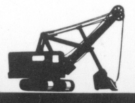
Province of British Columbia
Ministry of Energy, Mines and
Petroleum Resources
Hon. Jack Davis, Minister

MINERAL RESOURCES DIVISION
Geological Survey Branch



GOLD PRODUCTION AND RESERVES IN BRITISH COLUMBIA

by: T.G. Schroeter,
C. Lund and G. Carter

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INTRODUCTION

The mineral exploration industry in British Columbia has enjoyed a substantial boom during the past several years. Measured in terms of total exploration expenditures or the number of mineral claims records, the level of activity has been in an upward trend since the mid-1970s, broken only temporarily by the Great Recession of 1982-83. However, during the 1980s the criteria for target selection changed radically. Prior to the recession the total exploration effort in the province showed a fair balance between the search for base metals, precious metals, and coal; since 1983 the focus has been almost exclusively on gold.

This change of emphasis is seen as the result of two major factors; the collapse of the speculative bubble in commodity prices in 1982 and the advent of flow-through share financing, itself a government response to the collapse in metal prices which threatened the Canadian exploration industry with virtual extinction. Flow-through financing allowed junior companies to fill the vacuum left as producing companies curtailed their exploration efforts to conserve cash flow. Tax write-offs of little value to companies with no profits could now be "flowed through" to individual investors. The ability to maintain an aggressive exploration program became dependant in large measure, on the ability to tap this new source of high-risk capital. Financing base metal exploration made little sense to the private investor at a time when many base metal producers appeared to be heading toward bankruptcy. Gold, on the other hand, was seen as a tangible asset providing protection against double-digit inflation. The price had reached $850US per ounce in 1980 and many analysts confidently predicted it would surpass this level in the medium term. Precious metal projects offered the added attraction of generally lower development costs, shorter lead times from discovery to production, and therefore quicker financial returns in the event of exploration success.

The economic factors that underpinned the "gold rush" early in the decade appear less valid today. Base metal prices have doubled and tripled since 1987, while the price of gold has moved within a relatively narrow range over a 7-year period and, at the time of writing, is lower in constant dollar terms than the average price in 1979. This relative price stability reflects a dramatic increase in the supply of newly minted gold. Mine output in Western countries is expected to exceed 1400 tonnes in 1989 (Fung, 1989), an increase of almost 50 per cent over the 950 tonnes produced in 1980 (du Boulay, 1984). It is difficult to see how any significant increase in the bullion price can be sustained while the supply of new gold that can be profitably mined at prices below $300US per ounce continues to increase. Accordingly, shares of gold mining companies have fallen out of favour in the marketplace and it has become much more difficult for junior companies to raise risk capital.

Whether this is a short-term change in sentiment or heralds another major adjustment in the broad thrust of mineral exploration in Canada, only time will tell. The purpose of this report is not to attempt a prediction of future trends of exploration in British Columbia, but to document the abundance and diversity of gold discoveries that have resulted from the tightly focused and successful exploration effort over the last several years, and place them in context with the province's earlier history of precious metal production. Several new precious metal mines have been brought on stream over the last two to three years; more are in advanced stages of development. Gold production in British Columbia in 1987 totalled 11.7 tonnes, 10.6 per cent of Canadian production, ranking the province third-equal with the Northwest Territories as a gold producer, behind Ontario (44.8%) and Quebec (26.6%). Production is projected to double, and possibly triple, reaching more than 30 tonnes (1 million ounces) annually by early in the next decade; this is equivalent to 60 per cent of Canada's total production in 1981. There can be no better demonstration of the high potential for making new discoveries, including the possibility of world-class deposits such as Windy Craggy which, although discovered in 1958, was not explored in detail until almost 30 years later.

Relatively little analysis of gold production and reserves in British Columbia has been added to the literature in recent

years. An excellent summary paper, covering both placer and lode gold deposits in the Canadian Cordillera, was published in 1980 (Barr, 1980); it dealt primarily with historic past producers and then-current new discoveries such as Consolidated Cinola's Babe deposit on the Queen Charlotte Islands and the Northair mine on Brandywine Creek north of Squamish. A map and tabulation compiled by Schroeter and Panteleyev (1986) includes data to the end of 1984 and provides the most recent information prior to completion of this study.

INFORMATION SOURCES AND SCOPE OF REPORT

This Open File report draws heavily on Schroeter and Panteleyev's work (1986), expanding the listing of significant gold-bearing deposits in British Columbia from 148 to 191 (Figure 1 and Table 1; an alphabetical listing of the deposits included in Table 1 is included as Appendix 1, for cross-referencing purposes). Information sources include MINFILE, assessment reports, submissions to the Mine Development Review Committee, company reports and news releases, the mining press, personal property files of the senior author and numerous discussions with professional colleagues in both government and industry. The senior author has visited most of the deposits or camps listed.

Production statistics are completed to the end of 1987 and reserve estimates are the most recent available in January 1989. All historic production statistics and some current reserve estimates are reported in Imperial rather than metric units. Imperial units are therefore retained in the Tables and Figures included in this report, both for ease of compilation and to avoid a possible source of compilation errors; metric conversions are used in the text where appropriate. The text is purposely brief and intended only to provide the reader with both an incentive and starting point for further research.

Notes: 1) "Reserves" to Jan.1/89 unless otherwise indicated
2) Numbers in brackets [ ] are more recent data but are NOT included in TOTALS within tables, text or diagrams.

B.C. GOLD PRODUCTION AND RESERVES (1894-1987)

Table 1

Fig. 1 No.	DEPOSIT or CAMP NAME	NTS	MINFILE No.	YEARS OF PRODUCTION	MILLING RATE tons/day	GOLD PROD. RANK (CAMP)	Tons MINED or MILLED	RECOVERED OUNCES GOLD	RECOVERED OUNCES SILVER	Ag:Au	OTHER PRODUCTS	RESERVES (ALL CATEGORIES) (Tons)	GRADE oz/ton GOLD	RESERVES GOLD CONTENT (Ounces)	OTHER RESERVES (Incl. other commodities)	GOLD CONTENT (RES.+ MINED) (Ounces)	DEPOSIT TYPE
1	WINDY-CRAGGY	114P/12	114P002		1100 est.						Cu, Co Zn, Au	100,000,000	0.006	600,000	Part of total: 350 Mtons @1.5% Cu, 0.08% Co, .06 oz/T Ag, plus Zn	600,000	Massive Sulphide Volcanogenic (Besshi)
2	MAID OF ERIN	114P/10E	114P007	1911-1956 INT.		133	3,620	10	47,796	4780:1	Cu			0		10	Skarn
3	ATLIN RUFFNER	104N/12E	104N011	1916-1976 INT.		120	1,280	100	65,591	660:1	Cu, Pb Zn			0	63920 tons @15.4 oz/ton Ag 5% (Pb + Zn)	100	Vein Mesothermal
4	IMPERIAL	104N/12E	104N008	1899-1900		121	290	98	0							98	Vein Mesothermal
5	ENGINEER	104M/8E	104M014	1913-1952 INT.	50	52	17,150	18,058	8,950	1:2						18,058	Vein Epithermal
6	TULSEQUAH CHIEF	104K/12E	104K002	1939-1957	530	26	1,029,090	94,257	3,400,772	36:1	Cu, Pb Zn	2,380,000	0.08	190,400	2.9 oz/ton Ag, 2.0% Cu 1.2% Pb, 6% Zn	284,657	Massive Sulphide Volcanogenic (Kuroko)
7	POLARIS TAKU	104K/12E	104K003	1938-1951		18	753,250	231,603	11,760	1:10	Cu	222,854	0.316	70,422		302,025	Vein (Mesothermal) Replacement
8	TAURUS (HANNA)	104P/5E	104P012	1981-1987	150 est.		303,547	34,422	2,150 est.	1:10		60,000	0.25	15,000	Operations Suspended - 1988	49,422	Vein Mesothermal
9	CASSIAR CAMP (#):			1979-1987*		(17)	800,030	257,287	153,040			462,279		204,802		462,089	
9	ERICKSON GOLD (incl. Cusac 1986-1987)	104P/4E	104P029	1979-1987*	100-280		477,483	215,880	149,890 est.	1:1		233,684	0.332	77,583		293,463	Vein Mesothermal
(9# = includes Taurus, Erickson Gold, Cusac, Eileen East and Plaza (Vollaug)Totals)																	
10	CUSAC (CORDOBA)	104P/4E	104P070	1982,1983	20-50		1,000 est.	1,000	1,000	1:1					Nov.'88: 25,000 tons @1.0 oz/ton Au 0.36 oz/ton Ag	1,000	Vein Mesothermal
	EILEEN EAST (i)	(1985 discovery)										88,458	0.87	76,958		76,958	Vein (Mesothermal)
11	PLAZA (VOLLAUG)	104P/4E	104P019	1981, 1983	100		18,000	5,985				80,137	0.44	35,260	~0.34 oz/ton Ag	41,245	Vein Mesothermal
12	STIKINE COPPER (GALORE CREEK)	104G/3W	104G016							20:1	Cu, Ag	125,000,000	0.014	1,750,000	0.28 oz/ton Ag, 1.06% Cu	1,750,000	Porphyry (Alkaline)
13	LIARD COPPER (SCHAFT CREEK)	104G/7W	104G005							9:1	Cu, Mo Ag	1,000,000,000	0.004	4,000,000	0.035 oz/ton Ag, 0.3% Cu 0.02% Mo	4,000,000	Porphyry (Calcalkaline)
14	RED DOG (SPECTRUM)	104G/9W	104G005									2,400,000	0.037	88,800		88,800	Vein Mesothermal

15	RED-CHRIS	104H/12W	104H006								Cu	43,700,000	0.01	437,000	0.56% Cu	437,000	Porphyry (Alkaline)
16	LAWYERS	94E/6E	94E066	1989-	550							1,938,000	0.196	379,848	7.09 oz/ton Ag Mineable: 1,414,000 tons @0.205 oz/ton Au, 7.27 oz/ton Ag	379,848	Vein Epithermal
17	BAKER (CHAPPELLE)	94E/6E	94E026	1980-1983	100	43	87,740	37,558	742,198	20:1		55,000	0.56	30,800	5.1 oz/ton Ag	68,358	Vein Epithermal
18	REG(MT.JOHNNY)	104B/11E	104B077	1988-	250					2:1	Cu, Pb Zn	384,889	0.83	319,458	~0.9 oz/ton Ag ~0.7% Cu, +Zn & Pb Part of 1.09 mT @ .704 oz/ton Au	319,458	Vein Mesothermal
19	SULPHURETS CAMP:										TOTAL:	43,421,487		3,909,348		3,909,348	Vein (Mesothermal)
19	A) BRUCEJACK LAKE:	104B/9W	104B118							50:1	A) TOTAL	1,421,487	0.34	483,348	20.17 oz/ton Ag	483,348	Vein (Mesothermal)
19	WEST ZONE (i)	104B/9W	104B118							est.		854,072	0.354	302,341	22.94 oz/ton Ag	302,341	
19	SHORE (ii)	104B/9W	104B118									539,776	0.236	127,387	27.23 oz/ton Ag	127,387	
19	GOSSAN HILL (iii)	104B/9W	104B118									27,639	1.94	53,620	3.54 oz/ton Ag	53,620	
19	B) SNOWFIELDS GOLD	104B/9W	104B179									22,000,000	0.083	1,826,000		1,826,000	Porphyry (Alkaline)
19	C) SULPHURETS BRECCIA											20,000,000	0.08	1,600,000		1,600,000	Porphyry (Breccia)
20	SCOTTIE GOLD (SUMMIT LAKE)	104B/1E	104B074	1981-JAN. 1985	200	27	201,200	88,600	44,000	1:2		120,000	0.5	60,000	Fall '87: 28,992 tons @0.54 oz/ton Au	148,600	Vein Mesothermal
21	GRANDUC	104B/1E	104B021	1971-OCT. 1983	4000	31	16,500,000	65,510	3,739,895	57:1	Cu	10,900,000			1.79% Cu	65,510	Massive Sulphide Volcanogenic (Besshi)
22	BIG MISSOURI	104B/1E	104B054	1927-1942 1989-	750	33	847,610	58,384	52,676	1:1	Pb, Zn	1,685,200	0.09	151,668	0.67 oz/ton Ag Geolog. Res.: 4,062,000 tons @0.073 oz/ton Au, 0.62 oz/ton Ag	210,052	Vein Mesothermal
23	PREMIER	104B/1E	104B054	1918-1976 int. 1989-	200 (1912) 400 (1926) 2000 (1989	3	4,670,018	1,804,218	40,803,280	23:1	Cu, Pb Zn, Cd	7,000,000	0.068	476,000	2.59 oz/ton Ag Mineable: 6,468,756 tons @0.063 oz/ton Au, 2.34 oz/ton Ag	2,280,218	Vein Epithermal
23	POWER ZONE (i)											110,250	0.122	13,451	Au Equivalent	13,451	Vein Epithermal
24	INDIAN	104B/1E	104B031	1925-1953 int.		97	14,180	1,258	49,514	39:1	Pb, Zn					1,258	Vein Mesothermal
25	PORTER-IDAHO	103P/13W	103P089	1922-1950 int.		102	30,050	864	2,360,200	2732:1	Pb, Zn	853,000			20.1 oz/ton Ag	864	Vein (Stockwork) Mesothermal
26	DUNWELL	103P/13W	103P052	1926-1941		59	50,300	9,875	329,805	33:1	Cu, Pb Zn					9,875	Vein Mesothermal
27	EAST GOLD	104B/8W	104B033	1949-1965 int.		99	30	1,019	3,170	3:1	Cu, Pb Zn					1,019	Vein Mesothermal
28	TORBRIT	103P/12E	103P191	1928-1959 int.		119	1,379,300	110	18,646,304	> 10000:1	Pb, Zn	786,372			9.1 oz/ton Ag, 0.5% Zn 0.42% Cu	110	Vein (Mesothermal) Massive Sulphide Volcanogenic

29 GEORGIA RIVER	103P/16E	103P003	1937	109	500	329	409	1:1	Pb	120,037	0.55	66,020	0.68 oz/ton Ag	66,349	Vein Mesothermal
30 ESPERANZA	103P/6W	103P126	1911-1948 int.	113	4,980	256	143,115	560:1	Cu, Pb					256	Vein Mesothermal
31 ANYOX	103P/6W	103P021	1914-1936	23	23,948,410	121,298	6,633,087	55:1	Cu	18,000,000	0.003	54,000	0.09 oz/ton Ag 0.46% Cu	175,298	Massive Sulphide Volcanogenic (Cyprus)
31 A) HIDDEN CREEK															
31 B) BONANZA	103P/5W	103P023	1928-1936	86	724,190	2,783	281,243	101:1	Cu					2,783	
32 OUTSIDER	103O/8E	103O030	1906-1928	122	138,850	66	4,882	74:1	Cu	181,440			1.5% Cu	66	Massive Sulphide Volcanogenic (Cyprus)
33 GRANBY POINT	103P/5W	103P022	1917-1938	63	62,040	5,795	196,260	34:1	Silica					5,795	Vein Mesothermal
34 GOLDKEISH	103P/5W	103P027	1918-1938	69	50,890	4,831	26,443	6:1	Silica					4,831	Vein Mesothermal
35 VICTORIA	93M/4E	93M072	1926-1940	115	50	236		15:1	Co	1,000	1.24	1,240	0.08 oz/ton Ag 2% Co	1,476	Vein Mesothermal
36 SILVER STANDARD	93M/5E	93M049	1913-1985	56	225,246	14,975	7,623,712	509:1	Cu, Pb Zn, Cd	10,000	0.083	830	37.2 oz/ton Ag 4.5% Pb, 8% Zn	15,805	Vein Mesothermal
37 SILVER CUP, AMERICAN BOY	93M/5E	93M040,47	1913-1955 int.	127	6,620	34	128,794	3788:1	Pb, Zn					34	Vein Mesothermal
38 ROCHER DEBOULE	93M/4E	93M071	1915-1954 int.	68	136,020	5,055	85,300	17:1	Cu, Pb Zn	200,000	0.33	66,000	4.1 oz/ton Ag, 4% Co 4% Cu	71,055	Vein Mesothermal
39 VIRGINIA SILVER (TETRA)	93M/3E	93M021	1975, 1976	132	275	12	22,440	1870:1	Pb, Zn	20,000	0.03	600	86 oz/ton Ag, 4.4% Pb 2.2% Zn	612	Vein Mesothermal
40 GLACIER GULCH (NORTH)	93L/14W	93L107	1933-1939	110	180	296	1,186	4:1	Pb, Zn					296	Vein Mesothermal
41 LUCKY LUKE CORDILLERA	103I/9W	103I039, 40	1924-1967 int.	123	110	59	683	12:1	Cu					59	Vein Mesothermal
42 COLUMARIO	103I/9W	103I077	1934,1935	103	3,000 est.	679	1,868	3:1						679	Vein Mesothermal
43 DUTHIE (SIL-VAN, incl. Coronado, Victory)	93L/14W	93L088	1923-1983 1985	78	81,707	3,695	1,721,623	466:1	Cu, Pb Zn	21,700	0.07	1,519	6.0 oz/ton Ag 5% Pb, 7.5% Zn	5,214	Vein Mesothermal
44 HUNTER BASIN	93L/11E	93L042	1915-1941	114	290	238	8,265	35:1	Cu					238	Vein Mesothermal

45	DOME MOUNTAIN (Free Gold, The Forks, Boulder Ck)	93L/10E	93L023 93L022	1940-1951 1981-1982	100	106	5,862	387	663	2:1	Pb, Zn	318,615	0.37	117,888	2.00 oz/ton Ag, Incl. Boulder Zone: 207,817 tons @ 0.37 oz/ton Au, 1.88 oz/ton Ag Argillite Zone: 86,274 tons @ 0.43 oz/ton Au, 2.96 oz/ton Ag Boulder Extension: 25,248 tons @ 0.15 oz/ton Au, 0.084 oz/ton Ag	118,275	Vein Mesothermal
46	LITTLE JOE HYLAND BASIN	93L/15W	93L125 128	1927-1940		129	30	24	9,455	394:1	Cu, Pb Zn					24	Vein Mesothermal
47	CRONIN	93L/15W	93L127	1914-1974 int.		111	28,480	282	262,672	932:1	Pb, Cu Zn, Cd	320,000	0.436	139,520	2.8 oz/ton Ag	139,802	Vein Mesothermal
48	BELL COPPER (NEWMAN)	93M/1E	93M001	1972-1982 1985-1987*	17000	14	60,488,981	290,819	777,670	3:1	Cu	14,000,000	0.02	280,000	0.509% Cu	570,819	Porphyry (Calcalkaline)
49	GRANISLE	93L/16E	93L146	1966-1982	12500	21	57,498,131	148,000	1,906,000	13:1	Cu, MO					148,000	Porphyry (Calcalkaline)
50	GOLDEN EAGLE	93L/9E	93L015	1934-1978 int.		130	140	16	21,256	1329:1	Cu, Pb Zn					16	Vein Mesothermal
51	JEWEL (DENTONIA)	82E/2E	82E055	1940-1975 1984-1985 int.		42	137,486	39,711	234,517	6:1	Pb, Zn	50,000	0.31	15,500	2.0 oz/ton Ag	55,211	Vein Mesothermal
52	EQUITY SILVER TOTAL:	93L/1W	93L001	1980-1987*	5600	19	18,462,814	215,465	39,865,737	185:1	Cu, Sb As	16,200,000		623,131	2.52 oz/ton Ag 0.25% Cu Totals:	838,596	Transitional
52	A) SOUTHERN TAIL ZONE											1,000,000 est.	0.075	75,000	4.84 oz/ton Ag, 0.93% Cu	75,000	
52	B) WATERLINE ZONE											2,959,600	0.035	103,586	2.22 oz/ton Ag, 0.3% Cu	103,586	
52	C) NORTH ZONE											600,590	0.12	72,071	4.64 oz/ton Ag, 0.62% Cu	72,071	
52	D) MAIN ZONE											11,639,810	0.032	372,474	2.52 oz/ton Ag, 0.25% Cu	372,474	
53	SILVER QUEEN (NEW NADINA)	93L/2E	93L002	1972, 1973	300	81	200,200	3,156	438,796	140:1	Cu, Pb Zn, Cd	932,900	0.085	79,297	12.21 oz/ton Ag, 0.52% Cu 1.38% Pb, 6.94% Zn	82,453	Vein Mesothermal
54	EMERALD GLACIER	93E/11W	93E001	1951-1968 int.		125	9,190	48	83,494	1740:1	Cu, Pb Zn, Cd	45,000	0.03	1,350	10.34 oz/ton Ag 6.23% Pb, 9.49% Zn	1,398	Vein Mesothermal
55	DRUMLUMMON	103H/14E	103H018	1918-1926		124	1,030	57	1,575	28:1	Cu					57	Vein Mesothermal
56	HUNTER	103H/1W	103H034	1933		128	4	29	11	1:3	Cu	103,800	0.35	36,330		36,359	Vein Mesothermal
57	WESTERN COPPER	103H/1W	103H033	1928,1929		118	230	171	1,453	9:1	Cu					171	Vein Mesothermal
58	SURF INLET	103H/2W	103H027	1917-1926 1936-1943	300	12	1,012,060	388,881	201,210	1:2	Cu	57,000	0.35	19,950	(up to 0.4 oz/ton Au) Plus 0.28 oz/ton Ag, 0.6% Cu	408,831	Vein Mesothermal

59	SURF POINT, EYDE PASS (PORCHER IS.)	103J/2E	103J001, 002	1919-1939		49	67,870	20,574	230,755	11:1	Cu	623,000	0.2	124,600	0.16 oz/ton Ag Drill Indicated	145,174	Vein Mesothermal
											[part of	1,523,000	0.2	304,600]			
60	CINOLA (BABE)	103F/9E	103F034	1975, 1981 test mill.	6000 est. 1990	105	6,130 est.	415 est.	240 est.	1:2		26,240,000	0.072	1,889,280	0.09 oz/ton Ag "Mineable", better grade: 11,078,228 tons @0.097 oz/ton Au	1,889,695	Vein Epithermal
61	SOUTHEASTER	103G/5W	103G006	1919-1936 int.		126	500	40	27	1:1	Cu, Pb					40	Vein Mesothermal
62	EARLY BIRD	103C/16E	103C002	1913-1939 int.		112	180	280	39	1:7						280	Vein Mesothermal
63	TASU	103C/16E	103C003	1914- Oct. 83		40	22,965,511	43,066	1,620,205	36:1	Fe, Cu					43,066	Skarn
64	LILY-IKEDA WIRELESS LUCKY SEVEN	103B/6E	103B024, 028,044	1906-1920		93	14,830	1,664	27,960	17:1	Cu					1,664	Skarn
65	CAPOOSE	93F/6E	93F040									31,200,000	0.01	312,000	1.05 oz/ton Ag	312,000	Porphyry related (Calcalkaline)
66	CARIBOO-BARKERVILLE CAMP:	93H/4E	93H010, 19,25	1933-67,80-81		(5)	3,027,928	1,231,214	165,382	1:7	Cu, Pb Zn	327,000	0.108	35,316		1,266,530	TOTAL
66	A) CARIBOO GOLD QTZ (MT.ALLAN), ISLAND MT.(AURUM)			1933-1967			1,681,950	626,755	56,092	1:11		327,000	0.108	35,316		662,071	Vein
				1934-1954			1,245,295	569,528	81,658	1:7						569,528	Replacement
66	B) MOSQUITO CK			1980-1987*	100		100,683	34,931	27,632	1:1					Geol. Res. @0.88 oz/ton Au and 0.5 oz/ton Ag	34,931	(Mesothermal)
67	QR	93A/12W	93A121									950,000	0.21	199,500		199,500	Vein (Alkaline Porphyry related)
											[incl.	105,000 - Main Zone 39,000 - West Zone 6,500 - Midwest Zone]					
67	a SPANISH LAKE (CPW)	93A/11W	93A043									981,060	0.08	78,485		78,485	Vein Mesothermal
68	CARIBOO-BELL (MOUNT POLLEY)	93A/12E	93A059									128,000,000	0.012	1,536,000	0.31%Cu [Mineable: 53,540,000 tons @ 0.44% Cu, 0.017 oz/ton Au]	1,536,000	Porphyry (Alkaline)
69	FISH LAKE	92O/5E	92O041									200,000,000	0.014	2,800,000	0.03 oz/ton Ag, 0.241%Cu	2,800,000	Porphyry (Calcalkaline)
70	BLACKDOME	92O/8W	92O050-053	1986-1987*	225	29	118,859	76,471	205,149	3:1		280,000	0.74	207,200	2.41 oz/ton Ag Oct. '88: 200,000 tons @0.75 oz/ton Au, 2.16 oz/ton Ag	283,671	Vein Epithermal
71	CHU CHUA (CC)	92P/8E	92P140									785,000	0.012	9,420	3.1% Cu (Open Pit); Geol. Res. 2.76 Mtons @ 0.23 oz/ton Ag, 2% Cu, 0.4% Zn, 0.01 oz/ton Au 0.05% Co	9,420	Massive Sulphide Volcanogenic (Cyprus)

72	REA GOLD (HILTON)	82M/4W	82M191									160,000	0.247	39,520	Discovery Zone: 3.49 oz/ton Ag, 4.99% Zn 3.7% Pb, 1.06% Cu	39,520	Massive Sulphide Volcanogenic (Kuroko)
72a	HOMESTAKE	82M/4W	82M025	1935-1941		108	7,670	361	281,349	780:1	Cu, Pb Zn	877,652	0.028	24,574	6.03 oz/ton Ag, 0.5% Cu 28% Ba, 4% Zn	24,935	Massive Sulphide Volcanogenic (Kuroko)
73	ECLIPSE MERIDIAN SPYDER, MOHAWK	82K/13E	82KNW044 & 064	1911-1958 1903-1941 int.		47	239,000	29,400	1,724,794	59:1	Cu, Pb Zn, Cd	29,000	0.13	3,770	7.43 oz/ton Ag, 6.19% Pb, 6.05% Zn tons up to 75,000	33,170	Vein Mesothermal
74	SILVER CUP	82K/11W	82KNW027	1895-1985	500 est.	67	23,080	5,169	1,447,116	280:1	Pb, Zn Cu	700,000	0.1	70,000	Incl. 251,000 tons Stockpiled @ 0.1 oz/ton Au, 20 oz/ton Ag, 2.5% Pb 7.5% Zn	75,169	Vein Mesothermal
75	ST. EUGENE	82G/5W	82GSW025	1899-1929		89	1,610,400	2,534	5,873,731	2310:1	Pb					2,534	Vein (Mesothermal) (Replacement)
76	BULL RIVER	82G/6W	82GNW002	1972-1974		72	520,100	4,055	204,277	50:1	Cu					4,055	Vein Mesothermal
77	SULLIVAN	82F/9E	82FNE052	1900-1987*	1987:8000	64	153,383,973	5,622 (BEFORE 1980'S ONLY)	295,326,805	>10000:1	Pb, Zn Cd, Sn				32 Mtons @ 4.6% Pb 6.9% Zn, 1.02 oz/ton Ag	5,622	Massive Sulphide (Clastic Hosted)
78	WHITEWATER & HIGHLAND SURPRISE	82K/3E	82KSW131 & 37	1892-1976 int.		79	418,890	3,315	3,414,491	1030:1	Pb, Zn	SEE FAME 87				3,315	Vein Mesothermal
79	VICTOR (VIOLAMAC)	82F/14W	82FNW204	1923-1979		91	111,500	2,455	4,137,065	1690:1	Cu, Pb Zn, Cd					2,455	Vein Mesothermal
80	TILLICUM (ESPERANZA)	82F/13E	82FNW234	1981,1985-1987		80	3,726	3,160	3,000 est.	1:1 1:1		2,000,000	0.22	440,000	Heino Money Zone: Ind+Prov+Prob 55,000 tons @ 1.05 oz/ton Au East Ridge: Drill Indicated 385,000 tons @ 0.30 oz/ton Au Drill Inf: 1.6Mtons @0.17 oz/ton Au	443,160	Skarn
81	SCRANTON	82F/14E	82FNW112	1948-1979	150	77	8,960	3,766	112,460	30:1	Cu, Pb Zn, Cd					3,766	Vein Mesothermal
82	PERRIER	82F/6W	82FSW208	1913-1946		44	256	34,681	44,803	1:1	Pb, Zn					34,681	Vein Mesothermal
82a	GRANITE POORMAN	82F/6W	82FSW086	1890-1954		32	199,650	65,080	27,684	1:2	Pb, Zn Cu, Cd	18,000	0.27	4,860	Plus 7 oz/ton Ag, 8.2% Pb, 8.0% Zn	69,940	Vein Mesothermal

83 SHEEP CREEK:	82F/3E	TOTALS:	1902-1981		(8)	1,667,596	761,456	280,495	1:3	Cu,Pb,Zn	223,000	0.33	73,590		835,046	Vein (Mesothermal)
83 A) RENO	82F/3E	82FSW036	1906-1979			415,505	233,743	103,409	1:2	Cu,Pb,Zn					233,743	Vein (Mesothermal)
83 B) GOLD BELT	82F/3E	82FSW044	1934-1979			256,685	80,791	34,121	1:2	Cu,Pb,Zn					80,791	Vein (Mesothermal)
83 C) KOOTENAY BELL	82F/3E	82FSW046	1904-1967			278,124	112,755	41,996	1:3	Pb,Zn					112,755	Vein (Mesothermal)
83 D) QUEEN	82F/3E	82FSW048	1902-1970			716,158	303,933	100,359	1:3						303,933	Vein (Mesothermal)
83 E) VANCOUVER	82F/3E	82FSW049	1909-1933			382	29,983	412	1:73						29,983	Vein (Mesothermal)
83 F) NUGGET	82F/3E	82FSW040	1980-1981			742	251	198	1:1		223,000	0.33	73,590	Incl 75260 tons @.464 oz/ton Au Prov & Prob; and 148,500 tons @0.265 oz/ton Au Marg. & Poss.	73,841	Vein (Mesothermal)
84 BAYONNE	82F/2W	82FSE030	1935-1951, 1984		41	86,102	42,152	120,282	3:1	Pb, Zn	24,000	0.4	9,600	Plus 0.42 oz/ton Ag, 5% Pb 3% Zn, 0.2% Cu	51,752	Vein Mesothermal
85 ALPINE	82F/11W	82FNW127	1915-1948		57	17,000	11,451	7,119	2:1	Pb, Zn	210,000	0.5	105,000	Proven & Est: 990,000 tons @ 0.5 oz/ton Au	116,451	Vein Mesothermal
85 a CHAPLEAU, KILO	82F/11W	82FNW130, 131	1896-1941		85	5,040	2,853	14,844	5:1	Pb, Zn	720,000	0.3	216,000	6.0 oz/ton Ag	218,853	Vein Mesothermal
86 ROSSLAND CAMP (LE ROI, CENTRE, STAR, WAR EAGLE, JOSIE, ETC.,)	82F/4E	82FSW093 etc.,	1894-1974 int.		(2)	6,199,799	2,745,260	3,440,800	1:1	Cu, Pb Zn				Recovered Grade: 0.47 oz/ton Au 0.6 oz/ton Ag, 1% Cu [18,589 tons @ 0.47 oz/ton Au - North Belt West] [51,810 tons @ 0.23 oz/ton Au - North Belt East] [38,176 tons @ 0.57 oz/ton Au - South Belt (North Shore)]	2,745,260	Vein Mesothermal
87 SUSIE	82E/4E	82ESW090	1960-1976		88	7,860	2,639	48,822	19:1	Cu, Pb Zn					2,639	Vein Mesothermal
88 GREENWOOD CAMP: (Motherlode, Phoenix Greyhound, Emma, Oro Denoro, B.C.)	82E/2E	82ESE013 14,21,25 26,34,50, 60-63	1900-1978	TOTAL:	(6)	31,836,731	1,191,431	7,219,470	3:1	Cu	456,000		116,127		1,307,558	Skarn
88 A) GRENOBLE	82E/2E	82ESE									135,000	0.368	49,680	Plus 1.73% Cu (Drill Indicated)	49,680	
88 B) LEXINGTON	82E/2E	82ESE041	1950-1951			8		267		Pb, Zn	321,000	0.207	66,447	Plus 0.21% Cu	66,447	
88a GREENWOOD VEINS GRAND TOTAL:					(37)	178,584	46,673	2,049,221			107,000		36,880		83,553	Vein (Mesothermal)
88a GREENWOOD VEINS: PROVIDENCE, EPU, LAST CHANCE, SKYLARK	82E/2E	82ESE001 TO 12 48, 54	1893-1976 int. 1893-1973	TOTAL:		96,090	29,716	1,872,061	63:1	Pb, Zn Cu	30,000	0.1	3,000		32,716	Vein (Mesothermal)
											30,000	0.1	3,000	Plus 30 oz/ton Ag	3,000	Vein (Mesothermal)
88a A) WINNIPEG		82ESE033	1900-1940			58,770	11,674	36,549	3:1	Cu, Pb					11,674	Vein (Mesothermal)
88a B) SKOMAC. No:7		82ESE042 043,045	1893-1976			20,982	4,045	138,362	34:1	Cu, Pb Zn					4,045	Vein (Mesothermal)
88a C) GOLDEN CROWN		83ESE032	1900-1941			2,742	1,238	2,249	2:1	Cu	77,000	0.44	33,880	Drill Indicated	35,118	Vein Mesothermal

89 UNION	82E/9W	82ENE003	1913-1946 1987-		34	138,400 12,000	55,097 242	1,379,961 9,154	25:1 38:1	Cu,Pb,Zn	83,000	0.096	7,968	3.0 oz/ton Ag Tailings + Dump	55,097 8,210	Vein Mesothermal Tailings
90 HIGHLAND BELL (BEAVERDELL)	82E/6E	82ESW030	1913-1987*	130	55	1,084,756	16,082	33,488,913	2080:1	Cu, Pb Zn, Cd	38,000	?		0.2% Pb, 0.4%Zn, 9.0 oz/ton Ag	16,082	Vein Mesothermal
91 CARIBOO-AMELIA (CAMP MCKINNEY)	82E/3E	82ESW020	1894-1962		28	137,180	81,603	32,439	1:3	Pb, Zn	8,000	0.5	4,000	Potential: 250,000 tons @0.5 oz/ton Au	85,603	Vein Mesothermal
92 DUSTY MAC	82E/5E	82ESW078	1969-1976		51	58,700	19,483	339,283	17:1	Cu, Pb Zn				Recovered Grade: 0.33 oz/ton Au, 5.76 oz/ton Ag	19,483	Vein Epithermal
93 KALAMAKA	82L/3E	82LSW050	1935-1944		84	7,260	2,898	3,474	1:1	Cu, Pb Zn					2,898	Vein Mesothermal
94 CHAPUT (LUMBY)	82L/7W	82LSE006	1968-1976		50	1,690	20,361	54,569	3:1	Cu, Mo Pb, Zn	281,000	0.124	34,844		55,205	Vein Mesothermal
96 BRENDA	92H/16E	92HNE047	1970-1987*	30000	36	122,911,948	47,925	3,213,722	67:1	Cu, Mo	30,721,163	0.0004	12,288	0.177% Cu, 0.038% Mo 0.04 oz/ton Ag (Mined about 0.0004 oz/ton Au) Oct.'88: 16 Mtons	60,213	Porphyry (Calcalkaline)
97 HEDLEY CAMP:	92H/8E		1904-1987*	TOTAL:	(4)	4,432,849	1,678,080	219,485	1:8	Cu, Zn Co	10,558,000		1,006,132	Recovered Grade: 0.436 Oz/ton Au Oct.'88: ~8.7 Mtons @.088 oz/ton Au	2,684,212	Skarn
97 A) NICKEL PLATE		92HSE038	1904-1913	1988:2700		3,283,296	1,338,664	133,848	1:10		9,100,000	0.088	800,800		2,188,090	Skarn
			1987*			368,030	48,626	26,762	1:2							Skarn
97 B) HEDLEY MASCOT		92HSE036	1936-1949			682,472	233,032	54,882	4:1		800,000	0.13	104,000		337,032	Skarn
97 C) GOOD HOPE		92HSE060	1982,1946-48			10,177	5,298		1:2						5,298	Skarn
97 D) FRENCH		92HSE059	1950-55,57-61,82-83			87,238	51,930	3,993	1:5						51,930	Skarn
97 E) CANTY		92HSE064	1939,1941			1,636	530				658,000	0.154	101,332	Plus 1.7Mtons @.16 oz/ton Au U/G	101,862	Skarn
98 OROFINO & TWIN LAKES	82E/5E	82ESW010 & 011	1899-1942 1926-1942		60	21,800	8,846	2,393	1:4	Pb, Zn					8,846	Vein Mesothermal
99 FAIRVIEW CAMP:	82E/4E	82ESW006	1898-1949	TOTAL:	(53)	521,135	17,038	169,494	10:1	Pb, Zn	962,700		146,935		146,935	Vein
99 A) STEMWINDER		& 007	1933-1941			28,000	3,092	17,089	6:1	Pb, Zn	200,000	0.23	49,092	Plus 2.5 oz/ton Ag	49,092	Mesothermal
99 B) FAIRVIEW (MORNING STAR)			1898-1949			493,265	13,946	152,405	11:1	Pb,Cu,Zn	762,700	0.11	97,843	Plus 1.2 oz/ton Ag	97,843	
100 HORN SILVER	82E/4E	82ESW002	1915-1984	450	58	483,614	10,686	4,089,471	383:1	Cu,Pb,Zn					10,686	Vein Mesothermal
101 DIVIDEND- LAKEVIEW	82E/4E	82ESW001	1907-1949		54	122,634	16,216	2,804	1:6	Cu,Pb,Zn					16,216	Skarn
102 SIMILKAMEEN:	92H/7E	TOTALS:	1917-62,72-87*	22000	(9)	142,389,475	589,093	7,256,986	12:1		23,269,000	0.002	46,538	0.61 oz/ton Ag, 0.448% Cu	635,631	Porphyry-Skarn
102 A) INGERBELLE		92HSE004	1972-1987*	1987:24000		107,614,275	401,241	2,872,092	7:1	Cu	23,269,000	0.002	46,538	Oct.'88: 52 Mtons	447,779	(Alkaline)
102 B) COPPER MTN.		92HSE001	1917-1962			34,775,200	187,852	4,384,894	23:1	Cu		0.00043		@0.46% Cu, .005 oz/ton Au	187,852	
103 RABBIT	92H/10W	92HNE014	1939-1941		98	1,430	1,057	583	1:2						1,057	Vein Mesothermal

