REPORT #1

HVC
884002

(1)

The area between Jericho Mines — Gnawed Mt. and the Peel Showings on air photo BC5312-019 was mapped during May 13 to May 19/69. The area is underlain by Skeena granodiorite (3) and Bethsida qtz. monzonite (4). A contact between the 2 rk. types was mapped in the field. In general, the contact appears sharp. Rock type (3) is characterized by 5-10% mafics with either hornblende or biotite predominating over the other. Quartz is interstitial and comprises 20-25%. The hornblende is often large (5mm) and highly poikilitic enclosing plagioclase feldspar. Rock type (4) is characterized by large qtz. eyes (5mm), <5% mafics (predominately biotite) and >10% alkali feldspar. Alkali feldspar usually comprises <5% of the total rock but does increase to 15-20% in a variety termed "Mines" granite. The contact between "proper" (3) and Mines granite appears very gradational in the field. However, the identification of the Mines granite variety was easily made by HF staining on "cut" rocks.

3 dyke rocks were identified. The two main ones, termed crowded porphyries, have a distinct North-South trend. The distinction between the 2 was made on the basis of qtz. content. The third dyke type is aplite which is generally only a few inches in width but a foot up to 10" in width were observed. The crowded porphyries are restricted to rock type (3)

Jointing is nearly common in all outcrops but is more intense in the contact area between the 2 major rock types. Chlorite and epidote are nearly always present along joint surfaces in the contact zone. Slickensiding was rarely seen on flat surfaces. Approximately 90 attitudes of joints were taken and these were put into 6 divisions as follows: 020°-030°; 155°-165°; 040°-060°; 170°-010°; 135°-145°; and 110°-120°. When plotted on a joint frequency diagram, the prominent joint direction is 170° to 010°. Two other prominent directions are 040°-060° and 110°-120°. Mineral foliation (alignment of hornblend crystals) was observed in only 5 steps and is not distinctive of any trend.

Alteration is very characteristic in the contact zone between (3) and (4). Chloritization and epidotization along joint surfaces and in the adjacent rock is most common. Sericitization and sericitization are less common. Enrichment in alkali feldspar and silica is associated in some mineralized zones, especially on the Gaza property. At the Red Showing, the mineralized zone is silicified and contains abundant sericite. The Pebble Ridge Showing is only characterized by a shear zone with moderate chloritization + epidotization + several qtz. veins.

Mineralization in the area is for the most part only malachite. It occurs on joint surfaces mainly and also occurs in distinct

"mineralized" zones such as on the Gaza property. Minor amounts of bornite and chalcopyrite (< 1%) were observed (along joints + disseminated) except at the Bornite Ridge showing where pods and lenses of bornite occured in quartz veins up to 10" in width. No molybdenum was observed in the area. Pyrite is the common mineral at the Peel showings (25-30% in the silicified mineralized zone). Specularite was observed in veins on the Gaza property only. The mineralization observed in the area appears to be quite uneconomic. The most favourable looking area I would say is the Gaza property.

Roof pendant (4) to be extensively barren to mineralization here

Tom Schroeter
21/5/69

DISCUSSION ON HIGHLAND VALLEY

Feb. 16/72 TGS

(1) W. McMillan

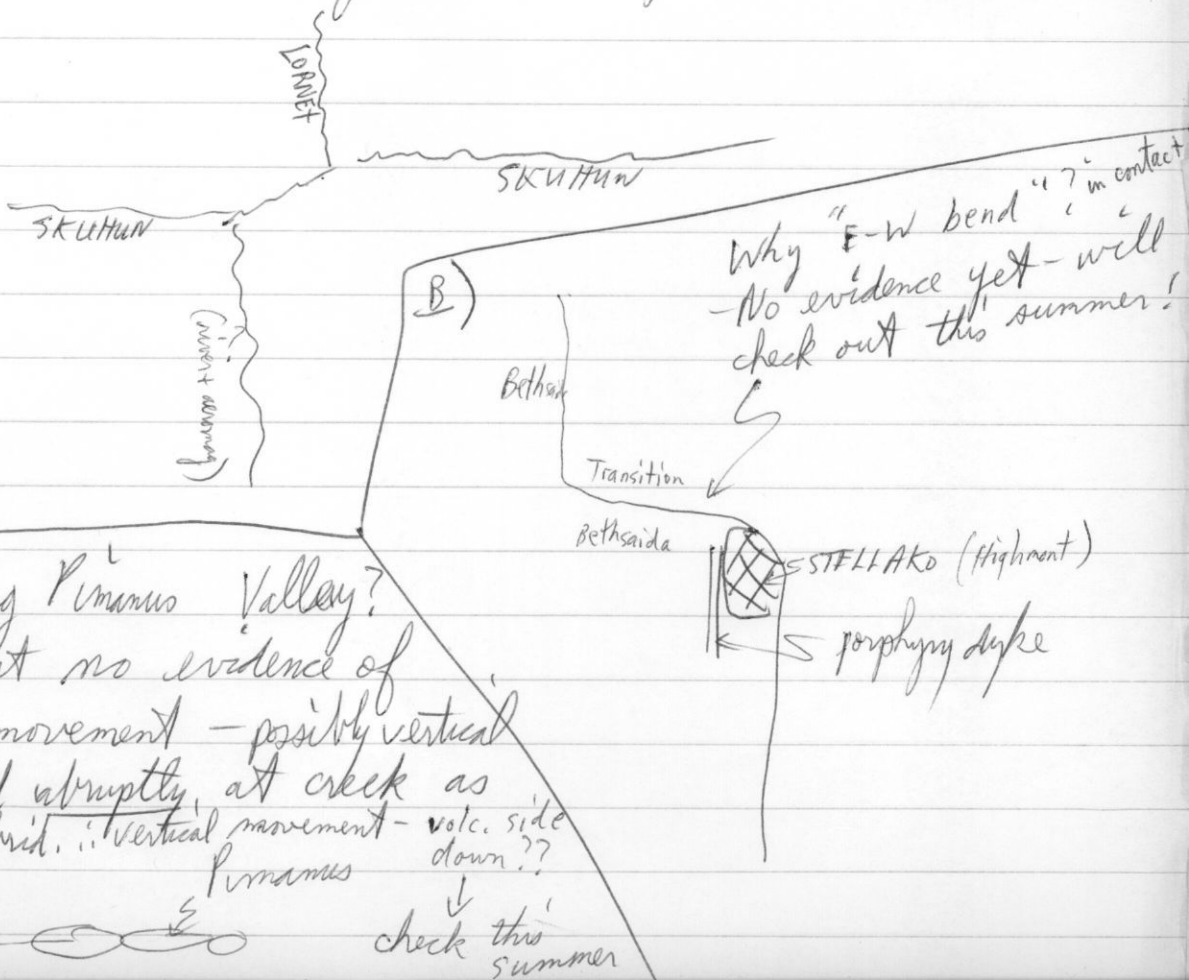
When Bethlehem phase came in - doming began + with it the initiation of N-S trending dyke swarms. Doming reached a max. with emplacement of Bethsaida phase

