

① MEG TALK: CT. MILLIGAN Feb. 14/90

- Mark Rebagliati

885737 ✓

Intro: Bob Dickenson

#7.1 m feasibility program / 200 ton bulk sample / 7 drills / 9 geol.
- credit given to Dave Copeland
- 340,000 ft drilled (64 miles) - 47,000 Au + Cu assays
(Min-Fu jobs)

- Irving Baragar diagram = monzonites (alkaline)
= Takla volcs. (alkaline)

- 120 line km of IP 240 line km of total mag by Lloyd Geol.
= 10 sq. km. large sulphide system
- 5 monzonite / plutons identified on prop.

- Volcs. - ands. full (+ trachytic), crse. fragments
- rx dip 30 to 85° E (4 hbl d)

- Latites : - ab, pyrox, phenox (+ lack of hbl)

base - pyrox, & tuffs
Trachyte - flow banded flows
- bedded tuffs

MBX - inverted cone

- at depth - Rainbow Dyke becomes 'detached'
- deeper - stock shrinks + Dyke disappears.

Sec. 9800 N - good!

* 9600 N - "

9400 N - "

* 9200 N - "

} Influence of Rainbow Fault

MINERALIZATION: Host - monzonites w assoc. intr. by.

- strike fracturing plus very fin. gr. dissemin.

- adj. on E side of MBX = strong sec. bto. overprints
by sec. Kspars - followed by overprint of carbonate +
finally late calcite stringers.

②

- magnetite bx. on E side of MBX stock
- chse. gr. sul. adj to MBX stock (up to 0.5% Au + 10.6% Cu)
- 2 albite pipes (centres low in Au; higher outer zones)
- Outwards from stock ^(eg. 100 to 200 m) - frac-rel. sul. decrease
- ppx → actinolite → calcite (in 'outside' latites)

bb Zone Min. - mainly intense prophytized volcs. (ep, pp) incl. carb halo around pp-ep veinlets

(earlier see. in full brotite)

- Trachytes - pp-dol (minor carb, ep) ← slow banding veinlets
- Free gold-in. pp - also in microfracs in pp
- assoc. with epp grains (5 to 100 microns - Au)

METALLURGY: correlate data from 'majors'

- Lakefield - recoveries: Au - 86%
Cu - 88%

conv. bulk sulphide float without cyanide

- Bond Work Index ~ 11

Est. ~ 50,000 tpd (geological)

MINING: ~ 293 m tons @ 0.75% equiv.

a) Milligan 257 m ton @ .8 equiv = mineable
ie. 75% value in Au, 25% in Cu

b) Southern Star 160 m tons @ .57 equiv.
ie. > 5 m oz Au 5 billion lbs of Cu

OR > 400,000 oz Au/yr.

Factor 1% Cu ≡ 1g Au

③

Feb. 14/90

QUESTIONS

- ① Higher grade core for initial mining?
- Yes - 2 ; i) Au-Cu in max zone, ii) Au-rich core in 66th
- for yrs. 3-4 - mill feed well above av. grade
- ② Cu grade in concentrate / Au?
24 to 25% plus Au - 2 opt
- ③ Prices used for calculations?
Au \approx US \$400 ; Cu - US 90¢
- ④ Carbonate content of ex.?
- acid drainage studies ongoing i.e. acid consuming
- ⑤ Where does all carbonate (calcite) come from?
- equiv. of carbonate that is usually peripheral to standard calc-alkaline plutons

⑥ Thank: Colin Spence (Rio Algom)
- commended entire project!
- "expl'n is alive + well in B.C."!

Mt. Milligan

Aug. 7/90

- discussion with Don Barker
- keep it SIMPLE!
ie. Mt. Milligan, should be kept simple from an engineering/mining aspect.
- want to work to 0.5 g/t Au cut-off
(ie. ~ 400 m tonnes)
- cannot separate Cu vs Au during mining → treat separately in mill → ok!
- Southern Star pit ~ 10 yrs after start.
- feasibility study soon
- good technical work!

