Memorandum

842741

Vancouver, B. C.
1980-02-20

IRON MOUNTAIN PROJECT - M491

Memo - #41/80-39

J. FOSTER:
S. YUNGUL:

We have another powerline type problem! Could you review the attached sheets and provide some recommendations as to what is geophysically possible on this property.

The attached electrical data may not be complete. It was only compiled with some difficulty. Call me if there are any obvious omissions that need clarifying.

The presumed target in this area is a narrow galena-rich massive sulphide body hosted by felsic volcanics and/or argillite and limestone. The sulphides would probably strike northeasterly and dip about 20^{o} to the SE. Our initial data gives 8% Pb, 3% Cu, 2 oz/ton Ag plus some Cu and Ba over 10'. In this sampling the pyrite content was probably quite low. There could of course be massive sulphide related stockwork sulphides also.

Initial coverage would be relatively shallow penetration reconnaissance with an areal extent partly filtered by this year's mapping. We are reasonably confident that we can locate the most favourable horizons at surface by semi-detail mapping. The best guess at the present is that we will want to examine geophysically a 4 mile strike length.

DAVID ARSCOTT

DA:am
Encls.

KEY LEGEND.

1 WESTERN ANDESITIC LAPILLI TUFFS. AND TUFFS

2. DARK GREY TUFF - fine grained siliceous mudstone with occasional fragments, passes laterally into a sedimentary package 2a.

3. PURPLE GREEN LAPILLI TUFF - ~~purple/mate~~ Andesitic, many chloritic clasts in purple matrix.

3a S.W. SEDIMENTS - Argillites and arkoses

4. WISPY CHLORITE UNIT - light green. ^ K-rich lapilli tuff with occasional beds of grit ~~4a~~ 4a.

5. RHYOLITE - light grey ^ lapilli tuff to fine tuff

6. PURPLE ARKOSE - massive to thinnly bedded purple/red. ^ silt-/sand-stone with many Jasper pods.

7 GREEN GRIT - green/grey coarse arkose flecked with chlorite spots.

8. ANDESITE LAPILLI TUFFS - dark green or maroon, some ~~sil~~ sediments

9. ANDESITE FLOWS AND TUFFS - light purple/red, flows may be amygdaloidal; pods of jasper

10 SEDIMENTS AND TUFF - sand-/silt-stones with pyroclastic beds + fragments

11. NORTH SEDIMENTS. - predominantly sedimentary, sand-, silt-stones ~~beds~~, argillites + limestone beds.

12. LIGHT GREEN SILICEOUS TUFF - very similar to wispy chlorite unit only much more siliceous.

13. RED SILTSTONE - uniform, partly siliceous, no fragments.

14. GREY LIMESTONE. | fossiliferous, calcargillite to calcarenite, occasional gritty arkosic beds. (14z)

14a (e) LIMEY SEDIMENTS. | calcareous to non-calcareous silt- to sand-stones, ~~tuffs & lapilli tuffs 14c~~ Andesitic tuffs + lapilli tuffs 14c; ~~limestone 14e~~, some fragmental sulphides 14b.

14b.

14c

14e. limestone.

15. S.E. RHYOLITE | - blue-grey or green, fine grained, no fragments + occasional feldspar phenocrysts.

15a S.E

16. ANDESITE LAPILLI TUFF | - ~~grey~~ to dark grey/purple, occasional silt- to sand-stone beds. Laterally passes into a small sedimentary package 16a

~~16a 16b~~ The start of another rhyolite unit.

17. COTTAGE CHEESE LAPILLI TUFF | - grey/green, sub rounded fragments in a calcareous matrix

18. RHYOLITE DYKE AND FLOWS | - uniform light green, highly siliceous with qtz eyes,

19. RHYOLITE MUD | - uniform green to black highly siliceous fine grained aquagene(?) tuff.

20. PURPLE ANDESITE BRECCIA. | - deep purple breccia, separated from (19) by a thin unit of green (unhematized?) lapilli tuff. 20a

20a

21. RED LIMESTONE | - fossiliferous ferrigenous limestone.

22. NORTH LIMESTONE | ~~20 of 21~~ grey biodastic limestone, part of 11 or 14a.

D. DIORITE | - medium to coarse grained.

J. JASPER | - as pods (thinly bedded) and thin sediment interbeds.

V VOLCANIC VENT - | volcanic breccia pipe?

TS.
3.C.22.
PF 193
TS 195

(1)

The general ~~geo structure~~ geology of Iron Mountian is predominantly volcanic pyroclastics, with lesser amounts of flows and intrusives, of an apparent wide compositional range. Periods of lesser igneous activity are represented by ~~sediments~~ immature clastic sediments and limestone. Broadly, the units trend NNE–SSW (≈030°), and from the occasional graded beds the sequence youngs to the E.

(1) The Western most unit appears to be a dark pyroclastic ~~unit~~ and flow unit. Dark green/grey/blk ~~fragmental~~ tuff to lapilli tuff fragments have a green rim of chlorite. The flows ~~is~~ are porphyritic to glomeroporphyritic (felspar crystals 2-3mm) and amygdaloidal partly filled with qtz. chlorite. acicular tremolite? In places matrix has been heavily hematized to a dark red/purple. ~~Fragments~~ and are largely monolithic, with occ xtal fragments. Only a few o/c mapped. Andesitic?

~~The next~~ Overlieing this Andesite lapilli tuff and flow unit is a varied ~~sediment~~ sediment unit characterized by a very hard siliceous dark grey (blue or blk, also occ. p. or green) fine grained tuff. Commonly with very few visible fragments, it may have euhedral & broken fsp and qtz ~~(fragments)~~ xtals (+2mm) or larger dark lithic fg. (≤ 1cm) occ J fg. Generally massive changes being gradual, this could possibly be a aquigene tuff.

Intermittant extrusive volcanism produced several porphyritic/glomero (fsp xtals ≈ 2mm) dark gy flows and/or fine grained tuffs. To the south this unit thickens considerably and [~~interfingers with the next pyroclastic~~] contains a small pocket of p. & gn mottled tuff. similiar to the ~~next unit~~. Purple/green lapilli tuff. [~~Within these sed. is one Jasper showing.~~]

(3) The purple/green lapilli tuff is a largely Andesitic? unit characterized by a dark purple matrix and an abundance of dark green chloritic fragments.

