GOLD FIELDS EXPLORATION PTY. LIMITED

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-6 OCT 1982

ST. DIZIER AREA

PROGRESS REPORT

64 001

AUGUST, 1981 TO JUNE, 1982

U M A.O. C.Q. E.O. D.S.M.E

Received
Answered 6 OCT 1982

DEPT. OF MINES
REF. No. 8220/82

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GEOLOGIST

July, 1982.

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SUMMARY

Five diamond drillholes have been completed since August, 1981 for a total of 1580.8m. Each hole intersected stanniferous magnetite skarn, however tin grades were relatively low, compared with previous intersections.

A further lease (M.L. 65 M/81) covering the easterly extension of the skarn zone and adjoining the previous eastern-most lease has been granted. Most of the work completed, including three of the five drillholes, reconnaissance geological mapping, bedrock sampling and a ground magnetics survey, was concentrated within the fourth lease. Although the skarn zone and granite "trough" appear to narrow in this area, mineralised skarn intersections were recorded at depths similar to those in more westerly holes.

A NE trending fault has been proposed to account for a wide carbonate intersection in SD13 and faulted-out hangingwall mineralisation inferred near SD17. This fault replaces the earlier NW trending structure proposed by Roberts (August,1981).

Work completed between July, 1981 and June, 1982 cost $176,526. Of this, the cost to Renison was $120,114. Renison has now spent $323,606 at St. Dizier and has earned a 51% interest in the prospect, having exceeded the required $250,000 expenditure.

1. INTRODUCTION

The St. Dizier deposit is a stanniferous magnetite skarn which occurs within hornfelsed Precambrian sediments on the northern margin of the Devonian Heemskirk Granite. It is located 18 km WNW of Zeehan, West Tasmania (Plan 1).

The property has been actively explored since the early 1960's primarily by four companies: Placer Prospecting, Minops, Cominco Exploration and the current Renison - Apollo Joint Venture. The first three companies carried out a series of geochemical and geophysical surveys and completed twenty-nine drillholes. During 1981-82 Renison earned a 51% interest in the prospect having exceeded the expenditure figure of $250,000 specified in the Joint Venture Agreement.

This report describes work carried out between August, 1981 and June, 1982.

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2. LAND TENURE

The property comprises four mining leases 13M/59, 16M/62, 17M/62 and 65M/81, covering a total of 33 hectares. The leases are held in the name of Apollo International Minerals N.L., and are subject to a Joint Venture Agreement between Renison Limited (51%) and that company (49%).

The first three leases were acquired by Apollo under the terms of an Option Agreement with Mr. R. Laffer of Zeehan in 1981. The fourth lease 65M/81, of 9ha., was acquired directly by application to the Mines Department in July, 1981.

The ground surrounding the leases is part of Exploration Licence 47/71 held by Gippsland Minerals, and is currently subject to a Joint Venture Agreement between that company (30%) and Aberfoyle (70%).

3. WORK COMPLETED

3.1 Access

A grid was established over the fourth lease with lines 50m apart and pegged every 25m. The grid baseline is centred over the skarn zone.

Access to and levelling of drill sites required minimal bulldozer work.

3.2 Geology

Detailed outcrop and interpretive geological mapping of all but the new lease, was completed by Roberts in 1981 and is discussed in the previous progress report (Roberts, August 1981). Reconnaissance mapping of the fourth lease has shown that granite outcrop is located within the SE corner of the lease. The granite"trough" enclosing the skarn and sediments therefore appears to narrow towards the east (information from drilling suggests that the trough is not significantly shallower in this area, however). East of the fourth lease , the topographic depression (which is the surface expression of the skarn-carbonate) opens into a broad marshland area with rare, scattered hornfels float and subcrop. (Plan 2).

3.3 Geochemistry

A bedrock sampling program was completed over the fourth lease. The sampling was carried out using a hand-held power auger, along gridlines at 25m intervals with closer spacing along main lines and between the lines over the skarn zone. Results are contoured in Plans 3A-F, and appended (Appendix 2)

Contouring of the results has strongly outlined the skarn zone with Cu(up to 850ppm), As(up to 390ppm) and, to a lesser extent Zn(up to 7440ppm) and WO_3(up to 120ppm). However Sn values within the swamp covered skarn zone are appreciably lower than in the enclosing quartzite, hornfels and granite. This is most obvious in the central and eastern parts of the lease where values within the skarn average 30 ppm compared to 50-100 ppm away from the skarn (up to 2120 ppm).

3.4 Geophysics

A ground magnetics survey was conducted over the fourth lease. The results have been contoured (Plan 4) and are appended (Appendix 3). The contour plan shows the highest values to be on the western edge of the lease centred over the skarn and decreasing to the east, which suggests that the source of the magnetic response is plunging or diminishing toward the east. This result agrees closely witha1974 Fluxgate survey by Cominco (Simpson 1975).

Following a recommendation by Roberts (August,1981) a study was made by Bishop, consultant geophysicist, of the effect of a large tabular magnetite bearing body on downhole camera surveys. This followed repeated apparent deviations as holes neared the magnetite body. (Similar deviations have been noted in drilling during this period). Bishop's conclusion was that the magnetite body would only have a negligible effect on surveys more than 30-40 metres distant from the body. His report is appended (Appendix 4).

3.5 Diamond Drilling

Six holes were drilled between August, 1981 and June, 1982 for a total of 1580.8m. All but one of these intersected the St. Dizier stanniferous magnetite skarn and contained moderate to low Sn, moderate to high Zn and generally low (but significant) WO_3 values over true widths ranging from three to ten metres.

In accordance with previous drilling practice, holes were drilled using NQ triple tube or HQ to keep core loss to a minimum in the generally broken ground present at St. Dizier (note: ground conditions apparently improve towards the east end of the fourth lease).

The drilling generally confirmed the structural interpretation of Roberts (August, 1981). Drill logs and assays are appended (Appendix 5.) and hole localities are shown on Plan 5. Petrological descriptions of parts of the skarn intersections of SD 16 and SD 18A have been appended with the drillhole logs. Descriptions of samples from SD17, SD19 and SD20 are pending at the time of writing.
Drilling details follow:

3.5.1 DDH SD 16 (Plan 6)

dip: -57^{o}
bearing: 182 AMG
length: 331.7m.

SD 16 intersected two major serpentinous magnetite skarn zones at 218.6 -259.7m (near hangingwall) and 279.5-295.8m (near footwall), separated by a hornfels/quartzite unit. The shallower magnetite skarn intersection was interbedded with hornfels/quartzite and included 4m (3m true thickness) of 0.42%Sn (0.31% acid soluble) and 0.17% WO_3 at 245.0 - 248.0m. The deeper intersection only contained minor hornfels interbeds, and included 4m (3m t.t.) of 0.33% Sn(0.18% acid soluble) and 0.06% WO_3. The hole was completed in granite.

The intersected positions of the skarn hangingwall and footwall and the granite contact confirmed the structural interpretation of Roberts in this area.

The abundance of metamorphosed clastic sediments within the skarn zone correlates with the skarn intersection of SD10, further to the west. As SD13 (70m further east) encountered a skarn unit free of clastic lithologies, this hole has better defined the extent of the clastic-rich "facies" in this area. The economic potential of the skarn is significantly affected by the size of this "facies" as its presence has probably had a diluting effect on tin grades, because there was less carbonate "available" for mineralization at the time of skarn formation.

3.5.2 DDH SD17 (Plan 7)

Dip:-59°
Bearing: 345 AMG
Length: 299.7m.

SD17 intersected a wide mineralized fault zone containing magnetite and serpentine at 263.7 - 283.0m. before entering granite. The hangingwall was not seen and it appears to have been faulted out, probably with a section of the skarn zone. The fault zone included 1.0m of 0.40%Sn(0.40% acid soluble) and 3m of 0.28%Sn(0.23%acid soluble).

The fault intersection in this hole has resulted in a revision of the structure contour plan (Plan 5) A N.E. trending fault, dipping at 75° to the S.E. is proposed. This fault also accounts for the unusually thick skarn zone encountered in SD13 (Plan 8), which was previously explained using a N.W. trending fault (Roberts,1981). The fault is also interpreted as having intersected SD10 and SD14. The net result of the new interpretation is a thickened skarn zone around 345200E and hence a small increase in ore potential in this area.

3.5.3 DDH SD18

dip: - 55°
bearing: 355 AMG
length: 132.6m.

SD18 was terminated in the footwall hornfels before intersecting the skarn zone because of excessive westerly drift (from 355 AMG to 332 AMG) and a steepening of the hole (-55° to-60°).

3.5.4 DDH SD18A (Plan 9)

dip: - 55°
bearing: 004 AMG
length: 286.3m.

SD18A intersected 37.5m. of stanniferous magnetite skarn at 198.5 - 236.0m. This included 23.0m. (10 m t.t.) of 0.38% Sn(0.28% acid soluble) and0.09%WO$_3$ at 204.0 - 227.0m. In order to correlate the association of metals with the various mineral assemblages observed within mineralised skarn in this hole, the assays have been plotted in histogram form (Plans 10 A - H). The mineralised zone was divided into three main units on the basis of geological logging:

(1) 198.5 - 212.6m. Magnetite-serpentine skarn, minor pyrrhotite.
(2) 212.6 - 223.6m. Magnetite skarn-pyrrhotite, minor pyrite and chalcopyrite.
(3) 223.6 - 236.0m. Magnetite-serpentine skarn.

The histograms show:

(i) Zn rich zones surround Sn rich areas.
(ii) High Fe values resulting from magnetite and pyrrhotite correspond with high Sn values.
(iii) Sn and S correspond except in the lower part of zone (1). In this section the Sn is all acid soluble. This may suggest a non-sulphide acid soluble Sn phase.
(iv) Cu and acid insoluble Sn are associated.

Structural interpretation of SD18A shows that the skarn zone narrows slightly and dips less steeply to the north (approximately 81°) than holes further to the west.

3.5.5 DDH SD19 (Plan 11)

dip:- 67.6°
bearing: 167 AMG
length: 322.5m

SD19 intersected 12m of magnetite-serpentine skarn at 192.6 - 204.6m, associated with a very broken, sheared contact zone between the skarn and the hangingwall. Between 195.0 and 204.0m (9m total, 5m t.t.) assays average 0.10% Sn(all acid soluble). It is possible that part of the mineralisation has been faulted out. Interpretation of the data available suggests that the skarn zone strikes eastward from SD18A but that the dip has shallowed slightly from 81° to 77° north. The dip of the northerly granite "trough wall" is interpreted to vary from steep north to steep south in this area, almost parallelling the skarn. The skarn intersection also indicated that the carbonate unit is thicker at depth than at the surface.

3.5.6 DDH SD20 (Plan 12)

dip: - 70°
bearing: 150.5 AMG
length: 340.6m.

SD20 intersected three separate magnetite skarn zones:

(1) 229.2 - 234.4m : Sulphide-rich (averaged 10%S), but barren of Sn, Zn or WO_3.

(2) 261.7 - 267.0m : 5m (3m t.t.) of 0.33% Sn(0.06% acid soluble) and 1.47% Zn.

(3) 294.5 - 313.6m :included 5m (3m t.t.) of 0.44%Sn (0.06% acid soluble) and 0.09% WO_3.

Both the second and third intersections werenotable for their high proportion of acid insoluble tin (cassiterite?). The third intersection was unusual in that it occured in a near-footwall position, in contrast with all of the other tin-tungsten mineralised intersections in the eastern part of the lease area.

The skarn intersected in this hole was similar to that obtained in drillholes SD10 and SD16 in that it contained a large percentage of interbedded clastic sediments. Significantly, the grade of tin-tungsten mineralisation in both holes was similar to the third magnetite skarn intersection of this hole.

3.6 Petrology

Samples of crushed drill core from the mineralised zones, were sent to AMDEL for petrological description. AMDEL was asked specifically to describe the grainsize and mineral associations of the tin and tungsten minerals and to make an estimate of the proportions of those minerals. Reports have been received for holes SD16 and SD18A (Appendix 8). Descriptions of holes SD17, SD19 and SD20 are pending at the time of writing. Samples from all but SD16 were bulked into intervals of up to 6 metres in an attempt to obtain a more representative assessment of the variable mineralisation.

The descriptionsto hand confirm previous findings which show that the skarn hosts a variety of exotic Sn phases of a very fine grained nature ($<1-100 \mu m$). Schoenfliesite ($Mg\ Sn\ (OH)_6$) and cassiterite are the most commonly identified minerals. The petrological descriptions for SD16 and SD18A are summarised in tables 1 and 2.

SAMPLE	INTERVAL (m)	SULPHIDES	Sn BEARING [illegible]SE (av. grainsize)	WO_3 PHASE	ASSAYS				
					%Sn	%S.Sn	$\%WO_3$	%Zn	%Cu
1.	224 -225	Mt ,Po ,cpy,sp(ga)	cassiterite (av 2-5 μm)	scheelite	0.40	0.03	0.04	0.04	0.07
2.	233 -234	Mt ,Po ,sp (cpy)	N.D.	wolframite 0.1 - 0.3mm, rare scheelite	0.03	0.01	0.42	0.03	0.03
3.	247 -248	Mt ,Po ,(cpy,sp, apy,cubanite)	one phase associated with fibrous Mn-magnetite(<20μm),minor cassiterite (<5μm) in (?) chlorite;composition of ore and ore minerals variable	scheelite 0.05 - 0.5mm.	0.85	0.66	0.18	0.03	0.05
4.	248 -249	Mt ,Po , cpy,ga, (apy)	N.D.	scheelite up to 2.5mm.	0.03	0.02	0.43	0.02	0.03
5.	281 -282	Mt ,Po ,(cpy)	Sn in fibrous Mn-magnetite (? <20μm)	scheelite 0.5mm.	0.25	0.24	0.20	0.03	0.02
6.	306 -307	Mt ,po ,sp ,cpy (marcasite)	fine inclusions (<10μm) of Sn mineral in serpentine probably cassiterite. Also irregular patches of cassiterite up to 0.5mm.	rare scheelite	0.26	0.03	<0.01	0.46	0.18

TABLE 1. SD16 PETROLOGICAL SUMMARY

SULPHIDES: Mt=magnetite, po=pyrrhotite, cpy=chalcopyrite, sp=sphalerite, ga=galena, apy=arsenopyrite.

Upper Case (e.g. Po) = abundant; lower case (e.g.po) = lesser; ( ) = minor.

SAMPLE	INTERVAL (m)	SULPHIDES	Sn BEARING PHASE (grainsize)	WO_3 PHASE	ASSAYS				
					%Sn	%S.Sn	$\%WO_3$	%Zn	%Cu
B1.	123.5-126.5	Sp,py (po,cpy)	-	-	0.10	0.01	<0.01	4.32	0.35
B2.	160-162	Sp,cubanite,apy, cpy, (py)	-	-	0.02	<0.01	<0.01	0.24	0.02
B3.	211-214	Po,Mt (apy,sp)	schoenfliesite (10µm) in fibrous magnetite	-	0.13	0.11	0.02	0.94	0.10
B4.	214-218	Mt,po,py,(cpy)	cassiterite (2-20µm) schoenfliesite (10µm) in spongy magnetite	-	0.52	0.20	0.04	0.16	0.23
B5.	218-222	Mt,Po,(py)	cassiterite (10µm) schoenfliesite (2-20µm) in magnetite	-	0.39	0.30	0.19	0.07	0.19
B6.	222-227	Mt,Po (py,cpy, apy)	cassiterite (1-10µm) in magnetite	-	0.42	0.03	0.17	0.24	0.07

TABLE 2. SD18A PETROLOGICAL SUMMARY

SULPHIDES: sp=sphalerite, py=pyrite, po=pyrrhotite, cpy=chalcopyrite, apy=arsenopyrite.

