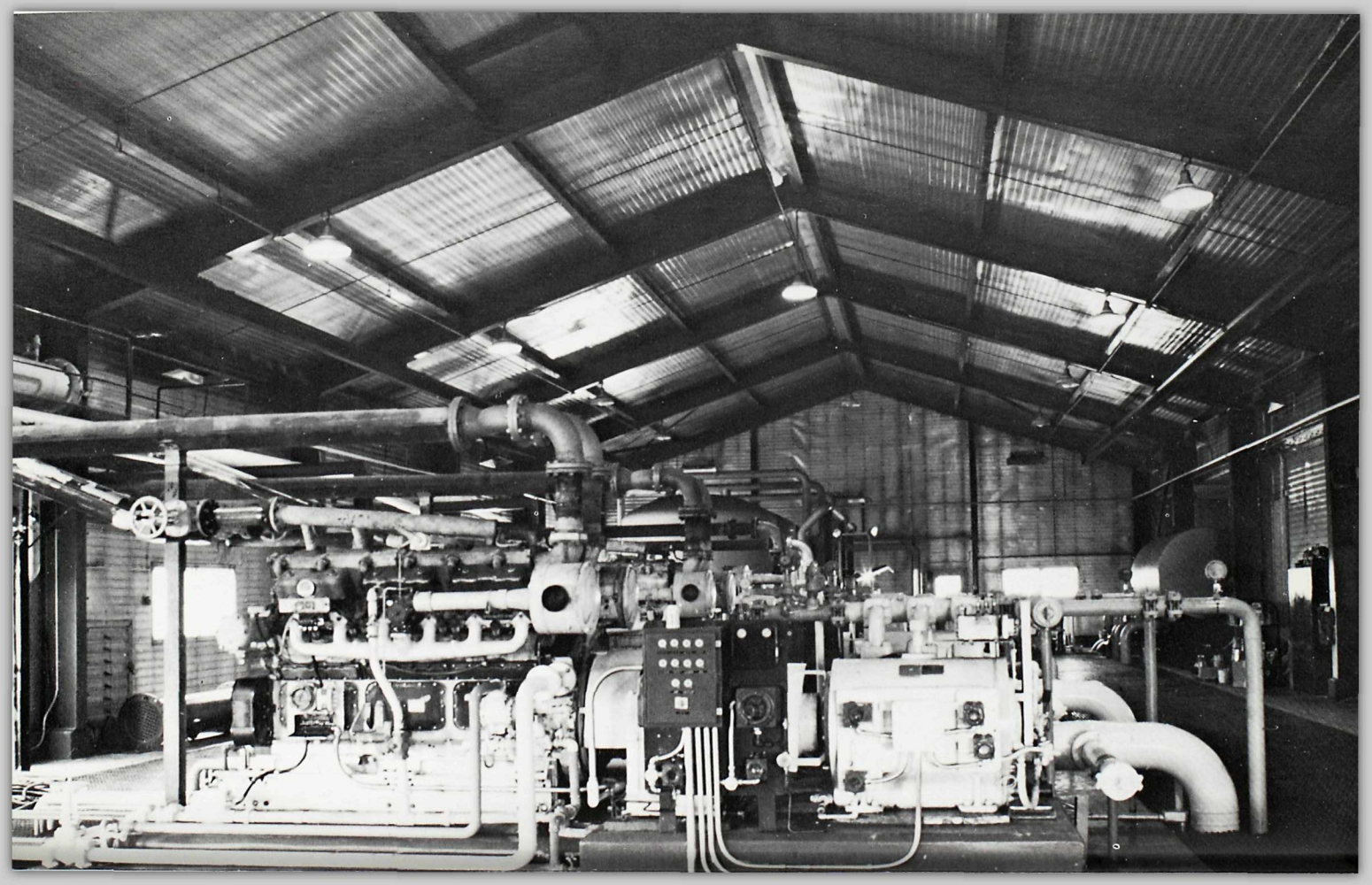
Exploration was carried out over 20 properties in the Peace River Coalfield. The most active of these were the Monkman (Petro-Canada Exploration Inc.) for which the Stage I report was submitted and has been accepted; Belcourt (Denison Coal Limited); Sukunka (BP Exploration Canada Limited) for which the Stage II report was submitted and accepted; Bullmoose (Teck Corporation) for which the Stage I report was submitted and has been accepted; Bri Dowling Creek (Utah Mines Ltd.); and the Adams property (Crows Nest Industries Limited).

In the southeastern part of British Columbia there were 15 properties in which active exploration took place, prominent amongst these were the Horseshoe Ridge and Line Creek

Ridge properties (Crows Nest Industries) for which the Stage II report was accepted. The Stage II report for Elk River (Elco Mining Ltd.) was accepted during the year as well. The Prospectus report for the Greenhills property (Kaiser Resources Ltd.) was submitted and accepted, and the Stage II report for the Sage Creek property (Rio Algom Limited) was submitted at the end of the year.

Elsewhere in the province exploration work took place on nine groups of licences in the Telkwa, Tuya, and Bowron coal basins as well as the Comox and Groundhog Coalfields.

The principal programs were as follows: Quinsam (Weldwood of Canada Limited) in the Comox Coalfield, for which the Stage I report was submitted and accepted; the Petro-Canada licences in the Tuya River area; the Crows Nest Industries' licences in the Telkwa basin; and Cyprus Anvil Mining Corporation's property in the Telkwa basin.



THE PETROLEUM INDUSTRY IN 1979

By THE STAFF OF THE PETROLEUM RESOURCES BRANCH

Record levels of drilling activity set in 1978 were maintained in 1979 with both number of wells and metres drilled slightly higher. Geophysical work was increased by 20 per cent. The production of both oil and gas was up by 7 and 14 per cent respectively due to greater producing capability and improved markets. Proceeds from the disposition of rights during 1979 amounted to $191.0 million compared to $177.5 million in 1978.

The following are tabulations of petroleum industry fiscal data for 1979:

Table 1-6—Value of Production of Petroleum Industry, 1979

	$
Crude oil	168 928 671
Field condensate	2 569 418
Marketable natural gas	699 508 127
Gas plant liquids	25 370 909
Total	896 377 125

Table 1-7—Provincial Revenue from Petroleum Industry, 1979

	$
Rentals and fees	21 474 579
Crown reserve dispositions	191 041 605
Royalties (oil, gas, and products)	45 935 056
Gas revenue from B.C. Petroleum Corporation	257 875 000
Total	516 326 240

DRILLING

For the third successive year drilling operations increased over the previous year although the gain in 1979 was small. Two more wells were drilled during 1979 than in 1978 while the number of metres drilled rose 6 per cent from 643 428.1 to 685 169.6. The results of drilling showed a greater number of oil completions, less gas completions, and about the same number of abandonments. There were 395 wells drilled of which 80 were oil wells, 180 were gas wells, and 128 were abandoned. These compare to 71, 187, and 129 respectively for 1978.

Greater emphasis was placed on wildcat and development drilling while outpost drilling decreased significantly which indicates operators were exploring in remote areas and drilling within known pools rather than in step-out locations.

PRODUCTION

Both oil and gas production significantly increased in 1979. This marks a reversal in trend after several years of continually declining production. Extensions of gas pipeline systems and improved markets and producing capability were responsible for this important change.

Oil production for 1979 was 2 139 962.9 m^3 (13 459 961.3 barrels), up 7 per cent over 1978. The largest producing oil fields during the year were: Boundary Lake, 865 716.7 m^3; Eagle, 296 465.2 m^3; Inga, 200 693.4 m^3; and Peejay, 164 200.3 m^3. The Eagle field moved from the fourth largest producer in 1978 to second largest producer in 1979 indicating the concentration of drilling and completions that took place in the area.

Gas production for 1979 also increased compared to 1978. The nonassociated raw gas production was 10 924 979.0 10^3m^3 (387 768 257 MCF), an increase of 14 per cent. Improved market conditions and expanded field gathering facilities were responsible for the increase.

Yoyo was again the largest gas-producing field reporting 1 878 445.5 10^3m^3, which was followed by Clarke Lake, 1 376 511.7 10^3m^3, Sierra, 912 831.8 10^3m^3, and Laprise Creek, 631 553.5 10^3m^3.

During the year many applications concerning drilling and production schemes were processed by the Branch. Each application was reviewed by the appropriate engineering staff resulting in rejection, approval, or modification.

Four applications by industry to convert wells to salt-water disposal service were approved in the Inga, Silver, and Siphon fields and the Sukunka area.

Applications for Good Engineering Practice were approved for the Boundary Lake—Halfway A pool, Bullmoose—Baldonnel A pool, Grizzly North—Halfway pools, Julienne Creek North—Debolt A pool, Oak—Halfway A pool, and the Sukunka—Baldonnel pools. Applications for concurrent production were approved for the Airport—Halfway B pool, Bulrush—Halfway B pool, Cecil Lake—North Pine A, Unit No. 1, Eagle—Belloy D pool, Fireweed—Doig B pool, Stoddart—Cecil C pool, and the Wildmint—Halfway B pool. All the foregoing approvals were granted contingent on the conservation of gas production. Three applications for downhole commingling of gas production and one for surface commingling were approved in Buick Creek, Dahl, Rigel, and Stoddart fields. An application to revert from 320 to 160-acre spacing in the Eagle—Belloy B pool was also approved. These schemes are detailed in Table 4-4.

Negotiations for the unitization of the Eagle—Belloy F pool are still proceeding and it is anticipated that the plan for pressure maintenance of the pool by water injection will be implemented by the middle of 1980.

Operators of Belloy oil wells in the Stoddart/West Stoddart area (Township 85, Range 20, and Township 86, Range 20) of the province are implementing schemes for the conservation of solution gas.

OPERATION PROBLEMS IN THE FIELD

During 1979, no major spills occurred at field production facilities, however, several fires at production facilities and one pipeline incident are worthy of mention.

The major pipeline spill which this section monitored occurred when the Norcen tank terminal at Boundary Lake experienced a power failure, and both the alarm system and the automatic shut-down equipment became inoperative. It was estimated that approximately 67 m^3 of oil escaped over the firewall from the storage tanks toward the Peace River. Oil spill containment booms were installed along the route in Moose Creek, Alces River, and at the confluence of the Alces and Peace Rivers. The majority of oil was contained, although perhaps 10 m^3 reached the Peace River. Cleanup operations satisfactorily removed all evidence of oil from the shorelines.

Toward the end of 1979 fire damage occurred at the Union Bulrush battery where extensive damage was incurred to a compressor unit, and at the Norcen Eagle battery where fire damaged the group separator, test separator, and inlet header beyond repair. Downtime at the Norcen Eagle battery was excessive due to the required delivery time of replacement equipment.

During 1979 no uncontrolled well blowouts occurred although several controlled blowouts are worth mentioning. The first occurred at CZAR et al Monias 6-25-82-21 while drilling at a depth of 1 636 metres. The crew were tripping in the hole with a new bit when a flow of mud was noticed coming from the drill pipe. The stabbing valve was installed immediately and the gas flow directed away from the rig. When the hydril was closed, gas was observed coming out of the ground under the pipe racks, and in the vicinity of the light

plant—a distance of approximately 25 metres from the wellbore. During the ensuing hours, equipment and materials were marshalled, and the gas blow was successfully controlled by pumping a large volume of water, followed by a weighted drilling fluid, into the well. Drilling operations were continued and the well was completed as a commercial gas well.

The second incident occurred at Wainoco Monias 7-30-82-20 while drilling at 2 083 metres. A drilling break occurred and a substantial increase in the level of the mud pit was observed. After checking for flow, and when none was observed, a decision was made to drill ahead. At 2 086 metres the mud became substantially gasified. The hydril was closed and gas flow increased rapidly to about 700 $10^3 m^3$ per day (25 MMCF per day).

The well was successfuly killed by pumping 90 m^3 of fresh water and 150 m^3 of weighted drilling fluid to the formation. The well was subsequently deepened to final total depth and successfully completed.

EXPLORATION AND DEVELOPMENT

Exploratory and development drilling activity for the 1979 calendar year again set a new record with a total of 395 wells drilled and re-entered in comparison with 393 wells drilled and re-entered in the previous year. Approximately 75 per cent of this total activity took place within the general Fort St. John area.

The exploratory wildcat and outpost drilling carried out in the northeastern sector of the province resulted in 4 oil and 89 gas completions respectively for an over-all success ratio of 56 per cent. This exploratory drilling effort resulted in 4 New Pool oil discoveries, 64 New Pool gas discoveries, 25 extensions to established reserves, and 82 dry holes.

None of the successful exploratory wells completed in 1979 can be given major gas discovery status at this time. However, substantial gas discoveries were made in the Fort Nelson, Fort St. John, and Sukunka-Grizzly areas. In general, the concentration of drilling was still centred around Fort St. John, although there was a decided increase in activity to the south. The highly active deep basin Elmworth play of Alberta was extended into British Columbia, although on a much lesser scale. Nevertheless, the significant amount of exploratory drilling that carried over into the province did result in a number of successes. The full significance of these discoveries will depend to a large degree on successful development drilling.

Development drilling activity provided a success ratio of 73 per cent with 154 completions out of 210 wells drilled. As in past years, the Fort St. John area saw the major effort in the development drilling program, with emphasis on the oil prospects in the immediate area. The balance of the northeastern area saw a steady rate of development drilling, controlled in part by proximity to pipelines and other facilities. The 154 completions comprised 88 gas completions and 66 oil completions.

The most significant field change as a result of development drilling took place in the Monias—Halfway gas pool, which was extended to the north and almost doubled in areal extent. Drilling at Yoyo resulted in the reinterpretation of the reservoir as reef atoll with a raised porous rim. Extensive development in the Tommy Lakes—Halfway gas play area, and in the Helmet region Jean Marie gas play also ensued, but conclusive flow testing has yet to be done in many wells to confirm success. Only infill and edge drilling occurred at the Eagle and West Stoddart—Belloy oil pools and some minor extension resulted. Other successful ventures included the Triassic at Sukunka, the Charlie Lake at the Commotion—Pine area (93-P-12), the Dunlevy in the Grizzly and Ojay areas, and isolated, areally small Devonian reefs adjacent to the main reef fronts.

Geophysical activity again set a new high, with 454 crew weeks of activity during the year. The activity was spread over all of the northeastern area, with a growing amount of activity to be found in the Foothills, and also in the areas to the north of Fort St. John, where interest in the deeper prospects seems to be increasing. Continued technical development of
2 both acquisition and processing methods have contributed to the increase in seismic

programs shot, although no one technique has been developed as a breakthrough. The high level of geophysical work would indicate a continued strong interest in the petroleum prospects of the area and the probability of further strong drilling activity for the next year.

Late in the year, a large area in the Nechako basin was opened for exploration with the posting of permits requiring work bonus bids. All of the successful bids were received from one operator, and a vigorous exploration program will be undertaken in the immediate future. While the area is decidedly wildcat in nature, only two wells having been drilled previously, it is thought by the successful bidder to be a worthwhile exploratory venture.

Table 1-8—Oil Discoveries, 1979

Well Authorization No.	Well Name	Location	Total Depth (Metres)	Productive Horizon
4768	PCP CEGO et al W Beatton	d-68-K/94-H-2	1 176.0	Bluesky.
4788	CZAR Fina et al Venus	b-28-C/94-P-9	1 096.0	Confidential.
4857	Ladd Buckthorn	a-25-D/94-A-16	1 245.0	Confidential.
4980	Cherokee et al S Inga	16-19-85-23	1 731.0	Inga.

Table 1-9—Gas Discoveries, 1979

Well Authorization No.	Well Name	Location	Total Depth (Metres)	Productive Horizon
4156	CZAR et al Butler	a-65-C/94-B-8	1 924.0	Confidential.
4398	Canhunter Moose	b-24-B/93-P-6	3 200.0	Dunlevy.
4411	Skelly Getty CS Commotion	c-29-C/93-P-12	4 721.0	Confidential.
4431	BP AEG W Sukunka	c-45-J/93-P-4	3 087.2	Confidential.
4449	Gulf Dome Norcen Thunder	a-38-I/93-I-15	4 115.0	Confidential.
4498	Esso Union Uno-Tex Windsor	a-3-B/93-P-16	3 760.0	Confidential.
4517	Canhunter et al Squaw	c-74-E/93-I-16	3 322.0	Confidential.
4569	Canhunter Blair	a-65-E/94-B-16	2 630.0	Confidential.
4644	Exalta Conuco et al Ring	a-89-A/94-H-16	1 165.0	Confidential.
4645	Exalta Conuco Ring	d-99-I/94-H-9	935.0	Confidential.
4646	Exalta Conuco Ring	b-62-I/94-H-9	1 060.0	Confidential.
4657	Remington et al Evie	b-49-F/94-I-15	2 504.0	Confidential.
4660	Mobil E Yoyo	b-97-F/94-I-14	2 257.0	Pine Point.
4661	Canhunter Tumbler	c-40-F/93-P-2	4 289.0	Confidential.
4662	Canhunter Bearhole	d-53-C/93-P-2	3 350.0	Confidential.
4677	Shell et al Lucy	a-29-G/94-P-4	2 477.1	Confidential.
4679	Tri Link et al Wildmint	d-61-A/94-H-2	1 107.9	Halfway.
4684	GEOG et al Martin	b-23-H/94-H-5	1 352.0	Baldonnel.
4686	Focus Zephyr et al Flatbed	c-54-H/93-P-2	2 650.0	Confidential.
4688	Chevron Amoco Ekwan	d-48-F/94-I-10	1 887.0	Confidential.
4692	Husky et al W Kiskatinaw	b-48-H/93-P-2	3 565.0	Confidential.
4693	Canhunter Jedney	b-26-H/94-G-1	1 726.0	Baldonnel.
4722	Chevron Ootla	d-1-I/94-O-9	2 445.0	Confidential.
4732	CZAR et al N Helmet	a-20-H/94-P-10	2 034.0	Pine Point.
4738	Dome et al Lime	c-96-C/94-H-1	1 113.1	Gething.
4741	Dome PCP Saskatoon	7-2-80-14-W-6	3 485.0	Confidential.
4750	Harbour et al Willow	d-17-H/94-H-2	1 133.0	Halfway.
4756	Cdn Res et al Bougie	d-96-F/94-G-15	2 757.0	Confidential.
4760	Fina HB PCP July	b-27-J/94-P-10	2 091.0	Confidential.
4764	Pacific Prespatou	d-73-A/94-H-3	1 186.0	Bluesky.
4774	Ashland Numac Montney	11-16-88-19	1 546.0	Confidential.
4782	Gulf Trutch	b-26-G/94-G-10	2 360.0	Confidential.
4798	CZAR BCRIC Dobin	b-10-G/94-P-9	1 220.0	Confidential.
4790	OIL Signalta N Nig	d-41-J/94-H-4	1 430.0	Confidential.
4805	Northstar Zephyr Prespatou	d-17-A/94-H-3	1 295.0	Bluesky.
4810	Wainoco Cdn-Sup Septimus	6-31-81-18	1 768.0	Confidential.
4813	Zephyr et al Black	c-98-B/94-H-6	1 258.0	Confidential.
4815	Esso Canhunter Hiding	a-1-G/93-I-16	3 675.5	Confidential.
4825	Amoco et al Buckinghorse	a-25-I/94-G-7	1 410.0	Confidential.
4827	Pacific Antler	b-6-J/94-G-9	1 159.0	Confidential.
4828	Dekalb et al Bivouac	a-67-B/94-I-8	575.0	Confidential.
4830	Westcoast et al Temple	a-21-J/94-G-9	1 100.0	Confidential.
4834	OIL et al Lapp	b-28-C/94-H-10	1 053.0	Confidential.

Table 1-9—Gas Discoveries, 1979—Continued

Well Authorization No.	Well Name	Location	Total Depth (Metres)	Productive Horizon
4835	Pacific Norcen Horn	a-63-H/94-G-9	1 302.0	Confidential.
4837	Esso Union Noel	b-86-C/93-P-8	3 251.0	Confidential.
4838	Esso Windsor	c-98-A/93-P-1	2 525.0	Confidential.
4844	Canhunter Gundy	b-26-A/94-B-16	2 386.0	Debolt.
4847	CZAR et al Butler	c-12-C/94-B-8	1 960.0	Confidential.
4854	Gulf et al Tupper	a-28-A/93-P-9	3 209.0	Confidential.
4855	Petromark et al Antler	d-11-K/94-G-9	1 138.3	Confidential.
4861	Esso et al Windsor	b-28-I/93-I-16	3 680.0	Confidential.
4867	Canhunter Thunder	d-93-I/93-I-15	4 285.0	Confidential.
4883	Dome et al Doe	11-22-81-14	2 586.8	Boundary.
4920	Pacific Norcen Laprise	c-12-L/94-H-5	1 313.0	Baldonnel.
4922	Canhunter et al Townsend	d-57-H/94-B-9	2 345.0	Confidential.
4923	Canhunter Petromark Cameron	c-74-K/94-B-9	2 095.0	Confidential.
4937	OIL ATAPCO Sunset	7-8-79-18	2 300.0	Confidential.
4965	Canhunter N Townsend	c-58-J/94-B-9	2 400.0	Confidential.
4970	Kaiser Numac Buick	7-19-88-19	1 522.0	Confidential.
4977	Dome Woods Prespatou	d-80-I/94-A-14	1 651.5	Confidential.
5007	Focus et al Sunrise	11-18-79-16	3 130.0	Confidential.
5017	Samedan et al Umbach	a-25-F/94-H-3	1 408.0	Confidential.
5043	Wainoco et al Tea	11-26-84-20	1 645.0	Confidential.
5075	PEX WP Doe	A7-16-80-14	742.0	Confidential.

LAND DISPOSITION

There were eight dispositions of Crown reserve petroleum and natural gas rights held during 1979. Seven of these resulted in tender bonus bids amounting to a record total of $191 041 605, an increase of $13 581 957 from the previous year. A total of 741 parcels was offered in the seven dispositions, a decrease of 165 over 1978, with bids accepted on 589 parcels, a decrease of 150 over 1978. The accepted bids covered 500 796 hectares, a decrease of 198 359 hectares. It is interesting to note that while both the number of purchased parcels and amount of hectares purchased decreased considerably, the total amount of bonus paid increased substantially.

The eighth disposition of Crown reserve was held in December when 51 permit parcels in the Nechako basin area west of Williams Lake and Quesnel were offered on the basis of work bonus bidding. A five-year work bid totalling $27 500 000 was accepted on 43 parcels covering 1 952 490 hectares.

HUGHES

Activity of the Ministry

CHAPTER 2

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HISTORY AND DEVELOPMENT

The Department of Mines was created in 1874. Before that time, mining laws were administered by the Provincial Secretary's Department, to a great extent through Gold Commissioners, the first of whom was appointed in 1858. As the province grew and mining increased in importance and diversity, the Bureau of Mines was formed as a technical division within the Department. Composed of professional men under the direction of a Provincial Mineralogist, the Bureau lasted from 1886 to 1934, when it was succeeded by the Mineralogical Branch, now the Geological Division of the Mineral Resources Branch. The Department took over administration of the *Petroleum and Natural Gas Act* and the *Coal Act* from the Department of Lands in 1953 and became the Department of Mines and Petroleum Resources in 1960. In a general name change in 1976 it became the Ministry of Mines and Petroleum Resources. On December 4, 1978, the mandate of the Ministry was enlarged to include responsibility for energy matters and it became the Ministry of Energy, Mines and Petroleum Resources.

The mandate of the Ministry as defined late in 1978 is to develop and manage the energy policy of the province, to manage provincial policies for mineral and petroleum resource development, and to implement sound conservation and environmental measures for these industries. The Ministry is responsible for all energy-related functions, and the Minister has direct responsibility for the British Columbia Petroleum Corporation, the British Columbia Hydro and Power Authority, and the British Columbia Energy Commission. Administration of all statutes respecting mining, petroleum and natural gas, energy, and geothermal resources are the responsibility of the Ministry.

In the energy field, the Ministry develops policy and makes analyses and recommendations to Cabinet, carries out forecasting on a regular basis, reviews new energy projects, and administers the energy conservation and technology program.For mineral resources, the Ministry maintains the tenure records of mineral claims, placer leases, and coal licences; provides the inspection and engineering services for worker and public safety in and around mines; ensures optimum extraction of mineral resources and reclamation of lands disturbed by mining; carries out geoscientific surveys, studies, and compilations to assist with exploration; and makes analyses for the government respecting the economic conditions, land use, and taxation factors as they relate to the mineral industry. The Petroleum Resources Branch administers the *Petroleum and Natural Gas Act*, the *Underground Storage Act, 1964*, and the *Geothermal Resources Act*. The objective is to assure the orderly development and conservation of the oil and gas resources, and to make recommendations to the government regarding the resource and the requirements for sound development.

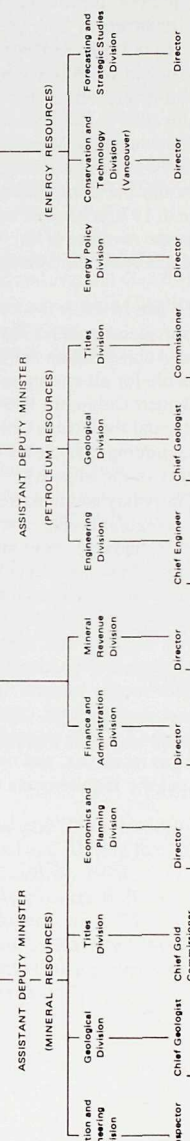

Figure 2-1—Organization Chart, Ministry of Energy, Mines and Petroleum Resources, November 1979.

LEGISLATION

In 1979, minor amendments were made to the *Energy, Coal, Mineral, Mineral Land Tax, Mineral Resource Tax*, and *Petroleum and Natural Gas Acts*.

Amendments to the *Energy Act* provided for the designation of surplus energy producers by the Lieutenant Governor in Council so that certain producers may not be subject to the provisions respecting energy producers contained in the Act. A second amendment provided the Energy Commission with the power to declare a carrier, purchaser, or processor of oil, natural gas, or liquid natural gas to be a common carrier, a common purchaser, or a common processor, thus enabling a producer or a processor of petroleum or natural gas to obtain a market for their product on a prorated basis. The amendment to the *Coal Act* gives authority to the Minister to require drill cores from the testing of coal deposits to be submitted to a central locality and allows the setting of regulations for the transportation and use of those samples. Section 10 of the *Mineral Act* was amended to clarify the rights for the use of the surface and the timber on mineral claims. The amendment to the *Mineral Land Tax Act* validated assessments made and taxes collected under the Act since its proclamation on June 15, 1973. Under the *Mineral Resource Tax Act* the definition of mineral was amended to include minerals as defined under the *Placer Mining Act*. The amendment to the *Petroleum and Natural Gas Act* requires the holder of a location to pay a penalty where he does not pay the royalties due or fails to file a complete report as required by the Regulations.

During the year, the Ministry of the Attorney General continued to work on the *Revised Statutes of British Columbia, 1979*, in which some statutes administered by the Ministry were amended along predetermined lines. The names of some statutes are amended, the numbering of sections in some statutes has been changed, and the wording has been modernized and clarified.

WELDWOOD
The Real Decorator Panel

BRANCH ACTIVITY

MINERAL RESOURCES BRANCH

The Mineral Resources Branch, under the direction of Assistant Deputy Minister, Edwin R. Macgregor, consists of four divisions: Inspection and Engineering, Geological, Titles, and Economics and Planning.

Inspection and Engineering Division

Coal mines, metal mines, and quarries were inspected during the year by inspectors stationed at the following listed locations. The inspectors also examined prospects, mining properties, roads and trails, and carried out special investigations under the *Mineral Act*. Dust, ventilation, and noise surveys were carried out by Environmental Control Inspectors under the supervision of S. Elias and, where necessary, recommendations were made regarding improvement to the environmental conditions. The roads and trails program was supervised by P. E. Olson. J. D. McDonald administered the reclamation sections of the *Coal Mines Regulation Act* and the *Mines Regulation Act*. Mine-rescue training was completed under the direction of the Coordinators, Mine-rescue Training, for the areas in which their stations were located.

Staff

Inspectors and Resident Engineers

W. C. Robinson, Chief Inspector of Mines	Victoria
V. E. Dawson, Deputy Chief Inspector of Mines, Coal and Special Services	Victoria
A. J. Richardson, Deputy Chief Inspector of Mines, Metals	Victoria
H. Dennis, Senior Inspector of Coal Mines	Victoria
T. G. Carter, Senior Inspector of Mines, Mechanical/Electrical	Victoria
J. Cartwright, Inspector of Mines, Electrical	Victoria
P. E. Olson, Senior Inspector of Mines, Mining Roads	Victoria
J. D. McDonald, Senior Inspector of Mines, Reclamation	Victoria
D. M. Galbraith, Inspector of Mines, Reclamation	Victoria
J. C. Errington, Inspector of Mines, Reclamation (Agrologist)	Victoria
S. Elias, Senior Inspector of Mines, Environmental Control	Vancouver
D. J. Murray, Inspector of Mines, Environmental Control	Vancouver
S. J. L. Miller, Inspector of Mines, Environmental Control	Vancouver
V. Pyplacz, Audiologist, Environmental Control	Vancouver
J. C. Ferguson, Inspector of Mines, Technician, Environmental Control	Vancouver
B. M. Dudas, Inspector of Mines and Resident Engineer	Vancouver
W. H. Childress, Inspector of Mines, Technician	Vancouver
J. W. Robinson, Inspector of Mines and Resident Engineer	Nanaimo
H. A. Armour, Inspector of Mines,Technician	Nanaimo
S. J. Hunter, Inspector of Mines and Resident Engineer	Prince Rupert
B. Varkonyi, Inspector of Mines, Technician	Prince Rupert
J. F. Hutter, Inspecter of Mines and Resident Engineer	Smithers
S. J. North, Inspector of Mines, Technician	Smithers
A. D. Tidsbury, Inspector of Mines and Resident Engineer	Prince George
T. Vaughan-Thomas, Inspector of Mines and Resident Engineer	Prince George
J. J. Sutherland, Inspector of Mines, Technician	Prince George
B. E. Warner, Inspector of Mines, Technician, Reclamation	Prince George
K. G. Hughes, Inspector of Mines, Technician, Mechanical	Prince George
D. I. R. Henderson, Inspector of Mines and Resident Engineer	Fernie
D. Smith, Inspector of Mines and Resident Engineer	Kamloops

Inspectors and Resident Engineers—Continued

E. S. Sadar, Inspector of Mines and Resident Engineer ..... Kamloops
J. P. MacCulloch, Inspector of Mines and Resident Engineer ..... Kamloops
J. A. Thomson, Inspector of Mines, Technician ..... Kamloops
R. H. Heistad, Inspector of Mines, Technician, Mechanical ..... Kamloops
J. B. C. Lang, Inspector of Mines and Resident Engineer ..... Nelson
A. L. O'Bryan, Inspector of Mines, Technician, Reclamation ..... Nelson
E. J. Hall, Inspector of Mines, Technician, Reclamation ..... Fort St. John

Coordinators, Mine-rescue Training

G. J. Lee, Senior Coordinator ..... Victoria
R. F. Brow ..... Nanaimo
J. E. A. Lovestrom ..... Smithers
R. J. Stevenson ..... Prince George
B. A. McConachie ..... Kamloops
E. C. Ingham ..... Nelson
P. J. Switzer ..... Fernie

Staff Changes

V. Pyplacz joined the Ministry as Audiologist, Environmental Control, on January 2, 1979.

In August, B. E. Warner resigned from the staff of the Reclamaton section.

In November, A. D. Tidsbury retired after 10 years of service.

J. F. Hutter, Inspector of Mines and Resident Engineer, Smithers, died suddenly on September 10, 1979. He had been with the Ministry for six years and he will be sadly missed by his colleagues.

Mine Inspection and Safety

The *Mines Regulation Act* and the *Coal Mines Regulation Act* were enacted for the purpose of minimizing personal injury and property damage resulting from mining operations and to ensure maximum possible recovery of resources, having due regard to good engineering practices. The Inspection and Engineering Division has the responsibility of enforcing these Acts and ensuring that good practice is carried out by persons engaged in mining in the province. The Division maintains a province-wide system of districts, staffed by experienced personnel, together with additional specialized personnel based in Victoria. A good standard of cooperation continued to exist at mines and safety programs were in effect at mines throughout the year.

Various certificates of competency, depending on a person's supervisory function, are required by certain supervisors and officials at mines. These are issued following examinations conducted by or on behalf of Boards of Examiners, appointed from the Inspection and Engineering Division, under the two Acts. The examinations are designed to ensure that the candidate has adequate knowledge of the Act and safe operating methods. In addition, miners' certificates, coal miners' certificates, and blasting certificates are issued by the District Inspectors.

Monitoring of dust, ventilation, and noise conditions continued at most mining operations and in addition radiation surveys were made for radon daughters and gamma radiation at 20 mining operations. Suitable improvements were requested and action taken by owners and management where the environmental conditions were found to be unsatisfactory. Audiometric testing of mine employees was continued at most mine operations. In addition to action requested by inspectors, efforts were also made by industry, on a voluntary basis, to reduce dust and noise produced at mines and in preparation plants.

Mine Rescue and First Aid

The expanding mining industry continued to place a heavy demand on mine-rescue and first-aid training services in 1979. A new course, concerning back problems, was added to the training syllabus.

Mine-rescue training stations were maintained at six districts under the supervision of coordinators who were fully qualified in first aid and mine rescue. These districts were Fernie, Nelson, Kamloops, Nanaimo, Prince George, and Smithers. Each station was equipped as a mobile unit, in order that equipment could be transported to any place within the area for rescue or training purposes. Sufficient self-contained, oxygen-supplying, breathing equipment to maintain at least two rescue teams of six men each was held at each station, in readiness for any emergency that might have arisen at mines served by the station. In addition to that equipment, some was loaned by the Ministry to supplement that owned by various mining companies.

The mine-rescue equipment owned by this Ministry during 1979, included 59 Aerorlox three-hour liquid oxygen breathing machines, 43 Draeger BG-174 and 46 McCaa two-hour high-pressure gaseous oxygen breathing machines, 51 Chemox one-hour chemical oxygen-producing machines, and 24 Demand 30-minute units. Industry owned 30 Aerorlox, 24 Draeger BG-174, 29 McCaa, and 83 Chemox machines. Each station, as well as most mines, had additional auxiliary equipment such as Type N gas masks, self-rescuers, gas detectors, oxygen therapy units, and first-aid equipment.

The district coordinators of rescue training made periodic visits to the mines for the purpose of giving rescue training to open-pit and underground employees and checking the rescue equipment to ensure its serviceability.

Full and refresher courses in underground, survival, gravel-pit, and surface mine-rescue training, as well as first aid, were presented by the district coordinators at various mines and centres throughout the province. The coordinators trained or assisted in training 226 persons who obtained St. John Ambulance first-aid certificates and 135 who obtained safety-oriented first-aid certificates. Forty persons were trained in industrial first aid, 82 in underground mine-rescue work, 275 in surface mine-rescue work, 34 in gravel-pit rescue work, and 212 in mine-rescue survival courses. Surface Mine Rescue Instructors' certificates were obtained by 9 persons, 1 person obtained a Survival Mine Rescue Instructors' certificate, 6 persons received Advance Mine Rescue Certificates, and 1 070 persons attended talks on back problems.

Four mine safety associations have been established in different areas in the province. These were supported by the Ministry of Energy, Mines and Petroleum Resources and were aided by mining company officials, safety supervisors, inspectors of mines, mine-rescue coordinators, and, in some areas, local industry. These organizations promoted mine-rescue and first-aid training, as well as safety education in their various districts.

On May 26, 1979 the Vancouver Island Mine Safety Association held its 65th Annual Mine-Rescue and First-Aid Competition at Nanaimo. The Western Mines Limited's team, captained by H. Uhrig, won the trophy in the underground mine-rescue event. The Noranda Mines Limited's Boss Mountain team, captained by B. Buys, was placed second and represented the Central B.C. Mine Safety Association area at the provincial meet.

On June 2, the West Kootenay Mine Safety Association held its 33rd Annual Competition at Nelson. The Kaiser Resources Ltd.'s team from Sparwood, captained by H. Eberts, won the underground mine-rescue event.

On June 9, the East Kootenay Mine Safety Association held its 58th Mine-Rescue and First-Aid Competition in Fernie. The trophy for the underground mine-rescue event was won by the Cominco Ltd.'s Sullivan mine team from Kimberley, captained by C. N. Carnel. The Byron Creek Collieries' team, captained by L. Robin, was placed first in the surface mine-rescue event.

On May 26 and June 1, the Central B.C. Mine Safety Association held its 31st Annual Mine-Rescue and First-Aid Competition in Kelowna and Smithers respectively. The Gibraltar Mines Limited's team, captained by P. Beaudoin, won the surface mine-rescue trophy at Kelowna. The Cassiar Asbestos Corporation Limited's team, captained by G. Smith, was placed first at Smithers.

On June 16, the provincial underground mine-rescue, surface mine-rescue, three-person miners' first-aid, and underground bench competitions were held at Cranbrook. In the surface mine-rescue event, the Gibraltar Mines' team from McLeese Lake, captained by P. Beaudoin, was placed first. In the underground mine-rescue event, the Western Mines' team from Campbell River, captained by H. Uhrig, won the trophy. This team went on to compete in the Canadian meet held at Whitehorse, Yukon Territory, on June 23, 1979, where teams from British Columbia, Yukon Territory, Northwest Territories, Alberta, Saskatchewan, and Nova Scotia competed. The Devco team from Nova Scotia was placed first in the competition. The Noranda Mines' Boss Mountain team from Hendrix Lake, captained by B. Buys, was placed first in the underground bench event and the Lornex Mining Corporation's team, captained by G. Collison, won the trophy in the three-person miners' first-aid event.

Safety of Mechanical/Electrical Equipment

An increase in mining activity in the province was reflected in the numbers of pieces of mechanical/electrical equipment in use at the mines. Construction type equipment, such as dozers, scrapers, and graders showed an increase of over 70 per cent over the previous year, while the number of permits issued to allow the operation of diesel-powered equipment underground doubled that for 1978.

A total of 925 large mining trucks were in use at the various mines and quarries during 1979 and well over 300 of these had capacities exceeding 75 tonnes. Several new models of trucks having gross vehicle weights in excess of 50 tonnes were qualified during the year for use in the province after exhaustive engineering evaluations of their braking, steering, and other safety-related systems had been carried out, together with a series of high-speed downhill brake tests. These preoperational tests and evaluations together with subsequent annual brake tests conducted at the mines are important factors in ensuring the continuing safety of such equipment.

The use of fire-resistant fluids in equipment operating underground increased substantially and this positive contribution to fire prevention was achieved without undue decrease in efficiency of the various systems in which it is used.

A close scrutiny was made of plant layout for new installations in order to ensure that safe operating and maintenance of equipment was considered at the design stage. This practice may necessitate alteration of design drawings but that is usually an easier task than rearranging items of plant once installed.

Electrical installation designs were reviewed and accepted as suitable for construction at several new properties, major expansions at existing mines, and the rehabilitation of two previously closed mines. In addition, engineering reviews were conducted on various electrically powered mining machines and directions were issued to equipment manufacturers on the manner of compliance with the electrical code requirements.

The annual meeting of the Canadian Committee for Electrical and Mechanical Mine Safety was attended in St. John's, Newfoundland, as well as meetings of the British Columbia Mobile Equipment Committee. Representation on the committee responsible for updating the Canadian Electrical Code, pertaining to the Use of Electricity in Mines, was continued during the year, and a member of the staff accompanied a team of engineers on a tour of coal operations and equipment manufacturers' plant in the United States, in order to advise on British Columbia safety requirements.

Mining and Petroleum Roads

The Ministry of Energy, Mines and Petroleum Resources' road program continued during 1979 under authority of the *Ministry of Energy, Mines and Petroleum Resources Act*. The purpose of the program was to encourage and assist in the development of mineral and fossil fuel resources in the province.

During 1979, an expenditure of around $475 000.00 was made to extend an all-weather road to the main gas-producing area east of Fort Nelson. This work included the construction of a bridge across the Snake River and the construction of a 2-kilometre by-pass road around an Indian reservation.

Approximately $215 000.00 was spent during the year to upgrade the Omineca road and construct a new bridge across Lay Creek. This work included the maintenance of the Takla Lake spur road.

In the order of $116 000.00 was granted to about 15 smaller access projects throughout the province by way of improving roads to mineral-rich areas.

Reclamation

Reclamation was administered by the Inspection and Engineering Division, under the authority of section 11 of the *Mines Regulation Act*, and section 8 of the *Coal Mines Regulation Act*. The objective is to restore lands used in mining, waste disposal, and exploration to useful purpose, compatible with the surrounding countryside. Reclamation does not apply to land disturbed by mining prior to legislation enacted in April 1969.

Surface work permits are issued on a permanent basis and annual reports are submitted and reviewed. Bonding requirements are assessed on a yearly basis from the annual reports. A total of 117 new surface work permits (4 metal, 6 coal, 48 mineral exploration, 36 placer, 23 sand and gravel) was issued during 1979.

Reclamation progressed satisfactorily during 1979 and, in particular, the coal mining industry showed good progress. The 38 active metal mines reported a total disturbance of 9 952 hectares, of which 210 hectares were revegetated during 1979. The four active coal operations reported a total disturbance of 4 965 hectares, of which 246 hectares were revegetated during 1979. The total amount revegetated since 1969 now stands at 1 262 hectares for metal mines and 1 021 hectares for coal mines.

Vegetation studies continued at the operating mines and the vegetation results were computerized. A program to summarize the results has been commenced and results will be published for the benefit of the mining industry. Vegetation projects on abandoned tailings ponds continued and these have shown excellent to poor results.

The 3rd Annual Mine Reclamation Symposium was held in March 1979, sponsored by the Ministry of Energy, Mines and Petroleum Resources and the Mining Association of British Columbia. One hundred and ninety participants attended the three-day session and heard talks on dump design for revegetation, reclamation planning,site preparation, and other resource and environmental problems and solutions.

During the symposium, the reclamation award for 1978 was presented to Kaiser Resources Ltd. for its excellent reclamation and research program. Citations were given to Craigmont Mines Ltd. at Merritt and Fording Coal Limited at Elkford.

Geological Division

Objectives and Organization

Metals, non-metallic minerals, and coal are nonrenewable judged by the scale of man's lifetime. The province's needs for these commodities for our own use and for export are fulfilled only by continuous exploration and discovery. The fundamental role of the Geological Division is to facilitate the renewal process. To do this the detailed objectives of the Geological Division are to provide accurate and current information on the quantity and

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distribution of mineral and coal deposits of the province for government and industry, to provide geological, geochemical, and geophysical maps and other data, ideas, interpretations, and training useful in the search for these deposits, and to assist in the orderly exploration, development, and use of these resources. To carry out these objectives, the Division is organized into four sections: Project Geology, Applied Geology, Resource Data and Analysis, and Analytical Laboratory, the work of which is described subsequently.

Staff

The staff on December 31, 1979, included 49 permanent positions, 1 vacancy, and 5 auxiliary positions. The permanent positions consisted of 27 geoscientists, 6 chemists, 9 technicians and technical assistants, and 8 secretaries, clerks, and office assistants. The auxiliary positions included two geoscientists, one laboratory technician, and two office assistants.

A. Sutherland Brown, Ph.D., P.Eng.	Chief Geologist

Project Geology

N. C. Carter, Ph.D., P.Eng.	Senior Geologist
P. A. Christopher, Ph.D., P.Eng	Geologist
B. N. Church, Ph.D., P.Eng.	Geologist
G. E. P. Eastwood, Ph.D., P.Eng.	Geologist
R. D. Gilchrist, B.Sc.	Geologist
T. Höy, Ph.D., P.Eng.	Geologist
D. G. MacIntyre, Ph.D., P.Eng.	Geologist
W. J. McMillan, Ph.D., P.Eng.	Geologist
A. Panteleyev, Ph.D., P.Eng.	Geologist
D. E. Pearson, Ph.D., P.Eng.	Geologist
V. A. Preto, Ph.D., P.Eng.	Geologist
J. L. Armitage	Chief Draughtsman
R. E. Player	Lapidary and Photographer

Applied Geology

E. W. Grove, Ph.D., P.Eng.	Senior Geologist
A. F. Shepherd, B.A.Sc., P.Eng.	Geologist
G. G. Addie, M.Sc., P.Eng.	District Geologist
G. H. Klein, B.A.Sc., P.Eng.	District Geologist
T. G. Schroeter, M.Sc., P.Eng.	District Geologist
G. P. E. White, B.Sc., P.Eng.	District Geologist
R. H. Karst, B.Sc.	District Geologist
D. A. Grieve, M.Sc.	District Geologist
G. V. White	Engineering Assistant

Resource Data and Analysis

[vacant]	Senior Geologist
K. E. Northcote, Ph.D., P.Eng.	Geologist
Z. D. Hora, M.Sc.	Geologist
T. E. Kalnins, B.A.Sc., P.Eng.	Geologist
J. E. Forester, M.A.	Research Officer
A. Matheson, B.Sc.	Research Officer

Analytical Laboratory

W. M. Johnson, Ph.D.	Chief Analyst
R. F. Ralph, L.R.I.C.	Deputy Chief Analyst
B. Bhagwanani, B.Sc.	Laboratory Scientist
R. J. Hibberson, B.Sc.	Laboratory Scientist
Y. T. J. Kwong, M.Sc.	Laboratory Scientist
V. V. B. Vilkos, Ph.D.	Laboratory Scientist
M. A. Chaudhry	Laboratory Technician
F. F. Karpick	Assayer
L. E. Sheppard	Laboratory Technician

Staff Changes

During 1979, J. A. Garnett, Senior Geologist, Resource Data and Analysis Section, resigned in July to take the position of Director of Mineral Resources of the Nova Scotia Department of Mines and Energy. V. E. Jackson resigned in June to return to New Brunswick to work for the Department of Mines. G. V. White replaced W. Proudlock as Engineering Assistant at Charlie Lake.

The Work of the Division

The distribution of major projects in 1979 and of district offices, regional geochemical surveys, and areas are shown on Figure 2-2.

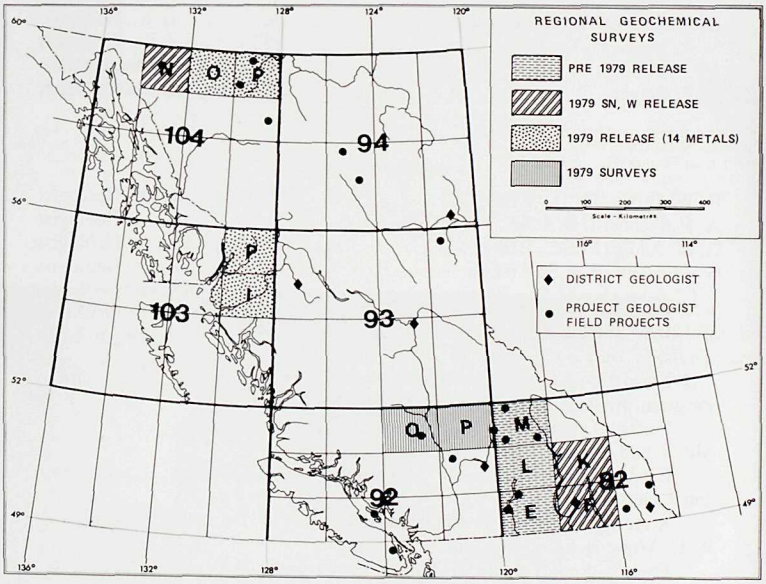

Figure 2-2—Geological and Geochemical Project Areas, District Geologist Offices, 1979.

Project Geology

The work of this section is devoted to geological mapping of areas important for mineral resources and regional geochemical reconnaissance surveys useful for both exploration and environmental baseline studies. The section mounted 11 main field projects at a total field cost of about $250 000 and a geochemical reconnaissance survey at a cost of $225 000. Salaries and other costs of the section totalled about $500 000.

The geochemical survey in 1979 of Taseko Lakes (92O) and Bonaparte River (92P) areas was done by a series of separate contracts with only planning, supervision, and control provided by the Division. Considerable help in data handling was received from the Geological Survey of Canada.

The previously mentioned studies by project geologists were augmented by work of district geologists and laboratory scientists both in cooperative studies such as that carried out at the Afton mine for a Ph.D. by J. Kwong of the Analytical Laboratory with the help of G. P. E. White, district geologist, Kamloops, and also by independent studies such as R. H. Karst and G. V. White's coal rank distribution in the Peace River district. In addition valuable field and office studies were conducted by professors and graduate students at The University of British Columbia with the aid of grants from the Ministry. Most of these studies were directly relevant to Division projects and some were cooperative. The following were conducted in 1979.

Project and Commodity Interest	Areas	Map Publication Scale	Principal Investigator
Geological Surveys (Bedrock)			
(a) North Okanagan Tertiary Stratigraphy (U, Au, Ag)	82E and parts of 82L	1:50 000	B. N. Church
(b) Southeast British Columbia Lead/Zinc Deposits	parts of 82 G, L, M	1:50 000 1:10 000	T. Höy
(c) Barriere Lake/Adams Plateau (Cu, Zn)	82M/3, 4, 5 92P/1, 8	1:25 000	V. A. Preto
(d) Nicola Volcanic Study (Cu, Zn, Mo) and Chu Chua Deposit	921/1, 2, 7 92P	1:25 000 1:25 000	W. J. McMillan
(e) Sicker Study (Zn, Cu, Au, Ag)	92B/13	1:50 000	G. E. P. Eastwood
(f) Northeastern British Columbia Lead/Zinc	94F/2, 3, 6, 11, 12, 13; 94L/1, 8	1:50 000	D. G. MacIntyre
(g) Cassiar Molybdenum/Tungsten Deposits	104P/4,5	1:25 000	A. Panteleyev
(h) Adanac Molybdenum Deposit	104N/11	1:10 000	P. A. Christopher
(i) Elk River Coalfields	82G/14, 15	1:10 000	D. E. Pearson
(j) Peace River Coalfield	parts of 93 I, P	1:25 000	R. D. Gilchrist
(k) Correlation Studies	parts of 93 I, P	—	P. McL. D. Duff
Geochemical Surveys			
Taseko Lakes, Bonaparte River	92 O, P	1:250 000	T. Kalnins, N. C. Carter

In addition, the Division sponsored field projects by The University of British Columbia staff. Many of these had Division staff as coinvestigators or the project was part of a larger Division study.

Evaluation Procedure for Geochemical Data, Uranium Reconnaissance Program, by A. J. Sinclair and W. K. Fletcher.

Surface Lithogeochemistry, Northair Mine, by A. J. Sinclair, J. H. L. Miller, and N. C. Carter.

Cariboo Mountains Project, by H. J. Greenwood, J. V. Ross, D. Klepacki, and J. Getsinger.

K/Ar Age Determinations, Wrede Creek Zoned Ultramafic Complex, by R. H. Wong and C. I. Godwin.

Progress Report on the Geology of the Specogna (Babe) Gold Deposit, by N. Champigny and A. J. Sinclair.

Preliminary Interpretation of Lead Isotopes in Galena-Lead from British Columbia Mineral Deposits, by C. I. Godwin, A. J. Sinclair, and B. D. Ryan.

The fieldwork of the section and these university projects are described yearly in January of the year following in *Geological Fieldwork* and also in a series of preliminary maps, papers, and authoritative bulletins.

Applied Geology

The work of the Applied Geology Section includes aid in the field to exploration personnel and prospectors, monitoring of exploration and geological developments at producing mines, coal core storage and studies, prospector training, and control of incentive grants to exploration. District geologists continued their property visits and field mapping as well as other duties related to prospectors, public information, and integrated resource management. The geological studies are described in *Geological Fieldwork, 1979*.

A considerable part of the effort of the section is devoted to prospectors and small developers. Over 1 000 students were enrolled in basic prospecting courses in 1979 and 32 prospectors graduated from the two-week-long Third Annual Mineral Exploration course held at Selkirk College, Castlegar. One hundred and sixty-one prospectors received grants under the *Prospectors Assistance Act*. The Mineral Exploration Incentive Program, with a budget of $500 000, which was first started in 1978 continued. It was designed to act as a fiscal bridge between prospecting and preliminary development. The Mineral Exploration Incentive Program provided grants up to one-third of the receipted cost of approved programs to a maximum of $50 000. Forty-six contracts were let in 1979 under the supervision of J. Bristow.

The operating costs of these programs were approximately as follows: core repository and recovery, $19 000; prospector training, $32 000; Prospectors' Assistance grants, $185 000; field programs of district geologists, $84 500; salaries and overhead, $234 000.

Resource Data and Analysis Section

This section is responsible for the collection, compilation, interpretation, and distribution of exploration and development data gathering from various sources. Most of the information is readily available after requisite confidential periods, normally one to three years. The major files are: MINFILE, a shallow computer file of over 8 000 mineral occurrences; assessment report file, over 7 000 microfilmed reports available at reader/printers in Vancouver or Victoria; property files of historic maps and data from producers and prospects recovered from many sources and filed by NTS system; and industrial minerals reference files. In addition, a computerized coal data file is being constructed under contract jointly with the Geological Survey of Canada, and a computer file of statistics on producing mines and major prospects is underway. The annual volume, *Exploration in British Columbia*, is produced by the section coincident with its update of MINFILE.

In addition, the section administers the Portable Assessment Credit account, produces map compilations and mineral potential evaluation studies related to land-use conflicts, and advises on regulations. Field-oriented studies related to industrial minerals and structural materials are also handled by this section.

The major field study was of aggregate materials of the lower mainland and Vancouver Island under the direction of Z. D. Hora with the cooperation of the Economics and Planning Division. K. E. Northcote also conducted field checks and liaison with other government agencies in regard to land-use intepretation.

The costs of this section were approximately as follows: field studies, $26 500; MINFILE and analyses, $65 000; coal file construction, $68 000; salaries and overhead, $230 000.

Analytical Laboratory—The laboratory, under W. M. Johnson, is responsible for a complete range of analytical services for the Division geologists and prospector grantees as

well as some services to other government agencies.The laboratory also runs control samples and handles the chemical data for the British Columbia regional geochemical surveys. The Chief Analyst is also responsible for assayer examinations for the province.

The facilities include X-ray fluorescence, atomic absorption and emission spectrography, X-ray diffraction, gamma ray spectrometry, and mineral separation. Capability in traditional wet analytical chemistry still exists. Instrument output is fully computerized.

Method Development and Research—Method development and research in the laboratory concentrated in 1979 on the following subjects: research on the mineral matter and oxidation of coal, measurement of low levels of uranium in silts, monitoring of uranium in natural waters, trace elements in molybdenum concentrates, geochemical standards, and new methods of determination of gold. Many of these studies cooperated with Project Geology or with other agencies. These studies were as follows:

X-ray diffraction determination of mineral matters in ash of coals by J. Kwong in cooperation with D. E. Pearson.

Investigation of the oxidation of coals by W. M. Johnson with D. E. Pearson and Dr. Paul West of the University of Victoria.

Development of a combined ion-exchange concentration/X-ray fluorescence measurement technique for the determination of low levels of uranium in silts and other geological materials.

Development and coordination by W. M. Johnson of a domestic water monitoring program with the Ministry of Health.

Development of a new method of determining gold by M. A. Chaudhry.

Development of trace element analysis by X-ray fluorescence by P. F. Ralph.

Participation in interlaboratory standards program and particularly M. A. Chaudhry and B. Bhagwanani in determination of cobalt, nickel, and copper results of standard reference material SU-2.

Collection and establishment of reference geochemical silt materials containing cobalt, nickel, silver, uranium, tungsten, and tin in cooperation with A. Panteleyev.

Cooperative program with Dr. Ian Jonasson of the Geological Survey of Canada in regard to rhenium, lanthanum, and gold in molybdenum concentrates from Canadian mines.

Certification—Two Certification of Efficiency in Assaying examinations were held with a total of eight examinees writing. Three certificates of efficiency were awarded.

Output—Wet Chemical and X-ray Fluorescence Laboratory: There were 373 determinations on 158 samples submitted by prospectors, 2 795 determinations on 804 samples from prospector grantees, and 13 380 determinations on 2 106 samples submitted by Ministry personnel.

Emission Spectrographic Laboratory: There were 48 870 semi-quantitative determinations on 1 629 samples. In addition, there were 1 123 quantitative samples.

X-ray Diffraction Laboratory: There were 619 mineral identifications made, determination of mineral matter in ash of coals on 93 samples, and 45 determinations on quartz.

Sample Comminution: There was a total of 2 751 samples received and prepared for analytical work, 1 842 from geologists and 909 from prospector grantees.

Mineral Separation: There were 47 mineral separations made.

Hearings

The Geological Division was involved in a number of ways in regard to the Bates Royal Commission of Inquiry, Health and Environmental Protection—Uranium Mining. The Commission was conducted and aided in its field visits by district and project geologists at localities throughout the province. The Division also provided much documentation early in

the inquiry before the hearing process began and then also prepared and presented a 109-page brief at the Phase I—Overview hearings. This brief was later published by the Ministry as Paper 1979-6.

Professional Activities

The staff of the Division was very active in professional activities related to their work during 1979.

Canadian Institute of Mining and Metallurgy—D. E. Pearson was elected councillor of the Institute, A. Panteleyev was Victoria Branch Chairman.

Geological Association of Canada—The Council of the Association met in Victoria in October as A. Sutherland Brown was President of the Association. T. Höy was a councillor of the Cordilleran Section and W. J. McMillan was a councillor of the Mineral Deposits Division. D. E. Pearson was appointed by the Association as a member of the North American Commission on Stratagraphic Nomenclature.

W. M. Johnson was President of the *Spectroscopy Society of Canada* and Vice Chairman of Analytical Chemistry Division of the *Chemical Institute of Canada*.

J. A. Garnett and then N. C. Carter were councillors of the *British Columbia Association of Professional Engineers*.

A. Sutherland Brown was Vice President of the *Canadian Geoscience Council* and a member of the Advisory Committee to the *Geological Survey of Canada*.

Publications

The work of the Division is presented to the interested public by a series of formal publications and maps as well as by informal discussions, consultations, and technical talks. Formal publications prepared by the Division in 1979 include the following:

Prepared yearly:

Geological Fieldwork—a preliminary account of work of the Division published as soon as possible after completion. Now published as part of the paper series of the Ministry.

Exploration in British Columbia—a report that summarizes and collates all known exploration in the province based on reports filled out jointly by the Division and industry personnel.

At irregular intervals:

Bulletins—these are generally the result of three or four years' work and commonly of areas of significant mineral potential. In 1979 three were published:

Bulletin 60—*Geology of the Akolkolex River Area*, by R. I. Thompson.

Bulletin 69—*Geology of the Nicola Group between Merritt and Princeton*, by V. A. Preto.

Bulletin 71—*Geology of the Goldstream Area*, by T. Höy.

Preliminary Maps, usually white prints issued as soon as compilations are complete with brief accompanying notes. In 1979, the following five were issued:

Map 31—*Geological Map of Crowsnest Coalfield, Northeast Part*, by F. B. Gigliotti and D. E. Pearson (NTS 82G/7 and 10; scale—1:10 000).

Map 32—*Geochemical Orientation Survey, Hazelton Area*, by T. E. Kalnins (NTS 93M/3W, 4E).

Map 33—*Coal Resources, Peace River Coalfield, Northeastern British Columbia*, by R. D. Gilchrist and B. P. Flynn (scale—1:50 000).

Map 34—*Geology of the Mount Fisher-Sand Creek Area*, by Margaret E. McMechan (NTS 82G/6, 11, 12; scale—1:25 000).

Map 35—*Geology of the Penticton Tertiary Outlier*, by B. N. Church (NTS 82E/4 and 5; scale—1:50 000).

Papers include a miscellaneous group of technical reports by the Ministry on many topics, some geological. In 1979 two geological papers were produced.

Paper 1979-1—*Geological Fieldwork, 1978*.

Paper 1979-6—*A Brief Submitted to the Royal Commission of Inquiry, Health and Environmental Protection—Uranium Mining*, by A. Sutherland Brown, N. C. Carter, W. M. Johnson, V. A. Preto, and P. A. Christopher.

Other map series issued included:

Regional Geochemical Reconnaissance maps—

104 O and P—Jennings River and Cassiar areas, scale 1:250 000, 12 elements (Uranium Reconnaissance Program, federal/provincial—Geological Survey of Canada Open Files 561 and 562).

103 I and part of J and 103 P and part of O—Terrace and Stikine areas, scale 1:250 000, 14 elements.

Aeromagnetic maps—

Federal/provincial series, 1:50 000 and 1:250 000 compilations, 104 A, B, G, H, I, J and 103P/9 to 16—the final maps of joint agreement.

Mineral Deposit/Land Use maps—No new nor revised maps of the 1:250 000-scale series were issued in 1979 but two related compilation maps were.

Metallic Mineral Potential of British Columbia (scale—1:2 000 000), a compilation of the 1:250 000 series.

Producer—Near Producer Properties of British Columbia (scale—1:2 000 000), an index of major metallic properties in British Columbia.

In addition, regularly updated maps in the following series are available:

Mineral Inventory maps, issued as ozalid prints, show location and commodities of all known mineral deposits.

Assessment Report Index maps show the location and number of reports accepted for assessment credit by the Ministry. A new Assessment Report Index to accompany the map series was issued in a ring binder for regular update.

Titles Division

The Titles Division of the Mineral Resources Branch is under the direction of the Chief Gold Commissioner and is responsible for the administration of the provincial laws relating to the acquisition of minerals and coal.

Staff

E. J. Bowles	Chief Gold Commissioner
R. Rutherford	Deputy Chief Gold Commissioner
D. Doyle	Gold Commissioner, Vancouver

Gold Commissioners and Sub-recorders are appointed for the 24 Mining Divisions throughout the province and their duties are specified in writing by the Chief Gold Commissioner.

Table 2-1—Gold Commissioners and Claim Inspectors

Mining Division	Phone	Location of Office	Name
Alberni	723-3501	4515 Elizabeth Street, Port Alberni V9Y 6L5	W. G. Mundell
Atlin	651-7577	Box 100, Atlin V0W 1A0	E. J. Johnstone
Cariboo	992-5591	102, 350 Barlow Avenue, Quesnel V2J 2C1	R. Campbell
Clinton	459-2268/69	Box 70, Clinton V0K 1K0	W. R. Anderson
Fort Steele	489-2311	102—11th Avenue South, Cranbrook V1C 2P2	W. L. Draper
Golden	344-5221/22	Box 39, Golden V0A 1H0	J. Olson
Greenwood	442-8642	Box 850, Grand Forks V0H 1H0	S. Matsuo
Kamloops	372-5233	Court House, Kamloops V2C 1E5	N. R. Blake
Liard	387-6246/55	411 Douglas Building, Parliament Buildings, Victoria V8V 1X4	E. A. H. Mitchell
Lillooet	256-7548	Box 70, Lillooet V0K 1V0	R. E. Hall
Nanaimo	754-2111	Courthouse, Nanaimo V9R 5J1	R. H. Archibald
Nelson	352-2211	Box 730, Nelson V1L 5R4	H. S. Tatchell
New Westminster	525-0375	100, 403 Sixth Street, New Westminster V3L 3B1	T. P. McKinnon
Nicola	378-9944	Box 339, Merritt V0K 2B0	L. P. Lean
Omineca	847-4411	Box 340, Smithers V0J 2N0	A. W. Milton
Osoyoos	493-1719	Courthouse, Penticton V2A 5A5	L. D. Sands
Revelstoke	837-3222	Box 380, Revelstoke V0E 2S0	D. G. B. Roberts
Similkameen	295-6957	Box 9, Princeton V0X 1W0	W. L. Marshall
Skeena	624-2121	Courthouse, Prince Rupert V8J 1B7	I. Williams
Slocan	353-2338	Box 850, Kaslo V0G 1M0	Mrs. J. James
Trail Creek	362-7324	Box 910, Rossland V0G 1Y0	A. D. Sherwood
Vancouver	688-2208	800 Hornby Street, Vancouver V6Z 2C5	D. Doyle
Vernon	545-2387	Courthouse, Vernon V1T 4W5	N. A. Nelson
Victoria	387-6246/55	411 Douglas Building, Parliament Buildings, Victoria V8V 1X4	E. A. H. Mitchell

Claim Inspectors

D. Lieutard, 401, 350 Barlow Avenue, Quesnel V2J 2C1.
R. T. Morgan, Box 877, Smithers V0J 2N0.
F. A. Reyes, 800 Hornby Street, Vancouver V6Z 2C5.
H. S. Turner, 212, 2985 Airport Drive, Kamloops V2B 7W8.

The recording of locations and of work on mineral claims as required pursuant to the provisions of the *Mineral Act,* and the recording of work on placer leases as required under the *Placer Mining Act,* must be made at the office of the Gold Commissioner for the Mining Division in which the claim or lease is located. The statistics for the Gold Commissioner's office are shown on Table 2-2.

Central Records Office (Victoria and Vancouver)

Copies of records of mineral claims and two-post claims recorded in the offices of Gold Commissioners are forwarded to the office of the Chief Gold Commissioner daily, while transcripts of all other recording in the offices of the Gold Commissioners are sent twice monthly.

Information concerning claims and leases and the ownership and standing of claims and leases in any Mining Division may be obtained from the Gold Commissioner for the Mining Division in which the property is situated or from the Ministry's offices, Room 411, Douglas Building, Victoria, and 800 Hornby Street, Vancouver, the office of the Gold Commissioner.