D' ~~Andesite~~ ~~And. tuff & flow~~ (3)

- laminated chlorite frag. has light yellow streaks. 4cm+ ✓
- pk br fg. silicified ✓
- ~~(light pk) fsp~~ fsp fg. qtz fg.
- red J?
- large p. fg. → porphyritic fsp.
- matrix chl. or silicified.
- red/brn silicified fg.
- angular fg. - sub angular. sub rounded
- small qtz vns

- light pk frag.
- slightly more acidic units.
- felsic intrusive fg.
- infilled voids - cc.
- gritty gn poorly sorted, generally ≤ 2mm (occ fg ≤ 1cm); volcanic arkosic. c. sst.

③ cont. - unygd. filled with cc. + some matrix cc. (alteration cc. =)
- gritty unit appears in places at the top of this unit.
- grades over 10-20 m into the Xcl unit.
- in the southern part of this unit - distal part? (thins against sea.) is a pocket of gypsum.
- seds become more common in the S end of this unit as it progresses laterally (interdigitating pockets)
to a clastic environment.

(3) The purple green lapilli tuff is a largely Andesitic (?) unit characterized by a dark-purple matrix and an abundance of dark gn chl. fg. Fragments are generally 2-3 cm but may be 4cm+. Chlorite fg. may show a yellow/gn streaked app. not seen in other units. Other fg are usually dark gy/purple or red/bn porphyritic (fsp) to fine grained angular + sub angular pyroclasts. [* Less frequently fg. of pk extrusive felsic and medium grained felsic intrusive (diorite ?) may be found and red J fg.] Fg usually touch each other.

Commonly the matrix and lithic fg. are very siliceous, but not the chl. fg. however it may vary from being entirely chl to entirely sil. Occasional voids are filled with cc as are amygdales within the occ. flow unit. There is with in this basic unit some felsic material either as discrete areas usually represented within only one outcrop, and [* ⟶] in the And. l. tuffs.

A vol. gn arkose unit appears in places near or at the top of this unit; its poorly sorted (fg generally ≤ 2mm ; occ fg ≤ 1cm) and becomes more important to the south as this unit thins and laterally progresses into a more sed. facies. Near where this unit changes from a predom pyroclastic to predom sed facies there is a small pocket of gypsum.

[There is a gradational change over 10-20m int the Light green wBpy chlorite unit.]

(4) - can be traced across the property. - tapers out at S end.

- red/pk. lightly hem (~~...~~)
- fg ≤1cm may be fine grained ≤ 1mm + larger dk fg. fg 2cm+
- fg fsp (pk)
- fg sub ang.
- lithic ~~xstal~~ fg. in fine matrix bn usually light-med. gn.
- chl. fg throughout v. chara.
- v. often heavily sil, in places chl
- occ red J fg.
- matrix flecked by v. small white spots

T.S.

SM 86.

- limonite spots
- light pk/crm fg ≤ 1.5mm.
- fine grained parts in xcl unit.
- multicolored — pale gn — pk/crm / light gn mottled.
- matrix may be nearly absent.
- chlorite fg ~~may be subrounded~~ may be angular to subang. 1mm → 1.5 cm.
- some gn qtz fg - subrounded.
- fg usually don't touch ie within fine grn matrix.
- some white fg.

Grnstn xnl. Wkd

med. bn/gy/grn.
fleck gn chl.
pk fg. up to 3mm.
fg ≤ 4mm (1 fg 1cm+)
not sil. ss tuff.

v. occ. basic fnd. dk gn/gy tuff with pk fsp xtals. slightly cc.

* Sed. unit

(3)

(4) The Light Green wBPy chlorite unit can be traced as a distinct unit across the property until the south where it thins out against the sed. pile. ~~It is an~~ acidic ~~tuff to lap. t. of~~ ~~(felsic crystal tuff)~~ with a light gn/gy ~~fine-grained~~ matrix, in which are scattered ~~usually~~ ~~not~~ without touching each other, dark grn angular - subang. chl. fg + wisps (2cm+) and bright red J frag (latter not always present) (up to 1cm). ~~(other less freq)~~ Xtal fg ~~(not)~~ are usually pk fsp [and less often qtz] ~~and~~ which may be altered to white (sericite?) [~~Other less freq. fg. are pk/crm rhyolite fg.~~ Parts of this unit ~~have~~ less matrix and ~~flag~~ give a multi-colored appearance.

Within this felsic l.t. are occasional gritty to argillaceous sed units, usually med bn/gy/gn flecked with chlorite, and a And tuff, dk gn/gy with pk fsp xtal fg. Overlieing this and partially interdigitating with it is a massive. dome? rhyolite unit.

* (3a)

- tuff arg matrix
  - dk blk f.gr.
  - white xtal fg some euhedral some broken. 2-3mm. fg - ang.
  - infreq lithic fg. sub-rounded. dk bn/red
  - ~~fsp~~ may have limonite spots.
- tuff fg ≤ 1cm.
- red gn bn yell altered.

Qtz-chl sp. tuff.

- med. dk. gn/gy
- equidimensional dk grn chl sp ≈ 1mm.
- fsp phen.
- fg 1-3mm.
- arkosic ss t.

—— may show Jasper bds throughout

- purple fine tuff.
- J. on facture surfaces.

- area generally has variable alterations of hem., sil. and sericitiz. in addition to some mineral. main spec + J. limonite spots prob. with dbs. spec.

- Acid l.p. fg 2-3 cm..

-

N.B. Fe SiO_2 floods out onto seafloor at same time exhalite is being dep. Event occurs for as long as it takes to dep p.t. including pods of J-which occurred in other units at possibly stratigraphically simultaneous times, by water transport, so that pt. is the basal part of gn gritty unit. Red hem color due to syngenetic hydrothermal activity as opposed to epig. fluids coloring + silicifying. Feeder zone in the S.W corner - spec vnng common beneath J. horizon (J. Hodgson.) J. pods formed during quiescent periods when concentrations in hollows could occur + currents bringing material in were quieter + didn't disturb the beds.

3a A small package of sed lies to the south of ~~both the~~ and stratigraphically equivalent to the p/gn lt. unit. It consists of argillites [with variable amounts of + impure sst. which have been (orig. fsp) extensively alt. in places subrounded. xtal fsp fg and lithic fg] [blk and variably siliceous]

The Argillites are [blk +] [c.]