104	COQUIHALLA GOLD BELT:	92H/11W	92HSW034														
104	A) CAROLIN (IDAHO)			1982-1984	1360	39	863,139	43,543	38,000	1:1		800,000	0.128	102,400		149,772	Vein
104	B) EMANCIPATION			1905-1941		75		3,829								3,829	Mesothermal
104	AURUM,WARD																
104	PIPESTEM																
105	CRAIGMONT	92I/2W	92ISE035	1961-1982		90	33,067,900	2,503	7,796	3:1	Cu, Fe					2,503	Skarn
106	LORNEX	92I/6E	92ISW045	1972-1986 JUNE	50000 TO 83000		277,782,840	3,156 (GOLD ONLY BEFORE 1980'S)	10,320,406	3270:1	Cu, Mo				See Highland Valley Copper Mined Grade: 0.421% Cu	3,156	Porphyry (Calcalkaline)
107	HIGHLAND VALLEY COPPER CAMP (#):		GRAND TOTAL:			(30)	496,416,220	68,255	17,427,394			807,530,353	0.00017	137,280		205,535	Porphyry
107	VALLEY COPPER	92I/7W	92ISW012	1983-1986 JUNE	26200		32,892,133	12,435	1,536,201	123:1	Cu, Mo					12,435	Porphyry (Calcalkaline)
107	A) BETHLEHEM COPPER (JERSEY, HUESTIS, ETC.)		92ISE001, 002,004, 005,006	1963-1982	20000		116,706,600	41,148	3,209,551	78:1	Cu, Mo	41,000,000			0.5% Cu 0.017% Mo	41,148	Porphyry (Calcalkaline)
107	B) HIGHLAND VALLEY COPPER	(AMALGAMATION LORNEX + VALLEY)		JULY 1986-1987*			69,034,647	11,516	2,361,236	205:1	Cu, Ag Au, Mo	807,530,353	0.00017	137,280	"Lornex + Valley": 0.433% Cu, 0.008% Mo	148,796	Porphyry (Calcalkaline)
(107# = Includes Valley Copper, Lornex, Bethlehem Copper and Highland Valley Copper totals)																	
108	AFTON	92I/9W	92INE023	1977-1987*	9000	13	26,921,822	382,889	2,279,754	6:1	Cu	10,469,000	0.03	314,070	1.5% Cu, 0.2 oz/ton Ag, - underground	696,959	Porphyry (Alkaline)
108	A) AJAX			1989-	11000							27,000,000	0.01	270,000	0.46% Cu	270,000	Porphyry (Alkaline)
109	BRIDGE RIVER CAMP:	92J/15W		1900-1978	TOTAL	(1)	8,060,079	4,178,069	1,002,541	1:4		2,547,000		566,380	Recovered Grades: 0.552 oz/ton Au, 0.012 oz/ton Ag	4,744,449	Vein Mesothermal
109	A) BRALORNE	92J/15W	92JNE001, 002,007	1900-1978	100-600		5,461,400	2,821,567	706,345	1:4		1,064,000	0.27	287,280	Incl. 150,000 tons @0.43 oz/ton Au	3,108,847	Vein (Mesothermal)
109	B) PIONEER	92J/15W	92JNE004	1908-1962	400		2,469,720	1,333,521	244,735	1:5						1,333,521	Vein (Mesothermal)
109	C) WAYSIDE	92J/15W	92JNE030	1915-1937			40,760	5,341	837	1:6		313,000	0.1	31,300	0.2% Cu, 2.55% Zn	36,641	Vein (Mesothermal)
109	D) MINTO	92J/15W	92JNE075	1934-1940			87,160	17,557	50,583	3:1	Cu, Pb					17,557	Vein (Mesothermal)
109	E) CONGRESS	92J/15W	92JNE029	1937			1,039	83	41	1:2	Cu	670,000	0.24	160,800		160,883	Vein (Mesothermal)
109	F) RELIANCE	92J/15W	92JNE033									500,000	0.174	87,000		87,000	Vein (Mesothermal)
110	NORTHAIR (WARMAN)	92J/3E	92JW012	1976-1982	300	20	345,700	166,582	845,854	5:1	Pb, Zn Cu, Cd	52,000	0.235	12,220	Recovered: 0.34 oz/ton Au, 2.5 oz/ton Ag, 4% Zn, 2% Pb	178,802	Vein Mesothermal
111	ASHLU	92G/14W	92GNW013	1932-1939		62	15,000	6,493	7,482	1:1	Cu	98,500	0.25	24,625	~0.33 oz/ton Ag, 0.7% Cu	31,118	Vein Mesothermal

112 BRITANNIA	92G/11E	92GNW003	1905-1977		10	52,783,960	493,069	5,815,395	12:1	Cu, Pb Zn, Cd				No.10 Mine: 1.424 Mtons @ 1.9% Cu Recovered Grade: 0.02 oz/ton Au, 0.2 oz/ton Ag	493,069	Massive Sulphide Volcanogenic (Kuroko)
113 HARRISON (SENECA)	92H/5W	92HSW013	1962		136	280	1	3	6:1	Cu, Zn	1,661,000	0.025	41,525	1.32 oz/ton Ag, 0.63% Cu, 0.15% Pb, 3.57% Zn	41,526	Massive Sulphide Volcanogenic (Kuroko)
114 LENORA TYEE (TWIN J)	92B/13W	92B001 92B002	1898-1964 1901-1952		38	305,000 est.	44,491	934,522	21:1	Cu					44,491	Massive Sulphide Volcanogenic (Kuroko)
115 SUNRO	92C/8E	92C073	1962-1978		48	1,465,000	28,912	72,747	3:1	Cu	1,500,000	0.01973 est.	29,603 est.	1.43% Cu	58,515 est.	Massive Sulphide Volcanogenic (Cyprus
116 THISTLE	93F/2E	92F083	1938-1942		87	6,920	2,760	2,120	1:1	Cu					2,760	Massive Sulphide (Kuroko)
117 TEXADA:			TOTAL:		(24)	23,282,705	106,508	1,286,450			78,810	0.35	27,584		134,092	Skarn
117 A) LITTLE BILLIE	92F/15E	92F105	1896-1952			70,229	11,676	38,526	3:1	Cu				U/G: 303,500 tons @ 0.27 oz/ton Au, 1.4 oz/ton Ag	11,676	Skarn
117 B) TEXADA IRON MINES (PRESCOTT)	92F/10E	92F106	1957-1976			22,943,503	28,530	760,211	27:1	Cu					28,530	Skarn
117 C) CORNELL	92F/10E	92F112	1897-1919			44,849	15,145	70,553	5:1	Cu					15,145	Skarn
117 D) MARBLE BAY	92F/15E	92F270	1899-1929			219,629	49,644	405,759	8:1	Cu	78,810	0.35	27,584	1.2% Cu (Probable + Possible)	77,228	Skarn
117 E) COPPER QUEEN	92F/15	92F271	1903-1917			4,495	1,513	11,401	8:1	Cu					1,513	Skarn
118 DOMINEER NO.22 (MT. WASHINGTON)	92F/14W	92F116	1961-1967		71	396,000	4,204	232,620	55:1	Cu	472,000	0.257	121,304	1.27 oz/ton Ag	125,508	Vein-Breccia (Epithermal)
119 MUSKETEER &	92F/5E	92F060	1942-1975		82	5,000	3,052	1,736	1:2	Cu, Pb	11,000	0.3	3,300		6,352	Vein
119 BUCCANEER	92F/5E	92F061	1941-1959		74	6,500	3,908	1,258	1:3	Cu, Pb					3,908	Mesothermal
120 FANDORA	92F/4E	92F041	1960-1964		95	900	1,468	269	1:5	Cu, Pb Zn	200,000	0.27	54,000		55,468	Vein Mesothermal
121 SILVERADO	93E/9W	92E017	1934-1938		65	130	5,567	10,294	2:1	Cu					5,567	Skarn
122 LYNX,MYRA,H-W, PRICE (BUTTLE LAKE)	92F/12E	92F071, 072,073	1966-1987*	750(1960) 1000(1982) 3000(1984) 4000(1988)	11	8,725,756	467,292	21,477,985	46:1	Cu, Pb Zn	13,798,000	0.07	965,860	1.10 oz/ton Ag, 2.40% Cu 0.36% Pb, 5.28% Zn	1,433,152	Massive Sulphide Volcanogenic (Kuroko)

123	ZEBALLOS CAMP: (PRIVATEER, SPUD VALLEY, ETC.,)	92L/2W	93L008 TO 038	1933-1953 1975	TOTAL:	(16)	718,475	276,067	120,140	1:2	Cu, Pb Fe	395,848		145,933		422,000	Vein Mesothermal
123	A) SPUD VALLEY											247,078	0.41	101,302	Incl. Proven: 91,562 tons @ 0.18 oz/ton Au Prob:117,178tons @0.64oz/ton Au Poss: 26,585tons @0.165oz/ton Au	101,302	Vein Mesothermal
123	B) PRIVATEER											148,770	0.3	44,631	0.08 oz/ton Ag, Proven & 394,516 tons @ 0.5 oz/ton Au, 0.12 oz/ton Ag (Probable)	44,631	Vein Mesothermal
124	A) OLD SPORT	92L/6E	92L035	1962-1973		22	2,929,494	124,386	377,165	3:1	Cu, Fe	500,000	0.02	10,000		134,386	Skarn
124	B) BENSON LAKE	92L/6E	92L091	1968-1969		92	27,400	2,021	15,704	8:1	Cu					2,021	Skarn
125	YREKA	93L/5E	92L052	1902-1967		94	147,200	1,604	145,873	91:1	Cu	141,590	0.2	28,318	0.54 oz/ton Ag, 1.05% Cu	29,922	Skarn
126	ISLAND COPPER	92L/11W	92L158	1971-1987*	40000 1988:50000	7	242,349,305	797,008	5,821,247	7:1	Cu, Mo	35,000,000 est.	0.007	245,000 est.	~0.03 oz/ton Ag, 0.435% Cu, 0.017% Mo	1,042,008	Porphyry (Calcalkaline)
127	DOCTORS POINT	92H/5W	92HNW071									100,000	0.1	10,000		10,000	Vein Mesothermal
128	CARMI	82E/6E	82ESE029	1901-1940		83	5,480	2,994	9,675	3:1	Pb, Zn				0.15% Pb, 3.57% Zn	2,994	Vein Mesothermal
129	CARIBOO-HUDSON (CUNNINGHAM CK.)	93A/14W	93A071	1938-1939		66	13,400	5,185	2,626	1:2		35,450	0.36	12,762	(above 200 foot level)	17,947	Vein Mesothermal
130	DORATHA MORTON	92K/11W	92K023	1898-1925		70	10,250	4,595	10,633	2:1	Cu	90,000 est.	0.35	31,500	~0.50 oz/ton Ag	36,095	Vein Mesothermal
131	WINDPASS	92P/8E	92P039	1916-1944		45	80,800	34,455	1,719	20:1	Cu					34,455	Vein Mesothermal
132	VIDETTE	92P/2W	92P086	1933-1940		46	53,900	29,869	46,573	2:1	Cu, Pb					29,869	Vein Mesothermal
133	PLANET	92I/8W	92ISE029	1926-1952		61	78,590	8,186	249,932	31:1	Cu, Pb Zn					8,186	Vein Mesothermal
134	IRON MASK	92I/9W	92SE010	1901-1928		76	146,300	3,794	14,843	4:1	Cu					3,794	Porphyry (Alkaline)
135	BIG SLIDE	92I/13W	92INW036	1934-1940		96	7,600	1,282	2,463	2:1	Cu, Pb					1,282	Vein Mesothermal
136	YELLOW GIANT:	103G/8E	103G009	TOTAL:								1,250,000		187,700		187,700	Vein-Mesothermal
136	A) TEL											100,000	0.5	50,000		50,000	Vein-Mesothermal
136	B) KIM											1,100,000	0.072	79,200		79,200	Vein (Mesothermal)
136	C) BOB											50,000	1.17	58,500		58,500	Skarn
137	KUTCHO CREEK	104I/1W	104I060									18,740,000	0.009	168,660	0.85 oz/ton Ag, 1.62% Cu 2.3% Zn, 0.06% Pb	168,660	Massive Sulphide Volcanogenic (Kuroko)

138	POISON MOUNTAIN	92O/2E	92O046										584,000,000	0.004	2,336,000	0.24% Cu, 0.007% Mo	2,336,000	Porphyry (Calcalkaline)
139	AYLWIN (WILLA)	82F/14W	82F071										456,727	0.176	80,384	Proven: 0.92% Cu, 0.28 oz/ton Ag Prob + Poss: 242,000 tons Same Grade	80,384	Porphyry-Breccia (Calcalkaline)
140	J & L	82M/8E	82M003										3,710,000	0.17	630,700	1.72 oz/ton Ag, 2.15% Pb 4.04% Zn, 4.86% As	630,700	Massive Sulphide Clastic Hosted
													[14,400,000 in all categories incl. prov. & prob. 795,000 tons @ 0.2 oz/ton Au]					
141	AL (THESIS III, VERRENASS, BV, THESIS II)	94E/6E	94E091	1986	PILOT MILL 6 TPD	111		386					304,000	0.5	152,000	Mineable (Included in 1.908 Mtons @0.16 oz/ton Au)	152,386	Vein Epithermal
142	SHAS	94E/6E	94E050										2,403,450	0.079	189,873		189,873	Vein Epithermal
143	LINDQUIST (DEER HORN)	93E/6W	93E019										275,000	0.312	85,800	8.0 oz/ton Ag, WO3	85,800	Vein Mesothermal
144	TOPLEY-RICHFIELD	93L/9W	93L018	1938-1953		135	47	1	868	870:1			170,000	0.12	20,400	5.6 oz/ton Ag, ~2% Zn+Pb	20,401	Vein Mesothermal
145	GOLDEN BEAR	104K/1	104K079	1990 -	est. 400								650,000	0.54	351,000	Geol. Res.: 1.8 Mtons @ 0.32 oz/ton Au	351,000	Vein Mesothermal
146	LARA (CORONATION)	92B/13W	92B110										583,000	0.138	80,454	2.92 oz/ton Ag, 1.01% Cu 1.22% Pb, 5.87% Zn	80,454	Massive-Sulphide Volcanogenic (Kuroko)
147	SILVER BUTTE	104B/1	104B150										[308,000]	[0.50] [uncut]	[155,540]	[cut to 1 oz/ton Au = 0.351, 1.07 oz/ton Ag]	[155,540]	Vein Mesothermal
148	TAYLOR-WINDFALL	92O/3W	92O028	1932-1935		131	610	15									15	Vein Mesothermal
149	YMIR CAMP:	82F/6E	82FSW	1899-1973	TOTALS #:	(15)	786,616	283,560	1,425,014	5:1	Pb, Zn		95,000	0.28	26,600	Many Small Deposits eg:Tamarac 145,000 tons @ 0.13 oz/ton Au	310,160	Vein Mesothermal
149	A) YANKEE GIRL	82F/6E	82FSW068	1907-1951			314,382	123,784	708,483	6:1	Pb, Zn							
149	B) YMIR	82F/6E	82FSW074	1899-1973			358,362	109,644	459,237	4:1	Pb, Zn							
	(149# = AND MINOR OTHER PRODUCERS)																	
150	BRETT	82L/6E	82LSW110										?				0	Vein Epithermal
151	BANBURY	92H/8E	92HSE046	1937		100	6,500	945	429	1:2	1865 lbs Cu		4,000,000	0.046	184,000	Mineral Inventory: Zone 86: 1.7Mtons @.06oz/ton Au Zone 87: 2.3Mtons @0.4oz/ton Au Pine Knot: 176,269 tons @0.32 oz/ton Au	184,945	Skarn, Vein
152	SILVER POND	94E/6E	94E069										70,000	0.17	11,900	West Zone	11,900	Vein Epithermal

153	VALENTINE MTN. (BLAZE)	92B/12W 92C/9E	92B108									500,000 est.	0.2 est.	100,000 est.	Up to 750,000 tons @ 0.5oz/ton Au [Inferred ~ 34,000 tons @ 0.429 oz/ton Au]	100,000 est. [~ 14,000]	Vein-shear
154	WISCONSIN	82F/7W	82FSE036									350,000	0.11	38,500	1.5 oz/ton Ag	38,500	Vein (Mesothermal)
155	PELLAIRE (HI DO)	92O/4E	92O045									74,000	0.67	49,580		49,580	Vein Mesothermal
156	MASCOT TAILINGS	92H/8E	?	700								685,000	0.06	41,100		41,100	Heap Leach Tailings
157	THUNDER (AHBAU CREEK)	93G/1	93G007									50,000	0.3	15,000	Discovery Zone 0.2 oz/ton Ag	15,000	Vein (Mesothermal)
158	TAKLA RAINBOW (TWIN)	93N/11W	93N082									471,290	0.32	150,813	Geol. Potential Inci. 220,000 Tons @0.4oz/ton Au	150,813	Vein Mesothermal
159	PAYDIRT	104G/3W	104G108									200,000	0.12	24,000		24,000	Vein (Mesothermal)
160	METS	94E/6W	94E093									160,000	0.23	36,800		36,800	Vein Epithermal
161	GREAT WESTERN (STARLIGHT, ETC.,)	82F/8W	82FSW171 TO 174	1907-1981	117	3,653	188	3,187	17:1	184 695 lbs Cu		200,000	0.15	30,000		30,188	Porphyry
162	TRUE FISSURE	92K/11W	92K030	1900-1944	116	5,313	216	50,815	235:1	Pb, Zn Cu		763,000	0.11	83,930	42.2 oz/ton Ag, 15% Pb	84,146	Vein Mesothermal
163	DEBBIE	92F/2E	92F331									1,189,000	0.17	202,130	Mineral Ck. Zone	202,130	Vein
164	SHERWOOD	92F/5E	92F069									50,000	0.2	10,000		10,000	Vein (Mesothermal)
165	A.M. (GIANT COPPER)	92H/6W	92HSW001									2,779,984	0.017	47,260	0.72 oz/ton Ag, 1.35% Cu 0.03% Mo	47,260	Porphyry (Breccia)
166	YELLOW JACKET	104N/12E	104N043									500,000 est.	0.3	150,000 est.		150,000	Vein Mesothermal
167	HANK	104G/1W	104G107									454,000 est.	0.1	45,400 est.		45,400	Vein Mesothermal
168	DOC (GRACY)	104B/8W	104B014									207,000	0.32	66,240	1.38 oz/ton Ag -> Q17 Vein Possible: 263,000 tons @0.23 oz/ton Au, 1.35 oz/ton Ag Total: 470,000 tons @0.27 oz/ton Au, 1.31 oz/ton Ag	66,240	Vein (Mesothermal)
169	GOLDWEDGE:	104B/8W	104B100	TOTALS:								373,224		280,856	1.1 oz/ton Ag Cut off: 0.2 oz/ton Au	280,856	Vein
169	GOLDEN ROCKET ZONE (i)											319,149	0.8	255,319	1.12 oz/ton Ag		Mesothermal
169	DISCOVERY (ii)											37,980	0.63	23,927	1.08 oz/ton Ag		
169	GOLDRIDGE (iii)											16,095	0.1	1,610	0.06 oz/ton Ag		

170	SMITH-NASH	93E/5E	93E014									22,190	0.302	6,701		6,701	Vein Mesothermal
171	SNIP	104B/10W	104B/023									2,446,000 [~ 1,800,000]	0.648	1,585,008	(30% Dilution)	1,585,008	Vein Mesothermal
172	BONAPARTE	92P/1W	92P159									10,000	0.6	6,000	Discovery Zone Other Zones	6,000	Vein Epithermal
173	HARRISON LAKE GOLD	92H/5E	92HSW092	1973-1981	est. 1100 (1990)	101		660	886			2,800,000 est.+	0.1	280,000	Add. Inferred 2.1 Mtons @ 0.1 oz/ton Au	280,886	Vein-Breccia?
174	FRASERGOLD	93A/7E	93A/150									15,000,000 est. + [2,130,000]	0.07 est. [0.141]	1,050,000 est. [~ 300,000]	(up to 20 Mtons @ 0.08 oz/ton Au	1,050,000 [~ 300,000]	Vein Mesothermal
175	GERLE GOLD	94D/16W	94D006									50,054	0.22	11,012		11,012	Vein Mesothermal
176	GOLDFINCH	82K/13E	82KNW076	1903-1904		104	1,450	670	179	1:4		186,000	0.296	55,056		55,726	Vein
176	INDEPENDENCE (WINDFLOWER)		82KNW073	1979		134		5	11	2:1						5	Mesothermal
177	LH	82L/15W	82LNE012									330,000	0.5	165,000		165,000	Vein, Skarn Mesothermal
178	MACKTUSH CK.	92F/2	___									152,000	0.54	82,080	2.29 oz/ton Ag, 0.75% Cu	82,080	Vein ? Massive Sulphide ?
179	MAMIE	93L/14W	93L091									60,000	0.32	19,200		19,200	Vein Mesothermal
180	SAMATOSUM	82M/4W	82M244		500 est.							661,000	0.052	34,372	32.08 oz/ton Ag, 3.5% Zn 1.7% Pb, 1.2% Cu	34,372	Massive Sulphide Volcanogenic (Kuroko)
181	HEDLEY TAILINGS	92H/8E	92HSE144	1989 -	est. 4500							1,681,000	0.041	68,921		68,921	Tailings
182	GIBRALTAR	93B/8E	93B006, 007, 012	1972-1987*	1988: 38575	73	231,408,502	4,020	1,695,878	422:1		163,000,000 est.	0.0001 est.	16,300	0.3% Cu, 0.015% MoS2 0.03 oz/ton Ag Oct.'88: 220 Mtons	20,320	Porphyry (Calcalkaline)
183	MT. MILLIGAN (PHIL, HEIDI)	93N/1E	93N194									80,000,000 est. [200,000,000]	0.022 [0.02]	1,760,000 [4,000,000]	0.32% Cu, Geol. Res. [0.35% Cu, Geol. Res.]	1,760,000 [~ 4,000,000]	Porphyry (Alkaline)
184	VAULT	82E/5E	82ESW173									1,000,000 est.	0.2 est.	200,000	Potential	200,000	Vein Epithermal
185	ARLINGTON	82F/3W	82FSW205	1900-1970 1987		35	576,966	54,667 2,000	139,359	3:1	Pb, Zn	[68,000]	[0.14]	[9520]	1987: U/G Rehab and Open Pit Potential	54,667	Vein Mesothermal
186	SECOND RELIEF	82F/6W	82FSW187	1900-1959		25	228,203	100,234	27,856	1:4	Pb, Zn Cu					100,234	Skarn

187	EXPO	92L/12E	92L240						57,500,000	0.012	690,000	Hushamu (mineable) Geol. Res.: 100 Mtons @0.008% Mo, 0.32% Cu	690,000	Porphyry (Calcalkaline)
188	MORRISON	93M/1E	93M007						41,876,000	0.01	418,760	0.42% Cu, 0.1 oz/ton Ag	418,760	Porphyry (Calcalkaline)
189	KERR	104B/9W	104B100						66,000,000	0.01	660,000	0.84% Cu, 0.06 oz/ton Ag	660,000	Porphyry (Alkaline)
190	LORRAINE	93N/14W	93N002						10,000,000	0.01	100,000	0.7% Cu	100,000	Porphyry (Alkaline)
191	ECSTALL	103H/13E	103H011						7,000,000	0.015	105,000	0.9% Cu, 2.5% Zn 0.6 oz/ton Ag	105,000	Massive Sulphide
192	ESKAY CREEK	104B/9W	104B008	1971	1	0	239		[2,800,000]	[0.23]	[644,000]	3.34 oz/ton Ag SIGNIFICANT DEPOSIT		Epithermal (Stratabound)
GRAND TOTAL: (Note: totals do *not* include Eskay Creek)					20,569,070 GOLD oz PRODUCED						40,073,110 GOLD oz IN RESERVES		60,642,180 GOLD oz CONTAINED (PROD.+ RES.)	

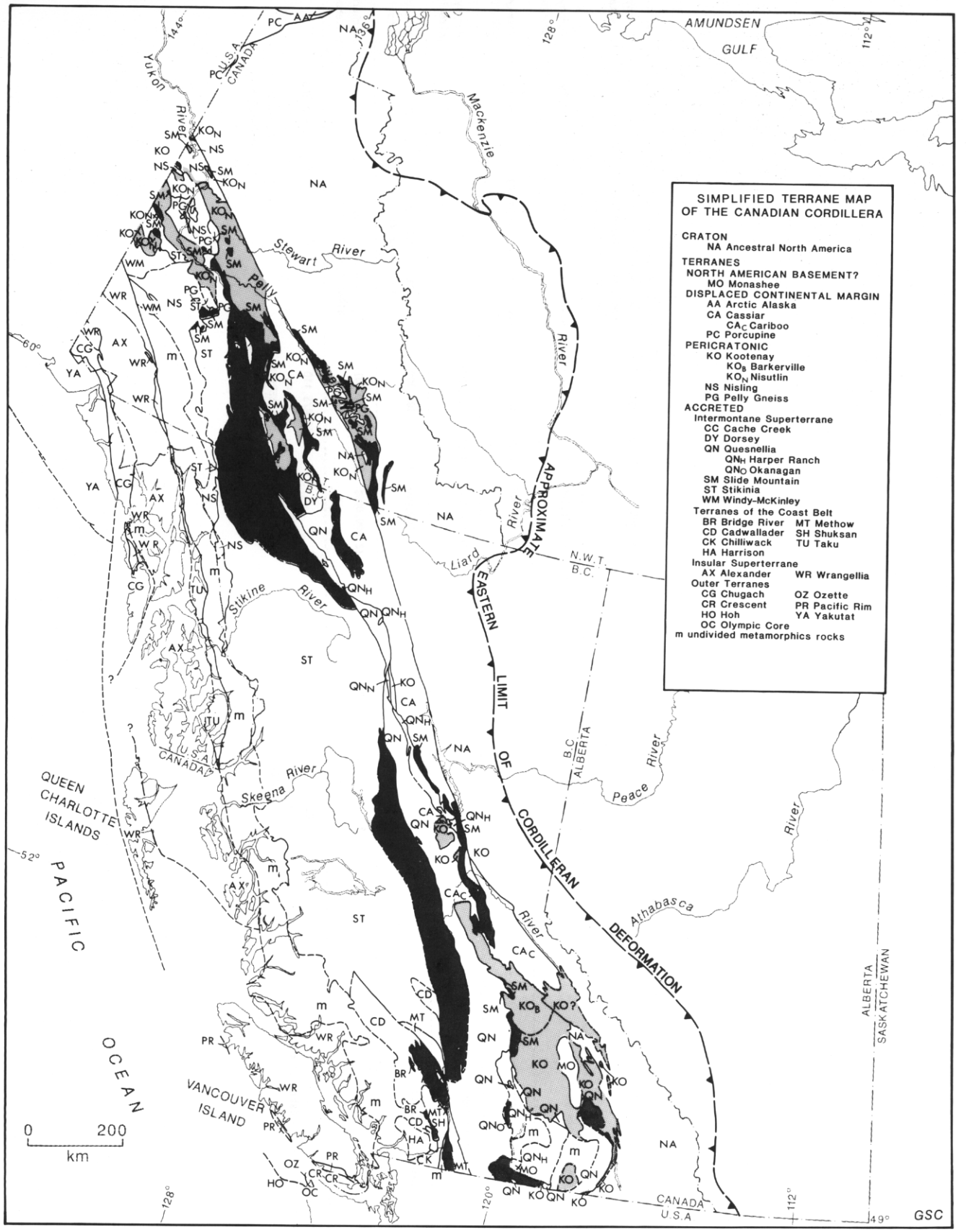


Figure 2. *Simplified terrane map of the Canadian Cordillera. PR & CR, Pacific Rim and Crescent terranes; CG & YA, Chugach and Yakutat terranes; WR, Wrangellia; AX, Alexander Terrane; GN, Gravina-Nutzotin Terrane; CP & MRX, Coast Plutonic and Metamorphic Rocks; BR-CD-SH-HA-CK-MT, Bridge River, Cadwallader, Shuksan, Harrison, Chilliwack and Methow terranes; ST, Stikinia; CC, Cache Creek Terrane; QN, Quesnellia; SM & DY, Slide Mountain and Dorsey terranes; KO, Kootenay Terrane; NA, North American Terrane (ancestral North America); MO, Monashee Terrane (North American Basement): PG & NS, Pelly Gneiss and Nisling Terrane. (Gabrielse, H. et al., in press).*

PROSPECTIVE ENVIRONMENTS FOR GOLD IN BRITISH COLUMBIA

The diversity of recent gold discoveries in British Columbia has already been stressed, however, a few broad generalizations can be made with respect to prospective geological environments. The spatial relationship between placer and lode gold deposits has been recognized since the first prospector realized that panning stream gravels to detect traces of alluvial gold could lead him to the "mother lode". Gold and tin were mined from placer and lode deposits by the ancients and the principles of prospecting with a gold pan were probably well known long before Homer wrote of the golden fleece. Many lode discoveries, in British Columbia and elsewhere, have been made in areas previously worked for placer gold; conversely a bedrock source commensurate in size with the amount of alluvial gold recovered has not been identified in some highly productive placer districts (for example Atlin, Klondike, Cariboo) leading to speculation that the mother lode still awaits discovery.

Many of British Columbia's historic gold districts are related to transcurrent faults bounding oceanic volcanic terranes (Figure 2). Other, more recent, discoveries are associated with extensional tectonism and graben-related volcanism as in the basin-and-range province of the southwestern United States (for example Okanagan area).

HISTORICAL PERSPECTIVE

Total gold production in British Columbia over the 130-year period 1858 to 1987 amounts to approximately 800 tonnes (26 million ounces) with 640 tonnes (20.6 million ounces) won from lode deposits and the balance from placer mining (Figure 3). An additional 60 tonnes (2 million ounces) of new lode-gold production is projected to 1990 and included in the production statistics presented in Figure 3.

Annual placer production peaked at 7160 kilograms (230 210 ounces) in 1863, only 6 years after the first gold production was recorded in the province, and declined steadily thereafter. Half the total recorded placer production had already been recovered by 1879, the first lode-gold production, from the Granite Poorman mine near Nelson, was not reported until 11 years later, in 1890. Lode-gold production peaked in 1939 when 18 266 kilograms (587 336 ounces) were won from 192 deposits; it reached its low point in 1971 when production dropped to 2668 kilograms (85 781 ounces) of which more than 75 per cent was recovered as a by-product of base metal mining.

Six major mining camps [Bridge River, Rossland, Premier (Stewart), Hedley, Cariboo-Barkerville (Wells) and Greenwood (Boundary District)] have each produced more than a million ounces of gold and together have accounted for more than 60 per cent of total lode-gold production (Table 2). It is interesting to relate the development of these historic camps to the three major cycles in the gold price that have occurred since the first prospectors arrived in British Columbia. The First World War marked the end of Pax Britannica and 200 years of stability in the sterling price of gold interrupted only by the inflationary spike associated with the Napoleonic wars early in the 19th Century (National City Bank, New York, 1959). However, in terms of constant Canadian dollars, the bullion price rose fairly steadily through the early years of British Columbia's history, reaching a peak in 1895 (Cranstone, 1985), roughly coincident with the start of production in the Greenwood and Rossland camps and shortly before the Hedley deposits were first developed. From the turn of the century to the end of the First World War the real price of gold fell more than 50 per cent and no new hard-rock gold mines were developed in British Columbia.

The second major upward cycle, related to post-war inflation, began in 1918 and peaked in 1933 following devaluation of the dollar and pegging of the gold price at $35US Constant dollar prices increased approximately 200 percent and the price measured in sterling, still the principal currency

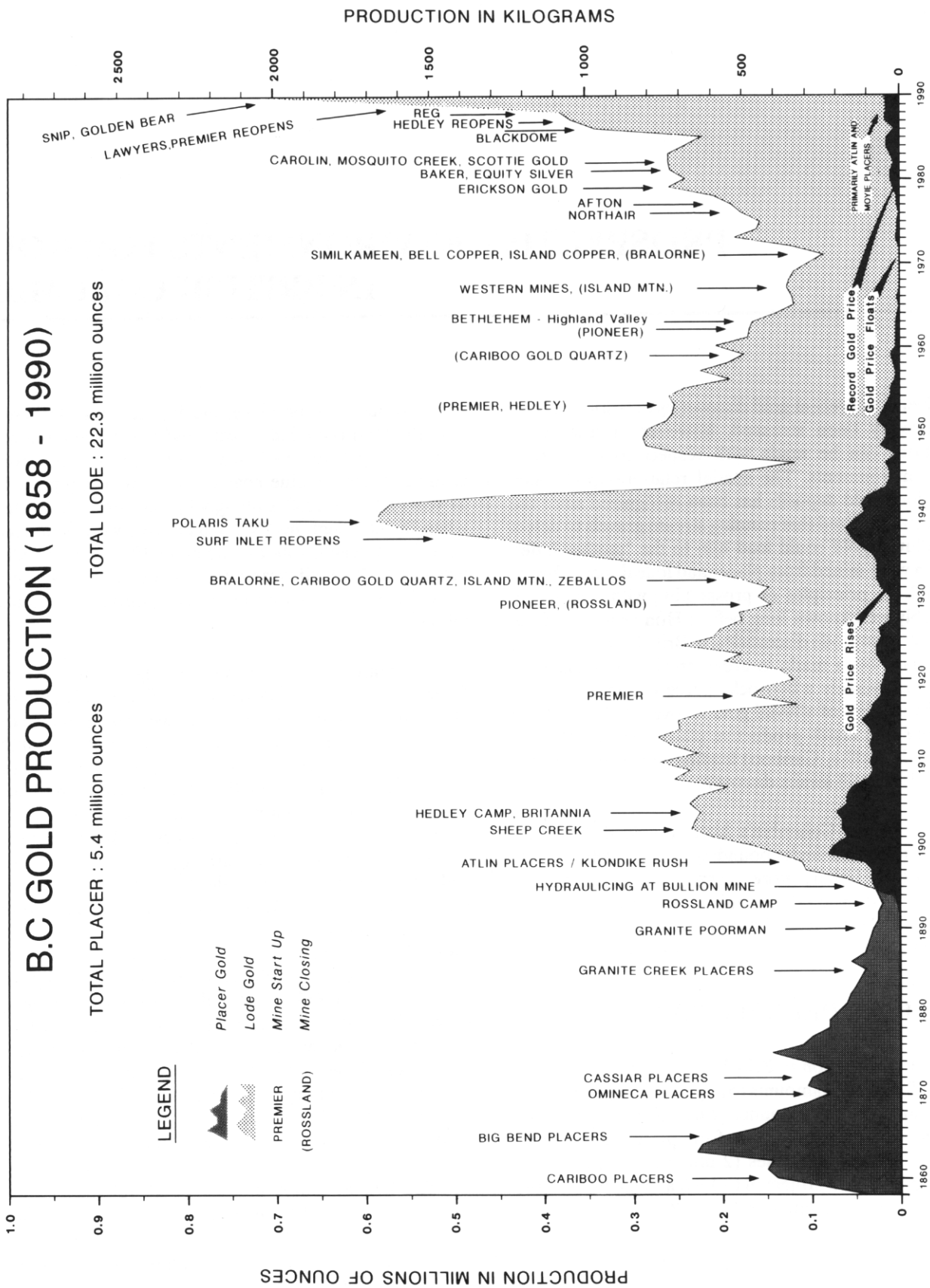


Figure 3. B.C. Gold production: 1858-1990.

of world banking and a major source of mining investment capital, by an even larger amount. The price in constant Canadian dollars remained stable through the deflationary period of the Great Depression, but began a 30-year decline as inflation accelerated during the Second World War, again eroding the inflation-adjusted price by approximately 50 per cent. The Premier, Bralorne, Pioneer, Cariboo Gold Quartz and Island Mountain mines, representing the second generation of major gold camps in British Columbia, were all brought on stream during the upward leg of this second price cycle and, from 1939 onward, production declined steadily, in line with the decline in the constant-dollar price. Again, no new gold mines were brought to production during the period of falling real prices. Almost 80 years of primary gold production in the province came to an end with the closure of the Bralorne mine in 1971, three years after the freeing of the gold price and on the threshold of the rally that saw it rise to $197US per ounce in late 1974, a 460 per cent increase over a three-year period and the beginning of the third major price cycle.

It was the 1971-74 price rally that rekindled interest in exploration for gold as a primary commodity rather than a by-product of mining other metals. Now, 15 years later, all six of the historic camps are either back in production (Hedley), have new production scheduled in the near future (Premier), or are being extensively explored, and the Iskut River – Eskay Creek – Sulphurets area may become the province's seventh major gold mining district.

The obvious conclusion to be drawn from this historical analysis is that British Columbia's gold mining industry has only prospered when the gold price has been rising faster than the rate of inflation in Canada (or remained fixed at a time of deflation). It is also a matter of historical observation that virtually all new production has been brought on stream within a few years either side of the peaks of three major price cycles, each separated by intervals of 38 years. The third cycle peaked in 1981, suggesting a gloomy future for the industry if history repeats itself. However the gold price, again measured in constant-dollar terms, has already lost two-thirds of its 1981 value, having suffered a much deeper and steeper drop than in the previous two cycles. Even so it remains not far below the level of previous peaks, a level that has historically provided an adequate financial incentive for the development of new mines. As already indicated, the purpose of this paper in not to offer predictions on future trends, the bulls and the bears can make their choices, but taking the long view, gold remains the only unit of currency that has retained its purchasing power over a period of 4000 years.

DEPOSIT CLASSIFICATION

The classification of deposit types used in this study is based on criteria published by the United States Geological Survey (Cox and Singer, 1986). The system developed by the Geological Survey of Canada (Eckstrand, 1984) is not used as it does not adequately address the diversity of deposit types found in the Cordillera. The Cox and Singer models systematically and concisely describe the essential attributes of each deposit type and represent a composite of the observed characteristics of a large number of individual deposits.

This compilation uses five broad deposit classes (massive sulphide deposits, porphyry deposits, skarns, veins and transitional deposits), some of which are further subdivided by Cox and Singer. The authors have included tailings as a sixth category. Although not mineral deposits in the true sense, abandoned dumps and tailings are being recognized as a potential precious metal resource in British Columbia and are therefore covered by this study.

REPORT ORGANIZATION AND GENERAL CONCLUSIONS

The six deposit categories outlined above form the basis of the organization of this report. Each class and sub-class of deposits is defined in terms of geological characteristics and the geological setting and production history of each deposit type in British Columbia is outlined. Additional descriptive sketches are provided for producing properties and potentially important undeveloped deposits.

Individual deposits or camps are ranked in order of total lode-gold production regardless of deposit type (Table 2); production statistics for major gold producers, including tonnage of ore milled and silver production, are tabulated separately (Table 3). Gold production is listed by deposit type in Table 4 and represented graphically in Figure 4. Gold recovered is plotted against tonnage milled in Figure 5, illustrating the grade range of each deposit type; calculated Ag:Au ratios, based on production statistics, are presented in Table 5. Recent production (1980-87) is ranked in terms of ounces of gold produced (Table 6) and broken down by deposit type (Figure 6). Annual statistics for both gold and silver production over the same period are tabulated by deposit type (Table 6). Estimated reserves in all categories, as of January 1989, and total gold inventory (past production plus current reserves) are tabulated by deposit type (Table 7) and displayed graphically in Figures 6 and 7. Significant current reserves are ranked on the basis of contained ounces of gold in Table 8. Detailed production and reserve statistics for each deposit category are presented in Tables 9 to 26. Key statistics for properties which have the potential for production in the short to medium term are summarized in Table 27.