Table 2-2—Gold Commissioners' and Mining Recorders' Office Statistics, 1979

Mining Division	Free Miners' Certificate		Lode Mining						Placer Mining				Revenue			
	Individual	Company	Mineral Claims Units	Work Numbers	Cash in Lieu	Bills of Sale, Etc.	Mining Leases Issued	Lease Rentals	Lease Issued	Work Numbers	Cash in Lieu	Bills of Sale, Etc.	Extensions	Free Miners' Certificates	Mining Receipts	Total
					$			$			$			$	$	$
Alberni	130	2	1 636	2 483	8 030	39	.....	1 946	.....	2	.....	.....	.....	1 150	33 205.00	34 355.00
Atlin	303	2	3 182	2 174	52 800	33	.....	368	181	208	3 600	32	.....	2 025	85 390.00	87 415.00
Cariboo	1 668	18	1 812	3 470	14 630	53	.....	10 716	361	593	8 100	104	9	9 408	102 730.96	112 138.96
Clinton	99	2	2 409	1 165	10 230	22	.....	104	42	27	.....	6	3	945	35 346.83	36 291.83
Fort Steele	350	3	2 534	4 967	21 450	9	.....	2 808	56	31	1 800	8	.....	2 005	71 718.21	73 723.21
Golden	173	9	1 760	1 767	14 300	11	.....	842	8	2	.....	.....	.....	2 715	32 968.75	35 683.75
Greenwood	187	10	1 650	8 425	33 110	78	.....	5 224	9	25	.....	5	.....	3 967	90 859.50	94 826.50
Kamloops	704	10	5 120	7 982	57 200	104	1	6 800	16	24	300	.....	.....	8 195	140 951.75	149 146.75
Liard	344	2	4 756	7 429	90 860	40	.....	6 094	100	106	2 400	21	12	3 586	192 122.50	195 708.50
Lillooet	127	3	1 892	1 747	20 350	19	.....	3 054	16	38	900	3	5	1 255	27 113.70	28 368.70
Nanaimo	390	6	604	903	31 020	22	.....	8 386	.....	6	.....	.....	.....	2 440	52 010.00	54 450.00
Nelson	418	3	1 328	1 948	11 770	22	.....	952	6	4	.....	.....	.....	2 185	29 660.12	31 845.12
New Westminster	1 082	20	1 674	1 299	20 680	42	.....	1 920	21	52	.....	6	.....	9 420	42 677.00	52 097.00
Nicola	98	1	973	3 000	15 840	38	.....	2 212	.....	.....	.....	.....	.....	810	41 851.91	42 661.91
Omineca	419	5	6 794	8 727	56 760	74	2	15 032	45	38	1 200	5	1	2 530	126 913.50	129 443.50
Osoyoos	328	7	1 297	3 910	61 930	54	.....	7 870	.....	.....	.....	.....	.....	2 970	100 661.50	103 631.50
Revelstoke	156	3	1 279	2 163	19 580	43	.....	750	15	12	.....	3	.....	1 300	40 882.00	42 182.00
Similkameen	230	2	1 531	1 850	23 980	20	.....	7 194	63	100	900	15	.....	1 585	59 837.00	61 422.00
Skeena	415	2	7 584	3 958	36 850	73	.....	3 922	2	9	300	.....	.....	460	120 033.35	120 493.35
Slocan	297	5	2 133	1 903	25 300	67	.....	6 138	1	2	.....	.....	.....	2 617	66 412.56	69 029.56
Trail Creek	84	4	480	513	1 100	9	.....	698	.....	.....	.....	.....	.....	1 930	10 528.50	12 458.50
Vancouver	3 088	410	1 177	1 556	11 660	31	.....	412	.....	.....	.....	.....	.....	161 260	67 701.70	228 961.70
Vernon	599	4	1 260	2 408	10 230	20	.....	654	15	14	.....	.....	.....	2 930	38 875.69	41 805.69
Victoria	902	110	487	487	2 200	21	.....	80	14	12	3 600	2	.....	61 575	85 794.10	147 369.10
Total, 1979	14 591	643	55 252	76 233	651 860	944	3	94 176	970	1 305	23 100	210	30	289 263	1 696 246.13	1 985 509.13
Total, 1978	9 444	531	37 242	65 705	583 450	1 299	.....	98 178	397	1 081	12 200	205	11	233 526	1 472 398.52	1 705 924.52

The records and maps, showing the approximate positions of mineral claims held by record and of placer leases, may be viewed by the public during regular office hours in Victoria and at the office of the Gold Commissioner in Vancouver. The position of mineral claims held by record and of placer leases is plotted from details supplied by the locators. Prints of mineral and placer titles reference maps at a scale of 1:50 000 may be obtained from the Victoria and Vancouver offices.

Appointed officials in the office of the Gold Commissioner at Victoria and the Gold Commissioner at Vancouver act as Sub-recorders for all Mining Divisions.

Mineral and Placer Title Maps

The initial program of redrawing mineral titles reference maps which are produced for the public on a scale of 1:50 000 was completed in 1977 and the entire province is now available at this scale. A new mapping program on the same scale using superior Ottawa base maps has been commenced. These maps will show contours and should be of great assistance to the prospector.

One thousand two hundred and eighty-two applications were received for placer leases under a new system, established in 1975 with the proclamation of a new *Placer Mining Act*, of only accepting applications for leases in designated placer areas.

There were 11 requests for the designation of additional areas under the *Placer Mining Act*.

Mineral Claims Inspectors are based at Kamloops, Smithers, Vancouver, and Quesnel. Their duties include checking the locations of mineral claims to correlate them with the plotted position of the claims, determining the validity of the staking under the *Mineral Act* and the *Placer Mining Act* and Regulations, investigation of possible misuse of mineral claims, and investigations of disputes. In order to fulfill the objectives of providing claim-holders with firm title and maintaining accurate and up-to-date records, the activities of the inspectors have increased with the use of the modified grid system and also as a result of the increase in applications for placer leases.

During 1979 as a result of 12 complaints under section 50 (formerly section 80) of the *Mineral Act*, nine mineral claims were cancelled.

The Gold Commissioner's office in Vancouver is now equipped with a microfilm reader which will allow the general public to view technical reports. The Xerox machine will print these reports at a nominal cost. The Vancouver office should now become a greater source of information for the mining community.

Coal

The Coal Administrator is responsible to the Chief Gold Commissioner for the daily administration of the *Coal Act*. This involves reviewing applications for coal licences and leases and maintenance of records of title.

The statistics related to coal licences for 1979 are shown in Table 2-3.

Table 2-3—Statistics for Coal Licences, 1979

Number of coal licence applications	1 807
Approximate area of coal licence applications	501 181 hectares
Number of coal licences issued	925
Approximate area of coal licences issued	253 708 hectares
Annual rental	$2 648 500.00
Application fees	$ 18 070.00
Cash in lieu of work	$ 74 285.00
Miscellaneous fees	$ 9 703.00

Economics and Planning Division

Objectives and Organization

The Division provides economic, financial, and statistical analyses pertaining to provincial mineral sector policy, legislation, and planning and also collects, maintains, and disseminates comprehensive statistical data in support of Ministry resource management responsibilities. These major objectives are further delineated as follows:

(1) the provision of expertise on the economic aspects of mineral sector policy and planning including assistance on the formulation of incentive programs, infrastructure support programs, taxation and tenure systems, appropriate evaluation frameworks, and provincial and intergovernmental mineral policies;

(2) the conduct of selected mineral industry economic analyses including marketing, supply, financial, economic and fiscal evaluations of mineral projects and government programs, and environmental-economic and socio-economic assessments; and

(3) the collection, maintenance, and dissemination of comprehensive British Columbia mineral industry statistics for use by the Division, the Ministry, and other users, covering producing metal, coal, industrial minerals, structural materials, and placer operations, and associated production, sales, and values of commodities produced from these operations.

The Division is organized under a Director into four groups—an administrative support group, an economic and financial analysis group, a mineral policy group, and a mineral statistics group.

Staff

The professional staff of the Division as at December 31, 1979 was as follows:

F. C. Basham	Director
J. F. Clancy	Senior Economic Analyst
P. Monier	Senior Financial Analyst
W. Wilson	Senior Mining Statistician

During the year, J. S. Poyen, Director of the Division since its inception in 1974, resigned. F. C. Basham was appointed Director in late 1979. P. Monier joined the Division in September 1979, following the establishment of a permanent financial analyst position. J. Harris and S. Thorleifson also joined the Division during the year as secretary to the Director and office assistant respectively.

Review of Activities

Major activity areas for the Division during the year included the evaluation of emerging coal and metal projects under the *Guidelines for Coal Development* and *Procedures for Approval of Metal Mine Development* pursuant to infrastructure assistance and benefit cost analysis of prospective coal and metal projects in several regions. Concurrent with these evaluations, efforts were also directed toward refining and updating C∅ALM∅D and MINSIM, the Ministry's computerized financial and economic evaluation systems for coal and metal mining projects respectively.

Following the November 1978 federal-provincial mineral taxation review, staff in the Division in consort with Mineral Revenue Division staff undertook reviews of tax legislation proposals from the industry and the federal government which were expected to culminate in modifications to British Columbia's mineral taxation system in 1980. The Division also provided a number of briefings, two seminars, and a publication on taxation of the mineral industry.

Staff of the Division continue to provide information on mineral policy and project planning to foreign and domestic groups of investors, buyers, and other parties. In 1979,

these groups included Alberta Energy Company, the Government of Hungary's Minerals Department, AMOK of France, the Coal Industry Rationalization Corporation and Mitsubishi Metal Corporation from Japan, the Department of Mineral Resources from Fiji, the LKAB coal mission from Sweden, and United Technologies/General Dynamics and Anaconda Copper Corporation from the United States. Discussions took place with these groups on subjects ranging from general policy matters, to coal market potential, and mineral processing and fabricating opportunities in British Columbia.

At year-end, it had become apparent that significant opportunities were emerging for increased coal trade, and selected mineral processing activity in the energy intensive minerals such as aluminum, zinc, and ferro alloys as well as copper. Staff were specifically engaged in preplanning and research for copper, aluminum, and ferro-alloy smelting. A major study of British Columbia's molybdenum mining industry in a world context was also completed during the year.

Research and analysis for a major resource management study of the sand and gravel industry in the lower mainland continued with staff of the Geological Division. Activity included assembly and analysis of survey returns and preliminary report preparation. The study is expected to be completed in 1981. Other shorter analyses were completed on mining projects expected in two regional districts and on markets for silica and perlite.

The mineral statistics group's activity during the year included assembly and dissemination, on a monthly and annual basis, the survey, collection, editing, and compilation of all mineral production activity and data for the province. Staff in the group participate regularly in joint consultative efforts with other governments to streamline the data collection process and improve the accuracy and validity of mineral statistical reports. The Division also continued with planning and programming for computerization of the monthly metal mine surveys, through the MINSTATS project. This work is expected to be completed in 1981 and will result in a much improved and more timely statistical reporting system.

PETROLEUM RESOURCES BRANCH

Organization

The Petroleum Resources Branch, under the general direction of Assistant Deputy Minister J. D. Lineham, Chief of the Branch, administers the *Petroleum and Natural Gas Act* and the regulations made thereunder, including the Drilling and Production Regulations, the Geophysical Regulations, the Drilling Reservation Regulations, and the Development Road Regulations. It also administers the *Underground Storage Act, 1964*. Therefore, the Branch is responsible for all matters related to the disposition of Crown-owned petroleum and natural gas rights as well as the regulation of the exploration, development, and production phases of the oil and gas industry.

The Branch is divided into three Divisions, namely, the Engineering Division, the Geological Division, and the Titles Division.

Engineering Division

The Engineering Division, under the direction of Chief Engineer A. G. T. Weaver, is responsible for all engineering activities of the Petroleum Resources Branch.

There are three main functions:

(1) Enforcement of the Drilling and Production Regulations under the *Petroleum and Natural Gas Act*, together with provision of advice to the Minister with respect to applications made by industry under the Act;

(2) Collection, filing for Branch and public use, and publication of drilling and production statistics, production and disposition data, and reservoir and pool performance data;

(3) Reservoir analysis of all oil and gas pools in the province, including maintenance of production rate forecasts together with data concerning reserves discovered to date and estimates of potential reserves growth.

The Development Engineering section, under the supervision of Senior Development Engineer W. L. Ingram, licenses drilling and service rigs, issues well authorizations, and maintains detailed records pertaining to all drilling and production operations.

The Reservoir Engineering section, under the Senior Reservoir Engineer B. T. Barber, is concerned with all reservoir engineering aspects of the Division's activities. The section is responsible for determination of reservoir and production characteristics of oil and gas pools in the province. This involves interpretation of reservoir pressure, rock and fluid properties, and production data. These parameters are used to forecast ultimate recoveries obtainable from oil and gas accumulations in the province, and the rates at which these volumes will be produced. Oil and gas allowable rates are set by the section, and recommendations concerning proposed improved recovery and produced fluid disposition schemes are made.

The Drilling and Production Engineering section, under the supervision of District Engineer D. L. Johnson, is located at the field office at Charlie Lake and is primarily responsible for enforcement of the Drilling and Production Regulations in the field. It also collects reservoir and other data as required, acts in a liaison capacity with industry at the field level, and maintains core and drill sample storage and examination facilities.

Geological Division

The Geological Division consists of two sections, under the direction of Chief Geologist W. M. Young, and is responsible for all geological activities of the Petroleum Resources Branch. The Division is accountable for the collection, compilation, and assessment of geological and related information concerned with the exploration for and development of petroleum resources within producing and nonproducing areas of the province; assisting in the framing of development procedures to ensure conservation and the best returns from these resources; estimating the remaining undiscovered petroleum resources used for the prediction in forecasts of oil and gas production; and providing data and opinions to attract, assist, and encourage industry in the development of the province's petroleum resources.

The Economic Geology section, under the supervision of Senior Economic Geologist J. A. Hudson, is responsible for the coordination and direction of projects concerned with regional mapping and the assessment of undiscovered petroleum resources.

The Reservoir Geology section, under the supervision of Senior Reservoir Geologist R. Stewart, is responsible for the coordination and direction of projects concerned with the detailed mapping and assessment of discovered petroleum resources.

Titles Division

The Titles Division consists of three sections, under the direction of Commissioner W. J. Quinn, and is responsible for administering those parts of the *Petroleum and Natural Gas Act* relating to and affecting title to Crown petroleum and natural gas rights. The Division administers the disposition of Crown petroleum and natural gas rights.

The Lease Administration section is responsible for all transactions involving petroleum and natural gas permits, all forms of leases, natural gas licences, and drilling reservations. They are also responsible for geophysical licences, notices of commencement of exploratory work, affidavits of work, unit agreements, and miscellaneous recordings.

The Revenue section is responsible for the collection and accounting of all petroleum and natural gas revenue payable to the Crown under the provisions of the Act with the exception of royalty.

The Draughting section is responsible for preparing and updating on a continuing basis title maps, seismic road and trail maps, and petroleum development road maps. They are also responsible for the preparation and affixing of plats to all title documents issued.

Staff

On December 31, 1979, the professional and senior staff included the following:

Assistant Deputy Minister, J. D. Lineham, P.Eng. ..... Chief of Branch

Engineering Division

A. G. T. Weaver, P.Eng.	Chief Engineer
W. L. Ingram, P.Eng.	Senior Development Engineer
M. B. Hamersley, C.E.T.	Development Technician
W. Duncan	Administrative Supervisor
B. T. Barber, P.Eng.	Senior Reservoir Engineer
P. S. Attariwala, P.Eng.	Reservoir Engineer
L. Pepperdine, P.Eng.	Reservoir Engineer
P. K. Huus	Reservoir Technician
J. H. Burt	Reservoir Technician
D. L. Johnson, P.Eng.	District Engineer
D. E. Krezanoski, P.Eng.	Field Engineer
D. A. Selby	Field Technician
G. T. Mohler	Field Technician
J. L. Withers	Field Technician
B. Baraniski	Field Technician
G. L. Holland	Field Technician
R. W. Nyffeler	Field Technician
G. German	Geophysical Technician
L. London	Geophysical Technician

Geological Division

W. M. Young, P.Eng.	Chief Geologist
R. Stewart, P.Eng.	Senior Reservior Geologist
T. B. Ramsay, P.Eng.	Reservoir Geologist
J. Coulson, P.Eng.	Reservoir Geologist
J. J. English	Reservoir Geologist
J. A. Hudson, P.Eng.	Senior Economic Geologist
K. A. McAdam	Economic Geologist

Titles Division

W. J. Quinn	Commissioner

Staff Changes

In the Engineering Division, L. London joined the District staff at Charlie Lake as Geophysical Technician.

In the Geological Division, J. Coulson, a long-time consulting geologist in Edmonton, joined the staff.

Highlights of the Petroleum Resources Branch

This section describes the highlights of both the technical and administrative work carried out by the Branch in 1979.

Legislation

The only significant new legislation of interest to the Petroleum Resources Branch was an amendment to the *Energy Act* to allow the British Columbia Energy Commission, after a hearing, to declare the purchaser of oil or gas from a pool to be a common purchaser. Related to this was provision also for the declaration of a common carrier and a common processor. The purpose of this legislation is to provide the means to remedy an inequitable reservoir drainage situation when a producer in a pool cannot obtain a purchase contract or access to a pipeline or processing plant.

Several amendments were made to the Drilling and Production Regulations during 1979. Most were of a minor nature but the following are significant:

(a) It was clarified that a production allowable always applies to an area, which could be a single spacing area, a Unit area, a Good Engineering Practice (GEP) area, or a project area.
(b) Gas wells may be produced at the rate of 125 per cent of their daily production allowable at any time provided that their average daily production rate does not exceed the allowable, over a specified year.
(c) A gas-oil ratio penalty formula replaced the series of tables in Schedule 3.

In addition to the above, the Drilling Reservation Regulations were amended to convert all numerical data into SI.

Mediation and Arbitration Board

The composition of the Mediation and Arbitration Board for the past year ended December 31, 1979, was the same as for 1978, that is, G. B. Pomeroy, Chairman; Cecil Ruddell, Vice Chairman; John Martin, Member.

The Mediation and Arbitration Board is established under Part 3 of the *Petroleum and Natural Gas Act*. Its authority and powers are covered by sections 6 to 32 inclusive. In these the Board is authorized to:

(a) grant right of entry to oil and gas companies over alienated lands where such right of entry has been refused by the landowner;
(b) determine conditions for right of entry and compensation to be paid therefore;
(c) to appoint a Member of the Board to act as a mediator between a petroleum company and a landowner where an impasse develops respecting right of entry;
(d) if mediation proves unsuccessful, to (as a Board) hear and determine compensation for right of entry respecting wellsite, campsite, roadways, and pipeline installations;
(e) to review and set a compensation on leases and previous Board orders of more than five years' duration;
(f) to terminate rights of entry when an operator has ceased to use the occupied land, after a Certificate of Restoration has been issued by the Ministry of Energy, Mines and Petroleum Resources; to amend or rescind orders from time to time, as circumstances and conditions dictate.

Each Board Member has, for the Board's proper business purposes, the power and authority of a Commissioner under the *Enquiry Act*, and the power and authority that may be conferred on a Commissioner under sections 12, 15, and 16 of the Act.

In 1979, 74 field surveys were carried out by the Board. The Board issued 34 right-of-entry orders, most of which were preceded by a mediation hearing and an on-the-site inspection of the proposed leased area. Seven arbitration hearings were held to set compensation. The Board met regularly, once each week, to deal with general Board matters and specific concerns of the public. In addition, many special meetings were held as circumstances warranted.

Engineering Division

The continued high level of activity by the petroleum industry during 1979 gave rise to a proportionately high regulatory work load by Division staff. In addition, the Division acted as advisor on petroleum engineering matters to governmental and private agencies and carried out studies and projects used, in the final analysis, for improving the public interest in provincial petroleum resources.

Projects included forecasts of future oil and gas producibility in the province, studies of various reservoir production mechanisms, development of regulations for geothermal operations, trial of the microfiche method of data retrieval, development of guidelines or

regulations on road construction, drillsite preparation, blowout prevention and electrical installations, and the construction of the first 11 kilometres (7 miles) of an all-weather road into the Sierra area.

These items are described more fully in the following summaries of work carried out in the three sections of the Engineering Division.

Development Engineering

The Development Engineering section is responsible for the administration of all matters related to the location, drilling, completion, and abandonment of wells in the province. This involves the assurance that operators of all wells located, drilled, and produced conform with the Drilling and Production Regulations and submit the required applications, reports, and information to the Branch.

Approval of well authorizations to drill proposed well locations is granted by the section after review and reference to the Titles and Geological Divisions. In 1979 there were 464 well authorizations issued, two less than during 1978. Throughout the life of a well the status, well name, or classification may be changed as circumstances require. During the year statuses were changed on 187 occasions, well names on 329, and well classifications on 34.

In addition to comprehensive well data records, all geological and geophysical reports submitted for work credits as well as the Branch correspondence files of the three Divisions are maintained by the section. The program to microfilm all significant full-sized documents in the well files for security purposes and to establish a library in microfiche format was continued. At the end of 1979 the first 4 200 well data files were in this library. Trials were run during the year to use this format for data retrieval. Although it proved to be considerably slower, the method will have to be adopted as filing space becomes limited. Other equipment and filing methods were examined to determine an improved method.

Effective at the beginning of 1979, all production and disposition records were converted to SI. The changeover caused difficulties initially but by year-end the submitting operators and the Branch had resolved most problems.

Each drilling and service rig operating in the province must have a valid Rig Licence. During 1979, 105 licences were renewed while 67 new ones were issued.

Drilling and Production Engineering

This section is located in the district office at Charlie Lake in the Peace River district of northeastern British Columbia. During 1979 over 260 000 kilometres (166 344 miles) were driven by the field staff of this section to enforce at the field level requirements of the Drilling and Production and the Geophysical Regulations, both made pursuant to the *Petroleum and Natural Gas Act*.

The high level of drilling activity and subsequent production operations carried on undiminished throughout 1979. The work load was dealt with by seven drilling and production technicians and one geophysical technician. To ensure compliance with gas conservation orders and to attempt to reduce needless flaring of gas, inspections were carried out on 688 different occasions at oil and gas battery facilities.

To ensure the accuracy and reliability of gas measurement equipment, gas production was monitored throughout the year with fast meter checks being made on 660 different occasions, and complete meter checks being made on 466 occasions.

To augment data received by the Reservoir Engineering section, 131 static pressure gradients were run, 10 oil and 20 gas well tests were witnessed, and 1 492 pressure bomb elements were calibrated. In keeping with the requirements for metrification all pressure bomb calibrations were done in SI.

Geophysical field activity continued at a very high level throughout 1979, with 198 seismic field inspections being made compared to 176 during 1978. The activity prompted a

request, which was subsequently approved, for the acquisition of a second geophysical technician. Recruitment for this position took place in late 1979.

Drilling activity continued at the unprecedented high level which had begun in 1977. Throughout 1979 the active well count never fell below 50 except for a short period following spring breakup when it dipped to 40 active wells. During 1979, 758 inspections were performed at drilling sites and 4 232 inspections were made at producing or abandoned locations.

Inspection of salt-water disposal systems and the witnessing of segregation tests was again emphasized during 1979.

This section continued its involvement with the Northeastern British Columbia Oil Spill Cooperative, taking an active role at all meetings and training exercises. It also had direct participation as an associate member of the PROSCARAC (Prairie Regional Oil Spill Containment and Recovery Advisory Committee), an organization having expertise and equipment for western Canada operations.

The section was also involved throughout 1979 as a member of the Blowout Prevention Certification Committee which was established under the auspices of the Canadian Petroleum Association, the Independent Petroleum Association, and the Association of Oil Well Drilling Contractors. The role of the committee was to establish training and course material and the subsequent examination for certification of Drilling Supervisors. By the end of 1979 this certification procedure was in place and working well.

Throughout 1979, industry was reminded of the proposed changes to the blowout prevention section of the Drilling and Production Regulations. Although they were in draft form and implementation of them was considered to be imminent, industry's acceptance of the changes was excellent as was their general attitude toward blowout prevention.

This section has been directly involved with the Sierra—Yoyo road project and spent many man-hours on both route selection and onsite supervision of the project. The road, which will ultimately give all-weather access from Fort Nelson to the general Sierra—Yoyo area, is of vital significance to the Ministry and to the Peace River area. It will not only allow for summer drilling activity and the resulting benefit for the Fort Nelson area, but it will also give access to the prolific gas fields of Sierra and Yoyo in the event of an uncontrolled blowout.

In May 1979, a meeting was held with the Fort Nelson Indian Band, when permission was obtained for the Ministry and its agents to use roads on the Indian Reserve and gain access to the starting point for road construction to the Snake River. By year-end road construction had reached the Snake River and site preparation for placement of a bridge on the Snake River was underway. Budgetary commitments are being requested to complete this project during 1980.

Reservoir Engineering

An important responsibility of the Reservoir Engineering section is to estimate on a continuing basis the oil and gas reserves in British Columbia. Estimates as of December 31, 1979 are shown in Table 4-3 and are summarized below.

Oil, established	28 484 10^3m^3	(179 249 MSTB)
Natural gas, established—		
Raw	259 511 10^6m^3	(9 211 BSCF)
Marketable	212 515 10^6m^3	(7 543 BSCF)
Natural gas liquids—		
Propane	1 533 10^3m^3	(9 658 MSTB)
Butane	2 227 10^3m^3	(14 023 MSTB)
Pentanes plus	4 199 10^3m^3	(26 424 MSTB)
Sulphur	8 146 10^3t	(8 017 MLT)

It may be observed from Table 4-3 that the oil reserves have decreased by 1.1 $10^6 m^3$ (6.7 MMSTB) from last year. Additions due to drilling and revisions were 0.4 $10^6 m^3$ (2.7 MMSTB) and 0.6 $10^6 m^3$. (4.0 MMSTB). Production reduced the reserve by 2.1 $10^6 m^3$ (13.4 MMSTB).

Raw gas reserves at the end of 1979 were 13.9 $10^9 m^3$ (493 BCF) higher than last year. Additions due to drilling were 26.1 $10^9 m^3$ (928 MCF). Revisions and production reduced the reserves by 0.8 $10^9 m^3$ (31 BCF) and 11.4 $10^9 m^3$ (404 BCF) respectively.

Revisions to the natural gas producibility forecast were made to reflect the impact of more discoveries in the first four years of the forecast (1979 to 1982) due to the continued surge in drilling activity and of expected higher off-take rates from pools in the vicinity of the southwest Sierra pipeline which is expected to be completed in the spring of 1980. Under these assumptions the provincial marketable gas producibility remains fairly constant at about 11 700 $10^6 m^3$ (415 billion cubic feet) per year until 1997.

A revised forecast of oil available from pools within the province was also made in support of a study by the British Columbia Energy Commission on the future oil supply, demand, marketing, and refinery patterns in the province. As a result of recent oil discovery experience it appears that decline from the 6 200-m^3 (38 000 to 40 000-barrel)-per-day range will be delayed for several years; however, it still appears unlikely that the province will ever produce more than 25 per cent of its own oil requirements

In the Yoyo—Pine Point gas pool, allowables in early wells were based on deliverability whereas recent wells received allowables based on recoverable reserves; this led to inequity among operators and, following a request from them, the Branch moved to place all allowables on a recoverable reserves basis. With information from recent wells the pool has been remapped and the volumetric reserves are now similar to reserves estimated by material balance. The reserves based allowables are sufficient to enable operators to fulfill their gas contracts without additional drilling.

Three reservoir simulation studies were conducted during the year, one on the Weasel Unit No. 2 oil pool, one on the Cabin—Slave Point C gas pool, and the third on a model water-driven gas pool in which the parameters of thickness, horizontal and vertical permeability, amount of penetration into the reservoir, production rate, and strength of water-drive could be varied individually to examine their influence on recovery.

The study on Weasel Unit No. 2 indicated that the waterflood was performing better than in most pools due to the favourable nature of the reservoir. The recovery is predicted to be about 50 per cent of the oil in place compared to the average of 35 per cent for all oil pools in the province. However, it was further predicted that with certain changes to the flood pattern, the recovery could be increased to about 64 per cent.

The study of the Cabin—Slave Point C gas pool was initiated because of the poor performance of the pool compared to the Clarke Lake pool studied in 1977. The study established that the early breakthrough of water was due to the influx of water from a large aquifer together with a marked water coning effect. The latter effect is greater than in Clarke Lake due to thinner pay and lower permeability. Recovery is predicted to be about 49 per cent of the gas in place due to a sweep efficiency of only 69 per cent, the sweep efficiency estimated in the Clarke Lake study was 94 per cent. It appears that infill drilling would be effective in increasing recovery in the pool.

In the third study, the parameter variations were selected to cover the range of values so far encountered in pools in the province and, from the various combinations of values tested in the model, it appears that sweep efficiency varies from 61 per cent up to 94 per cent and that recovery of initial gas in place varies from 36 per cent to 75 per cent. From variations in the values of an individual parameter with the values of all other parameters held constant it was established that sweep efficiencies increased as reservoir thickness increases, as horizontal permeability increases, as the ratio of horizontal to vertical permeability increases, and as the strength of the water drive decreases. The sweep efficiency is hardly

affected by reduced rates of production. It also appears that for maximum sweep efficiency the optimum depth of penetration into the reservoir is in the order of 15 to 20 per cent of reservoir thickness.

Geological Division

Economic Geology—The regional subsurface mapping coverage of the northeastern sedimentary basin area was increased by the addition of maps of the Triassic Halfway Formation in National Topographic Series 94 A, B, G, H and 93 I, O and P inclusive. All of the published subsurface mapping series of the western Canadian sedimentary basin were updated and revised to include released information as of April 30, 1979. This subsurface coverage of the major producing horizons is available on a 1:100 000 and 1:250 000 mapping scale. The latter scale, comprising eight map sheets, provides a broad regional perspective of the mapped horizon.

In addition to the previously mentioned mapping the drillstem test and penetration compilation map series were updated as of April 30, 1979. These maps, on a scale of 1:100 000, show, for all wells outside designated field boundaries, the deepest geological formation penetrated, all formation drillstem tests, and the zone(s) in which gas and oil wells are completed. In addition to the latter information and within the designated field limit, the penetration map will show drillstem tests in horizons other than that productive in the field as well as the formation at total depth for wells which have penetrated below the lowest productive horizon within the field.

Other project work carried out by the section during the year included the completion of seven regional Triassic stratigraphic cross-sections within the general Fort St. John area. The purpose of this publication is to aid in defining the limits of the Pre-Coplin Unconformity productive oil and gas-bearing zones within the Triassic Charlie Lake Formation.

The section was very active in assisting other Divisions, ministries, Crown agencies, and the public in matters concerning geology, estimates of the remaining undiscovered petroleum resources, evaluation of land sales, and assessment reports submitted in accordance with work requirements. Frequent meetings were held with industry representatives to discuss aspects of geology, geophysics, and the petroleum resource potential of the producing and nonproducing areas of the province.

Reservoir Geology—As a result of another year of high drilling activity, the Reservoir Geology section carried out an extensive program of assessment and mapping in detail of all oil and gas accumulations encountered by the drill. Structural, stratigraphic, and reservoir geologic data made available through drilling were used as a basis for new and revision-type map work, reservoir studies, evaluation of reserves, and the control of remedial work, cycling, repressuring, and secondary recovery projects.

In 1979 changes resulted from new drilling and studies in the following fields and hydrocarbon-bearing rock unit(s); Airport—Dunlevy, Beatton River West—Bluesky, Beaverdam—Halfway, Beavertail—Gething, Birch—Baldonnel and Halfway, Bivouac—Debolt, Buick Creek—Bluesky and Dunlevy, Buick Creek North—Dunlevy, Buick Creek West—Halfway, Cecil Lake—North Pine, Dahl—Bluesky, Eagle—Belloy, Fireweed—Dunlevy, Flatrock—Boundary Lake, Fort St. John—North Pine, Helmet—Jean Marie and Slave Point, Laprise Creek—Baldonnel, Mica—Mica, Monias—Halfway, Nig Creek—Baldonnel, Oak—Halfway, Paradise—Halfway, Rigel—Bluesky and Dunlevy, Rigel East—Gething, Stoddart West—Belloy, Two Rivers—Halfway, Wargen—Gething, Wilder—Halfway, Willow—Gething, and Yoyo—Pine Point.

Several new fields encompassing single or multiple well pools were designated. These included the Graham field with Gething, Dunlevy, and Debolt pools, the Ladyfern field with a Gething pool, the Martin field with Bluesky, Baldonnel, Siphon, and Halfway pools, the Ring field with Gething pools, and the Tommy Lakes field with a Halfway pool. All field and pool outlines were revised where necessary on a quarterly basis. The field and pool

designations often have significant impact on well confidentiality, royalty rates, wellhead prices paid for production, and lease tenure.

Much time was employed in assessing the volumetric oil and gas reserves of wells as a basis for determining production allowables. Controversy this year with industry was moderate in comparison to the previous year because in many cases more definitive data such as satisfactory penetration, adequate electric logs, and cores were available.

Preliminary studies were done on the distribution of the Cretaceous sands between Rigel East and Fireweed, the development of porosity in the Jean Marie limestone, the occurrence of isolated Devonian reefs, and porosity development in the Belloy down dip from the subcrop edge. Belloy lithology in the Eagle area was studied in detail in relation to a proposed waterflood scheme.

Routine assistance was provided in advising other Divisions with geological evaluations and assessments of Crown lands posted for disposal of petroleum and natural gas rights, petroleum and natural gas lease extension renewals, the reclassification of wells for the purpose of confidentiality of information and new pool discovery status, geological appraisal concerning industry production schemes such as concurrent production and good engineering practices (GEP'S), and the disposal of water production.

Titles Division

During 1979 there was a marked increase in the activities of the Division. Even though the number of parcels acquired by industry at the various dispositions was less than in 1978 the total number of title documents issued during the year increased by over 10 per cent. This was due to a substantial number of permits reaching the end of their term and being converted to leases, plus the effects of the amendments to the *Petroleum and Natural Gas Act* that became effective on July 1, 1978.

The two clerical positions that were approved in 1978 have been filled and this has enabled the Division to be redesigned into three functional groups, namely, Lease Records, Draughting, and Accounting. It is anticipated that two additional positions will be approved and filled during 1980 which will enable the Division to provide better service.

Geophysical exploration continued at a very active pace with 188 programs being approved in 1979. It is important to note that all projects were not confined to the northeast corner of the province, with the Queen Charlotte Islands, the Cariboo, as well as the Fernie area now being actively explored.

The Draughting section is nearing completion in converting the present base maps to a 1:50 000 scale and the Permit, Lease, and Well Location maps to a 1:200 000 scale. Both types should be available to industry sometime in April 1980. Topography will be shown on these maps and should prove very useful to companies undertaking geophysical work.

The British Columbia Resources Investment Corporation was very active in obtaining farmouts resulting in an additional 28 permits being issued over their licensed lands. The British Columbia Resources Investment Corporation has now completed agreements on approximately 70 per cent of lands held under the terms of the *British Columbia Resources Investment Corporation Act*.

In December 51 permit parcels in the Nechako basin area west of Quesnel and Williams Lake were advertised in a disposition of Crown petroleum and natural gas rights. This disposition was unique in that bonus bidding was not required. Instead, the determination of the successful bidder was done on the best work program over the maximum area during the normal five-year term of the permits. Of the parcels offered, 43 permits covering 1 952 490 hectares were awarded to Canadian Hunter Exploration Ltd. based on a work program bid of $27 500 000.00. The issue of these permits is effective January 15, 1980, therefore, the statistics that these permits represent are not included in the 1979 totals. As of December 31, 1979, 9 170 756 hectares of Crown petroleum and natural gas rights issued under the *Petroleum and Natural Gas Act* were held in good standing by approximately 460 companies and individuals. The form of title held and the number of hectares involved are as follows:

Form of Title	Number	Hectares
Permits	389	4 727 388
Natural gas licences	2	7 559
Drilling reservations	100	422 888
Leases (all types)	6 048	4 012 921
Total	6 539	9 170 756

During 1979 the following transactions were completed:

1. PERMITS—	
Issued	52*
Renewed	285
Converted to lease	83
Cancelled	1
Transferred (assigned)	131
2. DRILLING RESERVATIONS—	
Issued	39
Renewed	53
Converted to lease	42
Cancelled	4
Transferred (assigned)	26
3. LEASES—	
Issued	1 076
Annual rental paid	4 114
Continued under penalty	199
Continued NOT under penalty	627
Cancelled	85
Transferred (assigned)	936
4. NATURAL GAS LICENCES—	
Issued	5
Renewed	*Nil*
Converted to lease	5
Cancelled	*Nil*
Transferred (assigned)	*Nil*

	Number Advertised	Number Sold
5. CROWN SALES—		
Permits	28	23
Drilling reservations	45	39
Leases	668	527
Total	741	589
6. GEOPHYSICAL LICENCES—Issued		31
7. AFFIDAVITS OF WORK—Approved		
Permits		114
Leases		22
8. MISCELLANEOUS RECORDINGS (mergers, grouping notices, etc.)—Approved		3 000†
9. UNIT AGREEMENTS—Approved		1

* Includes 28 BCRIC permits.
† Estimated.

MINERAL REVENUE DIVISION

The Mineral Revenue Division is responsible for the administration of mineral and petroleum resource taxes and royalties assessable under the *Mineral Resource Tax Act*, *Mineral Land Tax Act*, Coal Royalty Regulations, Petroleum and Natural Gas Royalty Regulations, and the Iron Ore Royalty Agreements. The operations of the Division are under the direction of W. W. Ross, assisted by B. A. Garrison with a permanent establishment of 21 which was augmented by two auxiliary employees and one summer student during 1979.

A shifting work load necessitated the transfer of one established position to headquarters from the district office in Nelson, and the elimination of one position in the New Westminster office. This change will eliminate the necessity of employing one full-time auxiliary employee in the headquarters office.

Although there were not significant changes in the primary responsibilities of the Mineral Revenue Division, there was a substantial increase in revenue collections which rose by 26.7 per cent over the 1978 calendar year. Details of these collections are set out in Table 2-5.

A brief review of activity by statutory or regulatory authority follows.

Coal Royalty Regulations Under the Coal Act

Under the provisions of section 29 of the *Coal Act* and its related Coal Royalty Regulations, all coal produced under a licence, lease, or permit from Crown lands is subject to the payment of a 3.5-per-cent royalty based upon the minehead value of the coal produced and sold during each calendar month. Producers under this Act reported 2 869 503 tonnes of coal sold during the 1979 reporting period with a minehead value of $121 028 207.00, yielding Crown royalty collections of $4 235 987.00. The volume of coal shipped and sold during the period was 2.3 per cent greater than the volume during the same period in 1978; however, revenue collections were down by 15.8 per cent over the same period due to the inclusion in 1978 of $808 682.61 which relates to the 1974–1977 period audits.

Iron Ore Royalty Agreements Under the Mineral Act

Two mining operations producing iron ore during 1979 were subject to the payment of an iron ore royalty of $1.00 per long dry ton of contained iron in concentrates produced and sold during the year. Under the terms of these agreements, concentrates are deemed to have a 50-per-cent iron content, and the royalty payable may be reduced by 50 per cent where satisfactory exploration work for iron ore has been performed and approved. For the reporting period ending December 31, 1979, 645,248.67 long dry tons of iron concentrate with a deemed iron content of 322,624.34 long dry tons was reported as shipped and sold yielding royalty payments of $161 312.20.

Mineral Land Tax Act

Mineral rights in lands other than those vested in the Crown in the Right of the Province of British Columbia are subject to taxation under the *Mineral Land Tax Act*. For purposes of taxation, such freehold mineral rights are classified as undesignated mineral lands, a production tract, or a production area. Undesignated mineral lands pay a basic annual acreage tax ranging from 62 cents per hectare to $2.47 per hectare with a minimum tax of $10.00 depending on the total area held by an owner. Production areas are subject to an annual tax of $4.94 per hectare in place of the basic tax. Production tracts must pay a mill rate assessment, not exceeding 25 mills of the assessed value, in addition to the $4.94 per hectare assessed for production areas. Under current policy, only mineral lands producing coal, petroleum, or natural gas are designated as production tracts which are subject to an assessment of 12.5 mills of the assessed value as determined for the year under the assessment regulations.

The mineral land tax assessment roll on May 1, 1979 was composed of 7 639 folios covering a total of 534 819.97 hectares. The number of folios increased by 1 514 or 25 per cent over 1978, while the hectares on the roll increased by 13 168.15 hectares or 2.5 per cent.

Details of the 1979 mineral land tax assessment roll issued on May 1, 1979 are set out in the following table.

Table 2-4—Mineral Land Tax Assessment Roll

Classification of Mineral Land	Number of Folios	Hectares	Current	Delinquent and Interest	Agricultural Forgiveness	Net Assessments
			$	$	$	$
Nondesignated	7 564	516 265.50	410 995.75	22 080.68	(90 304.62)	342 771.81
Production Areas	46	12 590.70	62 198.06	5 482.02	—	67 680.08
Production Tracts	29	5 963.77	9 439 256.90	1 366.59	—	9 440 623.49
Totals	7 639	534 819.97	9 912 450.71	28 929.29	(90 304.62)	9 851 075.38

The External Audit section completed four audits under the Act which resulted in revised assessments of $65 870.00 at December 31, 1979. Also, administrative adjustments totalling $2 719.10 for interest, agricultural forgiveness, and surrenders were made to yield total tax assessments for the calendar year of $9 913 806.06.

Revenue collections for the year by classification of mineral land are as follows:

Classification of Mineral Land	Revenue Collected
	$
Nondesignated	323 733.89
Production Areas	71 310.16
Production Tracts	9 492 065.85
	9 887 109.90

In 1979, the Titles Search section completed a total of 21 266 searches of which 2 366 were for the Water Rights Branch of the Ministry of Environment. Title searching activity resulted in 1 798 parcels covering 70 016.62 hectares being added to the roll. Nonpayment of assessed taxes resulted in 115 parcels of mineral land covering 34 276.06 hectares being forfeited. Also seven surrenders covering 290.89 hectares were processed. Due to the complicated nature of the titles composing the "lieu lands" of the Esquimalt and Nanaimo Railway Belt located north of title 7434A, additional work has been required to produce the surrender document in registerable form. It is now anticipated that registration will not be completed until mid-1980.

On June 7, 1979, John Eric Merrett of 4128 Long View Drive, Victoria, B.C., was appointed Chairman of the Mineral Land Tax Review Board replacing John Bedford Evans who resigned in 1978. There were no appeals heard by the Board during 1979 although there were three appeals against 1979 assessments filed with the Board. Hearing dates for two of these appeals have been scheduled for the first quarter in 1980. Other appeals relating to 1978 and prior years and to matters dealt with in the Supreme Court judgment of the Honourable Mr. Justice Berger remain adjourned *sine die*.

An amendment which validated assessments made for the 1974–1977 taxation years under the *Mineral Land Tax Act* came into force and effect on September 10, 1979.

Table 2-5—Mineral Revenue Collections, 1979

	Petroleum and Natural Gas Royalties					Mineral Resource Royalties and Taxes							
1979 Month	Gas	Oil	Products	Penalties	Total	Iron Ore Royalty Agreements	Coal Act Royalties	Mineral Royalties Act	Total Mineral Resource Royalties	Mineral Land Tax Act	Mineral Resource Tax Act	Total Mineral Resource Tax and Royalties	Total Divisional Revenue
	$	$	$	$	$	$	$	$	$	$	$	$	$
January	6 680.01	4 184 189.95	113 254.67	.....	4 304 124.63	23 758.58	247 920.00	.....	271 678.58	3 024.84	474 468.80	749 172.22	5 053 296.85
February	1 895.19	3 022 636.42	92 661.49	.....	3 117 193.10	2 827.99	339 175.00	.....	342 002.99	28 943.73	686 562.48	1 057 509.20	4 174 702.30
March	11 451.94	3 288 338.62	67 740.02	.....	3 367 530.58	14 199.75	416 283.00	.....	430 482.75	414.09	422 164.00	853 060.84	4 220 591.42
April	6 244.78	3 650 247.34	89 966.60	.....	3 746 458.72	12 617.54	315 641.00	.....	328 258.54	791.97	179 761.97	508 812.48	4 255 271.20
May	5 526.25	3 635 961.51	54 646.29	.....	3 696 134.05	11 938.37	470 625.00	.....	482 563.37	29 209.98	244 844.53	756 617.88	4 452 751.93
June	5 557.56	4 164 697.15	78 952.79	.....	4 249 207.50	15 561.52	393 675.00	500.00	409 736.52	35 050.88	6 274 176.44	6 718 963.84	10 968 171.34
July	4 733.55	3 622 510.23	99 398.40	.....	3 726 642.18	16 377.28	394 742.00	.....	411 119.28	8 424 361.04	6 892 487.90	15 727 968.22	19 454 610.40
August	3 511.55	3 996 142.22	81 270.03	.....	4 080 923.80	7 592.91	366 310.00	3 234.41	377 137.32	1 290 325.44	1 699 237.73	3 366 700.49	7 447 624.29
September	4 664.58	4 013 298.06	108 106.51	.....	4 126 069.15	14 039.30	418 882.00	.....	432 921.30	12 635.97	1 690 380.55	2 135 937.82	6 262 006.97
October	987.64	3 256 297.55	66 714.91	.....	3 324 000.10	28 491.55	229 729.00	.....	258 220.55	26 669.91	1 697 022.69	1 981 913.15	5 305 913.25
November	9 545.63	4 286 681.36	79 481.06	.....	4 375 708.05	12 999.99	308 365.00	.....	321 364.99	24 057.37	1 806 806.16	2 152 228.52	6 527 936.57
December	6 401.39	3 698 109.01	116 553.31	.....	3 821 063.71	907.42	334 640.00	.....	335 547.42	11 624.68	1 711 372.52	2 058 544.62	5 879 608.33
1979 Total	67 200.07	44 819 109.42	1 048 746.08	.....	45 935 055.57	161 312.20	4 235 987.00	3 734.41	4 401 033.61	9 887 109.90	23 779 285.77	38 067 429.28	84 002 484.85
1978 Total	72 729.14	42 191 349.49	1 074 867.41	510.00	43 339 456.04	121 506.53	5 030 737.19	699 316.19	5 851 559.91	8 162 797.44	8 922 897.92	22 937 255.27	66 276 711.31
1977 Total	180 951.50	41 015 470.45	887 907.66	890.00	42 085 219.61	126 653.28	3 347 551.80	2 507 896.90	5 982 101.98	8 307 272.87	9 655 342.29	23 944 717.14	66 029 936.75
1976 Total	323 750.43	43 732 456.11	716 447.65	550.00	44 773 204.19	182 314.48	2 502 201.78	11 409 767.74	14 094 284.00	22 428 217.32	.....	36 522 501.32	81 295 705.51
1975 Total	2 848 929.60	44 782 489.47	569 521.01	800.00	48 201 740.08	185 283.60	3 644 267.91	5 016 838.24	8 846 389.75	15 416 461.09	.....	24 262 850.84	72 464 590.92
1974 Total	3 288 296.85	45 300 184.21	51 181.21	649.20	48 640 311.47	155 925.04	1 361 081.25	12 979 098.52	14 496 104.81	2 640 022.84	.....	17 136 127.65	65 776 439.12
Cumulative Total	6 781 857.59	261 841 059.15	4 348 671.02	3 399.20	272 974 986.96	932 995.13	20 121 826.93	32 616 652.00	53 671 474.06	66 841 881.46	42 357 525.98	162 870 881.50	435 845 868.46

MINERAL ROYALTIES ACT

Although this Act was repealed as of January 1, 1977, there remained delinquent royalty on account of two companies. Through the initiation of remedial measures, the Division collected $3 734.41 from one of the operators and has entered into an agreement with the other operator for recovery from future production incomes.

MINERAL RESOURCE TAX ACT

Any mine which produces minerals as defined under the *Mineral Act* or *Placer Mining Act* is subject to an annual tax of 17.5 per cent on the mining income derived from the operation of that mine in the province. In 1979, 49 returns were filed with the Commissioner for corporate fiscal years commencing in 1978. These returns reflected net aggregate incomes of $721 559 486.00 which translate to a gross tax payable of $16 453 820.00 which after allowing deduction of royalty credits in the amount of $1 760 317.00 yields a net tax payable of $14 693 502.00. Actual revenue collections during the year under this Act were $23 799 285.77. This represents a 166.5-per-cent increase over the corresponding period in 1978.

The External Audit section completed 51 audits under this Act, and issued 26 assessments for net adjustments of $409 469.00 during 1979.

A minor amendment was made to the Act during the year to ensure that the definition of mineral under the Act applied to placer mining operation thus placing it under the Act for purposes of taxation.

Petroleum and Natural Gas Royalty Regulations

Petroleum and natural gas produced from Crown land, with the exception of that sold under contract to the British Columbia Petroleum Corporation, is subject to the payment of royalty as prescribed under the regulations. During the 12-month period ending December 31, 1979, 6 545 returns were received and processed. An analysis of these returns reflects the following with respect to petroleum production during the period.

Table 2-6—Petroleum Production by Royalty Classification

Classification	Production	Value of Marketed Production	Crown Royalty Share	Average Royalty Rate
	m^3	$	m^3	Per Cent
Old oil	1 804 206.2	141 917 089.44	522 137.8	28.94
New oil	216 454.3	17 027 032.24	53 178.4	24.57
Exempt discovery wells	46 887.5	3 687 360.93	.....	.....
Freehold oil	109 990.5	8 652 435.30	.....	.....
Plant condensate	10 591.1	851 589.70	Collected as products royalty	
Total	2 188 129.6	172 135 507.61	575 316.2	26.39

A detailed analysis for natural gas is not presented because virtually all commercial production is sold under contract to the British Columbia Petroleum Corporation and only minor amounts of natural gas used for field production purposes are subject to the payment of royalty.

Actual revenue collections received for the year under these regulations are as follows:

Table 2-7—Petroleum and Natural Gas Revenue Collection, 1979

	$
Natural gas royalties	67 200.07
Crude petroleum royalties	44 819 109.42
Conservation plant and products royalties	1 048 746.08
Total	45 935 055.57

The petroleum exploration incentive program was discontinued in 1978, and is in a phase-out stage. Details of transactions under the program for the 1979 year are as follows:

Table 2-8—Oil Credits Transactions, 1979

	Credits	Value
Balance brought forward from 1978	1 590 266	1 192 699.50
Credits approved for prior periods	354	265.50
Credits redeemed	1 520 268	1 140 201.00
Balance December 31, 1979	70 352	52 764.00

An amendment to the Act was approved which will allow the Lieutenant Governor in Council to impose a penalty for failure to file the required returns or make payment of the royalty due within the prescribed time.

FINANCE AND ADMINISTRATION DIVISION

The Director of this Division is Robert R. Davy. Reporting to the Director are the Accounts Section and the Mail/Supplies Service. Publications and the Library reported to the Director, however now are the responsibility of the Communications Division. The Director also has the responsibility for space accommodation and telephone services. The Director reports directly to the Deputy Minister.

Accounts Section

This section is under the control of the Director. This section consists of the Accounts-Payable under Mary-Ellen Tonge and the Payroll under Sue Smith. The several functions in this section are the preparation of budget estimates, administering payment of suppliers' accounts and travel claims, payroll administration, costing and facilitating of purchases through the Purchasing Commission, licensing and insuring of vehicles, and other administrative accounting responsibilities.

Mail/Supplies Service

This section is located in Room 414, Douglas Building. The supervisor is Ian Clark. Services provided are the mail and runner service, and the acquisition and disbursement of general office supplies.

Library

The Ministry Library, located at Room 430, Douglas Building, Victoria, is administered by the Director of Finance and Administration and is supervised by S. Ferris. The Library provides geological and technical information for the staff, other ministries, industry, and the public.

The Library is the depository for all publications of the Ministry. Other holdings include reports of the geological surveys' and mines' branches of Canada, the United States, and other foreign nations. Government reports and maps total approximately 16 500 in number. There are about 2 000 texts and reference books. Audiovisual equipment is also stored in the Library for staff use. Special collections comprised of proceedings and guidebooks from international geological congresses, and annual reports of mining and petroleum companies are also held by the Library.

An estimated 2 000 requests for information were dealt with in 1979 and 80 interlibrary loan requests were made for staff members by the Library. Indexing of government serial publications was continued.

PUBLICATIONS

The Publications section is administered by the Director and supervised by Mrs. Rosalyn J. Moir. Responsibilities include publication preparation for the Ministry, maintaining indexes and publication lists, disseminating press releases, and dispatch of the ever-increasing requests for information from other government agencies, universities, industry, and the public. Approximately 9 000 communiques were handled during the year.

The Publication Committee, composed of a representative from each Division, is chaired by A. Sutherland Brown.

Publications that are in print may be obtained from the Ministry, 552 Michigan Street, Victoria, and from the Geological Survey of Canada, 100 West Pender Street, Vancouver. Current publications may also be obtained from the Gold Commissioner's office, 800 Hornby Street, Vancouver.

Publications are available for reference use in the Ministry Library, in the Reading Room of the Geological Survey of Canada, in the offices of the Inspector of Mines in Nelson and Prince Rupert, as well as in certain libraries.

Separate lists of publications are available for the Mineral Resources Branch and the Petroleum Resources Branch on request to the Publications Section, Ministry of Energy, Mines and Petroleum Resources, 552 Michigan Street, Victoria V8V 1X4. Mailing lists are maintained for all those interested in receiving notification of the release of new publications.

PERSONNEL

The Personnel Office staff remained at three with no change in 1979.

Projects underway include negotiations for transfer of British Columbia Energy Commission staff to the newly formed Energy Resources Branch, initial staffing of the Energy Resources Branch, and continuation of the Licensed Science Officer Classification Plan.

Personnel Statistics, 1979

Number of permanent employees	339
Number of appointments	31
Number of resignations	13
Number of retirements/preretirements	2
Number of in-service transfers	11
Number of promotions and reclassifications	12
Number of temporary employees	31
Number of temporary employees under WIG 1979	35
Number of Labour summer students	16
Death in service	1

ENERGY RESOURCES BRANCH

In December 1978, the mandate of the Ministry was expanded to include responsibility for energy matters.

Early in 1979, the Energy Resources Branch of the Ministry was formed. All non-regulatory functions of the British Columbia Energy Commission were then transferred into this new Branch.

The Energy Resources Branch is the principal agency for government energy policy initiatives and energy programs. It is responsible for policy recommendations on all energy and related issues, for energy data and analysis, and for conservation programs and the development of programs that pertain to new energy technology.

This was a formative year for the Energy Resources Branch. By the end of 1979, the Branch comprised three Divisions: the newly created Energy Policy Division, the Forecast-

ing and Strategic Studies Division, and the Conservation and Technology Division, the latter two transferred from the British Columbia Energy Commission. Further organizational changes are anticipated.

It was also a year of transition. Although the Branch had formal control of all its Divisions early in 1979, many sections continued to function under the joint aegis of the Ministry and the British Columbia Energy Commission for some or all of the year. The activities of these sections are properly included in this report.

For much of 1979, the Energy Resources Branch came under the direction of the Deputy Minister.

Energy Policy Division

The Energy Policy Division was created late in 1979 and staffed, initially with personnel seconded from other ministries.

Douglas H. Horswill was appointed Director of the Division shortly before year-end.

A primary objective of the Division is to design energy strategies which meet, on a continuing basis, the energy needs of British Columbia, while taking into account and developing policy to deal with environmental, social, and economic factors related to energy. The Division is also designed to provide the capability for quick and accurate responses to emergent, short-term energy issues.

The major thrust of the year's work was the development of an energy policy for British Columbia. That policy is geared to the achievement of energy security for British Columbia for the 1980's and beyond. The Energy Policy Statement, slated for release in February 1980, will provide a framework for detailed policy initiatives, to be developed over time as specific programs are introduced.

Forecasting and Strategic Studies Division

The Forecasting and Strategic Studies Division was created in July 1979, when staff of the Energy Resources Management Division of British Columbia Energy Commission were transferred to the Ministry.

Staff of the Division were involved almost exclusively with the preparation of a long-term energy supply and requirements forecast for British Columbia, extending to 1996. Both a summary and a technical report are due to be published early in 1980.

The Division is also preparing a study of opportunities for conversion to coal in the British Columbia cement industry. This study is also to be released early in 1980.

Conservation and Technology Division

In December of 1978, the Conservation and Technology Division of the British Columbia Energy Commission was seconded to the Ministry in anticipation of transfer at a later date. The Division, under the direction of R. L. Evans, continued its work, assessing energy conservation and renewable energy options and encouraging and promoting conservation and renewable energy developments.

A major initiative began on May 8, 1979 with the signing of the "Canada–British Columbia Agreement on the Development and Demonstration of Renewable Energy and Energy Conservation Technologies." This agreement provides $27 million over a five-year period for major energy conservation and renewable energy demonstration projects. During the year a number of important demonstration projects were initiated. These are described in more detail below.

During the year, the Division continued to provide advice and staff support on new energy technology and in particular on coal research and development. This work was in support of the government's intention to increase energy research and development activities in the province.

ENERGY CONSERVATION PROGRAMS

A number of studies and projects were carried out in order to encourage and promote the efficient use of energy in buildings including industrial, commercial, and residential establishments.

Energy Management for Commercial Buildings—The Conservation and Technology Division commenced work on a manual on energy conservation for commercial buildings. The manual will outline the potential for existing buildings to save energy and money and it explains how to set up an energy management program.

Energy Conservation for Schools—In cooperation with the Ministry of Education, Science and Technology, a manual was published on steps to energy conservation in schools. The manual outlines how in-school conservation programs could be established and suggests several energy conservation techniques.

IECM Conservation Information Tour—In cooperation with the federal Energy, Mines and Resources Canada, a team of people were hired to provide energy conservation information to the public in about 14 different British Columbia communities. The Ministry's residential energy conservation computer program BCHEAP was used by over 800 people in the different communities.

Building Owners and Managers Conference—In cooperation with Building Owners and Managers Association (BOMA) and University of British Columbia's Centre for Continuing Education, a workshop on building energy conservation management was provided. Over 120 participants attended the workshop and listened to guest speakers outline the potential savings and methods of conservation available to building operators.

Further projects were undertaken to encourage the efficient use of energy by industry and to continue to promote the increased substitution of wood waste as a fuel in place of other prime fuels such as oil or natural gas.

Energy Bus Program—Under the jointly funded federal/provincial agreement, the Conservation and Technology Division operates a computer-equipped mobile energy audit vehicle or "Energy Bus." This vehicle, with a highly trained technical staff, visits industrial and commercial establishments around the province to conduct free energy audits. In 1979, a total of 95 visits were made to establishments throughout British Columbia. Over $2.5 million in potential energy savings were identified by these visits.

The Use of Wood Waste and Municipal Solid Waste as Energy Resources—The Ministry has an ongoing interest in the use of wood waste and municipal solid waste as energy resources. In this context, the Management Committee of the Joint Canada-British Columbia Agreement on the Development and Demonstration of Renewable Energy and Energy Conservation Technologies approved the following external projects which are to be completed during 1980:

- Firing a lime kiln with a lamb wet-cell burner (wood waste)
- A technical and economic evaluation of a fluidized bed combustion unit in Vancouver (wood waste/municipal solid waste)
- A feasibility study of the concept of cogeneration for the metropolitan Victoria area based on the use of refuse derived fuel (municipal solid waste).

The following studies were undertaken during the year:

Cogeneration Survey—A joint study with British Columbia Hydro and Power Authority undertaken to assess the potential for increased cogeneration of electricity and process heat at industrial operations in the province was undertaken.

Electrical Generation Station Using Wood Waste as a Fuel—The feasibility study of a 60-megawatt wood waste-fired generating station at Quesnel commissioned by British Columbia Hydro and Power Authority was commenced. This was a follow-up study funded by the Wood-Waste Energy Coordinating Committee, chaired by the British Columbia Energy Commission. The Ministry was represented on the steering committee which directed the work.

Consumer Conservation Information Activities

Many consumer conservation information projects were undertaken during 1979 in order to improve public understanding of the need for, and benefits of, energy conservation.

Activities

Lovings/Hawthorne lectures—Luncheons were organized in order to provide an opportunity for many of Vancouver's business executives to meet and speak with Amory Lovings and Sir William Hawthorne (two prominent energy spokesmen).

These seminars were designed to provide information on conservation with such prominent speakers as the Honourable Mr. Justice Tom Berger, Dr. David Brooks, and Dr. John Helliwell.

Enersave Test—Enersave, a federal government home insulation audit, is available to all Canadians. Since it is not actively promoted by the federal government, the Ministry cooperated with them in distributing the audit throughout British Columbia.

Publications

A number of consumer information and materials were developed during 1979 including:

Energy: the Canadian Picture—a teacher's guide, and was prepared jointly with the Ministry of Education, Science and Technology to coincide with, and complement a teacher's kit of audiovisual materials assembled by the Provincial Education Media Centre.

Energy a Quest for New Technology—a pamphlet providing information on the federal/provincial renewable energy and conservation demonstration program.

U.B.C. Teacher's Kit—an assemblage of energy conservation information for home economics teachers.

Advertising

Two advertisements were placed in daily and weekly newspapers encouraging the public to reduce energy consumption.

- International Energy Conservation Month provided the forum to focus on energy conservation. During the month (October) one advertisement was placed four times in all daily newspapers.

Work continued on a number of renewable energy studies and demonstration programs in 1979. Some new projects were introduced, and as a result of the Canada-British Columbia Agreement some demonstration projects have been initiated. The following is a summary of projects, either completed or in progress in 1979.

Solar Resource Assessment Study—Acres Consulting Services Limited have prepared a draft final report of this study. It is expected that a summary report and three subreports will be issued for public distribution.

Geothermal Energy Resource Assessment Study—This project will result in a preliminary assessment of the availability of geothermal energy in British Columbia.

Wind Energy Resource Assessment Study—Work on this project to assess the availability of wind energy in British Columbia began in December 1979. Results to date are very encouraging and an original approach to the assessment of wind energy has been taken.

Windmill Demonstration Project—A demonstration project was undertaken in conjunction with British Columbia Hydro and Power Authority and the National Research Council. The unit will be situated at Christopher Point, the southern end of Victoria Island. Installation is expected to commence in April 1980 and the project will continue for one or two years. The design is a vertical axis unit with 55-kilowatt output and it stands some eight metres high. The power will feed British Columbia Hydro and Power Authority's grid and the operation will be monitored over a one-year period.

Windmill Education Project—A small grant was made to The University of British Columbia, Mechanical Engineering Department, to purchase and install a small horizontal axis windmill and use this in undergraduate course projects to enhance the energy sections of the syllabus. Useful information will also be obtained from the monitoring of a small system typical of a remote application, and British Columbia Hydro and Power Authority is also interested in using the machine to study the problems of a remote independent user, interfacing with the grid to feed in surplus power.

Geothermal Energy Project at Meager Mountain—Funding was provided to British Columbia Hydro and Power Authority to continue the geothermal exploration work at Meager Mountain in 1979. This work will carry over into 1980. This work concerns the drilling of shallow, slim holes to establish temperature profiles over the probable reservoir area. Environmental studies also took place to establish the conditions prior to any geothermal exploitation.

Geothermal District Heating Feasibility Study—A study was completed to investigate the preliminary feasibility of district heating from geothermal hot water in the northeastern sedimentary basin of British Columbia. A draft final report has been submitted recommending further work in the Fort Nelson/Dawson Creek areas.

Mineral Resource Statistics

CHAPTER 3

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INTRODUCTION

The statistics of the mineral industry are collected, compiled, and tabulated for this Report by the Economics and Planning Division of the Mineral Resources Branch.

In the interests of uniformity and to avoid duplication of effort, beginning with the statistics for 1925, Statistics Canada and the provincial ministries have cooperated in collecting and processing mineral statistics.

Producers of metals, industrial minerals, structural materials, coal, and petroleum and natural gas are requested to submit returns in duplicate on forms prepared for use by the province and by Statistics Canada.

As far as possible, both organizations follow the same practice in processing the data. The final compilation by Statistics Canada is usually published considerably later than the *Annual Report of the Minister of Energy, Mines and Petroleum Resources* for British Columbia. Differences between the values of production published by the two organizations arise mainly because Statistics Canada uses average prices considered applicable to the total Canadian production, whereas the British Columbia mining statistician uses prices considered applicable to British Columbia production.

Peat, classified as a fuel by Statistics Canada, is not included in the British Columbia statistics of mineral production, being regarded as neither a fuel nor a mineral.

The statistics of the petroleum industry are collected, compiled, and tabulated for this Report by the Petroleum Resources Branch.

METHODS OF COMPUTING PRODUCTION

The tabulated statistics are arranged so as to facilitate comparison of the production records for the various mining divisions, and from year to year. From time to time, revisions have been made to figures published in earlier reports as additional data became available or errors became known.

Data are obtained from the certified returns made by the producers of metals, industrial minerals and structural materials, and coal, and are augmented by data obtained from custom smelters. For petroleum, natural gas, and liquid by-products, production figures supplied by the Petroleum Resources Branch of the Ministry of Energy, Mines and Petroleum Resources are compiled from the monthly disposition reports and the Crown royalty statement filed with the Ministry by the producers.

Values are in Canadian funds. Metric weights are used throughout.

METALS

Average Prices

The prices used in the valuation of current and past production of gold, silver, copper, lead, and zinc are shown in the table on page 99.

Prior to 1974 the price of gold used was the average Canadian Mint buying-price for fine gold.

The price used for placer gold originally was established arbitrarily at $17 per ounce, when the price of fine gold was $20.67 per ounce. Between 1931 and 1962 the price was proportionately increased with the continuously changing price of fine gold. Since 1962, Canadian Mint reports giving the fine-gold content have been available for all but a very small part of the placer gold produced, and until 1973 the average price listed is derived by dividing ounces of placer gold into total amount received. Starting in 1974 the price used for the valuation of gold, lode and placer, is the amount received by the producer.

