

Canadian Reserves of Selected Major Metals, and Recent Production Decisions

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RESERVES OF SELECTED MAJOR METALS

In 2003, Canadian reserves of copper, nickel, lead, zinc, molybdenum, silver and gold decreased by amounts that varied from 1% for gold to 18% for silver, continuing a trend of declining ore reserves that began in the early 1980s.

Reserves Policy

Canadian reserves are estimated from information contained in annual and other corporate reports, and from the responses of mining companies to the annual Federal-Provincial/Territorial Survey of Mines and Concentrators.

Reserves reported here include only metal contained in material that is classified by companies as “proven reserves” or “probable reserves” at producing mines and in deposits that are firmly committed to production (Table 2). Metal contained in mineral resources classified by companies as “measured resources,” “indicated resources” or “inferred resources” is not included in national totals, nor is metal contained in deposits that have not advanced beyond the deposit appraisal phase (Figure 1). When available, only metal contained in mineable ore is included in Canadian totals in order to exclude losses inherent in the mining process. Every effort is made to achieve, from year to year, consistency in the reserves reported here; however, consistency ultimately depends on industry practice, which has evolved over the years. Imperial units reported by companies have been converted to metric units and the results have been rounded to the appropriate number of significant digits.

Reserves by Commodity

Gold

There were 1009 t of gold contained in Canadian mine reserves in December 2003. This represents a decrease of 1% (14 t) compared to December 2002. Significant additions were made to the reserves at the Porcupine Joint Venture (37 t) at Timmins in Ontario and at the LaRonde mine (33 t) at Cadillac in Quebec, with smaller additions at the Macassa mine (19 t) at Kirkland Lake in Ontario and the Musselwhite mine (20 t) at Opapamiskan Lake in Ontario. The greatest reduction in gold reserves was due to the closure of the Sigma-Lamaque mine (39 t) at Val-d’Or in Quebec, together with the depletion of reserves at the Williams mine (17 t) at Hemlo in Ontario and at the Eskay Creek mine (15 t) near Stewart in British Columbia.

Silver

There were 9245 t of silver contained in Canadian mine reserves in December 2003. This represents a decrease of 18% (1985 t) compared to December 2002. The greatest reductions in silver reserves occurred at the Eskay Creek mine (679 t) at Stewart in British Columbia and at the LaRonde mine (520 t) at Cadillac in Quebec. The 777 mine (121 t) at Flin Flon in Manitoba was the only mine to report a significant increase in silver reserves during 2003.

Zinc

During 2003, Canadian reserves of zinc declined by about 0.6 Mt (9%) to a year-end total of approximately 6.3 Mt. The greatest reductions in zinc reserves occurred at the LaRonde mine (0.26 Mt) at Cadillac in Quebec, the Kidd Creek mine (0.21 Mt) at Timmins in Ontario, and the Brunswick mine (0.2 Mt) at Bathurst in New Brunswick. Reserves at the 777 mine at Flin Flon in Manitoba increased by 0.27 Mt.

Lead

Canadian reserves of lead decreased by approximately 14% during 2003 to 749 000 t. The Brunswick mine at Bathurst in New Brunswick has reserves sufficient to