Upper Case (e.g.Po)=abundant; lower case (e.g.po) =lesser; ( ) =minor.

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3.7 Metallurgy

Metallurgical testwork was carried out on six samples from four St. Dizier drillholes. Magnetic separation,gravity concentration and flotation techniques were employed. Limited success was obtained and more testwork is required. A Renison Limited Internal Memorandum by E. Prince (Research Section) describing the testwork is appended (Appendix 6).

3.8 Reassaying

Sections of core from four of the twelve Cominco-Placer drillholes, H5 to H8, were reassayed. These holes were drilled betwen 7.3.66 and 16.5.66. The assays are appended (Appendix 7). The results generally conflicted with the original data where available. Assays fromH5 and H7 were significantly higher over slightly wider intersections, while assays from H6 were considerably lower than the original data. H8 assays revealed no significant Sn mineralisation in the tested intervals. The results are summarised in Table 3. Note the anomalous Zn values.

Hole No	Interval (m)	Thickness (m)	%Sn	%acid soluble	%Zn	%WO_3
H5	161.2-172.8	11.6	0.11	0.10	1.41	<0.01
	161.2-167.0	5.8	0.12	0.12	2.34	<0.01
	original assay					
	165.8-172.5	6.7	0.03	not	assayed	
H6	178.6-181.3	2.7	0.06	0.05	0.32	<0.01
	original assay					
	179.1-181.4	2.3	0.14	not	assayed	
H7	57.0-63.0	6.0	0.25	0.21	0.20	0.01
	61.0-63.0	2.0	0.39	0.39	0.30	0.02
	62.0-64.6	2.6	0.23	0.26	0.96	0.01
	original assay					
	55.5-58.2	2.7	0.28	not	assayed	
	60.2-63.2	3.0	0.10	not	assayed	
H8	33.0-89.0	56.0	0.01	<0.01	0.01	<0.01
	74.0-76.0	2.0	0.56	0.04	0.02	0.02

TAB[illegible] 3 SUMMARY OF REASSAY DATA

4. DISCUSSION (by P.A. Roberts)

Overall, the results of the drilling were disappointing: several drill holes failed to intersect mineralisation of any economic interest,and the others all cut mineralised intersections with a "natural" average grade below 0.5%Sn. Although these intersections include appreciable amounts of tungsten (0.1 - 0.2% WO_3), it's economic usefulness is not clear; metallurgical treatment of such complex tin ore may not permit the recovery of the tungsten as well.

Within the three older leases, the drilling indicated the following:

(1) The tonnage potential of near-hangingwall mineralisation in the vicinity of the SD16 intersection was reduced slightly. The intersection in SD16 was very similar in grade, thickness and mineralogy to that obtained in SD10 (further west), and thinner, and lower in grade than the SD13 intersection (further east).

(2) The tonnage potential of near-hangingwall mineralisation in the vicinity of the SD17intersection is unresolved. The fault invoked to explain the absence of significant mineralisation in SD17 may not have as great an effect as the interpretation suggests. Further drilling will be necessary to clarify this interpretation.

Within the new lease, M.L. 65 M/81, surface exploration work and drilling indicated the following:

(1) The skarn-carbonate unit thins towards the east on the surface but apparently maintains its thickness at depth.

(2) From west to east, the skarn-carbonate's dip tends to become less steep towards the north.

(3) The depth to the "keel" of the granite "trough" (which generally corresponds with the skarn-granite contact) is interpreted to remain roughly constant across the lease. However, at the eastern end of the lease, given the relative steepness of the granite's southern contact,

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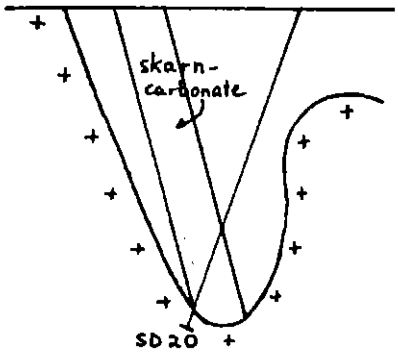
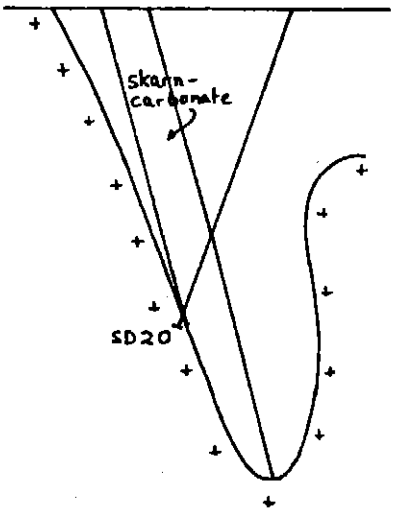
the depth to "keel" (and hence the skarn's depth potential) may be substantially greater than at the western end of the lease. Either of the schematic section interpretations below can be accomodated by the data:

EITHER



OR



(4) Although the current interpretation suggests that the structure is uncomplicated, further work may reveal that some faults are present(e.g. the faulted(?) hangingwall intersection in SD19).

(5) The ground magnetics and drilling data suggest that the near-hangingwall mineralised zone reaches its maximum thickness on the border between M.L.'s 17M/62 and 65M/81 and thins towards the east. In addition, the upper surface of magnetite skarn mineralisation probably dips shallowly eastwards.

(6) The best potential for substantial amounts of economic mineralisation is in the general vicinity of the near-hangingwall intersection in SD18A, at depth below SD19, and along strike from or below the near-footwall and near-hangingwall intersections in SD20.

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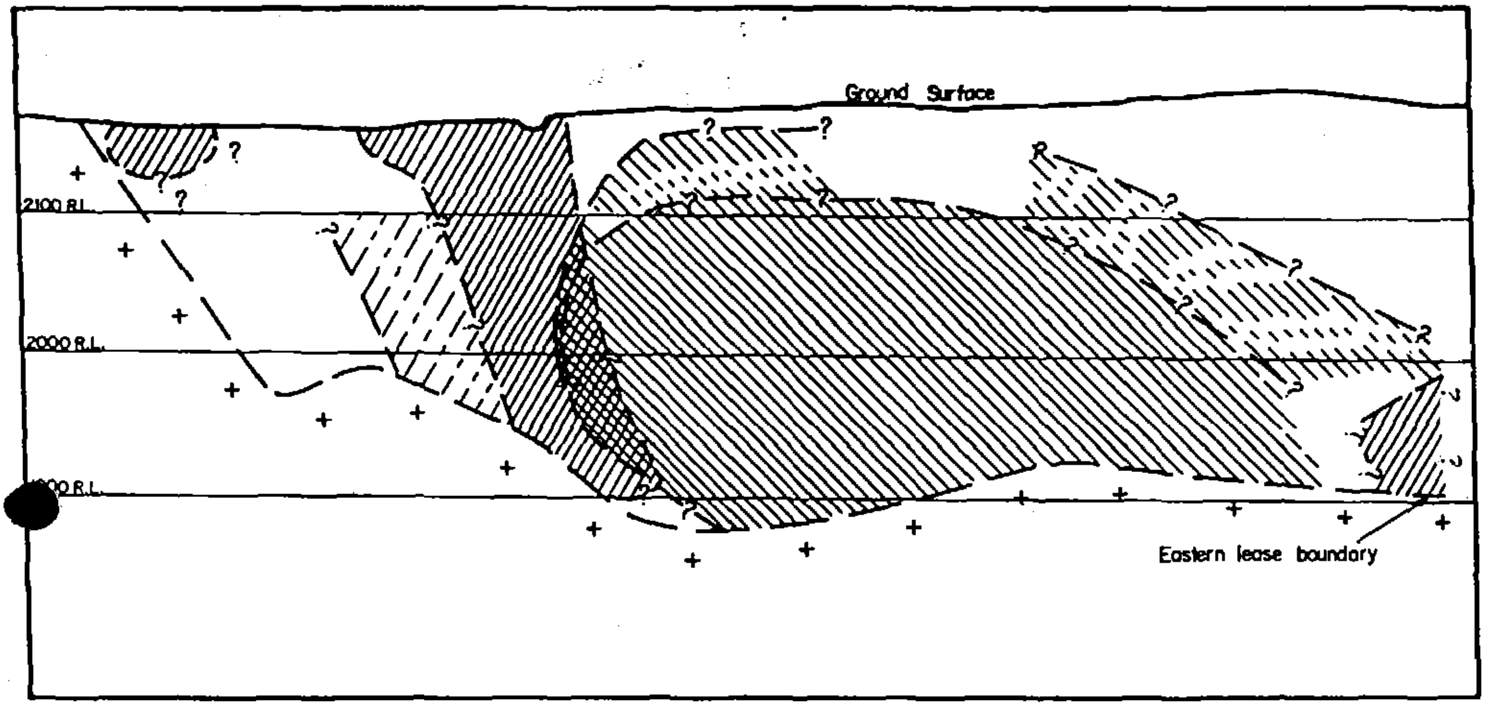
Examination of the assay data has revealed a consistent zoning pattern within the skarn. Both the central, near-footwall to centre skarn mineralisation and the eastern, near-hangingwall mineralisation are fringed by sphalerite-bearing zones. These average 0.5 to 1.5% Zn and 0.1 to 0.3% Sn (no tungsten), and, as such, are too low grade to be of economic interest. An approximate interpretation of the zones' distribution is shown in Figure 1.



LEGEND

Near FW. to Centre Skarn Mineralisation	▨	Tin zone
	▨	Low grade Zinc/Tin zone
Near HW. Mineralisation	▧	Tin zone
	▧	Low grade Zinc/Tin zone
	+ + +	Granite

5 cm

SCALE

0 500

METRES

GOLDFIELDS EXPLORATION PTY. LTD.		
LONGITUDINAL PROJECTION (Looking North)		
SCALE	DRAWN P.R.	FIG.1
DATE JULY 1982	DRAFTSMAN S.F.	

5. REFERENCES

ROBERTS, P.A., 1981: St. Dizier Area. Progress Report to July, 1981. Renison Limited. Unpublished Report.

SIMPSON, D.C., 1975: Report for R.S. Laffer(optioner) on St. Dizier, M.L.'s 13M/59, 16M/72 and 17M/62. Cominco Exploration Pty. Ltd. Unpublished Report.

GOLD FIELDS EXPLORATION PTY. LIMITED

[redacted]

EXPENDITURE JULY,1981-JUNE, 1982.

ITEM	$ EXPENDITURE	% OF TOTAL EXPENDITURE
Salaries (including loading)	16,089	9
Consumables	5,885	3
Renison Services (Survey, Assay, Research, Vehicles)	7,400	4
Travel and Accomodation	785	–
Diamond Drilling	135,900	77
Site and Access Development	1,641	1
Outside Services - Petrological	4,105	2
Outside Services - Other (Drafting, Geochemistry)	4,721	3
Rounding		1
TOTAL:	175,526	100
LESS: Apollo share:	56,411	
Renison Total:	120,114	

York, Vale [redacted]

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FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA St. Dizier **TRAVERSE** 000E, 050E & 025E **DATE** Dec. 81. **OBS** [illegible]

STATION	SAMPLE NO.	DEPTH metres		DESCRIPTION
000E	100S		·8	grey / blue w/rock
000E.	75S		·45	- - - -
000E	50S		·9	- / brown - -
000E	25S		·8	- / green - -
000E	125S	5	·5	fawn clay.
000E	Baseline	5	·0	- -
000E	25N		·7	cream / brown
000E	50N	1	·7	- / -
000E	75N	1	·7	tan clay.
000E	100N	2	·3	cream -
000E	125N		·4	grey coarse w/rock.
025E	B. line	6	·0	grey clay.
050E	125S		·2	grey / brown w/rock.
050E	100S	1	·2	- - - -
050E	75S		·3	- - - -
050E	50S		·3	dark grey / black w/rock.
050E	25S		·7	- - - clay.
050E	Baseline	2	·4	tan / grey clayey w/rock.
050E	25N	·	5	grey rock chip sample.
050	50N	·	3	- / fawn w/rock.
050E	75N	1	2	tan / - clayey w/rock.
~~050E~~	~~100N~~	1	5	- - -
050E	125N		·5	grey / brown coarse gritty w/rock.
050E	150N	2	·4	grey / - clay.
[illegible]	[illegible]		[illegible]	[illegible]

FIELD SHEET FOR GEOCHEMICAL SURVEY

64 027

025

AREA R. Dixier TRAVERSE 075E, 100E & 125E. DATE Dec '81 OBS N. Elliott.

64 026

STATION	SAMPLE NO.	DEPTH		DESCRIPTION
075E	Base line	6	.0	grey/fawn clay.
075E	12.5S	1	2	~~dark grey w/R.~~ red/brown clay
075E	25S.		.8	dark grey w/Rock
075E	25N	1	0	fawn w/R
100E	125S	1	.0	grey/Brown w/rock.
100E	100S		.9	- - -
100E	75S		.8	olive/brown -
100E	50S		.8	- -
100E	25S		.7	dark grey -
100E	12.5S	2	.5	- - clay
100E	Base line	2	0	fawn w/rock.
100E	25N	1	.2	- - -
100E	50N		.5	- - -
100E	75N	.	5	- -
100E	100N			No Sample.
100E	125N	.	6	Brown w/rock.
100E	150N	.	4	- - -
125E	25S		.4	dark grey w/rock.
125S	Base line	4	.5	fawn clay
125S	25N	1	0	- -

026

FIELD SHEET FOR GEOCHEMICAL SURVEY

64 028

AREA St. Dizier **TRAVERSE** 150E, 175E & 200E **DATE** Dec 81 **OBS** Elliot

STATION	SAMPLE NO.	DEPTH	DESCRIPTION
150E	150S	1.2	red/brown coarse w/rock.
150E	125S	.8	brown w/rock.
150E	100S	.8	" "
150E	75S	1.5	buff clay.
150E	50S	1.0	olive grey.
150E	25S	.8	dark grey clay.
150E	Base line	4.5	" " "
150E	25N	1.6	fawn clay.
150E	50N	1.5	red/brown w/rock.
150E	75N		no sample.
150E	100N	1.3	fawn clay.
150E	125N	2.3	orange clay.
175E	Base line	3.0	dark grey clay.
200E	150S	.25	orange gritty w/rock.
200E	125S	.3	" " "
200E	100S	1.2	" " "
200E	75S	.8	fawn w/rock.
200E	50S	1.8	grey/ " clay
200E	25S		no sample.
200E	~~[illegible]~~ 125S	2.5	dark grey w/rock.
200E 200E	25N 50N	.4 .6	fawn w/rock.
200E	75N	.5	" " "
200E	100N	1.2	orange coarse w/rock.
200E	125N	.5	" / "

027

FIELD SHEET FOR GEOCHEMICAL SURVEY

64 029

AREA St. Pizier **TRAVERSE** 225E, 250E, 300E **DATE** Dec '81 **OBS** [illegible]