Prior to 1949 the prices used for silver, copper, lead, and zinc were the average prices at the markets indicated in the table on page 102, converted into Canadian funds. The abbreviations in the table are Mont. = Montreal; N.Y. = New York; Lon. = London; E. St. L. = East St. Louis; and U.S. = United States.

Starting in 1949 the price of silver, copper, lead, and zinc were average United States prices converted into Canadian funds. Average monthly prices were supplied by Statistics Canada from figures published in the Metal Markets section of *Metals Week*. Specifically, for silver it was the New York price; for lead it was the New York price; for zinc it was the price at East St. Louis of Prime Western; for copper it was the United States export refinery price. Commencing in 1970 the copper price is the average of prices received by the various British Columbia shippers and since 1974 this applies also to gold, silver, lead, zinc, and cadmium.

For antimony and bismuth the average producers' price to consumers is used. For nickel the price used is the Canadian price set by Inco Limited. The value per tonne of the iron ore used in making pig iron at Kimberley was an arbitrary figure, being the average of several ores of comparable grade at their points of export from British Columbia.

Gross and Net Content

The gross content of a metal in ore, concentrate, or bullion is the amount of the metal calculated from an assay of the material, and the gross metal contents are the sum of individual metal assay contents. The net contents are the gross contents less smelter and refinery losses.

In past years there have been different methods used in calculating net contents, particularly in the case of one metal contained in the concentrate of another. The method established in 1963 is outlined in the following table. For example, the net content of silver in copper concentrates is 98 per cent of the gross content, of cadmium in zinc concentrates is 70 per cent of the gross content, etc. Commencing in 1974 the quantities represent the actual net quantities or metals paid for.

	Lead Concentrates	Zinc Concentrates	Copper Concentrates	Copper-Nickel Concentrates	Copper Matte
	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent
Silver	98	98	98	...	98
Copper	*Less* 26 lb./ton	...	*Less* 10 lb./ton	85	*Less* 10 lb./ton
Lead	98	50	...	...	50
Zinc	50	90	...	...	...
Cadmium	...	70	...	...	...
Nickel	...	...	...	88	...

Value of Production

For indium, iron concentrate, mercury, molybdenum, rhenium, and tin the value of production is the amount received by the shippers.

For gold, silver, copper, lead, zinc, antimony, bismuth, cadmium, some iron concentrate, and nickel the value of production was calculated from the assay content of the ore, concentrate, or bullion less appropriate smelter losses, and an average price per unit of weight. Since 1974 the values represent the settlement values received by the producers for the respective metals.

Prior to 1925 the value of gold and copper produced was calculated by using their true average prices and, in addition, for copper the smelter loss was taken into account.

The value of other metals was calculated from the gross metal content of ores or concentrates by using a metal price which was an arbitrary percentage of the average price, as follows: silver, 95 per cent; lead, 90 per cent; and zinc, 85 per cent.

It is these percentages of the average price that are listed in the table on page 99.

For 1925 to 1973 the values had been calculated by using the true average price (*see* page 99) and the net metal contents in accordance with the procedures adopted by Statistics Canada and the Ministry of Energy, Mines and Petroleum Resources.

Since 1974 the total quantity and value of metal production include the quantities paid for to the mines, and the smelter and refinery production that can be attributed to the mines but is not paid for. The quantity and value paid for to the mines, excluding outward

transportation costs, smelting and refining costs, penalties and deductions, are shown separately for comparative purposes.

INDUSTRIAL MINERALS AND STRUCTURAL MATERIALS

The values of production of industrial minerals and structural materials are approximately the amounts received at the point of origin.

COAL

The value of production of coal is calculated using a price per tonne which is the weighted average of the f.o.b. prices at the mine for the coal sold.

PETROLEUM AND NATURAL GAS

The values of production of natural gas, natural gas liquid by-products, and petroleum including condensate/pentanes plus are the amounts received for the products at the well head.

MINERAL AND PETROLEUM PRODUCTS IN BRITISH COLUMBIA

Antimony—Antimony metal was produced at the Trail smelter from 1939 to 1944; since 1944 it has been marketed alloyed with lead. The antimony is a by-product of silver-lead ores. In 1907 the first recorded antimonial ore mined in British Columbia was shipped from the Slocan area to England. Since then other out-of-province shipments have originated in the Bridge River, North Lardeau, Slocan, Spillimacheen, and Stuart Lake areas. In Table 3-7C the antimony assigned to individual mining divisions is the reported content of ore exported to foreign smelters; the antimony "not assigned" is that recovered at the Trail smelter from various ores received there. *See* Tables 3-1, 3-3, and 3-7C.

Arsenious oxide—Arsenious oxide was recovered at foreign smelters from arsenical gold ores from Hedley between 1917 and 1931, and in 1942, and from the Victoria property on Rocher Déboulé Mountain in 1928. No production has been recorded since 1942. *See* Tables 3-1 and 3-7D.

Asbestos—British Columbia has produced asbestos since 1952 when the Cassiar mine was opened. All British Columbia production consists of chrysotile from the Cassiar mine near the Yukon boundary. This deposit is noted for its high percentage of valuable long fibre and for the low iron content of the fibre. The original claims were located at Cassiar in 1950, and the first fibre was shipped two years later. The fibre is milled from the ore at Cassiar and now most is shipped by truck to Stewart. From 1953 to 1961 the fibre was valued at the shipping point in North Vancouver, but beginning in 1962 it has been valued at the mine, and values for the preceding years have been recalculated on that basis. *See* Tables 3-1, 3-3, and 3-7D.

Barite—Barite production began in 1940 and has been continuous since then, coming from several operations in the upper Columbia River valley. Some barite has been mined from lode deposits and the rest recovered from the mill-tailings ponds of the former Silver Giant and Mineral King silver-lead-zinc mines. *See* Table 3-7D.

Bentonite—Small amounts of bentonite were produced between 1926 and 1944 from deposits in the coal measures near Princeton. There has been no production since 1944. *See* Tables 3-1 and 3-7D.

Bismuth—Since 1929 the Trail smelter has produced bismuth. It is a by-product of lead refining and thus the production cannot be assigned to specific properties or mining divisions. *See* Tables 3-1, 3-3, and 3-7C.

Brick—*See* Clay and shale products.

Building-stone —Dimensional stone for building purposes is quarried when required from a granite deposit on Nelson Island and an andesite deposit on Haddington Island. Other stone close to local markets is quarried periodically or as needed for special building projects. *See* Tables 3-1, 3-3 and 3-7E.

Butane—Butane is recovered as a by-product at the gas-processing plant at Taylor and at oil refineries. *See* Tables 3-1, 3-3, 3-7A, and 4-16.

Cadmium—Cadmium has been recovered as a by-product at the Trail zinc refinery since 1928. It occurs in variable amounts in the sphalerite of most British Columbia silver-lead-zinc ores. In Table 3-7C the cadmium assigned to individual mining divisions is the reported content of custom shipments to the Trail and foreign smelters; that "not assigned" is the remainder of the reported estimated recovery at the Trail smelter from British Columbia concentrates. *See* Tables 3-1, 3-3, and 3-7C.

Cement—Cement is manufactured from carefully proportioned mixtures of limestone, gypsum, and other mineral materials. It has been produced in British Columbia since 1905. Present producers are Inland Cement Industries Ltd., with a 907 180-tonnes-per-year plant on Tilbury Island, and a 490 000-tonnes-per-year plant at Bamberton, and Canada Cement Lafarge Ltd., with a 476 000-tonnes-per-year plant on Lulu Island and a 191 000-tonnes-per-year plant at Kamloops. *See* Tables 3-1, 3-3, and 3-7E.

Chromite—Two shipments of chromite are on record, 608 tonnes from Cascade in 1918 and 114 tonnes from Scottie Creek in 1929. *See* Tables 3-1 and 3-7C.

Clay and shale products—These include brick, blocks, tile, pipe, pottery, lightweight aggregate, and pozzolan manufactured from British Columbia clays and shales. Common red-burning clays and shales are widespread in the province, but better grade clays are rare. The first recorded production was of bricks at Craigflower in 1853 and since then plants have operated in most towns and cities for short periods. Local surface clay is used at Haney to make common red brick, tile, and flower pots. Shale and fireclay from Abbotsford Mountain are used to make firebrick, facebrick, sewer pipe, flue lining, and special fireclay shapes in plants at Kilgard, Abbotsford, and South Vancouver. A plant at Quesnel makes pozzolan from burnt shale quarried south of Quesnel. Several hobby and art potteries and a sanitary-ware plant are in operation, but these use mainly imported raw materials and their production is not included in the tables. *See* Tables 3-1, 3-3, and 3-7E.

Coal—Coal is almost as closely associated with British Columbia's earliest history as is placer gold. Coal was discovered at Suquash on Vancouver Island in 1835 and at Nanaimo in 1850. The yearly value of coal production passed that of placer gold in 1883 and contributed a major part of the total mineral wealth for the next 30 years.

First production, by mining divisions: Cariboo, 1942; Fort Steele, 1898; Kamloops, 1893; Liard, 1923; Nanaimo, 1836; Nicola, 1907; Omineca, 1918; Osoyoos, 1926; Similkameen,1909; and Skeena, 1912.

The Nanaimo and Comox fields produced virtually all of the coal until production started from the Crowsnest field in 1898. The Crowsnest field contains coking coal and prospered in the early years of smelting and railroad building. Mining started in the Nicola-Princeton Coalfield in 1907, at Telkwa in 1918, and on the Peace River in 1923. The Nanaimo field was exhausted in 1953 when the last large mines closed, and only small operations on remnants were left. The colliery at Merritt closed in 1945 and at Coalmont in 1940. The closing of the large mine at Tsable River in 1966, and the last small one, near Wellington in 1968, marked the end of continuous production from the important Vancouver Island deposits. Recent exploration indicates the possibility of renewed coal mining on the island.

Undeveloped fields include basins in the foothills of the Rocky Mountains south of the Peace River, the Groundhog basin in north-central British Columbia, the Hat Creek basin west of Ashcroft, and Sage Creek basin southeast of Fernie.

The enormous requirements for coking coal in Japan created intense exploration in various areas of British Columbia since 1968. The signing of large contracts with the Japanese resulted in preparations for production at several deposits in the East Kootenays. First shipments to Japan via special port facilities at North Vancouver and Roberts Bank began in 1970.

All the coal produced, including that used in making coke, is shown as primary mine production. Quantity from 1836 to 1909 is gross mine output and includes material lost in picking and washing. From 1910 the quantity is the amount sold and used, which includes sales to retail and wholesale dealers, industrial users, and company employees; coal used under company boilers, including steam locomotives; and coal used in making coke. *See* Tables 3-1, 3-3, 3-7A, 3-8A, and 3-8B.

Cobalt—In 1928 a recovery of 1,730 pounds of cobalt was made from a shipment of arsenical gold ore from the Victoria mine on Rocher Déboulé Mountain. From 1971 to 1973, cobalt was shipped from the Pride of Emory mine at Hope. *See* Tables 3-1 and 3-7C.

Coke—Coke is made from special types of coal. It has been produced in British Columbia since 1895. Being a manufactured product, its value does not contribute to the total mineral production as shown in Table 3-1. Up to 1966, coke statistics had been included in the Annual Report at Table 3-9, but this table has been discontinued. The coal used in making coke is still recorded in Table 3-8B.

Condensate—(*a*) *Field*—Field condensate is the liquid hydrocarbons separated and recovered from natural gas in the field before gas processing. (*b*) *Plant*—Plant condensate is the hydrocarbon liquid extracted from natural gas at gas-processing plants. *See* Tables 3-1, 3-3, 3-7A, and 4-16.

Copper—From 1935 to 1978 no copper smelter operated in British Columbia and most of the copper concentrates were shipped to Japanese, eastern Canadian, and American smelters. In 1978, Afton Mines Ltd. started producing blister copper from its own concentrates. Most of the smelting in British Columbia in early years was done on ore shipped directly from the mines without concentration, but modern practice is to concentrate the ore first. Small amounts of gold and silver are commonly present and add value to the ore.

Ore was smelted in British Columbia first in 1896 at Nelson (from Silver King mine) and at Trail (from Rossland mines), and four and five years later at Grand Forks (from Phoenix mine) and Greenwood (from Mother Lode mine). Later, small smelters were built in the Boundary district and on Vancouver and Texada Islands, and in 1914 the Anyox smelter was blown in. Copper smelting ceased in the Boundary district in 1919, at Trail in 1929, and at Anyox in 1935. British Columbia copper concentrates were then smelted mainly at Tacoma, and since 1961 have gone chiefly to Japan.

Most of the production has come from southern British Columbia—from Britannia, Copper Mountain, Greenwood, Highland Valley, Merritt, Nelson, Rossland, Texada Island, and Vancouver Island, although a sizable amount came from Anyox and some from Tulsequah. During the 1960's, exploration for copper became intense, interest being especially directed toward finding very large, low-grade deposits suitable for open-pit mining. The activity has resulted in the establishment of operating mines at Merritt (Craigmont) in 1961, in Highland Valley (Bethlehem) in 1962, on Babine Lake (Granisle) in 1966, near Peachland (Brenda) in 1970, Stewart (Granduc)—closed mid-1978, near Port Hardy (Island Copper) in 1971, near Babine Lake (Bell), McLeese Lake (Gibraltar), Highland Valley (Lornex), Princeton (Ingerbelle) in 1972, and near Kamloops (Afton) in 1977. *See* Table 3-12 for a complete list of copper producers.

Some of these mines produce molybdenum as a by-product, for example, Bethlehem, Brenda, Lornex, Gibraltar, and Island Copper. Copper is also produced as a by-product of iron mining at Tasu Sound, Queen Charlotte Islands (Wesfrob), and with ores containing zinc, gold, silver, and lead at Buttle Lake (Lynx and Myra, Western Mines).

Copper has been the most valuable single commodity of the industry since 1966 except in 1977 when it was surpassed marginally by natural gas. *See* Tables 3-1, 3-3, 3-6, and 3-7B.

Crude oil—Production of crude oil in British Columbia began in 1955 from the Fort St. John field, but was not significant until late in 1961, when the oil pipeline was built to connect the oil-gathering terminal at Taylor to the Trans Mountain Oil Pipe Line Company pipeline near Kamloops. In 1978, oil was produced from 36 separate fields, of which the Boundary Lake, Inga, Peejay, and Eagle were the most productive.

In Tables 3-1, 3-3, and 3-7A, quantities given prior to 1962 under "petroleum, crude" are total sales, but since 1962 the field and plant condensates are listed separately. Table 4-16 incorporates all revisions since the commencement of production.

Diatomite—Relatively large deposits of diatomite are found near the Fraser River in the Quesnel area, and small deposits are widespread throughout the province. Small amounts of diatomite have been shipped from Quesnel periodically since 1928. A plant to process the material is located in Quesnel. *See* Table 3-7D.

Fluorite (fluorspar)—Between 1918 and 1929, fluorite was mined at the Rock Candy mine north of Grand Forks for use in the Trail lead refinery. From 1958 to 1968, small quantities were produced as a by-product at the Oliver silica quarry. *See* Table 3-7D.

Flux—Silica and limestone are added to smelter furnaces as flux to combine with impurities in the ore and from a slag which separates from the valuable metal. In the past, silica was shipped from Grand Forks, Oliver, and the Sheep Creek area. Today, silica from near Kamloops and limestone, chiefly from Texada Island, are produced for flux. Quantities have been recorded since 1911. *See* Tables 3-1, 3-3, and 3-7D.

Gold, lode—Gold has played an important part in mining in the province. The first discovery of lode gold was on Morseby Island in 1852, when some gold was recovered from a small quartz vein. The first stamp mill was built in the Cariboo in 1876, and it seems certain that some arrastras (primitive grinding mills) were built even earlier. These and other early attempts were short-lived, and the successful milling of gold ores began about 1890 in the southern part of the province. By 1900 the value of gold production was second only to that of coal. At the start of World War II, gold mining attained a peak yearly value of more than $22 million, but since the war it has dwindled until developments in the 1970s.

In the early years, lode gold came mostly from the camps of Rossland, Nelson, McKinney, Fairview, Hedley, and also from the copper and other ores of the Boundary district. A somewhat later major producer was the Premier mine at Stewart. In the 1930's the price of gold increased and the value of production soared, new discoveries were made and old mines were revived. The principal gold camps, in order of output of gold, have been Bridge River, Rossland, Portland Canal, Hedley, Wells, and Sheep Creek. In 1971 the Bralorne mine at Bridge River closed.

With the closing of the Bralorne mine, most of the lode gold is produced as a by-product of copper, copper-zinc-silver, and other base metal mining. Because of the volume of this production the amount of gold produced is still at a fairly high level, and with the significant rise in the price of gold in the 1970's the value of production has exceeded the peaks reached during the era of gold mines in the 1930's. *See* Tables 3-1, 3-3, 3-6, and 3-7B. *See* Table 3-12 for a complete list of current producers.

Gold, placer—The early explorations and settlement of the province followed rapidly on the discovery of gold-bearing placer creeks throughout the country. The first placer-miners came in 1858 to mine the lower Fraser River bars upstream from Yale.

The year of greatest placer-gold production was 1863, shortly after the discovery of the placer in the Cariboo. Another peak year in 1875 marked the discovery of placer on creeks in the Cassiar. A minor peak year was occasioned by the discovery of placer gold in the Granite Creek in the Tulameen in 1885. A high level of production ensued after 1899, when the Atlin placers reached their peak output. Other important placer-gold camps were established at Goldstream, Fort Steele, Rock Creek, Omineca River, and Quesnel River. The last important strike was made on Cedar Creek in 1921, and coarse gold was found on Squaw Creek in 1927 and on Wheaton Creek in 1932.

Mining in the old placer camps revived during the 1930s under the stimulus of an increase in the price of fine gold from $20.67 per ounce to $35 per ounce in United States funds. Since World War II, placer mining declined under conditions of steadily rising costs and a fixed price for gold but is showing signs of revival in response to a freely floating gold price since 1972. Since 1858, more than 161 181 000 grams valued at $98.5 million has been recovered.

A substantial part of the production, including much of the gold recovered from the Fraser River upstream from Yale (in the present New Westminster, Kamloops, and Lillooet Mining Divisions) and much of the early Cariboo production, was mined before the original organization of the Department of Mines in 1874. Consequently, the amounts recorded are based on early estimates and cannot be accurately assigned to individual mining divisions.

The first year of production for major placer-producing mining divisions was: Atlin, 1898; Cariboo, 1859; Liard, 1873; Lillooet, 1858; Omineca, 1869.

In 1965, changes were made in the allocation of placer gold in New Westminster and Similkameen Mining Divisions and "not assigned," to reconcile those figures with data incorporated in Bulletin 28, *Placer Gold Production of British Columbia*. *See* Tables 3-1, 3-3, 3-6, and 3-7A.

Granules—Rock chips used for bird grits, exposed aggregate, roofing, stucco, dash, terrazzo, etc., have been produced in constantly increasing quantities since 1930. Plants operate in Burnaby and near Grand Forks, Sirdar, Vananda, and Armstrong. *See* Tables 3-1, 3-3, and 3-7D.

Gypsum and gypsite—Production of gypsum and gypsite has been recorded since 1911. Between 1925 and 1956, more than 907 000 tonnes were shipped from Falkland and some was quarried near Cranbrook and Windermere. Since 1956, nearly all production has come from Windermere. *See* Tables 3-1, 3-3, and 3-7D.

Hydromagnesite—Small shipments of hydromagnesite were made from Atlin between 1904 and 1916 and from Clinton in 1921. *See* Tables 3-1 and 3-7D.

Indium—Production of indium as a by-product of zinc refining at the Trail smelter began in 1942. Production figures have not been disclosed since 1958.

Iron—Iron ore was produced in small quantities as early as 1885, commonly under special circumstances or as test shipment. Steady production started in 1951 with shipments of magnetite concentrates to Japan from Vancouver and Texada Islands.

Most of the known iron-ore deposits are magnetite, and occur in the coastal area. On the average they are low in grade and need to be concentrated. Producing mines have operated on Texada Island, at Benson Lake and Zeballos on Vancouver Island, and at Tasu and Jedway on Morseby Island. At Texada Island copper was a by-product of iron mining, and in the Coast Copper mine at Benson Lake iron was a by-product of copper mining. The latest operation, and to date the largest, is that of Wesfrob Mines Limited at Tasu, begun at the end of 1967; copper is produced as a by-product.

From January 1961 to August 1972, calcined iron sulphide from the tailings of the Sullivan mine was used for making pig iron at Kimberley. This was the first manufacture of pig iron in British Columbia. The iron occurs as pyrrhotite and pyrite in the lead-zinc ore of the Sullivan mine. In the process of milling, the lead and zinc minerals are separated for shipment to the Trail smelter, and the iron sulphides are separated from the waste rock. Over the years a stockpile has been built containing a reserve of about 18 million tonnes of iron ore.

The sulphur was removed in making pig iron and was converted to sulphuric acid, which was used in making fertilizer. A plant built at Kimberley converted the pig iron to steel, and a fabricating plant was acquired in Vancouver. The iron smelter at Kimberley closed in August 1972. The entire production, credited to the Fort Steele Mining Division in Table 3-7C, is of calcine. *See* Tables 3-1, 3-3, 3-6, and 3-7C.

Iron oxide—Iron oxide, ochre, and bog iron were mined as early as 1918 from several occurrences, but mainly from limonite deposits north of Squamish. None has been produced since 1950. *See* Tables 3-1 and 3-7D.

Jade (nephrite)—Production of jade (nephrite) has been recorded only since 1959 despite there being several years of significant production prior to that date. The jade is recovered from bedrock occurrences on Mount Ogden and near Dease Lake and as alluvial boulders from the Fraser River; the Bridge River and its tributaries, Marshall, Hell, and Cadwallader Creeks; O'Ne-ell, Ogden, Kwanika, and Wheaton Creeks. *See* Tables 3-1, 3-3, and 3-7D.

Lead—Lead was the most valuable single commodity for many years, but it was surpassed in value of annual production by zinc in 1950, by copper in 1966, by molybdenum in 1969, and in total production by zinc in 1966. Lead and zinc usually occur together in nature although not necessarily in equal amounts in a single deposit. Zinc is the more abundant metal, but lead ore usually is more valuable than zinc ore because it contains more silver as a by-product. For a long time British Columbia produced almost all of Canada's lead, but now produces about 28 per cent of the total. All of the concentrated ore was smelted and the metal refined at Trail in 1979.

Almost all of British Columbia's lead comes from the southeastern part of the province. The Sullivan mine at Kimberley is now producing about 99.4 per cent of the province's lead and has produced about 85.9 per cent of the grand total. This is one of the largest mines in the world and supports the great metallurgical works at Trail. Other mines are at Pend-d'Oreille River, North Kootenay Lake, Slocan, southwestern British Columbia, and Vancouver Island. In northwestern British Columbia less important parts of the total output have come from Tulsequah, the Premier mine, and several small mines in the general region of Hazelton. *See* Table 3-12 for the current lead producers.

A small amount of high-grade lead ore is shipped directly to the smelter, but most of the ore is concentrated by flotation and the zinc content is separated from the lead. All output from the Sullivan goes to the Trail smelter. Lead was first produced in 1887, and the total production amounts to approximately 7.8 million tonnes.

In 1958, revisions were made in some yearly totals for lead to adjust them for recovery of lead from slag treated at the Trail smelter. *See* Tables 3-1, 3-3, 3-6, and 3-7B.

Limestone—Besides being used for flux and granules (where it is recorded separately), limestone is used in agriculture, cement manufacture, the pulp and paper industry, and for making lime. It has been produced since 1886. Quarries now operate at Cobble Hill, near Prince George, at Kamloops, and on the north end of Texada Island. *See* Tables 3-1, 3-3, and 3-7E.

Magnesium—In 1941 and 1942, Cominco Ltd. produced magnesium from magnesite mined from a large deposit at Marysville. *See* Tables 3-1 and 3-7C.

Magnesium sulphate—Magnesium sulphate was recovered in minor amounts at various times between 1915 and 1942 from small alkali lakes near Basque, Clinton, and Osoyoos. *See* Tables 3-1 and 3-7D.

Manganese—From 1918 to 1920, manganese ore was shipped from a bog deposit near Kaslo and from Hill 60 near Cowichan Lake, and in 1956 a test shipment was made from Olalla. *See* Tables 3-1 and 3-7C.

Mercury—Mercury was first produced near Savona in 1895. Since then small amounts have been recovered from the same area and from the Bridge River district. The main production to date was between 1940 and 1944 from the Pinchi Lake and Takla mines near Fort St. James. In 1968 the Pinchi Lake mine reopened and continued in operation until 1975 when it closed because of market situations. *See* Tables 3-1 and 3-7C.

Mica—No sheet mica has been produced commercially in British Columbia. Between 1932 and 1961, small amounts of mica schist for grinding were mined near Albreda, Armstrong, Oliver, Prince Rupert, and Sicamous. *See* Tables 3-1 and 3-7D.

Molybdenum—Molybdenum ore in small amounts was produced from high-grade deposits between 1914 and 1918. Recently, mining of large low-grade molybdenum and copper-molybdenum deposits has increased production to the point that molybdenum now ranks second in importance in annual value of metals produced in British Columbia. The upswing began when the Bethlehem mine recovered by-product molybdenum from 1964 to 1966, commencing again in 1978. In 1965 the Endako and Boss Mountain mines, followed by the Coxey in 1966, and British Columbia Molybdenum mine in 1967, all began operations as straight molybdenum producers. The Boss Mountain mine closed in 1971 and reopened late in 1973. The Coxey and British Columbia Molybdenum mines closed in 1971 and 1972 respectively. In 1970 the Brenda mine, a combined copper-molybdenum producer, started operating, and Island Copper in 1971, and Lornex in 1972, while Gibraltar ceased molybdenum production in 1975 but recommenced in 1977. *See* Tables 3-1, 3-3, 3-6, and 3-7C.

Natro-alunite—In 1912 and 1913, 363 tonnes of natro-alunite was mined from a small low-grade deposit at Kyuquot Sound. There has been no subsequent production. *See* Tables 3-1 and 3-7D.

Natural gas—Commercial production of natural gas began in 1954 to supply the community of Fort St. John. In 1957 the gas plant at Taylor and the pipeline to serve British Columbia and the northwestern United States was completed. The daily average volume of production in 1975 was 1.14 billion cubic feet. In 1978 there were 83 gas fields producing both associated and nonassociated gas, of which the Yoyo, Clarke Lake, Sierra, and La Prise Creek, were the most productive.

The production shown in Tables 3-1, 3-3, 3-7A, and 4-16, is the total amount sold of residential gas from processing plants plus dry and associated gas from the gas-gathering system; that is, the quantity delivered to the main transmission-line. The quantity is net after deducting gas used on leases, metering difference, and gas used or lost in the cleaning plant. The quantity is reported as millions of cubic metres at standard conditions [99.2 kPa (kilopascals) pressure, 15°C temperature, up to and including the year 1960, and thereafter 101.3 kPa pressure, 15°C temperature].

Full details of gross well output, other production, delivery, and sales are given in the tables in chapter 4.

Nickel—One mine, the Pride of Emory near Hope, shipped nickel ore in 1936 and 1937 and began continuous production in 1958. From 1960 to 1974, bulk copper and nickel concentrates have been shipped to Japan and Alberta respectively for smelting. The mine closed in August 1974. *See* Tables 3-1, 3-3, and 3-7C.

Niobium—Niobium was produced from placer deposits on Vowell and Malloy Creeks in the Bugaboo area in 1956. A test shipment of 8 187 tonnes of gravel was shipped by St. Eugene Mining Corporation Limited to Quebec Metallurgical Industries. The placer contained a variety of minerals, including pyrochlore and uraninite. Recovery from the test shipment was as follows: 104.39 kilograms of niobium and 146.29 kilograms of uranium and thorium.

Palladium—Palladium was recovered in 1928, 1929, and 1930 as a by-product of the Trail refinery and is presumed to have originated in copper concentrates shipped to the smelter from the Copper Mountain mine. *See* Tables 3-1 and 3-7C.

Perlite—In 1953 a test shipment of 1 009 tonnes was made from a quarry on François Lake. There has been no further production. *See* Tables 3-1 and 3-7D.

Petroleum, crude—*See* Crude oil.

Phosphate Rock—Between 1927 and 1933, Cominco Ltd. produced 3 485 tonnes of phosphate rock for test purposes, but the grade proved to be too low for commercial use. More test shipments were made in 1964, but there has been no commercial production. *See* Tables 3-1 and 3-7D.

Platinum—Platinum has been produced intermittently from placer streams in small amounts since 1887, mostly from the Tulameen and Similkameen Rivers. Placer platinum also has been recovered from Pine, Thibert, McConnell, Rainbow, Tranquille, Rock, and Government Creeks; from Quesnel, Fraser, Cottonwood, Peace, and Coquihalla Rivers; and from beach placers on Graham Island. Some platinum recovered between 1928 and 1930 as a by-product at the Trail refinery is presumed to have originated in copper concentrates shipped to the smelter from the Copper Mountain mine. *See* Tables 3-1, 3-3, and 3-7C. Small amounts were contained in the placer gold in 1979.

Propane—Propane is recovered from gas-processing plants at Taylor and Boundary Lake, and at oil refineries. *See* Tables 3-1, 3-3, 3-7A, and 4-16.

Rhenium—Rhenium occurs in significant quantities only with molybdenite associated with porphyry copper deposits. It was first produced in 1972 by the Island Copper mine and is extracted as rhenium oxide from fumes produced during roasting of the molybdenite concentrate.

Rock—Production of rubble, riprap, and crushed rock has been recorded since 1909. *See* Tables 3-1, 3-3, and 3-7E.

Sand and gravel—Sand and gravel is used as aggregate in concrete work. The output varies from year to year according to the level of activity in the construction industry. *See* Tables 3-1, 3-3, and 3-7E.

Selenium—The only recorded production of selenium, 332 kilograms, was in 1931 from the refining of blister copper from the Anyox smelter. *See* Tables 3-1 and 3-7C.

Silver—Silver is recovered from silver ores or as a by-product of other ores. Most of it is refined in Trail, and some is exported in concentrated ores of copper, lead, and zinc to American and Japanese smelters. Silver bullion was produced by the Torbrit mine from 1949 to 1959.

Some silver is associated with galena, while other is recovered from gold and copper ores, and although the silver in such ores is usually no more than a fraction of an ounce per ton, even that amount is important in a large tonnage operation.

Production of silver began in 1887 from silver-copper and silver-lead ores in the Kootenays and has continued in this area to the present. Now, most of the silver is a by-product of lead-zinc ores and nearly all is refined at Trail, although some is exported with concentrates to American and Japanese smelters. Today the greatest single source of silver is the Sullivan mine, which has been in production since 1900. By 1979 the Sullivan mine has accounted for 46 per cent of the total silver production of the province. A significant total amount is contributed by the Lynx, Lornex, Island Copper, Afton, Silmonac, and Granisle mines. Table 3-12 details the current silver production. The only steady producer that is strictly a silver mine is the Highland Bell mine at Beaverdell, in operation since 1922. A former important mine, the Premier near Stewart, produced more than 1.3 million kilograms of silver between 1918 and 1968. *See* Tables 3-1, 3-3, 3-6, and 3-7B.

Sodium carbonate—Sodium carbonate was recovered between 1921 and 1949 from alkali lakes in the Clinton area and around Kamloops. There has been no further production. *See* Tables 3-1 and 3-7D.

Stone (see Building-stone)—Cut stone for building purposes is prepared from rock produced at quarries in various parts of the province when required. Two of the most productive quarries have operated on Haddington and Nelson Islands. *See* Tables 3-1, 3-3, and 3-7E.

Structural materials—In Table 3-7E the value of $5 972 171 for unclassified materials is the total for structural materials in the period 1886–1919 that cannot be allotted to particular classes of structural materials or assigned to mining divisions, and includes $726 323 shown against 1896 in Table 3-2 that includes unclassified structural materials in that and previous years not assignable to particular years. The figure $3 180 828 in Table 3-7E under "Other Clay Products" is the value in the period 1886–1910 that cannot be allotted to particular clay products or assigned to mining divisions. *See* Tables 3-1, 3-2, 3-3, 3-7A, and 3-7E.

Sulphur—The production of sulphur has been recorded since 1916. From 1916 to 1927 the amounts include the sulphur content of pyrite shipped. From 1928 the amounts include the estimated sulphur content of pyrite shipped, plus the sulphur contained in sulphuric acid made from waste smelter gases. The sulphur content of pyrrhotite roasted at the Kimberley fertilizer plant is included since 1953. Elemental sulphur has been recovered from the Westcoast Transmission Co. Ltd. plant at Taylor since 1958 and the Fort Nelson plant of Petrosul International Ltd. since 1978. *See* Tables 3-1, 3-3, and 3-7D.

Talc—Beween 1916 and 1936, talc was quarried at Leech River and at Anderson Lake to make dust for asphalt roofing. There has been no production since 1936. *See* Tables 3-1 and 3-7D.

Thorium—See Niobium.

Tin—Tin, as cassiterite, is a by-product of the Sullivan mine, where it has been produced since 1941. Tin is also produced in a lead-tin alloy at the Trail smelter. *See* Tables 3-1, 3-3, and 3-7C.

Tungsten—Tungsten, very largely as scheelite concentrates, was produced from 1937 to 1958, first from the Columbia Tungstens (Hardscrabble) mine in the Cariboo in 1937 and during World War II from the Red Rose mine near Hazelton and the Emerald mine near Salmo. The Red Rose closed in 1954 and the Emerald in 1958. Small amounts of scheelite have been produced from the Bridge River, Revelstoke, and other areas where demand was high. In 1970, production began from the Invincible mine near Salmo, which closed in 1973.

A very small amount of wolframite came from Boulder Creek near Atlin. *See* Tables 3-1, 3-3, and 3-7C.

Uranium—*See* Niobium.

Volcanic ash—The only recorded production of volcanic ash is 27 tonnes from the Cariboo Mining Division in 1954. *See* Table 3-7D.

Zinc—Zinc was first produced in 1905. For many years lead was the most valuable single metal, but in 1950 the annual value of production of zinc surpassed that of lead and in 1966 the total value of copper production exceeded that of zinc. In 1977 the production of zinc was exceeded by that of copper, molybdenum, asbestos, coal, crude oil, and natural gas. Zinc is invariably associated with lead, and most ores are mined for their combined values in zinc, lead, and silver, and rarely for their zinc content alone. Some zinc ores contain a valuable amount of gold, and zinc is associated with copper at Lynx mine. Modern practice is to concentrate and separate the zinc mineral (sphalerite) from the lead mineral (galena). Most of the zinc concentrates go to the zinc-recovery plant at Trail, are roasted, and are converted electronically to refined metal. Usually some concentrates are shipped to American or Japanese smelters.

About 85 per cent of the zinc that has been mined in British Columbia has originated in southeastern British Columbia, at the Sullivan mine, and at mines near Ainsworth, Invermere, Moyie Lake, Riondel, Salmo, Slocan, and Spillimacheen. Other production has come from mines at Portland Canal and Tulsequah and is coming from Buttle Lake and Callaghan Creek. The greatest zinc mine is the Sullivan, which contributed about 73 per cent of the total zinc production of the province. *See* Table 3-12 for details of current zinc producers.

Records for the period 1905 to 1908 show shipments totalling 17 096 tonnes of zinc ore and zinc concentrates of unstated zinc content. In 1918, revisions were made to some yearly totals for zinc to adjust them for recovery of zinc from slag treated at the Trail smelter. *See* Tables 3-1, 3-3, 3-6, and 3-7B.

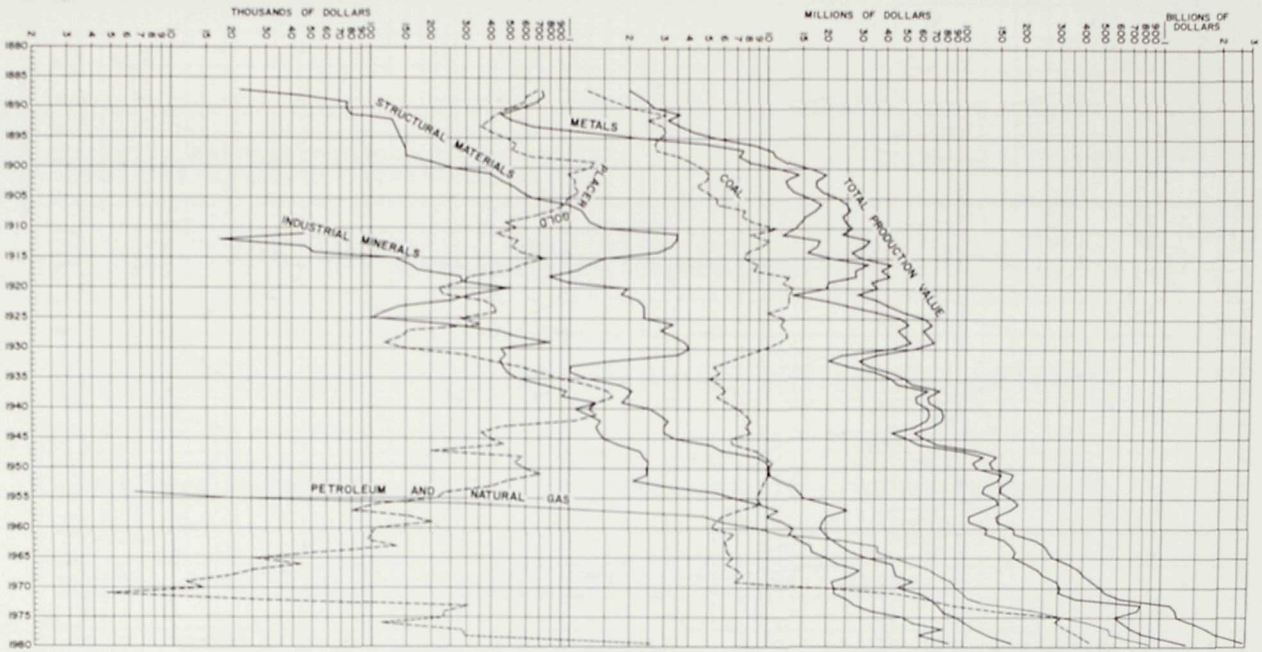

Figure 3-1—Value of mineral production, 1887–1979.

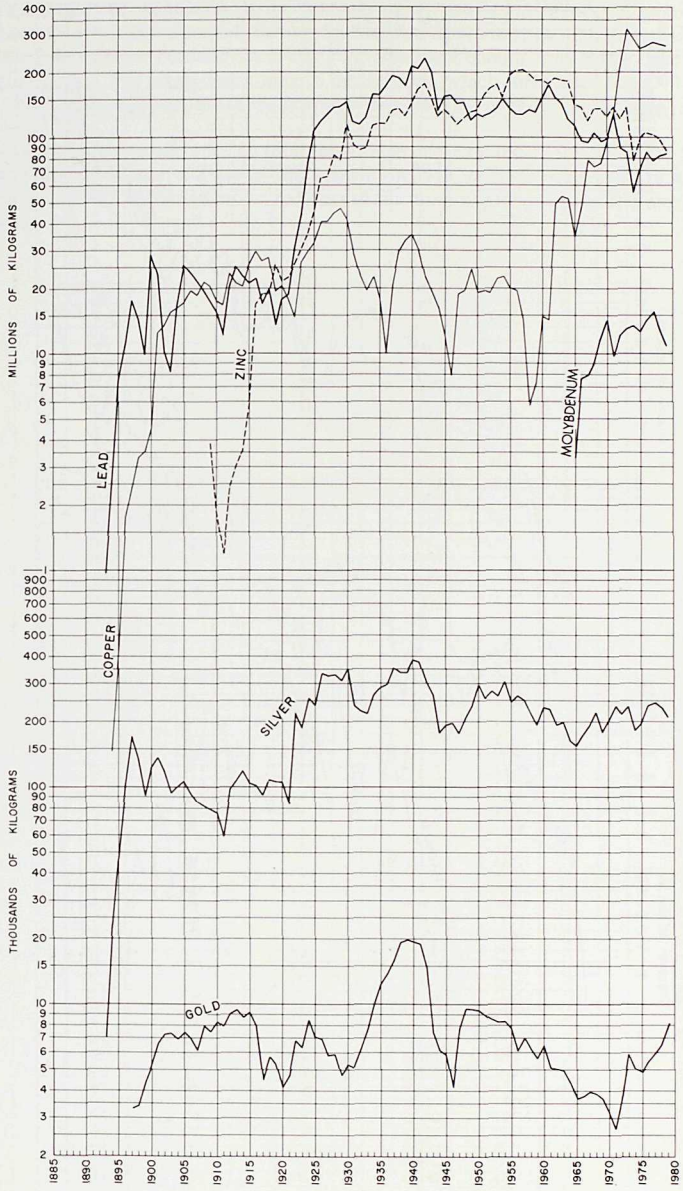

Figure 3-2—Production quantities of gold, silver, copper, lead, zinc, and molybdenum, 1893–1979.

Prices[1] Used in Valuing Production of Gold, Silver, Copper, Lead, Zinc, and Coal

Year	Gold, Fine	Silver, Fine	Copper	Lead	Zinc	Coal
	$/g	$/g	$/kg	$/kg	$/kg	$/t
1901	0.66457	0.01801 N.Y.	0.355 N.Y.	0.057 N.Y.	.....	2.92
1902	..	.01593 ..	.258 ..	.081 ..	.....	2.90
1903	..	.01633 ..	.292 ..	.084 ..	.....	2.94
1904	..	.01716 ..	.283 ..	.086 ..	.....	2.89
1905	..	.01650 ..	.344 ..	.094 ..	.....	2.98
1906	..	.02040 ..	.425 ..	.106 ..	.....	2.88
1907	..	.01995 ..	.441 ..	.106 ..	.....	3.38
1908	..	.01615 ..	.291 ..	.083 ..	.....	3.43
1909	..	.01573 ..	.286 ..	.085 ..	.....	3.52
1910	..	.01634 ..	.281 ..	.088 ..	0.101 E. St. L.	3.69
1911	..	.01628 ..	.273 ..	.088 ..	.108 ..	3.51
1912	..	.01858 ..	.360 ..	.089 ..	.130 ..	3.70
1913	..	.01826 ..	.337 ..	.087 ..	.106 ..	3.74
1914	..	.01675 ..	.300 ..	.077 ..	.097 ..	3.69
1915	..	.01518 ..	.381 ..	.092 ..	.248 ..	3.78
1916	..	.02006 ..	.600 ..	.136 ..	.240 ..	3.80
1917	..	.02487 ..	.599 ..	.174 ..	.167 ..	3.84
1918	..	.02956 ..	.543 ..	.147 ..	.153 ..	5.50
1919	..	.03394 ..	.412 ..	.114 ..	.138 ..	5.42
1920	..	.03080 ..	.385 ..	.158 ..	.144 ..	5.20
1921	..	.01914 ..	.276 ..	.090 ..	.087 ..	5.30
1922	..	.02062 ..	.295 ..	.114 ..	.107 ..	5.20
1923	..	.01981 ..	.318 ..	.144 ..	.124 ..	5.30
1924	..	.02040 ..	.287 ..	.161 ..	.119 ..	5.39
1925	..	.02221 ..	.310 ..	.173 Lond.	.174 Lond.	5.28
1926	..	.01997 ..	.304 ..	.149 ..	.163 ..	5.34
1927	..	.01812 ..	.285 ..	.116 ..	.137 ..	5.30
1928	..	.01870 ..	.321 ..	.101 ..	.121 ..	5.19
1929	..	.01704 ..	.399 ..	.111 ..	.119 ..	5.22
1930	..	.01227 ..	.286 ..	.087 ..	.079 ..	5.21
1931	..	.00923 ..	.179 ..	.060 ..	.056 ..	4.80
1932	.75459	.01018 ..	.141 Lond.	.047 ..	.053 ..	4.45
1933	.91953	.01216 ..	.164 ..	.053 ..	.071 ..	4.30
1934	1.10922	.01526 ..	.164 ..	.054 ..	.067 ..	4.41
1935	1.13140	.02083 ..	.172 ..	.069 ..	.068 ..	4.35
1936	1.12626	.01451 ..	.209 ..	.086 ..	.073 ..	4.66
1937	1.12497	.01443 ..	.288 ..	.113 ..	.108 ..	4.68
1938	1.13108	.01398 ..	.220 ..	.074 ..	.068 ..	4.42
1939	1.16195	.01302 ..	.223 ..	.070 ..	.068 ..	4.43
1940	1.23782	.01230 ..	.222 ..	.074 ..	.075 ..	4.70
1941	1.23782	.01230 ..	.222 ..	.074 ..	.075 ..	4.57
1942	1.23782	.01324 ..	.222 ..	.074 ..	.075 ..	4.55
1943	1.23782	.01455 ..	.259 ..	.083 ..	.088 ..	4.60
1944	1.23782	.01383 ..	.265 ..	.099 ..	.095 ..	4.68
1945	1.23782	.01511 ..	.277 ..	.110 ..	.142 ..	4.67
1946	1.18156	.02689 ..	.282 ..	.149 ..	.172 ..	5.16
1947	1.12529	.02315 ..	.450 ..	.301 ..	.248 ..	5.64
1948	1.12529	.02411 Mont.	.493 U.S.	.398 ..	.307 ..	6.71
1949	1.15744	.02387 U.S.	.440 ..	.348 U.S.	.292 U.S.	7.18
1950	1.22335	.02593 ..	.517 ..	.319 ..	.332 ..	7.09
1951	1.18477	.03040 ..	.611 ..	.406 ..	.439 ..	7.12
1952	1.10182	.02674 ..	.685 ..	.355 ..	.350 ..	7.65
1953	1.10665	.02693 ..	.669 ..	.292 ..	.235 ..	7.58
1954	1.09539	.02668 ..	.642 ..	.302 ..	.230 ..	7.72
1955	1.10986	.02825 ..	.844 ..	.329 ..	.267 ..	7.43
1956	1.10729	.02873 ..	.877 ..	.347 ..	.293 ..	7.26
1957	1.07867	.02799 ..	.574 ..	.310 ..	.246 ..	7.45
1958	1.09250	.02779 ..	.516 ..	.259 ..	.221 ..	8.21
1959	1.07932	.02812 ..	.611 ..	.257 ..	.242 ..	8.74
1960	1.09153	.02850 ..	.639 ..	.256 ..	.277 ..	7.32
1961	1.14008	.03012 ..	.620 ..	.243 ..	.258 ..	8.16
1962	1.20278	.03730 ..	.672 ..	.227 ..	.274 ..	8.19
1963	1.21371	.04436 ..	.676 ..	.265 ..	.290 ..	8.08
1964	1.21371	.04484 ..	.737 ..	.323 ..	.323 ..	7.65
1965	1.21307	.04481 ..	.846 ..	.380 ..	.345 ..	7.75
1966	1.21242	.04479 ..	1.176 ..	.359 ..	.344 ..	8.02
1967	1.21403	.05373 ..	1.125 ..	.333 ..	.329 ..	8.54
1968	1.21242	.07429 ..	1.195 ..	.321 ..	.312 ..	8.72
1969	1.21178	.06196 ..	1.470 ..	.354 ..	.347 ..	8.82

[1] *See* page 84 for detailed explanation.

Prices[1] Used in Valuing Production of Gold, Silver, Copper, Lead, Zinc, and Coal—Continued

Year	Gold, Fine	Silver, Fine	Copper	Lead	Zinc	Coal
	$/g	$/g	$/kg	$/kg	$/kg	$/t
1970	1.17545	.05946 ,,	1.294[2]	.360 ,,	.353 ,,	8.16
1971	1.13622	.05014 ,,	1.030[2]	.308 ,,	.359 ,,	11.06
1972	1.84934	.05348 ,,	.989[2]	.328 ,,	.388 ,,	12.08
1973	3.13185	.08251 ,,	1.835[2]	.359 ,,	.455 ,,	12.71
1974	5.34868[2]	.15653[2]	1.884[2]	.422[2]	.767[2]	19.93
1975	5.20466[2]	.15560[2]	1.283[2]	.346[2]	.808[2]	35.53
1976	4.03514[2]	.13571[2]	1.438[2]	.384[2]	.615[2]	39.63
1977	5.29972[2]	.15707[2]	1.398[2]	.541[2]	.591[2]	39.04
1978	7.32948[2]	.19832[2]	1.577[2]	.637[2]	.544[2]	40.35
1979	*12.58090*[2]	*.44228*[2]	*2.412*[2]	*1.043*[2]	*.700*[2]	*41.56*

[1] *See* page 84 for detailed explanation.
[2] *See* page 85 for explanation.

Table 3-1—Mineral Production: Total to Date, Past Year, and Latest Year

Products[1]	Total Quantity to Date[2]	Total Value to Date	Quantity, 1978	Value, 1978	Quantity, 1979	Value, 1979
Metals		$		$		$
Antimony ... kg	27 316 760	28 240 398	459 521	2 083 895	177 046	916 081
Bismuth ... kg	3 295 060	16 173 352	28 172	166 452	33 809	173 667
Cadmium ... kg	20 721 681	88 407 731	253 803	1 186 320	239 096	1 417 506
Chromite ... t	722	32 295				
Cobalt ... kg	114 484	376 661				
Copper ... kg	4 219 611 424	4 760 467 201	273 692 676	431 694 395	272 163 001	656 359 923
Gold—						
placer ... g	163 394 809	101 114 796	36 515	295 001	214 106	2 649 918
lode, fine ... g	577 535 557	786 288 095	6 542 332	47 951 880	8 062 810	101 481 156
Iron concentrates ... t	33 771 759	356 214 931	615 569	11 597 462	668 026	13 008 475
Lead ... kg	7 920 384 794	1 704 663 313	81 064 539	51 640 564	84 451 905	88 100 363
Magnesium ... kg	92 819	88 184				
Manganese ... t	1 564	32 668				
Mercury ... kg	6 094 387	49 218 263				
Molybdenum ... kg	170 945 559	1 193 570 798	13 055 203	167 714 272	10 766 497	321 228 104
Nickel ... kg	23 337 783	51 698 754				
Palladium ... g	23 296	30 462				
Platinum ... g	44 042	138 801			280	3 793
Selenium ... kg	332	1 389				
Silver ... g	17 084 804 047	665 440 861	227 271 890	45 071 509	214 117 518	94 700 656
Tin ... kg	9 659 586	29 162 551	261 863	3 675 508	240 984	3 818 948
Tungsten (WO_3) ... kg	9 090 002	48 068 016				
Zinc ... kg	7 510 616 387	1 930 263 511	95 618 111	52 048 701	88 418 642	61 890 891
Others ...		28 597 156		4 652 559		5 027 280
Totals ...		11 838 290 187		819 778 518		1 350 776 761
Industrial Minerals						
Arsenious oxide ... kg	9 987 789	273 201				
Asbestos ... t	1 603 400	527 496 967	68 266	47 066 170	94 286	65 520 069
Bentonite ... t	718	16 858				
Fluxes ... t	3 945 668	8 535 473	22 475	56 894	27 741	129 035
Granules ... t	627 634	15 417 983	26 849	1 186 160	30 074	1 458 987
Gypsum and gypsite ... t	8 242 501	35 779 991	733 080	3 110 695	722 933	5 155 924
Hydromagnesite ... t	2 044	27 536				
Iron oxide and ochre ... t	16 427	155 050				
Jade ... kg	2 138 758	6 811 112	488 759	1 422 018	258 505	1 325 777
Magnesium sulphate ... t	12 604	254 352				
Mica ... kg	5 815 954	185 818				
Natro-alunite ... t	474	9 398				
Perlite ... t	1 009	11 120				
Phosphate rock ... t	3 485	16 894				
Sodium carbonate ... t	9 518	118 983				
Sulphur ... t	9 075 987	136 414 290	322 181	5 647 993	383 724	9 616 390
Talc ... t	984	34 871				
Others ...		12 005 018		981 431		1 268 098
Totals ...		743 564 915		59 471 361		84 474 280
Structural Materials						
Cement ... t	20 162 624	522 770 070	1 020 065	56 140 564	1 336 080	80 052 461
Clay products ...		137 668 194		6 282 560		11 744 194
Lime and limestone ... t		99 131 313	2 445 053	6 929 484	2 880 138	8 037 476
Rubble, riprap, crushed rock ... t		103 905 348	2 841 920	8 410 065	2 488 389	6 766 665
Sand and gravel ... t		661 764 275	38 315 952	64 227 295	46 241 983	71 918 633
Building-stone ... t	1 060 371	9 370 750	405	18 030	2 194	19 700
Not assigned ...		5 972 171				
Totals ...		1 570 582 121		142 007 998		178 539 129
Coal						
Coal—sold and used ... t	200 833 429	2 756 503 138	9 463 920	381 895 241	10 570 370	439 280 152
Petroleum and Natural Gas						
Crude oil ... m^3	50 476 718	1 309 478 737	2 004 699	145 005 524	2 139 963	168 928 671
Field condensate ... m^3	251 231	9 929 615	25 386	1 836 217	32 549	2 569 418
Plant condensate ... m^3	3 288 311	54 574 374	155 503	10 269 861	184 398	13 396 500
Natural gas to pipeline ... 10^3 m^3	137 070 713	2 449 125 841	8 003 029	401 373 236	11 392 641	699 508 127
Butane ... m^3	1 658 342	27 830 302	106 580	5 932 766	112 683	7 122 711
Propane ... m^3	1 308 232	21 202 620	85 732	4 513 447	84 864	4 851 698
Totals ...		3 872 141 489		568 931 051		896 377 125
Grand totals ...		20 781 081 850		1 972 084 169		2 949 447 447

[1] *See* notes on individual products listed alphabetically on pages 87 to 96.
[2] *See* page 12 for conversion table to old system.

Table 3-2—Total Value of Mineral Production, 1836-1979

Year	Metals	Industrial Minerals	Structural Materials	Coal	Petroleum and Natural Gas	Total
	$	$	$	$	$	$
1836-86	52 880 750	.....	43 650	10 758 565	.....	63 610 965
1887	729 381	.....	22 168	1 240 080	.....	1 991 629
1888	745 794	.....	46 432	1 467 903	.....	2 260 129
1889	685 512	.....	77 517	1 739 490	.....	2 502 519
1890	572 884	.....	75 201	2 034 420	.....	2 682 505
1891	447 136	.....	79 475	3 087 291	.....	3 613 902
1892	511 075	.....	129 234	2 479 005	.....	3 119 314
1893	659 969	.....	.....	2 934 882	.....	3 594 851
1894	1 191 728	.....	.....	3 038 859	.....	4 230 587
1895	2 834 629	.....	.....	2 824 687	.....	5 659 316
1896	4 973 769	.....	726 323	2 693 961	.....	8 394 053
1897	7 575 262	.....	150 000	2 734 522	.....	10 459 784
1898	7 176 870	.....	150 000	3 582 595	.....	10 909 465
1899	8 107 509	.....	200 000	4 126 830	.....	12 434 312
1900	11 360 546	.....	250 000	4 744 530	.....	16 355 076
1901	14 258 455	.....	400 000	5 016 398	.....	19 674 853
1902	12 163 561	.....	450 000	4 832 257	.....	17 445 818
1903	12 640 083	.....	525 000	4 332 297	.....	17 497 380
1904	13 424 755	2 400	575 000	4 953 024	.....	18 955 179
1905	16 289 165	.....	660 800	5 511 861	.....	22 461 826
1906	18 449 602	.....	982 900	5 548 044	.....	24 980 546
1907	17 101 305	.....	1 149 400	7 637 713	.....	25 888 418
1908	15 227 991	.....	1 200 000	7 356 866	.....	23 784 857
1909	14 668 141	.....	1 270 559	8 574 884	.....	24 513 584
1910	13 768 731	.....	1 500 000	11 108 335	.....	26 377 066
1911	11 880 062	46 345	3 500 917	8 071 747	.....	23 499 071
1912	18 218 266	17 500	3 436 222	10 786 812	.....	32 458 800
1913	17 701 432	46 446	3 249 605	9 197 460	.....	30 194 943
1914	15 790 727	51 810	2 794 107	7 745 847	.....	26 382 491
1915	20 765 212	133 114	1 509 235	7 114 178	.....	29 521 739
1916	32 092 648	150 718	1 247 912	8 900 675	.....	42 391 953
1917	27 299 934	174 107	1 097 900	8 484 343	.....	37 056 284
1918	27 957 302	281 131	783 280	12 833 994	.....	41 855 707
1919	20 058 217	289 426	980 790	11 975 671	.....	33 304 104
1920	19 687 532	508 601	1 962 824	13 450 169	.....	35 609 126
1921	13 160 417	330 503	1 808 392	12 836 013	.....	28 135 325
1922	19 605 401	251 922	2 469 967	12 880 060	.....	35 207 350
1923	25 769 215	140 409	2 742 388	12 678 548	.....	41 330 560
1924	35 959 566	116 932	2 764 013	9 911 935	.....	48 752 446
1925	46 480 742	101 319	2 766 838	12 168 905	.....	61 517 804
1926	51 867 792	223 748	3 335 885	11 650 180	.....	67 077 605
1927	45 134 289	437 729	2 879 160	12 269 135	.....	60 720 313
1928	48 640 158	544 192	3 409 142	12 633 510	.....	65 227 002
1929	52 805 345	807 502	3 820 732	11 256 260	.....	68 689 839
1930	41 785 380	457 225	4 085 105	9 435 650	.....	55 763 360
1931	23 530 469	480 319	3 538 519	7 684 155	.....	35 233 462
1932	20 129 869	447 495	1 705 708	6 523 644	.....	28 806 716
1933	25 777 723	460 683	1 025 586	5 375 171	.....	32 639 163
1934	35 177 224	486 554	1 018 719	5 725 133	.....	42 407 630
1935	42 006 618	543 583	1 238 718	5 048 864	.....	48 837 783
1936	45 889 944	724 362	1 796 677	5 722 502	.....	54 133 485
1937	65 224 245	976 171	2 098 339	6 139 920	.....	74 438 675
1938	55 959 713	916 841	1 974 976	5 565 069	.....	64 416 599
1939	56 216 049	1 381 720	1 832 464	6 280 956	.....	65 711 189
1940	64 332 166	1 073 023	2 534 840	7 088 265	.....	75 028 294
1941	65 807 630	1 253 561	2 845 262	7 660 000	.....	77 566 453
1942	63 626 140	1 434 382	3 173 635	8 237 172	.....	76 471 329
1943	55 005 394	1 378 337	3 025 255	7 742 030	.....	67 151 016
1944	42 095 013	1 419 248	3 010 088	8 217 966	.....	54 742 315
1945	50 673 592	1 497 720	3 401 229	6 454 360	.....	62 026 901
1946	58 834 747	1 783 010	5 199 563	6 732 470	.....	72 549 790
1947	95 729 867	2 275 972	5 896 803	8 680 440	.....	112 583 082
1948	124 091 753	2 358 877	8 968 222	9 765 395	.....	145 184 247
1949	110 219 917	2 500 799	9 955 790	10 549 924	.....	133 226 430
1950	117 166 836	2 462 340	10 246 939	10 119 303	.....	139 995 418

Table 3-2—Total Value of Mineral Production, 1836–1979—Continued

Year	Metals	Industrial Minerals	Structural Materials	Coal	Petroleum and Natural Gas	Total
	$	$	$	$	$	$
1951	153 598 411	2 493 840	10 606 048	10 169 617	.....	176 867 916
1952	147 857 523	2 181 464	11 596 961	9 729 739	.....	171 365 687
1953	126 755 705	3 002 673	13 555 038	9 528 279	.....	152 841 695
1954	123 834 286	5 504 114	14 395 174	9 154 544	6 545	152 894 663
1955	142 609 505	6 939 490	15 299 254	8 986 501	18 610	173 853 360
1956	149 441 246	9 172 792	20 883 631	9 346 518	319 465	189 163 652
1957	125 353 920	11 474 050	25 626 939	7,340 339	1 197 581	170 992 829
1958	104 251 112	9 958 768	19 999 576	5 937 860	4 806 233	144 953 549
1959	105 076 530	12 110 286	19 025 209	5 472 064	5 967 128	147 651 217
1960	130 304 373	13 762 102	18 829 989	5 242 223	9 226 646	177 365 333
1961	128 565 774	12 948 308	19 878 921	6 802 134	11 612 184	179 807 321
1962	159 627 293	14 304 214	21 366 265	6 133 986	27 939 726	229 371 484
1963	172 852 866	16 510 898	23 882 190	6 237 997	36 379 636	255 863 587
1964	180 926 329	16 989 469	26 428 939	6 327 678	36 466 753	267 139 168
1965	177 101 733	20 409 649	32 325 714	6 713 590	44 101 662	280 652 348
1966	208 664 003	22 865 324	43 780 272	6 196 219	54 274 187	335 780 005
1967	235 865 318	29 364 065	44 011 488	7 045 341	67 096 286	383 382 498
1968	250 912 026	26 056 782	45 189 476	7 588 989	75 281 215	405 028 488
1969	294 881 114	20 492 943	55 441 528	6 817 155	86 756 009	464 388 749
1970	309 981 470	22 020 359	46 104 071	19 559 669	90 974 467	488 640 036
1971	301 059 951	21 909 767	59 940 333	45 801 936	99 251 158	527 963 145
1972	372 032 770	25 764 120	66 745 698	66 030 210	105 644 978	636 217 776
1973	795 617 596	27 969 664	73 720 831	87 976 105	124 104 445	1 109 388 641
1974	764 599 451	33 676 214	78 088 393	154 593 643	233 275 505	1 264 233 206
1975	586 650 344	48 667 602	90 928 011	317 111 744	320 719 474	1 364 077 175
1976	646 750 403	52 917 142	100 938 648	298 683 679	420 973 564	1 520 263 436
1977	714 036 707	79 185 099	115 650 992	328 846 883	550 439 856	1 788 159 537
1978	819 778 518	59 471 361	142 007 998	381 895 241	568 931 051	1 972 084 169
1979	1 350 776 761	84 474 280	178 539 129	439 280 152	896 377 125	2 949 447 447
Totals	11 838 290 187	743 564 915	1 570 582 121	2 756 503 138	3 872 141 489	20 781 081 850

Table 3-3—Mineral Production for the 10 Years, 1970–1979

Description	1970		1971		1972		1973		1974	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Metals		$		$		$		$		$
Antimony ... kg	329 521	1 104 040	146 748	243 614	308 260	419 042	753 110	1 192 118	221 238	879 897
Bismuth ... kg	59 935	828 486	37 431	388 674	42 556	324 617	1 293	13 058	33 711	680 771
Cadmium ... kg	426 062	3 343 944	470 243	2 011 223	315 540	1 759 995	367 761	2 951 236	195 979	1 532 096
Cobalt ... kg	...	...	51 503	103 099	70 642	155 739	18 555	117 403	...	...
Copper ... kg	96 329 694	124 657 958	127 286 040	131 037 918	211 832 288	209 403 822	317 603 055	582 803 251	287 547 048	541 644 913
Gold—placer ... g	15 272	14 185	5 505	4 647	21 492	26 905	119 156	311 524	45 162	232 512
lode, fine ... g	3 135 462	3 685 476	2 668 046	3 031 844	3 782 871	6 995 448	5 784 723	18 117 268	5 001 082	26 749 083
Iron concentrates ... t	1 704 650	17 391 883	1 750 738	18 153 612	1 139 698	11 642 379	1 420 160	12 906 063	1 306 930	12 742 227
Lead ... kg	97 448 607	35 096 021	112 865 575	34 711 408	88 109 663	28 896 566	84 890 924	30 477 936	55 252 692	23 333 016
Molybdenum ... kg	14 186 706	52 561 796	9 926 694	36 954 846	12 719 391	43 260 349	13 785 264	51 851 509	13 789 825	60 791 552
Nickel ... kg	1 545 927	4 703 320	1 153 742	3 497 420	1 469 851	4 601 486	1 119 221	3 775 232	688 656	2 351 406
Silver ... g	202 521 462	12 041 181	238 670 301	11 968 046	215 420 498	11 519 660	236 987 318	19 552 997	181 695 950	28 440 365
Tin ... kg	119 619	421 946	144 695	421 079	159 230	473 908	138 221	597 265	143 816	1 150 722
Tungsten (WO_3) ... kg	...	...	605 909	3 012 540	577 509	2 167 663	640 378	4 224 062	...	...
Zinc ... kg	125 005 208	44 111 055	138 549 629	49 745 789	121 719 968	47 172 894	137 380 768	62 564 751	77 733 732	59 582 753
Others ...	...	10 020 179	...	5 774 192	...	3 212 297	...	4 161 923	...	4 488 138
Subtotals ...	...	309 981 470	...	301 059 951	...	372 032 770	...	795 617 596	...	764 599 451
Industrial Minerals										
Asbestos ... t	78 680	16 033 827	79 032	17 800 406	95 986	20 870 241	98 852	21 102 892	83 403	27 398 900
Diatomite ... t	1 158	26 567	1 406	37 830	1 338	52 073	513	9 526	1 593	32 600
Fluxes (quartz, limestone) ... t	28 690	106 533	24 258	98 426	28 667	59 246	41 937	106 371	34 451	206 049
Granules (quartz, limestone, granite) ... t	20 275	526 491	26 524	519 192	33 709	757 924	31 135	857 643	31 546	1 025 615
Gypsum and gypsite ... t	245 180	736 635	312 791	930 348	352 272	1 087 196	331 347	1 114 009	400 338	1 412 157
Jade ... kg	119 114	250 256	76 094	196 332	110 551	235 218	69 967	306 808	3 510	18 613
Sulphur ... t	305 194	3 957 542	261 691	2,147 778	270 074	2 306 933	286 701	4 187 387	206 646	3 068 507
Others ...	...	382 508	...	179 455	...	395 289	...	285 028	...	513 773
Subtotals ...	...	22 020 359	...	21 909 767	...	25 764 120	...	27 969 664	...	33 676 214
Structural Materials										
Cement ... t	546 025	13 485 549	822 329	21 629 385	808 230	21 014 112	862 521	24 935 624	890 372	25 828 823
Clay products ...	...	4 714 368	...	5 981 785	...	5 263 749	...	5 590 290	...	6 615 128
Lime and limestone ... t	1 694 237	3 204 076	1 650 658	3 037 222	1 838 227	3 357 927	1 954 008	3 633 870	2 097 909	4 297 547
Rubble, riprap, and crushed rock ... t	2 442 384	3 018 242	3 327 758	3 670 583	3 013 438	4 032 548	2 579 122	4 160 009	2 691 473	5 715 219
Sand and gravel ... t	21 006 650	21 679 387	26 598 612	25 612 396	31 593 921	33 076 196	30 811 402	35 379 590	31 440 908	35 611 346
Building-stone ... t	159	2 449	2 057	8 962	176	1 166	729	21 448	452	20 330
Subtotals ...	...	46 104 071	...	59 940 333	...	66 745 698	...	73 720 831	...	78 088 393
Coal										
Sold and used ... t	2 398 635	19 559 669	4 141 496	45 801 936	5 466 846	66 030 210	6 924 733	87 976 105	7 757 440	154 593 643
Total solid minerals	...	397 665 569	...	428 711 987	...	530 572 798	...	985 284 196	...	1 030 957 701
Petroleum and Natural Gas										
Crude oil ... m^3	4 032 130	60 405 941	3 999 185	66 471 856	3 788 849	63 166 717	3 368 902	68 306 032	3 012 501	103 335 328
Field condensate ... m^3	17 052	277 829	17 331	287 781	16 619	277 069	20 114	407 807	16 561	568 075
Plant condensate ... m^3	159 489	253 009	177 137	293 287	161 854	327 820	180 088	222 463	178 534	924 549
Natural gas delivered to pipeline ... 10^3m^3	7 678 940	29 804 411	7 685 055	31 946 372	9 939 498	41 616 824	10 789 269	54 762 105	9 016 996	128 018 726
Butane ... m^3	49 074	98 772	50 590	101 822	54 200	106 533	109 057	212 640	105 426	232 085
Propane ... m^3	66 828	134 505	74 547	150 040	76 323	150 015	99 188	193 398	89 373	196 742
Total petroleum and natural gas	...	90 974 467	...	99 251 158	...	105 644 978	...	124 104 445	...	233 275 505
Total [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	636 217 776	[illegible]	1 109 388 641	[illegible]	1 264 233 206