TABLE 2
B.C. GOLD MINES PRODUCTION
BY RANK

FIGURE 1 NUMBER	MINE NAME	YEARS OF PRODUCTION (PRODUCING=*)	PROD. RANK (CAMP)	TONS MINED MILLED	GOLD PRODUCED oz	SILVER PRODUCED oz	AG:AU	GOLD RESERVES oz	DEPOSIT TYPE
109	BRIDGE RIVER CAMP:	1900-1978	(1)	8,067,600	4,178,069	1,002,473	1:4	566,380	11
86	ROSSLAND CAMP:	1894-1974	(2)	6,199,799	2,745,260	3,440,800	1:1		11
23	PREMIER	1918-1976,89-	3	4,670,018	1,804,218	40,803,280	23:1	476,000	12
97	HEDLEY CAMP:	1904-83,87*	(4)	4,432,849	1,678,080	219,485	1:8	1,006,132	20
66	CARIBOO-BARKERVILLE CAMP:	1933-67,80-87*	(5)	3,027,928	1,231,214	165,382	1:7	35,316	11
88	GREENWOOD CAMP:	1900-1978	(6)	31,836,731	1,191,431	7,219,470	3:1	116,127	20
126	ISLAND COPPER	1971-1987*	7	242,349,305	797,008	5,821,247	7:1	245,000	41
83	SHEEP CREEK:	1902-1981	8	1,688,943	761,456	293,105	1:3	73,590	11
102	SIMILKAMEEN:	1917-62,72-87*	(9)	142,389,475	589,093	7,256,986	12:1	46,538	42.2
112	BRITANNIA	1905-1977	10	52,783,960	493,069	5,815,395	12:1		31
122	LYNX,MYRA,H-W,	1966-1987*	11	8,725,756	467,292	21,477,985	46:1	965,860	31
58	SURF INLET	1917-26,36-43	12	1,012,060	388,881	201,210	1:2	19,950	11
108	AFTON	1977-1987*	13	26,921,822	382,889	2,279,754	6:1	314,070	42
48	BELL COPPER	1972-82,85-87*	14	60,488,981	290,819	777,670	3:1	280,000	41
149	YMIR CAMP:	1899-1973	(15)	786,616	283,560	1,425,014	5:1	26,600	11
123	ZEBALLOS CAMP:	1933-1953,75	(16)	718,475	276,067	120,140	1:2	145,933	11
9	CASSIAR CAMP:	1979-1987*	17		257,287			204,802	11
7	POLARIS TAKU	1938-1951	18	753,250	231,603	11,760	1:10	70,422	11
52	EQUITY SILVER	1981-1987*	19	18,462,814	215,465	39,865,737	185:1	623,131	10
110	NORTHAIR	1976-1982	20	345,700	166,582	845,854	5:1	12,220	11
49	GRANISLE	1966-1982	21	57,498,131	148,000	1,906,000	13:1		41
124	A) OLD SPORT	1962-1973	22	2,929,494	124,386	377,165	3:1	10,000	20
31	A) ANYOX	1914-1936	23	23,948,410	121,298	6,633,087	55:1	54,000	33
117	TEXADA:	1896-1976	(24)	23,282,705	106,508	1,286,450		27,584	20
186	SECOND RELIEF	1900-1959	25	228,203	100,234	27,856	1:4		20
6	TULSEQUAH CHIEF	1939-1957	26	1,029,090	94,257	3,400,772	36:1	190,400	31
20	SCOTTIE GOLD	1981-JAN.85	27	201,200	88,600	44,000	1:2	60,000	11
91	CARIBOO-AMELIA	1894-1962	28	137,180	81,603	32,439	1:3	4,000	11
70	BLACKDOME	1986-1987*	29	118,859	76,471	205,149	3:1	207,200	12
# 107	HIGHLAND VALLEY COPPER CAMP	1963-1987*	(30)	69,034,647	68,255	2,361,236	205:1	137,280	41
21	GRANDUC	1971-1983	31	16,500,000	65,510	3,739,895	57:1		32
82	GRANITE POORMAN	1890-1954	32	199,650	65,080	27,684	1:2	4,860	11
22	BIG MISSOURI	1927-1942,89-	33	847,610	58,384	52,676	1:1	151,668	11
89	UNION	1913-1946,87*	34	150,400	55,339	1,389,115	25:1	7,968	11
185	ARLINGTON	1900-1970,87	35	576,966	54,667	139,359	3:1		11
96	BRENDA	1970-1987*	36	122,911,948	47,925	3,213,722	67:1	12,288	41
88a	GREENWOOD VEINS GRAND TOTAL	1893-1976	(37)	96,090	46,673	1,872,061	63:1	36,880	11
114	LENORA	1898-1964	38	305,000	44,491	934,522	21:1		31
104	A) CAROLIN (IDAHO)	1982-1984	39	863,139	43,543	38,000	1:1	102,400	11
63	TASU	1914-1983	40	22,965,511	43,066	1,620,205	36:1		20
84	BAYONNE	1935-1951,84	41	86,102	42,152	120,282	3:1	9,600	11
51	JEWEL	1940-75,84-85	42	137,486	39,711	234,517	6:1	15,500	11
17	BAKER	1980-1983	43	87,740	37,558	742,198	20:1	30,800	12
82	PERRIER	1913-1946	44	256	34,681	44,803	1:1		11
131	WINDPASS	1916-1944	45	80,800	34,455	1,719	20:1		11
132	VIDETTE	1933-1940	46	53,900	29,869	46,573	2:1		11
73	ECLIPSE	1911-1958	47	239,000	29,400	1,724,794	59:1	3,770	11
115	SUNRO	1962-1978	48	1,465,000	28,912	72,747	3:1	29,603	33
59	SURF POINT	1919-1939	49	67,870	20,574	230,755	11:1	124,600	11
94	CHAPUT	1968-1976	50	1,690	20,361	54,569	3:1	34,844	11
92	DUSTY MAC	1969-1976	51	58,700	19,483	339,283	17:1		12
5	ENGINEER	1913-1952	52	17,150	18,058	8,950	1:2		12

99 FAIRVIEW CAMP:	1898-1949	(53)	152,050	17,038	169,494	10:1	129,897	11
101 DIVIDEND-LAKEVIEW	1907-1949	54	122,634	16,216	2,804	1:6		20
90 HIGHLAND BELL	1913-1987*	55	1,084,756	16,082	33,488,913	2080:1		11
36 SILVER STANDARD	1913-1985	56	225,246	14,975	7,623,712	509:1	830	11
85 ALPINE	1915-1948	57	17,000	11,451	7,119	2:1	105,000	11
100 HORN SILVER	1915-1984	58	483,614	10,686	4,089,471	383:1		11
26 DUNWELL	1926-1941	59	50,300	9,875	329,805	33:1		11
98 OROFINO & TWIN LAKES	1899-1942	60	21,800	8,846	2,393	1:4		11
133 PLANET	1926-1952	61	78,590	8,186	249,932	31:1		11
111 ASHLU	1932-1939	62	15,000	6,493	7,482	1:1	24,625	11
33 GRANBY POINT	1917-1938	63	62,040	5,795	196,260	34:1		11
77 SULLIVAN	1900-1987*	64	153,383,973	5,622	295,326,805	52530:1		34
121 SILVERADO	1934-1938	65	130	5,567	10,294	2:1		20
129 CARIBOO-HUDSON	1938-1939	66	13,400	5,185	2,626	1:2	12,762	11
74 SILVER CUP	1895-1985	67	23,080	5,169	1,447,116	280:1	70,000	11
38 ROCHER DEBOULE	1915-1954	68	136,020	5,055	85,300	17:1	66,000	11
34 GOLDKEISH	1918-1938	69	50,890	4,831	26,443	6:1		11
130 DORATHA MORTON	1898-1925	70	10,250	4,595	10,633	2:1	31,500	11
118 MT.WASHINGTON	1961-1967	71	396,000	4,204	232,620	55:1	121,304	12
76 BULL RIVER	1972-1974	72	520,100	4,055	204,277	50:1		11
182 GIBRALTAR	1972-1987*	73	231,408,502	4,020	1,695,878	422:1	16,300	41
119 BUCCANEER	1941-1959	74	6,500	3,908	1,258	1:3		11
104 B) EMANCIPATION	1905-1941	75		3,829				11
134 IRON MASK	1901-1928	76	146,300	3,794	14,843	4:1		42
81 SCRANTON	1948-1979	77	8,960	3,766	112,460	30:1		11
43 DUTHIE	1923-1983,85	78	81,707	3,695	1,721,623	466:1	1,519	11
78 WHITEWATER & HIGH. SURP.	1892-1976	79	418,890	3,315	3,414,491	1030:1		11
80 TILLICUM	1981,85-87	80	3,726	3,160	3,000	1:1	440,000	20
53 SILVER QUEEN	1972,1973	81	200,200	3,156	438,796	140:1	79,297	11
119 MUSKATEER	1942-1975	82	5,000	3,052	1,736	1:2	3,300	11
128 CARMI	1901-1940	83	5,480	2,994	9,675	3:1		11
93 KALAMAKA	1935-1944	84	7,260	2,898	3,474	1:1		11
85 a CHAPLEAU	1896-1941	85	5,040	2,853	14,844	5:1	216,000	11
31 B) BONANZA	1928-1936	86	724,190	2,783	281,243	101:1		33
116 THISTLE	1938-1942	87	6,920	2,760	2,120	1:1		31
87 SUSIE	1960-1976	88	7,860	2,639	48,822	19:1		11
75 ST. EUGENE	1899-1929	89	1,610,400	2,534	5,873,731	2310:1		11
105 CRAIGMONT	1961-1982	90	33,067,900	2,503	7,796	3:1		20
79 VICTOR	1923-1979	91	111,500	2,455	4,137,065	1690:1		11
124 B) BENSON LAKE	1968-1969	92	27,400	2,021	15,704	8:1		20
64 LILY-IKEDA	1906-1920	93	14,830	1,664	27,960	17:1		20
125 YREKA	1902-1967	94	147,200	1,604	145,873	91:1	28,318	20
120 FANDORA	1960-1964	95	900	1,468	269	1:5	54,000	11
135 BIG SLIDE	1934-1940	96	7,600	1,282	2,463	2:1		11
24 INDIAN	1925-1953	97	14,180	1,258	49,514	39:1		11
103 RABBIT	1939-1941	98	1,430	1,057	583	1:2		11
27 EAST GOLD	1949-1965	99	30	1,019	3,170	3:1		11
151 BANBURY	1937	100	6,500	945	429	1:2	184,000	20.1
173 HARRISON LAKE	1973-1981	101	660	886			280,000	10
25 PORTER-IDAHO	1922-1950	102	30,050	864	2,360,200	2732:1		11
42 COLUMARIO	1934,1935	103	3,000	679	1,868	3:1		11
176 GOLDFINCH	1903-1904	104	1,450	670	179	1:4	55,056	11
60 CINOLA	1975,1981	105	6,130	415	240	1:2	1,889,280	12
45 DOME MOUNTAIN	1940-51,81-82	106	5,862	387	663	2:1	117,888	11
141 AL	1986	107		386			152,000	12
72a HOMESTAKE	1935-1941	108	7,670	361	281,349	780:1	24,574	31
29 GEORGIA RIVER	1937	109	500	329	409	1:1	66,020	11
40 GLACIER GULCH	1933-1939	110	180	296	1,186	4:1		11
47 CRONIN	1914-1974	111	28,480	282	262,672	932:1	139,520	11
62 EARLY BIRD	1913-1939	112	180	280	39	1:7		11

30 ESPERANZA	1911-1948	113	4,980	256	143,115	560:1		11
44 HUNTER BASIN	1915-1941	114	290	238	8,265	35:1		11
35 VICTORIA	1926-1940	115	50	236		15:1	1,240	11
162 TRUE FISSURE	1900-1944	116	5,313	216	50,815	235:1	83,930	11
161 GREAT WESTERN	1907-1981	117	3,653	188	3,187	17:1	30,000	41
57 WESTERN COPPER	1928,1929	118	230	171	1,453	9:1		11
28 TORBRIT	1928-1959	119	1,379,300	110	18,646,304	169,512:1		11
3 ATLIN RUFFNER	1916-1976	120	1,280	100	65,591	660:1	0	11
4 IMPERIAL	1899-1900	121	290	98	0			11
32 OUTSIDER	1906-1928	122	138,850	66	4,882	74:1		33
41 LUCKY LUKE	1924-1967	123	110	59	683	12:1		11
55 DRUMLUMMON	1918-1926	124	1,030	57	1,575	28:1		11
54 EMERALD GLACIER	1951-1968	125	9,190	48	83,494	1740:1	1,350	11
61 SOUTHEASTER	1919-1936	126	500	40	27	1:1		11
37 SILVER CUP	1913-1955	127	6,620	34	128,794	3788:1		11
56 HUNTER	1933	128	4	29	11	1:3	36,330	11
46 LITTLE JOE	1927-1940	129	30	24	9,455	394:1		11
50 GOLDEN EAGLE	1934-1978	130	140	16	21,256	1329:1		11
148 TAYLOR-WINDFALL	1932-1935	131	610	15				11
39 VIRGINIA SILVER	1975,1976	132	275	12	22,440	1870:1	600	11
2 MAID OF ERIN	1911-1956	133	3,620	10	47,796	4780:1	0	20
176 INDEPENDENCE	1979	134		5	11	2:1		11
144 TOPLEY-RICHFIELD	1938-1953	135	47	1	868	870:1	20,400	11
113 HARRISON (SENECA)	1962	136	280	0.5	3	6:1	41,525	31

		TOTAL:		20,569,070				

Note: Reserves to Jan 1/89 unless otherwise indicated
#107 = includes Lornex, Valley Copper, Bethlehem Copper and Highland Valley Copper: Production and Reserves

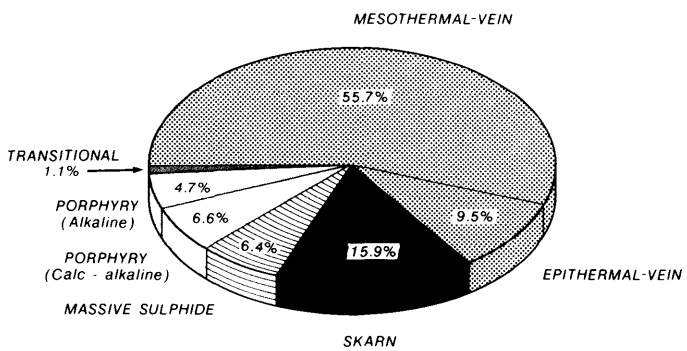
DEPOSIT TYPES: 10 = VEIN, 11 = Vein Mesothermal, 12 = Vein Epithermal
20 = SKARN
30 = MASSIVE SULPHIDE, 31 = Volcanogenic (Kuroko),
32 = Volcanogenic (Besshi), 33 = Volcanogenic (Cyprus)
34 = Exhalative, Sedex
40 = PORPHYRY, 41 = Calc-Alkaline, 42 = Alkaline

TRANSITIONAL DEPOSITS: .1 = Trans. to Vein, .2 = Trans. to Skarn
.3 = Trans. to Massive Sulphide, .4 = Trans. to Porphyry
.01 (.02,.03, etc.)= Trans. to subdivision of group

TABLE 3
B.C. LODE GOLD PRODUCTION (1894-1987) BY TYPE

TYPE	NUMBER OF DEPOSITS	PRODUCTION oz
PORPHYRY (ALKALINE):	3	975,776
PORPHYRY (CALC-ALKALINE):	7	1,356,215
MASSIVE SULPHIDE:	12	1,326,422
SKARN:	14	3,277,395
VEIN (EPITHERMAL):	8	1,960,793
VEIN (MESOTHERMAL):	88	11,456,118
TRANSITIONAL:	2	216,351
TOTAL:	134	20,569,070

B.C. LODE GOLD PRODUCTION (1894 - 1987)
(BY DEPOSIT TYPE)



Total Production : 20.6 million ounces

Figure 4. B.C. Lode gold production 1894-1987 (by deposit type).

TABLE 4
B.C. LODE Ag:Au RATIOS: 1894-1987 PRODUCTION BY TYPE

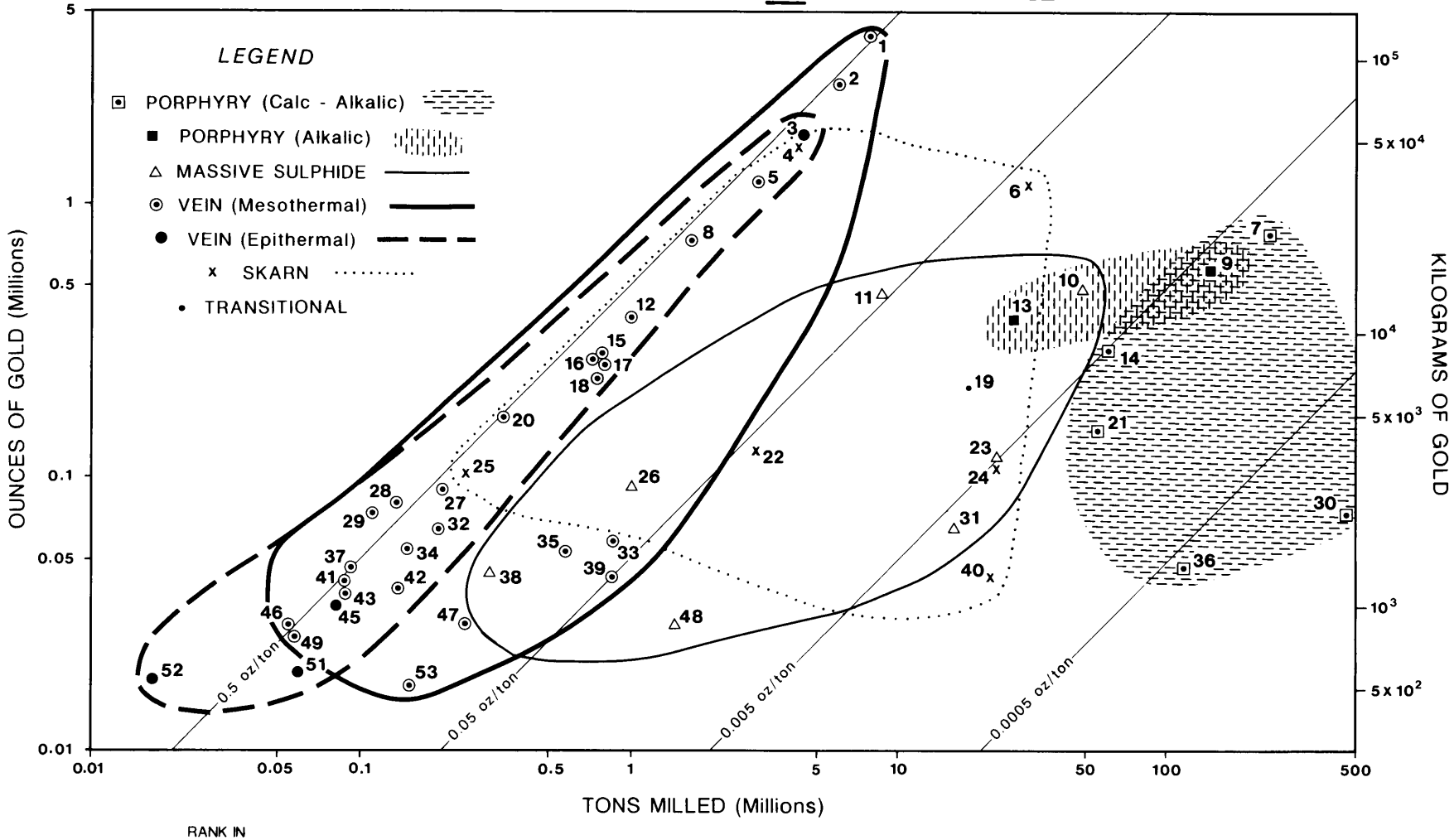
MINE NAME	Ag:Au RATIO	MINE NAME	Ag:Au RATIO
PORPHYRY (ALKALINE):		MASSIVE SULPHIDE:	
SIMILKAMEEN:	12:1	BRITANNIA	12:1
AFTON	6:1	LYNX,MYRA,H-W,	46:1
IRON MASK	4:1	ANYOX	55:1
		TULSEQUAH CHIEF	36:1
PORPHYRY (CALC-ALKALINE):		GRANDUC	57:1
		LENORA	21:1
ISLAND COPPER	7:1	SUNRO	3:1
BELL COPPER	3:1	SULLIVAN	52530:1
GRANISLE	13:1	BONANZA	101:1
HIGHLAND VALLEY COPPER CAMP:	205:1	THISTLE	1:1
BRENDA	67:1	HOMESTAKE	780:1
GIBRALTAR	422:1	OUTSIDER	74:1
GREAT WESTERN	17:1		
SKARN:		VEIN (MESOTHERMAL):	
HEDLEY CAMP:	1:8	BRIDGE RIVER CAMP:	1:4
GREENWOOD CAMP:	3:1	ROSSLAND CAMP	1:1
OLD SPORT	3:1	CARIBOO-BARKERVILLE:	1:7
TEXADA:	12:1	SHEEP CREEK CAMP:	1:3
SECOND RELIEF	1:4	SURF INLET	1:2
TASU	36:1	YMIR CAMP:	5:1
DIVIDEND-LAKEVIEW	1:6	ZEBALLOS CAMP:	1:2
SILVERADO	2:1	POLARIS TAKU	1:10
TILLICUM	1:1	CASSIAR CAMP:	1:1
CRAIGMONT	3:1	NORTHAIR	5:1
BENSON LAKE	8:1	SCOTTIE GOLD	1:2
LILY-IKEDA	17:1	CARIBOO-AMELIA	1:3
YREKA	91:1	GRANITE POORMAN	1:2
BANBURY	1:2	BIG MISSOURI	1:1
MAID OF ERIN	4780:1	UNION	25:1
		ARLINGTON	3:1
		GREENWOOD VEINS CAMP:	63:1
		CAROLIN (IDAHO)	1:1
		JEWEL	6:1
VEIN (EPITHERMAL):		TRANSITIONAL:	
PREMIER	23:1	EQUITY SILVER	185:1
BLACKDOME	3:1	HARRISON LAKE GOLD	<1:900
BAKER	20:1		
DUSTY MAC	17:1		
ENGINEER	1:2		
AL	1:2		

These voluminous data can be analyzed in many ways; a few general conclusions are:

* Vein deposits have accounted for 65 per cent of British Columbia's total gold production (13.4 million ounces). Skarn deposits, essentially the Hedley and Greenwood camps, account for 16 per cent, while by-product gold from porphyry and volcanogenic massive sulphide deposits accounts for 11.3 and 6.4 per cent respectively. The small balance is from the one significant transitional deposit, Equity Silver.
* Average recovered grades from each deposit type (Figure 5) are:
  - veins 0.5 ounce per ton (~17 g/t)
  - skarns 0.05 to 0.5 ounce per ton (~2 to 17g/t)
  - massive sulphide deposits 0.005 to 0.05 ounce per ton (~0.2 to 2g/t)
  - transitional deposits 0.01 ounce per ton (~0.35 g/t)
  - porphyry deposits <0.005 ounce per ton (<0.17 g/t)
* Slightly more than half the province's current gold reserves exist in porphyry deposits; vein deposits account for 30.2 per cent.
* During the period 1965 to 1983 a total of 107 properties reported some gold production; 17 of these can be classified as new discoveries. A total of 51 new mines were opened during the period, of which 25 worked vein deposits and 14 porphyry deposits. The largest number of gold producers in any given year was 49 in 1967, and the smallest number was 22 in 1985.

B.C. LODE GOLD MAJOR PRODUCERS (1894 - 1987)

OUNCES OF GOLD vs TONS MILLED



MINE NAME	RANK IN Au PROD. (Camp Total)								
BRIDGE RIVER	(1)	BRITANNIA	10	OLD SPORT	22	UNION	34	VIDETTE	46
ROSSLAND	(2)	LYNX, MYRA, H -W	11	ANYOX	23	ARLINGTON	35	ECLIPSE	47
PREMIER	3	SURF INLET	12	TEXADA	(24)	BRENDA	36	SUNRO	48
HEDLEY	(4)	AFTON	13	SECOND RELIEF	25	GREENWOOD VEINS	(37)	SURF POINT	49
CARIBOO - BARKERVILLE	(5)	BELL COPPER	14	TULSEQUAH CHIEF	26	LENORA	38	* CHAPUT	50
GREENWOOD	(6)	YMIR	(15)	SCOTTIE GOLD	27	CAROLIN (Idaho)	39	DUSTY MAC	51
ISLAND COPPER	7	ZEBALLOS	(16)	CARIBOO - AMELIA	28	TASU	40	ENGINEER	52
SHEEP CREEK	(8)	CASSIAR	(17)	BLACKDOME	29	BAYONNE	41	FAIRVIEW	(53)
SIMILKAMEEN	(9)	POLARIS TAKU	18	HIGHLAND VALLEY COPPER	(30)	JEWEL	42		
		EQUITY SILVER	19	GRANDUC	31	BAKER	43		
		NORTHAIR	20	GRANITE POORMAN	32	* PERRIER	44	(* not plotted)	
		GRANISLE	21	BIG MISSOURI	33	WINDPASS	45		

Figure 5. B.C. Lode gold major producers: 1894-1987 (oz. gold vs tons milled).

* Gold production increased sharply in 1986 when the Blackdome mine was brought on stream, the Bell porphyry copper mine reopened and increased recoveries were achieved at the Equity Silver and Brenda mines.
* Projected new production to 1990, specifically from the Lawyers and Premier deposits, will result in a further increase in production.

TABLE 5
B.C. MAJOR LODE GOLD PRODUCERS: 1980-1987

Rank	MINE	PRODUCTION YEARS (*=PRODUCING)	TONS MILLED	PRODUCED OZ	PRODUCED OZ YEARLY AVERAGE (80-87)
1	ISLAND COPPER:	71-87*	140,026,195	418,741	52,343
2	AFTON:	77-87*	18,799,149	290,201	36,275
3	EQUITY SILVER:	81-87*	18,462,814	215,465	26,933
4	LYNX, HW, MYRA:	67-87*	4,416,747	208,831	26,104
5	ERICKSON GOLD:	79-87*	445,680	197,404	24,676
6	SIMILKAMEEN:	17-62,72-87*	60,633,373	166,453	20,807
7	BELL COPPER:	72-82,85-87*	29,436,629	129,600	21,600
8	SCOTTIE GOLD:	81-84	176,691	95,940	23,985
9	BLACKDOME:	86-87*	118,859	76,471	38,236
10	HEDLEY CAMP:	82-83, 87*	380,501	51,963	17,321
11	CAROLIN:	82-84	993,977	46,610	15,537
12	NORTHAIR:	74-82	177,241	41,398	13,799
13	BAKER:	81-83	85,550	38,458	12,819
14	MOSQUITO CK:	80-87*	100,696	34,931	4,366
15	TAURUS:	82-87*	285,295	34,422	5,737
16	GRANISLE:	66-82	10,639,363	25,952	8,651
17	BRENDA:	70-87*	73,434,041	24,141	3,018
18	VALLEY COPPER:	83-86	32,892,133	12,435	3,109
19	HIGHLAND VALLEY CU	86-87*	69,034,647	11,516	5,758
20	GRANDUC:	81-84	8,950,873	10,190	2,548
21	TASU:	14-17, 67-83	4,457,469	8,387	2,097
22	BETHLEHEM:	62-82	17,519,656	8,362	2,787
	TOTAL:		491,467,580	2,147,869	368,503

(Note: Taurus 1987 production estimated to 18,284 Tons)

TABLE 6
B.C. LODE GOLD-SILVER (OUNCES) PRODUCTION 1980-1987

GOLD	Porphyry	Trnstnl.	Massive Sulphide	Skarn	Veins	TOTAL
1980	186137		14279	1804	39358	241578
1981	161957	16470	20822	2200	55938	257387
1982	94501	30836	22808	4739	105901	258785
1983	93117	26872	22882	3409	112033	258313
1984	110401	31475	14819	185	84442	241322
1985	135504	29670	26103	1798	28998	222073
1986	159338	40876	54804		59416	314434
1987	150465	39266	42504	48626	87687	368548
TOTALS	1091420	215465	219021	62761	573773	2162440
SILVER						
1980	1441380		657611	71170	691003	2861164
1981	1277193	5646585	1022098	76320	2932917	10955113
1982	1108673	8841018	1188653	86049	906760	12131153
1983	1338581	4908905	1126464	111981	618445	8104376
1984	1501392	5791410	738033	303	507312	8538450
1985	1829384	4345844	872304	2706	421375	7471613
1986	2713508	5313896	1402966		425714	9856084
1987	3281186	5018079	1066890	26762	493318	9886235
TOTALS	14491297	39865737	8075019	375291	6996844	69804188

B.C. LODE GOLD PRODUCTION (1980 - 1987)

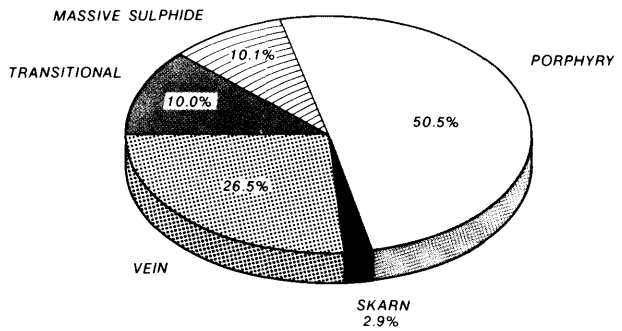


Figure 6a. B.C. Lode gold production 1980-1987.

B.C. LODE SILVER PRODUCTION (1980 - 1987)

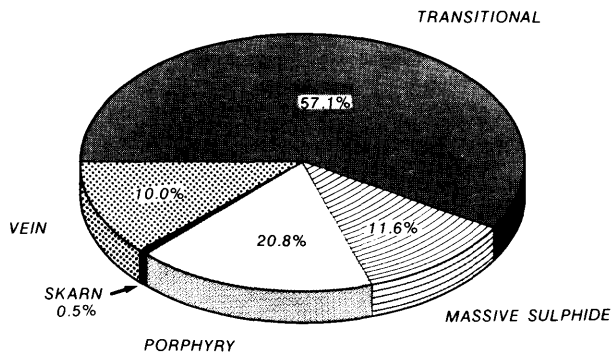


Figure 6b. B.C. Lode silver production (1980-1987).

TABLE 7
B.C. LODE GOLD INVENTORY BY DEPOSIT TYPE

Deposit Type	Number of Deposits	Production (oz x 000)	Reserves (oz x 000)	Total Reserves + production
Vein	127	13,416.9	12,088.9	25,505.8
Mesothermal	113	11,456.1	8,374.4	19,830.5
Epithermal	14	1,960.8	3,714.5	5,675.3
Skarn	14	3,277.4	1,812.2	5,089.6
Porphyry	27	2,332.0	20,304.4	22,636.4
alkaline	12	975.8	8,899.1	9,874.9
calcalkaline	15	1,356.2	11,405.3	12,761.5
Massive Sulphide	21	1,326.4	2,944.5	4,270.9
Transitional	5	216.3	2,805.3	3,021.6
Tailings	3	0.2	118.0	118.2
TOTAL	194	20,569.2	40,073.3	60,642.5

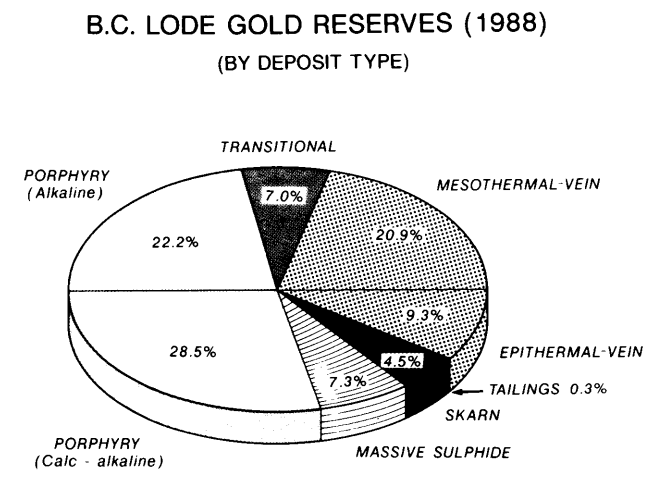


Figure 7. 1988 B.C. Lode gold reserves: by deposit type.

ACKNOWLEDGMENTS

Ongoing discussions with Ministry colleagues, particularly Andre Panteleyev, Bill McMillan, Vic Preto, Gerry Ray, Trygve Höy, Neil Church, Don MacIntyre, and Dani Alldrick have added considerably to the database and to our understanding of precious metal deposits. District Geologists provided up-to-date reserve estimates for producing mines. Appreciation is also extended to all those in industry who spoke openly about their projects, both in the field and the office. The charter aircraft businesses are to be commended for their excellent service in getting the senior author to the many remote places throughout the province, often under less than ideal weather conditions. Ron Smyth, Chief Geologist, is thanked for his continued interest in the project and his desire to have the information made available to the public as quickly as possible. Finally, sincere appreciation goes to John Newell, who edited and added many useful insights to the manuscript.

TABLE 8
1988 B.C. LODE GOLD RESERVES
BY RANK

RANK (CAMP)	DEPOSIT NAME	MAP NUMBER	RESERVES tons	GRADE oz/ton	RESERVES oz	TOTAL INVENTORY (RES.+ PROD.) oz
1	LIARD COPPER	13	1,000,000,000	0.004	4,000,000	4,000,000
(2)	SULPHURETS CAMP:	19	43,421,487		3,909,348	3,909,348
3	FISH LAKE	69	200,000,000	0.014	2,800,000	2,800,000
4	POISON MOUNTAIN	138	584,000,000	0.004	2,336,000	2,336,000
5	CINOLA	60	26,240,000	0.072	1,889,280	1,889,695
6	MT. MILLIGAN	183	80,000,000	0.022	1,760,000	1,760,000
7	STIKINE COPPER	12	125,000,000	0.014	1,750,000	1,750,000
8	SNIP	171	2,446,000	0.648	1,585,008	1,585,008
9	CARIBOO-BELL	68	128,000,000	0.012	1,536,000	1,536,000
10	FRASERGOLD	174	15,000,000	0.07	1,050,000	1,050,000
(11)	HEDLEY CAMP:	97	10,558,000		1,006,132	2,684,212
12	LYNX,MYRA,H-W,	122	13,798,000	0.07	965,860	1,433,152
13	EXPO	187	57,500,000	0.012	690,000	690,000
14	KERR	189	66,000,000	0.01	660,000	660,000
15	J & L	140	3,710,000	0.17	630,700	630,700
16	EQUITY SILVER	52	16,200,000		623,131	838,596
17	WINDY-CRAGGY	1	100,000,000	0.006	600,000	600,000
(18)	BRIDGE RIVER CAMP:	109	2,547,000		566,380	4,744,449
19	PREMIER	23	7,000,000	0.068	476,000	2,280,218
20	TILLICUM	80	2,000,000	0.22	440,000	443,160
21	RED-CHRIS	15	43,700,000	0.01	437,000	437,000
22	MORRISON	88	41,876,000	0.01	418,760	418,760
23	LAWYERS	16	1,938,000	0.196	379,848	379,848
24	GOLDEN BEAR	145	650,000	0.54	351,000	351,000
25	REG (MT.JOHNNY)	18	384,889	0.83	319,458	319,458
TOTALS:			2,571,969,376		31,179,905	39,526,604

TOP 25 GOLD RESERVES

TABLE 9
B.C. LODE GOLD PRODUCTION (1890-1987)
VEINS-MESOTHERMAL

FIGURE 1 NO.	MINE NAME	YEARS OF PRODUCTION	RANK (CAMP)	PRODUCED oz	RESERVES oz	TOTAL INVENTORY (PROD.+ RES.) oz
109	BRIDGE RIVER CAMP:	1900-1978	(1)	4,178,069	566,380	4,744,449
86	ROSSLAND CAMP	1894-1974	(2)	2,745,260		2,745,260
66	CARIBOO-BARKERVILLE:	1933-1967,80-87*	(5)	1,231,214	35,316	1,266,530
83	SHEEP CREEK CAMP:	1902-1981	(8)	761,456	73,590	835,046
58	SURF INLET	1917-26,36-43	12	388,881	19,950	408,831
149	YMIR CAMP:	1899-1973	(15)	283,560	26,600	310,160
123	ZEBALLOS CAMP:	1933-1953,1975	(16)	276,067	145,933	422,000
7	POLARIS TAKU	1938-1951	18	231,603	70,422	302,025
9	CASSIAR CAMP:	1979-1987*	17	257,287	204,802	462,089
110	NORTHAIR	1976-1982	20	166,582	12,220	178,802
20	SCOTTIE GOLD	1981-JAN.1985	27	88,600	60,000	148,600
91	CARIBOO-AMELIA	1894-1962	28	81,603	4,000	85,603
82	GRANITE POORMAN	1890-1954	32	65,080	4,860	69,940
22	BIG MISSOURI	1927-1942	33	58,384	151,668	210,052
89	UNION	1913-1946,1987	34	55,339	7,968	63,307
185	ARLINGTON	1900-1970,1987	35	54,667		54,667
88a	GREENWOOD VEINS GRAND TOTAL:	1893-1976	(37)	46,673	36,880	83,553
104	A) CAROLIN (IDAHO)	1982-1984	39	43,543	102,400	149,772
84	BAYONNE	1935-1951,1984	41	42,152	9,600	51,752
51	JEWEL	1940-1975,84-85	42	39,711	15,500	55,211
82	PERRIER	1913-1946	44	34,681		34,681
131	WINDPASS	1916-1944	45	34,455		34,455
132	VIDETTE	1933-1940	46	29,869		29,869
73	ECLIPSE	1911-1958	47	29,400	3,770	33,170
59	SURF POINT	1919-1939	49	20,574	124,600	145,174
94	CHAPUT	1968-1976	50	20,361	34,844	55,205
99	FAIRVIEW CAMP:	1898-1949	(53)	17,038	129,897	146,935
90	HIGHLAND BELL	1913-1987*	55	16,082		16,082
36	SILVER STANDARD	1913-1985	56	14,975	830	15,805
85	ALPINE	1915-1948	57	11,451	105,000	116,451
		TOTAL:		11,324,617	1,947,030	13,275,476

* Current production

Notes: 1. Top 30 out of 88

2. Significant reserves at Silver Queen (#53) and Dome Mountain (#45)

TABLE 10
B.C. LODE GOLD PRODUCTION (1894-1987)
VEINS-EPITHERMAL

FIGURE 1 NO.	MINE NAME	YEARS OF PRODUCTION	RANK	PRODUCED oz	RESERVES oz	TOTAL INVENTORY (PROD.+ RES.) oz
23	PREMIER	1918-1976	3	1,804,218	489,451	2,293,669
70	BLACKDOME	1986-1987*	29	76,471	207,200	283,671
17	BAKER	1980-1983	43	37,558	30,800	68,358
92	DUSTY MAC	1969-1976	51	19,483		19,483
5	ENGINEER	1913-1952	52	18,058		18,058
118	MT.WASHINGTON	1961-1967	71	4,204	121,304	125,508
60	CINOLA	1975,1981	105	415	1,889,280	1,889,695
141	AL	1986	107	386	152,000	152,386
* Current production		TOTAL:		1,960,793	2,890,035	4,850,828

TABLE 11
1988 B.C. LODE GOLD RESERVES
VEINS-MESOTHERMAL

FIGURE 1 NUMBER	DEPOSIT NAME	YEARS OF PRODUCTION (*=PRODUCING)	PRODUCED oz	RESERVES (ALL CATEGORIES) tons	GRADE oz/tons GOLD	RESERVES oz	RESERVES RANK (CAMP)	TOTAL INVENTORY (PROD.+RES.) oz
171	SNIP			2,446,000	0.648	1,585,008	8	1,585,008
174	FRASERGOLD			15,000,000	0.07	1,050,000	10	1,050,000
109	BRIDGE RIVER CAMP:	1900-1978	4,178,069	2,547,000		566,380	(18)	4,744,449
19	SULPHURETS (BRUCEJACK)			1,421,487	0.34	483,348	(2)	483,348
145	GOLDEN BEAR			650,000	0.54	351,000	24	351,000
18	REG (MT.JOHNNY)	1988-		384,889	0.83	319,458	25	319,458
169	GOLDWEDGE CAMP:			373,224	0.752	280,856	(28)	280,856
85	a CHAPLEAU	1896-1941	2,853	720,000	0.3	216,000	33	218,853
9	CASSIAR CAMP:		257,287	462,279		204,802	(35)	462,089
136	YELLOW GIANT:			1,250,000		187,700	(41)	187,700
177	LH			330,000	0.5	165,000	44	165,000
22	BIG MISSOURI	1927-1942,89-	58,384	1,685,200	0.09	151,668	46	210,052
158	TAKLA RAINBOW			471,290	0.32	150,813	47	150,813
166	YELLOW JACKET			500,000	0.3	150,000	48	150,000
123	ZEBALLOS CAMP:	1933-1953,75	276,067	395,848		145,933	(49)	422,000
47	CRONIN	1914-1974	282	320,000	0.436	139,520	50	139,802
99	FAIRVIEW CAMP:	1898-1949	17,038	962,700		129,897	(52)	146,935
59	SURF POINT	1919-1939	20,574	623,000	0.2	124,600	53	145,174
45	DOME MOUNTAIN	1940-1951,81-82	387	318,615	0.37	117,888	55	118,275
85	ALPINE	1915-1948	11,451	210,000	0.5	105,000	58	116,451
104	A+B) CAROLIN (IDAHO)	1982-1984	47,372	800,000	0.128	102,400	59	149,772
14	RED DOG			2,400,000	0.037	88,800	62	88,800
143	LINDQUIST			275,000	0.312	85,800	63	85,800
162	TRUE FISSURE	1900-1944	216	763,000	0.11	83,930	64	84,146
178	MACKTUSH CK.			152,000	0.54	82,080	65	82,080
53	SILVER QUEEN	1972, 1973	3,156	932,900	0.085	79,297	68	82,453
67	a SPANISH LAKE			981,060	0.08	78,485	69	78,485
83	SHEEP CREEK:	1902-1981	761,456	223,000	0.33	73,590	(70)	835,046
7	POLARIS TAKU	1938-1951	231,603	222,854	0.316	70,422	71	302,025
74	SILVER CUP	1895-1985	5,169	700,000	0.1	70,000	72	75,169
168	DOC (GRACY)			207,000	0.32	66,240	74	66,240
29	GEORGIA RIVER	1937	329	120,037	0.55	66,020	75	66,349

38	ROCHER DEBOULE	1915-1954	5,055	200,000	0.33	66,000	76	71,055
20	SCOTTIE GOLD	1981-JAN.85	88,600	120,000	0.5	60,000	77	148,600
176	GOLDFINCH	1903-1904	670	186,000	0.296	55,056	78	55,726
120	FANDORA	1960-1964	1,468	200,000	0.27	54,000	79	55,468
155	PELLAIRE			74,000	0.67	49,580	81	49,580
167	HANK			454,000	0.1	45,400	84	45,400
154	WISCONSIN			350,000	0.11	38,500	88	38,500
88a	GREENWOOD VEINS GRAND TOTAL:		46,673	107,000		36,880	(89)	83,553
56	HUNTER	1933	29	103,800	0.35	36,330	91	36,359
66	CARIBOO-BARKERVILLE:	1933-67,80-87*	1,231,214	327,000	0.108	35,316	(92)	1,266,530
94	CHAPUT	1968-1976	20,361	281,000	0.124	34,844	93	55,205
130	DORATHA MORTON	1898-1925	4,595	90,000	0.35	31,500	95	36,095
149	YMIR CAMP:	1899-1973	283,560	95,000	0.28	26,600	(100)	310,160
111	ASHLU	1932-1939	6,493	98,500	0.25	24,625	101	31,118
159	PAYDIRT			200,000	0.12	24,000	103	24,000
144	TOPLEY-RICHFIELD	1938-1953	1	170,000	0.12	20,400	104	20,401
58	SURF INLET	1917-1926,36-43	388,881	57,000	0.35	19,950	105	408,831
179	MAMIE			60,000	0.32	19,200	106	19,200
51	JEWEL	1940-1975,84-85	39,711	50,000	0.31	15,500	108	55,211
157	THUNDER			50,000	0.3	15,000	109	15,000
129	CARIBOO-HUDSON	1938-1939	5,185	35,450	0.36	12,762	111	17,947
110	NORTHAIR	1976-1982	166,582	52,000	0.235	12,220	113	178,802
175	GERLE GOLD			50,054	0.22	11,012	115	11,012
164	SHERWOOD			50,000	0.2	10,000	117	10,000
127	DOCTORS POINT			100,000	0.1	10,000	116	10,000
84	BAYONNE	1935-1951,85	42,152	24,000	0.4	9,600	119	51,752
170	SMITH-NASH			22,190	0.302	6,701	122	6,701
82	GRANITE POORMAN	1890-1954	65,080	18,000	0.27	4,860	124	69,940
91	CARIBOO-AMELIA	1894-1962	81,603	8,000	0.5	4,000	125	85,603
73	ECLIPSE	1911-1958	29,400	29,000	0.13	3,770	126	33,170
119	MUSKETEER	1942-1975	3,052	11,000	0.3	3,300	127	6,352
43	DUTHIE	1923-1983,85	3,695	21,700	0.07	1,519	128	5,214
54	EMERALD GLACIER	1951-1968	48	45,000	0.03	1,350	129	1,398
35	VICTORIA	1926-1940	236	1,000	1.24	1,240	130	1,476
36	SILVER STANDARD	1913-1985	14,975	10,000	0.083	830	131	15,805
39	VIRGINIA	1975,1976	12	20,000	0.03	600	132	612
		TOTAL:	8,401,024	42,619,077		8,374,379		16,775,403

NOTES: 1. Rossland camp not included in totals

NOTE: "RESERVES" TO JAN.1/88 UNLESS OTHERWISE INDICATED

TABLE 12
MESOTHERMAL GOLD DEPOSITS IN BRITISH COLUMBIA
BY RANK OF TOTAL CONTAINED GOLD >100,000 OZ.

