

### B.C. Zinc Deposits

The British Columbia Ministry of Energy, Mines and Petroleum Resources' MINFILE database lists 3814 zinc-bearing occurrences in the province. Those with mineral inventories are listed as current producers (1), past producers (876), developed prospects (201) and prospects (754). Total zinc production (1905-2005) from 64 mines is approximately 10 Mt, valued at over \$6 billion. The top 13 deposits account for over 99% of total production. Many older mines did not recover zinc as a byproduct, due primarily to its low value at the time. The **Sullivan** mine accounted for nearly 80% of the province's total zinc production. Total existing in-ground resources in 90 deposits are estimated at 10.5 Mt of zinc.

**Carbonate-hosted** deposits are believed to be Paleozoic in age. Kootenay Arc ones averaged between 6 and 7 Mt grading 3-4% Zn, 1-2% Pb and 3-4g/t Ag. The Robb Lake breccia deposits are referred to as Mississippi Valley-type.

Shale-hosted **Sedex** deposits are Middle Proterozoic (e.g. Sullivan) or Devonian-Mississippian (i.e. Gataga Belt deposits) in age. The **Sullivan** deposit, one of the largest deposits of this type ever discovered, milled 150.5 Mt of ore grading 5.7% Zn, 6.6% Pb and 7g/t Ag between 1909 and 2001. The Gataga deposits in the northeast typically contain 15-50 Mt grading 6-15% Zn, 2-4% Pb and 20-45g/t Ag.

**Besshi** types are Cambrian, Mississippian-Permian and Late Triassic in age. Deposits range in size from 1 Mt to almost 300 Mt (i.e. Windy Craggy). In southeast Alaska, the late Triassic age Greens Creek deposit had a resource in excess of 24 Mt grading 13.9% Zn, 5.1% Pb, 734g/t Ag and 5.8g/t Au.

**Kuroko/Noranda** types are typically Devonian in age. Deposits range from less than 1-2 Mt to more than 10 Mt. The largest, **Myra Falls**, has a combined tonnage in excess of 30 Mt grading approximately 1.2% Cu, 7% Zn, 0.5 Pb, 50g/t Ag and 1.3g/t Au.

**Cyprus** types are primarily Mississippian-Permian or Late Triassic in age. Published resources average 1.6 Mt grading 1.7% Cu, 0-2.1% Zn, 0-1.9g/t Au and 0-33g/t Ag.

**Polymetallic vein** types are Proterozoic or younger; mainly Cretaceous to Tertiary in age. Over 2000 occurrences provided significant sources of metals until the 1960s. For deposits larger than 20,000 tonnes, the average size is 160,000 tonnes grading 2.66% Zn, 3.47% Pb, 304g/t Ag, 0.09% Cu and 4g/t Au.

**Broken Hill** types are Late Proterozoic to Cambrian in age. Known deposits range in size from less than 1-6.5 Mt; geological resources may be considerably larger. Grades range from 2-5% Zn, 2.5-6.5% Pb and up to 50g/t Ag.

**Mantos and skarns** are Cretaceous to Eocene in age. Individual deposits average 1 Mt grading tens to hundreds of grams/tonne Ag and 5-20% combined Pb-Zn. Some 80 Pb-Zn, generally small, skarn occurrences have been identified.



### SULLIVAN

- \* Operated by Cominco Ltd (now Teck Cominco Ltd)
- \* 1892 - discovery; 1900 - mining started; average employment > 1000
- \* Longest-lived, continuous mining operation in Canadian history, and one of the world's largest Sedex Zn-Pb-Ag deposits [ $> 160$  Mt @ 5.6% Zn, 6.5% Pb and 67g/t Ag]
- \* Production (1900-2001): 150.5 Mt milled
  - Zn: 7.945 Mt      Cu: 5.1 Mkg
  - Pb: 8.378 Mt      Cd: 3.1 Mkg
  - Ag: 9264 Mkg      Sb: 0.41 Mkg
  - Sn: 9.7 Mkg      Bi: 0.02 Mkg
- valued at > \$20 billion, plus an estimated \$60 billion in gross products to the BC economy
- salaries and benefits averaged \$68,000/yr



