1971 D.D.H.
LOGS — GONDI

PACIFIC
WATERPROOF
Cruisers Transit Book
No. 340

EXPLN. ACCOUNT NO.

— 35060.

ENGG. ACCOUNT NO.

— 35220.

Drill hole interval

— 283'

FeS_2 — 47% Fe.

PbS — 86.6% Pb.

ZnS — 67% Zn.

ON THE BASIS,

APPROXIMATELY

40% Fe means — 90% PY.

3.18 TONS / Cu.Yd. — ORE

2.32 TONS / Cu.Yd. — WASTE

1 TON PER 8.49 Cu.Yd. OF ORE.

June 1, 1971 — Dec 31, 1975.

12% COMBINED Pb & Zn.

for 3.2 years, or until early 1974.

BUSH JOB

CABOOSE;

TENTS — 2.

OIL HEATERS — 3.

STOVE PIPE;
ELBOWS — 2 for each heater.
FITTINGS; COPPER TUBE;
TAPS;

PROPANE CYLINDERS;
Regulator to Stove;
copper tube; fittings;

To maintain this grade,
1,369,000 TONS OF LOWER
grade shall be stockpiled.

After grade drops to
9.0% for the remaining
1.8 years.

Average stripping
ratio during this period
is 5.7 Cu. Yards waste for
1 Cu. Yard ore

Shovels — 75% Utilization
Trucks — 80% "
Drilling — 80% "

(P TO)

FIVE YEAR PIT

ORE SUMMARY

BENCH	TO MILL TONS	GRADE	TO STOCKPILE TONS	GRADE
3925	1,371,000	12.3	140,000	6.9
3890	1,642,000	12.3	474,000	7.7
3855	2,422,000	12.0	755,000	6.6
3820	2,280,000	11.6	—	—
TOTAL	7,715,000	12.0%	1,369,000	7.0%

The above figures for 3.27 years @ (from 1/1/71) — 6600 TPD.

LAST 1.8 Years — 9900 TPD.

3820 —	776,000	7.0
3785 —	2,098,000	8.1
3750 —	1,637,000	9.2
3715 —	1,865,000	10.5
3680 —	109,000	9.0
TOTAL 5 Yrs.	6,485,000	9.0%
	14,200,000	10.6%

Pb concentrate

prices — 10¢/lb.

includes Ag.

Zn — 5¢/lb.

Smelting charges @ $50/Ton.

concentrate haulage cost

— $17.25/Ton.

JULY 30, 1970.

THE FOLLOWING FIGURES HAVE BEEN USED TOWARDS ASSESSMENT WORK OF BED ROCK DRILLING.

MOBILIZATION & DEMOBILIZATION COSTS.

TOTAL — $990.00

@ $90/DAY. (110 DAYS).

DRILL SUPPLIES, PERCUSSION SUPPLIES Etc.

— $60/DAY.

CAMP MAINTENANCE COSTS — $15/MAN/DAY.

GEOLOGIST'S WAGES —

— $30/DAY.

PICKUP — $15/DAY

BOMBARDIER — $30/DAY

D-8 cat @ — $38/hr.

~~Driller~~

Driller's wages —

$3.90/hr

Helper's wages —

$3.05/hr.

DRILL RENTAL.

30 DAY MONTH — $132.00/DAY

31 DAY MONTH — $127.74/DAY

DDH - 71-1 ; JULY 17, 1971

0 - 132

Calcareous Quartz chlorite Biotite Schist:

0 - 53.5 - OVER BURDEN

53.5' - 155'

FOLIATION - 25° more massive in the first one foot due to higher percentage of Silica.

55' - Sericite associated with Quartz.

55' - FAULTED CONTACT.

4" inches of gouge consisting of chlorite & Mica foliae in clay matrix.

55 - 100 Cal. Qua. chl. Bio Schi

About 15% of the core is lime with occasional segregated lime stone bands.

fo: 62°. Lime stone bands to occur as thin bands segregated within schistose and Py. partings. Sericite is occasionally present.

100 - 155

calc. Schist continues.

117 - 120 - Qtz chl Biotite Sch.

fo: 73°.

118 - F_1 is crenulated.

125 - 127 - fractre zone.

140' - cwPy & Py, Po disseminated in Qtz vein. < 0.5% by volume.

154 - cwPy, Ga & Sph. associated Quartz Grain of 0.5" dia.

155 - 165 calc sch contns.

165 - 195 — Quat. Bio. chl. calcite Schist.

Gradational contact.

FO: 64°.

Lime decreases but still persists to a minor extent. occurs as veinlets cutting across the foliation.

178 - crenulations

195 - 218 — Qtz Bio chl calcite Schist.

fo: 72°

205 - cwPy, Sph. associated with Qtz band and disseminated in the Schist.

212 — Py, Sp associated with Qtz band. continuable

217 - Py band occurs lining F_1 fold.

218 - 226 — Qtz Bio chl. cal Schi

226 - 240 —

Qtz Gr. chl Schist.

Contact: 85° sharp, continuable.

fo! - 85°.

229 - 230 - Quartz vein.

231 - 235 - Qtz Bio chl Grn Schist.
Py. associated with calcite.

235 - 251 calc. Qtz Bio chl Schist.

fo! 69°.

calcite finely disseminated. Also occurs as veinlets. Minor Graphite.

251 - 259 - Qtz Graphite Bio. Schist:-

fo! 67°.

crenulations are common.

F_1 is crenulated within the hinge of F_2.