FIGURE 1

GENERALIZED MODEL OF MINERAL RESOURCE DEVELOPMENT

PHASE	MINERAL RESOURCE ASSESSMENT	MINERAL EXPLORATION					MINERAL DEPOSIT APPRAISAL				MINE COMPLEX DEVELOPMENT	MINE PRODUCTION	ENVIRONMENTAL RESTORATION
		GRASS-ROOTS EXPLORATION					DA-1	DA-2	DA-3	DA-4			
		EX-1	EX-2	EX-3	EX-4	EX-5							
STAGE	MIRA Various surveys, research and synthesis. Supply information and tools to develop potential of the nation for economic benefit in the perspective of sustainable development.	EX-1 Exploration planning. Select target commodities. Establish exploration objectives and strategies. Select target areas. Acquire claims or permits if appropriate.	EX-2 Regional reconnaissance and surveys. Seek anomalies of interest over wide areas by various survey methods. Select the more promising targets. Acquire claims or permits.	EX-3 Prospecting and ground surveys of anomalies. Confirm the presence, exact location and characteristics of anomalies. Acquire claims, leases and properties.	EX-4 Verification of anomalies and showings. Investigate the cause of anomalies. Find mineral showings. Acquire claims, leases and properties.	EX-5 Discovery and delimitation of a mineral deposit. Discover, delimit and interpret grade, quality and tonnage of a deposit. Determine mineral characteristics of the deposit. Acquire all data required for project engineering and cost estimation.	DA-1 Mineral deposit definition. Define the limits, controls and internal distribution of grades, mineralogy and mineral processing characteristics of the deposit. Acquire all data required for project engineering and cost estimation.	DA-2 Project engineering. Determine, in an iterative fashion, the design, plans, estimates, cost and operating rates for all aspects of the project. Establish technical feasibility and costs thoroughly and realistically.	DA-3 Project economics. Obtain all the information required to determine the rate objectives for the project. Evaluate the social and political evaluation of the project.	DA-4 Feasibility study, production decision. Diligently validate and integrate project data, interpretations, estimates, plans and evaluations to achieve MCD and production objectives. Decide on whether to undertake the mining project. Obtain permits and financing.	MCD Mine development, construction of processing plant and infrastructure. Complete mine development and construction on schedule and within budgets and specifications. Ensure efficient and timely mine complex start-up according to schedule, specifications and cash flow forecasts.	MP Production, marketing and renewal of reserves. Achieve commercial production on schedule and meet cash flow forecasts and quality specifications. Achieve mine profitability and in the perspective of sustainable development.	ER Mine complex closure and decommissioning, site restoration. Restore mine site, outside plant and infrastructure to environmentally acceptable condition. Ensure the future quality of the environment.
EVALUATION METHODS	Geoscientific, mineral and economic surveys, research, compilations and synthesis by government, research institutes, universities and industry.	Metal and mineral market research. Review of geological and deposit information and of the legal, fiscal and socio-political context in various areas.	Remote sensing, aerial photography and airborne geophysics. Prospecting, geology and geochemistry. Appraisal, rating and selection of anomalies.	Ground, geological, geochemical and geophysical prospecting and surveys. Completion, appraisal and selection of significant anomalies.	Geological mapping and other surveys. Tracing, drilling and sampling. Appraisal of results, recommendations for further work, and selection of new targets.	Detailed mapping, sampling and drilling on surface or from underground. Systematic mineralogy and mineral processing tests. Environmental and site surveys. Detailed environmental and site feasibility studies.	Pilot tests, engineering design and planning. Capital and operating costs for mining, mineral processing, infrastructure, environmental protection and site restoration. Technical risk analysis. Pre-feasibility studies.	Market, prices, product development and financial studies. Environmental, economic, financial, and social-political risk analysis. Pre-feasibility studies.	Exhaustive due diligence review of all data, interpretations, plans and estimates. Evaluation of profitability, given the geological, technical, financial and qualitative risks, and the upside factors.	Project management methods in a quality assurance perspective. Training program for personnel and detailed start-up plan to meet the requirements of this demanding period.	Production management methods to ensure continuous quality and efficiency improvements. Exploration, deposit appraisal and development of new zones or deposits on-mine-site and off-mine-site.	Mine closure and decommissioning. Environmental restoration and monitoring.	
RESULTS	Maps, data bases, tools and models.	Exploration projects.	Regional anomalies.	Local anomalies.	Mineral showings.	Mineral deposit.	Deposit appraisal project.	Deposit appraisal project.	Mining project.	Mining complex.	Mineral production.	Restored site.	
MINERAL INVENTORY		UNDISCOVERED MINERAL POTENTIAL		HYPOTHETICAL		DELIMITED MINERAL RESOURCE		MINERAL RESERVE					
		SPECULATIVE		INFERRED RESOURCE		INDICATED		PROVEN AND PROBABLE					
ESTIMATION ERROR (targeted margin of error of tonnage/grade estimates at the 90% confidence level)		Low, but increasing multiple investments.		± 50% to ± 100%		Indicated: ± 50 to ± 30% Measured: ± 20 to ± 10% (often several sample grid dimensions are used in each category)		Proven (feasibility: ± 10%; mining: ± 5%)					
INVESTMENTS	Moderate	Low, but increasing multiple investments.		Very high, but decreasing risk of failure and financial loss.		Larger and increasing multiple investments.		Very large industrial investment.				Full compliance	
RISK LEVEL	Low	Very high, but decreasing risk of failure and financial loss.		High, but decreasing risk of failure.		Moderate to low industrial risk.							

Sources: Modified by D.A. Cranstone, A. Lemieux and M. Vallee, February 25, 1994, from M. Vallee, 1992, *Guide to the Evaluation of Gold Deposits*, CIM Special Volume 45, p. 4, and SOQUEM Annual Report, 1976-77, pp. 4 and 5. Revised by M. Vallee and G. Bouchard, January 2001.

For more information, please contact: Minerals and Mining Statistics Division, Programs Branch, Minerals and Metals Sector, Natural Resources Canada, 580 Booth Street, Ottawa, Ontario K1A 0E4; telephone (toll-free): 1-800-267-0452 or fax (toll-free): 1-877-336-3100.

continue production only until 2009, and the Myra Falls mine at Buttle Lake in British Columbia no longer reports lead values in its reserves.

Copper

In December 2003, Canadian reserves of copper were estimated at about 6.0 Mt, a decrease of about 11% (737 000 t) from a year earlier. The greatest decrease in copper reserves was due to the depletion and write-down of copper reserves at Inco's Ontario Division (434 000 t) and to the depletion of 178 000 t at the Highland Valley mine at Kamloops in British Columbia. This was partially replaced by the addition of 151 000 t at the 777 mine at Flin Flon, Manitoba.

