Cominco

# DRILL HOLE RECORD

**Location** Hatfield **Property** E.L. 15/73 **District** Tasmania
**Commenced** 30.10.1976 **Completed** 17.11.1976 **Core size** H2 NQ 3.0m-161.50m H2A BQ 147.0-217.0m
**Objective** Testing of two IP anomalies associated with the black shale - andesite contact. **% Recovery**

**Alt./R.L.** N/A **Co-ordinate** 5200N 3352E **Bearing (M)** 099° **Grid bearing (M)** 8°45'

**Hole No** H2 & H2A **Date** November 1976 **Logged** E.H. SKEY **Dip** -45°

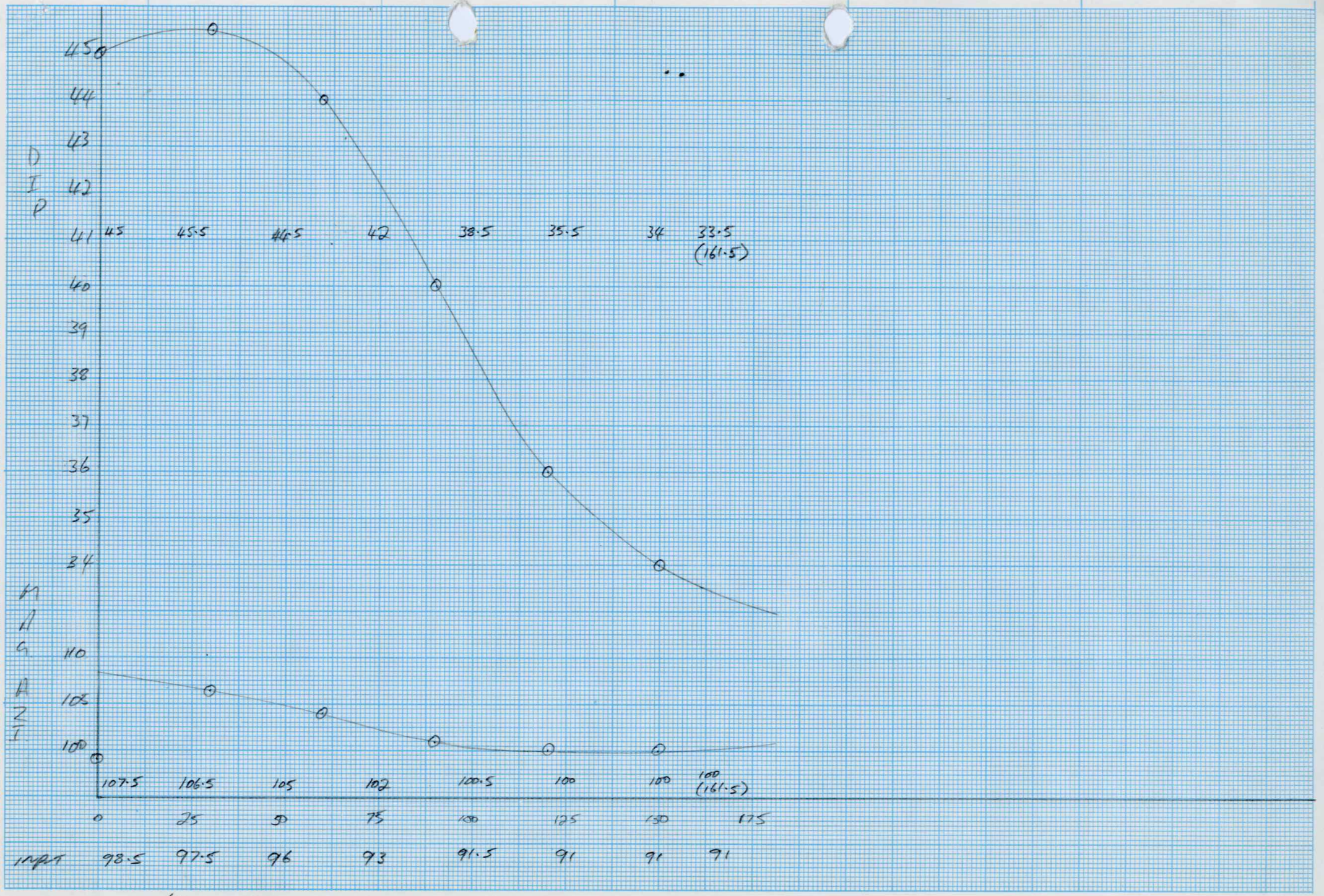
## SURVEY DATA

| DEPTH | DIP | BEARING(M) | INSTRUMENT TYPE |
|---|---|---|---|
| 0 | -45° | 099° | Brunton |
| 30 | -45.5 | 106.5 | Eastman |
| 60 | -44 | 104.0 | " |
| 90 | -40 | 101.0 | " |
| 120 | -36 | 100.0 | " |
| 150 | -34 | 100.0 | " |
| | | | |
| H2A | | | |
| 0 | -45 | 099° | Brunton |
| 50 | -43 | 210.0 | Eastman |
| 80 | -39 | 156.0 | " |
| 130 | -28 | 104.0 | " |
| 160 | -27 | 104.0 | " |
| 184 | 25 | 103.0 | " |
| 199 | 24 | 104.0 | " |
| 210 | 26 | 183.5 | " |
| 217 | 24 | 262.5 | " |