FIGURE 1 NUMBER	DEPOSIT NAME	MINFILE NUMBER	BELT (TERRANE)	HOST LITHOLOGY	STRUCTURAL CONTROL	POSS.AGE OF MIN.	YEARS OF PRODUCTION (*=PRODUCING)	GOLD PROD. RANK (CAMP)	PROD.TO END OF 1987 TONS	PRODUCED GOLD oz	PRODUCED SILVER oz	Ag:Au	RESERVES GOLD oz	TOTAL GOLD INVENTORY (PROD.+RES.) oz
109	BRIDGE RIVER CAMP:		COAST CRYSTALLINE	GREENSTONE,	CADWALLADER	EOCENE	1900-1978	(1)	8,060,079	4,178,069	1,002,541	1:4	566,380	4,744,449
109	A) BRALORNE	92JNE001	(BRIDGE RIVER)	DIORITE	SHEAR ZONE		1900-1978		5,461,400	2,821,567	706,345		287,280	3,108,847
109	B) PIONEER	92JNE004		(DISRUPTED			1908-1962		2,469,720	1,333,521	244,735			1,333,521
109	E) CONGRESS	92JNE029		OPHIOLITE)			1937		1,039	83	41		160,800	160,883
109	F) RELIANCE	92JNE033											87,000	87,000
109	C) WAYSIDE	92JNE030					1915-1937		40,760	5,341	837		31,300	36,641
109	D) MINTO	92JNE075					1934-1940		87,160	17,557	50,583			17,557
86	ROSSLAND CAMP:	82FSW093 etc.,	OMINECA (QUESNELLIA)	SHOSHONITIC VOLCANICS	FRACTURES, FAULTS	EOCENE	1894-1974	(2)	6,199,799	2,745,260	3,440,800	1:1		2,745,260
171	SNIP	104B023	COAST CRYSTALLINE (STIKINIA)	WACKE,SILST. ORTHOCLASE POR.	FAULTS	L.TRI.-L.JUR.						VERY LOW	1,585,008	1,585,008
174	FRASERGOLD	93A150	INTERMONTANE (QUESNELLIA)	PHYLLITES		L.TRIASSIC						VERY LOW	1,050,000	1,050,000
19	SULPHURETS CAMP:		INTERMONTANE	ANDESITES,	FAULTS	E.JURASSIC						50:1	3,909,348	3,909,348
19	A) BRUCEJACK LAKE (TOTAL):	104B118	(STIKINIA)	SANDSTONES,									483,348	483,348
19	WEST ZONE (i)	104B118		SYENITES									302,341	302,341
19	SHORE (ii)	104B118											127,387	127,387
19	GOSSAN HILL (iii)	104B118											53,620	53,620
66	CARIBOO-BARKERVILLE CAMP:		OMINECA	GREYWACKE,	STRATIGRAPHY	E.CRETACEOUS		(5)	3,027,928	1,231,214	165,382	1:7	35,316	1,266,530
66	A) CARIBOO GOLD QTZ	93H010	(BARKERVILLE)	LIMESTONE	VEINS		1933-1967		1,681,950	626,755	56,092		35,316	662,071
66	A) ISLAND MT (AURUM)	93H019					1934-1954		1,245,295	569,528	81,658			569,528
66	B) MOSQUITO CK	93H025					1980-1987*		100,683	34,931	27,632			34,931
83	SHEEP CREEK CAMP:		OMINECA	QUARTZITE,	FOLDS	JUR.-EOCENE ?	1902-1981	(8)	1,667,596	761,456	280,495	1:3	73,590	835,046
83	D) QUEEN	82FSW048	(ANCESTRAL	ARGILLITE,		(HOST ROCKS=	1902-1970		716,158	303,933	100,359			303,933
83	A) RENO	82FSW036	NORTH AMERICA)	PLUTONS		EOCAMBRIAN-	1906-1979		415,505	233,743	103,409			233,743
83	C) KOOTENAY BELL	82FSW046				E.CAMBRIAN)	1904-1967		278,124	112,755	41,996			112,755
83	B) GOLD BELT	82FSW044					1934-1979		256,685	80,791	34,121			80,791
83	F) NUGGET	82FSW040					1980-1981		742	251	198		73,590	73,841
83	E) VANCOUVER	82FSW049					1909-1933		382	29,983	412			29,983
9	CASSIAR CAMP:		OMINECA	GREENSTONE,	FAULTS,	E.CRETACEOUS	1979-1987*	(17)	800,030	257,287	153,040	1:1	204,802	462,089
9	ERICKSON GOLD	104P029	(SLIDE MOUNTAIN)	ARGILLITE,	SHEARS		1979-1987*		477,483	215,880	149,890		77,583	293,463
10	B) EILEEN EAST			LISTWANITE									76,958	76,958
8	TAURUS (HANNA)	104P012					1981-1987*		303,547	34,422	2,150		15,000	49,422
11	PLAZA (VOLLAUG)	104P019					1981,1983		18,000	5,985			35,260	41,245
10	A) CUSAC	104P070					1982,1983		1,000	1,000	1,000			1,000
58	SURF INLET	103H027	COAST CRYSTALLINE (ALEXANDER)	QTZ. DIORITE, CHL. SCHISTS	SHEAR ZONES	EOCENE	1917-1926	12	1,012,060	388,881	201,210	1:2	19,950	408,831
145	GOLDEN BEAR	104K079	INTERMONTANE (STIKINIA)	SILIC.LST., DOL.,TUFFS	FAULT ZONE	E.JURASSIC						~1:1	351,000	351,000
18	REG (MT.JOHNNY)	104B077	COAST CRYSTALLINE (STIKINIA)	VOLCANICLASTICS, ORTHOCLASE PORPHYRIES	FAULTS	L.TRI.-E.JUR.	1988-					~1:1	319,458	319,458

7 POLARIS TAKU	104K003	INTERMONTANE (STIKINIA)	ANDESITE, TUFFS	FAULTS	JURASSIC ?	1938-1951	18	753,250	231,603	11,760	1:10	70,422	302,025
123 ZEBALLOS CAMP:	93L008 TO 038	INSULAR (WRANGELLIA)	GRANODIORITE	SHEARS	TERTIARY ?	1933-1953, 1975	(16)	718,475	276,067	120,140	1:2	145,933	422,000
123 A) SPUD VALLEY												101,302	101,302
123 B) PRIVATEER												44,631	44,631
149 YMIR CAMP:		OMINECA	ARGILLACEOUS	FAULTS,	L.+ M.JURAS.?	1899-1973	(15)	786,616	283,560	1,425,014	5:1	26,600	310,160
149 A) YANKEE GIRL	82FSW068	(ANCESTRAL	QUARTZITE,	FOLDS		1907-1951		314,382	123,784	708,483			123,784
149 B) YMIR	82FSW074	NORTH AMERICA)	GRANODIORITE			1899-1973		358,362	109,644	459,237			109,644
169 GOLDWEDGE:	104B100	INTERMONTANE	FRAGMENTAL	FAULTS	E.JURASSIC	1989-					VERY LOW	280,856	280,856
169 GOLDEN ROCKET ZONE (i)		(STIKINIA)	ANDESITES									255,319	255,319
169 DISCOVERY (ii)												23,927	23,927
169 GOLDRIDGE (iii)												1,610	1,610
85 a CHAPLEAU	82FNW130	OMINECA (QUESNELLIA)	QUARTZ MONZONITE	SHEARS	M.JUR.-TERT.	1896-1941	85	5,040	2,853	14,844	5:1	216,000	218,853
85 ALPINE	82FNW127	OMINECA (QUESNELLIA)	QUARTZ MONZONITE	SHEARS	M.JUR.-TERT.	1915-1948	57	17,000	11,451	7,119	2:1	105,000	116,451
22 BIG MISSOURI	104B054	INTERMONTANE (STIKINIA)	ANDESITE CHERTY TUFFS	STRATIGRAPHY	E.JURASSIC	1927-1942,89-	33	847,610	58,384	52,676	1:1	151,668	210,052
110 NORTHAIR	92JW012	COAST CRYSTALLINE (GAMBIER)	INTERMEDIATE VOLCS.,WACKE	PARTLY STRATIF. FAULTS	CRET.-TERT.	1976-1982	20	345,700	166,582	845,854	5:1	12,220	178,802
177 LH	82LNE012	OMINECA (QUESNELIA)	ANDESITES	FAULTS	E.JURASSIC						?	165,000	165,000
158 TAKLA RAINBOW	93N082	INTERMONTANE (QUESNELIA)	ANDESITES	FAULTS	E.JURASSIC						LOW	150,813	150,813
166 YELLOW JACKET	104N043	INTERMONTANE (CACHE CREEK)	SERPENTINITE, GREENSTONE, ARGILLITE	SHEAR ZONE	M.JURAS.-U.CRET.?						LOW	150,000	150,000
20 SCOTTIE GOLD	104B074	INTERMONTANE (STIKINIA)	GRANODIORITE, LAPILLI ANDS.	SHEARS	E.JURASSIC	1981-JAN.85	27	201,200	88,600	44,000	1:2	60,000	148,600
99 FAIRVIEW CAMP:		INTERMONTANE	QUARTZITE,	SHEAR ZONES	JURAS.-CRET.	1898-1949	(53)	521,135	17,038	169,494	10:1	129,897	146,935
99 B) FAIRVIEW (MORNING STAR)	82ESW007	(QUESNELLIA)	GRANODIORITE			1898-1949		28,000	13,946	152,405		83,897	97,843
99 A) STEMWINDER	82ESW006					1933-1941		493,265	3,092	17,089		46,000	49,092
104 COQUIHALA GOLD BELT:	92HSW034	INTERMONTANE	SILTSTONE,	HOZAMEEN FZ	EOCENE								
104 A) CAROLIN (IDAHO)		(HOZAMEEN)	WACKE			1982-1984	39	863,139	43,543	38,000	1:1	102,400	145,943
104 B) EMANCIPATION						1905-1941	75		3,829				3,829
59 SURF POINT	103J001	COAST CRYSTALLINE (ALEXANDER)	QUARTZ DIORITE	SHEARS	EOCENE ?	1919-1939	49	67,870	20,574	230,755	11:1	124,600	145,174
47 CRONIN	93L127	INTERMONTANE (STIKINIA)	RHYOLITE, ARGILLITE	SHEARS	TERTIARY ?	1914-1974	111	28,480	282	262,672	VERY HIGH	139,520	139,802
45 DOME MOUNTAIN	93L023 93L022	INTERMONTANE (STIKINIA)	ANDESITIC PYROCLASTICS	SHEARS	E.JURASSIC	1940-1951, 1981-1982	106	5,862	387	663	2:1	117,888	118,275
						TOTALS:		25,911,869	10,751,640	8,459,340		6,732,669	17,484,309

TABLE 13
1988 B.C. LODE GOLD RESERVES
VEINS-EPITHERMAL

FIGURE 1 NUMBER	DEPOSIT NAME	YEARS OF PRODUCTION (*=PRODUCING)	PRODUCED oz	RESERVES (ALL CATEGORIES) tons	GRADE oz/tons GOLD	RESERVES oz	RESERVES RANK	TOTAL INVENTORY (PROD.+RES.) oz
60	CINOLA	1975,1981	415	26,240,000	0.072	1,889,280	5	1,889,695
23	PREMIER	1918-1976	1,804,218	7,110,250	0.069	489,451	19	2,293,669
16	LAWYERS	1989-		1,938,000	0.196	379,848	23	379,848
70	BLACKDOME	1986-1987*	76,471	280,000	0.74	207,200	34	283,671
184	VAULT			1,000,000	0.2	200,000	37	200,000
142	SHAS			2,403,450	0.079	189,873	40	189,873
141	AL	1986	386	304,000	0.5	152,000	45	152,386
118	MT.WASHINGTON	1961-1967	4,204	472,000	0.257	121,304	54	125,508
160	METS			160,000	0.23	36,800	90	36,800
17	BAKER	1980-1983	37,558	55,000	0.56	30,800	96	68,358
152	SILVER POND			70,000	0.17	11,900	114	11,900
172	BONAPARTE			10,000	0.6	6,000	123	6,000
		TOTAL:	1,923,252	40,042,700		3,714,456		5,637,708

TABLE 15
B.C. LODE GOLD PRODUCTION (1894-1987)
SKARNS

FIGURE 1 NO.	MINE NAME	YEARS OF PRODUCTION	RANK (CAMP)	PRODUCED oz	RESERVES oz	TOTAL INVENTORY (PROD.+ RES.) oz
97	HEDLEY CAMP:	1904-61,81,83,87*	(4)	1,678,080	1,006,132	2,684,212
88	GREENWOOD CAMP:	1900-1978	(6)	1,191,431	116,127	1,307,558
124	(A+B) OLD SPORT,BENSON LAKE	1962-1973	22	126,407	10,000	136,407
117	TEXADA:	1896-1976	(24)	106,508	27,584	134,092
186	SECOND RELIEF	1900-1959	25	100,234		100,234
63	TASU	1914-1983	40	43,066		43,066
101	DIVIDEND-LAKEVIEW	1907-1949	54	16,216		16,216
121	SILVERADO	1934-1938	65	5,567		5,567
80	TILLICUM	1981,85-87	80	3,160	440,000	443,160
105	CRAIGMONT	1961-1982	90	2,503		2,503
64	LILY-IKEDA	1906-1920	93	1,664		1,664
125	YREKA	1902-1967	94	1,604	28,318	29,922
151	BANBURY	1937	100	945	184,000	184,945
2	MAID OF ERIN	1911-1956	133	10	0	10
		TOTAL:		3,277,395	1,812,161	5,089,556

* Current production

NOTE: "RESERVES" TO JAN.1/89 UNLESS OTHERWISE INDICATED

TABLE 14
MAJOR EPITHERMAL GOLD DEPOSITS IN BRITISH COLUMBIA
BY RANK OF TOTAL GOLD INVENTORY

FIGURE 1 NO.	DEPOSIT NAME	MINFILE NUMBER	BELT (TERRANE)	HOST LITHOLOGY	STRUCTURAL CONTROL	POSS. AGE OF MIN.	YEARS OF PRODUCTION (*=PRODUCING)	GOLD PROD. RANK	PROD. TO END OF 1987 TONS	PROD. Au oz	PROD. Ag oz	Ag:Au	RESERVES GOLD oz	TOTAL GOLD INVENTORY (RES.+ PROD.) oz
23	PREMIER	104B054	INTERMONTANE (STIKINIA)	ANDESITIC PYROCLASTICS (Hazelton Gp.) Premier Por.	Faults	E.Jurassic	1918-1976 int., 1989-	3	4,670,018	1,804,218	40,803,280	23:1	476,000	2,280,218
60	CINOLA	103F034	INSULAR (WRANGELLIA)	CONGLOMERATE, SANDSTONE (Skonun Fmn.) Rhyolite Por.	Sandspit Fault System	Miocene	1975, 1981 test mill.	105	6,130 est.	415 est.	240 est.	1:2	1,889,280	1,889,695
	TOODOGGONE CAMP:		INTERMONTANE (STIKINIA)	ANDESITIC PYROCLASTICS	Faults	E.Jurassic	TOTALS:	N/A	87,740	37,944	742,198		801,221	839,165
16	LAWYERS	94E066	INTERMONTANE (STIKINIA)	'Toodoggone ^Volcanics'	Faults	E.Jurassic	1989-		—	—	—	20:1	379,848	379,848
17	BAKER	94E026	INTERMONTANE (STIKINIA)	Takla Gp. ANDESITE	Faults	E.Jurassic	1980-1983	43	87,740	37,558	742,198	20:1	30,800	68,358
160	METS	94E093	INTERMONTANE (STIKINIA)	'Toodoggone ^Volcanics'	Faults	E.Jurassic	—		—	—	—	?	36,800	36,800
142	SHAS	94E050	INTERMONTANE (STIKINIA)	'Toodoggone ^Volcanics'	Faults	E.Jurassic	—		—	—	—	?	189,873	189,873
152	SILVER POND	94E069	INTERMONTANE (STIKINIA)	'Toodoggone ^Volcanics'	Faults	E.Jurassic	—		—	—	—	?	11,900	11,900
141	AL	94E091	INTERMONTANE (STIKINIA)	'Toodoggone ^Volcanics'	Faults	E.Jurassic	1986 test mill	111	—	386	—	~1:1	152,000	152,386
70	BLACKDOME	920050-053	INTERMONTANE (STIKINIA)	ANDESITE, RHYOLITE (Eocene)	Shear Zones	Eocene	1986-1987*	29	118,859	76,471	205,149	3:1	207,200	283,671
184	VAULT	82ESW173	INTERMONTANE (overlap on Monashee?)	TUFFACEOUS TRACHYANDESITE (Lower Marama Fmn.)	Okanagan Fault System (Detachment/ Extensional?)	Eocene	—		—	—	—	?	200,000 est.	200,000 est.
118	MT. WASHINGTON	92F116	INSULAR (WRANGELLIA)	POLYMICTIC BRECCIA INTO MUDSTONE (Comox Fmn.)	Gentle west-dipping structure (thrust?)	Tertiary	1961-1967	71	396,000	4,204	232,620	55:1	121,304	125,508
92	DUSTY MAC	82ESW078	INTERMONTANE (overlap on Monashee?)	LAHARS (White Lk.Fmn.)	Okanagan Fault System Detachment/ Extensional?)	Eocene	1969-1976	51	58,700	19,483	339,283	17:1	—	19,483
5	ENGINEER	104M014	INTERMONTANE (STIKINIA)	GREYWACKES ARGILLITES (Laberge Gp.)	Shear Zones	Tertiary?	1913-1952 intermittent	52	17,150	18,058	8,950	1:2	—	18,058
192	ESKAY CREEK	104B008	INTERMONTANE (STIKINIA?)	RHYOLITE ARGILLITE (Hazelton Gp.)	Shear Zones	E.Jurassic?			—	—	—	?	?	Significant Deposit
150	BRETT	82LSW110	INTERMONTANE (QUESNELLIA)	ANDESITIC FLOWS & PYROCL.	Fault	Eocene	—		—	—	—	?	?	?
		TOTALS:								1,960,793 OZ GOLD PRODUCED	42,331,720 OZ SILVER PRODUCED		3,695,005 OZ GOLD RESERVE	5,654,798 TOTAL GOLD INVENTORY

TABLE 16
1988 B.C. LODE GOLD RESERVES
SKARNS

FIGURE 1 NUMBER	DEPOSIT NAME	YEARS OF PRODUCTION (*=PRODUCING)	PRODUCED oz	RESERVES (ALL CATEGORIES) tons	GRADE oz/ton GOLD	RESERVES oz	RESERVES RANK (CAMP)	TOTAL INVENTORY (PROD.+RES.) oz
SKARN:								
97	HEDLEY CAMP:	1904-61,82,83,87*	1,678,080	10,558,000		1,006,132	(11)	2,684,212
80	TILLICUM	1981,85-87*	3,160	2,000,000	0.22	440,000	20	443,160
151	BANBURY	1937	945	4,000,000	0.046	184,000	42	184,945
88	GREENWOOD CAMP:	1900-1978	1,191,431	456,000		116,127	(56)	1,307,558
125	YREKA	1902-1967	1,604	141,590	0.2	28,318	98	29,922
117	TEXADA:	1897-1976	106,508	78,810	0.35	27,584	(99)	134,092
124	A) OLD SPORT	1962-1973	124,386	500,000	0.02	10,000	118	134,386
		TOTAL:	3,106,114	17,734,400		1,812,161		4,918,275

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TABLE 18
B.C. LODE GOLD PRODUCTION (1894-1987)
PORPHYRIES

FIGURE 1 NO.	MINE NAME	YEARS OF PRODUCTION	RANK (CAMP)	PRODUCED oz	RESERVES oz	TOTAL INVENTORY (PROD.+ RES.) oz
	ALKALINE:					
102	SIMILKAMEEN:	1917-62,72-87*	(9)	589,093	46,538	635,631
108	AFTON	1977-1987*	13	382,889	314,070	696,959
134	IRON MASK	1901-1928	76	3,794		3,794
		TOTAL:		975,776	360,608	1,336,384
	CALC-ALKALINE:					
126	ISLAND COPPER	1971-1987*	7	797,008	245,000	1,042,008
48	BELL COPPER	1972-82,85-87*	14	290,819	280,000	570,819
49	GRANISLE	1966-1982	21	148,000		148,000
# 107	HIGHLAND VALLEY COPPER CAMP:	1963-1987*	(30)	68,255	137,280	205,535
96	BRENDA	1970-1987*	36	47,925	12,288	60,213
182	GIBRALTAR	1972-1987*	73	4,020	16,300	20,320
161	GREAT WESTERN	1907-1981	117	188	30,000	30,188
		TOTAL:		1,356,215	720,869	2,077,084
		PORPHYRIES TOTAL:		2,331,991	1,081,477	3,413,468

#107 = includes Lornex, Valley Copper, Bethlehem Copper and Highland Valley Copper Totals

* Current production

TABLE 17
BRITISH COLUMBIA PRECIOUS METAL ENRICHED SKARN DEPOSITS
RANKED BY OUNCES GOLD PRODUCED

NAME (FIGURE 1 NO.)	MINFILE No.	BELT (TERRANE)	YEARS OF PRODUCTION	PROD. TO END 1987 TONS	Au oz	Ag oz	Cu TONS	Fe TONS	Pb TONS	Zn TONS	GOLD RANK BY PROD. (CAMP)	CURRENT RESERVES TONS	GRADE oz/ton GOLD	RESERVES GOLD CONTENT oz	TOTAL GOLD INVENTORY (RES.+PROD.) oz
HEDLEY CAMP (97)	TOTALS:	Intermontane (Quesnellia)	1904-1963 1987*	4,432,849	1,678,080	219,485	2,065.26				(4)	10,558,000		1,006,132	2,684,212
Nickel Plate (97A)	092HSE037, 038,062	Intermontane (Quesnellia)	1904-1963 Aug-end'87 *	3,283,296 368,030	1,338,664 48,626	133,848 26,762	1,082					9,100,000	0.088	800,800	2,188,090
Hedley Mascot (97B)	092HSE036	Intermontane (Quesnellia)	1936-1949	682,472	233,032	54,882	960					800,000	0.13	104,000	337,032
French (97D)	092HSE059	Intermontane (Quesnellia)	1950-55, 1957-61, 1982-83	87,238	51,930	3,993	22.6								51,930
Good Hope (97C)	092HSE060	Intermontane (Quesnellia)	1946-1948 1982	10,177	5,298		0.66								5,298
Canty (97E)	092HSE064	Intermontane (Quesnellia)	1939,1941	1,636	530	___						658,000	0.154	101,332	101,862
GREENWOOD CAMP (88)	TOTALS:	Omineca (Quesnellia)	1900-1978	31,836,731	1,191,431	7,219,470	297,904	0.5	8.1	1.1	(6)	456,000		116,127	1,307,558
Phoenix Mine	082ESE013, 014,015, 082ESE016-030	Omineca (Quesnellia)	1900-1920 1924,1936-42, 1959-1978	25,621,165	1,005,777	6,395,741	253,630		1.1						
Motherlode	082ESE034	Omineca (Quesnellia)	1900-1920, 1957-71 intermittent	5,565,791	173,819	699,424	39,145								
Emma	082ESE062	Omineca (Quesnellia)	1902-27(int.)	265,599	6,810	78,253	2,591								
Oro Denoro	082ESE063,064	Omineca (Quesnellia)	1903-17(int.)	136,687	3,753	30,664	1,864								
Greyhound	082ESE049,050	Omineca (Quesnellia)	?	243,984	515	11,221	658								
Marshall	082ESE031	Omineca (Quesnellia)	1967,1971	213	489	566	1.1	0.5	2.6	0.6					
Morrison	082ESE052	Omineca (Quesnellia)	1901-1903	2,917	229	836	11.8								
Loyal Canadian	082ESE158	Omineca (Quesnellia)	1903,1916	326	28	141	3.4								
Sunnyside	082ESE160	Omineca (Quesnellia)	1913-34(int.)	49	11	2,624			4.8	0.5					
OLD SPORT (124A)	092L035	Insular (Wrangellia)	1962-1973	2,929,494	124,386	377,165	45,415	53,882			22	500,000	0.02	10,000	134,386
TEXADA ISLAND (117)	TOTALS:	Insular (Wrangellia)		23,282,705	106,508	1,286,450	38,882	11,423,553			(24)	78,810		27,584	134,092
Marble Bay (117D)	092F270	Insular (Wrangellia)	1899-1929	219,629	49,644	405,759	6,789					78,810	0.35	27,584	77,228
Texada Iron Mines (117B)	092F106	Insular (Wrangellia)	1957-1976	22,943,503	28,530	760,211	29,481	11,423,553							28,530
Cornell (117C)	092F112	Insular (Wrangellia)	1897-1919	44,849	15,145	70,553	1,509								15,145
Little Billie (117A)	092F105	Insular (Wrangellia)	1896-1952	70,229	11,676	38,526	903								11,676
Copper Queen (117E)	092F271	Insular (Wrangellia)	1907-1917	4,495	1,513	11,401	200								1,513
SECOND RELIEF (Ymir-Nelson)(186)	082FSW187	Omineca (Quesnellia)	1900-1959	228,203	100,234	27,856	22.28		1.2	0.2	25				100,234
TASU (63)	103C003	Insular (Wrangellia)	1914-Oct.'83	22,965,511	43,066	1,620,205	66,002	13,509,799			40				43,006
DIVIDEND-LAKEVIEW (101)	082ESW001	Intermontane (Quesnellia)	1907-1949	122,634	16,216	2,804	80		0.08	0.08	54				16,216
* Still Producing			TOTALS	85,798,127	3,259,921	10,753,435	450,371	24,987,235	9.38	1.38		11,592,810		1,159,843	4,419,704

TABLE 19
1988 B.C. LODE GOLD RESERVES
PORPHYRIES

FIGURE 1 NUMBER	DEPOSIT NAME	YEARS OF PRODUCTION (*=PRODUCING)	PRODUCED oz	RESERVES (ALL CATEGORIES) TONS	GRADE oz/ton GOLD	RESERVES oz	RESERVES RANK (CAMP)	TOTAL INVENTORY (PROD.+RES.) oz
	ALKALINE:							
19	B) SNOWFIELD (SULPHURETS)			22,000,000	0.083	1,826,000	(2)	1,826,000
183	MT. MILLIGAN			80,000,000	0.022	1,760,000	6	1,760,000
12	STIKINE COPPER			125,000,000	0.014	1,750,000	7	1,750,000
68	CARIBOO-BELL			128,000,000	0.012	1,536,000	9	1,536,000
189	KERR			66,000,000	0.01	660,000	14	660,000
15	RED-CHRIS			43,700,000	0.01	437,000	21	437,000
108	AFTON	1977-1987*	382,889	10,469,000	0.03	314,070	26	696,959
108	A) AJAX	1989-		27,000,000	0.01	270,000	31	270,000
67	QR			950,000	0.21	199,500	38	199,500
190	LORRAINE			10,000,000	0.01	100,000	61	100,000
102	SIMILKAMEEN:		589,093	23,269,000	0.002	46,538	(83)	635,631
		TOTAL:	971,982	536,388,000		8,899,108		9,871,090
	CALC-ALKALINE:							
13	LIARD COPPER			1,000,000,000	0.004	4,000,000	1	4,000,000
69	FISH LAKE			200,000,000	0.014	2,800,000	3	2,800,000
138	POISON MOUNTAIN			584,000,000	0.004	2,336,000	4	2,336,000
187	EXPO			57,500,000	0.012	690,000	13	690,000
188	MORRISON			41,876,000	0.01	418,760	22	418,760
65	CAPOOSE			31,200,000	0.01	312,000	27	312,000
48	BELL COPPER	1972-82,85-87*	290,819	14,000,000	0.02	280,000	30	570,819
126	ISLAND COPPER	1971-1987*	797,008	35,000,000	0.007	245,000	32	1,042,008
# 107	HIGHLAND VALLEY CU	1963-1987*	68,255	807,530,353	0.00017	137,280	(51)	205,535
139	AYLWIN (WILLA)			456,727	0.176	80,384	67	80,384
165	A.M.			2,779,984	0.017	47,260	82	47,260
161	GREAT WESTERN	1907-1981	188	200,000	0.15	30,000	97	30,188
182	GIBRALTAR	1972-1987*	4,020	163,000,000	0.0001	16,300	107	20,320
96	BRENDA	1970-1987*	47,925	30,721,163	0.0004	12,288	112	60,213
		TOTAL:	1,208,215	2,968,264,227		11,405,272		12,613,487
		PORPHYRIES TOTAL:	2,180,197	3,504,652,227		20,304,380		22,484,577

107= Includes Totals from Lornex, Valley Copper, Bethlehem Copper, and Highland Valley Copper

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TABLE 20
PORPHYRY Cu-Au DEPOSITS IN BRITISH COLUMBIA

NAME (FIGURE 1 NO.)	MINFILE NO.	TERRANE (TECTONIC BELT)	YR. OF ORIG. RES ASSESS'T	ORIGINAL RESERVES M TONS	ORIGINAL Cu %	ORIGINAL GOLD oz/ton	ORIGINAL SILVER oz/ton	ORIGINAL OTHER	YEARS OF PROD. (MINE LIFE)	PROD. TO END 1987 TONS	PRODUCED GOLD oz TO END '87	GOLD RANK BY PROD'N. (CAMP)	RESERVES TO END '88 (all categories) TONS	GRADE oz/ton GOLD	RESERVES GOLD CONTENT oz	OTHER RESERVES (incl. other commod.)	TOTAL GOLD INVENTORY (RES.+PROD.) oz
ALKALINE																	
Afton (108)	92INE023	Quesnellia (Intermontane)	1971	31	1	0.017	0.12		1977-1987* (0)	26,921,822	382,889	13	10,469,000	0.03	314,070	1.5% Cu, .2 Ag - UG	696,959
Ajax (108A)	92INE023	Quesnellia (Intermontane)	1987	27	0.46	0.01			1989 - (7)	—			AS SHOWN		270,000		270,000
Cariboo Bell (68)	93A059	Quesnellia (Intermontane)	1983	128	0.31	0.012	0.04		(?)				AS SHOWN		1,536,000		1,536,000
Kerr (189)	104B100	Stikinia (Intermontane)	1987	66	0.84	0.01	0.06		(?)				AS SHOWN		660,000		660,000
Lorraine (190)	93N002	Quesnellia (Intermontane)	1973	10	0.7	0.01	----		(?)				AS SHOWN		100,000		100,000
Mt. Milligan (183)	93N194	Quesnellia (Intermontane)	1987	20	0.3 - 0.5	0.02			(+10?)				80,000,000	0.022	1,760,000	0.32% Cu Geol. Reserves	1,760,000
QR (67)	93A121	Quesnellia (Intermontane)	1983	0.95		0.21			(+7)				AS SHOWN		199,500		199,500
Red Chris (15)	104H006	Stikinia (Intermontane)	1976	43.7	0.56	0.01			(?)				AS SHOWN		437,000		437,000
Similkameen		Quesnellia	1966	Total: 13						142,389,475	589,093	(9)	23,269,000		46,538	0.61 Ag, 0.448% Cu	635,631
Copper Mtn.	92HSE001	(Intermontane)		32	1.08	0.005	0.02		1917-1962	34,775,200	187,852						187,852
Ingerbelle (102)	92HSE004			~100	0.53	0.002	0.061		1972-1987* (+6)	107,614,275	401,241		23,269,000	0.002	46,538		447,779
SULPHURETS Snowfields(198)	104B179	Stikinia (Intermontane)	1983	22		0.083			(?)				AS SHOWN		1,826,000		1,826,000
Stikine Copper (Galore Creek) (12)	104G016	Stikinia (Intermontane)	1973	125	1.06	0.014	0.28		(?)				AS SHOWN		1,750,000		1,750,000
SUBTOTALS										169,311,297	971,982		536,388,000		8,899,108		9,871,090
CALC-ALKALINE																	
A.M. (165)	92HSW001	Methow (Intermontane)		2.8	1.35	0.017	0.72		(?)				AS SHOWN		47,260		47,260

Bell Copper (48)	93M001	Stikinia (Intermontane)	1963	100	0.48	0.01	0.03		1972-1982 1985-1987* (3)	60,488,981	290,819	14	14,000,000	0.02	280,000	0.509% Cu	570,819
Bethlehem (107)	92ISE001	Quesnellia (Intermontane)	1954	48	0.56	0.00035	0.03		1963-1982 (0)	116,706,600	41,148		41,000,000			0.5% Cu, 0.017% Mo Rec. grade: .00035 Au	41,148
Brenda (96)	92HNE047	Quesnellia (Intermontane)	1947	159	0.18	0.0009	0.043	.034% Mo	1970-1987* (1)	122,911,948	47,925	36	30,721,163	0.0004	12,288	0.038% Mo, 0.04 Ag, 0.177% Cu	60,213
Capoose (65)	93F040	Stikinia (Intermontane)	1978	31.2		0.01			(?)				AS SHOWN		312,000		312,000
Expo (187)	92L240	Wrangellia (Insular)	1967	57.5	0.32	0.012		.008% Mo	(?)				AS SHOWN		690,000	Part of geol. res. of 100 Mtons	690,000
Fish Lake (69)	92O041	Stikinia (Intermontane)	1975	200	0.241	0.014	0.03		(?)				AS SHOWN		2,800,000		2,800,000
Gibraltar (182)	93B006, 007,012	Cache Creek (Intermontane)	1963	327	0.37	tr.		.016% MoS2	1972-1987* (14?)	231,408,502	4,020	73	163,000,000 est.	0.0001 est.	16,300	0.3% Cu, 0.015% MoS2, 0.03 Ag	20,320
Granisle (49)	93L146	Stikinia (Intermontane)	1958	85	0.43	0.003	0.08		1966-1982 (0)	57,498,131	148,000	21					148,000
Great Western (161)	82FSW171 to 174	Quesnellia (Omineca)?	?	?	?	?	?		1907-1981	3653	188	117	200,000	0.15	30,000		30,188
Island Copper (126)	92L158	Wrangellia (Insular)	1966	257	0.52	0.0071	0.03	.017% Mo	1971-1987* (7?)	242,349,305	797,008	7	35,000,000 est.	0.007	245,000 est.	~0.03 Ag, 0.435% Cu, 0.017% Mo	1,042,008
Liard Copper (Schaft Creek) (13)	104G005	Stikinia (Intermontane)	1981	1000	0.3	0.004	0.035	.02% Mo	(?)				AS SHOWN		4,000,000		4,000,000
Lornex **,*** (106)	92ISW045	Quesnellia (Intermontane)	1964	425	0.41	-----	0.05	.023% MoS2	1972-JUNE'86 (***)	277,782,840	3156 (gold only before 1980's)		See Highland Valley Copper (**)				3,156
Morrison (188)	93M007	Stikinia (Intermontane)	1964	95	0.42	0.01	0.1		(?)				41,876,000	0.01	418,760	0.42% Cu, .1 Ag	418,760
Poison Mtn. (138)	92O046	Methow (Intermontane)	1972	175	0.33	0.009		0.025% MoS2	(?)				584,000,000	0.004	2,336,000	0.24% Cu, 0.007% Mo	2,336,000
Valley Copper **,*** (107)	92ISE001	Quesnellia (Intermontane)	1968	790	0.48	------			1983-JUNE'86 (***)	32,892,133	12,435		See Highland Valley Copper (**)				12,435
Willa (139)	82F071	Quesnellia (Omineca)	1984	0.46	0.92	0.176	0.28		(4)				As Shown plus Prob.& Poss. 242,000 tons @ same grade		80,384		80,384
** Amalgamation of Lornex & Valley Copper in July'88 to HIGHLAND VALLEY COPPER *** July'86 to end '87 production for both Lornex + Valley									JUNE'86-1987* (20)	69,034,647	11,516	(30)	807,530,353	0.00017 (est.)	137,280	0.433% Cu, 0.008% Mo	148,796
SUBTOTALS										1,211,076,740	1,356,215		3,009,529,516		11,405,272		12,761,487
TOTALS (ALKALINE PLUS CALC-ALKALINE)										1,380,388,037	2,328,197		3,545,917,516		20,304,380		22,632,577