Molybdenum

Canadian reserves of molybdenum stood at 78 000 t in December 2003, or about 4% lower than in the previous year. Reserves were reduced at the Highland Valley mine (3000 t) at Kamloops and at the Huckleberry mine (2000 t) at Houston, but reserves at the Endako mine at Fraser Lake were increased by 2000 t. All of the molybdenum mines are in British Columbia.

Nickel

In December 2003, there were some 4.3 Mt of nickel contained in Canadian mine reserves, a decrease of approximately 12% from 2002 levels. Reserves at Inco's Ontario Division at Sudbury decreased by 584 000 t. Reactivation of the McCreedy West mine at Sudbury in Ontario added 22 000 t to the nickel reserves, and the start of production at the Montcalm mine near Timmins in Ontario added 75 000 t.

Inco had some 3.5 Mt of nickel in Canadian reserves at the end of 2003, or about 81% of the national total.

Canadian Reserves by Province and Territory

Four provinces (Ontario, British Columbia, New Brunswick and Quebec) held dominant positions in terms of Canada's proven and probable mineable reserves of major metals in December 2003 (Table 4).

Ontario had 58% of the gold, 51% of the nickel and 48% of the copper, plus 23% of the silver and 21% of the zinc.

British Columbia had 100% of the molybdenum, 27% of the copper and 22% of the silver, plus 8% of the zinc and 12% of the gold.

New Brunswick had 94% of the lead, 28% of the zinc and 22% of the silver, plus 1% of the copper.

Quebec had 27% of the silver, 25% of the zinc, 25% of the gold, 12% of the nickel and 6% of the copper.

Manitoba had 19% of the zinc, 17% of the nickel and 5% of the gold, plus 9% of the copper and 6% of the silver.

Newfoundland and Labrador had 20% of the nickel, 8% of the copper, and 0.1% of the gold.

The Northwest Territories had 0.2% of the gold.

Nunavut had 0.5% of the gold and silver.

Canadian Reserves by Industry Classification

Canadian mines are, to a large extent, polymetallic, a complexity that the North American Industry Classification System (NAICS) tends to oversimplify (Table 5).

Current mine reserves of gold in Canada are distributed through the various NAICS classes as follows: Gold and Silver Ore Mining, 81%; Copper and Zinc Ore Mining, 13%; Nickel-Copper Ore Mining, 5%; Lead-Zinc Ore Mining, 0.2%; and Other Metal Ore Mining, 0.7%.

Current mine reserves of silver in Canada are distributed through the various NAICS classes as follows: Gold and Silver Ore Mining, 39%; Copper-Zinc Ore Mining, 31%; Nickel-Copper Ore Mining, 6%; and Lead-Zinc Ore Mining, 23%.

Current mine reserves of copper in Canada are distributed through the various NAICS classes as follows: Gold and Silver Ore Mining, 3%; Copper-Zinc Ore Mining, 43%; Nickel-Copper Ore Mining, 52%; Lead-Zinc Ore Mining, 1%; and Other Metal Ore Mining, 1%.

Current mine reserves of molybdenum in Canada are contained in the NAICS classes as follows: Copper-Zinc Ore Mining, 29%; and Other Metal Ore Mining, 71%.

Current mine reserves of nickel in Canada are contained 98% in the NAICS class of Nickel-Copper Ore Mining and 2% in the NAICS class of Other Metal Ore Mining.

Current mine reserves of lead in Canada are contained in the NAICS classes as follows: Copper-Zinc Ore Mining, 6%; and Lead-Zinc Ore Mining, 94%.

Current mine reserves of zinc in Canada are contained in the NAICS classes as follows: Gold and Silver Ore Mining, 16%; Copper-Zinc Ore Mining, 55%; and Lead-Zinc Ore Mining, 29%.

Apparent Life of Canadian Reserves

The apparent life (life index) of mine reserves is usually calculated by dividing the total amount of metals

remaining in mine reserves at the end of a given year by the corresponding amount of metals contained in the ores produced during that year. Similar calculations are often applied at the national level.

At the national level, life indices are but a very rough measure of the expected life of aggregate mine reserves and they are often misleading unless abnormal situations are recognized. Life indices based on proven and probable reserves do not make allowances for inferred extensions to reserves at current mines, gross additions that will accrue to current reserves from the likely development, in the foreseeable future, of known orebodies for which a production decision has yet to be made, or expected changes in production rates. Furthermore, life indices tend to overstate the apparent life of reserves when, for example, annual production is abnormally low due to strikes, cutbacks or suspensions at large establishments, or when significant increases in capacity resulting from new production decisions will be coming on stream, but only several years hence.

The apparent life indices for the major metals in Canada at the end of 2003 were 22 years for nickel, 9 years for copper, 6 years for molybdenum, 6 years for silver, 7 years for zinc, 7 years for gold, and 9 years for lead.

