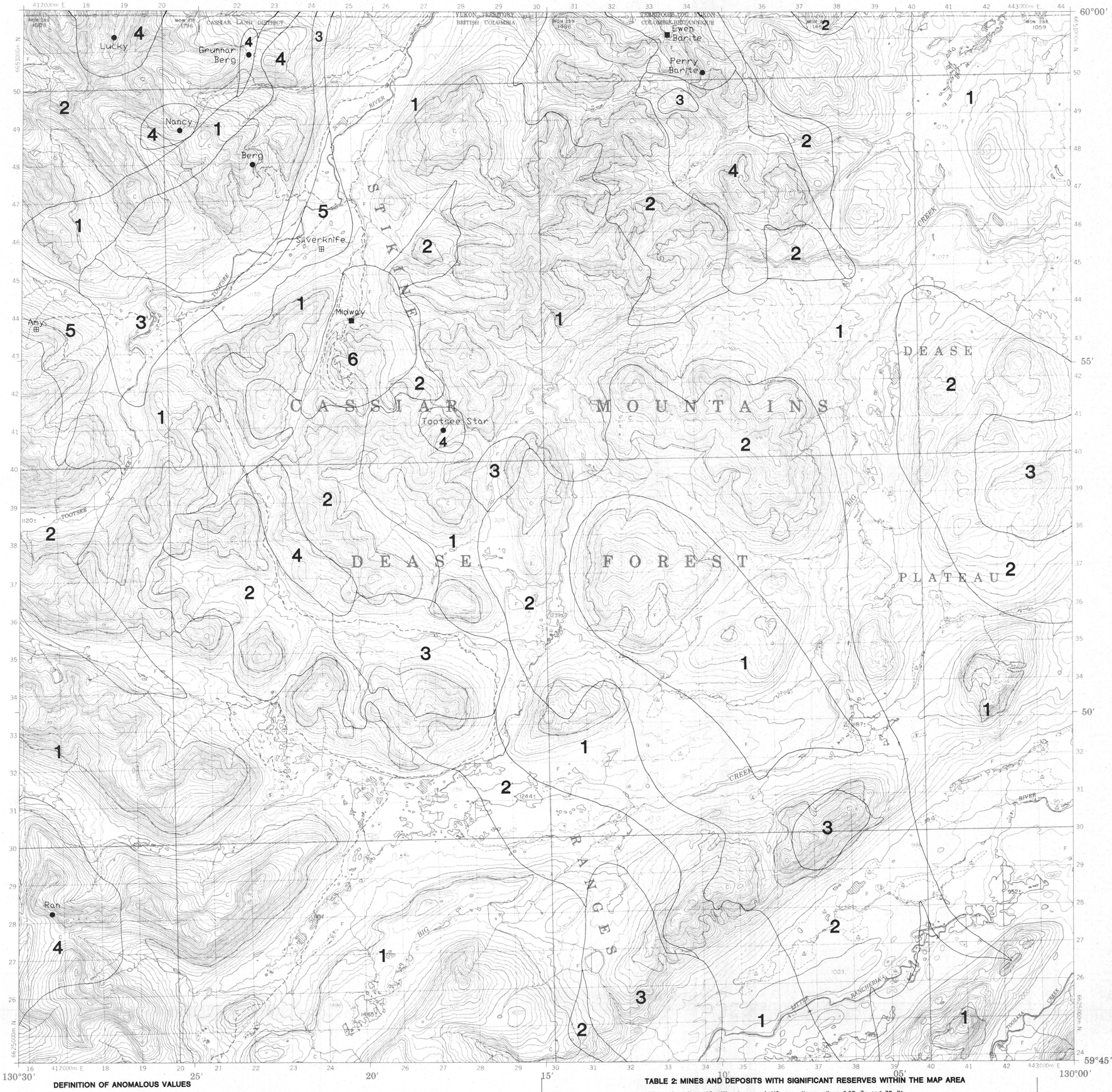


BC Ministry of Energy, Mines and Petroleum Resources

Geological Survey Branch

MINERAL POTENTIAL MAP 1992-12

MINERAL POTENTIAL ESTIMATE TOOTSEE LAKE MAP AREA

NTS 104O/16

BY J. L. NELSON

Scale 1:50 000

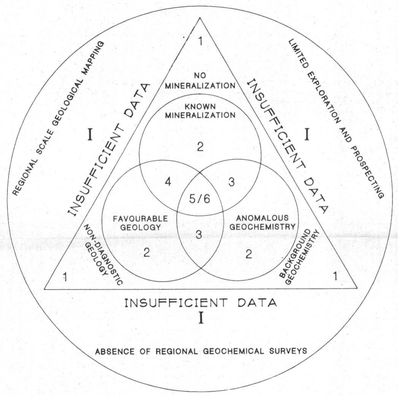
0 1 2 3 4 5

kilometres

INTRODUCTION

The geology of the Tootsee Lake map area encompasses a wide variety of tectonic units: shelf strata of the ancient North American continental margin; overthrust oceanic assemblages of basalt, deep-water sedimentary strata and ultramafic rocks; and granites of the Cassiar batholith. This lithological variety leads to a diverse mineral potential based on many deposit types. The most significant known mineral deposit in the area is the Midway silver-lead zinc manto. Midway is a completely blind deposit; it does not outcrop on the surface at all. It was discovered in the early 1980's in the course of a drill program designed to evaluate targets of another deposit type, sedex massive sulphides, that occur in the overlying strata.

CLASSIFICATION OF MINERAL POTENTIAL



QUALITATIVE DESCRIPTIONS OF MINERAL POTENTIAL CLASSIFICATIONS

Class	Mineral Potential	Description
6	Very High	Known deposits with identified resources in the ground. Favourable supporting data from all three sources; high degree of confidence in designation. Continued exploration highly probable; potential for mine developement is high.
5	High	Known occurrences in highly favourable metallogenic environment. Supporting data from all three sources; high degree of confidence in designation. Future exploration highly probable.
4	Moderate	Known or indicated mineral resources in favourable geological environment. Supporting data from these two sources specifically; moderate degree of confidence in designation. Future exploration to be expected.
3	Moderate	Favourable geological and geochemical environment, but significant mineral occurrences lacking. Supportive data from these two sources; moderate degree of confidence in designation. Future exploration likely, particularly if near areas of higher potential.
2	Moderate to Low	Supporting data from one of three sources, usually geological or geochemical; areas generally lack sufficient prospecting to identify mineralization. Moderate to low degree of confidence in designation. Reconnaissance exploration to be expected. Good potential for upgrading of classification.
1	Low	Current data is non-diagnostic for favourable metallogenic environment. Moderate to high degree of confidence in designation. Little likelihood of future exploration for deposit types considered.
I	Indeterminate	Current data is either outdated or insufficiently detailed for a reasoned determination of mineral potential. High degree of confidence in designation. Future exploration to be expected in parts of the area.