## GRAPH DERIVED DATA

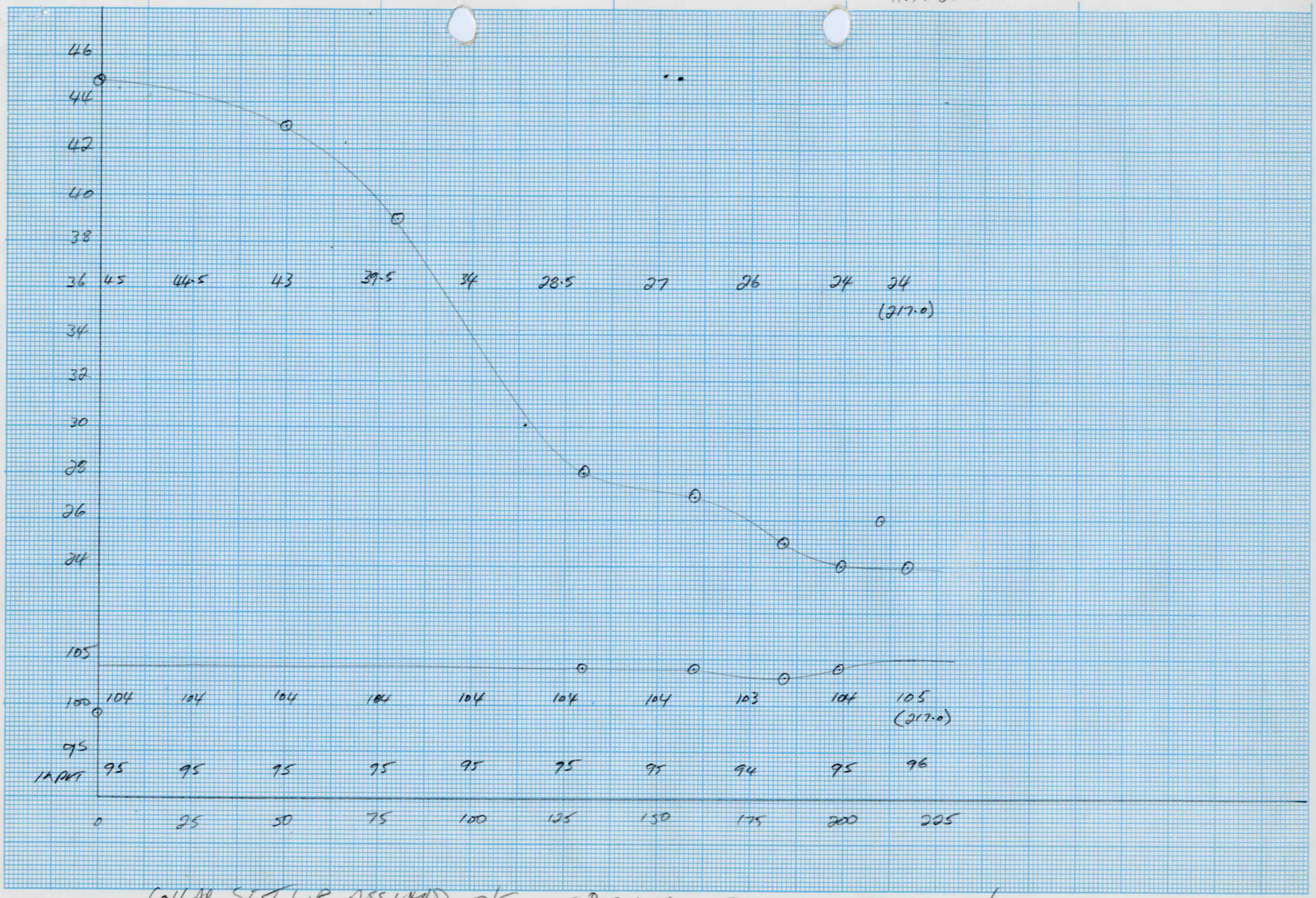
| DEPTH | DIP | BEARING(M) | NORTHING | EASTING | ALTITUDE | REMARKS |
|---|---|---|---|---|---|---|
| 0 | 45 | 099 | 3352.00 | | | |
| 25 | 46 | 101.5 | 3369.51 | | | |
| 50 | 45 | 100.5 | 3387.02 | | | |
| 75 | 42.5 | 97.5 | 3405.07 | | | |
| 100 | 38.5 | 96 | 3424.06 | | | |
| 125 | 35.5 | 95 | 3443.98 | | | |
| 150 | 34 | 95 | 3464.48 | | | |
| 161.50 | 34 | 95 | 3473.99 | | | |
| 0 | 45 | 99 | 3352.00 | | | |
| 25 | 46 | 101.5 | 3369.51 | | | Inside casing |
| 50 | 43 | 102 | 3387.31 | | | Inside casing |
| 75 | 40 | 101 | 3406.01 | | | |
| 100 | 33 | 99.5 | 3426.06 | | | |
| 125 | 28 | 99.5 | 3447.58 | | | |
| 150 | 27 | 98 | 3469.75 | | | |
| 175 | 26 | 99 | 3492.12 | | | Inside casing approx. 170 m. |
| 200 | 24 | 99.5 | 3514.77 | | | Inside casing |
| 217 | 24 | 99.5 | 3530.30 | | | |

HATD002




6° SUBTRACTED FROM ALL AZI's 9/91. ASSUME COLLAR SET UP E001)

HAT0002A




COLLAR SETUP ASSUMED OK. 5° SUBTRACTED FROM AZIS 9/91

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# DIAMOND DRILL LOG

Hole N° H-2. Page N° 1

**Feature :** Bedding, Foliation, Fragment - size & shape; Shearing, Fault (F), Vein (c carbonate, q quartz)

**Mineralization :** Trace 1-5%, Common 5-15%, Abundant 15-60%, Massive >60%

| CORE REC'D | DEPTH m | GEOLOGY | VISUAL LOG (TRACE / COMMON / ABUNDANT / MASSIVE) | DEPTH m | MINERALIZATION |
|---|---|---|---|---|---|
| | | NO CORE BEFORE 3 METRES. | | | |
| | .05 | Thoroughly weathered (brown) dolerite. Very broken, possibly densely packed scree, but considered most likely to be subcrop. Fractures are lined with black to dark brown staining (manganese oxides?) Rare kernels of fresh dark grey-blue dolerite occur. Texture is sub ophitic, but appears to be altered(?) Note substantial core losses. | | | No sulphide. |
| 5.0 | .25 | | | | |
| | .10 | | | | |
| 10.0 | | | | | |
| | .15 | | | | |
| 15.0 | .10 | | | | |
| | .35 | | | | |
| 20.0 | .45 | | | | |
| | .75 | | | | |
| 25.0 | | | | | |

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# DIAMOND DRILL LOG

Hole N° H-2 Page N° 2

**Feature :** Bedding, Foliation, Fragment - size & shape; Shearing, Fault (F), Vein (c carbonate, q quartz)

**Mineralization :** Trace 1-5%; Common 5-15%; Abundant 15-60%; Massive >60%

| CORE REC'D | DEPTH m | GEOLOGY | VISUAL LOG | TRACE | COMMON | ABUNDANT | MASSIVE | DEPTH m | MINERALIZATION |
|---|---|---|---|---|---|---|---|---|---|
| | 160 | | | | | | | | |
| | 28.40 | Weathered micaceous fine siltstone. Bedding 40° to c/a. | | | | | | | |
| | 28.55 | Weathered clotted. | | | | | | | |
| | 28.75 | | | | | | | | |
| | 170 | Micaceous siltstone becomes fine carbonaceous | | | | | | | |
| 30.0 | | shale after 25cms. | | | | | | | |
| | | Siltstone contains small (<0.5mm) | | | | | | | |
| | | feldspar (?). Bedding is 70° to c/a | | | | | | | |
| | 40 | The shale shows beds of less | | | | | | | |
| | | carbonaceous material up to 0.5cm | | | | | | | |
| | | at 75° to c/a. Bedding (less | | | | | | | |
| | 70 | apparent below 36m) is markedly | | | | | | | |
| | | disrupted by minor movement on | | | | | | | |
| | | joint surfaces. | | | | | | | |
| 35.0 | 170 | Intermittent development of strong | VERY BROKEN | | | | | | |
| | | cleavage is at approx 30° to c/a | | | | | | | |
| | | and is rotated 20° to strike relative | F? | | | | | | Dissem-ated, Trace pyrite apparent on cleavage surfaces from 50m approx. |
| | | to bedding. This relationship varies | | | | | | | |
| | 210 | somewhat, locally to 10°, or 30°. | | | | | | | |
| | | With regional cleavage assumed | | | | | | | |
| | | sub vertical (attention horizontal) | | | | | | | |
| | 100 | then steep west dips are implied | | | | | | | |
| 40.0 | | for the black slate. | | | | | | | |
| | | The shale does not break | | | | | | | |
| | 260 | preferentially along one plane but | | | | | | | |
| | | varies between bedding, cleavage and | | | | | | | |
| | | joint surfaces. | | | | | | | |
| | | Weathering alteration to pale | | | | | | | |
| | | grey colour, with orange ironstaining | | | | | | | |
| | 200 | on fractures persists to 56m, | | | | | | | |
| 45.0 | | however the bulk of the rock is | F | | | | | | |
| | | substantially fresh below 45m. | | | | | | | |
| | 245 | | | | | | | | |
| 50.0 | | | | | | | | | |

