



42A09NE0104 27 KERRS

010

DIAMOND DRILLING

Township: Kerrs

Report No: 27

WORK PERFORMED FOR: Utah Mines Ltd.

RECORDED HOLDER: SAME AS ABOVE [x]

: OTHER []

<u>CLAIM NO.</u>	<u>HOLE NO.</u>	<u>FOOTAGE</u>	<u>DATE</u>	<u>NOTE</u>
L 576915				
576920	JL-85-ASE	860'	Feb-Mar/85	(1) (2)
L 801334	JL-85-G	657'	Feb-Mar/85	(1) (2)
L 554337	JL-85-K	577'	Feb-Mar/85	(1) (2)

2094'

NOTES: (1) #192-85
(2) Exact dates for each drill hole not given - only time span of Feb 5/85 to Mar 3/85

Duman M. J. R.
APRIL 30, 1985.

DESCRIPTIVE
GEOLOGY
NOTES

HOLE JL-85-ASE

110 -126'

- intensely altered carbz and rock
- rock consists of a vfg light to med green and w irr blotches/bands (at no pref or) of lighter green to beige bleached appearing intensely carbz (mod reaction HCL, relatively hard, dolomitic) effecting approx 60% of rock, lends 'spotted appearance' to rock w unaltered andesite windows to 1/4" set in carbz 'matrix'
- in places carbz blotches contain 10% vfg diss hematite
- rock is v strongly frac at ran or, one prominent set at 70° to the ca, w pred calc, minor chl, qtz, talc, Py, hematite frac fil
- uncarbz and windows are weakly chlz but
- both altered and unaltered rock contains 15% small acicular 'snowflake' texture crystals of white fspr? (or maybe a function of intense micro brecciation and frac, rock appears 'shattered')
- rock is weakly brecciated by frac in plac
- sulphide content, 0.25% Py, associated pred w secondary carb vn, and minor vfg diss mineralization
- at 111', 1/2" calc vn at 50° to the ca, w 1% vfg diss Py and 1/16" talc seams at vn margins
- at 112', a few 1/4" calc seams at 50 to 60° to the ca, w up to 5% vfg diss Py
- at 112.5', 1/2" chl - calc - sericite vn at 60° to the ca, w numerous thin Py filled ass stringers
- at 114', 1" diffuse appearing calc minor ser vn at 70° to the ca, w 5% vfg diss Py
- from 117 to 117.5', v intensely frac w sets at 70 to 80° to the ca, and 0 to 20 to the ca, w pred calc and minor harder magnesite-dolomite frac fil, some talc chl, occ carb vn at 1/4" halos w diss hematite to 5%
- from 119 to 121', alteration patches become light pink, w 5% vfg diss hematite

110 -126' (cont)

-from 123.5' to 124.5', alteration affects 100% of rock around a few 1/2" magnesite
minor qtz vn at 65° to the ca,
-at 124.7', 1/2" fg qtz calc hematite
vn at 65° to the ca, w 1% diss Py
-arb contact w underlying more intensely altered unit

126 -142'

-intensely carbz bleached appearing intermediate to mafic vol rock
-similar to overlying unit but w no unaltered windows
-bleached appearing light green int carbz (dolomitic) and mod serz vfg vol rock pre cruser probably and to basalt
-contains 15 to 20% small 1/32 acicular and snowflake textured crystals (white to translucent light green) that maybe a fspr, or as above, maybe indicative of intense micro frac and brecciation, lends shattered appearance to rock
-rock is v soft,
-rock is v strongly frac w permanent sets at 60 to 70° to the ca, although other or present, w pred calc, magnesite some qtz, chl, Py, and talc frac fil,
-rock appears v weakly fol in places at 45° to the ca,
-rock is weakly brecciated in places by frac
-contains a few secondary carb vn to 1/2" at ran or
-sulphide content, 0.5% Py, pred as frac fil w carb and ass w carb vn, v minor v fg diss mineralization
-at 126.5', 1/8" calc-Py seam pll weak fol at 45° to the ca,
-from 128 to 128.5', contorted 1/2" magnesite vn at 0 to 50° to the ca, w 1% diss Py blebs to 1/16"
-at 130.5', 2" pink calc-magnesite-qtz vn at 35° to the ca. w minor Py at rims minor talc at rims, surrounding host is v soft, v strongly serz
-at 131.5', 1/2" magnesite vn at 50° to the ca,

126 -142' (cont)

- from 136 to 138', slightly darker green less intensely altered, more and appearing
- at 137', 1/2" calc vn at 30° to the ca, offset by several frac
- at 137.5', 2" magnesite-calc vn at 30° to the ca,
- from 132 to 142', rock appears weakly brecciated by numerous 1/8" chl - calc in filled frac
- from 141 to 142', alteration becomes intense, v bleached, Py locally to 1% as diss 1/4" blebs
- distinct contact w underlying intensely brecciated unit

142 -157'

- strongly brecciated, altered (chl-carb-ser) intermediate to mafic vol rock
- highly variable app due to differing intensities and types of alteration and varying intensities of brecciation
- rock comprised of pred angular to brecciated frag of light green, vfg, intensely bleached app, strongly carbz (weak reaction to HCL, dolomite) and serz intermediate to mafic vol, frag range in size from 1/16 to 1 to 2", depending upon intensity of brecciation, set in a -very similar (chemically, compositionally) ground mass/matrix of chl-calc-ser (often comprised of ground smaller frag less than 1/32")
- degree of brecciation highly variable ranging from intense where frag av 1/4 and frag/matrix ratio is approx 60/40, to mod, where frag av 1/2 to 1", and frag/matrix ratio is 90/10
- rock is mod fol as exhibited by pref or of brecciated frag at 40 to 45° to the ca,
- rock is intensely frac pred pll fol w pred magnesite, calc, chl, and some Py-Po frac fil
- a few secondary qtz carb vn at ran or also often brecciated
- sulph content, av 1% Py, w trace Cpy and Po pred as occ 1/4 to 1/2" blebs in matrix and forming matrix of breccia, some minor vfg diss mineralization in clasts
- from 142 to 144.5', locally intensely brecciated, frag av 1/8 to 1/4", frag matrix ratio is 60/40, frag themselves are strongly micro brecciated,

frag are strongly ser-chl-carb altered, and bleached appearing, locally numerous 1/4" to 1/2" vn frag of magnesite, locally matrix is pred a carbonate w minor chl and ser, carb is bright red in places w up to 5% diss hematite

- from 144.5 to 148', coarser breccia, w 2 to 3" unbrecciated light green ser carb altered intermediate to mafic vol bands, and 1 to 2" matrix seams of soft chl-calc rich rock, well dev fol locally at 35° to 45° to the ca, w a few thin 1 to 2" intensely brecciated bands (locally appears v conglomeratic/agg)
- at 146.5', a few contorted 1/4" qtz magnesite calc vn at 35° to the ca, w 5% vfg diss Py, and locally from 146.5 to 147' Py locally to 2%
- from 148 to 148.5', strongly brecciated, frag are angular to sub rounded, av 1/4 to 1/2", frag matrix ratio is 75/25
- from 148.5 to 149.5', only weakly brecciated, pred light green serz and carbz intermediate vol
- from 149.5 to 151', strongly brecciated, clasts av 1/4 to 1" , frag matrix ratio is 60/40, frag are v bleached, angular to sub rounded, locally app v clastic locally matrix contains 5% Py as irr blebs to 1/2" w numeorus small 1/8" spheroidal nodules in matrix and vfg diss mineralization in both matrix and clasts
- from 151 to 152', only weakly brecciated
- at 151.5', 1" magnesite vn at 10° to the ca w a few 1/4" Py blebs
- from 152 to 153', intensely brecciated frag av 1/4" to 1/8", frag matrix ratio 60/40, locally carbonate and matrix contains minor diss hematite
- from 153 to 157', mod brecciated, w a few 1 to 2" intensely brecciated zones, frag av 1/4 to 1/2" , frag matrix ratio av 80/20
- at 153.5', 2" intensely calc rich frag w 2% vfg diss Py and 2% diss hematite
- at 153.7', 2" vfg granular qtz w minor calc-magnesite vn at 50° to the ca,

-from 154.5', to 155', locally carb
in breccia matrix is blood red, contains
minor diss hematite
-rock weakly magnetic in places where
hematite as partial alteration of magnetite

157 -182.5'

-strongly altered, (bleached appearing carb
and rock

-rock pred soft light to med green, vfg
and, v bleached app, v strongly carbz
(reacts strongly w HCL, approx 25% vfg
diss calc as pervasive alteration)

-weakly ser altered, a few darker green
chlz zones

-pred appears massive, w a few weakly
fol zones at an av or of 50° to the ca,

-contains 10 to 15% v small 1/32"
acicular crystals, often in a crude
snowflake texture, white to light green,
maybe a fspr, or maybe a function
of intense micro fracturing

-rock is v strongly to intensely frac
w prominent sets at 70 to 80° to the ca,
and 0 to 20° to the ca, lends fol app
to rock in places, pred calc, chl, magne-
site, w some qtz and talc frac fil

-numerous secondary magnesite-calc - qtz
vn to 5% of rock

-frac app to weakly brecciate rock in
places,

-a few 2 to 3" strongly brecciated zones
often v strongly chl

-sulph content, 0.25% Py ass pred w brecc-
cia zone, or present to 1%, and minor
frac fil and vfg diss mineralization
in unbrecciated host rock

-at 158.5', 1/4" fg granular calc-qtz vn
at 45° to the ca, w 5% diss hematite and
1% diss Py around vn to 1",

-from 160.5', to 161', 6" dark green chlz
zone, intensely micro frac, resembles
breccia matrix, contains numerous 1/4"
magnesite seams and 1/4" hard calc-qtz
seam w 3% diss hematite and 2% diss Py
at 45° to the ca,

-from 161.5' to 162', 6" breccia zone,
dark green chl - calc rich matrix w 30 to
40% small brecciated host rock frag, matrix
contains 3% diss Py, a few 1/2" bands

157-182.5 (cont.)

of hard light grey vfg granular qtz calc w 3 to 5% Py and hematite (silicified zone)

-from 163 to 164.5', numerous 1/2 to 1" calc - magnesite - minor qtz chl vn at weak pref or of 45 to 55° to the ca, usually w ass 1 to 2" chl alteration halos, locally Py to 1% as mineralization ass w halos, and occ in vn,

-from 170 to 171', mod brecciated zone, frag of host is angular to sub rounded to 1/2" and 40%, set in a dark green aphanitic strongly chl - calc rich matrix locally w 0.5% diss Py and Py blebs to 1/4", locally a few vfg granular qtz calc seams

-at 173', 1/2" vfg calc - chl band at 20° to the ca, w 5% diss Py, locally numerous ass 1/8" calc-magnesite stringers

-at 173.3', 1/2" chl-calc band at 30° to the ca, w 0.5% diss Py

-from 175.2', to 175.6' numerous 1" pink to white calc and harder magnesite vn to 60% of rock, weakly brecciate rock

-from 179 to 182.5', numerous 1" calc magnesite chl vn at numerous or from 30 to 70° to the ca, to 25% of rock.

-from 182 to 182.5', cherty grey qtz vn at irr or w 5% diss magnetite blebs and hematized blood red magnetite blebs and 1% vfg diss Py, trace Cpy in vn and at vn margins, contains a few brecciated chlz host rock frag, (could be a brecciated thin chert magnetite iron formation band)

-rather arb contact w underlying more intensely altered unit.

182.5 -217'

- intensely altered (bleached, carbz (dolomite)) rock (precursor and to basalt, possibly an ultramafic)
- rock pred a vfg bright yellowish green intensely carbz (weak reaction HCL, appears dolomitic) rock, precursor probably and to basaltic
- fg crystalline appearance w 10 to 15% small (less than 1/32") acicular blades/crystals of white to light green translucent mineral often in crude snowflake texture (again, maybe a function of micro fracturing of brecciation, lends a very 'shattered app to rock)
- rock is relatively soft, mod serz
- only v weakly fol in a few places, at or ranging from 40 to 70° to the ca, (fol pred a function of intense fracturing)
- rock is intensely macro and micro frac w prominent sets at 70 to 80° to the ca, and 0 to 30° to the ca, although all other or are present, frac strongly brecciate rock in places
- contains pred calc, magnesite, and chl frac fil, w minor qtz, Py, ser, talc and serpentine?
- numerous 1/4" to 1/2" secondary qtz magnesite calc vn at ran or
- contains a few 1 to 2" intensely brecciate zones
- sulphide content, varies, from 182.5 to 192', 0.5% (0.25% Cpy, 0.25% Py) as vfg diss mineralization and as frac fil and from 192', 1% , pred Py, trace Cpy as vfg diss mineralization and frac fil note weak positive nickle testing places may be minor nickleferous Po present
- rock appears mottled in places w irr 1/8 to 1/4" zones of less altered weakly chl windows
- contains in places diss 1/32 to 1/16" chl blebs, often w ass vfg sulph mineralization
- frac often have 1/8 to 1/4" even more intensely altered carbz halos
- at 184.5', 1/2' calc magnesite minor chl-talc vn at 50° to the ca,
- from 187 to 188', locally intensely frac, at pref or of 70° to the ca, and 45° to the ca, w calc, magnesite, chl, Cpy, and serpentine infil frac to 1/4", several generations and offsets, frac weakly breccia rock

182.5 - 217 (cont)

-at 189.2', 2" dark green chl rich shear/
micro breccia zone at 40° to the ca,
w numerous thin calc - qtz- magnesite
blebs and seams pll shear or, locally
contains 2% vfg diss Py ass w qtz calc
blebs and as vfg diss mineralization
-from 191 to 192', locally v intensely
frac w sets at 70 and 30° to the ca,
w chl, calc, magnesite, and cpy infilled
frac to 1/16" and locally numerous 1/4"
to 1/2" magnesite qtz vn to 20% of rock
-from 193 to 194', locally intensely
frac, at pref or 70° to the ca,
-from 195 to 197', appears weakly sch
at 40° to the ca,
-at 195.5', 2" zone w 1/2" qtz-magnesite
calc vn brecciate rock at 40° to the ca,
containing 1% fg diss Py
-at 196.2', 1/2" qtz magnesite vn brecciate
rock at 55° to the ca, w 2% diss Py
-at 196.5', 1/2" magnesite vn at 50° to
the ca,
-from 197 to 198', well fol, sheared
appearing at 40° to the ca, w alternating
1" bands of bright yellow green intensely
carbz serz rock and bands to 1" of intense-
ly brecciated rock, breccia frag are
pred qtz magnesite, to 1/4", set in a
dark green chl matrix, locally contains
2% Py
-from 198 to 199', hard light pink to white
magnesite / dolomite vn, vuggy, contains
minor qtz, a few 1/8" sericitic blebs
a few 1/8 to 1/4" Py blebs
-from 199 to 202', appears weakly fol at
40 to 45° to the ca, locally numerous
1/4" qtz magnesite vn pred pll fol to
20% of rock,
-at 202.5', 1" qtz magnesite vn at 50°
to the ca,
-from 202.5', to 208', rock appears mottled
w irr 1/4 to 1/8" zone of dark green less
altered 'windows'
-from 204 to 206', hard white pale pink
carb in ass qtz calc vn to 1" and 40%
of rock, locally strongly brecciate
rock, py locally to 2% as vfg diss mineral
ization in vn and as frac fil, trace cpy
-from 208 to 209.5', several 1/2" qtz mag-
nesite vn at 80 to 90° to the ca, w
several ass 1/8 to 1/4" Py blebs

-at 213.5', 1/2" qtz carb vn at 55° to the ca,
-sharp contact at 217', w underlying less altered unit

217

-228.5'

-carbz (calc) and to basalt
-rock a med green a fg crystalline (w 15 to 20% small 1/32" acicular light green translucent blades often in a crude snowflake texture, of unknown mineral)
mod carbz, (w 15% fg diss calc) and to basaltic app vol rock
-weakly chlz, weakly serz in places
-no apparent fol
-strongly frac w pref or sets at 70° to the ca, although all other or are present w pred calc, some chl, and talc frac fil
-frac weakly brecciate rock in places
-some frac have 1 to 2" bleached carb ser rich alteration halos
-a few secondary calc and qtz calc vn to 1/2" and 5% of rock at weak pref or of 60 to 70° to the ca,
-becomes increasingly lighter green, softer, more strongly carbz (carbonate becomes more iron / magnesium rich) towards 228.5',
-rock appears v mottled in places w irr darker green less altered more chl blebs to 1/4" throughout, to 10 to 20% of rock
-sulph content, 0.5% Py, trace cpy, as fg diss mineralization and mineralization ass w calc vn and as frac fil
-at 217.5', 1" fg qtz calc vn at 70° to the ca, w a 2" bleached soft serz carbz alteration halo
-at 218', 1/8" calc fil frac w 1% fg diss py and minor diss hematite
-at 218.7', 1/4" calc fil frac at 30° to the ca, w 5% diss hematite
-at 219.5', 1/2" chl calc vn at 50° to the ca,
-at 224', 1/2" calc rich band at 50° to the ca, w 5% diss py
-at 224.5', 1/8" py fil frac at 40° to the ca,
-at 225', py fil frac at 45° to the ca,
-at 227.5', 1" calc vn at 10° to the ca,

-carb contact w underlying unit, is more bleached, more altered appearing

228.5 -241'

-strongly carbz, bleached appearing and to basaltic rock
-rock a vfg crystalline appearing (w 15 to 20% acicular short 1/32" light green translucent blades of unknown mineral often in a crude snowflake texture)
v strongly altered, soft, bleached appearing rock, whose precursor is probably and to basalt
-looks 'dacitic', a yellowish green colour, weakly serz
-v strongly macro and micro frac w prominent sets at 80 to 90° to the ca, and 20 to 40° to the ca, although other or are present w pred chl, calc, magnesite, and some talc py, and serpentine frac fil
-frac brecciate rock in places
-no apparent fol (other than frac or)
-strongly carbz, carb as a strong pervasive alteration, weak to mod reaction w HCL indicating a iron/magnesium rich carb (dolomitic, ankortitic)
-a few secondary calc magnesite vn to 1/2" at ran or
-becomes increasingly altered becomes 241',
-sulph content, 0.5%, pred py, trace cpy as mineralization ass pred w chl calc talc fil frac and as diss mineralization in alteration halos around frac
-at 230', 1/2" chl - calc - talc band at 60° to the ca, w minor diss cpy and py
-at 230.5', 1" calc vn at 10° to the ca, w 1" bleached alteration halo
-at 231.8', 2" bleached brecciated band at 90° to the ca, host frag to 1/4" and sixty percent set in a dark green chl-calc-talc rich matrix, w 2% diss py
-from 234.5 to 235.5', v intensely frac at 80 to 90° to the ca, w chl-calc-talc in filled frac to 1/4", rock is strongly brecciated, host frag to 1/2" are intensely carbz, and serz, locally contains 2% py as frac fil and ass w breccia matrix

-at 236.8', 1" calc py halo around a
1" talc-carb fil frac at 30° to the ca,
-carb contact w underlying intensely bleached
altered unit

241 -340'

-intensely altered (bleached appearing
intensely carbz) (dolomite), serz)
intensely frac (to brecciated in places)
rock (precursor probably basalt, looks
dacitic)
-rock varies in appearance due to varying
intensities of alteration and frac
but pred ,
-bright light yellowish green, vfg,
crystalline appearing (w 15 to 20% small
1/32" acicular crystals often in a crude
snowflake texture, often fibrous app
maybe a fspr, or perhaps tremolite)
rock , v soft,
-strongly carbz, weak reaction w HCL
indicates alteration pred dolomitic,
v bleached amorphous appearing in places
-strongly serz
-rock exhibits no distinct fol,
-rock is intensely frac w several generat-
ions , and prominent sets at 70 to 90°
to the ca, 20 to 40° to the ca, although
other or are present, w calc, magnesite,
chl, ser, and minor talc, qtz, sulph and
trace fuchsite frac fil
-frac strongly brecciate rock in places,
and in places rock is strongly brecciated
by chl - carb seams to 1" , and qtz-carb
vn to 1", where brecciated alteration
becomes intense, often complete alteration
to soft clay minerals
-rock is weakly silicified in a few places
-numerous secondary carb (calc and magne-
site) and qtz carb vn to 1 to 2" , av.
1/2", to 10% of rock
-sulph content , av 1%, pred py, trace cpy
virtually all mineralization ass w frac
fil and carb vn, v minor vfg diss mineral-
ization

241- 340' (cont)

- several in filled frac are zones of intense micro brecciation, w small 1/16" to 1/8" host rock frag in a chl calc ground mass
- rock appears mottled in places w varying intensities of carb alteration, often around major frac
- in places rock is slightly harder, appears more dacitic, maybe locally weakly sil
- at 243', 4" strongly brecciated zone rock brecciated by 1/2 to 1" dark green chl-talc rich bands at pref or of 40° to the ca, containing a few 1/4" py blebs and 3% diss py locally, brecciated host frag are strongly carb ser altered, often w zoned alteration reaction rims, a few frag are intensely silicified, cherty
- at 243.6 and 243.8', 1" calc, - talc vn at 75° to the ca, w trace diss ass py
- from 245 to 246.5', 1/4" to 1/2" chl calc talc fil frac at 0° to the ca, w 5% vfg diss py
- at 247', 1/4" calc vn at 25° to the ca,
- from 247 to 247.5', appears strongly autobrecciated w 1/8 to 1/4" host frag set in a slightly lighter grey green matrix of similar composition
- at 248', a few 1/4" micro brecciated infil frac at ran or
- at 249', 3" lighter grey brecciated altered frag w 5% diss cubic blebs to 1/8" usually proximal to rims, set in a dark green chl calc serpentine rich matrix/ micro breccia seam at 30° to the ca,
- at 250.2', a few 1/4" calc vn to 70° to the ca, w trace fuchsite
- at 251 and 251.5', locally frac fil is pred qtz,
- at 253', 2" magnesite vn at 80° to the ca, w trace fuchsite at rims
- from 252 to 256', locally strongly brecciated, pred by hard grey qtz magnesite vn to 1/4" at a weak pref or of 50° to the ca, and by dark greyish green calc - chl-ser seams to 1/2", locally host frag are intensely altered to a soft bright yellow clay mineral, containing minor fuchsite and 1% fg diss py, and trace smokey grey sub metallic mineral (mo?)

241-340' (cont.)