TABLE 21
B.C. LODE GOLD PRODUCTION (1894-1987)
MASSIVE SULPHIDES

FIGURE 1 NO.	MINE NAME	YEARS OF PRODUCTION	RANK	PRODUCED oz	RESERVES oz	TOTAL INVENTORY (PROD.+ RES.) oz
112	BRITANNIA	1905-1977	10	493,069		493,069
122	LYNX,MYRA,H-W,	1966-1987*	11	467,292	965,860	1,433,152
31	(A+B) ANYOX	1914-1936	23	124,081	54,000	178,081
6	TULSEQUAH CHIEF	1939-1957	26	94,257	190,400	284,657
21	GRANDUC	1971-1983	31	65,510		65,510
114	LENORA	1898-1964	38	44,491		44,491
115	SUNRO	1962-1978	48	28,912	29,603	58,515
77	SULLIVAN	1900-1987*	64	5,622		5,622
116	THISTLE	1938-1942	87	2,760		2,760
72a	HOMESTAKE	1935-1941	108	361	24,574	24,935
32	OUTSIDER	1906-1928	122	66		66
113	HARRISON (SENECA)	1962	136	0.5	41,525	41,526
		TOTAL:		1,326,422	1,305,962	2,632,384

* Current production

TABLE 22
1988 B.C. LODE GOLD RESERVES
MASSIVE SULPHIDES

FIGURE 1 NUMBER	DEPOSIT NAME	YEARS OF PRODUCTION (*=PRODUCING)	PRODUCED oz	RESERVES (ALL CATEGORIES) tons	GRADE oz/tons GOLD	RESERVES oz	RESERVES RANK	TOTAL INVENTORY (PROD.+RES.) oz
122	LYNX,MYRA,H-W,	1966-1987*	467,292	13,798,000	0.07	965,860	12	1,433,152
140	J & L			3,710,000	0.17	630,700	15	630,700
1	WINDY-CRAGGY			100,000,000	0.006	600,000	17	600,000
6	TULSEQUAH CHIEF	1939-1957	94,257	2,380,000	0.08	190,400	39	284,657
137	KUTCHO CREEK			18,740,000	0.009	168,660	43	168,660
191	ECSTALL			7,000,000	0.015	105,000	57	105,000
146	LARA			583,000	0.138	80,454	66	80,454
31	ANYOX	1914-1936	124,081	18,000,000	0.003	54,000	80	178,081
113	HARRISON	1962	1	1,661,000	0.025	41,525	85	41,526
72	REA GOLD			160,000	0.247	39,520	87	39,520
180	SAMATOSUM			661,000	0.052	34,372	94	34,372
72a	HOMESTAKE	1935-1941	361	877,652	0.028	24,574	102	24,935
71	CHU CHUA (CC)			785,000	0.012	9,420	120	9,420
		TOTAL:	685,992	168,355,652		2,944,485		3,630,477

TABLE 23
BRITISH COLUMBIA AURIFEROUS VOLCANOGENIC MASSIVE SULPHIDE DEPOSITS

TYPE	NAME (Fig No.1)	YEARS OF PRODUCTION	LOCATION NTS (MINFILE No.)	TERRANE (Tectonic Belt)	AGE	HOST LITHOLOGY	SHAPE	Fe SULPHIDE	INITIAL RESERVES (Mtons)	Au oz/ ton	Ag oz/ ton	Cu % Initial (Actual)	Zn % Initial (Actual)	Pb % Initial (Actual)	PROD. TO END 1987 TONS	PRODUCED GOLD oz	PRODUCED SILVER oz	CURRENT RESERVES & COMMENTS oz/ton	RESERVES GOLD CONTENT oz	TOTAL GOLD INVENTORY (RES.+PROD.) oz
BESS	GOLDSTREAM (-)	1983-1984	082M09W (082M141)	Kootenay? (Omineca)	Paleozoic	Lardeau Gp. phyllite, qtzite.	sheet	cpy,po	3.94	?	0.56	3.67 (3.51)	2.67 (2.5)		427,886		122,816	3,174,000 tons @ 3.15% Cu,2.5% Zn, .51 Ag Closed indef.		?
HI	GRANDUC (21)	1971-1983	104B01E (103B021)	Stikinia (Intermontane)	Early Jurassic	Unuk R. Fmn. andesite,"schist"	lenses, stringer	py,po, cpy	35.8	0.004	0.20	1.73			16,500,000	65,510	3,739,895	10 Mtons @ 1.79% Cu Closed		65,510
	WINDY-CRAGGY (1)	____	114P012 (114P002)	Alexander (Insular)	Late Triassic	Tats Group basalt, siltstone	folded, massive, stringer	py,po, cpy	350	?	0.06	1.5	?	___	____			Incl. 100 Mtons @ 0.006 Au, & .08% Co Expl'n 1983 - present	600,000	600,000
CYPRUS	ANYOX incl. Hidden Ck. Double Ed,Bonanza, Redwing, Eden (31)	1914-1936	103P06W (103P021, 023)	Stikinia (Coast Crystalline)	Early Jurassic? Late Triassic	Salmon River Fmn. -basalt Karmutsen Fmn. -basalt	15 lenses in 7 deposits	py,po, cpy	27.67	0.005	0.27	1.5			24,672,600	124,081	6,914,330	20 Mtons @ .46% Cu, .03% Co,.003 Au,.09 Ag Expl'n on assoc. qtz. veins+massive sulphides	54,000	178,081
	CHU CHUA (71)	____	092P08E (092P140)	Slide Mountain (Omineca)	Permian	Fennel Fmn. -basalt	3 lenses min. 700m length	py,cpy	0.785	0.012	0.23	3.1	0.40		____			Open Pit Reserve - Part of Geol. Res. of 2.5 Mtons @ .012 Au, .23 Ag, 2% Cu, .4% Zn, & 0.05% Co	9,420	9,420
	SUNRO (115)	1962-1978	092C08E (092C073)	Wrangellia (Insular)	Tertiary	Metchosin Fmn. -basalt, gabbro	shear zone	po,py, cpy	3.08	0.02	0.06	1.3			1,465,000	28,912	72,747	1.5 Mtons @ 1.43% Cu		28,912
KUROKO	BRITANNIA (112)	1905-1977	092G11E (092GNW003)	Gambier (Coast Crystalline)	Jurassic - Cretaceous	Gambier Group andesite, dacite	lenses, stringer	py,cpy	52.5	0.009	0.11	2.8 (1.1)	0.26 (0.65)		52,783,960	493,069	5,815,395	No.10 Mine: 1.424 Mtons @1.9% Cu + Ba, Gy, & Anhydrite Expl'n in Furry Ck. area		493,069
	DEBBIE (163)	____	092F2E,7E (092F079)	Wrangellia (Insular)		Myra Fmn. (Sicker Gp.) - rhyolite	lenses	py,cpy	1.189	0.17					____			U/G(1988) Mineral Creek Zone,also Regina Zone, Thistle	202,130	202,130
	ECSTALL (Red Gulch) (191)	____	103H13E (103H011)	Stikinia (Coast Crystalline)	Permian	Ecstall Pendant felsic volc. (schist)	2 lenses	py,cpy, po	7	0.015	0.60	0.9	2.50		____			Expl'n (1987) - also Packsack, Scotia	105,000	105,000
	HOMESTAKE (72a)	1935-1941	082M04W (082M025)	Kootenay (Omineca)	Devono - Miss.	Eagle Bay Fmn. felsic volc., schist	lenses	py, arsenopy	1	?	6.53	0.55	4.00	2.50	7,670	361	281,349	275,000 tons @ 6.60 Ag, .015 Au, .5% Cu, 2.2% Zn, 1% Pb + Ba; Expl'n(1988)	24,574	24,935
	KUTCHO CREEK (137)	____	104I01W (1041060)	Cache Creek (Intermontane)	Late Triassic	Kutcho Fmn. felsic pyroclastic & volcaniclastic	3 lenses	cpy,py, bn	18.7	0.009	0.85	1.62	2.32		____			as shown Awaits development	168,660	168,660
	LARA (146)	____	092B13W (092B110)	Wrangellia (Insular)	Late Devonian	Myra Fmn. (Sicker Gp.) - rhyolite	10 high - grade lenses	py,cpy	0.583	0.138	2.92	1.01	5.78	1.22	____	____	____	as shown U/G (1988) Expl'n + Ba	80,454	80,454
	REA GOLD (Discovery Zone) (72)	____	082M04W (082M191)	Kootenay (Omineca)	Devono - Miss.	Eagle Bay Assmb. felsic & mafic volcs.	lenses	py,cpy, arsenopy	0.16	0.247					____			as shown Expl'n to present	39,520	39,520
	SAMATOSUM (180)	____	082M04W (082M244)	Kootenay (Omineca)	Devono - Miss.	Eagle Bay Assmb. felsic & mafic volcanics	lenses	py,cpy	0.66	0.052	*****	1.2	3.50	1.70	____			as shown Prod.(1989), Ag-rich + Ba	34,372	34,372
	HARRISON (Seneca) (113)	1962	092H05W (092HSW013)	Harrison? (Coast Crystalline)	Middle Jurassic	Harrison Lake Fmn. andesite, rhyodac. pyroclastics	breccia	cpy,py	1.66	0.025	1.32	0.63	3.57	0.15	280	0.5		as shown Expl'n (1987) + Ba, Gy	41,525	41,526
	TULSEQUAH CHIEF (+ Big Bull) (6)	1939-1957	104K12E (104K002)	Stikinia (Coast Crystalline)	Pre - Permian	Stikine assemblage Stuhini Gp. rhyodacite	7 lenses, stringer	py,cpy	1.75 (?)	0.09	2.71	1.3	8.00	1.60	1,029,090	94,257	3,400,772	2.38 Mtons @ .08 Au, 2.9 Ag, 2.1% Cu, 6.0% Zn, 1.6% Pb, + Ba, Gy Active Expl'n	190,400	284,657
	LENORA (Twin J) (114)	1898-1964	092B13W (092B001, 002)	Wrangellia (Insular)	Devonian	Myra Fmn. (Sicker Gp.) - rhyolite	2 lenses, stringer	py,cpy	0.66	0.058	2.90	3 (3.31)	0.90 (7.51)	0.08	305,000	44,491	934,522	Expl'n. + Ba, Anhydrite		44,491
	BUTTLE LAKE (Lynx, Myra, Price, HW) (122)	1966-1987 Producing	092F12E (092F071, 072,073)	Wrangellia (Insular)	Late Devonian	Myra Fmn. (Sicker Gp.) - rhyolite	lenses, stringer	cpy,py	22	0.064	1.02	2.2	5.30	0.30	8,725,756	467,292	21,477,985	Jan/88:13,798,600 tons @ .07 Au, 1.1 Ag, 2.4% Cu, 5.28% Zn, .36% Pb Prod.(1987):42,504 oz.Au + Pb, Zn, Cu + Ba	965,860	1,433,152
						TOTALS			529.137						105,917,242	1,317,974	42,759,811		2,515,915	3,833,889

TABLE 24
B.C. LODE GOLD PRODUCTION (1894-1987)
TRANSITIONALS

FIGURE 1 NO.	MINE NAME	YEARS OF PRODUCTION	RANK	PRODUCED oz	RESERVES oz	TOTAL INVENTORY (PROD.+ RES.) oz
52	EQUITY SILVER	1980-1987*	19	215,465	623,131	838,596
173	HARRISON LAKE	1973-1981	101	886	280,000	280,886
		TOTAL:		216,351	903,131	1,119,482

TABLE 25
1988 B.C. LODE GOLD RESERVES
TRANSITIONALS

FIGURE 1 NUMBER	DEPOSIT NAME	YEARS OF PRODUCTION (*=PRODUCING)	PRODUCED oz	RESERVES (ALL CATEGORIES) tons	GRADE oz/tons GOLD	RESERVES oz	RESERVES RANK	TOTAL INVENTORY (PROD.+RES.) oz
19	C) SULPHURETS (BRECCIA)			20,000,000	0.08	1,600,000		1,600,000
52	EQUITY SILVER:	1980-1987*	215,465	16,200,000		623,131	16	838,596
173	HARRISON LAKE	1973-1981	886	2,800,000	0.1	280,000	29	280,886
163	DEBBIE			1,189,000	0.17	202,130	36	202,130
153	VALENTINE MTN.			500,000	0.2	100,000	60	100,000
		TOTAL:	216,351			2,805,261		3,021,612

TABLE 26
1988 B.C. LODE GOLD RESERVES
TAILINGS

FIGURE 1 NUMBER	DEPOSIT NAME	YEARS OF PRODUCTION (*=PRODUCING)	PRODUCED oz	RESERVES (ALL CATEGORIES) tons	GRADE oz/tons GOLD	RESERVES oz	RESERVES RANK	TOTAL INVENTORY (PROD.+RES.) oz
181	HEDLEY			1,681,000	0.041	68,921	73	68,921
156	MASCOT			685,000	0.06	41,100	86	41,100
89	UNION	1913-1946,87*	242	83,000	0.096	7,968	121	8,210
		TOTAL:	242	2,449,000		117,989		118,231

TABLE 27
POTENTIAL METAL MINES IN BRITISH COLUMBIA

Deposit Name	Proposed Prod. Date	Reserves Tons @ oz/ton	Contained oz Au [oz Ag] (million)	Mine Life (yrs)	Mining Rate tons/day	Mining Method (ug/op)	Capitol Costs $Cdn (million)	Work Force	Est. Oper Costs ($US) per oz Au	Est. Annual Prod. oz Au	Est. Annual Prod. oz Ag
AJAX (Afton)	1989	27 M @ .01 Au + .46% Cu	.27	7	11,000	OP	11	200	?	40K	
AL	1990?	In-situ 1,939,000 @ .157 Au or mineable 246,000 @ .29 Au	.304 or .07	3.2	220	OP	15	65	190	20K?	
BRALORNE	1990?	322,000 @ 0.35 Au all categories (cutoff .1-.4 opt)	.1127	4	300	UG	5	60?		35K	
CARIBOO BELL	1991	Mineable: 53 M @ .071 Au + .44% Cu	.901	10		OP	138			100K	
CHAPUT (LUMBY)	1990?	281,600 @ .124 Au	.035	7	250	OP	3	58			
CINOLA	1991?	Mineable 26.24M @ .072 Au,.09 Ag(.03 opt Au cutoff),Prv.& Prb. 40.7M @ .048 Au	1.68	12	6600	OP	120	201	230	150K	152K
CONGRESS	1990?	547,682 @ .264 Au	.145	8	250	UG	6?	80	?	20K?	
DOME MTN.	1990?	Prov. & Prob. 318,615 @ .370 Au/2.0 Ag	.12 [.64]	2.6	350	UG/OP	15.8	76	240	20K	
FAIRVIEW (OLIVER GOLD)	1990?	est. 2 M @.110 Au + 1.2 Ag	.22 [2.4]	10	300	UG	14	44			
GOLDEN BEAR	1990	650,000 @ .54 Au (proven) 1.8 M @ .32 Au (geol.)	.35(prvn) .58 (geol.)	6	400	OP/UG	36	100	225	64K	33K
GOLDWEDGE	1990	393,000 @ .78 Au + 1.1 Ag	.3 [.432]	6-10	200	UG	1.5	30	360	15K?	20K?
HARRISON LAKE GOLD	1990?	2.65 to 4 M @ .10 Au	.3	10	1100	UG	25	60?	190	35.4K	?
HEDLEY TAILINGS	Fall '88	1.7 M @ .04 Au	.07		4960	LEACH	3.14	25			
J + L	1991?	1.27 M @ .16 Au, 4.04% Zn, 2.12% Pb, 1.7 Ag	.2 [2.16]	+ 10	400	UG	15-20	90			
LARA	1990?	583,000 @ .138 Au, 2.92 Ag, 5.78% Zn, 0.22% Pb, 1.01% Cu	.08 [1.7]	?	>500	OP/UG	10	75?			
MASCOT TAILINGS	1989	685,000 @ .06 Au	.04	5	700	Heap Leach		16			
PORCHER ISLAND	1990	1,523,000 @ .2 Au	.3		500	UG				35K	
PREMIER + BIG MISSOURI	Early '89	Total:8.2 M @.072 Au,2.03Ag (.03 Au eqiv. cutoff) Prem:6,468,759 @.063 Au,2.34 Ag BM:1,731,241 @0.1 Au,.86 Ag	.6 [16.65]	10.5	2200	OP	80.35	157	164 Au 2.66 Ag	77K	890K
QR	1990	1 M @ .2 Au	.2	+ 7	550	OP/UG	15	70	165	25K	
SAMATOSUM (Rea Gold)	Mid '89	670,000 @.052 Au, 30.98 Ag, 1.18% Cu, 1.75% Pb, 3.5% Zn @ 7.3 Ag cutoff	.04 [43.65]	6	500	OP/UG	32.2	96	2.90 (Ag)	~10K	5.1M
SHEEP CREEK (NUGGET)	1990	223,000 @ .33 Au	.074	3?	100	UG	2	30			
SILVER QUEEN	1990	Total:~1,965,000 Prv&Prb:932,900 @ .085 Au,12.21 Ag, 1.38%Pb,6.94%Zn,.523%Cu/Coles Lk.(Poss):833,000/Camp Vein:200,000 @ .055 Au,21 Ag, .13%Cu,5.5%(Pb&Zn)	.118 [29.5]	>4	450	UG	10	50	140?	13.6K	136K
SNIP	1990	1,570,000 @ .64 Au (prvn. & prbl.)(pot'l for 3.3M tons)	1.0	13+	300 - 500	UG	50	209	200	>115K	
SPUD VALLEY (ZEBALLOS)	1990	246,400 @ .41 Au	.10	3 - 4	100 - 200	UG	2.5	25		15-20K	
SULPHURETS	1990	West: 304,044 @ .387 Au + 26.19(meas.+ind.) + 550,028 @ .335 Au + 21.15 Ag(inf.) @ .2 Au cut-off.Total: 854,072 @ .354 Au + 22.94 Ag	.302 [19.6]	7	350	UG	30-45	112	250-275?	30K	3.1M
TILLICUM	1990	1.4 M @ .27 Au	.386	5 +	100 - 300	UG	4	30	245	25-41K	
WINDY CRAGGY	1991	350 M @ 1.5% Cu, .08% Co, + Au,Ag(incl. 70 M T @ .007 Au)	.5	20	1100	UG/OP	150?	200			
		TOTALS:					~940	~2600		~1.1 M oz	~10.7 M oz

VEINS

DEFINITION

A vein deposit is a fairly well defined zone of mineralization, usually inclined and discordant, which is typically narrow compared to its length and depth. Most vein deposits occur in fault or fissure openings or in shear zones. Vein deposits include those in which all manner of epigenetic open-space filling and replacement has occurred. Mineralized stockworks and breccias are also included.

CLASSIFICATION AND GEOLOGICAL CHARACTERISTICS

Two basic subdivisions of vein deposits have been adopted in this study based on: ore and gangue mineralogy, postulated temperature and depth of formation, alteration assemblages, structural setting, continuity or discontinuity of mineralization at depth, host-rock lithologies (*e.g.* association with altered ultramafic rocks), intrusive relationships (spatial and genetic), textures, (*e.g.* open space, ribbon, streaky) and pathfinder elements (*e.g.* mercury, antimony, arsenic).

1). **Epithermal** vein deposits tend to be related to late structural events during high-level and subaerial magmatic activity. Hydrothermal solutions of meteoric derivation are postulated to have circulated at shallow depths. Mineralizing fluids were neutral to strongly acidic, oxygenated, dilute, with a low to moderate carbon dioxide content, and commonly boiling. Epigenetic veins in British Columbia are similar to those found elsewhere around the Pacific margin. They formed at relatively low temperatures (50 to 200 degrees C) and at depths normally within 1000 metres of surface. Virtually all are hosted by volcanic rocks, the major exception being the Cinola deposit which is hosted by conglomerate, sandstone and a rhyolite dike. Ag:Au ratios are relatively high (Table 5).

A plutonic heat source at depth is postulated to energize the hydrothermal system; movement of fluids and the mineralizing process are controlled by pre-existing structures, often related to extensional tectonism (*e.g.* Toodoggone, Blackdome).

Epithermal veins occur predominantly in the Intermontane and Insular belts and Stikine, Wrangell, and Quesnel terranes (Table 14). They are most often associated with regional strike-slip faults (*e.g.* Toodoggone area, Premier), extensional faults (*e.g.* Vault and Dusty Mac in the Okanagan area),and breccia zones along low-angle faults (*e.g.* Mount Washington).

Two distinct age groups are recognized:

i) *Early Jurassic* deposits hosted by shoshonitic volcanic rocks in accreted island-arc or back-arc depositional settings. These include the significant Toodoggone and Premier deposits in Hazelton Group andesitic rocks and coeval intrusions such as the McClair stock and Premier porphyry respectively.

ii) *Tertiary* (Eocene) post-accretionary deposits related to continental volcanism and epizonal to subvolcanic plutons, generally in zones of extensional tectonism (e.g. Blackdome, Vault, Cinola, Brett).

Using the Cox and Singer classification scheme, the following models for epithermal precious metal deposits related to subaerial felsic to mafic extrusive rocks are recognized in British Columbia:

- **Hot-spring** deposits (USGS Model 25a): Blackdome, Brett
- **Creede-type** deposits characterized by quartz-adularia mineralization (USGS Model 25b): Lawyers (Toodoggone)
- **Comstock-type** (USGS Model 25c) associated with basin-and-range style extensional tectonics: the Slocan and Republic areas; Vault, Dusty Mac
- **Acid-sulphate** deposits characterized by quartz-alunite

alteration (USGS Model 25e): Al (Toodoggone)

Sediment-hosted disseminated gold deposits include the large, low-grade Cinola deposit. Deposits related to breccia-hosted disseminations along low angle faults (USGS Model 37b) include Mount Washington.

A proposed British Columbia epithermal model (Panteleyev, 1988) illustrates a continuum of mineralization from hot-spring deposits at surface to pluton-related deposits at depth and compares Cordilleran deposits to those elsewhere in the world. The Toodoggone camp affords a near vertical cross-section through a well-preserved, Early Jurassic epithermal system.

Vein and stockwork deposits are important exploration targets for both high-grade (bonanza) or low-grade mineralization which can be mined by open-pit methods. Recovery of gold by heap leaching has not yet been shown to be economically feasible in British Columbia but heap-leach operations in the western United States have successfully exploited extremely low grade ores. The potential of many past producers (*e.g.* Premier) is now being re-examined; sound geologic thinking, perseverance and adequate financing will undoubtedly lead to new ore discoveries. Once the position of the paleosurface has been interpreted from geological field data, a model provides a useful guide for estimating depths to mineralization. Geochemical pathfinders such as arsenic, antimony, and mercury are useful, albeit no substitutes for gold and silver themselves!

2). **Mesothermal** vein deposits are related to both northwesterly trending **transcurrent** structures and northeasterly trending **transverse** structural zones that can be traced from the Canadian Shield westward in the Cordillera (Hodgson et al., 1982). Examples of such structures include the Stikine and Skeena arches, the Quesnel lineament, and the St. Mary and Moyie – Dibble Creek fault zones. Deposits are often hosted by regionally metamorphosed (greenschist grade) rocks and include the "hydrothermal metamorphic" type of Archean analogues such as the Yellowknife and Red Lake deposits. Deposits are formed from tectonically driven, large scale, deeply circulating fluid systems. They are structurally controlled, multiple, massive to ribboned quartz-vein systems with considerable lateral and vertical extent, predominantly in island arc volcanic and sedimentary rocks and remnant slices of oceanic material. Large gold-bearing systems, such as the Bridge River camp, have developed along the eastern margin of the Coast crystalline belt associated with wrench faulting along the Fraser River and subsidiary fault systems. Mineralization coincided with the emplacement of plutonic rocks in the Coast Belt during late Cretaceous to early Tertiary (Leitch and Godwin, 1988). Many mesothermal deposits lie along or close to terrane boundaries, predominantly within the Intermontane Belt and to a lesser extent in the Omineca and Coast crystalline belts, in rocks of the Stikine and Quesnel terranes. Ages of mesothermal deposits range from late Triassic to Eocene.

Mesothermal veins are characterized by their higher temperature (200 to 300 degrees C) and greater depth of formation (1 to 5 kilometres). Au:Ag ratios are generally high (>1); a zoning pattern to antimony, arsenic and mercury mineralization is often recognizable, sometimes along strike within a single vein structure. Two subtypes are recognized:

- **Motherlode-type** low-sulphide gold-quartz veins (USGS Model 36a)
- **Massive pyrite-pyrrhotite lodes** with minor base metal values but little or no quartz

Many mesothermal vein deposits in British Columbia are associated with high-angle reverse faults and commonly occur along or very near contacts between metasedimentary and serpentinized ultramafic rocks, with or without development of listwanitic alteration. Early vein formation often preceded regional deformation, resulting in drag-folded veins (Dome Mountain and Frasergold properties) or the development of saddle reefs (Coquihalla camp). Other examples of the Motherlode-type include the deposits of the Bridge River, Rossland, and Atlin camps, particularly the Yellowjacket property, the old Surf Inlet and Cariboo Gold Quartz orebodies and the Golden Bear and Frasergold deposits. The more recent discoveries in the Iskut River and Sulphurets areas (Snip, Sulphurets, Reg) also fall within this category. The Scottie Gold deposit in the Stewart camp and the pyritic ore shoots in the old Island Mountain mine in the Cariboo-Barkerville camp provide examples of the low-quartz massive sulphide subtype.

Partly because of the nature of glaciation and erosion in much of British Columbia, more deeper level vein systems are being recognized. Past producers are being re-examined and re-evaluated. Examples of new discoveries during the 1980s include: Golden Bear, Snip, Reg, Sulphurets, Cassiar deposits, Indata, Porcher Island, Dome Mountain, Scottie Gold, and Mosquito Creek (Figure 9).

PRODUCTION

Total gold production from vein deposits to 1987 amounts to 417 312 kilograms (13.4 million ounces) representing 65.2 per cent of total lode production in the province (Table 4 and Figure 4). Production from 88 mesothermal vein deposits accounted for 356 324 kilograms (11.5 million ounces) or more than 85 per cent of this total. Thirty mesothermal vein deposits or camps with more than 300 kilograms (10 000 ounces) of production are listed in Table 9 and account for almost 99 per cent of all production from this deposit type.

The top 25 producing districts in the province, each with more than 3000 kilograms (100 000 ounces) of production, include 10 **mesothermal** camps, accounting for more than 90 per cent of all recorded mesothermal vein production. These districts (with their overall production ranking in parentheses) are: Bridge River camp (1), Rossland camp (2), Cariboo-Barkerville camp (5), Sheep Creek camp (8), Surf Inlet mine (12), Ymir camp (15), Zeballos camp (16), Cassiar camp (17), Polaris Taku mine (18) and Northair mine (Warman) (20).

Eight **epithermal** deposits in the province have recorded production (Table 10), two of them only on a test milling basis, only one, Premier, ranked among the 25 leading districts with more than 3000 kilograms of production to 1987, but by the time of writing the Blackdome mine has joined this number. Premier and Blackdome mines are expected to produce annually 2395 kilograms (77 000 ounces) gold and 27 682 kilograms (890 000 ounces) silver, and 1555 kilograms (50 000) gold and 4 000 kilograms (124 000 ounces) silver respectively.

Historically, recovery from vein deposits has averaged close to 17 grams of gold per tonne (0.5 oz/ton) although some mines, most notably Big Missouri, Carolin and Northair, recovered less than 4 grams per tonne (Figure 5). Ag:Au ratios (Table 5) show a wide variation in mesothermal deposits from a high of 63 for veins in the Greenwood camp to a low of 0.1 in the Polaris Taku deposit; the median is about 1, represented by the Rossland and Cassiar camps. Ag:Au ratios for six epithermal deposits with production range from 23 for the Premier orebody to 0.5 at the Engineer mine; the average is 10.7.

Considering only the period 1980-87, a total of 17 846 kilograms of gold (573 773 ounces) and 217 626 kilograms of silver (6.997 million ounces), representing 24.1 and 6.7 per cent of lode-gold and silver production for the period, has been won from 34 vein deposits (Figure 6, Table 6). Eight primary gold producers, Erickson Gold, Scottie Gold, Blackdome, Carolin, Northair, Baker, Mosquito Creek and Taurus, have contributed 98.6 per cent of this total; only three other vein deposits, Horn Silver and Highland Bell, both silver producers, and the OK mine which operated for less than two years, have contributed more than 20 kilograms (640 ounces). The relatively low contribution of vein deposits to precious metal production in recent years reflects the dominance of by-product gold and silver production from porphyry copper mining and also the fact that the Equity Silver mine has alone contributed more than half of the province's silver production during the period.

RESERVES AND TOTAL INVENTORY

Vein deposits represent 30.2 per cent of identifiable lode-gold reserves of 1.25 million kilograms (40 million ounces). Mesothermal veins account for almost 70 per cent of this total (260 500 kilograms), epithermal deposits for the balance (Figure 7). A total of 68 mesothermal vein deposits (or camps) have identified existing reserves (Table 11) but in most cases tonnages are small. Less than a third of the properties listed in Table 11 have reserves in excess of 3000 kilograms (100 000 ounces) of contained gold. The Bridge River and Sulphurets camps, together with the Snip, Fraser-gold, Golden Bear and Reg (Johnny Mountain) deposits are each estimated to contain in excess of 9000 kilograms of gold and account for 52 per cent of mesothermal reserves.

Reserves of 115 500 kilograms of gold are contained in 12 epithermal deposits (Table 14). Three of these, Cinola, Premier and Lawyers, each contain in excess of 9000 kilograms and account for almost 75 per cent of estimated epithermal reserves.

The relatively low proportion of current reserves contributed by vein deposits (30 per cent as compared to 65 per cent of past production) almost certainly understates the potential of this class of deposits and is a reflection of the high cost of establishing reserves far ahead of production in vein deposits.

Total inventory for mesothermal vein deposits is approximately 616 800 kilograms (19.8 million ounces) representing 32.7 per cent of the total inventory for all deposit types (Figure 8). Twenty-nine deposits or camps (Figure 9) each have a total inventory greater than 3000 kilograms (100 000 ounces) and account for 90 per cent of this total. Only one of the major past producing districts, the Rossland camp, does not report current reserves although with production over 85 000 kilograms of gold it ranks second only to the Bridge River camp in terms of total inventory in mesothermal vein deposits.

Total inventory for epithermal vein deposits is ap-

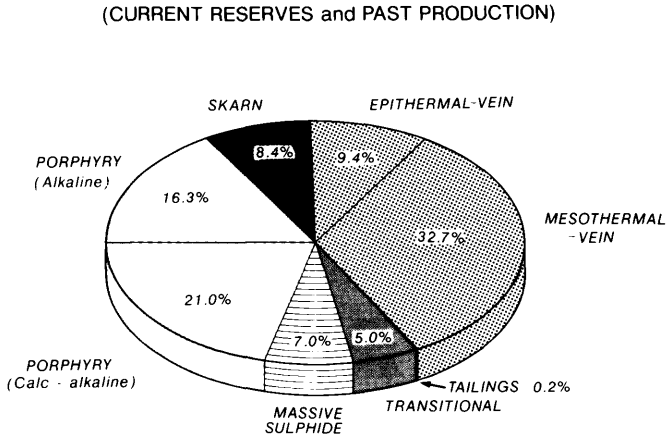

Figure 8. B.C. total gold inventory (current reserves and past production).

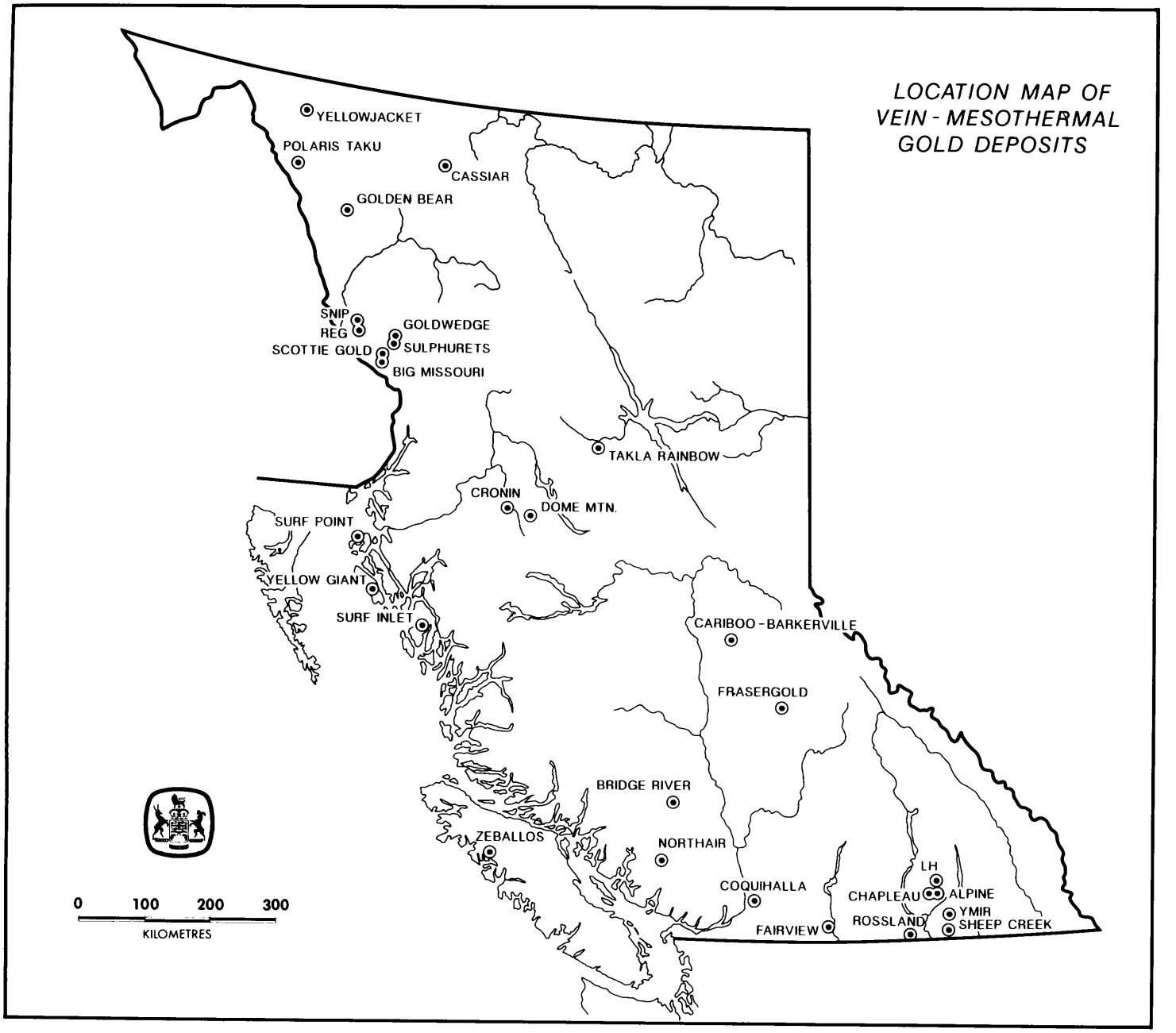

Figure 9. Location map of vein - mesothermal gold deposits.

proximately 176 500 kilograms (5.7 million ounces) comprising 9.4 per cent of the total provincial inventory (Figure 8). Eight deposits have a total inventory greater than 3 000 kilograms (Figure 10) and account for 97 per cent of the total for this subclass. Of these, only the Premier and Blackdome deposits have achieved significant production, but the remaining six are in varying stages of mine development or advanced exploration.

EXPLORATION AND DEVELOPMENT ACTIVITY - DEPOSIT UPDATES

A number of vein deposits are currently being developed for production and many more are being aggressively explored. Brief comments on some of the more significant projects follow.

MESOTHERMAL VEIN DEPOSITS

Westmin Resources Limited is preparing mesothermal vein deposits for open-pit mining on the **Big Missouri** property in the Stewart Camp. Start-up is planned for the spring of 1989. Ore from the Big Missouri mine and the adjacent Premier deposit will feed a single concentrator with a milling capacity of 2000 tonnes per day. Mining at the **Scottie Gold** deposit, also in the Stewart camp, has been confined to high-grade ore shoots; the possibility of low-grade ore in the

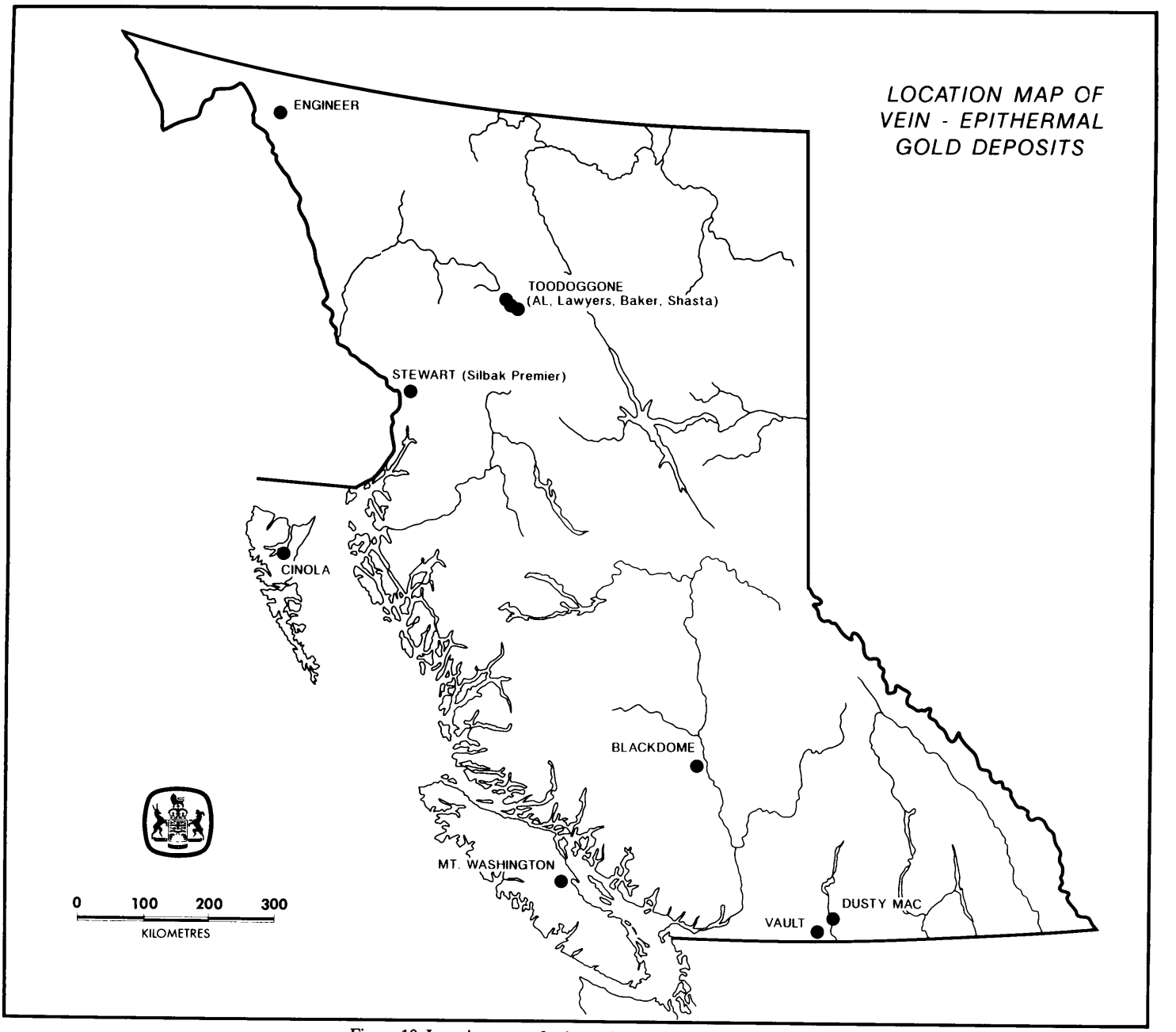

Figure 10. Location map of vein - epithermal gold deposits.

wall rocks is yet to be tested.