Table 3-3—Mineral Production for the 10 Years, 1970–1979—Continued

Description	1975		1976		1977		1978		1979	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Metals		$		$		$		$		$
Antimony ... kg	364 045	1 467 928	447 001	1 636 871	596 207	2 519 739	459 521	2 083 895	177 046	916 081
Bismuth ... kg	19 163	261 931	20 261	226 462	18 540	187 612	28 172	166 452	33 809	173 667
Cadmium ... kg	320 923	1 971 035	356 422	1 530 800	320 711	1 720 051	253 803	1 186 320	239 096	1 417 506
Cobalt ... kg										
Copper ... kg	258 497 599	331 693 850	263 618 197	378 984 941	275 224 115	384 736 661	273 692 676	431 694 395	272 163 001	656 359 923
Gold—placer ... g	43 744	232 204	26 064	115 613	46 170	289 075	36 515	295 001	214 106	2 649 918
lode, fine ... g	4 819 241	25 082 494	5 393 477	21 761 502	5 906 336	31 301 931	6 542 332	47 951 880	8 062 810	101 481 156
Iron concentrates ... t	1 305 840	15 273 878	1 255 277	14 760 526	445 317	7 362 345	615 569	11 597 462	668 026	13 008 475
Lead ... kg	70 603 483	24 450 158	85 407 582	32 796 533	78 172 646	42 316 293	81 064 539	51 640 564	84 451 905	88 100 363
Molybdenum ... kg	13 026 627	71 201 391	14 088 686	94 109 138	15 521 970	142 057 947	13 055 203	167 714 272	10 766 497	321 228 104
Platinum ... g									280	3 793
Silver ... g	196 305 885	30 545 947	239 720 882	32 532 836	241 503 007	37 934 098	227 271 890	45 071 509	214 117 518	94 700 656
Tin ... kg	32 511	200 669	102 262	712 912	187 478	1 912 300	261 863	3 675 508	240 984	3 818 948
Tungsten (WO_3) ... kg										
Zinc ... kg	99 668 230	80 572 872	106 498 987	65 499 108	103 780 228	61 301 001	95 618 111	52 048 701	88 418 642	61 890 891
Others		3 695 987		2 083 161		397 654		4 652 559		5 027 280
Subtotals		586 650 344		646 750 403		714 036 707		819 778 518		1 350 776 761
Industrial Minerals										
Asbestos ... t	76 771	37 849 743	90 443	40 727 296	97 033	69 729 205	68 266	47 066 170	94 286	65 520 069
Diatomite ... t	5 847	229 483	2 737	182 159	1 239	49 595	2 184	59 346	1 452	33 025
Fluxes (quartz, limestone) ... t	35 914	174 824	11 378	33 263	28 624	95 461	22 475	56 894	27 741	129 035
Granules (quartz, limestone, granite) ... t	33 316	1 144 968	31 476	1 219 884	29 551	1 238 485	26 849	1 186 160	30 074	1 458 987
Gypsum and gypsite ... t	474 387	1 751 799	556 134	4 434 471	653 126	2 357 488	733 080	3 110 695	722 933	5 155 924
Jade ... kg	110 437	414 123	483 796	1 535 030	266 621	825 523	488 759	1 422 018	258 505	1 325 777
Sulphur ... t	246 079	5 738 134	231 704	4 296 189	248 892	3 871 660	322 181	5 647 993	383 724	9 616 390
Others		1 364 528		488 850		1 017 682		922 085		1 235 073
Subtotals		48 667 602		52 917 142		79 185 099		59 471 361		84 474 280
Structural Materials										
Cement ... t	915 293	31 681 722	846 548	34 973 746	909 522	42 705 320	1 020 065	56 140 564	1 336 080	80 052 461
Clay products		6 593 189		6 995 917		4 909 799		6 282 560		11 744 194
Lime and limestone ... t	1 976 415	4 349 800	2 173 831	5 610 063	2 231 166	5 861 614	2 512 867	6 929 484	2 880 138	8 037 476
Rubble, riprap, and crushed rock ... t	4 103 452	8 723 448	2 485 215	5 205 973	2 464 503	7 309 536	2 841 920	8 410 065	2 488 389	6 766 665
Sand and gravel ... t	28 945 523	39 575 457	36 073 618	48 138 635	53 994 528	54 809 121	38 315 952	64 227 295	46 241 983	71 918 633
Building-stone ... t	53	4 395	657	14 314	4 535	55 602	405	18 030	2 194	19 700
Subtotals		90 928 011		100 938 648		115 650 992		142 007 998		178 539 129
Coal										
Sold and used ... t	8 924 816	317 111 744	7 537 695	298 683 679	8 424 181	328 846 883	9 463 920	381 895 241	10 570 370	439 280 152
Total solid minerals		1 043 357 701		1 099 289 872		1 237 719 681		1 403 153 118		2 053 119 931
Petroleum and Natural Gas										
Crude oil ... m^3	2 269 898	94 229 725	2 367 450	116 595 050	2 200 303	132 859 085	2 004 699	145 005 524	2 139 963	168 928 671
Field condensate ... m^3	16 094	668 092	18 309	901 711	24 465	1 477 248	25 386	1 836 217	32 549	2 569 418
Plant condensate ... m^3	185 272	6 525 837	167 576	7 198 957	180 267	9 751 058	155 503	10 269 861	184 398	13 396 500
Natural gas delivered to pipeline ... 10^3m^3	9 236 489	214 733 528	8 799 508	287 997 059	8 895 663	396 601 354	8 003 029	401 373 236	11 392 641	699 508 127
Butane ... m^3	106 427	2 577 205	109 781	4 591 832	111 357	5 358 167	106 580	5 932 766	112 683	7 122 711
Propane ... m^3	81 975	1 985 087	88 195	3 688 955	91 297	4 392 944	85 732	4 513 447	84 864	4 851 698
Total petroleum and natural gas		320 719 474		420 973 564		550 439 856		568 931 051		896 377 125
Grand totals		1 364 077 175		1 520 263 436		1 788 159 537		1 972 084 169		2 949 447 447

Table 3-4—Comparison of Total Quantity and Value of Production, and Quantity and Value of Production Paid for to Mines

Metals	Units	1979 Total Production		1979 Production Paid for to Mines	
		Quantity	Value	Quantity	Value
			$		$
Antimony	kg	177 046	916 081	.....	.....
Bismuth	kg	33 809	173 667	.....	.....
Cadmium	kg	239 096	1 417 506	26 630	90 991
Copper	kg	272 163 001	656 359 923	271 833 805	541 956 306
Gold—placer	g	214 016	2 649 918	214 106	2 649 918
Gold—lode, fine	g	8 062 810	101 481 156	8 062 810	88 669 459
Iron concentrates	t	668 026	13 008 475	668 026	13 008 475
Lead	kg	84 451 905	88 100 363	84 451 905	80 834 765
Molybdenum	kg	10 766 497	321 228 104	10 766 479	319 549 815
Platinum	g	280	3 793	280	3 793
Silver	kg	214 117 518	94 700 656	212 646 941	81 651 137
Tin	kg	240 984	3 818 948	198 955	3 144 877
Zinc	kg	88 418 642	61 890 891	74 760 690	37 580 298
Others		.....	5 027 280	.....	3 844 956
TOTALS		.....	1 350 776 761	.....	1 172 984 790

NOTE—For metals, the total quantity and value of production include the quantities paid for to the mines, and the smelter and refining production that can be attributed to the mines but is not paid for. The quantity and value paid for to the mines, excluding outward transportation costs, smelting and refining costs, penalties and deductions, are shown separately for comparative purposes.

Table 3-5—Exploration and Development Expenditures, 1974–1979

	Physical Work and Surveys	Administration, Overhead, Land Costs, Etc.	Construction, Machinery and Equipment, Other Capital Costs	Totals
A. Exploration on Undeclared Mines	$	$	$	$
Metal mines—				
1974	18 773 326	6 525 878	128 144	25 427 348
1975	16 366 152	5 298 367	442 327	22 106 846
1976	20 437 180	6 365 331	381 416	27 183 927
1977	19 097 099	6 974 231	106 059	26 177 389
1978	22 724 774	5 715 214	1 035 353	29 475 341
1979	42 789 552	10 438 163	583 114	53 810 829
Coal mines—				
1974	3 450 746	884 849	18 958	4 354 553
1975	9 955 507	3 057 843	.....	13 013 350
1976	9 234 269	3 678 893	.....	12 913 162
1977	14 741 425	4 797 788	.....	19 539 213
1978	15 289 351	4 511 572	.....	19 800 923
1979	11 765 168	6 073 861	.....	17 839 029
Others—				
1974	42 706	11 134	.....	53 840
1975	90 025	35 679	.....	125 704
1976	73 453	47 760	.....	121 213
1977	327 113	9 860	222 092	559 065
1978	342 100	117 180	.....	459 280
1979	135 062	149 131	.....	284 193
Totals—				
1974	22 266 778	7 421 861	147 102	29 835 741
1975	26 411 684	8 391 889	442 327	35 245 900
1976	29 744 902	10 091 984	381 416	40 218 302
1977	34 165 637	11 781 879	328 151	46 275 667
1978	38 356 225	10 343 966	1 035 353	49 735 544
1979	54 689 782	16 661 155	583 114	71 934 051
B. Exploration on Declared or Operating Mines				
Metal mines—				
1974	2 652 243	762 224	278 500	3 692 967
1975	2 792 378	3 090 135	.....	5 882 513
1976	8 359 413	83 304	.....	8 442 717
1977	2 988 366	2 020 259	.....	5 008 625
1978	6 562 912	1 729 402	.....	8 292 314
1979	6 946 143	1 585 176	263 586	8 794 905

Table 3-5—Exploration and Development Expenditures, 1974–1979—Continued

	Physical Work and Surveys	Administration, Overhead, Land Costs, Etc.	Construction, Machinery and Equipment, Other Capital Costs	Totals
B. Exploration on Declared or Operating Mines —Continued	$	$	$	$
Coal mines—				
1974	488 308	104 259	.....	592 567
1975	1 000 000	.....	.....	1 000 000
1976	665 000	28 000	.....	693 000
1977	5 978 043	25 115 000	.....	31 093 043
1978	4 052 774	510 612	.....	4 563 386
1979	3 376 551	398 984	.....	3 775 535
Others—				
1974	4 236	.....	.....	4 236
1975	36 242	2 700	.....	38 942
1976	214 081	30 000	.....	244 081
1977	106 896	403 300	.....	510 196
1978	12 025	.....	36 604	48 629
1979	35 200	.....	1 300	36 500
Totals—				
1974	3 144 787	866 483	278 500	4 289 770
1975	3 828 620	3 092 835	.....	6 921 455
1976	9 238 494	141 304	.....	9 379 798
1977	9 073 305	27 538 559	.....	36 611 864
1978	10 627 711	2 240 014	36 604	12 904 329
1979	10 357 894	1 984 160	264 886	12 606 940
C. Development on Declared Mines				
Metals mines—				
1974	1 280 513	1 028 199	1 985 000	4 293 712
1975	.....	57 166	840 344	897 510
1976	512 197	974 985	12 447 569	13 934 751
1977	380 419	1 132 316	33 672 153	35 184 888
1978	133 335	895 892	.....	1 029 227
1979	3 482 962	1 351 567	54 559 204	59 393 733
Coal mines—				
1974	320 098	256 055	111 500	687 653
1975	.....	.....	.....	.....
1976	1 425 312	583 304	.....	2 008 616
1977	1 725 484	247 313	.....	1 972 797
1978	30 957	38 910	.....	69 867
1979	981 517	350 157	.....	1 331 674
Others—				
1974	23 242	37 988	2 883 584	2 944 814
1975	.....	.....	.....	.....
1976	.....	3 155	18 001 500	18 004 655
1977	64 689	708	40 000	105 397
1978	7 045	2 159	10 000	19 204
1979	.....	.....	.....	.....
Totals—				
1974	1 623 853	1 322 242	4 980 084	7 926 179
1975	.....	57 166	840 344	897 510
1976	1 937 509	1 561 444	30 449 069	33 948 022
1977	2 170 592	1 380 337	33 712 153	37 263 082
1978	171 337	936 961	10 000	1 118 298
1979	4 464 479	1 701 724	54 559 204	60 725 407
D. Development on Operating Mines				
Metals mines—				
1974	20 933 501	1 722 680	46 732 326	69 388 507
1975	9 013 375	5 804 924	24 548 602	39 366 901
1976	6 937 229	404 226	41 881 126	49 222 581
1977	14 491 378	1 722 479	45 859 006	62 072 863
1978	10 424 872	575 164	17 908 816	28 908 852
1979	27 395 046	2 672 011	67 831 381	97 898 438
Coal mines—				
1974	9 027 818	.....	16 607 506	25 635 324
1975	3 300 000	.....	59 000 000	62 300 000
1976	16 043 383	55 377	20 767 397	36 866 157
1977	30 466 894	.....	25 943 377	56 410 271
1978	31 222 528	.....	15 621 757	46 844 285
1979	46 473 678	628 021	40 698 097	87 799 796
Others—				
1974	6 198 552	146 182	16 606 229	22 950 963
1975	17 350 175	124 860	18 077 384	35 552 419
1976	58 980	79 300	1 389 956	1 528 236
1977	432 731	108 500	931 521	1 472 752
1978	102 248	9 579	1 220 265	1 332 092
1979	187 044	30 700	1 033 645	1 251 389
Totals—				
1974	36 159 871	1 868 862	79 946 061	117 974 794
1975	29 663 550	5 929 784	101 625 986	137 219 320
1976	23 039 592	538 903	64 038 479	87 616 974
1977	45 391 003	1 830 979	72 733 904	119 955 886
1978	41 749 648	584 743	34 750 838	78 085 229
1979	74 055 768	3 330 732	109 563 123	186 949 623

Table 3-6—Production of Gold, Silver, Copper, Lead, Zinc, Molybdenum, and Iron Concentrates, 1858–1979

Year	Gold (Placer)		Gold (Fine)		Silver		Copper	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	g	$	g	$	g	$	kg	$
1858–90	100 978 533	55 192 163	.....	.....	6 876 531	214 152	.....	.....
1891–1900	11 703 748	6 397 183	19 682 165	12 858 353	700 977 829	13 561 194	16 064 375	4 365 210
1901–1910	15 787 261	8 628 660	72 224 836	47 998 179	971 114 910	16 973 507	172 344 737	56 384 783
1911	779 441	426 000	7 110 675	4 725 512	58 958 198	958 293	16 750 016	4 571 644
1912	1 016 446	555 500	8 008 898	5 322 442	97 417 955	1 810 045	23 340 171	8 408 513
1913	933 090	510 000	8 467 916	5 627 595	107 798 519	1 968 606	21 073 930	7 094 489
1914	1 033 864	565 000	7 687 729	5 109 008	112 038 605	1 876 736	20 415 949	6 121 319
1915	1 408 655	770 000	7 776 403	5 167 934	104 708 436	1 588 991	25 817 619	9 835 500
1916	1 062 167	580 500	6 902 751	4 587 333	102 699 711	2 059 739	29 655 426	17 784 494
1917	907 585	496 000	3 562 009	2 367 191	91 107 405	2 265 749	26 765 241	16 038 256
1918	585 358	320 000	5 121 855	3 403 811	108 803 644	3 215 870	27 888 416	15 143 449
1919	524 086	286 500	4 740 906	3 150 644	105 847 210	3 592 673	19 259 132	7 939 896
1920	405 583	221 600	3 733 853	2 481 392	105 061 237	3 235 980	20 360 601	7 832 899
1921	426 733	233 200	4 222 699	2 804 197	83 150 418	1 591 201	17 706 790	4 879 624
1922	674 624	368 800	6 153 915	4 089 684	220 872 076	4 554 781	14 678 125	4 329 754
1923	768 555	420 000	5 575 057	3 704 994	187 643 964	3 718 129	26 181 346	8 323 266
1924	769 799	420 750	7 704 711	5 120 535	259 454 010	5 292 184	29 413 222	8 442 870
1925	512 453	280 092	6 522 890	4 335 069	238 088 613	5 286 818	32 797 475	10 153 269
1926	650 426	355 503	6 264 984	4 163 859	334 312 337	6 675 606	40 523 625	12 324 421
1927	285 868	156 247	5 536 365	3 679 601	325 654 164	5 902 043	40 461 530	11 525 011
1928	262 012	143 208	5 619 130	3 734 609	330 536 775	6 182 461	44 410 233	14 265 242
1929	217 192	118 711	4 516 871	3 002 020	309 791 230	5 278 194	46 626 180	18 612 850
1930	278 527	152 235	5 002 482	3 324 975	352 342 964	4 322 185	41 894 588	11 990 466
1931	534 225	291 992	4 545 175	3 020 837	234 837 945	2 254 979	29 090 879	5 365 690
1932	634 501	395 542	5 649 891	4 263 389	222 406 822	2 264 729	22 955 299	3 228 892
1933	744 233	562 787	6 954 289	6 394 645	218 397 615	2 656 526	19 572 164	3 216 701
1934	783 205	714 431	9 244 309	10 253 952	267 920 527	4 088 280	22 521 530	3 683 662
1935	961 985	895 058	11 363 263	12 856 419	288 323 068	6 005 996	17 884 241	3 073 428
1936	1 349 528	1 249 940	12 583 590	14 172 367	296 944 198	4 308 330	9 830 071	2 053 828
1937	1 684 321	1 558 245	14 331 671	16 122 767	351 630 830	5 073 962	20 891 260	6 023 411
1938	1 796 478	1 671 015	17 340 607	19 613 624	337 827 661	4 722 288	29 832 572	6 558 575
1939	1 547 250	1 478 492	18 267 912	21 226 957	336 577 786	4 381 365	33 227 590	7 392 862
1940	1 215 101	1 236 928	18 149 347	22 461 516	383 436 042	4 715 315	35 371 049	7 865 085
1941	1 361 534	1 385 962	17 760 622	21 984 501	378 700 797	4 658 545	30 134 516	6 700 693
1942	1 023 413	1 041 772	13 825 843	17 113 943	301 011 133	4 080 775	22 723 823	5 052 856
1943	454 104	462 270	6 979 607	8 639 516	265 193 820	3 858 496	19 190 263	4 971 132
1944	355 601	361 977	5 804 815	7 185 332	177 453 003	2 453 293	16 465 584	4 356 070
1945	391 556	398 591	5 454 626	6 751 860	191 510 720	2 893 934	11 726 375	3 244 472
1946	489 219	475 361	3 658 086	4 322 241	197 994 264	5 324 959	7 938 069	2 240 070
1947	216 757	200 585	7 566 800	8 514 870	177 550 262	4 110 092	18 952 769	8 519 741
1948	632 386	585 200	8 902 612	10 018 050	209 016 328	5 040 101	19 515 886	9 616 174
1949	556 308	529 524	8 969 981	10 382 256	237 559 178	5 671 082	24 882 500	10 956 550
1950	595 125	598 717	8 832 723	10 805 553	295 772 610	7 667 950	19 147 001	9 889 458
1951	736 861	717 911	8 126 405	9 627 947	255 632 882	7 770 983	19 617 612	11 980 155
1952	545 982	494 756	7 955 805	8 765 889	274 042 530	7 326 803	19 053 280	13 054 893
1953	443 062	403 230	7 886 228	8 727 294	260 606 407	7 019 272	22 235 441	14 869 544
1954	270 098	238 967	8 036 642	8 803 279	305 630 613	8 154 145	22 747 578	14 599 693
1955	238 436	217 614	7 541 762	8 370 306	245 811 643	6 942 995	20 065 928	16 932 549
1956	120 213	109 450	5 963 782	6 603 628	261 423 017	7 511 866	19 667 923	17 251 872
1957	91 318	80 990	6 948 504	7 495 170	252 847 111	7 077 166	14 237 029	8 170 465
1958	175 732	157 871	6 044 992	6 604 149	218 998 027	6 086 854	5 741 837	2 964 529
1959	235 450	208 973	5 385 360	5 812 511	192 779 535	5 421 417	7 363 374	4 497 991
1960	119 653	107 418	6 394 155	6 979 441	231 612 937	6 600 183	14 997 694	9 583 724
1961	106 248	99 884	4 970 913	5 667 253	229 353 429	6 909 140	14 375 361	8 965 149
1962	103 106	96 697	4 940 712	5 942 101	192 521 474	7 181 907	49 431 850	33 209 215
1963	143 696	135 411	4 820 312	5 850 458	199 764 616	8 861 050	53 635 704	36 238 007
1964	57 292	55 191	4 307 361	5 227 884	163 901 675	7 348 938	52 414 456	38 609 136
1965	26 935	25 053	3 642 908	4 419 089	154 646 729	6 929 793	38 644 540	32 696 081
1966	47 743	44 632	3 717 057	4 506 646	172 594 622	7 729 939	47 990 080	56 438 255
1967	27 713	25 632	3 923 861	4 763 688	192 239 525	10 328 695	78 352 932	88 135 172
1968	20 839	19 571	3 853 537	4 672 242	221 791 325	16 475 795	73 024 968	87 284 148
1969	12 410	11 720	3 654 012	4 427 506	179 169 889	11 100 491	75 937 956	111 592 416
1970	15 272	14 185	3 135 462	3 685 476	202 521 462	12 041 181	96 329 694	124 657 958
1971	5 505	4 647	2 668 046	3 031 844	238 670 301	11 968 046	127 286 040	131 037 918
1972	21 492	26 905	3 782 871	6 995 448	215 420 498	11 519 660	211 832 288	209 403 822
1973	119 156	311 524	5 784 723	18 117 268	236 987 318	19 552 997	317 603 055	582 803 251
1974	45 162	232 512	5 001 082	26 749 083	181 695 950	28 440 365	287 547 048	541 644 913
1975	43 744	232 204	4 819 241	25 082 494	196 305 885	30 545 947	258 497 599	331 693 850
1976	26 064	115 613	5 393 477	21 761 502	239 720 882	32 532 836	263 618 197	378 984 941
1977	46 170	289 075	5 906 336	31 301 931	241 503 007	37 934 098	275 224 115	384 736 661
1978	36 515	295 001	6 542 332	47 951 880	227 271 890	45 071 509	273 692 676	431 694 395
1979	214 106	2 649 918	8 062 810	101 481 156	214 117 518	94 700 656	272 163 001	656 359 923
Totals	163 394 809	101 114 796	577 535 557	786 288 095	17 084 804 047	665 440 861	4 219 611 424	4 760 467 201

Table 3-6—Production of Gold, Silver, Copper, Lead, Zinc, Molybdenum, and Iron Concentrates, 1858–1979—Continued

Year	Lead		Zinc		Molybdenum		Iron Concentrates	
	Quantity	Value	Quantity	Value	Quality	Value	Quantity	Value
	kg	$	kg	$	kg	$	t	$
1858-90	473 729	45 527	.....	.....	.....	.....	27 097	70 879
1891-1900	93 002 804	7 581 619	.....	.....	.....	.....	11 820	45 602
1901-1910	184 989 089	17 033 102	5 753 423	894 169	.....	.....	17 738	68 436
1911	12 189 051	1 069 521	1 195 003	129 092	.....	.....	.....	.....
1912	20 353 243	1 805 627	2 430 462	316 139	.....	.....	.....	.....
1913	25 112 864	2 175 832	3 065 710	324 421	.....	.....	.....	.....
1914	22 963 016	1 771 877	3 568 151	346 125	901	662	.....	.....
1915	21 093 563	1 939 200	5 888 705	1 460 524	1 641	2 000	.....	.....
1916	22 102 314	3 007 462	16 859 478	4 043 985	5 598	20 560	.....	.....
1917	16 922 293	2 951 020	18 982 067	3 166 259	3 371	11 636	.....	.....
1918	19 912 447	2 928 107	18 947 777	2 899 040	435	1 840	907	5 000
1919	13 370 004	1 526 855	25 735 631	3 540 429	.....	.....	1 116	6 150
1920	17 840 247	2 816 115	21 413 198	3 077 979	.....	.....	1 335	7 360
1921	18 779 664	1 693 354	22 416 133	1 952 065	.....	.....	916	5 050
1922	30 593 731	3 480 306	25 921 103	2 777 322	.....	.....	1 089	3 600
1923	43 845 439	6 321 770	26 464 465	3 278 903	.....	.....	220	1 337
1924	77 284 697	12 415 917	35 893 017	4 266 741	.....	.....	.....	.....
1925	107 908 698	18 670 329	44 568 438	7 754 450	.....	.....	.....	.....
1926	119 305 027	17 757 535	64 807 554	10 586 610	.....	.....	.....	.....
1927	128 364 347	14 874 292	65 872 809	8 996 135	.....	.....	.....	.....
1928	138 408 812	13 961 412	82 445 946	9 984 613	.....	.....	18	.....
1929	139 705 336	15 555 189	78 061 406	9 268 792	.....	.....	.....	.....
1930	145 966 952	12 638 198	113 614 910	9 017 005	.....	.....	.....	.....
1931	118 796 232	7 097 812	91 657 703	5 160 911	.....	.....	.....	.....
1932	114 308 115	5 326 432	87 143 752	4 621 641	.....	.....	.....	.....
1933	123 235 512	6 497 719	88 887 198	6 291 416	.....	.....	.....	.....
1934	157 562 183	8 461 859	113 013 038	7 584 199	.....	.....	.....	.....
1935	156 156 723	10 785 930	116 227 650	7 940 860	.....	.....	.....	.....
1936	171 444 146	14 790 028	115 475 574	8 439 373	.....	.....	.....	.....
1937	190 107 902	21 417 049	132 081 905	14 274 245	.....	.....	.....	.....
1938	187 323 227	13 810 024	135 395 388	9 172 822	.....	.....	.....	.....
1939	171 794 338	12 002 390	126 283 585	8 544 375	.....	.....	.....	.....
1940	211 758 089	15 695 467	141 529 456	10 643 026	.....	.....	.....	.....
1941	207 218 262	15 358 976	166 861 962	12 548 031	.....	.....	.....	.....
1942	230 060 714	17 052 054	175 646 590	13 208 636	.....	.....	.....	.....
1943	199 196 604	16 485 902	152 474 485	13 446 018	.....	.....	.....	.....
1944	132 866 893	13 181 530	126 126 765	11 956 725	.....	.....	.....	.....
1945	152 849 156	16 848 823	133 714 538	18 984 581	.....	.....	.....	.....
1946	156 879 853	23 345 731	124 406 109	21 420 484	.....	.....	.....	.....
1947	142 306 192	42 887 313	114 761 068	28 412 593	.....	.....	.....	.....
1948	145 165 821	57 734 770	122 610 001	37 654 211	.....	.....	616	3 735
1949	120 373 215	41 929 866	130 736 145	38 181 214	.....	.....	4 964	27 579
1950	128 830 683	41 052 905	131 697 238	43 769 392	.....	.....	.....	.....
1951	124 037 181	50 316 015	153 091 761	67 164 754	.....	.....	102 997	790 000
1952	129 250 197	45 936 692	169 130 882	59 189 656	.....	.....	816 898	5 474 924
1953	135 004 129	39 481 244	173 407 848	40 810 618	.....	.....	899 240	6 763 105
1954	150 807 088	45 482 505	151 555 559	34 805 755	.....	.....	486 018	3 733 891
1955	137 241 656	45 161 245	194 680 177	52 048 909	.....	.....	554 223	3 228 756
1956	128 691 681	44 702 619	201 327 284	58 934 801	.....	.....	335 616	2 190 847
1957	127 732 462	39 568 086	203 787 462	50 206 681	.....	.....	324 174	2 200 637
1958	133 615 439	34 627 075	195 952 146	43 234 839	.....	.....	571 769	4 193 442
1959	130 372 360	33 542 306	182 498 693	44 169 198	.....	.....	770 421	6 363 848
1960	151 321 570	38 661 912	182 977 897	50 656 726	2 456	9 500	1 052 651	10 292 847
1961	174 307 617	42 313 569	175 970 780	45 370 891	.....	.....	1 211 147	12 082 540
1962	152 080 806	34 537 454	187 528 084	51 356 376	.....	.....	1 627 342	18 326 911
1963	142 869 197	37 834 714	182 734 698	53 069 163	.....	.....	1 869 009	20 746 424
1964	121 896 644	39 402 293	181 797 313	58 648 561	12 812	47 063	1 816 684	20 419 487
1965	113 480 794	43 149 171	141 179 547	48 666 933	3 306 274	12 405 344	1 964 410	21 498 581
1966	95 929 798	34 436 934	138 401 395	47 666 540	7 754 088	27 606 061	1 952 074	20 778 934
1967	94 406 546	31 432 079	119 217 472	39 248 539	7 945 782	31 183 064	1 954 468	20 820 765
1968	105 063 971	32 782 257	135 803 151	43 550 181	8 980 988	32 552 722	1 900 311	21 437 569
1969	95 286 815	33 693 539	134 565 199	46 639 024	12 064 350	47 999 442	1 882 266	19 787 845
1970	97 448 607	35 096 021	125 005 208	44 111 055	14 186 706	52 561 796	1 704 650	17 391 883
1971	112 865 575	34 711 408	138 549 629	49 745 789	9 926 694	36 954 846	1 750 738	18 153 612
1972	88 109 663	28 896 566	121 719 968	47 172 894	12 719 391	43 260 349	1 139 698	11 642 379
1973	84 890 924	30 477 936	137 380 768	62 564 751	13 785 264	51 851 509	1 420 160	12 906 063
1974	55 252 692	23 333 016	77 733 732	59 582 753	13 789 825	60 791 552	1 306 930	12 742 227
1975	70 603 483	24 450 158	99 668 230	80 572 872	13 026 627	71 201 391	1 305 840	15 273 878
1976	85 407 582	32 796 533	106 498 987	65 499 108	14 088 686	94 109 138	1 255 277	14 760 526
1977	78 172 646	42 316 293	103 780 228	61 301 001	15 521 970	142 057 947	445 317	7 362 345
1978	81 064 539	51 640 564	95 618 111	52 048 701	13 055 203	167 714 272	615 569	11 597 462
1979	84 451 905	88 100 363	88 418 642	61 890 891	10 766 497	321 228 104	668 026	13 008 475
Totals	7 920 384 794	1 704 663 313	7 510 616 387	1 930 263 511	170 945 559	1 193 570 798	33 771 759	356 214 931

Table 3-7A—Mineral Production by Mining

Division	Period	Placer Gold		Metals	Industrial Minerals	Structural Materials
		Quantity	Value			
		g	$	$	$	$
Alberni	1978	.....	.....	24 988 615	.....	1 016 069
	1979	.....	.....	**44 641 124**	.....	**917 051**
	To Date	50 294	33 253	327 436 991	9 398	8 764 665
Atlin	1978	3 328	26 880	.....	.....	17 542
	1979	**58 342**	**763 144**	.....	.....	**21 686**
	To Date	23 042 312	18 702 010	38 171 207	20 325	407 189
Cariboo	1978	9 611	78 621	41 934 799	59 346	4 665 794
	1979	**23 004**	**277 976**	**121 356 715**	**33 025**	**10 241 475**
	To Date	81 287 415	54 779 218	613 355 361	1 031 009	61 619 925
Clinton	1978	.....	.....	.....	.....	1 775 423
	1979	**975**	**11 791**	.....	.....	**2 547 997**
	To Date	317 324	254 860	848 377	162 427	10 429 495
Fort Steele	1978	.....	.....	102 876 534	1 531 236	854 961
	1979	.....	.....	**166 856 343**	**2 283 198**	**1 339 489**
	To Date	639 241	472 087	2 954 491 413	29 709 312	15 711 868
Golden	1978	.....	.....	36 541	3 110 695	99 744
	1979	.....	.....	**17 538**	**5 157 040**	**483 155**
	To Date	14 587	11 268	66 302 170	33 644 234	5 264 778
Greenwood	1978	.....	.....	3 621 966	23 339	249 802
	1979	**1 346**	**16 274**	**4 930 911**	**87 800**	**532 207**
	To Date	159 163	131 936	250 212 139	2 439 936	4 297 909
Kamloops	1978	.....	.....	179 822 859	.....	13 310 737
	1979	**13 812**	**166 963**	**358 878 012**	.....	**17 917 942**
	To Date	872 099	771 748	1 405 468 769	6 540 538	103 971 408
Liard	1978	591	4 750	.....	50 028 356	4 541 797
	1979	**14 891**	**180 016**	**8 422 918**	**70 432 192**	**5 083 171**
	To Date	1 580 194	1 438 169	27 579 416	556 921 025	30 488 907
Lillooet	1978	.....	.....	106 590	.....	310 803
	1979	**418**	**5 057**	.....	.....	**439 890**
	To Date	2 893 766	1 942 910	148 273 846	473 095	4 846 200
Nanaimo	1978	.....	.....	102 917 596	56 734	10 258 269
	1979	**3 800**	**45 939**	**172 355 903**	**119 594**	**11 039 696**
	To Date	30 735	65 239	973 229 844	2 958 418	122 880 542
Nelson	1978	.....	.....	4 195 459	1 139 304	1 694 028
	1979	.....	.....	**127 479**	**1 350 105**	**2 096 353**
	To Date	111 535	89 026	409 314 614	9 417 026	16 029 684
New Westminster	1978	31	250	.....	.....	22 012 397
	1979	.....	.....	**17 168**	.....	**29 860 052**
	To Date	975 418	597 152	63 768 973	1 611 625	322 865 028
Nicola	1978	.....	.....	41 065 672	.....	163 101
	1979	.....	.....	**39 779 612**	.....	**307 874**
	To Date	7 278	4 764	459 250 006	10 050	3 410 654
Omineca	1978	342	2 750	139 006 311	48 689	1 027 152
	1979	**1 918**	**23 189**	**197 711 930**	**1 755**	**2 924 269**
	To Date	1 757 925	1 532 339	1 151 599 018	1 562 575	21 914 125
Osoyoos	1978	.....	.....	74 146 136	22 100	501 870
	1979	**264**	**3 186**	**100 373 878**	**19 327**	**542 425**
	To Date	7 729	8 652	565 407 503	6 801 441	7 895 442
Revelstoke	1978	.....	.....	.....	.....	269 539
	1979	**491**	**10 061**	**3 000**	.....	**508 491**
	To Date	236 314	174 538	15 503 414	.....	5 132 082
Similkameen	1978	.....	.....	40 878 260	.....	347 514
	1979	**2 065**	**24 734**	**72 480 723**	.....	**212 744**
	To Date	1 417 469	902 938	412 547 209	18 558	6 229 423
Skeena	1978	.....	.....	37 248 519	.....	1 725 272
	1979	**280**	**3 382**	**24 779 427**	.....	**3 885 397**
	To Date	143 447	108 951	704 586 677	1 240 215	32 811 851
Slocan	1978	.....	.....	2 604 889	.....	93 820
	1979	.....	.....	**6 653 541**	.....	**210 381**
	To Date	11 384	9 397	293 566 345	.....	3 500 523
Trail Creek	1978	.....	.....	82 734	.....	1 735 319
	1979	.....	.....	**73 928**	.....	**693 766**
	To Date	26 469	24 260	91 061 303	.....	6 647 179
Vancouver	1978	.....	.....	8 815 561	.....	28 366 072
	1979	**365**	**4 417**	**13 401 366**	.....	**48 611 369**
	To Date	6 026	9 723	332 123 856	7 066 964	288 249 620
Vernon	1978	.....	.....	9 360	.....	1 788 720
	1979	**23 286**	**281 495**	.....	**8 325**	**2 538 694**
	To Date	108 344	354 844	371 414	233 666	21 813 376
Victoria	1978	.....	.....	2 943	160	32 120 435
	1979	.....	.....	.....	.....	**31 677 157**
	To Date	19 533	15 680	24 812 286	190 811	386 461 141
Not Assigned	1978	22 612	181 750	15 122 173	3 451 402	13 061 818
	1979	**68 849**	**832 294**	**15 265 327**	**4 981 919**	**3 906 398**
	To Date	47 678 808	18 679 834	407 893 240	81 502 267	78 939 107
Totals	1978	36 515	295 001	819 483 517	59 471 361	142 007 998
	1979	**214 106**	**2 649 918**	**1 348 126 843**	**84 474 280**	**178 539 129**
	To Date	163 394 809	101 114 796	11 737 175 391	743 564 915	1 570 582 121

Divisions, 1978 and 1979, and Total to Date

Coal		Petroleum and Natural Gas						Division Total
		Crude Oil and Condensates		Natural Gas Delivered to Pipeline		Butane and Propane		
Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	
t	$	m³	$	10³m³	$	m³	$	$
								26 004 684
								45 558 175
								336 244 307
								44 422
								784 830
								57 300 731
								46 738 560
								131 909 191
263	1 100							730 786 613
								1 775 423
								2 559 788
								11 695 159
9 463 648	381 888 469							487 151 200
10 570 145	**439 273 927**							**609 752 957**
125 957 129	2 419 690 259							5 420 074 939
								32 466 980
								5 657 733
								105 222 450
								3 895 107
								5 567 192
								257 081 920
								193 133 596
								376 962 917
13 687	59 765							1 516 812 228
		2 185 588	157 111 602	8 003 029	401 373 236	192 312	10 446 213	623 505 954
		2 356 910	**184 894 589**	**11 392 641**	**699 508 127**	**197 547**	**11 974 409**	**980 459 422**
131 923	1 515 507	54 016 260	1 373 982 726	137 070 713	2 449 125 841	2 966 574	49 032 922	4 490 084 513
								417 393
								444 947
								155 536 051
								113 232 599
								183 561 132
67 425 673	301 144 744							1 400 278 787
								7 028 791
								3 573 937
								434 850 350
								22 012 647
								29 877 220
								388 842 778
								41 228 773
								40 087 486
2 657 660	11 080 836							473 756 310
272	6 772							140 091 674
225	**6 225**							**200 667 368**
457 192	3 452 078							1 180 060 135
								74 670 106
								100 938 816
1 018	5 008							580 118 046
								269 539
								521 552
								20 810 034
								41 225 774
								72 718 201
4 188 851	19 553 725							439 251 853
								38 973 791
								28 668 206
33	116							738 747 810
								2 698 709
								6 863 922
								297 076 265
								1 818 053
								767 694
								97 732 742
								37 181 633
								62 017 152
								627 450 163
								1 798 080
								2 828 514
								22 773 300
								32 123 538
								31 677 157
								411 479 918
								31 817 143
								24 985 938
								587 014 448
9 463 920	381 895 241	2 185 588	157 111 602	8 003 029	401 373 236	192 312	10 446 213	1 972 084 169
10 570 370	**439 280 152**	**2 356 910**	**184 894 589**	**11 392 641**	**699 508 127**	**197 547**	**11 974 409**	**2 949 447 447**
200 833 429	2 756 503 138	54 016 260	1 373 982 726	137 070 713	2 449 125 841	2 966 574	49 032 922	20 781 081 850

Table 3-7B—Production of Lode Gold, Silver, Copper, Lead, and Zinc by Mining Divisions, 1978 and 1979, and Total to Date

Division	Period	Lode Gold		Silver		Copper		Lead		Zinc		Division Total
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	
		g	$	g	$	kg	$	kg	$	kg	$	$
Alberni	1978	605 420	4 121 668	29 431 680	5 435 156	3 000 193	3 802 301	2 364 683	1 387 099	14 872 224	10 111 375	24 857 599
	1979	**746 359**	**8 556 256**	**32 192 378**	**12 595 419**	**3 301 045**	**7 160 051**	**2 541 656**	**2 769 095**	**15 613 192**	**13 418 635**	**44 499 456**
	To Date	15 920 175	39 225 786	308 266 338	42 922 371	50 155 744	65 687 179	21 531 378	10 887 399	210 636 086	115 296 032	274 018 767
Atlin	1978	...	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...	...
	To Date	10 706 647	12 131 576	105 785 004	2 997 652	11 239 012	8 160 361	10 818 897	3 453 882	41 309 830	10 865 614	37 609 085
Cariboo	1978	...	...	2 867 758	612 970	18 835 185	29 339 407	...	...	...	...	29 952 377
	1979	...	...	**3 036 104**	**1 672 851**	**30 977 166**	**79 490 069**	...	...	...	...	**81 162 920**
	To Date	37 393 613	43 347 296	25 326 131	4 743 785	277 422 663	453 591 475	11 890	3 993	230	20	501 686 569
Clinton	1978	...	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...	...
	To Date	727 499	827 328	982 419	14 237	26 103	5 905	88	7	...	...	847 477
Fort Steele	1978	...	...	102 608 113	19 987 927	...	...	80 961 213	51 795 162	52 286 179	27 509 538	99 292 627
	1979	...	...	**96 025 705**	**38 462 209**	...	...	**83 900 138**	**86 967 777**	**57 227 253**	**37 781 376**	**163 211 362**
	To Date	390 707	749 363	8 137 251 323	285 188 165	7 163 855	12 534 149	6 681 607 007	1 415 965 167	5 073 377 428	1 187 347 116	2 901 783 960
Golden	1978	...	...	66 031	14 242	...	...	12 083	9 057	20 446	13 013	36 312
	1979	**24**	**342**	**19 502**	**12 540**	...	...	**3 582**	**3 950**	**858**	**706**	**17 538**
	To Date	13 989	25 757	143 549 645	4 943 571	532 092	367 849	117 957 087	26 297 805	152 338 678	33 466 756	65 101 738
Greenwood	1978	64 352	430 899	10 888 321	2 172 005	581 146	906 571	93 926	60 529	102 993	50 751	3 620 755
	1979	**3 541**	**46 071**	**9 571 277**	**4 722 171**	**34**	**55**	**82 216**	**87 607**	**103 232**	**73 105**	**4 929 009**
	To Date	43 566 455	40 683 495	1 406 793 743	50 071 406	273 352 581	153 550 433	11 904 406	2 896 119	11 728 410	2 800 165	250 001 618
Kamloops	1978	1 109 879	8 595 976	27 414 961	5 787 702	94 121 838	146 155 242	...	...	...	...	160 538 920
	1979	**1 901 420**	**23 274 745**	**28 503 885**	**12 740 162**	**105 000 817**	**241 118 092**	**13 768**	**15 177**	**3 412**	**1 881**	**277 150 057**
	To Date	5 347 146	35 528 914	205 722 118	34 760 355	781 732 543	1 197 850 247	401 143	122 559	245 652	53 388	1 268 315 463
Liard	1978	...	...	...	...	...	...	...	...	...	...	...
	1979	**557 374**	**8 155 921**	**510 159**	**266 997**	...	...	**3 582**	**3 950**	**858**	**706**	**8 422 918**
	To Date	560 920	8 160 041	543 968	268 413	13 570 392	19 147 861	7 428	2 736	804	286	27 579 337
Lillooet	1978	13 934	106 240	1 742	350	...	...	...	...	...	...	106 590
	1979	...	...	...	...	...	...	...	...	...	...	...
	To Date	130 197 655	147 465 171	30 730 480	719 985	181	41	28 355	2 548	7	2	148 187 747
Nanaimo	1978	1 298 208	9 968 963	9 362 470	2 110 717	48 466 230	81 382 719	...	...	...	...	93 462 399
	1979	**1 628 454**	**20 284 336**	**9 896 099**	**4 624 648**	**48 070 311**	**119 716 070**	...	...	...	...	**144 625 054**
	To Date	19 041 997	75 102 397	129 115 018	15 916 491	433 936 619	674 048 299	...	...	...	...	765 067 187
Nelson	1978	...	...	249 415	39 771	...	...	1 202 688	700 689	6 962 555	3 329 215	4 069 675
	1979	**10 877**	**114 783**	**8 958**	**5 760**	...	...	**4 318**	**4 722**	**4 016**	**2 214**	**127 479**
	To Date	41 743 887	42 179 256	324 087 507	9 127 558	6 765 479	1 689 196	240 832 928	69 415 820	686 786 264	223 720 796	346 132 626
New Westminster	1978	...	...	...	...	...	...	...	...	...	...	...
	1979	**1 067**	**17 168**	...	...	...	...	...	...	...	...	**17 168**
	To Date	140 160	131 544	470 246	7 729	11 333 143	11 553 105	12 893	1 119	5 786	481	11 693 978
Nicola	1978	...	...	...	...	25 173 621	40 126 034	...	...	...	...	40 126 034
	1979	**93**	**1 575**	**3 235**	**2 591**	**15 618 019**	**38 483 495**	**225**	**248**	**158**	**87**	**38 487 996**
	To Date	343 314	397 887	8 601 753	138 223	369 339 119	451 154 026	1 016 946	91 530	147 071	11 064	451 792 730

Omineca	1978	1 113 056	8 413 612	3 937 235	815 374	30 794 069	50 550 297	2 378	1 784	3 891	2 402	59 783 469
	1979	**1 046 543**	**15 260 608**	**5 004 778**	**3 010 618**	**29 460 114**	**73 754 794**	**13 930**	**15 568**	**10 367**	**5 698**	**92 047 286**
	To Date	11 307 706	54 446 395	374 956 114	17 551 241	287 897 049	445 784 959	13 830 554	3 950 202	19 628 343	6 193 423	527 926 220
Osoyoos	1978	122 639	924 324	13 541 437	2 787 539	13 545 457	22 652 512	9 918	6 366	16 165	5 523	26 376 264
	1979	**110 010**	**1 423 681**	**10 265 906**	**6 182 869**	**10 224 828**	**26 840 760**	**6 208**	**7 254**	**13 607**	**7 800**	**34 462 364**
	To Date	53 438 343	58 813 279	206 407 767	25 615 083	140 305 339	209 049 129	302 511	98 967	191 589	73 025	293 649 483
Revelstoke	1978	...	...	...	...	...	...	...	...	...	...	...
	1979	**124**	**2 727**	**342**	**220**	...	...	**30**	**33**	**30**	**20**	**3 000**
	To Date	1 163 656	1 084 708	128 317 385	2 821 585	69 710	51 037	16 406 564	3 876 090	12 314 318	3 317 177	11 150 597
Similkameen	1978	1 012 496	7 040 384	3 083 303	586 077	23 746 609	33 251 799	...	...	...	...	40 878 260
	1979	**1 036 648**	**11 582 483**	**2 849 794**	**1 139 597**	**25 469 090**	**59 755 716**	...	...	...	...	**72 477 796**
	To Date	12 297 459	44 713 377	155 129 677	6 736 607	423 213 267	360 944 717	178 550	15 137	36 494	5 258	412 415 096
Skeena	1978	159 403	1 521 659	9 566 928	2 067 748	15 325 225	23 369 465	14 029	10 511	9 602	5 875	26 975 258
	1979	**91 111**	**1 352 554**	**3 720 505**	**2 748 541**	**3 674 403**	**9 431 654**	**11 291**	**13 491**	**15 313**	**8 579**	**13 554 819**
	To Date	78 161 299	71 411 076	2 287 124 143	61 521 369	512 450 333	394 904 883	27 254 742	5 469 541	7 838 031	2 561 305	535 868 174
Slocan	1978	3 173	23 035	8 344 064	1 654 119	87	100	881 852	560 023	576 913	357 945	2 595 222
	1979	**3 950**	**59 971**	**9 970 438**	**4 926 977**	**40**	**50**	**923 416**	**977 360**	**900 645**	**673 046**	**6 637 404**
	To Date	597 957	867 556	2 478 102 472	67 506 090	6 531	2 183	516 974 332	110 373 414	435 771 840	108 951 765	287 701 008
Trail Creek	1978	1 897	13 616	261 390	50 277	...	...	12 216	7 363	23 342	11 478	82 734
	1979	**4 945**	**71 550**	**3 515**	**2 378**	...	...	...	...	...	...	**73 928**
	To Date	92 882 345	63 585 122	117 184 038	2 531 304	55 592 776	18 245 404	175 629	61 660	198 043	87 750	84 511 240
Vancouver	1978	1 039 182	6 799 359	5 338 052	888 589	40 369	36 704	1 005 908	603 925	1 124 390	486 984	8 815 561
	1979	**923 649**	**11 315 831**	**1 064 361**	**763 627**	**37 938**	**72 269**	**592 288**	**630 531**	**868 607**	**619 108**	**13 401 366**
	To Date	19 319 073	42 922 453	194 360 237	8 139 851	507 031 219	243 026 478	11 495 879	3 937 138	111 545 112	32 891 860	330 917 780
Vernon	1978	156	1 125	37 106	8 235	...	...	...	...	...	...	9 360
	1979	...	...	...	...	...	...	...	...	...	...	...
	To Date	165 250	181 914	2 246 726	148 293	297	100	86 363	29 276	33 511	11 299	370 882
Victoria	1978	31	225	404	81	1 994	2 637	...	...	...	...	2 943
	1979	...	...	...	...	...	...	...	...	...	...	...
	To Date	1 375 157	1 236 720	29 478 396	654 567	29 775 654	22 581 791	95 298	19 848	1 618 731	283 923	24 776 849
Not Assigned	1978	−1 494	−9 205	271 480	52 630	60 653	118 607	−5 496 355	−3 501 944	19 619 411	10 164 602	6 824 690
	1979	**−3 379**	**−39 446**	**1 470 577**	**820 481**	**329 196**	**536 848**	**−3 641 161**	**−3 392 450**	**13 657 952**	**9 298 636**	**7 224 069**
	To Date	733 148	1 069 684	284 271 399	20 394 930	26 699 723	16 536 394	247 453 926	47 691 356	744 864 129	202 325 006	288 017 370
Total	1978	6 542 332	47 951 880	227 271 890	45 071 509	273 692 676	431 694 395	81 064 539	51 640 564	95 618 111	52 048 701	628 407 049
	1979	**8 062 810**	**101 481 156**	**214 117 518**	**94 700 656**	**272 163 001**	**656 359 923**	**84 451 905**	**88 100 363**	**88 418 642**	**61 890 891**	**1 002 532 989**
	To Date	577 535 557	786 288 095	17 084 804 047	665 440 861	4 219 611 424	4 760 467 201	7 920 384 794	1 704 663 313	7 510 616 387	1 930 263 511	9 847 122 981

Table 3-7C—Production of Miscellaneous Metals by Mining Divisions, 1978 and 1979, and Total to Date

Division	Period	Antimony		Bismuth		Cadmium		Chromite		Iron Concentrates		Manganese		Mercury	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
		kg	$	kg	$	kg	$	t	$	t	$	t	$	kg	$
Alberni	1978	...	...	...	...	26 872	131 016	...	...	...	...	...	...	...	...
	1979	...	...	...	...	**22 944**	**141 668**	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	582 945	3 783 513	...	...	4 293 517	49 634 711	...	...	...	...
Atlin	1978	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	144 791	561 762	...	...	...	...	...	...	...	...
Cariboo	1978	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Clinton	1978	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	114	900	...	...	...	...	...	...
Fort Steele	1978	...	...	...	...	...	...	...	...	25 459	384 563	...	...	...	...
	1979	...	...	...	...	...	...	...	...	**33 856**	**492 251**	...	...	...	...
	To Date	...	...	...	...	1 542 022	10 064 486	...	...	1 361 848	15 724 036	...	...	...	...
Golden	1978	...	...	...	...	66	229	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	To Date	18 172	14 906	...	...	259 162	1 185 526	...	...	...	...	...	...	...	...
Greenwood	1978	...	...	...	...	350	1 211	...	...	...	...	...	...	...	...
	1979	...	...	...	...	**404**	**1 902**	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	37 287	179 126	608	31 395	...	...	...	...	...	...
Kamloops	1978	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	99	641	...	...	19 204	95 851	...	...	4 984	5 795
Liard	1978	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lillooet	1978	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	To Date	6 108	4 321	...	...	...	...	...	...	...	...	...	...	4 187	41 304
Nanaimo	1978	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	15 872 977	152 633 401	...	...	...	...
Nelson	1978	...	...	...	...	26 568	125.784	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	4 059 962	19 859 034	...	...	...	...	...	...	...	...
New West-minster	1978	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nicola	1978	...	...	...	...	...	...	...	...	35 696	939 638	...	...	...	...
	1979	...	...	...	...	...	...	...	...	**44 528**	**1 291 616**	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	343 569	7 457 276	...	...	...	...

Omineca	1978														
	1979														
	To Date	53 697	21 882			135 245	628 342							6 085 216	49 171 164
Osoyoos	1978														
	1979														
	To Date											15			
Revelstoke	1978														
	1979														
	To Date	4 261	3 455			46 997	176 102								
Similkameen	1978														
	1979														
	To Date														
Skeena	1978									554 414	10 273 261				
	1979									**589 642**	**11 224 608**				
	To Date					64 360	316 764			11 880 145	130 667 731				
Slocan	1978					2 514	9 667								
	1979					**3 282**	**16 137**								
	To Date	14 453	8 133			1 242 173	5 849 044					491	8 160		
Trail Creek	1978														
	1979														
	To Date					52	210			499	1 925				
Vancouver	1978														
	1979														
	To Date					257 261	1 206 076								
Vernon	1978														
	1979														
	To Date					86	532								
Victoria	1978														
	1979														
	To Date					3 175	10 929					1 058	24 508		
Not Assigned	1978	459 521	2 083 895	28 172	166 452	197 433	918 413								
	1979	**177 046**	**916 081**	**33 809**	**173 667**	**212 466**	**1 257 799**								
	To Date	27 220 069	28 187 701	3 295 060	16 173 352	12 346 064	44 585 644								
Totals	1978	459 521	2 083 895	28 172	166 452	253 803	1 186 320			615 569	11 597 462				
	1979	**177 046**	**916 081**	**33 809**	**173 667**	**239 096**	**1 417 506**			**668 026**	**13 008 475**				
	To Date	27 316 760	28 240 398	3 295 060	16 173 352	20 721 681	88 407 731	722	32 295	33 771 759	356 214 931	1 564	32 668	6 094 387	49 218 263

Table 3-7C—Production of Miscellaneous Metals by Mining Divisions, 1978 and 1979, and Total to Date—Continued

Division	Period	Molybdenum		Nickel		Palladium		Platinum		Tin		Tungsten (WO_3)		Other Value	Division Total
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value		
		kg	$	kg	$	kg	$	g	$	kg	$	kg	$	$	$
Alberni	1978	...	...	...	...	...	...	...	...	...	...	...	...	...	131 016
	1979	...	...	...	...	...	...	...	...	...	...	...	...	...	**141 668**
	To Date	...	...	...	...	...	...	...	...	...	...	...	...	...	53 418 224
Atlin	1978	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	...	...	132	360	...	562 122
Cariboo	1978	883 690	11 982 422	...	...	...	...	...	...	...	...	...	...	...	11 982 422
	1979	**1 023 637**	**40 193 142**	...	...	...	...	**48**	**653**	...	...	...	...	...	**40 193 795**
	To Date	14 547 814	111 644 409	...	...	...	...	1 883	2 952	...	...	12 564	21 431	...	111 668 792
Clinton	1978	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	...	...	...	...	...	900
Fort Steele	1978	...	...	...	...	...	...	...	...	227 957	3 199 344	...	...	...	3 583 907
	1979	...	...	...	...	...	...	...	...	**198 955**	**3 152 730**	...	...	...	**3 644 981**
	To Date	...	...	...	...	...	...	...	...	9 404 531	26 830 747	...	...	88 184[1]	52 707 453
Golden	1978	...	...	...	...	...	...	...	...	...	...	...	...	...	229
	1979	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	...	...	...	...	...	1 200 432
Greenwood	1978	...	...	...	...	...	...	...	...	...	...	...	...	...	1 211
	1979	...	...	...	...	...	...	...	...	...	...	...	...	...	**1 902**
	To Date	...	...	...	...	...	...	...	...	...	...	...	...	...	210 521
Kamloops	1978	1 998 132	19 283 939	...	...	...	...	...	...	...	...	...	...	...	19 283 939
	1979	**2 366 139**	**81 727 955**	...	...	...	...	...	...	...	...	...	...	...	**81 727 955**
	To Date	12 718 317	137 051 019	...	...	...	...	...	...	...	...	...	...	...	137 153 306
Liard	1978	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	62	79	...	...	...	...	...	79
Lillooet	1978	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	To Date	666	2 440	...	...	...	...	93	113	...	...	14 675	37 921	...	86 099
Nanaimo	1978	859 104	9 455 197	...	...	...	...	...	...	...	...	...	...	...	9 455 197
	1979	**1 111 400**	**27 730 849**	...	...	...	...	...	...	...	...	...	...	...	**27 730 849**
	To Date	5 623 290	55 529 256	...	...	...	...	...	...	...	...	...	...	...	208 162 657
Nelson	1978	...	...	...	...	...	...	...	...	...	...	...	...	...	125 784
	1979	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	To Date	6 819	18 378	...	...	...	...	...	...	...	...	8 056 095	43 304 576	...	63 181 988
New West-minster	1978	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	23 337 783	51 698 754	...	...	...	...	...	...	...	...	376 241[2]	52 074 995
Nicola	1978	...	...	...	...	...	...	...	...	...	...	...	...	...	939 638
	1979	...	...	...	...	...	...	...	...	...	...	...	...	...	**1 291 616**
	To Date	...	...	...	...	...	...	...	...	...	...	...	...	...	7 457 276

Omineca	1978	6 030 967	79 222 842												79 222 842
	1979	**3 738 530**	**105 664 644**												**105 664 644**
	To Date	87 863 759	569 153 126					93	154			1 002 839	4 697 710	420[2]	623 672 798
Osoyoos	1978	3 283 310	47 769 872												47 769 872
	1979	**2 526 791**	**65 911 514**												**65 911 514**
	To Date	36 870 276	271 758 020												271 758 020
Revelstoke	1978														
	1979														
	To Date	1 190 713	4 167 573									3 531	5 687		4 352 817
Similkameen	1978														
	1979							**216**	**2 927**						**2 927**
	To Date							40 246	132 113						132 113
Skeena	1978														10 273 261
	1979														**11 224 608**
	To Date	10 470 935	37 732 288									166	331	1 389[3]	168 718 503
Slocan	1978														9 667
	1979														**16 137**
	To Date														5 865 337
Trail Creek	1978														
	1979														
	To Date	1 652 970	6 514 289			23 296	30 462	1 649	3 177						6 550 063
Vancouver	1978														
	1979														
	To Date														1 206 076
Vernon	1978														
	1979														
	To Date														532
Victoria	1978														
	1979														
	To Date														35 437
Not Assigned	1978									33 906	476 164			4 652 559	8 297 483
	1979							**16**	**213**	**42 029**	**666 218**			**5 027 280**	**8 041 258**
	To Date							16	213	255 055	2 331 804			28 597 156	119 875 870
Totals	1978	13 055 203	167 714 272							261 863	3 675 508			4 652 559	191 076 468
	1979	**10 766 497**	**321 228 104**					**280**	**3 793**	**240 984**	**3 818 948**			**5 027 280**	**345 593 854**
	To Date	170 945 559	1 193 570 798	23 337 783	51 698 754	23 296	30 462	44 042	138 801	9 659 586	29 162 551	9 090 002	48 068 016	29 063 390	1 890 052 410

[1] Magnesium, page 92. [2] Cobalt, page 89. [3] Selenium, page 94.

Table 3-7D—Production of Industrial Minerals by

Division	Period	Asbestos		Barite[1]		Diatomite		Fluxes (Quartz and Limestone)		Granules (Quartz, Limestone, and Granite)	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
		t	$	t	$	t	$	t	$	t	$
Alberni	1978	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	...	...
Atlin	1978	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	...	...
Cariboo	1978	...	...	...	...	2 184	59 346	...	...	...	...
	1979	...	...	...	...	**1 452**	**33 025**	...	...	...	...
	To Date	...	...	...	...	26 218	887 529	...	...	44	168
Clinton	1978	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	...	...
Fort Steele	1978	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	7	80	...	...	...	...	...	...
Golden	1978	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	**73**	**1 116**	...	...
	To Date	...	...	398 388	4 489 227	...	...	3 029	13 728	...	...
Greenwood	1978	...	...	...	...	...	...	...	...	711	23 339
	1979	...	...	...	...	...	...	...	...	**2 168**	**87 800**
	To Date	...	...	...	...	...	...	1 624 308	1 540 319	3 101	116 039
Kamloops	1978	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	567	12 230
Liard	1978	68 266	47 066 170	...	...	...	...	...	...	...	...
	1979	**94 286**	**65 520 069**	...	...	...	...	...	...	...	...
	To Date	1 603 400	527 496 967	...	...	...	...	...	...	...	...
Lillooet	1978	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	...	...
Nanaimo	1978	...	...	...	...	...	...	22 451	56 734	...	...
	1979	...	...	...	...	...	...	**27 657**	**119 594**	...	...
	To Date	...	...	...	...	...	...	1 049 891	2 181 269	31 506	777 149
Nelson	1978	...	...	...	...	...	...	...	...	25 327	1 139 304
	1979	...	...	...	...	...	...	...	...	**27 162**	**1 350 105**
	To Date	...	...	...	...	...	...	6 895	8 174	254 987	9 352 951
New Westminster	1978	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	99 490	1 611 625
Nicola	1978	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	...	...
Omineca	1978	...	...	...	...	...	...	...	...	20	1 417
	1979	...	...	...	...	...	...	...	...	**25**	**1 755**
	To Date	...	...	...	...	...	...	...	...	148	11 233
Osoyoos	1978	...	...	...	...	...	...	...	...	791	22 100
	1979	...	...	...	...	...	...	...	...	**719**	**19 327**
	To Date	...	...	...	...	...	...	728 113	3 699 031	194 932	2 769 939
Similkameen	1978	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	...	...
Skeena	1978	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	545 232	1 050 722	...	...
Vancouver	1978	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	26 936	418 606
Vernon	1978	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	**11**	**8 325**	...	...
	To Date	...	...	...	...	...	...	2 914	38 725	7 210	190 963
Victoria	1978	...	...	...	...	...	...	24	160	...	...
	1979	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	286	3 505	8 713	157 080
Not Assigned	1978	...	...	...	...	...	...	...	...	...	...
	1979	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	...	...
Totals	1978	68 266	47 066 170	...	...	2 184	59 346	22 475	56 894	26 849	1 186 160
	1979	**94 286**	**65 520 069**	...	...	**1 452**	**33 025**	**27 741**	**129 035**	**30 074**	**1 458 987**
	To Date	1 603 400	527 496 967	398 395	4 489 307	26 218	887 529	3 960 668	8 535 473	627 634	15 417 983

[1] From 1972, excludes production which is confidential.
Other: *See* notes on individual materials listed alphabetically on pages 87 to 96.

[2] Natro-alunite.
[3] Hydromagnesite.
[4] Volcanic ash.
[5] Magnesium sulphate.
[6] Sodium carbonate.
[7] Phosphate rock.

