

# Zinc

The Yukon is well-endowed with zinc deposits and has high potential for new discoveries in a variety of geological environments (sedimentary-exhalative, volcanic-hosted massive sulphide, Mississippi Valley and skarn settings).

Much of the eastern Yukon is underlain by the Selwyn Basin, a Neoproterozoic-Mississippian depositional basin that is characterized by off-shelf deep water anoxic shales in a basin bounded by platform carbonates. Three major periods of sedimentary-exhalative sulphide deposition have been recognized, including the Cambrian-aged Anvil camp, Silurian-aged Howard's Pass camp, and the Devonian-aged MacMillan Pass camp. The Anvil District contains five known pyritic massive sulphide deposits, with a total pre-production mineral inventory of 120.1 million tonnes averaging 9.3% combined lead-zinc; Howard's Pass has a combined inventory of 120 million tonnes averaging 7.5% combined lead-zinc, and this deposit is not completely defined and contains over 500 million tonnes of a lower grade zinc resource. These large mineral inventories, together with the continuous stratigraphy, bode well for the further mineral potential of the Selwyn Basin.



Volcanic-hosted massive sulphide (VMS) deposits (e.g., the Marg deposit) are also known to occur in the Selwyn Basin, and more recently were discovered in variably metamorphosed Upper Paleozoic sedimentary and volcanic rocks of the Yukon-Tanana Terrane. The massive sulphide deposits formed in continental-arc and back-arc-basin settings during rifting from the continental margin. Since the initial discovery of the Kudz Ze Kayah deposit by Cominco in 1994, four additional deposits (GP4F, Wolverine, Fyre and Ice) and numerous occurrences have been discovered in the Finlayson Lake district of southeastern Yukon. The two most promising zinc deposits, Kudz Ze Kayah and Wolverine, contain 11 million tonnes of over 8% combined zinc-lead-copper and 5 million tonnes over 15% combined zinc-lead-copper, respectively, each with precious metal values. The nature of VMS deposits to occur in clusters is indicative of high

potential in the Yukon-Tanana Terrane. Recent 1:50,000-scale regional mapping by the Yukon Geological Survey in the Finlayson Lake district has defined the stratigraphy hosting the VMS deposits. This increased understanding of the Yukon-Tanana Terrane, and the availability of airborne geophysical data in other areas of Yukon underlain by the Yukon-Tanana Terrane, will aid in the exploration for similar deposits in other areas of Yukon.

Several Mississippi Valley-type deposits and showings are hosted in Proterozoic carbonate rocks in northern Yukon. Skarn and replacement zinc mineralization, such as that at the Sa Dena Hes mine, is associated with Cretaceous plutons intruding the Paleozoic carbonate platforms of the continental margin. Exploration interest for both of these deposit types is increasing due to their favourable metallurgical qualities.

## \$5 million exploration

Banded sphalerite-galena mineralization from drill core of the Howard's Pass deposit. A \$5 million exploration drilling program is being conducted in 2005 on this sedimentary-exhalative deposit.







Sulphide mineral blast in Faro mine open pit, June, 1979. The deposit produced over 50 million tonnes of ore grading 4.7% Zn, 2.1% Pb, and 36 g/t Ag.

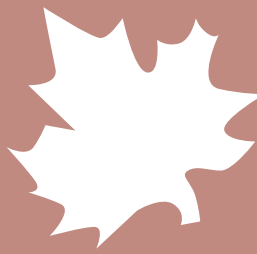
Silver-lead-zinc-copper breccia from the Blende property, north of Mayo.



Drilling near the Wolverine high-grade zinc-silver VMS deposit. Feasibility studies, including test mining are currently underway.