- at 256', several 1" qtz magnesite vn at 30° to the ca,
- at 256.6', a few 1/2" magnesite vn at 30° to the ca, w trace fuchsite and cpy
- locally from 256' to 257', rock is v bright light yellowish green, intensely altered to ser, carb, and clay minerals, v soft, locally strongly fol at 45° to the ca, (this could be a major alteration halo around the vn at 257')
- from 257 to 258.3', fg granular sugary texture pred qtz and hard pink to white magnesite vn w a few brecciated host rock frag to 1/2" at 40° to the ca,
- at 261', 1" qtz magnesite vn at 10° to the ca, locally frac fil is pred qtz
- from 261.6 to 262', numerous 1/2 to 1" magnesite-dolomite and qtz vn at irr or to 60% of rock, w minor vfg diss py and trace fuchsite along frac in vn
- some vn exhibit fibrous intergrowths of qtz and carb
- from 262.5 to 263', brecciated zone, rock is brecciated by 1/2 to 1" dark green soft talc chl rich micro breccia bands at a pref or of 50° to the ca, w 5% py as massive blebs to 1/2" and vfg diss mineralization, bands to 40% of rock, w ass frag to 1", intensely altered to cherty light green silica or hard white grey carb, often w dark grey smokey qtz blebs diss and carbz frag (may be a brecciated vn)
- at 263.5', 4" zone brecciated by dark green chl calc rich bands to 1/4" and 40% w frag pred of brecciated qtz carb or intensely sil and carbz host rock locally matrix contains 3% diss py
- from 263.6' to 264', qtz carb vn
- from 266 to 266.5', several 1 to 2" qtz carb vn at 70 to 80° to the ca, and to 50% of rock, w trace fuchsite at rims
- from 266.5 to 267', intensely brecciated /micro brecciated zone, w large 1" intensely sil cherty frag to 30% set in a dark green talc chl dolomite rich micro brecciated ground mass, well foliated at 50° to the ca contains 1% diss py
- at 267.5', 1/2" dark green chl rich micro brecciated band at 30° to the ca,

241-340' (cont)

-from 268 to 269.5', brecciated by 1" thick soft green micro brecciated chl-carb rich bands at 0 to 30° to the ca, frag locally are altered to v hard cherty dolomite, matrix is locally contains 1% py as blebs to 1/4", locally frag matrix ratio is 50/50

-from 269 to 271.5', qtz and hard white cherty carb vn to 50% and 1/2" strongly brecciate rock, at weak pref or of 30 to 40° to the ca, w intense sil of brecciated frag to 2 to 3", contains locally 10% py as semi massive blebs and bands to 1/2" and v fg diss mineralization in altered frag

-from 273 to 273.3', 4" qtz carb vn at 80° to the ca, w minor vfg diss dark brown py at rims

-at 274', 1/2" hard white magnesite fil frac at 20° to the ca,

-from 275 to 275.8', 1/2" magnesite py vn at 0° to the ca, py locally 1% over 1'

-from 276 to 277', qtz magnesite vn w 0.5% ass py to 1/2" and 30% of rock

-from 277.5 to 278', numerous 1/2" magnesit qtz vn at 30° to the ca, w ass 2" brecciate bands, of host rock frag to 1/8" and dark green chl ground mass, locally contains 1% diss py

-at 279.5', numerous 1/2 to 1" magnesite dolomite vn w minor qtz at weak pref or of 60° to the ca, although highly contorted by frac, w a few 1/8" py blebs and trace fuchsite/ser at rims

-from 280 to 280.5', 6" grey to white carb (magnesite-dolomite) vn at 30° to the ca, w minor diss py

-from 280 to 284', large (2" av 1/2") secondary pred hard white to dark grey dolomite/magnesite vn to 35% of rock strongly brecciated rock, at no pref or vn themselves are often brecciated into large 1/2" frag, w ass 1% dark brown py as blebs and bands to 1/4", locally surrounding host rock is intensely altered to bright yellowish green ser-carb and in a few places to soft green clay

241 - 340' (cont.)

-at 285', 1/8" py fil frac at 500 to the ca and a 1" qtz dolomite magnesite vn at 600 to the ca, w a few 1/8" - 1/4" py blebs
-from 285 to 286.5', numerous 1/8 to 1/4" randomly or hard grey carb (magnesite-dolomite) vn/fil frac w locally 1% py as blebs to 1/8" ass w carb and as frac fil
-from 286.5' to 287', rock v intensely altered to soft bright yellow dolomite - sericite- clay minerals
-from 287 to 293', rock intensely brecciated pred by carb minor qtz and qtz vn to 2 to 3", av 1/4 to 1/2", at ran or, to 30% of rock, and , thin dark green chl talc - ser-carb rich micro breccia bands to 1/2" av. 1/4", at ran or, to 15% of rock, surrounding host frag av 1/2 to 1" are intensely altered pred to a bright yellowish green dolomite-sericite and in places are v soft clay mineral, locally py to 5% as blebs to 1/4" ass pred w micro breccia bands and as frac fil
-from 294 to 295', several 1/4 to 1/2" light green cherty qtz and hard white carb vn / fil frac at weak pref or of 300 to the ca,
-at 297', 6" zone where 1 to 2" cherty grey qtz vn strongly breccia rock, vn to 50%, w intensely sil halos affecting the remaining host rock, (alteration to cherty sil) and only a few unsil carb carbz host frag to 1/2"
-at 298', 2" micro breccia band w a few 1/4" py blebs, a few 1/2" intensely sil host frag
-from 298.7 to 301', numerous dark green 1" chl micro breccia bands at 100 to the ca, w 3% dark brown py to 1/4" and thin seams pl to breccia band or, micro breccia band locally to 60% of rock
-from 301.6 to 302.5', rock is mod brecciated by numerous 1/4" dark green chl rich micro breccia and mylonitic bands at weak pref or of 00 to the ca, as well as a few secondary calc-magnesite vn to 1/2" , locally contains 2% py as blebs to 1/4" and vfg diss mineralization ass w micro breccia bands
-at 304.5 to 305', numerous dark 1" green micro breccia bands at 0 to 300 to the ca, w 3% py as semi massive blebs to 1/4" and vfg diss mineralization in matrix.

241-340' (cont.)

- from 305.5 to 306.1', numerous contorted 1 to 2" micro breccia bands av or of 80o to the ca, to 40% of rock, w 5% py as semi massive blebs to 1/4" in matrix, and as diss mineralization in strongly altered 1/2" frag
- at 306.8', 1" calc vn at 45o to the ca,
- at 307', 2" micro breccia band at 45o to the ca,
- at 311', 6" zone w 90% hard pink and white and minor qtz vn to 2 to 3" at pref or of 80o to the ca, w trace fuchsite at vn rims
- at 312.5', 3" zone w numerous 1/4 to 1/2" magnesite dolomite vn and in filled frac at pref or of 45o to the ca, w 1/2" yellow carb-dolomite alteration halos
- from 313 to 313.5', breccia zone, rock brecciated by 2" thick hard grey green vfg chl-calc rich seam at no pref or w numerous ass thin 1/4" hard white magnesite stringers, and 10% py as nodular appearing blebs to 1/4" and vfg diss mineralization throughout, brecciated host rock frag to 1" are intensely sil, to a light green chert
- at 314', 2" similar breccia zone, w 1/4 to 1/2" dark grey to green chl seams brecciating host rock, contains py to 5% as blebs to 1/2", frag are intensely sil to a grey chert, av 1"
- from 314.5' to 315', rock is brecciated by thin 1/2" chl seams w 3% vfg diss py and py blebs to 1/4" at no pref or
- at 317.7', 1/2" breccia band at 45o to the ca, pred comprised of chl and hard grey carb, w a few 1/4" semi massive py blebs
- from 318.5 to 319.2', numerous qtz 1" hard white carb vn at 30o to the ca,
- at 319.5', 2" breccia zone, rock is brecciated by dark grey to green chl seams to 1"
- at 320', 1/2" qtz - magnesite at 50 o to the ca,
- from 320.5', to 321.2', rock is strongly brecciated by grey chl - calc micro band to 1/2" and 30% of rock, and is ass 10% hard white carb vn at weak pref or of 10o to the ca

241-340' (cont.)

- at 328.5' 2" qtz-hard white carb vn at 30 o to the ca,,
- at 329', a few 1/4" micro brecciated bands
- from 330 to 330.5', 1/2" chl micro breccia band at 10o to the ca, w a few 1/4" semi massive py blebs
- from 331 to 332', numerous 1"hard magnesite - qtz vn to 1" and 10% of rock w a few 1" micro brecci bands to 10% of rock
- from 333.5 to 334.5', a few 1/2" chl micro breccia bands at 0 to 20o to the ca,
- at 337',, 1" qtz vn at 55o to the ca,
- at 337.5', to 338', pred qtz hard white carb vn
- from 338 to 340', qtz hard white carb vn and brecciated vn frag to 1" and 40% of rock

340 -344.5'

- mineralized graphitic metasediments
- rock consists pred of a v hard dark grey relatively graphitic (25 to 30%) vfg thinly bd metasediment (slightly coarser than an arg)
- bd well dev at 20 to 30o to the ca, although brecciated in palces and highly contorted
- rock is v carb rich, w approx 25 to 30% vfg diss calc
- contains 5% thin 1/16 to 1/4" light green ser soft calc rich intermediate tuff appearing interbd (or epiclastic wacke eq)
- rock contains approx 7 to 8% Py as thin 1/4" semi massive and massive bands pl1 bd, nodular blebs to 1/4", and as frac fil
- rock is intensely frac at no pref or w pred calc and harder magnesite, qtz, py and hematite frac fil
- hematite to 5% of rock as frac fil and partial alteration of py in places
- a few thin secondary qtz carb vn at ran or
- at 342', 3" light green ser rich fg granular appearing intermediate tuff or grey-wacke interbd w a 1" semi massive py band pl1 bd
- maybe minor amounts of sphalerite present difficult to distinguish from abundant hematite present

344.5 - 352'

-interbd ser & biotite rich metasediment
-rock comprised of thinly bd interbd
interbd
-1. light green, strongly serz/ser rich
soft, fg, v granular app metasediment
(siltstone size, to grwk) to 40% and
-2. dark grey to black fg v granular
app, harder, biotite rich metasediment
(again siltstone size to grwk) biotite
to 30% of bd, also v calc rich, w up to
25% fg diss calc, maybe v weakly carb
in places
-bd ranges from 0 to 300 to the ca,
v contorted, slumped crenulated in places,
av or approx 10 to 150 to the ca,
-rock contains numerous (to 10%) secondary
qtz and hard white magnesite, calc
vn to 2 to 3" av. 1/4 to 1/2", pred pll
sub pll bd
-rock appears weakly sch pll bd
-some boudinaged, slumped interbd
lends clastic, - lithic wacke app to rock
in places
-rock is strongly frac w 1 prominent set
at 70 to 800 to the ca, although other
or are present, w pred magnesite, calc
hematite frac fil
-sulph content, 1% py, pred in ser rich
interbd as diss blebs to 1/4", and minor
vfg diss mineralization in both interbd
-at 344.5', 1/4" carb-hematite fil frac
at 250 to the ca,
-from 344.5 to 345', bd is v kinked
crenulated, some slumped interbd lends
lithicwacke app to rock, pred ser wacke
locally, w a few thin 1/16" biotite -chl
rich interbd
-from 345 to 345.5', highly contorted
2" pred qtz minor magnesite vn, locally
bd is v contorted, contains a few thin
v hematite rich interbd
-from 345.5 to 347', pred soft light green
fg granular appearing ser metasediment
w a few thin 1/16" black biotite chl rich
interbd and 1/8" boudinaged / brecciated
frag lending lithic wacke app to rock
locally contains 1% py as thin diss bands
of cubes to 1/16" pll to bd, occ 1/4"
semi massive blebs
from 346.5 to 347', 1/4" qtz magnesite vn
pll bd

-from 347 to 348', pred dark grey to black biotite rich metasediment,

-from 348 to 349.5', 50% black biotite rich bd and 50% ser bd, locally ser bd w 3% py as diss blebs along bd and sch planes to 1/4", bd locally at v contorted, a few thin graphitic arg interbd to 5% locally

-from 349.5', to 351', pred black vfg biotite chl rich metasediment, locally abundant hematite frac fil

-from 351 to 352', 1 to 2" qtz minor hard white magnesite vn to 7% rock, pll bd at 250 to the ca,

352

- 355'

-mineralized brecciated graphitic meta-sediment

-rock pred a thinly bd (to 1/4 to 1/2") dark grey to black fg granular weakly graphitic (to 20%) v calc rich (25%) metasediment (grwk) which has been intensely brecciated/frac by numerous thin pred hard white magnesite and qtz (w minor ser, lending light green coloured to qtz carb) seams, vn, and infilled frac to 1/2" av. 1/16 to 1/8" , at weak pref or of 250 to 400 to the ca, and to 30% of rock

-also abundant hematite frac fil

-some rem bd direction at 20 to 300 to the ca, although pred v contorted and brecciated

-py to 5% as semi massive blebs to 1/4" and thin bands to 1/4" pll bd, occ nodular app blebs to 1/8" , and frac fil

-5% brecciated frag of light green serz and carbz altered dacite tuff interbd

355

- 350'

- strongly altered (carb as dolomite, serz) rock (looks dacitic, but precursor probably an andesite to basalt)
- rock a fg crystalline app (w 15% acicular white light green translucent blades of unknown mineral, poss a fspr, often in crudely dev snowflake texture) light yellowish green bleached app strongly carbz, - v weak reaction HCL, mod serz massive rock
- intensely frac at ran or w pred coarse and magnesite infil frac to 1/8"
- weakly brecciated in places by 1/4" seams of dark green chl micro breccia bands
- a few secondary qtz carb vn to 1/2"
- minor hematite - ser- chl frac fil
- trace py as frac fil and v minor fg diss mineralization

359

-364.5'

- interbd metasediment
- rock consists pred of a dark grey vfg granular app relatively hard metasediment v calc rich w up to 25% diss calc, thinly bd, w contorted bd at 0 to 200 to the ca, containing 15 to 20% slightly lighter grey green weakly ser fg calc rich metasediment bds
- rock is intensely frac, multiple generations at ran or, w prominent sets at 70 to 800 to the ca, and 30 to 400 to the ca, w pred qtz, carb, some hematite py frac fil
- contains a few conglomeratic app light green dacitic type clasts to 1"
- contains 5% py as large massive blebs to 1/2", smaller 1/16 to 1/8", occ nodular app, and frac fil mineralization, maybe trace amts of sphalerite present.
- from 361 to 362', light greenish yellow dolomite - ser altered vol frag to 90% of rock

364.5 - 373'

-strongly altered (carb-dolomite-ser)
rock (looks dacitic but probably an
altered andesite to basalt)
-same as 355 to 359', a few strongly
brecciated zones, py locally to 0.5%

373 - 405.5'

-mineralized brecciated interbd metasedi-
ment
-(note core is v badly ground)
-highly variable app due to diff degrees
of brecciation, interbd contents, etc,
but pred
-rock comprised of thinly bd (1/4 to 1/8"
occ bd to 1",) interbd
-1. dark grey to black weakly chl relatively
hard fg granular app (siltstone range size)
metasediment, usually v calcite rich,
w 20% fg diss calc, often v sheared,
sch app pll to bd, in places ser rich,
to 40% of rock
-2. light green v strongly serz/ser rich
fg granular app (siltstone to sandstone
size) metasediment to 30% of rock
-3. hard dark black weakly graphitic arg
to coarser graphitic grwk to 20% of rock
and
-4. vfg grey v carb rich (80% calc) meta-
sediment to 10% of rock
-these interbd often in a slumped brecciat-
ed maylonge
-bd is highly variable, highly contorted
slumped, but pred or is 20 to 350 to the
ca,
-bd are often boudinaged, brecciated, lend-
ing conglomeratic app to rock, where
brecciated is often into 0/4 to 1/2" frag
-rock is also brecciated by secondary
qtz carb vn to 1 to 2", av 1/4 to 1/2"
to 25% of rock, carb pred hard white
magnesite, some calc, in places vn to 50%
of rock
-rock is intensely frac at numerous or
w pref sets of 40 to 45 to 550 to the ca,
cross cutting bd, sets pll to and sub pll
bd, w pred qtz, carb(magnesite and calc)
py, hematite, and some chl, ser frac fil
-sulph content, py av 5% pred as semi
massive bands and blebs pll bd, often
brecciated in large frag from 1/8 to 1/4"

also occ nodules to 1/4", some minor vfg diss mineralization and mineralization at the rims of qtz carb vn, maybe minor amt of sphalerite present, but difficult to distinguish from abundant hematite present

-from 373 to 373.5', locally 1/4" qtz and minor carb vn and in filled frac at pref or of 100 to the ca, to 40% of rock strongly brecciate rock

-at 374.5', 2" qtz pink calc vn pll bd locally 300 to the ca,

-from 379 to 380.5', qtz calc magnesite vn to 40% of rock locally

-from 380.5 to 382.5', graphitic (80%) arg to 80% of rock locally

-from 387.5 to 396', strongly brecciated, w angular frag of light green strongly altered ser rock to 30% set in a dark grey metasedimentary type matrix

-at 396', 1" qtz carb vn pll bd locally at 300 to the ca,

-from 396 to 399', bd locally well dev at 300 to 350 to the ca,

-at 397.5', 1" semi massive py bd at 300 the the ca,

-from 401 to 405.5', secondary calc w minor qtz and magnesite vn to 50%, w 30% grey v calc rich interbd

405.5 - 426'

-mineralized conglomeratic/breccia

-(identical to IJ breccia zones)

-rock comprised of

-1. vfg to fg, v granular app, light green strongly serz, mod carbz, (w diss calc to 10%) siltstone type frag / clasts (v 'dacitic' app, but granular), pred mod rounded to angular, ranging in size from 1/4 to 6 to 8", often appears sch pll frag or, often mottled app w 5% small irr chl clots usually pll to fol, and in places frag v calc rich, to 30% occ siltstone clasts are themselves clastic appearing, to a grwk, w 10 to 15% small 1/8 to 1/4" lithic and carb blebs, set in a

-2. dark black, weakly carb (5% graphite) grwk matrix, comprised of a vfg to fg granular black relatively hard matrix w 10%

405.5 - 426' (cont.)

small diss calc blebs and 15 to 20% small 1/32 to 1" lithic frag of serz carbz siltstone, black graphitic arg, and sulphides

- matrix bd/zones to 3 - 4" av 1/2 to 1"
- overall composition app 50% black grwk matrix and 50% ser siltstone type frag
- mod dev fol /bd as exhibited by pref or of frag/clasts at or ranging from 35 to 500 to the ca, (pred a 45 to 500 to the ca)
- rock contains a few well bd thinly bd grwk interbd
- matrix contains occ 1 to 2" frag of vfg to arg dark grey v calc (80%) rich meta-sediment (matrix is mineralized with an av of 3% py as large brecciated app frag to 1" av 1/4 to 1/2" often ass w calc, and nodular blebs to 1/2" av 1/4"
- some minor vfg diss py in both matrix and brecciated frag
- rock is mod to strongly frac, pred pll crude fol, although other or exist, w pred calc, some qtz, chl graphite, py frac fil
- a few secondary qtz carb vn at ran or
- a few brecciated qtz carb vn frag to 1/2" in matrix
- minor diss hematite and hematite frac fil in grwk matrix, maybe trace sphalerite in places
- unit app slumped in places
- unit is a brecciated metasedimentary sequence, or epiclastic conglomerate
- from 405.5 to 407', v well dev bd locally thinly bd, to 2", av 0/4 to 1/2", bd at 250 to the ca, pred light grey to green ser rich siltstone and darker grey to black weakly carb siltstone, w a few 1/4" semi massive py bd, locally a few light pink to green v soft hematite rich frag to 1"
- at 408', 1" brecciated app semi massive py blebs in matrix
- at 410.5', 3" cherty grey sil frag, v calc rich, locally siltstone frag are v calc rich to 30%, and locally a few hard black graphitic arg frag to 1"
- at 411', 6" siltstone clasts appears coarser, a wacke, w 10 - 15% , 1/8 to 1/4"

calc clasts/frag pll fol
 -at 411.5' 1/2" calc vn pll fol locally
 at 50o to the ca,
 -at 412.5' , 1" massive py frag
 -at 413', locally appears slumped, fol
 ranges from 0 to 45o to the ca, and locally
 a 1/2" qtz calc vn pll slumped fol
 -at 414', a few 1" angular hard grey sil
 vfg granular qtz clasts
 -from 414.5', to 415', numerous 1/8"
 to 1/4" calc stringers at ran or to 15%
 of rock, locally also a 2" long brecciated
 py band
 -at 416', a few soft talc frag to 1/2",
 light pink w up to 3% diss hematite
 from 418.5 to 419', locally a well bd
 (35o to the ca,) fg siltstone - sandstone
 type soft ser metasediment w 2% vfg diss
 py
 -at 419.2', 2" qtz calc harder beige
 carb vn at 25o to the ca,
 -at 420.2', 1" contorted qtz carb vn
 -from 421.5 to 422.5', numerous qtz calc
 vn to 1" pll sub pll fol at 30o to the ca,
 to 30% of rock
 -from 423 to 424.5', hard vfg granular sil
 pale grey 'qtz' type bd
 -contact at 426.5' based on frag matrix
 ratio becomes much more frag/clast rich
 in underlying unit

426 - 479'

-brecciated (or conglomeratic) siltstone-
 sandstone
 -rock comprised pred of
 -1/ vfg relatively granular light greenish
 yellow mod serz but relatively hard sil
 siltstone to sandstone (grain size)
 implied frag/clasts, degree of ser alterat-
 ion varies from weak (and larger clasts)
 to strong in smaller clasts where softer
 granular somewhat over printed app almost
 sch
 -contains 10 to 15% fg diss calc
 -frag/clasts pred angular-sub angular
 some rounded, av size 1" , but ranges from
 1/16 to 6 to 8", app to be brecciated
 frag but may be conglomeratic clasts
 as rock exhibits a mod to well dev fol
 as exhibited by pref or and alignment of
 clasts/frag at av or of 40o to the ca,

426 - 479' (cont.)