IROSAN - more of a tectonic bx. rather than explosion bx.

- Drilling on Jenkins property near road → volcanics.
- Drilling by Cominco on road ~ ½ mile towards H.V. from turn off to Jim Black Lake ⇒ Volc. (on south side of inferred fault [E-W]).

FAULTING

A) Note: Skuhun fault 'valley'



(2)

Study on Volcanics
- esp. Kamloops — this summer - special project

Nicola — rhyolite → b s/t.

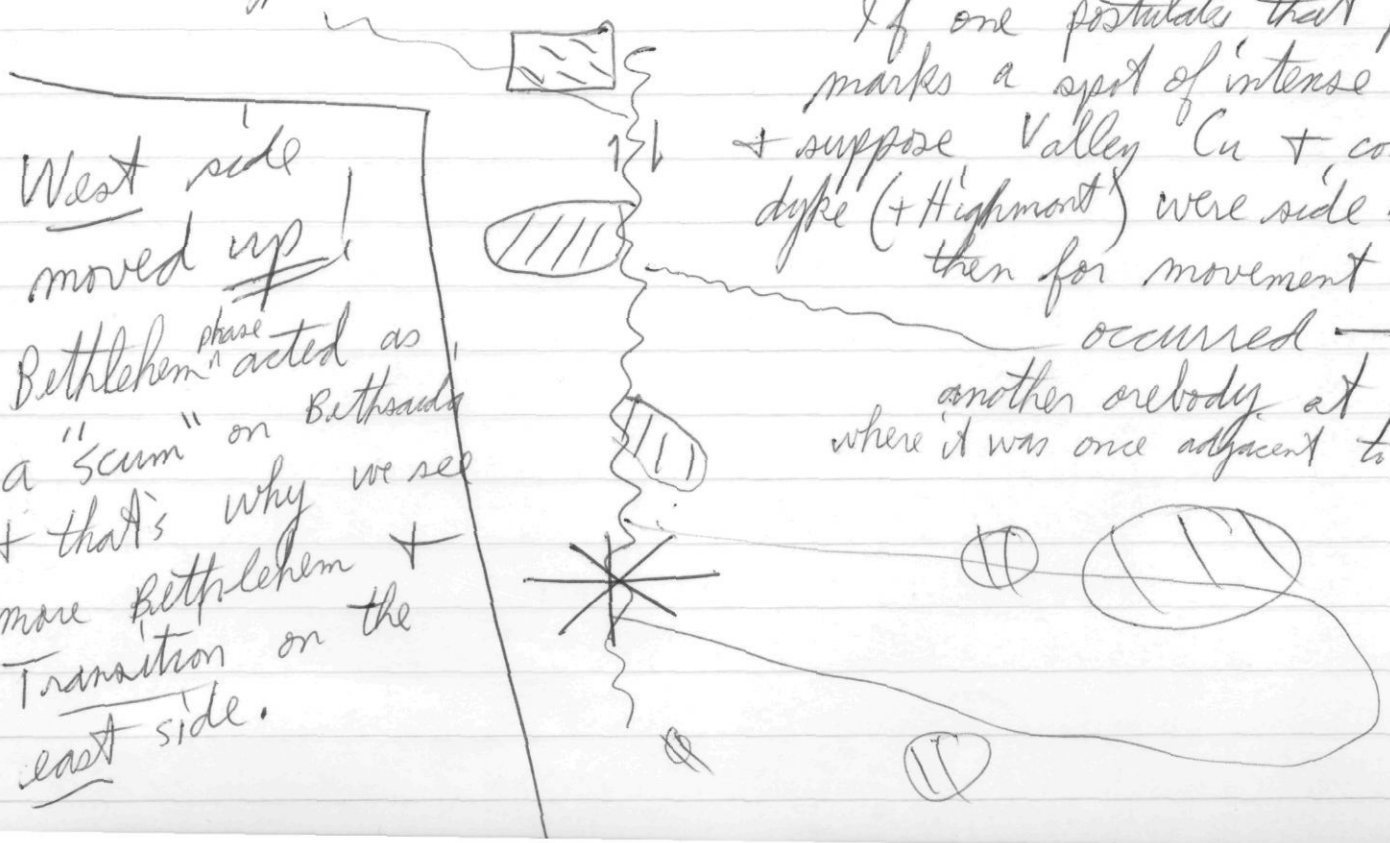
Kamloops — ?