### CIRQUE

- \* Owned by Cirque Operating Co. (Teck Cominco and Korea Zinc)
- \* Major Sedex deposit in the Gataga Belt, NEBC
- \* 1977 - discovery; to 1991 - 58,000m drilling, plus 1300m drifting
- \* \$60M spent on exploration to date
- \* 1992 - project received a Mine Development Certificate
- \* 1995 - estimated capital cost of \$300M for a 4000 tpd open-pit mine with a life of 12 years
- \* 2000 - project put on "enhanced care and maintenance"
- \* Mineral Inventory ~ 50 Mt grading 10% combined Zn-Pb
- \* Mineral Reserves: 24.7 Mt grading 8.5% Zn, 2.3% Pb and 50.8g/t Ag

#### For more information:

[www.em.gov.bc.ca/Mining/Geolsurv](http://www.em.gov.bc.ca/Mining/Geolsurv) (604) 660-2812

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# Zinc in British Columbia



Banded sulphide ore (Sullivan)

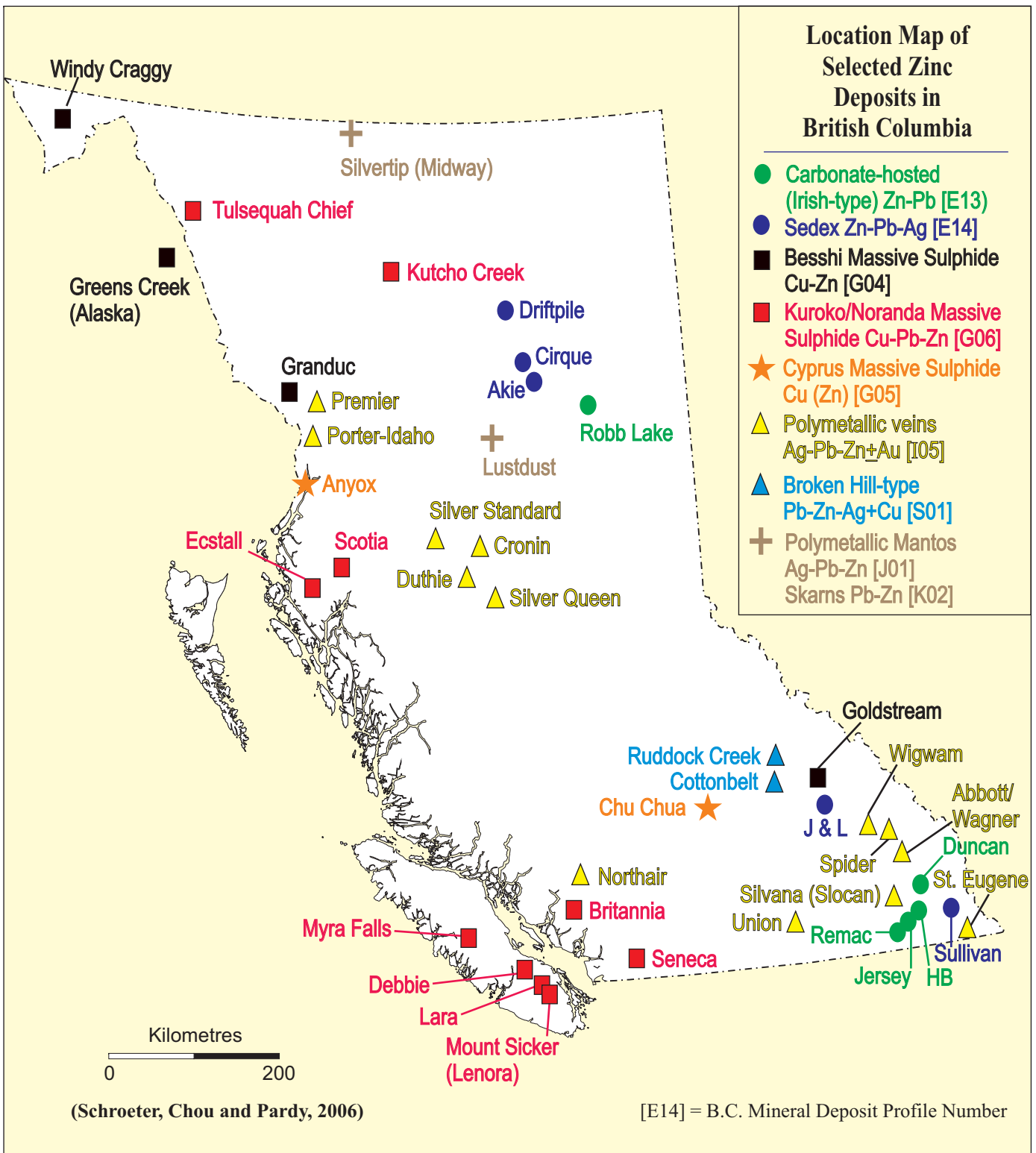


Banded sulphide ore (Myra Falls)



Ministry of Energy, Mines and Petroleum Resources

Information Circular 2006-4



### Selected B.C. Zinc Producers (1905-2005) By Rank

Mine * = current	Milled t (x10 <sup>3</sup> )	Zinc t (x10 <sup>3</sup> )	Silver kg (x10 <sup>3</sup> )	Lead t (x10 <sup>3</sup> )	Copper t (x10 <sup>3</sup> )	Gold kg (x10 <sup>3</sup> )	Others
Sullivan	150,500	7,995	9,264	8,412	5.1	.175	Sn, Cd, Sb, Bi
*Myra Falls	18,319	825.4	408,212	20.4	314	20.9	Cd
Britannia	47,463	125.3	180.9	15.6	517	15.4	Cd