259 - 332 -

calc. Qtz Bio. chl Schist:

fo! 58°

Segregated quartz bands.

Minor amount of Ser. occurs throughout.

315 - 320 - Graphite occurs.

332 - 352 calc. Qtz Bio chl Ser Schist;

352 - 443 calc. feldspathic chlorite tremolite Schist:-

Gradational contact.

Green Schist with no preferred orientation of foliation.

Highly contorted at microscopic level with coarse chlorite folia oriented in several directions and crenulated. Acicular actinolite is noted in places but not common constituent.

Py & Po amount to 1% of the rock in places. Py occurs as microscopic lenses associated with feldspathic veins.

could be met. equivalent to Andesitic tuff.

Gradational Contact.

443 - 606.5 : Quartz chl. Bio Ser Schist

446 - 1 cm size Galena noted.

454 - fo! 84°

469 - Graphite occurs over a 6 foot increment.

488 - Contorted.

493.5 - 504 - Increase in Bio.

514 - Minor faulting; Trend not clear.

Py bands throughout zone.

519 - Minor movements.
Py deposition.

522 - fo! 65°

529' - 529.5' - Quartz vein -
- associated with are Py & Ga specks.

532 – 534 – enhancement in Seri. calcite occurs filling fractures and finely disseminated Py occurs with it. Py also occurs as filling vugs.

539 – 548 – MYLONITE ZONE.

Brecciated Qtz. chlorite Sericite Schist Zone. Sericite Septa oriented in several directions. Preferred orientation of foliation measures 14°. Steepness ≠ caused by faulting. Contact not apparent due to poor recovery of core & broken pieces. Mylonite related to faulting. increase in Seri. Py occurs as widely distributed throughout the Mylonite Zone.

548 – 605 – Qtz Cl Bio Ser Schist: fo: 82°.

565.5' – calcite vein.

567 – fol almost flat measures 83°.

584 – Fo: 82°

586 – Disseminated Py in Qtz vein.

594 – 595 – Qtz vein.

593 – Fo: 72°.

593 – 594 – Gr. Schist.

594 – Diss. Py.

606.5' – Sharp cont. Contact. fo: 81°.

606.5 – 614 – Qtz. Ser. Schist.

603.5' – cont. Py vein fels folin dipping 12° from horizontal.

Andalusite occurs occassionally in this increment.

White lustrous coarsely foliated Qtz And Ser Schist. Bleached in places. Distribution of Py increases throughout and ≈ amounts to 0.5% of the rock in places.

614 – 615.5' – Qtz Gra Schist: fo: 78°

disseminated Sulphides. Essentially Py – amounts to 1/– 4% of rock.

615.5 – Sharp Contact.

Massive Sdes.

Cnt – 81°

615.5 – 616.5' – Massive Sdes.

Po, Py, Sp & Ga occur in decreasing order of abundance

silica bands now sulphide gauges.
Po is fine grained & Py occurs as coarse porphyroblasts.
Coarse Qtz grains scattered throughout sulphides and fine SP diss. in grains.

616.5 — 624.5 : Qtz Bio Ser. Schist:

well foliated schist dips 76°.
Disseminated sdes occur throughout

624.5 — 630 — Qtz Cv. Schist.

fo : 68°

Disseminated sulphides occur throughout.

630 — 662.5 Chl Ser Schist.

fo: 57°.

S_2 is folded at several places and developed wrinkle lineations at an oblique angle of 36° to fol plane.

644 — fo: 58°

Qtz occurs as segregated bands

Silvery ser is the most common mineral

Andalusite occurs occasionally.

65° 5.5 — 658 Minor fault zone gouge.

661 — Diss. Py.

662.5 — 700 —

Qtz chl bio ser Schist:

fo : 58°

663 — coarse Py.

Cumulated throughout.

700 — END of DDH.

71-DS-1

0 - 12 - O.B

12 - 501 — calc. Qtz chl Bio

Ser Schist:

12 - 41 - calc. chl Schist:

Fo: No preferred orientation.

Green chl. Schist- deformation visible only through lens. chlorite folia oriented in irregular laity. calcite occurs as diss and as veinlets.

41 - 152

Fo: 78°

Greyish brown calc. Qtz chl Bio ser Schist. Foggie gited bands of calcite & quartz ||el to f_2 impart a pronounced banding.

147 - 152 - Increase in Bio.

184 - crenulated

189 - 198

enrichment in chlorite

203 - 204 - Gr. Schist.

cont. relation

221 - 223 - " "

243 - 245.5' Highly calcareous and tends to be more limy ph. no fol in this increment.

261 - 266 Highly calc.

FOLIATION STILL SAME.

289 - 298 —

calc Qtz Bio Schist.

301 - 308

Highly calc and in places pure lst bands.

346 - 356 - Highly calc and limy phy in places.

401 - 431 - Qtz Bio chl. calc. Schist.

Fo: 82°

431.5 - fracture zone.

PY Deposition

433 - 454 - chl. Schist.

Fo: 77°

Highly friable chlorite Schist with coarse bolia. wrinkle lineations on septa.

454 - 501

calc. Qtz chl Bio Gr Schist:

Fo: 81°

491 - 498 - Qtz Gr. Schist

Fo: 81°

501 - 1000

Qtz Bio chl Schist (Semi)

(Negligible - calcite 501 - 706)

502 -

Fo: 82°. phy partings.

Pronounced F_2 fold. Segg. bands & Qtz veins F_2 and emplaces are dragged & formed lenses.

544 - 544.5 - Gr. Schist.

Qtz veining common throughout.