The coarser sed are mineralogically + texturally immature arkosic sandst. Med dk gn/gy with fsp + qtz xtal fg speckled with dark grn chl. spots (≈ 1 mm)

There is also several basic to felsic tuff to lapilli tuff beds. Alteration is extensive + variable making original rock type definition difficult. Hematization + spec vein are commonly assc with spec. is a white/crm alteration silicification. Ferrigenous qtz (J) has also been obs. + ppt on fract. surfaces in places.

Marking ~~part of the sed facies and the p/gn lt. unit~~ [A finger of the p/gn lt.] the sed unit is separated from the next unit by [ ] which shows a gradational change over 10-20m into the light gn xtal unit.

BILLS NOTES !!!

(5) - to the north unit 4 is overlain + interfing with a zonal rhyolite body which pinches out rapidly to the south and thins considerably to the north.

- med gy/bl/gn. ✓ light gn/gy → white.
- rounded chl. fg.
- agate fills amygdules.
- x. sil.
- fine med sst.
- fg ≤ 1.5 cm.
- occ fsp. fg.
- xtl by qtz
- v. fractured.

- others orange/yellow.
- fine blk occ larger xtals (white)
- other parts are light colored
- fg up to 6-7 cm.
- occ And fg.
- banded
- xtal tuff fsp laths // to bed.
- 1 large rounded fg.
- sub aqueous bed?

- heavily altered areas are light colored and may be silicified ~~so that~~ + look like like felsic lt. may be altered more basic unit.

- mottled gn/bn
- white silica ~~along~~ streaks - poss. flow ~~flattened~~ amygdales?

(5) ~~Variably~~ light gn/gy or grn to a dark blgy/gn when fresh. - it weathers a yellow rust orange, and is very fractured ~~massive~~ It appears to be a predominantly pyroclastic unit generally lapilli tuff (up to 6-7cm) with finer tuffs or flows. ~~Very siliceous~~ Both matrix + fg are ~~the~~ often similar light colored + v. siliceous, occ dark And (?) fg occur. Frag are all angular, + poorly sorted ~~in some places the fg show~~ however in one place ~~a bedded unit fine tuffaceous~~ unit material shows bedding with laths of fsp (1-2mm) aligned parallel to bedding and there is a large rhyolite pebble, indicating that at least part of this unit may have been subaqueous in its deposition. (may also be due to reworking)

Another flow? unit ~~the~~ in the north part of this unit shows many ~~oblong~~ 3-4mm qtz filled ovoids amygdales in a ~~fine~~ fine (quenched?) matrix, ~~representing~~ perhaps flow flattened amygdales.

This unit has been heavily altered in areas and the sericitization? and poss. silicification may have made more basic material look like part of this felsic unit, further T.S. work is required.

5.

(55)

(6) - present only in the southern part of the map ✓
- it overlies the Xcl unit and after that pinches out it lies against the p/gn l.t. ✓
- it is uncertain whether in fact this is not a hematized area of a thicker gritty ash directly above it.
- The purple ~~arenite~~ arenite:
- red/~~purp~~ bn ✓
- occ large f. ✓
- occ gn/blk chl. flecks. ✓
- some cc.
- pale pk fsp fg. ✓
- in places silicified sil simult. with Fe hem? feeding of soln to Jasper horizon.
- occ bright red fg. J. ✓
- generally sand/silt. ✓
- bedded thinly. ? show thin banding. ✓ ppt in water.
- Jasper pods mixed with white qtz. ✓
- ~~spec~~ veining.
- places → orange patches.
- qtz vns.
  - parts have not be hem. ind? → part of gritty unit?
- barite veining ~~rare~~.
-

The purple arenite starts approx where (5) stops, it is overlain for a lateral distance of 550m. by this unit before it pinches out. The p. aren. lies ~~again~~ directly above the Xcl unit. Generally a red/p ~~color~~ sltst to c. sst. with occ visible pale pk fsp fg (≈1 mm) and gn/blk chl. flecks, it has ~~very~~ v. infreq. single larger fg. ≤ 1cm, including some J. fg.

It is massive to thinly bedded ~~and fissile~~, mineralogically + text. immature (arkosic), with small pods (< 40m long and 20 m. thick) of massive, bedded or brecciated J.

6 (cont) There is quite frequent spec. vning + qtz vning with ass. silici of arenite in many places. ~~(Bartlett Inlet)~~.

One arc of this unit is not p/arenite but a bn/gn fine clastic ~~lith~~, further evidence that the p/arenite is the same ~~unit~~ as (7) but under a diff. enviroment.

(7) - med gy dk. blue/gy may have p. tint.
- flecked with chl. 1mm. - 2mm.
- Amygdales ?voids? filled with cc. or qtz up to 7mm
- fg or xtals. fsp.
- fine grn. - sandy ≤ 2mm.
- non sil. — sil.
- epidotization. esp along fract.

rounded wisp. + chlorite — red fg.
dk gy/blk fine arg + fsp xtals fg. silicified.

- may be altered. heavy spec vning.
- Manganese spots.

Swards

A rapidly thickening ~~sandy to silty unit~~ clastic unit overlies the p. t. and the Rhy inter fingers for several 100m between the pt. + gn/gy grit. ~~Characteristics~~ Usually a ~~pk~~ med dk gn/gy or bl/gy and flecked with blk chlorite spots ≤ 2mm Fragmental xtals of qtz + fsp are often visible. as are the occasional red fg of J.

Alteration by epidotization is ~~often~~ common. along fractures and the whole rock may or may not be silicified.

A characteristic feature of this unit is the abundance of angular voids throughout up to 7mm which has subseq. been filled or partially filled by cc and/or qtz.

There are minor amounts of blk, arg ~~s~~ schistose usually with white fsp xtal

fg. visible within the matrix.

8. - whiter gy/bl.gy or gn or maroon porphyritic.
- mass. -
- med xtals ≤ 2mm white fsp. up to 10%
dk p/gy matrix.
- many amygdales voids. qtz filled irreg. + spherical.
- fine xtal fg. ash
- - v. fine grained gy/gn. tuffs. +/- fsp xtals.

- gritty like 7, with J.

- J. rich splotch between in some fg.
- fg angular ≤ 1cm. lithic + xtal fg. Basalt.
- 1 red fg.
- may be heavily hem. + bright red → J.
- much cc in places between fg + in voids.
- spherical + ang. chl fg.
- ~~sil. non-silicious~~
- ~~tight gn/gy~~
- blue/gy - blk + red/green grey + wht fg. dess py.
-
- rhy. mat. v. occ.