Reserve Trends

Figure 2 and Table 6 show how Canadian reserves of copper, nickel, lead, zinc, molybdenum and silver have declined since the early 1980s. In contrast, gold reserves increased substantially until 1988 before beginning to decline. In 2003, Canadian reserves of copper, nickel, lead, zinc, molybdenum, silver and gold decreased by amounts that varied from 1% for gold to 18% for silver, continuing a trend of declining ore reserves that began in the early 1980s.

The annual aggregate change in Canadian reserves is the net result of three main factors affecting individual mines (Figure 3): additions to reserves, deletions to reserves, and production. Additions to reserves are the result of new discoveries; of new geological, metallurgical, production or other information; of a decrease in production costs; or of a rise in commodity prices, all of which increase the quantity of mineral resources that is profitable to mine. Deletions to reserves are the result of new geological, metallurgical, production or other information; of increases in costs; or of decreases in commodity prices, all of which reduce the quantity of mineral resources previously counted in mine reserves that are now expected to be mined at a profit. Production was the main factor reducing the reserves at individual mines in 2003.

RECENT PRODUCTION DECISIONS

Several criteria need to be met for a project to be considered here to have reached the production decision stage. In general, there needs to have been a positive production feasibility study, all of the necessary permits must have been obtained, financing must have been arranged, and directors must have approved construction.

The Montcalm mine near Timmins, Ontario, was committed to production by Falconbridge Limited in late 2003, adding 75 000 t of nickel and 36 000 t of copper to the reserves. Also in 2003, the McCreedy West mine at Sudbury, Ontario, was reactivated by FNX Mining Company Inc. and Dynatech Corporation. The ore reserves at the McCreedy West mine at the end of 2003 were approximately 22 000 t of nickel and 10 000 t of copper.

OUTLOOK

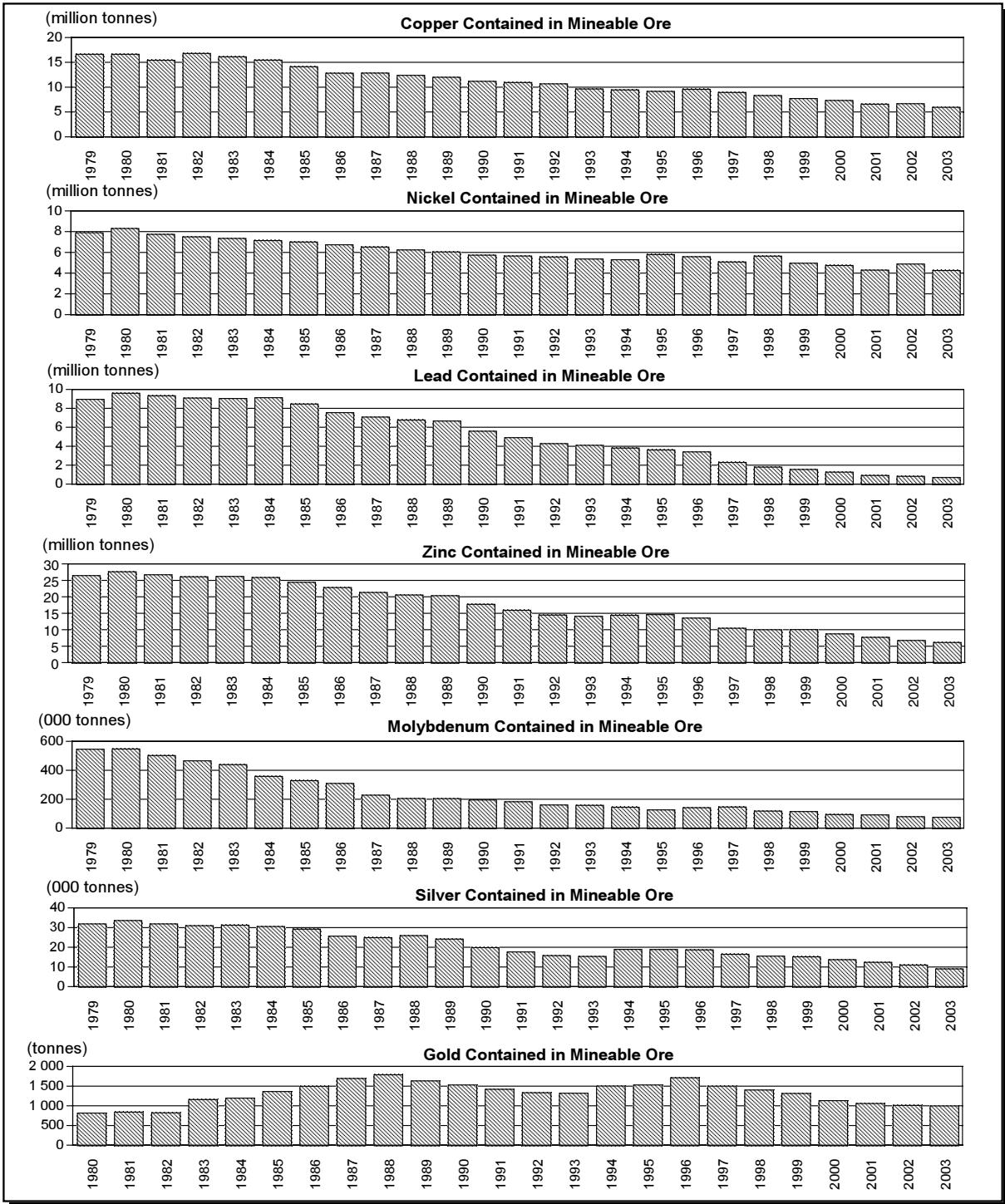
Although the Gibraltar copper-molybdenum mine resumed production in 2004 near Williams Lake in British Columbia, and although the prices paid for most of the metals covered in this chapter strengthened during 2004, it is probable that mine reserves of precious metals and most base metals will decline further during 2005.