(varies 35 to 450),
-frag clasts av 80% of rock, and are set in
-2. a matrix of v fg relatively hard black to grey granular app weakly carb (5%) metasediment (grwk)
-contains 5% to 10% small diss 1/32" calc blebs, and 10 to 15% small 1/32 to 1/16" lithic frag of siltstone (smaller brecciated frag)
-minor diss hematite in places
-a few zones where frag matrix ratio approaches 60/40
-also a few black arg and graphitic arg clasts to 1/2"
-rock is mod frac at ran or w pred calc, minor chl graphite, py, qtz, hematite frac fil
-breccia pred matrix supported
-contains an av of 1% py as occ large brecciated app blebs to 1/2", av. 1/8 to 1/4", and occ nodules in matrix to 1/8" and minor vfg diss mineralization in both matrix and clasts
-a few secondary carb vn at ran or,
-occ larger siltstone type clasts themselves app conglomeratic, w smaller similar type clasts to 1/4"
-appears to be a weak sch pll bd affecting texture in frag/clasts
-clasts app v mottled in places w small diss chl blebs
-clasts occ contain small 1/16" bright light green fuchsite blebs
-at 433.5', 1" black fg v carb rich meta-sedimentary clasts
-from 444.6 to 446', 2" calc minor qtz vn at 100 to the ca,
-at 450 and 451', bd/fol locally at 300 to the ca, around thin ser calc vn at 300 to the ca,
-at 455', 2" fg granular v hard sil white 'qtz' type clasts/frag
-from 450 to 479', matrix becomes gradationally grey, less carb, (to trace) becomes more 'mylonitic' appearing i.e. composed of similar composition as frag, appears vfg, granular, grey, and calc and occ ser -chl rich, and contains more small brecciated frag/clasts
-approaching 1/32", frag becomes less alter-

ed, more sil, approaching a qtz, py decreases to 0.5% appears more 'auto-brecciated'

-from 464 to 465.5', unbrecciated siltstone sandstone bd

-at 468' 2" harder white fg qtz type frag

-at 468.7', 2" harder white fg qtz type frag

-at 469', 4" qtz frag

-at 471.5' 6" qtz frag

-at 474', numerous 2 to 3" harder whiter bleached app qtz app clasts/frag

-from 474 to 479', numerous 1/8" chl/ser fil frac with calc

-arb contact w underlying unit, whos clasts are more fg, sil, and matrix more autobrecciated app

479

-492'

-brecciated (or conglomeratic) metasediment -similar overlying unit, but frag/clasts pred a vfg, white to pale yellowish green, v hard, sil, granular, 'qtz' type litho (v bleached app maybe an alteration product, i.e. sil), a few serz siltstone type frag/clasts still present

-pred strongly brecciated, frag range from 1/2 to 6 to 8", av 1", weakly aligned pll crude fol at av or 35o to the ca, although highly variable

-frag clasts - fragment-clasts/matrix ratio av 80/20,

-matrix a vfg dark grey to black grwk type metasediment w matrix seams w brecciated large frag containing 40 to 50% small (1/32 to 1/4") brecciated frag

-frag often v mottled app w irr diss 1/32" dark grey blebs of unknow mineral proximal to frac, and often large frag/clasts have 1/2" grey mottled ser reaction rims

-sulphide content, 0.25% py, trace cpy pred as frac fil and minor vfg diss mineralization in matrix

-from 479 to 482', fol locally at 200
to the ca, app sheared/sch pll or
-from 481 to 482', 1" qtz calc chl vn at
200 to the ca,
-from 482 to 483', large clasts are
brecciated bd of hard white fg granular
qtz, v mottled app locally w 15% diss
1/32 to 1/6" dark grey blebs of unknown
mineral
-from 484 to 484.5', 1/2" qtz calc vn
at 200 to the ca,

492

- 507'

-interbd brecciated metasediments
(grwk and siltstone-qtz) (brecciation
lends conglomeratic app to rock)
-rock comprised of
-1. light grey weakly serz weakly carbz
(5% vfg diss intergranular calc) vfg
to fg granular relatively hard sil 'silt-
stone') type bd and brecciated frag
to 40% of rock, often clastic app, w
small 1/8" fspr blebs, and
-2. harder, white, bleached appearing
vfg, v sil, 'qtz' type frag (may be eq
to siltstone but sil), usually v mottled
app w numerous diss green chl and ser
blebs to 1/16", these bd and frag are
to 20% of rock
-set in a dark grey to black vfg granular
grwk to lithic wack matrix which contains
25 to 30% small lithic frag of siltstone
and qtz site, maybe v weakly carb in
places, matrix comprises of 40% of rock
-frag are pred angular to subangular-
av 1 to 2", ranging from 1/32" in grwk
matrix to bd to 6 to 8"
-weak or to frag/clasts at 350 to the ca,
varies locally from 25 to 450 to the ca,
-rock is mod to strongly frac at ran or
w chl, qtz, calc, talc, magnesite frac
fil
-numerous qtz carb stringers w ran or to
1/4" and 5% of rock

-sulph content, trace py, ass pred w qtz
calc vn and frac fil and v minor diss
mineralization in clasts and matrix
-from 493 to 494', numerous 1/4 to 1/2"
contorted qtz calc talc vn at ran or
to 20% of rock,
-from 496.5 to 497', qtz calc vn, w a few
thin py fil frac, and at 496.5', a few 1/4"
py blebs at vn margins
-from 503.5 to 504.5', 1/2" qtz calc vn
at 200 to the ca,
-unit gradationally towards 507'
becomes more grwk/matrix pred, f, w
breccia frag reduced in size to 1/4-1/2"
and 30% of rock, matrix becomes darker
black, increasingly carb (to 10%)
-arb contact w underlying grwk - lithic
wacke

507

- 566'

-mineralized carbonaceous (graphitic)
lithic wacke to conglomeratic
-rock pred a v dark grey to black, vfg
granular app, weakly carb (to mod in places
av 10% graphite) grwk
-mod dev bd at or ranging from 30 to 500
to the ca, av 35 to 400
-rock contains numerous zones where
brecciated or conglomeratic frag/clasts
of relatively hard lighter grey to green-
ish grey, slightly coarser fg granular
siltstone to 3 to 4", av 1/4 to 1/2"
to 15% of rock (a few bd were present
to 80% of rock)
-app autobrecciated, w v faint similar grwk
frag in a grwk matrix
-grwk contains 20% small 1/32" to 1/16"
lithic ser siltstone present as frag
-rock is mod calc rich w 10% fg diss
calc
-a few large congl app 4 to 6" hard white
bleached sil metasediment clasts (qtz
usually highly frac, and brecciated by thin
chl and graphite seams)
-rock is strongly frac, w one prominent
set at 70 to 900 to the ca, w pred calc
some chl,qtz,graphite,talc frac fil
-numerous secondary qtz carb vn at ran or
to 5% of rock

507-566' (cont.)

-sulph content is variable, from 507' to 542', trace py ass pred w vn and some minor vfg diss mineralization, and from 542 to 566', py is 5%, as outlined below

-rock app sheared, sch in places, pll bd fol

-from 507 to 508.3', siltstone type clasts to 40% of rock, av 1/4 to 1/2"

-from 508.3 to 508.8', 6" vfg granular light grey siltstone clasts

-from 509 to 509.8', hard white vfg sil granular qtz type clasts, strongly frac to brecciated by 1/16" ran or black chl fil frac

-at 511', 6" hard white v sil vfg granular qtz type clasts, locally v mottled app w 15% small 1/16" diss ser and chl clots

-at 511.5', 4" weakly serz siltstone clasts, irr diffuse contact w grwk matrix maybe some of the irr type of alteration

-at 512.5', 1/4" talc fil frac at 200 to the ca,

-at 516.6', 3" hard light grey vfg granular siltstone to qtz type clasts locally w 0.5% diss py

-at 517.5', 1/2" qtz calc vn at 300 to the ca, w numerous thin pll sub pll ass 1/8" stringers

-from 520 to 521', pred qtz minor calc vn at 100 to the ca, w trace cpy, numerous thin ass 1/16" stringers locally weakly brecciate rock

-from 521 to 523', thin calc and minor qtz stringers to 1/4" at ran or, locally to 10% of rock, locally graphite to 25% of rock

-from 523 to 524.2', large 6" siltstone clasts to 80% of rock

-at 524.5', 1/2" qtz calc vn at 550 to the ca,

-from 525 to 525.7', vfg granular hard sil bleached app light grey siltstone qtz clasts, w minor vfg diss py

-at 530', 2" qtz clasts, but w irr diffuse contact w grwk matrix, look like an alteration product, sil ?

-at 531', 1/2" qtz calc fil frac at 300 to the ca,

-at 533', 1" qtz calc vn at 700 to the ca, cross cuts bd, locally numerous thin ran or 1/16" ass stringers

507-566' (cont.)

- from 534 to 538', thin 1/16 to 1/4" qtz calc stringers to 10% of rock, w a few 1 to 2" qtz calc vn
- at 535', 1" qtz calc vn
- at 536.4', 1" qtz calc vn at 45o
- at 536.7', 2" siltstone clast
- at 537.2', 2" qtz calc vn cross cuts bd at 30o to the ca,
- from 537', becomes v calc rich (to 25%)
- from 539 to 540', 1/4" brecciated siltstone frag/clasts to 80% of rock
- from 542 to py increases to 5%, pred as large (1/8 to 1" av 1/2") brecciated app frag ass w and set in calc and qtz blebs and brecciated by thin calc and qtz seams, occ semi massive bands to 1/4" pll bd, and vfg diss mineralization in a few arg clasts to 15%, a few nodules to 1" av 1/8 to 1/4"
- becomes more graphitic, to 15 to 20% and v calc rich, to 25 to 30%
- better dev bd at 35 to 40o to the ca, better dev grwk to conglomerate texture, w an av of 25% clasts of siltstone, graphitic arg, and py arg, and hard white qtz clasts up to 2 to 3", av 1/8 to 1/4"
- at 544', 1/4" semi massive py bd
- at 544.5', a few 1/2" graphitic arg clasts w 15% diss py
- at 544.5 to 545.5', hard black graphitic arg interbd at 30o to the ca, w 10% py
- at 547' 2" band w diss calc and hematite to 10% maybe trace sphalerite present
- from 549 to 550', locally 1/4 to 1/2" qtz calc stringers at ran or to 20% of rock
- from 550 to 551', large 4 to 5" siltstone type clasts to 80% of rock
- at 552.5', a few 2" siltstone clasts
- from 553.5', to 554.5', a few 2" siltstone clasts
- at 558.4', a few 2" brecciated massive py blebs
- at 558.6' 3" siltstone bd at 60o to the ca,
- from 559 to 560', py locally to 10% as large brecciated frag to 1/2", nodules to 1/2", and clasts of graphitic arg w 15 to 20% vfg diss py
- at 563.5', 1" py nodule and a few 1" brecciated py frag

507-566' (cont.)

- some frac have bright yellowish green v bleached dolomitic alteration halos to 1",
- contains small diss chl blebs to 1/32" and 5 to 10% of rock in places
- frac brecciate rock in places
- numerous secondary qtz minor carb vn to 1" and 5% of rock
- a few med grained app phases
- sulph content, av 0.5% py as fg diss mineralization and frac fil
- rock app auto brecciated in places w 1/4 to 3" 'frag'
- from 606.5 to 608', appears weakly fol at 45o to the ca, locally intensely frac to brecciated by 1/16" qtz calc chl seams pred pll fol
- from 608 to 609', rock strongly brecciated by 1/4 to 1/2" calc qtz py bands at ran or to 25% of rock (py to 3% over 1') w brecciated frag exhibiting intense alteration w mottled ser rims and bleached at 609.5' 3" similar breccia zone, rock brecciated by 2" seams/bands of grey fg granular qtz calc w 5% py blebs to 1/4" breccia frag to 1/2" are completely ser calc altered, bleached white
- at 610.5' 1/2" vfg granular qtz calc vn at 30o to the ca,
- at 611', appears autobrecciated
- from 612 to 614', appears auto brecciated w several 4 to 5" slightly coarser 'frag' of rock in similar app matrix
- at 614', 1/2" zone banded app hard white magnesite vn at 45o to the ca,
- at 616', 1/4" qtz carb vn at 40o to the ca, w soft ser rich alteration halo
- from 617' rock becomes slightly coarser w v well dev crystalline texture, carb alteration becomes pred dolomitic
- at 618' 1/2" magnesite vn at 50o to the ca
- from 621.5 to 623', thin qtz calc chl vn from 0 to 20o to the ca, to 20% of the rock
- at 625', 6" zone where 1/4 to 1/2" qtz calc magnesite vn at 30o to the ca, to 25% of rock

- 2. vfg dark grey to black granular app v graphitic chl metasediment, graphite to 30 to 40%
- dacite tuff to 30% of rock, and graphitic metasediment to 70% of rock
- both units are intensely frac to brecciated by thin 1/8 to 1/4" pred qtz minor ass calc and magnesite stringers at weak pref or pll bd to 30% of rock, often themselves brecciated into small 1/8" to 1/4" frag throughout rock
- minor hematite, ser, chl, py frac fil also present
- rock contains 5% py as thin seams and vfg diss mineralization in ser rich interbd and as semi massive bands pll bd to 1/4" throughout
- often two litho type brecciated into a melange
- minor diss hematite blebs in places maybe trace amounts of sphalerite
- from 600 to 606.5', brecciated contact w underlying unit

606.5 - 627'

- strongly carbz, bleached app, and to basalt rock (looks dacitic, similar to unit from 228 to 241 etc)
- rock pred a yellowish green fg crystalline rock w 20% small 1/32" acicular blades of light green translucent mineral often in a crude snowflake texture
- v bleached app, strongly carbz w both zones of strong calc enrichment and zones of more dolomitic enrichment
- mod serz alteration
- rock is relatively soft
- pred massive app, although a few fol/sch zones and in places intense frac lends fol app to rock
- rock is v strongly frac w prominent sets at 40 to 500 to the ca, and 80 to 900 to the ca, although other or are present, w pred qtz lesser calc, magnesite chl, ser and talc frac fil

-from 626.4' to 627', numerous 1/4" qtz vn at 30 o to the ca, w 1% ass py as blebs to 1/4"
-arb grad contact w underlying f less bleached appearing less carbz unit

627

-641'

-carbz and rock
-rock similar to overlying unit and underlying unit but less bleached app no dolomite alteration, pred a light green fg crystalline (w same 20% small 1/32" acicular blades of translucent light mineral often in crude snowflake texture) and appearing litho massive, strongly carbz w 20% fg diss calc
-strongly frac w sets at 60 to 80o to the ca, and all other or, w pred calc, chl, some qtz and py frac fil
-a few secondary qtz calc vn at pref or of 60 to 80o to the ca, to 1'
-sulphide content 1%, py ass pred w qtz carb vn and as frac fil
minor fg diss mineralization
-at 628', 1/4'' granular qtz calc vn at 60o to the ca, w a 1'' beige carb and light green talc alteration halo
-from 629 to 629.5', numerous 1/4 to 1/2" qtz calc vn to 60o to the ca, w 1% ass py at vn margin
-at 631.2', 1" qtz calc vn at 50o to the ca, w 2% thin py blebs at rims
-at 631.5', 1/2" calc magnesite chl vn at 50o to the ca,
-from 632.5 to 634', numerous 1/2" irr chl-ser-calc rich fil frac at 0 to 10o to the ca, w 1% py
-at 636' 1" sheared app chl ser calc rich band at 35o to the ca, w 2% diss py
-from 637' becomes increasingly greenish yellow, increasingly bleached, dolomitized app, arb contact w underlying intensely altered unit at 641'

- strongly altered (bleached appearing, carbz) rock (looks dacitic, but probably an altered and to basalt)
- rock pred a fg crystalline app (w 20% vfg small 1/32" fibrous acicular blades of light green translucent mineral, in weakly ;dev snowflake texture in places) extremely altered, soft bright yellowish green strongly carbz (dolomite in 15 to 20% diss white calc blebs to 1/8")
- rock
- pred massive appearing, w a few fol/sch zones
- rock is v strongly frac at ran or w pred calc, ser, minor qtz, chl, talc and py frac fil, frac brecciate rock in places, some frac have strongly bleached carb alteration halos
- mod ser alteration
- a few secondary calc ser chl vn at ran or to 1",
- contains numerous (to 5%) small 1/32" to 1/16" diss chl clots
- alteration intensity increases towards 655'
- sulphide content, py to 1% as diss mineralization and mineralization ass w qtz carb vn and frac fil
- at 641.5', locally numerous 1/8" py fil frac, often w py 1/8" diss alteratio halos
- at 642' 1" qtz calc vn at 300 to the ca, w 1% py at rims
- at 642.5', 1/2" qtz calc vn at 800 to the ca,
- at 642.8', 1/8" py fil frac w 1/8" py diss halo
- at 643', 1" calc ser qtz vn at 500 to the ca,
- at 644', 1/2" calc ser seam at 600
- from 646 to 646.6', 1" qtz calc vn at 100 to the ca, w v bright light green ser diss in vn and at rims, maybe minor amt of fuchsite, 0.5% py
- from 647 to 648', numerous 1/4 to 1/2" hard white magnesite vn / fil frac at ran or to 20% of rock w minor ass fuchsite
- at 649.5', 1" light green ser chl-calc vn at 500 to the ca,
- from 650.5', to 652' rock brecciated by numerous 1/4" to 1/2" dark grey vfg

qtz magnesite calc bands at ran or
w ass 2% diss py, locally host frag are
weakly fol to 300 to the ca, and intensely
altered to a bright yellow ser carb and
clay mineral, extremely soft,
-from 654 to 655', rock is brecciated
by thin qtz calc magnesite py seams
and v altered to v soft bright yellow
ser and clay

655 - 658'

-qtz carb py rich brecciated metasediment
(grwk)
-rock pred a dark grey to black a vfg
v granular app, hard sil calc rich
(20 to 25% diss) thinly bd (bd v contorted,
poorly dev, where visible at 20 to 300
to the ca,) metasediment, w 30% thin
(av 1/16 to 1") qtz and fg granular
qtz magnesite calc stringers and vn that
strongly brecciate rock at ran or
-contains 5% py as semi massive bd/bands
to 1/4" pll bd, brecciated frag to 1/4"
and vfg diss mineralization
-from 655 to 656.5', contains large
1 to 2" brecciated frag of intensely
altered rock from overlying unit to 25%
-rock is intensely frac at ran or w
calc, qtz, py hematite frac fil
a few 1/4" diss hematite blebs throughout
rock, maybe trace amounts of sphalerite

658 - 676.5'

-intensely altered (to ser, carb, v bleach-
ed app) strongly brecciated rock (looks
dacitic but probably andesite to basalt
-rock comprised of
-1. fg brecciated frag, pred angular to
sub angular, ranging in size from 1/8 to
6 to 8", av 3 to 4", often elongate pll
weakly dev and highly variable fol at or
ranging from 30 to 600 to the ca, bright
yellowish green soft intensely altered
(to ser and dolomite and some diss calc)
-crystalline app (faint crystalline texture
exhibited by 20 to 25% small 1/32" acicular
light grey green translucent minerals
often in fibrous and snowflake textures)

-and to basalt (looks dacitic but probably more altered mafic vol) frag themselves are strongly frac w qtz calc ser chl frac fil, brecciated by

-2. matrix seams to 2 to 3", av 1/8 to 1/4" pred fg v granular clastic app qtz calc ser rich rock resembling a grwk, w numerous smaller micro brecciated frag of host rock, and in places matrix is micro brecciated mylonitic type ground host rock

-frag matrix ratio av 90/10, in places to 70/30 where strongly brecciated

-a few secondary qtz calc magnesite vn to 1" often brecciate into frag

-matrix may contains trace amounts of fuchsite

-frag often app to be weakly sch pll to fol

-0.25% py pred as diss mineralization and matrix bands and as frac fil

-at 665.2' a few thin seams of black non magnetic metallic mineral to 1/16"

-at 675', 1/4" fuchsite seam

676.5 - 679.5'

-qtz carb py rich interbd metasediments

-rock pred a v hard sil fg granular dark grey to black metasediment, v calc rich w 15 to 20% fg diss calc, thinly bd at av or of 350 to the ca, but bd is poorly dev, and highly contorted in places
-contains 10% lighter green fg granular ser grwk type interbd to 1/4", also highly contorted

-rock is shot throught w fg granular qtz calc magnesite vn and stringers and infil frac to 1/2", av 1/16 to 1/8" at ran or to 25% of rock

-contains 5% py as semi massive bands to 1/4" and brecciated frag to 1/4", a few 1/8" nodules, minor frac fil mineralization

-contains 5% hematite as large 1/4" blebs and a few bands pll fol, and as

alteration around py blebs and bands
-from 678.8' to 679.5', qtz calc magne-
site vn to 2 to 3" and 70% of rock,
w a few thin bright yellow clay altered
bands pll bd
-maybe trace fuchsite
-trace amounts of graphite as frac fil,
and seams along sch planes

679.5 - 708'

-intensely altered (to ser, carb-dolomite)
brecciated rock (looks dacitic but pre
cursor probably an and to basalt)
-rock comprised of
-1. strongly altered often brecciated frag
of light green to v bright yellowish green
soft intensely serz and carbz (pred
dolomite - in places alteration to a
yellow soft clay mineral) vfg weakly
crystalline app (w faint crystalline
texture exhibited by 15 to 20% v small
acicular pale green translucent mineral
blades often in a crude snowflake texture
visible only where not intensely altered)
rock, looks dacitic, but more probably
an altered and to basalt, brecciated by
-2. fg v granular dark grey qtz carb
seams, carb pred magne-stite some calc
seams exhibit pref or at 400 to the ca,
to 1 to 2", av 1/8 to 1/4",
-overall composition approx 80% frag
20% matrix,
-av frag size to 2 to 3",
-appears sch in places, pll to bd
-numerous secondary coarse qtz carb vn 1
to 2" and 5% of rock
-some ser alteration zones may contain
trace amounts of fuchsite
-rock is intensely frac, one set pll
fol but other or present, w pred qtz
carb, ser, some chl, sulph, and talc
frac fil
-fol lends agg app to rock in places
-sulph content, av 1% py, as mineralization
ass w qtz carb vn frac fil, and minor vfg
diss mineralization in both frag and
matrix seams
-from 680 to 681', brecciated qtz frag and
vn pll fol at 400 to the ca, to 1" and 80%
of rock

679.5 - 708' (cont.)

- from 681 to 682', qtz vn and brecciated vn frag to 1/2" to 30% of rock
- at 682.5', a few 1/2" qtz magnesite vn at 400 to the ca, w thin py stringers at vn margins
- at 684 to 686', secondary qtz calc magnesite vn to 1" pll fol at 400 to the ca to 80% of rock, locally minor amounts of fuchsite and vfg diss py in host proximal to vn
- from 688 to 689 ser alteration locally bright light green, maybe minor amounts fuchsite
- from 692 to 694' frag altered to v bright yellow green pred ser and clay
- from 694 to 695.5', ser alteration v bright light green, maybe fuchsite to 60% of rock locally
- at 694', 2" calc magnesite qtz vn at 500 to the ca,
- at 695', 1" qtz vn at 600 to the ca,
- from 694 to 696', strongly brecciated frag matrix ratio locally 50/50
- from 697 to 701.5' only weakly brecciated less strongly altered
- from 701.5 to 704.5', intensely brecciated frag matrix ratio is 50/50 frag altered to a bright yellow ser and clay, py increases to 5% locally
- from 701.5 to 702', brecciated qtz vn frag to 1" to 40% of rock
- at 702.3', 1/4" semi massive py py band in matrix pll fol locally to 900 to the ca
- at 702.8', a few 1/2" semi massive py bands in matrix
- at 703.5, 2" zone w brecciated qtz magnesite frag to 80% of rock w 5% py blebs to 1/4"
- at 704' a few contorted 1/2" qtz vn

708

- 714'

-qtz carb py rich interbd metasediment (graphitic-chl arg and grwk)
-bd pred well dev at 50 to 550 to the ca although highly contorted, slumped in places, w interbd of
-1. hard jet black vfg to arg weakly carb weakly carb (5 to 10% graphite) meta-sediment (arg to siltstone) w 10% vfg diss calc, and usually strongly brecciated by thin pred qtz minor ass minor ass calc magnesite stringers/vn to 1/4" to 25% of rock at ran or , w 5% py as semi massive bands pll bd and brecciated frag to 1/2", minor vfg diss py, and w 5% hematite as large blebs and bands to 1/4", and
-2. interbd to 2' fg granular weakly ser grwk
-ratio of 1 to 2 is approx 50/50
-interbd often breccia / boudinaged into conglomeratic app breccia
-overall sulph content, 3% py ass pred w graphitic bd
-a few thin light green v ser and chl arg interbd

714

- 732'

-grwk
-rock a light greenish grey v soft strongly serz fg granular app grwk matrix, containing 25 to 30% small elongate pll to fol 1/32" to 1/4" carb blebs (pred hard white to pale yellow carb, magnesite/dolomite)
-bd well dev at 500 to the ca, app to be a weak pll sch
-looks tuffaceous due to elongate pll to nature of carb frag, but matrix is v granular and clastic app
-contains 5% small 1/8 to 1/4" bright light green fuchsite app blebs/frag/clasts elongate pll to fol
-contains numerous thin bright yellow 1/16" to 1/32" ser-clay mineral stringers pll sch and proximal to frac
-rock is strongly frac pred pll sub pll bd although other or present, w pred calc magnesite, ser, and some qtz, chl and py frac fil

714 - 732' (cont.)

- a few coarser zones where clasts to 1/4" and 30 to 40% of rock
- a few secondary qtz carb vn at ran or
- contains 1% py as clastic app blebs to 1/8" minor frac fil and fg diss mineralization
- at 716', 1/2" qtz vn cross cuts fol at 80o to the ca, w thin bright yellow 1/16" ser seams at rims, locally a few 1/4" fuchsite app blebs in host rock
- from 718.6 to 719', qtz w minor hard white magnesite vn and stringers to 1/2" to 45o to 90o to the ca, to 30% of rock, host w 25% bright yellow thin clay ser seams pll fol, and locally 10% fuchsite blebs in thin seams pll fol to 1/4"
- from 719 to 719.5', graphitic arg interbd, w highly contorted slumped bd at 0 to 90o to the ca, w 5% py as blebs and thin bands to 1/4"
- at 720' 1" qtz carb vn at 30o to the ca, locally the trace fuchsite at rims
- from 720.5 to 721', pred a hard grey granular carb vn to 1/2" at ran or to 50% of rock
- at 722', 1/2" qtz magnesite vn at 35o to the ca, w a 1/8" graphite seam
- at 723' 6" graphitic breccia interbd w 5% py as semi massive blebs to 1/2"
- at 723.7' 2" graphitic breccia interbd w 5% py
- from 723.7 to 724', brecciated qtz vn magnesite vn to 50% of rock
- at 725.5', 6" graphitic breccia zone w 2% py
- from 726 to 732', coarser lithic wacke w clasts of ser arg, qtz carb, py, and chl to 1/4" and 40% of rock coarsens towards 732', sharp contact at 732',
- 732 to 860', and crystal tuff or reworked epiclastic eq
- rock a light greyish green to green vfg to fg granular app dacite to and tuff crystal tuff or slightly reworked epiclastic eq
- relatively soft, mod serz to weakly chlz by 860'
- mod carbz w 20% small. diss calc blebs throughout rock
- well dev fol at 40o to the ca, app bd with a weak pll sch

732 - 860'

732 - 860' (cont.)

