

896476

89/9/6

Toodagone Meeting

Attendance: 25

structure

ascending, Evolving fluid

A77 Fossil Hot Springs

+ calderas

↓ Buchanan model

vertical system

geometry

Perhaps not boiling just

CO₂ evolution causes

Permeability + stacked
systems

Giles + Nelson

24180-

Toodagone

argillite - alunite

Cunningham

caps related to ground
water level \approx surface

*GIVES SURFACE FOR
REFERENCE

- CALDERAS - B.S. -

need structures, not
calderas

- Over stuff relates
better to those in modern
island arcs

Allluck

Stewart - island arc

Toodagone - bkep up
contin. margin?

DO NOT NEED CALDERA

" " " CONTIN. SETTING

Extension with compression well
work

Mineralogy

free gold electrum
argentite

minor spg .01 %
" sphal .03 %
erratic lead

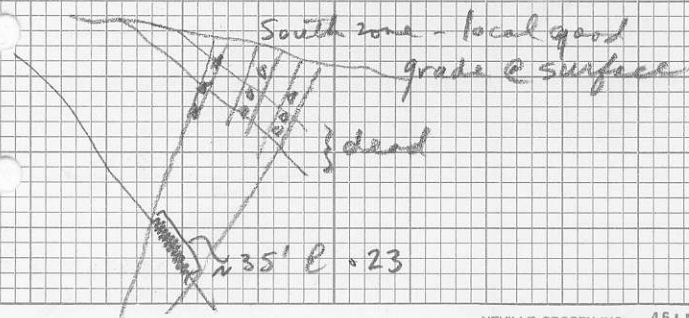
no As Sb Hg

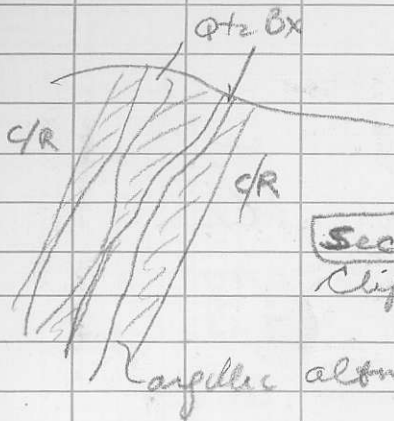
Cliff Ch

near surface $70^{\circ} W$

at depth - flattens to $50^{\circ} W$

VEINS all dip west.





Section

Cliff ck zone

argillaceous

AGE

> 182

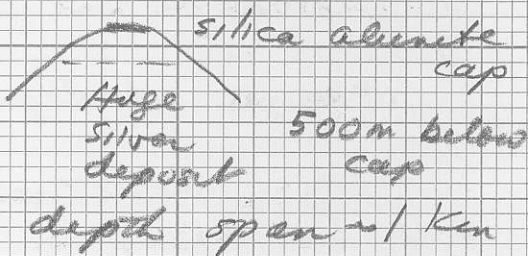
< 210

• Flow domes - neglected
TERTIARY DEPOSITS

• STRATOVOLCANOS

Sillitoe et al

MESOZOIC DEPOSITS



chalced qtz / other qtz
partly corroded / aluminite
barite HIGH LEVEL

silic. sponge rock
native sulphur bars

* Adularia - sericite

Continental

Hot springs

may not have much lateral

• acid sulphate ^{mixing}

steam heated

corrosion strong

vertical extent higher

magma at depth

lots of meteoric fluid

will be mixed in.