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# DIAMOND DRILL LOG

Hole Nº H-2 Page Nº 3

**Feature :** Bedding, Foliation, Fragment - size & shape; Shearing, Fault, Vein (c carbonate, q quartz)

**Mineralization :** Trace 1-5%, Common 5-15%, Abundant 15-60%, Massive >60%

| CORE REC'D | DEPTH m | GEOLOGY | VISUAL LOG | TRACE | COMMON | ABUNDANT | MASSIVE | DEPTH m | MINERALIZATION |
|---|---|---|---|---|---|---|---|---|---|
| | 260 | Massive black slate with laminar bedding at 70° to c/a continues to 67m. Beyond this, bedding is not visible, the rock being uniformly rich in carbonaceous material. | | | | | | | Rare pyrite on cleavage surfaces. |
| 55.0 | 270 | Minor erratic carbonate veining occurs between 56.50 and 58m. and infrequently thereafter. Cleavage is 35 – 50° to c/a but is not well developed. Core also breaks along joints at 60-80° to c/a. Fracture surfaces are occassionally carbonate lined (< 1mm thick), no iron oxides apparent, but fresh pyrite may occur on cleavage surfaces. | | | | | | | |
| 60.0 | 280 | | | | | | | | |
| | 295 | | | | | | | | |
| 65.0 | 295 | | | | | | | 64.80 | Large ellipsoidal kernel of massive pyrite 2×5×5? cms dimensions. parallel to bedding. |
| | 300 | | | | | | | | |
| 70.0 | 285 | 179617 – T/S at 73.05m | | | | | | 69.60 | Deformed massive pyrite 'layer' (1cm) in carbonate host (2cm layer) occurs as a circular feature in core 7 cms in diameter. surrounded internally and externally by shale |
| | 72.50 | Vesicular, carbonated, dolerite or andesite dike. Carbonate filled vesicles parallel shale foliation. | | | | | | | |
| | 73.85 | Carbonate veins fill, perpendicular, late, torsion gashes | | | | | | | |
| | 300 | Massive carbonate vein (calcite). | | | | | | | |
| 75.0 | 74.50 | Dike as previously, though colour pale grey | | | | | | | |

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# DIAMOND DRILL LOG

Hole No H-2. Page No 4

**Feature :** Bedding, Foliation, Fragment - size & shape; Shearing, Fault (F), Vein (c carbonate, q quartz)

**Mineralization :** Trace 1-5%, Common 5-15%, Abundant 15-60%, Massive >60%

| CORE REC'D | DEPTH m | GEOLOGY | VISUAL LOG | TRACE | COMMON | ABUNDANT | MASSIVE | DEPTH m | MINERALIZATION |
|---|---|---|---|---|---|---|---|---|---|
| | 295.93 | not dark grey, Carbonate veins ad amygdales as before<br>Irregular contact with xenoliths of shale within dike, | | | | | | | Rare 1mm lenticles of pyrite. |
| | 300 | Massive black shale with carbonate veinlets, broken below 78.30, with slickensided fractures.<br>T/S 179618 at 80.90. | | | | | | | |
| 80.0 | 79.60 | Strongly sheared, carbonate rich volcanic or dike with partly hornfelsed shale xenoliths to 10cms, bottom contact shows chilled margin merging | | | | | | | Disseminated pyrite 1-2% |
| | 300 | into hornfelsed shale. | | | | | | | |
| | 80.90 | Massive black shale, uniform colour and texture, no bedding visible, cleavage foliation is 60° to c/a, with thin (1-2mm) carbonate veins ad irregular fracture fillings, especially 87.10 to 88.40, 94.70 to 97.20. | | | | | | 87.10 | Two clasts of massive pyrite, subellipsoidal 10×10×20cms 'parallel' to foliation, otherwise pyrite is rare. |
| 85.0 | 300 | | | | | | | | |
| | 280 | | | | | | | | |
| 90.0 | 285 | | BROKEN CORE | | | | | | |
| | 295 | | | | | | | | |
| 95.0 | 290 | | | | | | | | |
| | 290 | | | | | | | | |
| 100.0 | | | | | | | | | |

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# DIAMOND DRILL LOG

Hole Nº H-2. Page Nº 5

**Feature :** Bedding, Foliation, Fragment - size & shape; Shearing, Fault (F), Vein (c carbonate, q quartz)

**Mineralization :** Trace 1-5%, Common 5-15%, Abundant 15-60%, Massive >60%

| CORE REC'D | DEPTH m | GEOLOGY | VISUAL LOG | TRACE | COMMON | ABUNDANT | MASSIVE | DEPTH m | MINERALIZATION |
|---|---|---|---|---|---|---|---|---|---|
| | 300 | Massive black shale continues. | | | | | | | |
| | 300 | | | | | | | | 103.0m Pyrite occurs in thin partings, (<<1mm thick), decline below 104.50m |
| 105.0 | | T/S 179619 at 106.55m | | | | | | | |
| | 106.0 | | | | | | | 106.0 | |
| | 260 | Distinct bedding apparent, at 55° to c/a, but showing some gentle undulations of wavelength 0.5 - 2cms approx. Beds are 1mm to 2cms and consists of horizons richer and poorer in suspfine pyrite. Pyrite concentration shows a cyclic variation, increasing in each bed up hole to a sharp cut off, succeeded by black shale, which then progressively increases pyrite making a new cycle. This style of bedding is most apparent to 113m then only occassional pyrite beds occur to 120m. | | | | | | | Most pyrite is very fine, but rare thin layers of visibly crystalline pyrite occur. Sulphide content very difficult to estimate but circa 5% varying to 20%?? T/S and P/S for microscopic examination. |
| 110.0 | 285 | | | | | | | | |
| | 300 | | | | | | | 113 | |
| 115.0 | | | POSSIBLY BROKEN CORE | | | | | | |
| | 285 | 113.50 — 117.50, Broken core with fractures at low angles to core axis | | | | | | | |
| | 285 | | | | | | | | |
| 120.0 | | | | | | | | | |
| | 122.0 | | | | | | | 122 | |
| | 285 | Approx contact (not definite) Bedding of variable sulphide content recommences and persists to 129m approx. — at 85° to c/a. | | | | | | | Very fine pyrite ? 2-5% locally 10%?? |
| 125.0 | | | | | | | | | |

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# DIAMOND DRILL LOG

Hole N° H-2. Page N° 6.

