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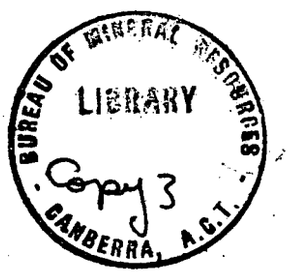

GEOCHEMICAL AND RADIOMETRIC INVESTIGATIONS, GOULD AREA, NORTHERN TERRITORY, 1966. (MOUNT MINZA AND WATERHOUSE No.2 AREAS)

by

D.G. Semple

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SUMMARY

A detailed geological, geochemical, and radiometric investigation of the Mount Minza area and Waterhouse No. 2 Prospect, Gould area, Northern Territory, was carried out in 1966 to test anomalies detected in previous investigations.

Geochemical sampling outlined thirteen copper anomalies, seven nickel anomalies, and three cobalt anomalies, all with greater than twice threshold values. Most of the copper anomalies are related to north-east trending faults; the strongest of these anomalies was C10, at the Waterhouse No. 2 Prospect, with a peak of 3,000 ppm. The nickel and cobalt anomalies appear to be related to certain horizons in the Golden Dyke Formation. The radiometric survey revealed anomalous radioactivity at the Waterhouse No. 2 Prospect.

A programme of rotary percussion drilling to test the Waterhouse No. 2 Prospect, and two diamond drill holes to test a significant nickel copper-cobalt anomaly, are proposed.

INTRODUCTION

The Darwin Uranium Group of the Bureau of Mineral Resources carried out reconnaissance geological, geochemical, and geophysical surveys in the Gould area in 1965 (Shatwell & Duckworth, 1966) and outlined two broad areas of anomalous geochemical values:

(a) Mount Minza, and

(b) Waterhouse No. 2 Prospect,

of which only Mount Minza was tested in detail.

This report describes the results of detailed geological, geochemical, and radiometric surveys north and west of Mount Minza, and at the Waterhouse No. 2 Prospect.

Location and Physiography

The survey covered an area of about five square miles south of the township of Batchelor, between the eastern margin of the Waterhouse Granite and the Stuart Highway (Plate 1).

The area consists of lightly timbered black soil plains with intervening quartzite strike ridges rising about 100 feet above the plains. The highest point, Mount Minza, rises 300 feet above the plains. Intermittently flowing watercourses drain to the west and south-east.

Previous work

The regional geology of the Gould area has been described by Malone (1958) in his report on the Darwin/Adelaide River area. The Waterhouse No. 2 Prospect was outlined by airborne radiometric surveys in 1952 and 1957 (Wood and McCarthy, 1952; Livingstone, 1959).

Methods

A grid surveyed over the Gould area in 1965 consisted of traverses 2,400 feet apart, pegged at 50-foot intervals. In 1966, additional traverses were pegged 400 feet apart between the original traverse lines. Auger holes were drilled by a Gemcodrill at intervals of 200 feet along all traverse lines. The purpose of auger drilling was threefold:

1. to collect samples, preferably of weathered rock, for geochemical analysis;
2. to measure readioactivity to moderate depths; and
3. to provide geological information for mapping concealed geological boundaries.

Drilling commenced on May 4th, and finished on August 5th, 1966. Two drills were employed during the first two months, one owned and operated by the B.M.R., the other under contract. A total of 27,026 feet were drilled, 17,609 feet by the B.M.R. and 9,417 feet by contract. In areas of outcrop, samples were collected with a mattock. All samples were submitted to the Australian Mineral Development Laboratories, Adelaide, for determination of copper, cobalt, and nickel by atomic absorption spectrophotometer.

Auger holes were tested for radioactivity with a Harwell type 1368A ratementer. Readings were recorded at intervals of one foot.

A diamond drill hole, D.D.H. 66/4, was also put down to an inclined depth of 422 feet in the Mount Minza area, to test Slingram, geochemical, and radiometric anomalies indicated by the 1965 survey, but no significant mineralization was intersected. A summary log of this hole is given in Appendix 1.

STRATIGRAPHY

The geological succession in the Gould area has been described by Shatwell and Duckworth (1966), who recorded the following units, in order of increasing age:

Superficial deposits	Quaternary
Laterite	?Tertiary
Amphibolite	?Lower Proterozoic
Noltenius Formation	Lower Proterozoic
Acacia Gap Tongue of the Masson Formation	
Golden Dyke Formation	
Coomalie Dolomite	
Crater Formation	

The Acacia Gap Tongue and the Crater Formation were not encountered in the 1966 Survey (Plates 2, 3, 6.)

Coomalie Dolomite

The south-western part of the area is soil-covered, but auger samples were obtained of a light red-brown, fine-grained quartz sand, with minor ironstone grains, in a ferruginous matrix. Elsewhere in the Rum Jungle area, similar sand is known to overlie the Coomalie Dolomite. A small exposure of breccia underlying this sand consists of quartzite fragments with minor specular hematite in a limonitic and siliceous matrix. On weathered samples, the rock has a vuggy appearance which is characteristic of silicified carbonate rocks. A similar rock forms pods along the boundary with the overlying Golden Dyke Formation.

Golden Dyke Formation

The Golden Dyke Formation underlies most of the Gould area, but exposures are only found in outcrops around Mount Minza and in costeans at the Waterhouse No. 2 Prospect. Tremolitic siltstone, sericitic schist, graphitic and chloritic black shale, and amphibolite are the main rock types. Facies changes and lensing out of beds are common. Alternating beds of graphitic and chloritic black shales, with some amphibolite, are characteristic of the middle part of the Formation, whereas tremolitic siltstone and sericitic schist predominate towards the top.

In the areas of outcrop, hematite quartz breccia (H.Q.B), banded ironstone, and silicified shale predominate. The H.Q.B. acts as a marker horizon throughout the area because of its resistance to weathering.

Noltenius Formation

The Noltenius Formation is well exposed in the core of a syncline in moderately rugged country south-west of the Minza area. The main rock type is a grey medium-grained subgreywacke containing over 50% quartz grains, with interbedded lenses of siltstone and silicified shale. The derived soil is ginger-brown and talcose, and contains subgreywacke fragments and quartz grains.

Amphibolite

Amphibolite bodies form narrow condordant zones within the Golden Dyke Formation. Outcrop is sparse, and in soil covered areas amphibolite was assumed to be present wherever khaki to green-brown clay, commonly containing magnetite grains and generally calcarous concretions, occurred in the auger cuttings. Moreover, radiometric readings in amphibolite are very low - of the order of 0.006mR/Hr.

Geophysical results (Farrow, 1967) indicate that two types of amphibolite occur in this area; one type is associated with both E M Gun and magnetic anomalies, the other solely with E M Gun anomalies. The difference is probably due to the occurrence of significantly greater amounts of magnetite and/or pyrrhotite in the magnetic amphibolite bodies. Moreover, the magnetic amphibolite bodies are in many places associated with nickel anomalies, whereas the non-magnetic type, with one important exception, does not contain even threshold nickel values. This association suggests that the magnetic amphibolite bodies are essentially igneous rocks, as nickeliferous magnetite is a common accessory of basic igneous rocks.

TABLE 1

SUPERFICIAL DEPOSITS

HORIZON	COOMALIE COLOMITE (Dolomite)	NOLTENIUS FORMATION (Subgreywacke)	(Shale)	GOLDEN DYKE FORMATION (Siltstone/Schist)	Amphibolite	REMARKS
A	Brown soil, commonly lateritised.	Seldom present	Grey soil, commonly curry-brown.	Grey to brown soil	Grey-brown soil.	Not always present; usually less than one-foot thick.
B	Pale brown sandy ferruginous soil with rounded, fine-grained quartz.	Pale orange to brown talcose soil.	Brown to red-brown soil with iron-stone.	Brown to red-brown ferruginous soil or clay, commonly sericitic.	Red-brown clay with calcareous fragments and iron-stone.	Thickness varies according to formation and situation.
C	Nowhere reached by auger drill.	Ginger-brown talcose soil with fragments of subgreywacke.	Light grey to dark grey or black, depending on graphite content. Very talcose soil with shale frag-ments.	Pale fawn serici-tic soil with rock fragments.	Khaki-green to brown-green clay with magne-tite and schistose fragments.	Colour usually indicative of rock type.

In support of this suggestion, an amphibolite assocated with magnetic and nickel anomalies was intersected in a diamond drill hole just north of the Waterhouse No. 2 Prospect (collared at about 245S, 392.5E, depressed to 55° grid west - Ruxton, 1961), and was described as an igneous rock. On the other hand, the non-magnetic amphibolites are unlikely to be igneous rocks, but are most probably amphibole-chlorite schists formed by low-grade regional metamorphism from lenses of semi-calcareous composition. In auger cuttings, fragments of such schist would be indistinguishable from weathered igneous amphibolite.

This division into igneous and non-igneous amphibolite is of importance in determining which of the nickel anomalies in this area may be of economic significance.

Laterite

Laterite is sporadically distributed over the Gould area, and in many places appears to be associated with fault zones.

Superficial Deposits

Most of the Gould area is covered by residual and semi-residual soils which are generally divisible into A, B, and C horizons (not all of which are everywhere present). Typical profiles are summarzed in Table 1.

STRUCTURE

The rocks of the Mount Minza area are folded into a south-plunging anticline, whose outlines are well marked by zones of H.Q.B. and banded ironstone and also by the long axes of Slingram and Turam anomalies. This anticline is separated from the easterly dipping sequence in the vicinity of the Waterhouse No. 2 Prospect by a syncline which is well developed in the Noltenius Formation.

The structure of the Mount Minza area is dominated by three parallel, north-easterly trending faults, the largest of which passes just north of the Waterhouse No. 2 Prospect. These faults are all sub-parallel to the Giants Reef Fault, which defines the major fault direction in the Rum Jungle East and Rum Jungle Triangle areas. However, they appear to have

only small displacements, which are in the same direction as the Giant's Reef Fault movement, that is, north block east.

GEOCHEMICAL AND RADIOMETRIC RESULTS

The geochemical analyses and radiometric results are tabulated in Appendix 2.

In many localities, the top five feet of soil showed high radiometric readings which did not persist in depth. As the aim of the drilling was to determine radioactivity in weathered rock of in residual soils, the results of each auger hole have been grouped into those from the A and B soil horizons and those from the C soil horizon, the maximum in each group being shown in the table. It is considered that, in general, anomalies which persist into the C horizon are more significant than those which do not.

Statistical Analysis

Copper, cobalt, and nickel values from the auger samples, and maximum radioactivity from the A/B horizon and C horizon in auger holes, were plotted as cumulative frequency curves on logarithmic probability paper (Plate 9), following the method outlined by Tennant and White (1959), and adopted for all Rum Jungle surveys since 1963. The purpose of the plots was to attempt a division of the values into anomalous and background populations. Table 2 summarizes the estmated background and threshold values for base metals and radioactivity.

TABLE 2

BACKGROUND AND THRESHOLD VALUES FOR BASE METALS AND RADIOACTIVITY

	Background	Threshold	Percentage of results below threshold value
Cu	60 ppm	200 ppm	92%
Co	60 ppm	200 ppm	99%
Ni	60 ppm	400 ppm	91%
A/B horizon radioactivity	0.015 mr/Hr	0.030 mr/Hr	99.6%
C horizon radioactivity	0.020 mr/Hr	-	-

Geochemical Results

Plates 4 and 5 show the geochemical contours for the Gould area.

Copper: Thirteen copper anomalies with at least twice threshold values have been indicated. Of these the most important is C10, situated at the Waterhouse No. 2 Prospect, with a peak value of almost sixteen times threshold. This anomaly will be discussed in another section. Of the other anomalies, C1, C8, and C11 are four times threshold. All lie in the Golden Dyke Formation, though there is no consistent association with any particular rock type or any stratigraphic positions, the common factor being structural, as eleven of the anomalies are associated with faults. The principal fault of the area, which extends north-easterly from the Waterhouse No. 2 prospect, controls anomalies C12, C11, C10 and C9, and the two parallel faults in the Mount Minza area control C6, C7, C8, C4 and C3.

Nickel: There are seven nickel anomalies with twice threshold values, and two, Ni2 and Ni6 have peak values five times threshold. As mentioned earlier, most of the nickel anomalies are associated with amphibolite of probable igneous derivation. The one exception is Ni6 which has a peak of 2300 ppm in tremolitic siltstone, and a subsidiary peak of 1250 ppm in non-magnetic amphibolite, with associated cobalt values of 276 ppm and 1210 ppm respectively. This close geochemical affinity between tremolitic siltstone and amphibolite suggests that both could be metamorphic derivatives of an impure calcareous parent rock. This anomaly is therefore thought to be of greater significance than those associated with igneous amphibolite, which probably have resulted from local concentration of nickel normally associated with magnetite in these rocks.

Cobalt: There are two cobalt anomalies with twice threshold values, and one, Co3, which has a peak value six times threshold.

Radiometric Results

Plates 4 and 5 also show the radiometric results for the Gould area. Contours commence with the background value, and have a contour interval of 0.005 mR/Hr.

The results of the radiometric survey in the Gould area are generally unpromising.

A and B horizons: R2 is a surface anomaly in laterite, and is regarded as insignificant. R5, a surface anomaly extending on strike from the Waterhouse No. 2 Prospect at 237S to 285S, is associated with the H.Q.B. - graphitic black shale sequence, and its northern extension overlies C horizon anomalies R3 and R4, where it may assume significance.

C horizon: R1 consists of two isolated insignificant anomalies, barely above background. R3 and R4 will be discussed in a subsequent section of this report, dealing with the Waterhouse No. 2 Prospect. R6 and R7 are insignificant anomalies lying close to the Noltenius Formation boundary. R8 occurs in the Noltenius Formation, and is also insignificant.

Table 3 lists the geochemical and radiometric anomalies in the Gould area.

TABLE 3

GEOCHEMICAL AND RADIOMETRIC ANOMALIES

No/Type	Location	Value	Association	Remarks
C1, R1	143S-151S, 496E	800 ppm Cu at 145S, 496E; 0.022 mR/Hr at 149S, 496E.		Isolated value
C2	163S-169S, 484E	400 ppm Cu at 165S, 484E	Coincides with anomaly Ni2	"
Ni2	163S-181S, 470E-486E	1990 ppm Ni at 177S, 476E; 1300 ppm Ni at 165S, 484E	Coincides with magnetic anomaly and anomaly Col.	Large area of above threshold values.
Co1	175S-179S, 476S	417 ppm Co at 177S, 476E		
Ni1	159S-169S, 490E-506E	1200 ppm Ni at 165S, 496E; 800 ppm Ni at 165S, 504E		In amphibolite, not significant
C3	175S-179S, 498E	460 ppm Cu at 177S, 498E	E.M.Gun anomaly & Turam anomaly	Related to fault Isolated value
Ni3	179S-187S, 490E-496E	844 ppm Ni at 181S, 494E	Geophysical anomalies. Threshold copper.	South of C3. In amphibolite-probable cause of geophysical anomalies.
C4	187S-193S, 481S-484S	475 ppm Cu at 189S, 482E	Threshold nickel.	South of Ni3. Related to fault.
Ni4	183S-191S, 469S-473E	1180 ppm Ni at 185S, 470E	Threshold copper.	In black shale.

Table 3 (Cont.)