Dec. 5/89
NWMA

JOS

MR. MILLIGAN

- need cross-sections

MR. MILLIGAN

- Mark Rebagliati

JOS
Feb. 15/90

Glaciation

SW → NE

'Marker' Horiz. - trachyte tuffs
& flows

latite vs andesite (subaqueous)
(high pyrox)

- MBX Stock = downward decreasing funnel-shaped
dyke - fault (Rainbow) 'system' appears to
have 'influenced' the '66' zone.

- with depth - dyke is 'detached' from MBX stock
→ 66 zone becomes Au-rich, rel. - Cu-poor

Stock: early bio-k alt'n → sec. kspar (+ mag)
→ outwards to large propylitic alt'n zone

(beyond 16 sq. km of sulphide system - eq.)
→ alt'n patterns - complex - overprinting 20km
by other plutons

- assoc. intrusion breccias (in 'all' stocks)
(incl. milling)

Mineralization - local bn - outside edge of stocks or
in adj. vales. (absence of PY)

- cpY - ubiquitous (av. +5%)
- mag (av. 9%)

→ all auriferous - bulk of Au assoc. w PY

- intense kspar alt'n - esp. 'in' Rainbow fault
(overprints earlier sec. bio)

- Core of MBX + strong bio-kspar alt'n (+ albite pipe)

- strong carb. assoc. with py-epi veinlets (+ in trachytes)

- overprint of sec. kspar on earlier chmide

OVER

island arc type

Feb. 15/90



Alkaline Gold Model

- assoc. volcs. are high K shoshonites (Spence, 1985)
- devel. of explosive volcanic centre characterized by interbedded basaltic augite porphyry flows + thick bx.
- quiescent phase, with dep. of tuffs, some interbedded flows, sands.
- renewed volcanism with eruption of alkaline intermediates to felsic volcs. + emplacement of zoned subvolc. diorite - monzonite - syenite stocks. Por. Cu-Au dep. dev. in + around these intrusions (commonly at high levels)
- preponderance of submarine enviro. in Quesnel Trough.
- Shoshonite setting may be critical for gold min.
- Au-enriched dep. are characterized by feldspar and magnetite-stable alt'n, at least in early stages of min.
- Sillitoe (1979) concluded that gold content is not rel. to geotectonic setting, comp. of host intr., nature of wall rocks, age of min., erosion level, size of ore body or the presence or absence of sericitic alt'n.
- zoning - central K-fsp-bio(+cpx, bn) + peripheral propylitic (chl, ep, albite, cpx, py)

SHOSHONITE ASSOCIATION

- a) Defn: $K_2O / Na_2O = 1$
- low TiO_2 , $< 1.3\%$
 - basalts are near-saturated in SiO_2
 - high Al (14-19%)
 - enrichment in P, Rb, Sr, Ba, Pb, light R.E.E.
- b) Tectonic setting
- rel. to late stages or "deaths" of island arcs.
 - reorg. of plate boundaries, accompanied by transcurrent faulting + rotation of the arc out of the realm of subduction.

Mr. Milligan

Feb. 6/90

- Meeting with Preto & Faulkner
- VGS to supply geological update in pt. form.
- VGS to supply age date data
- VGS gave Faulkner copies of 2 mps (July '89 & Dec. '89)
- to both Preto & Faulkner by Feb. 28th! (i.e. 19th, 20th)

MR. MILLIGAN

Feb. 15/90

Bill McMillan confirmed that Dr. Tom Krogh at the Royal Ontario Museum told him that he has observed (tentatively) from sample no. 89-5(?)
"Abundant black & brown rutile"

Significance

- BCGS Geol. Fluid article by Kwang et al. (~1984?) showed sig. recoverable(?)
titanium (from rutiles) in tailings
(eg. Equity Silver)

→ ~~try~~ try dating Ti from rutiles