**Feature :** Bedding, Foliation, Fragment - size & shape; Shearing, Fault (F), Vein (c carbonate, q quartz)

**Mineralization :** Trace 1-5%, Common 5-15%, Abundant 15-60%, Massive >60%

| CORE REC'D | DEPTH m | GEOLOGY | VISUAL LOG (TRACE / COMMON / ABUNDANT / MASSIVE) | DEPTH m | MINERALIZATION |
|---|---|---|---|---|---|
| | 300 | | | | |
| | 300 | | | | |
| | 129.00 | | | 129 | |
| 130.0 | | Massive fine grained black shale, with an almost irridescent appearance on broken surfaces. | | | Rare pyrite. |
| | 300 | | | | |
| | 133.45 | | | 133.45 | |
| | 300 | Sheared agglomerate of feldspar porphyry.* Colour is orange-brown to light grey, contains chert clasts, overall schistose foliation at 45°. | | | Pyrite 5-7%, stringers, clots, disseminations. |
| 135.0 | 135.35 | - typical streaky pyroclastic of Que River Prospect. | | 135.35 | |
| | | Massive black shale - with occasional thin (1-2 cm) bands of wispy tuff with quartz phenocrysts; fine carbonate veining and fracture filling throughout. | | | No pyrite. |
| | 137.05 | | | 137.05 | |
| | 235 | See below. | | | |
| | 137.58 | FAULTED ZONE, much sheared broken debris. | F | | Pyrite 3-5%, as clasts, veinlets and disseminated crystals. |
| | 20 | | F | | |
| 140.0 | 139.75 | | F | 139.75 | |
| | 195 | 137.05 — 145.10 (approx). Sheared pale grey carbonate-sericite rich (as above*) feldspar porphyry agglomerate (streaky pyroclastic), with wispy pumice(?) and sub angular clasts of porphyritic dacite(?). Clast size is typically 0.5 - 5 cms to 140 m then increasing to 2 - 7 cms below. Carbonate present throughout but, as veins particularly 139.75 - 139.90. Elsewhere in yellow alteration of clasts rims and matrix. | | | Trace pyrite. |
| | 300 | | | | |
| 145.0 | 145.10 | Gradational contact to less altered agglomerate of feldspar porphyry of andesitic aspect. Fragments are angular to subangular, all sizes up to 7 cms, dark grey-green in colour becoming progressively greener down hole. The matrix is lighter grey in colour with white carbonate and | | | |
| | 300 | | | | |
| 150.0 | | | | | |

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# DIAMOND DRILL LOG

Hole No H-2[illegible] Page No 7

**Feature :** Bedding, Foliation, Fragment - size & shape; Shearing, Fault (F), Vein (c carbonate, q quartz)

**Mineralization :** Trace 1-5%, Common 5-15%, Abundant 15-60%, Massive >60%

| CORE REC'D | DEPTH m | GEOLOGY | VISUAL LOG | TRACE | COMMON | ABUNDANT | MASSIVE | DEPTH m | MINERALIZATION |
|---|---|---|---|---|---|---|---|---|---|
| | | Lesser quartz veinlets. There is no sericite alteration. Foliation (schistosity) is 45° to c/a | | | | | | | |
| | 300 | White feldspars become very prominent (to 1mm) down hole. Both green (andesite) and grey dacite (?) clasts occur. | | | | | | | |
| 155.0 | 300 | | | | | | | | |
| | 300 | | | | | | | | |
| 160.0 | 190 | | | | | | | | Traces to 5% sphalerite in last 50cms core. |
| | 161.50 | HOLE ENDS | | | | | | | |
| 165.0 | | | | | | | | | |
| 170.0 | | | | | | | | | |
| 175.0 | | | | | | | | | |

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# DIAMOND DRILL LOG

Hole Nº H-2 A. Page Nº 1

**Feature :** Bedding, Foliation, Fragment - size & shape; Shearing, Fault, Vein (c carbonate, q quartz)

**Mineralization :** Trace 1-5%, Common 5-15%, Abundant 15-60%, Massive >60%

| CORE REC'D | DEPTH m | GEOLOGY | VISUAL LOG | TRACE | COMMON | ABUNDANT | MASSIVE | DEPTH m | MINERALIZATION |
|---|---|---|---|---|---|---|---|---|---|
| | 130.0 | New hole recommenced from same collar and drilled immediately adjacent to H2. Correctly marked core was collected after cessation of triconing and is logged below. This hole effectively extends H2. | | | | | | | |
| | 135.0 | | | | | | | | |
| | 140.0 | | | | | | | | |
| | 145.0 | | | | | | | | |
| | 147.70 | | | | | | | | |
| | 330 | Massive feldspar porphyry agglomerate of gross andesitic aspect, but with grey fragments of possible dacitic composition. | | | | | | | Trace sphalerite and galena. |
| | 150.0 | | | | | | | | |

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# DIAMOND DRILL LOG

Hole Nº H-2A Page Nº 2

**Feature :** Bedding, Foliation, Fragment - size & shape; Shearing, Fault (F), Vein (c carbonate, q quartz)

**Mineralization :** Trace 1-5%, Common 5-15%, Abundant 15-60%, Massive >60%

| CORE REC'D | DEPTH m | GEOLOGY | VISUAL LOG | TRACE | COMMON | ABUNDANT | MASSIVE | DEPTH m | MINERALIZATION |
|---|---|---|---|---|---|---|---|---|---|
| | | Rock colour is dominantly dark green, mtl carbonate-silica alteration of matrix, also minor carbonate veining. Fragments vary in size up to 7 cms but are commonly around 3-4 cms. diameter. | | | | | | 157.00 | Disseminated sphalerite 1% as small grain aggregates, also rare galena, mtl trace pyrite. |
| 155.0 | 300 | | | | | | | | |
| | 255 | | | | | | | | |
| | 290 | | | | | | | | |
| 160.0 | | | | | | | | | |
| | 300 | Fragmental texture becomes diffuse due to carbonate-silica alteration of matrix. | | | | | | | |
| | 295 | | | | | | | 164.0 | ? Sphalerite averages ½%, mtl rare galena, |
| 165.0 | | | | | | | | | |
| | 300 | | | | | | | | |
| 170.0 | | | | | | | | | |
| | 280 | | | | | | | | |
| | 300 | | | | | | | | |
| 175.0 | | | | | | | | | |

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# DIAMOND DRILL LOG

Hole Nº H-2A Page Nº 3.