Coarse dark grey clusters & grading cutting across the foliation are commonly present throughout the core.

518 - 518.5 - Minor fracture zone - Py depo.

(F.O)

837- 885

Qtz/ Gr. Schist:

Cont - 82°

Regularly banded Qtz Gr. Schist with wide septa of Gr.

Following the septa occur Py, Sp & few specks of Ga.

Minor crenulations are common.

Total Sulphide mineralization app. amounts to 2%.

Normally this section is typical of preceeding section & Ma sides and here the depo. did not occur.

This section is quite typical at the end of Sulphide zone.

885 - 1000

Qtz Bio chl (ser) Schist

fo : 8°

998 - 1000 = Chem.

71-DS-2

0-15 — O.B

15-73.5

Qtz

Calc. Bio. chl. Schist:

FO: 72°

Minor Sericite is present in some parts of the core. Calcite occurs as segregated bands and finely disseminated.

50' — F_2 is folded and produced ~~wi~~ in wrinkle lineations on foliation planes. The lineations parallel the axes of folds.

73.5 — 101.5 — chlorite Schist.

FO: 62°

~~Calcite is present throughout disseminated grains.~~

Stringers of Qtz are present throughout. Calcite occurs as veins upto 5 mm wide.

101.5 — 248

Calc. Qtz Bio chl Ser Schist:

FO: 65°

Segregated bands of Qtz are widely present and usually occur parallel to foliation 2. Phyllitic partings occur wherever Biotite increases. Sericite occurs occasionally.

149 — Diss. Py.

163.5 — 164

Minor Breccia. No apparent fault. Appears as Solution caving. Py deposition occurred in fracture zones.

173.5 — Minor Py.

198 — FO: 63°.

223 — 225 — Highly calcareous.

243 — 247 — " "

231 — Py & Sp assoc. with 5 mm Qtz vein.

248 — 293 : Calc. Qtz Bio chl Ser. Schist:

fo: 67°

287 - Minor SP. assoted with Qtz Vein.

293 - 366 calc. Qtz Bio chl. Ser Schist:

fo: 71°

305 — Stringers of Ga & SP asso. with 6" Quartz band. P_b increased at the lower contact and ~~appa~~. amounts to 12% of the core at the contact. Some Skarny (Greenish yellow) ~~epi~~dotic material is present in the irregular contact.

308.5 — 309 — Highly siliceous, almost massive impure Qtzite with Plg. partings. Py porphyroblasts are widely present.

307 - 307.5 — 3 mm wide vein of SP, Ga & Py occurs continuable to fz. ~~Sk~~ Greenish yellow Skarny material ~~is~~ occurs at irregular intervals.

307.5 — 307.8 — Minor Breccia zone. Not related to fault.

Mine. increases in the Structure. Skarn & Mine. are not related.

330 — mine — Ga, SP & Py in Skarny matl.

332.7 - 333.2 — Mingl fracturing. Not fault zone. Deposition of Sdes — ≈ 4% by vol.

335 — Small Scale fault. dip slip - 3 mm. Ga, SP & Py asso. with Skarny material.

335 366 — calc Bi. Qtz chl Schist continues.

366 - 509 — calc. Qtz Bio. chl. Ser Schist;

fo: 79°.

calc.

413 - 415 — Qtz Gr. Schist. contin. band.

509 - 536 Same as above

536 – 566 – FAULT ZONE.

Qtz chl ser Schist.

Upper contact not clear due to broken core & gouge.

Fault breccia occurs commonly: gouge persists throughout.

553 – Py deposition.

Foliations dip in all directions & dragged. at 557 measures 14° indicating dip slip.

550-552 – Fo – 78°.

core intact.

561 – Py dep.

561.5 – 563.5 – Fo: 78°. core intact.

Appears a combination of two faults with dip slips.

566 – 689 Qtz chl Ser Bio Schist:

The calcite gradually decreases and rock unit changes to Qtz chl Ser Bio. Schist.

Fo: 71°

582.5 – Py

595.5 – Py

610 – 626 – Fracture zone.

628 – Highly crenulated.

671 – Highly crenulated.

681.5 – 682 – Bio rich

686 – Py

689 – 717 Qtz Bio chl Ser Schist:

Fo: 82°

701 – crenulated.

716 – 717 – "

717 – 741 Qtz Bio chl Ser Schist.

Crenulations common.

741 – 791 "

745 – 748 – fault zone

Appears to be a clean dip slip.

Foliations at lower contact not disturbed & dip 68° right in the contact.

Py dep at the L. cont.

762 – 773 – crenulations.

791 – E-P

71 - 2

0 - 41.7 - O. B.

41.7 - 298 - Calc. Qtz Bio chl. Sev. Schist.

41.7 - 122.5

Calc. Qtz. Diopside chl. Sev Gneiss with Phy. partings & Schistose bands.
Fol - 69°. Schistosity and banding Wells.
Massive Qtz Diopside carbonate bands occur throughout within Phy. partings.
Diss. Py rarely occurs filling minor fractures.
Lineations are commonly seen and dip 8°.

122.5 - 298 - Calc. Qtz. Bio. chl. Sev. Schist.
Fol 83°
The grade of metasm. increases and the rocks are well deformed and prominent Bio. sch. bands occur at several intervals.
Diopside still persists but to a minor extent.
Massive Qtz DioP. carbo. bands occur occasionally.

135' - finely diss. Py occurs along a fracture.