26 1811

(8) In the center of the map is a unit of dark gn/~~blk~~ or maroon Andesitic? l.t. . Thickest in the middle it ~~tapers~~ thins both to the north (eventually pinching out) and to the south.

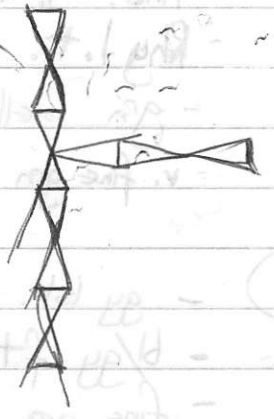
A Massive fragmental unit, the constituents are generally ~~dark~~ basic ~~(gy-blk red/gn)~~ with occ lighter felsic fg. and r. occ ~~int~~ outcrops of a more felsic nature. frag are generally angular and ≤ 1cm and consist of lithic and xtal types. Xtal fg can be up to 10% of the rock and lithic frag 30-40%. Quite often there are qtz + cc filled voids ~~(amygdales)~~ of irregular to spherical (amygdales?) shape.

Chlorite fg. are also common in places and are generally angular [~~Rare~~] There is also a no. of fine grained dark argillic tfts (with or without fp xtal fg.), ~~and~~ fine silts, and gritty beds like (7). [and Jasper fg. are occasionally seen]

In places this unit is bright red in splotches between fg. due to the intro of Fe chert.

(9) And. Unit.

- small unit of predominantly red/purple ramyg. And. flows. ✓
- variable hem. may be blk. -
- not v. porph. ✓
- Banding often ns. ✓
- pieces of J. ✓
- malachite ✓
- w. epi. + chl. ✓
- occ J-qtz vn. ✓
- gn lt. pale pk-p. sub ang fg. massive
- argillaceous matrix
- dk gn lt. hem fg. surrounds ← sub ang. plag phen. small platy chlorite fg.



Mining min. / clastic py. / Jasper | rock sample map.

- l. purple
- massive.
- mang. staining. sub ang red fg. - light green fg.
Jasper - banded

bdark p/gn

(9) This is a small unit of light purple/red flows and tuffs/ l.t. Generally massive with sub ang red and/or light gn fg. and red J fg. Flows are amygdaloidal and banding may be visible.
- there is several pods of banded J. and J-qtz vns, and hematization is variable throughout. This is a poorly defined unit and possibly Although it is similar to the p/gn l.t. (Andesitic?) Sandy has mapped this as rhyolitic, possibly a part of unit (5) in which there was simultaneous Fe - SiO_2 hydrothermal act, giving the darker color, supported by the presence of Jasper pods.

(10) - chy porhy tuff. angular fg.
- chl.
- sed.
- crm tuff ang
- A.t. masss.
- And. l. t. dk bn blk white ang fg.
- Rhy l.t. - dk gn/gy f gr matrix.
- grn well sorted R. t.
- v. fine grn. R.t.

(11) - gy lst. ca vn.
- bl/gy f.t elastic sulphides?
- fine arg.
- light maroon to light brn l.t. cl. + plc fg.
- gy brn sst. → c sst.

p/bn l.t. hard some band. l. bn + dk gy fg.
- bedded.
  - fg. in p. l.t. ≤ 2cm.
  - mod xcl.
  - c + f bedded.
- dk gn l.t
- bn l.t with large bx sized fg.
- pocket of lst. pebbly
- gn - dk gn At cl. units.

(10) A mixed sed ~~,~~ felsic + basic clastic unit which interfingers with and is possibly a lateral facies change from unit (11). Sed are usually ss + sst with pyroclastic fg. There is ~~(no equiv)~~ approx equivalent amounts within the pyroclastic material of felsic + basic.

Felsic material tends to be light colored [angular] l.t to frgm. Argillite [but may be dk gn/gy or p. due to hem.] and may be well sorted.

Basic material is dk bn/p. or blk with some white ang. fg. generally only l.t - tuff and quite often altered (partly) to chlorite.

(11) This unit is a predominantly sed. unit with some pyroclastic material. Sediments are generally [sandst or ss.], bedded, poorly sorted and not very mature. [blue/gy, gn/br or brown] There are occasional beds of argillite and gy lst, and some of the beds are fairly calcareous. Many of the beds have occ larger fg of pol. material + one bed has clastic sulphides. To the extreme north there appears a small lst pocket which may be part of this unit.

There are several beds of dark gn or p/b l.t with a variety of generally basic angular fg. ≤ 2cm although 1 bed has bx sized fg. These l.t may be variably altered by silica and by chloritization.

(12) - light grn
- v. siliceous
- fine grned matrix.
- multicolored dk gr chl. wisps. red J. fg.
- angular ≤ 1cm. most 2-4mm
- not touching.
- Acidic lithf.

Although a fairly thin unit, it outcrops continuously across the property and is a distinctive unit as is the next unit. This is an acidic light grn highly siliceous lithf, with a fine grained matrix ~~and a fabric~~ set in which without generally touching each other are a no. of colored fragments, the most distinctive being ~~dkcl~~ + red hem. st or J fg. ~~Fragment~~ Frag size is ≤ 1.5 cm and generally ⇒ 2-4 mm, angular to subangular, [there are other occ bn + purple fg.] This unit is occ. chloritic, and at first glance looks exactly the same as unit (4) only more siliceous.

(13) A second distinctive unit named overlies (11) ~~and~~ and is a uniform reasonably sorted, uniform dark red/purple ss-sst, ~~fine grained but~~ finer grained than the p.t. and a little ~~harder~~ although not gen. sil, it doesn't appear to be bedded. In places there may be small (2-3 mm) chl. wisps, but these are the only fg. that app in this unit. [part of Mcmillians marker bed.

To the north east the (12) + (13) units are in direct contact with each other and lie between 2 sed. units. Further south they become separated from each other and ~~from~~ from the overlying sed unit by a ~~thin~~ p/gn lit, this p/gn lit. unit is in most respects similar to the unit (8) so that (12) + (13) may be areally more extensive or ~~beds~~ within the (8) unit. However because of their uniform + persistant nature they form a useful double marker unit.