Spences Bridge — ~~Andesitic~~ Basaltic andesite → rhyodacite

Kingsvale — Andesitic-dacite → rhyodacite

Colly granite just S.W. of Craigmont — looks similar to Guichon — will date to see if some Cu went from there to Craigmont ⇒ unlikely.

W. M. Hypothesis



(3)

The 'explosion' breccia at Gnawed Mt. has frags. of Guichon + hybrid rk. as well as Lornex porphyry → thus it must have picked them up on way.

→ Spaist Mt. — probably a roof pendant.

- Major N-S zone of porphyry intrusion (eg. Bethlehem → Krain) — maybe even down to Stellako.

- Bill agrees with me that areas indicated by Ken Northcotte as being Witches Brook area actually areas with concentrations of dykes of Bethlehem phase.

- LeRoy granodiorite may be a scum of Bethlehem

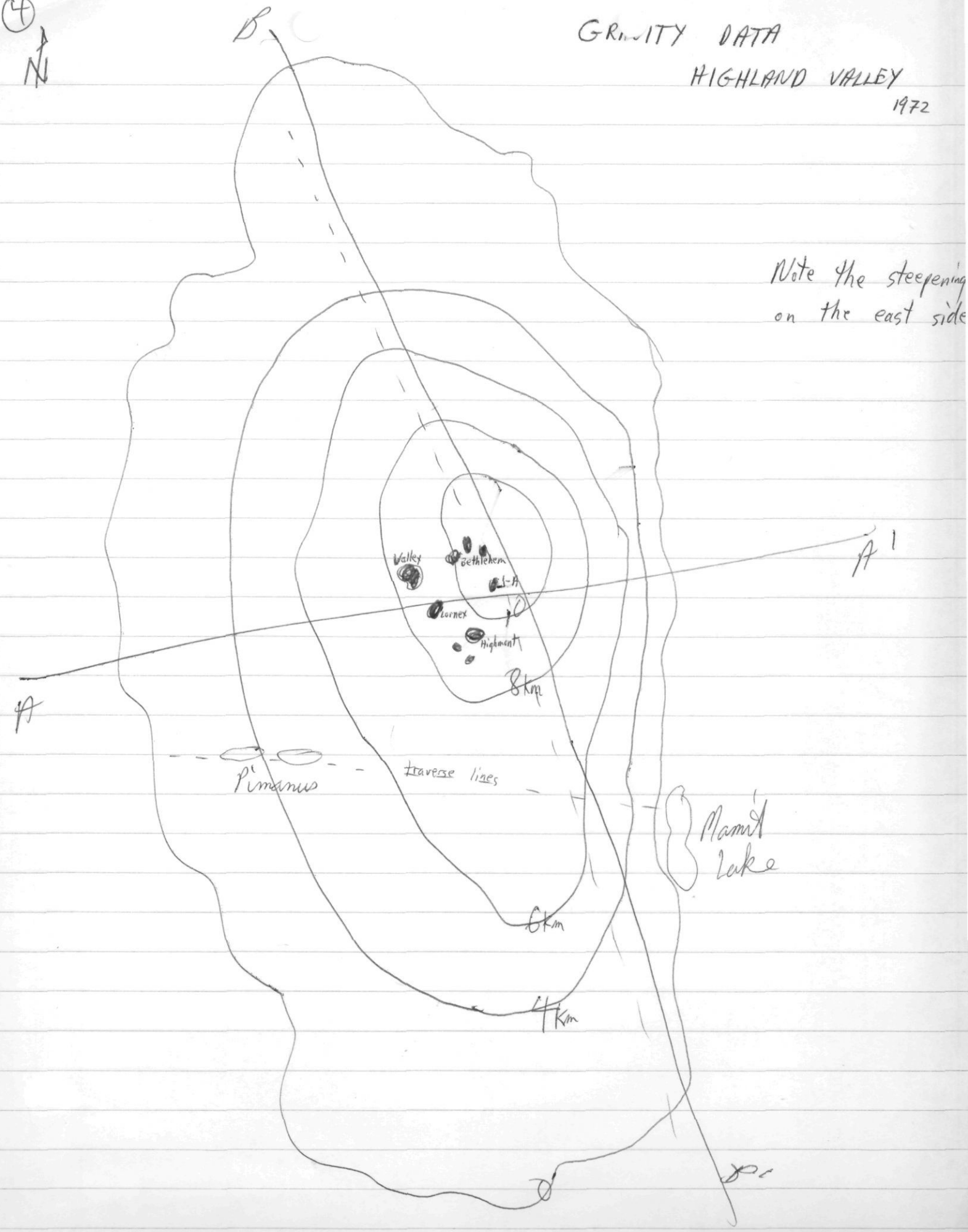
Victor Mine - leaching effort → useless! No oxide Cu to leach! — mainly primary!
- Lornex owns but won't look at for a while - probably has 100,000 tons of 2% Cu.