152
Fo - 74°.

180.5 Finely diss. Py.
Bio, Schi. & Qtz, diop. carb. are well segregated by metasm. One tends to break in Bio schi along Fol. planes. Qtz Diop carb. bands exhibit Gneissic texture in places.

249 Fo: 75°

254 - 259

FAULT ZONE.
Minor Breccia & gouge.
Foliations are not disturbed.
Appears to be a minor dip slip.

260 - 260.5'

FAULT ZONE.
Same as above

286

FO: 81°

287 Minor Gv. Sch. Associated with occurs Py.

298 – 450.5

Q+z Bio chl. Ser Schist;

FO: 76°

298 – 301.5' – Q+z chl Schist.

301.5 – 302.5' – Gv. Schist.

310.5 – 312.5' – "

318 – 319 – FAULT ZONE.

MINOR BRECCIA & GOUGE.

Schist is bleached.

325.5' – Dissted Py.

348 – 356.4

Gv. Schist.

348.5' – Py filling a vug.

362 – 365' – Minor faulting.

Gouge & Sericitization

369.5 – 374 – fault zone.

Gouge;

Sericitization.

378 – 385 – fault zone.

gouge; Sericite Schist.

394 – 394.5' cont; 65°.

Argillized band of Intr.

coarse feld & par (Ortho) crystals.

414 – FO; 78°

416 – 434

Q+z chl Act. Schist;

No preferred foliation.

Py mineralizn. throughout.

Approx – 2% – 4%

Probable Metc. equivalent of Andesite.

434 – 459.5'

Qtz chl bio ser schist;

fo: 81°.

456.5' – Minor brecciation.

459.5' – 460.5

Ser. schist.

460.5 – 471

Gr. schist.

Fo: 72°

471 – 503

sericite schist;

fo:

481 – 483

FAULT ZONE.

fault breccia, gouge;

Steepening of foliations.

Folns. measure 12°.

Suggests steeply dipping dip slip fault.

Minor sulp. deposition.

503 – 532

Qtz Gr. Schist; contact not apparent due to broken core.

fo: 66°

514.5' – 517 – Highly cremulated.

Minor sp & py disseminated and asso. with Qtz stringers.

520 – 523 – Ser. Schist.

Cont. contact dips 65°.

Bleached & easily friable.

Disseminated py in Ser. schist.

Lower contact – 78°.

523 – 532

Qtz Gr. Schist.

fo: 63°.

532 – 539 Quartzite.

532 – Abrupt contact. Attitude not apparent due to broken core.

532 – 532.6 Massive Py band with little Ga & Sp. Dissem. Sp. occurs throughout.

539 – 546 Massive Sdes.

Contact irregular but abrupt. Generally dips 8°.

Massive fine grained Po, Sp & Ga also.

Lower contact – 27°.
Last 4" of core highly enriched in Marmitiferous Sphalerite.

546 – 555.5 Qtz.

Impure Quartzite consists of rich horizons of Gr & Ser.

Fo: 38°

Diss. Sph. occurs throughout.

555.5 – 578.5

Qtz Gr. Schist:

Cont: 32°.

Coarsely foliated Qtz Gr.

Schist with minor Ser.

Fol flattens with depth & measures 62° @ 563'.

Cremulations are common throughout the interval.

578.5 – 589

Qtz Ser Schist.

Gradational contact.

Minor diss. Sp. occurs – ~3% – 8% by vol in places.

589 – 603

Quartz Sericite Schist;

Fo: 7° Drag folds are common @ 589. The stretching of foliation appears to be related to hinge zone.

593.5' – Qtz vein to 6" wide

594 – Fo: 45°.

603 – END OF DDH.

71-3 : JULY 27, 1971.

53-98 calcite Diopside Quartz Induadite(?) Skarn — calcareous Quartz chl. Bio Schist:

0-71- massive calc Diopside Skarn with few phyllitic partings- Banded occasionally that measures 63°.

71-98- Some Schistose bands exist mostly enriched in Biotite where foliation measured 55°.

76- f, foliation is seen as highly crenulated between F_2 bands and the crenulations disappear in massive Skarny core.

Throughout the increment, the fractures are readily filled by coarsely xne calcite.

98-141 calcite Diopside Quartz Skarn — calcareous Quartz chl. Bio. Schist.

Fo: 72°

~~massive Skarn, highly calcareous~~ Highly calc. massive Skarn consists of several small bands of foliated Biotite Schist. Sometimes the foliations terminate abruptly against massive calcareous core.

105-105.5' — FRACTURE ZONE.

113- Banding dips @ 67°

118-141 FAULT ZONE:

Associated gouge, breccia is present throughout the zone. Lime content increases in the fault zone.

The upper contact is not apparent, but at lower contact the foliations dip 79° and exhibit no disturbance. This suggests a strike slip fault or an oblique fault.

16 141 - 307

Calcareous Qtz Bio. chl. Ser. Schist:

Fo: 68°.

Segregated Bio schi bands occur quite commonly. Massive Skarn bands occur occasionally. Minor amount of Py is usually present associated with fractures and joints.

184 - 187 - High. calca.

199 - Fo: 65°

228 - 235 - fracture zone.

233 - A 3 inches of Ga, Sp & Cu Py occurs filling a fracture.

257 - F_2 is crenulated and associated D3 cleavages dip @ 48°.

262 - F_1 is recognizable and dips 37°

273 - 286 - Enrichment in Graphite. Phyllitic bands occur occasionally.

305 - Disseminated Py & Po & cu Py. This zone is highly siliceous.