Notes: (1) For definitions and valuation of mineral production, shipments and trade, please refer to Chapter 64. (2) Information in this review was current as of April 29, 2005. (3) This and other reviews, including previous editions, are available on the Internet at www.nrcan.gc.ca/mms/cmy/2004CMY_e.htm.

NOTE TO READERS

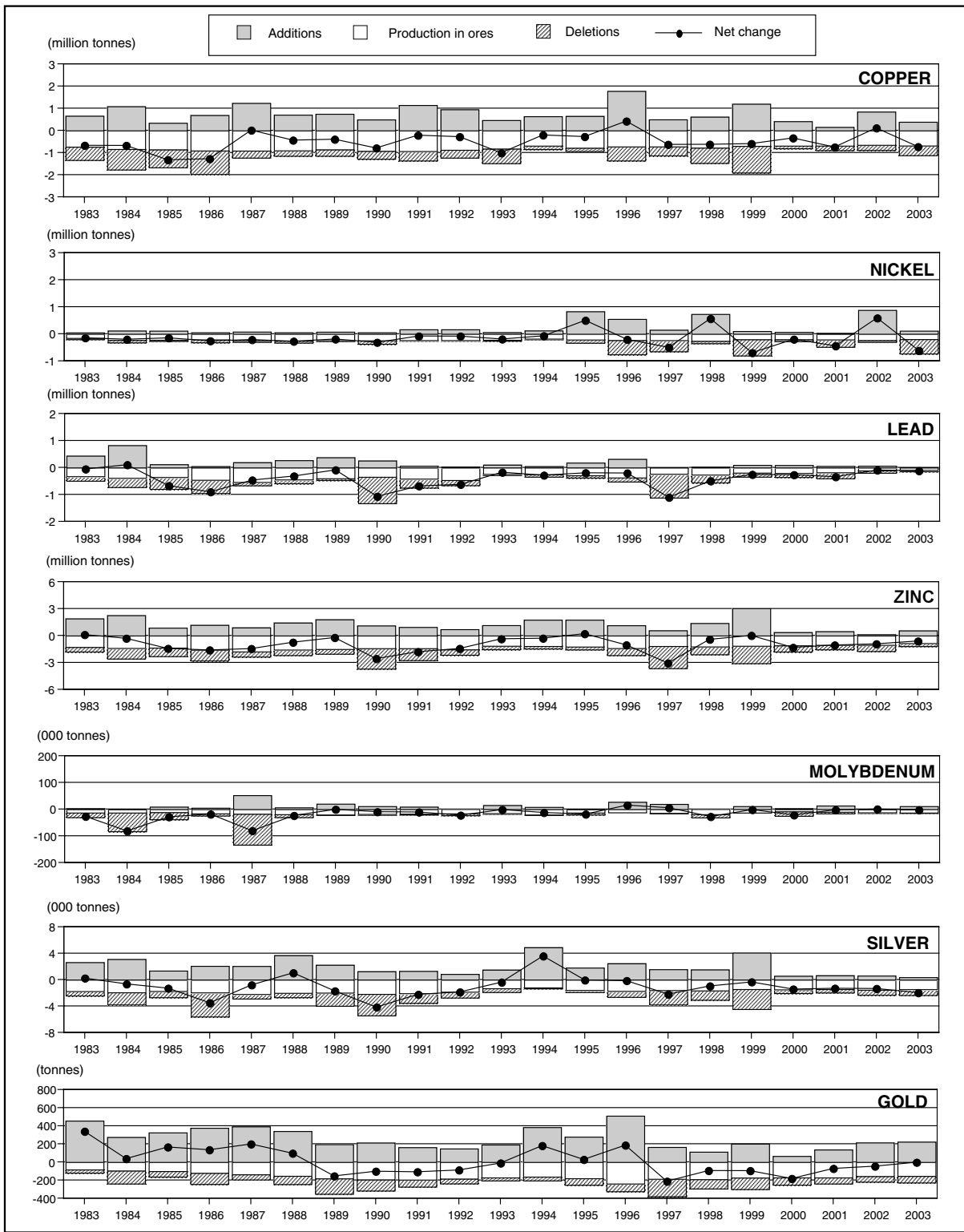
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Figure 2
Canadian Reserves of Selected Major Metals, 1979-2003
 Metal Contained in Proven and Probable Mineable Ore in Operating Mines and Deposits Committed to Production, as at December 31 of Each Year



Source: Natural Resources Canada, based on company reports and the federal-provincial/territorial survey of mines and concentrators.
 Note: This series was revised during 1996.