**Feature :** Bedding, Foliation, Fragment - size & shape; Shearing, Fault, Vein (c carbonate, q quartz)

**Mineralization :** Trace 1-5%, Common 5-15%, Abundant 15-60%, Massive >60%

| CORE REC'D | DEPTH m | GEOLOGY | VISUAL LOG | TRACE | COMMON | ABUNDANT | MASSIVE | DEPTH m | MINERALIZATION |
|---|---|---|---|---|---|---|---|---|---|
| | 300 | Altered (carbonate-silica) andesitic agglomerate continues. | | | | | | | |
| 180.0 | 280 | | | | | | | | |
| | 300 | | | | | | | | |
| 185.0 | 300 | | | | | | | | |
| | 270 | Fractures sub parallel to core axis. | | | | | | | |
| 190.0 | 190.78 | | BROKEN CORE | | | | | | |
| | 205 | Massive quartz vein. | | | | | | | No sulphide associated with vein |
| | 191.50 | | | | | | | | |
| | 100 | Massive silicified andesite agglomerate or possibly brecciated lava, continues. | | | | | | | |
| 195.0 | 300 | Colour is dominantly green, with white feldspar phenocrysts to 1 mm, but colour locally varies to pale fawn to pinkish brown due to matrix carbonate alteration (?) Rare carbonate veins are present. | | | | | | | Disseminated rare sphalerite and galena |
| | 300 | | | | | | | | |
| 200.0 | | | | | | | | | |

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# DIAMOND DRILL LOG

Hole Nº H-2A Page Nº 4

**Feature :** Bedding, Foliation, Fragment - size & shape 0%; Shearing, Fault F, Vein c carbonate q quartz

**Mineralization :** Trace 1-5%; Common 5-15%; Abundant 15-60%; Massive >60%

| CORE REC'D | DEPTH m | GEOLOGY | VISUAL LOG | TRACE | COMMON | ABUNDANT | MASSIVE | DEPTH m | MINERALIZATION |
|---|---|---|---|---|---|---|---|---|---|
| | 295 | | | | | | | | |
| | 175 | Note diffuse nature of fragment boundaries. — subangular to rounded. | | | | | | | Trace sphalerite and galena, associated with silica (quartz) vein lets. |
| 205.0 | 300 | | | | | | | | |
| | 95 | | | | | | | | |
| | 300 | | | | | | | | |
| 210.0 | | | | | | | | | |
| | 300 | Rare massive chlorite veins (1-2 cm). Minor epidote (?) with some veins of carbonate | | | | | | | |
| 215.0 | 300 | | | | | | | | |
| | 217.0 | | | | | | | | |
| | | END OF HOLE | | | | | | | |
| 220.0 | | | | | | | | | |
| 225.0 | | | | | | | | | |

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# DIAMOND DRILL LOG

Hole N° H.2 Page N° 1.

**Feature :** Bedding, Foliation, Fragment - size & shape; Shearing, Fault (F), Vein (c carbonate, q quartz)

**Mineralization :** Trace 1-5%; Common 5-15%; Abundant 15-60%; Massive >60%

| CORE REC'D | DEPTH m | GEOLOGY | VISUAL LOG (TRACE / COMMON / ABUNDANT / MASSIVE) | DEPTH m | MINERALIZATION |
|---|---|---|---|---|---|
| | | No Core before 3 metres. | | | |
| .05 | 5 | Thoroughly weathered (brown) dolerite. Very broken, possibly densely packed scree, but more likely sub-crop. Fractures are lined with black to dark brown manganese oxide. Rare kernels of fresh dark grey-blue dolerite. Texture is subophitic, but appears to be altered. Note core loss. | | | No sulphide. |
| .25 | | | | | |
| .10 | | | | | |
| - | 10 | | | | |
| - | | | | | |
| .15 | | | | | |
| .10 | 15 | | | | |
| .35 | | | | | |
| .45 | 20 | | | | |
| .75 | | | | | |
| | 25 | | | | |

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# DIAMOND DRILL LOG

Hole N° H.2 Page N° 2.

**Feature :** Bedding, Foliation, Fragment - size & shape, Shearing, Fault, Vein (c carbonate, q quartz)

**Mineralization :** Trace 1-5%, Common 5-15%, Abundant 15-60%, Massive >60%

| CORE REC'D | DEPTH m | GEOLOGY | VISUAL LOG | DEPTH m | MINERALIZATION |
|---|---|---|---|---|---|
| | | Dolerite as above. | | | |
| .60 | 28.10 | Weathered micaceous fine siltstone. | | | |
| | 28.55 | Bedding 40° to core axis. | | | |
| | 28.75 | Weathered dolerite. | | | |
| 170 | | Micaceous siltstone, becomes fine carbonaceous shale after 25 cm. Siltstone contains small (less than 0.5 mm) feldspars. Bedding is 70° to C.A. | | | |
| | 30 | | | | |
| 40 | | The shale shows beds of less carbonaceous material up to 0.5 cm at 75° to C.A. Bedding is markedly disrupted by minor movement on joint surfaces. | | | |
| 70 | | Intermittant development of strong cleavage is at approx. 30° to C.A. and is rotated 20° in strike relative to bedding. This relationship varies between 10° and 30°. | BROKEN CORE | | |
| 70 | 35 | | | | |
| | | With regional cleavage assumed subvertical then steep west dips are implied for the black shale. | | | Disseminated, trace pyrite apparent on cleavage surfaces from 50 m. |
| 210 | | The shale does not preferentially break along one plane but varies between bedding, cleavage and joint surfaces. | | | |
| 100 | | Weathering to a pale grey colour with orange iron staining on fractures persists to 56 m, however the bulk of the rock is substantially fresh below 45 m. | | | |
| | 40 | | | | |
| 260 | | | | | |
| 200 | | | | | |
| | 45 | | | | |
| 245 | | | | | |
| | 50 | | | | |

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# DIAMOND DRILL LOG

Hole N° H.2 Page N° 3.

**Feature :** Bedding, Foliation, Fragment - size & shape; Shearing, Fault (F), Vein (c carbonate, q quartz)

**Mineralization :** Trace 1-5%; Common 5-15%; Abundant 15-60%; Massive >60%

| CORE REC'D | DEPTH m | GEOLOGY | VISUAL LOG | TRACE | COMMON | ABUNDANT | MASSIVE | DEPTH m | MINERALIZATION |
|---|---|---|---|---|---|---|---|---|---|
| 260 | | Massive black shale with laminar bedding at 70° to C.A. continues to 67 m. Beyond this, bedding is not visible, the rock being rich in carbonaceous material. | | | | | | | Rare pyrite on cleavage surfaces. |
| 230 | | Minor erratic carbonate veining occurs between 56.5 and 58 m, and infrequently thereafter. | | | | | | | |
| | 55 | Cleavage is 35° - 50° to C.A. but is not well developed. Core also breaks along joints at 60° - 80° to C.A. | | | | | | | |
| 270 | | Fracture surfaces are occassionally carbonate lined (less than 1 mm wide) fresh pyrite may occur on cleavage surfaces. | | | | | | | |
| 280 | 60 | | | | | | | | |
| 295 | | | | | | | | | |
| | 65 | | | | | | | 64.8 | Large ellipsoidal kernel of massive pyrite 5 cm, parallel to bedding. |
| 295 | | | | | | | | | |
| 300 | | | | | | | | | |
| | 70 | | | | | | | 69.6 | Deformed massive pyrite layer ( 1 cm) in carbonate occurs as a circular feature in core surrounded by shale. |
| 285 | | Thin section at 73.05 m, Number 179617. | | | | | | | |
| | 72.50 | Vesicular, carbonated dolerite or andesite dike. Carbonate filled vesicles parallel shale foliation. | | | | | | | |
| | 73.85 | Massive carbonate vein (calcite). | | | | | | | |
| 300 | 74.50 | Dike as above. | | | | | | | |
| | 75 | | | | | | | | |

Cominco

# DIAMOND DRILL LOG

Hole N° H.2 Page N° 4.