The calcite gradually decreases in the last 30' and gradationally changes to Qtz chl Bio Ser Schist

307 - 403 - Qtz. Bio. chl. Ser. Schist:

Fo: 76°

328 - 329 - Rich in Graphite.

The earlier structs are destroyed and the only common feature is well developed F_2 foliation and crenulated F_2 foliation.

367 – 376 – Qtz Gr. Schist.

Fo: 49°.

very well developed F_2 folm. and highly separable septa.

382 – 384 – fault zone.

398 – 403 Qtz Bio ser Schist.

403 – 417 Qtz Bio ser Schist.

Fo: 68° finely foliated Qtz Biotite Schist consists of F_2 bands of Qtz.

Diss. Py < 1% occurs occasionally.

417 – 432.5 – calc. chl. Schist.

Fo: 81°

Coarsely foliated wide septa of chlorite separated by calcareous bands.

Probably a meta. equivalent of Andesite.

432.5 – 469

Qtz chl Bio Ser Schist.

Fo: 85° – FLAT.

wide bands of Qtz occur throughout.

449 – 454 – Bleached ser causes even breaking of core and susceptible for breaking.

469 – 486

Qtz Bio Ser. chl. Schist: –

473 – Fo: 87°.

finely foliated Qtz Bio Ser chl Schist, almost flat foliation consists of segregated Qtz bands.

478.5 – Andalusite associated with Quartz mein and Sericite mica.

486 – 504

Qtz. Graphite Schist:

487 – Small scale fault displaces folia by 0.3".

492 – Fo: 67°.

'Py' enhances in this increment and occurs as fine stringers conf. to foliation.
Also occurs associated with segregated Q+z bands.
The width of Q+z bands varies from 0.1" — 0.5".

504 — coarse prismatic Andalusite crystals occur as porphyroblasts and Graphitic folia are twisted around and foliation is irregular.

504 — 575

Q+z. Bio. chl Ser Schist:

Fo: 83°.

finely foliated in the first 4 feet of the increment and getS coarser down the hole.

527.5 — Andalusite occurs associated with Q+z vein.

528 — 529 — Highly crenulated.

540.8 — 541.2 — Q+z vein

546 — Minor fracture zone associated with it occurs gouge.

554 — Spongy Py. occurs filling a fracture.

561 — Py occurs as disseminated.

561.5 — fine x^ne Py occurs associated with Q+z vein.

572

Fo: 72°

575 — 583 — Q+z Ser. Schist.

Fo: 83° ABRUPT CONFORMABLE CONTACT.

Pale buff white silvery Quartz Sericite schist consists of Andalusite porphyroblasts occasionally. Py mineralization is predominant in places amounts to 5.0% over 1" core.

583 — 593 — Quartz Gr. Schist.

Fo: 81°

Abrupt conf. Contact.

Disseminated Sdes occur throughout. Predo. mineral is Py. Minor Cupy. Sdes are essentially associated with Q+z veins that occur throughout separated by Gr. folia.

(contd)

19

593 — 598 — Massive SULPHIDES

Contact — 79°.
Generally irregular contact but along a specific surface measured 79°.

596 - 596.5' — Highly enriched in Qtz and almost Qte.

598 — 640 — Quartz Graphite Schist:

FO: 82° @ 601'

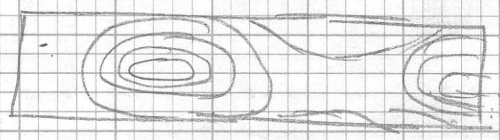
620 — FO: 27°

Well banded 11° to f_2.

Segregated bands of Qtz & folia of Graphite impart a well banded appearance to core. Diss. SP, Ga, Py & minor Cpy occurs throughout.

629 - 631

The drill hole intersected through minor folds ~~indicated~~ through hinge zones indicated by circular bands.



Hinge zones are about 2'.

640 - 645' —

Qtz Ser Schist:

FO: 29°

Coarsely folded white Qtz Ser minor Chl Schist.

645' - End of DDH.

71-5

0-14' — OVER BURDEN.

14'-165' — Calc. Q+Z Bio chl. (Sericite) Schist:

fo: 57°.

Q+Z bands occur parallel to f2. Bio-like schist occurs as segregated bands of 0.1" wide separated by Q+Z rich bands. Calcite occurs as finely disseminated as well as veins.

86-86.5 — Q+Z vein.

100 — band of PY 0.05" wide occurs filling a fracture in lime stone band.

105-110 — Highly enriched in Calcite.

133-144 — Massive calc. Q+Z Bio. Dioxide band with Phy. partings. Schistose bands occur occasionally.

149 — fo: 78°

158-163 — FAULT ZONE.

Fault Gouge occurs throughout and the zone is enriched in calcite & chlorite.

The contacts and attitudes are not apparent.

163-216 — Calc. Q+Z. Bio chl. (Ser) Schist:

fo: 63°

171-181 — chl. schist. No preferred orientation of foliation.

The core is fractured throughout probably related to above fault zone.

198-204 — Graphitic Schist.

fo: 79°

Disseminated PY occurs commonly throughout the schist.

204-216 — Calc. Q+Z Bio chl (Ser) Schist.

fo: 82°.

216-221 — Gr. Schist.

221-244 — Bleached Ser. Schist — PHY.

242 — fo: 86°

Upper contact not clear due to broken core.

kolinite clay mineral occurs along fracture zones.

234 - Minor fault zone recognized by different orientation of foliations and gouge to some extent. Appears the bleaching caused by movements within the unit.