Figure 3
Main Components of Change in Canadian Reserves of Selected Major Metals, 1983-2003



Source: Natural Resources Canada.

TABLE 1. MAIN COMPONENTS OF CHANGE DURING 2003 IN CANADIAN RESERVES OF SELECTED MAJOR METALS

Metal	Units	Revised Opening Metal Balance, January 2003	Metal in Ore Mined During 2003	Metal Apparently Written Off During 2003	Metal in New Reserves Found During 2003	Net Change During 2003	Closing Metal Balance, December 2003	% Change During 2003
Copper	000 t	6 774	-685	-436	384	-737	6 037	-11
Nickel	000 t	4 920	-193	-535	111	-617	4 303	-13
Lead	000 t	872	-87	-51	16	-123	749	-14
Zinc	000 t	6 871	-851	327	557	-621	6 251	-9
Molybdenum	000 t	82	-13	-1	11	-3	78	-4
Silver	t	11 230	-1 454	-886	355	-1 985	9 245	-18
Gold	t	1 023	-154	-72	223	-4	1 009	-1

Source: Natural Resources Canada, based on company reports and the federal-provincial/territorial survey of mines and concentrators.

TABLE 2. TONNAGES AND GRADES OF OPERATIONS INCLUDED IN CANADIAN RESERVES OF SELECTED MAJOR METALS, AS AT JANUARY 1, 2004

Tonnages classified by companies as "resources" are not included, nor are tonnages for which there is not a firm production decision. Confidential data have been suppressed from the details of this report.

	Tonnes	Grade						
		Cu	Ni	Pb	Zn	Mo	Ag	Au
		(%)	(%)	(%)	(%)	(%)	(g/t)	(g/t)
NEWFOUNDLAND AND LABRADOR								
Hammerdown								
Richmont Mines Inc.								
Proven	27 216							12.69
Probable	13 608							12.69
Voisey's Bay								
Inco Limited								
Proven	28 000 000	1.77	3.02					
Probable	2 000 000	0.55	0.77					
NEW BRUNSWICK								
Brunswick No. 12 Underground								
Noranda Inc.								
Proven	16 730 000	0.37		3.67	9.11		100.30	..
Probable	2 452 000	0.23		3.63	9.11		90.90	..
QUEBEC								
Beaufor								
Richmont Mines Inc.								
Louvem Mines Inc.								
Proven	203 209						..	7.39
Probable	635 029						..	7.95
Bell Allard								
Noranda Inc.								
Proven	689 000	1.08			15.25		38.20	0.42
Bouchard-Hébert								
Breakwater Resources Ltd.								
Proven and probable	1 126 000	0.40			6.10		27.00	0.90
Doyon								
Cambior inc.								
Proven	3 135 000						..	5.30
Probable	3 622 000						..	6.20
Joe Mann								
Campbell Resources Inc.								
Proven	169 063	..					3.43	9.19
Probable	324 627	10.08
Langlois								
Breakwater Resources Ltd.								
Proven and probable	3 323 000	0.80			10.80		52.00	0.10
LaRonde								
Agnico-Eagle Mines Limited								
Proven	6 212 401	0.42			4.24		85.37	3.09
Probable	31 528 298	0.31			2.32		50.40	4.46
Louvicourt								
Aur Resources Inc.								
Novicourt Inc.								
Teck Corporation								
Proven	1 629 000	2.76			1.96		23.80	0.85
Probable	12 000	0.16			9.42		48.30	0.99
Raglan								
Falconbridge Limited								
Proven	8 308 000	0.77	2.86					
Probable	9 355 000	0.80	2.86					

TABLE 2 (cont'd)