STATION	SAMPLE NO.	DEPTH		DESCRIPTION
225E	12.5S	2	.0	Black dark grey clay/w/rock.
225E	Base line	1	.8	Fawn clayey w/rock.
250E	175S		.9	olive grey w/rock.
250E	150S	1	.5	light orange „ –
250E	125S	1	.2	„ „ –
250E	100S		.3	Stiff coarse w/rock.
[illegible]E	75S		.7	fawn clayey w/rock.
250E	50S	1	.0	„ „ „
250E	25S	1	.8	grey „ „ –
250E	12.5S	1	.8	dark grey „ „ –
250E	Base line	2	.0	olive/grey –
250E	12.5N	1	.8	„ „ „
250E	25N	1	.9	fawn w/rock.
250E	50N		.6	„ –
250E	75N		.25	„ –
[illegible]0E	100N		.35	„ –
250E	125N	1	.6	orange clayey w/rock.
275E	12.5S	3	.0	dark grey clayey w/rock
300E	100N		.7	fawn clayey w/rock.
300E	75N		.6	„ – –
300E	50N	1	.3	„ /grey „
300E	25N	2	.5	dark grey clay
300E	12.5N	2	.5	„ – –
300E	Base line	2	.5	„ – –
300E	12.5S	3	.0	fawn clay

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028

RENISON LIMITED

64 030

GEOCHEMICAL ASSAY RESULTS

Area: ST. DIZIER

Grid Line: 00E

Date:

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	Sn	SSn	As	WO_3	Cu	Pb	Zn		
	Sn	SSn	As	WO_3				Bi	Ag
125 N	50	<50	20	40	<10	<10	<10	10	<1
100 N	10	<50	10	<20	<10	10	<10	30	1
75 N	60	<50	40	60	30	10	20	30	1
50 N	40	<50	20	20	100	10	40	20	1
25 N	100	<50	20	30	<10	<10	<10	<10	<1
BL/00	40	<50	70	30	150	60	900	20	1
12.5 S	580	430	90	120	210	40	1890	40	2
25 S		50			40	80	10	20	1
50 S	6290	120	80	50	120	10	<10	10	1
75 S	50	<50	70	30	830	2300	1600	20	1
100 S	190	<50	10	20	<10	<10	<10	<10	<1

FORM NO. 81/90

029

64 031

RENISON LIMITED

GEOCHEMICAL ASSAY RESULTS

Area: ST. DIZIER

Grid Line: 25 E

Date:

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	Sn	SSn	As	WO_3	Cu	Pb	Zn	Bi	Ag
25 N									
BL/00	210	<50	90	30	360	110	60	20	1
125 S									
25 S									

FORM NO. 81/90

030

RENISON LIMITED

64 032

GEOCHEMICAL ASSAY RESULTS

Area: ......ST. DIZIER........

Grid Line: ......50E..............

Date: ....

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	Sn		As		Cu	Pb	Zn		
	Sn	SSn	As	WAs				Bi	Ag
175N	110	<50	10	20	<10	<10	<10	<10	1
150N	100	<50	10	10	10	30	<10	20	<1
125N	20	<50	20	40	<10	<10	<10	10	<1
100N	220	<50	20	30	<10	<10	<10	10	<1
75N	50	<50	20	20	<10	<10	<10	60	1
50N	80	<50	10	30	<10	<10	<10	<10	<1
25N	70	<50	60	20	40	<10	20	<10	<1
BL/00	290	50	120	40	430	70	300	30	1
125S									
25S	70	70	170	<20	880	70	70	30	3
50S	50	<50	10	20	10	<10	<10	10	<1
75S	90	<50	20	20	<10	<10	10	10	<1
100S	150	50	30	30	110	190	1300	10	<1
125S	630	50	20	30	<10	260	<10	10	<1
750S									

FORM NO. 81/90

031

64 033

RENISON LIMITED

GEOCHEMICAL ASSAY RESULTS

Area: ST. DIZIER

Grid Line: 75E

Date:

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	Sn		As		Cu	Pb	Zn		
	Sn	SSn	As	WO_3				Bi	Ag
25 N	60	<50	10	20	<10	<10	<10	<10	<1
BL/00	30	<50	40	20	40	<10	120	<10	<1
12.5 S	<10	<50	80	50	200	10	650	20	1
25 S	60	<50	20	20	<10	<10	10	<10	<1

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032

64 034

RENISON LIMITED

GEOCHEMICAL ASSAY RESULTS

Area: ST. DIZIER

Grid Line: 100E

Date:

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	Sn		As		Cu	Pb	Zn		
/	Sn	SSn	As	WO_3				Bi	Ag
150N		<50			<10	<10	20	<10	1
175N	30	<50	30	30	10	10	10	230	1
100 N									
75 N	90	<50	20	40	<10	<10	<10	<10	<1
50 N	170	50	20	40	<10	<10	<10	<10	<1
25 N	70	<50	20	20	<10	<10	<10	<10	<1
BL/00	90	50	50	30	70	80	830	<10	<1
12·5 S	<10	<50	30	100	200	10	180	10	1
25 S	20	<50	10	40	<10	<10	<10	<10	<1
50S	50	<50	10	<20	<10	10	40	<10	1
75S	100	<50	10	20	200	20	<10	<10	<1
100S	30	<50	<10	20	<10	10	20	<10	<1
125S	100	<50	10	20	<10	<10	10	<10	<1

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033

64 035

RENISON LIMITED

GEOCHEMICAL ASSAY RESULTS

Area: ST. DIZIER

Grid Line: 125E

Date:

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	Sn		As		Cu	Pb	Zn		
	Sn	SSn	As	WO_3				Bi	Ag
150 N									
125 N									
100 N									
75 N									
50 N									
25 N	100	<50	20	20	20	<10	10	<10	1
04/00	20	<50	40	20	100	20	100	<10	1
12.5S									
25S	20	<50	10	20	<10	<10	30	<10	<1

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RENISON LIMITED

64 036

GEOCHEMICAL ASSAY RESULTS

Area: ST. DIZIER

Grid Line: 150E

Date:

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	Sn		As		Cu	Pb	Zn		
	Sn	SSn	As	WO_3				Bi	Ag
150 N									
125 N	50	<50	40	<20	90	10	<10	30	<1
100 N	50	<50	10	20	<10	<10	<10	20	<1
75 N									
50 N	90	<50	20	20	<10	<10	<10	50	1
25 N	110	<50	20	30	10	<10	10	40	1
BL/00	<10	<50	70	30	110	<10	40	20	1
12.5 S									
25 S	40	<50	30	20	30	<10	20	10	<1
50 S	50	<50	20	20	10	<10	20	10	<1
75 S	30	<50	10	20	10	20	60	30	1
100 S	20	<50	10	20	<10	10	10	20	1
125 S	140	<50	20	20	<10	<10	<10	30	<1
150 S	90	<50	20	20	<10	10	40	40	1

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035

RENISON LIMITED

64 037

GEOCHEMICAL ASSAY RESULTS

Area: ST. DIZIER

Grid Line: 175 E

Date:

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	Sn		As		Cu	Pb	Zn		
	Sn	SSn	As	WO_3				Bi	Ag
25 N									
BL / 00 N									
12.5 S	20	<50	170	30	230	220	170	20	2
25 S									

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64 038

RENISON LIMITED

GEOCHEMICAL ASSAY RESULTS

Area: St. DIZIER

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Grid Line: 200 E

Date:

	Sn		As		Cu	Pb	Zn		
	Sn	SSn	As	WO$_3$				Bi	Ag
125 N	40	<50	20	30	<10	<10	<10	20	<1
100 N	80	<50	40	30	20	<10	<10	30	<1
75 N	60	<50	20	30	<10	<10	<10	30	1
50 N	80	<50	20	40	<10	<10	<10	20	<1
25 N	80	<50	20	20	<10	<10	<10	20	1
BL/00 N									
125 S	30	<50	100	30	110	10	100	20	<1
25 S									
50 S	30	<50	60	40	20	10	20	90	1
75 S	70	<50	20	20	<10	<10	10	10	<1
100 S	20	<50	10	30	<10	10	10	10	<1
125 S	100	<50	220	30	10	10	<10	50	1
150 S	90	<50	80	20	10	20	<10	40	1

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64 039

RENISON LIMITED

GEOCHEMICAL ASSAY RESULTS

Area: ST. DIZIER

Grid Line: 225 E

Date:

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	Sn		As		Cu	Pb	Zn		
	Sn	SSn	As	WO_3				Bi	Ag
25N									
BL/00	330	50	260	90	280	20	700	60	2
12.5S	30	<50	70	20	180	10	30	30	1
25S									

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64 040

RENISON LIMITED

GEOCHEMICAL ASSAY RESULTS

Area: ST. DIZIER

Grid Line: 250 E

Date:

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	Sn	(SSn)	As ~~AB~~	WO_3	Cu	Pb	Zn	Bi	Ag
125 N	80	<50	590	50	70	10	<10	20	<1
1.00 N	50	<50	30	30	<10	<10	<10	<10	<1
75 N	40	<50	30	30	10	<10	70	<10	<1
50 N	80	<50	30	40	<10	<10	<10	<10	<1
25 N	30	<50	40	30	10	20	<10	<10	<1
12.5 N	10	50	210	100	390	80	490	20	<1
BL/00 N	50	80	390	100	500	50	7440	20	4
12.5 S	40	<50	40	20	90	20	60	<10	<1
25 S	50	<50	20	40	50	30	210	<10	1
50 S	90	<50	20	20	10	20	20	<10	<1
75 S	30	<50	20	20	<10	<10	<10	<10	<1
100 S	10	<50	20	40	<10	10	<10	20	<1
125 S	30	<50	20	20	<10	70	<10	20	1
150 S	30	<50	10	<20	<10	10	<10	20	<1
175 S	2120	<50	20	60	<10	<10	<10	<10	<1

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RENISON LIMITED

64 641

GEOCHEMICAL ASSAY RESULTS

Area: ST. DIZIER

Grid Line: 275 E

Date:

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	Sn	SSn	As	WO3	Cu	Pb	Zn	Bi	Ag.
25 N									
00 N									
12.5 S	<10	<50	10	30	20	<10	160	<10	1
25 S									

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040

RENISON LIMITED

64 042

GEOCHEMICAL ASSAY RESULTS

Area: ST. DIZIER

Grid Line: 300E

Date:

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	Sn	SSn	As	WO_3	Cu	Pb	Zn	Bi	Ag
100 N	60	<50	20	30	<10	<10	<10	<10	<1
75 N	70	<50	30	40	<10	<10	<10	<10	<1
50 N	60	<50	40	30	<10	<10	<10	<10	<1
25 N	<10	<50	110	100	310	20	10	<10	1
12.5 N	1220	690	600	30	440	4100	90	20	2
BL/00 N	50	<50	50	30	100	120	240	10	1
12.5 S	20	<50	50	50	20	<10	160	<10	1

RENISON LIMITED

041

PROTON MAGNETOMETER FIELD RECORDINGS

64 043

Date: 6/11/81 Operator: P.A.R. Grid Location: St.Dizier Fourth Leave

Grid Station	Gamma Reading	Time	Diurnal Correction	Corrected Reading
00 / 120S	62 445	2.50 pm.	+5	62 450
110S	62 506		-5	62 511
100S	62 562		+5	62 567
90S	62 658		+5	62 663
80S	62 775		+5	62 780
70S	62 920		+5	62 925
60S	63080		+5	63085
50S	63269		+5	63274
40S	63485		+5	63490
30S	63711		+5	63716
20S	63909		+5	63914
10S	64 159		+5	64 164
00	64 367		+5	64 371
10N	64483		+5	64488
20N	64422		+5	64 427
30N	64275	3.00 pm.	+5	64 280
40N	64254		+5	64259
50N	64 178		+5	64 183
60N	64 011		+4	64 015
70N	63 848		+4	63 852
80N	63 683		+4	63 687
90N	63 525		+4	63 529
100N	63 410		+4	63 414
110N	63 297		+3	63 300
120N	63 213		+3	63 216
130N	63 117		+3	63 120
140N	63043	3.07 pm.	+3	63046

ORM NO. 19/209

RENISON LIMITED

042

PROTON MAGNETOMETER FIELD RECORDINGS

64 044

Date: 6/11/81 Operator: P.A.R. Grid Location: St. Dizier Fourth Lease

Grid Station	Gamma Reading	Time	Diurnal Correction	Corrected Reading
50E / 180N	62713	3.10 p.m.	+2	62715
170N	62766		+2	62768
160N	62817		+2	62819
150N	62887		+1	62888
140N	62949		+1	62950
130N	63007		+1	63008
120N	63105		+1	63106
110N	63201		+1	63202
100N	63279		0	63279
90N	63377		0	63377
80N	63468		0	63468
70N	63590		0	63590
60N	63714		0	63714
50N	63756		-1	63755
40N	63778		-1	63777
30N	63857	3.20 p.m.	-1	63856
20N	64048		-1	64047
10N	64211		-1	64210
00	64284		-2	64282
10S	64067		-2	64065
20S	63824		-2	63822
30S	63508		-2	63506
40S	63285		-2	63283
50S	63165		-3	63162
60S	62977		-3	62974
70S	62847		-3	62844
80S	62697		-3	62694
90S	[illegible]		[illegible]	[illegible]

043

PROTON MAGNETOMETER FIELD RECORDINGS

64 045

Date: 6/11/81 Operator: P.A.R. Grid Location: St. Dizier Fourth Lease.

Grid Station	Gamma Reading	Time	Diurnal Correction	Corrected Reading
50E/100S	62385 * close to diamond drill rig.		-4	62381 *?
110S	62396	3.30 p.m.	-4	62392
120S	62444		-4	62440
130S	62404		-4	62480
140S	62373	3.33 p.m.	-4	62369

044

PROTON MAGNETOMETER FIELD RECORDINGS

64 046

Date: 6/11/81 Operator: P.A.R. Grid Location: St. Dizier Fowell Lease

Grid Station	Gamma Reading	Time	Diurnal Correction	Corrected Reading
100E/140S	62362	3.35 p.m.	-4	62358
130S	62384		-4	62380
120S	62418		-4	62414
110S	62458		-4	62454
100S	62491		-4	62487
90S	62545		-4	62541
80S	62599		-4	62595
70S	62677		-4	62673
60S	62762		-4	62758
50S	62844		-4	62840
40S	62940	3.40 p.m.	-4	62936
30S	63040		-4	63036
20S	63146		-5	63141
10S	63246		-5	63241
00	63330		-5	63325
10N	63376		-5	63371
20N	63387		-6	63381
30N	63340		-6	63334
40N	63306		-6	63300
50N	63269		-6	63263
60N	63239		-7	63232
70N	63198		-7	63191
80N	63148		-7	63141
90N	63094		-7	63087
100N	63042		-8	63034
110N	62984	3.50 p.m.	-8	62976
120N	62932		-8	62924
130N	62873		-8	62865

ORM NO. 79/269

045

RENISON LIMITED

64 047

PROTON MAGNETOMETER FIELD RECORDINGS

ate: 6/11/81 Operator: P.A.R Grid Location: St.Dizier Fourth Lease.