244 — 257 — Gr. Schist. cont. Contact.

fo: 78°

257 - 305 Quartz. Bio. chl. Ser. Schist.

fo: 79°

Segregated bands of Bio. Schist and Qtz. present throughout.

270 F_1 dips @ 18° and at the margins transposed into F_2.

288 — 294 — Breccia Zone.

No fault gouge. Appears to be local fracturing and collapse breccia (?)

290 — Py occurs associated with Quartz Vein.

294.5 — Py along fracture zone.

295 — F_2 74°.

305 — 332

chl. Ser. Bio. Schist.

fo: 71°

Coarsely foliated Grey to white schist.

320 — Py occurs filling a fracture.

332 — 355 — Gr. schist.

fo: 66°

336 — 338 — FAULT BRECCIA.

342 — 345 — " "

Two parallel faults — The movement doesn't appear to be great due to lack of Stretching of foliations. The fols. within the zones dip 61°. However the weak zone caused by mine. along Graphitic rock.

355 — 384 — Qtz chl Gr. Ser. Schist. cont. contact.

fo: 62°

Coarsely foliated Schist consists of cont. Qtz bands occasionally.

222

384 — 450

Qtz chl ser Bio Schist:

fo: 81°

386.5 — Py associated with Qtz Vein.

The chl & Bio folia are well separated and range in .05" — 0.1" width.

400 — Microsco. fault. displa — 0.1"

407 — DDH intersected through hinge zone shown by ring structures.

417 — 420 — FAULT ZONE.

Upper contact dips 42°.
enrichment of chlorite in the fault zone. Brecciated.
Lower cont. not apparent.

425.5 — Po associated with Qtz Vein.

426 — fo: 63°

436.5 — fracture displaced the folds minutely.

446 — 447 — fault zone — BRECCIA.

447 — 448 — Qtz. Andalusite vein.

450 — 455 — Sv. Schist.

451 — fo: 45°.

452 — 455 — FAULT ZONE.

455 — 469 — Faulted contact

BLEACHED SEV. chl. Schist:

fo: 460' — 32°.

Appears the whole unit is subjected to movement exhibited by steep folds & bleaching — gouge occurs commonly throughout.

459 — fo — 0°

469 — 503 — Qtz Bio chl. Ser Schist.

fo: 76°

483 — 483.5 — Qtz vein.

507 – 514 – Gr. Schist.

fo: 81°

Grad. contact.

514 – 517.5 – Qtz Gr. Schist.

fo: 78°

consists of Diss. sulphides.
Mottly Py along foln. planes.
Disstd Copper.

517.5 – 527.5 MASSIVE SULPHIDES.

contact: 68°

The contact zone of one foot is enriched in Py and to a minor extent by Sp.

The total sulphide mass approximates to 85% – 95%
and Py ~~ext~~ amounts to 60%. Altered Ign. material occurs as small phacoyths.

527.5 – 547

QUARTZITE – QUARTZ Ser.
Gr. Schist:
DISSEMINATED – BANDED SULPHIDES.

contact is arcuate and flat while foliation dips @ 45°.

Sp. occurs along foln planes.
Galena occurs as coarse xtls and veinlets cutting foln.
540 – 541 – BRECCIA ZONE.
547 – 560.5 – Qtz – Gtz Gr. Ser Schist. fo: 63°
Disse. Sphalerite forms stringers // ing foliation planes.

560.5 – 567

Qtz Ser Gr Schist.

fo: 62°

561 – 562 –
~~Hanging~~ FAULT ZONE.

Neg. amount of diss Sulp.

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0-17 — OVERBURDEN.

17-196 —

Calc. Qtz Bio ~~Diopside~~ chl Ser Schist.

Fo: 62°

Plot this in petrographic space.

Calcite occurs as marbine bands to disseminated. Boggue-gated bands of Biot. Schist terminate against marbine & bands. Discont. bands of Bio. schist.

91-91.5 — Qtz vein.

118-123 — Qtz Bio Schist.

Fo: 65°

139-145 — Amphibole chl or. Schist bands of 3" wide occur occasionally.

185 — 2" wide Qtz band

185.5 — F2 is crenulated.

196-204 — AMPHIBOLITE. combinable

Mainly Tremolite & flaviodase Minor chlorite.

Acicular Amphiboles, no preferred oriented fol'n. gently dips @ 69°.

Contains minor Py.

Few Gr. schist bands @ 0.3" wide occur occasionally.

204-312 Quartz Biotite chlorite (Stranolite) Sericite Schist:

Fo: 69°

Cont. Contact.

229-233 — Gr. Schist.

234 — Mino breccia tion.

235 downwards ~~increasingly~~ more and wide bands of 0.3" persist throughout the increment.

312-422 Qtz Bio chl (Staur) Ser Schist.

Fo: 67° Boggy patches

Qtz occurs as bands &

wrinkles in f_2 are commonly observed.

353 - 355 - Chl Ser Schist
360 - 363 - SLIGHTLY GRAPHITIC.
365.5 - 366 MINOR BRECCIA.

Py occurs along fracture planes.

383 - 391 - Chl ser schi band

422 - 439 -

Qtz Bio Gra Schist:

Carb. contact.
fo: 73°

Pure Gr Schist bands inter~~bedded~~ foliated with Qtz Bio Schi bands.
Py is common sulphide and approx. 2%

Py occurs as small stringers along bdn planes.

a minor amount of calcite occurs filling fractures.

439 - 500.5 Quartz Bio Chl.

Ser. Schist.

439 -
fo: 83°

444 - 458 - Qtz ± Garnet Bio Ser schist.

f_2 is generally crenulated.