No/Type	Location	Value	Association	Remarks
Ni5	165S-189S, 449E-466E	1160 ppm Ni at 177S-456E; 1070 ppm Ni at 181S, 456E	Coincides with anomaly C5	Peak values in black shale.
R2	181S,446E	0.027 mR/Hr		Surface anomaly.
C5	177S-191S, 454E-457E	500 ppm Cu at 189S, 456E		
C6	193-205S, 460E	403 ppm Cu at 197S, 460E		Related to fault.
C7	203S-211S, 462E-467E	495 ppm Cu at 205S, 464E	Coincides with anomaly Co2	Amphibolite-limestone contact, related to fault.
Co2	203S-209S, 463E-465E	450 ppm Co at 205S, 464E		
C8	197S-207S, 468E-475E	806 ppm Cu at 201S, 470E; 782 ppm Cu at 205S,472E	Threshold cobalt.	Peaks both sides of fault.
C9	219S-225S, 407E,413E	475 ppm Cu at 225S, 408E	EM Gun anomaly parallel to fault.	Related to fault
C10	245S-257S, 391E-396E	2950 ppm Cu at 247S, 392E; 1510 ppm Cu at 251S,394E; 1030 ppm Cu at 253S,392E.	Threshold nickel. Coincides with R3,R4,R5. Two parallel EM Gun anomalies.	Lies stratagrafically above H.Q.B. in graphitic and siliceous shale; contours swing NE along fault.
R3,R4	245S-255S, 392E-396E	0.033 mR/Hr at 247S, 394E		Controlled by fault. Peak in graphitic shale.
R5	237S-285S, 386E-404E	0.054 mR/Hr at 253S, 392E; 0.065 mR/Hr at 285S,394E		Surface anomaly only.
C11	253S-259S, 384E-398E	780 ppm Cu at 257S, 386E	Coincides with anomaly Ni6. Threshold cobalt.	Related to fault.
C12	259S-271S, 377E-386E	468 ppm Cu at 261S, 382E; 430 ppm Cu at 265S,380E	Coincides with anomalies Ni6 and Co3.	Related to fault.

Table 3 (Cont.)

No/Type	Location	Value	Association	Remarks
Ni6	251S-277S, 381E-388E	2300 ppm Ni at 257S, 386E; 1250 ppm Ni at 261S,382E.	No magnetic anomaly. Coincides with anomalies C11, C12 and Co3.	Tremolitic siltstone and amphibolite. Most significant of all nickel anomalies.
Co3	257S-263S, 381E-384E	1210 ppm Co at 261S, 382E.	Coincides with anomaly Ni6.	
C13	211S-215S, 365E-367E	445 ppm Cu at 213S, 366E.		Isolated value.
Ni7	199S-211S, 374E-387E	1330 ppm Ni at 205S, 380E; 1250 ppm Ni at 209S,376E; 980 ppm Ni at 201S,384E.	Threshold copper. Magnetic anomaly.	Anomaly trends NE in amphibolite.
R6	265S, 408E	0.023 mR/Hr.		Probably Insignificant.
R7	233S, 420E	0.027 mR/Hr.		" "
R8	265S, 422E	+0.025 mR/Hr.		" "

WATERHOUSE No. 2 PROSPECT

Introduction

Following upon recommendations of the 1965 reconnaissance survey (Shatwell & Duckworth, 1966), detailed geological, geochemical, and radiometric work was carried out at the Waterhouse No. 2 Prospect. Additional traverses were pegged 200 feet apart between the 400-foot traverse lines, and auger holes were drilled at intervals of 100 feet along all traverse lines. To ensure adequate mesurement of sub-surface radioactivity, holes were drilled 5 to 6 feet into weathered bedrock wherever possible (total depth generally about 30 feet).

The prospect is 600 feet west of the North Australian Railway, and lies about three miles from the south end of Gould airstrip. It is situated in country of low relief rising about 15 feet above the adjacent alluvial plain.

Copper and radiometric anomalies had first been revealed in this area by a preliminary geological, radiometric, geochemical, and magnetic survey (Wyatt and Alle, 1953). In 1953 three costeans were excavated by the B.M.R. Subsequently, the area was held under reserve by United Uranium N.L.; this company sank a shaft to 41 feet, drilled a diamond drill hole, and excavated ten costeans. Uranium mineralization was intersected between 34 and 38 feet in the shaft. The diamond drill hole, (situated about 160 feet east of the shaft) was drilled vertically to 280 feet, intersecting pyritic shale with only trace amounts of copper, lead, zinc and nickel. No significant radioactivity was detected. Two diamond drill holes were put down to test electromagnetic anomalies found in 1957 (Daly and Tate, 1960):

Collar: D.D.H./2 : 250.6S, 395.5E Grid W, depressed at 55°.
D.D.H./4 : 245S, 392.5E Grid W, depressed at 55°.

The results are described by Ruxton (1961), who reported anomalous radioactivity in black shales in D.D.H. 2 and minor (2%) amounts of pyrite and chalcopyrite.

Stratigraphy

Shatwell (Shatwell and Duckworth, 1966) has shown that the succession of sediments in the core of the Mount Minza anticline can be correlated with that at the Waterhouse No. 2 Prospect (Table 4).

TABLE 4

CORRELATION: MINZA AND WATERHOUSE AREAS

Waterhouse No. 2	Mount Minza
Banded shale and siltstone	
Shale (Silicified)	Shale (Silicified)
Graphitic black shale	Graphitic black shale
Shale (Silicified)	
Hematite quartz breccia	Hematite quartz breccia
Graphitic black shale	Graphitic black shale
Banded ironstone	Banded ironstone
Tremolitic siltstone	Tremolitic siltstone

Plate 6 shows the geology of the Waterhouse No. 2 Prospect at a scale of 1" to 200 feet.

The tremolitic siltstone crops out at the Waterhouse No. 2 Prospect as a small rocky hill. It is a fine grained, well bedded buff-brown rock, seldom found fresh in the Gould area, and in most exposures is heavily ferruginous. The rock consists of quartz and tremolite with minor sphene, the brown colour being due to the weathering of tremolite to a ferruginous material.

The banded ironstone consists of alternating thin bands of quartz and hematite, and is well exposed in the Mount Minza area.

Graphitic shales, showing varying degrees of leaching and silicification, are well exposed in the numerous costeans. They grade into siltstone in the upper part of the succession.

Ruxton (1961) considered that the hematite quartz breccia (H.Q.B.) at Waterhouse fills tension gashes. However, regional evidence supports the contention that it is a sedimentary bed, and the breccia can be traced south to Stapleton and north of Mount Minza to Area 65. The H.Q.B. is a pinkish-white rock made up of angular quartzite fragments, ranging in size from a few inches to sand size particles, set in a hematite matrix, with specular hematite occurring as isolated grains. The H.Q.B. bears some resemblance to breccias found in the Coomalie Dolomite, and has undergone post-depositional silicification and enrichment in hematite.

Structure

The beds in the vicinity of the Waterhouse No. 2 Prospect lie on the western limb of a syncline, and have a general strike of 350°, with easterly dips. Variations in strike and dip occur in the shales and H.Q.B., owing to local flexures. The sequence is truncated at the northern end by a major north-easterly trending fault, which extends to the area north of Mount Minza. The graphitic shales show a fracture cleavage, generally vertical, which parallels this fault direction.

Mineralization

Malachite coatings with associated torbernite occur in the costeans immediately to the north and south of the shaft. The mineralization is confined to a few bedding plane exposures in the graphitic shale.

Geochemical Results

Plate 7 shows the geochemical contours for the Waterhouse Prospect at a scale of 1" to 200 feet.

Copper anomaly C10 is the highest found in the Gould area. There are three peaks:

1. 2950 ppm at 247S, 392E; and 1620 ppm at 247S, 393E.
2. 1510 ppm at 251S, 394E.
3. 1030 ppm at 253S, 392E.

Peak 1 is associated with threshold nickel values.

The anomaly lies in graphitic and silicified shales up-dip from the H.Q.B. bed. The north-south trend of the anomaly, parallel to the strike of the shales, suggests a bedding control for the mineralization. This is supported by evidence from diamond drill hole D.D.H. 2, put down to test an electromagnetic anomaly; this intersected minor amounts (about 2%) of pyrite and chalcopyrite "in veins less than one-tenth of an inch thick, commonly following the bedding" (Ruxton, 1961).

The 100 ppm copper contour turns sharply at 245S, and follows the north-east direction of the fault. This, and the fact that the copper values decrease south, away from the fault, suggests that the mineralising solutions may have been introduced into the shales via the fault. The fault itself, or the parallel fracture cleavage in the shales, may therefore control the present distribution of copper minerals.

Radiometric Results

Plate 8 shows the radiometric contours for both A/B soil horizons and C soil horizon. Like the copper values, these are the highest found in the Gould area.

A/B soil horizon results (anomaly R5) show that most of the prospect area has above background radioactivity. Three above threshold peaks are indicated:

1. 0.054 mR/Hr at 253S, 392E (R5b)
2. 0.040 mR/Hr at 247S, 393E (R5a)
3. 0.030 mR/Hr at 257S, 393E (R5c)

Peaks R5a and R5b correspond to copper peaks, suggesting that the radioactivity and base metal mineralization are related.

C soil horizon results (anomalies R3 and R4) are only slightly higher than background. The R3 contours, like the copper contours, trend north-easterly along the faults. The highest value recorded was 0.033 mR/Hr at 247S, 394E.

Geophysical results

These are discussed in detail in a separate report (Farrow, 1967). It is sufficient to say here that the anomalous area is characterized by two roughly parallel north-south troughs of the E.M. Gun real component values, which terminate at the fault. The anomalies are probably due to two separate beds, viz. the graphitic shales above and below the H.Q.B. horizon (Farrow, pers. comm.)

Induced polarisation readings taken along traverses 249S and 253S clearly indicate the zone of high conductivity causing the E.M. anomaly, but frequency effects in the region of the conductor do not suggest a high degree of metallic mineralization.

CONCLUSIONS

Within the area covered by the present survey, the Waterhouse No. 2 Prospect is the only favourable locality for uranium mineralization.

Anomalies R3, R4, and R5 are associated with the H.Q.B.-graphitic black shale sequence. This association of radiometric anomalies with H.Q.B. is a common occurrence in the Rum Jungle district, as both Whites' and Rum Jungle Creek South uranium deposits are found close to phosphatic H.Q.B. It is not known whether or not the H.Q.B. at Waterhouse No. 2 Prospect contains phosphate, but the H.Q.B. can be traced south to the phosphate-rich H.Q.B. at Stapleton.

In the absence of phosphate, uranium would not be so readily fixed in the weathered rock, and thus auger drilling results would probably show that anomalous radioactivity was a near-surface effect only, due to lateritic-type weathering. Therefore, although the radiometric values are not especially high, and in many places are confined to the top few feet of soil, it is recommended that a programme of rotary-percussion drilling be undertaken to test the Waterhouse No. 2 Prospect.

The copper anomalies in the Gould area, related as they are to the north-east trending faults, could indicate areas of mineralization in fracture zones associated with these faults. Of the anomalies, C10 is of primary importance, and is related to the radiometric anomalies. Geophysical results indicate a relatively shallow depth, and rotary-percussion drilling would be advisable in the vicinity of the fault. These holes would serve the dual purpose of testing both radiometric and copper anomalies.

Of the nickel anomalies only those associated with non-magnetic amphibolite bodies are thought to be significant, as anomalies over igneous amphibolite probably indicate only a local concentration of nickel obtained from nickeliferous magnetite. Thus anomaly Ni6, which overlies a non-magnetic amphibolite, and is associated with minor copper and cobalt anomalies, is regarded as a significant anomaly, and is favourably located near the major Minza-Waterhouse fault; two diamond drill holes to test this anomaly are recommended.

RECOMMENDATIONS

The following rotary-percussion sites are recommended at the Waterhouse No.2 Prospect (Table 5.)

TABLE 5.

PROPOSED ROTARY PERCUSSION DRILLING AT WATERHOUSE PROSPECT

	Collar		Length	Target
A	247S	392E	200 feet	Radiometric and copper anomalies.
B	247S	393E	"	
C	247S	394E	"	"
D	247S	395E	"	"
E	253S	392E	"	"
F	253S	393E	"	"
G	253S	394E	"	"
H	253S	395E	"	"

If encouraging results are obtained, further drilling - possibly to a total of 10,000 feet - may be required.

The following diamond drill sites are recommended to test anomalies Ni6, C11 and Co3 (Table 6).

TABLE 6

PROPOSED DIAMOND DRILLING

	Collar		Azimuth	Depression	Length	Target
A	257S	388E	Grid W	45°	350 feet	Ni6, C11 at 200'
B	261S	384E	Grid W	45°	350 feet	Ni6, Vo3 at 200'

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APPENDIX 1

LOG OF D.D.H. 66/4

This hole was designed to test strong Slingram and weak geochemical and radioactive anomalies in black slate overlying H.Q.B. in the Mount Minza areas. The anomalies were outlined by the 1965 survey (Shatwell & Duckworth, 1966). The hole was collared at 237S, 460E, depressed at 60°, grid west.

Following is a summary log:

0 - 210 feet	Grey shale with claystone bands. Pyritic from 200 feet.
210 - 340 feet	Black pyritic graphitic slate. Trace of chalcopyrite at 300 feet.
340 - 390 feet	H.Q.B. with minor pyrite.
390 - 422 feet	Grey siliceous slate.

The core was scraped in 20-foot sections from 200 feet and the scrapings spectrographically scanned for trace elements by A.M.D.L. Between 340 and 380 feet the scarpings were found to contain 10 ppm Ag.

Probing revealed no anomalous radioactivity.

APPENDIX 2

GEOCHEMICAL ANALYSIS OF SAMPLES

Geochemical analyses of samples from the Gould area traverses are listed by co-ordinate position and sample number. Samples were analysed at AMDEL by atomic absorption spectrophotometer and all results are in ppm. A minus (-) in front of a number here means "less than".

Mattock samples taken from outcrop or sub-outcrop are marked "M". All others are bottom-hole auger samples with depth shown.

Auger holes were probed (Harwell 1368A ratemeter) for radioactivity, the first column shows maximum radioactivity for the A/B soil horizon, the second column that for the C soil horizon.

Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr). A/B.hor.	C.hor.
66120042	145S	432E	89	16	51	M	-	-
41		434E	24	7	35	5	.008	-
40		436E	52	7	35	23	.010	.011
39		438E	127	25	250	17	.010	.007
38		440E	91	13	47	23	.010	.007
37		442E	98	22	70	17	.008	.005
36		444E	17	-6	42	23	.010	.011
35		446E	70	22	85	17	.007	.007
34		448E	97	-6	47	23	.011	.009
33		450E	35	-6	55	23	.011	.010
32		452E	26	-6	30	23	.010	.010
31		454E	89	24	237	11	.010	---
30		456E	26	-6	20	23	.012	.012
29		458E	10	-6	7	23	.013	.013
27		460E	10	-6	12	17	.011	.012
26		462E	135	20	208	29	.007	.010
25		464E	10	-6	12	23	.010	.013
24		466E	14	124	300	23	.006	.004
23		468E	28	47	138	17	.008	.003
22		470E	93	79	135	'M'	Sample	
21		472E	67	-6	26	11	.010	.013
20		474E	40	-6	24	11	---	.012
19		476E	162	11	290	11	.007	.009
18		478E	98	-6	83	11	.006	.011
17		480E	26	-6	10	11	.008	.012
16		482E	30	-6	16	13	.016	.013
15		484E	120	-6	67	8	.009	.008
14	145S	486E	52	31	67	17	.009	.010

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) A/B.hor.	C.hor.
66120013	145S	488E	24	17	30	29	.011	.013
12		490E	24	-6	10	29	.013	.014
11		492E	80	7	105	23	.008	.007
10		494E	127	29	262	23	.010	.013
09		496E	800	81	345	23	.009	.014
08		498E	33	-6	20	23	.015	.011
07		500E	125	26	80	29	.011	.011
06		502E	109	34	365	29	.011	.004
05		504E	114	61	630	23	.011	.005
04		506E	235	69	512	11	.011	.010
66120003	145S	508E	43	30	130	"M" / SAMPLE		
66120043	149S	432E	30	-6	27	17	.009	.012
44		434E	98	22	79	23	.011	.009
45		436E	30	145	14	17	.008	.009
46		438E	170	47	203	23	.012	.013
47		440E	30	-6	25	17	.009	.011
48		442E	7	-6	15	23	.009	.012
49		444E	35	-6	20	23	.006	.009
50		446E	33	-6	35	23	.006	.008
51		448E	119	31	487	23	.006	.005
52		450E	10	20	26	23	.006	.002
53		452E	18	-6	26	23	.011	.011
54		454E	30	-6	50	23	.011	.012
55		456E	27	-6	22	23	.011	.013
56		458E	27	-6	15	23	.012	.012
57		460E	20	-6	-6	23	.010	.011
58		462E	44	-6	43	23	.010	.010
59		464E	16	-6	12	21	.009	.010
60		466E	18	-6	-6	23	.010	.011
61		468E	40	43	203	17	.009	.012
62		470E	75	-6	-6	17	.007	.012
63		472E	44	-6	26	"M" / SAMPLE		
64		474E	16	-6	-6	17	.013	.012
65		476E	14	-6	-6	11	.010	---
66		478E	12	-6	-6	17	.012	---
67		480E	20	7	33	12	.009	.012
68		482E	18	-6	7	12	.011	---
69		484E	20	-6	-6	7	.008	---
70		486E	63	-6	15	23	.010	.012
71		489E	18	-6	-6	23	.011	.013
72		490E	70	7	40	23	.008	.012
73		492E	18	-6	7	29	.013	.011
74		494E	132	23	85	23	.009	.010
75		496E	254	14	145	23	.012	.022
66120076	149S	498E	73	11	42	23	.010	.010

Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) A/b.hor.	C.hor.
66120077	149S	500E	63	23	145	17	.007	.013
78		502E	163	66	750	23	.012	.013
79		504E	155	50	490	23	.015	.004
80		506E	170	16	203	17	.019	---
66120081	149S	508E	12	-6	24	'M' / Sample		
66120101	153S	432E	40	14	26	23	.007	.007
02		434E	40	16	42	23	.007	.008
03		436E	54	18	55	23	.008	.007
04		438E	84	20	60	29	.007	.005
05		440E	84	34	94	29	.006	.007
06		442E	22	37	25	29	.006	.004
07		444E	4	43	15	23	.008	.004
08		446E	22	18	67	23	No Count	
09		448E	22	22	51	23	.005	.009
10		450E	33	40	75	23	.004	.003
11		452E	27	14	33	23	.006	.005
12		454E	27	18	35	23	.005	.005
13		456E	30	20	50	23	.005	.004
14		458E	56	18	65	23	.005	.005
15		460E	14	11	-6	23	.006	.006
16		462E	8	-6	-6	23	.008	.008
17		464E	33	11	94	-5	.009	.010
18		466E	104	55	143	'M' / Sample		
19		468E	75	11	51	23	.008	.011
20		470E	127	105	170	'M' / Sample		
21		472E	89	125	180	'M' / Sample		
22		474E	132	43	123	'M' / Sample		
23		476E	16	7	7	7	.008	.009
24		478E	30	11	7	5	.005	.006
25		480E	37	11	12	5	.007	.008
26		482E	30	7	-6	7	.004	.008
27		484E	65	16	15	-6	007	.008
28		486E	75	43	62	'M' / Sample		
29		488E	108	20	67	6	.007	.010
30		490E	217	275	540	23	.009	.007
31		492E	89	72	410	29	.007	.004
32		494E	56	63	143	23	.007	.008
33		496E	170	63	110	23	.006	.010
34		498E	101	25	64	29	.008	.011
35		500E	79	23	70	23	.008	.007
66120136	153S	502E	40	11	57	23	.008	.009

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) A/B.hor.	C.hor.
66120137	153S	504E	141	56	357	23	.004	.002
38		506E	16	18	46	'M' / Sample		
66120139	153S	508E	10	-6	-6	'M' / Sample		
66120120	157S	432E	40	-6	70	17	.007	.007
19		434E	30	11	59	17	.008	.005
18		436E	44	20	37	23	.008	.007
17		438E	7	-6	40	23	.009	.013
16		440E	20	31	63	23	.010	.005
15		442E	14	25	26	12	.011	---
14		444E	24	7	33	23	.010	.013
13		446E	35	13	47	23	.007	.009
12		448E	147	80	443	23	.012	.007
11		450E	270	75	410	29	.010	.006
10		452E	30	-6	37	23	.011	.008
09		454E	26	-6	40	23	.010	.011
08		456E	52	43	60	23	.010	.012
07		458E	14	-6	7	15	.010	.014
06		460E	50	-6	35	23	.013	.013
05		462E	7	-6	-6	23	.012	.013
04		464E	5	-6	-6	23	.012	.011
03		466E	173	7	57	23	.008	.012
02		468E	198	133	160	23	.012	.012
01		470E	465	32	113	23	.013	.017
100		472E	235	280	685	17	.009	.008
99		474E	350	112	115	11	.010	.013
98		476E	52	-6	7	23	.011	.014
97		478E	48	18	25	10	.010	---
96		480E	26	-6	12	6	---	---
95		482E	30	-6	10	5	.008	---
94		484E	33	-6	25	'M' / Sample		
93		486E	20	-6	7	8	.008	.010
92		488E	70	18	67	14	.014	---
91		490E	65	33	137	29	.011	.005
90		492E	48	18	115	23	.008	---
89		494E	84	-6	55	23	.011	.009
88		496E	150	120	685	23	.010	.011
87		489E	135	85	357	23	.008	.008
86		500E	140	85	335	23	.009	.006
85		502E	68	14	90	23	.009	.012
84		504E	144	54	400	29	.004	.004
83		506E	10	7	30	'M' / Sample		
66120082	157S	508E	8	-6	7	'M' / Sample		

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Sample No	Co-ordinates Position		Cu	Co	Ni	Sample Depth (Feet)	Radioactivity (mR/Hh) M/B.hor.	C.hor.
66120148	161S	432E	20	31	32	23	.009	.008
44		434E	24	28	32	29	.007	.008
66120176		436E	30	7	30	23	.009	.015
75		438E	17	-6	25	23	.009	---
74		440E	16	7	18	23	.010	.008
73		442E	20	11	25	23	.009	.006
72		444E	22	-6	11	17	.009	.010
71		446E	22	-6	15	17	.009	.011
70		448E	20	-6	-6	17	.009	.010
69		450E	33	-6	18	17	.010	.010
68		452E	17	-6	63	17	.010	.011
67		454E	48	-6	20	11	.008	.008
66		456E	30	-6	-64	7	.008	.009
65		458E	144	23	118	11	.008	---
64		460E	50	-6	20	5	.009	---
63		462E	14	-6	-6	17	.007	.010
62		464E	75	7	22	17	.009	.012
61		466E	124	11	37	23	.008	.007
60		468E	89	165	176	23	.009	.008
59		470E	79	20	70	23	.007	.011
58		472E	75	35	183	23	.006	.007
57		474E	124	31	183	23	.008	.005
56		476E	33	11	35	6	.008	...
55		478E	192	18	37	29	.006	.008
54		480E	24	-6	10	13	---	---
53		482E	65	20	72	'M' / Sample		
52		484E	31	-6	18	'M' / Sample		
51		486E	144	210	215	23	.005	.008
50		488E	70	31	113	23	.006	.005
49		490E	77	50	87	23	.006	.007
48		492E	84	60	195	23	.006	.011
47		494E	138	85	375	29	.007	.010
46		496E	114	100	340	17	.008	---
45		498E	193	117	493	23	.007	---
44		500E	122	100	470	23	.006	.008
43		502E	111	66	300	23	.005	.005
42		504E	24	11	37	23	.009	.010
41		506E	20	20	94	'M' / Sample		
66120140	161S	508E	10	11	7	'M' / Sample		

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) A/B hor.	C.hor.
66120221	165S	434E	43	24	81	23	.008	.010
22		438E	48	-6	40	23	.012	.011
23		442E	50	34	63	'M' / Sample		
24		446E	118	118	232	'M' / Sample		
26		450E	35	9	32	'M' / Sample		
27		451E	17	-6	10	23	.015	.012
28		452E	13	9	-6	17	.011	.011
29		454E	45	-6	32	17	.011	.011
30		458E	80	65	124	'M' / Sample		
31		460E	39	9	18	23	.013	.010
32		462E	204	69	388	23	.011	.010
33		466E	165	259	176	23	.009	.009
34		470E	44	38	194	23	.009	.004
35		474E	130	24	133	17	.010	.009
36		476E	31	-6	25	11	.012	.011
37		478E	85	9	48	17	.009	---
38		480E	106	49	176	21	.006	.005
39		482E	45	-6	44	23	.007	.008
40		484E	300	197	764	23	.007	.004
41		486E	162	73	697	17	.008	.006
42		488E	39	89	232	23	.007	.009
43		490E	62	38	222	23	.009	.008
44		494E	182	69	446	23	.009	.004
45		489E	80	69	274	23	.008	---
46		502E	173	89	274	23	.010	.005
47		504E	152	53	657	23	.004	.003
66120248	165S	506E	98	53	367	'M' / Sample		
66120149	169S	432E	50	-6	48	17	.011	.012
66120180		434E	24	-6	25	23	.010	.010
81		436E	20	-6	25	23	.012	.010
82		438E	47	-6	10	23	.011	.010
83		440E	23	-6	7	23	.011	.010
84		442E	46	28	115	'M' / Sample		
85		444E	100	73	214	'M' / Sample		
86		446E	100	54	150	'M' / Sample		
87		448E	75	27	133	'M' / Sample		
88		450E	50	-6	25	17	.014	.014
89		452E	270	238	541	14	.009	.010
90		454E	56	10	48	23	.016	.014
91	[illegible]	456E	60	7	44	12	.013	.015
92		458E	20	-6	10	17	.016	.017
93		460E	154	81	705	23	.016	.010
94		462E	204	57	618	29	.011	.006
95		464E	115	50	160	35		
66120196	169S	466E	56	65	107	23	.006	.011

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) A/B.hor.	C.hor.
66120197	169S	468E	98	75	232	23	.013	.011
98		470E	93	78	331	23	.009	.007
99		472E	260	150	548	23	.008	.006
200		474E	123	93	413	29	.013	.009
66120301		476E	125	30	287	35	.007	.013
02		478E	230	100	876	23	.010	.010
03		480E	174	91	636	23	.012	.006
04		482E	113	100	743	23	.010	.007
05		484E	249	91	1090	23	.005	.009
06		486E	56	57	178	23	.013	.013
07		488E	80	67	116	23	.014	.020
08		490E	68	42	143	23	.011	.014
09		492E	125	77	307	29	.011	.007
10		494E	152	90	411	23	.013	.007
11		496E	220	98	379	23	.017	.013
12		498E	108	51	226	23	.014	---
13		500E	115	45	251	23	.019	.005
14		502E	108	12	70	23	.011	.012
66120315	169S	504E	67	9	43	6	.010	---
66120266	173S	432E	47	17	56	23	.011	.012
85		434E	45	20	59	23	.010	.011
84		436E	37	20	80	23	.008	.007
83		438E	27	6	14	23	.010	.010
82		440E	14	7	-6	23	.011	.010
81		442E	28	-6	6	23	.012	.010
80		444E	187	9	116	23	.009	.013
79		446E	17	-6	8	23	.012	.014
78		448E	20	6	19	17	.013	.017
77		450E	56	9	36	17	.010	.012
76		452E	28	6	19	17	.012	---
75		454E	20	9	26	23	.012	.008
74		456E	68	21	90	23	.012	.012
73		458E	118	45	348	23	.010	.004
72		460E	132	55	319	23	.010	.017
71		462E	135	113	587	23	.018	.013
70		464E	162	30	112	29	.017	.013
69		466E	115	36	90	23	.014	.016
68		468E	101	150	223	29	.010	---
66120267	173S	470E	93	89	252	29	.012	.006

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Sample No	Co-ordinates Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) A/B.hor.	C.hor.
66120266	173S	472E	113	118	442	29	.011	.006
65		474E	92	78	401	35	.009	.006
64		476E	217	151	610	23	.006	.009
63		478E	179	97	761	29	.009	.005
62		480E	171	118	980	54	.010	---
61		482E	115	65	401	29	.012	---
60		484E	89	57	214	23	.017	---
59		486E	65	69	99	27	.011	.012
58		488E	65	53	166	35	.017	.006
57		490E	65	7	56	23	.013	.011
56		492E	52	9	67	23	.012	.009
55		494E	149	49	241	29	.014	.014
54		396E	93	65	274	23	.013	.006
53		498E	118	31	357	23	.014	.005
52		500E	197	16	194	23	.014	.015
51		502E	22	-6	14	6	---	.013
66120250	173S	504E	4	-6	7	10	.011	---
66120350	177S	432E	27	13	15	23	.009	.007
49		434E	73	30	95	21	.010	.006
48		436E	65	96	92	23	.008	.007
47		438E	73	47	175	23	.008	.002
46		440E	93	27	150	23	.012	---
45		442E	80	39	314	23	.010	.009
44		444E	106	61	379	29	.010	---
4 43		446E	52	30	170	23	.011	---
42		448E	115	90	226	29	.013	.009
41		450E	31	-6	28	23	.012	.012
40		452E	118	51	392	23	.018	.009
39		454E	15	54	708	23	.014	.013
38		456E	298	164	1160	29	.013	.010
37		458E	115	47	386	23	.009	.006
36		460E	120	24	314	29	.011	.009
35		462E	162	100	732	23	.009	.006
34		464E	171	94	833	29	.014	.010
33		466E	112	91	337	23	.016	.011
32		468E	245	157	460	23	.009	.005
31		470E	157	138	330	23	.010	.007
30		472E	106	68	354	29	.011	.005
29		474E	265	143	1050	23	.009	---
66120328	177S	476E	31	417	1990	23	.012	.006