Grid Station	Gamma Reading	Time	Diurnal Correction	Corrected Reading
100E/140N	62825		-8	62817
150N	62782		-8	62774
160N	62739		-8	62731
170N	62698	3.53pm.	-8	62690

PROTON MAGNETOMETER FIELD RECORDINGS

Date: 6/11/81 Operator: P.A.R. Grid Location: St. Dizier Forth Lease

Grid Station	Gamma Reading	Time	Diurnal Correction	Corrected Reading
150E/170N	62599	3.54 p.m.	-9	62590
160N	62630		-9	62621
150N	62655		-9	62646
140N	62691		-9	62682
130N	62720		-9	62711
120N	62753		-10	62743
110N	62782		-10	62772
100N	62810		-10	62800
90N	62839		-10	62829
80N	62865		-10	62855
70N	62885		-10	62875
60N	62899	4.00 p.m.	-10	62889
50N	62920		-10	62910
40N	62932		-10	62922
30N	62940		-10	62930
20N	62939		-10	62929
10N	62918		-10	62908
00	62894		-10	62884
10S	62844		-10	62834
20S	62793		-11	62782
30S	62734		-11	62723
40S	62682		-11	62671
50S	62630		-11	62619
60S	62578		-11	62567
70S	62538		-11	62527
80S	62487	4.10 p.m.	-11	62476
90S	62458		-11	62447
100S	62429		-11	62418

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047

64 049

RENISON LIMITED

PROTON MAGNETOMETER FIELD RECORDINGS

Date: 6/11/81

Operator: P.A.R

Grid Location: St. Dizier Fourth Lease

Grid Station	Gamma Reading	Time	Diurnal Correction	Corrected Reading
150E/110S	62400		-11	62389
120S	62378		-11	62367
130S	62353		-11	62342
140S	62340		-11	62329
150S	62325		-11	62314
160S	62314		-11	62303
170S	62305	4.14 p.m.	-11	62294

PROTON MAGNETOMETER FIELD RECORDINGS

Date: 6/11/81 Operator: P.A.R. Grid Location: St. Dizier Fourth Lease

Grid Station	Gamma Reading	Time	Diurnal Correction	Corrected Reading
200E/ 170S	62 296	4.16 p.m.	-11	62285
160S	62 304		-11	62293
150S	62 311		-11	62300
140S	62 317		-11	62306
130S	62 328		-11	62317
120S	62 342		-11	62331
110S	62 356		-11	62345
100S	62 369		-11	62358 /
90S	62389	4.20 p.m.	-11	62378
80S	62408		-11	62397
70S	62435		-11	62424
60S	62 460		-11	62449
50S	62 488		-11	62477
40S	62 524		-11	62513
30S	62554		-11	62543
20S	62593		-11	62582
10S	62 637		-11	62626
00	62666		-11	62655
10N	62690		-11	62679
20N	62707		-11	62696
30N	62716		-11	62705
40N	62722		-11	62711
50N	62724		-11	62713
60N	62718		-11	62707
70N	62711	4.30 p.m.	-11	62700
80N	62700		-11	62689
90N	62686		-11	62675
100N	62672		-10	62662

PROTON MAGNETOMETER FIELD RECORDINGS

Date: 6/11/81

Operator: P.A.R.

Grid Location: St. Dizier Fourth Lease

Grid Station	Gamma Reading	Time	Diurnal Correction	Corrected Reading
200E/110N	62655		-10	62645
120N	62635		-10	62625
130N	62610		-10	62600
140N	62593	4.33 p.m.	-10	62583

PROTON MAGNETOMETER FIELD RECORDINGS

64 052

050

Date: 6/11/81 Operator: P.A.Q. Grid Location: St. Dizier Fourth Lease.

Grid Station	Gamma Reading	Time	Diurnal Correction	Corrected Reading
250E/140N	62528	4.36 p.m.	-9	62519
130N	62541		-9	62532
120N	62564		-9	62555
110N	62579		-9	62570
100N	62598		-8	62590
90N	62616		-8	62608
80N	62629		-8	62621
70N	62646	4.40 p.m.	-8	62638
60N	62657		-8	62649
50N	62665		-8	62657
40N	62669		-8	62661
30N	62667		-8	62658
20N	62654		-8	62646
10N	62644		-8	62636
00	62603		-8	62595
10S	62556		-8	62548
20S	62518		-8	62510
30S	62481		-8	62473
40S	62446		-8	62438
50S	62418	(4.46 p.m.)	-8	62410
60S	62405		-8	62397
70S	62380		-8	62372
80S	62358		-8	62350
90S	62342		-8	62334
100S	62333	4.50 p.m.	-8	62325
110S	62325		-8	62317
120S	62314		-8	62306
130S	62304		-8	62296

PROTON MAGNETOMETER FIELD RECORDINGS

64 653

031

Date: 6/11/81 **Operator:** P.A.R. **Grid Location:** St. Dizier Fourth Lease

Grid Station	Gamma Reading	Time	Diurnal Correction	Corrected Reading
250E/ 140S	62292		-8	62284
150S	62283		-8	62275
160S	62272		-8	62264
170S	62261		-8	62253
180S	62249		-8	62241
190S	62247	4.54pm.	-8	62239

62 · 054

052

PROTON MAGNETOMETER FIELD RECORDINGS

Date: 6/11/81 Operator: P.A.R. Grid Location: St. Dizier Fourth lease

Grid Station	Gamma Reading	Time	Diurnal Correction	Corrected Reading
300E/00	62629	4.58 p.m.	-7	62622
10N	62697		-7	62690
20N	62794		-7	62787
30N	62790		-7	62783
40N	62780	5.00 p.m.	-7	62773
50N	62764		-7	62757
60N	62729		-7	62722
70N	62695		-7	62688
80N	62656		-7	62649
90N	62621		-7	62614
100N	62595		-7	62588
110N	62568		-7	62561
120N	62545	5.04 p.m.	-7	62538

PROTON MAGNETOMETER FIELD RECORDINGS

64 055

053

Date: 6/11/81

Operator: N. Revell

Grid Location: St. Dizier
Fourth Lease

Grid Station	Gamma Reading	Time	Diurnal Correction	Corrected Reading
BASE STATION	READINGS	— Base station location approx 20 m S.W. of grid 100E/125S on old Cominco peg.		
				[redacted]
Base	62355	2.45 p.m.	+5	
"	62355	2.50	+5	
"	62355	3.00	+5	
	62358	3.10	+2	
"	62361	3.20	-1	
"	62364	3.30	-4	
"	62364	3.40	-4	
"	62368	3.50	-8	
"	62370	4.00	-10	
"	62371	4.10	-11	
"	62371	4.20	-11	
"	62371	4.30	-11	
	62368	4.40	-8	
"	62368	4.50	-8	
"	62367	5.00 p.m.	-7	

Set 62360 as base value

054

64 656

A NOTE ON

BOREHOLE SURVEYING
NEAR MAGNETIC BODIES

MITRE GEOPHYSICS PTY. LTD.
October, 1981

055

64 657

MITRE GEOPHYSICS PTY LTD
MINERAL EXPLORATION AND ENGINEERING CONSULTANTS
BUGGS LANE ELLIOTT TASMANIA 7325 PHONE 004-363143

A NOTE ON
BORESHOLE SURVEYING NEAR
MAGNETIC BODIES

by

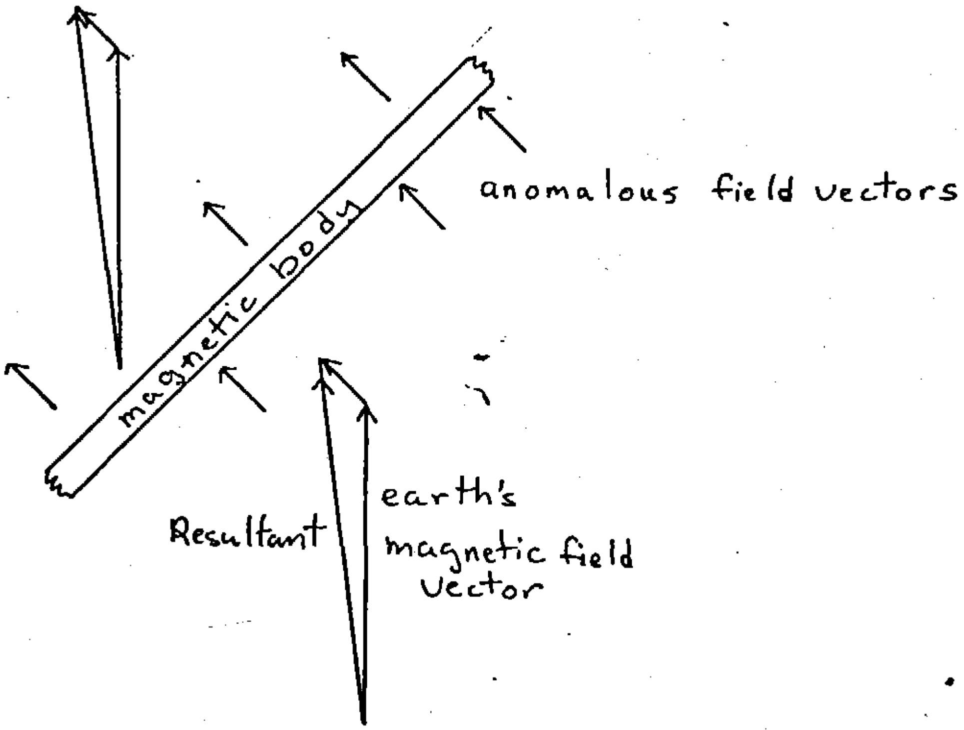
Dr. J.R. Bishop

October 10, 1981

Bore hole survey instruments which use a compass to determine the azimuth cannot be used in cased holes or in highly magnetic rocks. Alternative methods are gyroscopic instruments which contain a small directional gyro for determining azimuth, or those which measure the deflection of the probe itself (e.g. the Reflex-Fotobor DDI, marketed by ABEM: according to Reedman (1979)* this could only be used in holes with a minimum diameter of 46mm.).

This note investigates the apparent deviations which may be encountered in drill holes through highly magnetic bodies using compass-based surveying techniques. The problem is complex and I am not able to list, for example, a table of distances and deviations for any given body. However the points made below may be useful. For all cases, the magnetic body is assumed to be vertical and tabular.

(1) A NE-SW striking body (i.e. strike = 45° mag.)



Magnetic Deviation is to the West (on both sides of the body).

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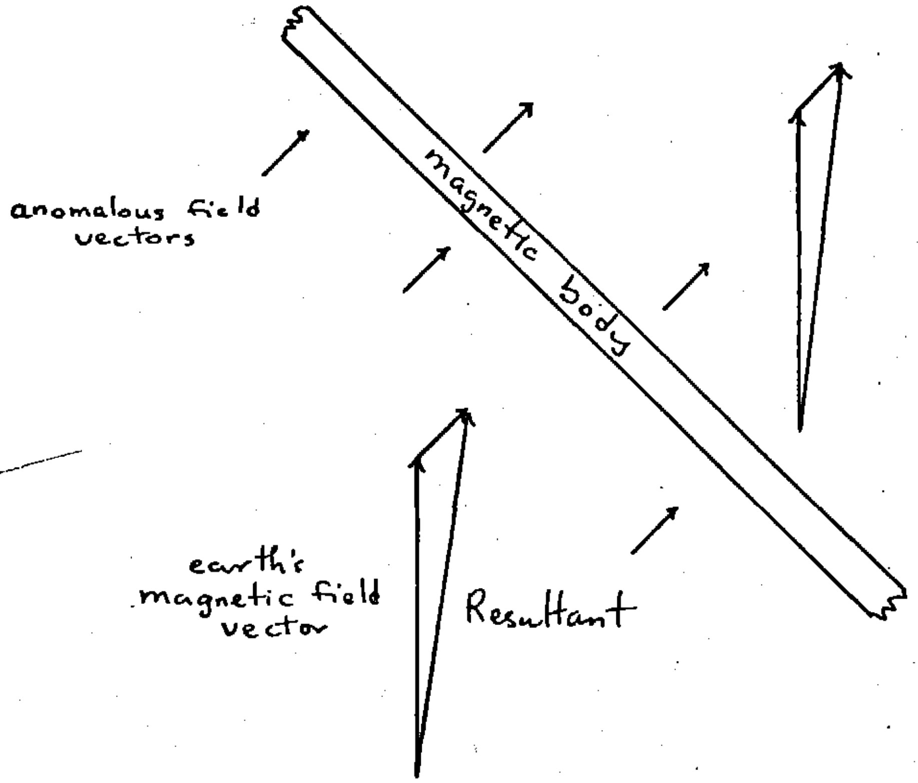
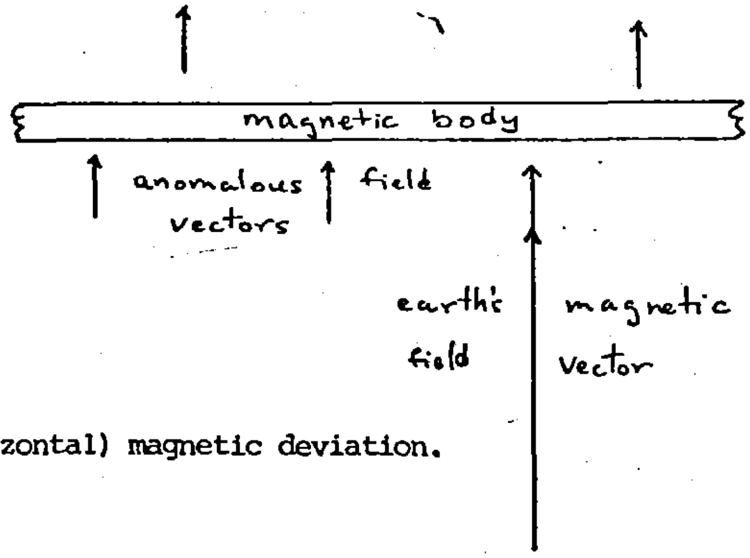
* Reedman, J.H., 1979. Techniques in Mineral Exploration. Applied Science, London. 533p.

(2) A NW-SE striking body (i.e. strike = 135° mag.)



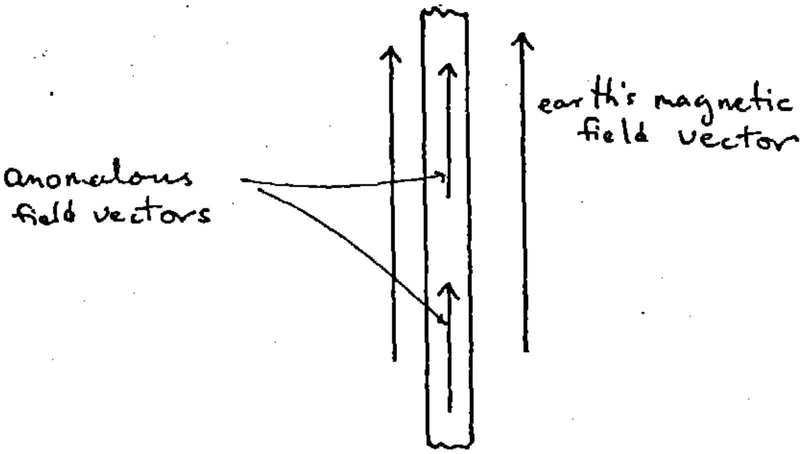
Magnetic Deviation is to the East (on both sides of the body).

(3) An EW striking body (i.e. strike = 90° mag.)