482 - 483 - FAULT ZONE

500.5 - 526

Qtz. Gr Schist;

fo: 83°.

Diss. sdes - essentially Py & Sp.

Qtz occurs as segregated bands & crenulated.

526 - fo: 45°

526 - 547 - Massive sdes.

sharp contact.

526 - 533.5 - enriched in Py.

526.5 - 532 - Po, CuPy, Sp association

532 - 547 - Py, Po, Ga, Sp association.

538.5 - BRECCIA.

26 547 – 560.5

Q+Z Gv. Schist.

fo: 63°.

wide Sep+ at Gv & Q+Z.

Diss. Py & Sp

560.5 – 570 –

Q+Z Bio Sch Schist.

fo: 55°

560.5 – 564 – Mainly Diss Sulfs.

562 – 563 – Band of Py & Sp

563 – 570 – Mainly diss. Py – 2%

570 – END OF DD#.

66-PR-3

0-37 ob DEPTH — 440'

66-PR-21

0-25 ob DEPTH — 278'

66-PR-2

0-40 ob DEP — 782'

06-PR-3

52-79

Biotite. Ser. Chl. Schist:

fo: 45°

Qtz bands occur ll'd to folia.

Crenulated? through out.

Minor Stauro. porphyroblasts @ 67'

79-240 — [illegible] Ser chl. [illegible]

fo: 55°

91-93 — Assoc. Qtz veins

107.5' — Fault Zone:

Breccia; Bleached ser schist for 1 foot.

No Gouge. foliations scattered.

112.5' — Qtz Assoc. vein.

130-131 — Ser. Schist.

134 — Band of Py of 1/2" wide associated with Qtz vein.

135 — fault zone of 6" wide.

203' — Qtz tourmaline band of 4" wide.

217.5' — Fault Breccia. 4" wide zone.

217.5' — 221.5' — [redacted]

[redacted] band of Chl. Schist.

222 — 3" band of Qtz withenite

228 — fo: 45

233-238

— [redacted] Chl. Schist.

238-240 — Bio Ser chl Schist

240-269

fo: 65°

Bio Ser. Chl. Schist:

Py Assoc. with Qtz vein @ 252'.

261-263 — Bleached zone.

clayey in places along fractures.

Appears as water percolating zone.

269-303 Bio Ser. Chl. Schist:

Sand size grains of Stauro. disseminated throughout.

Fo: 62°

Minor cremulations occasionally.

279 – 284 – Bio Ser Schist.

284.5 – Py asso. with Qtz vein.

287 – 289 – Bio. Ser Schist.

291 – 292.5 – Amphibolite band.
Acicular Amphiboles and very little Biotite.
Minor diss. Py.

294 Fo: 75°.

303 – 440 Bio. Ser. Schist:

304 – fractured core
2.5% Py along fractures.

308: Fol/A: 45°

303 – 340 – Very rich in Sericite.
Qtz veins throughout as aggregated bands.
cremulations are common
326 – 331 – Ser. Schist.

326 – 335 – Barytes & witherite form ~5% of the core, mainly as fracture filling.

340 – 440
Coarsely foliated Bio. Ser Schist.

347 Fo: 72°

Qtz occurs as segg. bands.

210 – 321 66-DR-9

210 – 249
Qtz & Bio Ser (chl) Schist.

249 – 289 – Amphibole Schist.
Minor Biotite & chlorite.

289 – 304 – Qtz Bio Ser Schist.

66-PR-2

524 – 598

Garnetiferous Quartz Bio Ser. Schist:

Fo: 82°.

White & brown schist consisting of

segg. Qtz bands. Qtz also occurs as

lenses in places. Garnets occurs as

porphyroblasts throughout (5%)

537.5 – 539 – Amphibolite

556-558 – Chl Bio Ser Schist.

40 – 132

Quartz Bio Chl. Ser. Schist:

fo: 75°

45 – 46 – Qtz Vein.

85 – Mino Sp & Py – fract. zone

Segregated Qtz bands occurs

throughout.

119 – 124 – Amphibolite

Diss. Po & Py. – very little

66-PR-2

210 – 331

210 – 249

Qtz Bio ser (Chl) Schist:

Fo: 86° – flat.

Qtz occurs throughout as

segregated bands. Biotite is

the predominant mineral. Chlorite

also throughout.

Porphyroblasts of Grey Staurolite

occurs.

249 – 289 – Amphibole Schist.

Minor Biotite & Chlorite.

Sharp contact: 82°.

Fo: 62°.

In places Biotite occurs as

segregated bands.

Minor Po & Py.

Some calcite occurs as

veins filling fractures.

284 – 304

Qtz Bio Ser Schist.

291 – Fo: 0° Vertical probably due to folding. No fault seen. Extensively crenulated and foliation not apparent.

304 – 316 Amphibolite, chlorite – Greenstone.

is the commonly occurring mineral throughout.

Green Amphibole chl. Schist.

Akin to: Amphibolite – Greenstone.

316 – 331 [redacted] Few 6" wide bands of Qtz Bio Ser chl. Schist.

Fo: 86°.

196 – 210 Qtz Bio Ser Schist.

Fo: flat.

350 – 511

350 – 375 Greenstone – Amphibole chl Schist.

Fo: flat. 86° – 82°.

Segregated quartz bands occur rarely.

375 – 511 Qtz Bio Ser (chl) Schist:

Light brown Schist with flat foliation. Qtz occurs as segregated bands & as disseminated. chl occurs rarely.