TABLE 1: MINERAL DEPOSIT MODELS CONSIDERED IN CONSTRUCTION OF THIS MAP

DEPOSIT TYPE	COMMODITIES/ INDICATORS	GEOLOGICAL INDICATORS	EXAMPLE
Asbestos	asbestos (no geochemical indicators)	serpentine multiphase structural history outer contact aureole?	McDame mine 16 million tonnes 5.6% fibre
Gold-quartz veins	Au, Ag, Pb, Zn, Cu; As, Sb	basalt-serpentine hosts carbonate alteration, listwanite probably cryptic contact aureole	Erickson mine 500,000 tonnes 15.6 g/tonne Au 11.3 g/tonne Ag
Silver-lead-zinc Mantos	Ag, Pb, Ag, Cu, Au?; F, Sn, Sb	limestone hosts high-angle faults small felsic fluorine-enriched intrusions	Midway (104)/16) 1.2 million tonnes 410 g/tonne Ag 9.6% Zn, 7% Pb
Sedex massive sulphide	Zn, Pb, Ag, Cu; Ba	basinal shales and siltstones of Earn Group, some in unit lMs of Sylvestor allochthon Growth faults; association with sedex barite deposits	Stronsay (94F) 40 million tonnes 7.8% Zn, 2.2% Pb 47 g/tonne Ag
Sedex barite	barite; Zn, Pb	basinal shales and siltstones of Earn Group; some in unit lMs of Sylvestor allochthon	Ewen barite 104)/16 181,000 tonnes
Porphyries (Molybdenum)	Mo, Cu; F, U	small relatively young intrusions within and east of eastern side of Cassiar batholith	Storie Moly 104P/04 45 million tonnes 0.14% Mo
Skarns	W, Mo, Cu; F, U	carbonate hosts; in contact aureoles of small, relatively young intrusions at and east of eastern margin of Cassiar batholith	Kuhn 409,000 tonnes 0.46% W, 0.134% Mo
Polymetallic veins	Ag, Pb, Zn, Cu; Au	carbonate and other hosts near intrusions; faults Similar stting to mantos but characteristically smaller deposits	Joe Reed vein (104P/06) 40,000 tonnes 220 g/tonne Ag 5.5% Pb, 4% Zn
Copper-gold stockworks	Cu, Au, Ag	variety of hosts (unit lMs, lIIPPHv of Sylvester allochthon); alteration haloes	Mare (104P/12) no reserves
Chromite	Cr, Pt, Au	Dunite cumulates in Sylvester allochthon	traces in 104P/12
Cyprus-type volcanogenic massive sulphides	Cu, Zn, Ag, Au	Volcanic suites of Sylvester allochthon with stratiform sulphides or rhodonite	Lang Creek (104P/04) 27,000 tonnes 1.52% Cu, 0.9% Zn
Placer gold	Au	Known placer creeks	
Geochemical anomalies	Uranium	Cassiar batholith (southwest corner of map)	
(no geologic support)	other elements	scattered	

DEFINITION OF ANOMALOUS VALUES

Regional Geochemical Survey data is available for the area for Zn, Pb, Cu, Ag, Mo, W, Ni, Co, U, and F and U in waters. These samples were not analysed for Au, As or Sb. Anomalous threshold values were established statistically by using the PROBPLOT program (Stanley, 1987). Anomalous thresholds are either a) the lower (2%) threshold for the first identifiably distinct population at or above the 95th percentile or b) the average of this lower threshold with the upper threshold for the next lower population; whichever option is most geologically reasonable. Element anomalies were used to increase the potential for deposit types in their area if and only if those elements were shown under "COMMODITIES/INDICATORS" for that deposit type; for instance a fluorine anomaly would be used to increase an area designated for manto potential from 2 to 3; but it would not affect asbestos potential.

ANOMALOUS THRESHOLDS

Zn	154 ppm
Cu	48 ppm
Pb	16 ppm
Ag	0.4 ppm
Mo	8 ppm
W	9 ppm
U	29 ppm
F-water	158 ppm

EXPLANATION OF SYMBOLS

- Mine
- Deposit with major reserves
- Deposit with minor reserves
- Showing

TABLE 2: MINES AND DEPOSITS WITH SIGNIFICANT RESERVES WITHIN THE MAP AREA

Midway deposit	1.2 million tonnes of 410 grams/tonne silver, 9.6% Zn and 7% Pb
Ewen Barite	181,000 tonnes of industrial grade barite

REFERENCES

Nelson, J. and Bradford, J. (1987a): Geology of the area around the Midway Deposit, Northern British Columbia (104O/16), *B. C. Ministry of Energy, Mines and Petroleum Resources*, Geological Fieldwork 1986, Paper 1987-1, pages 181-192.

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Stanley, C.R. (1987): PROBPLOT: An Interactive Program to Fit Mixtures of Normal (and Log-Normal) Distributions with Maximum Likelihood Optimization Procedures; Association of Exploration Geochemists Special Volume 14.