(14) - Grey massive lst.
- fossiliferous? - brachiopods + small unidentified bioclastic.
+ calcareous ss. + sst. occ.
- calcargilite → calcarenite often has white fsp xtal fg.
- cc tuffs.
- thin volcanic, And +. (with white phenos.
- thin gn gritty arkose bed.
- cut by cc vns + chl. vn.
- fg include J. angular.
- in places coarse xtals of cc → recrystallized.
- this mass. lst is gen. pure + is only S. of fault

(14a) - A predominantly calcareous unit but with many more impurities and pyroclastic and sed units.
— aqua-gene light gn - fine grn siliceous tuffs.
— And. dk p/gn flows + tuffs amygdaloidal. may or may not be sil or cc.
— occasional pods of pure grey lst, with fossils - bryzoan. and bioclastic material (2-4mm max.)
— dl/gy sst.
bl/gy greywacke.
— alternating clastic sed + lst.
- chert + arg. interbeds.
- graded in places youngs E.
— a characteristic unit in the [illegible] is a pebble xtal tuff.
- frag may be angular + well rounded pebbles.
— most ss - sst beds are cc.
— lithic + xtal tuffs.
cmm/gy calcarenite.
dk gy " arg.

Ec arkosic sed.

- shallow water variable clastic input basin with occ pyroclastic units arriving areally?
- some beds have massive py clasts up to 1 cm + in a gy gritty arkosic unit.
- Eastern N. part the sed are a distinctive golden color when weathered (seen well on access road just before saddle.

14 Overlying the double marker unit is a predom calcareous sequence sed. unit which has been div into 2 parts. A limestone unit and a mixed limestone calcareous clastic + pyroclastic package. The limestone unit is to the south of the A fault and with the possible exception of a small wedge immed. N. of the fault. is separated from the marker beds by a thin unit of p/gr l.t.

It is a massive grey, fossiliferous calcargillite to calcarenite, with a common clastic impurity of white fsp xtals. In places the limestone is coarsely xtalline + oss debris. to local heating + recrystall; it is also regularly cut by thin cc + chl vns. and occ. qtz vns. Fossils are primarily brachiopods with alot of bioclasts (2mm). There are a minor amount of purple And. + ut beds, generally cc, and they may include f fg. and fsp xtals, and a thin green/grey gritty (2-3 mm) arkosic bed.

14a. The limy sed. unit is both N. + S. of A fault. and to the north of the fault this unit lies at first against the 2 marker beds and then nearer the A fault becomes sep from marker bed by a wedge of And. p/gr l.t. To the south of the A fault the limy sed unit is at first against the massive grey lst unit but they soon become separated by a rapidly thickening wedge of rhy + And + l.t. Graded beds show it youngs the blue/grey. The limy sed unit does have beds of pure, bioclastic (2mm max) limestone, but their extent is limited [fossils include brachiopods and bryozoan remains] The majority of the unit, is made of alternating impure calcarenite or calcargillite with calcareous sandstones to rdn calcareous ? greywacke lithic + xtal siltstones, and tuffs. Argillaceous beds including light green siliceous fine grained aquagene tuffs, and cherty beds are also present. A characteristic bed in the N. is a red rounded pebble xtal tuff and in the same area this unit is generally distinguished by a characteristic golden colour.

Pyroclastic material is largely dk/p/gn And. with an occas amygd. flow, both of which may or may not be silicified or calcareous, the fragment rocks are generally lithic + xtal tuffs, although some beds have large fg. Within this unit (core) is a horizon(s) in which there are massive py clasts upto 1cm+

usually in a dk gn/gy gritty arkosic unit. Rapidly changing sed facies. These sed facies and their rapid alternating indicates an ~~fairly shallow basin had developed possibly getting deeper to the S.~~ sed environment in which there was frequent changes in the current velocitys and the material they brought in, and it seems likely that a shallow basin had developed here during a reasonably quiescent volcanic period. The basin may have ~~extended~~ deepened slightly to the south allowing for a quieter enviroment in which lst could be deposited.

15

sil
fgr mtx
fg ≤ 1.5 mtx.
with red-bn fg white
fsp 2mm porphyritic for fg ≤5mm
med gn bl/gn fsp phenocrystal acidic-inter flow. 5mm fsp. may be aligned
streaky
chl. lines along fractures.
- bl/gn may be cc.
- qtz vns.
- no qtz eyes may be more intermediate.
- cc cubes & py ≤ 1mm.
- Manganese

The S.E Rhyolite Body

15. Forms a thick taco shape overlieing the limestone unit, to the North it pinches out between the 2 limestone units and to the S. it pinches out between the underlying limestone and the overlying Andesitic + - lit. unit. Commonly a bl/gy to gn fgr siliceous rock often v. uniform without evidence of fg. and only a few fsp pheno? There are no qtz eys so this may be a more inter. volcanic. fsp pheno can be up to 5mm long and in the larger xtal sizes

may show a // lineation (flow?) Alteration of fsp occurs occ. and a small amount of ~~some~~ chl. streaks along fractures, and occ there is ~~some~~ ~~calcite~~ carbonate.
~~(In several places cubes of py were seen)~~

(16) - ∂ gy / mottle gn
- Aft.
- rd fg. ≤ ±2cm. porphyritic lithic + xtal fg. angular.
- may be cc. or sil
- fsp fg alt. on rim to orange.
- may be chl. occ diss. py.
- occ Rhyolitic tuff ± flow near base of And. unit perhaps a inter finger from (15).

sed. - gn/gn fgr banded aq. t.
- blk cc arg.
- p./gy + sil pk; p; gn fg.
- gn vol. sst grades to c. sst.
- ~~bedded~~ grades sE cyclic repitition
c-gr ss sst
- fg py.

(16) - ~~The next unit is a more And. tope~~ The Rhyolite changes abruptly into a basic (And?) pyroclastic unit which interfingers with a volcanic sst - argillite unit.

The And ~~tuff~~ to l.t. are dk gy/p and mottled green with a both lithic ~~crys~~ (rarely felsic) and xtal fg, both are angular. The rock may be entirely cc or sil. or commonly a sil matrix and gn chl. fg. Some of the dk lithic fg. have porphyritic fsp, and there are occ rd fg (≤ 2cm) There are occasional bds within and a larger interfingered area of gn volcanic ss. to csst

with lesser amounts of blk sil. argillite and gn/gy fine gr. aq. t. Commonly bedded and graded (tops to S.E.) these vol sst often show a cyclic nature. to the SE
[Occ. outcrops show fg pyrite.]

(17) Cheese
Cottage, Lapilli tuff.
- fg ≤ 1cm generally 2-5mm up to 60% rock
- set in calcareous matrix, so that fg weather to positive relief.
- green/grey green.
- chl. alt. yes + no.
- may be f.grned.