-contains 5 to 10% small less than 1/32" slimps of unknown pale white to pink mineral elongate pll to fol
-mod frac pred pll sub pll fol w calc, magnesite, ser, qtz, and chl frac fil
-a few secondary 1/4 to 1" qtz carb vn pred pll fol
-0.5% diss py
-from 732 to 736', slightly lighter yellowish grey, carb maybe more dolomitic locally
-at 734', 1/2" qtz magnesite vn pll fol
-at 751.5', 1/2" fg qtz magnesite vn pll fol
-at 752.6', 1" fg magnesite calc qtz vn pll fol
-at 753 to 754.5', numerous 1/2 to 1" fg granular beige hard carb vn pll fol to 35% of rock
-at 757', 2" qtz magnesite vn pll fol
-at 773', 3" magnesite qtz vn pll fol
-by 750', becomes strongly carbz w diss calc to 25 to 30% of rock becomes lighter green colour increasingly chlz,
-at 798', a few 1/4" calc vn at 650 to the ca,
-at 813', 1" qtz calc vn pll fol
-at 835.5', 1" calc vn pll fol

END OF HOLE

576917

576916

576915

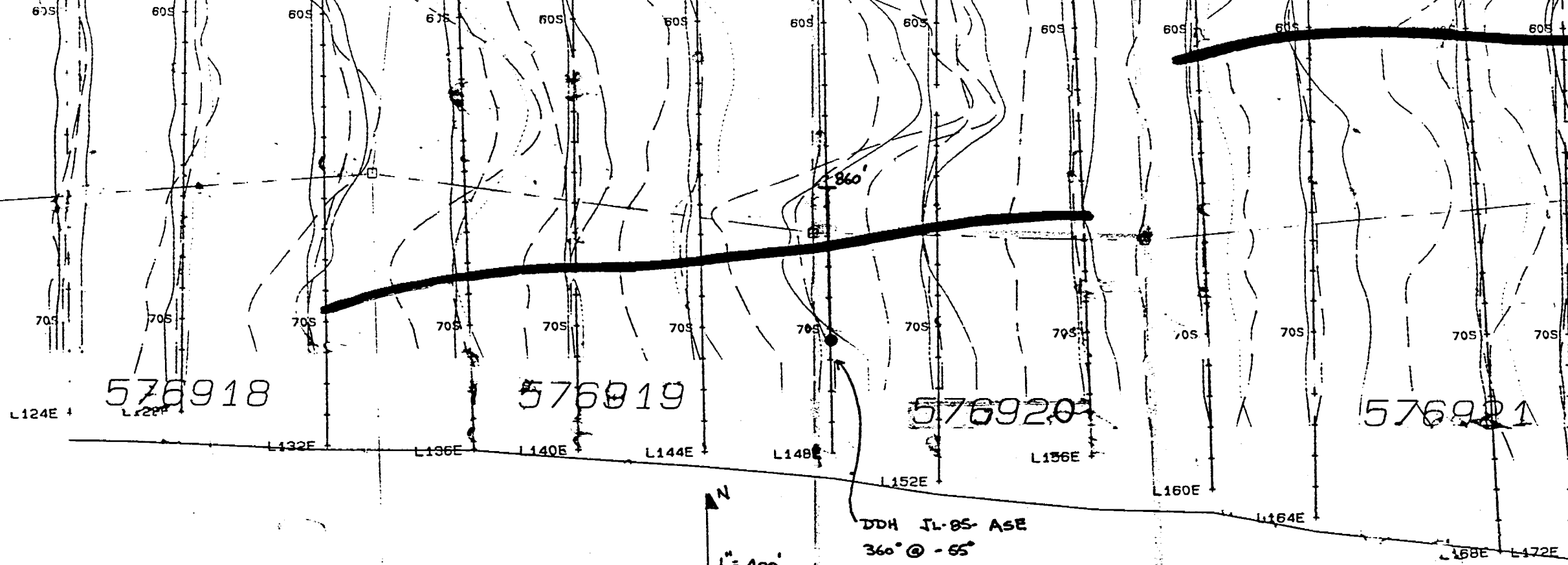
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N
1" = 400'

DDH JL-85-ASE
360' @ -65''

D. McIvor
APRIL 30, 85

DESCRIPTIVE

GEOLOGY

NOTES

HOLE JL-85-G

94 - 101'

-andesite to basalt tuff
-vfg dark green massive relatively hard
fresh only weakly chlz and to basalt
app rock, but w a v granular texture,
maybe a crystal tuff or reworked epiclastic
eq
-weakly frac at ran or w chl frac fil
-1% diss py as cubic blebs to 1/8"
-v homogeneous app

101 - 143.5'

-brecciated, intensely altered (dolomitized
/sil) rock (precursor probably an and to
basalt tuff)
-rock v greatly in app, due to varying
intensities of alteration and brecciation
-rock comprised of,
-1. vfg to aphanitic light green v hard
sil (?) rock
-2. light grey to pinkish grey v hard
dolomitized rock, also often v cherty
in places and
-3. softer, greenish grey, v fg granular
app serz to chlz tuff,
-these occ in breccia frags to 1 to 2"
brecciated by
-autobrecciated app mylonitic type
seams of similar composition and
-softer chl seams and
-qtz hard white to pink dolomite seams,
often enter mixed and in an extremely
altered, brecciated, and v strange
texture
-in some places rock appears less altered,
slightly coarser, and resembles an epiclas
and to basalt tuff (or possibly an
clastic eq)

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101 - 143.5' (Cont.)

- rock is intensely frac at ran or w chl, dolomite, calc, qtz, ser frac fil
- rock exhibits a v crude fol in places of 300 to the ca, (although highly variable and contorted)
- contains secondary hard carb (dolomite-magnesite) - qtz-calc vn to 2 to 3", and thin stringers to 1/4" at ran or to 15% of rock
- difficult to distinguish alteration features from brecciation features, and breccia matrix from frag, a v tectonized rock, but overall composition approx 85% breccia frag, and 15% breccia matrix
- qtz carb fil frac often have hard light green to grey bleached app silica and carb alteration halos to 1/2", and also as irr 1/8" sub spherical alteration blebs and bleb agg around frac
- silicification often in the form of irr diss 1/8" alteration blebs, lends porphyritic app to rock in places
- sulph content, av 0.5% py, trace cpy as occ diss blebs to 1/8", usually proximal vn and ass w qtz carb vn
- from 101 to 102', py locally to 3% as diss cubes to 1/8", locally 1/8 to 1/4" calc and hard light green carb vn in stringers at ran or to 30% of rock
- at 109' 1" qtz calc vn at 500 to the ca,
- from 111 to 112', chlz zone, around highly contorted 4" qtz calc vn at 111.5', vn contains 0.5% diss py, and a few 1/8" case spar blebs
- from 113.5', to 114.5', v strongly brecciated zone, w grey 'mylonitic' host matrix containing 25 to 30% angular brecciated hard light green silicified alteration frag to 1" and a few chlz brecciated seams
- at 114' 2" qtz calc vn at 350 to the ca, w 0.5% diss py, trace cpy
- from 114 to 116', rock is strongly brecciated by v hard v fg grey to light green sil - carb band to 1" at ran or, rock locally app autobrecciated
- from 119' to 122', grey, v mottled app app to intensely sil cherty zone brecciated by 2 to 3" chl seams, large cherty frag also app weakly autobrecciated

- from 122 to 123.5', mineralized qtz rich zone, w large (to 3") coarse grained granular qtz vn, often contorted, brecciated, to 60% of rock, w diss py blebs to 1/4" and 10% of rock
- from 122 to 122.8', v banded app, bright light green cherty zone w 10% py bands and blebs to 1/4"
- at 126.5', 2" qtz chl carb contorted vn
- from 124', numerous frag are a hard light pink, look dolomitic but no reaction HCL, v sil,
- from 129 to 133', v strongly brecciated w light pink to green intensely sil and in places dolomitized frag to 1/2" set in similar composition matrix, and chl matrix seams, locally frag matrix ratio is 70/30
- arb contact w underlying more mineralized unit

143.5 -163'

- mineralized brecciated altered rock
- rock pred a vfg, relatively soft, light greyish green to pink grey, v granular granular app v strongly altered rock
- alteration pred ser, precursor probably an intermediate crystal tuff or epiclastic eq
- rock is well fol at 350 to the ca, (although v contorted in places ranging from 0 to 500 the ca) as exhibited by or of brecciating seams
- rock is strongly brecciated, pred auto brecciated app, by thin 1/16 to 1/8" bands pll fol of similar fg granular ser to chl material, in places also brecciated by dark green v chl bands, and by qtz carb bands/vn in stringers, and vfg granular calc minor qtz bands
- frag av 1/2", range from 1/16" to 2 to 3"
- rock is strongly frac pred pll sub pll although other or present, w pred calc, qtz, harder carb, chl, ser, and some sulph frac fil
- contains numerous large secondary coarse grained granular app pred qtz lesse calc and harder magnesite vn to 1 to 2" and 10% of rock sulph content av 80% (3% py, 5% po, trace cpy) as vfg diss

143.5 - 163' (cont.)

mineralization in both frag and matrix, diss blebs to 1/8", and mineralization ass w qtz calc vn, and qtz calc frac fil, pred vfg diss mineralization in breccia frags where brecciated by qtz carb vn

-from 143.5 to 144.5' brecciated by ran or 1/4 to 1" fg granular light grey to green qtz calc bands to 80% of rock, w ass 5% diss py cubes to 1/8" and 1% po

-from 144.5 to 146', coarse grained crystalline pred qtz minor calc vn in brecciated vn frag to 3" and 80% of rock, w ass 5% py po as frac fil and in vn to 1/8", diss blebs to 1/4" and vfg diss mineralization in surrounding host rock frag locally a few bright light green soft fuchsite blebs at vn margins, and along frac in vn

-from 146.5 to 148', sulph locally to 10% (8% po, 2% py, trace cpy) as vfg diss mineralization in host rock and blebs to 1/2" ass w numerous thin 1/4" qtz carb ser stringers

-at 147.5', 2" qtz vn

-at 149', 1" band pll fol at 350 to the ca of large 1/8 to 1/4" qtz blebs set in a calcitic matrix w ass 5% vfg py-po

-from 154.5' to 156', numerous ran or 1/4 to 1/2" pred qtz w minor calc vn to 40% of rock, weakly brecciate rock, w surrounding host rock containing 10% vfg diss po and py

-at 156.5', 2" light green bleached app zone w 20% vfg diss py

-from 157 to 159.5', rock is brecciated by 1 to 2" coarse grained crystalline grey calc bands to 30% of rock and white ran or 1/2 to 1" qtz bands to 25% of rock w surrounding host rock frag containing 15% diss sulphides (12% po, 3% py) and a few large 1/4" py po blebs ass w vn

-from 161 to 161.5', coarse g crystalline qtz vn to 80% of rock pll fol, w 5% thin

bright green fuchsite seams infilling
frac and at vn margins, vn contain 10%
py as diss blebs to 1/8" frac fil
w calc in vn and blebs to 1/4" at vn
margins
-at 163', fg granular qtz calc vn pll fol
w thin 1/8" bright light fuchsite seams
at rims
-arb contact w underlying less mineral-
ized unit

163

- 199'

-altered brecciated intermediate rock
(tuff or reworked epiclastic eq)
-rock varies greatly in appearance due to
varying intensities of alteration and
brecciation
-pred a well fol rock, at an av or of 35o
to the ca, although very slightly in places
-comprised of light greyish green to pinkish
green, v fg, very granular app, mod serz
in places carbz, w 10 to 15% fg diss calc
brecciated app frag from 1/2 to 2" elongate
pll fol, set in a darker grey green but
v similar matrix/ground mass (auto breccia-
ted app), comprised of v fg granular
app slightly more chloritic bands from
1/8 to 1/4" pll fol, and brecciated rock
-occ larger dark green v strongly chl
1/2 to 2" breccia bands pll fol, often v
clastic/lithic wacke app, w 20% 1/8 to 1/4
small brecciated frac of rock
-rock is mod to strongly frac, pred pll
fol, although other or are present w pred
calc, some chl, qtz, ser and py frac fil
-breccia consists of approx 90% frag and
10% matrix, and in a few places more
strongly brecciated, w the frag matrix
ratio 70/30
-a few 1 to 2" secondary qtz carb vn
pred pll fol,
-many frac have light pinkish green v hard
1/4" sil alteration halo
-sulphide content, av 2%, 1.75% py, 0.25%
po, trace cpy, as vfg mineralization
pred in chl breccia seams occ in frag
and mineralization ass w qtz calc vn in
carb frac fil

163-199' (cont.)

- from 163.5 to 164', frag app to be a light pinkish green, locally v calc rich
- at 165', 2" dark green chl band pll fol breccia rock, w a 1/2" fg granular qtz calc vn pll fol containing 3% py and minor po
- at 165.5', 1" chl ser rich breccia band at 350 to the ca, w 1% fg diss py and py frac fil,
- from 169.5', to 171', more strongly brecciated, w soft chl ser rich breccia band pll fol to 1/4" and 30% of rock w ass 5% py as blebs to 1/8", and vfg diss mineralization
- at 171.5', a few 1/8" massive py fil frac
- from 174' to 174.5', 2" auto brecciated band at 250 to the ca, locally v clastic app, w 25 to 30% small 1/4 to 1/2" elongat brecciated host rock frag and smaller 1/8" chl blebs, locally w 2% fg diss py
- from 174.5 to 175', locally rock is altered to a pale pink v calc rich (30% diss) contains 10 - 15% small 1/32" acicular blades
- from 175 to 179', strongly auto brecciated app, frag to 1" to 70% of rock, set in 30% matrix in similar composition a few chl alteration/breccia bands locally frag are pale pink, v calc rich
- at 179', 1/2" chl rich breccia band at 150 to the ca, w 2% py,
- from 179' to 181', v strongly brecciated resembles a lithic wacke to conglomerate w 25 to 30% small 1/8 to 1/4" frag pll fol set in a matrix of similar composition
- from 180.5 to 181.5', chl breccia band w numerous 1/2" fg granular qtz calc vn at 150 to the ca, locally w 5% diss py in vn and in chl bands
- at 181.7', 1" chl bd at 250 to the ca, w 2% ass py and thin qtz calc stringers pll fol
- from 182 to 182.5', chl breccia band at 300 to the ca, w numerous thin fg 1/8" qtz calc stringers and 10% ass py as thin

seams and at rims of vn
 -from 184 to 185', numerous 1/4" fg granular qtz calc bands pll fol w 1" chl alteration halos and ass 3% thin 1/16" py seams at margins of QC stringers
 -from 187.7 to 188.7', numerous 1/4" fg granular qtz calc seam at 10 to 300 to the ca, to 15% of rock w ass 2" chl alteration halos and 5% py as 1/16" seams at vn margins and diss in vn
 -from 191 to 192', locally strongly auto brecciated and brecciated by 1/2" chl band pll fol
 -from 193 to 193.5', white qtz and med grey crystalline calc vn at 450 to the ca, to 95% of rock
 -from 194 to 198', rock becomes darker green, weakly chlz, v well fol, at 350 to the ca, looks like an and tuff

199 - 231'

-sheared, sch crystalline and
 -rock pred a med green, sheared, sch, app fg crystalline and
 -well dev sch at av or of 350 to the ca although v slightly in places
 -rock comprised of 35% thin small elongate pll fol chlz ferromags blebs to 1/16" (looks v tuffaceous, but probably stretched altered ferromag crystals) set in a fg lighter green and ground mass which is relatively hard, plag rich
 -mod carbz w 15% small diss calc blebs throughout rock, occ stained light pink w minor hematite
 -a few zones w strong epidote altered of ground mass, and a few 1/4 to 1/2" epidote vn at ran or
 -rock is mod frac at ran or w pred calc, some epidote, chl and qtz frac fil
 -in places app to be dioritic where slightly coarser
 -contains 0.25% fg diss py
 -at 199.2', 1/2" qtz calc vn cross cuts fol at 300 to the ca, w a 1/2" chl alteration envelope, locally sch is weakly kinked, crenulated
 -from 205 to 205.5', a few 1/8 to 1/4" qtz epidote calc vn at 900 to the ca,

-at 206', a few 1/4" vuggy qtz calc seams
 pll fol, locally a few 1/32" py fil frac
 -at 207', 1" qtz calc epidote vn at 80o
 to the ca,
 -at 209', 1/2" qtz epidote vn at 90o
 to the ca,
 -from 211 to 212.5', epidote alteration
 increases as altered plag phenocrysts
 and thin stringers pll fol
 -at 212.5', 1/2" qtz calc vn at 65o to
 the ca,
 -from 212.5 to 214.5', strong pervasive
 epidote alteration of plag rich ground
 mass, locally fol app to be 0o to the ca,
 as exhibited by weak pref or of 35%
 small chlz ferromag blebs
 -at 214.5', numerous 1/4" qtz calc epidote
 vn at ran or
 -from 216 to 216.5', locally a vfg phase
 w a few 1/4" qtz calc stringers pll fol
 -from 216.5', fol becomes v strong,
 v well dev, w strong metamorphic crystallin
 texture and chlz ferromagnesium blebs
 to 1/8" elongate pll fol, lending v
 tuffaceous/clastic app to rock

231

- 243.5'

-strongly carbz chlz and to basalt
 -rock pred a dark green vfg to aphanitic
 mod sch (at av or 30o to the ca,)
 strongly carbz (v strong reaction to
 HCL, w diss calc to 25% of rock)
 weakly to mod chlz and to basalt
 -a few coarser fg crystalline app phases
 -rock app weakly autobrecciated in
 places w frag app 1/2 to 1" clasts/frag
 set in a similar compositon ground mass
 -rock is mod to strongly frac at ran or
 w pred calc and chl frac fil
 -a few 1/4" diffuse calc vn at ran or
 -sulphides, av 1% fg diss pred cubic
 py and py ass w thin calc fil frac and
 stringers
 -becomes increasingly carbz, softer,
 towards 243.5',

243.5 - 250'

- strongly carbz and to basalt (tuff-lapilli tuff)
- rock comprised of a fg some what granular app soft, v strongly carbz (w 30% diss calc blebs) and mod ser-chl altered ground mass, app strongly fol, sch at 350 to the ca,
- contains 10 to 15% 1/8 to 1/4" elongate pll fol fg granular blebs of pred calc w minor qtz, look like lapilli size tuff frag
- rock is mod to strongly frac at ran or although one set pll sch, w pred calc some chl-ser frac fil
- contains 0.25% fg diss py and py ass w calc frac fil
- from 244 to 244.5', 1/2 to 1" qtz calc chl vn at 70 to 900 to the ca, to 60% of rock

250 - 261'

- strongly carbz, serz, brecciated in places rock, (precursor probably an and to basalt possibly a tuff)
- note that from 250' on, all unit contact are arb, based on intensities of alteration and type of alteration present, rock increasingly altered to unrecognisable material by 261', precursor is questionable but probably is an and to basalt
- rock varies in app due to varying intensities and types of alterations and brecciation, a gradationally a unit from overlying and basalt to underlying intensely altered rock, pred
- a vfg weakly crystalline app (w 5 to 10% small 1/32" acicular blades of unknown mineral, pale green to translucent grey, often in a crude snowflake texture) to a somewhat fg granular app (due pred to diss carb) light green to yellowish green intensely altered rock
- v strongly carbz, pred calc as vfg diss mineralization to 25 to 30% of rock, towards 261' becomes less reactive w HCL, slightly yellower green, and more dolomitic
- mod serz, and weakly chlz, increasing alteration towards 261',

- strongly brecciated (autobrecciated app) in places, w distinct 1/4" to 1" sub angular to sub rounded yellowish more intensely carb frag set in a darker green matrix of similar composition
- mod fol at av or of 350 to the ca, as exhibited by pref of brecciated frag and a weak pll sch
- in places rock is also brecciated by 1/8 to 1/4" distinct chl calc infilled frac
- rock is v strongly frac, w pred chl calc, some ser frac fil
- a few secondary calc dolomite ser vn pred pll fol
- sulphide content, 0.5% py pred ass w fg granular calc minor qtz in filled frac and fg diss mineralization
- from 251 to 252', numerous 1/4 to 1/2" diffuse calc seams at ran or w minor diss hematite and py, locally rock is weakly brecciated by a few 1/4" chl calc seams pll fol
- from 253' to 255', rock is strongly auto-brecciated, frag av 1/2 to 60% of rock, set in a v similar composition ground mass frag locally v yellowish green, v calc ser rich
- at 255', 3" intensely chlz micro breccia zone around a 1" fg granular qtz calc vn w 3% vfg diss py
- at 258', 1" qtz dolomite vn
- at 258.5', 1" irr qtz dolomite bleb
- at 260.5 to 261', 1" fg granular qtz-dolomite-calc vn at 300 to the ca, w 1% diss py blebs to 1/8"
- arb contact w underlying more intensely altered unit

-intensely altered (serz, dolomitized) sheared, brecciated rock (precursor probably an and to basalt (rock pred a vfg, v soft, bright yellowish green, intensely altered, sheared, sch rock

-crystalline app in places w 10% acicular small blades of unknw mineral, to granular app in places

-v strongly serz

-v strongly to intensely carbz, carb app to be pred calc at 261', to pred dolomite by 283', overall pred a dolomitic carb

-rock app v sheared, sch, at changing or at 261', from 30 to 35o, at 275', from 15 to 20o, and by 283', from 0 to 10o to the ca,

-by 283', shearing and sch is intense lends banded app to rock

-rock is v strongly to intensely frac w distinct sets at 15o to the ca, lending bd app to rock, w other or present, w pred fg granular calc, calc qtz, chl ser, and py frac fil

-frac strongly brecciate rock in places

-rock is occ brecciated by larger 1/8" to 1/4" qtz calc vn

-occ brecciated by 1 to 2" dark green v chl rich bands pll fol, of micro brecciated rock,

-some frac have even more intense bright yellowish green ser carb alteration halos occ altered to a yellow gungy clay mineral

-a few secondary qtz carb vn pred pll fol

-alteration intensity increases towards 283',

-sulphide content, variable, from 261 to 267', 0.25% py, trace cpy, as micro frac fil w calc, and from 267', 0.5% py trace cpy, as micro frac fil w qtz and calc and minor vfg diss mineralization

-at 261.5', 1/2" fg granular qtz calc vn cross cuts fol at 35o to the ca, w 1% fg diss py

-at 262', 3" zone w numerous 1/4" qtz calc dolomite seams pll fol w a few 1/8" cpy and py blebs, locally a few thin ser seams are v bright light green, maybe mino amounts of fuchsite present.

261- 283' (cont.)