Mining Divisions, 1978 and 1979, and Total to Date

Gypsum and Gypsite		Jade		Mica		Sulphur		Other, Value	Division Total
Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value		
t	$	kg	$	t	$	t	$	$	$
								9 398[2]	9 398
								20 325[3]	20 325
									59 346
									33 025
				4 542 160	143 012			300[4]	1 031 009
792	6 236							156 191[3 5 6]	162 427
						87 752	1 531 236		1 531 236
						89 467	**2 283 198**		**2 283 198**
102 400	298 824					1 583 295	29 393 514	16 894[7]	29 709 312
733 080	3 110 695								3 110 695
722 933	**5 155 924**								**5 157 040**
7 005 719	29 140 003							1 276[8 9]	33 644 234
									23 339
									87 800
								783 578[10]	2 439 936
1 131 179	6 323 178			192 640	2 075			203 055[5 6]	6 540 538
		451 908	1 374 746			89 480	1 587 440		50 028 356
		258 505	**1 325 777**			**147 437**	**3 586 346**		**70 432 192**
		1 327 428	4 803 264			1 187 207	24 620 794		556 921 025
		253 391	467 966					5 129[9]	473 095
									56 734
									119 594
									2 958 418
									1 139 304
									1 350 105
								55 901[8]	9 417 026
									1 611 625
2 184	10 050								10 050
		36 851	47 272						48 689
									1 755
		557 939	1 539 882					11 460[11 12]	1 562 575
									22 100
									19 327
				720 664	25 938			306 533[5 10 11]	6 801 441
227	1 700							16 858[13]	18 558
				287 689	10 815	37 761	178 678		1 240 215
						623 773	6 550 969	97 389[8]	7 066 964
									8 325
				72 801	3 978				233 666
									160
								30 226[8 9]	190 811
						144 949	2 529 317	922 085	3 451 402
						146 820	**3 746 846**	**1 235 073**	**4 981 919**
						5 643 951	75 670 335	5 831 932	81 502 267
733 080	3 110 695	488 759	1 422 018			322 181	5 647 993	922 085	59 471 361
722 933	**5 155 924**	**258 505**	**1 325 777**			**383 724**	**9 616 390**	**1 235 073**	**84 474 280**
8 242 501	35 779 991	2 138 758	6 811 112	5 815 954	185 818	9 075 987	136 414 290	7 546 445	743 564 915

[8] Iron oxide and ochre.
[9] Talc.
[10] Fluorspar.
[11] Arsenious oxide.
[12] Perlite.
[13] Bentonite.

Table 3-7E—Production of Structural Materials by Mining Divisions, 1978 and 1979, and Total to Date

Division	Period	Cement	Lime and Lime-stone	Building-stone	Rubble, Riprap, and Crushed Rock	Sand and Gravel	Clay Products	Unclassi-fied Materials	Division Total
		$	$	$	$	$	$	$	$
Alberni	1978	...	...	...	...	1 016 069	...	...	1 016 069
	1979	...	...	...	...	**917 051**	...	...	**917 051**
	To Date	...	...	...	346 659	8 418 006	...	...	8 764 665
Atlin	1978	...	...	...	...	17 542	...	...	17 542
	1979	...	...	...	...	**21 686**	...	...	**21 686**
	To Date	...	1 108	...	102 453	303 628	...	...	407 189
Cariboo	1978	...	469 780	...	2 004 453	2 191 561	...	...	4 665 794
	1979	...	**476 521**	...	**2 766 143**	**6 998 811**	...	...	**10 241 475**
	To Date	...	4 151 612	...	14 242 889	42 892 967	332 457	...	61 619 925
Clinton	1978	...	...	...	1 323 000	452 423	...	...	1 775 423
	1979	...	...	...	**38 300**	**2 509 697**	...	...	**2 547 997**
	To Date	...	...	...	3 237 430	7 192 065	...	...	10 429 495
Fort Steele	1978	...	...	...	20 000	834 961	...	...	854 961
	1979	...	...	...	**9 000**	**1 330 489**	...	...	**1 339 489**
	To Date	...	43 873	71 941	2 984 311	12 595 825	15 918	...	15 711 868
Golden	1978	...	...	...	...	99 744	...	...	99 744
	1979	...	...	...	...	**483 155**	...	...	**483 155**
	To Date	...	1 000	50 840	255 923	4 828 856	128 159	...	5 264 778
Greenwood	1978	...	8 261	...	...	241 541	...	...	249 802
	1979	...	**16 900**	**20**	...	**515 287**	...	...	**532 207**
	To Date	...	67 721	161 040	278 474	3 669 391	121 283	...	4 297 909
Kamloops	1978	9 067 294	...	...	1 544 504	2 698 939	...	...	13 310 737
	1979	**14 151 699**	...	...	**1 394 030**	**2 372 213**	...	...	**17 917 942**
	To Date	59 350 684	25 067	19 800	18 614 430	25 889 048	72 379	...	103 971 408
Liard	1978	...	...	...	459 000	4 082 797	...	...	4 541 797
	1979	...	...	...	...	**5 083 171**	...	...	**5 083 171**
	To Date	...	...	...	2 622 808	27 866 099	...	...	30 488 907
Lillooet	1978	...	303 150	...	...	7 653	...	...	310 803
	1979	...	**386 926**	**9 755**	...	**43 209**	...	...	**439 890**
	To Date	...	1 314 006	11 755	1 122 818	2 397 621	...	...	4 846 200
Nanaimo	1978	...	5 085 859	...	1 679 297	3 493 113	...	...	10 258 269
	1979	...	**5 951 297**	...	**708 182**	**4 380 217**	...	...	**11 039 696**
	To Date	...	81 041 288	3 450 735	8 289 387	28 920 140	1 178 992	...	122 880 542
Nelson	1978	...	929 653	...	1 455	762 920	...	...	1 694 028
	1979	...	**1 035 960**	...	**1 371**	**1 059 022**	...	...	**2 096 353**
	To Date	...	5 013 430	437 138	592 397	9 964 745	21 974	...	16 029 684
New Westminster	1978	...	86 172	...	845 288	14 798 377	6 282 560	...	22 012 397
	1979	...	**120 896**	...	**445 516**	**17 549 446**	**11 744 194**	...	**29 860 052**
	To Date	...	3 801 778	20 974	26 262 463	172 300 469	120 479 344	...	322 865 028
Nicola	1978	...	...	...	...	163 101	...	...	163 101
	1979	...	...	...	...	**307 874**	...	...	**307 874**
	To Date	...	...	8 000	187 994	3 214 660	...	...	3 410 654
Omineca	1978	...	4 278	105	6 420	1 016 349	...	...	1 027 152
	1979	...	**5 548**	**125**	**590 072**	**2 328 524**	...	...	**2 924 269**
	To Date	...	42 777	701	3 541 555	18 323 818	5 274	...	21 914 125
Osoyoos	1978	...	...	...	...	501 870	...	...	501 870
	1979	...	...	...	...	**542 425**	...	...	**542 425**
	To Date	...	43 774	33 018	355 349	7 463 301	...	...	7 895 442
Revelstoke	1978	...	...	17 925	600	251 014	...	...	269 539
	1979	...	...	**9 800**	**13 800**	**484 891**	...	...	**508 491**
	To Date	...	1 000	77 145	787 553	4 266 384	...	...	5 132 082
Similkameen	1978	...	...	...	...	347 514	...	...	347 514
	1979	...	...	...	...	**212 744**	...	...	**212 744**
	To Date	10 500	11 571	24 000	712 341	5 457 656	13 355	...	6 229 423
Skeena	1978	...	...	...	526 048	1 199 224	...	...	1 725 272
	1979	...	...	...	**800 251**	**3 085 146**	...	...	**3 885 397**
	To Date	...	1 645 300	144 000	6 331 546	24 677 756	13 249	...	32 811 851
Slocan	1978	...	...	...	...	93 820	...	...	93 820
	1979	...	...	...	...	**210 381**	...	...	**210 381**
	To Date	...	1 000	115 143	157 323	3 227 057	...	...	3 500 523
Trail Creek	1978	...	...	...	...	1 735 319	...	...	1 735 319
	1979	...	...	...	...	**693 766**	...	...	**693 766**
	To Date	...	32 500	85 520	381 393	6 147 766	...	...	6 647 179
Vancouver	1978	21 947 739	...	...	...	6 418 333	...	...	28 366 072
	1979	**41 482 114**	...	...	...	**7 129 255**	...	...	**48 611 369**
	To Date	184 702 850	40 885	4 012 560	8 681 796	89 722 937	1 088 592	...	288 249 620
Vernon	1978	...	...	...	...	1 788 720	...	...	1 788 720
	1979	...	...	...	...	**2 538 694**	...	...	**2 538 694**
	To Date	...	351 416	141 367	403 649	20 755 690	161 254	...	21 813 376
Victoria	1978	25 125 531	42 331	...	...	6 952 573	...	...	32 120 435
	1979	**24 418 648**	**43 428**	...	...	**7 215 081**	...	...	**31 677 157**
	To Date	308 706 036	1 184 709	55	532 563	65 182 642	10 855 136	...	386 461 141
Not Assigned	1978	...	...	...	...	13 061 818	...	...	13 061 818
	1979	...	...	...	...	**3 906 398**	...	...	**3 906 398**
	To Date	...	315 498	505 018	2 879 844	66 085 748	3 180 828	5 972 171	78 939 107
Totals	1978	56 140 564	6 929 484	18 030	8 410 065	64 227 295	6 282 560	...	142 007 998
	1979	**80 052 461**	**8 037 476**	**19 700**	**6 766 665**	**71 918 633**	**11 744 194**	...	**178 539 129**
	To Date	522 770 070	99 131 313	9 370 750	103 905 348	661 764 275	137 668 194	5 972 171	1 570 582 129

Table 3-8A—Production of Coal, 1836–1979

Year	Quantity[1]	Value	Year	Quantity[1]	Value
	t	$		t	$
1836–59	37 985	149 548	1920	2 587 763	13 450 169
1860	14 475	56 988	1921	2 422 455	12 836 013
1861	13 995	55 096	1922	2 473 692	12 880 060
1862	18 409	72 472	1923	2 391 998	12 678 548
1863	21 687	85 380	1924	1 839 619	9 911 935
1864	29 091	115 528	1925	2 305 337	12 168 905
1865	33 345	131 276	1926	2 182 760	11 650 180
1866	25 518	100 460	1927	2 316 408	12 269 135
1867	31 740	124 956	1928	2 431 794	12 633 510
1868	44 711	176 020	1929	2 154 607	11 256 260
1869	36 376	143 208	1930	1 809 364	9 435 650
1870	30 322	119 372	1931	1 601 600	7 684 155
1871	50 310	164 612	1932	1 464 759	6 523 644
1872	50 310	164 612	1933	1 249 347	5 375 171
1873	50 311	164 612	1934	1 297 306	5 725 133
1874	82 856	244 641	1935	1 159 721	5 048 864
1875	111 912	330 435	1936	1 226 780	5 722 502
1876	141 425	417 576	1937	1 312 003	6 139 920
1877	156 525	462 156	1938	1 259 626	5 565 069
1878	173 587	522 538	1939	1 416 184	6 280 956
1879	245 172	723 903	1940	1 507 758	7 088 265
1880	271 889	802 785	1941	1 673 516	7 660 000
1881	232 020	685 171	1942	1 810 731	8 237 172
1882	286 666	846 417	1943	1 682 591	7 742 030
1883	216 721	639 897	1944	1 752 626	8 217 966
1884	400 391	1 182 210	1945	1 381 654	6 454 360
1885	371 461	1 096 788	1946	1 305 516	6 732 470
1886	331 875	979 908	1947	1 538 895	8 680 440
1887	419 992	1 240 080	1948	1 455 552	9 765 395
1888	497 150	1 467 903	1949	1 470 782	10 549 924
1889	589 133	1 739 490	1950	1 427 907	10 119 303
1890	689 020	2 034 420	1951	1 427 513	10 169 617
1891	1 045 607	3 087 291	1952	1 272 150	9 729 739
1892	839 591	2 479 005	1953	1 255 662	9 528 279
1893	993 988	2 934 882	1954	1 186 849	9 154 544
1894	1 029 204	3 038 859	1955	1 209 157	8 986 501
1895	954 727	2 824 687	1956	1 285 664	9 346 518
1896	909 237	2 693 961	1957	984 886	7 340 339
1897	906 610	2 734 522	1958	722 490	5 937 860
1898	1 146 015	3 582 595	1959	625 964	5 472 064
1899	1 302 088	4 126 803	1960	715 455	5 242 223
1900	1 615 688	4 744 530	1961	833 827	6 802 134
1901	1 718 692	5 016 398	1962	748 731	6 133 986
1902	1 667 960	4 832 257	1963	771 594	6 237 997
1903	1 473 933	4 332 297	1964	826 737	6 327 678
1904	1 712 739	4 953 024	1965	862 513	6 713 590
1905	1 855 121	5 511 861	1966	771 848	6 196 219
1906	1 929 540	5 548 044	1967	824 436	7 045 341
1907	2 255 214	7 637 713	1968	870 180	7 588 989
1908	2 143 225	7 356 866	1969	773 226	6 817 155
1909	2 439 109	8 574 884	1970	2 398 635	19 559 669
1910	3 007 074	11 108 335	1971	4 141 496	45 801 936
1911	2 305 778	8 071 747	1972	5 466 846	66 030 210
1912	2 913 778	10 786 812	1973	6 924 733	87 976 105
1913	2 461 665	9 197 460	1974	7 757 440	154 593 643
1914	2 029 400	7 745 847	1975	8 924 816	317 111 744
1915	1 883 851	7 114 178	1976	7 537 695	298 683 679
1916	2 343 671	8 900 675	1977	8 424 181	328 846 883
1917	2 209 982	8 484 343	1978	9 463 920	381 895 241
1918	2 336 238	12 833 994	1979	10 570 370	439 280 152
1919	2 207 659	11 975 671	Totals	200 833 429	2 756 503 138

[1] Quantity from 1836 to 1909 is gross mine output and includes material lost in picking and washing. For 1910 and subsequent years the quantity is that sold and used.

Table 3-8B—Coal Production and Distribution

	Raw Coal Production			Clean Coal Production	Coal Used	
	Surface	Underground	Total		Plant Use and Misc.	Making Coke
	t	t	t	t	t	t
Fort Steele Mining Division						
Byron Creek Collieries Ltd.						
Thermal	893 074	.....	893 074	775 639	.....	.....
Coleman Collieries Ltd.						
Metallurgical	621 359	.....	621 359	387 483	.....	.....
Fording Coal Ltd.						
Metallurgical	4 824 951	.....	4 824 951	2 921 954	.....	.....
Kaiser Resources Ltd.						
Metallurgical	7 120 799	845 826	7 966 625	6 367 471	5 784	159 737
Thermal	321 497	.....	321 497	130 878	.....	
Total Kaiser Resources Ltd.	7 442 296	845 826	8 288 122	6 498 349	5 784	159 737
Omineca Mining Division						
Bulkley Valley Colliery Ltd.						
Thermal	86	139	225	225	5	.....
Totals 1979						
Metallurgical	12 567 109	845 826	13 412 935	9 676 908	5 784	159 737
Per cent of 1979 totals	91.2	100.0	91.7	91.4	100.0	100.0
Thermal	1 214 657	139	1 214 796	906 742	5	.....
Per cent of 1979 totals	8.8	.....	8.3	8.6	.....	.....
Totals 1979	13 781 766	845 965	14 627 731	10 583 650	5 789	159 737

Table 3-8C—Metallurgical and Thermal Coal Sold and Used, 1973–1979

Year	Metallurgical		Thermal		Total	
	t	$	t	$	t	$
1973	6 853 120	87 406 677	71 613	569 428	6 924 733	87 976 105
1974	7 279 406	149 025 665	496 034	5 567 978	7 757 440	154 593 643
1975	8 104 102	305 484 901	820 714	11 626 843	8 924 816	317 111 744
1976	6 824 493	283 753 979	713 202	14 929 700	7 537 695	298 683 679
1977	7 615 953	314 316 005	808 228	14 530 878	8 424 181	328 846 883
1978	8 530 370	361 254 834	933 550	20 640 387	9 463 920	381 895 241
1979	9 591 975	412 392 598	978 395	26 887 554	10 570 370	439 280 152

by Collieries and by Mining Division, 1979

Coal Sales							Total Coal Sold and Used		
Canada			United States	Japan	Others	Total	Quantity	Total Value	Average Value
British Columbia	Other Provinces	Total							
t	t	t	t	t	t	t	t	$	$/t
8 146	713 909	722 055	.....	71 854	.....	793 909	793 909	22 175 741	27.93
.....	.....	.....	.....	392 716	.....	392 716	392 716	16 800 135	42.78
.....	.....	.....	.....	3 001 731	49 665	3 051 396	3 051 396	126 218 012	41.36
243	.....	243	.....	4 444 749	1 537 350	5 982 342	6 147 863	269 374 451	43.82
50 728	.....	50 728	.....	120	133 413	184 261	184 261	4 705 588	25.54
50 971	.....	50 971	.....	4 444 869	1 670 763	6 166 603	6 332 124	274 080 039	43.28
220	.....	220	.....	.....	.....	220	225	6 225	27.67
243	.....	243	.....	7 839 196	1 587 015	9 426 454	9 591 975	412 392 598	42.99
.....	.....	.....	.....	99.1	92.2	90.6	90.7	93.9	.....
59 094	713 909	773 003	.....	71 974	133 413	978 390	978 395	26 887 554	27.48
100.0	100.0	100.0	.....	0.9	7.8	9.4	9.3	6.1	.....
59 337	713 909	773 246	.....	7 911 170	1 720 428	10 404 844	10 570 370	439 280 152	41.56

Table 3-8D—Destination of British Columbia Coal, 1979*

	Metallurgical	Thermal	Total
	t	t	t
British Columbia	243	59 094	59 337
Manitoba	.....	46 102	46 102
Ontario	.....	667 807	667 807
Brazil	254 684	.....	254 684
Chile	49 315	.....	49 315
Denmark	.....	133 413	133 413
Greece	49 665	.....	49 665
Italy	115 241	.....	115 241
Japan	7 839 196	71 974	7 911 170
Korea	798 097	.....	798 097
Mexico	59 999	.....	59 999
Spain	153 569	.....	153 569
Sweden	49 218	.....	49 218
Taiwan	57 227	.....	57 227
Total	9 426 454	978 390	10 404 844

* Excludes coal used at plants and for making coke.

Table 3-9—Principal Items of Expenditure, Reported for Operations of All Classes

Class	Salaries and Wages	Fuel and Electricity	Process Supplies
	$	$	$
Metal mining	146 627 673	48 510 967	165 769 397
Exploration and development	91 962 580	.....	.....
Coal	79 421 521	18 419 796	17 426 778
Petroleum and natural gas (exploration and production)	11 013 759	.....	.....
Industrial minerals	22 066 856	5 587 808	12 099 468
Structural materials industry	36 042 982	24 648 417	15 770 949
Totals, 1979	387 135 371	97 166 988	211 066 592
1978	335 136 110	84 785 126	189 133 090
1977	337 382 149	71 149 313	192 025 357
1976	277 736 828	59 220 204	170 075 616
1975	246 953 568	49 104 838	154 476 238
1974	272 945 078	42 381 258	140 002 685
1973	221 877 595	36 750 711	103 840 649
1972	199 351 449	31 115 621	77 092 955
1971	179 175 692	23 166 904	68 314 944
1970	172 958 282	19 116 672	59 846 370
1969	123 450 327	14 554 123	43 089 559
1968	113 459 219	13 818 326	38 760 203
1967	94 523 495	13 590 759	34 368 856
1966	93 409 528	12 283 477	28 120 179
1965	74 938 736	11 504 343	30 590 631
1964	63 624 559	10 205 861	27 629 953
1963	57 939 294	10 546 806	12 923 325
1962	55 522 171	9 505 559	14 024 799
1961	50 887 275	8 907 034	17 787 127
1960	52 694 818	7 834 728	21 496 912
1959	49 961 996	7 677 321	17 371 638
1958	48 933 560	8 080 989	15 053 036
1957	56 409 056	8 937 567	24 257 177
1956	57 266 026	9 762 777	22 036 839
1955	51 890 246	9 144 034	21 131 572
1954	48 702 746	7 128 669	19 654 724
1953	55 543 490	8 668 099	20 979 411
1952	62 256 631	8 557 845	27 024 500
1951	52 607 171	7 283 051	24 724 101
1950	42 738 035	6 775 998	17 500 663
1949	41 023 786	7 206 637	17 884 408
1948	38 813 506	6 139 470	11 532 121
1947	32 160 338	5 319 470	13 068 948
1946	26 190 200	5 427 458	8 367 705
1945	22 620 975	7 239 726	5 756 628
1944	23 131 874	5 788 671	6 138 084
1943	26 051 467	7 432 585	6 572 317
1942	26 913 160	7 066 109	6 863 398
1941	26 050 491	3 776 747	7 260 441
1940	23 391 330	3 474 721	6 962 162
1939	22 357 035	3 266 000	6 714 347
1938	22 765 711	3 396 106	6 544 500
1937	21 349 690	3 066 311	6 845 330
1936	17 887 619	2 724 144	4 434 501
1935	16 753 367	2 619 639	4 552 730

NOTE—This table has changed somewhat through the years, so that the items are not everywhere directly comparable. Prior to 1962, lode mining referred only to gold, silver, copper, lead, and zinc. Prior to 1964, some expenditures for fuel and electricity were included with process supplies. Process supplies (except fuel) were broadened in 1964 to include "process, operating maintenance and repair supplies . . . used in the mine/mill operations; that is, explosives, chemicals, drill steel, bits, lubricants, electrical, etc. . . . not charged to Fixed Assets Account . . . provisions and supplies sold in any company-operated cafeteria or commissary." Exploration and development other than in the field of petroleum and natural gas is given, starting in 1966.

Table 3-10—Employment in the Mineral Industry, 1901–1979

Year	Metals						Coal Mines			Structural Materials		Industrial Materials	Exploration and Development	Petroleum and Natural Gas Exploration and Development	Total
		Mines													
	Placer	Under	Above	Concentrates	Smelters	Total	Under	Above[1]	Total	Quarries and Pits	Plants				
1901	.....	2 736	1 212	.....	.....	3 948	3 041	933	3 974	.....	.....	.....	.....	.....	7 922
1902	.....	2 219	1 126	.....	.....	3 345	3 101	910	4 011	.....	.....	.....	.....	.....	7 356
1903	.....	1 662	1 088	.....	.....	2 750	3 137	1 127	4 264	.....	.....	.....	.....	.....	7 014
1904	.....	2 143	1 163	.....	.....	3 306	3 278	1 175	4 453	.....	.....	.....	.....	.....	7 759
1905	.....	2 470	1 240	.....	.....	3 710	3 127	1 280	4 407	.....	.....	.....	.....	.....	8 117
1906	.....	2 680	1 303	.....	.....	3 983	3 415	1 390	4 805	.....	.....	.....	.....	.....	8 788
1907	.....	2 704	1 239	.....	.....	3 943	2 862	907	3 769	.....	.....	.....	.....	.....	7 712
1908	.....	2 567	1 127	.....	.....	3 694	4 432	1 641	6 073	.....	.....	.....	.....	.....	9 767
1909	.....	2 184	1 070	.....	.....	3 254	4 713	1 705	6 418	.....	.....	.....	.....	.....	9 672
1910	.....	2 472	1 237	.....	.....	3 709	5 903	1 855	7 758	.....	.....	.....	.....	.....	11 467
1911	.....	2 435	1 159	.....	.....	3 594	5 212	1 661	6 873	.....	.....	.....	.....	.....	10 467
1912	.....	2 472	1 364	.....	.....	3 836	5 275	1 855	7 130	.....	.....	.....	.....	.....	10 966
1913	.....	2 773	1 505	.....	.....	4 278	4 950	1 721	6 671	.....	.....	.....	.....	.....	10 949
1914	.....	2 741	1 433	.....	.....	4 174	4 267	1 465	5 732	.....	.....	.....	.....	.....	9 906
1915	.....	2 709	1 435	.....	.....	4 144	3 708	1 283	4 991	.....	.....	.....	.....	.....	9 135
1916	.....	3 357	2 036	.....	.....	5 393	3 694	1 366	5 060	.....	.....	.....	.....	.....	10 453
1917	.....	3 290	2 198	.....	.....	5 488	3 760	1 410	5 170	.....	.....	.....	.....	.....	10 658
1918	.....	2 626	1 764	.....	.....	4 390	3 658	1 769	5 427	.....	.....	.....	.....	.....	9 817
1919	.....	2 513	1 746	.....	.....	4 259	4 145	1 821	5 966	.....	.....	.....	.....	.....	10 225
1920	.....	2 074	1 605	.....	.....	3 679	4 191	2 158	6 349	.....	.....	.....	.....	.....	10 028
1921	.....	1 355	975	.....	.....	2 330	4 722	2 163	6 885	.....	.....	.....	.....	.....	9 215
1922	.....	1 510	1 239	.....	.....	2 749	4 712	1 932	6 644	.....	.....	.....	.....	.....	9 393
1923	.....	2 102	1 516	.....	.....	3 618	4 342	1 807	6 149	.....	.....	.....	.....	.....	9 767
1924	.....	2 353	1 680	.....	.....	4 033	3 894	1 524	5 418	.....	.....	.....	.....	.....	9 451
1925	.....	2 298	2 840	.....	.....	5 138	3 828	1 615	5 443	.....	.....	.....	.....	.....	10 581
1926	299	2 606	1 735	808	2 461	7 610	3 757	1 565	5 322	493	324	124	.....	.....	14 172
1927	415	2 671	1 916	854	2 842	8 283	3 646	1 579	5 225	647	138	122	.....	.....	14 830
1928	355	2 707	2 469	911	2 748	8 835	3 814	1 520	5 334	412	368	120	.....	.....	15 424
1929	341	2 926	2 052	966	2 948	8 892	3 675	1 353	5 028	492	544	268	.....	.....	15 565
1930	425	2 316	1 260	832	3 197	7 605	3 389	1 256	4 645	843	344	170	.....	.....	14 032
1931	688	1 463	834	581	3 157	6 035	2 957	1 125	4 082	460	526	380	.....	.....	12 171
1932	874	1 355	900	542	2 036	4 833	2 628	980	3 608	536	329	344	.....	.....	10 524
1933	1 134	1 786	1 335	531	2 436	6 088	2 241	853	3 094	376	269	408	.....	.....	11 369
1934	1 122	2 796	1 729	631	2 890	8 046	2 050	843	2 893	377	187	360	.....	.....	12 985
1935	1 291	2 740	1 497	907	2 771	7 915	2 145	826	2 971	536	270	754	.....	.....	13 737
1936	1 124	2 959	1 840	720	2 678	8 197	2 015	799	2 814	931	288	825	.....	.....	14 179
1937	1 371	3 603	1 818	1 168	3 027	9 616	2 286	867	3 153	724	327	938	.....	.....	16 129
1938	1 303	3 849	2 266	919	3 158	10 192	2 088	874	2 962	900	295	369	.....	.....	16 021
1939	1 252	3 905	2 050	996	3 187	10 138	2 167	809	2 976	652	311	561	.....	.....	15 890
1940	1 004	3 923	2 104	1 048	2 944	10 019	2 175	699	2 874	827	334	647	.....	.....	15 705
1941	939	3 901	1 823	1 025	3 072	9 821	2 229	494	2 723	766	413	422	.....	.....	15 084
1942	489	2 920	1 504	960	3 555	8 939	1 892	468	2 360	842	378	262	.....	.....	13 270
1943	212	2 394	1 699	891	2 835	7 819	2 240	611	2 851	673	326	567	.....	.....	12 448
1944	255	1 896	1 825	849	2 981	7 551	2 150	689	2 839	690	351	628	.....	.....	12 314
1945	209	1 933	1 750	822	2 834	7 339	1 927	503	2 430	921	335	586	.....	.....	11 820
1946	347	1 918	1 817	672	2 813	7 220	1 773	532	2 305	827	555	679	.....	.....	11 933
1947	360	3 024	2 238	960	3 461	9 683	1 694	731	2 425	977	585	869	.....	.....	14 899
1948	348	3 143	2 429	1 126	3 884	10 582	1 594	872	2 466	1 591	656	754	.....	.....	16 397
1949	303	3 034	2 724	1 203	3 763	10 724	1 761	545	2 306	2 120	542	626	.....	.....	16 621
1950	327	3 399	2 415	1 259	3 759	10 832	1 745	516	2 261	1 916	616	660	.....	.....	16 612
1951	205	3 785	3 695	1 307	4 044	12 831	1 462	463	1 925	1 783	628	491	.....	.....	17 863
1952	230	4 171	3 923	1 516	4 120	13 730	1 280	401	1 681	1 530	557	529	.....	.....	18 257
1953	132	3 145	2 589	1 371	3 901	11 006	1 154	396	1 550	1 909	559	634	.....	.....	15 790
1954	199	2 644	2 520	1 129	3 119	9 412	1 076	358	1 434	1 861	638	584	.....	.....	14 128
1955	103	2 564	2 553	1 091	3 304	9 512	1 100	378	1 478	1 646	641	722	.....	.....	14 102
1956	105	2 637	2 827	1 043	3 339	9 846	968	398	1 366	1 598	770	854	.....	.....	14 539
1957	67	2 393	2 447	838	3 328	9 006	1 020	360	1 380	1 705	625	474	.....	.....	13 257
1958	75	1 919	1 809	625	3 081	7 434	826	260	1 086	1 483	677	446	.....	.....	11 201
1959	99	1 937	1 761	618	3 008	7 324	765	291	1 056	1 357	484	459	.....	.....	10 779
1960	86	1 782	1 959	648	3 034	7 423	894	288	1 182	1 704	557	589	.....	.....	11 541
1961	74	1 785	1 582	626	3 118	7 111	705	237	942	1 828	508	571	.....	.....	11 034
1962	35	1 677	1 976	949	3 356	7 958	548	228	776	1 523	481	517	270	.....	11 560
1963	43	1 713	2 012	850	3 239	7 814	501	247	748	909	460	528	450	.....	10 952
1964	5	1 839	1 967	822	3 281	7 909	446	267	713	1 293	444	509	772	.....	11 645
1965	2	1 752	2 019	965	3 529	8 265	405	244	649	1 079	422	639	786	441	12 283
1966	2	2 006	2 296	1 014	3 654	8 970	347	267	614	1 269	393	582	1 894	478	14 202
1967	.....	1 928	2 532	992	3 435	8 887	260	197	457	1 309	372	584	1 264	507	13 380
1968	.....	1 823	2 369	1 072	3 283	8 547	195	358	553	1 207	380	582	3 990	400	15 659
1969	7	1 794	2 470	1 099	3 468	8 831	245	455	700	1 097	549	567	4 270	416	16 437
1970	.....	2 160	3 167	1 331	3 738	10 396	242	1 033	1 275	740	647	627	4 964	437	19 086
1971	.....	2 073	3 058	1 513	3 481	10 125	444	1 013	1 457	846	794	666	4 040	495	18 423
1972	.....	1 833	3 463	1 734	3 353	10 383	214	1 771	1 985	1 116	800	527	4 201	458	19 470
1973	.....	1 704	4 005	2 394	3 390	11 493	265	1 951	2 216	898	802	667	3 392	454	19 922
1974	.....	1 509	4 239	2 352	2 767	10 867	267	2 255	2 522	895	782	646	2 848	509	19 069
1975	.....	1 100	3 619	1 983	3 733	10 435	299	2 464	2 763	826	725	705	2 931	518	18 903
1976	.....	1 268	3 733	2 048	3 542	10 591	327	2 300	2 627	931	680	670	3 101	495	19 095
1977	.....	1 208	3 768	2 224	3 590	10 790	312	2 556	2 868	1 380	626	766	3 537	490	20 457
1978	.....	1 009	3 874	2 029	3 838	10 750	377	2 606	2 983	734	460	618	3 232	496	19 273
1979	.....	**898**	**3 615**	**2 084**	**4 273**	**10 870**	**413**	**2 931**	**3 344**	**931**	**601**	**726**	**3 707**	**489**	**20 668**

[1] Commencing with 1967, does not include employment in by-product plants.

NOTE—These figures refer only to company employees and do not include the many employees of contracting firms.

Table 3-11—Employment at Major Metal and Coal Mines, 1979

	Tonnes		Days Operating Mill	Average Number Employed[1]					
	Mined	Milled		Administrative, Etc.	Mine		Mill	Others	Total
					Surface	Underground			
Metal Mines									
Afton Mines Ltd. (Afton)	3 173 024	2 822 850	365	82	100	.....	128	.....	310
Bethlehem Copper Corp. (Bethlehem)	6 985 101	6 525 449	344	19	181	.....	152	.....	352
Brenda Mines Ltd. (Brenda)	9 286 700	9 075 723	331	125	170	.....	177	5	477
Cominco Ltd. (Sullivan)	1 853 639	2 047 726	362	210	111	456	215	.....	992
Craigmont Mines Ltd. (Craigmont)	2 010 812	1 924 570	361	57	111	79	41	.....	288
Dankoe Mines Ltd. (Horn Silver)	25 536	25 536	211	9	5	23	3	.....	40
Erickson Gold Mining Corp. (Erickson)	28 896	28 896	352	2	.....	12	27	.....	41
Gibraltar Mines Ltd. (Gibraltar)	11 296 537	10 446 035	317	130	111	.....	227	.....	468
Lornex Mining Corp. Ltd. (Lornex)	16 102 384	16 126 103	365	97	394	.....	276	1	768
Newmont Mines Ltd. (Similkameen Division)	6 951 938	6 898 844	365	74	141	.....	96	.....	311
Noranda Mines Ltd. (Bell)	4 831 942	5 073 909	365	77	60	.....	154	.....	291
Noranda Mines Ltd. (Boss Mountain)	496 108	496 108	360	53	13	49	75	.....	190
Noranda Mines Ltd. (Granisle)[2]	4 716 418	4 382 882	365	82	137	.....	129	.....	348[4]
Northair Mines Ltd. (Warman)	87 655	88 309	339	.....	19	54	16	19	108
Placer Development Ltd. (Endako Mining Division)[3]	4 630 271	4 768 000	273	121	35	.....	82	.....	238
Silvana Mines Ltd. (Silmonac)	20 863	19 625	365	14	12	21	9	3	59
Teck Corp. Ltd. (Highland Bell)	35 300	33 664	355	7	7	20	9	.....	43
Utah Mines Ltd. (Island Copper)	13 264 642	13 339 997	364	165	532	.....	173	.....	870
Wesfrob Mines Ltd. (Tasu)	1 009 247	1 009 247	272	42	.....	31	76	.....	149
Western Mines Ltd. (Lynx and Myra)	266 877	266 877	313	46	36	153	19	.....	254
Total Metal Mines	.....	.....	.....	1 412	2 175	898	2 084	28	6 597
Coal Mines									
Byron Creek Collieries Ltd.	893 074	.....	365	30	56	.....	11	.....	97
Coleman Collieries Ltd.	621 359	.....	365	29	157	.....	.....	.....	186
Fording Coal Ltd.	4 824 951	.....	365	234	568	.....	333	.....	1 135
Kaiser Resources Ltd.	8 288 122	.....	365	432	891	413	190	.....	1 926
Total Coal Mines	.....	.....	.....	725	1 672	413	534	.....	3 344

[1] The average number of employed includes wage-earners and salaried employees. The average is obtained by adding the monthly figures and dividing by 12, irrespective of the number of months worked.

[2] Granisle mine operated by Zapata Granby Corp. from January–November 1979, and Noranda Mines Ltd. December 1979.

[3] On strike from February 14–November 1, 1979.

[4] Estimated.

Table 3-12—Metal Production, 1979

Property or Mine (and Location of Mine)	Owner or Agent	Ore Shipped or Treated	Product Shipped	Gross Metal Content					
				Gold	Silver	Copper	Lead	Zinc	Cadmium
		t		g	g	kg	kg	kg	kg
Alberni Mining Division									
Lynx and Myra (Buttle Lake)	Western Mines Ltd.	266 877	Copper concentrates, 12 284 t; lead concentrates, 7 178 t; zinc concentrates, 34 069 t	802 688	37 990 999	3 595 016	3 137 575	18 933 570	79 887
Atlin Mining Division									
Nil									
Cariboo Mining Division									
Boss Mountain (Big Timothy Mountain)	Noranda Mines Ltd. (Boss Mountain Division)	496 108	Molybdenite concentrates, 1 094 t containing 614 961 kg of molybdenum						
Gibraltar (McLeese Lake)	Gibraltar Mines Ltd.	10 446 035	Copper concentrates, 115 388 t; molybdenite concentrates, 752 t; molybdic trioxide, 25 t containing 408 676 kg of molybdenum		3 373 452	32 217 953			
Clinton Mining Division									
Nil									
Fort Steele Mining Division									
Shado (St. Mary River)	Shado Mines Ltd.	3	Crude ore		1 352		756	143	
Sullivan (Kimberley)	Cominco Ltd.	2 047 726	Lead concentrates, 142 223 t; zinc concentrates, 130 512 t; tin concentrates, 549 t containing 207 095 kg of tin		107 342 730		92 146 668	70 745 854	
Golden Mining Division									
Ruth Vermont (Spillimacheen)	Ruth Vermont Mines Ltd.	36	Clean-up; lead concentrates, 34 t; zinc concentrates, 2 t	26	20 964		3 981	5 459	
Greenwood Mining Division									
B A S (Rock Creek)	R. W. Yorke-Hardy, Revelstoke	1	Crude ore	22	7 029		83	77	
Highland Bell (Beaverdell)	Teck Corporation	33 664	Lead concentrates, 388 t; zinc concentrates, 399 t; jig concentrates, 97 t	4 199	10 259 637	613	93 324	140 679	1 000
Midway, Number Seven (Boundary Falls)	David Moore, Midway	36	Crude ore	105	8 253				
Riverside (Rock Creek)	Baykem Enterprises Ltd.	85	Crude ore	93	16 889		460	591	

Table 3-12—Metal Production, 1979—Continued

Property or Mine (and Location of Mine)	Owner or Agent	Ore Shipped or Treated	Product Shipped	Gross Metal Content					
				Gold	Silver	Copper	Lead	Zinc	Cadmium
		t		g	g	kg	kg	kg	kg
Kamloops Mining Division									
Afton (Kamloops)	Afton Mines Ltd.	2 822 850	Copper concentrates, 10 249 t; blister copper, 19 827 t	1 860 022	9 365 673	25 611 766	.....	.....	.....
Bethlehem (Highland Valley)	Bethlehem Copper Corp.	6 525 449	Copper concentrates, 51 339 t; molybdenite concentrates, 592 t containing 306 286 kg of molybdenum	122 797	6 535 338	21 260 613	.....	.....	.....
Lornex (Highland Valley)	Lornex Mining Corp Ltd.	16 126 103	Copper concentrates, 194 829 t; molybdenite concentrates, 3 818 t containing 2 059 851 kg of molybdenum	.....	16 562 009	60 858 558	.....	.....	.....
Mosquito King (Adams Plateau)	Orell Copper Mines Ltd.	147	Crude ore	218	35 645	.....	14 804	12 256	.....
Liard Mining Division									
Erickson (McDame Lake)	Erickson Gold Mining Corp.	28 896	Gold concentrates, 401 t	574 668	567 763	.....	.....	.....	.....
Lillooet Mining Division									
Nil	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nanaimo Mining Division									
Island Copper (Rupert Inlet)	Utah Mines Ltd.	13 339 997	Copper concentrates, 218 490 t; molybdenite concentrates, 2 705 t containing 1 111 400 kg of molybdenum; rhenium shipments are confidential	1 684 627	10 994 861	50 254 743	.....	.....	.....
Nelson Mining Division									
Big John (Salmo)	R. Spinks and T. Brown, Salmo	44	Crude ore	.....	4 417	.....	2 219	3 438	.....
Gold Belt (Salmo)	Goldbelt Mines Ltd.	1 010	Crude ore	9 860	21 275	681	7 564	3 927	.....
Keystone (Salmo)	R. G. Taylor, Montrose	40	Crude ore	1 337	5 319	54	1 459	1 072	.....
Reno (Salmo)	Nugget Mines Ltd.	64	Crude ore	554	.....	.....	.....	.....	.....
New Westminster Mining Division									
R N (Harrison Lake)	R. J. Dealy, Vancouver	37	Crude ore	1 147	.....	.....	.....	.....	.....
Nicola Mining Division									
Craigmont (Merritt)	Craigmont Mines Ltd.	1 924 570	Copper concentrates, 56 631 t; iron concentrates, 41 372 t; coarse iron, 3 156 t	.....	.....	16 188 137	.....	.....	.....
Stump Lake (Nicola)	El Klondike Mines Ltd.	9	Crude ore	111	3 473	.....	239	168	.....

Omineca Mining Division									
Bell (Newman), (Babine Lake)	Noranda Mines Ltd. (Babine Div.—Bell mine)	5 073 909	Copper concentrates, 48 456 t	656 601	1 661 368	13 136 524	.....	.....	.....
Endako (Endako)	Placer Development Ltd. (Endako Mines Div.)	4 768 000	Molybdenite concentrates, 12 t; molybdic trioxide, 6 205 t; ferromolybdenum, 104 t; total content, 3 738 530 kg of molybdenum	.....	.....	.....	.....	.....	.....
Granisle (Babine Lake)	Zapata Granby Corp. and Noranda Mines Ltd. (Babine Div.—Granisle Mine)	4 382 882	Copper concentrates, 50 205 t	497 624	5 338 725	17 326 860	.....	.....	.....
Sil-Van (Smithers)	P. Kindrat, Smithers	94	Crude ore	118	344 693	.....	8 008	9 279	.....
Silver Standard (Hazelton)	G. Braun, New Hazelton	93	Crude ore	233	114 243	.....	5 348	5 627	.....
Sunrise Silver (Hazelton)	Kryco Mines Ltd.	181	Silver concentrates, 15 t	.....	22 985	.....	2 790	2 374	.....
Osoyoos Mining Division									
Brenda (Brenda Lake)	Brenda Mines Ltd.	9 075 723	Copper concentrates, 36 672 t; molybdenite concentrates, 4 496 t containing 2 536 180 kg of molybdenum	101 289	5 727 844	10 626 562	.....	.....	.....
Horn Silver (Keremeos)	Dankoe Mines Ltd.	25 536	Bulk concentrates, 872 t; jig concentrates, 132 t	18 755	6 084 338	4 789	17 244	24 299	.....
Revelstoke Mining Division									
Independence (Revelstoke)	R. Bacon, Kamloops	31	Crude ore	156	373	.....	31	31	.....
Similkameen Mining Division									
Similkameen (Ingerbelle), (Princeton)	Newmont Mines Ltd. (Similkameen Div.)	6 898 844	Copper concentrates, 94 297 t	1 185 509	4 316 292	26 506 197	.....	.....	.....
Skeena Mining Division									
Blue Grouse (Glacier Creek)	J. Lehto, Stewart	6	Crude ore	26	16 360	36	1 104	1 325	.....
Goat Ridge (Stewart)	Nor-Quest Resources Ltd.	124	Crude ore	1 110	540 401	.....	726	9 789	.....
Premier (Stewart)	Spring Investments Ltd.	105	Clean-up; lead concentrates, 36 t; ore, 69 t	2 242	13 122	445	9 937	8 146	.....
Tasu (Tasu Sound)	Wesfrob Mines Ltd.	1 009 247	Iron concentrates, 589 642 t; copper concentrates, 18 739 t	92 159	3 529 716	3 861 563	.....	.....	.....
Troy (Stewart)	N. Benkovich, Stewart	33	Crude ore	505	16 588	.....	870	1 004	.....

Table 3-12—Metal Production, 1979—Continued

Property or Mine (and Location of Mine)	Owner or Agent	Ore Shipped or Treated	Product Shipped	Gross Metal Content					
				Gold	Silver	Copper	Lead	Zinc	Cadmium
		t		g	g	kg	kg	kg	kg
Slocan Mining Division									
Arlington (Slocan)	Edward Shukin, Slocan	1 037	Lead concentrates, 32 t; zinc concentrates, 17 t	588	117 300	53	15 724	12 967	46
Colonial (Sandon)	N. Sibilleau, North Surrey	3	Crude ore	.....	5 163	.....	1 482	128	.....
Emerald Hill (Ainsworth)	J. A. Jardine, Kaslo	2	Crude ore	.....	11 757	.....	463	44	.....
Fourth of July (Retallack)	Tri County Holdings Ltd.	2	Crude ore	.....	2 364	.....	470	117	.....
Gladstone (New Denver)	W. Turley, Kaslo	4	Crude ore	.....	9 424	.....	576	721	.....
Grey Copper (Blue Bird), (Cody)	G. H. Cook, Calgary, and G. Sipos, Kaslo	684	Lead concentrates, 2 t; zinc concentrates, 27 t; ore, 7 t	.....	39 167	.....	3 099	15 241	114
H J (Nakusp)	F. D. Jordans, Nakusp	11	Crude ore	.....	622	.....	10	10	.....
J R T (Duncan Lake)	J. O. Elmer, Vernon	4	Crude ore	2	4 354	18	2 059	38	.....
Lakeview (Slocan)	Selmon Resources Ltd.	426	Lead concentrates, 4 t; zinc concentrates, 8 t	11	51 570	.....	1 593	3 612	24
Millie Mack (Burton)	W. D. Smith and S. G. Ramer, Kelowna	73	Crude ore	529	21 088	32	905	626	.....
Molly Hughes (New Denver)	Denver Silver Inc.	3	Crude ore	5	1 768	2	26	12	.....
Morning Star (Slocan)	L. C. Dekock, Slocan	19	Crude ore	.....	404	.....	39	20	.....
Au (Silverton)	Sybér Mines Ltd.	562	Lead concentrates, 7 t; zinc concentrates, 34 t; ore, 18 t	24	82 825	143	5 868	17 094	123
Ottawa, Memphis (Springer Creek)	Memphis Mines Ltd.	69	Crude ore	.....	673 764	.....	.....	.....	.....
Panama (New Denver)	United Hearne Resources Ltd.	850	Crude ore	342	757 121	.....	4 196	.....	.....
Scranton (Kaslo)	David Minerals Ltd.	3 120	Lead concentrates, 53 t; zinc concentrates, 259 t	3 348	117 670	1 012	37 256	131 535	1 563
Pilot Bay (Pilot Bay)	D. Pearce, Nelson	208	Clean-up	31	73 746	.....	824	2 100	.....
Silmonac (Minniehaha), (Slocan Lake)	Silvana Mines Ltd.	19 625	Lead concentrates, 1 500 t; zinc concentrates, 1 323 t	.....	9 021 470	.....	912 566	813 375	4 961
Silver Maiden (Silverton)	R. F. Mills, Silverton	39	Crude ore	.....	27 651	.....	659	4 458	.....
Spokane (Slocan)	W. Turley, Kaslo	183	Lead concentrates, 3 t; zinc concentrates, 16 t; ore, 8 t	.....	98 522	.....	3 025	11 716	75
Victor (Sandon)	E. Petersen, New Denver	10	Crude ore	175	43 370	.....	6 016	137	.....
Wonderful (Sandon)	G. Sipos, Kaslo	120	Lead concentrates, 4 t; zinc concentrates, 8 t	.....	20 218	.....	1 645	3 772	.....
Trail Creek Mining Division									
Midnight (Rossland)	Carnelian Mines Ltd.	42	Crude ore	5 319	3 764	183	144	42	.....
Vancouver Mining Division									
Warman (Northair) (Callaghan Creek)	Northair Mines Ltd.	88 309	Lead concentrates, 1 712 t; zinc concentrates, 1 587 t; dore bars	954 534	1 926 052	94 186	724 866	1 106 137	.....
Vernon Mining Division									
Nil	.....	.....	.....	.....	.....	.....	.....	.....	.....
Victoria Mining Division									
Nil	.....	.....	.....	.....	.....	.....	.....	.....	.....

Table 3-13A—Destination of British Columbia Ores and Concentrates, 1979

Destination	Ore	Gold-Silver Concentrates	Copper[1] Concentrates	Lead Concentrates	Zinc Concentrates	Iron Concentrates	Molybdenite Concentrates, Molybdic Trioxide, Ferro-Molybdenum	Tin Concentrates
CANADA	t	t	t	t	t	t	t	t
Trail	4 387	.....	.....	153 176	146 742	.....	.....	.....
Other Canadian	.....	173	77 960	.....	.....	78 384[2]	1 121	.....
FOREIGN								
Australia	.....	.....	5 255	.....	.....	24 893	160	.....
Germany	.....	.....	15 372	.....	.....	.....	.....	.....
Japan	.....	.....	651 199	.....	.....	362 224	3 815	.....
Korea	.....	.....	25 002	.....	.....	.....	.....	.....
Philippines	.....	.....	.....	.....	.....	.....	24	.....
Spain	.....	.....	43 478	.....	.....	.....	.....	.....
U.K.	.....	.....	19 827	.....	.....	.....	.....	.....
U.S.A.	12	243	14 772	.....	21 519	202 525	5 080	549
U.S.S.R.	.....	.....	74 541	.....	.....	.....	.....	.....
Europe (country not specified)	.....	.....	.....	.....	.....	.....	9 603	.....
Total	4 399	416	927 406	153 176	168 261	668 026	19 803	549

[1] Includes blister copper.
[2] Includes small amount of coarse iron.

Table 3-13B—Destination of Ores and Concentrates Shipped from British Columbia Mines Showing Metals Paid for and Values, 1979

Country	Gold		Silver		Copper		Lead	
	g	$	g	$	kg	$	kg	$
Canada	2 029 687	26 649 635	133 815 899	56 225 139	20 539 261	51 747 458	84 434 755	88 081 488
Australia	23 452	240 900	916 153	291 142	1 033 121	2 258 699	.....	.....
Germany	119 873	2 032 863	828 086	659 445	4 963 308	13 192 642	.....	.....
Japan	3 669 099	44 436 710	57 238 934	27 171 027	172 018 897	419 246 003	.....	.....
Korea	10 564	104 158	1 109 092	368 119	7 279 371	16 942 771	.....	.....
Philippines	.....	.....	.....	.....	.....	.....	.....	.....
Spain	129 545	2 023 392	3 641 351	2 204 331	17 050 883	42 821 367	.....	.....
U.K.	1 300 199	18 413 789	6 402 459	3 469 563	19 808 605	45 882 293	.....	.....
U.S.A.	780 391	7 579 709	5 576 164	2 288 565	7 429 011	11 927 793	17 150	18 875
U.S.S.R.	.....	.....	4 589 380	2 023 325	22 040 544	52 340 897	.....	.....
Europe (not specified)	.....	.....	.....	.....	.....	.....	.....	.....
	8 062 810	101 481 156	214 117 518	94 700 656	272 163 001	656 359 923	84 451 905	88 100 363

Table 3-13B—Destination of Ores and Concentrates Shipped from British Columbia Mines Showing Metals Paid for and Values, 1979—Continued

Country	Zinc		Cadmium		Iron		Molybdenum	
	kg	$	kg	$	t	$	kg	$
Canada	79 020 993	53 213 952	229 829	1 360 543	78 384	1 783 867	609 930	16 687 837
Australia	.....	.....	.....	.....	24 893	724 705	97 893	3 227 665
Germany	.....	.....	.....	.....	.....	.....	.....	.....
Japan	.....	.....	.....	.....	362 224	6 337 909	2 251 582	77 287 019
Korea	.....	.....	.....	.....	.....	.....	.....	.....
Philippines	.....	.....	.....	.....	.....	.....	12 547	188 585
Spain	.....	.....	.....	.....	.....	.....	.....	.....
U.K.	.....	.....	.....	.....	.....	.....	.....	.....
U.S.A.	9 397 649	8 676 939	17 647	106 572	202 525	4 161 994	2 534 236	87 698 616
U.S.S.R.	.....	.....	.....	.....	.....	.....	.....	.....
Europe (not specified)	.....	.....	.....	.....	.....	.....	5 260 309	136 138 382
	88 418 642	61 890 891	247 476	1 467 115	668 026	13 008 475	10 766 497	321 228 104

Table 3-14—Petroleum and Natural Gas, 1954–1979

Year	Crude Oil		Field Condensate		Plant Condensate		Natural Gas to Pipeline		Butane		Propane		Total Value
	m^3	$	m^3	$	m^3	$	10^3m^3	$	m^3	$	m^3	$	
1954	.....	.....	.....	.....	.....	.....	1 715	6 545	.....	.....	.....	.....	6 545
1955	93	480	.....	.....	.....	.....	4 752	18 130	.....	.....	.....	.....	18 610
1956	23 602	299 322	.....	.....	.....	.....	5 292	20 143	.....	.....	.....	.....	319 465
1957	54 901	763 751	.....	.....	4 449	no value	233 138	433 830	.....	.....	.....	.....	1 197 581
1958	81 675	1 009 609	.....	.....	39 915	380 072	1 635 204	3 368 327	12 980	26 115	10 985	22 110	4 806 233
1959	137 484	1 573 227	.....	.....	81 554	367 797	1 817 945	3 928 839	32 916	66 249	15 410	31 016	5 967 128
1960	137 981	1 531 049	.....	.....	119 377	459 741	2 257 170	7 101 949	46 643	93 878	19 888	40 029	9 226 646
1961	161 462	1 900 104	25	297	129 349	737 761	2 703 776	8 818 891	51 148	102 946	25 928	52 185	11 612 184
1962	1 415 772	16 827 118	1 530	18 184	133 206	674 644	3 062 513	10 226 323	61 618	124 019	34 500	69 438	27 939 726
1963	1 989 747	24 900 381	2 174	27 205	133 828	536 193	2 973 071	10 719 298	65 041	130 908	32 619	65 651	36 379 636
1964	1 832 404	23 396 716	4 192	63 436	146 622	587 685	3 351 574	12 192 816	73 415	147 763	38 921	78 337	36 466 753
1965	2 141 679	28 696 841	5 053	67 696	150 632	576 106	3 910 948	14 493 255	75 996	152 956	57 042	114 808	44 101 662
1966	2 645 259	36 268 683	6 291	86 265	154 946	312 360	4 543 460	17 339 587	79 650	160 311	53 153	106 981	54 274 187
1967	3 125 181	44 748 477	6 450	92 357	161 541	267 941	5 596 092	21 667 136	93 505	188 197	65 672	132 178	67 096 286
1968	3 521 783	50 082 837	8 611	122 408	152 670	247 455	6 317 544	24 531 445	83 870	168 814	63 723	128 256	75 281 215
1969	4 023 815	58 176 213	12 425	180 520	150 104	263 278	7 218 831	27 897 585	66 385	133 613	52 069	104 800	86 756 009
1970	4 032 130	60 405 941	17 052	277 829	159 489	253 009	7 678 940	29 804 411	49 074	98 772	66 828	134 505	90 974 467
1971	3 999 185	66 471 856	17 331	287 781	177 137	293 287	7 685 055	31 946 372	50 590	101 822	74 547	150 040	99 251 158
1972	3 788 849	63 166 717	16 619	277 069	161 854	327 820	9 939 498	41 616 824	54 200	106 533	76 323	150 015	105 644 978
1973	3 368 902	68 306 032	20 114	407 807	180 088	222 463	10 789 269	54 762 105	109 057	212 640	99 188	193 398	124 104 445
1974	3 012 501	103 335 328	16 561	568 075	178 534	924 549	9 016 996	128 018 726	105 426	232 085	89 373	196 742	233 275 505
1975	2 269 898	94 229 725	16 094	668 092	185 272	6 525 837	9 236 489	214 733 528	106 427	2 577 205	81 975	1 985 087	320 719 474
1976	2 367 450	116 595 050	18 309	901 711	167 576	7 198 957	8 799 508	287 997 059	109 781	4 591 832	88 195	3 688 955	420 973 564
1977	2 200 303	132 859 085	24 465	1 477 248	180 267	9 751 058	8 895 663	396 601 354	111 357	5 358 167	91 297	4 392 944	550 439 856
1978	2 004 699	145 005 524	25 386	1 836 217	155 503	10 269 861	8 003 029	401 373 236	106 580	5 932 766	85 732	4 513 447	568 931 051
1979	2 139 963	168 928 671	32 549	2 569 418	184 398	13 396 500	11 392 641	699 508 127	112 683	7 122 711	84 864	4 851 698	896 377 125
Totals	50 476 718	1 309 478 737	251 231	9 929 615	3 288 311	54 574 374	137 070 713	2 449 125 841	1 658 342	27 830 302	1 308 232	21 202 620	3 872 141 489

Stearns-Roger

Petroleum and Natural Gas Statistics

CHAPTER 4

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Chapter 4 is a series of tables and figures providing important information on the petroleum industry operations in 1979. It complements the review of the industry in Chapter 1 and the work on the Ministry reported in Chapter 2.

Table 4-1—Hectares of Crown Petroleum and Natural Gas Rights Held, 1970–1979

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Petroleum and natural gas permits	8 652 268	7 578 468	8 050 271	7 046 019	6 567 416	5 379 502	5 363 440	5 232 700	5 057 241	4 727 388
Petroleum and natural gas leases	3 142 766	2 924 492	2 627 973	2 507 752	2 592 138	2 255 952	2 387 335	2 911 776	3 131 372	3 755 470
Natural gas licences	.....	.....	.....	8 410	6 299	3 160	2 904	14 721	.....	7 559
Natural gas leases	191 409	190 986	190 314	194 156	194 240	197 388	203 789	209 117	228 480	255 903
Petroleum leases	.....	520	520	520	520	1 287	1 287	1 287	1 548	1 548
Drilling reservations	118 335	136 649	182 956	169 925	146 019	128 570	212 529	338 681	426 117	422 888
Totals	**12 104 778**	**10 831 815**	**11 052 034**	**9 926 782**	**9 506 632**	**7 965 859**	**8 171 284**	**8 708 282**	**8 904 758**	**9 170 756**

Table 4-2—Petroleum and Natural Gas Revenue, 1947–1979

	1947–70 $	1971 $	1972 $	1973 $	1974 $	1975 $	1976 $	1977 $	1978 $	1979 $	1947–79 $
Rentals and Fees											
Permits	45 745 272	1 615 619	1 729 829	1 524 431	2 224 111	2 150 965	2 114 161	2 128 190	1 882 589	1 629 423	62 812 590
Drilling reservations	1 120 770	79 120	107 537	77 344	85 481	75 635	124 196	172 078	266 654	223 760	2 332 575
Natural gas licences	68 254	.....	.....	803	8 057	4 155	3 838	.....	47 502	43 262	175 871
Leases (all)	78 109 417	7 733 584	6 976 517	6 500 830	9 678 015	10 242 543	11 925 123	13 680 926	16 782 862	19 428 644	181 058 461
Total rentals	**125 044 713**	**9 428 323**	**8 813 883**	**8 103 408**	**11 995 664**	**12 473 298**	**14 167 318**	**15 981 194**	**18 979 607**	**21 392 089**	**246 379 497**
Crown Reserve Disposition Bonuses											
Permits	69 189 481	14 688 570	13 818 020	7 877 134	15 434 510	6 623 647	27 548 820	60 017 393	49 518 449	45 949 254	310 665 278
Drilling reservations	28 446 578	2 486 763	3 011 025	3 108 092	2 669 318	2 708 463	6 152 419	30 633 861	64 467 213	60 987 012	204 670 744
Leases	68 199 340	5 101 918	3 666 617	6 791 215	4 851 506	3 417 137	9 525 202	34 816 472	63 473 986	84 105 339	283 857 732
Crown reserve disposition totals	**165 835 399**	**22 186 251**	**20 495 662**	**17 776 441**	**22 955 334**	**12 749 247**	**43 226 441**	**125 467 726**	**177 459 648**	**191 041 605**	**799 193 754**
Crown Royalties											
Gas	25 085 290	4 209 793	5 580 434	6 061 250	2 843 329	2 848 930	173 315	180 951	72 729	67 200	47 123 221
Oil	52 570 535	10 415 656	9 845 125	14 543 621	48 296 036	44 782 489	43 925 220	41 015 470	42 191 350	44 819 110	352 404 612
Processed products and penalties	1 011 589	42 517	44 379	42 675	134 180	570 321	711 810	888 799	1 075 378	1 048 746	5 570 393
Gas revenue from B.C. Petroleum Corp.	.....	.....	.....	.....	26 000 000	172 150 000	149 850 000	174 250 000	159 400 000	257 875 000	939 525 000
Crown royalty totals	**78 667 414**	**14 667 966**	**15 469 938**	**20 647 546**	**77 273 545**	**220 351 740**	**194 660 345**	**216 335 220**	**202 739 457**	**303 810 056**	**1 344 623 227**
Miscellaneous fees	304 460	35 604	42 775	27 028	19 104	18 451	32 248	64 583	69 392	82 490	696 225
Total petroleum and natural gas revenue	**369 851 986**	**46 318 144**	**44 822 258**	**46 554 423**	**112 243 647**	**245 592 826**	**252 086 352**	**357 848 723**	**399 248 104**	**516 326 240**	**2 390 892 703**

Table 4-3—Established Hydrocarbon and By-product Reserves, December 31, 1979

	Crude Oil $10^3 m^3$	Raw Gas $10^6 m^3$	Marketable Gas $10^6 m^3$ [1]	Propanes $10^3 m^3$ [2]	Butanes $10^3 m^3$ [2]	Pentanes $10^3 m^3$ [2]	Sulphur $10^3 t$ [2]
Initial reserves, current estimate	78 881.8	424 805.0	349 043.0	2 937.4	4 215.0	8 089.0	10 218.0
Cumulative production to December 31, 1978	48 279.6	153 900.4	126 149.0	1 338.4	1 879.1	3 679.5	1 949.2
Remaining reserves estimated at December 31, 1978	29 546.2	245 634.9	200 173.4	1 315.6	1 990.7	3 854.8	7 678.8
Drilling in 1979	+427.3	+26 142.0	+21 223.0	+228.0	+291.0	+443.0	+602.0
Reserves in 1979	+628.7	−872.3	+1 497.6	+55.4	+54.2	+111.7	−12.0
Production in 1979	−2 140.0	−11 393.6	−10 379.0	−66.0	−108.9	−210.5	−122.8
Production adjustment	+22.3	.....	.....	.....	.....	.....	.....
Remaining reserves in December 31, 1979	28 484.5	259 511.0	212 515.0	1 533.0	2 227.0	4 199.0	8 146.0

NOTE: Gas volumes measured at 101.325 kPa and 15° C.

[1] Figures in this column are estimates of marketable gas, that is, the gas available to the transmission line after removal of acid gases and a percentage of liquid hydrocarbons.

[2] Figures in these columns are estimates based on average gas analyses and estimated plant recoveries. Actual recoveries of propanes, butanes, pentanes, and sulphur were 84.9, 112.7, 216.9 $10^3 m^3$ and 131.1 $10^3 t$ respectively during 1979.

Table 4-4—Drilling and Production Schemes Approved in 1979

Field	Pool	Area or Well	Date of Approval
Salt-water Disposal			
Inga	Inga 'A'	Texaco Inga 16-13-87-24	1979 12 05
Silver	Bluesky 'B'	Westcoast Numac Silver b-6-B/94-H-11	1979 11 23
Siphon	Dunlevy 'A'	Kissinger Vaughey Siphon 7-3-87-16	1979 11 19
Other Areas	Dunlevy	Triad BP Sukunka c-56-B/93-P-5	1979 08 13
Good Engineering Practice			
Boundary Lake	Halfway A	Twp 85, Rge 14	1979 04 23
		NW/4, section 3, section 4; S/2 and NE/4, section 9, section 10; SW/4, section 14; S/2, section 15; SE/4, section 16	
Bullmoose	Baldonnel A	94-P-3	1979 11 28
		Block E, Units 11 to 13, 21 to 23, 31 to 37, 41 to 47, 52 to 59, 62 to 69, 72 to 80, 82 to 90, and 96 to 100	
		Block F, Units 20, 30, 40, and 50	
		Block L, Units 6 to 10, 18 to 20, 28 to 30, 40, and 50	
		93-P-4	
		Block H, Units 71, 81, and 91 to 93	
		Block I, Units 1 to 3, 11 to 15, 21 to 25, 31 to 35, 41 to 45, 52 to 57, and 62 to 67	
Grizzly North, Unit 2	Halfway 'A,' 'B'	93-I-15	1979 10 25
		Block G, Units 31 to 33, 41 to 43, 51 to 55, 61 to 65, 71 to 79, 81 to 89, and 94 to 99	
		Block H, Units 16 to 19, 26 to 29, 38 to 40, 48 to 50, 59, 60, 70, 80, and 90	
		Block J, Units 4 to 9, 16 to 19, and 26 to 29	
Julienne Creek North	Debolt 'A'	94-G-2	1979 04 27
		Block H, Units 12, 13, 22, and 23	
Oak	Halfway A	Twp 86, Rge 17	1979 12 04
		Section 30	
		Twp 86, Rge 18	
		Sections 23 to 27, and 33 to 36	
		Twp 87, Rge 17	
		Section 6	
		Twp 87, Rge 18	
		Sections 1 to 3	
Sukunka	Baldonnel A, B, C	93-P-4	1979 01 04
		Block I, Units 72 to 79, 82 to 89, and 92 to 99	
		93-P-5	
		Block A, Units 2 to 9, 14 to 20, 24 to 30, 34 to 40, 44 to 50, 58 to 60, 68 to 70, 78 to 80, and 88 to 90	
		Block B, Units 11 to 13, 21 to 23, 31 to 35, 41 to 45, 51 to 57, 61 to 67, 71 to 77, and 81 to 87	
Concurrent Production			
Airport	Halfway B	Twp 84, Rge 17	1979 11 28
		Section 3	
Bulrush	Halfway B	94-A-16	1979 04 23
		Block F, Units 75, 76, 85, and 86	

Table 4-5—Wells Drilled and Drilling, 1979—Continued

Concurrent Production – *Continued*			
Cecil Lake	North Pine 'A,' Unit 1	Twp 84, Rge 17 Sections 19, 30, and 31 Twp 84, Rge 18 Sections 13 and 24	1979 02 01
Eagle	Belloy D	Twp 84, Rge 18 Section 34 Twp 85, Rge 18 Sections 3 and 10	1979 01 31
Fireweed	Doig B	94-A-11 Block L, Units 96 and 97 94-A-14 Block D, Units 6 and 7	1979 04 06
Stoddart	Cecil C	Twp 86, Rge 19 N/2, Section 19	1979 08 31
Wildmint	Halfway B	94-A-15 Block I, Units 93 to 95 94-H-2 Block A, Units 2, 4, and 5	1979 10 01
Downhole Commingling			
Buick Creek	Bluesky 'A' Dunlevy 'B'	Texaco NFA Buick c-98-L/94-A-10	1979 06 15
Dahl	Bluesky 'A' Halfway 'A'	Pacific et al Dahl c-100-H/94-H-7	1979 02 12
Rigel	Bluesky 'A' Dunlevy 'F'	Esso Fina Rigel d-57-I/94-A-10	1979 01 31
Miscellaneous			
Stoddart[1]	North Pine 'B' Belloy 'A'	Ipex et al N Pine 6-22-85-18	1979 08 30
Eagle[2]	Belloy B	Twp 84, Rge 18 Sections 15, 21 to 23, 26 to 28, and 35	1979 08 03

[1] Surface commingling.
[2] Revert to 160 core spacing.