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) A/B.hor.	C.hor.
66120327	177S	478E	197	67	724	23	.010	.011
26		480E	185	158	875	23	.011	.010
25		482E	68	51	150	23	.011	.011
24		484E	118	61	132	23	.014	.012
23		486E	60	57	97	23	.011	.007
22		488E	168	12	143	23	.011	.012
21		490E	51	9	90	23	.011	.011
20		492E	159	76	84	23	.010	.012
19		494E	143	61	314	23	.007	.004
18		496E	140	47	146	23	.010	.008
17		498E	460	18	136	23	.015	.010
66120316	177S	500E	10	-6	-6	7	.012	.014
66120351	181S	432E	38	26	43	23	.011	.007
52		434E	127	89	240	23	.007	.007
53		436E	56	17	46	23	.009	.007
54		438E	49	33	80	23	.008	---
55		440E	83	46	188	23	.014	.010
56		442E	92	30	92	23	.013	.012
57		444E	215	36	166	25	.020	.013
58		446E	83	61	180	17	.027	.031
87		446E	95	39	200	23	.013	.012
59		448E	27	61	245	23	.015	.011
86		448E	174	71	270	23	.014	.007
60		450E	11	120	940	29	.009	.007
61		452E	9	9	24	'M' / Sample		
62		454E	7	40	643	13	.008	---
63		456E	270	85	1070	35	.007	.005
64		458E	123	57	449	23	.010	.005
65		460E	142	20	582	23	.010	.005
6 66		462E	162	61	398	23	.006	.005
67		464E	276	93	665	23	.008	.005
68		466E	70	17	60	23	.013	.010
69		468E	311	57	172	23	.013	.012
70		470E	232	20	91	23	.011	.011
71		472E	215	165	287	23	.011	.006
72		474E	120	112	143	22	.009	.006
73		476E	88	112	322	23	.010	.009
74		478E	56	53	165	23	.012	.009
75		480E	123	153	844	23	.015	.009

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (Feet)	Radioactivity (mR/Hr) A/B.hor.	C.hor.
66120376	181S	482E	66	26	180	29	.009	.008
77		484E	163	36	322	23	.012	.013
78		486E	149	89	563	23	.010	.005
79		488E	147	9	77	19	.012	.010
80		490E	83	9	43	23	.010	.009
81		492E	123	64	281	23	.008	.005
82		494E	104	68	844	23	.009	.006
83		496E	32	20	24	'M' / Sample		
84		498E	22	6	17	6	.010	---
66120385	181S	500E	22	13	17	'M' / Sample		
66120287	185S	432E	40	23	91	35	.009	.004
88		434E	120	89	254	23	.007	.007
89		436E	106	68	327	23	.009	---
90		438E	108	46	204	29	.010	---
91		440E	106	27	112	23	.010	.008
92		442E	152	61	215	23	.013	.006
93		444E	132	23	92	23	.013	.008
94		446E	38	17	81	17	.012	---
89		446E	90	15	79	23	.012	.013
95		448E	48	17	80	8	.009	---
96		450E	12	17	53	6	.005	---
97		452E	14	30	127	'M' / Sample		
98		454E	20	39	200	'M' / Sample		
99		456E	320	116	622	5	.005	---
300		458E	182	85	582	23	.009	.006
66120401		460E	152	46	587	23	.010	.006
02		462E	104	68	454	23	.008	.004
03		464E	127	75	454	23	.007	.004
04		466E	254	135	729	23	.007	.007
05		468E	98	53	186	23	.013	.011
06		470E	360	183	1180	29	.014	.009
07		472E	102	6	27	23	.012	.015
08		474E	315	33	235	23	.014	.014
09		476E	66	168	383	23	.010	.008
10		478E	90	95	188	23	.009	.010
11		480E	127	88	230	23	.010	.012
12		482E	142	85	568	23	.015	.008
13		484E	57	-6	105	23	.013	.012
14		486E	100	20	98	23	.013	.013
15		488E	138	20	105	11	.010	.011
66120416	185S	490E	86	60	94	23	.010	.013

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (Feet)	Radioactivity (mR/Hr) A/B.hor.	C.hor.
66120417	185S	492E	261	131	815	23	.006	.009
66120418	185S	494E	28	9	12	'M' / Sample		
66121375	189S	362E	17	24	35	17	.008	.004
76		364E	230	65	120	18	.012	.010
77		366E	68	-6	20	23	.015	.010
78		370E	27	6	35	23	.010	.008
79		374E	93	30	105	17	.009	.006
80		376E	61	24	112	23	.011	.009
81		378E	75	48	200	23	.011	.008
82		382E	85	15	92	23	.009	.007
83		386E	32	-6	38	23	.008	.011
84		388E	36	-6	47	23	.011	.010
66121385	189S	390E	36	9	29	23	.008	.009
66120715		394E	152	50	602	23	.007	.004
16		398E	137	64	787	23	.007	.004
15		402E	50	20	92	23	.009	.007
14		406E	14	20	12	23	.006	.003
1 13		410E	33	10	24	23	.009	.010
12		414E	38	20	50	23	.008	.005
10		418E	18	6	14	23	.006	.008
09		422E	30	10	17	23	.007	.009
08		426E	165	26	92	23	.007	.007
07		430E	54	7	47	23	.006	.008
06		434E	290	75	260	23	.008	.007
05		438E	120	17	135	29	.007	.007
04		442E	-3	6	6	23	.009	.009
03		444E	40	6	12	3	.004	---
02		446E	18	6	6	6	.009	---
[illegible]		450E	22	20	85	'M' / Sample		
700		454E	277	95	463	'M' / Sample		
66120400		458E	163	75	333	23	.009	.006
399		462E	140	60	333	23	.006	.003
98		466E	17	16	33	23	.007	.006
97		470E	43	13	149	23	.009	.006
96		472E	350	82	665	3	.008	---
95		474E	290	75	109	11	.009	---
94		476E	140	16	99	5	.008	---
66120393	189S	478E	160	89	735	23	.009	.005

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) A/B.hor.	C.hor.
66120392	189S	480E	125	75	512	23	.009	.005
91		482E	472	96	363	23	.011	.007
90		484E	228	96	109	23	.010	.009
89		486E	27	13	27	23	.007	.010
88		488E	222	82	602	23	.007	.007
87		490E	75	40	91	10	.008	.008
66120386	189S	494E	8	13	12	'M'	/ Sample	
66121374	193S	360E	25	27	35	23	.008	.003
73		362E	17	94	125	23	.014	.009
372		364E	43	6	38	23	.015	.010
71		366E	21	-6	23	17	.012	.008
70		368E	39	6	56	23	.011	.005
69		370E	101	24	79	12	.012	---
68		372E	70	36	105	23	.010	.005
67		374E	50	21	79	23	.011	.005
66		376E	50	39	85	23	.009	.007
65		378E	75	27	72	23	.009	.004
64		380E	101	12	75	23	.011	.010
63		382E	17	6	35	23	.011	.012
62		384E	337	98	550	11	.010	.016
61		386E	50	15	75	23	.009	.011
60		388E	154	140	400	23	.008	.010
59		390E	52	18	66	23	.009	.008
66121358	193S	392E	75	132	181	6	.007	---
66120468		394E	132	75	622	17	.006	.004
67		396E	18	53	478	17	.009	.003
66		398E	54	33	78	23	.010	.011
65		400E	17	6	9	23	.011	.010
64		402E	27	17	43	23	.008	.007
63		404E	20	20	21	23	.006	---
62		406E	27	16	17	23	.010	.005
61		408E	42	6	131	23	.007	.005
60		410E	61	26	124	23	.009	.008
59		412E	38	9	21	23	.010	.010
58		414E	40	9	30	23	.011	.007
66120457	193S	416E	38	-6	27	23	.012	.011

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (Feet)	Radioactivity (mR/Hr) A/B.hor.	C.hor.
66120456	193S	418E	28	-6	21	23	.009	.009
55		420E	32	6	17	23	.010	.010
54		422E	78	17	57	23	.009	.006
53		424E	74	61	210	23	.009	.004
52		426E	80	17	147	23	.008	.004
51		428E	95	79	322	23	.008	.004
50		430E	87	33	127	23	.010	.005
49		432E	108	13	43	23	.010	.011
48		434E	52	13	27	17	.012	.008
47		436E	33	13	21	17	.012	.008
46		438E	44	16	21	23	.012	.012
45		440E	11	-6	6	23	.012	.012
66120430	193S	462E	142	57	404	23	.011	.006
29		464E	135	78	512	23	.008	.004
28		466E	160	96	520	29	.009	.007
27		468E	100	6	14	23	.013	.011
26		470E	68	13	36	17	.013	.010
25		472E	290	33	281	17	.013	.010
24		474E	258	23	135	17	.013	.012
23		476E	79	10	30	11	.014	---
22		478E	127	68	287	17	.010	.009
21		480E	81	26	122	23	.010	.009
20		482E	225	104	675	29	.007	.007
66120419	193S	484E	43	9	30	23	.013	.013
66121340	197S	360E	68	79	117	23	.012	.011
41		362E	58	20	83	23	.013	.008
42		364E	49	54	124	23	.013	.009
43		366E	40	17	38	23	.012	.007
44		368E	44	11	60	23	.014	.008
45		370E	52	34	79	23	.010	.003
46		372E	54	23	73	23	.009	.003
47		374E	78	47	150	23	.009	---
48		376E	83	63	150	10	.009	---
49		378E	35	11	60	23	.010	.011
50		380E	58	8	60	23	.009	.012
51		384E	44	17	47	23	.010	.010
52		384E	32	6	40	23	.010	.010
53		386E	43	9	47	23	.010	.010
54		388E	32	21	60	23	.009	.010
55		390E	66	76	580	23	.006	.002
56		392E	21	21	82	23	.008	.006
66121357		394E	34	9	40	23	.009	.012
66120718	197S	396E	28	6	30	23	.009	.011

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) T/B.hor.	C.hor.
66120719	197S	398E	11	23	43	29	.005	.005
20		400E	11	14	30	23	.007	.010
21		402E	24	6	27	23	.012	.012
22		404E	107	40	92	23	.010	.005
23		406E	37	10	24	23	.008	.010
24		408E	157	26	225	35	.010	.010
25		410E	15	-6	-6	23	.010	.010
26		412E	28	6	30	23	.010	.009
27		414E	24	-6	18	23	.010	.010
28		416E	24	-6	14	23	.011	.010
29		418E	172	29	240	27	.008	.007
66120730		420E	49	57	175	29	.009	.005
66120431		472E	111	20	57	23	.014	.014
32		474E	61	9	17	17	.012	.011
33		476E	61	9	36	6	.011	---
34		478E	74	13	77	23	.012	.012
35		480E	87	16	56	23	.009	.012
36		482E	83	13	56	23	.011	.017
66120437	197S	484E	106	40	365	23	.005	.004
66121339	201S	360E	47	290	125	19	.012	.007
38		362E	22	11	23	23	.014	.005
37		364E	240	14	51	23	.015	.009
36		366E	54	11	60	23	.014	.006
35		368E	65	44	82	17	.010	.005
34		370E	74	53	120	23	.009	.006
33		372E	54	-6	41	23	.010	.014
32		374E	37	8	33	23	.009	.010
31		376E	35	23	127	23	.011	.012
30		378E	83	8	60	23	.009	.010
29		380E	88	17	103	23	.007	.010
28		382E	24	8	32	23	.008	.010
27		384E	78	83	980	23	.008	.002
26		386E	312	69	700	17	.010	.004
25		388E	47	44	75	5	.006	---
24		390E	13	-6	11	23	.011	.010
23		392E	30	23	75	23	.008	.004
66121322		394E	28	14	29	23	.010	.012
66120743	201S	396E	25	13	43	23	.007	.009
42		398E	35	33	175	23	.006	.004
66120741	201S	400E	40	20	30	23	.007	.011

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Sample No	Co-ordinates Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (MR/Hr) A/B.hor.	C.hor.
66120740	201S	402E	128	30	205	23	.007	.005
39		404E	52	20	12	23	.007	.009
38		406E	13	-6	6	23	.010	.009
37		408E	40	20	122	23	.008	.007
36		410E	21	-6	12	23	.009	.009
35		412E	19	-6	17	23	.011	.009
34		414E	47	9	36	23	.011	.006
33		416E	103	20	123	23	.009	.006
32		418E	56	23	50	14	.007	.009
66120731	201S	420E	52	16	33	23	.009	.010
66120444	201S	472E	650	89	210	23	.013	.012
43		474E	92	14	36	23	.010	.012
42		476E	130	20	78	23	.013	.013
41		478E	93	40	221	23	.007	.012
40		480E	50	9	39	23	.008	.010
39		482E	95	53	282	23	.004	.004
66120438	201S	484E	55	33	115	23	.006	.007
66121304	205S	360E	32	69	70	23	.000	.004
05		362E	34	54	68	5	---	---
06		364E	72	69	105	23	.015	.011
07		366E	58	38	140	23	.011	.006
[illegible]		[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
08		368E	65	29	87	23	.011	.006
09		370E	70	86	120	23	.010	.006
10		372E	37	-6	70	23	.009	.009
11		374E	68	50	180	18	.009	.012
12		376E	22	-6	23	23	.010	.011
13		378E	54	14	120	23	.005	.006
14		380E	137	110	1330	23	.003	.003
15	3	382E	112	180	500	23	.007	.003
16		384E	40	-6	38	23	.009	.012
17		386E	30	-6	34	23	.012	.012
18		388E	63	14	45	29	.009	.008
19		390E	16	14	55	23	.007	.006
20		392E	140	38	240	23	.008	.004
66121321	205S	394E	24	8	29	23	.008	.013

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) E/B.hor.	C/hor.
66120744	205S	396E	62	68	750	29	.006	.006
45		398E	35	64	735	23	.007	.009
46		400E	43	13	27	29	.006	.009
47		402E	23	6	17	23	.007	.009
48		404E	21	13	36	23	.005	.005
49		406E	87	30	122	23	.009	.003
50		408E	18	6	11	23	.007	.008
51		410E	45	33	81	23	.011	.007
52		412E	37	6	43	23	.011	.010
53		414E	128	57	449	35	.013	.009
54		416E	52	16	59	17	.013	---
55		418E	29	9	30	13	.016	.017
66120756	205S	420E	19	13	17	12	.017	.014
66121303	209S	360E	44	63	162	23	.014	.004
02		362E	49	50	100	23	.015	.004
01		364E	88	190	230	6	.011	---
300		366E	70	38	170	23	.009	.006
299		368E	58	32	132	23	.009	.009
98		370E	83	41	100	23	.011	.005
97		372E	40	14	90	23	.008	.008
96		374E	35	-6	21	23	.008	.011
95		376E	175	130	1250	23	.005	.003
94		378E	228	63	630	17	.008	.007
93		380E	168	38	150	23	.010	.003
92		382E	157	26	120	23	.009	.006
91		384E	265	41	210	23	.007	.003
90		386E	72	23	173	23	.012	.005
89		388E	24	-6	38	23	.014	.011
88		390E	28	8	41	23	.009	.007
87		392E	187	71	435	23	.014	.009
66121286	209S	394E	146	29	94	23	.007	.003
66120469	209S	396E	82	40	47	23	.007	.007
70		398E	33	13	24	23	.007	.010
71		400E	18	6	27	23	.010	.010
72		402E	17	-6	9	23	.010	.007
73		404E	61	20	165	23	.012	.006
74		406E	32	9	84	23	.010	.010
75		408E	42	-6	50	23	.007	.006
76		410E	80	6	36	29	.008	.006
66120477	209S	412E	61	13	71	23	.010	.009