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Canada's Yukon





# Zinc targets in Yukon



- Insular
- Yukon-Tanana Terrane
- Selwyn Basin
- Other Sedimentary Basins
- Cassiar Platform
- North American Platform



- Deposit
- Deep Water Port
- Occurrence
- International Airport
- Existing Roads
- Yukon-Tanana Terrane
- Selwyn Basin

## Sediment-associated (sedimentary-exhalative) zinc deposits

<b>Deposit</b> Owner/optioned to/contact	<b>Zone(s)</b> Year resource-reserve was calculated/reference	Mineral resource-reserve category‡/ Tonnage@ grade/commodity	Status Yukon MINFILE no.**
<b>Howard's Pass</b> Placer Dome (CLA) Limited <i>Optioned to:</i> Pacifica Resources Ltd. 1710-1177 Hastings Street W Vancouver, British Columbia Canada V6E 2L3 Telephone: 604-682-5474	<b>XY zone</b> 1983 EMR Mineral Bulletin MR 213, p. 313  <b>Anniv zone</b> 1983 EMR Mineral Bulletin MR 213, p. 313	Historical calculation 59 Mt@ 5.4% Zn, 2.1% Pb  Historical calculation 61 Mt 5.4% Zn, 2.1% Pb	<i>Deposit, active in 2005. \$5 million exploration drilling program planned.</i>  1972: discovery. 1973: winter road and airstrip construction. 1977: road building. 1980-81: underground development. 1991: site cleanup. Completion of over 34 600 m of drilling on XY and Anniv zones.  105I 012/037
<b>Faro</b> <i>In receivership:</i> Wes Treleaven Senior Vice President Deloitte and Touche Inc. 1900-79 Wellington Street W Toronto, Ontario Canada M5K 1B9 Telephone: 416-601-4482 E-mail: wtreleaven@deloitte.ca	<b>Total</b> 1983 CIM Special Volume 37, p. 319-381	Geological resource Pre-production 57.6 Mt @ 4.7% Zn, 3.4% Pb, 36 g/t Ag	<i>Deposit mined out. Currently on care and maintenance.</i>  1965: discovery. 1965-1969: exploration. 1969-1992: production with some hiatus intervals.  105K 061
<b>Swim</b> <i>In receivership:</i> Wes Treleaven Senior Vice President Deloitte and Touche Inc. 1900-79 Wellington Street W Toronto, Ontario Canada M5K 1B9 Telephone: 416-601-4482 E-mail: wtreleaven@deloitte.ca	<b>Total</b> 1983 CIM Special Volume 37, p. 319-381	Historical calculation 4.3 Mt@ 4.7% Zn, 3.8% Pb, 42 g/t Ag	<i>Deposit, care and maintenance.</i>  1964: discovery. 1964-1976: exploration. Total of 10 150 m of drilling. Deposit is roughly 460 m long and 150 m wide, with an average thickness of 21 m.  105K 046
<b>Vangorda</b> <i>In receivership:</i> Wes Treleaven Senior Vice President Deloitte and Touche Inc. 1900-79 Wellington Street W Toronto, Ontario Canada M5K 1B9 Telephone: 416-601-4482 E-mail: wtreleaven@deloitte.ca	<b>Total</b> 1996 Anvil Range Mining Corp. Annual Information Form	Pre-production Geological resource 7.1 Mt @ 4.3% Zn, 3.4% Pb, 48 g/t Ag, 0.75 g/t Au  Proven reserve* 165 000 t @ 4.14% Zn, 3.27% Pb, 43 g/t Ag	<i>Open pit past producer, care and maintenance. Deposit mined out.</i>  1953: discovery. 1979: metallurgical and feasibility studies. Over 23 500 m of drilling. 1989: bulk sampling. 1990-93 and 95-96: production.  105K 055
<b>Grum</b> <i>In receivership:</i> Wes Treleaven Senior Vice President Deloitte and Touche Inc. 1900-79 Wellington Street W Toronto, Ontario Canada M5K 1B9 Telephone: 416-601-4482 E-mail: wtreleaven@deloitte.ca	<b>Total</b> 1996 Anvil Range Mining Corp. Annual Information Form	Proven reserve* 1 589 000 t @ 5.34% Zn, 3.56% Pb, 58 g/t Ag, 0.83 g/t Au  Probable reserve* 17.06 Mt @ 4.34% Zn, 2.6% Pb 44 g/t Ag, 0.74 g/t Au	<i>Open pit past producer, care and maintenance. Deposit partly mined out.</i>  1973: discovery. 1976-77: underground development, feasibility study. 1979: metallurgical testing. Total of over 75 000 m of drilling completed. 1995-96 and 1997-98: production.  105K 056