Table 4-5—Wells Drilled and Drilling, 1979

Well Authorization Number	Well Name	Date Spudded	Date Rig Released	1979 Depth	Status at December 31, 1979
4742	ATAPCO PCP Klua a-61-E	79 01 25	79 03 14	2 340.0	Abandoned - dry
5144	ATAPCO HBOG Klua b-50-G	79 12 29	----------	----------	Drilling
4775	AmMin N Helmet c-15-E	79 02 11	79 03 16	1 900.0	Abandoned - dry
4825	Amoco et al Buckinghorse a-25-I	79 04 02	79 05 13	1 410.0	Confidential gas
4976	Amoco et al Narraway b-27-I	79 12 24	----------	----------	Drilling
4622	Anadarko et al Buick d-45-I	78 11 28	79 01 04	1 436.0	Dunlevy gas
5088	Aquit et al Callisto 7-7-83-21	79 12 04	----------	----------	Drilling
4940	Aquit et al Sundance 16-27-77-22	79 07 25	79 11 27	3 094.0	Abandoned - dry
4757	Ashland Murphy LaGarde 6-26-88-15	79 02 10	79 02 24	1 300.0	Halfway gas
4774	Ashland Numac Montney 11-16-88-19	79 03 25	79 04 11	1 546.0	Halfway gas
4432	Ashland et al Pocketknife d-1-I	78 11 04	79 02 24	2 090.0	Abandoned - dry
4730	Ashland Homestead N Red 10-35-86-22	79 01 07	79 02 04	1 700.6	Abandoned - dry
4785	Ashland Velma b-82-A	79 03 01	79 03 12	1 155.0	Gething gas
4973	BP Blind c-54-F	79 10 19	----------	----------	Drilling
4552	BP et al Bullmoose a-43-E	79 01 12	----------	----------	Drilling
4690	BP et al Komie a-59-D	79 01 12	79 03 25	2 480.0	Slave Point gas
4573	BP et al Perry b-43-c	79 03 22	79 10 09	2 884.0	Abandoned - dry
4431	BP AEG W Sukunka c-45-J	78 07 01	79 03 09	3 087.2	Baldonnel gas
4907	Baay et al Wilder 10-2-83-20	79 07 28	79 08 30	1 565.0	Artex gas
4792	Baay et al Wilder 10-12-83-20	79 02 21	79 04 10	2 020.0	Halfway gas
4233	Blake et al Hunter c-18-E	79 01 12	79 01 29	1 300.0	Abandoned - dry
5093	Bluesky et al Bonnie d-79-F	79 12 07	----------	----------	Drilling
5156	Bluesky et al Louise d-71-F	79 12 30	----------	----------	Drilling
4909	Brascan Cecil 6-5-85-17	79 06 04	79 06 19	1 376.0	Cecil oil
4817	Brascan Cecil 16-1-85-18	79 06 15	79 07 09	1 568.0	Cecil oil and North Pine gas
5038	Brent et al Flatrock 11-25-84-17	79 10 29	79 11 19	1 538.0	Dunlevy gas
5107	Brinco et al Ring b-42-H	79 12 28	----------	----------	Drilling
4769	CCS et al Donnie d-39-E	79 03 07	79 03 20	1 237.4	Abandoned - dry
4745	CCS Wargen c-14-C	79 03 23	79 04 02	1 270.0	Confidential gas
4321	CDCOG Union Snake a-27-B	78 02 21	79 01 25	2 325.0	Abandoned - dry
4619	CDCOG Weasel b-36-B	78 12 09	79 02 01	1 222.0	Halfway oil
4691	CEGO et al Flatrock 10-28-84-16	79 03 26	79 04 09	1 510.0	Abandoned - dry
4925	CEGO Frio Stoddart A6-20-85-19	79 07 11	79 08 11	1 992.0	Belloy oil
4930	CEGO Frio Stoddart 16-20-85-19	79 07 10	79 08 23	1 996.0	Abandoned - dry
4628	CEGO Frio Stoddart 6-25-85-20	79 01 02	79 02 21	2 020.0	Belloy oil
4846	CEGO Frio S Stoddart 16-19-85-19	79 06 06	79 07 06	1 996.0	Belloy oil
5051	CEGO et al W Stoddart 14-14-86-21	79 12 04	79 12 29	2 080.0	Belloy oil
5086	CT et al Eagle 8-3-85-19	79 12 01	----------	----------	Drilling

5039	CZAR Cdn Res et al W Altares c-32-G	79 11 10	----------	----------	Drilling
4982	CZAR et al Amherst 11-22-81-22	79 08 31	----------	----------	Drilling
4889	CZAR et al Birch d-57-I	79 07 19	79 08 07	1 314.0	Baldonnel gas
4998	CZAR Shell Boucher 6-17-82-22	79 09 04	----------	----------	Drilling
4279	CZAR et al Boundary 10-5-87-13	79 11 13	79 12 01	1 482.0	Halfway and Coplin gas
4955	CZAR et al Butler c-60-B	79 08 21	79 11 06	2 038.8	Standing
4847	CZAR et al Butler c-12-C	79 03 09	79 05 08	1 960.0	Confidential gas
4156	CZAR et al Butler a-65-C (re-entry)	79 02 15	79 02 27	1 924.0	Baldonnel gas
4914	CZAR et al N Cache b-64-I	79 06 16	79 07 10	1 746.0	Doig oil
4723	CZAR et al Callisto 11-13-83-21	79 01 08	79 02 09	1 606.0	Halfway gas
4858	CZAR et al Callisto 11-24-83-21	79 04 29	79 05 25	796.0	Junked and abandoned
4906	CZAR et al Callisto A11-24-83-21	79 05 26	79 06 21	1 631.0	Halfway gas
4789	CZAR BCRIC Dobin b-10-G	79 02 15	79 03 02	1 220.0	Jean Marie gas
4754	CZAR et al N Helmet c-18-A	79 01 26	79 02 13	1 172.0	Jean Marie gas
4732	CZAR et al N Helmet a-20-H	79 01 17	79 03 02	2 034.0	Pine Point gas
5122	CZAR et al Kimea b-30-B	79 12 18	----------	----------	Drilling
4802	CZAR et al Midwinter a-9-I	79 03 21	----------	----------	Drilling
5025	CZAR et al Monias 11-10-82-21	79 10 07	79 12 06	1 675.0	Abandoned - dry
4877	CZAR et al Monias 6-25-82-21	79 06 23	79 08 26	1 649.0	Halfway gas
4843	CZAR et al Monias 10-29-82-21	79 03 07	79 05 06	1 625.0	Confidential gas
4876	CZAR et al Monias 11-35-82-21	79 08 29	79 10 02	1 619.0	Halfway gas
5015	CZAR et al Nig b-22-C	79 09 29	79 10 22	1 407.0	Baldonnel gas
5040	CZAR Gulf W Nig d-77-D	79 10 30	79 12 17	1 702.0	Confidential gas
5074	CZAR Gulf et al Peppermint c-16-E	79 12 03	----------	----------	Drilling
5103	CZAR et al Rigel c-16-C	79 12 07	79 12 19	1 061.0	Dunlevy gas
5079	CZAR Gulf et al Sojer b-22-L	79 12 11	----------	----------	Drilling
4715	CZAR et al Tommy d-33-A	79 01 04	79 01 21	1 227.0	Abandoned - dry
4788	CZAR Fina et al Venus b-28-C	79 03 07	79 03 18	1 096.0	Tetcho oil
4175	Can Del Scurry Beavertail a-67-B	79 02 11	79 02 21	1 077.0	Gething gas
4176	Can Del Scurry Mink b-10-H	79 01 23	79 02 07	1 258.0	Abandoned - dry
4963	Canhunter E Altares 10-36-83-25	79 10 11	----------	----------	Drilling
4662	Canhunter Bearhole d-53-C	79 03 10	79 09 22	3 350.0	Gething gas
4964	Canhunter Esso Bernadet 6-2-88-25	79 08 18	79 09 20	1 850.0	Charlie Lake gas
4870	Canhunter et al Bernadet 6-10-88-25	79 03 29	79 05 29	1 805.0	Bluesky gas
4556	Canhunter Bernadet 10-14-88-25	79 01 05	79 02 20	1 860.0	Halfway oil
4569	Canhunter Blair a-65-E	78 12 14	79 03 01	2 630.0	Halfway gas
5031	Canhunter Esso N Bubbles b-57-G	79 12 14	----------	----------	Drilling
4923	Canhunter Petromark Cameron c-74-K	79 10 09	79 11 12	2 095.0	Confidential gas
5081	Canhunter Esso Diaber b-50-E	79 12 18	----------	----------	Drilling
4844	Canhunter Gundy b-26-A	79 03 12	79 05 21	2 386.0	Debolt gas
4693	Canhunter Jedney b-26-H	79 02 26	79 03 22	1 726.0	Baldonnel gas
4898	Canhunter N Julienne b-2-H	79 06 29	79 09 17	1 569.0	Baldonnel gas
4398	Canhunter Moose b-24-B	79 10 15	79 02 27	3 200.0	Dunlevy gas
4517	Canhunter et al Squaw c-74-E	78 11 06	79 03 09	3 322.0	Dunlevy gas
5053	Canhunter Esso Steeprock c-12-L	79 12 03	----------	----------	Drilling

Table 4-5—Wells Drilled and Drilling, 1979—Continued

Well Authorization Number	Well Name	Date Spudded	Date Rig Released	1979 Depth	Status at December 31, 1979
4867	Canhunter Thunder d-93-I	79 04 26	79 10 16	4 285.0	Confidential gas
4862	Canhunter Town c-70-J	79 06 11	79 07 23	1 824.0	Standing
5005	Canhunter Nemco Town b-A90-J	79 09 25	79 10 12	1 485.0	Baldonnel gas
4922	Canhunter et al Townsend d-57-H	79 10 04	79 12 04	2 345.0	Debolt gas
4965	Canhunter N Townsend c-58-J	79 08 21	79 10 02	2 400.0	Halfway gas
4661	Canhunter Tumbler c-40-F	79 03 20	79 11 17	4 289.0	Confidential gas
4966	Canhunter et al Windsor b-82-B	79 11 08	----------	----------	Drilling
4953	Can-Tex Nortun Boundary 10-3-86-14	79 07 20	79 08 02	1 470.0	Abandoned - dry
4708	Cdn Oxy et al Prophet d-26-L	79 01 29	79 03 15	2 450.0	Abandoned - dry
4756	Cdn. Res et al Bougie d-96-F	79 02 07	79 04 26	2 757.0	Debolt gas
4783	Cdn Res et al Dahl b-70-D	79 03 06	79 03 15	965.3	Bluesky gas
4859	Cdn Res et al Dahl b-4-E	79 03 18	79 03 24	965.0	Bluesky gas
4763	Cdn Res et al Dahl a-3-H	79 02 23	79 03 25	950.0	Bluesky gas
4638	Cdn-Sup Cache 11-15-88-22	79 07 27	79 08 14	1 623.0	Halfway gas
4719	Cdn-Sup Fireweed d-37-D	79 05 28	79 06 22	1 736.0	Montney gas
4893	Cdn-Sup Fireweed a-67-D	79 06 26	79 07 15	1 245.0	Dunlevy oil
5095	Cdn-Sup Inga 8-19-88-23	79 12 29	----------	----------	Drilling
4991	Cdn-Sup Inga 14-1-88-24	79 11 24	79 12 21	1 680.0	Inga oil
4910	Cdn-Sup Rigel a-63-I	79 08 19	79 09 04	1 350.0	Abandoned - dry
4944	Champlin et al Flatrock 11-3-84-16	79 08 06	79 08 25	1 520.0	Abandoned - dry
4980	Cherokee et al S Inga 16-19-85-23	79 08 15	79 09 11	1 731.0	Inga oil
4688	Chevron Amoco Ekwan d-48-F	78 12 29	79 02 25	1 887.0	Kakisa gas
4795	Chevron Ekwan a-99-G	79 03 04	----------	----------	Drilling
4310	Chevron CCL Kyklo d-95-F	78 12 15	79 02 26	2 043.0	Abandoned - dry
4292	Chevron W Milo c-40-H	78 02 06	79 01 14	2 642.0	Abandoned - dry
4722	Chevron Ootla d-1-I	79 01 24	79 04 01	2 445.0	Confidential gas
4218	Coseka Wescent W Buick c-16-L	79 12 05	79 12 17	1 266.0	Abandoned - dry
4852	Coseka et al Falcon b-8-C	79 12 28	----------	----------	Drilling
5011	Coseka et al W Gundy a-34-B	79 09 30	79 10 28	1 278.5	Baldonnel gas
4828	DeKalb et al Bivouac a-67-B	79 02 26	79 03 08	575.0	Debolt gas
4759	DeKalb et al Bivouac b-70-B	79 02 04	79 02 12	600.0	Debolt gas
4879	Dome Boundary 8-21-85-14	79 04 18	79 05 05	1 345.0	Abandoned - dry
4872	Dome Boundary 2-22-85-14	79 03 30	79 04 15	1 365.0	Boundary Lake oil
4800	Dome Boundary 4-3-86-14	79 05 08	79 05 23	1 345.0	Boundary Lake oil
4905	Dome W Boundary 11-34-84-15	79 06 10	79 07 12	2 073.0	Abandoned - dry
5030	Dome Brassy d-89-B	79 11 08	----------	----------	Drilling
4649	Dome et al Doe 6-15-81-14	78 12 15	79 02 20	2 575.0	Belloy gas
4883	Dome et al Doe 11-22-81-14	79 04 01	79 05 26	2 586.8	Boundary gas

4680	Dome et al Ekwan c-44-G	78 12 29	79 02 05	1 797.0	Abandoned - dry
4816	Dome Columbia Fireweed d-51-B	79 02 20	79 03 11	1 410.0	Abandoned - dry
4915	Dome et al W Flatrock 10-36-84-17	79 06 13	79 07 01	1 526.0	Boundary Lake gas
4721	Dome et al Hoss d-55-J	79 02 14	79 04 08	2 093.0	Abandoned - dry
4884	Dome Inga c-54-F	79 06 10	79 06 29	1 475.0	Baldonnel gas
4736	Dome et al Laurel b-30-C	79 01 24	79 02 02	1 143.0	Abandoned - dry
4738	Dome et al Lime c-96-C	79 02 05	79 02 16	1 113.1	Gething gas
5004	Dome Columbia Martin b-2-E	79 09 22	79 10 12	1 330.0	Halfway gas
4656	Dome et al Martin d-13-E	79 01 02	79 02 10	1 322.0	Halfway gas
5024	Dome Col Martin c-14-E	79 10 14	79 11 03	1 300.0	Abandoned - dry
4655	Dome et al Martin d-55-E	78 12 29	79 01 20	1 320.0	Standing
4977	Dome Woods Prespatou d-80-I	79 11 07	79 12 02	1 651.5	Confidential gas
4741	Dome PCP Saskatoon 7-2-80-14	79 02 17	79 05 25	3 485.0	Confidential gas
4860	Dome Colgas Silver b-A22-D	79 03 31	79 04 10	1 119.0	Abandoned - dry
4841	Dome et al Silver d-53-D	79 03 17	79 03 28	1 145.0	Abandoned - dry
5109	Dome Siphon 10-13-87-16	79 12 18	----------	----------	Drilling
5063	Dome Westcoast Sojer b-88-K	79 12 08	----------	----------	Drilling
4945	Dome Stoddart A6-6-86-18	79 02 07	79 07 23	1 245.0	Baldonnel gas
5097	Dome Two Rivers 6-5-83-15	79 12 10	----------	----------	Drilling
4987	Esso et al Boundary A11-10-85-14	79 11 13	79 12 10	1 395.0	Halfway oil
4990	Esso et al Boundary 5-14-85-14	79 12 03	79 12 03	1 430.0	Halfway oil
4668	Esso Pac Westcoast Eagle 8-26-84-19	79 10 16	79 11 08	1 906.4	Belloy oil
4815	Esso Canhunter Hiding a-1-G	79 03 21	79 08 27	3 673.5	Confidential gas
4999	Esso Kelly c-16-I	79 09 21	----------	----------	Drilling
4837	Esso Union Noel b-86-C	79 06 29	79 09 08	3 251.0	Confidential gas
4957	Esso Fina Rigel c-40-L	79 07 29	79 08 12	1 335.0	Confidential gas
4665	Esso BCRIC Stanislas d-13-L	79 01 19	79 03 23	2 961.0	Abandoned - dry
4838	Esso Windsor c-98-A	79 04 05	79 06 23	2 525.0	Confidential gas
4498	Esso Union Uno-Tex Windsor a-3-B	78 12 15	79 05 07	3 760.0	Confidential gas
4861	Esso et al Windsor b-28-I	79 04 06	79 07 29	3 680.0	Confidential gas
4874	Exalta Conuco et al Caribou b-64-G	79 04 01	----------	----------	Drilling
4689	Exalta Conuco et al Helmet c-31-D	79 01 11	79 02 14	1 738.0	Abandoned - dry
4644	Exalta Conuco et al Ring a-89-A	79 03 05	79 03 18	1 165.0	Gething gas
4646	*Exalta Conuco Ring b-62-I*	*79 02 18*	*79 02 28*	*1 060.0*	*Gething gas*
4645	Exalta Conuco Ring d-99-I	79 12 11	79 12 21	935.0	Confidential gas
4921	Fina W Buick d-55-K	79 07 22	79 08 22	1 841.0	Abandoned - dry
4865	Fina Fireweed d-15-D	79 10 03	79 11 07	1 697.0	Dunlevy gas
4760	Fina HB PCP July b-27-J	79 02 08	79 04 03	2 091.0	Pine Point gas
4969	Fina Saturn b-26-K	79 08 29	79 09 29	1 977.0	Abandoned - dry
4568	Focus Scurry Eagle 14-14-85-19	79 05 25	79 06 29	1 875.0	Belloy gas
4959	Focus Scurry Eagle 14-15-85-19	79 08 05	79 09 01	1 973.0	Belloy oil
4686	Focus Zephyr et al Flatbed c-54-H	79 01 19	79 04 08	2 650.0	Dunlevy gas
5009	Focus et al Halfway 7-22-87-25	79 10 04	79 11 16	1 617.0	Halfway gas
4799	Focus et al Louise b-70-L	79 02 14	79 03 25	2 153.0	Slave Point gas
5032	Focus et al Red Creek 7-20-85-21	79 11 19	79 12 1	1 708.0	Dunlevy gas

Table 4-5—Wells Drilled and Drilling, 1979—Continued

Well Authorization Number	Well Name	Date Spudded	Date Rig Released	1979 Depth	Status at December 31, 1979
4897	Focus et al Red Creek 11-31-85-21	79 07 08	79 08 02	1 772.0	Abandoned - dry
4962	Focus et al Spirea 6-2-88-21	79 08 20	79 09 25	2 190.0	Abandoned - dry
4994	Focus et al Stoddart 16-29-85-19	79 09 06	79 10 09	1 930.0	Cecil gas
4707	Focus et al Stoddart 6-30-85-19	79 01 09	79 02 08	1 990.0	Belloy oil
4934	Focus et al Stoddart 8-30-85-19	79 07 19	79 08 16	2 002.0	Belloy oil
4728	Focus et al Stoddart 6-33-85-19	79 04 07	79 06 13	1 884.0	Belloy gas
4896	Focus Scurry S Stoddart 6-21-85-19	79 06 15	79 07 12	1 985.0	Belloy oil
5007	Focus et al Sunrise 11-18-79-16	79 09 24	79 12 21	3 130.0	Dunlevy gas
4787	GAO et al Boudreau 6-36-83-21	79 02 05	79 03 01	1 550.0	Abandoned - dry
4360	GAO Numac Dahl c-94-B	78 03 18	79 03 20	1 224.0	Abandoned - dry
4832	GAO Stoddart 14-26-85-20	79 03 26	79 04 16	1 960.0	Belloy oil
4629	GAO Stoddart 6-2-86-20	79 10 05	79 11 07	1 980.0	Belloy oil
4901	GAO W Stoddart 8-26-85-20	79 07 09	79 08 02	1 967.0	Belloy oil
4735	GAO W Stoddart 14-35-85-20	79 06 10	79 07 05	1 983.1	Belloy oil
4684	GEOG et al Martin b-23-H	78 12 29	79 01 18	1 352.0	Baldonnel gas
4751	GEOG et al W Stoddart 14-32-87-20	79 02 05	79 03 14	1 945.0	Abandoned - dry
5091	GEOG Wargen d-53-D	79 12 10	----------	----------	Drilling
5029	Gascan Wincan Rigel 10-33-87-17	79 10 30	79 11 12	1 104.0	Dunlevy oil and Dunlevy gas
4887	Getty et al Gwillin c-27-E	79 08 03	----------	----------	Drilling
4572	Getty Pine 7-16-77-25	79 08 04	----------	----------	Drilling
4643	Gulf BCRIC Cheves c-82-B	78 12 13	79 03 14	3 070.0	Abandoned - dry
4746	Gulf Dome Lapp c-14-C	79 02 15	79 03 01	1 082.0	Abandoned - dry
4903	Gulf Mica 14-27-81-14	79 06 06	79 06 20	1 560.0	Mica gas
4918	Gulf et al Parkland 6-1-82-15	79 06 23	79 07 17	1 635.0	Gething and Boundary Lake gas
4449	Gulf Dome Norcen Thunder a-38-I	78 08 04	79 04 07	4 115.0	Halfway gas
4782	Gulf Trutch b-26-G	79 10 13	79 12 21	2 360.0	Confidential gas
4854	Gulf et al Tupper a-28-A	79 06 19	79 09 10	3 209.0	Confidential gas
4703	HB W Komie b-72-K	79 01 07	79 02 20	2 524.0	Abandoned - dry
4712	HB Canhunter Moss d-73-D	79 02 28	79 04 08	2 427.4	Abandoned - dry
4274	HB et al Paddy b-64-C	79 02 19	79 04 09	2 500.0	Abandoned - dry
4609	HB et al N Pocketknife d-50-D	78 11 24	79 02 14	1 547.0	Abandoned - dry
4750	Harbour et al Willow d-17-H	79 03 05	79 03 15	1 133.0	Halfway gas
4931	Highfield et al Aspen b-5-J	79 07 15	79 09 08	2 021.0	Abandoned - dry
4633	Highfield et al Golata 10-31-83-15	79 01 12	79 02 14	1 945.0	Abandoned - dry
4784	Highfield Total et al Helmet c-1-J	79 03 04	79 03 26	1 940.0	Abandoned - dry
4600	Home et al Blackhawk a-91-D	78 12 02	79 03 04	3 228.0	Abandoned - dry
4913	Home PCP Farmington 6-13-80-15	79 06 30	79 07 08	815.0	Cadotte gas
4912	Home Sun Uno-Tex Sundown d-13-H	79 06 12	79 08 23	2 710.0	Abandoned - dry

4621	Huber Cdn-Sup Total Nig b-22-A	78 12 18	79 01 17	1 280.0	Baldonnel gas
4630	Huber Cdn-Sup Total Nig a-41-A	79 10 22	79 11 08	1 308.0	Baldonnel gas
4904	Husky CRA W Bear Flat 16-6-84-20	79 06 13	79 07 12	1 550.0	Confidential oil
4886	Husky Rem Boundary 7-6-85-14	79 06 07	79 06 26	1 475.0	Abandoned - dry
4692	Husky et al W Kiskatinaw b-48-H	79 02 11	79 07 11	3 565.0	Confidential gas
4212	Husky Pembina Silver c-92-K	79 12 07	79 12 28	1 284.0	Bluesky gas
4648	ICG et al W Cache 10-27-88-23	79 01 16	79 02 20	1 674.0	Abandoned - dry
4770	Joffre et al Birley d-53-A	79 03 18	79 04 02	1 256.0	Abandoned - dry
4933	Joffre et al Boundary 12-33-85-14	79 08 22	79 09 04	1 310.0	Boundary Lake oil
4672	Joffre et al E Bulrush d-13-K	78 12 11	79 01 01	1 157.0	Abandoned - dry
4949	Joffre et al Two Rivers 16-22-82-16	79 07 12	79 08 19	1 648.0	Abandoned - dry
4895	Joffre et al Two Rivers 6-35-82-16	79 06 24	79 07 17	1 634.5	Standing
5098	Joffre et al Two Rivers 14-35-82-16	79 12 05	79 12 21	1 610.0	Halfway oil
4958	Joffre et al Two Rivers 6-2-83-16	79 08 10	79 09 20	1 885.0	Halfway oil
5001	Joffre et al Two Rivers 6-11-83-16	79 11 03	79 11 28	1 970.0	Belloy gas
5076	KANENERGY et al Boundary 7-25-84-15	79 12 11	79 12 31	1 455.0	Abandoned - dry
4970	Kaiser Numac Buick 7-19-88-19	79 08 01	79 08 19	1 522.0	Gething gas
4894	Kaiser Numac Jeans d-59-G	79 07 08	79 07 26	1 340.5	Dunlevy gas
4900	Kaiser Numac Jeans a-5-K	79 06 13	79 07 05	1 465.0	Abandoned
4667	Kilo et al Bulrush c-20-K	78 12 29	79 01 17	1 156.3	Abandoned - dry
4995	Kilo N Pine 10-20-85-18	79 09 06	79 10 08	1 840.0	Abandoned - dry
4917	Kilo N Pine A6-28-85-18	79 06 14	79 07 08	1 830.0	Belloy gas
4864	Kilo Lassiter Wilder 11-7-84-19	79 05 13	79 06 02	1 603.0	Abandoned - dry
4885	Ladd Buckthorn a-5-D	79 06 11	79 06 25	1 192.0	Gething gas
4857	Ladd Buckthorn a-25-D	79 04 05	79 04 22	1 245.0	Halfway oil
4916	Ladd et al Flatrock 10-23-84-17	79 06 28	79 07 16	1 506.0	Halfway gas
4983	Ladd Ft St John 11-26-83-19	79 08 22	79 09 13	1 545.0	Halfway gas
5002	Ladd Monias 10-19-82-21	79 09 19	79 10 22	1 553.0	Abandoned - dry
4869	Ladd Osborn a-63-L	79 05 16	79 06 04	1 255.0	Confidential gas
5000	*Landbank et al Buick d-31-K*	79 10 19	79 11 09	1 600.0	Baldonnel gas
4634	Landbank et al W Milligan a-22-F	79 08 21	79 09 01	1 170.0	Confidential gas
4666	Landbank et al Paradise 6-17-85-15	79 03 22	79 06 05	1 480.0	Halfway gas
4725	Mobil Junior a-85-E	79 01 23	79 03 10	2 165.0	Abandoned - dry
4613	Mobil Kyklo b-39-B	78 11 25	79 01 15	2 312.0	Abandoned - dry
4640	Mobil Sahtaneh a-8-B	78 12 07	79 03 05	2 055.0	Slave Point gas
4705	Mobil Sahtaneh b-26-B	79 03 11	79 04 02	720.0	Abandoned - dry
5058	Mobil Sierra b-93-C	79 11 22	----------	----------	Drilling
4812	Mobil S Sierra a-29-K	79 06 12	79 07 29	2 295.0	Abandoned - dry
4660	Mobil E Yoyo b-97-F	78 12 16	79 02 15	2 257.0	Pine Point gas
5054	Monsanto Cecil 14-6-85-17	79 11 11	79 11 29	1 370.0	Abandoned - dry
5050	Monsanto Eagle 6-9-85-18	79 10 29	79 11 22	1 890.0	Belloy oil
4777	Murphy W Weasel c-76-C	79 12 30	----------	----------	Drilling
4682	Norcen Eagle 8-32-84-18	79 06 15	79 07 04	1 900.0	Belloy oil
4943	Norcen Eagle 14-33-84-18	79 07 08	79 07 21	1 872.0	Belloy oil
4939	*Norcen Murphy Eagle 6-4-85-18*	79 07 24	79 08 11	1 868.0	Belloy oil

Table 4-5—Wells Drilled and Drilling, 1979—Continued

Well Authorization Number	Well Name	Date Spudded	Date Rig Released	1979 Depth	Status at December 31, 1979
4997	Norcen Murphy Eagle 14-4-85-18	79 09 15	79 10 14	1 863.0	Belloy oil
4637	Norcen Murphy Eagle 16-5-85-18	78 12 31	79 01 31	1 921.0	Belloy oil
4975	Norcen Eagle 6-8-85-18	79 08 13	79 09 05	1 911.0	Belloy oil
5036	Norcen Murphy Eagle 8-8-85-18	79 10 25	79 11 14	1 860.0	Belloy oil
5070	Norcen Evie d-54-E	79 12 28	----------	----------	Drilling
4624	Northstar et al Crush d-70-F	79 04 02	79 04 13	1 160.0	Abandoned - dry
4739	Northstar et al Doig 10-33-87-16	79 01 20	79 02 09	1 350.0	Abandoned - dry
4681	Northstar Ft St John 6-25-83-18	78 12 21	79 01 16	1 537.0	Charlie Lake oil
5082	Northstar Ft St John 14-25-83-18	79 12 09	----------	----------	Drilling
5110	Northstar Kestrel c-94-K	79 12 13	----------	----------	Drilling
4805	Northstar Zephyr Prespatou d-17-A	79 02 13	79 03 04	1 295.0	Bluesky gas
4936	OIL et al W Buick d-11-D	79 10 07	79 10 17	1 155.0	Abandoned - dry
4243	OIL et al Bulrush d-67-F	79 08 15	79 09 01	1 155.0	Abandoned - dry
4834	OIL et al Lapp b-38-C	79 03 15	79 03 25	1 054.0	Bluesky gas
4790	OIL Signalta N Nig d-41-J	79 03 02	79 03 31	1 430.0	Bluesky gas
5041	OIL et al Pintail 4-31-84-24	79 12 17	----------	----------	Drilling
4938	OIL et al W Siphon 6-3-87-17	79 07 19	79 08 13	1 776.0	Abandoned - dry
4937	OIL ATAPCO Sunset 7-8-79-18	79 10 21	79 12 09	2 300.0	Confidential gas
4871	Oakwood et al Cardinal 6-28-88-15	79 03 20	79 03 31	1 268.0	Abandoned - dry
4888	Ocelot et al Flatbed 6-14-84-16	79 05 24	79 06 07	1 510.0	Abandoned - dry
4753	Orbit et al N Boundary 10-6-87-14	79 02 12	79 03 01	1 407.0	Abandoned - dry
4564	Orbit et al N Boundary 7-22-87-14	78 12 28	79 01 13	1 443.0	Doig gas
4779	Orbit et al Fox d-37-D	79 01 27	79 02 09	1 235.0	Abandoned - dry
5028	Orbit et al Montney 6-11-87-19	79 11 17	79 12 08	1 545.0	Abandoned - dry
4653	Orbit et al Rigel 11-29-87-17	79 01 16	79 01 27	1 086.0	Dunlevy gas
4768	PCP CEGO et al W Beatton d-68-K	79 03 08	79 03 21	1 176.0	Bluesky oil
5060	PCP CEGO et al W Beatton d-77-K	79 12 28	----------	----------	Drilling
4951	PCP CEGO et al W Beatton d-78-K	79 08 12	79 08 24	1 140.0	Bluesky oil
4752	PCP Gulf Bivouac d-95-C	79 02 04	79 03 01	645.0	Debolt gas
4749	PCP Gulf Bivouac d-93-D	79 03 04	79 03 15	668.0	Abandoned - dry
4711	PCP Murphy Elm c-94-C	78 12 30	70 91 13	1 220.0	Abandoned - dry
4701	PCP CDC Kwokwullie d-89-K	79 01 26	79 03 02	1 953.5	Abandoned - dry
5075	PEX WP Doe A-7-16-80-14	79 12 01	79 12 18	742.0	Cadotte gas
4827	Pacific Antler b-6-J	79 02 27	79 04 05	1 159.0	Halfway gas
4717	Pacific W Beatton d-66-K	79 02 05	79 02 17	1 065.6	Bluesky gas
5023	Pacific et al W Buick a-25-E	79 12 29	----------	----------	Drilling
4947	Pacific et al W Buick b-6-F	79 09 15	79 10 22	1 563.0	Charlie Lake gas
4803	Pacific et al Clarke c-29-I	79 06 26	79 07 24	1 945.0	Slave Point gas

4929	Pacific et al Clarke b-86-I	79 07 29	79 09 05	1 972.0	Slave Point gas
4612	Pacific Imp Clarke a-92-I	78 12 17	79 01 22	1 912.0	Slave Point gas
4804	Pacific et al Clarke b-33-J	79 05 18	79 06 22	1 998.0	Standing
4724	Pacific Imp Clarke a-76-L	79 01 25	79 03 04	2 025.0	Slave Point gas
4762	Pacific Crow d-16-A	79 02 04	79 08 28	2 917.0	Abandoned - dry
4807	Pacific WP Doe 7-30-80-14	79 03 31	79 09 19	3 424.0	Abandoned
4636	Pacific et al Ft St John 11-20-83-18	79 05 19	79 06 02	990.0	Dunlevy gas
4960	Pacific Norcen Horn d-55-A	79 08 24	79 09 16	1 397.0	Halfway gas
4972	Pacific Norcen Horn b-28-H	79 09 23	79 10 15	1 365.0	Halfway gas
4835	Pacific Norcen Horn a-63-H	79 03 09	79 04 01	1 302.0	Halfway gas
5014	Pacific et al Inga 8-21-87-23	79 10 26	79 11 23	1 637.6	Inga oil
4920	Pacific Norcen Laprise c-12-L	79 07 31	79 08 21	1 313.0	Baldonnel gas
4350	Pacific et al Milo a-67-E	79 03 01	79 04 03	2 181.3	Slave Point gas
4764	Pacific Prespatou d-73-A	79 02 20	79 03 04	1 186.0	Bluesky gas
4842	Pacific et al Tooga c-36-G	79 03 10	79 03 24	693.0	Abandoned - dry
4280	Pangaea et al Elm d-61-C	79 02 24	79 03 10	1 182.0	Abandoned - dry
4919	Pembina et al Flatrock 10-31-84-16	79 06 13	79 07 04	1 545.0	Abandoned - dry
5012	Pembina Coseka Rigel 6-30-87-18	79 09 22	79 10 07	1 345.0	Baldonnel gas
5008	Pembina et al Stoddart 14-25-85-20	79 10 10	79 10 30	2 021.0	Belloy oil
4855	Petromark et al Antler d-11-K	79 03 09	79 03 27	1 138.3	Halfway gas
4755	Petromark E Osborn a-89-I	79 02 26	79 03 14	1 285.0	Charlie Lake oil
4811	Petrorep et al Boundary 6-9-87-13	79 03 03	79 03 20	1 480.0	Halfway gas
5013	Petrorep et al Boundary 6-17-87-13	79 10 13	79 11 10	1 520.0	Abandoned - dry
4829	Petrorep Silver c-20-A	79 03 20	79 03 29	1 245.0	Abandoned - dry
4831	Petrorep Silver a-65-I	79 03 18	79 03 30	1 275.0	Abandoned - dry
5021	Petrorep et al N Siphon 7-25-87-16	79 11 12	79 12 03	1 367.0	Dunlevy gas
4704	Petroy et al Dunedin a-39-B	79 01 09	79 03 12	1 758.0	Abandoned - dry
4740	Petroy et al Odayin a-15-E	79 03 17	79 04 07	1 578.0	Abandoned - dry
4623	Placid et al Yoyo c-A18-L	79 01 08	79 02 26	2 207.0	Pine Point gas
5080	Precambrian et al Trutch d-13-F	79 12 17	----------	----------	Drilling
5027	Quasar et al Dunlevy a-40-L	79 11 30	----------	----------	Drilling
4550	Quasar N Grizzly a-51-G	78 12 17	79 07 13	2 841.0	Dunlevy gas
4776	Quasar N Grizzly a-63-G	79 05 03	----------	----------	Drilling
4136	Quasar N Grizzly c-74-G	78 09 04	79 01 15	3 148.0	Dunlevy gas
4542	Quasar et al Murray a-89-E	78 09 27	79 04 09	3 100.0	Abandoned - dry
4555	Quasar et al Wolverine d-77-K	78 10 15	79 04 20	3 591.0	Dunlevy gas
4221	Quasar Pacific Wolverine b-64-L	78 05 21	79 01 01	3 474.7	Dunlevy gas
4699	Quintah Shell Elleh d-79-F	79 01 04	79 03 24	2 068.0	Slave Point gas
4702	Quintana PCP Helmet a-32-C	78 12 19	79 02 04	1 912.0	Slave Point gas
4731	Quintana et al Helmet c-92-G	79 02 10	79 03 17	1 914.0	Abandoned
4853	Quintana et al Maro c-32-K	79 03 26	79 04 29	2 275.0	Abandoned - dry
4845	Quintana et al Tooga c-18-L	79 03 19	79 03 27	650.6	Abandoned - dry
4778	Quintana et al W Tooga c-51-J	79 02 16	79 03 02	644.0	Abandoned - dry
4744	Ranger et al E Osborn a-29-I	79 01 18	79 02 06	1 586.0	Gething gas
4229	Regency Turbo Klua a-87-B	79 01 07	79 03 18	2 336.0	Standing

Table 4-5—Wells Drilled and Drilling, 1979—Continued

Well Authorization Number	Well Name	Date Spudded	Date Rig Released	1979 Depth	Status at December 31, 1979
4607	Rem et al Two Rivers 3-27-83-16	78 11 24	79 01 14	2 197.0	Abandoned - dry
4657	Remington et al Evie b-49-F	79 01 24	79 04 11	2 504.0	Slave Point gas
4806	Renaissance Zephyr Buick c-74-D	79 03 04	79 03 17	1 325.0	Abandoned - dry
4501	Renaissance et al Buick b-66-L	79 03 06	79 03 16	1 152.0	Abandoned - dry
5035	Renaissance et al Laprise d-64-C	79 11 16	79 12 11	1 475.0	Abandoned - dry
4734	SPOG et al Helmet c-32-F	79 02 17	79 03 18	1 928.0	Abandoned - dry
4714	SPOG et al Helmet d-19-J	79 01 04	79 02 14	1 815.0	Abandoned - dry
5037	Sabine Wainoco Numac Red 11-7-86-21	79 10 27	79 11 21	1 711.0	Baldonnel oil
5018	Samedan et al Umbach a-43-E	79 10 03	79 10 23	1 430.0	Abandoned - dry
5106	Samedan et al Umbach c-18-F	79 12 18	----------	----------	Drilling
5017	Samedan et al Umbach a-25-F	79 10 26	79 11 26	1 408.0	Confidential gas
4796	Seagull et al Dahl d-71-D	79 12 15	79 12 22	985.0	Abandoned - dry
3202	Scurry CEGO Cecil 6-23-84-18 (re-entry)	79 06 25	79 07 16	1 680.0	Belloy oil
4603	Scurry CEGO Eagle 6-20-84-18	78 12 17	79 01 23	1 830.0	Belloy oil
4562	Scurry CEGO Eagle 15-22-84-18	79 03 03	79 03 24	1 866.0	Belloy oil
5045	Scurry CEGO Eagle 8-27-84-18	79 11 09	79 11 26	1 865.0	Belloy oil
5016	Scurry CEGO Eagle 8-28-84-18	79 10 19	79 11 07	1 863.0	Belloy oil
5046	Scurry CEGO Eagle A6-35-84-18	79 11 14	79 11 30	1 340.0	Baldonnel oil
4948	Scurry CEGO Eagle 14-25-84-19	79 07 12	79 08 02	1 906.0	Belloy oil
4892	Scurry CEGO Eagle 8-36-84-19	79 06 12	79 08 11	2 630.0	Belloy oil
4899	Scurry CEGO Eagle 14-36-84-19	79 06 10	79 07 06	1 911.0	Belloy oil
5026	Scurry et al Eagle 8-4-85-18	79 10 19	79 11 09	1 853.0	Belloy oil
4848	Scurry CEGO Eagle 14-6-85-18	79 03 11	79 03 25	1 870.0	Belloy oil
4927	Scurry CEGO Eagle 8-7-85-18	79 07 19	79 08 08	1 940.0	Belloy oil
4942	Scurry CEGO Eagle 14-7-85-18	79 08 09	79 08 28	1 898.0	Belloy oil
5123	Scurry Eagle 14-8-85-18	79 12 28	----------	----------	Drilling
4808	Scurry CEGO Eagle 7-1-85-19	79 02 17	79 03 08	1 868.0	Lower Belloy gas
4671	Scurry CEGO Eagle 14-1-85-19	78 12 15	79 02 13	1 875.0	Belloy oil
5062	Scurry CEGO Eagle 6-2-85-19	79 11 30	79 12 19	1 935.0	Belloy oil
4716	Scurry CEGO Eagle 8-2-85-19	79 05 16	79 06 05	1 930.0	Belloy oil
5010	Scurry CEGO Eagle 14-2-85-19	79 09 15	79 10 15	1 915.2	Belloy oil
4967	Scurry CEGO Eagle 8-11-85-19	79 08 05	79 08 29	1 878.8	Belloy oil
4986	Scurry CEGO Eagle 14-11-85-19	79 09 01	79 09 22	1 915.0	Belloy oil
4985	Scurry CEGO Eagle 8-12-85-19	79 08 31	79 09 17	1 861.0	Belloy oil
4984	Scurry CEGO Eagle 14-12-85-19	79 09 19	79 10 17	1 850.0	Belloy oil
4928	Scurry et al Mallard 6-17-85-19	79 08 06	79 09 04	2 010.0	Belloy oil
5042	Scurry et al W Stoddart 8-27-85-20	79 11 13	79 12 05	1 915.4	Belloy oil
5019	Scurry et al W Stoddart 14-27-85-20	79 10 13	79 11 09	1 985.0	Belloy oil

4979	Scurry et al W Stoddart 16-33-85-20	79 09 16	79 10 08	1 980.0	Belloy oil
5085	Scurry et al W Stoddart 8-3-86-20	79 12 08	79 12 28	1 905.0	Belloy oil
4891	Scurry et al W Stoddart 8-4-86-20	79 06 02	79 06 22	1 935.0	Belloy oil
4698	Scurry et al Taylor 6-33-82-18	79 01 21	79 02 28	1 950.0	Abandoned - dry
4579	Shell Alexander 16-3-86-25	79 04 03	79 05 19	1 735.0	Abandoned - dry
4674	Shell Elleh d-93-I	79 01 12	79 02 19	2 132.0	Abandoned - dry
4677	Shell et al Lucy a-29-G	79 01 02	79 02 18	2 477.1	Pine Point gas
4726	Shell W Sierra c-97-L	79 02 26	----------	----------	Drilling
4798	Siebens Southland Redeye b-2-H	79 02 16	79 03 01	1 056.1	Abandoned - dry
4826	Signalta et al Birch c-30-I	79 07 27	79 08 08	1 304.8	Baldonnel oil
4411	Skelly Getty CS Commotion c-29-C	79 06 27	79 07 01	4 721.0	Confidential gas
4881	Sun Adsett d-53-E	79 04 21	79 07 13	2 650.0	Slave Point gas
4932	Sundance et al N Blueberry b-62-H	79 09 05	79 09 26	1 475.0	Abandoned - dry
4683	Sundance Ft St John 16-35-83-18	79 04 03	79 04 30	1 577.0	Abandoned - dry
4824	*Texaco et al Beavertail d-71-D*	*79 04 07*	*79 04 07*	*1 086.3*	*Dunlevy gas*
4590	Texaco et al Buick b-66-A	79 03 14	79 03 26	1 102.6	Dunlevy gas
4587	Texaco et al Buick d-13-H	79 02 25	79 03 11	1 129.0	Dunlevy gas
4823	Texaco et al Buick d-79-I	79 05 27	79 06 26	1 431.0	Abandoned - dry
4822	Total et al Helmet d-13-K	79 02 27	79 03 25	1 880.0	Abandoned - dry
4685	Tri-Link et al Drake b-14-F	79 02 04	79 02 16	1 064.0	Abandoned - dry
4709	Tri-Link et al Laurel b-8-C	79 01 20	79 01 31	1 141.0	Abandoned - dry
4697	Tri-Link et al E Milligan c-76-I	79 02 19	79 03 02	1 134.0	Abandoned - dry
4875	Tri-Link et al Oak 10-28-86-18	79 04 01	79 04 15	1 427.0	Abandoned - dry
4679	Tri-Link et al Wildmint d-61-A	79 01 03	79 01 17	1 107.9	Halfway gas
4670	Tri Star et al Sahtaneh b-88-I	79 01 22	79 03 15	2 032.0	Abandoned - dry
4632	Turbo et al Flatrock 11-30-84-16	79 02 09	79 02 27	1 542.0	Halfway gas
5053	Union Quasar Ojay a-64-F	79 11 29	----------	----------	Drilling
4718	Union et al Tupper b-25-I	79 03 30	79 05 22	2 859.0	Abandoned - dry
4839	Union Quasar Weejay d-17-OF	79 07 05	79 11 08	3 445.0	Confidential gas
5092	Uno-Tex et al Stoddart 8-36-85-20	79 12 10	----------	----------	Drilling
5059	Wainoco et al Cecil 10-20-84-17	79 11 08	79 11 26	1 488.0	Abandoned - dry
4706	Wainoco CT Res et al Crush d-17-F	79 01 08	79 01 21	1 190.0	Abandoned - dry
4772	Wainoco Tri Star Dahl c-34-I	79 02 17	79 03 01	1 205.0	Bluesky gas
4696	Wainoco Tri Star Dahl b-50-L	79 01 26	79 02 11	1 073.0	Halfway gas
4659	Wainoco et al Eagle 15-19-84-18	78 12 31	79 01 25	1 880.0	Belloy gas
4902	Wainoco et al Eagle 16-24-84-19	79 06 02	70 07 04	1 876.0	Belloy oil
5133	Wainoco et al Kilkerran 6-25-77-14	79 12 16	----------	----------	Drilling
4758	Wainoco Canhunter Kotcho c-72-C	79 01 21	79 02 16	1 525.0	Debolt gas
4278	Wainoco Monias 7-30-82-20	79 07 27	79 09 20	2 137.0	Confidential gas and *confidential gas*
4911	Wainoco Monias 14-14-82-21	79 06 14	79 07 24	1 578.0	Abandoned - dry
4810	Wainoco Cdn-Sup Septimus 6-31-81-18	79 02 22	79 04 05	1 768.0	Halfway gas
4978	Wainoco Cdn-Sup Septimus 7-32-81-18	79 09 24	79 10 27	1 870.5	Halfway gas
5071	Wainoco et al Stoddart 6-4-86-19	79 11 26	79 12 29	1 876.0	Belloy gas
5043	Wainoco et al Tea 11-26-84-20	79 11 19	79 12 10	1 645.0	Charlie Lake gas

Table 4-5—Wells Drilled and Drilling, 1979—Continued

Well Authorization Number	Well Name	Date Spudded	Date Rig Released	1979 Depth	Status at December 31, 1979
5020	Wainoco Two Rivers 16-34-82-16	79 10 12	79 11 21	1 917.0	Belloy gas
4335	Wainoco Focus et al Yoyo 1-87-E	78 02 28	79 01 16	2 228.0	Pine Point gas
4664	Westburne Two Rivers A10-7-83-16	79 01 21	79 02 16	1 452.0	Standing
4793	Westcoast et al Elm d-17-F	79 03 08	79 03 23	1 238.0	Abandoned - dry
4650	Westcoast Ft St John SE 10-3-82-17	78 12 04	79 01 30	1 426.0	Abandoned - dry
4956	Westcoast GAO N Red 6-26-86-21	79 07 23	79 08 04	1 275.0	Abandoned - dry
4849	Westcoast GAO N Red 6-34-86-21	79 03 04	79 03 11	602.0	Abandoned - junked
4868	Westcoast GAO N Red A-6-34-86-21	79 03 11	79 03 23	1 256.0	Dunlevy gas
5078	Westcoast Numac Silver a-89-K	79 11 30	79 12 10	1 118.0	Abandoned - dry
4873	Westcoast Numac Silver c-98-K	79 11 05	79 11 15	1 120.0	Bluesky gas
4761	Westcoast et al Temple b-22-B	79 02 02	79 02 19	1 050.0	Abandoned - dry
4836	Westcoast et al Temple d-15-I	79 03 13	79 03 26	1 170.0	Halfway gas
5066	Westcoast et al Temple a-15-J	79 12 17	----------	----------	Drilling
4830	Westcoast et al Temple a-21-J	79 02 24	79 03 11	1 100.0	Halfway gas
4733	Westcoast et al Temple b-82-J	79 01 09	79 02 01	1 310.0	Halfway gas
4950	Westcoast Two Rivers 11-30-82-15	79 07 11	79 08 19	2 095.0	Confidential gas and oil
4981	Westgrowth et al Buick c-52-C	79 08 17	79 08 27	1 225.0	Dunlevy gas
4993	Westgrowth et al Buick b-82-L	79 09 01	79 09 12	1 071.0	Dunlevy gas
5003	Westgrowth et al Rigel 10-25-87-18	79 09 14	79 09 28	1 130.0	Dunlevy gas
5056	Westgrowth W Stoddart 11-17-86-20	79 11 10	79 12 11	1 945.0	Bluesky gas
4729	Wincan et al Willow b-90-A	79 01 30	79 02 19	1 150.0	Halfway gas
4618	Woods N Julienne d-B33-H	78 11 08	79 02 10	2 699.0	Debolt gas
4954	Woods Oak 16-1-86-18	79 08 05	79 08 19	1 425.9	Halfway gas
4713	Woods et al Wilder 11-28-83-20	79 01 28	79 03 02	1 383.0	Abandoned - dry
1866	Zephyr et al Birch d-19-I	79 04 07	79 06 07	1 311.0	Baldonnel oil
941	Zephyr et al Birch d-75-I	79 07 10	79 08 07	1 561.0	Baldonnel gas
4926	Zephyr et al Birch d-32-J	79 06 17	79 07 07	1 375.0	Baldonnel oil
4813	Zephyr et al Black c-98-B	79 03 17	79 04 03	1 258.0	Halfway gas
4245	Zephyr et al Black a-27-F	78 12 12	79 01 16	1 275.0	Bluesky gas
5034	Zephyr et al Fireweed a-7-E	79 11 20	79 12 12	1 480.5	Dunlevy oil
4800	Zephyr et al Pickell d-33-A	79 03 13	79 04 02	1 279.8	Abandoned - dry
4710	Zephyr et al Silver b-70-K	79 01 19	79 02 01	1 260.0	Bluesky gas

Table 4-6—Summary of Drilling and Production Statistics, 1979

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Well authorizations issued	73	51	30	5	24	35	22	33	20	32	50	89	464
Well authorizations cancelled	3	1	.....	1	2	5	1	1	.....	1	.....	.....	.....
Wells spudded	50	53	62	16	15	36	29	29	21	29	30	43	413
Rigs operated (during month)	74	84	93	60	41	51	56	53	45	45	50	63	93[1]
Rigs operating (at month end)	67	68	46	32	29	46	42	37	32	39	39	51	.....
Metres drilled –													
Development	22 978.0	34 712.5	40 571.9	17 403.3	6 072.8	24 215.0	38 298.1	38 062.5	20 442.1	24 789.9	33 377.0	30 474.7	331 298.8
Exploratory outpost	19 588.9	30 842.7	33 004.5	15 010.1	4 191.0	5 432.0	12 885.5	14 480.0	18 635.0	8 419.5	12 650.8	11 160.0	186 256.0
Exploratory wildcat	6 267.0	11 800.9	42 455.5	28 789.4	16 834.0	2 525.0	11 966.0	9 535.6	10 437.0	7 169.0	10 887.0	8 948.5	167 614.8
Totals	48 833.9	77 356.1	116 031.9	61 103.8	27 097.8	32 172.0	63 149.6	62 078.0	49 514.1	40 378.4	56 914.8	50 539.2	685 169.6
Oil wells*	3	5	5	3	1	4	13	12	8	5	12	9	80
Gas wells*	13	25	32	15	8	11	15	13	12	12	13	17	186
Abandoned wells	12	19	36	14	4	4	5	11	6	5	5	7	128
Service wells	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Standing wells	1	1	1	.....	.....	1	2	.....	.....	.....	1	.....	7
Totals	29	50	74	32	13	20	35	36	26	22	31	33	401
Producible oil wells	802	807	817	815	813	818	826	842	850	854	866	876	.....
Producing oil wells	550	510	527	527	573	585	594	606	604	601	611	597	.....
Production in m^3	179 693.5	151 568.2	181 061.2	174 982.4	182 842.8	181 131.5	188 141.2	198 808.9	159 541.7	187 748.7	176 436.0	178 006.8	2 139 962.9[3]
Average daily production	5 796.6	5 413.2	5 840.7	5 832.7	5 898.2	6 037.7	6 069.1	6 413.2	5 318.1	6 056.4	5 881.2	5 742.2	5 862.9
Producible gas wells	1 483	1 512	1 537	1 489	1 498	1 505	1 522	1 537	1 551	1 563	1 576	1 599	.....
Producing gas wells	564	574	599	599	592	556	534	523	526	562	613	616	.....
Production in $10^3 m^3$ [2]	1 160 149.3	1 055 340.1	1 037 454.9	988 916.5	772 567.5	756 440.2	754 440.7	660 491.2	693 725.9	816 274.4	1 051 875.0	1 177 303.3	10 924 979.0[3]
Average daily production	37 424.2	37 690.7	33 466.3	32 963.9	24 921.5	25 214.7	24 336.8	21 306.2	23 124.2	26 331.4	35 062.5	37 977.5	29 931.4

SUMMARY FOR 1979

Drilled		*Completions*	
Locations drilled	393	Oil wells*	80
Multizone wells	6	Gas wells*	186
Re-entries	2	Service wells	.....
Total	**401**	Standing	7
		Abandoned	128
		Total	**401**

[1] Rigs operated during 1979.
[2] Nonassociated gas production only.
[3] Year-end amendments not included.
*Each zone of the multizone well is counted as one well.

Table 4-7—Monthly Crude-oil and Condensate Production by Fields and Pools, 1979
(Volumes in m³ at 15° C)

Field and Pool	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Airport–Halfway	142.9	74.9	71.9	----------	----------	----------	----------	----------	----------	----------	----------	----------	289.7
Aitken Creek–													
Gething	3 264.9	2 696.2	2 862.3	3 458.2	3 610.4	2 371.1	3 549.6	3 784.1	3 424.4	3 171.8	878.8	927.1	33 998.9
Gething[1]	279.2	320.6	362.2	238.8	254.6	201.9	121.3	176.3	105.2	167.0	283.1	169.4	2 679.6
Totals	3 687.0	3 091.7	3 296.4	3 697.0	3 865.0	2 573.0	3 670.9	3 960.4	3 529.6	3 338.8	1 161.9	1 096.5	36 678.5
Bearflat–North Pine	317.1	278.8	301.9	280.5	279.2	251.7	261.9	255.7	251.0	237.9	257.2	276.7	3 249.6
Beatton River–Halfway	4 250.0	2 967.7	4 088.8	4 470.6	3 757.9	4 238.4	4 163.1	4 154.7	3 818.8	3 971.1	3 943.7	3 868.0	47 692.8
Beatton River West–Bluesky	3 185.3	2 556.0	3 931.0	4 053.3	3 886.9	3 851.0	3 445.7	3 802.7	3 346.5	3 845.2	3 555.8	2 768.6	42 228.0
Beaverdam–Halfway[1]	22.3	21.0	17.4	14.2	9.1	24.0	10.5	19.4	12.0	9.1	11.5	15.7	186.2
Beg–Belloy	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------
Bernadet–Halfway	----------	----------	141.3	----------	----------	----------	----------	410.6	----------	----------	----------	----------	551.9
Birch–													
Baldonnel	----------	20.5	----------	223.4	143.8	167.6	120.7	27.7	304.2	254.5	236.1	243.8	1 742.3
Baldonnel[1]	----------	----------	121.1	122.9	34.8	----------	----------	----------	----------	----------	----------	----------	278.8
Totals	----------	20.5	121.1	346.3	178.6	167.6	120.7	27.7	304.2	254.5	236.1	243.8	2 021.1
Blueberry–Debolt	6 134.2	5 508.6	6 569.9	5 727.6	5 432.4	4 447.3	5 372.2	5 641.4	3 945.2	4 269.2	5 143.1	4 787.7	62 978.8
Boundary Lake–													
Baldonnel[1]	12.4	10.8	13.2	0.9	----------	3.4	1.8	----------	11.9	6.9	8.7	10.8	80.8
Cecil	70.9	64.0	68.4	39.1	71.7	117.9	122.4	78.2	49.5	56.6	64.1	58.0	860.8
Boundary Lake	71 776.2	55 598.3	72 080.6	70 952.2	72 127.7	77 658.1	79 142.8	79 432.4	51 535.6	76 113.7	74 741.2	75 940.3	857 487.1
Halfway	683.4	158.5	197.7	131.3	1 323.7	1 219.0	432.0	1 085.5	615.1	547.6	636.7	338.3	7 368.8
Totals	72 542.9	56 219.6	72 359.9	71 123.5	73 523.1	78 998.4	79 699.0	80 596.1	52 212.1	76 724.8	75 450.7	76 347.4	865 797.5
Boundary Lake North–													
Halfway	192.7	192.1	196.0	115.4	104.2	198.3	105.4	67.5	185.4	191.6	238.3	130.6	1 917.5
Halfway[1]	94.5	132.8	283.1	128.5	22.3	28.2	156.4	227.4	261.9	117.2	103.0	156.9	1 712.2
Totals	287.2	324.9	479.1	243.9	126.5	226.5	261.8	294.9	447.3	308.8	341.3	287.5	3 629.7
Buick Creek–													
Bluesky[1]	1.0	6.0	0.8	0.4	0.3	4.6	1.0	0.3	1.0	----------	13.6	10.9	39.9
Dunlevy	----------	----------	----------	----------	----------	44.3	54.0	45.1	29.8	48.0	66.9	----------	288.1
Dunlevy[1]	314.2	248.8	252.8	176.7	86.0	252.7	196.8	17.1	176.1	148.5	120.4	140.0	2 130.1
Doig	1 156.7	1 059.8	1 057.6	612.5	337.2	1 029.0	590.0	141.2	----------	----------	----------	----------	5 984.0
Totals	1 471.9	1 314.6	1 311.2	789.6	423.5	1 330.6	841.8	203.7	206.9	196.5	200.9	150.9	8 442.1
Buick Creek West–													
Dunlevy	----------	----------	111.8	----------	----------	78.7	183.1	210.2	190.1	----------	87.4	211.9	1 073.2
Dunlevy[1]	124.6	19.5	56.6	59.0	43.1	52.3	34.6	48.5	23.1	43.9	54.3	53.1	612.6
Totals	124.6	19.5	168.4	59.0	43.1	131.0	217.7	258.7	213.2	43.9	141.7	265.0	1 685.8
Bulrush–Halfway	381.9	293.2	314.5	539.5	713.7	586.6	429.7	577.9	458.5	426.4	495.0	408.3	5 625.2
Cache Creek–													
Coplin[1]	----------	1.2	40.7	72.6	7.6	----------	15.1	7.5	19.1	21.0	20.4	30.9	236.1
Halfway[1]	----------	12.6	128.2	117.6	134.8	----------	39.3	30.5	97.9	35.9	61.3	66.6	724.7
Totals	----------	13.8	168.9	190.2	142.4	----------	54.4	38.0	117.0	56.9	81.7	97.5	960.8
Cecil Lake–													
Cecil	456.6	334.5	526.3	229.0	458.0	540.7	523.1	524.0	608.6	546.7	518.1	535.6	5 801.2
Cecil[1]	----------	61.1	----------	----------	26.9	49.0	62.2	250.1	255.5	195.4	116.3	64.7	1 081.2
North Pine	252.1	511.8	591.9	922.3	859.2	825.8	983.6	948.1	973.1	1 074.2	888.1	796.5	9 626.7
North Pine[1]	----------	232.5	256.6	12.6	78.1	25.9	9.5	----------	----------	----------	----------	90.0	705.2
Belloy	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	30.0	37.3	67.3
Totals	708.7	1 139.9	1 374.8	1 163.9	1 422.2	1 441.4	1 578.4	1 722.2	1 837.2	1 816.3	1 552.5	1 524.1	17 281.6
Crush–Halfway	860.2	984.3	1 007.9	1 007.5	1 057.7	910.9	1 131.0	959.6	1 081.3	961.7	901.6	782.6	11 646.3
Currant–Halfway	441.1	967.5	896.2	1 117.6	1 007.4	922.8	942.3	955.4	341.4	455.3	461.2	584.4	9 092.6

Dahl–Bluesky[1]	33.4	58.8	19.7	24.7	11.3	10.8	9.3	3.6	8.3	9.2	22.3	60.4	271.8
Eagle–													
Siphon	103.2	74.0	84.0	57.1	50.0	50.6	55.4	110.6	92.8	147.0	105.1	127.7	1 057.5
Belloy	18 446.6	18 908.4	21 149.6	22 493.5	24 665.7	24 187.6	24 653.9	30 894.1	29 395.5	30 916.6	25 773.3	23 922.9	295 407.7
Totals	18 549.8	18 982.4	21 233.6	22 550.6	24 715.7	24 238.2	24 709.3	31 004.7	29 488.3	31 063.6	25 878.4	24 050.6	296 465.2
Fireweed–													
Dunlevy	81.8	170.2	173.2	165.5	22.7	170.1	180.8	155.8	144.0	134.5	128.9	137.8	1 665.3
Dunlevy[1]	7.6	60.5	103.7	40.7	29.8	20.6	42.5	12.0	36.6	11.0	16.6	67.8	449.4
Doig	----------	----------	----------	----------	----------	----------	----------	686.1	633.3	641.7	127.0	81.9	2 170.0
Totals	89.4	230.7	276.9	206.2	52.5	190.7	223.3	853.9	813.9	787.2	272.5	287.5	4 284.7
Flatrock–													
Boundary Lake	11.4	16.2	19.8	23.5	25.5	25.5	25.0	18.5	18.9	22.2	34.1	48.2	288.8
Halfway	334.8	334.7	293.2	----------	----------	249.5	341.4	----------	----------	282.2	220.9	7.9	2 064.6
Halfway[1]	152.8	137.7	102.4	163.4	173.6	66.2	125.2	106.2	117.6	124.6	133.9	149.3	1 552.9
Totals	499.0	488.6	415.4	186.9	199.1	341.2	491.6	124.7	136.5	429.0	388.9	205.4	3 906.3
Fort St. John–Charlie Lake	1 022.4	768.3	882.2	719.0	779.0	324.7	1 023.6	1 035.2	829.5	1 015.5	840.5	756.0	9 995.9
Fort St. John Southeast–Siphon[1]	----------	----------	----------	254.8	120.7	----------	----------	111.1	----------	2.4	----------	382.8	871.8
Goose–North Pine[1]	24.9	13.1	45.0	----------	----------	----------	28.7	----------	----------	----------	----------	----------	111.7
Inga–													
Gething[1]	7.9	7.6	9.6	9.3	9.6	7.1	5.9	0.3	----------	----------	----------	----------	57.3
Inga	20 017.7	16 947.2	18 699.3	17 446.4	18 302.2	13 388.1	17 136.6	16 716.0	15 739.2	15 943.4	15 443.8	14 913.5	200 693.4
Inga[1]	690.6	637.0	713.2	635.1	478.9	103.5	626.2	245.9	312.0	488.1	651.2	396.0	5 947.7
Totals	20 716.2	17 591.8	19 422.1	18 090.8	18 790.7	13 498.7	17 768.7	16 962.2	16 051.2	16 431.5	16 065.0	15 309.5	206 698.4
Jedney–													
Baldonnel[1]	14.9	7.9	10.8	12.6	14.3	2.5	----------	----------	14.5	16.7	16.7	6.4	117.3
Halfway[1]	6.6	3.5	3.7	4.2	7.0	0.3	----------	----------	4.7	5.3	7.3	4.0	46.6
Totals	21.5	11.4	14.5	16.8	21.3	2.8	----------	----------	19.2	22.0	24.0	10.4	163.9
Laprise–Baldonnel[1]	----------	8.5	1.2	----------	----------	----------	----------	----------	----------	----------	1.8	----------	11.5
Mica–													
Boundary	56.3	66.1	52.3	70.6	27.0	61.7	43.1	59.0	55.5	51.7	40.7	32.6	616.6
Mica	972.2	719.9	946.1	662.0	466.9	1 241.3	979.8	1 061.0	905.8	876.4	745.5	728.2	10 305.1
Totals	1 028.5	786.0	998.4	732.6	493.9	1 303.0	1 022.9	1 120.0	961.3	928.1	786.2	760.8	10 921.7
Mike–Gething	538.9	486.3	529.2	163.3	----------	----------	----------	----------	----------	----------	----------	519.5	2 237.2
Milligan Creek–													
Gething[1]	----------	----------	----------	----------	----------	----------	----------	----------	7.2	3.0	----------	----------	10.2
Halfway	7 905.0	7 114.6	6 350.9	6 513.8	7 422.5	6 385.3	7 532.2	6 777.2	6 338.6	7 523.5	5 773.4	6 765.1	82 402.1
Totals	7 905.0	7 114.6	6 350.9	6 513.8	7 422.5	6 385.3	7 532.2	6 777.2	6 345.8	7 526.5	5 773.4	6 765.1	82 412.3
Milligan Creek West–Halfway[1]	12.6	----------	----------	----------	----------	----------	----------	----------	----------	----------	7.1	8.1	27.8
Monias–Confidential	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	19.5	19.5
Montney–Halfway	18.6	6.3	31.6	----------	----------	58.3	59.2	38.7	----------	40.8	87.1	360.8	701.4
Nettle–Halfway	----------	----------	----------	----------	1.1	----------	----------	----------	----------	----------	----------	----------	1.1
Nig Creek–													
Gething[1]	----------	4.9	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	4.9
Baldonnel	15.4	8.6	13.4	----------	6.9	59.2	53.3	51.3	9.3	21.1	----------	----------	238.5
Baldonnel[1]	----------	----------	----------	----------	----------	----------	4.8	26.5	158.0	152.4	3.6	----------	345.3
Totals	15.4	13.5	13.4	----------	6.9	59.2	58.1	77.8	167.3	173.5	3.6	----------	588.7
North Pine–North Pine	----------	----------	----------	----------	----------	64.2	197.5	190.3	27.2	124.1	140.3	144.6	888.2
Oak–													
Cecil[1]	12.7	17.3	13.0	13.9	6.3	7.7	15.1	14.2	15.2	----------	----------	----------	115.4
Halfway	1 181.2	758.4	1 008.1	1 069.5	1 048.0	894.7	1 230.3	1 159.2	1 018.3	1 031.6	1 077.9	1 297.2	12 774.4
Halfway[1]	751.4	703.6	677.8	404.3	445.4	221.3	381.0	507.8	424.2	433.4	601.9	555.7	6 107.8
Totals	1 945.3	1 479.3	1 698.9	1 487.7	1 499.7	1 123.7	1 626.4	1 681.2	1 457.7	1 465.0	1 679.8	1 852.9	18 997.6
Osprey–Halfway	323.8	215.9	236.8	204.0	252.7	243.7	231.7	256.9	349.7	360.0	212.1	312.0	3 199.3
Parkland–Wabamun[1]	----------	17.5	50.2	----------	----------	----------	----------	----------	----------	----------	----------	----------	67.7
Peejay–													
Halfway	13 140.7	11 892.8	13 625.2	13 716.3	14 822.4	14 588.0	13 501.8	13 490.0	14 039.5	14 571.1	13 573.8	13 238.7	164 200.3

[1] Condensate.