- at 262.5', 2" fg granular app chl calc ser rich micro breccia band pll fol at 35o to the ca, w a few thin qtz calc stringers and minor diss py
- from 264 to 264.5', fg granular qtz calc vn pll fol
- at 267', 1/2" qtz calc vn cross cuts bd at 70o to the ca, w 1% diss py
- at 269', a few 1/4" calc vn cross cut fol at 80o to the ca, w 1/4" ser dolomite yellow alteration halos, locally rock v banded app w bright light yellow dolomite rich vrs lighter green ser rich band pll fol
- at 269.8', 1/2" qtz calc vn
- at 271' 1/2" qtz vn pll fol
- at 271.5', 1" chl calc ser rich micro breccia band pll fol at 25o to the ca, w 1% diss py
- from 272', to 274', v banded/bd app at 25o to the ca, w thin 1/4 to 1/2" alternating bands of ser vrs carb rich rock
- carb bands locally app boudinaged, brecciated into 1/2" elongate pll to banded frag app blebs
- at 273.5', a few 1" dark green chl ser carb rich micro breccia bands pll fol at 25o to the ca,
- at 274', 1/2" qtz calc vn pll fol
- at 275.5' 1" dolomite calc ser micro breccia band pll fol
- from 275', alteration becomes intense to bright yellow ser dolomite and clay minerals
- from 276.5 to 278', numerous 1/4 to 1/2" qtz vn weakly brecciate rock pred pll fol which locally ranges from 0 to 20o to the ca, locally py to 1% as diss blebs to 1/8" and numerous bright light green soft talc ser fuchsite seams
- at 278.7' 1" micro breccia band pll fol
- from 278.7 to 279.2', 1/4" qtz calc vn pll fol at 20o to the ca, w 5% diss py
- arb contact at 283', w underlying talc-fuchsite ? rich unit who's fol is pred at 0o to the ca,

-mineralized, intensely altered (ser, carb, calc and dolomite) intensely sheared rock (precursor probably an and to basalt)

-rock pred a vfg, intensely sheared app, sch, intensely altered bright light green soft rock

-intensely serz, ser is bright light green and maybe fuchsite, unit is isolated based on the presence of this mineral to 50% of rock

-intensely carbz pred weak reaction to HCL and probably dolomite

-intensely sheared, sch app at av or of 0o to the ca, ranges from 0 to 15o to the ca,

-strongly to intensely frac w prominent sets pll fol at 0o to the ca, and one prominent set at 50o to the ca, cross cutting sch, lended banded app to rock, w pred hard grey calc, magnesite, dolomite, qtz, chl, ser, and py frac fil

-numerous thin 1/4 to 1/2" secondary fg granular qtz calc vn pred pll sub pll fol to 15% of rock, often boudinaged, brecciated app

-py to 3% of rock is fg diss mineralization ass w qtz carb fil frac and vn, and as frac fil w ser

-numerous thin v bright yellow ser/clay minerals slips and seams pll fol, and diss blebs throught rock

-from 283 to 285.5', thin 1/4" to 1/2" fg granular qtz calc vn and brecciated vn' frac to 30% of rock, w ass 5% py as thin diss seams at rims and diss blebs in vn to 1/8"

-from 290 to 290.5', 1/4 to 1/2" fg qtz calc dolomite vn pll fol at 15o to the ca w ass 5% diss py to 80% of rock

-arb contact at 292' where fuchsite dis-appears, and where fol steepens to 30 to 35o to the ca.

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-intensely altered (ser-carb-dolomite) sheared, sch rock (precursor probably and to basalt) (brecciated in places)

-rock pred a v soft, intensely altered (to ser and dolomite, alteration almost complete) bright yellow to greenish yellow strongly sheared app, sch, (at or ranging from 15 to 350 to the ca, av or is 200 to the ca,) rock

-intense shearing/sch lends banded/bd app to rock

-intensely frac w prominent sets pll sub pll fol at 15 to 200 to the ca, w other or present, w pred calc, dolomite qtz, and py frac fil

-frac brecciate rock in places

-numerous 1/4 to 1" dark green chl rich intensely micro brecciated bands pll fol, often ass w qtz calc vn (maybe alteration halos to 10% of rock,)

-numerous 1/2 to 2" secondary qtz calc and qtz dolomite vn to 15% of rock, pred pll sub pll fol, breccia rock in places

-in places rock completely altered to a bright yellow clay mineral

-sulphide content, 1% py, as micro frac fil and fg diss mineralization ass w thin qtz calc vn and stringers, and in thin chl micro brecciated bands

-at 292.8', 4" weakly brecciated zone, brecciated by thin 1/8" chl ser calc rich seams pll fol

-from 294.5' to 295', 1" qtz vn pll fol w 3" chl ser carb rich micro breccia band/halo, w locally 1% py as fg diss mineralization

-from 295.5 to 297', v banded app w bright yellow ser carb bands and lighter grey carb rich bands, often boudinaged/brecciate into elongate 1/2" frag pll fol lending agg app to rock, w numerous 1/4" chl micro breccia bands and halos on fg granular qtz calc vn to 1/4", w 1% vfg py

-at 298', 1/2" qtz calc vn pll fol w 2% fg diss py

-at 300.5', 2" qtz carb calc vn w a 1" micro brecciated chl ser carb rich halo at 350 to the ca, surrounding host rock is v bright yellow, intensely altered to dolomite and ser

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- at 301', 1/2" micro breccia band pll fol at 350 to the ca, w numerous 1/4" brecciated qtz carb frag and vn pll fol
- from 302 to 302.5', coarse g crystalline qtz magnesite vn
- from 303.5 to 304.5', 1" hard white carb (magnesite) vn at 00 to the ca, w 1% diss py, and w ass 1/4 to 1/2" chl ser carb rich micro breccia bands/alteration halos, surrounding host rock is v bright yellow, intensely altered to ser-dolomite and clay minerals
- from 304.5 to 305', numerous 1/4 to 1/2" dolomite qtz vn pll fol w 1/2 to 1" micro brecciated alteration halos
- from 306 to 309', 1/4 to 1" qtz carb (calc and dolomite) vn to 1/2" w 1/4 to 1/2" chl ser rich micro brecciated alteration halos, to 30% of rock, pred pll fol at locally 10 to 200 to the ca,
- from 311 to 312', cherty grey qtz minor calc dolomite vn to 3" and 70% of rock
- from 311.5 to 312.5', 1" chl-carb rich micro breccia band at 100 to the ca,
- from 312.8 to 313.5', coarse qtz grey to pink carb vn to 3" and 50% of rock w numerous 1/4" semi massive vfg py blebs and bands in vn, and minor fuchsite at vn rims
- arb contact w underlying less intensely altered unit

313.5 - 358.5'

- strongly altered (serz, carbz, dolomite) rock, brecciated in places (looks dacitic but more probably an altered and to basalt
- rock pred a bright light green to yellowish green vfg crystalline app (crystalline texture exhibited by 15 to 20% small less than 1/32" acicular blades of unknown pale green to white translucent mineral, often in fibrous app clots or snowflake texture) rock
- v strongly altered, bleached app, strongly carbz (dolomite) and mod to strongly serz rock is relatively soft
- v mottled app in places w irr 1/8 to 1/4" less altered more weakly chl darker green blotches throughout rock (less altered windows)
- rock is only weakly fol in a few places

313.5 - 358.5' (cont.)

- rock is only weakly fol in a few places at av or of 400 to the ca,
- rock is v strongly frac w sets at at 70 to 800 to the ca, and 0 to 200 to the ca, although other or are present, w calc, magnesite, qtz, chl, ser, and py frac fil
- frac strongly brecciate rock in places, and rock in places, app autobrecciated, w distinct 1/4 to 1/2" angular frag set in a matrix of similar composition
- rock is also often brecciated by dark green chl micro breccia bands to 1/2" these bands are often ass w qtz carb vn and maybe alteration halos
- a few secondary qtz carb vn to 1 to 2" and 5% of rock, usually pll sub pll weak' fol
- sulph content, 0.5% py, pred as micro frac fil and mineralization ass w qtz carb vn and fil frac, minor vfg diss mineralization in host rock, usually proximal to vn or infil frac
- at 316', 1" coarse qtzp-pink hard carb vn at 400 to the ca,
- at 316.8', 1.5" coarse qtz pink hard carb vn pll fol at 450 to the ca, w a few 1/4" massive py blebs at rims
- at 319.5', to 321', locally v intensely frac at pref of of 900 and 0 to 200 to the ca, w chl, calc, qtz, magnesite frac fil, locally rock is v mottled app w irr sub spherical 1/4" darker green less alteration patches to 50% of rock
- at 320.5', 1" fg granular qtz carb vn at 900 to the ca,
- at 322', 1/2" fg white-carb-qtz vn at 800 to the ca,
- at 324', 1/2" qtz calc vn at 350 to the ca
- from 324 to 324.5', locally v strongly frac at 900 to the ca, frac app offset and kinked,
- from 325.5 to 326.5', numerous 1 to 2" dark green chl micro breccia bands at 30 to 350 to the ca, and 50% of rock
- at 327.5', and 328.5', 2 to 3" strongly autobrecciated app zones

313.5 - 358.5' (cont.)

- from 332 to 333', 1/2" fg granular
qtz hard white carb vn at 100 to the ca
- at 335', numerous 1/4 to 1/2" qtz dolomite
vn at ran or, locally crystalline
texture and rock is well dev w small
acicular blades to 1/16" and 40% of rock
- from 335.5 to 336.2', rock is strongly
brecciated by thin 1/8 to 1/4" dark green
chl ser rich micro breccia bands at 350
to the ca, locally frag matrix ratio is
80/20 around a 1" hard grey granular
qtz dolomite vn at 350 to the ca, w
% fg diss py
- from 338 to 339', rock is strongly
brecciated by thin 1/4" chl and light green
ser micro breccia bands at 400 to the ca,
frag matrix ratio locally is 90/10, frag
are angular to sub rounded, av 1/2 "
- at 340' 3" auto brecciated zone
- at 340.8', 1/2" chl qtz carb band at 350
to the ca, w 2% diss py
- at 341', 1" med g crystalline qtz carb
vn at 400 to the ca, w minor fuchsite
seams to 1/4" at rims
- from 344', becomes less strongly altered,
greyer, more mottled app, w irr 1/4 to 1/2"
blotches of darker grey green less serz
rock, begins to app 'granular' w 30%
small 1/32" diss white blebs between
mod dev crystalline texture, possibly a
diss carb
- from 351 to 352', numerous 1" carb qtz
vn to 50% of rock at 70 to 900 to the ca,
- at 353.5', 1" qtz calc vn at 900 to the
ca, w thin fuchsite seams at rims
- from 354 to 358.5', v mottled app w darker
green irr blotches to 30% of rock
- from 357.5 to 358.5', numerous 1/2"
qtz calc vn w 2% diss py
- arb contact w underlying less altered unit

358.5 - 657'

- strongly carbz (calc) andesitic rock (brecciated in places)
- varies slightly in app due to varying intensities of alteration and brecciation
- rock pred a light grey to greenish grey fg crystalline app (w 25 to 30% small short 1/32" acicular pale green to white translucent crystals often in a crude fibrous or snowflake texture ranges from poorly dev at 10 to 15% to well dev at 35 to 40%,) rock
- strongly carbz w vfg diss calc blebs to 1/32" and 35 to 40% of rock, lends granular app to rock
- relatively soft
- weakly serz to weakly chlz in a few places
- pred app massive w a few sch zones where rock is brecciated
- rock pred app weakly brecciated by frac av frag size 1 to 2"
- rock is strongly to v strongly frac w pref sets at 0 to 30 o to the ca, and 40 to 60o to the ca, frac brecciate rock in places where infilled to 1/8", pred w chl, calc,
- rock is brecciated in places by chl-calc seams to 1/4", and rock occ app auto brecciated
- a few secondary qtz calc vn to 1". av 1/4" to 1/2" at weak pref or of 70 to 80o to the ca, although other or present
- app mottled in places
- sulphide content av 0.25 to 0.5% py, pred ass w calc and chl fil frac and thin breccia seams, v minor diss mineralization in host rock, trace po and cpy
- in places weakly to mod bleached app around intensely frac zones, v grey, dacitic app
- numerous 1 to 3" micro breccia band of chl ground mass w small intensely brecciated and altered (to ser, chl, carb) host frag from 1/8 to 1/4" and 30 to 40% of rock, these bands usually contain fg granular qtz calc vn and 2 to 3% fg diss py

358.5-657' (cont.)

- from 359.5 to 360', qtz calc chl vn at 45o to the ca, w 0.5% fg diss py rock is weakly brecciated around vn
- from 358.5 to 363', rock is weakly serz
- from 362 to 362.5', rock is strongly brecciated around a 1" chl calc ser rich micro breccia band at 25o to the ca, w 0.5% diss py
- from 362.5 to 363.5', rock app weakly auto brecciated by thin 1/8" chl ser calc seams weakly or at 45o to the ca,
- at 365', 1/2" pink calc qtz vn at 45o to the ca,
- from 377.5 to 380', rock app weakly auto brecciated, and weakly brecciated by a few thin 1/8" chl calc minor qtz stringers at ran or, w minor diss py to 0.5%
- from 380.5 to 381', calc vn at 70o to the ca,
- at 381.5 to 382', pred calc minor qtz vn and blebs to 1/2" and 30% of rock at 45 to 55o to the ca,
- from 382 to 383', weakly brecciated by a few 1/4" fg granular qtz calc and chl seams at 0 to 50o to the ca, w 0.5% diss py
- at 386', a few 1/2" calc vn
- from 386 to 386.5', weakly brecciated by thin 1/8" chl calc seams crudely fol at 50o to the ca,
- at 394.5', 1" qtz calc vn at 60o to the ca,
- from 395 to 397', numerous 1/4 to 1/2" pred calc minor qtz vn at pref or of 70o to the ca, to 10% of rock
- from 397 to 398.5', rock is weakly to mod brecciated by thin 1/16" chl calc qtz seams at pref or 0o to the ca, locally host rock is harder, slightly bleached app, locally maybe weakly sil
- at 399.5' 2" dark green micro brecciated band at 10o to the ca, surrounding rock is 2" hard bleached app sil alteration halo
- at 401.5', locally some minor hematite frac fil

358.5-657' (cont.)

-at 402', 1" fg granular qtz calc vn
at 400 to the ca, w 1% diss py
vn has 1" dark green chlz micro breccia
band halo which in turn has hard
grey 2" amorphus app sil halo

-at 403.5', 1" qtz calc vn at 550 to the ca
-from 403.5 to 406.5', rock is mod brecciated
by thin 1/16" to 1/8" chl calc
occ qtz seams w minor diss py po at
ran or to 15% of rock, frag app weakly
bleached, locally slightly harder

-at 406.3', 1" qtz calc vn at 450 to the
ca,
-from 406.3 to 406.5', rock is strongly
brecciated, w a dark green chl ground
mass, 2% diss py, and 30% 1/4" elongate
pll breccia band fol at 450 to the ca,
host frag

-at 406.7', 1" qtz calc vn at 500 to the
ca,
-at 407', 1/2" qtz calc vn at 600 to the ca
w a few 1/16" py blebs at rims,
-from 407 to 408.5', mod brecciated
by dark green chl 1/4" bands at ran or
locally frag matrix ratio is 80/20
-from 408.5' crystalline texture well
dev w acicular blades to 30 to 35% of rock,
locally v grey, slightly harder, app
dacitic locally

-at 415.5', 1/4" calc vn at 500 to
the ca, w minor diss py

-at 416.6', 1/8" calc seam at 700 to the
ca, w thin fuchsite seams at rims

-from 416.6 to 417.5', 1/4" qtz calc
hematite fil frac at 100 to the ca, w
2% fg diss py

-from 419.5 to 423', mineralized zone
rock becomes dark grey green, locally
v chlz, v granular app, locally w fg
diss 1/32" calc blebs to 40% of rock
and 10% py occurring as 1/2" large to
2" brecciated app frag blebs ass w fg
granular calc, and in places grey cherty
qtz, and minor fg diss blebs to 1/8" and
fg diss mineralization, py locally
a v dark brown

358.5 - 657' (cont.)

- at 420', 3" elongate massive py bleb.
- at 420.5', 1/2" cherty qtz bleb at 0o to the ca w numerous 1/4 to 1/2" py bleb elongate pll fol locally at 0o to the ca,
- from 420.7 to 421', 1/2" semi massive py band at 0o to the ca,
- at 421.5', 1/2" semi massive py band at 35o to the ca,
- at 422', 1/2" semi massive py band at 20o to the ca,
- from 423.5 to 424', rock is weakly to mod auto brecciated by thin 1/2" bands of intensely brecciated rock
- at 427', 3" qtz calc vn at 80o to the ca, w from 426.7 to 427', a breccia zone w chl micro breccia bands to 1/2" at 60 to 70o to the ca, brecciating host by 1/4" frag, locally contains 5% py as blebs to 1/2" ass w qtz carb vn and in chl matrix
- from 427.5 to 430.5', weakly brecciated by thin 1/8" chl seams and infilled frac at ran or
- at 430.3', 1/2" qtz calc vn at 35o to the ca,
- from 430.5 to 434', v grey, slightly harder locally, v dacitic app, crystalline texture v well dev, locally v calc (40%) rich
- from 438 to 439', dark green chl to lighter green ser calc rich bands strongly brecciate rock (frag matrix ratio 30/70) w 10% py as large cubic blebs to 1/4" locally brecciated frag have v granular app corroded rims
- from 442 to 442.6', v grey slightly harder, locally v dacitic app, locally crystalline texture is v well dev
- from 442.6 to 443', dark green chl and hard green ser-calc rich bands to 2" brecciate rock, w 3% fg diss py blebs to 1/16" locally frag have v granular, corroded rims
- at 445.5', a few 1 to 2" strongly brecciated bands w frag to 1/8" to 1/4" set in a chl ser calc rich matrix, locally frag matrix ratio 70/30
- at 446', 2" chl ser calc band brecciates host
- from 447' to 448', numerous 2 to 3" autobrecciate app zones

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358.5 - 657' (Cont.)

- from 451', pred slightly harder slightly lighter grey green more dacitic app weakly ser
- at 453.7', 2" micro breccia band at 450 to the ca, w numerous 1/4" hard grey calc bands and chl micro breccia halos locally bands has a 4 to 6" hard grey amorphous bleached app weakly sil alteration halo
- from 458.5 to 460.5', weakly brecciated by numerous thin 1/8 to 1/4" chl calc rich seam/infilled frac at weak pref or of 30 to 400 to the ca,
- at 462', 2" soft green chl-ser rich micro breccia band at 450 to the ca, w 3 to 4" bleached app harder weakly sil alteration halo
- from 464 to 468.5', pred bleached app lighter grey, amorphous app, as weak sil alteration halos around numerous thin chl micro breccia bands as outlined below
- from 464.3 to 466', intensely brecciated by thin 1/4 to 1/2" chl ser micro breccia bands at crude or 200 to the ca, micro breccia bands consists of chl ground mass w 30 to 40% 1/16 to 1/4" intensely serz host frag, at 464.8', 1" fg granular pred qtz minor qtz vn and micro breccia band w 5% diss py blebs to 1/4"
- from 466 to 467', 1" micro breccia band at 00 to the ca,
- at 467', 1" micro breccia band at 500 to the ca,
- at 467.7', 1" micro breccia band at 400 to the ca,
- at 476.2', 1/2" qtz calc vn at 700 to the ca,
- at 476.7 to 477', numerous 1/4 to 1/2" calc minor qtz vn at pred 80 to 900 to the ca, w a few 1/8" py - cpy blebs
- from 477 to 477.3', 4" qtz calc vn at 800 to the ca, w a few 1/16" py blebs
- from 477.3 to 477.6', chl ser micro breccia zone w a few 1/4" to 1/2" fg qtz calc py vn
- from 477.6 to 478', bleached app harder locally appears more dacitic
- from 478.4 to 478.8', chl micro breccia band at 400 to the ca, w numerous 1/4 to 1/2" irr fg qtz calc blebs in vn and up to 3% diss py

358-5-657' (cont.)

- at 483.6', 2" chl ser micro breccia band
- at 488.8', 2" chl micro breccia band at 300 to the ca, w 3" bleached weakly sil alteration halo
- at 489.5', 1" qtz calc vn at 300 to the ca
- from 489 to 508', locally harder, more dacitic app
- at 504', 1" micro breccia band at 200 to the ca, w a few 1/2" massive py blebs and a 2" strongly bleached app hard grey weakly sil alteration halo
- at 505.8', 2" micro breccia band at 400 to the ca, w a 2" bleached alteration halo
- from 504 to 506.6', numerous 1/2" to 1" auto brecciated band at ran or
- at 507.7', 1" micro breccia band
- from 508', becomes more and app
- at 509.5', 1/2" qtz calc vn at 400 to the ca, w 5% diss py, rimed by a 1/2" chl micro breccia band and a 2" bleached app hard grey sil alteration halo
- at 509.8', a few 1/4" qtz calc vn weakly pll fol locally at 400 to the ca, locally minor hematite frac fil
- at 511' 2" pred calc minor qtz vn at 600 to the ca,
- at 511.5', a few 1/2" qtz calc vn at 450 to 700 to the ca,
- at 512', 1" chl micro breccia band
- at 513', 1/2" qtz calc vn at 600 to the ca,
- at 516.5', 2" chl micro breccia band at 300 to the ca, cored by a 1" fg granular qtz calc vn,
- at 518', 2" chl ser rich micro breccia band at 700 to the ca, cored by a 1/4" calc py seam, py to 5%, locally host rock is brecciated by numerous thin ass micro breccia bands and qtz calc seams, locally w minor hematite frac fil, micro breccia band has a 2" bleached alteration halo at 200 to the ca,
- from 520 to 522', locally mod auto breccia frag av 1/2", frag ratio matrix 80/20
- at 523.5', 2" strongly auto brecciated zone, weakly fol at 350 to the ca, frag av 1/4", frag ratio matrix is 70/30
- at 524.5', a few 1/8" py qtz calc fil frac

358.5-657' (cont.)