‡Mineral resource-reserve category: resource and reserve figures have been compiled from a variety of historical data sources that in most cases predate the implementation of National Instrument 43-101. Therefore, only those figures indicated by an asterisk (\*) comply with National Instrument 43-101.

\*\* The Yukon MINFILE is a computerized mineral inventory system that documents the exploration history and geology of metallic, industrial mineral and coal occurrences in the Yukon. The database contains detailed descriptions of 2606 separate mineral occurrences located throughout the Yukon.



## Sediment-associated (sedimentary-exhalative) zinc deposits, *continued*

Deposit Owner/optioned to/contact	Zone(s) Year resource-reserve was calculated/reference	Mineral resource-reserve category‡/ Tonnage@ grade/commodity	Status Yukon MINFILE no.**
<b>Grizzly</b> <i>In receivership:</i> Wes Treleaven Senior Vice President Deloitte and Touche Inc. 1900-79 Wellington Street W Toronto, Ontario Canada M5K 1B9 Telephone: 416-601-4482 E-mail: wtrelaevan@deloitte.ca	<b>Total</b> 1996 Anvil Range Mining Corp. Annual Information Form	Indicated* 17.24 Mt @ 6.39% Zn, 4.85% Pb, 71.6 g/t Ag, 0.75 g/t Au	<i>Deposit, care and maintenance.</i>  1953: staked as part of Vangorda property. 1976: discovery during deep drilling. Completion of 52 000 m of drilling to date.  105K 101
<b>Clear Lake</b> Energold Minerals Inc. 201-347 Bay Street Toronto, Ontario Canada M5H 2R7 Telephone: 416-362-6686	<b>Clear Lake</b> 1991 George Cross Newsletter, 03/04/1991, p. 2	Not defined 5 570 114 t @ 11.4% Zn, 2% Pb, 38.1 g/t Ag	<i>Deposit, inactive.</i>  1965: discovery. 1979: airstrip construction. 1993: baseline environmental studies. Over 18 700 m of drilling completed to date.  105L 045
<b>Tom</b> Hudson Bay Mining and Smelting Company Limited 2200-201 Portage Avenue Winnipeg, Manitoba Canada R3B 3L3 Telephone: 204-949-4261	<b>West zone</b> 1986 CIM Special Volume 37, p. 100-115  <b>East zone</b> 1986 CIM Special Volume 37, p. 100-115	Indicated 6 864 800 t @ 7.16% Zn, 4.44% Pb, 42.6 g/t Ag  Indicated 2 418 900 t @ 8.42% Zn, 11.13% Pb, 145.4 g/t Ag	<i>Deposit, inactive.</i>  1951: discovery. 1970-71: underground development, bulk sampling, metallurgical testing. 1980-82: underground development, engineering and environmental studies. Completion to date of over 27 200 m of drilling.  105O 001
<b>Jason</b> Mac Pass Resources Limited 1409-409 Granville Street Vancouver, British Columbia Canada V5K 1A1	<b>Total (Main, South and End zones)</b> 1983 CIM Special Volume 37, p. 87-99	Historical calculation 14.1 Mt @ 6.57% Zn, 7.09% Pb 79.9 g/t Ag	<i>Deposit, inactive.</i>  1974: discovery. 1982: environmental studies. 1985: feasibility studies. Total of 30 700 m of drilling completed to date.  105O 019