Table 4-7—Monthly Crude-oil and Condensate Production by Fields and Pools, 1979—Continued

Field and Pool	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Peejay – *Continued*													
Halfway[1]	11.3	1.6	2.9	18.4	.....	.....	21.6	.....	28.6	.....	4.0	.....	88.4
Totals	13 152.0	11 894.4	13 628.1	13 734.7	14 822.4	14 588.0	13 523.4	13 490.0	14 068.1	14 571.1	13 577.8	13 238.7	164 288.7
Peejay West–Halfway	487.3	509.8	389.8	447.0	631.6	665.0	681.5	262.2	167.0	448.4	387.2	423.3	5 500.1
Red Creek–Halfway[1]	.....	.....	14.9	31.2	.....	.....	.....	.....	.....	.....	.....	.....	46.1
Rigel–													
Dunlevy	255.6	431.7	408.3	263.8	205.3	409.6	368.8	368.3	197.5	265.4	344.7	336.2	3 855.2
Dunlevy[1]	16.4	0.8	6.6	.....	.....	.....	.....	.....	.....	.....	.....	.....	23.8
Totals	272.0	432.5	414.9	263.8	205.3	409.6	368.8	368.3	197.5	265.4	344.7	336.2	3 879.0
Silverberry–North Pine[1]	15.9	.....	31.8	.....	.....	18.3	.....	12.2	31.8	.....	.....	13.8	123.8
Siphon–													
Dunlevy[1]	12.0	12.4	6.0	5.9	5.2	1.2	10.5	11.8	4.8	11.4	6.9	7.5	95.6
Baldonnel[1]	53.8	.....	.....	.....	.....	.....	2.6	17.5	43.2	16.7	26.6	.....	160.4
Siphon[1]	14.7	12.0	7.3	6.5	7.1	1.1	7.8	5.6	1.2	4.4	0.9	1.5	70.1
Halfway[1]	36.7	42.1	18.1	17.5	14.0	3.1	36.2	37.3	22.0	55.1	33.1	35.7	350.9
Totals	117.2	66.5	31.4	29.9	26.3	5.4	57.1	72.2	71.2	87.6	67.5	44.7	677.0
Siphon East–Bluesky[1]	14.4	.....	.....	16.8	.....	10.5	.....	9.7	.....	7.2	.....	10.9	69.5
Stoddart–													
Cecil	365.6	346.1	358.2	288.1	281.6	393.8	300.1	395.7	243.3	346.8	97.0	282.5	3 698.8
Belloy	302.2	255.6	287.4	266.6	275.6	340.3	338.6	332.0	313.6	269.6	269.8	244.9	3 496.2
Belloy[1]	.....	.....	.....	16.9	88.6	41.8	80.9	.....	.....	.....	.....	.....	228.2
Totals	667.8	601.7	645.6	571.6	645.8	775.9	719.6	727.7	556.9	616.4	366.8	527.4	7 423.2
Stoddart South–Belloy	474.3	410.3	461.6	.....	84.4	542.6	512.7	489.2	499.8	539.7	583.5	655.4	5 253.5
Stoddart West–													
Belloy	4 116.7	3 351.3	3 263.1	1 696.2	2 425.6	4 020.5	4 162.0	4 751.2	4 704.8	4 354.0	4 803.7	4 727.4	46 376.5
Belloy[1]	435.9	341.6	392.2	436.6	443.9	410.2	338.1	242.2	303.2	348.2	367.8	394.8	4 454.7
Totals	4 552.6	3 692.9	3 655.3	2 132.8	2 869.5	4 430.7	4 500.1	4 993.4	5 008.0	4 702.2	5 171.5	5 122.2	50 831.2
Two Rivers–Halfway	152.4	45.9	210.4	.....	91.3	140.4	145.5	271.5	208.6	233.3	196.9	226.9	1 923.1
Wessel–Halfway	10 124.7	8 450.2	10 430.7	9 964.5	10 798.1	8 102.4	9 144.5	10 882.6	8 027.3	7 081.7	7 921.6	9 328.1	110 256.4
Wessel West–Halfway	1 186.4	968.7	1 182.2	845.6	1 097.0	860.8	779.6	1 149.6	667.8	899.1	858.5	859.7	11 355.0
Wildmint–Halfway	3 179.2	2 556.3	3 040.8	2 521.7	2 040.3	2 480.5	1 935.1	2 107.2	2 028.9	1 985.3	2 034.9	2 903.5	28 813.7
Willow–													
Gething	152.2	209.3	158.1	201.3	189.4	156.8	147.9	191.1	147.8	190.1	161.8	173.5	2 079.3
Halfway[1]	13.3	46.4	7.9	22.2	.....	.....	.....	.....	.....	30.6	.....	10.8	131.2
Totals	165.5	255.7	166.0	223.5	189.4	156.8	147.9	191.1	147.8	220.7	161.8	184.3	2 210.5
Wolf–Halfway	1 115.4	417.8	1 264.0	1 109.8	1 434.1	1 287.6	952.4	1 024.6	763.0	686.6	758.6	1 120.0	11 933.9
Other Areas–													
Gething[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Baldonnel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Baldonnel[1]	.....	0.8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.8
Cecil	.....	.....	.....	.....	.....	.....	.....	55.6	14.2	.....	98.9	155.6	324.3
North Pine	.....	.....	.....	.....	.....	.....	230.3	199.9	175.1	178.2	151.3	154.9	1 089.7
Halfway	41.6	202.6	199.7	46.9	189.5	231.5	237.9	217.3	118.2	140.2	62.9	175.0	1 863.3
Halfway[1]	64.4	36.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100.4
Doig	66.8	.....	.....	.....	.....	177.6	82.9	119.5	31.1	47.4	.....	.....	525.3
Doig[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belloy	.....	.....	.....	89.6	.....	29.1	124.6	197.6	174.5	65.2	10.2	66.2	757.0
Confidential	.....	.....	.....	.....	.....	.....	.....	.....	22.3	132.6	146.2	83.4	384.5
Totals	172.8	239.4	199.7	136.5	189.5	438.2	675.7	789.9	535.4	563.6	469.5	635.1	5 045.3
Totals–													
Crude	**179 756.6**	**151 298.2**	**180 765.2**	**174 925.6**	**182 806.4**	**181 290.2**	**188 942.6**	**198 817.0**	**159 260.4**	**187 738.5**	**176 355.4**	**178 006.8**	**2 139 962.9**
Condensate	**3 252.4**	**3 238.5**	**3 770.7**	**3 079.2**	**2 554.4**	**1 568.2**	**2 384.9**	**2 141.0**	**2 496.8**	**2 464.6**	**2 664.3**	**2 934.0**	**32 549.0**
Totals	**183 009.0**	**154 536.7**	**184 535.9**	**178 004.8**	**185 360.8**	**182 858.4**	**191 327.5**	**200 958.0**	**161 757.2**	**190 203.1**	**179 019.7**	**180 940.8**	**2 172 511.9**

Table 4-8—Monthly Nonassociated and Associated Gas Production by Fields and Pools, 1979 (Volumes in 10^3m^3 at 101.325 kPa and 15° C)

Field and Pool	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Airport–													
Bluesky	20.1	----	----	----	----	436.8	799.3	630.4	386.5	520.4	400.2	293.6	3 487.3
Dunlevy	795.3	656.5	811.7	607.9	619.8	522.1	435.0	623.1	540.9	628.7	707.5	847.3	7 795.8
Halfway	336.1	242.2	257.3	----	----	----	----	----	----	----	----	----	835.6
Totals	1 151.5	898.7	1 069.0	607.9	619.8	958.9	1 234.3	1 253.5	927.4	1 149.1	1 107.7	1 149.9	12 118.7
Aitken Creek–													
Gething	2 575.7	2 157.9	1 878.9	853.0	2 969.9	2 042.3	----	----	----	1 861.0	4 876.9	4 563.0	23 778.6
Gething[1]	5 775.8	5 082.6	5 032.6	5 711.4	5 834.9	4 733.8	6 140.4	6 047.6	5 799.9	5 912.4	2 338.4	3 085.1	61 494.9
Totals	8 351.5	7 240.5	6 911.5	6 564.4	8 804.8	6 776.1	6 140.4	6 047.6	5 799.9	7 773.4	7 215.3	7 648.1	85 273.5
Bear Flat–North Pine[1]	1 436.8	1 264.7	1 395.8	1 333.0	1 391.5	1 276.1	1 348.8	1 373.0	1 386.5	1 276.8	1 352.7	1 421.6	16 257.3
Beatton River–Halfway[1]	281.5	185.6	208.9	303.1	257.0	336.0	336.3	312.0	299.3	317.2	307.5	303.2	3 447.6
Beatton River West–Bluesky[1]	172.3	125.3	185.1	203.0	181.9	190.7	187.6	188.9	169.0	189.0	153.6	153.4	2 099.8
Beaverdam–Halfway	1 544.7	1 326.5	1 216.3	895.0	686.0	1 087.4	889.5	2 011.3	806.7	429.9	449.3	1 273.6	12 616.2
Beavertail–Gething	9 554.2	9 806.7	9 842.5	9 216.7	8 046.2	5 903.6	3 526.6	3 681.5	5 287.6	7 435.4	9 753.9	9 517.2	91 572.1
Beg–													
Baldonnel	6 825.9	8 369.1	6 852.6	6 787.3	6 776.2	2 929.6	1 824.5	1 988.8	----	1 841.7	7 588.4	5 810.1	57 594.2
Halfway	6 383.2	5 323.8	5 004.8	7 046.9	7 610.4	3 428.9	6 047.6	3 147.6	2 485.6	5 774.2	7 287.9	6 290.3	65 825.7
Totals	13 209.1	13 692.9	11 857.4	13 834.2	14 386.6	6 358.5	7 866.6	5 136.4	2 485.6	7 615.9	14 876.3	12 100.4	123 419.9
Bernadet–Halfway[1]	----	----	----	----	----	----	----	106.3	----	----	----	----	106.3
Birch–													
Gething	221.3	268.2	219.9	73.6	169.3	94.0	49.6	60.2	38.3	2.6	----	----	1 197.0
Baldonnel	534.8	521.5	1 320.7	1 161.6	945.6	817.4	510.2	797.7	623.5	349.4	942.0	1 055.4	9 579.8
Baldonnel[1]	----	2.7	----	29.1	2.7	20.6	13.7	2.9	78.3	65.6	58.6	53.2	327.4
Halfway	1 385.7	1 184.4	1 252.7	1 069.3	1 319.8	1 048.3	732.6	892.8	742.4	1 125.9	1 074.8	718.2	12 546.9
Totals	2 141.8	1 976.8	2 793.3	2 333.6	2 437.4	1 980.3	1 306.1	1 753.6	1 482.5	1 543.5	2 075.4	1 826.8	23 651.1
Bivouac–Debolt	----	----	50.4	----	----	----	----	----	----	----	----	----	50.4
Blueberry–													
Dunlevy	1 849.9	1 693.6	1 999.9	1 936.5	1 980.0	1 361.6	1 849.9	1 738.5	1 576.2	2 095.8	1 896.6	1 947.4	21 925.9
Debolt[1]	2 485.5	3 023.8	2 403.3	1 907.1	2 352.7	2 263.8	3 850.2	3 197.6	1 692.1	1 665.5	4 078.8	3 766.0	32 686.4
Totals	4 335.4	4 717.4	4 403.2	3 843.6	4 332.7	3 625.4	5 700.1	4 936.1	3 268.3	3 761.3	5 975.4	5 713.4	54 612.3
Blueberry West–Baldonnel	769.3	453.2	780.8	682.6	727.6	173.5	----	----	432.0	386.9	673.0	693.9	5 772.8
Boundary Lake–													
Bluesky	310.0	327.0	346.0	316.2	289.6	184.5	40.1	247.4	163.3	225.9	339.3	250.9	3 040.2
Gething	1 141.7	1 138.4	1 232.1	1 080.0	1 116.1	1 132.3	700.4	83.5	1 022.6	633.0	619.4	831.3	10 730.8
Baldonnel	1 517.9	1 241.2	1 507.2	1 442.0	1 763.3	1 358.6	215.0	----	1 638.5	1 594.8	2 538.6	2 812.4	17 629.5
Cecil[1]	7.7	10.4	12.7	7.3	6.0	13.1	25.6	13.8	4.4	5.6	5.5	5.6	117.7
Boundary Lake[1]	6 316.5	5 680.9	7 500.8	7 237.4	7 213.4	7 493.1	8 456.5	7 729.6	5 083.3	8 528.8	7 917.4	8 285.1	87 442.8
Basil Boundary	244.0	229.9	234.6	250.2	249.2	215.6	109.4	16.7	155.3	131.0	149.7	190.3	2 175.9
Halfway[1]	270.5	138.9	164.6	145.0	810.1	663.0	72.9	455.8	67.3	206.3	328.8	51.9	3 375.1
Totals	9 808.3	8 796.7	10 998.0	10 478.1	11 447.7	11 060.2	9 619.9	8 546.8	8 134.7	11 325.4	11 898.7	12 427.5	124 542.0
Boundary Lake North–													
Halfway	2 963.3	2 954.4	2 894.9	2 119.9	1 638.3	632.2	3 347.4	3 062.7	2 006.2	1 363.8	2 043.0	2 515.0	27 541.1
Halfway[1]	35.6	40.1	39.4	22.9	22.8	44.3	22.8	17.3	45.7	60.6	59.2	35.2	445.9
Totals	2 998.9	2 994.5	2 934.3	2 142.8	1 661.1	676.5	3 370.2	3 080.0	2 051.9	1 424.4	2 102.2	2 550.2	27 987.0
Bubbles–Baldonnel	1 682.8	5 710.7	5 611.8	5 211.2	4 256.3	795.0	2 714.6	----	585.2	4 274.3	4 985.2	5 976.7	41 803.8

[1] Associated gas.

Table 4-8—Monthly Nonassociated and Associated Gas Production by Fields and Pools, 1979—Continued

Field and Pool	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Buick Creek—													
Bluesky	3 940.5	3 471.0	3 736.5	3 801.1	4 140.0	3 683.0	2 813.5	669.2	840.5	1 596.2	2 815.4	3 591.2	35 098.1
Gething	768.7	469.1	622.2	548.2	517.3	497.8	466.1	430.8	399.3	382.7	430.2	362.7	5 895.1
Dunlevy	35 192.3	30 692.4	35 665.9	30 092.3	20 224.1	20 237.1	15 202.3	16 287.9	14 712.4	15 378.8	24 650.9	29 307.2	287 643.6
Dunlevy[1]	.....	.....	.....	.....	.....	10.7	17.3	27.9	21.8	32.2	17.7	.....	127.6
Doig[1]	1 643.1	1 432.9	1 467.9	819.2	533.3	1 520.3	898.6	284.6	.....	.....	.....	.....	8 599.9
Totals	41 544.6	36 065.4	41 492.5	35 260.8	25 414.7	25 948.9	19 397.8	17 700.4	15 974.0	17 389.9	27 914.2	33 261.1	337 364.3
Buick Creek North—													
Bluesky	5 201.5	5 675.9	5 949.2	4 070.3	3 902.6	3 265.3	3 555.7	3 713.0	3 572.9	3 307.2	4 443.6	5 141.3	51 798.5
Dunlevy	3 495.8	1 554.7	4 448.8	3 739.2	4 175.3	3 291.1	4 462.2	1 795.0	2 375.1	3 944.3	3 234.0	3 468.9	39 984.4
Totals	8 697.3	7 230.6	10 398.0	7 809.5	8 077.9	6 556.4	8 017.9	5 508.0	5 948.0	7 251.5	7 677.6	8 610.2	91 782.9
Buick Creek West—													
Bluesky	7 258.1	6 226.4	7 202.3	4 573.1	5 150.7	4 424.1	4 335.9	4 139.9	3 495.8	3 678.0	5 046.5	4 807.9	60 338.7
Dunlevy	3 709.7	3 074.1	3 118.2	3 345.2	3 984.7	3 211.6	4 643.6	2 596.3	2 825.2	3 241.1	2 825.2	3 727.2	40 302.1
Dunlevy[1]	.....	.....	48.2	.....	.....	44.4	9.3	8.9	5.9	.....	4.9	11.7	133.3
Baldonnel	215.2	181.9	312.7	275.2	292.4	184.4	201.4	213.1	254.0	267.6	208.9	255.0	2 861.8
Totals	11 183.0	9 482.4	10 681.4	8 193.5	9 427.8	7 864.5	9 190.2	6 958.2	6 580.9	7 186.7	8 085.5	8 801.8	103 635.9
Bulrush—Halfway[1]	1 586.2	1 146.0	1 767.8	2 101.1	2 503.7	2 199.8	1 365.4	1 958.5	1 558.8	1 089.9	711.8	1 474.9	19 463.9
Cabin—Slave Point	6 666.0	5 463.3	7 170.2	7 841.9	6 633.2	6 571.8	5 780.7	5 483.7	5 132.4	6 382.7	6 030.3	5 961.2	75 117.4
Cache Creek—													
Coplin	3 029.0	2 608.7	3 767.5	2 064.0	1 339.6	1 185.1	2 329.9	2 084.3	2 004.5	2 807.1	3 645.7	3 907.0	30 772.4
Halfway	2 997.3	2 692.8	5 201.9	3 106.1	3 678.9	1 056.0	2 257.3	2 860.4	1 926.3	1 828.9	7 279.7	5 975.7	40 861.3
Totals	6 026.3	5 301.5	8 969.4	5 170.1	5 018.5	2 241.1	4 587.2	4 944.7	3 930.8	4 636.0	10 925.4	9 882.7	71 633.7
Cecil Lake—													
Cecil	.....	713.0	.....	.....	421.3	977.8	1 049.1	1 497.8	1 218.7	918.7	565.4	245.6	7 607.4
Cecil[1]	22.5	17.5	27.2	12.4	25.7	31.3	27.8	31.2	33.9	33.1	32.6	34.7	329.9
North Pine	.....	247.5	1 096.2	356.2	2 113.8	2 399.7	2 293.9	2 188.3	2 251.4	2 297.7	2 310.5	2 413.3	19 968.5
North Pine[1]	102.9	392.1	445.0	506.2	702.4	716.8	819.2	847.5	713.0	869.8	665.2	576.3	7 356.4
Belloy[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	30.0	37.3	67.3
Totals	125.4	1 370.1	1 568.4	874.8	3 263.2	4 125.6	4 190.0	4 564.8	4 217.0	4 119.3	3 603.7	3 307.2	35 329.5
Clarke Lake—Slave Point	*160 454.4*	*135 761.5*	*123 964.2*	*126 042.0*	*62 429.4*	*111 636.0*	*90 890.9*	*91 105.3*	*101 293.7*	*777 775.2*	*115 027.1*	*180 132.0*	*1 376 511.7*
Crush—Halfway[1]	502.0	443.7	503.4	501.0	452.6	607.7	550.9	469.8	435.4	469.2	385.9	390.4	5 712.0
Currant—Halfway[1]	183.7	285.3	268.9	652.7	1 091.2	869.5	862.5	1 108.9	512.6	154.8	54.2	292.6	6 336.9
Currant West—Halfway	1 717.6	1 496.8	1 541.9	1 200.6	264.8	256.9	1 454.1	1 145.0	711.2	1 040.6	1 102.5	1 648.7	13 580.7
Dahl—Bluesky	14 598.4	15 044.2	19 796.9	20 433.1	16 129.2	17 119.1	12 036.4	10 401.2	7 490.6	12 822.7	19 064.2	19 398.0	184 334.0
Dilly—Slave Point	2 571.3	2 354.8	2 588.7	2 714.7	2 999.1	3 745.4	3 358.7	1 152.6	.....	.....	.....	.....	21 485.3
Eagle—													
Siphon[1]	28.6	19.8	19.2	16.2	14.2	15.3	16.4	37.5	24.0	16.5	26.9	30.1	264.7
Cecil	1 584.9	1 198.1	1 506.1	1 049.8	1 084.4	858.4	891.9	1 118.5	820.6	916.5	1 197.8	1 041.5	13 268.5
Belloy[1]	2 604.2	2 328.7	2 730.2	3 167.6	3 400.9	3 298.2	3 218.4	3 411.8	3 377.4	4 692.6	3 101.2	2 904.4	38 235.6
Belloy	.....	.....	200.5	5.0	.....	.....	92.8	1 080.1	1 128.7	1 246.2	933.9	.....	4 687.2
Lower Belloy	238.7	198.2	188.9	82.1	26.0	8.9	91.9	76.9	427.5	426.2	494.3	67.0	2 326.6
Totals	4 456.4	3 744.8	4 644.9	4 320.7	4 525.5	4 180.8	4 311.4	5 724.8	5 778.2	7 298.0	5 754.1	4 043.0	58 782.6
Farrell Creek—													
Charlie Lake	2 127.6	1 985.7	2 435.8	2 353.2	2 370.8	877.7	187.7	40.0	59.7	1 483.7	1 981.0	2 223.7	18 126.6
Halfway	960.3	758.0	966.8	765.6	708.5	183.9	800.7	560.0	898.9	834.5	762.1	761.8	8 961.1
Totals	3 087.9	2 743.7	3 402.6	3 118.8	3 079.3	1 061.6	988.4	600.0	958.6	2 318.2	2 743.1	2 985.5	27 087.7

Fireweed–													
Bluesky	4 089.1	4 121.8	3 307.3	2 432.5	2 752.7	1 978.3	2 706.8	3 021.1	2 040.7	1 859.5	3 752.4	1 673.1	33 735.3
Dunlevy	14 546.9	13 933.3	15 093.6	12 235.8	11 923.3	5 040.1	8 983.6	9 425.2	7 815.5	8 360.3	13 759.8	13 152.1	134 269.5
Dunlevy[1]	6.2	16.6	22.7	21.9	3.0	23.4	20.3	11.6	14.2	12.2	13.3	18.6	184.0
Baldonnel	209.0	177.8	168.3	159.8	191.7	36.4	173.7	162.4	97.4	172.8	147.5	28.2	1 725.0
Doig	.....	.....	.....	.....	.....	.....	.....	207.2	322.6	637.0	286.0	237.0	1 689.8
Totals	18 851.2	18 249.5	18 591.9	14 850.0	14 870.7	7 078.2	11 884.4	12 827.5	10 290.4	11 041.8	17 959.0	15 109.0	171 603.6
Flatrock–													
Siphon	2 500.5	3 517.7	2 770.5	3 956.6	2 983.2	1 185.4	1 381.1	1 184.3	1 225.6	1 156.0	2 543.0	3 586.7	27 990.6
Boundary Lake[1]	11.3	4.8	14.6	14.6	17.0	19.2	17.1	12.7	15.1	8.5	15.8	25.6	176.3
Halfway	5 493.2	4 743.2	4 293.6	4 622.1	4 384.1	1 358.6	2 937.3	2 473.5	2 375.9	2 870.4	4 434.8	4 836.8	44 823.5
Halfway[1]	141.4	133.3	109.2	.....	.....	62.9	170.6	.....	.....	52.4	50.6	1.1	721.5
Totals	8 146.4	8 399.0	7 187.9	8 593.3	7 384.3	2 626.1	4 506.1	3 670.5	3 616.6	4 087.3	7 044.2	8 450.2	73 711.9
Flatrock West–Halfway	2 578.4	1 992.3	2 080.6	1 711.8	1 719.7	913.9	1 401.5	1 707.0	1 379.1	1 525.5	2 032.7	1 806.3	20 848.8
Fort St. John–													
Baldonnel	3 627.6	3 123.6	3 101.1	2 880.9	2 919.1	974.4	3 249.0	4 235.1	2 706.9	4 186.5	3 685.8	3 667.9	38 357.9
Charlie Lake[1]	1 241.2	1 364.0	978.6	974.6	1 009.9	529.1	959.2	1 231.3	1 449.1	1 538.3	1 462.5	1 327.3	14 065.1
Halfway	2 902.2	6 017.5	6 041.4	5 956.1	5 687.8	2 955.9	4 623.1	4 981.1	4 163.2	5 665.8	5 262.3	4 875.1	59 131.5
Belloy	612.5	617.9	686.2	653.5	630.7	185.1	619.5	680.2	419.7	616.3	580.4	543.5	6 845.5
Totals	8 383.5	11 123.0	10 807.3	10 465.1	10 247.5	4 644.5	9 450.8	11 127.7	8 738.9	12 006.9	10 991.0	10 413.8	118 400.0
Fort St. John Southeast–													
Baldonnel	1 193.4	827.0	1 108.5	1 002.8	417.4	.....	663.0	467.5	.....	.....	.....	1 432.0	7 111.6
Siphon	2 196.4	1 928.0	2 393.4	1 746.4	692.6	.....	.....	354.4	.....	.....	.....	1 599.4	10 910.6
Halfway	1 468.6	1 552.9	1 446.5	1 361.8	485.5	.....	1 064.1	834.5	.....	.....	.....	1 174.9	9 388.8
Belloy	2 409.3	1 996.2	1 224.3	808.4	388.7	.....	1 557.7	930.2	.....	.....	.....	1 947.8	11 262.6
Totals	7 267.7	6 304.1	6 172.7	4 919.4	1 984.2	.....	3 284.8	2 586.6	.....	.....	.....	6 154.1	38 673.6
Goose–North Pine	2 971.6	2 726.8	2 507.1	1 855.9	2 053.3	1 013.1	1 634.9	1 124.1	1 073.1	379.1	.....	.....	17 339.0
Gote–Sulphur Point	4 070.7	4 400.9	3 433.9	3 842.0	2 107.6	.....	1 637.4	2 353.2	3 049.8	3 471.8	4 291.3	3 737.5	36 396.1
Graham–													
Dunlevy	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	74.9	279.2	354.1
Debolt	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	401.4	3 291.2	3 692.6
Totals	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	476.3	3 570.4	4 046.7
Grizzly North–Dunlevy	3 840.6	3 301.4	3 576.8	3 733.5	4 977.7	4 465.5	4 221.0	4 424.2	3 861.1	5 859.2	6 470.4	5 946.1	54 677.5
Grizzly South–													
Dunlevy	14 972.7	14 437.4	13 148.5	13 514.5	12 348.9	9 947.5	7 894.5	7 710.3	6 820.1	6 746.7	5 687.9	5 161.3	118 390.3
Halfway	58.7	174.2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	232.9
Totals	15 031.4	14 611.6	13 148.5	13 514.5	12 348.9	9 947.5	7 894.5	7 710.3	6 820.1	6 746.7	5 687.9	5 161.3	118 623.2
Gundy Creek–													
Dunlevy	65.6	53.3	67.5	57.9	54.4	36.7	60.7	61.0	50.3	55.7	41.3	39.9	644.3
Baldonnel	2 032.5	1 756.5	1 937.0	1 852.5	1 808.6	1 689.7	1 672.8	1 594.2	1 799.7	1 756.7	1 589.8	1 671.0	21 161.0
Totals	2 098.1	1 809.8	2 004.5	1 910.4	1 863.0	1 726.4	1 733.5	1 655.2	1 850.0	1 812.4	1 631.1	1 710.9	21 805.3
Gundy Creek West–													
Dunlevy	3 152.8	2 629.2	2 786.1	2 245.5	2 597.5	1 609.7	1 479.8	1 178.5	2 018.9	2 056.4	1 534.4	1 545.2	24 834.0
Baldonnel	1 805.2	1 237.0	1 282.3	1 252.1	1 048.2	767.3	779.2	545.9	1 732.7	2 252.2	2 435.6	2 320.0	17 457.7
Totals	4 958.0	3 866.2	4 068.4	3 497.6	3 645.7	2 377.0	2 259.0	1 724.4	3 751.6	4 308.6	3 970.0	3 865.2	42 291.7
Helmet–													
Jean Marie	916.6	659.6	737.9	1 196.2	1 196.6	1 196.9	1 000.6	1 262.7	1 110.3	934.8	997.4	1 072.6	12 282.2
Slave Point	48 678.4	42 014.3	42 776.0	37 761.5	27 915.6	24 579.9	24 859.0	25 363.4	34 600.6	43 885.1	41 813.9	42 976.7	437 224.4
Totals	49 595.0	42 673.9	43 513.9	38 957.7	29 112.2	25 776.8	25 859.6	26 626.1	35 710.9	44 819.9	42 811.3	44 049.3	449 506.6

[1] Associated gas.

Table 4-8—Monthly Nonassociated and Associated Gas Production by Fields and Pools, 1979—Continued

Field and Pool	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Inga—													
Gething	277.3	261.4	248.1	278.5	261.6	149.9	222.6	188.9	172.2	201.1	183.0	220.4	2 665.0
Dunlevy	3 294.2	3 120.1	3 865.5	2 073.0	1 949.7	673.7	1 028.9	1 692.7	1 725.5	3 173.3	3 284.6	3 451.0	29 332.2
Coplin	1 691.8	1 563.7	1 715.6	1 003.4	914.1	612.4	1 176.6	1 478.2	663.8	825.7	1 311.6	1 563.9	14 520.8
Inga	18 333.9	15 792.7	15 942.1	15 561.3	13 931.1	3 365.9	9 040.7	7 511.6	9 015.0	14 326.2	15 551.5	16 549.7	154 921.7
Inga[1]	5 375.1	4 844.2	5 360.4	4 969.3	5 053.4	4 184.4	5 327.7	5 124.5	4 901.2	4 540.6	4 332.6	4 255.5	58 268.9
Totals	28 972.3	25 582.1	27 131.7	23 885.5	22 109.9	8 986.3	16 796.5	15 995.9	16 477.7	23 066.9	24 663.3	26 040.5	259 708.6
Jedney—													
Baldonnel	15 675.8	12 915.0	16 234.4	15 959.0	12 880.9	4 553.7	8 766.0	8 050.1	10 762.0	14 362.5	13 536.8	15 102.4	148 798.6
Halfway	12 094.1	9 456.4	13 795.2	13 344.1	11 220.0	3 323.3	8 270.2	3 762.0	4 900.1	8 318.7	9 105.2	9 652.3	107 241.6
Totals	27 769.9	22 371.4	30 029.6	29 303.1	24 100.9	7 877.0	17 036.2	11 812.1	15 662.1	22 681.2	22 642.0	24 754.7	256 040.2
Julienne Creek—Halfway	706.3	558.9	652.4	652.4	671.8	264.7	723.7	.....	.....	367.1	713.3	577.5	5 888.1
Julienne Creek North—Debolt	3 202.1	3 460.0	3 479.5	1 596.7	1 453.4	1 610.6	1 438.3	1 558.4	1 489.0	758.6	2 278.4	3 719.4	26 044.4
Julienne Creek South—Debolt	1 523.1	1 301.7	1 323.2	1 083.5	1 276.4	1 002.2	950.2	844.7	711.9	820.7	556.2	526.3	11 920.1
Klua—													
Debolt	81.3	5.7	45.2	46.2	27.9	1.2	32.9	36.5	20.4	23.2	51.8	47.3	419.6
Slave Point	18 055.0	13 725.5	17 876.6	15 068.3	8 091.9	10 240.9	5 958.3	6 078.0	6 634.8	10 411.1	15 656.1	7 461.0	135 257.5
Pine Point	9 163.5	6 438.2	8 969.5	3 590.5	4 193.6	5 001.5	5 143.0	5 737.2	3 296.6	638.7	9 277.3	10 599.0	72 048.6
Totals	27 299.8	20 169.4	26 891.3	18 705.0	12 313.4	15 243.6	11 134.2	11 851.7	9 951.8	11 073.0	24 985.2	18 107.3	207 725.7
Kobes—Townsend—													
Dunlevy	478.1	473.9	510.6	402.2	419.6	67.7	207.3	136.5	52.6	240.0	532.5	564.6	4 085.6
Charlie Lake	5 096.4	1 333.0	4 286.3	1 185.8	1 188.4	210.7	399.2	342.9	133.5	1 440.7	974.4	905.0	17 496.3
Halfway	5 913.3	7 942.1	5 998.6	8 130.3	6 094.2	1 796.1	4 925.2	4 389.5	6 775.0	8 734.5	8 538.6	6 375.9	75 613.3
Debolt	2 152.1	1 831.4	1 997.6	1 661.1	1 941.8	674.0	2 082.9	1 898.5	1 131.4	1 856.6	1 738.7	1 638.2	20 604.3
Totals	13 639.9	11 580.4	12 793.1	11 379.4	9 644.0	2 748.5	7 614.6	6 767.4	8 092.5	12 271.8	11 784.2	9 483.7	117 799.5
Kotcho Lake—Slave Point	8 970.7	11 560.2	8 408.6	6 629.2	6 577.9	7 719.8	7 375.8	8 207.2	7 191.8	7 303.8	6 486.2	5 729.8	92 161.0
Kotcho Lake East—													
Bluesky	589.5	233.9	804.0	931.1	176.2	.....	.....	.....	.....	.....	855.4	752.6	4 342.7
Slave Point	9 237.4	6 529.0	12 670.8	10 400.0	8 405.0	8 450.1	6 571.5	7 949.9	9 123.5	5 374.2	8 769.9	10 083.8	103 565.1
Totals	9 826.9	6 762.9	13 474.8	11 331.1	8 581.2	8 450.1	6 571.5	7 949.9	9 123.5	5 374.2	9 625.3	10 836.4	107 907.8
Laprise Creek—													
Gething	193.0	130.7	.....	127.1	168.2	174.0	157.1	.....	.....	.....	28.3	.....	978.4
Baldonnel	64 207.4	58 870.9	58 468.0	58 777.1	50 411.3	58 901.8	28 084.5	30 485.1	44 864.1	47 436.7	60 140.0	60 549.4	621 196.3
Nancy	864.9	847.8	907.7	886.8	936.9	843.5	504.7	761.8	586.8	754.9	726.4	756.6	9 378.8
Totals	65 265.3	59 849.4	59 375.7	59 791.0	51 516.4	59 919.3	28 746.3	31 246.9	45 450.9	48 191.6	60 894.7	61 306.0	631 553.5
Laprise Creek West—Baldonnel	818.9	528.7	.....	.....	.....	.....	.....	.....	.....	.....	588.0	393.6	2 329.2
Louise—Slave Point	1 917.5	1 460.1	1 451.8	1 291.1	1 321.0	1 221.2	1 333.4	1 441.5	1 726.3	1 263.0	1 429.0	1 480.3	17 336.2
Martin—													
Baldonnel	.....	.....	75.2	.....	.....	.....	.....	.....	.....	.....	.....	.....	75.2
A—Marker	19.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	19.5
Totals	19.5	.....	75.2	.....	.....	.....	.....	.....	.....	.....	.....	.....	94.7
Mica—													
Boundary Lake[1]	12.3	18.0	12.0	20.4	11.7	26.6	15.1	10.4	17.7	19.3	13.2	8.0	184.7
Mica	.....	.....	.....	.....	.....	.....	122.0	.....	.....	.....	.....	.....	122.0
Mica[1]	145.5	112.2	118.0	104.4	50.2	229.3	155.4	226.2	199.7	184.5	137.4	138.2	1 801.0
Totals	157.8	130.2	130.0	124.8	61.9	255.9	292.5	236.6	217.4	203.8	150.6	146.2	2 107.7

(2)													
Mike–Gething	185.3	164.4	215.9	56.9	.....	.....	.....	.....	.....	.....	.....	85.3	707.8
Milligan Creek–													
Gething	141.0	145.4	138.8	146.7	161.5	100.8	180.8	113.5	91.3	147.9	113.1	118.2	1 599.0
Halfway[1]	363.8	303.1	327.0	206.5	487.3	417.7	336.4	310.5	474.1	463.6	305.8	440.8	4 436.6
Totals	504.8	448.5	465.8	353.2	648.8	518.5	517.2	424.0	565.4	611.5	418.9	559.0	6 035.6
Montney–Halfway	4.7	1.6	7.9	.....	.....	15.9	14.9	8.8	.....	6.0	13.0	53.4	126.2
Nettle–Halfway	1 234.8	735.0	968.1	1 332.6	1 639.6	481.0	1 399.2	958.3	1 612.3	770.6	1 697.6	1 287.4	14 116.5
Nig Creek–													
Gething	.....	103.3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	103.3
Baldonnel	20 814.9	17 613.0	16 440.6	19 824.8	11 262.4	6 873.8	17 150.0	6 530.2	9 460.3	14 299.6	20 417.3	21 037.8	181 724.7
Baldonnel[1]	6.0	3.6	11.6	.....	0.8	14.9	2.0	21.5	16.3	3.9	.....	.....	80.6
Totals	20 820.9	17 719.9	116 452.2	19 824.8	11 263.2	6 888.7	17 152.0	6 551.7	9 476.6	14 303.5	20 417.3	21 037.8	181 908.6
North Pine–													
North Pine	1 020.2	614.6	693.4	868.5	973.7	879.5	679.3	.....	259.9	771.8	767.9	679.1	8 207.9
North Pine[1]	.....	.....	.....	.....	.....	56.2	277.7	348.1	52.8	264.6	252.5	266.2	1 518.1
Totals	1 020.2	614.6	693.4	868.5	973.7	935.7	957.0	348.1	312.7	1 036.4	1 020.4	945.3	9 726.0
Oak–													
Cecil	7.2	9.8	7.4	7.8	3.1	3.2	5.1	5.1	1.2	.....	.....	.....	49.9
Halfway	5 325.2	6 647.6	5 667.6	4 519.8	4 830.7	1 906.5	4 091.8	4 326.5	4 215.5	6 215.2	7 400.7	8 215.0	63 362.1
Halfway[1]	269.2	85.6	154.4	197.5	217.0	177.0	243.7	211.4	113.0	160.7	200.2	303.7	2 333.4
Totals	5 601.6	6 743.0	5 829.4	4 725.1	5 050.8	2 086.7	4 340.6	4 543.0	4 329.7	6 375.9	7 600.9	8 518.7	65 745.4
Osprey–													
Bluesky	.....	.....	.....	.....	.....	.....	512.3	1 980.5	510.5	848.3	1 873.2	2 004.8	7 729.6
Gething	.....	570.7	167.9	.....	.....	.....	117.6	495.9	7.0	180.7	.....	200.0	1 739.8
Halfway[1]	371.1	210.4	246.5	229.8	325.5	234.9	267.3	221.1	366.3	341.2	264.4	319.1	3 397.6
Totals	371.1	781.1	414.4	229.8	325.5	234.9	897.2	2 697.5	883.8	1 370.2	2 137.6	2 523.9	12 867.0
Paradise–Halfway	791.7	429.3	664.3	342.5	598.3	260.6	408.9	146.7	545.3	187.8	.....	.....	4 375.4
Parkland–													
Mica	.....	.....	.....	.....	.....	.....	.....	8.2	.....	.....	.....	.....	8.2
Wabamum	8 962.7	9 647.7	9 607.5	9 318.9	9 026.0	8 537.1	9 160.0	9 256.5	9 994.3	11 464.7	10 784.1	11 068.6	116 828.1
Confidential	.....	.....	.....	.....	.....	.....	.....	233.3	.....	.....	.....	.....	233.3
Totals	8 962.7	9 647.7	9 607.5	9 318.9	9 026.0	8 537.1	9 160.0	9 498.0	9 994.3	11 464.7	10 784.1	11 068.6	117 069.6
Peejay–													
Gething	953.7	871.0	864.4	904.4	873.0	812.9	597.9	760.2	891.4	778.5	738.9	864.2	9 910.5
Baldonnel	1 980.7	1 754.1	1 623.4	1 741.7	1 692.3	1 430.8	1 003.8	1 257.4	1 405.3	1 472.4	1 403.7	1 296.3	18 061.9
Halfway	3 686.0	3 503.5	2 936.6	3 007.4	3 029.4	1 844.4	1 664.0	2 166.4	2 814.4	3 431.9	3 227.2	2 789.4	34 100.6
Halfway[1]	1 496.1	966.8	1 199.9	1 298.0	1 409.8	1 160.0	1 014.9	1 229.3	1 298.0	1 416.4	1 464.5	1 397.0	15 350.7
Totals	8 116.5	7 095.4	6 624.3	6 951.5	7 004.5	5 248.1	4 280.6	5 413.3	6 409.1	7 099.2	6 834.3	6 346.9	77 423.7
Peejay West–Halfway[1]	53.2	1 786.7	1 361.8	1 671.6	1 781.5	1 288.3	1 428.2	1 057.2	1 345.7	2 020.9	1 893.7	1 590.3	17 279.1
Petitot River–Slave Point	5 085.9	4 926.9	5 294.4	4 944.7	5 331.8	5 090.4	4 698.0	4 164.3	2 808.8	6 026.3	6 043.2	4 561.3	58 976.0
Red Creek–Halfway	1 193.8	1 211.0	1 172.7	502.5	.....	.....	446.8	834.3	109.1	400.6	287.4	393.8	6 552.0
Rigel–													
Bluesky	242.5	387.6	183.9	182.9	175.1	59.8	86.3	187.0	289.1	307.5	233.8	335.7	2 671.2
Gething	.....	.....	.....	.....	.....	.....	1 269.5	11.1	.....	62.0	1 185.7	.....	2 528.3
Dunlevy	34 622.8	31 293.6	24 395.7	30 941.2	16 361.7	18 435.0	9 898.5	18 828.8	18 333.5	17 342.9	26 449.8	36 276.5	283 180.0
Dunlevy[1]	860.9	751.8	640.8	558.3	233.7	681.9	638.6	660.0	446.1	519.8	1 084.0	1 018.3	8 094.2
Lower Dunlevy	.....	.....	940.7	.....	.....	.....	.....	.....	.....	.....	523.6	148.1	1 612.4
Totals	35 726.2	32 433.0	26 161.1	31 682.4	16 770.5	19 176.7	11 892.9	19 686.9	19 068.7	18 232.2	29 476.9	37 778.6	298 086.1
Rigel East–Gething	2 418.3	1 708.0	2 317.0	1 895.4	1 383.0	1 721.4	1 754.1	751.5	1 143.2	1 092.8	2 045.9	4 001.5	22 232.1
Roger–Pine Point	27 367.8	24 353.0	19 996.5	23 713.1	11 458.7	15 940.2	18 986.9	14 780.6	21 215.3	23 922.7	27 482.0	28 302.3	257 519.1
Sahtaneh–Slave Point	.....	.....	.....	.....	.....	.....	.....	.....	1 059.3	4 468.9	4 675.6	686.1	10 889.9
Sierra–Slave Point	95 972.6	95 353.6	72 973.7	74 278.6	66 496.0	90 922.5	82 718.5	55 845.2	56 054.7	45 507.6	64 454.3	112 254.5	912 831.8

[1] Associated gas.

Table 4-8—Monthly Nonassociated and Associated Gas Production by Fields and Pools, 1979—Continued

Field and Pool	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Silver–													
Bluesky	13 369.6	11 988.1	13 383.0	13 429.1	10 048.3	10 147.0	7 748.9	7 030.2	7 612.5	10 548.5	15 519.3	16 701.6	137 526.1
Halfway	1 786.2	1 674.3	779.5	500.7	398.3	534.5	729.0	657.9	435.9	1 368.7	756.3	1 107.0	10 728.3
Totals	15 155.8	13 662.4	14 162.5	13 929.8	10 446.6	10 681.5	8 477.9	7 688.1	8 048.4	11 917.2	16 275.6	17 808.6	148 254.4
Silverberry–North Pine	1 393.6	537.1	1 182.7	1 286.4	898.2	2 261.1	599.0	823.2	955.3	839.1	1 042.0	1 212.8	13 030.5
Siphon–													
Dunlevy	9 849.6	7 823.4	7 013.5	4 234.5	2 671.6	680.1	6 330.9	6 046.6	4 207.6	5 858.2	6 090.1	7 285.1	68 091.2
Baldonnel	64.2	9.0	66.0	63.8	389.7	79.9	186.6	183.9	268.8	148.2	101.3	122.0	1 683.4
Siphon	1 554.3	1 246.9	2 024.1	1 686.1	969.9	902.6	1 257.3	1 615.6	1 129.8	1 401.2	1 277.0	1 452.4	16 517.2
Halfway	3 036.2	2 877.9	2 442.9	1 377.6	885.2	94.7	2 628.9	2 473.3	1 735.2	2 548.5	2 908.2	3 045.2	26 053.8
Totals	14 504.3	11 957.2	11 546.5	7 362.0	4 916.4	1 757.3	10 403.7	10 319.4	7 341.4	9 956.1	10 376.6	11 904.7	112 345.6
Siphon East–													
Bluesky	5 262.6	4 314.0	4 265.4	2 366.3	1 295.4	1 814.4	4 212.4	4 479.1	2 150.4	3 018.0	3 774.3	4 830.5	41 782.8
Baldonnel	9.5	.....	10.1	9.3	2.0	6.5	14.8	8.8	4.5	1 482.1	12.2	14.9	1 574.7
Totals	5 272.1	4 314.0	4 275.5	2 375.6	1 297.4	1 820.9	4 227.2	4 487.9	2 154.9	4 500.1	3 786.5	4 845.4	43 357.5
Stoddart–													
Cecil[1]	89.3	81.6	70.4	83.7	105.9	56.7	86.3	69.9	49.9	100.0	81.7	68.7	944.1
North Pine	.....	151.5	135.7	133.2	135.1	87.4	122.5	.....	163.4	84.9	.....	.....	1 013.7
Belloy	27 616.1	23 785.8	25 228.5	24 540.3	25 608.8	22 179.5	20 317.6	13 447.0	23 168.2	26 804.6	28 869.8	28 139.6	289 705.8
Belloy[1]	78.7	105.7	53.2	54.0	126.8	136.4	151.2	151.7	165.3	232.6	80.9	73.2	1 409.7
Totals	27 784.1	24 124.6	25 487.8	24 811.2	25 976.6	22 460.0	20 677.6	13 668.6	23 546.8	27 222.1	29 032.4	28 281.5	293 073.3
Stoddart South–Belloy[1]	55.0	45.9	17.9	.....	2.5	55.4	77.4	89.5	94.8	77.0	147.6	164.8	827.8
Stoddart West–													
Cecil	1 801.8	1 560.6	1 669.2	231.8	37.4	15.6	.....	.....	.....	.....	670.8	187.8	6 175.0
Belloy	8 100.9	7 619.7	9 049.2	9 236.0	8 611.1	7 246.6	6 345.2	5 895.5	5 694.0	7 243.2	7 188.3	8 307.2	90 536.9
Belloy[1]	3 552.1	601.6	938.9	352.9	395.6	679.7	978.6	1 126.9	1 692.6	624.7	968.1	718.2	12 629.9
Totals	13 454.8	9 781.9	11 657.3	9 820.7	9 044.1	7 941.9	7 323.8	7 022.4	7 386.6	7 867.9	8 827.2	9 213.2	109 341.8
Sunrise–Cadotte	308.4	248.6	297.5	277.9	280.9	268.7	133.6	209.7	301.8	405.6	431.1	355.9	3 519.7
Town–													
Baldonnel	1 343.8	1 201.9	1 263.1	732.2	1 123.2	323.2	779.6	822.3	763.1	750.2	1 086.8	1 057.0	11 246.4
Halfway	1 882.9	2 196.0	1 940.0	1 350.7	1 630.9	395.9	1 128.6	1 470.8	908.7	1 082.5	2 239.0	1 826.6	18 052.6
Totals	3 226.7	3 397.9	3 203.1	2 082.9	2 754.1	719.1	1 908.2	2 293.1	1 671.8	1 832.7	3 325.8	2 883.6	29 299.0
Tsea–Slave Point	3 070.0	3 306.7	1 690.0	1 814.9	2 715.2	2 856.3	3 291.3	2 531.8	1 928.1	3 269.0	2 710.7	2 406.9	31 590.9
Two Rivers–													
Halfway	3 312.1	2 900.7	3 134.9	3 000.0	2 697.5	719.2	2 096.3	1 980.1	1 149.2	2 040.6	2 565.4	2 840.2	28 436.2
Halfway[1]	38.3	11.5	75.6	.....	30.1	51.3	52.4	108.5	113.2	149.6	150.7	209.0	990.2
Totals	3 350.4	2 912.2	3 210.5	3 000.0	2 727.6	770.5	2 148.7	2 088.6	1 262.4	2 190.2	2 716.1	3 049.2	29 426.4
Velma–													
Gething	6 073.0	4 518.5	7 102.4	5 933.6	4 576.7	2 074.1	1 975.0	2 553.6	3 587.2	4 045.6	7 272.9	8 945.8	58 658.4
A–Marker	1 946.2	2 520.6	3 226.3	3 353.7	3 052.9	2 025.6	3 699.7	2 460.2	1 106.6	1 225.4	2 413.5	2 181.0	29 211.7
Totals	8 019.2	7 039.1	10 328.7	9 287.3	7 629.6	4 099.7	5 674.7	5 013.8	4 693.8	5 271.0	9 686.4	11 126.8	87 870.1
Weasel–													
Baldonnel	65.7	57.5	47.2	49.3	43.8	37.2	33.5	37.2	34.7	44.1	67.2	88.6	606.0
Halfway[1]	750.9	641.7	660.9	671.8	734.7	619.1	659.6	946.5	574.0	539.8	515.4	579.5	7 893.9
Totals	816.6	699.2	708.1	721.1	778.5	656.3	693.1	983.7	608.7	583.9	582.6	668.1	8 499.9
Weasel West–Halfway[1]	86.2	68.8	86.8	52.9	84.4	79.7	52.2	86.6	55.3	70.3	74.2	65.5	862.9
Wilder–Halfway	7 921.2	7 097.1	4 810.0	6 917.1	6 767.9	1 783.9	4 866.7	4 426.7	3 997.3	7 177.3	7 691.8	8 346.2	71 083.2

Wildmint–													
Bluesky	161.7	176.4	186.2	156.7	151.2	145.1	131.9	143.8	150.5	156.8	166.8	178.6	1 905.7
Halfway	82.3	109.9	168.7	35.7	52.3	2.1	8.6	107.3	95.1	104.1	28.6	45.3	840.0
Halfway[1]	1 181.9	373.1	549.1	503.0	393.3	477.3	364.8	374.9	351.6	384.3	343.3	328.8	5 625.4
Totals	1 425.9	659.4	904.0	695.4	596.8	624.5	505.3	626.0	597.2	645.2	538.7	552.7	8 371.1
Willow–													
Gething[1]	206.4	195.7	214.3	195.6	211.0	180.8	190.8	204.8	152.8	200.2	189.5	196.8	2 338.7
Halfway	2 093.8	2 749.4	2 803.9	1 067.9	2 838.7	1 067.2	2 376.4	3 021.7	2 078.3	4 274.6	3 841.1	3 847.4	32 060.4
Totals	2 300.2	2 945.1	3 018.2	1 263.5	3 049.7	1 248.0	2 567.2	3 226.5	2 231.1	4 474.8	4 030.6	4 044.2	34 399.1
Wolf–Halfway[1]	135.1	88.3	217.7	217.8	311.4	275.7	202.2	229.6	159.3	156.8	145.9	142.6	2 282.4
Wolverine–Dunlevy	2 563.3	1 580.2	1 108.8	873.1	780.9	125.2	555.8	587.2	520.9	523.0	458.8	447.3	10 124.5
Woodrush–Halfway	4 539.1	3 829.1	3 959.6	1 977.3	1 617.8	1 717.7	1 770.9	1 908.4	1 876.4	3 332.0	2 498.0	3 692.6	32 718.9
Yoyo–Pine Point	195 442.2	180 403.8	153 467.5	163 736.7	122 452.9	152 073.6	149 628.5	107 343.1	116 381.0	149 247.1	200 591.8	187 677.3	1 878 445.5
Other Areas–													
Bluesky	.....	.....	158.5	970.2	686.9	988.1	988.5	1 062.8	178.5	910.1	1 039.1	1 063.5	8 046.2
Gething	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dunlevy	1 196.3	1 123.5	1 255.1	1 146.5	1 041.7	860.6	1 202.6	481.9	923.6	914.6	1 288.9	1 194.0	12 629.3
Baldonnel	.....	6.5	33.5	.....	.....	.....	.....	.....	.....	.....	1 297.3	2 457.6	3 794.9
Baldonnel[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cecil[1]	.....	.....	.....	.....	.....	.....	.....	18.5	4.7	.....	13.5	8.6	45.3
Inga	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 414.8	2 077.4	3 492.2
North Pine	.....	.....	.....	.....	.....	.....	.....	29.5	.....	.....	.....	.....	29.5
North Pine[1]	.....	.....	.....	.....	.....	.....	55.4	45.7	40.0	39.1	31.0	32.1	243.3
A–Marker	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Halfway	708.3	79.1	26.2	1 327.1	375.0	855.9	219.0	945.7	611.4	54.5	467.7	181.6	5 851.5
Halfway[1]	1.5	12.4	18.3	4.2	10.2	14.0	15.8	12.8	5.9	5.7	2.9	5.9	109.6
Doig	.....	.....	16.3	.....	.....	.....	.....	112.6	.....	.....	.....	.....	128.9
Doig[1]	19.1	.....	.....	9.8	.....	221.7	150.6	103.5	11.9	86.7	.....	.....	603.3
Bellov[1]	.....	.....	.....	6.6	.....	2.1	9.2	20.5	17.9	65.6	1.3	18.3	141.5
Upper Kiskatinaw	369.8	2 259.4	2 552.5	1 806.5	1 401.4	1 417.6	1 459.5	1 470.6	989.1	2 424.2	576.5	.....	16 727.1
Debolt	.....	.....	.....	85.2	.....	.....	.....	.....	.....	.....	.....	.....	85.2
Slave Point	1 394.1	1 277.1	1 387.9	1 103.8	1 118.7	597.0	791.0	835.0	595.2	1 032.8	863.1	680.4	11 616.1
Sulphur Point	1 098.4	1 005.5	1 140.3	886.7	675.2	730.5	702.1	621.3	483.5	914.5	900.0	610.5	9 768.5
Pine Point	.....	.....	.....	.....	.....	.....	.....	.....	840.3	24 925.5	16 307.7	17 901.5	59 975.0
Confidential	1 824.4	1 466.4	2 064.3	1 409.2	1 170.7	574.9	1 282.5	2 133.9	666.4	534.1	484.8	758.3	14 369.9
Confidential[1]	.....	.....	.....	.....	.....	.....	.....	.....	1.6	71.7	207.0	8.7	289.0
Totals	6 611.9	7 169.9	8 652.9	8 755.8	6 479.8	6 262.4	6 876.2	7 894.3	5 370.0	31 979.1	24 895.6	26 998.4	147 946.3
Totals–													
Nonassociated gas	**1 159 426.8**	**1 054 878.8**	**1 028 121.0**	**990 895.4**	**769 639.0**	**762 105.7**	**762 843.3**	**662 640.6**	**695 977.3**	**825 202.8**	**1 057 473.7**	**1 179 565.9**	**10 948 770.3**
Associated gas	**40 529.3**	**34 856.6**	**38 162.7**	**37 151.8**	**39 803.7**	**38 320.1**	**42 176.2**	**42 113.1**	**35 831.3**	**40 579.9**	**36 348.8**	**36 984.9**	**462 858.4**
Totals	**1 199 956.1**	**1 089 735.4**	**1 066 283.7**	**1 028 047.2**	**809 442.7**	**800 425.8**	**805 019.5**	**704 753.7**	**731 808.6**	**865 782.7**	**1 093 822.5**	**1 216 550.8**	**11 411 628.7**

[1] Associated gas.