**Feature :** Bedding, Foliation, Fragment - size & shape; Shearing, Fault (F), Vein (c carbonate, q quartz)

**Mineralization :** Trace 1-5%; Common 5-15%; Abundant 15-60%; Massive >60%

| CORE REC'D | DEPTH m | GEOLOGY | VISUAL LOG | TRACE | COMMON | ABUNDANT | MASSIVE | DEPTH m | MINERALIZATION |
|---|---|---|---|---|---|---|---|---|---|
| | 75.43 | Irregular contact with xenoliths of shale within dike. | | | | | | | |
| 300 | | Massive black shale with carbonate veinlets, broken below 78.5 m, with some slickensides. | | | | | | | Rare 1 mm lenticles of pyrite. |
| | | Thin section at 80.9 m, No. 179618. | | | | | | | |
| | 79.60 | | | | | | | | |
| | 80 | Strongly sheared, carbonate rich dike or volcanic with partly hornfelsed shale xenoliths to 10 cm, lower contact shows | | | | | | | Disseminated pyrite 1 - 2%. |
| 300 | 80.90 | chilled margin merging with shale. | | | | | | 81.1 | Two clasts of massive pyrite sub ellipsoidal to 10 cm parallel to foliation. Otherwise pyrite is rare. |
| | | Massive black shale, uniform colour and texture, cleavage foliation is 60° to C.A., with thin (1-2 mm) carbonate veins and fracture fillings, especially at 87.1 - 88.4 m and 94.7 - 97.2 m. | | | | | | | |
| 300 | | | | | | | | | |
| | 85 | | | | | | | | |
| 280 | | | | | | | | | |
| 285 | 90 | | BROKEN CORE | | | | | | |
| 295 | | | | | | | | | |
| | 95 | | | | | | | | |
| 290 | | | | | | | | | |
| 290 | | | | | | | | | |
| | 100 | | | | | | | | |

Cominco

# DIAMOND DRILL LOG

Hole N° H.2 Page N° 5.

**Feature :** Bedding, Foliation, Fragment - size & shape; Shearing, Fault (F), Vein (c carbonate, q quartz)

**Mineralization :** Trace 1-5%, Common 5-15%, Abundant 15-60%, Massive >60%

| CORE REC'D | DEPTH m | GEOLOGY | VISUAL LOG | TRACE | COMMON | ABUNDANT | MASSIVE | DEPTH m | MINERALIZATION |
|---|---|---|---|---|---|---|---|---|---|
| 300 | | Massive black shale continued. | | | | | | | 103.0 m Pyrite occurs in thin partings, (much less than 1 mm wide). |
| 300 | 105 | Thin section at 106.55 m No. 179619. | | | | | | | |
| | 106.0 | Distinct bedding apparent at 55° to C.A. but showing some gentle undulations. | | | | | | 106.0 | Pyrite is very fine, but rare thin layers of euhedral pyrite occur. Sulphide content is approx. 5% locally 20%. |
| 260 | | Beds are 1 mm to 2 cm thick and consist of horizons of ultra fine pyrite. Pyrite concentration shows a cyclic variation, increasing to a sharp cut-off succeeded by black shale. This style of bedding is most apparent | | | | | | | |
| 285 | 110 | to 113 m and only occasionally to 120 m. | | | | | | | Thin section and polished section prepared. |
| 300 | | 113.5 - 117.5 m, Broken core with fractures at low angles to core axis. | BROKEN CORE | | | | | | |
| 285 | 115 | | | | | | | | |
| 285 | 120 | | | | | | | | |
| 285 | 122.0 | Approx. contact. Bedding of variable sulphide content persists to 129 m at approx. 85° to C.A. | | | | | | 122.0 | Very fine pyrite 2-5% locally 10%. |
| | 125 | | | | | | | | |

Cominco

# DIAMOND DRILL LOG

Hole N° H.2 Page N° 6.

**Feature :** Bedding, Foliation, Fragment - size & shape; Shearing, Fault (F), Vein (c carbonate, q quartz)

**Mineralization :** Trace 1-5%; Common 5-15%; Abundant 15-60%; Massive >60%

| CORE REC'D | DEPTH m | GEOLOGY | VISUAL LOG | DEPTH m | MINERALIZATION |
|---|---|---|---|---|---|
| 300 | | | | | |
| 300 | 129.0 | | | 129.0 | Rare pyrite. |
| | 130 | Massive fine grained black shale, with an almost irridescent appearance on broken surfaces. | | | |
| 300 | | | | | |
| | 133.45 | | | 133.45 | |
| 300 | | Sheared agglomerate of feldspar porphyry. Colour is orange-brown to light grey, contains chert clasts around which foliation diverges. Similar to SP units at Que River. (Sericite alteration). | | | Pyrite 5-7%, stringers, clots, disseminations. |
| | 135 | | | | |
| | 135.35 | Massive black shale with occassional thin 1-2 cm bands of wispy tuff with quartz phenocrysts, fine carbonate veining | | 135.35 | No pyrite. |
| | 137.05 | and fracture filling throughout. | | 137.05 | |
| 235 | 137.58 | Sheared feldspar porphyry agglomerate. Fault zone, sheared and broken core. | F | | Pyrite 3-5%, as clasts, veinlets and disseminated crystals. |
| 20 | 139.75 | | F | 139.75 | |
| | 140 | Sheared pale grey carbonate-sericite rich feldspar porphyry agglomerate. SP. With wispy pumice (fiamme) and subangular clasts of porphyritic dacite. Fragment size is typically 0.5 - 5.0 cm to 140 m then increasing to 2-7 cm. Carbonate is common with veins between 139.75 and 139.9 m. | F, c | | Trace pyrite. |
| 195 | | | | | |
| 300 | | | F | | |
| | 145 | | | | |
| | 145.10 | Gradational contact to less altered agglomerate of feldspar porphyry of andesite. (Lava breccia). Fragments are are angular to subangular all sizes up to 7 cm, dark grey-green in colour becoming greener with depth. The matrix is light grey in colour with white carbonate and minor quartz veinlets. Foliation (schistosity) is 45° to C.A. White feldspar (altered to carbonate) become very prominent ( to 1 mm) down hole. | | | |
| 300 | | | | | |
| | 150 | | | | |

Cominco

# DIAMOND DRILL LOG

Hole Nº H.2 Page Nº 7.

**Feature :** Bedding, Foliation, Fragment - size & shape; Shearing, Fault (F), Vein (c carbonate, q quartz)

**Mineralization :** Trace 1-5%, Common 5-15%, Abundant 15-60%, Massive >60%

| CORE REC'D | DEPTH m | GEOLOGY | VISUAL LOG | TRACE | COMMON | ABUNDANT | MASSIVE | DEPTH m | MINERALIZATION |
|---|---|---|---|---|---|---|---|---|---|
| | | Both green andesitic and grey dacitic fragments occur. | | | | | | | |
| 300 | | | | | | | | | |
| | 155 | | | | | | | | |
| 300 | | | | | | | | | |
| 300 | | | | | | | | | |
| | 160 | | | | | | | | |
| 140 | 161.50 | Hole ends. | | | | | | | Traces to 5% sphalerite in last 50 cm of core. |

Cominco

# DIAMOND DRILL LOG

Hole N° H.2A Page N° 1.