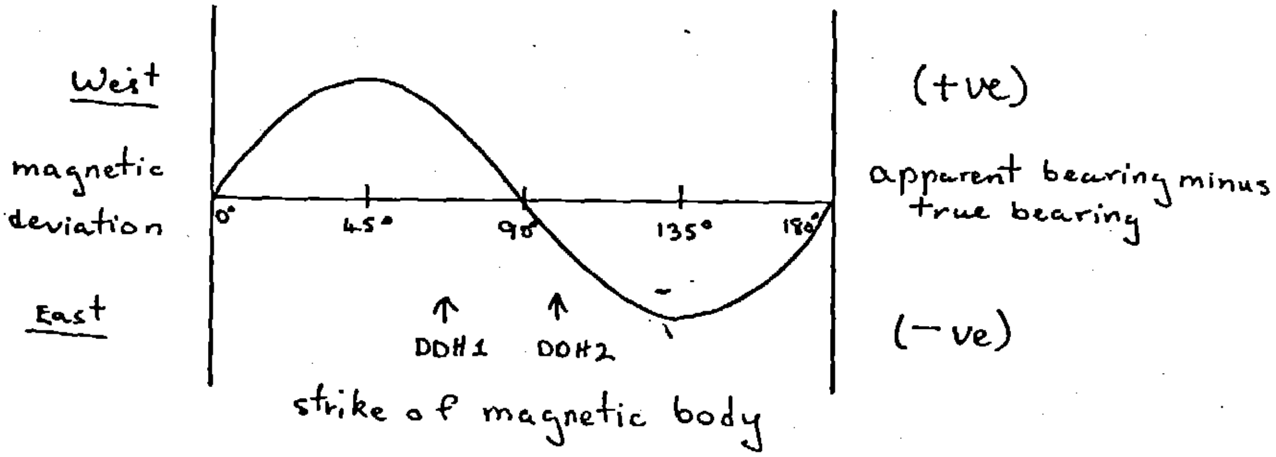
No (horizontal) magnetic deviation.

(4) A NS striking body (i.e. strike = 0° mag.)



No (horizontal) magnetic deviation.

Thus deviation may be shown in the following way;



If the compass is deflected to the west, then the apparent bearing will be larger than the true bearing: if to the east then it will be less. (This is readily demonstrated with a compass upon which a given bearing can be set; deviate the compass with a nearby metallic object and move the bearing ring to realign north with the compass needle.) The graph above shows that the discrepancy is at a maximum for 45° and 135° striking bodies.

(1) DDH 1

The plan for DDH 1 is shown in Figure 1 and the distribution of magnetite is given in Figure 2. The magnetic body's strike is approx. 68° mag. and therefore any changes in apparent bearing would be expected to increase towards the body. Such an increase does occur, but there is a large step from the collar survey to the first down-hole measurement at 33m.; also there is no corresponding decrease between the magnetic body and the end of the hole. (Whilst identical values are not expected either side of the body, similar gradients should occur.) Further, the bearings between the body and end of hole are all within one degree of the collar value.

Whilst anomalous field distributions cannot (readily) be calculated below the top of the magnetic body, there are several algorithms which calculate the magnetic field above the body. An approximate cross section of the body and DDH 1 is given in Figure 3 and this shows that deviations can be determined for the surveys at 33m. and 69m. Calculations (using Parker Gay's formulae *) gave negligible horizontal deviations, much less than one degree for these positions (and down to 82m., the lowest calculable level). Thus it appears that the 164°, 165°, 167° and 168° readings are in error and that 158°-159° is the true (and constant) bearing.

(2) DDH 2

The plan for DDH 2 is shown in Figure 3; the magnetic body's strike is approx. 101° mag. Thus little horizontal deviation is expected from this almost E-W body, although any that did occur should show an apparent decrease in the measured bearing of the bore hole. The bearings (Figure 4) show instead, increases of about 5°-9°.

---

* Parker Gay, S., 1967. Standard curves for Interpretation of Magnetic anomalies over long tabular bodies. Mining Geophysics Vol. 2. Society of Exploration Geophysicists.

There are two values which show these increases; at 138m. and at 177m. The latter is coincident with one highly magnetic body and the former is within 3m. of another. Readings within magnetic bodies are usually highly erratic and an increase (rather than the expected decrease) is not surprising. With regard to the reading 3m. away from the magnetic body, the increase could perhaps be explained by a local change in strike, a heterogeneous distribution of magnetite, etc. Whatever the cause, at 3m. distance a change of 6°-9° was registered, but at 50m. (the next survey point) there is no apparent change. The readings at 138m. and at 177m. should be disregarded.

Both DDH's have significant differences between the collar orientation and the first survey point (one an increase, the other a decrease): an error in the survey instrument seems possible and its accuracy and repeatability should be (re)ascertained. (To determine the former, the device could perhaps be triggered in an inclined plastic pipe, the orientation of which has been independently determined.)

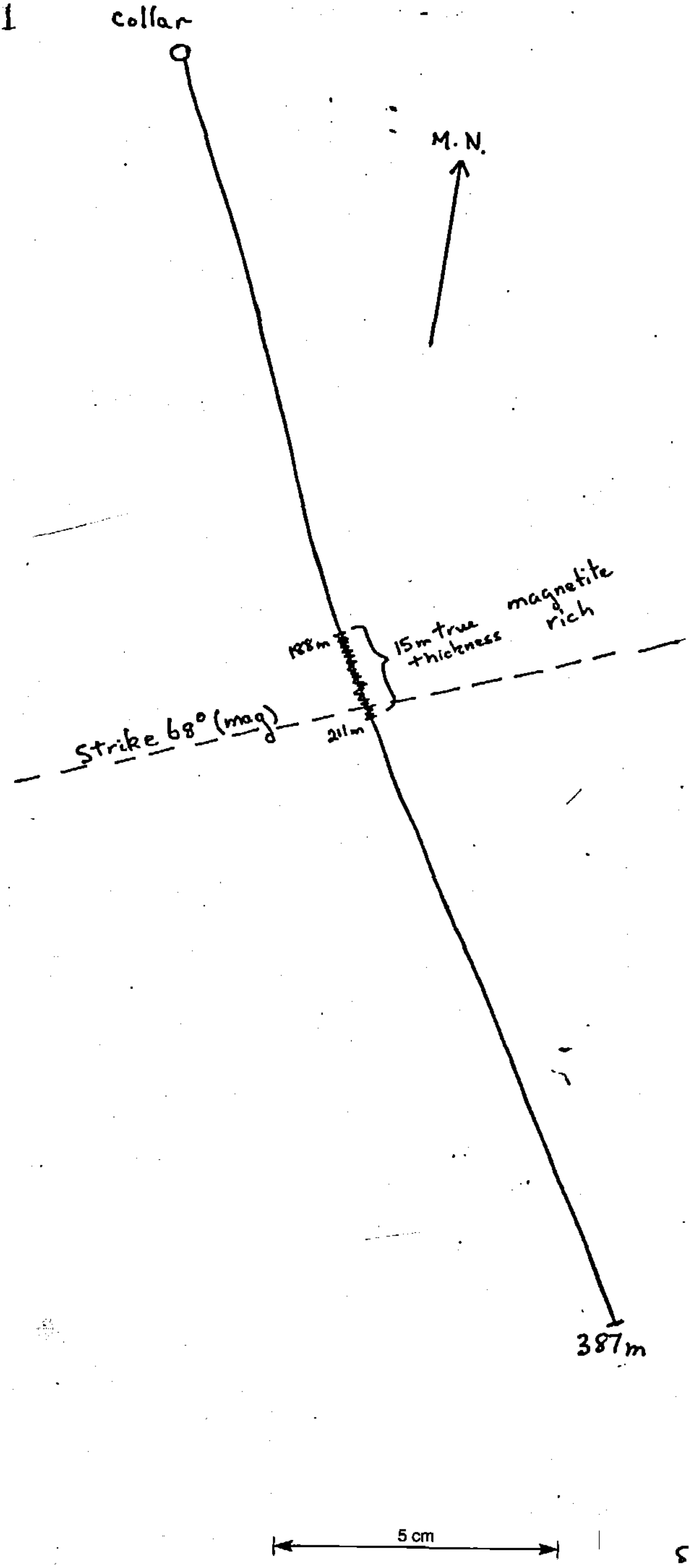
Conclusions

Calculations have shown that the series of higher readings in DDH 1 are not due to the magnetic field of the (known) magnetic body and other explanations such as other magnetic bodies, sticking compass, etc. must be sought.

There are three surveys of DDH 1 with question marks, presumably either the device failed (confirming the instrument error suggested above) or the measurements were judged meaningless. If the latter is the case, it appears that the effect of the magnetic body was recorded some 35-40m. away.

The survey of DDH 2 has shown that deviations of 5° or 6° can occur within 3m. of thin, highly magnetic bodies (and not necessarily in the direction predicted by the strike of the body). The effect was not measurable at 55m. and is probably negligible 20-25m. from the body.

Oct. 1981.



Surveys

Depth (m)	bearing (to AMG)
Collar	158°
33	164°
69	165°
99	167°
132	168°
156	?
186	?
226	?
262	156°
300	159°
336	159°
366	159°

Figure 1

Plan View of
DDH 1

scale 1:1000

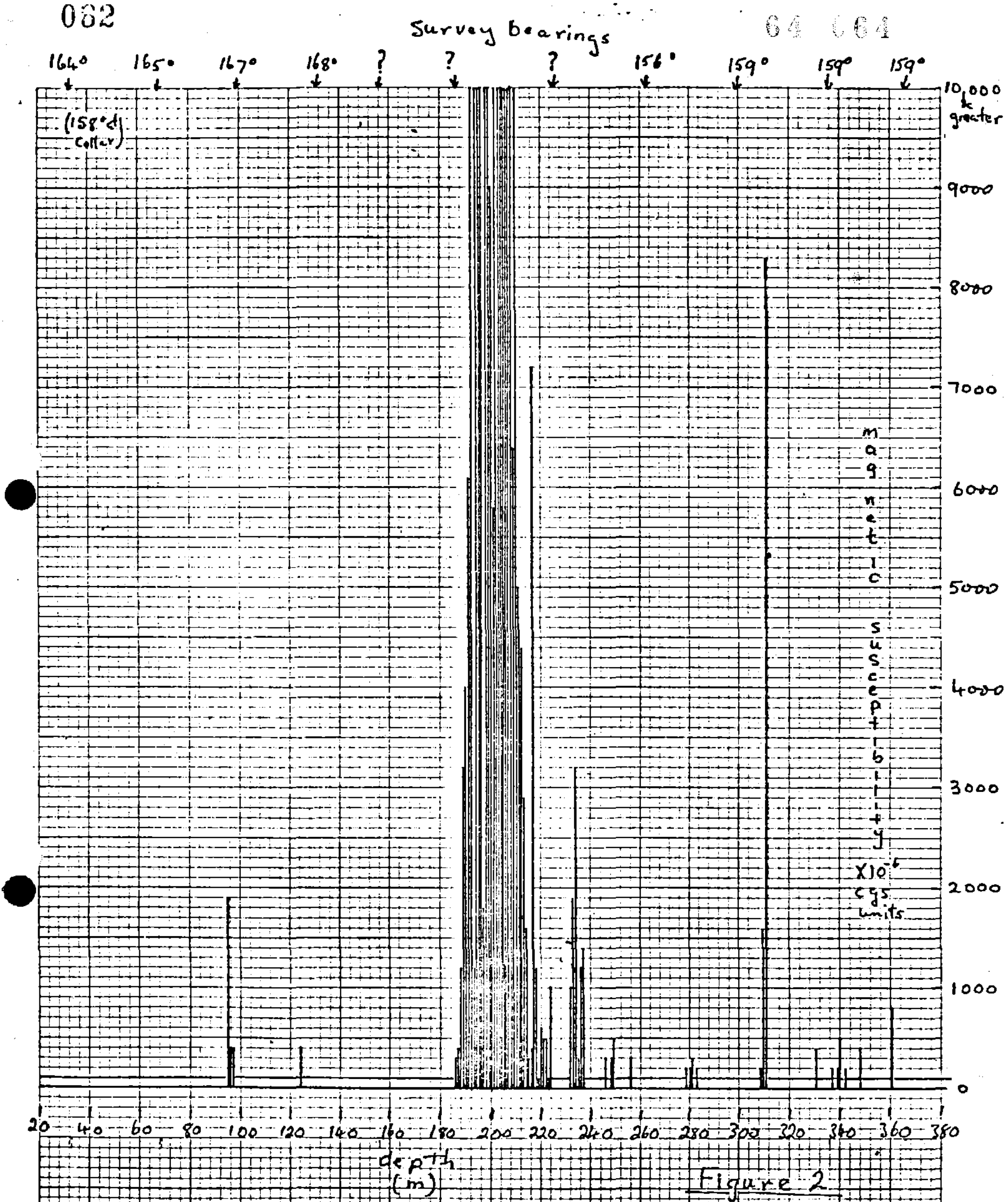


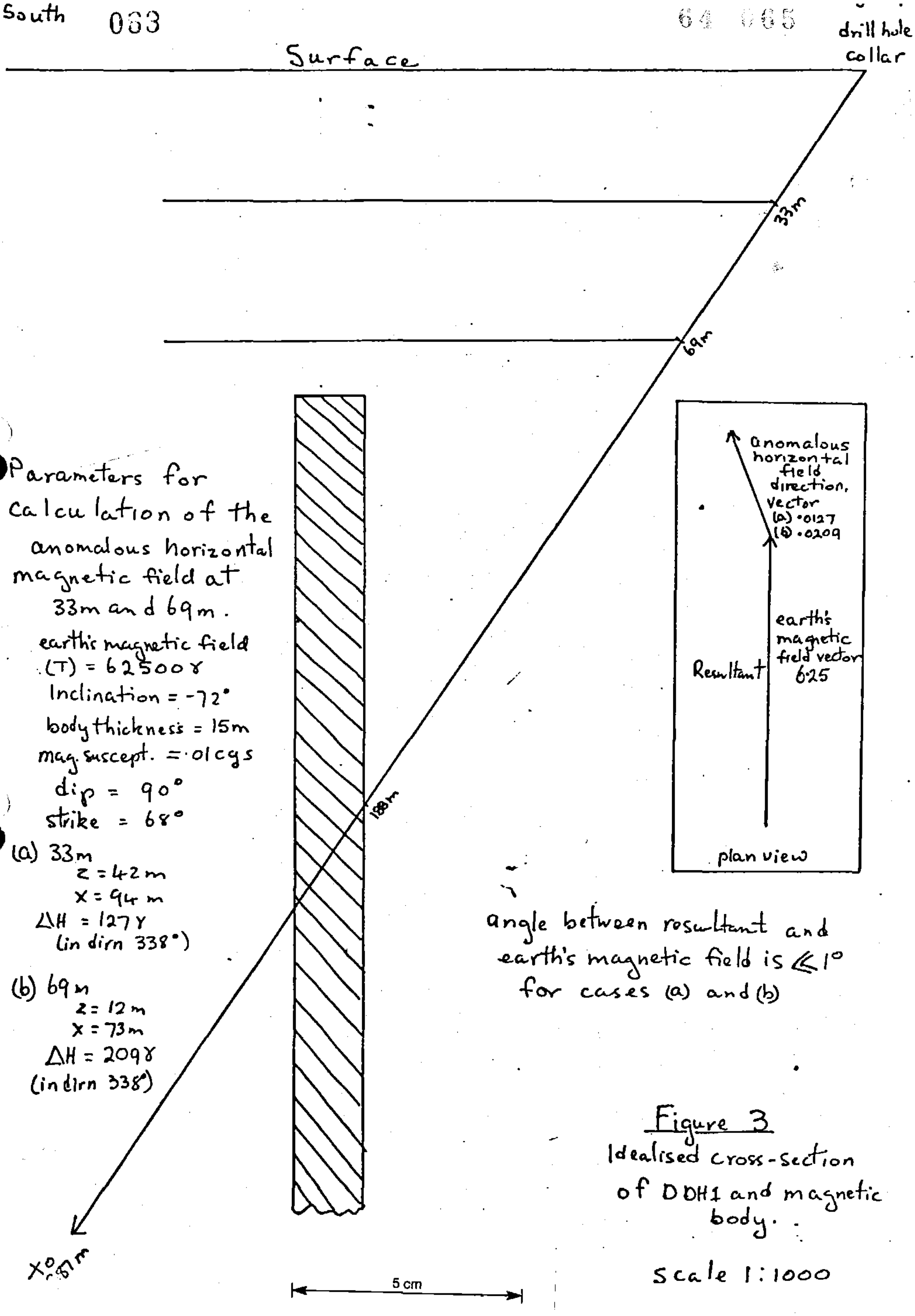
Figure 2

Magnetic Susceptibility Log

DDH 1

Vert scale 1:500X10^{-6} cgs

horiz scale 1:2000



Parameters for calculation of the anomalous horizontal magnetic field at 33m and 69m.

earth's magnetic field (T) = 62500γ
Inclination = -72°
body thickness = 15m
mag. suscept. = ·01cgs
dip = 90°
strike = 68°

(a) 33m
z = 42m
x = 94 m
ΔH = 127γ
(in dirn 338°)

(b) 69m
z = 12m
x = 73m
ΔH = 209γ
(in dirn 338°)

angle between resultant and earth's magnetic field is ≪1° for cases (a) and (b)

Figure 3
Idealised cross-section of DDH1 and magnetic body.