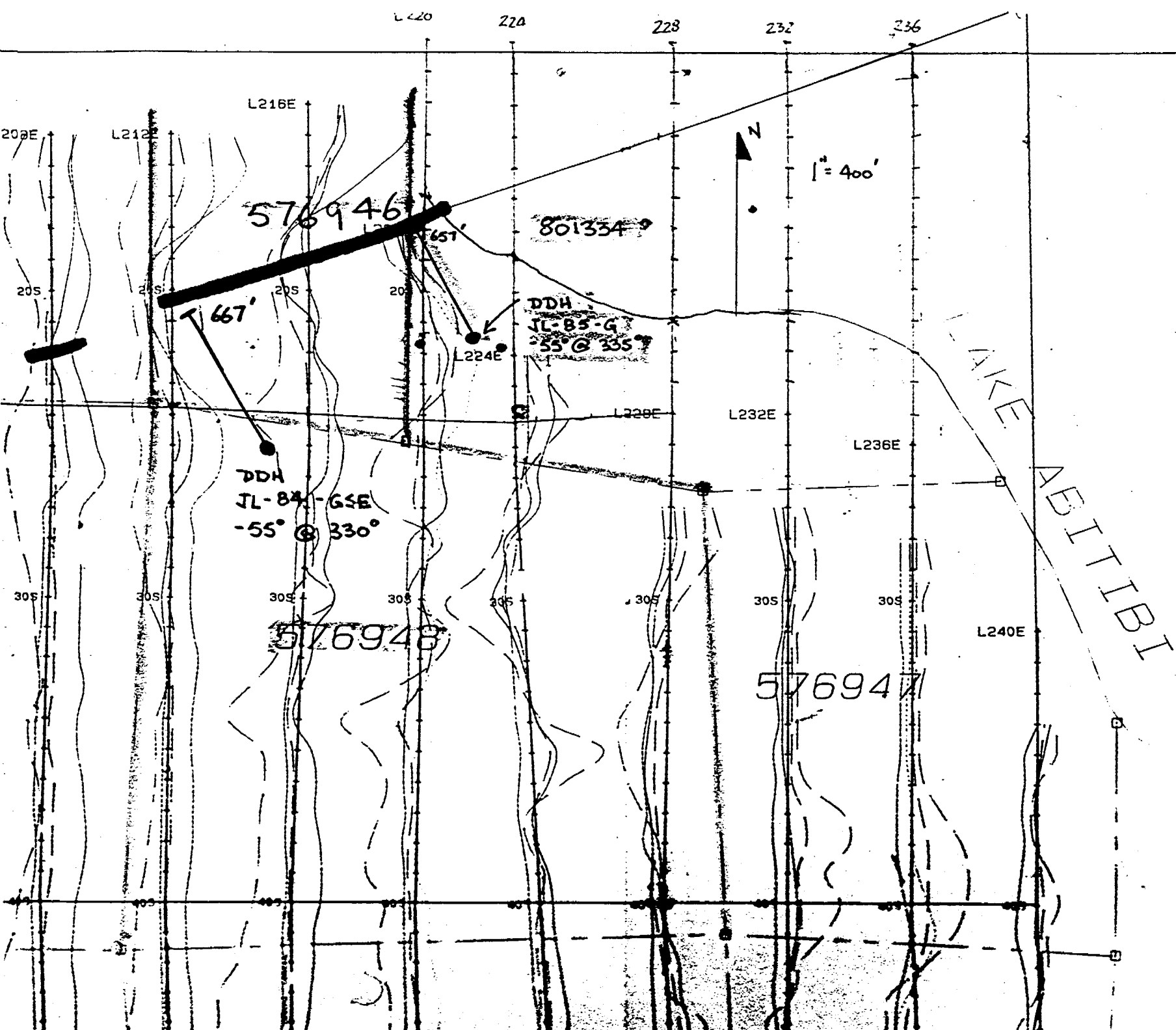
- at 525.3', 1" qtz calc vn at 30o to the ca,
- from 531.5', to 533.5', bleached, grey, sil, app, as halos around numerous 1 to 2" chl micro breccia bands at weak pref or of 45o to the ca, to 40% of rock locally py and po to 2% ass w qtz calc bands in micro breccia bands
- from 541 to 542', numerous 1/4 to 1/2" calc vn w minor diss cpy and py vn locally to 30% of rock
- at 543 to 543.5', locally a few 1/4" calc chl vn w a few 1/8" py blebs
- from 544 to 546', 1/4 to 1/2" chl calc vn to 10% of rock
- from 546 to 546.5', breccia zone dark green chl matrix w 30% angular brecciated host rock frag to 1/2''
- at 551', 1/4" fg granular qtz calc vn at 45o to the ca, w 10% diss py and minor hematite w a 1/2" chl ser rich micro breccia halo which in turn has a 1" beige app weakly sil alteration halo
- at 554.2', 2" micro breccia band at 30o to the ca, w a 1" calc core and 5% diss py, band has a 1" bleached alteration halo
- from 557 to 560', mod autobrecciated
- from 560 to 561', micro breccia band to 2 to 3" at av or of 40o to the ca, to 60% of rock w a few ass 1/4" qtz calc vn and 1% diss py, surrounding host frag are v bleached
- from 565 to 565.5', chl ser micro breccia band at 40o to theca, w numerous 1" calc blebs coring micro breccia band w 2% fg diss py
- at 566', 1" chl micro breccia band at 35o to the ca, surrounding host rock is strongly auto brecciated
- at 566.5', 1" micro brecciated band at 35o to the ca, w 2% diss py
- at 567.5', 2" calc minor qtz vn at 30o to the ca, w a 1" micro brecciated chl halo

358.5 - 657' (cont.)

- from 568.5', 4" micro breccia band, highly contorted from 0 to 90° to the ca, and contorted from 0 to 90° to the ca, w a 1/2" calc minor qtz core w 5% diss py
- at 570.5', 1/2" calc qtz vn at 80° to the ca,
- at 572', 3" micro breccia band at 30° to the ca, w calc rich core and 2% fg diss py
- from 572.5 to 574.5', strongly brecciated chl and soft bright green ser calc rich micro breccia bands to 90% of rock w a few 1/2" to 1" altered host frag, crude or of 10° to the ca, some frag are intensely sil, locally py to 10% as blebs to 1/4" elongate pll fol and ass w fg granular qtz calc core to micro breccia bands
- from 576 to 576.5', micro breccia band to 40° to the ca, w 1% diss py
- at 579.5', a few 1/4" qtz calc vn at 70° to the ca,
- at 580', 1" qtz calc vn at 60° to the ca,
- at 582', 1" qtz calc vn at 70° to the ca,
- at 586', 2" calc vn at 60° to the ca,
- from 586 to 597', more andesitic app v mottled app, crystalline texture and v well dev w numerous small chl blebs lending mottled app to rock
- at 587.4', 1" qtz calc vn at 80° to the ca w a few 1/8" cpy blebs
- at 589.6', 2" qtz calc vn at 60° to the ca,
- from 591 to 592', numerous 1/4" to 1/2" qtz calc vn at 70° to the ca, to 10% of rock
- at 593', contorted qtz calc vn at 60° to the ca, w a few 1/16" py blebs
- at 593.8', 1/2" qtz calc vn at 65° to the ca,
- at 595.2', 1/2" qtz calc vn at 60° to the ca,
- from 597 to 598.8', 1/2" calc vn at 0° to the ca w 2% vfg diss py
- from 602 to 610', strongly mottled app w 1/4 to 1/8" irr calc rich grey blotches to 30% of rock in locally a weak ser dacitic and ground mass, locally minor fg diss

358.5-657' (cont.)

py often as cores to irr carb blotches
-at 606', numerous 1/4" calc qtz vn at 70o to the ca, and 30% of rock w ass 2% py
-at 607.8', 1/2" qtz calc vn at 25o to the ca, w 5% py
-from 609.5 to 610', numerous 1/4" to 1/2" qtz calc vn at 55o to the ca, to 40% of rock w minor diss py
-from 612 to 612.5', numerous 1/4" qtz and and qtz calc vn at 60 to 80o to the ca, and 35% of rock
-from 620.5 to 621', 1" qtz calc vn at 25o to the ca,
-at 623.2', 2" calc qtz vn at 40o to the ca
-at 627.8', 1/2" calc vn at 25o to the ca,
-at 635', 3" calc qtz vn at 50o to the ca,
-at 635.7', 2" qtz calc vn at 55o to the ca,
-at 637.3', 2" qtz calc vn at 60o to the ca,
-from 639 to 642', v mottled app w irr 1/4" calc rich blotches to 30% of rock
-at 641', 1/2" chl py fil frac at 30o to the ca,
-at 646', 2" strongly brecciated zone by thin chl ser micro brecciated bands
-at 647', 1/2" cherty light green qtz vn
-from 647 to 647.5', weakly brecciated by 1/2" calc band at ran or
-at 652', 3" micro breccia band at 30o to the ca, w 3% py as blebs to 1/4"
-from 652.5 to 654', micro breccia band at 0 to 25o to the ca, to 80% of rock w 1% py
-at 655.5', 2" micro breccia band at 70o to the ca,



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KIRKLAND LAKE, ONT.

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D. Mylor
APRIL 30. 85.

DESCRIPTIVE
GEOLOGY
NOTES

HOLE DDH JL-85-K

- 0 - 272' - Overburden
- 272 - 298'
- graphitic argillite
 - thinly bd (bd av. 1/8 to 1/4", bd v well dev at or ranging from 0 to 35° to the ca av. 20° to the ca, although v contorted and slumped in places, note that locally it appears we are drilling down dip, but bd is v contorted, and steepens toward 298' where it is 35° to the ca,)
 - dark black rel soft, graphitic (80%) argillite, w 10% thin (to 1/4", av. 1/16" to 1/8") soft white to grey sericitic argillite interbeds (often v Py rich w up to 20% vfg diss Py mineralization)
 - rock is mod to strongly microfractured at pref or of 0 to 10° to the ca, although other orientations are present, w pred Py, and a bright light green chl frac fil
 - contains on av. , 8 to 10% Py, as thin f semi massive bands to 1/16", frac fil, vfg diss mineralization in sericitic argillite interbeds, and occ nodules to 1/8", minor calc ass w thin sulphides seams, trace sphalerite
 - some minor v bright yellow soft clay minerals as frac fil
 - some slumping in places, w offsets along frac
 - a few lighter grey, slightly harder, slightly less graphitic (50%) argillite interbeds to 10% of rock, lends banded appearance to rock
 - note that microfracture cross cuts bd, and may be a function of a cross cutting sch
 - at 274.5', 1/4" light green fg granular sericitic interbd pll fol at 15° to the ca v clastic appearing, a greywacke/sandstone w white blebs to 1/16" and 30% of rock that resembles carbonate, but give no reaction w HCL

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HOLE DDH JL-85-K

272 - 298'

-at 275.5', 1/2" wacke interbd, v soft sericitic matrix w 15 to 20% small (1/16") white clasts, soft, look like carbonate but no reaction to HCL, locally contains 5% diss Py, trace sphalerite, ass w a 1/2" semi massive Py-calc bd pll fol at 20° to the ca

-at 282.5', 1/2" semi massive Py band at 20° to the ca, (w cubes to 1/8" and 80%, set in a vuggy calc matrix)

-at 285', a few 1/4" semi massive vuggy Py-chl-calc bands pll fol at 20° to the ca

-at 290', a few 1/4" sericitic-Py argillaceous interbd, often brecciated /boudinaged into frag appearing blebs

-at 293.5', 1/2" sericitic arg interbd at 20° to the ca, w 5% vfg diss Py

-from 294 to 294.5', interbd of white v v soft, bleached appearing, sericitic fg granular greywacke, at 25° to the ca, (locally pll bd), v strongly frac w chl and Py frac fil, often w 1/8" chl alteration halos around frac affecting up to 30% of rock, contains 15% vfg diss Py, trace diss sphalerite, contact w graphitic arg are slumped, rock contains a few 1/2" slumped brecciated graphitic fra

-from 294.5', bd is 35° to the ca,

-at 297.5', 1/2" lighter grey sericitic arg interbd w a few 1/2" vuggy Py blebs

298 - 303'

-interbd (and slumped brecciated) graphitic arg and serz intermediate (dacite) tuff

-bd highly contorted, slumped brecciated but pred or is 25° to the ca, rock consist of thinly bd jet black arg bd to 6 to 7" and light green v soft intensely serz 'dacitic' tuff interbds to 3 to 4", approx 50% of each

-contact between two are soft sediments deformed, and slumped,

-both units are strongly frac at ran or w pred Py and chl frac fil, some movement along frac, frac and dacite tuff interbd often have 1/4" chl alteration halos

HOLE DDH JL-85-K

298 - 303'

-dacite tuff interbd appear bleached carbz, but no reactions w HCL
-from 298 to 298.5', light greenish grey, v soft strongly serz vfg dacitic interbd w 2% Py frac and 5% vfg diss sub metallic mineral (?) lends mottled app to rock
-from 298.5 to 298.8', black graphitic arg, thinly bd locally at 25% to the ca w 3% Py as thin seams pll bd and frac fil
-from 298.8 to 299.5', grey bleached app intensely serz dacite tuff, locally w 5% vfg diss Py and Py frac fil, and 2% diss black sub metallic unknown mineral
-from 299.5 to 301', thinly bd jet black graphitic arg w 2% Py
-from 301 to 301.3', serz dacite tuff w 3% vfg diss Py
-from 301.3 to 301.5', graphitic arg
-from 301.5 to 302.6', serz light green soft dacite tuff w 3% Py frac fil and vfg diss mineralization, w numerous 1/2" slump breccia graphitic arg angular frag
-from 302.6 to 303', graphitic arg
-overall sulphide content approx 2% Py, w trace sphalerite, pred as frac fil and thin seams within graphitic arg, and fg diss mineralization in serz dacite tuff (dacite tuff maybe slightly reworked, and epiclastic, technically a greywacke.)

303 - 307.5'

-serz carbz mineralized 'greywacke'
-rock a light greenish grey fg v granular (sand size particles) metasediment (grwk) v homogeneous app, only v weakly fol (bd) at 35° to the ca,
-mod to strongly serz, and mod carbz w 15% diss calc in places, relatively soft
-weakly frac at pref or of 20 to 30° to the ca, w chl and Py frac fil
-contains 3% vfg diss Py, lends mottled app to rock, and Py frac fil

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307.5 - 315'

- graphitic arg
- v thinly bd (av. 1/8" to 1/4")
- jet black graphitic (80%) arg, bd ranges from 20 to 40° to the ca, pred at 35° contorted and slumped in places
- a few thin 1/16 to 1/4" light green serz arg interbd
- strongly micro frac at or pred pll bd (35°) and cross cutting bd at 0. to 20° to the ca; w pred Py and chl frac fil
- Py to 5% as micro frac fil, and occ thin semi massive 1/16" band pll fol
- appears banded w alternate light grey vs jet black bd, due to slight variation in graphite content.
- from 309 to 310', locally v strongly micro frac at 0° to the ca, w Py frac fil
- at 310.5', a few 1/4" semi massive Py bd
- from 312 to 313.5', slumped brecciated frag / interbd to 1" and 40% of rock of vfg light green intensely serz bleached app greywacke w 15% vfg diss Py and 10% vfg diss black metallic mineral (maybe hematized Py) v mottled app, strongly frac w Py and chl frac fil and 1/8" chl alteration halos around frac
- from 313.5' to 315', a few 1/8 to 1/16" qtz magnesite stringers cross cut bd at 70° to the ca,

315 - 332'

- 'greywacke'
- rock pred a med green fg v granular (sand size particles) homogeneous app rock, only v crudely fol (bd) at 35° to the ca, relatively hard, weakly serz, weakly carbz w 5 to 10% small diss calc blebs
- weakly to mod frac at ran or w calc, chl, minor hem, and Py frac fil,
- contains 0.5% vfg diss Py and minor Py frac fil
- contains 30 to 40% light yellowish green (ser) blebs that may be small altered lithic frag / grains

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315 - 332'

-from 315 to 316.5', fg zone, more strongly serz, more strongly micro frac at 0 to 20° to the ca, w Py frac fil, Py to 3% locally as frac fil and vfg diss mineralization
-at 316.5', 1/2" graphitic arg at 25° to the ca,
-from 325.5 to 327', interbd of interbd arg, bd locally at 35° to the ca, pred dark grey soft weakly chl - sercitic arg, a few light green intensely ser arg bd (notably a three inch interbd at 326', which contains 5% vfg Py and Py micro frac fil)

332 - 338'

-f greywack / 'sandstone'
-rock a vfg, granular, light grey, homogeneous app greywack to sandstone (term implies a grain size only), relatively hard only weakly serz, weakly to mod carbz w 15 to 20% vfg diss calc blebs that maybe altered grains
-only faintly bd in a few places at 40° to the ca,
-weakly frac at ran or w pred calc, some qtz, Py frac fil
-to 0.25% fg diss Py and Py frac fil
-at 333', 1" qtz minor hard white carb (magnesite) contorted vn w a few 1/16" Py blebs
-at 334', 1/4" calc minor qtz fil frac at 70° to the ca,
-at 336', 6" zone w well dev bd at 40° to the ca,
-from 337 to 338', 1/2" corroded qtz (all carb is gone, v vuggy) vn at 10° to the ca, w 2% Py as blebs to 1/8"
-sharp contact at 338', at 40° to the ca,

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338 - 346.5'

- interbd arg
- rock comprised of thinly bd (bd av. 1/4 to 1/2") interbd arg
- bd v well dev at 40° to the ca, although is contorted in places, w some soft sediment deformation, and slumping
- comprised of, 1 dark grey relatively hard siliceous (and perhaps v weakly graphitic, 1 to 2%) arg to 30%
- 2 soft light green v strongly serz arg to 30%
- 3 grey v chert siliceous agr to 20%
- 4 black soft graphitic arg to 10%
- arg bd av. 6 to 8"
- all units are mod to strongly micro frac at a weak pref or of 0 to 20° to the ca, (although other or exist) w pred chl, calc Py and some qtz frac fil
- mod macrofrac at ran or, w pred calc, harder white magnesite, and qtz frac fil
- from 338 to 340.5', pred hard black to grey v sil arg
- at 338 to 338.3', 1/2" qtz calc vn at 20° to the ca, w a few 1/8" Py blebs
- from 338 to 340.5', 1% Py as micro frac fil, and thin slips along bd planes, w occ larger blebs ass w qtz carb macro frac in fillings
- from 339.5 to 340.5', numerous 1/4" to 1/8" qtz calc fil frac at 30 to 50° to the ca, w occ Py blebs to 1/4"
- from 340.5 to 342.5', pred relatively soft light green v ser rich thinly bd arg, w a few 1/4" to 1/2" chert interbd to 10%
- from 340.5 to 341', numerous 1/8" qtz cal fil frac at 0 to 20° to the ca,
- locally from 341 to 341.5', bd is v contorted, slumped,
- from 340.5 to 342.5', Py locally only 0.25%, pred as micro frac fil
- from 342.5' to 343.5', pred dark grey to black relatively hard sil arg, v weakly graphitic in places, becomes increasingly graphitic towards 343.5', only trace Py as micro frac fil

HOLE DDH JL-85-K

338 - 346.5'

-from 343.5', to 344.5', hard jet black graphitic arg, only mod graphitic (30%) 0.25% as microfrac fil
-344.5 to 346.2', light grey to greenish grey chert, w numerous 1/8" qtz hard magnesite in fil frac at 0 to 10° to the ca, rock locally v strongly frac, contains 0.25% Py as micro frac fil
-from 344.5 to 345', 1" highly contorted qtz magnesite vn at 0° to the ca, w a few 1/8" Py and sphalerite blebs
-from 346.2 to 346.5', hard dark black sil arg, w trace Py
-overall sulphide content from 0.25% to 0.5% Py, pred as micro frac fil

346.5 - 357'

-fg granular light green metasediment (grwk-sandstone)
-rock pred a rel hard, fg, v granular app, light green, weakly chl - ser grwk to sandstone (term sandstone implies a grain size only)
-v weakly fol at 45° to the ca, appears v homogeneous, almost and., but granular texture
-mod carbz/calc rich, w up to 20% small diss 1/16" calc grains, av is 5 to 10%
-rock is weakly to mod frac at ran or w pred calc, minor chl, Py, and hematite frac fil
-trace to 0.25% vfg diss Po and Py and min Py frac fil, trace Cpy as smears along frac
-from 346 to 348.5', locally more strongly frac w calc, - chl - Py frac fil, Py locally to 0.5% as small cubes to 1/16" along frac and fg diss mineralization
-from 354 to 357', sulph increase to 1% pred v fg diss Po blebs

HOLE DDH JL-85-K

357 - 361'

-sphalerite bearing interbd arg
-rock comprised of thinly bd (bd av. 1/2"
bd is v well dev at 40° to the ca)
interbd - light green relatively soft
v ser rich arg to 30%
-light grey to green chert and cherty
arg to 30%
-dark grey to black weakly carb arg to 30%
-all units are in v strongly frac and micr
frac at ran or (one set pll bd) w Py,
sphalerite, calc, qtz, and chl frac fil
-overall sulph content, 0.5% (0.25% sphal,
0.25% Py, trace Cpy) as micro frac fil
and minor vfg diss mineralization
-from 357 to 357.8', pred light grey
to green soft ser arg. w trace Py and
sphal pred as frac fil
-from 357.8 to 359.8', pred light greenish
grey chert w a few 1/4" dark green slightl
coarser chl arg interbd, locally v strongl
frac w 0.5% sphalerite frac fil, 0.25%
Py and trace Cpy, a few 1/4" secondary
qtz calc vn pred pll fol
-from 359.8' to 361', pred thinly bd
light grey ser and dark grey weakly carb
arg, v strongly frac locally pred pll
sub pll fol , w qtz , calc, and magnesite
frac fil, w ass 0.25% sphalerite and PY

361 - 363'

-sphalerite bearing fg granular serz meta-
sediment (grwk)
-rock a weakly fol (at 40° to the ca,)
light green , vfg granular app soft strong
serz metasediment, (grain size pred a
'sandstone')
-mod to strongly frac at ran or (one set
pll sub pll fol) w 0.5% sphalerite as
frac fil seams to 1/16", and minor ass
calc, chl, galena, Cpy, and Py
-overall sulp content, 0.75%, pred sphale-
rite (0.5%)and 0.25% Py, trace Cpy, galena

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363 - 370'

- sphalerite bearing interbd arg
- thinly bd (to 1/2", av. 1/8 to 1/4") interbd
- light grey weakly ser arg to 30%, and
- dark grey to black weakly carb arg to 70% (by 367' dark black arg is weakly graphitic to 5%)
- bd v well dev at 40° to the ca, although slumped and contorted in a few places
- rock is v strongly frac w sets at pref or cross cutting fol at 50° to the ca, and at 0 to 30° to the ca, although other or are present , w pred chl, calc, sphal, and minor qtz and Py frac fil
- a few slightly coarser light green granular 1/4" 'siltstone-sandstone' type interbd usually w ass chl-ser alteration
- over all sulph content, 0.5% sphal, trace Py, Cpy , galena, pred as micro frac fil and some vfg mineralization ass w slightly coarser granular , ser- chl rich interbd
- at 363.2' 1" slightly coarser light green 'sandstone' interbd, w 3% vfg diss sphal and locally numerous 1/16" sphalerite fil frac
- at 363.6', 1/4" light green slightly coarser granular app interbd w 5% diss sphalerite
- from 368.5 to 369', coarser light green ser rich granular 'sandstone' type interbd locally to 1/4" and 10% of rock, w ass 3% vfg diss sphal

NOTE:

FROM 370', THE FOLLOWING CONTACTS ARE ALL ARB BASED ON SUBTLE CHANGES IN COLOUR TEXTURE, BEDDING ORIENTATIONS ETC.
-ROCK PRED INTERBD ARG AND SLIGHTLY COARSER GRWK-SANDSTONES

HOLE DDH JL-85-K

370 - 376.5'

- soft grey arg - mudstone
- rock pred a thinly bd (to 1" bd v well dev at av. or 35° to the ca, although some slumping, soft sediment deformation features, and offsets along frac) soft, weakly ser, grey arg to slightly coarser mudstone-siltstone
- contains a few (to 10%) slightly coarser vfg granular grey 'siltstone-sandstone' type interbd, characterized by being v calc rich (to 10% vfg diss calc), bd av. 1/16 to 1" in places
- rock is weakly to mod frac, 1 set a pref or cross cutting bd at 35 to 50° to the ca w pred calc and Py frac fil
- a few thin Py rich bd (to 1% fg diss)
- overall sulp content, 0.25% Py, pred as frac fil and diss in a few interbd,
- at 372', a few 1" highly contorted slight coarser vfg calc rich sandstone type inter
- at 373', 1" highly contorted slightly coarser fg granular calc (30%) rich sandstone interbd
- at 373.5' 2" intensely contorted light brown v calc rich (50%) fg granular siltstone - sandstone interbd
- from 374 to 375', numerous 1/4" qtz w minor hard white magnesite vn and in fill frac at ran or to 15% of rock, weakly brecciate rock, w a few 1/16" Py blebs, seams, and in fill frac
- arb contact w underlying unit

376.5 - 383.5'

- interbd dark grey to black arg and slightly coarser sericite - carbonate rich fg granular 'siltstone-sandstone' type metasediment
- thinly bd at 30 to 35° to the ca, although some slumping, and soft sediment deformation features present
- rock comprised of 70% dark grey to black weakly graphitic (5%) arg, relatively soft, and

HOLE DDH JL-85-K

376.5 - 383.5'

-30% coarser fg v granular app light green, v ser rich, soft, v calc rich (to 30% diss calc) 'sandstone-grwk' type interbd to 2 to 3", av. 1/4 to 1/2"
-rock is mod microfrac at pref or of 0 to 20° to the ca, and cross cutting bd at 30 to 50° to the ca, w pred Py, minor chl, and calc frac fil
-at 377.5', 2" light greenish grey fg granular calc rich sandstone - wacke type interbd
-from 379.5' to 381', fg granular ser calc rich wacke type interbd to 2" and 70% of rock, locally a few cross cutting secondary calc vn to 1/4"
-from 381 to 383.5', light green ser rich grwk type interbd to 1" and 40%
-overall sulph content, 1% pred Py as micro frac fil and minor diss mineralization within sandstone-grwk type interbd may be trace amt of sphalerite
-arb contact w underlying unit