**Feature :** Bedding, Foliation, Fragment - size & shape; Shearing, Fault (F), Vein (c carbonate, q quartz)

**Mineralization :** Trace 1-5%, Common 5-15%, Abundant 15-60%, Massive >60%

| CORE REC'D | DEPTH m | GEOLOGY | VISUAL LOG | TRACE | COMMON | ABUNDANT | MASSIVE | DEPTH m | MINERALIZATION |
|---|---|---|---|---|---|---|---|---|---|
| | 130 | New hole commenced from same collar and drilled adjacent to H.2.<br>Tricone used to 147.7 m. | | | | | | | |
| | 135 | | | | | | | | |
| | 140 | | | | | | | | |
| | 145 | | | | | | | | |
| | 147.70 | | | | | | | | |
| 330 | | Massive <u>feldspar porphyry agglomerate</u> of andesite but with grey fragments of possibly dacitic composition. | | | | | | | Trace sphalerite and galena. |
| | 150 | | | | | | | | |

Cominco

# DIAMOND DRILL LOG

Hole N° H.2A Page N° 2.

**Feature :** Bedding, Foliation, Fragment - size & shape; Shearing, Fault (F), Vein (c carbonate, q quartz)

**Mineralization :** Trace 1-5%, Common 5-15%, Abundant 15-60%, Massive >60%

| CORE REC'D | DEPTH m | GEOLOGY | VISUAL LOG | TRACE | COMMON | ABUNDANT | MASSIVE | DEPTH m | MINERALIZATION |
|---|---|---|---|---|---|---|---|---|---|
| 300 | 155 | Rock colour is dominantly dark green with carbonate-silica alteration of matrix, also minor carbonate veining. Fragments vary in size up to 7 cm average 3-4 cm. | | | | | | 157.0 | Disseminated sphalerite 1% as small grain aggregates, also rare galena and trace sphalerite. |
| 255 | | | | | | | | | |
| 290 | 160 | Fragmental texture becomes diffuse due to deuteric alteration of the matrix by carbonate and silica. | c | | | | | | |
| 300 | | | | | | | | 164.0 | Sphalerite averages less than 1% with rare galena. |
| 295 | 165 | | | | | | | | |
| 300 | | | | | | | | | |
| 280 | 170 | | | | | | | | |
| 300 | | | c | | | | | | |
| | 175 | | | | | | | | |

Cominco

# DIAMOND DRILL LOG

Hole N° H.2A Page N° 3.

**Feature :** Bedding, Foliation, Fragment - size & shape; Shearing, Fault (F), Vein (c carbonate, q quartz)

**Mineralization :** Trace 1-5%, Common 5-15%, Abundant 15-60%, Massive >60%

| CORE REC'D | DEPTH m | GEOLOGY | VISUAL LOG | TRACE | COMMON | ABUNDANT | MASSIVE | DEPTH m | MINERALIZATION |
|---|---|---|---|---|---|---|---|---|---|
| 300 | | Altered carbonate-silica andesitic agglomerate continues. | | | | | | | |
| 280 | 180 | | | | | | | | |
| 300 | | | | | | | | | |
| 300 | 185 | | | | | | | | |
| 270 | | Fractures sub-parallel to core axis. | BROKEN CORE | | | | | | |
| | 190 | | | | | | | | |
| 205 | 190.78 | | | | | | | | |
| | 191.50 | **Massive quartz vein.** | | | | | | | No sulphide associated with vein. |
| 100 | | Massive silicified andesitic agglomerate or lava breccia. Colour is dominantly green, with white feldspar phenocrysts to 1 mm. The colour varies locally to pale fawn and pink due to carbonate alteration. Rare carbonate veins are present. | | | | | | | Disseminated rare sphalerite and galena. |
| 300 | 195 | | | | | | | | |
| 300 | | | | | | | | | |
| | 200 | | | | | | | | |

Cominco

# DIAMOND DRILL LOG

Hole N° M.2A Page N° 4.

**Feature :** Bedding, Foliation, Fragment - size & shape; Shearing, Fault (F), Vein (c carbonate, q quartz)

**Mineralization :** Trace 1-5%; Common 5-15%; Abundant 15-60%; Massive >60%

| CORE REC'D | DEPTH m | GEOLOGY | VISUAL LOG | TRACE | COMMON | ABUNDANT | MASSIVE | DEPTH m | MINERALIZATION |
|---|---|---|---|---|---|---|---|---|---|
| 295 | | Fragment boundaries often corroded. | | | | | | | Trace sphalerite and galena, associated with quartz veinlets. |
| 175 | | | | | | | | | |
| 300 | 205 | | | | | | | | |
| 95 | | | | | | | | | |
| 300 | | | | | | | | | |
| | 210 | | | | | | | | |
| | | Rare massive chlorite veins 1 - 2 cm minor epidote with some veins of carbonate. | | | | | | | |
| 300 | | | | | | | | | |
| | 215 | | | | | | | | |
| 300 | | | | | | | | | |
| | 217.0 | End of Hole. | | | | | | | |

From Appendix A. Young, 1980 (Mack/Hat 2)



samples the feldspar phenocrysts are totally sericitized and are scattered through what appears to be basually a primary siliceous matrix. A few slightly "reabsorbed" quartz grains are also present in similar to those normally ancountened in dacites.

Diamond Drill Hole DDMH 1 and H 2 (samples 206252, 60.5 m; 206253, 103.5 m)

Sample 206252 is a fine siltstone consisting of a very weakly foliated mass of sericite, quartz, chlorite, some fine pyrite and carbonaceous material. Secondary veinlets of pyrite with pressure fringes of chlorite and quartz cut the rock. Sample 206253 is sericitized, chloritized and silicified andesitic tuff lava or pyroclastic although the alteration is not as strong as in the acid samples of DDM's MC 1, 2,and 3. The rock consists of variably sized, often large (up to many millimetres) porphyritic andesitic rock fragments with partially altered feldspar phenocrysts separated by zones of polycrystalline fine-grained quartz containing some smaller feldspar crystals. The latter are also only slightly altered.

Diamond Drill Hole H 2 (samples 206254, 202 m; 206255, 153 m)

Sample 206254 is a weakly altered andesite or dacite consisting of feldspar laths and euhedra (0.3 to 0.8 mm) in a "dusty" matrix of feldspar, quartz, chlorite, minor sericite and some secondary leucoxene. Sample 206255 seems to be a more altered (carbonatized) version of sample 206253.