Tulsequah Chief	934	56.6	105.8	12.2	12.3	2.9	Cd
Spider	124	11.5	53.5	10.9	.09	.04	Cd, Sb
Goldstream	2,211	8	26.2		78.3	.04	Cd, Sb
Premier	5,877	8	1,333	24.8	1.9	62.2	Cd
Northair	475	7.3	26.3	5.3	.4	5.2	Cd
Silver Queen	191	5.1	13.7	.7	.4	0.1	Cd
Lenora	120	1.9	10.7	.2	3.6	.4	Cd

Note: Total zinc production from 64 past producers ~ 9 million tonnes

### Selected B.C. Zinc Resources (2005) By Rank

Mine * = current	Category t (x10 <sup>6</sup> )	% Zn	% Cu	% Pb	g/t Au	g/t Ag	Contained Zn t (x10 <sup>3</sup> )
Cirque	M. 18.5	8.1		2.2			3,598
	Ind. 24.7	8.5		2.3		50.8	
Akie	Inf. 12	8.6		1.5		17.1	1,032
	Ind. 2.44	11.9		3.1			
Driftpile	Inf. 2.44			2.4			0.726
	Ind. 18.15						
Kutcho Creek	M. + Ind. 14.2	2.44	1.86		0.39	32.7	0.680
	M. + Ind. 2	2.93	5.5		0.63	69	
	Inf. 5.5	1.23	1.91		0.17	18.1	
Robb Lake	M. 6.45	7.11					0.460
Tulsequah Chief	M. + Ind. 5.38	6.73	1.41	1.32	2.73	100.8	0.445
	Inf. 1.54	5.44	1.13	1.07	2.23	85.1	
	M. 6.39	6.7	1.1		1.4	49	
*Myra Falls	M. 6.39	6.7	1.1		1.4	49	0.430
Red Bird	Ind. 2.18	18.5		6.5		68.5	0.400
	Ind. 0.633	3.54		2.14		20	
Wigwam	Ind. 0.633	3.54		2.14			0.290
	Inf. 7.7	3.54		2.14			
Duncan	Ind. 9	2.9		2.7			0.260

Note: 90 deposits have been outlined with resources (all categories) of approximately 10.5 million tonnes of zinc.

■ 43-101 Compliant M = measured; Inf = inferred; Ind = indicated