383.5 - 394'

-thinly bd dark black weakly graphitic arg
-thinly bd (bd declines towards 394', at 383.5' is 35° to the ca, and at 394' is 25° to the ca, bd v contorted in places ranges from 0 to 35° to the ca,
-bd av 1/8 to 1/4" pred dark black weakly graphitic (5 to 10%) arg w 10 to 15% interbd to 1/4" of light green weakly ser slightly coarser 'siltstone', often v calc rich w up to 25% diss calc
-bd exemplified by alternating bands/bd of lighter grey vs dark grey graphitic arg bd (slight variation in graphite content)
-rock is mod to strongly micro frac at pref or of 0 to 20° to the ca, although other or exist, w pred Py, calc, and minor bright green chl frac fil

HOLE DDJ JL-85-K

383.5 - 394'

-sulph content , Py to 3% primarily as micro frac fil and a few thin 1/16 to 1/8" semi massive bands pll bd, minor vfg diss mineralization
-at 383.5', a few 1/4" fg granular ser calc 'siltstone' interbd w a few 1/4" Py blebs
-at 384.5', 1/8" semi massive Py band pll bd
-at 385', 1/4" graphitic bd w up to 50% vfg diss Py
-from 385 to 386.5' , locally thin bd (1/4 to 1/2") interbd light grey softer weakly ser arg (60%) and light green slightly coarser vfg more granular appearing ser - calc rich 'siltstone' (30%) locally v strongly micro frac at 0 to 10° to the ca, w Py and dark brown v v fg sulph that maybe sphalerite frac fil to 5%, frac pattern may be the result of cross cutting sch / fol at 0° to the ca,
-from 387 to 388', 1/4" Py-calc fil macro frac at 20° to the ca,
-at 388.5', 1/4" calc fil frac / vn pll bd at 25° to the ca,
-at 389', a few 1/2" light green weakly ser slightly coarser fg granular app 'siltstone' bd w a few 1/4" Py blebs
-from 389.5 to 390.5', bd is highly contorted , folded from 25 to 0° to the ca,
-at 390', a few 1/2" Py blebs ass w light green weakly ser slightly coarser siltstone interbd
-from 391.5 to 392', locally 1/16" light green ser - calc (30%) rich slightly coarser siltstone type interbd to 30% of rock
-at 392.2', 1/2" light green cherty interbd
-at 393.5', 1/4" semi massive Py bd
-rather arb contact w underlying softer, light grey mudstone

HOLE DDH JL-85-K

394 - 417.5'

-thinly bd light grey arg - mudstone
-rock pred a v thinly bd (1/4" to 2")
light grey relatively soft vfg to arg
argillite to mudstone, bd ranges from
25 to 30° to the ca, althoug contorted
and highly slumped in places
-appears banded, w alternating shades of
grey in different bd
-contains 10% interbd of slightly coarser
vfg granular light greyish green weakly
ser v calc rich (to 30%) 'siltstone to
grwk' type interbd, usually highly contorted
slumped, and in places brecciated
-rock is mod frac pred at 0 to 20° to
the ca, and cross cutting bd at 30 to 50°
to the ca, w calc, Py, and minor chl frac
fil
-rock may be v weakly carb in a few places
-sulph content, 0.5% Po-Py, pred as micro
frac fil, minor vfg diss Py ass w ser
calc rich siltstone type interbd, a few
1/8" semi massive Po-Py seams pll bd
-at 396', light green ser - calc rich
fg granular siltstone bd w 1% fg diss
Py
-at 397', 1" light green fg granular ser
calc rich siltstone bd
-from 404 to 404.5', siltstone type interbd
to 1/2" and 80% of rock
-from 405.5 to 406', siltstone type inter
bd to 1/2" and 80% of rock
-at 406.5', a few 1/8" Po blebs
-from 409.5 to 410.5', light greenish grey
v calc rich (40%) fg granular siltstone
grwk type interbd to 3" and 80% of rock
w a few 1/8" Po blebs along bd planes
-at 412', a few 1/8" Po blebs along calc
fil frac
-from 416.5 to 417.5', sulph locally from
1%, 0.5% Po, 0.5% Py, as blebs to 1/8"
ass w calc fil frac

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417.5 - 428.2'

-interbd soft grey (weakly graphitic) arg and slightly coarser, light green, ser calc rich metasediment
-rock comprised of,
-1. relatively soft light to dark grey v fg to arg, thinly bd, arg to mudstone v weakly carb, to 40% of rock, and
-2. slightly coarser vfg to fg, granular light green to grey, mod serz /ser rich mod carbz in places (w up to 25% vfg diss calc) sandstone - grwk, weakly chl in place
-bd well dev at av. or of 20° to the ca although some contorted bd in places slumping in places, pred affecting coarser 'sandstone' type bd
-bd av 1/4" to 1" to 4 to 5" in places
-both litho are mod macro frac pred pll sub pll fol at 0 to 20° to the ca, although other or are present, w calc, Py, and minor chl frac fil
-strongly micro frac weakly cross cutting bd at 10° to the ca, w calc, Py, and minor chl frac fil
-strongly micro frac weakly cross cut bd at 10° to the ca, w calc, Py, and chl frac fil
-sulph content, 0.5% pred Py as micro frac fil, minor v fg diss mineralization ass pred w ser-carb granular metasediment bd, trace Po and sphalerite
-from 417.5' to 420.5', pred slightly coarser, 'sandstone' type bd
-from 423 to 424', pred dark grey to black soft weakly graphitic arg to mudstone
-from 424 to 425.5', pred light green ser - calc rich metasediment
-from 425.5' to 428.2', thinly bd, alternating 1/4 to 1/2" bd of graphitic arg and coarser granular 'sandstone' type bd, locally abundant soft sediment deformation features, and sulph (pred Py w trace Po and sphal) increase to 1% as micro frac cross cutting bd at 0 to 10° to the ca,
-at 427', 1/2" calc minor qtz vn at 0° to the ca,

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428.2 - 435'

- thinly bd black weakly graphitic arg to mudstone
- rock consists pred of jet black to light grey relatively soft, v thinly bd (av. 1/8 to 1/4") weakly graphitic (5%) arg to v slightly coarser 'siltstone' or mudstone
- bd ranges from 10 to 35° to the ca av. 15 to 20°, v contorted, slumped in places
- contains 15 to 20% thin (to 1", av. 1/16 to 1/8") light green ser arg to mudstone interbd and a few slightly coarser vfg granular ser - calc rich 'sandstone-grwk' type interbd
- rock is mod macrofrac w pref or at 40 to 60° cross cutting bd and pll sub pll bd at 10 to 30°, w pred calc, minor qtz and Py frac fil
- strongly micro frac at 0 to 10° to the ca, w pred Py frac fil (micro frac is late stage feature, affects in filled macro frac)
- sulph content, 1% Py pred as micro frac fil, a few larger 1/8" blebs ass w calc in fil macro frac
- from 428.2 to 428.5', 1/2" qtz calc vn in fil frac at 20° to the ca, w numerous 1/16" Py blebs at rims
- at 429.5', 4" slightly coarser v fg granular ser - calc rich (calc to 30%) 'sandstone-grwk' type bd
- at 431', 1/4" semi massive Py fil frac pll bd locally at 15° to the ca,
- from 432 to 433.5', 1/4" light green ser calc rich 'sandstone' type bd, locally contain a few 1/4" Py blebs

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435 - 437.5'

-interbd, slumped brecciated, fg granular ser - calc rich metasediment, and dark grey to black arg to mudstone
-approx 50% bd, and large slumped brecciated frag of light grey to green soft, v calc rich (30%), ser rich fg granular metasediment (sandstone-grwk) w 3% vfg diss sulph (pred Py, trace sphal) as micro frac fil, and 50% soft vfg to arg black arg to mudstone (maybe v weakly carb) bd to 2 to 3", v contorted, slumped, pred at an or or 25° to the ca, (bd ranges from 20 to 35° to the ca,
-strongly macro frac and micro frac macro frac exhibit a weak pref or pll sub pll to bd w calc, and minor Py frac fil and micro frac are weakly pll fol at 20 to 30° to the ca, w pred Py, calc chl, and ser frac fil
-overall sulph content, 3% Py, trace sphal as vfg diss mineralization of coarser bd and micro frac fil

437.5 - 463'

-we have dark grey arg to mudstone
-rock pred a relatively hard, dark grey v fg to arg metasediment, and arg to slightly coarser 'mudstone' - siltstone
-well dev bd at or ranging from 10 to 20° to the ca, pred at 15°, although v contorted in places, w abundant soft sediment deformation features
-bd av. 1/4 to 1/2"
-a few slightly coarser, more granular app dark grey 'sandstone-grwk' type interbd w 5 to 10% small grey lithic frag to 1/16"
-a few light green weakly ser - calc rich slightly coarser vfg granular 'sandstone' type interbd, often boudinaged, slumped brecciated, into frag
-rock is weakly to mod macro frac at a weak pref or of 0 to 30° to the ca, w pred calc, minor qtz, sulph, (Py-Po) frac fil

HOLE DDH JL-85-K

437.5 - 463'

-contains a few secondary 1/4" qtz-calc vn at a pref or of 30° to the ca, cross cutting bd

-sulphide content, from 0.5% to 1%, pred vv fg diss Py, and occ larger 1/16 to 1/4" Po and Py blebs ass pred w lighter green ser - carb rich granular metasediment interbd, and as frac and micro frac fill occ slumped breccia app frag in arg

-arg app 'very dirty' in places, w numerous (to 10%) , small 1/16" to 1/8" blebs of light grey lithic frag?, or boudinaged /brecciated interbd

-at 439.5', a few 1" lighter green slightly coarser granular ser - calc rich 'sandstone grwk', type interbd slumped brecciated frag to 1"

-from 441.5', to 442.5', a few highly contorted slumped lighter green vfg granular calc - ser rich interbd, w a few elongate pll to bd 1/4" Po and Py blebs

-from 444 to 444.7', 1" light green vfg granular siltstone - sandstone type interbd boudinaged app, into 1" frag, contains a few 1/4" Po blebs,

-at 447.5', 1/4" slumped brecciated app Po bleb

-at 448', 1/2" light grey v calc rich (40%) fg granular 'sandstone' type bd w numerous elongate semi massive Po blebs to 1/4" and 5% of rock

-from 450 to 451', a few 1/2" semi massive Po-Py - calc blebs elongate pll to fol locally at 0° to the ca, ass w thin light green v calc rich granular meta-sedimentary interbd

-at 452.7', 2" boudinaged / brecciated semi massive Py bd at 0° to the ca,

-at 453.5', 1/4" calc-Py band pll bd

-at 454.2', fg granular qtz calc vn cross cuts bd at 70° to the ca,

-at 455', 1/4" qtz calc vn cross cuts bd at 30° to the ca,

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437.5 - 463'

-at 456.3', 1/2" granular qtz calc vn cross cut bd at 35° to the ca,
-from 458 to 460', locally slightly coarser vfg granular, grwk, contains 5% small elongate pll to bd black arg lithic frag from 1/32" to 1/4" (maybe boudinaged or slumped brecciated interbd)
locally weakly calc calcitic, w 10% vfg diss calc
-at 461', 2" lighter grey-green slightly coarser fg granular calc rich metasediment bd, w 1% vfg diss Py,
-from 462 to 463', a few 1/4" boudinaged /brecciated semi massive Po - Py (with trace Cpy) blebs

463 - 481.5'

-interbd dark grey to black weakly graphitic (1 to 2%) arg to slightly coarser mudstone-siltstone, and light grey to greenish grey, weakly ser, calc rich slightly coarser vfg granular metasediment (siltstone-sandstone)
-rock composed of approx,
- 1. 60% light grey to green, weakly sericitic, often v calc rich, (up to 30% diss calc in some bd, av. 5 to 10%) vfg, granular, well sorted, 'siltstone to sandstone' type metasedimentary bd, bd to 6 to 8", av. 1/2 to 1" w 1% vv fg diss pred Py, trace Po and sphalerite, and
- 2. 40% dark grey to black vfg to arg v weakly graphitic (1 to 2%) arg to slightly coarser 'mudstone - siltstone'
-interbd range from 1/16 to 1/2", up to 6 to 8", usually 1 to 2",
-bd pred at 10 to 15° to the ca, although highly variable in places due to slumping, and soft sediment deformation features (slumps, flame structures, locally highly contorted bd)

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463 - 481.5'

-rock is weakly to mod macro frac, at a weak pref or cross cutting bd at 30° to the ca, although other or present, w pred calc, minor qtz, Py frac fil

-rock is mod micro frac pred pll sub pll bd, w calc, qtz, and Py frac fil

-a few secondary qtz calc vn

-both bd are relatively hard

-sulph content, approx 2%, vfg diss Py w trace Po, occ in both bd, and as micro frac fil, and occ blebs to 1/8"

-from 463 to 465', pred light grey green siltstone, w 2% vv fg diss Py

-from 464 to 464.5', 1" coarse brecciated app qtz calc vn sub pll bd at 30° to the ca, w a few 1/16" Py stringers pll to vn at rims

-rock contains locally 10 to 15% diss calc blebs crudely aligned pll to bd

-black arg bd often contain 5% small 1/8" to 1/4" lithic frag of siltstone (slumped boudinaged thin interbd)

-a few thin siltstone bd contain up to 5% vfg diss sulph

-from 465' to 468', pred black arg to mudstone, w numerous thin 1/8 to 1/4" siltstone bd and slumped / boudinaged brecciated frag to 1/4"

-from 468 to 471.5', light grey to green siltstone bd, v calc rich to (30% diss), w 3% vfg diss pred Py, trace Po, and numerous thin black arg interbd

-from 471.5 to 476', thinly bd interbd zones, bd av. 1/2 to 1", approx 60% siltstone type bd, and 40% arg - mudstone type bd

-from 475.5 to 476', a few 1" coarse g calc vn highly contorted from 0 to 35° to the ca,

-from 476 to 477.5', pred v calc rich (30% diss) siltstone bd

-from 477.5' to 479.5', interbd zone bd av. 1/4" to 1/2" locally 60% arg, and 40% siltstone to sandstone

-from 479.5 to 481.5', pred siltstone-sandstone, v calc rich (to 30%)

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481.5 - 529.5'

-dark grey to black weakly graphitic (1 to 2%) pyritic, vfg granular meta-sediment
-rock pred a v dark grey to black v granular app, weakly graphitic (1 to 2% graphite) relatively hard metasediment
-v weakly dev bd at 0 to 10° to the ca, pred at 10° to the ca, although v contorted slumped, n places, w soft sediment deformation features
-contains approx 10% small (to 1/4 to 1/2" av. 1/8") elongate pll to bd, boudinaged and slumped brecciated lithic frag of slightly lighter grey to green, often v calc rich, vfg granular metasediment (these frag technically make the rock a lithic grwk)
-vfg texture exemplifies by 10 to 15% v small (less than 1/32") white to pale green 'grains' of fspr/calc diss throughout rock
-v pyritic, overall Py content approx 4%, occurring as 1% brecciated / boudinaged app frag of semi massive interbd, usually elongate frag to 1" pll bd and 3% v v fg diss Py, w occ larger blebs to 1/8", and minor macro and micro frac fil
-contains approx 15% thin 1/16" to 1/2" lighter grey green vfg granular weakly ser, often v calc rich (diss to 20%) 'siltstone-sandstone' type interbd, occ to 2 to 3",
-rock is weakly to mod macro frac at pref or cross cut bd at 30 to 50° to the ca, and weakly pll sub pll bd at 0 to 10° to the ca, w pred calc, and minor Py-Chl frac fil
-appears weakly micro frac in places, pred pll sub pll bd at 0 to 10° to the ca,
-rock contains minor (to 5%) vfg diss calc in places

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481.5 - 529.5'

- from 481.5 to 487', thin 1/4" slightly lighter grey green 'siltstone' type interbeds locally to 25%
- at 485.5', a few 1/4" to 1/2" semi massive Py blebs, look like boudinaged thin interbed frag elongate pl to bd, often in close spacial ass w light green siltstone
- at 487.5' to 488', lighter grey siltstone type interbed
- at 491', a few 1/2" elongate Py-calc blebs pl to bd
- from 491.5 to 492.5', numerous 1/4" to 1/2" long thin semi massive Py blebs w minor ass calc, look like boudinaged interbed
- from 493 to 499.5', lighter grey, v calc rich (to 25%) diss siltstone type interbed w 3% vfg diss Py
- at 497', 497.2', 498.5', and 499', 1/4" calc vn w a few 1/4" Py blebs at ran or
- at 515', 2" x 1/2" semi massive Py band, boudinaged / brecciated interbed elongate pl to bd
- at 517', 2" Py bleb, boudinaged / brecciated frag
- locally from 517 to 517.5', numerous 1/2" Py frag to 3% of rock
- from 516.5 to 518', lighter grey calc (10%) rich siltstone interbed at 5° to the ca,
- from 518 to 523', numerous (to 40%) slightly coarser lighter grey, vfg granular calc rich (to 30% diss) siltstone-sandstone interbed
- from 528 to 529.5', 1/4" qtz calc vn at 10° to the ca, w Py blebs to 1/8" at seam
- sharp contact w underlying graphitic arg at 10° to the ca, at 529.5'

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529.5 - 548.5'

- graphitic arg
- rock pred a dark grey to jet black mod to strongly graphitic (approx 30%) arg,
- pred thinly bd, to 2 to 3", bd v well dev at or ranging from 0 to 15° to the ca pred at 10° to the ca, w some soft sediment deformation features, slumping, and slump brecciated frag
- contains 15% thin, (to 1", av. 1/8" to 1/4") lighter grey to light greenish grey weakly sericitic, slightly coarser 'siltstone' type interbd, occ v calc rich w up to 30% vfg diss calc
- mod macro frag at pref or cross cut bd at 20 to 30° to the ca, and pll sub pll bd at 0 to 30° to the ca, although other or are present, w pred Py, minor Po, calc, qtz, chl frac fil
- contains in places 5% small (to 1/4") lithic frag of slumped brecciated siltstone interbd, lending grwk app to rock
- alternating bd of slightly differing graphite content (various shades of grey) lends banded app to rock
- sulph content, av. 2% (pred Py w trace Po w 1% vfg diss mineralization and 1% frac fil,
- at 529.5 to 531.5', thin 1/4" slightly greyer, weakly ser arg interbd, and a few slightly coarser 1/8" sericitic siltstone type interbd to 30%, siltstone interbd locally contain approx 10% vfg dis Py, locally strongly micro frac pll sub pll bd w Py and calc frac fil
- at 532', a few 1/8" semi massive Py bands pll bd
- from 533 to 534', 1/8 to 1/4" massive Py fil frac pll bd at 15° to the ca,
- at 534.5', a few 1/4" calc fil frac at 15° to the ca,
- at 536', a few 1/4" calc fil frac at 35° to the ca,
- from 535.5' to 538.5', thin 1/4" to 1/2" slightly lighter v calc rich arg interbd (w diss calc to 30%) to 30% of rock or highly contorted,

HOLE DDH JL-85-K

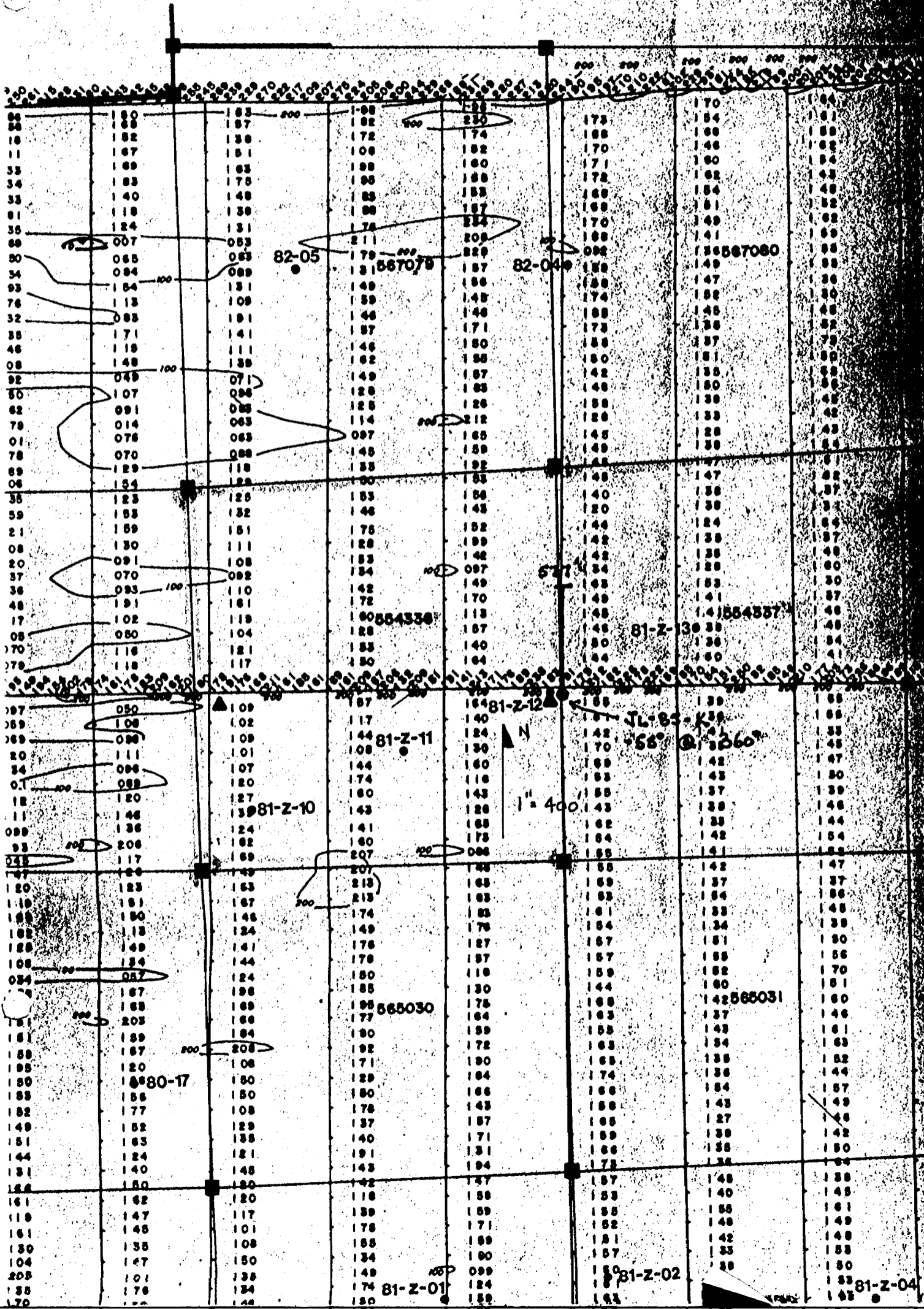
529.5 - 548.5'

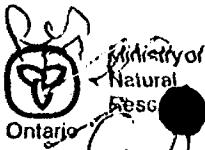
-from 541 to 543', 1/4" Py - calc
minor qtz vn / fil frac at 5° to the ca,
-from 542.5 to 545', a few 1/4" lighter
grey green weakly ser arg - siltstone inter-
bd,
-from 545 to 547', only v weakly graphitic
(5%)
-sharp contact w underlying unit
at 548.5',

548.5 - 577'