Not far to the north, in the Iskut River district, Cominco Ltd. is preparing the **Snip** deposit for production beginning in 1990. This is the most significant new discovery in British Columbia for several years. Impressive start-up reserves suggest the mine may achieve annual production in excess of 3500 kilograms of gold. Also in the Iskut River area, the **Reg** deposit was put in production in August 1988, but target production of 1850 kilograms gold annually has not been achieved. Reserve estimates have been revised downwards and the viability of the project is currently being re-assessed; nonetheless, there is good potential to add tonnage to existing reserves.

Recognition of significant precious metal bearing veins in the Brucejack Lake area of the **Sulphurets** property in 1984 has led to a major underground exploration program which may result in a production decision by 1990. Several high-grade but erratic ore shoots have been outlined and the potential for developing addition ore remains excellent.

The **Golden Bear** deposit, west of Dease Lake, now under development by Golden Bear Operating Company, was discovered in the early 1980s. Production is anticipated in 1990. The new access road opens up this remote area in northwestern British Columbia and should be a stimulus to further exploration.

Several vein targets in the Atlin district have been ex-

plored during the 1980s. The **Yellowjacket** property, under continuing exploration by Homestake Mineral Development Company, has produced the most encouraging results to date. This deposit has many of the characteristics of the classic Motherlode model and, together with similar deposits as yet undiscovered, is the probable source of the gold in the highly productive Atlin placer camp. In the **Cassiar** camp, developed reserves in the **Erickson Gold** and **Taurus** mines were exhausted in late 1988 and both mines closed. At the time of writing, Erickson Gold Mining Corporation is driving an adit to develop new reserves beneath the old Cusac mine workings.

In the **Bridge River** camp, the old **Bralorne** mine has been re-evaluated by Corona Corporation over the last several years and although plans are currently described as on hold, a proposal to reopen the mine at a milling rate of 270 tonnes per day has been proposed. Congress Operating Company has outlined several potential new ore zones on the nearby **Congress** property and a production decision in the near future appears possible.

Mosquito Consolidated Gold Mines Limited is aggressively exploring for gold-rich pyritic replacement deposits in the **Cariboo-Barkerville** camp, with attention focused on the Main Band limestone, the ore host at the **Mosquito Creek** mine. This horizon remains largely untested on the old **Island Mountain** and **Cariboo Gold Quartz** properties although similar pyritic orebodies, elsewhere in the stratigraphy, were the mainstay of production at the Island Mountain mine for a number of years.

Exploration of the Pugsley and Surf veins at the old **Surf Inlet** mine on Princess Royal Island during the 1980s has indicated excellent potential for additional ore, both laterally and down-dip from the old workings. At the old **Surf Point** mine on Porcher Island, Cathedral Gold Corporation estimates reserves in the AT zone to be 1.35 million tonnes grading 6.85 grams per tonne gold. The existing infrastructure and coastal location immediately south of Prince Rupert will be positive factors in assessing the viability of reopening this old producing property.

Recent exploration in the **Zeballos** camp on Vancouver Island has targeted both mesothermal veins and auriferous skarns. Underground exploration by McAdam Resources Inc. on the **Spud Valley** property has outlined significant reserves on several veins and production is possible as early as 1990.

Reactivated interest in the **Sheep Creek** camp in the West Kootenay district is focused on the old **Nugget** mine. Modest reserves have been outlined and small-scale production, with a 3-year life is a possibility as early as 1990. Also in southern British Columbia, exploration in the **Fairview** camp west of Okanagan Lake has outlined a potential orebody on the old **Fairview** and **Stemwinder** mines.

Epithermal Vein Deposits

Production at the **Blackdome** mine, west of Clinton, began in 1986 with a projected mine life of 7 years. Aggressive exploration programs have identified several potential new ore zones in the dozen or more quartz-vein systems on the property. Gold production in 1988 amounted to approximately 1555 kilograms (50 000 ounces) and production costs at $140US per ounce.

Production from the AGB zone at the **Lawyers** mine in the **Toodoggone** camp began in January, 1989, at a milling rate of 500 tonnes per day. This Creede-type epithermal deposit is the most significant discovery made in the Toodoggone camp to date. Its development, and the improved access resulting from it, may lead to the further exploration and development of several other deposits with modest existing reserves.

The **Premier** deposit in the Stewart camp is being prepared for production in conjunction with the Big Missouri orebody (*see* Mesothermal Vein Deposits). Both high-sulphide and low-sulphide epithermal vein deposits will be mined, initially by open pit and later by underground methods.

The **Cinola** deposit on the Queen Charlotte Islands has estimated reserves of 59 000 kilograms (1.9 million ounces) of contained gold, ranking it first in terms of undeveloped reserves in vein deposits. It represents the middle to upper levels of an epithermal hotspring-type precious metal system, and geologically, is the youngest known potentially economic gold deposit in British Columbia. The project is currently in the government's Mine Development Review Process.

Recent exploration in the **Mount Washington** area of Vancouver Island has identified several potential epithermal orebodies associated with a flat-lying fault zone. A feasibility study is planned. Current geological thinking suggests that epithermal deposits in the Okanagan Lake area, most notably the **Dusty Mac** orebody mined in the early 1970s and the **Vault** deposit currently being explored by Inco Gold, are related to a northern extension of the Republic Graben system. Both have many characteristics in common with orebodies in the Republic camp in northern Washington State which have supported significant precious metal production for many years. Mineralization in the Vault deposit is hosted by Tertiary pyroclastic rocks cut by quartz veins and extends over an area of 900 by 500 metres at a depth of approximately 300 metres below surface. Also in the Okanagan district, a gold-bearing epithermal system hosted by Tertiary pyroclastic rocks cut by steeply dipping faults is being aggressively explored by Huntington Resources on the **Brett** property in the Whiteman Creek area.

Over the last several years Houston Metals Corporation has undertaken a major underground exploration program in the old **Silver Queen** mine near Owen Lake in central British Columbia. Again the mineralized veins are hosted by Tertiary volcanic rocks. Although economic feasibility has not yet been demonstrated, the vein systems have been extended laterally and at depth, and reserves have been increased; exploration work is continuing.

SKARNS

DEFINITION

The term precious metal enriched (PME) skarn refers to an accumulation of calc-silicate minerals with elevated levels of precious metals (relative to base and ferrous metals). The shape and size of orebodies is controlled by the protolith and ground preparation.

CLASSIFICATION

Four types of skarn are recognized in British Columbia:

- **Iron** (27.3%) (USGS Model 18d),
- **Copper** (68.4%) (USGS Model 18b),
- **Silver-rich gold-poor**(2.5%), and
- **Gold** (1.8%)(Ettlinger and Ray, *in press*)

Previously, Orris *et al.* (1987) attempted to classify gold-bearing skarns into gold skarns with an average grade of 1 gram per tonne gold or more and primarily exploited for their gold content, and "by-product gold skarns" mined primarily for base or ferrous metals but containing significant by-product gold. Unfortunately, this classification is best suited to producing properties rather than occurrences and is influenced by fluctuations in metal prices. Ettlinger and Ray (*in press*) have researched 40 deposits worldwide that are described in the literature as gold, copper, or iron skarns and have also examined many skarn deposits in British Columbia. They have found the Cu:Au ratios in skarn deposits are a good classification tool. Gold skarns have ratios of less than 1000, as opposed to 2000 to 25 000 for copper skarns and 20 000 to 160 000 for iron skarns. The gold skarn field is clearly distinguishable.

GENERAL

More than 350 skarn occurrences are known in British Columbia and new ones are being recognized each year; locations of major PME skarns are shown in Figure 11. Of these, at least 126 are enriched in precious metals.

Many PME skarns occur in lower Mesozoic volcanic-sedimentary assemblages in association with comagmatic mafic to intermediate alkaline granitoid plutons (for example Hedley, Tillicum, Texada Island, Banks Island). Precious metal enrichment occurs in calcic skarns, most commonly with copper or iron affinities, rather than tungsten, zinc or lead. Gold is commonly intimately associated with sulphides and also may occur predominantly as free gold.

Ettlinger and Ray have documented a **lithological** control whereby more than 80 per cent of PME skarn occurrences are associated with deformed limestone or marble-rich sequences that often also contain some shale, argillite, conglomerate, tuff and volcanic flow components. A **temporal control** is also suggested as more than 60 per cent of productive PME skarns are hosted by Triassic rocks and 43 per cent are associated with Jurassic intrusions. These favourable island-arc and back-arc basin assemblages are extensive and include rocks from the Nicola, Stuhini, Takla, Vancouver, and Lewes River Groups. Intrusions vary in composition from granite to gabbro but are mainly quartz diorite to diorite. All PME skarns are associated with subalkaline, I-type intrusions with calc-alkaline affinities.

The most common sulphides in PME skarns are pyrrhotite, pyrite, arsenopyrite, chalcopyrite, bornite, sphalerite and cobaltite; those enriched in gold are often characterized by arsenopyrite, hedleyite, bismuthinite, native bismuth, maldonite and cobaltite (Ettlinger and Ray, *in press*). On a district scale there is some suggestion of mineral zoning (for example Hedley,Texada Island), however, more detailed work is required to substantiate this theory. The highest gold grades appear to be associated with arsenic-bismuth-tellurium skarn systems.

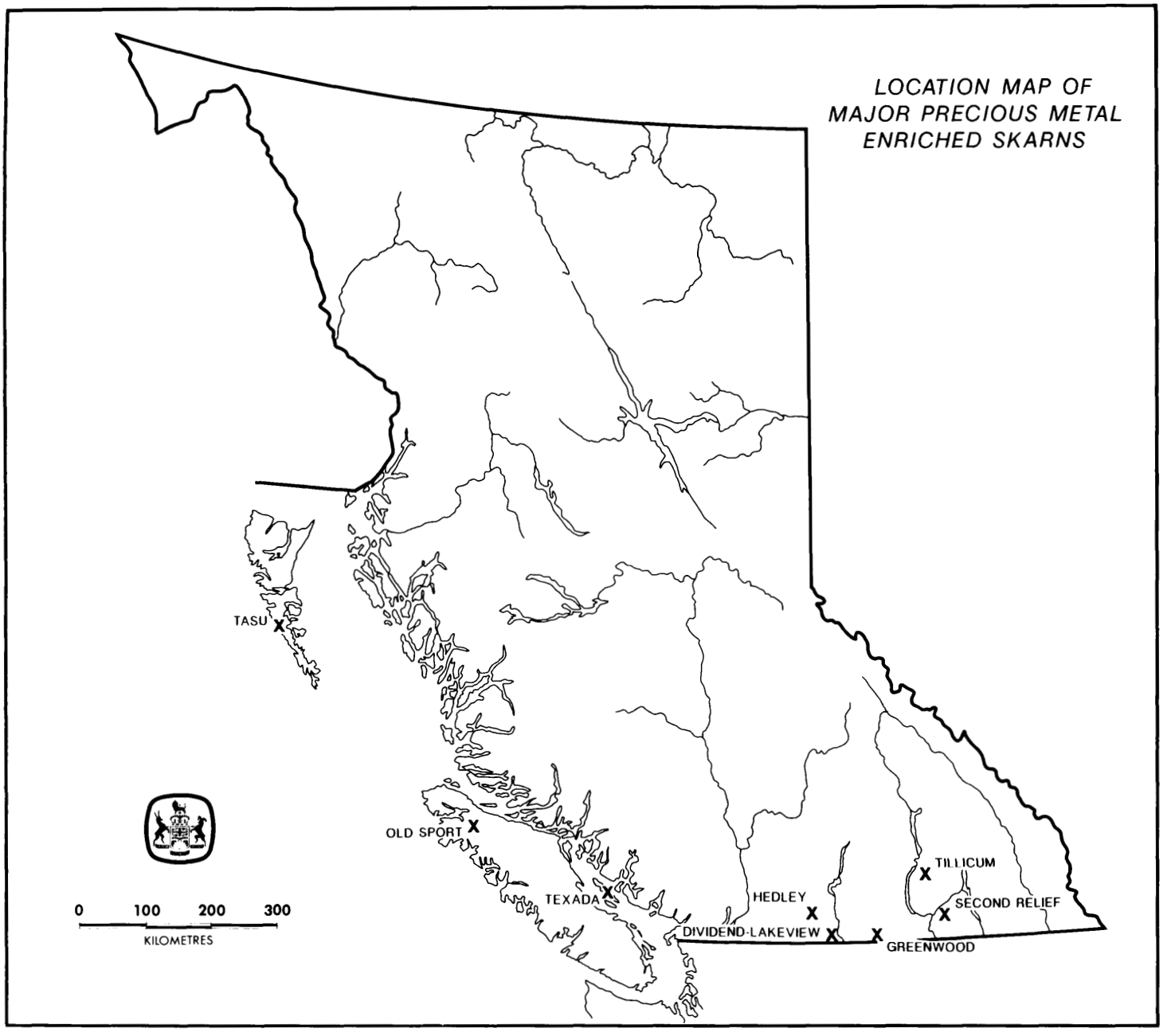

Figure 11. Location map of major precious metal enriched skarns.

PRODUCTION

Thirty skarn deposits in British Columbia have produced almost 102 600 kilograms (3.3 million ounces) of gold representing 15.9 per cent of total lode production in the province (Table 4, Figure 4), but output is dominated by two districts, the Hedley and Greenwood camps, which together account for 87.5 per cent of the total (Table 15) and represent almost 9 per cent of estimated worldwide gold production from skarns. Production in these camps is in turn dominated by two world-class deposits. The **Nickel Plate** mine accounts for 80 per cent of the gold won from the Hedley camp, a proportion that will increase with ongoing production, while 84 per cent of production in the Greenwood camp has been from the **Phoenix mine**, largely as a by-product of copper mining.

Five producing districts have recorded production exceeding 3000 kilograms (100 000 ounces) and account for 98 per cent of total production from gold-bearing skarns (Table 15). These districts (with their overall gold production ranking in parentheses) are Hedley camp (4), Greenwood camp (6), Old Sport (22), Texada Island (24), the Second Relief deposit in the Nelson area (25), and the Tasu mine on the Queen Charlotte Islands (40). Two deposits in the Hedley camp, Nickel Plate and Hedley Mascot, and two in the Greenwood camp, Phoenix and Motherlode, have each exceeded 3000 kilograms of production. Production on Texada Island derives from five individual deposits, of which the Marble Bay mine

produced the most gold, a little over 1500 kilograms or roughly half the total for the district.

Gold recovery from skarn deposits varies widely depending on whether it is the primary commodity produced or a by-product. Average recovered grades in the Hedley camp and from the Second Relief mine, both primary producers, have been 13.0 and 9.5 grams per tonne respectively. By-product recovery from copper mining in the Greenwood camp has averaged 1.3 grams per tonne and from iron mining at Tasu less than 0.1 gram per tonne (Figure 5). Ag:Au ratios (Table 4) for primary producers are in the range 0.1 to 1.0, whereas secondary producers tend to be much higher in silver.

Considering only the period 1980-87, precious metal production from skarns has totalled 1950 kilograms (62 760 ounces) of gold and 11 670 kilograms (375 290 ounces) of silver, representing 2.9 and 0.5 per cent of lode-gold and silver production for the period (Table 5). Two mines, Tasu and the Nickel Plate at Hedley have contributed 91 per cent of the gold and 97 per cent of the silver (Appendix 3). Production from the Intermontane and Omineca belts, from Quesnel terrane, has accounted for 92 per cent of total gold produced.

RESERVES AND TOTAL INVENTORY

Skarn deposits represent only 4.5 per cent of identifiable lode-gold reserves in British Columbia (Figure 7). Seven skarn deposits (or camps) have identified reserves (Table 16) but the Hedley camp dominates the picture, accounting for 55 per cent of contained gold in skarn reserves. The Tillicum and Banbury deposits, and the Greenwood camp, each have in excess of 3000 kilograms of contained gold in reserves and, together with Hedley, account for more than 95 per cent of the total for this deposit type.

Total inventory for skarn deposits is approximately 158 300 kilograms (5.7 million ounces) representing 8.4 per cent of the total inventory for all deposit types (Figure 8). Past production accounts for almost two-thirds of this total and the distribution of total inventory parallels that of past production.

EXPLORATION AND DEVELOPMENT ACTIVITY - DEPOSIT UPDATES

PME skarns are significant gold producers on a worldwide basis; the favourable geology and tectonic settings in British Columbia provide good exploration targets and considerable work is being done. Exploration guides include a calc-silicate mineral assemblage high in pyroxene relative to garnet and a geochemical signature including elevated bismuth, tellurium, arsenic and cobalt.

Past, present, and future production from the **Hedley Camp**, which may reach a total of 65 000 kilograms if potential underground reserves are developed, has certainly put British Columbia on North America's gold mining map. The Nickel Plate mine reopened in April 1987 as an open-pit operation milling 2450 tonnes per day. Mineable reserves were estimated at 8.2 million tonnes grading 3.01 grams per tonne gold based on a cut-off of 1.71 grams per tonne. Stacked ore lenses are confined to 100 metres of favourable stratigraphy within a discontinuous zone of garnet-pyroxene skarn alteration up to 300 metres thick, developed in upper Triassic argillites and siltstones peripheral to a Jurassic granodiorite stock and swarms of dioritic dikes and sills.

Both iron and copper-gold skarns have long been known on **Texada Island**. In addition, manto-type massive sulphide replacements with elevated precious metal values have been identified in limestone, particularly in the Ideal Cement Quarry. A deep geophysical anomaly over this occurrence makes it an attractive exploration target.

Mesozoic (?) granodiorite, quartz monzonite and gabbro have intruded Triassic limestones with the resulting formation of skarns. The possibility of metallogenic zoning on a district scale needs further study; gold-dominant PME skarns (Vananda-type) are distinguished from low-gold PME skarns (Texada-type). The Vananda gold-copper-silver deposits tend to consist of narrow, relatively short lenses but with very substantial down plunge projections, sometimes more than 250 metres.

For the first time in the 100-year history of the Texada camp, a number of old mining properties (Texada Mines, Marble Bay, Little Billie, Cornell, and Copper Queen) have been assembled for a comprehensive exploration program and aggressive programs elsewhere on the island, based on sound geologic modelling, may also lead to significant successes in the future.

At least four subparallel zones of calc-silicate skarns 15 to 60 metres thick have been recognized on the **Tillicum** property in the Slocan district. The host-rocks are metabasalts and tuffaceous siltstones of the Rossland Group that have been intruded by early Jurassic diorite to syenite porphyry dike swarms.

Total reserves in the Heino-Money and East Ridge zones are 1.3 million tonnes grading 9.26 grams per tonne. These have been drilled to depths of 180 and 240 metres respectively. The nearby Strebe Zone has similar mineralization over a width of 4.3 metres. Soil geochemistry and careful prospecting have been most useful during exploration of these properties.

Another year of aggressive underground exploration/development should allow the Tillicum project to proceed to the mining stage in 1990 (Table 27).

PORPHYRY DEPOSITS

DEFINITION

All porphyry copper deposits, as defined by the Cox and Singer model, contain chalcopyrite in stockwork veinlets cutting hydrothermally altered porphyry and adjacent country rock. The term also has engineering connotations, implying relatively low-grade ores requiring bulk-mining (open pit or block caving methods) for their successful exploitation.

CLASSIFICATION AND GEOLOGICAL CHARACTERISTICS

Cox and Singer's general porphyry model (Model 17) is subdivided into several subtypes including porphyry copper-gold (Model 20c) and copper-molybdenum deposits (Model 21a), both of which are well represented in British Columbia and support significant gold production. Some deposits, most notably Granisle, Island Copper and Schaft Creek are not broken out of the general model, but are, in fact, readily separable on the basis of the volcanic affinity of the host rocks.

Two classes of auriferous porphyry copper associations are recognized in this study:

* The **alkaline or shoshonitic suite** of quartz-poor subvolcanic intrusions, corresponding essentially to Cox and Singer's copper-gold model.
* The **calc-alkaline suite** of deeper intrusive systems, corresponding to Cox and Singer's copper-molybdenum model and including deposits in intrusion-related breccia bodies.

Rocks of the **alkaline suite** range in composition from diorite to syenite and in most cases the age of the intrusions is early to middle Jurassic (175 to 198±7 Ma), essentially coeval with the enclosing volcanic rocks of the Takla, Nicola and Stuhini groups. Mineral deposits associated with these rocks are found in the Quesnel and Stikine terranes, particularly in the Quesnel trough and its probable extensions. Significant examples include the Afton, Ingerbelle, Copper Mountain, Cariboo Bell and Galore Creek deposits and the more recent discovery at Mount Milligan. Average gold grades range from less than 0.1 to 0.7 gram per tonne (Figure 5) and Ag:Au ratios are in the range 4 to 12 (Table 5). Locally there appears to be a correlation between mineralization and increased magnetite in the host rock, which provides a useful exploration guide.

The quartz-bearing rocks of the **calc-alkaline suite** range in composition from quartz diorite and granodiorite to quartz monzonite and granite. Mineralized plutons are comagmatic with arc volcanism but intruded deeper in the subvolcanic settings than the alkaline deposits and range in age from earliest Jurassic (Highland Valley) to Tertiary (Bell Copper). Deposits in this subcategory are found in Quesnel, Stikine, Wrangell and the Cache Creek and Methow terranes. Average gold grades range from 0.01 to 0.3 gram per tonne (Figure 5) and Ag:Au ratios are in the range 3 to 400 (Table 5).

Discussion of the numerous features that distinguish alkaline from calc-alkaline porphyry deposits is beyond the scope of this report, but one salient feature is a consistent trend toward higher copper values and higher Au:Cu ratios in the alkalic deposits (Figure 12).

Gold occurs in the core of porphyry deposits and in the propylitic alteration zone, but values are commonly highest at the top of the mineralized zone in the area of advanced argillic alteration (for example, Island Copper). High gold contents do not appear to be related to geotectonic setting, the lithology of the host rocks, the age of mineralization or the development of sericitic alteration.

PRODUCTION

Total gold production from porphyry deposits to 1987

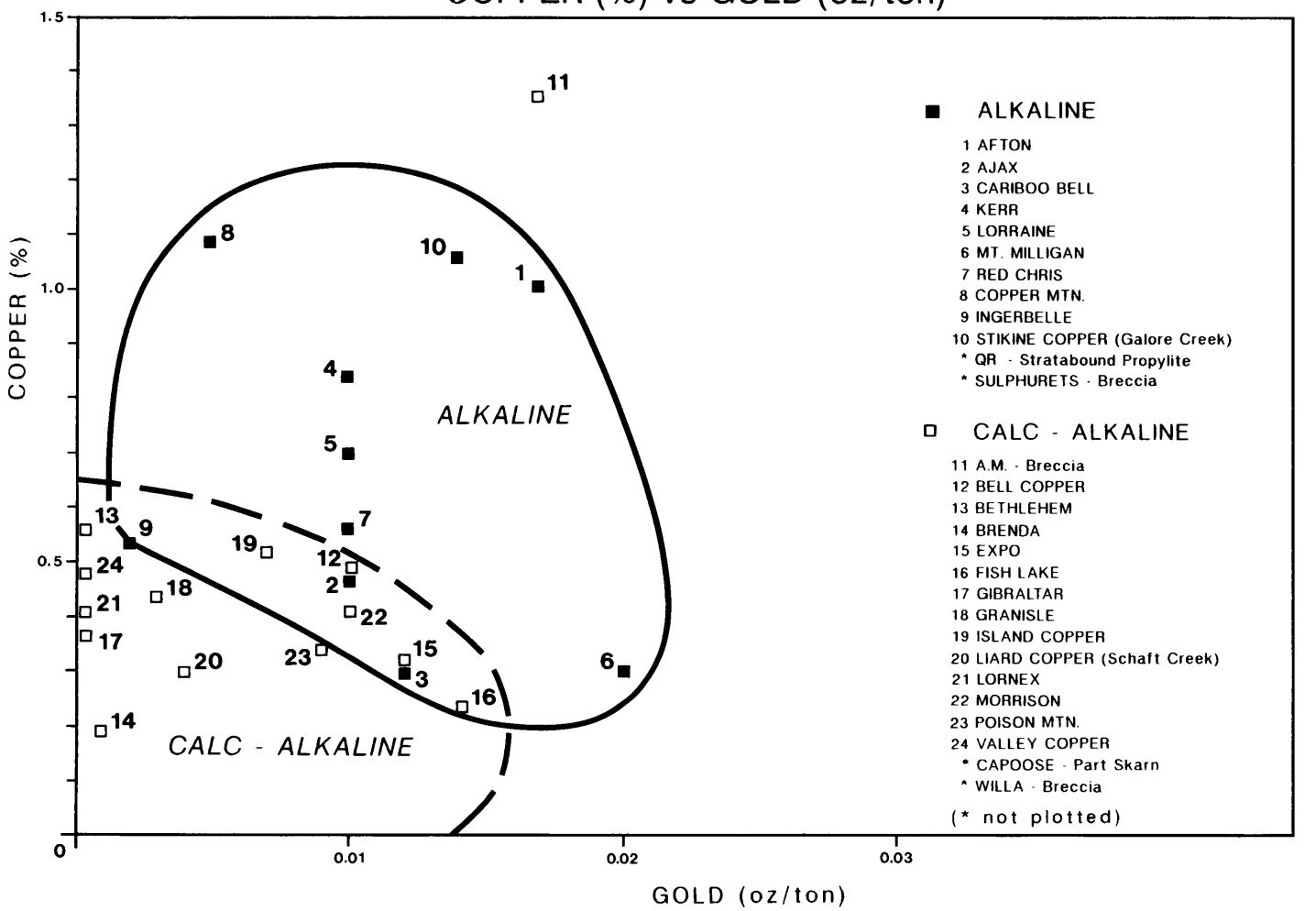

Figure 12. Porphyry Cu-Au deposits in B.C.: Cu% vs Au oz/t.

amounts to 72 533 kilograms (2.3 million ounces) representing 11.3 per cent of total lode production in the province (Table 4 and Figure 4).

Three alkalic porphyry copper-gold deposits or camps are listed in Table 17, accounting for 42 per cent of total porphyry production, however, two operations, Afton and Similkameen, account for 99.6 per cent of the total. The third producing property, the Iron Mask mine, was worked as a small high-grade operation between 1901 and 1928, and its contribution is negligible in the overall picture. Similkameen and Afton rank 9th and 13th among all British Columbia lode-gold producers (Table 2).

Seven calc-alkaline porphyry deposits or camps listed in Table 18 recorded production 42 200 kilograms of gold (1.36 million ounces) to 1987, representing 58 per cent of porphyry production. Three of them, Island Copper, Bell Copper and Granisle, have produced more than 3000 kilograms of gold and account for 91 per cent of production from this deposit category; they rank 7th, 14th and 21st in overall production ranking.

Almost half of all by-product precious metal production from porphyry deposits took place during the period 1980-87, when 33 950 kilograms of gold (1.1 million ounces) and more than 450 000 kilograms of silver (14.5 million ounces) were recovered, representing 50.5 per cent of gold production and 20.8 per cent of silver production from all deposit types. The Granisle mine closed in 1982 but more than 31 000 kilograms of gold were recovered from the four other leading producers, Island Copper, Afton, Similkameen and Bell, and they ranked 1st, 2nd, 6th and 7th in overall production for the 8-year period.

All porphyry production is the outcome of a decade of vigorous and successful exploration for porphyry copper deposits that ended in the mid-1970s. British Columbia's first

porphyry copper mine, Bethlehem, was brought on stream in 1963 and closed in 1982; although no new porphyry mines have been developed since Afton in 1977, one out of every four orebodies brought to production between 1965 and 1987 was a porphyry deposit. The life of a porphyry operation in British Columbia averages in the 20 to 25-year range and most are now within sight of the end of their productive lives. The lead-time from discovery to production in the heyday of porphyry development was 9 years (Schroeter *et al*, 1987) and the lack of exploration for porphyry deposits, particularly calc-alkaline deposits, over the last 10 years strongly suggests that much of this production will not be replaced, at least not in the short to medium term. It follows that the dominance of precious metal production from porphyry deposits which has characterized the last decade will slowly erode.

RESERVES AND TOTAL INVENTORY

Gold reserves in porphyry deposits exceed production by almost an order of magnitude and account for roughly half of identifiable lode-gold reserves in British Columbia (Figure 7). Eleven alkaline porphyries are estimated to contain 276 800 kilograms (8.9 million ounces) of gold, 44 per cent of the total porphyry reserve and a slightly higher proportion than the share of production held by this subcategory. Four undeveloped deposits, the Snowfields Gold zone on the Sulphurets property, Mount Milligan, Stikine Copper (Galore Creek) and Cariboo Bell, each with estimated reserves in excess of 47 000 kilograms (1.5 million ounces) of contained gold, account for 77 per cent of the total (Table 19).

Fourteen calc-alkaline porphyry deposits are estimated to contain reserves of 354 700 kilograms of gold (11.4 million ounces). Three undeveloped deposits, Liard Copper (Schaft Creek), Fish Lake and Poison Mountain, each contain in excess of 70 000 kilograms (2.25 million ounces) of gold and account for 80 per cent of estimated calc-alkaline porphyry reserves (Table 19).

Remaining reserves in the seven porphyry copper mines currently in production total 32 700 kilograms (approximately 1 million ounces), only 5 per cent of the total porphyry reserve. The seven major undeveloped porphyry deposits together contain almost 500 000 kilograms (16 million ounces), 80 per cent of porphyry reserves and 70 per cent of all known gold reserves in the province. Clearly the future of by-product precious metal production from porphyry deposits, which has accounted for half of total production in recent years, is inseparably linked to the future development of these deposits.

The viability of low-grade copper deposits is a complex issue beyond the scope of this report, but there is no question that by-product precious metal credits will be a major factor in determining feasibility. At Afton, by-product gold and silver accounted for a third of revenue, and probably more than half during times of very low copper prices. The lower the copper grade, the more significant by-product credits become; most British Columbia porphyry mines would not have survived without them during the 5-year slump in copper prices in the mid-1980s.

Total inventory in porphyry deposits closely parallels reserves, as to be expected when 90 per cent of identified inventory remains in the ground. The seven major undeveloped deposits, together with Island Copper, represent 75 per cent of the total porphyry inventory and 13 per cent of the inventory for all deposit types.

EXPLORATION AND DEVELOPMENT ACTIVITY - DEPOSIT UPDATES

As already discussed, the potential for development of new gold production from porphyry deposits is, in large measure, linked to the economics of open-pit low-grade copper mines. Nevertheless, several porphyry deposits with above-average gold content have been aggressively explored, most notably the new discovery at Mount Milligan, Afton's Ajax deposit, Cariboo Bell, and the Willa and QR deposits which, with grades of 6.0 and 7.2 grams per tonne gold respectively, are in a class on their own. Other deposits not previously tested for their gold content, for example Catface on Vancouver Island and Berg in central British Columbia, are also being re-examined. The drill-indicated reserve of 39.3 million tonnes grading 0.3 gram per tonne gold in the Red-Chris deposit is known to contain zones of much higher grade material and is also likely to be re-evaluated.

ALKALINE PORPHYRY DEPOSITS

Operations at the **Afton** mine near Kamloops ceased in 1988, however the nearby **Ajax** deposit is being readied for production in late 1989 and will feed the Afton concentrator. With a change in ownership in 1988, and much improved copper prices, the life of the **Similkameen** operation at Princeton now seems assured well in the 1990s.

Two of the three main breccia deposits within the **Cariboo Bell** intrusive complex host economic copper-gold mineralization; about 25 per cent of the copper content is present as supergene mineralization amenable to low-cost leaching. The project has entered the Mine Development Review Process with production planned in 1991. This development has led to significant renewed interest in exploration for similar deposits elsewhere in the Quesnel trough. Also in the Quesnel trough, a feasibility study on the **QR** deposit is approaching completion at the time of writing

and a production decision may be reached as early as 1990. The deposit is characterized by its well-developed propylitic alteration zone and locally developed calc-silicate alteration associated with alkaline intrusions and zoned porphyry copper mineralization.

A major new alkalic porphyry copper-gold deposit was discovered at **Mount Milligan** in 1987; several mineralized zones are now under investigation. The 66 zone of disseminated gold mineralization grades in the MBX copper-gold zone on the eastern side of a large (500 by 365 metres), circular sulphide system in andesitic to latitic flows and pyroclastic rocks intruded by a monzonite porphyry stock. This exciting discovery has stimulated exploration interest in a previously under-explored area.

In addition to the mesothermal veins at Brucejack Lake, several zones of porphyry mineralization are known on the **Sulphurets** property. The **Snowfields Gold** zone on the **Sulphurets** property is host to a large, disseminated pyritic copper-gold deposit. Improved access to the area will allow more aggressive pursuit of low-grade targets of this nature. The **Kerr** deposit, a copper-gold porphyry with a high-grade ore, has been outlined on the property adjoining Sulphurets to the west; delineation drilling and environmental impact studies are planned.

Also in northwestern British Columbia, the high-grade

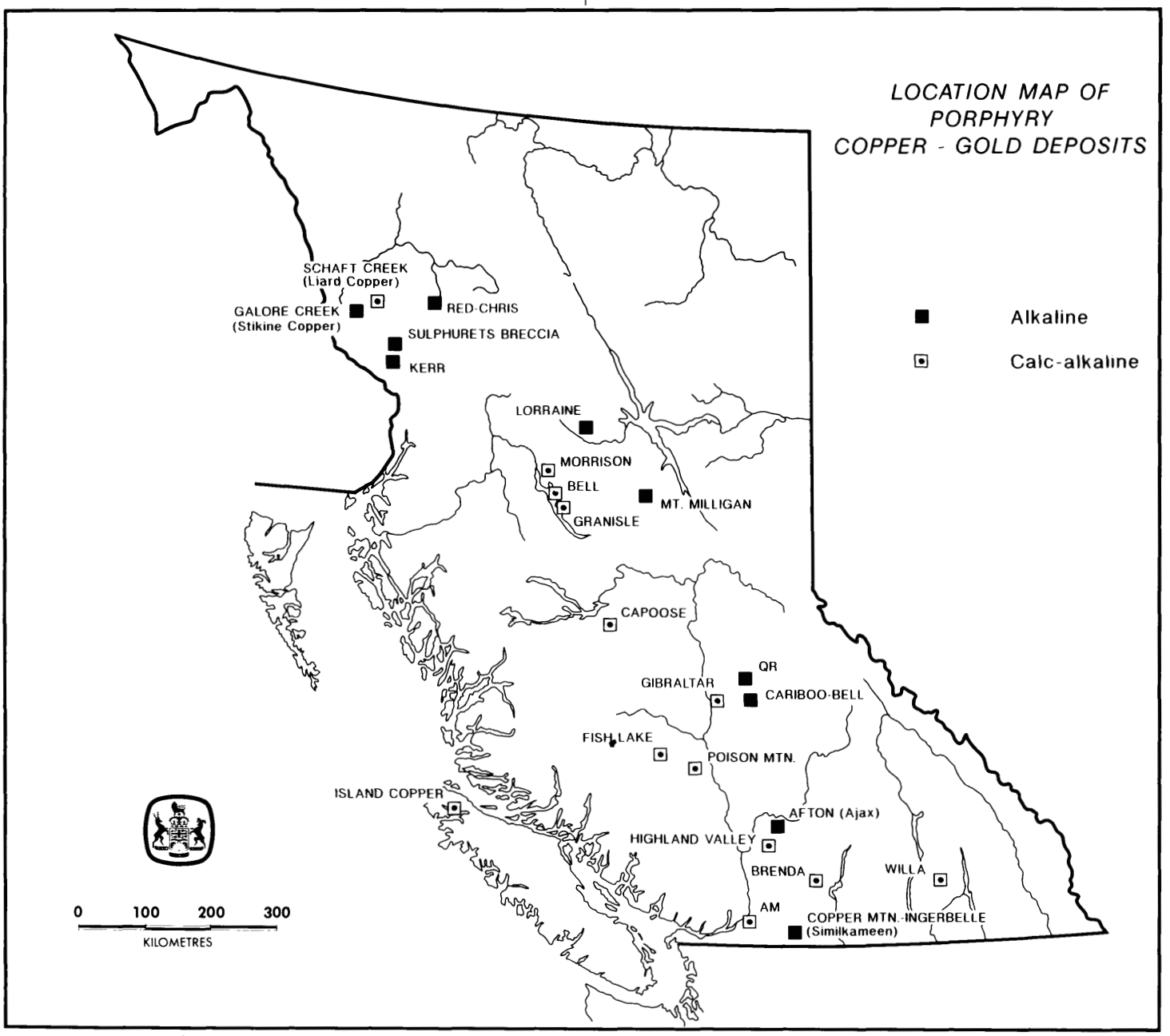

Figure 13. Location map of porphyry Cu-Au Deposits (alkaline/calc-alkaline).

Galore Creek (Stikine Copper) deposit has sat idle for two decades. It is regarded by many as the bellwether property for major mining developments in the Stikine district and it is encouraging that interest has been rekindled following recent improvements in base metal prices. Work to test the gold potential in more detail is proposed in 1989. Exploration activity in the surrounding area is also increasing, targeting similar porphyry deposits and associated gold-bearing veins.

CALC-ALKALINE PORPHYRY DEPOSITS

The **Island Copper** mine on northern Vancouver Island is not only a prolific producer of copper, molybdenum and rhenium but has also produced almost 25 tonnes of gold (800 000 ounces), an amount equal to half Canada's annual production in the years 1974 to 1980. Production is expected to continue well in the 1990s and substantial reserves of similar mineralization have been outlined in the **Expo** deposit northwest of the mine.