TRACE ELEMENT ANALYSIS BY XRF Continued...

| Hole No. | Depth | Sample No. | Ba | Ce | Co | Cr | Cu | La | Nb | Ni | Pb | Rb | Sc | Sr | Th | V | Y | Zn | Zr | Geological Log |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H1 | 60.5 m | 206252 | 955 | 82 | 47 | 160 | 137 | 111 | 9 | 160 | 48 | 103 | 19 | 7 | 15 | 150 | 30 | 183 | 117 | Pyritic black shale (Que River Slates) |
| | 103.5 m | 206253 | 1601 | 197 | 44 | 22 | 110 | 222 | 5 | 31 | 0 | 95 | 22 | 550 | 13 | 178 | 30 | 73 | 140 | Andesitic pyroclastic |
| H2 | 202 m | 206254 | 2304 | 153 | 65 | 10 | 18 | 171 | 6 | 22 | 70 | 79 | 18 | 460 | 30 | 128 | 24 | 2684 | 123 | Andesite |
| | 153 m | 206255 | 2240 | 138 | 25 | 3 | 135 | 165 | 9 | 21 | 842 | 28 | 20 | 508 | 20 | 174 | 26 | 1775 | 125 | Andesitic pyroclastic |

# CORE GRINDING FROM HATFIELD DRILL HOLE H2-H2A.

HATDOO2

HOLE No H2-H2A DATE 29/9/77.

| SAMPLE No | FROM (M) | TO (M) | IW (cm) | REMARKS | INITIAL ANALYSIS: BBMINCO. ppm %Cu AAS | ppm %Cu XRF | ppm %Pb AAS | ppm %Pb XRF | ppm %Zn AAS | ppm %Zn XRF | %Fe TIT | ppm Ag AAS | ppb Au AAS | ppm Au FIRE | CHECK LAB: INT. | %Cu | %Pb | %Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 205863 | 30.0 | 35.0 | 500 | | 110 | | 35 | | 120 | | | | | | | | | |
| 64 | 35.0 | 40.0 | 500 | | 80 | | 30 | | 125 | | | | | | | | | |
| 65 | 40.0 | 45.0 | 500 | | 75 | | 35 | | 150 | | | | | | | | | |
| 66 | 45.0 | 50.0 | 500 | | 85 | | 30 | | 155 | | | | | | | | | |
| 67 | 50.0 | 55.0 | 500 | | 80 | | 70 | | 160 | | | | | | | | | |
| 68 | 55.0 | 60.0 | 500 | | 85 | | 30 | | 130 | | | | | | | | | |
| 69 | 60.0 | 65.0 | 500 | | 85 | | 30 | | 125 | | | | | | | | | |
| 70 | 65.0 | 70.0 | 500 | | 80 | | 30 | | 115 | | | | | | | | | |
| 71 | 70.0 | 75.0 | 500 | | 145 | | 25 | | 155 | | | | | | | | | |
| 72 | 75.0 | 80.0 | 500 | | 125 | | 45 | | 165 | | | | | | | | | |
| 73 | 80.0 | 85.0 | 500 | | 90 | | 50 | | 140 | | | | | | | | | |
| 74 | 85.0 | 90.0 | 500 | | 80 | | 50 | | 150 | | | | | | | | | |
| 75 | 90.0 | 95.0 | 500 | | 70 | | 100 | | 260 | | | | | | | | | |
| 76 | 95.0 | 100.0 | 500 | | 70 | | 65 | | 190 | | | | | | | | | |
| 77 | 100.0 | 105.0 | 500 | | 60 | | 50 | | 155 | | | | | | | | | |
| 78 | 105.0 | 110.0 | 500 | | 75 | | 40 | | 110 | | | | | | | | | |
| 79 | 110.0 | 115.0 | 500 | | 70 | | 35 | | 105 | | | | | | | | | |
| 80 | 115.0 | 120.0 | 500 | | 80 | | 60 | | 155 | | | | | | | | | |
| 81 | 120.0 | 125.0 | 500 | | 75 | | 40 | | 140 | | | | | | | | | |
| 82 | 125.0 | 130.0 | 500 | | 75 | | 40 | | 130 | | | | | | | | | |
| 83 | 130.0 | 132.8 | 280 | CHANGE IN ROCK TYPE | 70 | | 40 | | 105 | | | | | | | | | |
| 84 | 132.8 | 135.0 | 220 | FROM SHALE TO ANDESITE. | 65 | | 45 | | 105 | | | | | | | | | |
| 85 | 135.0 | 190.0 | 500 | | 65 | | 40 | | 55 | | | | | | | | | |
| 86 | 140.0 | 145.0 | 500 | | 55 | | 55 | | 65 | | | | | | | | | |
| 87 | 145.0 | 150.0 | 500 | | 55 | | 640 | | 780 | | | | | | | | | |
| 88 | 150.0 | 155.0 | 500 | | 60 | | 900 | | 2200 | | | | | | | | | |
| 89 | 155.0 | 160.0 | 500 | | 150 | | 1040 | | 1900 | | | | | | | | | |
| 205890 | 160.0 | 161.5 | 150 | END OF H-2. | 160 | | 550 | | 2000 | | 28 | | | | | | | |

CORE GRINDING FROM HATFIELD DRILL HOLE - H2 - H2A.

HAT0002A

HOLE No H2-H2A DATE 29/9/77.

| SAMPLE No | FROM (M) | TO (M) | W (cm) | REMARKS | INITIAL ANALYSIS: ppm %Cu AAS | %Cu XRF | ppm %Pb AAS | %Pb XRF | ppm %Zn AAS | %Zn XRF | %Fe TIT | ppm Ag AAS | ppb Au AAS | ppm Au FIRE | CHECK LAB: INT. | %Cu | %Pb | %Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 205891 | 147.75 | 150.0 | 225 | START OF WEDGING FROM | 160 | | 460 | | 1240 | | | | | | | | | |
| 92 | 150.0 | 155.0 | 500 | H2 HOLE. | 155 | | 910 | | 2700 | | | | | | | | | |
| 93 | 155.0 | 160.0 | 500 | | 230 | | 1800 | | 3700 | | | | | | | | | |
| 94 | 160.0 | 165.0 | 500 | | 165 | | 115 | | 3450 | | | | | | | | | |
| 95 | 165.0 | 170.0 | 500 | | 195 | | 1070 | | 2800 | | | | | | | | | |
| 96 | 170.0 | 175.0 | 500 | | 115 | | 1460 | | 2500 | | | | | | | | | |
| 97 | 175.0 | 180.0 | 500 | | 95 | | 710 | | 1400 | | | | | | | | | |
| 98 | 180.0 | 185.0 | 500 | | 95 | | 720 | | 1420 | | | | | | | | | |
| 99 | 185.0 | 190.0 | 500 | | 70 | | 205 | | 1858 | | | | | | | | | |
| 900 | 190.0 | 195.0 | 500 | | 90 | | 810 | | 2100 | | | | | | | | | |
| 01 | 195.0 | 200.0 | 500 | | 190 | | 1050 | | 2000 | | | | | | | | | |
| 02 | 200.0 | 205.0 | 500 | | 105 | | 420 | | 4000 | | | | | | | | | |
| 03 | 205.0 | 210.0 | 500 | | 130 | | 600 | | 2700 | | | | | | | | | |
| 04 | 210.0 | 215.0 | 500 | | 210 | | 1500 | | 3100 | | | | | | | | | |
| 205905 | 215.0 | 217.0 | 200 | | 110 | | 225 | | 690 | | (15) | | | | | | | |