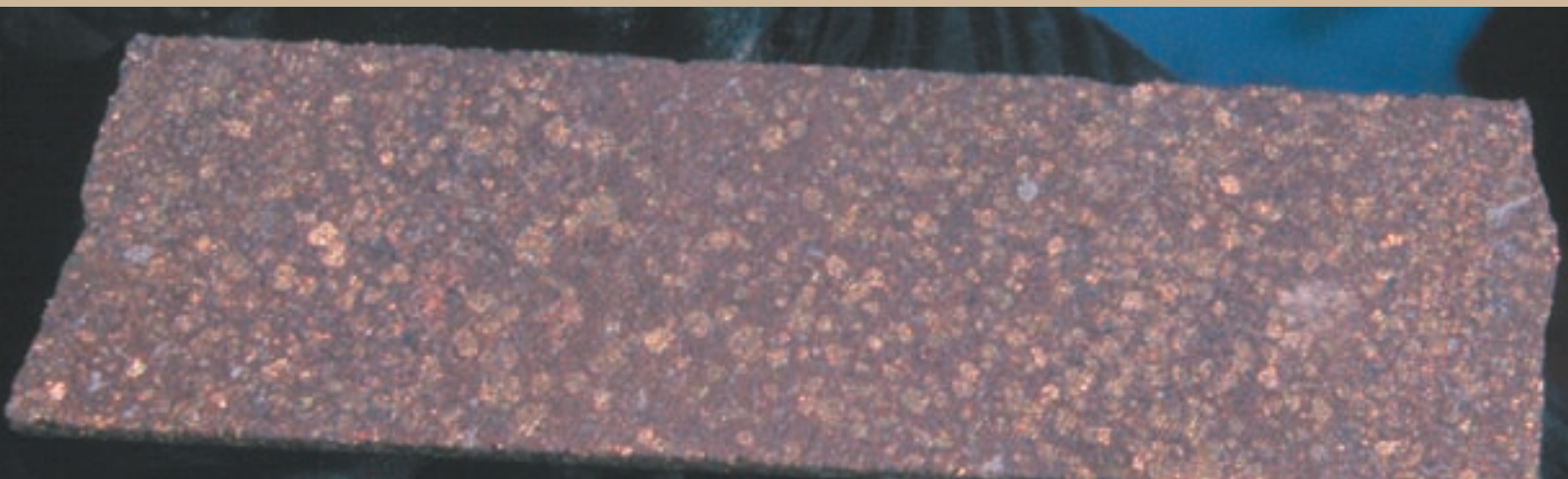
Aerial view of the Kudz Ze Kayah zinc-lead volcanic-associated massive sulphide deposit. This and the GP4F deposit occur within Devonian to Mississippian rocks of the Yukon-Tanana Terrane.