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) @ A/E	@ Elec.
66120478	209S	414E	24	6	27	11	.005	---
79		416E	100	96	180	23	.006	.004
80		418E	55	6	88	23	.006	.004
66120483	209S	420E	87	23	99	23	.006	.005
6612272	213S	360E	41	33	116	23	.010	.006
73		362E	27	21	120	23	.009	---
74		364E	43	36	140	23	.010	.008
75		366E	445	15	60	23	.010	.008
76		368E	52	58	116	17	.010	.006
77		370E	50	55	96	11	.011	---
78		374E	48	8	72	23	.011	.013
79		378E	54	24	99	23	.010	.011
66121280	213S	382E	52	30	60	17	.006	.004
81	213S	386E	28	41	105	23	.013	.012
82		388E	68	115	230	23	.008	.007
83		390E	60	44	85	23	.006	.003
84		392E	47	23	65	23	.008	.008
66121285	213S	394E	54	26	125	23	.010	.011
66120765	213S	398E	79	23	88	23	.015	.013
64		402E	30	6	27	23	.013	.017
63		406E	62	23	57	23	.012	.011
62		408E	32	9	27	23	.009	.009
61		410E	75	20	50	13	.007	---
60		412E	63	17	99	29	.011	.007
59		414E	91	13	106	23	.015	.012
58		418E	75	20	64	23	.013	.013
66120757	213S	422E	56	9	12	23	.019	.018
66121271	217S	360E	154	39	66	23	.010	.008
70		362E	54	15	99	23	.010	.011
69		364E	27	15	79	23	.013	.008
68		366E	103	64	99	23	.009	.007
267		368E	73	70	92	11	.010	---
266		370E	93	27	47	23	.010	.008
265		372E	109	186	385	23	.010	.004
64		374E	57	24	82	23	.011	.011
63		376E	100	6	35	23	.013	.010
62		378E	32	6	40	23	.010	.014
66121261	217S	380E	61	12	53	23	.008	.012

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) T A/S	Short C. Loc.
66121260	217S4	382E	64	45	79	17	.009	.003
59		384E	25	12	40	23	.009	.013
58		386E	117	71	400	11	.008	.004
57		388E	82	27	63	23	.009	.013
56		390E	285	67	415	17	.009	.004
55		392E	78	33	133	11	.010	---
54		394E	93	85	425	17	.009	.004
66121253	217S	396E	106	21	126	23	.009	---
66120492	217S	398E	49	23	50	23	.009	.010
91		400E	14	68	265	23	.008	.006
90		402E	97	46	123	23	.008	.006
89		404E	28	6	36	'M' ~~Sample~~		—
88		406E	24	6	30	'M' ~~Sample~~		—
87		408E	93	23	109	23	.007	---
86		410E	98	33	230	23	.006	.006
85		412E	83	46	115	23	.006	.003
84	XXX	414E	70	46	126	23	.008	.004
83		416E	104	82	81	23	.007	.007
66120482	217S	418E	254	120	332	23	.009	.009
66121234	221S	360E	210	32	99	23	.011	.009
35		362E	57	36	75	23	.011	.011
36		364S	64	21	60	23	.012	.008
37		366E	52	76	72	23	.012	.004
38		368E	52	52	53	6	.011	.005
39		370E	59	64	85	23	.011	.004
40		372E	68	132	96	23	.011	.008
41		374E	43	6	35	23	.011	.010
42		376E	50	21	40	23	.013	.009
43		378E	36	-6	29	23	.012	.010
44		380E	34	18	53	23	.009	.009
45		382E	25	6	40	23	.010	.008
46		384E	73	64	340	23	.009	.003
47		386E	34	15	53	17	.008	.007
48		388E	34	24	85	23	.010	.008
49		390E	78	88	126	23	.008	.004
XX	XXE	XX	XX	XXX	XX	XXX	XXX	—
50		392E	95	123	500	23	.008	.004
51		394E	50	52	126	11	.007	.005
66121252	221S	396E	189	112	660	17	.007	.005

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactive (mR/Hr) A/B.hor.	C.hor.
66120493	221S	398E	117	53	138	23	.008	.005
94		400E	123	82	1110	23	.007	.007
95		402E	97	26	50	23	.007	.008
96		404E	73	53	123	23	.005	.006
974		406E	82	60	183	23	.003	.004
66120498		408E	91	57	147	23	.006	.005
66120777		410E	243	89	434	23	.007	.006
78		412E	352	53	271	23	.005	.005
79		414E	195	72	122	23	.006	.006
80		416E	133	64	78	23	.010	.009
66120781	221S	418E	43	17	43	7	.006	.008
66121233	225S	360E	43	32	79	23	.011	.009
32		362E	32	24	85	23	.012	.007
31		364E	36	30	151	23	.010	.011
30		366E	68	45	120	23	.013	.007
29		368E	90	21	99	23	.012	.007
28		370E	64	32	56	23	.010	.011
27	225S	372E	61	55	53	23	.010	.003
66121226		374E	30	-6	29	23	.015	.009
25		376E	61	30	99	23	.012	.011
24		378E	52	39	120	23	.016	.010
23		380E	54	24	53	23	.012	.011
22		384E	160	67	435	23	.012	.006
66121221	225S	388E	52	26	85	23	.010	.009
66120766	225S	420E	29	30	33	23	.011	.015
67		422E	32	-6	30	23	.012	.015
68		424E	16	9	14	23	.010	.018
69		426E	18	17	27	11	.013	.016
70		428E	45	23	43	7	.014	---
71		430E	56	23	43	23	.014	.019
72		432E	95	9	27	11	.018	.018
73		434E	63	23	50	11	.013	.015
74		436E	65	13	14	11	.010	.013
75		438E	56	26	36	8	.006	.007
66120776	225S	440E	52	20	27	18	.011	.013

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) A/B.hor.	C.hor.
66121111	227S	459E	22	11	21	5	---	.016
66121112	227S	456.5E	109	6	21	12	.015	.018
66121208	229S	360E	30	18	116	23	.007	.006
09		362E	151	45	99	23	.011	.010
10		364E	66	81	155	23	.009	.010
11		366E	73	71	92	12	.010	---
12		368E	43	15	69	23	.014	.012
13		370E	39	30	79	23	.012	.009
14		372E	88	30	79	23	.012	.009
15		374E	30	67	92	23	.011	.006
16		376E	27	6	40	23	.013	.013
17		378E	36	-6	35	23	.013	.012
18		380E	36	12	40	23	.012	.010
19		382E~~382E~~	54	21	72	23	.010	.009
66121220		384E	19	-6	29	23	.013	.012
66120782		420E	-3	6	12	17	.014	.014
83		422E	19	6	12	12	.011	.014
84		424E	26	13	12	23	.013	.012
85		426E	5	6	-6	23	.013	.013
86		428E	35	13	14	5	.010	---
87		430E	87	20	12	16	.013	.015
88		432E	34	13	14	23	.013	.016
89		434E	49	26	30	5	.011	---
90		436E	25	6	9	11	.009	.011
91		438E	21	6	12	9	.012	---
66120792		440E	49	13	36	5	.008	---
66121114		457.5E	26	-6	8	6	.013	.014
66121113	229S	458E	11	-6	8	6	.012	.013
66121207	233S	360E	13	-6	23	23	.009	.009
06		362E	28	42	158	23	.010	.005
05		364E	200	45	158	23	.009	.009
04		366E	16	6	23	23	.009	.008
03		368E	35	12	53	23	.012	.012
02		370E	151	48	470	23	.013	.011
01		372E	54	12	47	23	.012	.011
200		374E	123	36	220	23	.012	.011
199		376E	40	6	50	23	.012	.013
98		378E	34	15	50	23	.012	.012
97		380E	106	36	120	23	.012	.011
96		382E	37	21	63	17	.011	.010
66121195	233S	384E	20	6	29	23	.011	.010

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Sample No	Co-ordinates Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) A/B.hor.	C.hor.
66120810	233S	420E	14	9	6	6	.016	.023
09		422E	34	9	12	13	.012	.017
08		424E	39	13	14	7	.013	.015
07		426E	25	6	9	17	.011	.014
06		428E	13	-6	6	12	.014	.017
05		430E	18	6	-6	17	.011	.017
04		432E	18	6	-6	7	.013	.012
03		434E	71	40	50	23	.011	.014
02		436E	32	9	15	15	.012	.015
01	[illegible]	438E	25	-6	6	11	.012	.009
66120800	233S	440E	29	9	14	15	.012	.012
66121115		461S	5	-6	8	24	.013	.020
66121116	233S	464E	13	-6	10	40	.013	.015
66121117	235S	459.5E	8	-6	8	22	.015	.012
66121118	235S	461S	13	-6	10	11	.012	.012
66121191	237S	374E	72	36	99	23	.012	.010
92		378E	34	12	47	23	.010	.010
93		382E	20	-6	17	23	.011	.009
66121195	237S	386E	22	9	47	23	.011	.013
66120963		388E	80	65	371	23	.013	.004
64		389E	86	71	419	29	.011	.003
65		390E	24	47	31	23	.011	.004
66120948		391E	32	28	103	29	.011	.004
47		392E	35	11	61	29	.012	.010
46		393E	72	51	123	29	.011	.010
45		394E	28	11	27	29	.015	.013
44	[illegible]	395E	32	14	45	29	.012	.011
43		396E	35	65	745	17	.011	.004
42		397E	22	20	31	23	.015	.005
66120941		398E	160	72	810	29	.012	.005
66121119		462E	217	-6	15	39	.017	.027
20		466E	20	6	-6	41	.020	.018
66121121		468E	35	8	-6	17	.016	.018
66121185		360E	20	52	12	23	.008	.008
86		362E	16	6	43	23	.009	.008
87		364E	16	-6	62	23	.009	.005
88		366E	44	14	59	23	.010	.009
89		368E	40	19	82	23	.009	.007
66121190	237S	370E	35	11	78	18	.009	---

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Sample No	Co-ordinate Position		Cu	Co	Mn	Sample Depth (feet)	Radioactivity (m.R/Hr) A/B.hor.	C.hor.
66120812	237S	400E	67	17	54	11	.016	.012
11		402E	25	17	33	23	.019	.015
66120501		406E	30	-6	12	14	.018	---
500		410E	14	-6	6	12	.015	.017
499		414E	8	-6	6	8	---	.010
66120799		418E	14	-6	6	23	.010	.016
98		422E	39	6	12	18	.013	.015
97		426E	16	-6	21	23	.011	.014
96		430E	29	13	21	23	.013	.012
95		434E	21	6	17	11	.013	.014
94		438E	21	6	12	8	.008	.010
66120793	237S	442E	29	13	12	17	.013	.011
66120952	239S	388E	30	11	36	29	.010	.013
53		389E	47	51	165	23	.010	.004
54		390E	83	55	156	29	.011	.005
55		391E	60	23	48	29	.012	.004
56		392E	68	92	151	29	.012	.005
57		393E	52	14	72	29	.012	.009
58		394E	34	17	33	29	.015	.011
59		395E	37	17	61	29	.013	.004
60		396E	46	65	713	21	.015	.004
61		397E	35	37	37	23	.015	.004
66120962	239S	398E	30	6	24	29	.019	.010
66120930	241S	388E	24	6	42	29	.012	.010
31		389E	52	29	128	23	.014	.005
32		390E	49	33	405	17	.013	.004
33		391E	44	23	21	29	.016	.005
34		392E	49	17	56	29	.017	.009
35		393E	20	6	26	29	.014	.011
36		394E	42	8	24	29	.015	.010
37		395E	34	8	41	29	.016	.013
38		396E	86	75	778	29	.016	.003
39	"	397E	40	16	108	29	.019	.006
66120940		398E	225	103	375	29	.019	.015
66121184	241S	360E	-3	-6	12	23	.007	.006
83		362E	22	11	21	23	.009	.007
82		364E	32	8	28	23	.009	.005
81		366E	63	8	59	23	.011	.009

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity, (MR/Hr) A/Bhor.	C hor.
66121180	241S	368E	32	6	28	23	.009	.008
79		370E	34	19	36	23	.010	.006
78		372E	60	40	163	23	.011	.009
77		374E	58	11	36	23	.014	.010
66121176		376E	49	8	79	23	.006	.007
66121100		378E	24	58	51	17	.005	.003
99		380E	49	8	36	23	.010	.009
98		382E	20	17	21	23	.012	.012
97		384E	40	14	67	23	.012	.010
66121096	241S	386E	49	54	59	05	.012	---
66120813		400E	60	20	27	23	.015	.014
14		402E	30	9	21	11	.012	.013
15		404E	72	23	27	12	.011	---
16		406E	32	6	6	13	.018	.018
17		408E	43	9	12	17	.014	.020
18		410E	9	-6	-6	23	.019	.017
19		412E	22	9	9	15	.016	.020
20		414E	25	9	24	16	.022	.015
21		416E	22	-6	9	17	.022	.022
22		418E	88	29	21	11	.010	.011
23		420E	32	9	15	14	.012	.013
24		422E	17	6	6	11	.011	.012
25		424E	5	6	6	11	.013	.009
26		426E	17	-6	6	10	.012	.013
27		428E	20	-6	9	'M' / Sample		
28		430E	19	9	9	'M' / Sample		
29		432E	20	-6	15	17	.011	.012
30		434E	7	-6	9	'M' / Sample		
31		436E	5	-6	-6	17	.010	.011
32		438E	30	19	33	5	.009	---
33		440E	8	-6	6	'M' / Sample		
34		442E	20	6	6	'M' / Sample		
35		444E	75	16	6	6	.012	---
36		446E	43	9	15	6	---	.009
37		448E	30	-6	15	9	.014	---
66120838	241S	450E	15	-6	9	9	.021	.017

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) A/B.hor.	C.hor.
66120951	243S	388E	13	8	31	23	.017	.015
66120699		389E	68	131	122	5	.014	---
98		390E	46	68	331	17	.016	.008
97		391E	88	41	72	29	.017	.005
96		392E	46	22	37	29	.017	.011
95		393E	18	11	26	29	.017	.012
94		394E	54	17	31	29	.017	.012
93		395E	90	49	498	29	.022	.008
92		396E	236	49	206	29	.020	.007
91		397E	40	28	22	29	.018	.016
66120690	243S	398E	58	14	27	23	.016	.012
66120929	245S	388E	109	49	104	8	.011	---
28		389E	118	29	168	23	.012	.005
27		390E	49	49	330	12	.012	.004
26		391E	30	23	16	29	.012	.004
25		392E	47	37	64	29	.015	.012
24		393E	35	6	26	29	.015	.011
23		394E	154	66	273	29	.019	.011
22		395E	60	17	36	7	.011	.019
21		396E	83	35	36	16	.011	.019
20		397E	37	65	157	12	.013	---
66120919	245S	398E	60	14	26	26	.011	.014
66121082	245S	360E	16	-6	24	23	.011	.010
83		362E	14	6	24	23	.008	.010
84		364E	16	14	39	23	.010	.009
85		366E	88	22	32	24	.010	.010
86		368E	54	22	74	11	.009	---
87		370E	28	22	47	23	.011	.011
88		372E	22	6	28	23	.011	.010
89		374E	24	6	21	23	.007	.008
90		376E	18	37	71	23	.007	.003
91		378E	68	31	32	17	.004	.002
92		380E	24	48	78	8	.005	---
93		382E	22	31	10	23	.007	.011
94		384E	35	14	37	23	.011	.010
66121095	245S	386E	37	24	74	23	.013	.012