Scale 1:1000

Surveys

Depth (m)	bearing (to AMG)
Collar	197°
43	193
77	196
138	202
177	?201
220	193

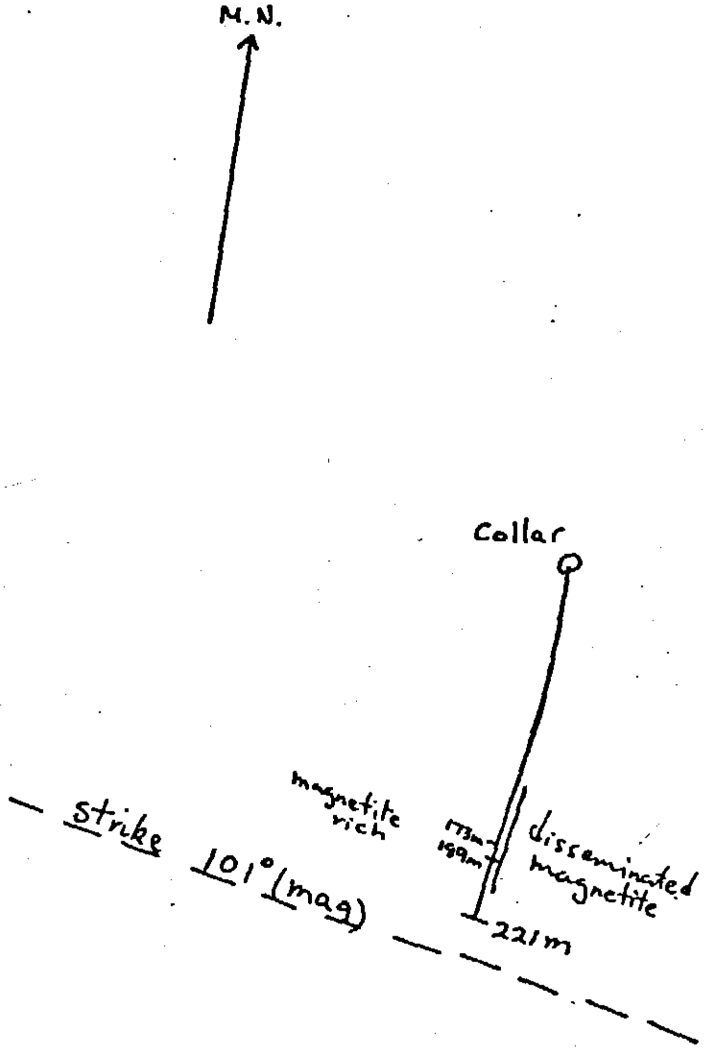


Figure 4

Plan view of DDH2

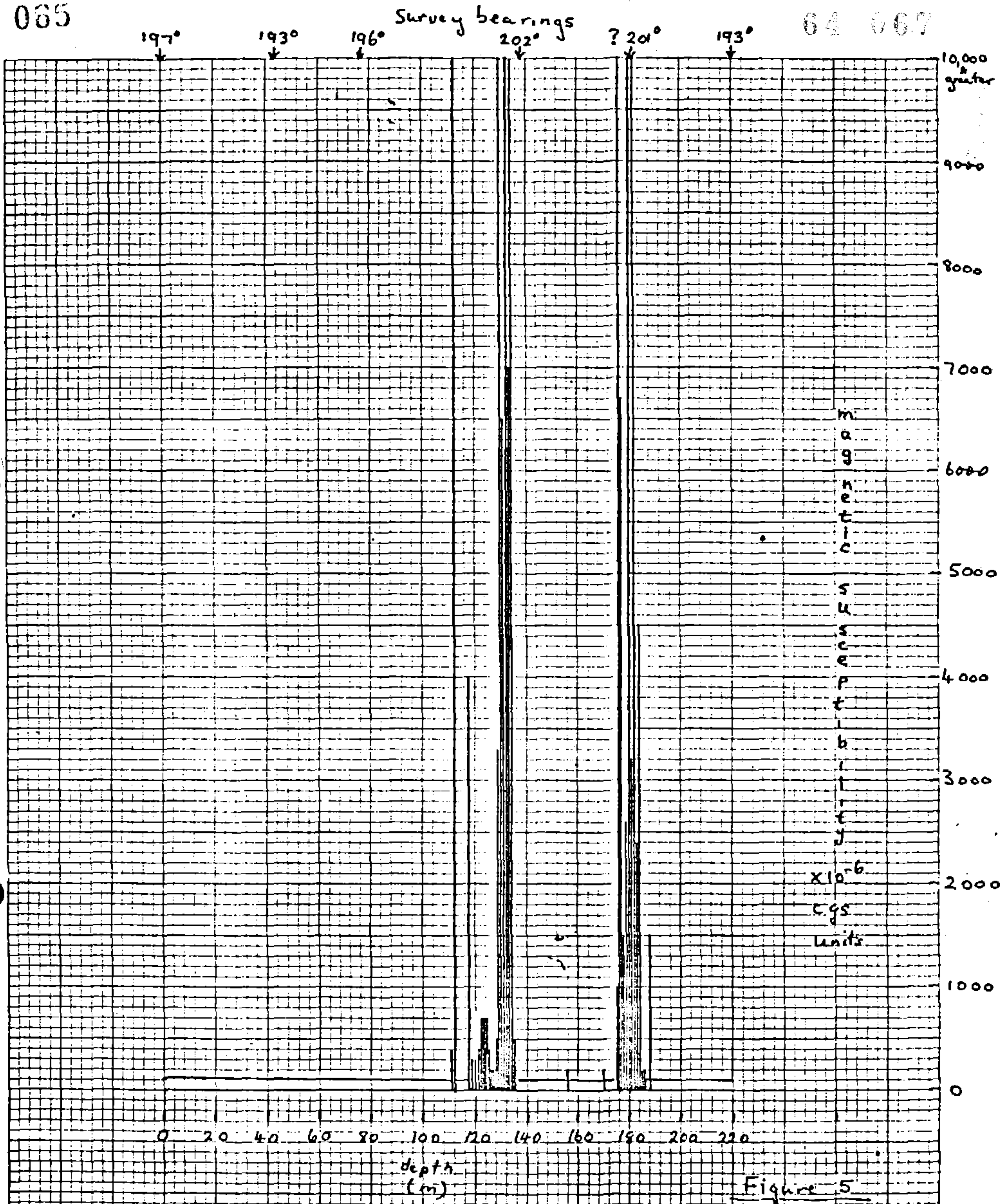


Figure 5

Magnetic Susceptibility Log
ODH 2

Vert scale 1: 500x10⁻⁶ cgs
horiz. scale 1:2000

5 cm

DDH. No. 1

MAGNETIC SUSCEPTIBILITY X 10^{-6} C.G.S. UNITS

DEPTH	MS	DEPTH	MS	DEPTH	MS	DEPTH	MS	DEPTH	MS	DEPTH	MS
0-114	<100*	-194	32000	-209	6400	-224	1000	-255	<100*	-336	<100*
-115	1900	-195	41000	-210	27000	-231	<100*	-256	300	-337	200
-116	400	-196	49000	-211	5000	-232	1000	-265	<100*	-338	<100
-117	400	-197	1800	-212	4400	-233	1900	-278	100*	-339	200
-123	<100*	-198	18000	-213	2900	-234	3200	-279	200	-340	500
-124	400	-199	40000	-214	1600	-235	300	-280	200	-341	<100
-105	<100*	-200	9000	-215	300	-236	1200	-281	300	-342	200
-186	300	-201	5800	-216	400	-237	1400	-282	<100	-347	<100*
-187	400	-202	10000	-217	7200	-239	<100*	-283	200	-348	400
-180	1200	-203	12000	-218	1200	-242	100*	-308	<100*	-360	<100
-189	3200	-204	33000	-219	100	-245	<100*	-309	200	-361	800
-190	4000	-205	75000	-220	600	-246	300	-310	1600	-307	<100*
-191	6100	-206	45000	-221	500	-247	<100	-311	0300	* Same result for more than 1 metre.	
-192	12000	-207	18000	-222	500	-248	300	-330	<100*		
-193	1200	-208	13000	-223	100	-249	500	-331	400		

TABLE 1

Magnetic susceptibilities

DDH 1

D.D.H. No. 2

INTERVAL (m)		RECOVERY		MAGNETIC SUSCEPTIBILITY x 10^{-6} c.g.s. units							
FROM	TO	m	%								
DEPTH	M.S.	DEPTH	M.S.	DEPTH	M.S.	DEPTH	M.S.	DEPTH	M.S.	DEPTH	M.S.
0	≤100	42.0	≤100	84.0	≤100	126.0	200	168.0	≤100	210.0	≤100
–	"	–	"	–	"	–	200	–	"	–	"
–	"	–	"	–	"	–	500	170.0	200	–	"
–	"	–	"	–	"	–	4300	–	≤100	–	"
–	"	–	"	–	"	130.0	25000	–	"	–	"
–	"	–	"	–	"	–	6500	–	"	–	"
–	"	–	"	90.0	"	–	11000	–	"	–	"
–	"	–	"	–	"	–	7000	–	1900	–	"
–	"	50.0	"	–	"	–	19000	–	17000	–	"
–	"	–	"	–	"	–	500	–	6700	–	"
10.0	"	–	"	–	"	–	≤100	–	1500	220.0	"
–	"	–	"	–	"	–	"	–	2600	220.5	"
–	"	–	"	–	"	–	"	100.0	30000	End of hole	
–	"	–	"	–	"	–	200	–	3200		
–	"	–	"	–	"	140.0	≤100	–	17000		
–	"	–	"	–	"	–	"	–	2400		
–	"	–	"	100.0	"	–	"	–	4500		
–	"	–	"	–	"	–	"	–	200		
–	"	60.0	"	–	"	–	"	–	200		
–	"	–	"	–	"	–	"	–	≤100		
20.0	"	–	"	–	"	–	"	–	1500		
–	"	–	"	–	"	–	"	–	≤100		
–	"	–	"	–	"	–	"	190.0	"		
–	"	–	"	–	"	–	"	–	"		
–	"	–	"	–	"	150.0	"	–	"		
–	"	–	"	–	"	–	"	–	"		
–	"	–	"	110.0	"	–	"	–	"		
–	"	–	"	110.5	400	–	"	–	"		
–	"	70.0	"	–	19000	–	"	–	"		
–	"	–	"	–	≤100	–	"	–	"		
30.0	"	–	"	–	"	–	200	–	"		
–	"	–	"	–	"	–	≤100	–	"		
–	"	–	"	–	"	–	"	200.0	"		
–	"	–	"	–	"	–	"	–	"		
–	"	–	"	–	4000	160.0	"	–	"		
–	"	–	"	–	300	–	"	–	"		
–	"	–	"	120.0	300	–	"	–	"		
–	"	–	"	–	400	–	"	–	"		
–	"	80.0	"	–	700	–	"	–	"		
–	"	–	"	–	700	–	"	–	"		
40.0	"	–	"	–	700	–	"	–	"		
–	"	–	"	–	400	–	"	–	"		

TABLE 2

Magnetic Susceptibilities

DDH 2

[redacted]

007

RE ON LIMITED - DRILL CORE RECO

HOLE NUMBER	SD 16
PURPOSE	To test magnetite mineralization near the hanging wall quartzites between the mineralized intersections in SD 10 and SD 13.
LOCATION	ST. DIZIER
COLLAR R.L.	2195.0
CO-ORDINATES	5367 720.8 N 345 159.5 E
LENGTH	331.7m
HOLE SIZE	0-100m HW (3-100m reamed over HQ) 100-331.7m HQ
DATE DRILLED	8/8/81 - 28/9/81
SIGNIFICANT CORE LOSS ZONES	0.0-13.7m 5.2m loss 58.7-67.7m 3.9m loss 322.7-325.7m 1.4m loss
ORE ZONE GROUND CONDITIONS	
LOGGED BY	P. ROBERTS

SURVEY			From - To	Distance D	VERTICAL		HORIZONTAL	
Depth	Bearing	Dip			D.Sin.Dip	R.L.	D.Cos.Dip	Prog. Total
(m)	(AMG)							
Collar	180°	-57°	0-5.4	5.4	4.5	2190.5	2.9	2.9
10.7	181.5°	-57°	-33.4	28.0	23.5	2167.0	15.2	18.1
56.0	179°	-58.2°	-73.5	40.1	34.1	2132.9	21.1	39.2
91.0	178°	-59.2°	-110.9	37.4	32.1	2100.8	19.2	58.4
130.7	182°	-59.8°	-148.7	37.8	32.7	2068.1	19.0	77.4
166.7	184°	-60.3°	-199.2	40.5	35.2	2032.9	20.1	97.5
211.7	186°	-61°	-243.2	54.0	47.2	1985.7	26.2	123.7
274.7	Assume 185.5°	-60°	-301.4	58.2	50.4	1935.3	29.1	152.8
328.0	185°	-59.5°	-331.7	30.3	26.1	1901.2	15.4	168.2

COMMENTS

The hole intersected 90.2m of intercalated magnetite skarn, hornfels-quartzite and carbonate between 218.6 and 308.8m. The large component of non-calcareous sediments was similar to the skarn intersection in SD 10 and indicated that lenses of detrital sediments are present in part of the skarn zone between the central mineralized zone and SD 13.