- consider boiling versus
mixing

- not every geoth system
result in gold
deposits - some do

acid sulphate

rich in As / CO₂
Sb / evolved

Silica sinter

micas clays alunite

• rate of flow key -
too slow - deluted

fast - explosive

• many epithermals have
bx zones - BUT

HISHIKARI

adularia - sericite -
caliche

boiling

3.86 moz in 1.5 mt
809/9

no signif. bxtn

• Lateral flow -
geothermal systems

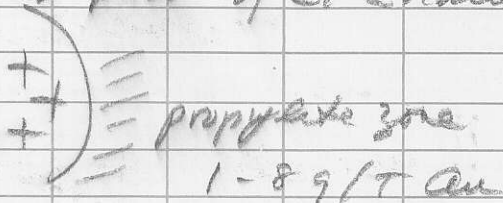
• gold xptd @ 1-10 ppb
level

• Stratovolcano - fluid

up - then lateral & down
slope through permeable
vx

will cause 'rootless'
alteration zones - gold
will be a source - not
under alter

Lower part of Et Indio



El Indio

Enargite - Au - Ag
argillite - silica

pyroph - albite

STRATOVOLCANO
RELATED

El Tambro?

Top of system

Fluorite box

perovskite clay alter

Bx - barite albite
silica
+ native Au

? Seawater influence?
ie seawater not
meteoric water

gold in fluids -
S component critical

are a_p - concn a fn
of S fugacity

Base metals - Cl critical

silver + base metals in

sea water - dilution
causes deposition

now take remaining

fluid higher - boil it

+ a_n + a_p dump

Xenothermal?

telescoped

HOT but at surface

Basement

Ash flow / fall

Stratovolcano

gray dacites younger

Remove flts, etc

→ linear volc features

deposit - scale graben

defined - slope, NW

structure

Evolved fluid

magmatic component

Henry Marsden

SHASTA DEPOSIT

1:10K scale mapping
of 20 km²

Peter Holbeck

Peter Tiersch

Margaret McPherson

4 major episodes

Stuheno

angite phytic

↓

subaerial

Dacitic volca

Qtz phytic

H₂O Bio Fs

LT, epidiorites

cut by intrusions

Saunders grey dacite

ash flow

a huge cooling unit

Property

Qtz
Bio

H₂O
x 15

Volc debris
flows

span of volcano
to NE?

welded
ash flows

Dacitic

Volcanic clast

~~Dacite~~
dome

Basal talus

Stehens

oversteepened by continued
dome growth

Qtz carb structures in breccia

Ksp an alt zones

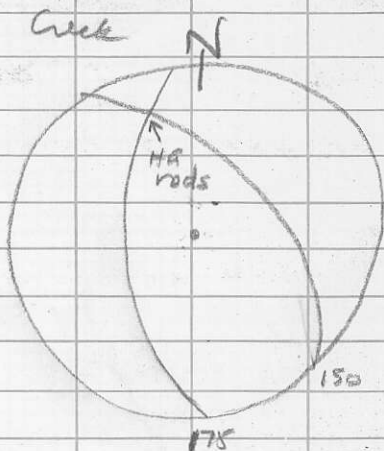
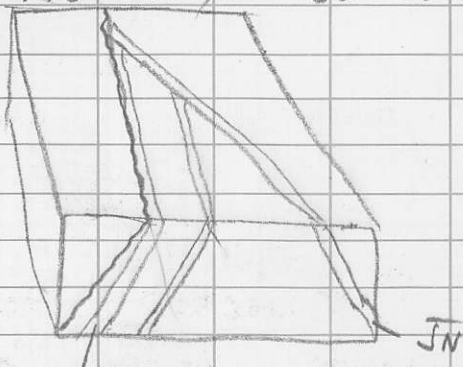
shallow zones, not veins

JN zone

330 / 50° NE

Creek zone

175-180 / 55-60° W



Explain significance
model - measure
strike - predict dip

CR pyroclastics - where
intersects dacite dome
contact - it splays
& becomes poddy.