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) T/B.hor	C.hor.
66120502	245S	400E	38	16	36	23	.011	.013
03		402E	70	6	27	7	.010	---
04		404E	48	9	21	23	.013	.013
05		406E	25	6	24	23	.011	.012
06		408E	40	43	30	23	.013	.017
07		410E	20	16	27	17	.012	.012
08		412E	35	9	21	17	.013	.012
09		414E	15	13	21	23	.012	.015
10		416E	50	6	21	23	.012	.014
11		418E	27	6	15	23	.015	.010
12		420E	27	6	15	18	.012	.011
13		422E	15	-6	9	23	.012	.015
14		424E	33	-6	12	23	.012	.012
15		426E	38	-6	9	23	.010	.013
16		428E	25	6	12	20	.013	.015
17		430E	18	9	9	23	.014	.013
18		432E	27	9	9	23	.015	.015
19		434E	12	-6	6	23	.012	.010
20		436E	29	-6	6	23	.012	.013
21		438E	5	-6	6	'M' /	Sample	
22		440E	12	-6	9	'M' /	Sample	
23		442E	18	-6	-6	'M' /	Sample	
24		446E	22	9	-6	'M' /	Sample	
25		448E	5	-6	-6	'M' /	Sample	
27		450E	13	6	9	'M' /	Sample	
66120528	245S	444E	18	6	9	'M' ½	Sample	
66120679	247S	388E	4	14	26	25	.010	.012
80		389E	5	22	48	29	.009	.006
81		390E	68	63	323	23	.007	.011
82		391E	49	28	41	29	.008	.012
83		392E	2950	146	547	29	.027	.008
84		393E	1620	73	83	6	.040	---
85		394E	68	43	121	19	.036	.033
86		395E	103	46	33	10	.019	---
87		396E	86	26	34	5	.010	---
88		397E	72	32	53	25	.011	.015
66120689	247S	398E	76	65	56	23	.011	.013

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) A/B.hor. C.hor.	
66120667	249S	399E	63	34	45	29	.014	.014
66120666	249S	400E	52	28	37	29	.010	.016
66120678		388E	18	11	48	29	.012	.016
77		389E	14	43	11	29	.010	.006
76		390E	16	43	36	29	.008	.007
75		391E	78	134	170	29	.008	.009
74		392E	900	11	26	6	.014	---
73		393E	137	14	24	29	.019	.023
72		394E	364	42	63	10	.030	---
71		395E	630	124	61	29	.015	.025
70		396E	72	31	79	18	.019	.012
69		397E	34	25	26	21	.009	.012
66120668		398E	86	28	37	29	.007	.011
66121079		364E	20	-6	28	23	.008	.009
78		366E	16	-6	24	17	.009	.008
77		368E	37	17	74	14	.009	---
66121076		370E	9	8	51	'M' / Sample		
66121175		372E	30	6	56	14	.008	.010
74		374E	28	6	33	18	.009	.008
73		376E	56	31	112	23	.005	.003
72		378E	68	34	28	23	.006	.003
71		380E	42	28	21	23	.006	.003
70		382E	22	-6	-6	23	.008	.009
69		384E	37	8	36	23	.015	.013
66121168	249S	386E	72	17	127	23	.014	.014
66120544		402E	58	19	15	23	.010	.010
43		404E	80	19	18	23	.010	.013
42		406E	70	16	21	23	.012	.013
41		408E	58	9	12	23	.010	.015
40		410E	25	13	15	23	.013	.013
39		412E	34	13	15	23	.015	.011
38		414E	48	9	15	23	.014	.016
37		416E	27	-6	-6	23	.014	.013
36		418E	30	6	15	12	.015	.017
35		420E	15	-6	15	23	.015	.016
34		422E	29	6	12	23	.014	.015
33		424E	29	6	12	23	.016	.016
32		426E	13	-6	9	'M' / Sample		
31		428E	40	13	24	8	---	.014
30		430E	70	9	24	23	.014	.016
66120529	249S	432E	76	13	12	23	.017	.017

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) A/B.hor	C.hor.
66120906	251S	388E	86	84	628	29	.006	.004
07		389E	86	64	154	29	.010	.008
08		390E	28	48	79	18	.013	.016
09		391E	42	22	24	'M' Sample		
10		392E	32	31	56	29	.020	.015
11		393E	274	6	8	29	.018	.016
12		394E	1510	138	93	18	.030	.022
66120913	251S	395E	118	34	21	15	.019	.015
14		396E	154	71	113	29	.013	.013
15		397E	49	17	16	29	.013	.012
16		398E	72	25	26	29	.013	.012
17		399E	70	22	26	29	.013	.017
66120918	251S	400E	40	35	26	29	.016	.016
66120653	253S	388E	165	117	193	'M' Sample		
54		389E	389	275	488	8	.014	---
55		390E	11	8	13	23	.014	.020
56		391E	5	6	15	29	.024	.020
57		392E	1030	42	63	5	.054	---
58		393E	394	11	21	29	.016	.018
59		394E	470	11	31	10	.026	---
60		395E	168	70	96	29	.024	.016
61		396E	165	90	74	12	.018	---
62		397E	70	14	16	29	.016	.014
63		398E	96	34	53	29	.014	.012
64		399E	52	17	24	29	.016	.018
66120665	253S	400E	37	17	21	29	.026	.014
66121152	253S	360E	28	-6	14	23	.010	.014
53		362E	20	6	28	23	.010	.008
54		364E	22	22	10	23	.010	.007
55		366E	5	-6	-6	23	.009	.008
56		368E	16	6	17	18	.009	.010
57		370E	30	6	55	17	.010	.010
58		372E	37	11	67	23	.011	.011
59		374E	44	17	55	23	.012	.012
60		376E	49	11	74	23	.007	.013
61		378E	37	6	24	29	.008	.003
62		380E	308	70	51	23	.005	.005
63		382E	28	-6	10	23	.011	.010
64		384E	24	-6	-6	23	.010	.010
66121165	253S	386E	30	-6	189	23	.014	.009

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) A/B.hor.	C.hor.
66120569	253S	402E	65	19	33	17	.016	.017
70		404E	46	19	24	17	.013	.014
71		406E	45	16	27	17	.015	.012
66120572		408E	54	13	24	11	.014	.015
66120850		410E	27	-6	6	5	---	.014
49		412E	14	-6	6	16	.017	.015
48		414E	30	-6	15	6	.022	.014
47		416E	23	-6	6	6	.018	.018
46		418E	23	16	30	11	.014	.018
45		420E	21	-6	15	14	.020	.014
44		422E	61	-6	15	11	.015	.013
43		424E	45	-6	15	11	---	.015
42		426E	14	-6	15	9	.010	.012
41		428E	21	-6	18	'M' Sample		
40		430E	14	37	36	11	.014	.024
66120839	253S	432E	11	44	70	13	.015	.018
66120905	255S	388E	244	114	665	29	.013	.012
04		389E	26	31	24	'M' Sample		
03		390E	18	17	46	26	.021	.022
02		391E	109	25	58	19	.016	.016
01		392E	244	14	45	29	.023	.023
900		393E	143	-6	24	24	.014	.014
99		394E	351	17	24	18	.026	.015
98		395E	168	42	42	29	.020	.012
97		396E	218	145	141	24	.019	.023
96		397E	34	14	31	29	.016	---
95		398E	93	17	36	29	.012	.016
94		399E	32	6	11	31	.015	.018
66120993	255S	400E	37	11	24	29	.013	.017
66120652	257S	388E	8	111	1130	23	.032	.018
51		389E	9	9	8	29	.012	.018
50		390E	4	22	31	29	.022	.012
49		391E	140	195	128	10	.014	---
48		392E	109	6	15	29	.026	.016
47		393E	242	17	34	29	.030	.024
46		394E	137	11	21	29	.024	.016
45		395E	287	31	38	29	.018	.016
44		396E	101	8	11	23	.012	.014
43		397E	72	22	51	29	.016	.018

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) A/B.hor.	C.hor.
66120642	257S	398E	22	26	42	23	.018	.014
41		399E	18	8	24	29	.020	.014
66120640		400E	70	19	36	29	.018	.016
66121064		360E	24	11	32	10	.012	.014
65		363E	22	11	36	8	.012	.013
66		364E	20	11	39	12	.010	.014
67		366E	20	11	43	9	.013	.016
68		368E	18	11	51	10	.013	.015
66121069		370E	26	17	79	11	.015	.017
66121151		372E	42	11	56	17	.008	.012
50		374E	32	8	32	17	.012	.008
49		376E	28	-6	39	23	.011	.010
48		378E	46	11	67	18	.009	.009
47		380E	70	22	136	23	.009	.007
46		382E	9	-6	17	23	.011	.011
45		384E	76	28	1360	23	.012	.006
66121144	257S	386E	780	276	2300	23	.010	.011
66120545		402E	82	36	36	14	.015	.012
46		404E	35	9	15	18	.010	.011
47		406E	58	-6	-6	23	.016	.017
48		408E	17	-6	-6	14	.013	.013
49		410E	34	-6	-64	10	---	.016
50		412E	34	-6	-6	11	.015	.015
51		414E	60	-6	-6	6	---	.010
52		416E	43	-6	-6	12	.009	.016
53		418E	22	-6	-6	17	.013	.012
54		420E	18	-6	-6	10	.012	.012
55		422E	32	-6	-6	6	---	.015
56		424E	30	-6	6	5	---	.015
57		426E	104	-6	9	'M' Sample		
58		428E	95	-6	6	'M' Sample		
59		430E	53	-6	9	'M' Sample		
66120560	257S	432E	30	-6	9	'M' Sample		
66120626	259S	388E	22	14	8	29	.016	.016
27		389E	20	14	18	29	.016	.014
28		390E	6	8	8	29	.016	.016
29		391E	12	86	310	29	.022	.014
30		392E	75	220	57	15	.014	.016
31		393E	100	60	42	24	.014	.012
32		394E	77	14	13	29	.022	.014
33		395E	53	8	11	29	.018	.014
34		396E	166	44	36	26	.018	.014
35		397E	37	38	48	29	.016	.014
66120636	259S	398E	12	9	6	29	.018	.016

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) A/B.hor.	C.hor.
66120637	259S	399E	26	14	16	29	.016	.020
66120638	259S	400E	41	17	37	29	.020	.016
66120881	261S	388E	14	40	153	16	.011	.016
82		389E	14	-6	15	23	.015	.017
83		390E	8	-6	11	29	.017	.016
84		391E	5	6	11	35	.020	.021
85		392E	18	11	50	29	.014	.018
86		393E	96	54	61	21	.019	.019
87		394E	37	8	15	18	.013	.014
88		395E	101	14	24	30	.020	.012
89		396E	49	11	38	15	.015	.012
90		397E	76	28	34	27	.019	.015
91		398E	18	17	18	21	.018	.01[illegible]
66120892		399E	9	8	15	21	.020	.019
~~66120639~~	~~400E~~	~~23~~	~~14~~	~~31~~	~~23~~	~~.016~~	~~.026~~	
66120639		400E	23	14	31	23	.016	.026
66121137	261S	362E	16	8	24	18	.008	.010
38		367E	11	6	21	23	.012	.010
39		370E	14	6	17	17	.011	.011
40		374E	30	6	43	17	.009	.013
66121141		378E	181	228	785	23	.011	.006
66121167		380E	140	17	95	23	.009	.010
66121142		382E	468	1210	1220	23	.010	.007
43		384E	68	180	785	23	.009	.012
66121166		386E	51	250	393	5	.006	---
66120568		401.5E	12	-6	9	11	.014	.015
67		406E	46	-6	9	17	.014	.013
5 66		410E	104	6	21	23	.010	.014
65		414E	7	-6	6	8	.014	---
64		418E	63	9	21	23	.013	.015
63		422E	13	-6	9	8	.017	.017
62		426E	15	-6	6	'M' Sample		
66120561	261S	430E	65	-6	9	'M' Sample		
66121056	265S	374E	28	11	34	13	.012	---
55		376E	56	8	60	17	.009	.011
54		378E	218	8	40	23	.012	.015
53		380E	430	16	183	23	.012	.015
52		382E	218	102	768	17	.011	.005
51		384E	225	40	419	23	.012	.005
50		386E	88	95	388	12	.013	.006
49		388E	90	70	583	23	.009	.005

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) A/B.hor.	C.hor.
66121048	265S	390E	5	-6	-6	23	.014	.013
47		392E	8	8	15	29	.015	.014
46		394E	22	8	10	23	.018	.013
45		396E	60	8	41	23	.024	.017
44		398E	9	8	18	23	.028	.017
66121043		400E	20	-6	15	9	.021	.019
66121063		360E	13	8	21	11	.011	.016
62		362E	20	8	17	14	.010	.013
61		364E	5	-6	7	18	.012	.010
60		366E	16	8	28	18	.011	.014
59		368E	11	-6	7	11	.011	---
58		370E	24	11	24	13	.010	.009
66121057	265S	372E	28	11	28	18	.007	.008
66120573	265S	402E	35	-6	15	11	.017	...
74		404E	85	6	15	9	---	.016
75		406E	35	-6	9	11	.014	.011
76		408E	155	16	45	23	.013	.023
77		410E	30	48	27	23	.012	.012
78		412E	9	16	15	17	.010	.013
79		414E	55	19	27	17	.013	.013
80		416E	7	9	18	17	.016	.015
81		418E	85	13	21	17	.015	.016
82		420E	10	-6	6	17	.023	.020
83		422E	9	-6	6	6	---	.027
84		424E	9	-6	-6	'M' Sample		
85		426E	5	-6	-6	'M' Sample		
86		428E	7	36	-6	'M' Sample		
87		430E	50	-6	-6	'M' Sample		
66120588	265S	432E	60	-6	6	'M' Sample		
66121136	269S	360E	8	-6	17	23	.010	.010
35		362E	13	-6	21	23	.009	.008
34		364E	14	6	28	23	.009	.008
33		366E	20	-6	36	18	.012	.008
32		368E	24	-6	24	23	.009	.008
31		370E	30	6	42	20	.008	.009
30		372E	37	11	95	23	.012	.006
29		374E	218	11	66	23	.013	.012
28		376E	47	37	59	19	.007	.007
27		378E	373	17	92	23	.008	.010
26		380E	103	17	240	23	.008	.008

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) A/B.hor.	C.hor.
66121125	269S	382E	140	102	608	23	.009	.004
24		384E	304	54	382	23	.006	.003
23		386E	198	67	283	23	.010	.006
66121122		388E	112	36	234	23	.008	.007
66121110		390E	63	45	178	7	.007	---
09		392E	5	31	63	23	.016	.012
08		394E	35	25	70	23	.011	.009
07		396E	30	11	80	23	.020	.018
06		398E	16	6	25	9	.024	---
05		400E	18	-6	8	23	.016	.019
66121104	269S	402E	58	6	10	9	.016	---
66120603		404E	62	-6	6	6	-	.013
02		406E	22	-6	-6	5	.011	---
01		408E	20	-6	-6	12	.014	.013
600		410E	20	-6	-6	17	.013	.013
599		412E	52	-6	-6	17	.009	.012
98		414E	47	19	15	6	.010	.009
97		416E	32	29	39	23	.015	.015
96		418E	58	-6	-6	10	.017	.016
95		420E	7	-6	-6	5	---	.011
94		422E	-3	-6	-6	5	---	.012
93		424E	3	-6	-6	'M' Sample		
92		426E	9	-6	-6	'M' Sample		
91		428E	40	-6	-6	'M' Sample		
90		430E	61	-6	6	'M' Sample		
66120589	269S	432E	74	6	21	'M' Sample		
66121021	273S	360E	28	11	40	10	.014	.016
22		362E	16	6	15	23	.008	.011
23		364E	32	11	48	20	.006	.012
24		366E	22	11	25	18	.010	.013
25		368E	35	14	70	18	.009	.011
26		370E	35	11	55	17	.010	.012
27		372E	47	14	34	23	.014	.014
28		374E	72	16	55	9	---	.012
29		376E	56	16	68	23	.014	.008
30		378E	106	19	80	23	.010	.012
31		380E	28	22	60	13	---	.010
32		382E	109	16	100	23	.013	.012
33		384E	120	70	491	23	.010	.006
34		386E	165	22	250	23	.009	.004
35		388E	154	48	212	23	.011	.012
36		390E	151	61	511	35	.014	.006
66121037	273S	392E	26	6	8	29	.016	.012

Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) A/B.hor.	C.hor.
66121038	273S	394E	22	-6	30	9	.023	.019
39		396E	40	-6	15	23	.017	.015
40		398E	28	6	15	8	.010	.013
41		400E	9	-6	-6	23	.013	.018
66121042	273S	402E	78	6	10	23	.017	.016
66120851	273S	404E	17	-6	6	17	.010	.010
52		406E	41	-6	9	11	.013	.010
53		408E	33	6	9	11	.013	.013
54		410E	20	-6	-6	11	.013	.014
55		412E	46	19	27	18	.011	.012
56		414E	23	6	15	17	.009	.015
57		416E	77	-6	15	17	.016	.016
58		418E	33	-6	86	11	.023	.018
59		420E	8	-6	-6	11	.023	.020
60		422E	4	-6	-6	5	.016	.017
61		424E	5	-6	-6	'M' Sample		
62		426E	75	9	21	'M' Sample		
63		428E	50	26	33	'M' Sample		
64		430E	88	9	39	'M' Sample		
66120865	273S	432E	74	16	33	'M' Sample		
66120982	277S	360E	22	11	30	23	.009	.012
83		362E	16	-6	15	23	.008	.010
84		364E	32	6	30	23	.005	.007
85		366E	11	-6	8	23	.010	.008
86		368E	11	-6	15	23	.007	.012
87		370E	28	11	70	5	.007	---
88		372E	13	6	19	17	.007	.009
89		374E	52	6	30	23	.007	.008
90		376E	24	6	25	11	.007	.008
91		378E	13	11	15	17	.009	.007
92		380E	42	14	55	11	.011	---
93		382E	56	14	60	17	.011	---
94		384E	112	124	663	23	.010	.004
95		386E	168	113	438	23	.009	.004
96		388E	187	19	388	23	.010	.009
97		390E	90	28	228	23	.014	.010
98		392E	40	8	60	17	.014	.013
99		394E	34	28	55	23	.021	.019
66121060		396E	46	11	48	11	.014	---
66121101		398E	35	11	21	6	.014	---
02		400E	8	-6	-6	23	.014	.015
66121103	277S	402E	14	-6	-6	23	.014	.015

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Sample No	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) A/B.hor.	C.hor.
66120604	277S	404E	35	33	15	6	---	.009
05		406E	15	-6	-6	11	---	.012
06		408E	27	-6	-6	10	---	.014
07		410E	32	-6	9	15	.012	.010
08		412E	55	9	15	23	.010	.012
09		414E	22	16	27	23	.012	.016
10		416E	59	26	24	23	.014	.017
11		418E	93	-6	-6	11	.018	.019
12		420E	20	-6	-6	11	---	.016
13		422E	270	6	12	8	---	.010
14		424E	133	23	12	'M' Sample		
15		426E	68	13	24	'M' Sample		
16		428E	52	9	15	'M' Sample		
17		430E	55	-6	9	'M' Sample		
66120618	277S	432E	63	-6	-6	'M' Sample		
66120876	281S	412E	16	6	8	11	.010	.011
77		410E	83	19	34	6	.008	---
78		408E	35	11	15	10	.010	---
79		406E	32	11	15	13	.015	---
66120880	281S	404E	40	17	26	9	.010	---
66121005	281S	390E	42	15	73	11	.014	---
04		392E	20	38	53	23	.014	.010
66121394		393E	-3	-6	8	23	.012	.012
93		394E	64	21	47	12	.020	---
92		395E	80	9	38	23	.022	.019
66121003		394E	13	14	50	17	.014	.033
02		396E	49	41	31	18	.014	.016
66121001		398E	22	16	53	20	.010	.009
66120950		400E	24	19	61	11	.010	---
66120949		402E	24	17	84	11	.009	---
66121020		360E	30	38	34	18	.012	.016
19		362E	44	11	62	16	.009	.011
18		364E	34	6	21	21	.012	.011
17		366E	14	6	19	19	.012	.009
16		368E	24	6	19	17	.008	.009
15		370E	30	11	21	3	.007	---
14		372E	22	6	30	10	.008	---

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Sample No.	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) A/B.hor.	C.hor.
66121013	281S	374E	20	-6	30	14	.007	.011
12		376E	16	8	30	14	.009	-
11		378E	35	14	48	11	.010	-
10		380E	125	106	738	29	.010	.003
09		382E	42	11	70	11	.012	-
08		384E	47	11	65	11	.010	-
07		386E	52	11	70	10	.009	-
06		388E	56	11	90	11	.011	-
66120875		414E	33	23	21	17	.011	.012
74		416E	8	6	15	'M'	.010	.011
73		418E	46	-6	-6	16	.010	.011
72		420E	14	-6	6	13	-	.011
71		422E	51	13	15	11	-	.013
70		424E	35	9	6	5	-	.011
69		426E	103	16	15	'M'	-	-
68		428E	116	-6	-6	'M'	-	-
67		430E	64	-6	9	'M'	-	-
66		432E	37	-6	-6	'M'	-	-
66121395	283S	393E	19	27	150	23	.012	.007
96		394E	30	88	185	23	.023	.011
97		395E	15	-6	23	23	.019	.012
98		396E	36	-6	23	23	.020	.016
66120619	285S	406E	13	11	8	17	.010	-
20		410E	44	8	15	17	.009	.010
21		414E	37	8	15	23	.008	.012
22		418E	93	8	11	17	.013	.013
23		422E	412	11	11	17	.009	.013
24		426E	143	11	36	11	.009	.011
25		430E	20	-6	-6	'M'	-	-
66120978		366E	99	68	151	23	.010	.005
77		370E	32	18	26	14	.010	-
76		372E	20	11	24	11	.008	-
75		374E	16	14	24	17	.007	.011
74		378E	20	6	26	17	.012	-
73		382E	60	53	43	6	.008	-
72		384E	32	11	31	11	.009	-
71		386E	103	57	105	17	.009	-
70		390E	34	136	203	23	.010	-
69		394E	4	11	56	23	.065	.016
68		398E	96	19	53	23	.016	.008
67		400E	47	17	41	29	.013	.011
66120966	285S	402E	32	22	26	12	.009	--

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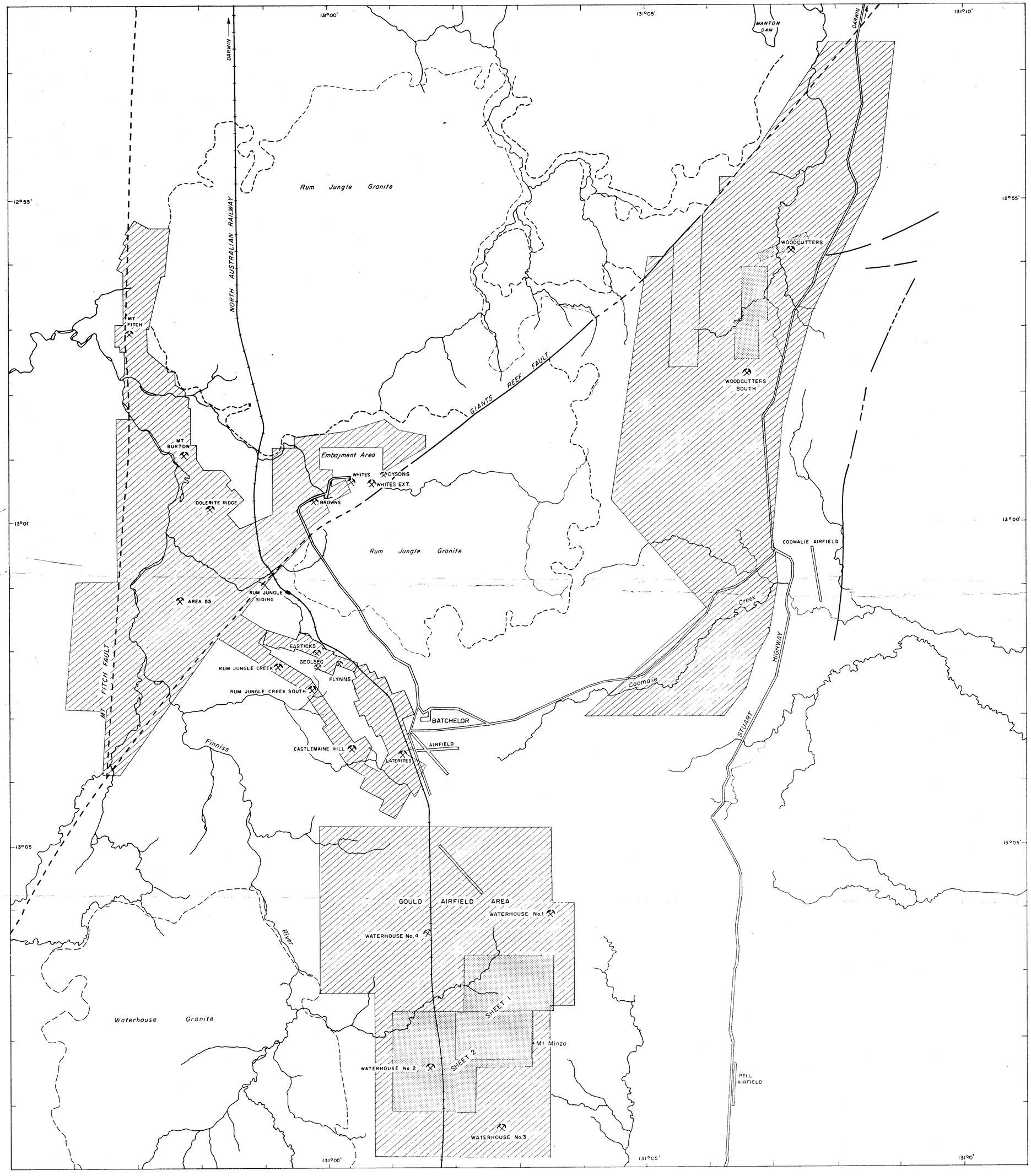
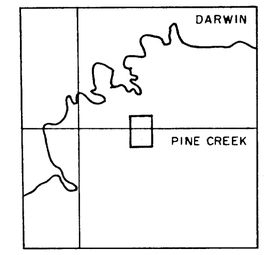
Sample No.	Co-ordinate Position		Cu	Co	Ni	Sample Depth (feet)	Radioactivity (mR/Hr) A/B.hor.	C.hor.
66120979	285S	364E	96	19	150	23	.010	.008
80		362E	88	11	85	23	.009	.010
81		360E	28	-6	21	23	.008	.011
66121390		393E	-3	-6	17	23	.014	.008
66121401		394E	13	30	116	23	-	-
400		395E	15	-6	38	23	.026	.015
66121399	285S	396E	21	-6	32	23	.030	.015
66121391	287S	394E	4	9	53	23	.023	.014

Plate I.



LOCALITY MAP



REFERENCE TO AUSTRALIA 1:250,000 STANDARD MAP SERIES

LEGEND

- HIGHWAY
- RAILWAY
- FAULT
- MINE OR PROSPECT
- GEOLOGICAL BOUNDARY
- RIVER OR STREAM
- GEOCHEMICAL AND GEOPHYSICAL SURVEY AREAS UP TO 1965
- GEOCHEMICAL SURVEY AREA 1966

SCALE

1 0 1 2 MILES

GEOCHEMICAL SURVEY 1966
MOUNT MINZA - GOULD AREA
RUM JUNGLE, N.T.
LOCALITY MAP

D 52/A8/209

BASED ON D52/57-191

To accompany Records 1967/41 and 1967/42.

Bureau of Mineral Resources, Geology and Geophysics

PLATE 2

REFERENCE

Geological Boundaries
- Position accurate
- Position approximate
- Inferred, deduced

Bedding
- Measured
- Prevailing

Faulting
- Position accurate
- Position approximate
- Inferred
- Anticline (plunge indicated)
- Syncline (plunge indicated)
- Costean

LOWER PROTEROZOIC Nolternius formation — Pln
- Laterite
- Subgreywacke
- Siltstone

LOWER PROTEROZOIC Golden Dyke Formation — Pld
- Amphibolite
- Black shale (gr. - graphitic, chl. - chloritic)
- Shale
- Hematite-quartz breccia
- Banded iron formation
- Quartzite
- Tremolitic siltstone / sericitic schist
- Limestone
- Undifferentiated

Survey finished at 12E between 1458 & 1896

Mt. Minga

DD 66:4

1966 SURVEY

MINZA AREA - GEOLOGY

(SHEET 1)

SCALE: 400 FEET TO AN INCH

400 0 400 800 1200

N

Bureau of Mineral Resources, Geology & Geophysics, Darwin, Dec. 1966

To accompany Record 1967/41.

D52/A8/216

PLATE 3

Pld

Pln

Plo

Scattered Laterite

Waterhouse No.2 Prospect

Mt Minza

REFERENCE

Geological Boundaries
- Position accurate
- Position approximate
- Inferred, deduced

Bedding
- Measured
- Prevailing

Faulting
- Position accurate
- Position approximate
- Inferred
- Anticline (plunge indicated)
- Syncline (plunge indicated)
- Costean
- Proposed diamond drill hole

LOWER PROTEROZOIC
Volteinus formation
Pln

LOWER PROTEROZOIC
Coomalie Dolomite
Plo

LOWER PROTEROZOIC
Golden Dyke Formation
Pld

- Undifferentiated
- Laterite
- Subgreywacke
- Siltstone
- Silicified Shale
- Amphibolite
- Black shale (gr-graphitic chl-chloritic)
- Shale
- Hematite-quartz breccia
- Banded iron formation
- Quartzite
- Tremolitic siltstone/sericitic schist
- Limestone
- Undifferentiated

1966 SURVEY

MINZA AREA - GEOLOGY

(SHEET 2)

SCALE : 400 FEET TO AN INCH

400 0 400 800 1200

D52/A8/217

To accompany Record 1967/41.

Bureau of Mineral Resources, Geology & Geophysics, Darwin 1:1:67

NO NICKEL ANALYSES

DRILLED 1965

800 ppm Cu
C1
R1
0022 mR/hr
Ni1
1200 ppm Ni
1300 ppm Ni
800 ppm Ni
876 ppm Ni
C2
400 ppm Cu
1090 ppm Ni
0020 mR/hr
980 ppm Ni
Ni2
1990 ppm Ni
417 ppm Co
Co1
875 ppm Ni
C3
460 ppm Cu
844 ppm Ni
Ni3
1160 ppm Ni
R2
0027 mR/hr
Ni5
1070 ppm Ni
940 ppm Ni
1180 ppm Ni
Ni4
C4
475 ppm Cu
500 ppm Cu
C5
403 ppm Cu
C6
806 ppm Cu
C8
Co2
450 ppm Co
495 ppm Cu
C7
782 ppm Cu

PLATE 4.