411 – 411.5' – ⅀ zone

416 – 416.5 – ⅀ zone

482 – Amdalm. Qtz grain.

496 – 506 – Bleached zone. Qtz Ser. Schist.

Fo: 81° Biotite rich in places.

508 – Highly Qtz zone. Qtz Bio. Schist.

598 – 618

Qtz Bio Ser Schist.

fo: flat – 86°

637 – 639 – Qtz Bio Ser Schist.

fo: 86°

639 – 649 – Marble.

Coarse xne white marble with some Qtz.

649 – 653 – Qtz Bio Ser Schist

653 – 662 – Marble & Qtz.

probable name is Qtz CO_3.

662 – 668 – Alternating marble and Qtz Bio Ser Schist.

Marble consists of Bio & Mus in places in this increment.

668 – 755

Qtz Bio Ser Schist.

fo: 86°

668 – 682 – Marble occurs as thin bands.

678 – 679 – Breccia.

Staurolite occurs throughout as porphyroblasts.

66-BR-1

0-25 — O.B.

25-34 — Cl. Ser. Schist.

Fo: 45°.

34-73 — Gr. Schist.

Fo: 52°.

Py occurs throughout as bands filling fractures & as disst'd.

73-82 — Cbl Ser Schist

Fo: 45°

Mine Py along fracture planes.

82-106

Gr. Schist.

Fo: 35°

Qtz occurs as segg. bands throughout.

Py occurs as diss. and fracture filling.

106 — Gouge.

Probably fault but no clear evidence.

106-181

Rhyolite: fine grained Rhy consists of Glassy Qtz phenocrysts.

181-221 — Qtz Cbl Graph Ser Schist:

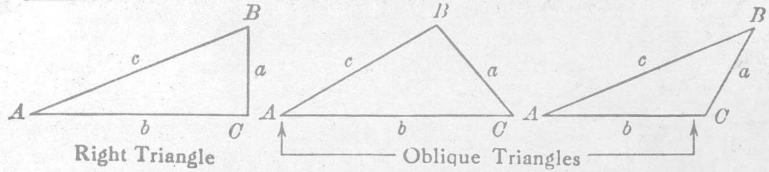
Fo: not apparent.

Core is highly friable and only fragments are recovered. The entire core appears as a fault zone.

221-275 — Rhyolite:

Same as 106-181.

275 — End DDH



Right Triangle — Oblique Triangles

Solution of Right Triangles

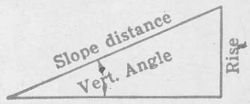
For Angle A. $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\operatorname{cosec} = \frac{c}{a}$

Given	Required	
a, b	A, B, c	$\tan A = \frac{a}{b} = \cot B$, $c = \sqrt{a^2 + b^2} = a\sqrt{1 + \frac{b^2}{a^2}}$
a, c	A, B, b	$\sin A = \frac{a}{c} = \cos B$, $b = \sqrt{(c+a)(c-a)} = c\sqrt{1 - \frac{a^2}{c^2}}$
A, a	B, b, c	$B = 90° - A$, $b = a \cot A$, $c = \frac{a}{\sin A}$
A, b	B, a, c	$B = 90° - A$, $a = b \tan A$, $c = \frac{b}{\cos A}$
A, c	B, a, b	$B = 90° - A$, $a = c \sin A$, $b = c \cos A$,

Solution of Oblique Triangles

Given	Required	
A, B, a	b, c, C	$b = \frac{a \sin B}{\sin A}$, $C = 180° - (A + B)$, $c = \frac{a \sin C}{\sin A}$
A, a, b	B, c, C	$\sin B = \frac{b \sin A}{a}$, $C = 180° - (A + B)$, $c = \frac{a \sin C}{\sin A}$
a, b, C	A, B, c	$A + B = 180° - C$, $\tan \frac{1}{2}(A - B) = \frac{(a-b)\tan \frac{1}{2}(A+B)}{a+b}$, $c = \frac{a \sin C}{\sin A}$
a, b, c	A, B, C	$s = \frac{a+b+c}{2}$, $\sin \frac{1}{2}A = \sqrt{\frac{(s-b)(s-c)}{bc}}$, $\sin \frac{1}{2}B = \sqrt{\frac{(s-a)(s-c)}{ac}}$, $C = 180° - (A + B)$
a, b, c	Area	$s = \frac{a+b+c}{2}$, area $= \sqrt{s(s-a)(s-b)(s-c)}$
A, b, c	Area	area $= \frac{bc \sin A}{2}$
A, B, C, a	Area	area $= \frac{a^2 \sin B \sin C}{2 \sin A}$

REDUCTION TO HORIZONTAL



Horizontal distance = Slope distance multiplied by the cosine of the vertical angle. Thus: slope distance = 319.4 ft. Vert. angle = 5° 10′. From Table, Page IX. cos 5° 10′ = .9959. Horizontal distance = 319.4 × .9959 = 318.09 ft.

Horizontal distance also = Slope distance minus slope distance times (1 − cosine of vertical angle). With the same figures as in the preceding example, the following result is obtained. Cosine 5° 10′ = .9959. 1 − .9959 = .0041. 319.4 × .0041 = 1.31. 319.4 − 1.31 = 318.09 ft.

When the rise is known, the horizontal distance is approximately:—the slope distance less the square of the rise divided by twice the slope distance. Thus: rise = 14 ft., slope distance = 302.6 ft. Horizontal distance $= 302.6 - \frac{14 \times 14}{2 \times 302.6} = 302.6 - 0.32 = 302.28$ ft.