Why? Zones are weak

- zones of incipient

movement - pyroclastics

permeable, wet - forms

good structures - dacites

avg Ck zone 1:15 Au/Ag

JN zone 1:45 Au/Ag

no coherent structures
so no good ore zones

SHASTA FAULT

Truncates Creek/JN
intersection is post-mineral

Net slip vector calculated
from fet intersections +
defined blind drill targets

180 m on fault - normal
with slip @ 65° to strike.
Zones in dacites -

follow them to pyroclastics

- test for ore grade mat'l

Zones

2 - 25 m

5-6 g/T gold \equiv

Reserves

500 000 8.79 g/T Au

or 1.2 MT 5.79 g/T Au

Peter Teggart

CHENT GOLD

Structure

Separation of post-ore
functioning is difficult
but necessary.

amethyst Au br-

$\frac{1}{2}$ MT $\cdot 25$ Au $7\% \text{ Ag}$

Cliff ck 160 m strike 750k Tons

Cliff ck fit $\frac{0.19 \text{ Au } 7\% \text{ Ag}}{(?)}$

Mining A&B Zone from 1700 level
up

$2\frac{1}{2}$ yrs reserves @ 500 TPD

zone still pump @ elev 1600 m

STRATIGRAPHY

Upper Andesite - pyritic

Kfs megacrystic tuff

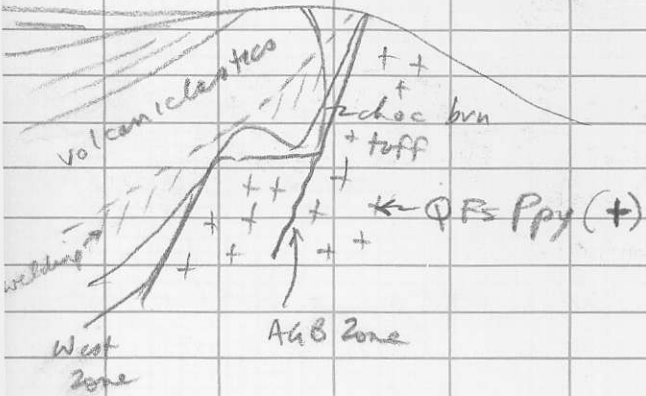
waterlain tuffs/epiclastics

air fall trachytic tuff

welded tuff \leftarrow welding @ 30° to bedding

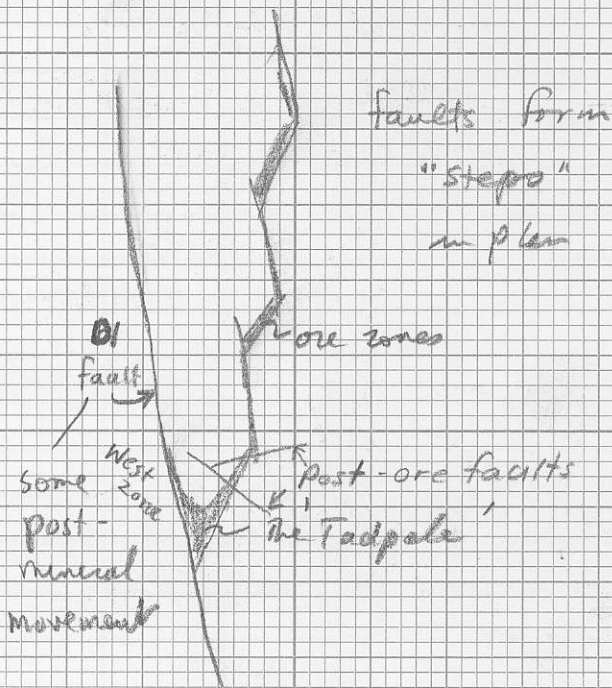
chocolate brn tuff

Q Fs Ppy - Dacitic
[Qtz Eye Andesite]



Hydro fluids up half
graben marginal faults?

D1 Fault



alteration

Qtz Eye cloud is host rock

Envelopes narrow

actz to Kspar

Qtz - chl

argillie

(clays, micas - white)

$Qz / Ag = 1 : 5$ south (fringe)
↓
 $1 : 50$ north (core)

Graben - filled during subsidence
to account for steep
dips