-grey arg
-rock pred a dark grey relatively
hard arg
-well dev bd at 10° to the ca,
although contorted and slumped in places
w soft sediment deformation features,
bd av. 1/4 to 1/2" occ to 2 to 3"
-bd marked by presence of numerous thin
1/16" to 1/4" (occ to 1 to 2") slightly
coarser vfg granular light grey to green
calc rich (to 20% diss) siltstone type
interbd to 10% of rock, occ highly
contorted, boudinaged, and brecciated
-rock is weakly frac, w set pll to and
cross cut bd at 10 to 20° to the ca,
-w pred calc, minor Py frac fil
-overall sulph content, 0.5% as vfg
diss Py, and Py frac fil, w trace Po
and Cpy
-occ larger Py blebs and seams to 1/8"
usually ass w siltstone interbd
siltstone type interbd usually more sulph
rich, w 1 to 2% vfg diss Py and trace Po
-from 548.5 to 557', siltstone type inter-
bd to 30% of rock, to 1/2", a few 2 to 3"
bd, notably between 549 and 550',

MOODY TWP
GALNA TWP





Report of Work

#192 Kerrs
2568874 Mining



42A09NE0104 27 KERRS

300

Name and Postal Address of Recorded Holder: **UTAH MINES LTD, 5 Birch St. North**
 Prospectors Licence No.: **T-793**
TIMMINS, Ontario, P4N 6C8

Summary of Work Performance and Distribution of Credits

Total Work Days Cr. claimed 3138	Mining Claim			Mining Claim			Mining Claim		
	Prefix	Number	Work Days Cr.	Prefix	Number	Work Days Cr.	Prefix	Number	Work Days Cr.
for Performance of the following work. (Check one only)	L	568876	40	L	576903	60	L	576911	60
<input type="checkbox"/> Manual Work		568877	40		576904	60		576912	60
<input type="checkbox"/> Shaft Sinking Drifting or other Lateral Work.		576897	60		576905	60		576913	60
<input type="checkbox"/> Compressed Air, other Power driven or mechanical equip.		576898	60		576906	60		576914	60
<input type="checkbox"/> Power Stripping		576899	60		576907	60		576915	35
<input checked="" type="checkbox"/> Diamond or other Core Drilling		576900	60		576908	60		576916	60
<input type="checkbox"/> Land Survey		576901	60		576909	60		576917	60
		576902	60		576910	60		576918	60

All the work was performed on Mining Claim(s): 801334, 576920, 576915, 610882, 610919, 554337 (see attachment)

Required Information eg: type of equipment, Names, Addresses, etc. (See Table Below)

Five BQ diamond drill holes, Totalling 3138'

- HOLE JL-85-D1 collared at L264E, 18+50N, northeast grid (see enclosed maps) bearing: 180o, Inclination: -45o, total depth: 547'
- HOLE JL-85-D2 collared at L252E, 18+00N, northeast grid (see enclosed maps) bearing: 180o, Inclination: -45o, total depth: 497'
- HOLE JL-85-K collared at L32E, 00+15S, south grid (see enclosed maps) bearing: 360o, Inclination: -55o, total depth: 577'
- HOLE JL-85-ASE collared at L148E, 70+20S, southeast grid, (see enclosed maps) bearing: 360o, Inclination: -55o, total depth: 860'
- HOLE JL-85-G collared at 330' @ 155o from 18+50S, L220E, southeast grid (see enclosed maps) bearing: 335o, Inclination: -55o, total depth: 65'

LARDER LAKE MINING DIV.
RECEIVED
 MAY 13 1985
 7 8 9 10 11 12 1 2 3 4 5 6

ALL HOLES WERE DRILLED BY: BRADLEY BROS LTD
 P. O. BOX 485, TIMMINS, ONT
 P4N 7E7
 DURING THE PERIOD: Feb 05 to March 03, 1985

RECORDED MAY 13 1985
 REC. No.

Date of Report: APRIL 30/85
 Recorded Holder or Agent (Signature): *Duncan F. McIvor*

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying: DUNCAN F. MCIVOR, 117-1214 Riverside Drive, Timmins, Ontario, P4R 1A4

Date Certified: RESIDUE BROUIGIST/85
 Certified by (Signature): *Duncan F. McIvor*

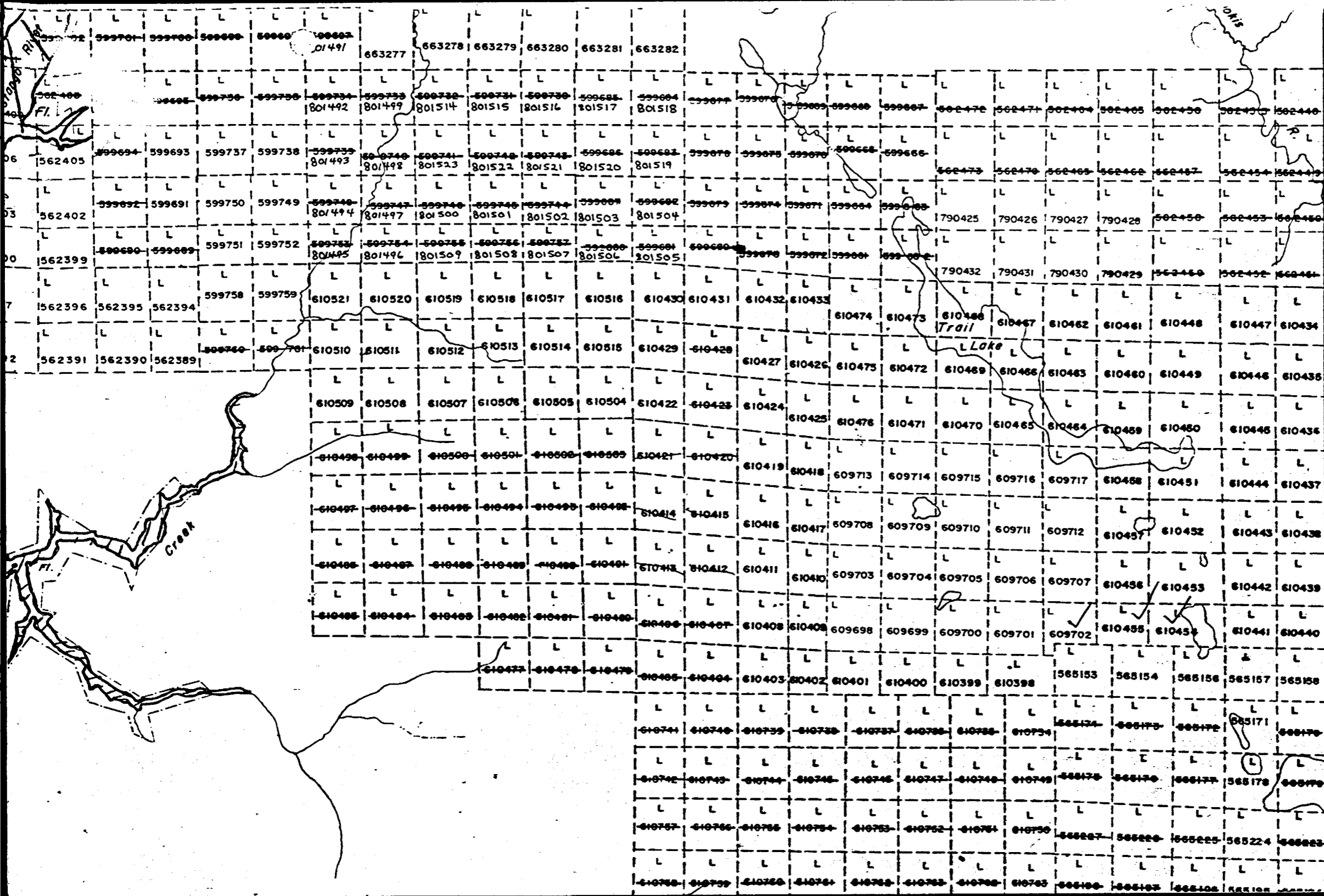
Table of Information/Attachments Required by the Mining Record

Type of Work	Other information (Common to 2 or more types)	Attachments
Manual Work	ASSESSMENT FILES RESEARCH OFFICE NII	
Shaft Sinking, Drifting or other Lateral Work	KIRKLAND, ONT	Work Sketch: those are required to show the location and extent of work in relation to the nearest claim post.
Compressed air, other power driven or mechanical equip.	Type of equipment	
Power Stripping	Type of equipment and amount expended. Note: Proof of actual cost must be submitted within 30 days of recording.	Names and addresses of owner or operator together with dates when drilling/stripping done.
Diamond or other core	Signed core log showing footage, diameter of	

REPORT
OF
WORK (cont)

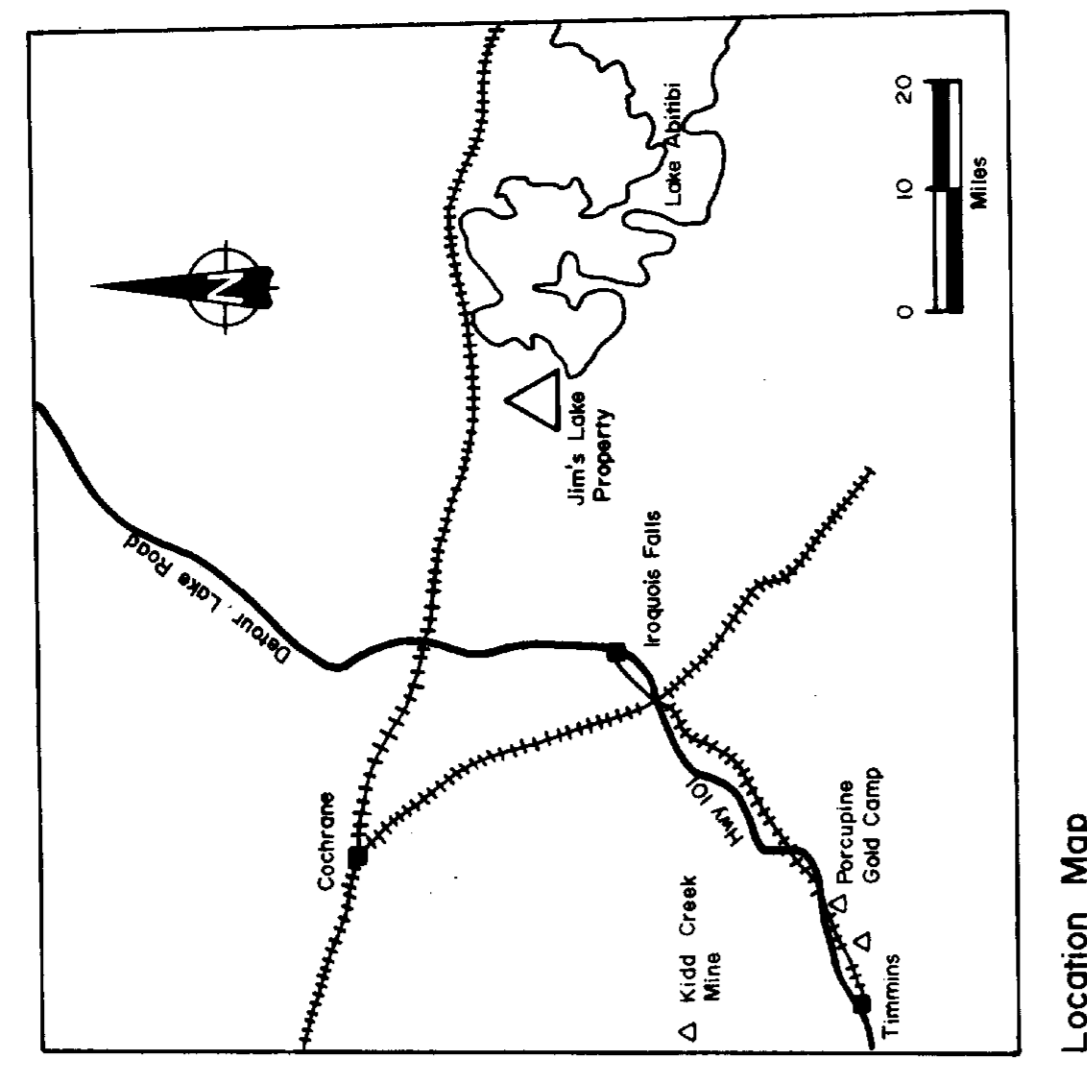
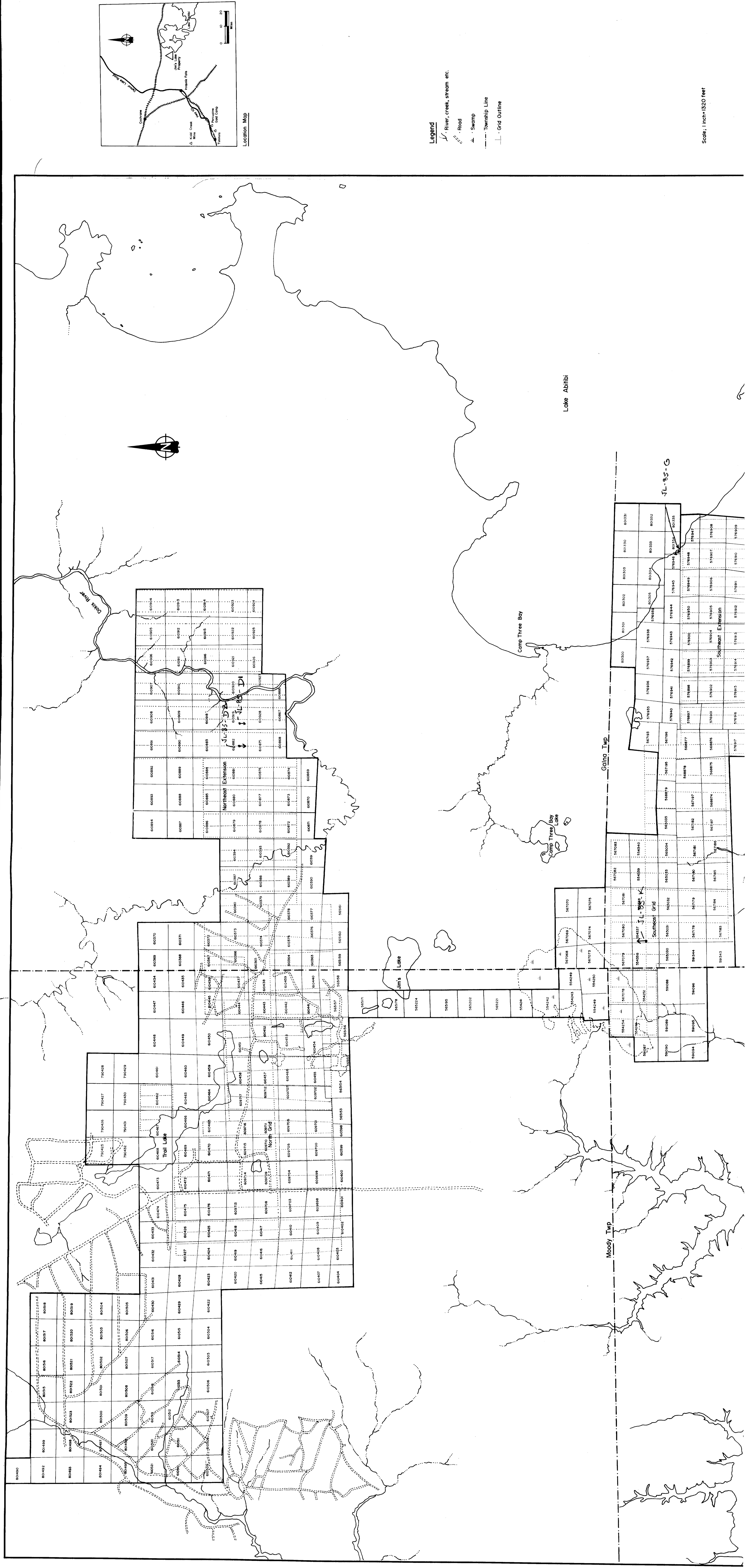
<u>CLAIM NUMBER</u>	<u>WORK DAYS CREDIT</u>
L 576919 ✓	60
576920 ✓	60
576921 ✓	60
576944 ✓	60
576945 ✓	60
576946 ✓	60
576947 ✓	60
576948 ✓	60
576949 ✓	60
576950 ✓	60
801304 ✓	200
801332 ✓	200
801333 ✓	200
801334 ✓	200
801335 ✓	200
609702 ✓	60
610454 ✓	43
610455 ✓	60

3138 DAYS



Moody
Twp.
M. 1832

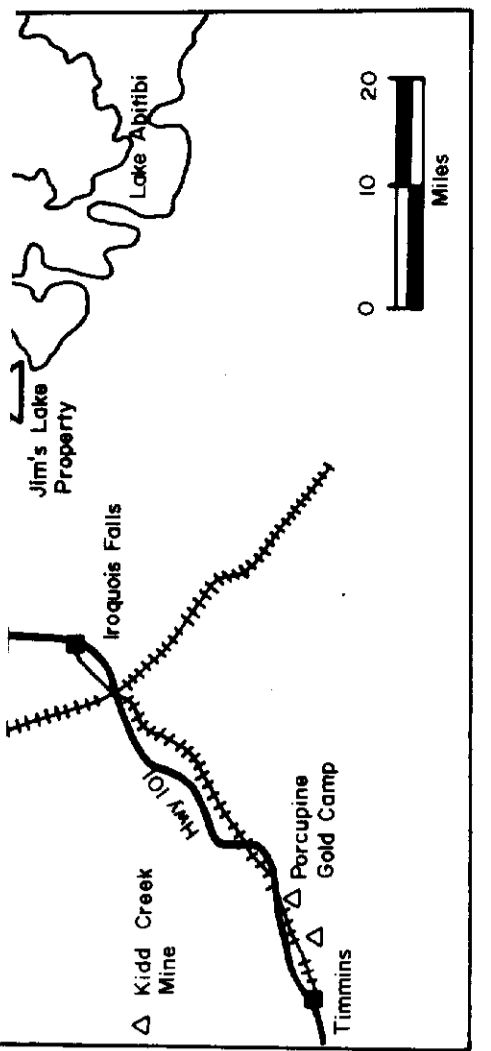
GALNA TR. M. 480



- Legend**
- River, creek, stream, etc.
 - Road
 - Swamp
 - - - Township Line
 - - - Grid Outline

Scale: 1 inch = 1320 feet

80490					
80492	80499	80505	80511	80517	80523
80494	80500	80506	80512	80518	80524
80496	80502	80508	80514	80520	80526
80498	80504	80510	80516	80522	80528
80500	80506	80512	80518	80524	80530
80502	80508	80514	80520	80526	80532
80504	80510	80516	80522	80528	80534
80506	80512	80518	80524	80530	80536
80508	80514	80520	80526	80532	80538
80510	80516	80522	80528	80534	80540
80512	80518	80524	80530	80536	80542
80514	80520	80526	80532	80538	80544
80516	80522	80528	80534	80540	80546
80518	80524	80530	80536	80542	80548
80520	80526	80532	80538	80544	80550
80522	80528	80534	80540	80546	80552
80524	80530	80536	80542	80548	80554
80526	80532	80538	80544	80550	80556
80528	80534	80540	80546	80552	80558
80530	80536	80542	80548	80554	80560
80532	80538	80544	80550	80556	80562
80534	80540	80546	80552	80558	80564
80536	80542	80548	80554	80560	80566
80538	80544	80550	80556	80562	80568
80540	80546	80552	80558	80564	80570
80542	80548	80554	80560	80566	80572
80544	80550	80556	80562	80568	80574
80546	80552	80558	80564	80570	80576
80548	80554	80560	80566	80572	80578
80550	80556	80562	80568	80574	80580
80552	80558	80564	80570	80576	80582
80554	80560	80566	80572	80578	80584
80556	80562	80568	80574	80580	80586
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80562	80568	80574	80580	80586	80592
80564	80570	80576	80582	80588	80594
80566	80572	80578	80584	80590	80596
80568	80574	80580	80586	80592	80598
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80580	80586	80592	80598	80604	80604
80582	80588	80594	80600	80606	80605
80584	80590	80596	80602	80608	80606
80586	80592	80598	80604	80610	80607
80588	80594	80600	80606	80612	80608
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80634	80640	80646	80652	80658	80631
80636	80642	80648	80654	80660	80632
80638	80644	80650	80656	80662	80633
80640	80646	80652	80658	80664	80634
80642	80648	80654	80660	80666	80635
80644	80650	80656	80662	80668	80636
80646	80652	80658	80664	80670	80637
80648	80654	80660	80666	80672	80638
80650	80656	80662	80668	80674	80639
80652	80658	80664	80670	80676	80640
80654	80660	80666	80672	80678	80641
80656	80662	80668	80674	80680	80642
80658	80664	80670	80676	80682	80643
80660	80666	80672	80678	80684	80644
80662	80668	80674	80680	80686	80645
80664	80670	80676	80682	80688	80646
80666	80672	80678	80684	80690	80647
80668	80674	80680	80686	80692	80648
80670	80676	80682	80688	80694	80649
80672	80678	80684	80690	80696	80650
80674	80680	80686	80692	80700	80651
80676	80682	80688	80694	80702	80652
80678	80684	80690	80696	80704	80653
80680	80686	80692	80698	80706	80654
80682	80688	80694	80700	80708	80655
80684	80690	80696	80702	80710	80656
80686	80692	80698	80704	80712	80657
80688	80694	80700	80706	80714	80658
80690	80696	80702	80708	80716	80659
80692	80698	80704	80710	80718	80660
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80696	80702	80708	80714	80722	80662
80698	80704	80710	80716	80724	80663
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80702	80708	80714	80720	80728	80665
80704	80710	80716	80722	80730	80666
80706	80712	80718	80724	80732	80667
80708	80714	80720	80726	80734	80668
80710	80716	80722	80728	80736	80669
80712	80718	80724	80730	80738	80670
80714	80720	80726	80732	80740	80671
80716	80722	80728	80734	80742	80672
80718	80724	80730	80736	80744	80673
80720	80726	80732	80738	80746	80674
80722	80728	80734	80740	80748	80675
80724	80730	80736	80742	80750	80676
80726	80732	80738	80744	80752	80677
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80732	80738	80744	80750	80758	80680
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80742	80748	80754	80760	80768	80685
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80754	80760	80766	80772	80780	80691
80756	80762	80768	80774	80782	80692
80758	80764	80770	80776	80784	80693
80760	80766	80772	80778	80786	80694
80762	80768	80774	80780	80788	80695
80764	80770	80776	80782	80790	80696
80766	80772	80778	80784	80792	80697
80768	80774	80780	80786	80794	80698
80770	80776	80782	80788	80796	80699
80772	80778	80784	80790	80798	80700
80774	80780	80786	80792	80800	80701
80776	80782	80788	80794	80802	80702
80778	80784	80790	80796	80804	80703
80780	80786	80792	80798	80806	80704
80782	80788	80794	80800	80808	80705
80784	80790	80796	80802	80810	80706
80786	80792	80798	80804	80812	80707
80788	80794	80800	80806	80814	80708
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80842	80848	80854	80860	80868	80735
80844	80850	80856	80862	80870	80736
80846	80852	80858	80864	80872	80737
80848	80854	80860	80866	80874	80738
80850	80856	80862	80868	80876	80739
80852	80858	80864	80870	80878	80740
80854	80860	80866	80872	80880	80741
80856	80862	80868	80874	80882	80742
80858	80864	80870	80876	80884	80743
80860	80866	80872	80878		



Location Map

- Legend**
- River, creek, stream etc.
 - Road
 - Swamp
 - - - Township Line
 - - - Grid Outline

Scale: 1 inch = 320 feet

KERBS TO DDR # 27
UTAH MINES LIMITED
 EXPANSION AGREEMENT
 TOWNSHIP OF MOODY, CANADA

JIM'S LAKE PROPERTY
 APRIL 20, 85

DATE	BY	CHECKED	REVISED	N.T.S.	FILE	MAP
01/22/85	J.M.	J.M.				
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0