	Tonnes	Grade						Au (g/t)
		Cu (%)	Ni (%)	Pb (%)	Zn (%)	Mo (%)	Ag (g/t)	
QUEBEC (cont'd)								
Sleeping Giant								
Aurizon Mines Ltd.								
Cambior inc.								
Proven	150 000						..	11.20
Probable	268 000						..	12.10
Troilus								
Inmet Mining Corporation								
Proven	4 870 000	0.10					1.10	0.60
Probable	31 660 000	0.10					1.10	0.90
ONTARIO								
Campbell								
Placer Dome Inc.								
Proven	696 000						..	17.60
Probable	2 820 000						..	11.40
David Bell								
Homestake Canada Inc.								
Teck Cominco Limited								
U/G Proven	2 380 000						..	10.60
Eagle River								
River Gold Mines Ltd.								
Proven	369 000						..	11.20
Probable	899 000						..	9.50
Falconbridge Sudbury Integrated Nickel Operations								
Falconbridge Limited								
Proven	5 588 000	1.34	1.40					
Probable	8 503 000	1.24	1.22					
Golden Giant								
Newmont Mining Corporation								
Probable	997 903						..	10.29
Holloway								
Newmont Mining Corporation								
Proven	793 152						..	5.83
Probable	1 090 436						..	6.86
Holt-McDermott								
Barrick Gold Corporation								
Proven	28 123						..	5.52
Probable	280 320						..	5.55
Inco Ontario Division								
Inco Limited								
Proven	90 000 000	1.66	1.42				..	0.29
Probable	52 000 000	1.42	1.16				..	0.45
Kidd Creek								
Falconbridge Limited								
Proven	8 239 000	2.23		0.19	7.00		53.00	
Probable	12 585 000	1.86		0.24	5.60		71.00	
Lac des Iles (Palladium-Platinum)								
North American Palladium Ltd.								
O/P Proven	25 812 000	0.06	0.08					0.14
O/P Probable	10 391 000	0.07	0.08					0.16
U/G Probable	3 542 000	0.07	0.08					0.35
Macassa								
Kirkland Lake Gold Inc.								
Proven	531 973						..	14.40
Probable	666 962						..	17.83
McCreedy West								
Dynatec Corporation								
FNX Mining Company Inc.								
Reserves contact	1 122 278	0.23	1.91					
Reserves footwall	107 955	6.83	0.75					0.04
Mishi								
River Gold Mines								
Proven	44 000							3.80
Probable	149 000							5.40
Montcalm								
Falconbridge Limited								
Probable	5 113 000	0.71	1.46					

TABLE 2 (cont'd)

	Tonnes	Grade						
		Cu	Ni	Pb	Zn	Mo	Ag	Au
		(%)	(%)	(%)	(%)	(%)	(g/t)	(g/t)
BRITISH COLUMBIA (cont'd)								
Eskay Creek								
Barrick Gold Corporation								
Shipping	248 264						3 015.00	56.40
Milling	592 631						1 013.00	25.77
Highland Valley								
Teck Cominco Limited								
Highmont Mining Company								
Proven	203 300 000	0.42			
Probable	49 000 000	0.43			
Huckleberry								
Imperial Metals Corporation								
Mitsubishi-Dowa-Furukawa-Marubeni								
Probable	25 018 000	0.51				0.01	2.97	0.06
Kemess								
Northgate Minerals Corporation								
Proven	91 715 448	0.23						0.70
Mount Polley								
Imperial Metals Corporation								
Bell Probable	5 538 829	0.33						0.35
Springer Probable	24 617 500	0.37						0.34
Myra Falls								
Breakwater Resources Ltd.								
Proven and Probable	7 747 000	1.20			6.30		40.00	1.20
NORTHWEST TERRITORIES								
Giant Open Pit - Giant Underground								
Miramar Mining Corporation								
Proven	20 000						..	13.70
Probable	116 000						..	11.70
NUNAVUT								
Lupin								
Kinross Gold Corporation								
Proven	310 000						..	7.38
Probable	248 000						..	10.25

Source: Natural Resources Canada, based on published company reports.

.. Not available in published reports or estimated by author.

Notes: One tonne (t) = 1.1023113 short tons. One gram per tonne (g/t) = 0.02916668 troy oz per short ton.

**TABLE 3. PRODUCTION DECISIONS ADDED TO CANADIAN RESERVE TOTALS
AS AT DECEMBER 31, 2003**

Project	Operators and Major Partners	Province	Metals
McCreedy West	FNX Mining Company Inc. Dynatec Corporation	Ont.	Nickel, copper
Montcalm	Falconbridge Limited	Ont.	Nickel, copper

Source: Natural Resources Canada, based on company reports.

TABLE 4. CANADIAN RESERVES OF SELECTED MAJOR METALS BY PROVINCE AND TERRITORY, AS AT DECEMBER 31, 2003
Metal Contained in Proven and Probable Mineable Ore (1) in Operating Mines (2) and Deposits Committed to Production

Metal	Units (3)	N.L.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	B.C.	Yukon	N.W.T.	Nunavut	Canada (5)
Copper	000 t	507	—	68	384	2 902	554	20	1 602	—	—	—	6 037
Nickel	000 t	861	—	—	505	2 192	745	—	—	—	—	—	4 303
Lead	000 t	—	—	703	2	46	—	—	—	—	—	—	749
Zinc	000 t	—	—	1 747	1 561	1 281	1 166	8	488	—	—	—	6 251
Molybdenum	000 t	—	—	—	—	—	—	—	78	—	—	—	78
Silver	t	—	—	2 051	2 450	2 087	587	4	2 065	—	—	1	9 245
Gold (4)	t	1	—	1	250	581	47	6	117	—	2	5	1 009

Source: Natural Resources Canada, based on company reports and the federal-provincial/territorial survey of mines and concentrators.