A rather irregular shaped area of l.tuff overlies part of the lmy sed unit. and has been called the cottage cheese l.t.. Green to grey/green fg ≤ 1cm and on average 2-5mm make up about 60% of the rock. Sub angular to subrounded and set in a cc mtx they have been with. ink a positive relief although not all is lumpy, some areas are fine grned. tuff. hence the name. Chloritic alt is common but not everywhere.

(18) This small unit makes a distinctive hummock just to the s. of the road, and is a rhyolitic intrusive + poss. extrusive body. There are no frag. units, through out the unit it is a light gy/gn/bn with a highly siliceous matrix and qtz eggs throughout (< 1mm). It wthers a characteristic cwm/gy with bn equispaced streaks on wthered surfaces, possibly a flow banding? or a jointing related to cooling.

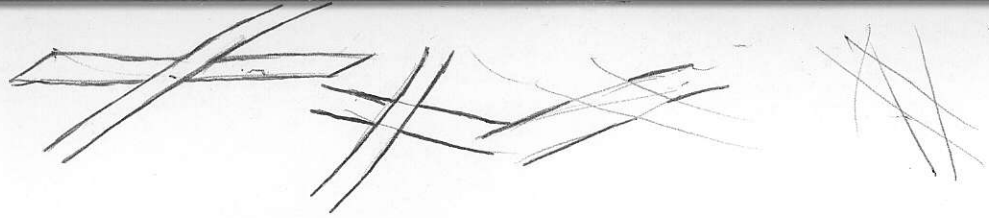
On the S. end of this hummock is a classic example of hexagonal columnar jointing, of the same rock type, and it probably represents a feeder dyke with either the surrounding rhyolite being extrusive flows or as a high level sill intrusion.

19. Partly surrounding and overlying the rhyolite dyke + sill unit is an extensive area of very uniform rock, the grn ~~blue/grn~~ gy. tuff.. It is a very f. gr argillic unit that varies in color from grn and blue or gy variations to a dark drab/blk color, but otherwise remains remarkably similar and highly siliceous rhyolite mud.

Frag are not a common part but chl fg and ~~qtz~~. qtz eyes (10%) when present, ~~are~~ do occur, and there are occas. ~~lens~~ beds of Ft with fg ≤ 1cm. The ~~SW~~ part of this unit topographically below the rhy. dyke has P. fsp (plag.) ph. in a dgy mtx and may be a flow.

(20.) The grn rhy. mud/flow unit grades into a grn/gy l.t. with fg ≤ 1cm and up to 40% ch. fg. and this is probably the un hem part of the next unit a purple/red andesitic breccia. ~~(red)~~ P-red fmg Frag up to 9cm, although more commonly ≤ 5cm, make up 70% of the rock and are set within a dark p. matrix ~~red~~. Most fg. app to be And with occ chloritic + other lithic fg, including sed. and bx. not many xtal fg. P fsp. vol. Often the matrix is cc. some ob. cc vns. and a few qtz vns.

(21) One outcrop of the next unit – a red highly fossiliferous (reef) ferriginous (hematite stained) lst.



DIORITE (FELSIC INTRUSIVES). These occur as small bodies (maximum ~350 m wide) of medium to coarse grained stocks. Generally a fairly irregular outline these intrusions have caused local hornfels contact metamorphism and alteration by sericitization and silicification, and the minor introduction of some copper minerals.

VOLCANIC VENT. There is one 50m wide resistant plug bounded on the south east by a cliff (fault?), it forms a small steep sided hummock, and is acidly circular. It is a volcanic agglomerate (or breccia) with fragments in excess of 7cm, of lithic igneous and pyroclastic nature with a moderate amount of finer matrix.

FRAGMENTAL SULPHIDES: Further evidence of mineralization of a stratiform massive sulphide type comes from the presence within the tuffy sediments unit (Pfs) of beds with clasts of pyrite up to 1/2 5 cm in size and variably rounded, and occasionally bedded. There is however no clasts of base metal ores. Nor has it been possible from the available data to determine any direction in which the fragments become larger.

STRUCTURE The iron mountain sequence appears to be broadly striking SSW-NNE although to the north this changes to SW-NE, it appears to be the result of a gentle fold. The beds dip generally to the east however within the volcanics bedding readings are much more variable with perhaps half the readings indicating that the beds dip east, and often with 56-100 m of each other several reading are for opposite dips. In part this may be depositional but it would seem there has also been some small scale folding as well.

56-86.

The beds dip moderately steeply 56-90

JASPER: The jasper on Iron mountian typically occurs in discontinuous pods and thin beds up to 15 m long and several meters thick. Usually thinly bedded ≤ 0.75 cm and very often brecciated, brecciation varies from slight breaking ~~and rotation but not displacement~~ of the beds to complete rotational brecciation, there is also some pre-lithification slump features. The jasper "horizon" is not confined to any one unit or boundary between units ~~it was~~ but it does run along strike ~~(largely) within~~ and is generally above (stratigraphically) the Xcl unit [although it appears to transgress this unit to the north ??? this may possibly be another jasper horizon which is below the Xcl unit like the jasper horizon at the old antennae site.

There are several other jasper occurrances both above and below [but not as continuous or as large], which would indicate that the hydrothermal activity occured ~~over~~ intermittantly ~~over~~ through the basic volcanics on the west side. The hyolites mark the apparent end of a volcanic phase and with it the jasper deposition. During Discussion with Jay Hodgeson this summer ~~he~~ he indicated that in many of the [Japanese massive sulphides deposits] jasper horizons associated with [_____] are underlain by a feeder zone of heavy speculaite veining. Such a situation appears to occur on iron mountian. In the S.W. corner of the area mapped, there is an area in which many of the outcrops have speculaite veins from $\leq$ hand to 1 m. These speculaite veins are variably present above the major jasper horizon and have often caused heavy alteration (sericitization, silicification and some epidotization.) in the rocks below the purple arenite (tuff).

It is also possible that the purple arenite ⑥ is the same as the green gritty unit ⑦ but that is was deposited during the heavy ferruginous silica hydrothermal activity

and occasional trough cross bedding and grading indicates that these beds young towards the east.

~~Faulting~~ occurs A major fault (A) cuts the entire sequence of rocks and it would appear to have been down-thrown ~~of~~ on the south side but the amount of movement is unknown. although it is probably not a great deal.