In 1986 the **Lornex** and **Valley Copper** operations were amalgamated to form the **Highland Valley Copper** joint venture. With a milling capacity of 131,000 tonnes per day this is now the third largest porphyry copper mine in the world, behind only the Panguna mine on the island of Bougainville in New Guinea, and Chuquicamata in Chile. The gold content is very low, 0.006 gram per tonne, but even Highland Valley Copper ranks 30th in total production over the period 1890-1987, and 19th for the period 1980-87; annual production is estimated to be roughly 280 kilograms (9000 ounces).

The **Schaft Creek (Liard Copper)** deposit contains the largest undeveloped gold reserve in the province, almost 125 tonnes (4 million ounces). Like Galore Creek, it has been dormant for a number of years, due to the generally unfavourable economics of developing new large-scale copper-mining capacity, particularly in remote areas. The development of smaller, mesothermal vein deposits in the general area will lead to improved access and exploration activity in the region has increased. The **Fish Lake** porphyry copper deposit represents the second largest undeveloped gold reserve in British Columbia (87 tonnes or 2.8 million ounces); unfortunately the copper grade is very low (~0.3 per cent) and the property is currently the subject of a legal dispute.

The **Willa** deposit in the Slocan district is a porphyry-related breccia deposit with modest reserves that are subeconomic at current metal prices. Nevertheless a potentially economic deposit has been outlined and attention has been drawn to the favourable geologic setting in volcanic rocks of the Rossland Group.

MASSIVE SULPHIDE DEPOSITS

DEFINITION

"Massive sulphides", as used in this report, are defined as stratabound base-metal deposits generally containing greater than 75 per cent sulphides by volume (but also including stringer breccia ore) associated with volcanic (volcanogenic) and sedimentary (clastic-hosted) rocks. The term stratabound implies that mineralization is confined to a specific statigraphic unit, but veins, lenses, layers, sheets, stringer zones and breccia zones may be transgressive within the host unit.

CLASSIFICATION AND GEOLOGICAL CHARACTERISTICS

Volcanic massive sulphide deposits are further subdivided into three deposit types, based primarily on mineralogy, ore tenor, host lithology, and tectonostratigraphic setting (Table 23):

1) **Besshi** or **Kieslager** deposits (USGS Model 24b) are bedded thin sheet-like cupriferous iron sulphide deposits associated with mafic extrusive rocks and related terrigenous clastic sediments which accumulated in fore-arc or back-arc basins. British Columbia examples include the Goldstream, Granduc and Windy Craggy deposits.

2) **Cyprus-type** deposits (USGS Model 24a) are cupriferous pyrite deposits associated with basic to intermediate, extrusive rocks, often pillowed, formed in submarine rifts associated with oceanic or back-arc spreading ridges. British Columbia examples include the Anyox, Chu Chua and Sunro deposits.

3) **Kuroko** deposits (USGS Model 28a) are polymetallic copper, and copper-zinc deposits, commonly with a barite gangue, hosted by submarine volcanic rocks of intermediate to felsic composition and closely associated with volcanic centres. The model was developed from the study of Tertiary deposits in Japan and also embraces the Archean massive sulphide orebodies in greenstone belts in the Canadian Shield, the large lead-zinc deposits in New Brunswick and many others worldwide. British Columbia examples include the Westmin deposits at Buttle Lake, Britannia orebodies, the Kutcho Creek, Tulsequah Chief, Lenora, Samatosum deposits and a number of other occurrences.

Clastic-hosted deposits do not generally contain significant amounts of gold with the notable exception of the J & L deposit.

Volcanogenic massive sulphide deposits are well distributed throughout British Columbia (Figure 14) in all tectonostratigraphic belts except the Eastern Marginal Belt, although the Intermontane Belt is under-represented in terms of the number of economically significant deposits. Distribution with respect to terranes is broadly parallel to the area of exposure; the significant deposits fall within Superterrane I, five within Superterrane II, but Wrangellia and the Kootenay terrane are clearly over-represented for their size, with five and four deposits respectively.

The age of deposits ranges from Devonian to Tertiary but there are two principal clusters. Late Paleozoic deposits include the Lara and Lenora deposits and the Buttle Lake orebodies in the Sicker Group on Vancouver Island, the Samatosum, Chu Chua and Homestake deposits in the Adams Plateau area, and the Goldstream, Tulsequah Chief and Ecstall deposits. Late Triassic to early Jurassic deposits include the Britannia, Anyox and Granduc orebodies and major undeveloped deposits at Windy Craggy and Kutcho Creek.

Host lithologies include chlorite and sericite schists, greenstones, phyllites, quartzites, and volcanic rocks ranging in composition from basalt to rhyolite. Many deposits have been metamorphosed or undergone penetrative deformation.

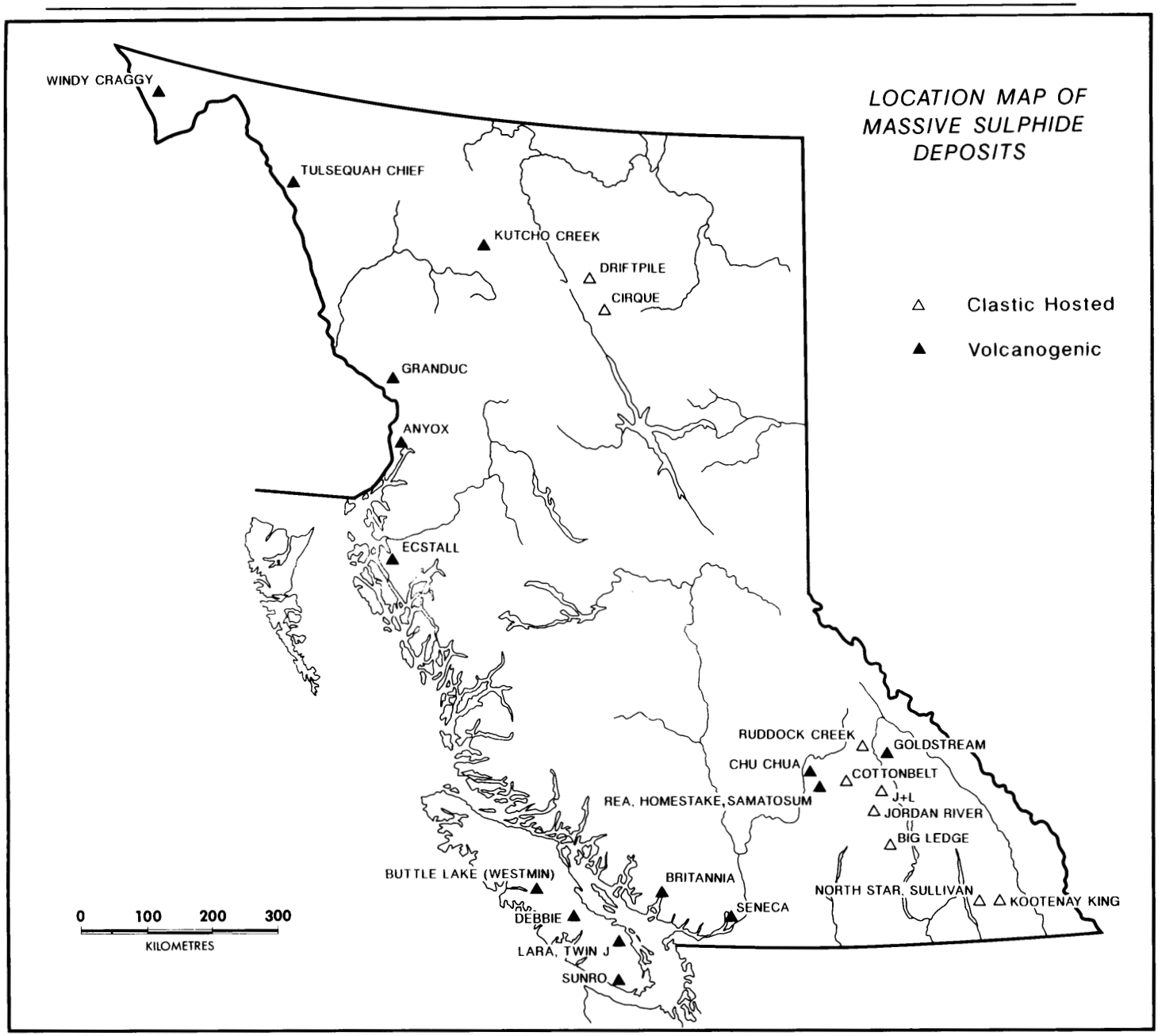

Figure 14. Location map of massive sulphide deposits.

PRODUCTION

Total gold production from volcanogenic massive sulphide deposits to 1987 amounts to 41 256 kilograms (1.3 million ounces) representing 6.4 per cent of lode production in the province (Table 4 and Figure 4).

Gold has been recovered from 12 massive sulphide deposits although in three cases production is insignificant (less than 15 kilograms or 500 ounces); three camps, Britannia, Anyox and Buttle Lake have produced more than 3000 kilograms (100 000 ounces) and a fourth, Tulsequah Chief, falls short by less than 200 kilograms. Together these four clusters of deposits account for 89 per cent of all the gold recovered from massive sulphide orebodies (Table 21); they rank 10th, 11th, 23rd and 26th in terms of overall production. Britannia, Buttle Lake and Tulsequah Chief are kuroko deposits. Anyox is classified here as a Cyprus-type deposit but others have included it in the Besshi category (for example, Sharpe, 1980). By the end of 1988 gold production from the Buttle Lake deposits had surpassed 15 500 kilograms (0.5 million ounces) and displaced the Britannia orebodies as the production leader among massive sulphide deposits.

Average grades of gold range between roughly 0.15 and 5.0 grams per tonne (0.005 to 0.15 ounces per ton) and there is a tendency for the grade to be higher in smaller deposits, the kuroko deposits cluster towards the high end of the range, the Besshi deposits at the bottom (Figure 5). This relationship

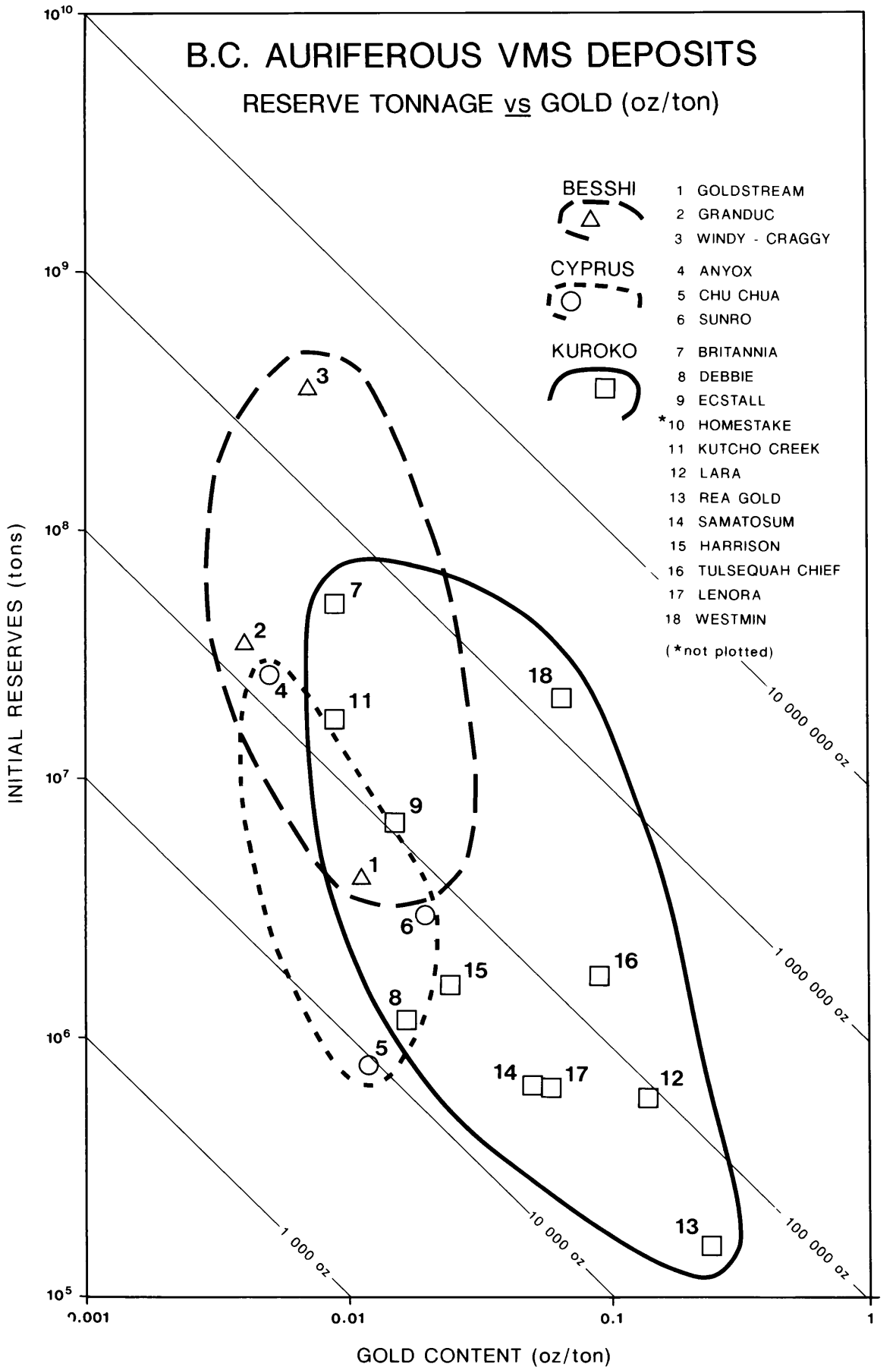

Figure 15. B.C. auriferous VMS deposits: Reserve tonnage vs Au oz/t .

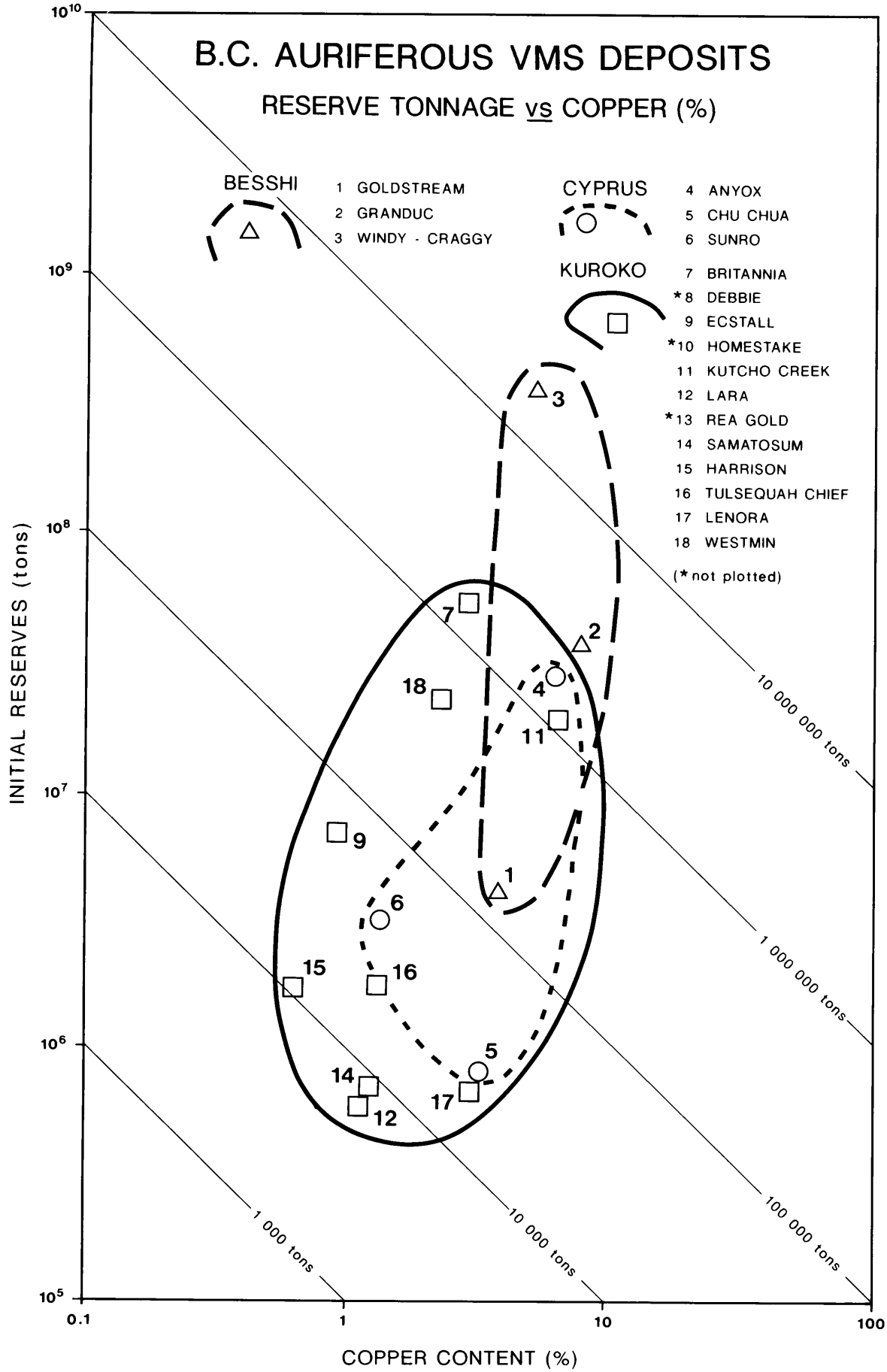

Figure 16. B.C. auriferous VMS deposits: reserve tonnage vs Cu%.

is shown more clearly on a plot of gold grade against reserve tonnage (Figure 15). Although the sample population is too small to draw meaningful conclusions, there is a clear trend of increasing gold grade from the large Besshi deposits, through deposits classified as Cyprus type, to the relatively small kuroko deposits. The same trend is apparent within each deposit category. This might be even more apparent if individual orebodies in the Britannia and Buttle Lake camps were plotted separately. A similar plot of copper grade against reserve tonnage (Figure 16) shows a slight trend in the opposite direction, with the lowest copper grades in the smallest kuroko deposits. Ag:Au ratios in volcanogenic deposits range from a low of 1 in the Thistle deposit to a high of 780 in the Homestake deposit (Table 5). Only two clastic-hosted deposits are covered by this study; the Sullivan orebody with a Ag:Au ratio of over 50 000 is typical of the deposit type, although the J & L clastic-hosted deposit has a ratio of only 10.

Considering only the period 1980-87, two mines, Granduc and the Westmin complex at Buttle Lake, produced 6800 kilograms (~220 000 ounces) of gold, representing 10 per cent of total provincial production. The Buttle Lake operations contributed 95 per cent of this total and, with a more than twofold increase in production following development of the H-W orebody and expansion of milling capacity in 1986, this camp will hold its preeminent position among massive sulphide producers for some time to come. The Buttle Lake operations also produced more than 230 000 kilograms (7.4 million ounces) of silver over the same period.

RESERVES AND TOTAL INVENTORY

Gold reserves in 13 massive sulphide deposits total 91 600 kilograms (2.9 million ounces); although reserves exceed past production by a factor of two (Table 9), they account for 7.3 per cent of identifiable lode-gold reserves in British Columbia (Figure 7). Nine kuroko deposits contribute 56 per cent of this total; although the kuroko reserves are dominated by the H-W orebody, three other deposits, Tulsequah Chief, Kutcho Creek and Ecstall (Red Gulch) are each estimated to contain in excess of 3000 kilograms of gold. Almost all the balance is divided evenly between the Windy Craggy (Besshi) and J & L (clastic-hosted) deposits.

The distribution of total inventory in massive sulphide deposits closely parallels reserves. Kuroko deposits represent 64 per cent of the total, with the Buttle Lake deposits contributing more than half this amount; the Windy Craggy and J & L deposits account for a further 30 per cent.

EXPLORATION AND DEVELOPMENT ACTIVITY - DEPOSIT UPDATES

Exploration for polymetallic massive sulphide deposits in British Columbia has increased in recent years. A number of factors have contributed to this trend, all of which suggest it is likely to continue. These include the relatively recent widespread recognition of the potential for world-class volcanogenic massive sulphide deposits (*e.g.* Windy Craggy); the high unit value of massive sulphide ores, allowing the development of smaller deposits with lower capital investment and faster pay-back than large bulk-mining projects (*e.g.* Samatosum); and the product diversification provided by polymetallic deposits, reducing the impact of cyclical swings in the price of a single metal.

Kuroko Deposits

The bimodal calc-alkaline volcanic rocks of the Sicker Group represent the remnants of an immature island arc extending from central Vancouver Island to just north of Victoria. At the northern end of the belt the **Buttle Lake** property of Westmin Resources Limited covers a cluster of kuroko deposits including the **Lynx, Myra, H-W** and **Price** orebodies. The deposits are associated with rhyolite domes within a sequence of felsic volcanic rocks 500 metres thick and extending for at least 6000 metres of strike length and from 150 to 1000 metres down dip. The discovery of the world-class H-W orebody in 1980, the result of detailed geological mapping and careful modeling, stimulated major exploration programs applying the Westmin model throughout the Sicker belt. New discoveries have been made on the **Lara** and **Debbie** properties and the old **Lenora** deposit on Mount Sicker is being extensively re-evaluated.

Re-evaluation of the old **Tulsequah Chief** property by Cominco Ltd. has led to the recognition of seven ore lenses, at several stratigraphic levels, near the base of a large lenticular mass of felsic pyroclastic rocks overlying a thick sequence of andesitic pyroclastics and flows. New reserves are reported as 2.1 million tonnes grading 2.1 per copper, 6.0 per cent zinc, 1.6 per cent lead, 99.4 grams silver 2.7 grams gold per tonne. The system is large, offering potential for a five to tenfold increase in reserves.

The **Samatosum** deposit on the Adams Plateau, discovered in 1986, is being developed for production in late 1989; initial production will be from an open pit. The orebodies occur in the same stratigraphic unit as the nearby **Rea Gold (Discovery)** deposit and are believed to have formed in an island arc environment with an unusual alkaline affinity (Höy, 1986). The ore lenses are cut by quartz veins carrying polymetallic sulphides, possibly representing metamorphic remobilization of the primary mineralization.

The **Chu Chua** deposit is being examined for its open pit potential.

Ten orebodies were mined at **Britannia**, on Howe Sound north of Vancouver, over a strike length of 4000 metres. Total production of 50 million tonnes was largely stockwork ore but included a massive section of 2 million tonnes of fairly typical kuroko grade (1.5 per cent copper, 4.4 per cent zinc, 9.6 grams per tonne gold and 10.3 grams per tonne silver). The "Britannia shear zone," a zone of alteration that hosted the Britannia, Robinson, Furry and Fairwest orebodies, has been traced eastwards toward Furry Creek, leading to the discovery of the new Watershed Showings.

Three subeconomic massive sulphide deposits (**Red Gulch, Packsack** and **Scotia**) are hosted by bimodal volcanic rocks in the Ecstall septum, a roof pendant in the Central Gneiss Complex south of Prince Rupert. They are interpreted as kuroko deposits related to felsic volcanic centres. The Red Gulch deposit and 13-Mile Creek showing on the **Ecstall** property have been actively investigated in recent years.

Besshi Deposits

The **Windy Craggy** deposit, located in the extreme northwest corner of British Columbia is a world-class copper-gold-cobalt deposit extending over a strike length of at least 1600 metres and a width of 160 metres, with a vertical extent of at least 600 metres. Geological reserves are estimated to be approximately 315 million tonnes. A possible stockwork feeder zone has also been identified. The deposit is hosted by Triassic argillite intercalated with intermediate to mafic volcanic flows and sills and has been separated into two distinct bodies by tight isoclinal folding subsequently refolded into a broad anticlinal structure. Development of a 100 million tonne resource grading 2 to 3.5 per cent copper, 0.1 per cent cobalt and 0.3 gram per tonne gold is under consideration. Recent exploration has focused on outlining zones of higher gold grade; one diamond-drill intercept in a chert-ankerite-sulphide unit outside the massive sulphide zone assayed 14.7 grams per tonne gold over a core length of 29.7 metres. Underground exploration continues.

Cyprus-type Deposits

Sulphide lenses at Anyox occur at the tops of mafic volcanic cycles and are generally overlain by argillites which provide an excellent stratigraphic guide to ore. Exploration during the 1980s has focused on the gold potential.

Clastic-hosted Deposits

The **J & L** deposit north of Revelstoke is a massive sulphide sheet hosted by Lower Cambrian quartzites and phyllites of the Hamill Group. No feeder zone has been identified. The deposit has a strike length of more than 3.5 kilometres and attains widths up to 13 metres. The main mineralized zone contains gold, silver, lead, zinc and arsenic with most of the gold associated with galena and arsenopyrite. Quoted reserves are 1.1 million tonnes grading 4.04 per cent zinc, 2.12 per cent lead, 58.3 grams silver and 5.5 grams gold per tonne, but there is geological potential for 11 million tonnes of sulphide mineralization.

TRANSITIONAL DEPOSITS

VOLCANIC-HOSTED COPPER-ARSENIC-ANTIMONY DEPOSITS

DEFINITION

Transitional deposits are defined, in this study, as being intermediate between porphyry copper systems and near-surface epithermal fluid-streaming zones. They include massive sulphide pods and lenses, veins, and parts of porphyry and skarn-related systems.

CLASSIFICATION

Transitional deposits are characterized by a distinctive alteration suite consisting of a central zone of advanced argillic within a broader zone of illite-muscovite alteration (Schroeter and Panteleyev, 1985 and Panteleyev, 1988). Ore composition and mineralogy are also distinctive. The best-known example in British Columbia is the Equity Silver deposit, classified by Cox and Singer as a "volcanic-hosted copper arsenic-antimony deposit" (USGS Model 22a).

PRODUCTION

Total gold production from transitional deposits to 1987 amounts to 6729 kilograms (216 350 ounces), virtually all of it from the Equity Silver mine in central British Columbia (Table 24) and representing only 1.1 per cent of total production in the province (Table 4 and Figure 4).

RESERVES AND TOTAL INVENTORY

Gold reserves in five transitional deposits total 87 250 kilograms (2.8 million ounces), 7.0 per cent of identifiable lode-gold reserves (Figure 7). This total is boosted by inclusion of the Sulphurets Breccia zone and the Harrison Lake deposits in this category, although the latter might be better classed as mesothermal vein deposits. Reserves of 19 400 kilograms at the Equity Silver mine represent 22 per cent of the transitional reserve as defined here (Table 25).

Total inventory for transitional deposits is 94 000 kilograms (3 million ounces), 5 per cent of the total inventory for all deposit types (Table 7), but these deposits are a difficult exploration target and there seems little doubt that more await discovery, particularly in the northwestern part of the province.

EXPLORATION AND DEVELOPMENT ACTIVITY – DEPOSIT UPDATES

Open-pit mining on the Main zone at the **Equity Silver** mine is ongoing and the Waterline zone is now being prepared for production. Exploration is continuing and a new zone (North zone) has been discovered on strike to the north of the Waterline zone. The **Sulphurets, Harrison Lake** and **Debbie** properties are also the subject of continuing exploration programs.

TAILINGS

The development of heap-leach technology for recovering gold from very low-grade material has resulted in at least three tailings projects being identified as potential producers of gold. Heap leaching of dumps and tailings at the **Union** mine was begun in 1987 and small quantities of gold and silver have been recovered. The tailings from the old **Nickel Plate** mine at Hedley were scheduled for production in late 1988 with reserves estimated at 5 million tonnes grading 1.37 grams per tonne gold. The **Hedley Mascot** tailings are scheduled for production in 1989 with reserves estimated at 621 295 tonnes grading 2.06 grams per tonne gold. Total contained gold in old tailings at Hedley is therefore 3400 kilograms (110 000 ounces). Scavenger leaching of tailings at the **Equity Silver** mine has increased gold production over the last several years.

Including the small reserve at the Union mine, currently estimated reserves of gold in dumps and tailings total approximately 3670 kilograms (Table 23) or 0.3 per cent of total gold reserves (Figure 7).

As technology continues to improve, additional dump and tailings recovery operations may become feasible, for example, at Surf Inlet.

CONCLUSIONS: NEW MINES IN SIGHT

Existing lode-gold reserves in British Columbia are currently estimated at 1.25 million kilograms, almost double all previous production. Porphyry copper deposits account for slightly more than half of this total and vein deposits for almost a third. Massive sulphide deposits, transitional deposits and skarns account for 7.3, 7.0 and 4.5 per cent of reserves respectively.

Sixteen mines in the province, including the newly developed Reg deposit in the Iskut River district, produced gold in 1988. Six of these mines are primary gold producers, five working vein deposits (Blackdome, Erickson Gold, Taurus, Mosquito Creek and Reg) and the sixth (Nickel Plate) exploiting skarn mineralization. Other production was derived as a by-product from seven porphyry copper mines,

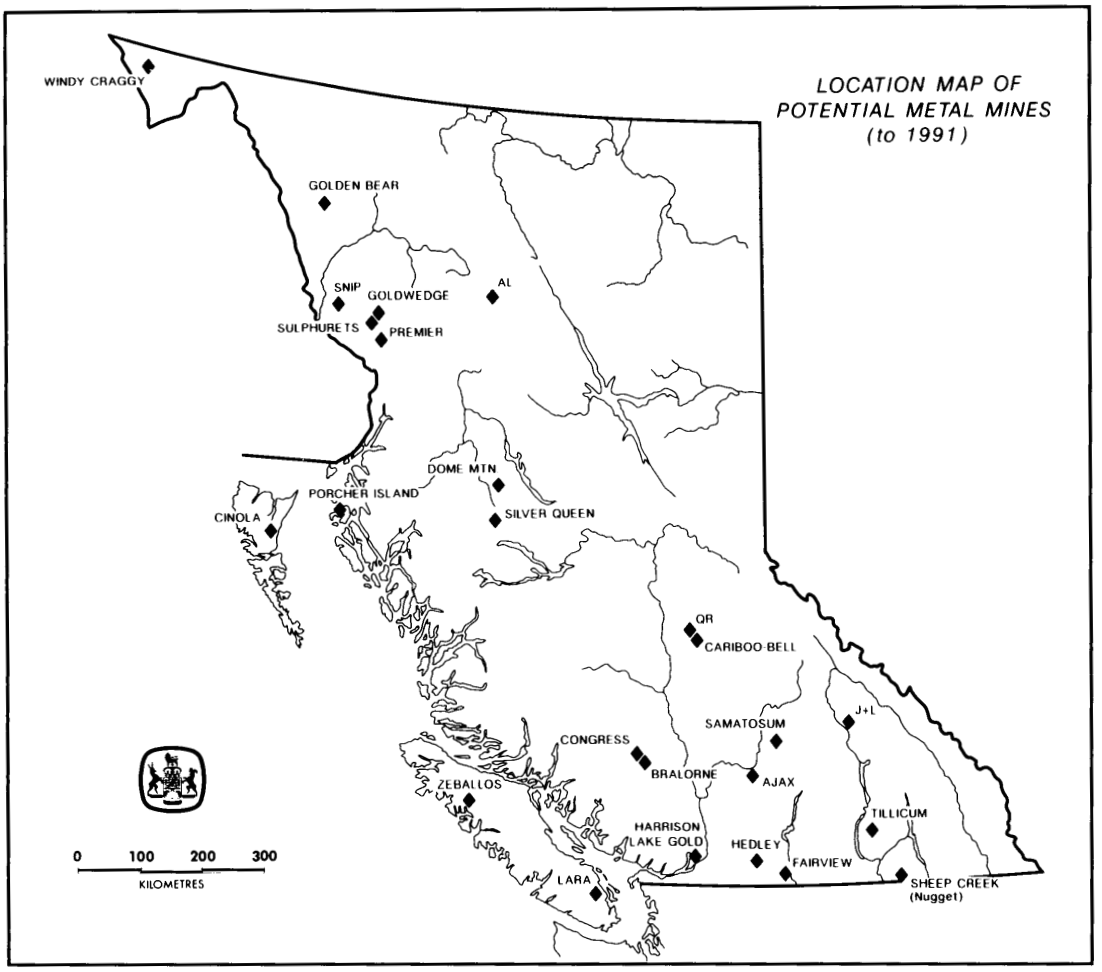

Figure 17. Location map of potential metal mines (to 1991).

the Buttle Lake polymetallic massive sulphide deposits and the Equity Silver and Highland Bell silver mines.

Clearly the preponderance of gold production in the province is currently won as a by-product from the recovery of other metals, but the proportion of primary gold production appears set to increase substantially over the next few years, at least in terms of the number of primary producing properties. Table 27 lists twenty-six possible new mines and two tailings recovery projects with the potential for production in the short to medium term as outlined in the Province of British Columbia Mine Development Review Process (see also Figure 17 for locations). Estimated operating costs for these projects, where available, are in the range $165US per ounce (Premier - Big Missouri and QR) to $250-275US (Sulphurets). Sixteen of these potential new orebodies are vein deposits with gold being the primary commodity; in addition the Harrison Lake transitional mineralization and Tillicum skarn deposit will also be primary producers. Of the remaining prospective mines, three are porphyry deposits in which gold will either be the major product produced in terms of dollar value, or at least a major coproduct; the other four are massive sulphide deposits with significant values in metals other than gold but, in all seven cases, the value of precious metal recovery will almost certainly be a determining factor in the economics of the operation.

Production plans for a number of these deposits have already been announced. At least five new mines are slated for production in 1989, including the Lawyers mine which is already on stream as this is written. The other four are the Premier - Big Missouri vein deposits, the Samatosum massive sulphide orebody and the Ajax porphyry copper-gold deposit. Potential new mines in 1990 include Sulphurets, Golden Bear, Snip, Tillicum, QR, and Silver Queen. Any attempt to look further ahead must be tempered by an appreciation of the volatility of the economics of gold mining, but one or more of the Cinola, J & L, Cariboo Bell and Windy Craggy deposits may possibly achieve production by 1991.

The number of new mines already being developed or on the drawing board is impressive testimony to the success of exploration for precious metals in British Columbia in recent years. In addition to exploration success, research into gold recovery from abandoned mine tailings and waste dumps by bacteriological leaching is producing encouraging results. As leaching techniques are perfected, more tailings recovery projects are likely to be developed in old mining camps and *in situ* leaching of low-grade ores becomes a possibility.