— Nil or less than one unit.

(1) No allowance is made for losses in milling, smelting and refining. Excludes material classified as "resources." (2) Includes metal in mines where production has been suspended temporarily.
(3) One tonne (t) = 1.1023113 short tons = 32 150.746 troy oz. (4) Excludes metal in placer deposits because reserves data are generally unavailable. (5) May not balance due to rounding at the provincial/territorial level.

TABLE 5. CANADIAN RESERVES OF SELECTED MAJOR METALS BY INDUSTRY, AS AT DECEMBER 31, 2003
Metal Contained in Proven and Probable, Mineable Ore (1) in Operating Mines (2), and Deposits Committed to Production

SIC no. (5)	(Units (3))	Copper, Copper-Zinc Mines		Nickel-Copper Mines	Zinc-Lead-Silver Mines	Molybdenum Mines	Miscellaneous Metal Mines	Canada (6)
		611	612	613	614	615	619	
		161	2 623	3 119	72	36	25	6 037
Copper	000 t	—	—	4 197	—	75	32	4 303
Nickel	000 t	—	46	—	703	—	—	749
Lead	000 t	995	3 440	—	1 816	—	—	6 251
Zinc	000 t	—	23	—	—	56	—	78
Molybdenum	000 t	3 577	2 861	725	2 082	—	—	9 245
Silver	t	815	134	51	2	—	7	1 009
Gold (4)	t							

Source: Natural Resources Canada, based on company reports and the federal-provincial/territorial survey of mines and concentrators.

— Nil or less than one unit.

(1) No allowance is made for losses in milling, smelting and refining. Excludes material classified as "resources." (2) Includes metal in mines where production has been suspended temporarily. (3) One tonne (t) = 1.1023113 short tons = 32 150.746 troy oz. (4) Excludes metal in placer deposits because reserves data are generally unavailable. (5) SIC = Standard Industrial Classification. (6) May not balance due to rounding at the SIC level.

TABLE 6. CANADIAN RESERVES OF SELECTED MAJOR METALS AS AT DECEMBER 31 OF EACH YEAR, 1977-2003
Metal Contained in Proven and Probable Mineable Ore (1) in Operating Mines (2) and Deposits Committed to Production

Year	Copper	Nickel	Lead	Zinc	Molybdenum	Silver	Gold (3)
	(000 t)	(000 t)	(000 t)	(000 t)	(000 t)	(t)	(t)
1977	16 914	7 749	8 954	26 953	369	30 991	493
1978	16 184	7 843	8 930	26 721	464	30 995	505
1979	16 721	7 947	8 992	26 581	549	32 124	575
1980	16 714	8 348	9 637	27 742	551	33 804	826
1981	15 511	7 781	9 380	26 833	505	32 092	851
1982	16 889	7 546	9 139	26 216	469	31 204	833
1983	16 214	7 393	9 081	26 313	442	31 425	1 172
1984	15 530	7 191	9 180	26 000	361	30 757	1 208
1985	14 201	7 041	8 503	24 553	331	29 442	1 373
1986	12 918	6 780	7 599	22 936	312	25 914	1 507
1987	12 927	6 562	7 129	21 471	231	25 103	1 705
1988	12 485	6 286	6 811	20 710	208	26 122	1 801
1989	12 082	6 092	6 717	20 479	207	24 393	1 645
1990	11 261	5 776	5 643	17 847	198	20 102	1 542
1991	11 040	5 691	4 957	16 038	186	17 859	1 433
1992	10 755	5 605	4 328	14 584	163	15 974	1 345
1993	9 740	5 409	4 149	14 206	161	15 576	1 333
1994	9 533	5 334	3 861	14 514	148	19 146	1 513
1995	9 250	5 832	3 660	14 712	129	19 073	1 540
1996	9 667	5 623	3 450	13 660	144	18 911	1 724
1997	9 032	5 122	2 344	10 588	149	16 697	1 510
1998	8 402	5 683	1 845	10 159	121	15 738	1 415
1999	7 761	4 983	1 586	10 210	119	15 368	1 326
2000	7 419	4 782	1 315	8 876	97	13 919	1 142
2001	6 666	4 335	970	7 808	95	12 593	1 070
2002	6 774	4 920	872	6 871	82	11 230	1 023
2003	6 037	4 303	749	6 251	78	9 245	1 009

Source: Natural Resources Canada, based on company reports and the federal-provincial/territorial survey of mines and concentrators.

(1) No allowance is made for losses in milling, smelting and refining. Excludes material classified as "resources."

(2) Includes metal in mines where production has been suspended temporarily. (3) Excludes metal in placer deposits because reserves data are generally unavailable.

Note: One tonne (t) = 1.1023113 short tons = 32 150.746 troy oz.