A second small fault (B) further south shows a movement possibly on the north side* If this is the case then the Lucky Todd shaft would appear to be in a small down-thrown block ~~of~~ *

Other smaller faults locally offset these units.

* There also appears to be some transform movement along these faults which has had to some drag folding developing along the fault.

MINERALIZATION. Iron mtn has been so named because of the extensive ~~amount~~ hematite and specularite mineralization, already described which has occurred near the top of the mtn and on which a large amount of blasting has occurred.

Galena, Sphalerite, and occasionally copper mineralization ~~has occur~~ is present in three places as what appear to be veins. The major vein (the Lucky Todd) [was worked during 1927-28 when] was 2 m wide ~~and~~ and located at a rhyolite-sediment contact, this [——] when sample yields gave Ag 1-2 oz Pb 8-18% with Au ~~as~~ in trace amounts. Zn 2-3%

The other two veins have been trenched in the past and samples taken from these gave the following results:

	ST (2)	ST (1)
Cu	184	1080
Pb	>10000	>10000
Zn	>10000	8750
Ba	>10000	>10000

These veins are ~~not~~ spaced across the property and do not lead to large anomalous soil ~~assay~~ assay zones. The veins are with rhyolites or in the case of ST 2 in sediments (Ha?)

Copper (malachite, azurite) occurs ~~as~~ as minor mineralization in heavily altered, silicified and sericitized zones. ~~and~~ Some of these altered zones exist around the diorite intrusions and mineralization is related to these. Elsewhere the copper has no obvious ~~reason~~ for explanation

ALTERATION.

WAH.
+ Hats -

Re: Lucky Todd Shaft rehabilitation -

The old cribbing around the shaft collar has caved in and some of the adjacent overburden has also caved into the shaft.

I am convinced that it would be a worthwhile venture to re-crib the collar and elevate the shaft so as to permit an examination of the workings.

ie where is the 'flat fault' which cuts off the ore? which way is movement indicated?
what is the composition of the footwall RKs to the fault? and from here can we suggest where in the section the fault a footwall rocks lie?

The Iron formation showings @ ~ 46N 49+50E are most impressive
The jasper locally exhibits very fine lamination and graded bedding and soft sediment deformation. it is exceptionally hard and difficult to expose clean faces. bedding appears to dip into the hill moderately and strike ~ 030°-035° within ~ 10 meters bedding appears to be ~ E-W and vertically dipping - neither attitude is conclusive
The Jasper is bounded on the East by a mottled purple to pink rhyolite tuff (McMillan's K rich lavas?) very similar to o/c at 52N 49E adjacent to the road to the clearing on top of the mtn. the impression is that these rhyolites overly the Jasper.
McMillan Maps a fault across the South side of Iron Mtn and it should pass very close to the South of the Jasper Showings. A small caved in Land trench or very small adit is on the base of the Jasper outcrop.
and 2 periods of very old claim posts are located adjacent to the trench.

Pending results of Geophysical surveys,
the following sites are suggested for short drill
holes (~125 to 150 m)

R. ash lapilli tuff is considered hanging wall
(cf. wispy chl @ Seneca and similar wispy chl
in ash L. tuff @ Fran Mtn)

The coarser fragmental R. ash L. tuff appear to be between old ant. clearing and top of Mtn.

the proximal relationship between the ash tuff and ferruginous chert is present in several locations.

	63E	52E
1C	60N	50E
	56N	51E (on side road.) *
	53N	46+50E ‡
	46N	49+50E ‡‡

* at this pt the chert is exposed along an old drill rd. and is located 100 m W of a white Rhyolite breccia containing copper oxides in the matrix.
Rocks in the intervening 100 m yield Cu Pb Zn Ag values of: {1630, 1300, 8400, 26, / 5200, 1800, 800, 17} (ppm) and use the location of a "strong EM-16 crossover"
(Steve Presunka, Falconbridge - Pers. Communication)
bedding here is dipping easterly @ 83°

‡‡ Ferruginous chert at the location achieves its thickest development noted on the property. it is well bedded, massive Jasper. .6 to 1.0 m thick bedding is not conclusive but it appears the steeply dipping westward to folded E-W and near vertical dips.

‡ Jasper at this location is restricted to thin concentrically folded layers ~.5 to 1 cm thick

with thin laminations of very fine tuff.
overlying a basic fragmental lapilli
the beds dip easterly with moderate to steep dips
tuffaceous beds to the south 35 meters have parallel bedding
but 4 meters eastward a very reliable bedding attitude is
dipping moderately to steeply westward (in fine ss to silty tuffs)
no explanation is offered for this apparent contradiction.
the sediment are overlain sheetlike eastward by
a distinct lapilli Breccia of pale grey to dirty yellow coloured
'ash' with distinctive chloritic fragments and common
very large 10 - 30 cm fragments of Pink rhyolite.

Fragmental sulphides and sulphide rich fragments are found in lithy grit units at ~ 60N 59E (Pye landing) and in similar rocks ~ 37N 57E. these lithy greywackes overlie a thin massive grey lithic unit and underlie an andesitic lapilli breccia with a lithy matrix (at least in the vicinity of 60N 59E) sulphide fragments observed are up to 1cm but more commonly are 1 - 3 mm. the beds are recessive weathering and are exposed in excavation for a log landing. the continuation of the beds under glacial cover may be projected but outcrop is sparse to non existent. over much of the stratigraphic projection. the beds, at least in the north are moderately dipping eastwards.

The possibility of down dip accumulation of massive sulphides is a distinct possibility.

The testing of the stratigraphy from about 125 m east of Pye landing would require a depth of ~ 150 m to the grit unit at a -45 angle. with real dips of up to -60°

several holes, (minimum of 3) will be required to achieve a crude indication on transport direction of the sulphides assuming clast imbrication is the best parameter to use.

Additional surface information might be achieved with the use of a backhoe in tracing the unit along surface.