LORNEX geologist - MIKE SCOPIS

PhD. THESES:
① Joe Briskey - Bethlehem
② Bob Schmuck - Lornex
③ Mike Jones - Valley
} Oregon State U. Corvallis, Oregon 97331 under Cy Field

M.Sc.
Chuck Ager - Geophysics Dep't - U.B.C.
U.B.C. - 228-2267
Home - 278-6047
} 815 B Cambie Rd.

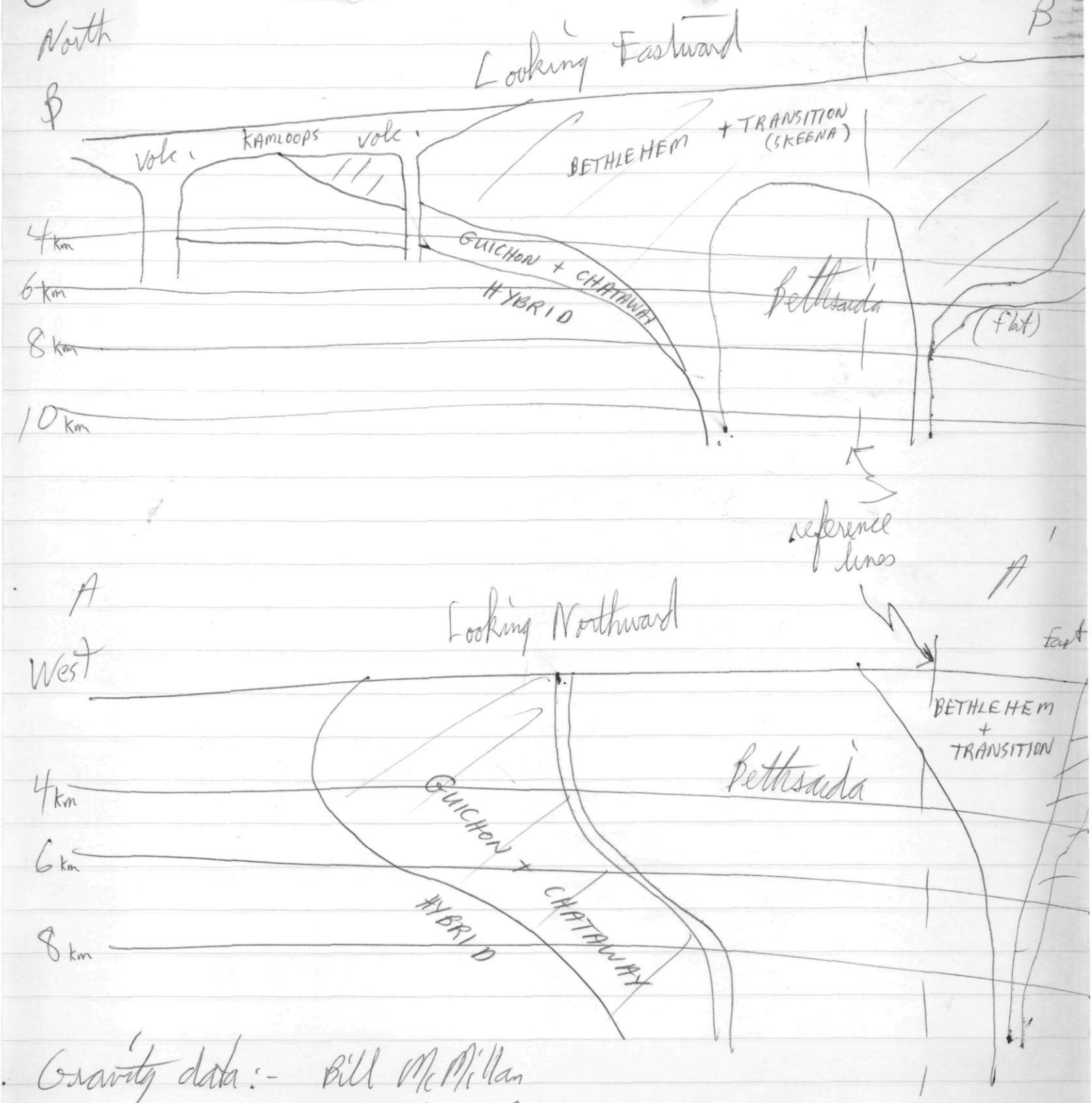
(4)



GRAVITY DATA
HIGHLAND VALLEY
1972

Note the steepening on the east side

PROFILES



Gravity data:- Bill McMillan + Chuck Ager

HVC (Highland Valley Copper) Apr. 13/95

- talk with Lorne Band (mine geol @ HVC)
- moly contributes ~ $3M/yr. at HVC.
- ~ $200 k for '95 expln
- looking at ways to develop JA (i.e. technology)

KEG '95 → PVC

To date, production = $11.5 billion

→ 2nd largest Cu milling oper. in the world.

Mine Life: 2008

1994: $465 million in sales revenue.