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APPENDICES

1. Alphabetical index to Figure 1
2. B.C. placer and lode gold production: 1858-1990
3. B.C. lode gold production by year: 1980 to 1987 (incl.)
4. B.C. lode gold total inventories (1894-1987): by rank (top 60)

APPENDIX 1
ALPHABETICAL INDEX TO FIGURE 1

DEPOSIT OR CAMP NAME	FIG.1 NO.
AFTON	108
AJAX	108A
AL	141
ALPINE	85
AMERICAN BOY, SILVER CUP	37
ANYOX	31
ARLINGTON	185
ASHLU	111
ATLIN RUFFNER	3
A.M.	165
BAKER	17
BANBURY	151
BAYONNE	84
BEAVERDELL	90
BELL COPPER	48
BENSON LAKE	124B
BETHLEHEM COPPER	107A
BIG MISSOURI	22
BIG SLIDE	135
BLACKDOME	70
BONAPARTE	172
BRALORNE	109A
BRENDA	96
BRETT	150
BRIDGE RIVER CAMP	109
BRITANNIA	112
BUCCANEER	119
BULL RIVER	76
BUTTLE LAKE	122
CAPOOSE	65
CARIBOO GOLD QTZ	66A
CARIBOO-AMELIA	91
CARIBOO-BARKERVILLE CAMP	66
CARIBOO-BELL (MT. POLLEY)	68
CARIBOO-HUDSON	129
CARMI	128
CASSIAR CAMP	9
CHAPLEAU, KILO	85A
CHAPUT	94
CHU CHUA	71
CINOLA	60
COLUMARIO	42
CONGRESS	109E
COQUIHALLA GOLD BELT	104
CRAIGMONT	105
CRONIN	47
CUSAC	10
DEBBIE	163
DIVIDEND-LAKEVIEW	101
DOC	168
DOCTORS POINT	127
DOME MOUNTAIN	45
DORATHA MORTON	130
DRUMLUMMON	55
DUNWELL	26
DUSTY MAC	92
DUTHIE	43
EARLY BIRD	62
EAST GOLD	27
ECLIPSE	73
ECSTALL	191
EMERALD GLACIER	54
ENGINEER	5
EQUITY SILVER	52
ERICKSON GOLD	9
ESPERANZA	30
EXPO	187
FAIRVIEW CAMP	99
FAIRVIEW (MORNING STAR)	99B
FANDORA	120
FISH LAKE	69
FRASERGOLD	174
GALORE CREEK	12
GEORGIA RIVER	29
GERLE GOLD	175
GIBRALTAR	182
GLACIER GULCH	40
GOLDEN BEAR	145
GOLDEN EAGLE	50
GOLDFINCH	176
GOLDKEISH	34
GOLDWEDGE	169
GRANBY POINT	33
GRANDUC	21
GRANISLE	49
GRANITE POORMAN	82a
GREAT WESTERN	161
GREENWOOD CAMP	88
GREENWOOD VEINS	88a
HANK	167
HARRISON	113
HARRISON LAKE GOLD	173
HEDLEY CAMP	97
HEDLEY TAILINGS	181
HIGHLAND BELL (BEAVERDELL)	90
HIGHLAND SURPRISE	78
HIGHLAND VALLEY COPPER CAMP	107
HOMESTAKE	72a
HORN SILVER	100
HUNTER	56
HUNTER BASIN	44
H-W	122
IMPERIAL	4
INDIAN	24
IRON MASK	134
ISLAND COPPER	126
ISLAND MT.	66A
J & L	140

DEPOSIT OR CAMP NAME	FIG.1 NO.
JEWEL	51
KALAMAKA	93
KERR	189
KILO, CHAPLEAU	85a
KUTCHO CREEK	137
LARA	146
LAWYERS	16
LENORA	114
LH	177
LILY-IKEDA	64
LINDQUIST	143
LITTLE JOE	46
LORNEX	106
LORRAINE	190
LUCKY LUKE	41
LYNX	122
MACKTUSH CK.	178
MAID OF ERIN	2
MAMIE	179
MASCOT TAILINGS	156
METS	160
MORRISON	188
MOSQUITO CK.	66B
MOUNT POLLEY	68
MT. MILLIGAN	183
MT. WASHINGTON	118
MUSKETEER	119
MYRA	122
NICKEL PLATE	97A
NORTHAIR	110
OLD SPORT	124A
OROFINO & TWIN LAKES	98
OUTSIDER	32
PAYDIRT	159
PELLAIRE	155
PERRIER	82
PIONEER	109B
PLANET	133
PLAZA (VOLLAUG)	11
POISON MOUNTAIN	138
POLARIS TAKU	7
PORCHER ISLAND	59
PORTER-IDAHO	25
PREMIER	23
PRICE	122
PRIVATEER	123B
QR	67
RABBIT	103
REA GOLD	72
RED DOG	14
RED-CHRIS	15
REG(MT.JOHNNY)	18
RELIANCE	109F
ROCHER DEBOULE	38
ROSSLAND CAMP	86
SAMATOSUM	180
SCHAFT CREEK	13
SCOTTIE GOLD	20
SCRANTON	81
SECOND RELIEF	186
SHAS	142
SHEEP CREEK CAMP	83
SHERWOOD	164
SILVER BUTTE	147
SILVER CUP	74
SILVER CUP, AMERICAN BOY	37
SILVER POND	152
SILVER QUEEN	53
SILVER STANDARD	36
SILVERADO	121
SIMILKAMEEN CAMP	102
SMITH-NASH	170
SNIP	171
SOUTHEASTER	61
SPANISH LAKE	67a
SPUD VALLEY	123A
STEMWINDER	99A
ST. EUGENE	75
SULLIVAN	77
SULPHURETS CAMP	19
SUNRO	115
SURF INLET	58
SURF POINT, PORCHER ISLAND	59
SUSIE	87
TAKLA RAINBOW	158
TASU	63
TAURUS (HANNA)	8
TAYLOR-WINDFALL	148
TEXADA ISLAND CAMP	117
THISTLE	116
THUNDER	157
TILLICUM	80
TOPLEY-RICHFIELD	144
TORBRIT	28
TRUE FISSURE	162
TULSEQUAH CHIEF	6
TWIN LAKES & OROFINO	98
UNION	89
VALENTINE MTN.	153
VALLEY COPPER	107
VAULT	184
VICTOR	79
VICTORIA	35
VIDETTE	132
VIRGINIA SILVER	39
WAYSIDE	109C
WESTERN COPPER	57
WHITEWATER	78
WILLA	139
WINDPASS	131
WINDY-CRAGGY	1
WISCONSIN	154
YELLOW GIANT	136
YELLOW JACKET	166
YMIR CAMP	149
YREKA	125
ZEBALLOS CAMP	123

APPENDIX 2
B.C. PLACER AND LODE GOLD PRODUCTION

YEARS	PLACER OZ	LODE OZ
1858	41,470	
1859	95,000	
1860	131,090	
1861	156,830	
1862	156,290	
1863	230,210	
1864	219,760	
1865	205,365	
1866	156,590	
1867	145,930	
1868	139,590	
1869	104,410	
1870	78,640	
1871	105,850	
1872	94,760	
1873	76,810	
1874	108,510	
1875	145,580	
1876	105,100	
1877	94,600	
1878	75,010	
1879	75,890	
1880	59,640	
1881	61,570	
1882	56,120	
1883	46,720	
1884	43,300	
1885	41,980	
1886	53,160	
1887	40,810	
1888	36,280	
1889	34,640	
1890	29,080	500
1891	25,280	-----
1892	23,500	500
1893	20,950	1,170
1894	23,850	6,252
1895	28,330	39,264
1896	32,000	62,259
1897	30,210	106,141
1898	37,840	110,061
1899	79,110	138,315
1900	75,220	167,153
1901	57,060	210,384
1902	63,130	236,491
1903	62,380	232,831
1904	65,610	222,042
1905	57,020	238,660
1906	55,790	224,027
1907	48,710	196,179
1908	38,060	255,582
1909	28,060	238,224
1910	31,760	267,701
1911	25,060	228,617
1912	32,680	257,496
1913	30,000	272,254
1914	33,240	247,170
1915	45,290	250,021
1916	34,150	221,932
1917	29,180	114,523
1918	18,820	164,674
1919	16,850	152,426
1920	13,040	120,048
1921	13,720	135,763
1922	21,690	197,856
1923	24,710	179,245
1924	24,750	247,716
1925	16,476	209,719
1926	20,912	201,427
1927	9,191	178,001
1928	8,424	180,662
1929	6,983	145,223
1930	8,955	160,836
1931	17,176	146,133
1932	20,400	181,651
1933	23,928	223,589
1934	25,181	297,216
1935	30,929	365,343
1936	43,389	404,578
1937	54,153	460,781
1938	57,759	557,522
1939	49,746	587,336
1940	39,067	583,524
1941	43,775	571,026
1942	32,904	444,518
1943	14,600	224,403
1944	11,433	186,632
1945	12,589	175,373
1946	15,729	117,612
1947	6,969	243,282
1948	20,332	286,230
1949	17,886	288,396
1950	19,134	283,983
1951	23,691	261,274
1952	17,554	255,789
1953	14,245	253,552
1954	8,684	258,388
1955	7,666	242,477
1956	3,865	191,743
1957	2,936	223,403
1958	5,650	194,354
1959	7,570	173,146
1960	3,847	205,580
1961	3,416	159,821
1962	3,315	158,850
1963	4,620	154,979
1964	1,842	138,487
1965	866	117,124
1966	1,535	119,508
1967	891	126,157
1968	670	123,896
1969	399	117,481
1970	491	100,809
1971	177	85,781
1972	691	121,624
1973	3,831	185,986
1974	1,452	160,791
1975	1,406	154,945
1976	838	173,407
1977	1,484	189,896
1978	1,174	210,344
1979	6,884	259,229
1980	9,006	241,582
1981	9,379	257,391
1982	5,646	258,788
1983	9,253	258,316
1984	13,853	241,326
1985	12,445	222,077
1986	5,353	314,439
1987	14,676	368,553
1988	14,147	382,352
1989 EST.	14,468	500,000
1990 EST.	14,790	710,000
TOTAL:	5,376,359	22,322,119

APPENDIX 3

1980 B.C. GOLD PRODUCTION

Mine	Deposit Class	Tons Milled	Gold oz	Silver oz	Copper lb	Lead lb	Zinc lb	Cadmium lb	Molybdenum lb	Tin lb
Island Copper	4	15,194,930	56,190	432,636	110,323,720				2,454,328	
Afton	4	3,020,628	46,014	284,842	53,407,927					
Similkameen	4	7,289,769	37,568	156,281	57,900,153					
Bell	4	5,525,667	27,275	72,643	38,658,153					
Warman	1	78,414	18,137	60,898	214,333	1,921,038	2,748,790			
Erickson	1	31,756	15,582							
Lynx, Myra	3	306,764	14,279	657,611	4,146,802	3,459,330	39,511,254	168,158		
Granisle	4	4,340,239	12,445	131,036	29,235,652					
Mosquito Ck.	1	12,589	4,400	1,186						
Bethlehem	4	6,925,646	4,154	209,085	50,087,556				205,724	
Brenda	4	10,062,363	2,491	154,857	20,178,877				4,090,641	
Tasu	2	1,098,555	1,662	70,941	4,907,426					
Horn Silver	1	21,646	257	94,405		20,451	33,677			
Sunrise		211	214	1,024	505	7,444	8,886			
Motherlode	2	480	142	229		1,535	2,267			
Nugget		15	137	92		1,034	959			
Goat Ridge		2,056	110	30,385	337	7,228	71,435			
Highland Bell	1	43,501	108	345,872	858	205,678	320,442	2,381		
Keystone		215	105	370	271	6,509	4,800			
Golden Drip		25	85	50		205	53			
Dome	1	571	51	32,298	2,725	65,451	70,617			
Rachel		15	30	124		2,944				
Utica		10,501	26	33,983		63,405	313,017	1,272		
Park (Barkerv.)	1	190	23	7,825	2,364	22,901	8,723			
Panama		911	13	29,090	1,784	6,370	1,369			
Bralorne	1	7	13	4		15	15			
Pilot Bay			10	17,050		12,833	29,093			
Zumar		61	8	75		121	121			
Canadian		74	7	219		3,274	2,827			
Hecla		539	7	18,328	860	65,674	91,871			
Whitewater	1	20	7	12		40	77			
Goldridge		51	6	83		719	256			
Meteor		36	5	500		73	73			
Gem		44	3	152	97	1,502	353			
El Klondike		11	2	146		357	335			
Riverside		9	2	10		37	4			
McAllister		577	2	4,662		5,515	3,943			
Westmont		530	1	2,888	119	5,268	10,928	37		
Monroe		7	1	72			174			
Black Bear		18	1	43		108	73			
Puck		99	1	539		399	399			
Hall		45	1	5,807		66,390	913			
Monarch		51	1	2,675	101	14,255	4,459			
Nor 1 and 2		15	0.1	137		141	236			
1980 Total		53,969,852	241,578	2,861,163	369,070,620	5,968,245	43,242,440	171,849	6,750,693	0

1981 B.C. GOLD PRODUCTION

Mine	Deposit Class	Tons Milled	Gold oz	Silver oz	Copper lb	Lead lb	Zinc lb	Cadmium lb	Molybdenum lb	Tin lb
Island Copper	4	15,607,670	53,324	421,622	117,032,196				2,793,268	
Afton	4	2,562,341	35,032	207,671	35,824,772					
Bell	4	5,986,058	32,487	91,148	49,940,450					
Similkameen	4	7,572,617	26,931	145,560	51,038,835					
Lynx, Myra	3	271,380	18,402	866,167	5,298,225	5,042,771	34,979,575	141,085		
Erickson	1	42,163	17,199							
Equity Silver	4	2,105,633	16,470	5,646,585	9,450,308					
Warman	1	68,853	15,450	48,183	148,401	1,367,532	24,673,760			
Baker	1	19,343	9,855	157,022						
Granisle	4	4,225,373	9,148	104,486	25,937,902				14,513	
Mosquito Ck.	1	23,286	7,947	2,078,897						
Brenda	4	11,244,747	3,294	188,967	24,751,579				6,911,158	
Scottie	1	7,327	2,911	1,270						
Granduc	3	6,872,914	2,420	155,931	16,815,385					
Tasu	2	1,137,680	2,000	75,457	5,279,601					
Bethlehem	4	7,162,116	1,741	117,739	35,863,505				606,483	
OK, Alvin	1	118,110	1,139	57,014	4,591,105					
Pioneer	1	clean-up	400	75		130	306			
Highland Bell	1	39,471	346	389,036	703	346,831	401,407	2,262		
Horn Silver	1	23,668	240	85,248		10,350	15,175			
Tillicum	2	64	146	105		728	1,903	22		
Nugget		275	114	106		990	549			
Free Gold	1	600	99	137		957				
Motherlode	2	33	47	30		135	66			
Keystone		94	44	248		2,772	1,215			
Silver Standard	1	467	32	27,455		59,306	59,458			
Lucky Gold		58	32	76		465	1,746			
Goat Ridge		458	31	9,409			22,277			
Golden Drip		10	24	41		329	42			
Silverton		158	13	8,059		20,215	28,811			
Jumbo		31	12	206		2,403	496			
Atlin Ruffner	1	1,193	8	849	977	34,910	12,941	33		
White and Bell		4	7	68		741	68			
Starlight		11	7	33	441					
Silverado	2	24	6	728	117	1,122	732			
Bayonne	1	43	6	52		344	172			
Black Bear		13	6	1,780		2,007	964			
Robin		24	5	3,593	617	14,288	5,698			
Victor	1	18	4	2,773		8,875	9,521			
Skomac	1	12	2	193			12,247			
Hecla		82	1.4	2,966		1,065	95,516	862		
J.R.F.		14	0.7	438		11,861				
B.N.A.		24	0.4	419		781	1,559			
Tiny Tim		9	0.3	944	57	845	456			
Victor	1	17	0.3	926		16,568	3,405			
Dardenelles		29	0.2	99						
Ruth Vermont		14,155	0.03	55,299	14,379	656,812	448,087	2,997		
1981 Total		8,826,202	257,387	10,955,113	381,989,556	7,606,132	60,778,153	147,261	10,325,422	0

1982 B.C. GOLD PRODUCTION

Mine	Deposit class	Tons Milled	Gold oz	Silver oz	Copper lb	Lead lb	Zinc lb	Cadmium lb	Molybdenum lb	Tin lb
Island Copper	4	16,859,051	44,870	435,227	118,827,675					
Scottie	1	54,102	33,721	17,576						
Equity Silver	4	2,138,349	30,836	8,841,018	16,832,560					
Lynx, Myra	3	317,061	21,116	1,072,692	5,902,809	5,312,983	39,521,637	166,539		
Erickson	1	42,693	21,084							
Similkameen	4	7,391,183	20,048	173,086	48,726,374					
Baker	1	34,211	16,993	361,203						
Bell	4	3,720,419	12,093	65,569	23,923,864					
Carolin	1	288,918	8,867	402						
Mosquito Ck.	1	24,815	8,391	2,418						
Taurus	1	40,979	8,074							
Warman		29,974	7,810	34,170	93,865	936,303	1,561,455			
Afton	4	72,174	7,724	57,249	8,531,145					
Granisle	4	2,073,751	4,359	54,884	14,185,733					
Brenda	4	10,456,730	2,940	185,955	23,573,602				5,455,049	
Good Hope	2	7,579	2,489	3,843	1,327	1,327				
Bethlehem	4	3,431,894	2,467	136,703	33,695,214					
Tasu	2	1,221,749	2,160	81,608	6,680,175					
Granduc	3	551,619	1,692	115,961	11,864,913					
Horn Silver	1	3,217	251	17,746	717	2,701				
Free Gold	1	5,200	243	432		2,655	13,481			
OK, Alvin		correction	164	9,677	687,861					
Highland Bell	1	39,949	149	415,481	613	246,142	320,179	1,751		
French	2	1,151	90	598	6,395					
Silver Standard	1	630	69	35,540		90,491	99,961	168		
Golden Drip		handful	54							
Skomac	1	37	10	803		4,622	2,386			
Morning Star	1	4	8	28		77,069	46,140			
Robin		19	5	2,742		7,931	6,006			
Solo		23	3	46		410	137			
ViolaMac	1	25	2	2,024		28,927	2,997			
Wagner Hall		121	1	1,841		29,384	11,640			
Victor (Pet.)	1	17	0.8	3,417		15,475	6,359			
Little Tim		238	0.03	1,214	82	1,180	774			
1982 Total		48,807,882	258,784	12,131,153	313,534,923	6,757,600	41,593,153	168,458	5,455,049	0

1983 B.C. GOLD PRODUCTION

Mine	Deposit class	Tons Milled	Gold oz	Silver oz	Copper lb	Lead lb	Zinc lb	Cadmium lb	Molybdenum lb	Tin lb
Island Copper	4	18,003,914	52,027	480,066	132,371,045	confid.	rhenium		3,688,473	
Erickson	1	76,620	36,964							
Scottie	1	67,099	31,532	17,102						
Equity Silver	4	2,403,163	26,872	4,908,905	16,199,767					
Similkameen	4	7,552,308	19,709	182,872	47,578,782					
Carolin	1	382,511	19,208	2,017						
Lynx, Myra	3	273,835	18,597	870,838	5,690,803	5,605,128	37,936,403	148,348		
Afton	4	1,186,128	15,184	108,799	16,123,445					
Baker	1	31,996	11,610	223,974						
Mosquito Ck.	1	20,889	6,610	2,050						
Taurus	1	46,587	5,615							
Granduc	3	1,137,565	4,285	255,626	26,294,718					
Brenda	4	9,024,407	3,209	189,167	21,678,080				4,961,565	
Valley	4	7,907,113	2,988	377,678	66,074,953					
Tasu	2	999,486	2,565	108,151	8,339,930					
French	2	3,742	759	3,751	38,885					
Highland Bell	1	39,914	132	320,291		197,921	230,019	340		
Horn Silver	1	3,969	106	9,081	3,870					
Midnight		45	89	1,085		721	88			
Motherlode	2	109	85	79		789	1,583			
Henderson		426	48	27,879		71,228	60,161			
Pioneer	1	20	47	12						
Skomac,Boundary	1	1,800	38	5	1,905	26,279	11,451			
Trek		34	13	41		179	207			
Silver Standard	1	147	10	6,928		16,101	16,176			
Utica		1,386	5	5,613		13,276	33,417			
Republic No:2		49	2	205		190	101			
IXL		11	2	17						
Hewitt		3,491	1	849		5,656	230,381			
Hecla		783	1	1,284		1,372	49,811			
Referendum		67	0.6	11						
1983 Total		49,169,614	258,312	8,104,376	340,396,183	5,938,839	38,569,798	148,688	8,650,039	0
Total imperial										

1984 B.C. GOLD PRODUCTION

Mine	Deposit Class	Tons Milled	Gold oz	Silver oz	Copper lb	Lead lb	Zinc lb	Cadmium lb	Molybdenum lb	Tin lb
Island Copper	4	18,037,911	55,774	431,912	127,735,097				3,223,026	
Equity Silver	4	2,303,905	31,475	5,791,410	24,234,937					
Afton	4	2,909,588	31,251	252,574	34,844,684					
Scottie	1	48,163	27,776	16,302						
Erickson	1	91,676	26,166	16,096						
Carolin	1	322,547	18,534	1,109						
Similkameen	4	7,184,228	16,927	206,898	47,799,547					
Lynx, Myra	3	224,509	13,026	611,229	4,290,418	4,363,547	30,993,914			
Taurus	1	102,971	9,157							
Valley	4	9,301,956	3,893	465,688	87,112,434					
Brenda	4	6,735,246	2,556	144,319	17,178,383				6,076,852	
Granduc	3	388,775	1,793	126,804	12,353,715					
Mosquito Ck.	1	2,568	1,503	427						
Bayonne	1	1,103	597	1,838		14,229	11,786	150		
Horn Silver	1	2,906	188	28,088		17,891	13,422			
Motherlode	2	798	185	303	335	3,387	1,594			
Highland Bell	1	40,566	130	386,434	928	241,315	304,989			
Ashlu	1	40	102	95	562					
Maggie		57	57	137		346	6,251			
Jewel	1	215	55	377						
Midnight		19	49	29		115	37			
Silver Standard	1	309	37	21,910		66,185	49,125			
Silver Cup	1	85	27	4,193		45,205	18,754			
Hall		610	20	10,567		51,928	7,047			
Referendum		67	13	33		337	423			
IXL		49	11	2						
Beatrice		37	6	3,020		11,186	24,021			
Blaze		7	5	82		104	42			
Chambers		2,523	5	12,462		161,884	519,802	3,552		
Victor (Pet.)	1	14	4	2,337		6,408	8,066			
Republic No:2		7	1	116						
Gold Cliff		12	0.5	1,659		3,969	3,969			
1984 Total		47,703,466	241,323	8,538,450	355,551,042	4,988,036	31,963,243	3,702	9,299,879	0
Total imperial										

1985 B.C. GOLD PRODUCTION

Mine	Deposit Class	Tons Milled	Gold oz	Silver oz	Copper lb	Lead lb	Zinc lb	Cadmium lb	Molybdenum lb	Tin lb
Island Copper	4	18,198,270	57,445	470,639	127,164,983				3,401,164	
Afton	4	2,923,037	48,559	305,070	49,315,883					
Equity Silver	1	2,269,717	29,670	4,345,844	18,498,757					
Lynx, HW	3	645,701	26,103	872,304	11,468,121	3,037,546	65,014,354			
Erickson	1	28,665	20,384	16,268						
Similkameen	4	7,586,412	17,352	266,666	52,704,320					
Bell, Newman	4	1,750,505	5,651	32,118	11,745,867					
Taurus	1	42,017	5,601							
Valley	4	10,248,397	3,820	448,470	85,995,254					
Mosquito Ck.	1	8,318	2,068	935						
Gibraltar	4	14,775,250	1,577	226,424	82,945,485				793,621	
Tillicum		185	1,555	1,658		4,375	7,332			
Brenda	4	3,314,460	1,100	79,997	10,347,756				4,247,238	
Jewel	1	441	462	3,476	397	10,238	1,546	126		
WWW-14	1	108	252	758	3,036	662	5,462			
Motherlode	1	1,068	244	1,048		5,499	2,959			
Highland Bell	1	40,594	106	344,309	2,020	215,616	298,729			
Silver Cup	1	104	52	8,672		49,727	28,852			
Duthie	1	267	48	28,803		72,037	83,001	62		
Silver Standard	1	193	14	13,793		21,896	21,900			
Referendum	1	41	5	15		82	82			
Victor (Pet.)	1	19	4	3,039		9,501	9,201			
Meteor	1	8	1	591		64	49			
Wagner Hall	1	47	0.6	531		8,502	4,441			
Flint	1	8	0.4	141		3,032	2,538			
Yosie	1	4	0.06	45		2,657	375			
1985 Total		61,833,836	222,074	7,471,613	450,191,880	3,441,434	65,480,820	187	8,442,023	0
Total imperial										

1986 B.C. GOLD PRODUCTION

Mine	Deposit Class	Tons Milled	Gold oz	Silver oz	Copper lb	Lead lb	Zinc lb	Cadmium lb	Molybdenum lb	Tin lb
Afton	4	2,969,897	58,330	315,003	48,186,273					
Lynx, HW	3	1,175,997	54,804	1,402,966	54,525,483	9,902,062	125,353,304			
Island Copper	4	18,878,108	54,049	437,432	122,886,233				4,301,551	
Equity Silver	4	3,261,967	40,876	5,313,896	16,376,396					
Blackdome	1	37,273	29,807	78,807						
Bell, Newman	4	5,879,771	23,966	121,951	47,261,635					
Erickson	1	27,171	23,178	7,835						
Similkameen	4	7,580,836	13,493	386,019	52,180,714					
Brenda	4	11,249,820	4,214	294,217	37,476,348				9,616,622	
Taurus	1	52,740	3,902							
Mosquito Ck.	1	4,724	2,407	57						
Highland Valley Copper *	4	22,730,750	1,975	688,097	161,726,530				4,506,076	
Valley *	4	5,434,667	1,734	244,365	46,740,091					
Gibraltar	4	13,431,024	1,577	226,424	82,945,485				1,746,486	
Highland Bell	1	37,616	121	339,015	2,792	228,295	299,452			
1986 TOTAL		92,752,361	314,434	9,856,084	670,307,978	10,130,357	125,652,756	0	20,170,736	0

* July/86 amalgamation of Lornex and Valley to Highland Valley Copper

Total imperial

1987 B.C. GOLD PRODUCTION

Mine	Deposit Class	Tons Milled	Gold oz	Silver oz	Copper lb	Lead lb	Zinc lb	Cadmium lb	Molybdenum lb	Tin lb
Mascot	2	368,030	48,626	26,762						
Afton	4	3,155,355	48,107	269,797	43,671,434					
Blackdome	1	81,586	46,664	12,625						
Island Copper	4	19,246,343	45,063	414,618	125,606,795				2,915,083	
Lynx, HW, Myra	3	1,201,500	42,504	1,066,890	55,445	7,433	104,916			
Equity Silver	4	3,980,080	39,266	5,018,079	13,261,684					
Erickson	1	104,935	36,847	18,137						
Bell(Noranda)	4	6,574,208	28,128	110,579	48,338,742					
Similkameen	4	8,476,020	14,425	397,157	52,487,677					
Highland Valley Copper	4	46,303,898	9,541	1,673,139					6,147,053	
Brenda	4	11,346,269	4,335	288,189	39,085,089					
Taurus	1		2,073							
Mosquito Ck.	1	3,506	1,604	19						
Gibraltar	4	13,863,938	866	127,707	78,120,369				991,099	
Highland Bell	1	40,682	300	348,241		292,039				
1987 Total		114,746,348	368,350	9,771,940	400,627,235	299,472	104,916	0	10,053,234	0

Total imperial

APPENDIX 4
B.C. LODE GOLD TOTAL MINERAL INVENTORIES: 1894-1987
BY RANK

INVENTORY RANK	MINE NAME	TOTAL INVENTORY (PROD.+RES.) TONS	TOTAL INVENTORY (PROD.+RES.) OZ
1	BRIDGE RIVER CAMP	10,607,079	4,744,449
2	LIARD COPPER	1,000,000,000	4,000,000
3	SULPHURETS CAMP	43,421,487	3,909,348
4	FISH LAKE	200,000,000	2,800,000
5	ROSSLAND CAMP	6,199,799	2,745,260
6	HEDLEY CAMP	14,990,849	2,684,212
7	POISON MOUNTAIN	584,000,000	2,336,000
8	PREMIER	11,780,268	2,293,669
9	CINOLA	26,246,130	1,889,695
10	MT. MILLIGAN	80,000,000	1,760,000
11	STIKINE COPPER	125,000,000	1,750,000
12	SNIP	2,446,000	1,585,008
13	CARIBOO-BELL	128,000,000	1,536,000
14	LYNX,MYRA,H-W,PRICE	22,523,756	1,433,152
15	GREENWOOD CAMP	32,292,731	1,307,558
16	CARIBOO-BARKERVILLE CAMP	3,354,928	1,266,530
17	FRASERGOLD	15,000,000	1,050,000
18	ISLAND COPPER	277,349,305	1,042,008
19	EQUITY SILVER	34,662,814	838,596
20	SHEEP CREEK	1,890,596	835,046
21	AFTON	37,390,822	696,959
22	EXPO	57,500,000	690,000
23	KERR	66,000,000	660,000
24	SIMILKAMEEN	165,658,475	635,631
25	J & L	3,710,000	630,700
26	WINDY-CRAGGY	100,000,000	600,000
27	BELL COPPER	74,488,981	570,819
28	BRITANNIA	52,783,960	493,069
29	CASSIAR CAMP	1,262,309	462,089
30	TILLICUM	2,003,726	443,160
31	RED-CHRIS	43,700,000	437,000
32	ZEBALLOS CAMP	1,114,323	422,000
33	MORRISON	41,876,000	418,760
34	SURF INLET	1,069,060	408,831
35	LAWYERS	1,938,000	379,848
36	GOLDEN BEAR	650,000	351,000
37	REG(MT.JOHNNY)	384,889	319,458
38	CAPOOSE	31,200,000	312,000
39	YMIR CAMP	881,616	310,160
40	POLARIS TAKU	976,104	302,025
41	TULSEQUAH CHIEF	3,409,090	284,657
42	BLACKDOME	398,859	283,671
43	HARRISON LAKE	2,800,660	280,886
44	GOLDWEDGE	373,224	280,856
45	AJAX	27,000,000	270,000
46	CHAPLEAU	725,040	218,853
47	BIG MISSOURI	2,532,810	210,052
48	HIGHLAND VALLEY COPPER CAMP	1,303,946,573	205,535
49	DEBBIE	1,189,000	202,130
50	VAULT	1,000,000	200,000
51	QR	950,000	199,500
52	SHAS	2,403,450	189,873
53	YELLOW GIANT	1,250,000	187,700
54	BANBURY	4,006,500	184,965
55	NORTHAIR	397,700	178,802
56	ANYOX	41,948,410	175,298
57	KUTCHO CREEK	18,740,000	168,660
58	LH	330,000	165,000
59	AL	304,000	152,386
60	TAKLA RAINBOW	471,290	150,813
61	YELLOW JACKET	500,000	150,000
62	CAROLIN (IDAHO)	1,663,139	149,772
63	SCOTTIE GOLD	321,200	148,600
64	GRANISLE	57,498,131	148,000
65	FAIRVIEW CAMP	1,114,750	146,935
66	SURF POINT,PORCHER ISLAND	690,870	145,174
67	CRONIN	348,480	139,802
68	OLD SPORT	3,429,494	134,386
69	TEXADA	23,361,515	134,092
70	MTWASHINGTON	868,000	125,508
71	DOME MOUNTAIN	324,477	118,275
72	ALPINE	227,000	116,451
73	ECSTALL	7,000,000	105,000
74	SECOND RELIEF	228,203	100,234
75	VALENTINE MTN.	500,000	100,000
76	LORRAINE	10,000,000	100,000
77	RED DOG	2,400,000	88,800
78	LINDQUIST	275,000	85,800
79	CARIBOO-AMELIA	145,180	85,603
80	TRUE FISSURE	768,313	84,146
81	GREENWOOD VEINS GRAND TOTAL	285,584	83,553
82	SILVER QUEEN	1,133,100	82,453
83	MACKTUSH CK.	152,000	82,080
84	LARA	583,000	80,454
85	AYLWIN (WILLA)	456,727	80,384
86	SPANISH LAKE	981,060	78,485
87	SILVER CUP	723,080	75,169
88	ROCHER	336,020	71,055
89	GRANITE POORMAN	217,650	69,940
90	HEDLEY TAILINGS	1,681,000	68,921
91	BAKER	142,740	68,358
92	GEORGIA RIVER	120,537	66,349
93	DOC (GRACY)	207,000	66,240
94	GRANDUC	27,400,000	65,510
95	UNION	150,400	63,307
96	BRENDA	153,633,111	60,213
97	SUNRO	2,965,000	58,515
98	BOB	50,000	58,500
99	GOLDFINCH	187,450	55,726
100	FANDORA	200,900	55,468
101	JEWEL	187,486	55,211
102	CHAPUT	282,690	55,205
103	ARLINGTON	576,966	54,667
104	BAYONNE	110,102	51,752
105	PELLAIRE	74,000	49,580
106	A.M.	2,779,984	47,260
107	HANK	454,000	45,400
108	LENORA	305,000	44,491
109	TASU	22,965,511	43,066
110	HARRISON	1,661,280	41,526
111	MASCOT TAILINGS	685,000	41,100
112	REA GOLD	160,000	39,520
113	WISCONSIN	350,000	38,500
114	METS	160,000	36,800
115	HUNTER	103,804	36,359
116	DORATHA	100,250	36,095
117	PERRIER	256	34,681
118	WINDPASS	80,800	34,455
119	SAMATOSUM	661,000	34,372
120	ECLIPSE	268,000	33,170
121	ASHLU	113,500	31,118
122	GREAT WESTERN	203,653	30,188
123	YREKA	288,790	29,922
124	VIDETTE	53,900	29,869
125	HOMESTAKE	885,322	24,935
126	PAYDIRT	200,000	24,000
127	TOPLEY-	170,047	20,401
128	GIBRALTAR	394,408,502	20,320
129	DUSTY MAC	58,700	19,483
130	MAMIE	60,000	19,200
131	ENGINEER	17,150	18,058
132	CARIBOO-HUDSON	48,850	17,947
133	DIVIDEND-	122,634	16,216
134	HIGHLAND BELL	1,122,756	16,082
135	SILVER	235,246	15,805
136	THUNDER	50,000	15,000
137	SILVER POND	70,000	11,900
138	GERLE GOLD	50,054	11,012
139	HORN SILVER	483,614	10,686
140	SHERWOOD	50,000	10,000
141	DOCTORS POINT	100,000	10,000
142	DUNWELL	50,300	9,875
143	CHU CHUA (CC)	785,000	9,420
144	OROFINO &	21,800	8,846
145	PLANET	78,590	8,186
146	SMITH-NASH	22,190	6,701
147	MUSKATEER &	16,000	6,352
148	BONAPARTE	10,000	6,000
149	GRANBY POINT	62,040	5,795
150	SULLIVAN	153,383,973	5,622
151	SILVERADO	130	5,567
152	DUTHIE	103,407	5,214
153	GOLDKEISH	50,890	4,831
154	BULL RIVER	520,100	4,055
155	BUCCANEER	6,500	3,908
156	B) EMANCIPATION	?	3,829
157	IRON MASK	146,300	3,794
158	SCRANTON	8,960	3,766
159	WHITEWATER &	418,890	3,315
160	CARMI	5,480	2,994
161	KALAMAKA	7,260	2,898
162	B) BONANZA	724,190	2,783
163	THISTLE	6,920	2,760
164	SUSIE	7,860	2,639
165	ST. EUGENE	1,610,400	2,534
166	CRAIGMONT	33,067,900	2,503
167	VICTOR	111,500	2,455
168	B) BENSON LAKE	27,400	2,021
169	LILY-IKEDA	14,830	1,664
170	VICTORIA	1,050	1,476
171	EMERALD GLACIER	54,190	1,398
172	BIG SLIDE	7,600	1,282
173	INDIAN	14,180	1,258
174	RABBIT	1,430	1,057
175	EAST GOLD	30	1,019
176	PORTER-IDAHO	883,050	864
177	COLUMARIO	3,000	679
178	VIRGINIA	20,275	612
179	GLACIER	180	296
180	EARLY BIRD	180	280
181	ESPERANZA	4,980	256
182	HUNTER	290	238
183	WESTERN COPPER	230	171
184	TORBRIT	2,165,672	110
185	ATLIN RUFFNER	1,280	100
186	IMPERIAL	290	98
187	OUTSIDER	320,290	66
188	LUCKY LUKE	110	59
189	DRUMLUMMON	1,030	57
190	SOUTHEASTER	500	40
191	SILVER CUP,	6,620	34
192	LITTLE JOE	30	24
193	GOLDEN	140	16
194	TAYLOR-WINDFALL	610	15
195	MAID OF ERIN	3,620	10
196	INDEPENDENCE	?	5

NOTES

Province of British Columbia
Ministry of Energy, Mines and Petroleum Resources

BRITISH COLUMBIA GEOLOGICAL SURVEY

OPEN FILE MAP 1989-22

GOLD IN BRITISH COLUMBIA

COMPILED FEBRUARY 1989
BY T.G. SCHROETER, A. PANTELEYEV, C. LUND AND G. CARTER
GEOLOGICAL SURVEY BRANCH

SCALE 1: 2 000 000

KILOMETRES 50 0 50 100 150 200 KILOMETRES

LEGEND

GOLD PRODUCTION IN OUNCES	GOLD DEPOSITS GOLD IS PRINCIPAL COMMODITY.	GOLD-BEARING DEPOSITS GOLD IS PRESENT BUT NOT MAIN COMMODITY; COMMONLY SILVER-RICH AND/OR BASE METAL DEPOSITS.
OCCURRENCE-- no production to 10 ounces	•	•
10 to 1,000	•104	•109
1,000 to 10,000	○	△
10,000 to 100,000	○	△
100,000 to 1 MILLION	◯	△
>1 MILLION	●	▲

NUMBER REFERS TO DEPOSITS IN TABULATION.
IMPERIAL UNITS HAVE BEEN USED THROUGHOUT FOR HISTORIC PRODUCTION RECORDS; DATA SINCE 1975 ARE CONVERTED FROM METRIC RECORDS.

PRELIMINARY MAP -- SUBJECT TO REVISION

ORE RESERVES

Reserve data are taken from various sources, mainly MINFILE. The MINFILE reserve data include all categories, commonly unspecified, of ore reserves. The data have been accumulated from many different sources including incomplete records and promotional materials. Much of the reserve data can not be verified and is, therefore, NOT AUTHORITATIVE.

DEPOSIT LOCATIONS

Deposits are located as shown on MINFILE or other maps. Clustered deposits and areas with a high density of deposits can have increased spacing between individual deposits for diagrammatic purposes; locations in these areas are approximate.

SYMBOLS AND ABBREVIATIONS

DESIGNATED PLACER AREAS ('Historic' valid until 1988) .....

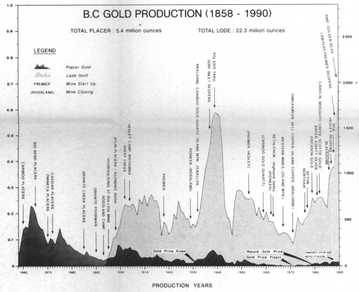
NATIONAL TOPOGRAPHIC SYSTEM (MAP QUADRANT)	NTS	LEAD	Pb
TONS PER DAY	T.P.D.	ZINC	Zn
INTERMITTENT PRODUCTION	Int.	MOLYBDENUM	Mo
ACTIVE MINE, 1984	*	COPPER	Cu
MINE REOPENED 1985	**	IRON	Fe
TONS	T	CADMIUM	Cd
MILLION TONS	m T	GOLD	Au
ESTIMATED AMOUNT	est.	SILVER	Ag
EQUIVALENT	equiv.	COBALT	Co
ANTIMONY	Sb	TIN	Sn
		ARSENIC	As

GOLD MINING IN BRITISH COLUMBIA

The first chronicled discovery of lode gold was in 1851 at Thetis Cove on the west coast of Moresby Island, Queen Charlotte Islands. Placer gold was purchased from Indians at Kamloops in 1852 and first mined from the mouth of the Nicoamen River, tributary to the Thompson River, above Lytton in 1857.

Peak lode production was in 1939 when 587,336 ounces (18 268 kilograms) was won from 188 producing deposits. The least gold production was in 1971 when 85,781 ounces (2 668 kilograms) of gold was recovered, mainly as a byproduct from base metal mining. During the early 1970s over 80 per cent of the gold was recovered as a byproduct, mainly from porphyry copper deposits. The dramatic price increases of gold and silver in 1979 regenerated mining of primary precious metal deposits. During 1980 to 1987 the proportion of byproduct gold increased to about 76 per cent of total production, the rest was won mainly from a number of small (around 200 tons per day) gold mining operations.

The average annual gold production from 1980 to 1987 has been about 270,305 ounces (7 317 kilograms).



B.C. MAJOR GOLD LODE PRODUCERS 1894-1987 — Table 1

RANK (CAMP)	NAME	MAP NUMBER	YEARS OF PRODUCTION	TONS MILLED	AU RECOVERED oz	AG RECOVERED oz	AU RESERVES oz	TOTAL INVENTORY (RES.+PROD) oz
	* still producing							
(1)	BRIDGE RIVER CAMP: (Bralorne, Pioneer, Wayside, Minto)	109	1899-1978	8,067,600	4,178,069	1,002,475	566,380	4,744,449
(2)	ROSSLAND CAMP: (Le Roi, Centre Star, War Eagle, Josie, etc.,)	86	1894-1974	6,199,799	2,745,260	3,440,800		2,745,260
3	PREMIER	23	1918-1976	4,670,018	1,804,218	40,803,280	476,000	2,280,218
(4)	HEDLEY CAMP: (Nickel Plate, Hedley, Mascot, French, Good Hope, etc.)	97	1904-1961, 1982,83,87*	4,432,849	1,678,080	219,485	1,006,152	2,684,212
(5)	CARIBOO-BARKERVILLE CAMP: (Cariboo Gold Quartz, Island Mtn, Aurum, Mosquito Creek)	66	1933-1987*	3,027,928	1,231,214	165,382	35,316	1,266,530
(6)	GREENWOOD CAMP: (Phoenix, Motherlode, Greyhound, BC, Emma, Oro Denoro, etc.,)	88	1900-1978	31,836,751	1,191,431	7,219,470	116,127	1,307,558
7	ISLAND COPPER	126	1971-1987*	242,349,305	797,008	5,821,247	245,000	1,042,008
8	(SHEEP CREEK CAMP: (Reno, Gold Belt, Kootenay Bell, Queen, Vancouver, Nugget)	83	1902-1981	1,688,943	761,456	293,105	73,590	835,046
(9)	SIMILKAMEEN:	102	1917-62,72-87*	142,389,475	589,093	7,256,986	46,538	635,631
10	BRITANNIA	112	1905-1977	52,783,960	493,069	5,815,395		493,069
11	LYNX,MYRA,W-W,	122	1966-1987*	8,725,756	467,292	21,477,985	965,860	1,433,152
12	SURF INLET	58	1917-20,36-43	1,012,060	388,881	201,210	19,950	408,831
13	AFTON	108	1977-1987*	26,921,822	382,889	2,279,754	314,070	696,959
14	BELL COPPER	48	1972-82,85-87*	60,488,981	290,819	777,670	280,000	570,819
(15)	YMIR CAMP: (Yankee Girl, Ymir, etc.,)	149	1899-1973	786,656	283,560	1,425,814	26,600	310,160
(16)	ZEBALLOS CAMP: (Privateer, Spud Valley, etc.,)	123	1933-1953,75	718,475	276,067	120,140	145,933	422,000
17	CASSIAR CAMP: (Taurus, Erickson Gold, Cusac, Eileen East, Plaza)	9	1979-1987*		257,287		204,802	462,089
18	POLARIS TAKU	7	1938-1951	753,250	231,603	11,760	70,422	302,025
19	EQUITY SILVER	52	1981-1987*	18,462,814	215,465	39,865,737	623,131	838,596
20	NORTHAIR	110	1976-1982	345,700	166,582	845,854	12,220	178,802
21	GRANISLE	49	1966-1982	57,498,131	148,000	1,906,000		148,000
22	OLD SPORT	124 A	1962-1973	2,929,494	126,386	377,165	10,000	136,386
23	AHTOR	31 A	1914-1936	23,948,410	121,298	6,633,087	54,000	175,298
(24)	TEXADA: (Little Billie, Texada Iron, Cornell, Marble Bay, Copper Queen)	117	1898-1976	23,282,705	106,508	1,286,650	27,584	134,092
25	SECOND RELIEF	186	1900-1959	228,203	100,234	27,856		100,234
	TOTAL OF TOP 20 PRODUCERS:			723,549,025	19,029,769	149,273,305	5,319,655	24,349,424

NOTE: "RESERVES" TO JAN.1/89 UNLESS OTHERWISE INDICATED

CARTOGRAPHY BY P. CHICORELLI