Summary of Considerations -

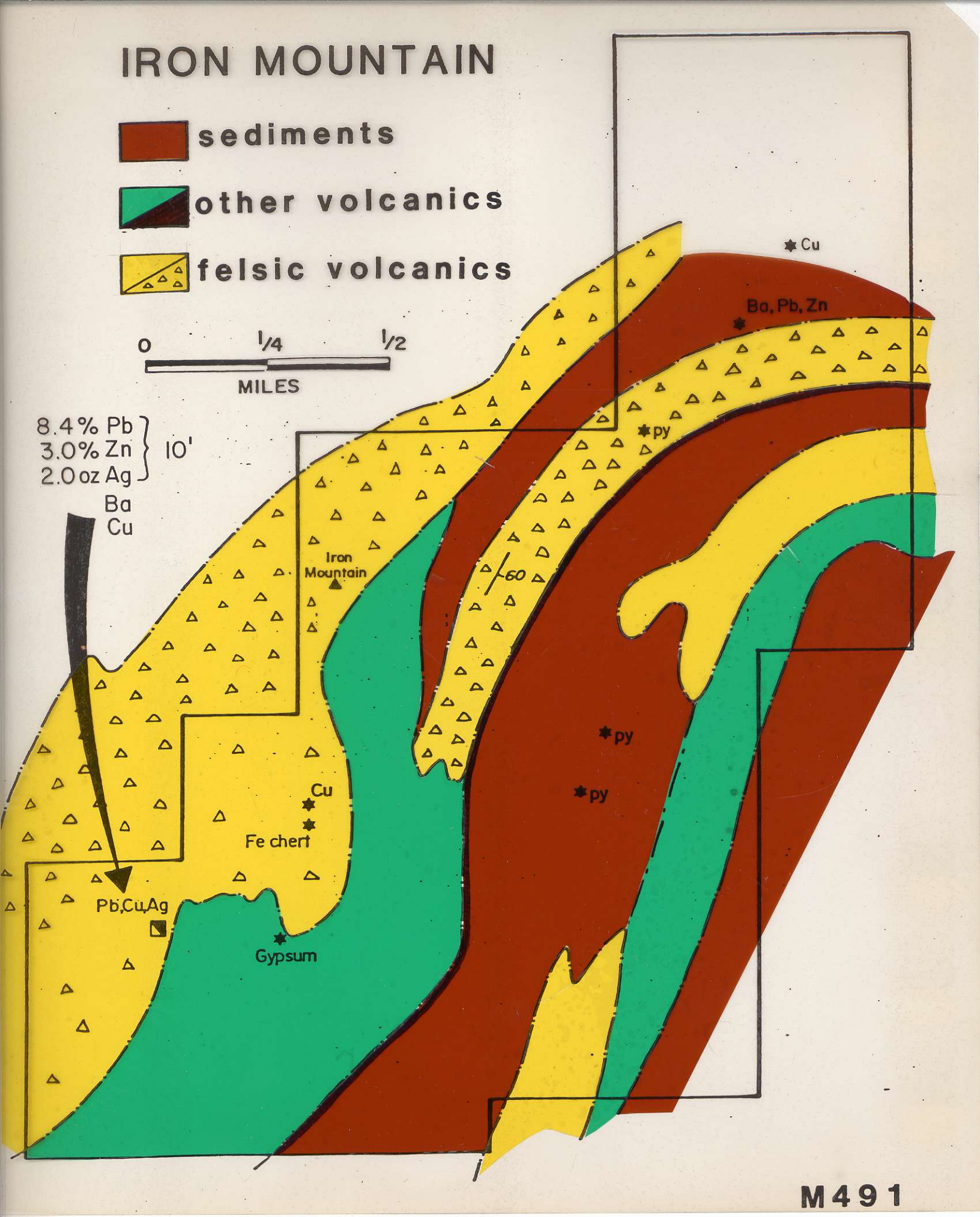
1) a zone of favourable geology with a presumed hangingwall displacement exists along the top of the mtn. as outlined by a zone containing ferruginous shale and acidic lapilli ash tuff. (Area A.)

2) a second type of potential occurs with the fragmented sulphides. Areas B & C there may be connected.

3) Geophysical methods should be employed i.e EM & possibly Gravity.

5) More land should be aquired to East before any further exploration on Areas B or C is undertaken.

IRON MOUNTAIN



M491

IRON MOUNTAIN

Adapted from W.J. McMillan BCDM 1978

Chevron Standard Limited
Minerals Staff

FIGURE No. | PROJECT No. M491

DATE MAY '79 | REVISIONS | SCALE

NTS No. 92 I/2 | FILE No.

COMPILED BY W.H.

1km : 200m.

feet R33 0 833 1666 2499

Metres 200 0 200 400 600

LEGEND

QUATERNARY OR YOUNGER PLATEAU BASALTS (565,000 360,000 YEARS)
- 8 — Basalt

EOCENE(?) KAMLOOPS GROUP(?)
- 7 — Volcanic flow and fragmental rocks

PALEOCENE TO EOCENE NICOLA BATHOLITH
- 6 — Quartz diorite to quartz monzonite

CRETACEOUS TO EOCENE COLDWATER SERIES
- 5 — Conglomerate, sandstone, shale, coal

CRETACEOUS KINGSVALE GROUP
- 4 — Volcanic flows and pyroclastic rocks, arkose, conglomerate

JURASSIC(?) CONGLOMERATE
- 3 — Chert pebble conglomerate

TRIASSIS/JURASSIC INTRUSIVE ROCKS
- 2 — Granodiorite, quartz diorite, quartz monzonite

LATE TRIASSIC NICOLA GROUP (NOT LISTED IN AGE SEQUENCE)
- 1 — Undivided
- 1o — Volcanic sedimentary rocks and tuffs
- 1n — K-rich acidic lava and breccia
- 1m — Lapilli to ash chloritic clast acidic breccia (ash flow tuff ?)
- 1l — Acidic volcanic breccia, some with andesitic clasts
- 1k — K-poor acidic lavas, breccia, and tuff
- 1j — Reefoid ferruginous-cemented limestone
- 1i — Massive to bedded often fossiliferous limestone
- 1h — Interlayered argillite, impure to pure limestone, siltstone sharpstone volcanic conglomerate and acidic volcanic breccia
- 1g — Red to purple andesitic breccia
- 1f — Grey to green andesitic breccia
- 1e — Quartzofeldspathic accretionary lapilli tuff generally has a red matrix
- 1d — Green to grey-green plagioclase lithic lapilli to ash tuff and breccia
- 1c — Dark-coloured andesitic to basaltic flows and flow breccias
- 1b — Microdiorite
- 1a — Diorite

Godey Ck
Power Line
3500
4000
4500
5000
5556'
5500
Iron Mtn
50°03'
Pye
Nelly Ck
Edna L.
Howarth Ck
Gwen L.
I.R. 3
120°45'