1 HIGHLAND VALLEY COPPER   Thur Sept. 22/05

- JOGMEC TOUR   Cloud +10°C
- Dennis, Mine Geol.   snow on hills
- Ralf ~~Kirstins~~ Kintzi - Mine Super.   9am-3pm
- eat bag lunch @ mine office

Produces: 1.4% world's Cu
3% world's moly
1.1 Mlbs Cu/day (@ 0.4 to 0.44% Cu)   [$1M/day of moly / $1.5M/day profit]
~ 955 employees
~ 50Mt ore processes/yr
2 in-pit crushers in Valley Pit (2-km conveyor) [2 km long]
(~400 m down)
[ultimate pit floor another 50-m lower]
Mill Capacity: ~133,000 tpd
Valley 0.3? ... .01% MoS_2 (harder ore)
Lor... .001% (softer ore)
Conc... Ashcroft → rail to Van
→ ... Japan)
Tail... y = 2Bt (used 1Bt)
Mine... ...n extension → 2013
2.5... ...h ~ tailings sand
on downhill side (to Fraser R.)
→ largest in world

HVC Sept 22/05
$1M/day moly
$1.5M/day profit
T08

(2) No. 2004: ~10 M lbs moly (more in Lornex pit)

2006 Highmont ~ 6 M lbs moly

2010: 7 M lbs moly peak (.015% MoS_2)

2004 Rev: 40% of revenue was moly

2005: 1 - 1.5 Mt Highmont ore to be mined in '05

Moly recovery ~ 60%
(Cof. Cu ~ 90%)

→ Leach it on site (~ 50% MoS_2 conc. grade)

2005: Lornex pit: 25% feed
Valley pit: 75% feed

Highmont Exp'n: 2005

30 kdth = 4000 m

If Cu > $1.30/lb resources

~ 860 Mt = +15% more by 2013

* Press Rel. ~ Sept. 23/05
- extension of mine life to Sept 2013
- Capital cost ~ $40M
- involves more ore from Lornex pit, rel & cabling of 2 in-pit crushers in Valley pit, and pushback of Valley pit wall

HIGHLAND VALLEY COPPER Apr. 2/96

- field trip (am) as part of KEG '96

Photo: collage looking N over VALLEY pit

- Stripping ratio = 0.6 : 1
- in-pit crusher; note rusty (unconsol. seds.) to rt. of conveyor belt.

40-42% Cu con. (better bornite)
(cf. Lornex - ~35% Cu

- black unconsol. (water-rich) sed to left of conveyor belt.
(trace of E-W Highland Valley fault

Mill - larger crushers can do 35,000 tpd.

Moly value ≈ 1 to 3% profit
Mo con = 45 to 55% Mo (sent to England)

Valley - 95%, Lornex - 5% feed
(i.e. push back E + S walls of pit

- minor (locally elevated) arsenic - usually assoc. with 'high' bornite ± enargite

cut-off = 0.25% Cu equiv
(or 0.2% Cu)

- need to add gold (from Snip) to reach 'credit limit' for gold prod.
(cf. Goldstream)

1996 Expl'n - look at ore in east wall + east across Lorne fault

- also recce IP elsewhere
(1995 -> 300 line-km of IP)

JA - problem with O/C but .45% there = "lots"?

~50 persons in pit (not incl. maintenance)

[Highmont - up to .25% Cu locally = low priority]

NEVILLE CROSBY INDUSTRIES

HVC

Thur. Oct. 3/96
Cloud +12°C

9:00 - noon

- Lorne Bond
- BHP - BC Mine Tour (Ne)

Current
0.395% Cu 0.007% Mo

Mill Feed
Valley ~ 95%; Lornex ~ 5%

- Stripping @ Lornex, plus ext. stripping on NNE side of Valley (soft).
975 m ⇒ 750 m asl (i.e. ~200 m left to go)

Mine Life: 2008

.18 Cu Cut-off

Stop in lowest level (~0.7% Cu)
- bn-rich + ser + kspar

Photo: look S over Lornex pit
(on east side of Lornex fault
- black seam to rt. of rusty zone,
upper rt. of photo)
(0.35% Cu)
~120 MT of ore/ore left in Lornex

'96 Expln Exp. = #600,000

(1) HIGHMONT 1969

~ 60 million tons (June '69)

~ 95 million tons (as far as AMAX can see - Aug. 15/69)

~ 120 million tons (George Cross Newsletter - Aug. 25/69)

- far too high! - took too much into account. eg. possible ore say they had a vein with mineralization. Then they would include 300 ft. on each side of vein to have possible ore. And if there were slight overlaps, it would all be massed in as ore. oo values are too high!

=> moly is main ore mineral
+ cpy + bn.
- Lornex porphyry present but unmineralized for the most part.
- Breccia (tourmaline matrix with predom. Lornex porphyry inclusions) -> Last explosive phase! -> best seen on top of Gnawed Mnt.

=> different than Lornex + Valley Copper deposits {i.e. not same structural + alteration features}
-> Two main zone - East + West.
moly values appear higher in the west zone.
- no financing at present! AMAX did a complete feasability

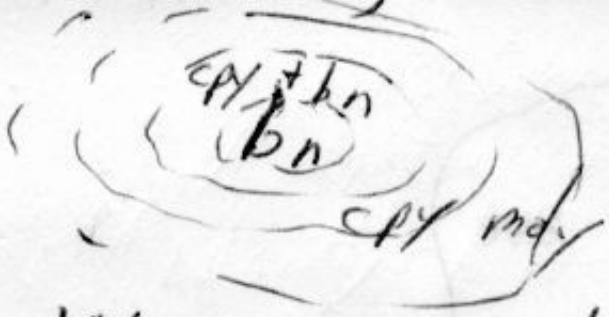
(2) study during July + August of 1969 + feel that the only deal would be a 100% ownership.

- Highmont management seems very incompetent. eg. maps not up to date. drill holes not correlated. etc. etc.