Table 4-9—Monthly Supply and Disposition of Crude Oil/Pentanes Plus, 1979 (Volumes in m³ at 15° C)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Supply													
British Columbia production—													
Crude oil	179 693.5	151 568.2	181 061.2	174 982.4	182 842.8	181 131.5	188 141.2	198 808.9	159 541.7	187 748.7	176 436.0	178 006.8	2 139 962.9
Field condensate	3 315.5	3 013.6	3 511.2	3 073.7	2 466.7	1 719.9	2 555.3	2 156.1	2 496.8	2 522.3	2 783.9	2 934.0	32 549.0
Plant condensate	17 062.0	15 390.8	17 605.6	17 381.4	15 500.5	12 729.4	13 029.6	12 174.4	11 754.5	15 598.3	17 826.3	18 345.0	184 397.8
Total British Columbia	200 071.0	169 972.6	202 178.0	195 437.5	200 810.0	195 580.8	203 726.1	213 139.4	173 793.0	205 869.3	197 046.2	199 285.8	2 356 909.7
Alberta imports—													
Pipeline	569 379.3	678 486.7	800 877.8	761 752.9	621 146.1	758 862.9	838 634.0	778 753.5	732 156.2	862 625.8	676 839.5	856 234.7	8 935 749.4
Rail	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	419.0	419.0
Total Alberta	569 379.3	678 486.7	800 877.8	761 752.9	621 146.1	758 862.9	838 624.0	778 753.5	732 156.2	862 625.8	676 839.5	856 653.7	8 936 168.4
Total supply	**769 450.3**	**848 459.3**	**1 003 055.8**	**957 190.4**	**821 956.1**	**954 443.7**	**1 042 360.1**	**991 892.9**	**905 949.2**	**1 068 495.1**	**873 885.7**	**1 055 939.5**	**11 293 078.1**
Disposition													
Inventory changes—													
Field	118.7	1 313.2	−1 164.0	4 803.5	−1 212.7	−2 923.8	−0.7	952.4	963.4	−969.0	−157.1	601.2	2 256.6
Plant	3 196.6	−3 259.5	4 087.5	2 236.2	−3 444.3	−2 489.6	3 665.7	−5 305.0	54.6	2 320.5	1 437.4	−1 667.6	832.5
Transporters	−70 872.1	16 458.3	21 262.8	59 901.0	−37 231.6	−49 658.3	136 524.5	−69 454.9	−17 545.6	34 139.3	−27 373.2	−23 861.4	−27 711.2
Totals	−67 556.8	14 512.0	24 186.3	66 940.7	−41 888.6	−55 071.7	140 189.5	−73 807.5	−16 527.6	35 490.8	−26 092.9	24 927.8	−24 622.1
Losses and adjustments—													
Field	−486.0	−2 473.1	18 981.2	8 553.3	−338.4	5 098.5	6 588.6	7 387.9	6 264.7	−151.0	−972.3	−471.7	49 898.1
Plant	−24.5	−579.3	147.6	−552.8	3 286.9	1 494.8	971.6	1 030.4	793.2	725.2	426.7	1 012.7	8 732.5
Transporters	924.0	858.0	−149.2	1 631.6	186.3	1 227.3	−1 738.0	1 154.1	−4 622.7	5 836.9	−2 601.3	1 464.4	4 171.4
Totals	413.5	−2 194.4	18 979.6	9 632.1	3 134.8	7 820.6	5 822.2	9 752.4	2 435.2	6 411.1	−3 146.9	2 005.4	62 802.0
Transfers	5 931.8	8 596.0	7 848.3	8 741.7	7 486.1	6 780.2	3 739.1	8 114.9	5 729.3	6 203.2	7 325.3	9 057.4	85 553.3
Deliveries to British Columbia refineries—													
British Columbia production	204 363.6	164 342.1	207 921.1	176 929.7	195 508.8	229 024.5	183 474.9	187 483.0	183 707.6	195 168.8	195 334.8	133 527.8	2 255 071.1
Alberta production	547 479.0	567 797.7	631 801.6	482 705.2	557 861.3	636 985.6	618 159.6	623 204.3	643 366.0	658 994.5	588 841.8	729 247.5	7 286 444.1
Totals	751 842.6	732 139.8	839 722.7	659 634.9	753 370.1	866 010.1	801 634.5	810 687.3	827 073.6	854 163.3	784 176.6	862 775.3	9 541 515.2
Deliveries to export—													
British Columbia production	7 957.3	7 598.4	7 780.6	6 391.3	5 849.9	4 672.3	5 297.0	58 151.0	6 232.4	36 136.7	8 572.0	65 891.4	220 530.3
Alberta production	91 145.3	82 633.1	132 193.4	215 365.3	92 665.8	128 855.4	111 624.8	188 233.2	87 386.5	131 037.9	102 475.4	140 822.5	1 504 438.6
Totals	99 102.6	90 231.5	139 974.0	221 756.6	98 515.7	133 527.7	116 921.8	246 384.2	93 618.9	167 174.6	111 047.4	206 713.9	1 724 968.9
Total disposition	**769 450.3**	**848 459.3**	**1 003 055.8**	**957 190.4**	**821 956.1**	**954 443.7**	**1 042 360.1**	**991 892.9**	**905 949.2**	**1 068 495.1**	**873 885.7**	**1 055 939.5**	**11 293 078.1**
Reporting adjustment	−20 283.4	5 174.4	−27 655.1	−9 515.6	1 338.0	−4 623.2	−25 947.0	−9 058.4	−6 380.2	−947.9	576.2	315.3	−97 139.2
British Columbia refineries													
Receipts—													
British Columbia crude	212 607.6	160 667.6	192 987.6	180 453.9	201 465.9	224 868.6	190 185.9	190 749.5	176 287.0	222 235.8	214 465.1	130 030.7	2 297 005.2
British Columbia condensate	5 931.8	8 596.0	7 848.3	8 741.7	7 486.1	6 780.2	3 739.1	8 114.9	5 729.3	6 203.2	7 325.3	9 057.3	85 553.2
Totals	218 539.4	169 263.6	200 835.9	189 195.6	208 952.0	231 648.8	193 925.0	198 864.4	182 016.3	228 439.0	221 790.4	139 088.0	2 382 558.4
Alberta crude	525 073.6	522 992.7	563 791.9	449 879.6	520 573.4	571 419.7	537 825.2	554 828.6	568 987.4	569 993.0	519 857.5	656 188.5	6 561 411.1
Alberta condensate	27 710.0	48 160.0	68 983.0	42 458.0	36 850.0	65 366.0	79 659.0	68 523.0	76 830.0	83 432.0	71 819.0	80 140.0	749 930.0
Totals	552 783.6	571 152.7	632 774.9	492 337.6	557 423.4	636 785.7	617 484.2	623 351.6	645 817.4	653 425.0	591 676.5	736 328.5	7 311 341.1
Total receipts	**771 323.0**	**740 416.3**	**833 610.8**	**618 533.2**	**766 375.4**	**868 434.5**	**811 409.2**	**822 216.0**	**827 833.7**	**881 864.0**	**813 466.9**	**875 416.5**	**9 693 899.5**

Disposition

Inventory changes	413.1	11 095.8	−2 524.4	9 259.6	−9 410.2	29 177.3	−11 557.2	−15 075.5	−6 375.8	−5 216.1	7 085.0	19 875.8	26 747.4
Losses and adjustments	220.0	−322.2	59.3	41.9	83.0	117.9	3 638.0	137.0	171.0	4 217.0	31 079.0	3 582.0	43 023.9
Refinery runs—													
British Columbia production	203 812.4	351 349.5	229 997.7	177 519.9	207 547.7	233 700.6	137 944.7	153 288.9	195 082.3	204 739.5	195 960.4	142 345.9	2 433 289.5
Alberta production	566 877.5	378 293.2	606 078.2	494 711.8	568 154.9	605 438.7	681 383.7	683 865.6	638 956.2	678 123.6	579 342.5	709 612.8	7 190 838.7
Totals	770 689.9	729 642.7	836 075.9	672 231.7	775 702.6	839 139.3	819 328.4	837 154.5	834 038.5	882 863.1	775 302.9	851 958.7	9 624 128.2
Total disposition	**771 323.0**	**740 416.3**	**833 610.8**	**681 533.2**	**766 375.4**	**868 434.5**	**811 409.2**	**822 216.0**	**827 833.7**	**881 864.0**	**813 466.9**	**875 416.5**	**9 693 899.5**

Table 4-10—Monthly Supply and Disposition of Natural Gas, 1979
(Volumes in $10^3 m^3$ at 101.325 kPa and 15° C)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Supply													
British Columbia production—													
Nonassociated gas	1 160 149.3	1 055 340.1	1 037 454.9	988 916.5	772 567.5	756 440.2	754 440.7	660 491.2	693 725.9	816 274.4	1 051 875.0	1 177 303.3	10 924 979.0
Associated gas	40 101.8	34 267.8	36 849.4	37 492.2	36 993.2	39 574.0	50 621.2	44 226.9	38 099.4	48 353.1	41 961.7	39 247.5	487 888.2
Less injected	−2 833.6	−2 144.4	−1 366.2	−3 043.1	−3 213.0	−2 862.9	−2 117.5	−2 807.4	−2 370.0	−1 861.1	−1 534.3	−2 493.1	−28 646.6
Net British Columbia production	1 197 417.5	1 087 463.5	1 072 938.1	1 023 365.6	806 347.7	793 151.3	802 944.4	701 910.7	729 455.3	862 766.4	1 092 302.4	1 214 057.7	11 384 220.6
Imports—													
Alberta	181 703.1	160 838.3	141 626.5	127 427.0	126 627.9	129 864.3	58 546.9	50 908.4	68 364.5	146 682.5	174 113.8	157 812.5	1 524 515.7
Northwest Territories	62 276.8	53 826.1	62 594.2	53 248.3	37 630.3	49 788.2	38 867.5	39 262.8	53 809.5	53 598.0	53 640.8	53 488.9	612 031.4
Total imports	243 979.9	214 664.4	204 220.7	180 675.3	164 258.2	179 652.5	97 414.4	90 171.2	122 174.0	200 280.5	227 754.6	211 301.4	2 136 547.1
Total supply	**1 441 397.4**	**1 302 127.9**	**1 277 158.8**	**1 204 040.9**	**970 605.9**	**972 803.8**	**900 358.8**	**792 081.9**	**851 629.3**	**1 063 046.9**	**1 320 057.0**	**1 425 359.1**	**13 520 767.7**
Disposition													
Flared—													
Field	13 541.9	6 997.2	6 769.2	8 498.4	6 514.5	8 176.3	7 188.3	9 615.6	7 442.7	6 785.9	7 899.4	6 573.0	96 002.4
Gathering systems	846.4	107.6	237.6	83.0	75.7	96.7	63.5	102.8	59.7	77.4	91.7	236.2	2 078.3
Plant	111.3	27.4	111.3	418.8	33.3	1 146.8	278.2	241.3	60.6	1 131.5	17.4	795.8	4 373.7
Totals	14 499.6	7 132.2	7 118.1	9 000.2	6 623.5	9 419.8	7 530.0	9 959.7	7 563.0	7 994.8	8 008.5	7 605.0	102 454.4
Fuel—													
Field	10 605.1	10 181.4	11 888.7	9 361.8	8 368.5	9 321.1	7 071.3	6 804.7	6 061.0	8 692.9	9 353.4	10 244.4	107 954.3
Compressor	1 115.4	932.4	967.1	31.8	34.8	28.5	482.4	413.0	317.7	603.6	741.9	921.5	6 590.1
Plant	48 260.8	42 980.3	44 837.1	42 932.2	34 426.6	49 228.4	31 354.2	30 993.9	31 677.4	36 107.4	42 050.7	50 193.0	485 042.0
Totals	59 981.3	54 094.1	57 692.9	52 325.8	42 829.9	58 578.0	38 907.9	38 211.6	38 056.1	45 403.9	52 146.0	61 358.9	599 586.4
Losses and adjustments—													
Field	42 002.7	45 630.9	14 432.0	18 305.9	15 361.5	23 019.4	19 165.6	12 139.4	21 170.6	25 255.9	39 355.8	67 696.8	343 536.5
Plant	15 691.3	11 112.9	13 089.4	11 467.9	12 446.5	16 376.0	2 986.9	10 431.5	10 773.1	8 208.8	25 202.5	14 472.5	152 259.3
Totals	57 694.0	56 743.8	27 521.4	29 773.8	27 808.0	39 395.4	22 152.5	22 570.9	31 943.7	33 464.7	64 558.3	82 169.3	495 795.8
Line pack	−84.5	−947.2	627.8	−1 708.3	451.7	−439.3	355.8	1 061.2	−178.7	728.2	−750.6	736.0	−147.9
Processing shrinkage	108 210.9	100 310.5	99 367.3	93 571.0	73 044.1	77 041.5	78 625.8	69 353.1	71 019.6	79 623.1	100 703.8	112 958.2	1 063 828.9
Available marketable gas in northeastern British Columbia	1 220 131.3	1 096 716.6	1 099 992.6	1 021 521.4	825 911.7	806 051.3	774 459.3	665 651.7	704 500.6	894 271.6	1 111 256.1	1 172 176.3	11 392 640.5
Reporting adjustment	−18 935.2	−11 922.1	−15 161.3	−443.0	−6 063.0	−17 242.9	−21 672.5	−14 726.3	−1 275.0	1 560.6	−15 865.1	−11 644.6	−133 390.4
British Columbia Transporters													
Supply													
Available marketable gas in northeastern British Columbia	1 220 131.3	1 096 716.6	1 095 944.4	1 025 569.6	825 911.7	806 051.3	774 459.3	665 651.7	704 500.6	894 271.6	1 111 256.1	1 172 176.3	11 392 640.5
Imports to southeastern British Columbia—													
Alberta	1 152 495.3	1 012 693.4	1 110 269.7	1 070 136.3	1 047 162.2	980 802.3	1 006 263.9	985 240.2	979 350.6	1 069 844.6	1 107 387.9	1 135 254.8	12 656 901.2
Total supply	**2 372 626.6**	**2 109 410.0**	**2 206 214.1**	**2 095 705.9**	**1 873 073.9**	**1 786 853.6**	**1 780 723.2**	**1 650 891.9**	**1 683 851.2**	**1 964 116.2**	**2 218 644.0**	**2 307 431.1**	**24 049 541.7**

Disposition													
Fuel	76 960.1	66 843.2	53 902.5	53 214.8	32 997.5	35 022.4	31 249.0	26 048.1	31 016.1	43 454.9	65 184.1	68 559.4	584 452.1
Losses and adjustments	*−5 069.4*	*−5 447.7*	*314.8*	*73.4*	*5 447.3*	*4 668.3*	*4 389.4*	*−6 144.8*	6 244.1	8 104.9	8 830.9	7 905.0	29 316.2
Line pack changes	537.5	1 704.8	3 623.2	−1 296.7	−3 434.0	4 269.5	2 289.3	−3 367.0	2 464.6	−1 915.4	−802.8	4 601.4	8 674.4
Deliveries to													
British Columbia distribution—													
North	16 078.4	17 286.4	11 521.6	9 124.8	6 507.1	4 208.2	3 683.3	3 570.6	5 195.8	7 785.7	10 273.2	14 269.0	109 504.1
Interior	199 767.0	160 882.3	186 350.6	153 761.1	141 308.5	125 329.2	102 223.2	105 515.1	119 333.7	152 079.1	183 118.9	189 948.2	1 819 616.9
Lower Mainland	307 969.8	265 733.1	259 198.4	256 276.2	150 025.9	122 002.7	109 569.7	110 531.5	132 929.7	188 203.9	259 134.7	269 976.4	2 431 552.0
Totals	523 815.2	443 901.8	457 070.6	419 162.1	297 841.5	251 540.1	215 476.2	219 617.2	257 459.2	348 068.7	452 526.8	474 193.6	4 360 673.0
Deliveries to export—													
From northeastern British Columbia	653 837.1	589 802.4	595 991.4	584 222.5	521 826.1	537 400.0	531 545.9	441 111.4	434 142.8	535 723.4	622 919.7	665 371.5	6 713 894.2
From southeastern British Columbia	1 106 721.7	998 687.3	1 073 542.2	1 034 402.2	1 012 709.2	951 222.6	975 968.2	957 099.9	945 650.2	1 030 818.2	1 065 512.3	1 097 289.1	12 249 623.1
Totals	1 760 558.8	1 588 489.7	1 669 533.6	1 618 624.7	1 534 535.3	1 488 622.6	1 507 514.1	1 398 211.3	1 379 793.0	1 566 541.6	1 688 432.0	1 762 660.6	18 963 517.3
Reporting adjustment	15 824.4	13 918.2	21 769.4	5 927.6	5 686.3	2 730.7	19 805.2	16 527.1	6 874.2	−138.5	4 473.0	−10 488.9	102 908.7
Total disposition	**2 372 626.6**	**2 109 410.0**	**2 206 214.1**	**2 095 705.9**	**1 873 073.9**	**1 786 853.6**	**1 780 723.2**	**1 650 891.9**	**1 683 851.2**	**1 964 116.2**	**2 218 644.0**	**2 307 431.1**	**24 049 541.7**
British Columbia Distributors													
Receipts—													
From transportation	559 430.5	483 236.8	458 109.6	412 273.1	283 622.7	240 567.0	218 191.7	220 932.7	260 441.4	353 461.7	460 807.0	486 596.0	4 437 670.2
From storage	1 306.5	731.3	1 719.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	3 756.9
Other receipts	113.3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	113.3
Total receipts	**560 850.3**	**483 968.1**	**459 828.7**	**412 273.1**	**283 622.7**	**240 567.0**	**218 191.7**	**220 932.7**	**260 441.4**	**353 461.7**	**460 807.0**	**486 596.0**	**4 441 540.4**
Disposition													
Fuel	1 799.9	526.5	1 513.5	−107.6	1 198.5	1 090.3	665.6	776.9	780.1	974.9	1 171.8	1 796.4	12 186.8
Losses and adjustments	40 145.3	−57 543.1	−46 777.6	−36 693.5	−52 541.9	−10 227.5	−2 584.6	3 753.2	29 392.6	80 621.2	150 692.3	43 952.2	142 188.6
Line pack changes	−390.3	179.7	−160.6	−73.3	−206.6	−40.7	−225.8	109.1	184.2	−473.9	409.1	146.8	−542.3
To storage	.....	−474.5	.....	1 575.9	3 086.8	2 527.0	2 872.5	3 242.8	3 111.5	.....	.....	.....	15 942.0
Sales—													
Residential	200 621.3	204 872.1	154 020.7	119 755.9	84 996.5	57 552.8	40 500.7	33 898.6	32 197.8	45 011.6	65 596.3	126 915.4	1 165 939.7
Commercial	183 651.4	171 626.0	139 152.7	110 001.3	94 643.6	49 284.5	45 246.4	43 700.2	39 553.1	56 896.8	80 226.3	149 209.4	1 163 191.7
Industrial	133 074.3	161 336.2	178 361.1	155 219.5	148 819.9	138 869.6	130 515.3	134 450.0	137 008.1	161 572.6	161 343.4	162 843.5	1 803 413.5
Electric power	1 948.4	3 445.2	33 718.9	62 594.9	3 625.9	1 511.0	1 201.6	1 001.9	18 214.0	8 858.5	1 367.8	1 732.3	139 220.4
Totals	519 295.4	541 279.5	505 253.4	447 571.6	332 085.9	247 217.9	217 464.0	213 050.7	226 973.0	272 339.5	308 533.8	440 700.6	4 271 765.3
Total disposition	***560 850.3***	***483 968.1***	***459 828.7***	***412 273.1***	***283 622.7***	***240 567.0***	***218 191.7***	***220 932.7***	***260 441.4***	***353 461.7***	***460 807.0***	***486 596.0***	***4 441 540.4***

Table 4-11—Monthly Supply and Disposition of Propane, 1979
(Volumes in m^3 at 15° C)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Supply													
British Columbia production—													
Plant	6 843.6	6 345.0	7 292.9	6 635.8	6 685.4	6 809.9	5 655.7	8 070.6	5 650.8	5 896.4	7 733.5	11 244.8	84 864.4
Refinery	9 296.3	8 025.6	10 061.7	7 724.1	6 891.1	9 293.2	8 559.3	8 852.8	10 199.2	12 003.9	10 795.5	10 653.1	112 355.8
Totals	16 139.9	14 370.6	17 354.6	14 359.9	13 576.5	16 103.1	14 215.0	16 923.4	15 850.0	17 900.3	18 529.0	21 897.7	197 220.2
Alberta imports	60 589.6	50 085.8	53 761.8	39 185.3	31 916.8	34 964.9	50 631.4	54 004.1	44 482.6	57 086.0	59 339.9	49 897.7	585 945.9
Total supply	**76 729.5**	**64 456.4**	**71 116.4**	**53 545.2**	**45 493.3**	**51 068.0**	**64 846.4**	**70 927.5**	**60 332.6**	**74 986.3**	**77 868.9**	**71 795.6**	**783 166.1**
Disposition													
Inventory change	−886.6	−22.6	472.7	−502.6	706.8	−291.7	−226.3	−44.9	21.3	513.6	−1 309.2	2 416.2	846.7
Fuel	.....	.....	.....	.....	.....	160.6	.....	.....	.....	.....	.....	.....	160.6
Losses and adjustments	−874.4	64.5	36.0	42.4	316.4	248.8	−230.9	133.0	63.1	265.1	906.8	2 379.5	3 350.3
Sales of British Columbia production—													
British Columbia	15 864.6	13 338.5	14 170.9	11 321.9	8 496.4	10 835.3	11 492.6	12 030.4	12 666.8	16 368.0	15 262.8	15 905.9	157 754.1
Alberta	.....	.....	736.1	944.9	31.8	2 532.1	.....	230.0	228.0	166.8	.....	.....	4 869.7
Northwest Territories	747.9	990.2	627.7	244.8	101.0	76.3	63.6	76.6	.....	250.2	339.3	1 072.1	4 589.7
United States	1 288.4	.....	1 311.2	2 308.5	3 924.1	2 541.7	3 116.0	4 498.3	2 870.8	336.6	3 329.3	124.2	25 649.1
Offshore	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total British Columbia	17 900.9	14 328.7	16 845.9	14 820.1	12 553.3	15 985.4	14 672.2	16 835.3	15 765.6	17 121.6	18 931.4	17 102.2	192 862.6
Sales of Alberta production—													
British Columbia	29 080.4	19 231.0	10 421.1	10 902.8	10 530.2	7 027.5	6 493.1	8 309.6	7 271.9	11 602.3	17 375.1	20 566.5	158 811.5
Offshore	31 509.2	30 854.8	43 340.7	28 282.5	21 386.6	27 937.4	44 138.3	45 694.5	37 210.7	45 483.7	41 964.8	29 331.2	427 134.4
Total Alberta	60 589.6	50 085.8	53 761.8	39 185.3	31 916.8	34 964.9	50 631.4	54 004.1	44 482.6	57 086.0	59 339.9	49 897.7	585 945.9
Total sales	**78 490.5**	**64 414.5**	**70 607.7**	**54 005.4**	**44 470.1**	**50 950.3**	**65 303.6**	**70 839.4**	**60 248.2**	**74 207.6**	**78 271.3**	**66 999.9**	**778 808.5**
Total disposition	**76 729.5**	**64 456.4**	**71 116.4**	**53 545.2**	**45 493.3**	**51 068.0**	**64 846.4**	**70 927.5**	**60 332.6**	**74 986.3**	**77 868.9**	**71 795.6**	**783 166.1**

Table 4-12—Monthly Supply and Disposition of Butane, 1979
(Volumes in m^3 at 15° C)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Supply													
British Columbia production—													
Plant	8 948.7	7 403.6	9 098.4	9 260.3	10 702.5	9 988.0	9 641.3	9 970.4	9 510.3	9 526.7	11 246.6	7 386.5	112 683.3
Refinery	4 126.7	4 696.1	6 582.8	3 080.0	7 097.7	9 637.9	10 129.2	8 147.5	9 232.3	6 986.9	3 830.6	4 697.1	78 244.8
Totals	13 075.4	12 099.7	15 681.2	12 340.3	17 800.2	19 625.9	19 770.5	18 117.9	18 742.6	16 513.6	15 077.2	12 083.6	190 928.1
Alberta imports	2 861.8	2 155.4	599.7	521.4	339.7	276.3	612.4	373.1	212.3	238.6	2 060.4	1 350.1	11 601.2
Total supply	**15 937.2**	**14 255.1**	**16 280.9**	**12 861.7**	**18 139.9**	**19 902.2**	**20 382.9**	**18 491.0**	**18 954.9**	**16 752.2**	**17 137.6**	**13 433.7**	**202 529.3**
Disposition													
Inventory change	651.2	−224.3	1 001.8	−1 435.7	2 066.4	−1 531.1	31.5	−623.3	1 082.9	1 833.3	−1 833.3	1 513.3	2 532.7
Gasoline blending	3 100.4	1 928.5	2 810.4	1 376.3	2 073.2	1 805.4	1 045.2	1 878.3	3 062.4	3 054.5	3 394.5	4 449.4	29 978.5
Losses and adjustments	.....	120.1	121.7	−1.5	152.6	573.2	−608.9	−1.1	206.8	−0.6	3 071.9	−4 783.9	−1 149.7
Sales of British Columbia production—													
British Columbia	4 773.8	5 977.0	7 452.6	6 373.2	6 918.8	11 221.6	11 868.9	9 200.8	8 631.6	7 787.8	4 603.8	5 455.4	90 265.3
Alberta	.....	.....	.....	633.7	.....	2 876.7	2 278.9	1 543.3	118.0	.....	556.6	2 024.1	10 031.3
United States	4 550.0	4 298.4	4 294.7	5 394.3	6 589.2	4 680.1	5 154.9	6 119.9	5 640.9	3 838.6	5 283.7	3 425.3	59 270.0
Totals	9 323.8	10 275.4	11 747.3	12 401.2	13 508.0	18 778.4	19 302.7	16 864.0	14 390.5	11 626.4	10 444.1	10 904.8	159 566.6
Sales of Alberta production—													
British Columbia	2 861.8	2 155.4	599.7	521.4	339.7	276.3	612.4	373.1	212.3	238.6	2 060.4	1 350.1	11 601.2
Total sales	**12 185.6**	**12 430.8**	**12 347.0**	**12 922.6**	**13 847.7**	**19 054.7**	**19 915.1**	**17 237.1**	**14 602.8**	**11 865.0**	**12 504.5**	**12 254.9**	**171 167.8**
Total disposition	**15 937.2**	**14 255.1**	**16 280.9**	**12 861.7**	**18 139.9**	**19 902.2**	**20 382.9**	**18 491.0**	**18 954.9**	**16 752.2**	**17 137.6**	**13 433.7**	**202 529.3**

Table 4-13—Monthly Supply and Disposition of Sulphur, 1979
(Volumes in metric tons)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Supply													
British Columbia production	15 640.1	12 687.7	14 093.8	12 511.0	11 834.5	7 207.4	5 938.9	4 819.9	6 070.0	10 572.2	12 761.3	17 009.9	131 146.7
Disposition													
Inventory change	4 187.9	1 940.2	2 509.3	855.6	1.0	−3 348.5	−7 185.0	−9 471.4	−6 843.3	−6 118.9	1 426.4	7 004.2	−15 042.5
Sales—													
North America	9 631.2	7 663.0	8 216.9	7 914.5	7 364.0	7 415.8	9 466.7	7 589.6	9 334.8	10 134.3	7 349.5	6 171.4	98 251.7
Offshore	1 821.0	3 084.5	3 367.6	3 740.9	4 469.5	3 140.1	3 657.2	6 701.7	3 578.5	6 556.8	3 985.4	3 834.3	47 937.5
Totals	11 452.2	10 747.5	11 584.5	11 655.4	11 833.5	10 555.9	13 123.9	14 291.3	12 913.3	16 691.1	11 334.9	10 005.7	146 189.2
Total disposition	**15 640.1**	**12 687.7**	**14 093.8**	**12 511.0**	**11 834.5**	**7 207.4**	**5 938.9**	**4 819.9**	**6 070.0**	**10 572.2**	**12 761.3**	**17 009.9**	**131 146.7**

Table 4-14—Crude-oil Pipelines, 1979

Company	Fields Served	Size and Length of Main and Lateral Lines: Size mm	Size and Length of Main and Lateral Lines: km	Pumping Stations: No.	Pumping Stations: Capacity m^3/day	Present Capacity	Gathering Lines km	Throughput m^3/day	Storage Capacity m^3
Blueberry-Taylor Pipeline Co.	Aitken Creek, Blueberry	323.9	3.8	----	----	----	----	----	----
		219.1	100.2	1	795	1 908	62.4	265	10 334
	Fort St. John	----	----	----	----	----	----	29	159
	Inga	168.3	2.7	1	1 987	1 987	----	653	----
	Stoddart	----	----	----	----	----	----	12	----
CDC Oil and Gas Limited	Inga	168.3	5.1	2	1 240	----	----	200	----
		114.3	14.0	1	1 590	1 590	22.2	300	----
		88.9	3.2	1	254	----	----	----	----
Norcen Pipelines Ltd.	Beatton River, Beatton River West, Boundary Lake, Bulrush, Currant, Milligan Creek, Osprey, Peejay, Weasel, Wildmint, Willow, Wolf	----	----	1	5 723	8 267[1]	136.1	5 782	25 438
		323.9	62.9	2	7 154	7 154[2]	----	----	----
		219.1	167.3	----	----	----	----	----	----
		168.3	69.0	----	----	----	----	----	----
		114.3	123.9	----	----	----	----	----	----
Westcoast Petroleum Ltd.		232.9	815.8	12	11 129	11 129	----	5 008	93 167

[1] Boundary Lake.
[2] Terminal to Westcoast Petroleum Ltd.

Table 4-15—Crude-oil Refineries, 1979

Name	Location	Type	Year of First Operation	Source of Crude	Crude-oil Capacity m^3/calendar day	Storage Capacity m^3	Cracking Plant Units	Cracking Capacity m^3/calendar day	Other Units
Chevron Canada Ltd.	North Burnaby	Complete	1936	B.C. and Alberta	5 565	309 390	Catalytic fluid	1 350	Catalytic polymerization, catalytic reformer, lube-oil blending plant, asphalt
Gulf Canada Limited	Kamloops	Complete	1954	B.C. and Alberta	1 480	99 685	Catalytic fluid	445	Catalytic polymerization, catalytic reformer, distillate, desulphurization, merox, asphalt, naptha
Gulf Canada Limited	Port Moody	Complete	1958	B.C. and Alberta	5 915	280 295	Catalytic fluid	1 815	Catalytic reformer, distillate, desulphurization, alkylation sulphuric acid, naptha-desulphurization, merox, sulphur
Husky Oil Limited	Prince George	Complete	1967	B.C.	1 590	143 090	Catalytic fluid	475	Unifiner, reformer, asphalt, sulphur, gas concentration
Imperial Oil Limited	Ioco	Complete	1915	B.C. and Alberta	6 465	485 705	Catalytic fluid	1 955	Catalytic polymerization, powerformer, tuluene extraction, sulphur, LPG plant, desulphurization
Petrocanada	Taylor	Complete	1960	B.C.	2 275	174 885	Catalytic fluid	770	H.F. alkylation, asphalt, pentane splitter, platformer unifiner, HDS unit, DDS unit
Shell Canada Limited	North Burnaby	Complete	1932	B.C. and Alberta	3 500	390 360	Catalytic fluid	950	Catalytic polymerization, platformer, vacuum flashing, solvent fractionation, distillate hydrotreater, sulphur recovery

Table 4-16—Natural Gas Pipelines, 1979

Company	Source of Natural Gas	Transmission Lines		Compressor Stations		Present Daily Capacity	Gathering and Distribution Lines		Areas Served by Distributors
		Size mm	km	No.	Power Watts 10^6	$10^3 m^3$	Size mm	km	
British Columbia Hydro and Power Authority	Westcoast Transmission Co. Ltd.	106.7	29.9	----	----	17 156	----	6 725.0	Lower Mainland of British Columbia
		762	62.4	----	----	----	----	----	
		610	30.1	----	----	----	----	----	
		508	75.3	----	----	----	----	----	
		457	31.2	----	----	----	----	----	
		406.4	27.7	----	----	----	----	----	
		323.9	92.4	----	----	----	----	----	
		273.1	24.0	----	----	----	----	----	
		219.1	44.1	----	----	----	----	----	
		168.3	49.5	----	----	----	----	----	
		114.3	21.1	----	----	----	----	----	
Columbia Natural Gas Ltd.		219.1	89.3	----	----	2 422	219.1	2.9	Cranbrook, Fernie, Kimberley, Creston, Sparwood, Elk Valley, Skookumchuck, Elko, Elkford, and Yahk
		168.3	113.8	----	----	----	168.3	7.6	
		114.3	32.5	----	----	----	114.3	16.3	
		88.9	45.2	----	----	----	88.9	43.5	
		60.3	0.8	----	----	----	60.3	79.2	
		----	----	----	----	----	42.2	110.2	
		----	----	----	----	----	26.7	236.9	
		----	----	----	----	----	21.3	7.4	
Gas Trunk Line of British Columbia	Beg field	----	----	----	----	----	406.4	44.1	To Westcoast Transmission Co. Ltd.
		----	----	----	----	----	168.3	9.5	
	Boundary Lake field	----	----	----	----	----	406.4	50.5	
		----	----	----	----	----	168.3	4.7	
	Jedney and Bubbles field	----	----	----	----	----	323.9	50.7	
		----	----	----	----	----	273.1	11.3	
	Laprise Creek field	----	----	----	----	----	323.9	38.3	
	Nig Creek field	----	----	1	1.34	----	406.4	45.5	
Inland Natural Gas Co.	Westcoast Transmission Co. Ltd.	323.9	575.3	3	1.64	5 949	219.1	19.9	Peace River, Prince George, Cariboo, Thompson, Okanagan, and Kootenay areas
		273.1	192.0	----	----	----	168.3	67.6	
		219.1	53.1	----	----	----	114.3	363.7	
	Alberta and Southern Gas Co. Limited	168.3	177.9	----	----	----	88.9	139.9	
		114.3	240.9	----	----	----	60.3	1 067.0	
		88.9	113.0	----	----	----	48.3	33.3	
		60.3	129.8	----	----	----	42.2	560.2	
		42.2	2.2	----	----	----	----	----	

Northland Utilities (BC) Ltd.	Peace River Transmission Co.	88.9	3.2	----	--------	282	273.1	0.6	Dawson Creek, Pouce Coupe, and Rolla
		60.3	0.6	----	--------	--------	219.1	2.6	
		42.2	5.1	----	--------	--------	168.3	4.3	
		--------	--------	----	--------	--------	114.3	20.3	
		--------	--------	----	--------	--------	88.9	8.8	
		--------	--------	----	--------	--------	60.3	43.1	
		--------	--------	----	--------	--------	48.3	0.9	
		--------	--------	----	--------	--------	42.2	29.7	
		--------	--------	----	--------	--------	26.7	1.0	
Pacific Northern Gas Ltd.	Westcoast Transmission Co. Ltd.	273.1	441.3	2	2.35	1 521	168.3	3.9	
		219.1	148.7	----	--------	--------	114.3	16.9	
		168.3	58.0	----	--------	--------	88.9	33.1	
		114.3	22.5	----	--------	--------	60.3	84.2	
		101.6	70.3	----	--------	--------	42.2	66.2	
		73.0	28.6	----	--------	--------	26.7	53.0	
		60.3	48.4	----	--------	--------	21.3	0.3	
		48.3	6.4	----	--------	--------	--------	--------	
Plains Western Gas & Electric Co. Ltd.	Westcoast Transmission Co. Ltd.	168.3	0.5	----	--------	338	114.3	24.3	
		114.3	33.6	----	--------	--------	88.9	5.8	
		88.9	7.4	----	--------	--------	73.0	2.4	
		60.3	3.2	----	--------	--------	60.3	92.9	
		--------	--------	----	--------	--------	48.3	7.2	
		--------	--------	----	--------	--------	42.2	0.6	
		--------	--------	----	--------	--------	33.4	22.1	
		--------	--------	----	--------	--------	26.7	19.5	
Westcoast Transmission Co. Ltd.	Alberta	660	52.3	----	--------	6 057	--------	--------	
	Taylor-Willow Flats	914	37.3	----	--------	--------	--------	--------	
		660	122.8	----	--------	--------	--------	--------	
	Willow Flats-Huntington	660	917.8	13	208.53	38 317	--------	--------	
		914	789.2	----	--------	--------	--------	--------	
	Aitken Creek	--------	--------	----	--------	--------	323.9	31.4	
	Alaska Highway system	--------	--------	----	--------	--------	660	60.4	
		--------	--------	----	--------	--------	508	29.1	
		--------	--------	----	--------	--------	457	28.8	
		--------	--------	----	--------	--------	323.9	15.9	
	Beaver River system	610	178.5	1	29.08	7 607	--------	--------	
	Blueberry West field	--------	--------	----	--------	--------	219.1	10.8	
	Boundary Lake field	--------	--------	1	2.98	--------	406.4	0.8	
	Bubbles field	--------	--------	1	0.49	--------	--------	--------	
	Buick Creek field	--------	--------	----	--------	--------	660	2.9	
		--------	--------	----	--------	--------	273.1	11.7	
	Buick Creek East field	--------	--------	----	--------	--------	219.1	10.6	
	Buick Creek West field	--------	--------	1	1.48	--------	508	26.1	
	Bullmoose field	--------	--------	----	--------	--------	219.1	13.0	
	Cache Creek field	--------	--------	----	--------	--------	168.3	13.8	

Table 4-16—Natural Gas Pipelines, 1979—Continued

Company	Source of Natural Gas	Transmission Lines Size mm	Transmission Lines km	Compressor Stations No.	Compressor Stations Power Watts 10^6	Present Daily Capacity $10^3 m^3$	Gathering and Distribution Lines Size mm	Gathering and Distribution Lines km	Areas Served by Distributors
Westcoast Transmission Co. Ltd. – *Continued*	Charlie Lake field	--------	--------	----	--------	--------	168.3	3.7	
	Clarke Lake field	--------	--------	----	--------	--------	406.4	44.7	
	Clarke Lake South field	--------	--------	----	--------	--------	219.1	18.4	
	Dawson Creek field	--------	--------	----	--------	--------	219.1	8.7	
	Fireweed field	--------	--------	----	--------	--------	273.1	24.6	
		--------	--------	----	--------	--------	168.3	6.8	
		--------	--------	----	--------	--------	101.6	8.0	
	Flatrock field	--------	--------	----	--------	--------	101.6	8.0	
	Fort St. John field	--------	--------	3	1.48	--------	457	12.6	
		--------	--------	----	--------	--------	273.1	1.4	
		--------	--------	----	--------	--------	219.1	1.1	
	Fort St. John Southeast field	323.9	11.3	----	--------	--------	323.9	6.4	
	Fort Nelson plant	660	355.3	4	69.65	24 173	--------	--------	
	Fort Nelson-Willow Flats	914	74.8	----	--------	--------	--------	--------	
	Gundy Creek field	--------	--------	----	--------	--------	273.1	9.8	
	Grizzly field	--------	--------	----	--------	--------	610	56.5	
		--------	--------	----	--------	--------	508	82.7	
		--------	--------	----	--------	--------	273.1	14.8	
	Helmet field	--------	--------	----	--------	--------	406.4	50.5	
		--------	--------	----	--------	--------	273.1	20.3	
		--------	--------	----	--------	--------	219.1	5.8	
	Kobes-Townsend field	--------	--------	1	4.45	--------	323.9	30.4	
		--------	--------	----	--------	--------	219.1	8.9	
	Kotcho Lake field	--------	--------	----	--------	--------	323.9	15.6	
	Kotcho Lake East field	--------	--------	----	--------	--------	273.1	18.5	
	Laprise Creek field	--------	--------	1	3.85	--------	168.3	4.0	
	Milligan-Peejay system	--------	--------	1	2.98	--------	323.9	51.8	
		--------	--------	----	--------	--------	273.1	37.7	
		--------	--------	----	--------	--------	219.1	21.2	
		--------	--------	----	--------	--------	168.3	10.9	
	Monias field	--------	--------	----	--------	--------	219.1	32.6	
	Montney field	--------	--------	----	--------	--------	114.3	11.9	
	Nig field	--------	--------	----	--------	--------	168.3	3.7	
	Oak field	--------	--------	----	--------	--------	406.4	33.3	
		--------	--------	----	--------	--------	168.3	1.4	
	Parkland field	--------	--------	----	--------	--------	219.1	10.8	

Westcoast Transmission Co. Ltd. — *Continued*	Petitot-Louise system	----------	----------	----	----------	----------	273.1	19.0
		----------	----------	----	----------	----------	323.9	25.4
		----------	----------	----	----------	----------	406.4	10.5
		----------	----------	----	----------	----------	508	41.7
	Red Creek field	----------	----------	----	----------	----------	114.3	12.4
	Rigel field	----------	----------	1	5.07	----------	323.9	17.9
		----------	----------	1	1.04	----------	273.1	18.5
	Rigel North field	----------	----------	----	----------	----------	168.3	10.6
	Sierra field	----------	----------	----	----------	----------	323.9	10.9
		----------	----------	----	----------	----------	406.4	10.9
	Silver-Dahl area	----------	----------	----	----------	----------	406.4	72.1
		----------	----------	----	----------	----------	273.1	62.3
		----------	----------	----	----------	----------	219.1	10.1
		----------	----------	----	----------	----------	168.3	9.7
	Stoddart field	----------	----------	1	1.04	----------	219.1	10.1
	Yoyo field	----------	----------	----	----------	----------	610	77.2

Table 4-17—Gas-processing Plants, 1979

Operator	Location	Fields Served	Plant Type	Year of First Operation	Plant Capacity $10^3 m^3$/day In	Plant Capacity $10^3 m^3$/day Out	Natural Gas Liquids	Residual Gas to—
Esso Resources Canada	SE¼, Sec. 2, Tp. 85, Rge. 14, W6M	Boundary Lake	Inlet separator, MEA absorption, treating, glycol absorption, dehydration, combined refrigeration and oil absorption, natural gas liquid recovery distillation	1964	590	480	Pentanes plus, propane-butane mix	Westcoast Transmission Co. Ltd.
Mobil Oil of Canada Ltd.	Unit 91, Block D, NTS Map 94-I-14	Sierra and Sahtaneh	Inlet separator, dry desiccant dehydration	1969	8 761	8 705	. . . . .	Westcoast Transmission Co. Ltd.
Petro-Canada	Sec. 36, Tp. 82, Rge. 18, W6M	All BC producing gas fields except Parkland and Boundary Lake that are between 56° and 58° latitude	Inlet separator, MEA treating, dry desiccant dehydration, oil absorption, distillation	1957	14 086	12 819	Condensate, pentanes plus, propanes, butanes	Westcoast Transmission Co. Ltd.
Quasar Petroleum Ltd.	Unit 74, Block G, NTS Map 93-I-15	Grizzly North and South	DEA gas sweetening unit, TEG glycol dehydration	1978	1 416	1 360	. . . . .	Westcoast Transmission Co. Ltd.
Westcoast Transmission Co. Ltd.	NW¼, Sec. 10, Tp. 85, Rge. 14, W6M	Boundary Lake	MEA absorption dehydration	1961	265	279	Condensate	Westcoast Transmission Co. Ltd.
Westcoast Transmission Co. Ltd.	Unit 85, Block G, NTS Map 94-J-10	All BC producing gas fields except Sierra and Sahtaneh north of 58° latitude	Potassium carbonate, MEA DEA absorption, dehydration	1965	30 287	23 948	. . . . .	Westcoast Transmission Co. Ltd.

Table 4-18—Sulphur Plants, 1979

Name	Location	Raw Material	Principal Product	Year of First Operation	Capacity Tonnes/day
Westcoast Transmission Co. Ltd.	Taylor	Hydrogen sulphide	Sulphur	1957	264
Westcoast Transmission Co. Ltd.	Fort Nelson	Hydrogen sulphide	Sulphur	1976	406

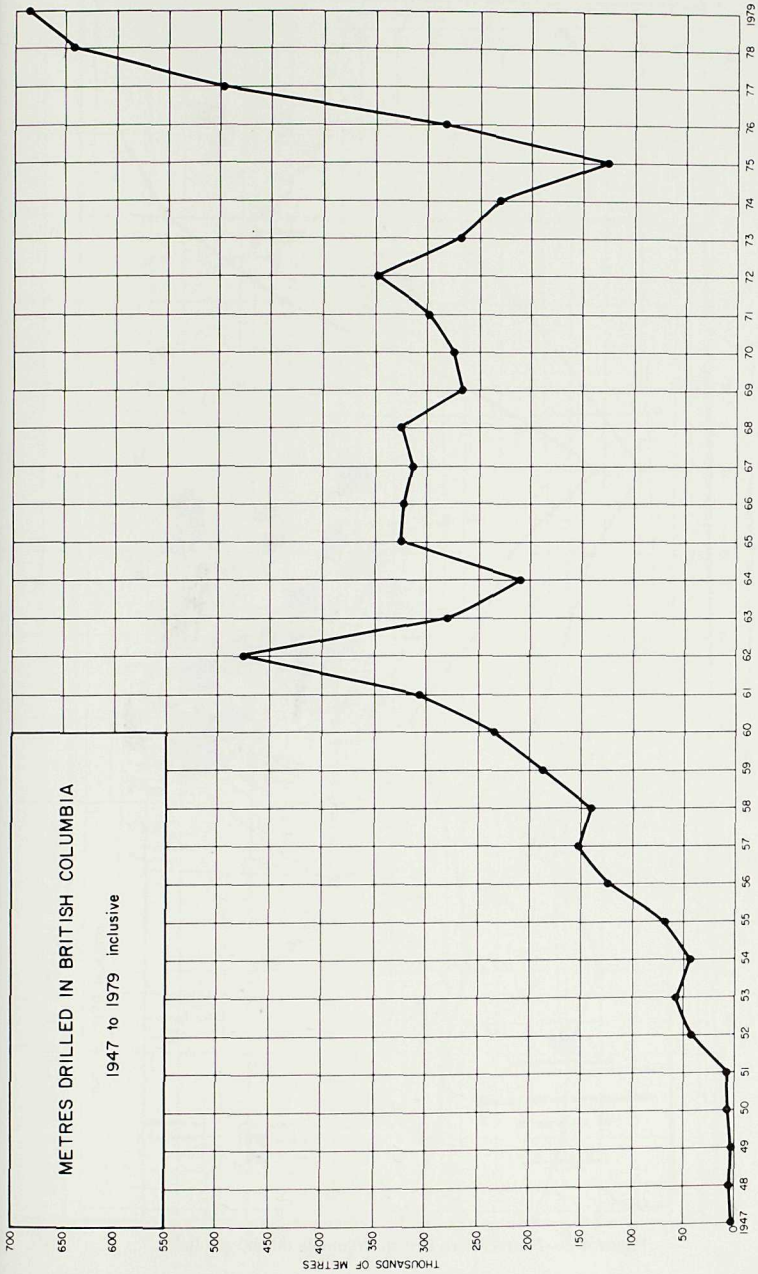

Figure 4-1—Metres drilled in British Columbia, 1947–1979.

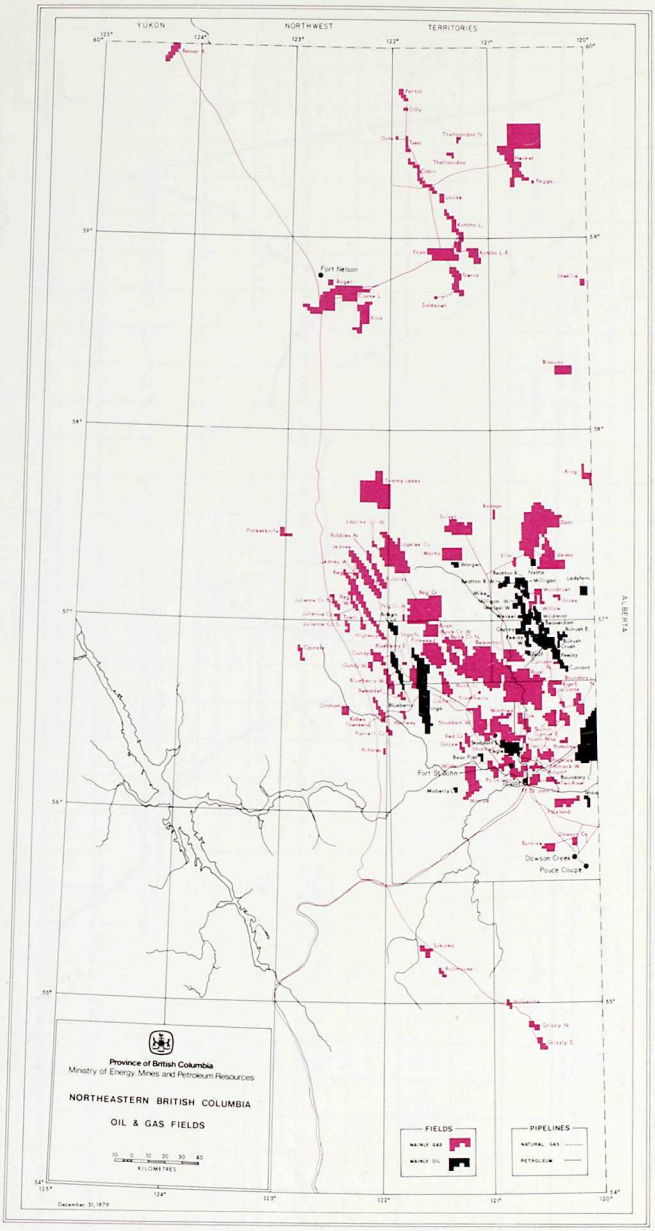

Figure 4-2—Northeastern British Columbia oil and gas fields.

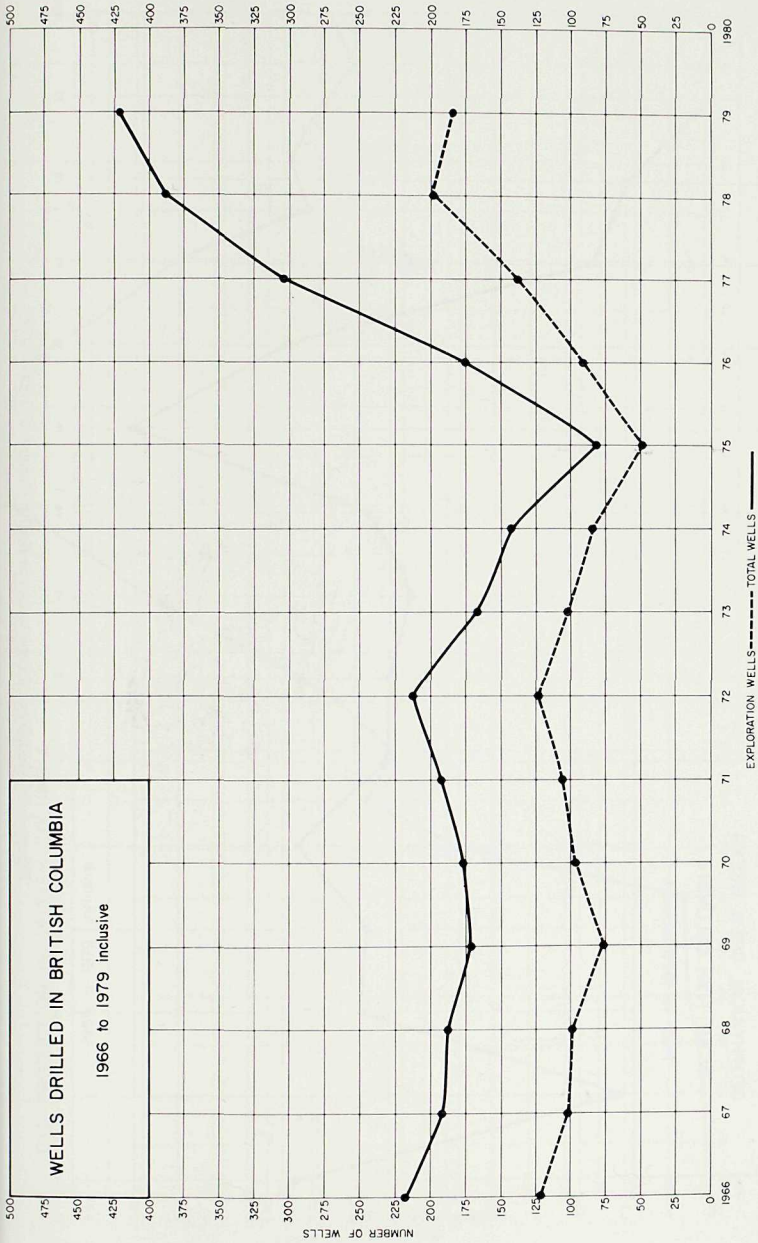

Figure 4-3—Wells drilled in British Columbia, 1966–1979.

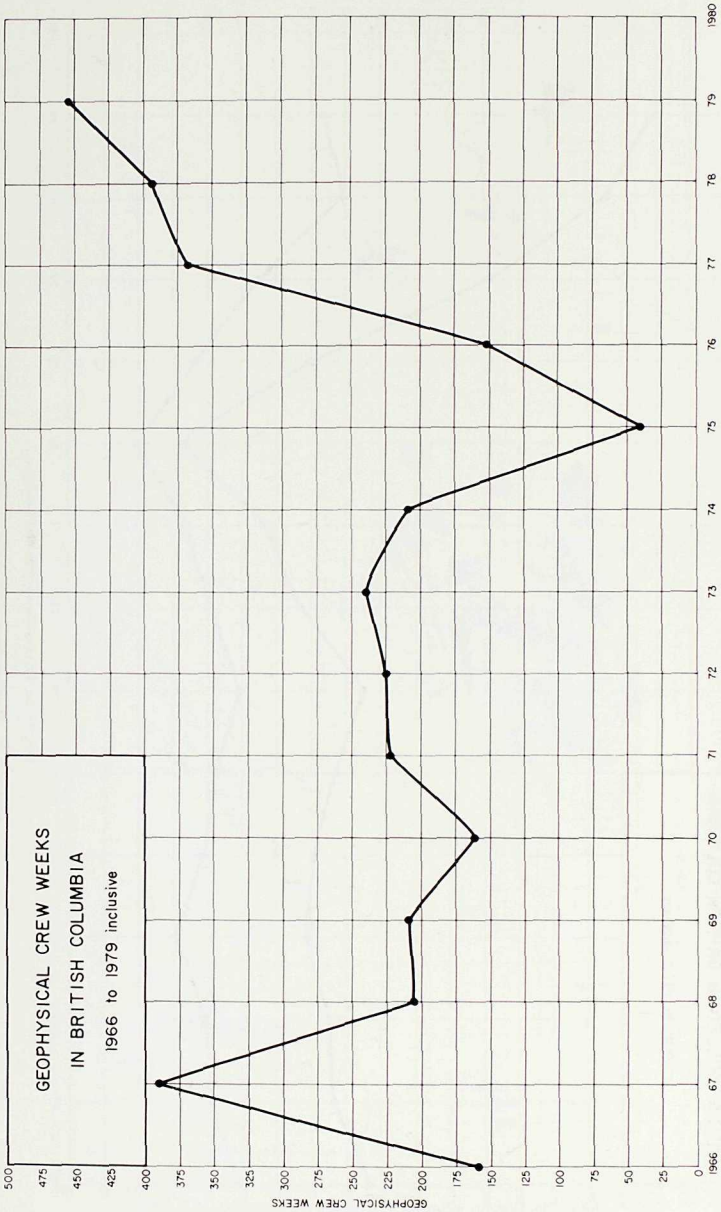

Figure 4-4—Geophysical crew weeks in British Columbia, 1966–1979.

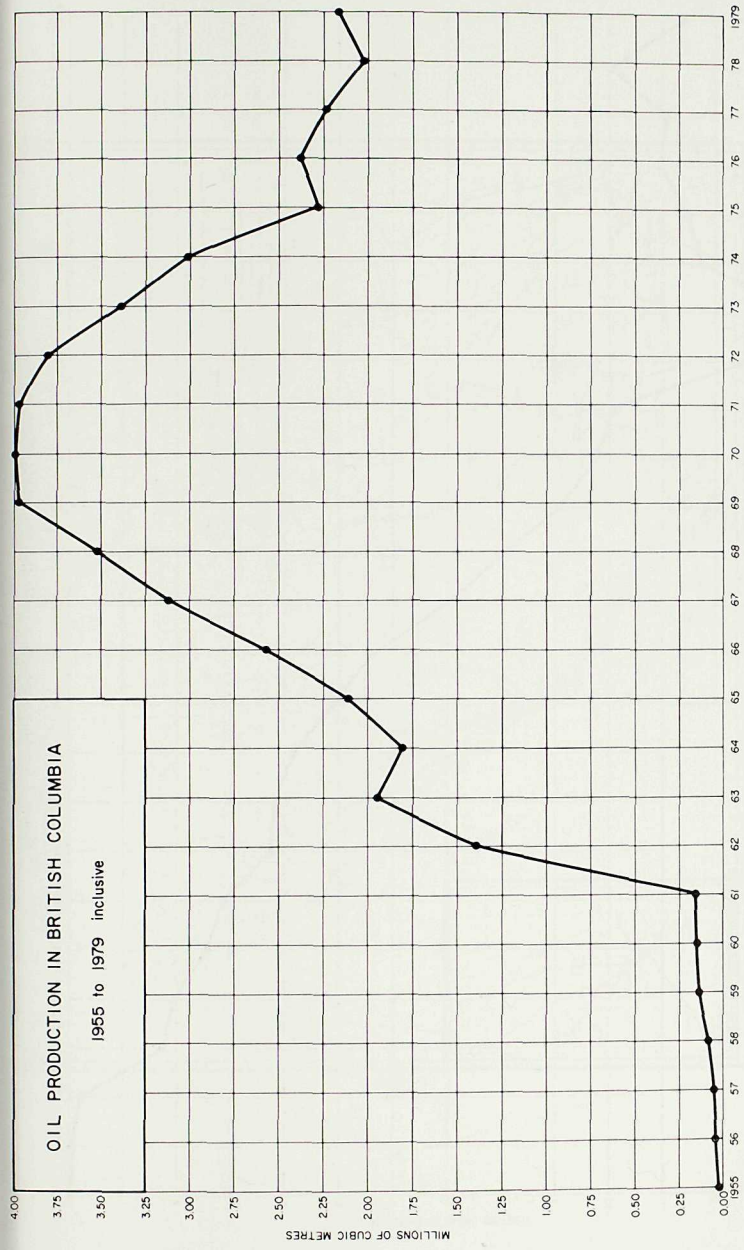

Figure 4-5—Oil production in British Columbia, 1955–1979.

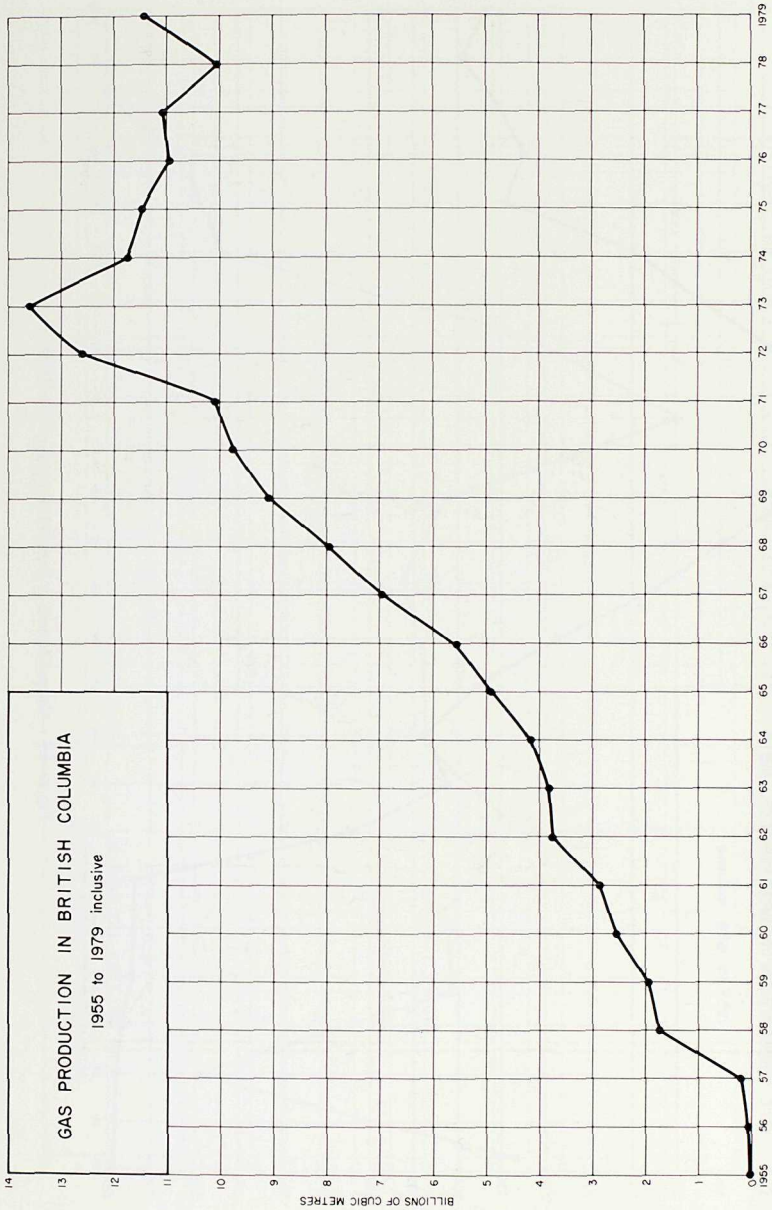

Figure 4-6—Gas production in British Columbia, 1955–1979.

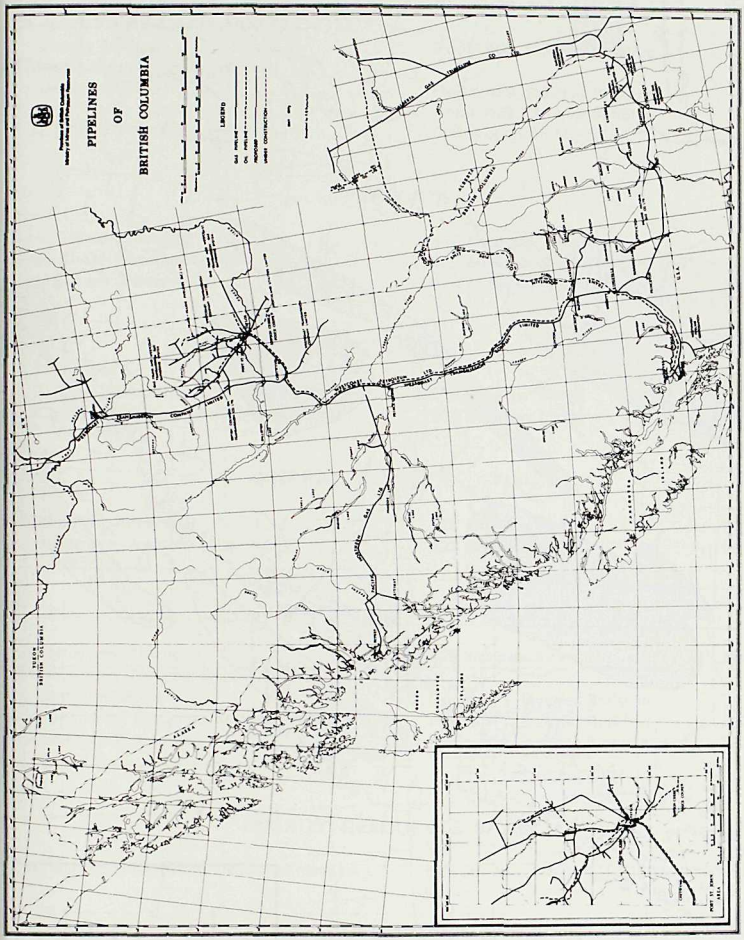

Figure 4-7—Pipelines of British Columbia.

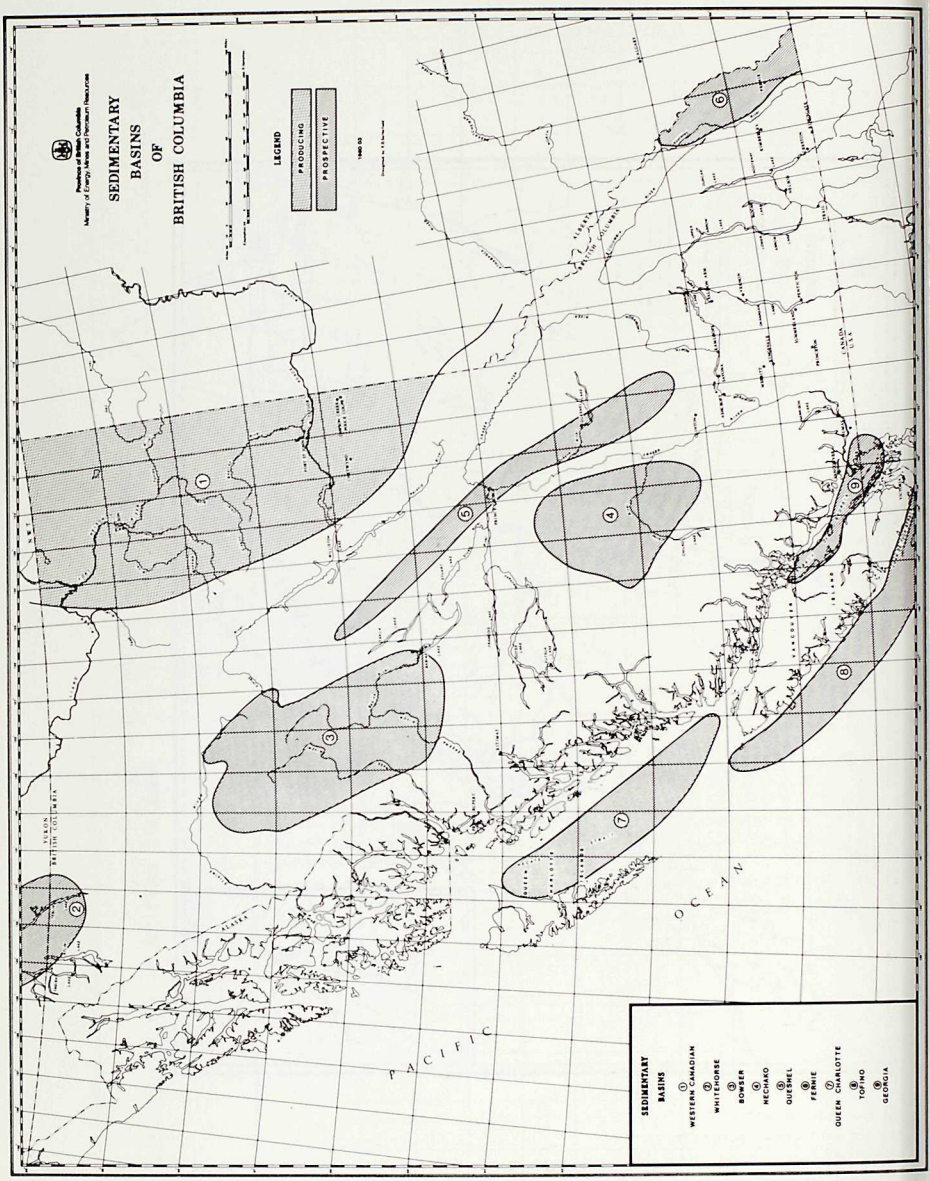

Figure 4-2 — Sedimentary Basins of British Columbia

DIRECTORY

(as of February 28, 1981)

Hon. R. H. McClelland (Minister)	Room 310, Parliament Buildings	387-5295
Kathy Mayoh (Executive Assistant to the Minister)	Room 310, Parliament Buildings	387-5295
R. Illing (Deputy Minister)	Room 406, Douglas Building	387-5445
Dr. James T. Fyles (Senior Assistant Deputy Minister)	Room 409, Douglas Building	387-6242
T. Chatton (Executive Assistant to Deputy Minister)	Room 429, Douglas Building	387-5476
J. Lewis (Policy Advisor)	Room 428, Douglas Building	387-3354
P. D. Meyers (Solicitor for Ministry)	609 Broughton Street	384-4434

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A. MacInnis (Personnel Officer)	516 Michigan Street	387-3775
Cathie Green (Personnel Clerk)	516 Michigan Street	387-3775

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Joan Darling (Energy Analyst)	525 Superior Street	387-5231

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A. Ferguson (Research Officer)	525 Superior Street	387-5231
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Dr. J. M. Hill (Coordinator, Renewable Energy)	2006, 1177 West Hastings Street, Vancouver V6E 2L7	689-1831
T. G. Hedley (Coordinator, Energy from Wastes)	2006, 1177 West Hastings Street, Vancouver V6E 2L7	689-1831
G. W. Bachmayer (Coordinator, Internal Conservation Program)	2006, 1177 West Hastings Street, Vancouver V6E 2L7	689-1831
P. K. Honke (Coordinator, Industry)	2006, 1177 West Hastings Street, Vancouver V6E 2L7	689-1831

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A. J. Richardson (Deputy Chief Inspector—Metal)	525 Superior Street	387-3781
H. J. Dennis (Senior Coal Inspector)	525 Superior Street	387-3781
T. Carter (Senior Mechanical/Electrical Inspector)	525 Superior Street	387-3781
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J. D. McDonald (Senior Reclamation Inspector)	525 Superior Street	387-3781

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Nelson Office: J.B.C. Lang (Inspector)	310 Ward Street, V1L 5S4	352-2211, ext. 213/342
Fernie Office: D.I.R. Henderson (Inspector)	Box 1290, V0B 1M0	423-6222
Nanaimo Office: J. W. Robinson (Inspector)	2226 Brotherstone Road, V9S 3M8	758-2342
Prince Rupert Office: V. A. Pakalniskis (Inspector)	Box 758, V8J 3S1	624-3245, ext. 202
Smithers Office: S. J. Hunter (Inspector)	Box 877, V0J 2N0	847-4411, ext. 237/245

Prince George Office:

T. Vaughan-Thomas (Inspector)	1652 Quinn Street, V2N 1X3	562-8131, ext. 322/323
R. W. Lewis (Inspector)	1652 Quinn Street, V2N 1X3	562-8131, ext. 322/323

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[vacant] (Deputy Chief Gold Commissioner)	Douglas Building	
D. I. Doyle (Gold Commissioner, Vancouver)	800 Hornby Street, V6Z 2C5	668-2672
E.A.H. Mitchell (Gold Commissioner)	Room 411, Douglas Building	387-6255, 387-6246
P. Hagan (Coal Administrator)	Room 411, Douglas Building	387-5687

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Vancouver: [vacant]	800 Hornby Street, V6Z 2C5	668-2672
Kamloops: H. Turner	212, 2985 Airport Drive, V2B 7W8	554-1445

TITLES DIVISION *(Continued)*

Quesnel: D. Lieutard	401, 350 Barlow Avenue, V2J 2C1	7-751-260
Smithers: [vacant]	Box 877, V0J 2N0	776-278
Nelson: D. Moule	403 Vernon Street, V1L 4E4	352-2211, ext. 311

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P. F. Ralph (Deputy Chief Analyst)	541 Superior Street	387-6249

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Dr. T. Hoy	626 Superior Street	387-5068
Dr. D. G. MacIntyre	626 Superior Street	387-5068
Dr. A. Panteleyev	626 Superior Street	387-5068
Dr. V. A. Preto	626 Superior Street	387-5068
Dr. B. N. Church	630 Superior Street	387-5068
Dr. G.E.P. Eastwood	630 Superior Street	387-5068

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G. McArthur (Senior Geologist)	Room 418, Douglas Building	387-5975

Geologists

Special Projects: [vacant]	Room 416, Douglas Building	387-5975
Industrial Minerals: Z. D. Hora	630 Superior Street	387-5068
Mineral Inventory:		
T. Kalnins	Room 427, Douglas Building	387-5975
J. E. Forester	Room 424, Douglas Building	387-5975
Coal Inventory: A. Matheson	625 Superior Street	387-6588

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Fort St. John: R. H. Karst	Box 7438, V1J 4M9	785-6906
Kamloops: G.P.E. White	101, 2985 Airport Drive, V2B 7W8	376-7201
Nelson: G. G. Addie	310 Ward Street, V1L 5S4	352-2211, ext. 213

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Prince George: G. H. Klein	1652 Quinn Street, V2N 1X3	562-8131, ext. 322/323
Smithers: T. G. Schroeter	Box 877, V0J 2N0	847-4411, ext. 277

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P. Monier (Senior Financial Analyst)	525 Superior Street	387-3787
J. F. Clancy (Senior Economic Analyst)	525 Superior Street	387-3787

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B. T. Barber (Senior Reservoir Engineer)	Room 436, Douglas Building	387-5993
P. K. Huus (Reservoir Engineering Technician)	Room 403, Douglas Building	387-5993
W. L. Ingram (Senior Development Engineer)	Room 443, Douglas Building	387-5993
M. B. Hamersley (Development Engineering Technician)	Room 443, Douglas Building	387-5993
D. L. Johnson (District Manager)	Box 6880, Fort St. John, V1J 4M9	758-6906

GEOLOGICAL DIVISION

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R. Stewart (Senior Reservoir Geologist)	Room 440, Douglas Building	387-5993
J. A. Hudson (Senior Economic Geologist)	Room 442, Douglas Building	387-5993

TITLES DIVISION

W. J. Quinn (Commissioner)	Room 446A, Douglas Building	387-1908