MINZA AREA GEOCHEMICAL AND RADIOMETRIC CONTOURS

(SHEET 1)

REFERENCE

- 200 — Copper 100, 200, 400, 800 ppm
- 400 — Nickel 400, 800, 1600 ppm
- 200 — Cobalt 200, 400 ppm
- 0.015 — A/B Soil horizon radioactivity 0·015, 0·020, 0·025 mR/hr
- 0.020 — C Soil horizon radioactivity 0·020, 0·025, 0·030 mR/hr
- 800 ppm Ni — Max. value for each anomaly. Results obtained by atomic absorption spectrophotometer at A.M.D.E.L.
- Fault, position accurate
- Fault, position approximate
- Fault, inferred

Scale

400 0 400 800 1200 1600 feet

To accompany Record 1967/41.

D52/A8/210 EJ

PLATE 5.

MINZA AREA

GEOCHEMICAL AND RADIOMETRIC CONTOURS

(SHEET 2)

REFERENCE

- Copper 100, 200, 400, 800, 1600 ppm
- Nickel 100, 200, 400, 800, 1600 ppm
- Cobalt 100, 200, 400, 800 ppm
- A/B soil horizon radioactivity 0.015, 0.020, 0.025, etc.
- B Soil horizon radioactivity 0.020, 0.025, 0.030 mR/hr
- 800 ppm Ni — Max value for each anomaly. Result obtained by atomic absorption spectrophotometer at A.M.D.L.
- Fault, position accurate
- Fault, position approximate
- Fault, inferred
- Proposed diamond drill hole

Scale

400 0 400 800 1200 1600 feet

To accompany Record 1967/41.

D52/A8/211

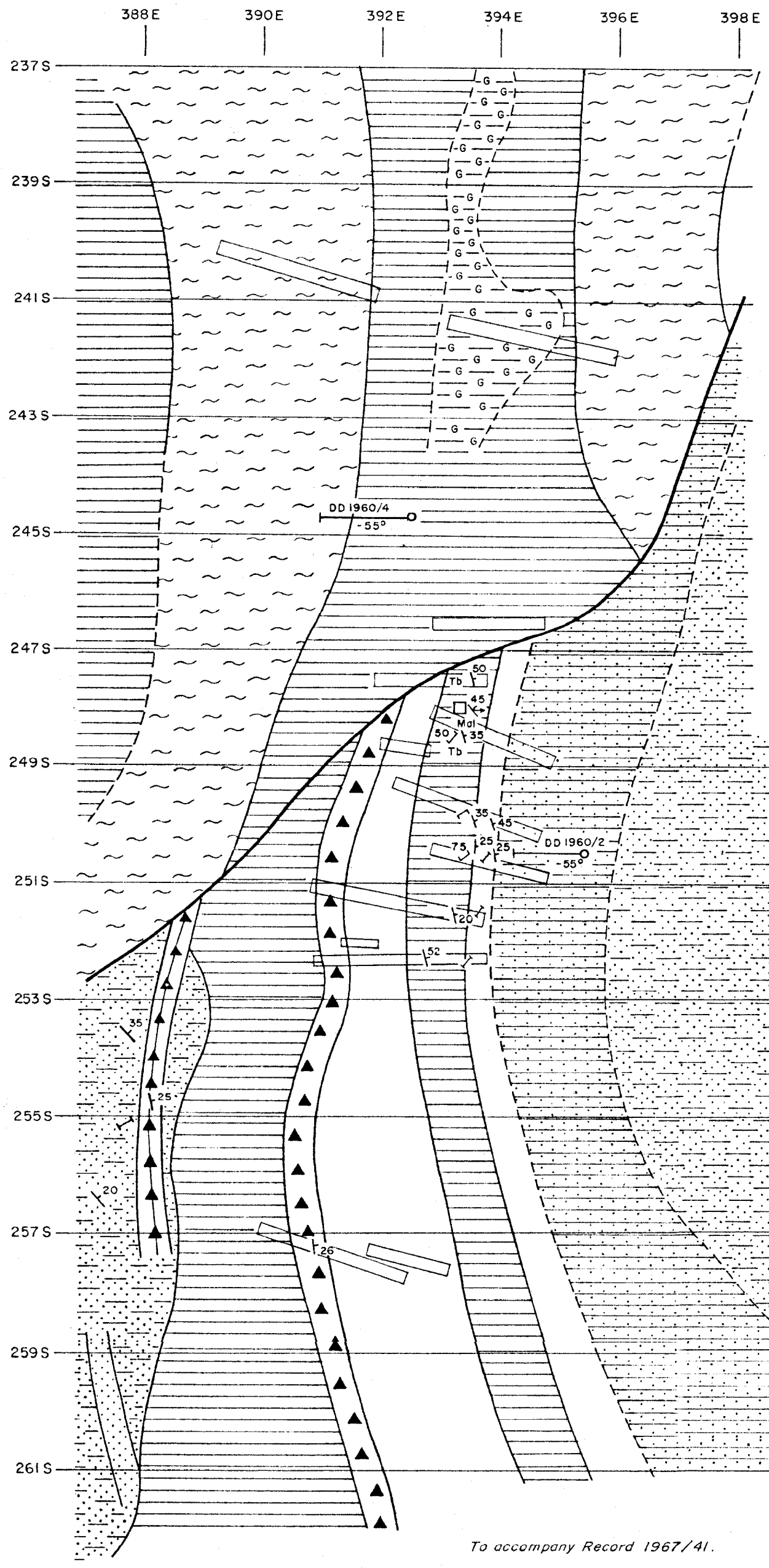
EJ

GEOLOGY WATERHOUSE No2 PROSPECT

Plate 6.

Scale

200 100 0 200 Feet



Reference

Lower Proterozoic

Golden Dyke Formation

- *Amphibolite*
- *Graphitic siltstone*
- *Banded siltstone and shale*
- *Black shale (silicified)*
- *Quartz-hematite breccia*
- *Graphitic black shale*
- *Banded iron formation*
- *Quartzite*
- *Tremolitic siltstone*

Geological boundaries:

- *accurate*
- *approximate*
- *Fault*
- 40 *Strike and dip of bedding*
- *Costean*
- *Shaft*

Fracture cleavage:

- I *vertical*
-] *inclined*
- *lineation*
- DD 1960/2 / -55° *Diamond drill hole*
- Tb *Torbernite*
- Mal *Malachite*

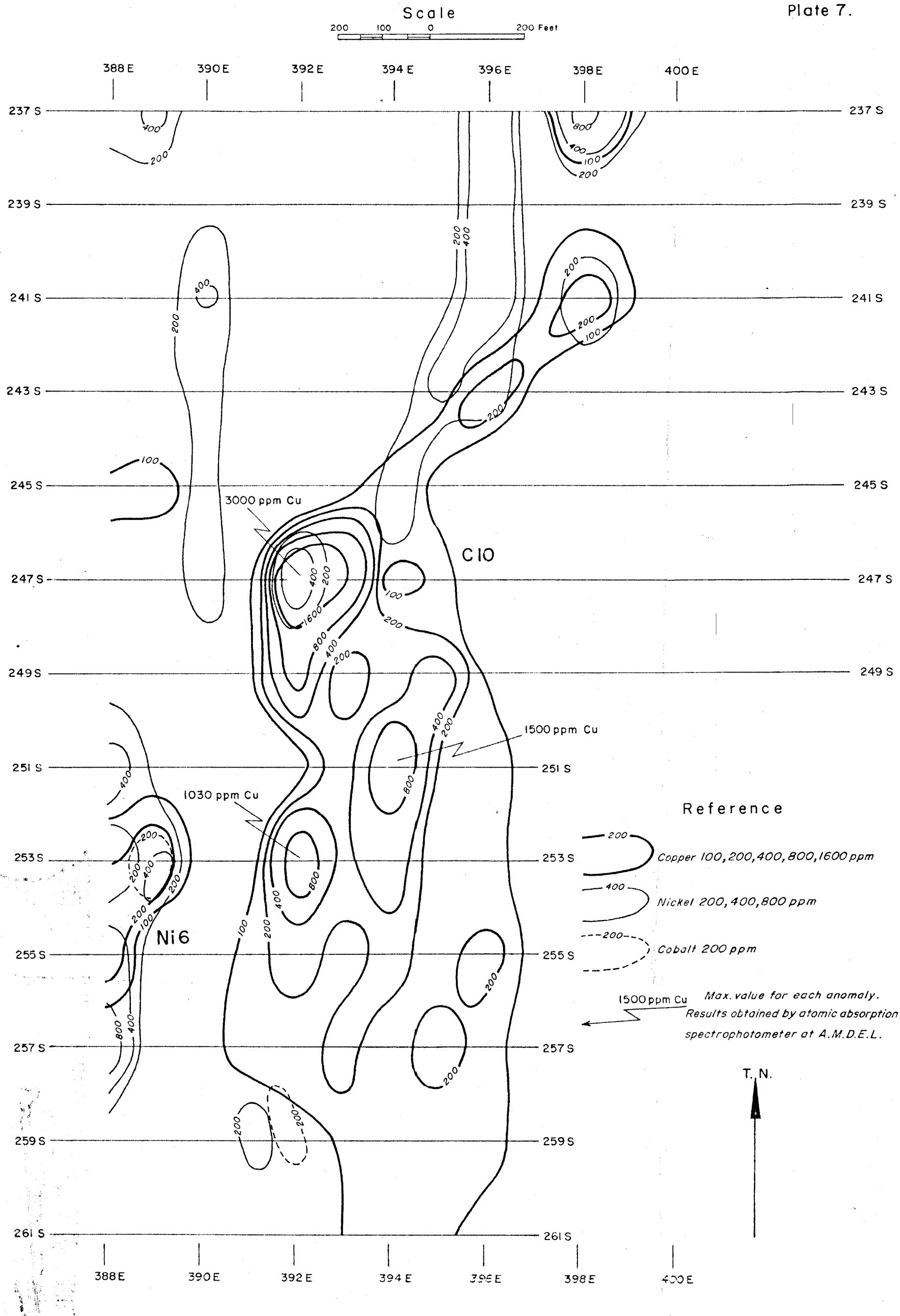
N T

To accompany Record 1967/41.

D 52/A8/212 EJ

WATERHOUSE No2 PROSPECT
GEOCHEMICAL CONTOURS COPPER-NICKEL-COBALT

Plate 7.



To accompany Record 1967/41.

D 52/A8/213. EJ

WATERHOUSE No2 PROSPECT
RADIOMETRIC CONTOURS

Plate 8.

Scale
200 100 0 200 Feet

388E 390E 392E 394E 396E 398E 400E

237 S 239 S 241 S 243 S 245 S 247 S 249 S 251 S 253 S 255 S 257 S 259 S 261 S

T. N.

0.033 mR/Hr
0.040 mR/Hr
0.054 mR/Hr
0.054 mR/Hr

R3
R5a
R5b
R5c
R5d
R4

Reference

A/B Soil horizon radioactivity
0.015 to 0.050 mR/Hr

C Soil horizon radioactivity
0.015 to 0.030 mR/Hr

0.054 mR/Hr Maximum value for each anomaly

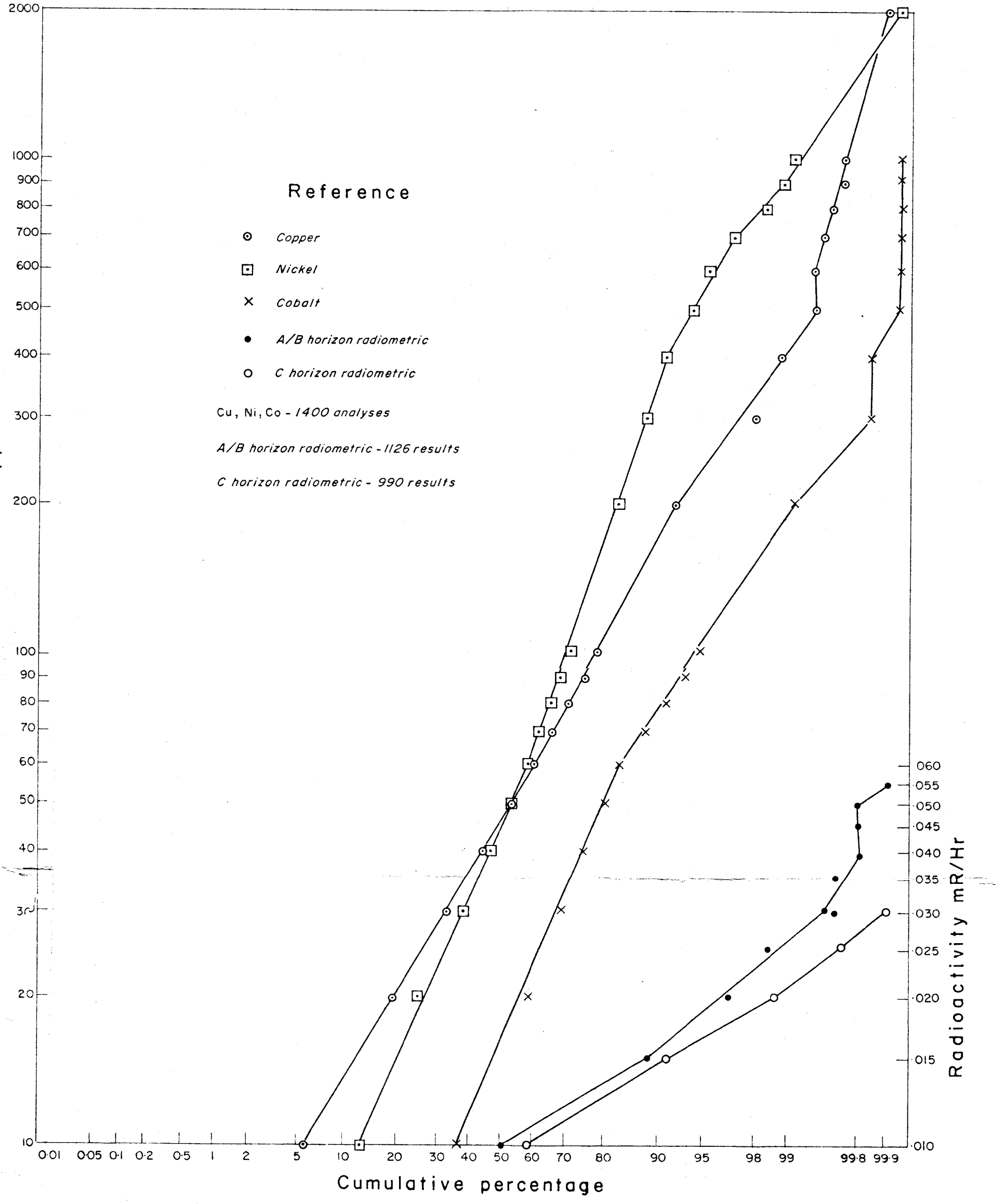
Proposed rotary percussion drill hole

To accompany Record 1967/41.

D 52/A8/214 EJ

Plate 9.

CUMULATIVE FREQUENCY PLOTS OF BASE METAL AND RADIOMETRIC VALUES



To accompany Record 1967/41.

D 52/A8/215 EJ