③ LORNEX 1969

~600 million tons ~.4% Cu

- bn, cpy & moly - some chalcocite.
- in both Skeena & Bethsaida rock types.
- mineral zoning



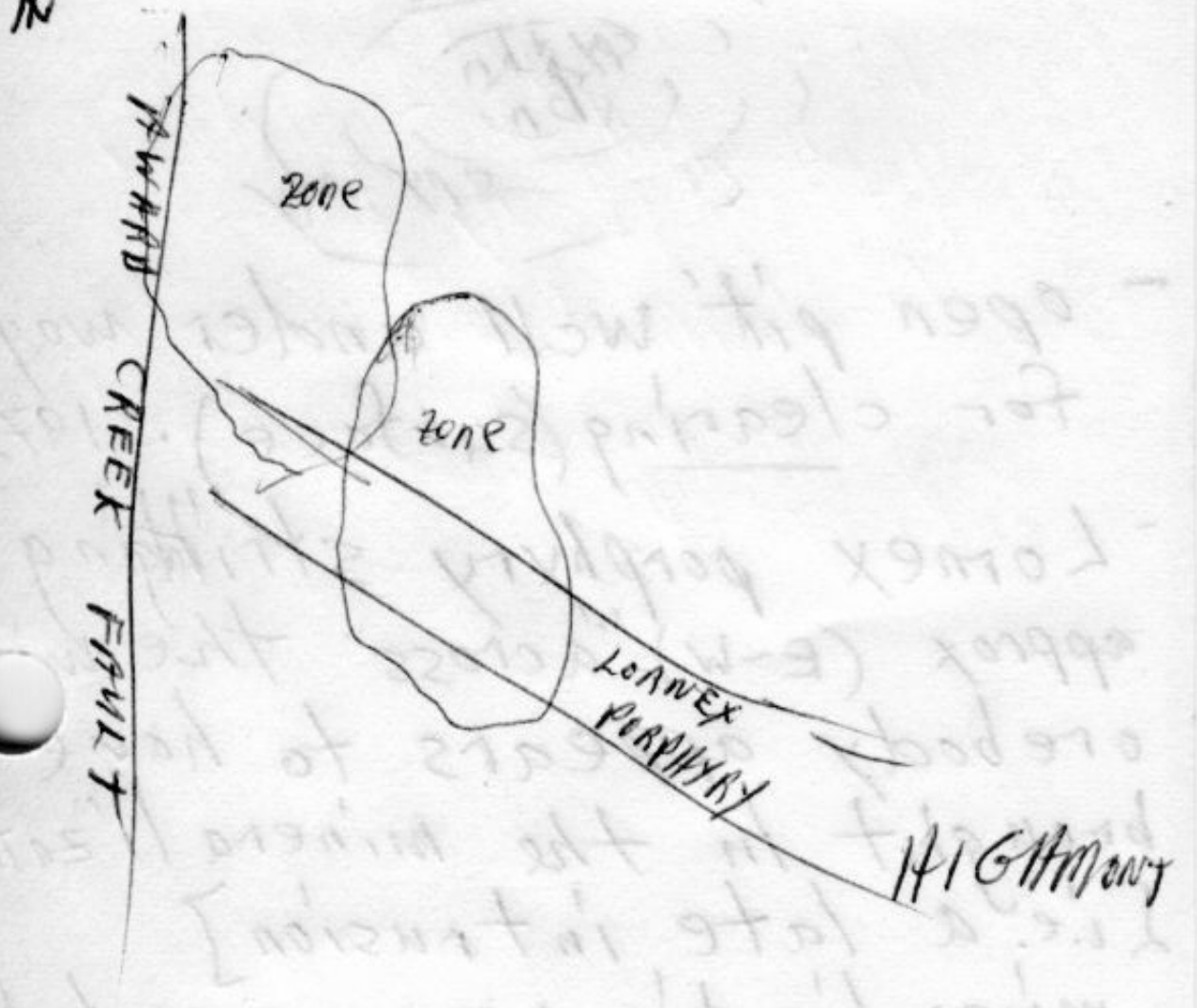
- open pit well under way for clearing (surface). 1972
- Lornex porphyry striking approx (E-W) "across" the w orebody appears to have braught in the mineralizati [i.e. a late intrusion]
- mineralization was concentrate

by the AWARD CREEK fault.
-alteration is chloritization, sericite & saussurite.

several other smaller N-S faults cutting the main orebody.

DOUG GUILD
[ENGINEER]

VALLEY COPPER



(4) VALLEY COPPER 1969

900 million tons ~.4% Cu

- bn + cpy in Bethsaida - highly quartz veined plus sericite + saussurite. - minor moly

At least 20% of orebody extends onto Bethlehem ground (to the east + possibly "across" the valley to the north)

Structural control is very important. Orebody cut-off to north by an E-W Highland Valley fault ?? Not enough known. Orebody in vicinity of major N-S fault - the AWARD CREEK fault. Geochem. values very distinctive. Overburden ~only 40 ft.

Adit in ~ 20° slope south
[in ~ 650 ft. Aug. '69]
Faulting & qtz-veining in adit
-ominant. [steeply dipping]
Jim Allen [chief geologist] doesn't
beliere a Bethsaida-Skeena
contact is important - rather
the structural + alteration
aspect.
Drilling still continuing to
outline orebody + give better
grade estimates.
⇒ will be one of largest
copper orebodies in the world!!