## Volcanic-associated zinc deposits.

Deposit Owner/optioned to/contact	Zone(s) Year resource-reserve was calculated/reference	Mineral resource-reserve category‡/ Tonnage@ grade/commodity	Status Yukon MINFILE no.**
<b>Wolverine</b> Yukon Zinc Corporation 701-475 Howe Street Vancouver, British Columbia Canada V6C 2B3 Telephone: 604-682-5474	<b>Main lens</b> 2000 Yukon Zinc website (estimate by Hatch Assoc. Ltd., based on Oct. 2000 report by Nilsson Mine Services Ltd)	Indicated 4 941 000 t @ 12.43% Zn, 1.37% Cu, 1.44% Pb 336.6 g/t Ag, 1.59 g/t Au	<i>Deposit, \$14 million feasibility stage program currently in progress.</i>  1973: original staking. 1995: discovery. 1996: airstrip construction. Over 42 000 m of drilling to date. Metallurgical tests and development plans completed. Feasibility study commissioned. Test mining, underground development and exploration.  105G 072
<b>Kudz Ze Kayah</b> Teck Cominco Limited 600-200 Burrard Street Vancouver, British Columbia Canada V6C 3L9 Telephone: 604-687-1117	<b>Total</b> 2003 Teck Cominco annual report	Indicated* 11.3 Mt @ 5.9% Zn, 0.9% Cu, 1.5% Pb, 137 g/t Ag, 1.3 g/t Au	<i>Deposit, active.</i>  1993: discovery. 1994-95: airstrip and tote road construction, 40 tonne bulk sample, engineering, metallurgical and environmental studies. Over 32 000 m of drilling. Environmental permitting completed, Class A water license signed. Active on other targets in area.  105G 117
<b>GP4F</b> Teck Cominco Limited 600-200 Burrard Street Vancouver, British Columbia Canada V6C 3L9 Telephone: 604-687-1117	<b>Total</b> 1998 Teck Cominco annual report	Inferred 1.5 Mt @ 6.4% Zn, 0.1% Cu, 3.1% Pb, 90 g/t Ag, 2 g/t Au	<i>Deposit, active exploration.</i>  1994: staked, airborne geophysics. 1998: drilling (1556 m), discovery. Active exploration on other targets in area.  105G 143
<b>Marg</b> Atna Resources Limited <i>Optioned to:</i> Yukon Gold Corporation Suite 408, 347 Bay Street Toronto, Ontario Canada M5H 2R7 Telephone: 416-865-9790	<b>Marg</b> 1997 Unpublished company report, as quoted in George Cross Newsletter, 02/28/2000, p.2	Not defined 5 527 000 t @ 4.6% Zn, 1.76% Cu, 2.46% Pb, 62.7 g/t Ag, 0.98 g/t Au	<i>Deposit, active exploration planned for 2005.</i>  1965: discovery. 1988: airstrip and road construction. 1997: preliminary metallurgical testing, winter road completed to facilitate development. Total of over 23 000 m of drilling to date. Deposit limits are open.  106D 009
<b>Hart River</b> Calypso Acquisition Corp. 1180-625 Howe Street Vancouver, British Columbia Canada V6C 1G8 Telephone: 604-408-2212	<b>Total</b> 1969 Mineral Industry Report 1969 and 1970, p. 25. Also Canadian Mines Handbook 1971-72, p. 181	Not defined (originally reported as proven reserves) 523 849 t @ 3.65% Zn, 1.45% Cu, 0.87% Pb, 49.7 g/t Ag, 1.41 g/t Au	<i>Deposit, inactive.</i>  1955: discovery. 1968-71: winter road construction, underground development, 5989 m of surface and underground drilling, feasibility study completed. 1993-94: 3208 m of additional drilling.  116A 009
<b>Wolf</b> Atna Resources Limited (66%) and YGC Resources Limited (34%)	<b>Total</b> 2000 Atna website (reported as in-house resource)	Not defined 4.1 Mt @ 6.2% Zn, 1.8% Pb, 84 g/t Ag	<i>Deposit, inactive.</i>  1955: discovery. 1967: road construction. Total of 10 508 m of drilling completed to date. 2000: completion of engineering studies indicating that upper portion of the ore body could be mined by open-pit methods.  105G 008

Massive sulphide mineralized rock in drill core from the GP4F deposit.



## Skarn/replacement zinc deposits.

<b>Deposit</b> Owner/optioned to/contact	<b>Zone(s)</b> Year resource-reserve was calculated/reference	Mineral resource-reserve category‡/ Tonnage@ grade/commodity	<b>Status</b> Yukon MINFILE no.**
<b>Sa Dena Hes</b> Teck Cominco and Korea Zinc Company Limited Teck Cominco Limited 600-200 Burrard Street Vancouver, British Columbia Canada V6C 3L9 Telephone: 604-687-1117	<b>Total remaining</b> 2003 Teck Cominco Limited Annual Report	Pre-production resource 5.1 Mt @ 12.7% Zn, 4.2% Pb, 64 g/t Ag  Indicated 2 190 000 t @ 10.4% Zn, 2.6% Pb	<i>Underground past producer, mill, care and maintenance.</i>  1962: discovery: 1963: road construction. 1990-92: underground development, mill construction, produced until Dec. 1992 when closed due to low metal prices.  105A 012
<b>McMillan</b> Noranda BCE Place, 200-181 Bay Street Toronto, Ontario Canada M5J 2T3 Telephone: 416-982-7111	<b>Main</b> 1991 Assessment report #092920  <b>South</b> 1991	Historical calculation 1.1 Mt @ 8.3% Zn, 4.1% Pb, 62 g/t Ag  Historic calculation 400 000 t @ 1.7% Zn, 9.3% Pb, 214 g/t Ag	<i>Deposit, inactive.</i>  1892: discovery. 1930: first staked. Total of 15 204 m of drilling completed. 1990: trenching to test for gold potential. 1993: reclamation program.  095D 006