SUMMARY - ASSAY DATA

LODE NAME	FROM	TO	LENGTH (m)	AVERAGE WEIGHTED ASSAYS													B.C.A.
				Sn.	Acid Sol. Sn.	Cu.	As.	S.	~~Pb.~~ Fe	Zn.	Bi.	WO$_3$	Ag g/t				
	223.0	226.0	2.0	0.20	0.06	0.05	<0.1	1.9	20.4	0.06	0.023	0.03					
	232.0	234.0	2.0	0.05	0.02	0.03	<0.1	0.5	26.7	0.03	0.159	0.30					
	245.0	248.0	3.0	0.55	0.41	0.06	<0.1	3.9	21.2	0.04	0.011	0.08					
	247.0	259.0	12.0	0.10	0.06	0.05	<0.1	1.7	20.6	0.03	0.025	0.18					
	281.0	285.0	4.0	0.33	0.18	0.02	<0.1	<0.1	27.8	0.04	0.021	0.06					
	302.0	307.0	5.0	0.16	0.03	0.06	<0.1	2.2	16.1	0.86	0.007	<0.01					

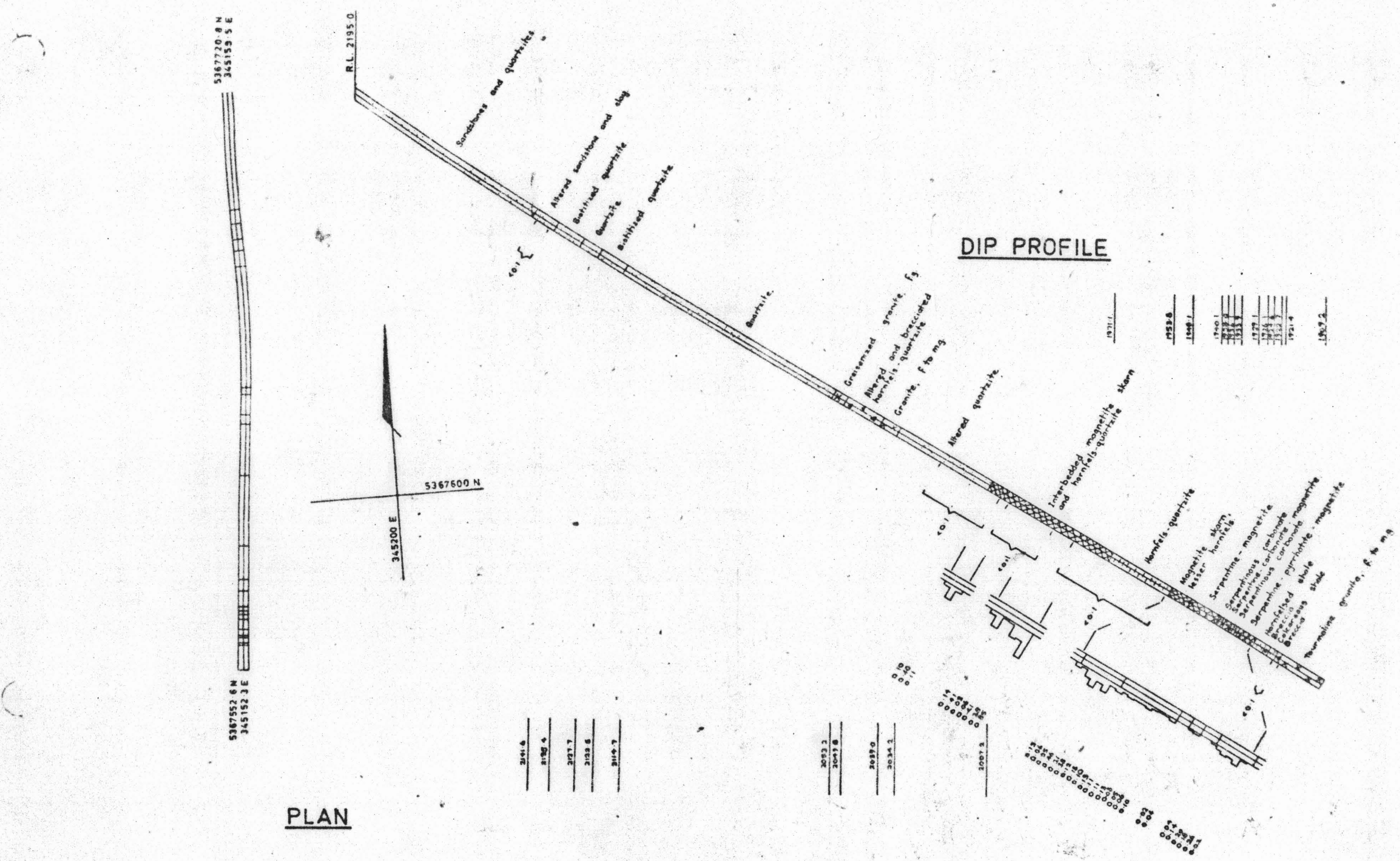
HOLE No. **SD 16**

SCALE : 0 20 40 metres

RENISON LIMITED

DIAMOND DRILL HOLE PLOT

5 cm



PLAN

DIP PROFILE

020

DIAMOND DRILL RECORD

HOLE NUMBER : SD 16

LOGGED BY : P. ROBERTS

NWPS

	INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn.									
	FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO$_3$
	0.0	63.0	52.3	93	SANDSTONES AND QUARTZITES Pale grey and pale brown, generally very fine grained, transitional to coarse grained siltstones, bedded, quartz rich. Variably banded in places massive, in places with beds rich in muscovite (flakes 0.5 – 2mm) or, less frequently, green-brown or brown tourmaline. Alternates between relatively hard sandstone-quartzite and, lesser, softer patches where sandstone is interbedded with puggy, cream clay or completely weathered/degraded fine grained sandstone. Few quartz veins up to 10cm thick (VCA'S not observed because core is badly broken), mostly <2mm. Very minor pyrite on joint facings, in thin veinlets and with vein quartz. B.C.A.'S vary: 0-16m, 35-40°m; 16-38m, 40-50°; 38-60m, 40°; 60-63m, 40-75°. Badly broken throughout along bedding and rough joints coated with dark brown organic material and/or MnOxides (0-40m). 10.7m core loss generally in soft, clayey zones. Gradational transitional to:													
	63.0	70.4	4.7	64	ALTERED SANDSTONE AND CLAY Motled, pale green and ~~mauve~~ · brown. Sandstone is fine grained faintly laminated (BCA'S 50-70°), soft, Includes fine grained disseminated Ti-biotite and very minor veinlet tourmaline. Clay is very soft and puggy, contains abundant (up to 30%) disseminated fine grained pyrite (grainsize ≤0.5mm). 2.7m core loss. 68.5m two thin veins of fine grained granite? VCA'S 25° and 40° (~60° between the two). Gradational transition to:		64.6	66.0 67.0 68.0 69.0	0.02 0.02 0.02 0.02	0.02 <0.01 <0.01 <0.01						0.003 0.003 0.002 0.002	1 2 1 <1	<0.01 <0.01 <0.01 <0.01
	70.4	79.1	8.6	99	BIOTITIZED QUARTZITE Mauve and pale yellow mottled, including abundant disseminated and veinlet Ti-biotite but content decreases downwards. Yellow patches softer, silty. Banded in places-probably bedding. Veined by irregular quartz veinlets and veins, some with tourmaline,< 1cm thick with VCA'S varying 35-50°. Some thin (0.5-2cm) fine to medium grained granitic (?) veins, VCA'S 30-70°, several intruded by vein quartz (at 76.5-76.7m). Trace pyrite on joint faces. BCA'S vary: 70.6m, 45°; 70.8m, 30°; 72.6-73.1m folded 10° (at top) through 0 to 25° opposite direction (at bottom); 74.5m,45°. Broken along bedding and some joints, some of both coated by soapy, soft serpentine(?).													

thi

DIAMOND DRILL RECORD

HOLE NUMBER : SD 16
LOGGED BY : P. ROBERTS

	INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn									
	FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO$_3$
					Gradational transition to:													
	79.1	85.5	6.4	100	QUARTZITE Grey, mauve grey, flecked with grey-green and yellow. Silicified minor patchy muscovite, minor brown tourmaline in isolated spots (1-2mm) and veins of tourmaline-quartz, notably at 94.1-94.5m where the vein is haloed by tourmalinized banded quartzite. Includes few, thin granitic veins (as above). BCA'S vary 25-35°. Broken only along joints, some thinly coated with yellow clay. JCA'S 30-70°. Gradational transition to:													
	85.5	94.3	8.8	100	BIOTITIZED QUARTZITE Mauve and mauve-grey, largely interbedded. Abundant Ti-biotite and disseminations, generally fine grained (flakes < 0.5mm). Minor sulphide disseminated and on joint faces - mainly pyrite some pyrrhotite (?). Minor tourmaline in thin (≤5mm) veins, some with quartz, several with a discoloured selvedge 1cm thick, possibly tourmalinized quartzite, VCA'S 35-40°. Numerous, variously oriented quartz veins. Rare small rounded blobs of quartz (<1cm diameter) with inclusions of dark grey-green mineral ? phlogopite. Broken along irregular, often slickensided joints, thinlycoated with green-yellow or yellow clayey material. Gradational transition to:													
	94.3	109.6	15.2	99	QURTZITE Pale green-grey and mauve-brown; pale green-grey is banded (probably bedded), commonly micaceous (muscovite), with rare isolated spots of black tourmaline; mauve-brown is massive and possibly contains very fine Ti-biotite. Both types cross-cut by numerous, anastomosing yellow , clayey (?) veins. Some irregular quartz veins and veinlets up to 2cm thick. (several of the thicker veins may be silicified microgranite). BCA'S: 70m, 25-30°, 98.7-99.8m, 40.50°; 99.8-100.1m, 30° average; 100.1-102.9m, 35-45° Broken only along joints coated with material, badly broken 97.5-98.5m. 96.5-96.9m Microgranite (?) dyke, white. Includes 15cm of quartz on upper margin. Grainsize ≤ 0.5mm. Comprises quartz, white and yellow (argillized) feldspars, minor muscovite. Upper contact not visible (broken core), lower contact													

DIAMOND DRILL RECORD

HOLE NUMBER : SD 16

LOGGED BY : P. ROBERTS

	INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn.									
	FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu	% As	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO3
					at ~30° to c.a. Very fine Ti-biotite present in quartzite near contact.													
					102.2-102.3m Banded quartz-black tourmaline vein. Banding at ~40° to c.a. (replaced along bedding planes?). Contacts at ~50° to c.a.													
	109.6	165.2	55.5	150	QUARTZITE													
					Grey; hard, partly bedded, siliceous, minor disseminated muscovite. Minor pinkish mauve patches (enriched in fine Ti-biotite?). Minor brown tourmaline mostly in bands parallel bedding. Numerous irregular veins of quartz and/or tourmaline and /or muscovite; vein thicknesses <1mm to 3cm (thicker veins are quartz-rich). Traces of pyrite throughout - disseminated and in thin veins or coating fractures. In places, the quartzite has a granular fabric, "grain-size" 1-2mm. BCA'S: 114m, 0-10°, 115m, 25°, 115.7 - 116.4m, 40-70° 118.5-120m, 45-70°; 1228m, 60°; 123.6-124.7m~5°; 140.9m, 25°; 141.7-142.0m, ~30° (bedding?); 147.0-147.5m, 10-35°; 150.7m, 35°; 151.5-153.6m, 5-10°; 158.0-159.0m, 20°. Broken along numerous irregular joints, rarely parallel bedding.													
					125.7-125.8m Quartzite including numerous white laths, average size 1cm x 1mm.													
					127.0-127.2m As above, but fewer laths.													
					127.2-130.7 Intensely silicified quartzite (?). Includes patches of white quartz, several veins of microgranite (?) 1cm thic (VCA'S ~45°), patches of quartz-tourmaline muscovite greisen and muscovite-enriched patches. Possibly affected by proximity to granite near hole but not intersected.													
					132.3-132.4m Vein of fine grained quartz-brown tourmaline rock. Equigranular, average grainsize 1mm. VCA 35°													
					139.4m Greisenized, fine grained granite (?) in 1cm vein. Grainsize 0.5 - 2mm. Quartz-muscovite - tourmaline rock. VCA 55°.													
					160.1-160.2m Quartzite including lath-like tourmaline, average													

DIAMOND DRILL RECORD

HOLE NUMBER : SD 16

LOGGED BY : P. ROBERTS

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn									
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu	% As	% S	% Pb	% Zn	% Bi	g/t Ag	% WO$_3$
				dimensions 8mm x 1.5mm.													
				Quartzite is pale brown, yellow stained (bleached?) near contact, which lies at 25° to c.a.													
165.2	169.5	4.3	100	GREISENIZED GRANITE Paly yellow, pale grey (grainsize averages 1mm). Comprises quartz, muscovite and pale yellow, argillized feldspar. Includes "veins" of fine greisen (10-20 % of total) 5-30cm thick some with central thin (1-3mm) veins of sulfides - pyrite, chalcopyrite and arsenopyrite and/or rare, thicker (1-3cm) veins of tourmaline - quartz; VCA'S 70-80°, less frequently 10-20°. Broken along thin sulfide veins and irregular, clayey fractures. Flat contact at 75° to c.a.													
169.5	181.8	11.4	93	ALTERED AND BRECCIATED HORNFELS-QUARTZITE Mauve, green-grey. Fragments and patches of hornfelsed siltstone and quartzite. Both fragments and matrix contain disseminated Ti-biotite, particularly within 2cm of top contact. Bedding apparent in places but BCA'S probably meaningless (in larger fragments). Breccia textures less apparent lower 4m but probably brecciated throughout. Minor sulfides, as thin veins/veinlets, ≤ 3mm thick, and disseminated; mainly pyrite, very minor pyrrhotite. Very minor white and pale yellow tremolite (?) in small patches. Broken along irregular, clayey or green and serpentinous joints; badly broken 178.8-179.5m. 0.8m core loss 170.2-172.5m. <u>169.6 - 169.7m</u> Includes several elliptical patches of tremolite, with moderately magnetic grey mineral (partly magnetite?), dimensions average 1x2 cm^2. Slightly irregular contact at ~40° to c.a.													
181.8	187.3	5.5	100	GRANITE Pale yellow-white, fine to medium grained, including patches of micropegmatite. Comprises quartz, weakly argillized feldspar, minor brown-black biotite. Very minor black tourmaline in coarse crystals in micropegmatitic patches, associated with pyrite in vugs. Minor greisen "veins" 5-3 cm thick, crossing core at ~70° and ~30° to c.a. - grey, fine grained, comprising quartz, muscovite, some with central thin (≤4mm) veins of sulfide ± tourmaline: sulfide mainly pyrite , one sphalerite vein at 186.2m.													
187.3	218.6	30.5	97	ALTERED QUARTZITE													