⑤ BETHLEHEM 1969

ZONES

① East Jersey (closed) but still 3 million tons to be mined

② 10 N A

③ HUESTIS - clearing under way at time,

④ Jersey

- 14,000 tons daily.

-> cpy + bn
(~ 36% Cu concentrate)

host rock is Guichon
- contact of Skeena + Guichon partly responsible for mineralization!
- Also several C.P. dykes

Bethlehem now drilling on the lake to find limits of Valley Copper orebody

⇒ good results!

- also drilling on side of road [by BLACKHAWK on INDIAN RESERVE].

→ called Bethlehem's Lake deposit.

- Bethlehem "secretly" doing Mamit Lake survey now.

⑥ CRAIGMONT 1969

All underground operation now
300 ft. of Kingsvale vol
"dumped" in on bottom of
pit to prevent caving in.
- dangerous now!

orebodies are in a general
E-W direction.
- good magnetic high anomaly.
- "tongue" of Guichon coming
up centre of No. 2 orebody.

⇒ read report!

→ road to Jackson Lake + up
Abbott Lake passable.

(7) ABERDEEN - 1969

- old shaft.
- specularite mainly
- some mal. + cpy.
- in Guichon rock with 3 dykes.

CAROLIN - 1969

- deep gullies just east of main rd. - no observable mineralization except mal. → extreme alteration to chlorite

(8) NORANDA TRENCHES 1964

→ on Guichon – hybrid contact
→ extreme chloritization ± some epidotization + sericitization + kaolinization
→ cpy mainly!! some bn, spec, moly., tetrahedrite.
→ 2 main shear zone 240° + 180°. Main mineralized + altered (sericite) zone is ~125°. Several 3 f dykes present.
→ interesting situation.
– I.P. survey just beginning,
– dissem. cpy. in 2p. [pink granodiorite – Guichon].

⑨ NE district 1969

- good map by Sim Allen for Valley Copper - Comin. 1966
- → minor bn & cpx occurrences
- → several ~N-S 3pf dykes in 2p

NW district 1969

- mainly alt'd in hybrid rocks
- current I.P. surveys [eg. by Continental Cinch etc.]

SPITSUM ROCKS

- → distinctive green fsp.

(10) West side. 1969

→ Gully traverses

Hybrid rx → Nicola, Cache Creek + Spences Bridge

- mineralization is mainly all Py. in volcanics! (~3%)

SPAIST - MNT 1969

elevation 6200 ft.

- summit is Guichon

- on east side of summit is a thin sliver of Skeena then Bethsaida - see T.C. Explorations map. → on their grid system

(11) hybrid rocks, on west slope. - several mafic-rich inclusions + ~~sto~~ clots.

T. C. Ex. property (north

-On Bethsaida - Skeena - Chataway contact.
-> no sig. mineralization
- mainly bn., (cpy) + moly.*
-> some spec
-> good sericitization

CLEVELAND 1966

Drill holes (2 in Chataway with dissem. bn) + one in volcanics (502 ft.) - barren
-> one trend (N-S) with moly-

rosettes plus cpy.
Orbicular granite otcp.
~4 miles from turn off
Alwin road.

→ Sim Black Lake road connects onto Cleveland EW road + down to Spatsum road but is washed out near H.V. road.

SKUKUM 1969

→ COMINCO camp option
- Skukost fault! - poor otcp at skeen + bethsaida bends "sharply" to the SE suggesting a possible faut.
→ TOM CURNOW property
- mainly cpy + bn in gtz

(12) veins + on fractures.
mineralized veins ~ 030°
+ volcanic dykes ~ 140°
⇒ distinctive on west side

Highland Queen prospect just been optioned - on "top" of hillside I climbed twice th Guichon rx with volcanic dykes, ⇒ dissem. bn + cpy + dissem. py. in volcanic dyke

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Benson Mines — Zumac - 1969

South of Lornex property
all in Bethsaida
→ uninteresting!
bn + mal.

BORNITE RIDGE MINES 1969

dissem. bn & cpy in gtz veins mainly at Bornite ridge.
- in Chataway (dissem) at Billy Lake (airstrip)

JERICHO MINES 1969

- High grade veins - bn main, no present work!

GAZA PROPERTY

→ early I.P. survey by MacDonalds from Vancouver
- looks like a good area
- C.P. dykes present.

(13) PEEL SHOWINGS

- highly silicified - sauss. zone ~ 200 ft. wide with "fantastic" pyrite cubes → minor cpy + bn.

⇒ strong N-S aplite zone trending up thru Chataway zone + down to Skuhun.

CHATAWAY EXPL. 1969

Not great work going on, → cpy mainly in qtz veins + associated 3f dyke rocks

⇒ 3f zone on east side of batholith from Cannoo Mines south ~~0~~, just east of Antler Lake, thru Mamit Lake trenched area + on South to Aberdeen.

1969 MAMIT LAKE TRENCHE.

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hybrid rocks with 3f dykes
→ good cpy on joints + as stringers + in qtz veins
→ 2 small shafts.
→ "in between" 2 large N-S gullies.
→ road up past old saw mill.
→ current drilling south of trenches (for Bethlehem?)

(14) CANOO MINES

→ good cpy. mineralization
py. + moly values also.
→ 3 f dykes on property.
→ "AMAX" report by Sellmar
→ structural control - 2 main gullies (faults?).
— access off Billie Lake Air strip road or off power line road.

NEW INDIAN MINES - 1969

all in Zp.
— poor mineralization — mainly dissem + fracture cpy.