## Mississippi Valley-type zinc deposits.

<b>Deposit</b> Owner/optioned to/contact	<b>Zone(s)</b> Year resource-reserve was calculated/reference	Mineral resource-reserve category‡/ Tonnage@ grade/commodity	<b>Status</b> Yukon MINFILE no.**
<b>Goz</b> Almaden Minerals Limited 1103-750 Pender Street W Vancouver, British Columbia Canada V6C 2T8 Telephone: 604-689-7644	<b>Goz</b> 1989 George Cross Newsletter, 05/19/89, p. 2	Historical calculation 2 494 758 t @ 11% Zn	<i>Deposit, inactive.</i>  1973: discovery, prospecting, mapping, geochemistry. 1974: mapping, drilling (2024 m). 1975: geochemistry, mapping, drilling (4195 m).  106C 020
<b>Craig</b> Falconbridge Limited BCE Place, 200-181 Bay Street Toronto, Ontario Canada M5J 2T3 Telephone: 416-982-7111	<b>West zone</b> 2002 Canadian Mines Handbook 2001/02, p. 233	Not defined 874 980 t @ 8.5% Zn, 13.5% Pb, 123 g/t Ag	<i>Deposit, inactive.</i>  1976: discovery. Completion of over 6600 m of drilling to date.  106C 073

## Vein/breccia associated zinc deposits.

<b>Deposit</b> Owner/optioned to/contact	<b>Zone(s)</b> Year resource-reserve was calculated/reference	Mineral resource-reserve category‡/ Tonnage@ grade/commodity	<b>Status</b> Yukon MINFILE no.**
<b>Logan</b> Yukon Zinc Corporation (60%) and Almaden Minerals Limited (40%) Yukon Zinc Corporation 701-475 Howe Street Vancouver, British Columbia Canada V6C 2B3 Telephone: 604-682-5474	<b>Main zone</b> Report by Hatch Associates Ltd, March 2004	Inferred* 13.08 Mt @ 5.1% Zn, 23.7 g/t Ag	<i>Deposit, inactive.</i>  1979: discovery. 1987: construction of air strip. Total of over 16 400 m of drilling. 2000: prefeasibility study. 2003: engineering studies.  105B 099
<b>Blende</b> Eagle Plains Resources 200-16 11th Avenue S Cranbrook, British Columbia Canada V1C 2P1 Telephone: 250-426-0749	<b>West zone</b> 2004 Technical report by B. Price, Oct. 2004	Inferred* 15.3 Mt @ 3.04% Zn, 3.23% Pb, 67.5 g/t Ag	<i>Deposit, active exploration.</i>  1975: discovery. 1989: road construction. 1991: metallurgical studies. Completion to date of 16 500 m of drilling. 2004: geochemistry, mapping and prospecting.  106D 064
<b>Andrew</b> Ron Berdahl Mile 7.3 Carcross Road Whitehorse, Yukon Telephone: 867-668-4963 E-mail: rberdahl@yukon.net	<b>Andrew</b> Personal communication R. Berdahl (internal Noranda report)	Not defined 1 106 226 t @ 12.4% Zn, 6.9% Pb, 19.2 g/t Ag, 55.4 ppm Ge	<i>Deposit, available for option.</i>  1967: originally staked. 1999: restaked. 2000: discovery. 2001-2002: drilling.  105K 089