TROJAN - 1969

→ on strike with major fault - porphyr zone will goes N-S thru Bethlehem ??

→ explosion breccia deposit.
→ looking for financing.

KRAIN - 1969

on volcanics (Kamloops) + Guichon contact.
→ present option by Noranda (Dan Peg.) - Art Sorgelli

TRANSVAAL 1969

I did not see!
C.J.H. says it's an interesting place!

(15) ALWIN 1969

- old ak. mine
→ high grade bn. + cpy. some chalcocite.
→ high grade vein deposit with dissem cpy. + bn. in highly sauss. - seric. rk.
→ adit goes under main trenches + hooks up with old shaft + workings
→ present financing under question. - production or not?
→ drilling on side of la[illegible] went thru ~400 ft. of volcanics (tuff) + continues.
- rk. type is all Bethsaida.

→ Webb Cummings - geologist
grade is ~ 2% Cu.

Katheleen - Empire 1969

- Laura mines option.?
- cpy., bn. & moly.
→ not sig!
- ~~Rea~~ in Bethsaida rx.

→ major E-W fault thru
Calling Lake ??
- also Pimanus Lake ??

STELLAKO, BETHSAIDA etc.
I didn't see!

(16) Extreme detail by AMAX in Valley Copper - Lornex - Highmont

⇒ good map will be produced by C.S.A. (eg. 1" = 1000')

Aeromag. maps outline & contacts [batholith → volcanic + also the major phases of the batholith].

⇒ distinct rusty zone around Valley - Lornex - Highmont area!

Jim Hylands

P.h.D. candidate - Stanford
economics + structure of Quichon

Mike Carr's + Ken Northcottes maps.

→ new smelter to be built in Princeton will affect the whole Highland Valley, including Ashcroft!

1969 GIBRALTER MINES

500,000 million tons ~.3% Cu
Waste:ore ratio ~ 1.5:0:1
Canex bought a mill from Germany
→ good core ~~valleys~~ values
→ new "porphyry-Cu" zone

Eskay mine: 10,000m ddh
Winslow Gold option (Bonanza Ck.)
Eskie $1M
Telkwa coal
Willow Ck. – ddh
Wisham qtzite – Ava Res.
Red Lk. (Fullers Earth)
Ajax west – close in May

Kamloops – #22M ('96) ~ 115,000 m ddh
Fors 2400m in 5 holes in early '97
target = Sullivan horizon at depth

'97 – 1500m decline @ Bull River (Stanfield)
look at Cu-Au veins

Jersey – Emerald – u/g ddh in '97

Silver Queen
Kettle River looks for option ($1)

Linda Caron – Kettle River expects ~~Battle M~~ Echo Bay to option (all) its holdings in the Greenwood camp (soon!)

KEG '97

Call Gerry Carlson re-lunch with Doug Leishman (brokerage 'input' at Pathways '98!)

ESKAY CK. – (Edmunds)
Since Dec. '94 to end '96 ~260,000 t @ 66.69 Au, 3352 Ag 750,000 oz equiv.

Eskay Ck. 109 zone – colloform – flotation-amenable (~250,000 oz)
14,585m of expl'n ddh in '96
Mill – 165 tpd

'96 resource growth of 900,000 oz Au
120,000 oz Au equiv. in NEX (upper section of rhyolite) ~100m N of 21B

July 11th – Greenwood Days – + Ron + Sally McMillan / Ross + Mona Blusson
"bring sleeping bags"

HVC – Lorne Bond – no expl'n on site this yr. – mainly number crunching
– '96 additional res. is at NE part of Valley pit, adj. to major Lornex fault
– currently stripping north area (o/b) of Valley pit, plus east end of Lornex pit

Getty North → ask for aerial slide
16,200m (53,200 ft) of ddh '97
→ $3M
Glossie Zone
Woods Ck. zone + Skain (gains)
– Bethlehem style
60 ddh 9230m
53.2 mt in Camp Zone intr.
MAC ; 0.3 Cu + .01 Mo
started to date 48 mt – contained 1.3% Mo
0.97% Mo .1320 BioCa

(62)

Imilco – Steve Blower – number crunching
'waiting'

MT. POLLEY: June – production (Reg.)
48.3 g/t Au ; 27% Cu – concentrate grades
– 'high' acid consumption

41,000m ddh completed since July '96
PROSPERITY
nearly completed program.
11% incr. in Au ; 4% incr. in Cu (angle holes)
– then reserve estimates (in office)

BRITISH COLUMBIA

May 1/00

To: Don Mustard
From: Tom Schroeter

Re: PRODUCTION (Wealth) from HIGHLAND VALLEY CAMP

① See attachment: Total Production for a) HVC b) Bethlehem c) Lornex

1963-1998: 940 M tonnes (milled) = 7,165 kg Au; 1,162,300 kg Ag; 4,518,197,921 kg Cu; 3,518,000,000 kg Mo

② Est. 1999 Prod: 30.1 M tonnes = ~~475~~ kg Au; ~~49,000~~ Ag; 109,000,000 kg Cu; 1,700,000 kg Mo

Total: ~ 970 M tonnes = 7540 kg Au; 1,211,300 kg Ag; 4,627,200,000 kg Cu; 5,218,000,000 kg Mo
(1963-1999 incl.)

P.S. When you get a 'number' (#), could you share it (along with commodity price chosen) Thanks, T.

Tom

Ministry of Energy and Mines
Geological Survey Branch
Mineral Development Office
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