RENISON LIMITED

DIAMOND DRILL RECORD

HOLE NUMBER : SD 16
LOGGED BY : P. ROBERTS

MWPS

	INTERVAL (m)		RECOVERY		DESCRIPTION	FORM			% Sn.									
	FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	~~% Pb.~~	% Zn.	% Bi.	g/t Ag	% WO3
					Pale grey, grey-brown with yellow patches, hard, partly bedded.									%Fe				
					Includes numerous, variously oriented veinlets of pyrite, and veins or													
					patches of yellow and yellow-green calc-silicates (?), including													
					pale yellow tremolite and brown tourmaline ± quartz in places. From 192.6m													
					contains patchy, disseminated Ti-biotite, particularly 207.8-212.4m													
					which is both biotite-and sulfide-rich (pyrite and pyrrhotite).													
					BCA'S: 188.5m,55°; 190.7-191.0m,45° 194.5-194.7m,45°; 196.0-196.4m,													
					30-35°; 201.7-201.8m, 0-40° (folded); 202.8-202.9m, 0°; 206.7-													
					207.4m, 35°; 208.9-209.7m, 45-70°; 213.3-218.6m, 15-45° (av. 35°).													
					Broken along irregular fractures, some thinly coated with yellow clay,		203.0	204.0	0.02	<0.01	0.03	<0.1	1.0	5.6	0.02	0.002		<0.01
					and, towards bottom, green-black serpentine.			205.0	0.02	<0.01	0.03	<0.1	2.5	7.0	0.01	0.002		<0.01
								206.0	0.02	<0.01	0.02	<0.1	1.6	8.2	0.01	0.002		<0.01
					192.6-193.8m Brecciated (?). Rounded "fragments" in a biotite-rich			207.0	0.02	<0.01	0.03	<0.1	3.9	9.2	0.01	0.006		0.01
					matrix. Includes one vein of quartz-tourmaline-			208.0	0.03	<0.01	0.04	<0.1	7.5	13.8	0.01	0.004		<0.01
					pyrite, broken, at 193.2-193.4m; VCA 45°.			209.0	0.03	<0.01	0.04	<0.1	9.1	14.6	0.01	0.004		<0.01
								210.0	0.03	<0.01	0.05	<0.1	10.3	17.1	0.01	0.005		<0.01
					196.0-193.1m Quartz-black tourmaline vein. Coarse grained,			211.0	0.03	<0.01	0.07	<0.1	11.6	17.9	0.02	0.004		0.01
					silicified. Muscovite-bearing selvedge 5cm thick			212.0	0.03	<0.01	0.04	<0.1	4.9	10.9	0.01	0.006		<0.01
					on lower side. VCA 45-50°.			213.0	0.02	<0.01	0.04	<0.1	3.6	12.0	0.01	0.003		<0.01
								214.0	0.02	<0.01	0.03	<0.1	1.5	4.7	0.01	0.002		<0.01
					198.0-199.3m Badly broken zone, including soft pale yellow silty			215.0	0.02	0.01	0.02	<0.1	1.5	3.5	0.01	0.002		<0.01
					rock (altered siltstone?) at 198.7-198.9m.			216.0	0.02	<0.01	0.03	<0.1	1.9	5.4	0.01	<0.001		0.01
								217.0	0.02	0.02	0.03	<0.1	1.7	6.8	0.02	0.001		<0.01
					205.0-206.7m Very badly broken zone, including 0.7m core loss.			218.0	0.02	<0.01	0.04	<0.1	2.3	7.2	0.01	<0.001		<0.01
					212.6-213.3m Badly broken zone.													
					215.3-215.4m Quartz vein near parallel to bedding (VCA 40°),													
					possibly silicified aplite.													
	218.6	259.7	41.1	100	INTERBEDDED MAGNETITE SKARN AND HORNFELS-QUARTZITE		218.0	219.0	0.02	<0.01	0.03	<0.1	0.4	5.0	0.02	0.001		<0.01
					Banded green-black and grey; predominantly green-black, comprising			220.0	0.03	<0.01	0.05	<0.1	1.7	13.8	0.08	0.002		<0.01
					magnetite, pyrrhotite and pale green mica (phlogopite) with minor			221.0	0.02	<0.01	0.04	<0.1	0.8	18.0	0.19	0.016		<0.01
					green-black serpentine, lesser pale grey and greenish white hornfels			222.0	0.07	0.05	0.03	<0.1	0.1	20.9	0.15	0.075		<0.01
					quartzite. Non-calcareous, but includes rare thin calcite veins.			223.0	0.05	0.01	0.04	<0.1	1.1	19.1	0.22	0.013		<0.01
					Minor pyrrhotite and (lesser) pyrite in thin veins. Very minor			224.0	0.10	0.09	0.02	<0.1	<0.1	20.7	0.04	0.008		0.04
					disseminated scheelite(?) - blue fluorescent under short wave UV,			225.0	0.40	0.03	0.07	<0.1	0.9	25.1	0.04	0.040		0.04
					generally in spots ≤ 1mm. Occasionally in large patches (eg. 229.3m,			226.0	0.11	0.04	0.05	<0.1	3.1	15.5	0.10	0.022		<0.01
					several cm across), apparently interstitial to sulfides and other			227.0	0.04	0.03	0.05	<0.1	1.6	23.6	0.04	0.046		0.15
					skarn materials.			228.0	0.05	0.03	0.05	<0.1	1.8	14.2	0.15	0.017		<0.01
								229.0	0.03	0.01	0.06	<0.1	1.7	15.8	0.04	0.014		0.08
								230.0	0.04	0.01	0.10	0.2	6.8	20.7	0.04	0.293		0.10
								231.0	0.04	0.02	0.06	<0.1	1.9	15.2	0.03	0.032		0.12

DIAMOND DRILL RECORD

HOLE NUMBER : SD 16
LOGGED BY : P. ROBERTS

	INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn					% Fe				
	FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	~~% Pb~~	% Zn.	% Bi.	g/t Ag	% WO$_3$
					Generally well-bedded except in intensely magnetite- mineralized		231.0	232.0	0.03	0.01	0.06	<0.1	2.1	13.9	0.02	0.022		0.02
					patches. BCA'S: 219.6-221.5m,15°; 221.5-224.0m, 35-45°; 225.5-226.5m,			233.0	0.06	0.02	0.02	<0.1	0.1	27.1	0.02	0.090		0.18
					60-75°, 227.6 - 227.9m, folded with fold axis near parallel			234.0	0.03	0.01	0.02	<0.1	0.8	26.3	0.03	0.218		0.42
					varying from 20° to 60°; 228.6-228.8, also folded from 40° to 0° to			235.0	0.05	0.02	0.02	<0.1	0.1	28.1	0.03	0.127		<0.01
					90°; 230.3-230.6m, 20°;231.2-232.6m, folded 0-35° (~ 20° average);			236.0	0.05	0.02	0.03	<0.1	0.8	30.5	0.02	0.130		<0.01
					235.7-259.7m, 5-30° (~15° average). Broken along variously orientated			237.0	0.05	0.03	0.02	<0.1	0.2	29.1	0.04	0.053		<0.01
					serpentinous slickensided joints and smooth serpentinous bedding			238.0	0.04	0.02	0.02	<0.1	0.4	26.3	0.03	0.044		<0.01
					breaks.			239.0	0.03	0.01	0.04	<0.1	2.1	17.3	0.02	0.024		0.01
					224.6-225.5m Brecciated zone, a jostle breccia? - fragments do not			240.0	0.05	0.02	0.04	<0.1	1.1	24.3	0.03	0.096		0.02
					appear to have moved much.			241.0	0.07	0.04	0.09	<0.1	4.0	14.6	0.02	0.014		0.01
								242.0	0.14	0.12	0.05	<0.1	2.6	10.2	0.06	0.019		0.01
					231.4m Includes patches of soft pinkish mineral-rhodochrosite			243.0	0.41	0.43	0.04	<0.1	1.7	16.7	0.04	0.021		0.06
					(?).			244.0	0.03	0.02	0.08	<0.1	3.7	11.3	0.07	0.020		0.01
								245.0	0.06	0.03	0.07	<0.1	2.4	12.5	0.04	0.009		<0.01
					236.3-236.6m Includes patches of soft pinkish mineral-rhodochrosite			246.0	0.41	0.32	0.07	<0.1	4.0	15.4	0.06	0.010		0.01
					(?).			247.0	0.38	0.25	0.07	<0.1	3.5	20.9	0.03	0.007		0.06
								248.0	0.95	0.66	0.05	<0.1	2.7	27.3	0.03	0.017		0.18
					240.3-245.7m Predominantly pale grey-green, banded hornfels with			249.0	0.03	0.02	0.03	<0.1	1.1	19.7	0.02	0.036		0.43
					only minor pyrrhotite-magnetite patches			250.0	0.03	0.01	0.04	<0.1	1.3	19.7	0.03	0.049		0.31
								251.0	0.04	<0.01	0.05	<0.1	2.2	20.6	0.04	0.061		0.17
					252.7-255.2m Very badly broken along slickensided joints.			252.0	0.03	<0.01	0.06	<0.1	3.9	14.9	0.02	0.019		0.03
								253.0	0.02	<0.01	0.05	<0.1	2.9	16.2	0.04	0.017		0.11
					PETROLOGICAL SAMPLE 236.5m			254.0	0.02	<0.01	0.07	<0.1	1.8	14.8	0.02	0.008		0.06
								255.0	0.03	0.01	0.05	<0.1	0.9	18.7	0.03	0.030		0.12
					Gradational increase in hornfels content towards bottom.			256.0	0.03	<0.01	0.05	<0.1	1.2	32.2	0.04	0.007		0.09
								257.0	0.02	<0.01	0.02	<0.1	1.0	21.3	0.03	0.009		0.21
	259.7	279.5	19.8	100	HORNFELS-QUARTZITE			258.0	0.02	<0.01	0.04	<0.1	0.8	17.8	0.02	0.028		0.20
					Grey, brown-grey, finely bedded, hard. Minor bands and veins of			259.0	0.02	<0.01	0.03	<0.1	0.8	24.3	0.03	0.021		0.19
					magnetite-sulfide-phlogopite(?). In places, mauve brown, may			260.0	0.02	0.01	0.05	<0.1	1.2	15.9	0.02	0.002		0.09
					contain very fine grained disseminated Ti-biotite. Includes numerous			261.0	0.02	<0.01	0.05	<0.1	1.0	12.9	0.02	0.005		0.05
					irregular quartz veins and serpentine veinlets, lesser pyrite and			262.0	0.01	<0.01	0.05	<0.1	1.3	10.7	0.02	0.011		0.12
					pyrrhotite veinlets. Trace disseminated scheelite (?) specks,			263.0	0.02	<0.01	0.06	<0.1	1.4	6.9	0.02	0.006		0.02
					particularly below 271m. BCA'S: 259.7-263.9m, 5° average,			264.0	0.02	<0.01	0.05	<0.1	1.5	7.1	0.02	0.010		0.03
					Includes one fold at 261.0m, 263.9-276.0m, 20-30°; 276.0-279.5m,			265.0	0.02	<0.01	0.06	<0.1	2.2	12.5	0.02	0.085		0.05
					35-40°. Broken along bedding and slickensided serpentine-coated			266.0	0.02	<0.01	0.05	<0.1	1.9	7.9	0.01	0.007		0.01
					joints.			267.0	0.02	<0.01	0.05	<0.1	1.3	7.8	0.04	0.008		0.01
								268.0	0.02	<0.01	0.04	<0.1	0.9	6.6	0.02	0.008		0.01
					265.4-267.4m Badly broken along slickensided, serpentinous joints.			269.0	0.07	0.01	0.04	<0.1	2.1	10.2	0.04	0.007		0.05
								270.0	0.02	<0.01	0.06	<0.1	1.4	3.6	0.02	0.004		0.11
					273.7-273.9m Very soft, puggy green serpentinous clay matrix			271.0	0.01	<0.01	0.04	<0.1	1.3	6.4	0.01	0.003		<0.01
					including fragments of hornfels-quartzite			272.0	0.04	<0.01	0.08	<0.1	5.0	12.4	0.02	0.025		0.24
								273.0	0.01	<0.01	0.07	<0.1	2.4	9.7	0.01	0.007		<0.01
								274.0	0.01	<0.01	0.04	<0.1	2.3	7.9	0.02	0.004		0.01

DIAMOND DRILL RECORD

HOLE NUMBER : SD 16

LOGGED BY : P. ROBERTS

	INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn.					%Fe				
	FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	~~% Pb~~	% Zn.	% Bi.	g/t Ag	% WO₃
					degraded, soft vein material (?).													
							274.0	275.0	0.02	0.01	0.05	<0.1	1.2	10.4	0.02	0.015		0.03
					274.4-274.7m Badly broken along slickensided, serpentinous joints.			276.0	0.01	<0.01	0.04	<0.1	1.1	7.0	0.02	0.006		0.02
								277.0	0.03	0.01	0.05	<0.1	2.3	20.4	0.04	0.052		0.03
					PETROLOGICAL SAMPLE 269.8m			278.0	0.03	0.01	0.07	<0.1	3.3	10.6	0.02	0.008		0.03
					Gradational increase in proportioncf magnetite-rich patches.			279.0	0.02	0.13	0.05	<0.1	1.1	10.7	0.02	0.012		0.03
								280.0	0.13	0.13	0.05	<0.1	1.2	12.1	0.02	0.016		0.08
	279.5	286.3	6.8	100	MAGNETITE SKARN, LESSER HORNFELS			281.0	0.06	0.04	0.02	<0.1	0.7	15.3	0.03	0.042		0.06
					Dark and pale grey, banded, hard. Proportionof hornfels decreased			282.0	0.25	0.24	0.02	<0.1	0.1	25.5	0.03	0.032		0.20
					progressively downwards. Magetite-rich bands comprise magnetite			283.0	0.46	0.36	0.02	<0.1	0.1	29.5	0.04	0.012		0.02
					serpentine, minor green phlogopite (?). Hornfels is hard, white,			284.0	0.21	0.06	0.02	<0.1	<0.1	21.9	0.04	0.007		0.02
					micaceous (muscovite). Very little visible sulfide. Scheelite (?)			285.0	0.35	0.06	0.02	<0.1	<0.1	26.6	0.04	0.032		0.01
					in rare specks, abundant, disseminted at 291.7-281.8m. BCA'S average			286.0	0.12	0.05	0.03	<0.1	<0.1	17.1	0.03	0.009		0.01
					30°. Broken on rough joints and rarely parallel bedding.													
	286.3	295.8	9.5	100	SERPENTINE-MAGNETITE		286.0	287.0	0.18	0.08	0.02	<0.1	<0.1	22.5	0.04	0.009		<0.01
					Grey and green-black, mostly unbanded. Comprises green-black to apple			288.0	0.10	0.06	0.02	<0.1	<0.1	15.9	0.05	0.007		<0.01
					green serpentine interspersed with dark grey magnetite, cut by numerous			289.0	0.13	0.06	0.06	<0.1	<0.1	19.1	0.05	0.003		0.01
					carbonate veinlets (mostly calcite). Apart from the latter, non-			290.0	0.11	0.06	0.03	<0.1	0.5	13.9	0.02	0.005		<0.01
					calcareous at top but becoming calcareous towards bottom. Negligible			291.0	0.11	0.05	0.02	<0.1	<0.1	13.4	0.02	0.003		<0.01
					visible sulfides or scheelite. BCA'S (bedding?): 290.8-291.5m,			292.0	0.13	0.08	0.02	<0.1	<0.1	15.4	0.03	0.005		0.01
					20-45 ; 292.3-293.0m, 20-60°; Broken along irregular, carbonate-			293.0	0.08	0.05	0.04	<0.1	0.1	15.3	0.29	0.003		<0.01
					coated joints, some slickensided.			294.0	0.05	0.04	0.02	<0.1	<0.1	14.8	0.16	0.003		<0.01
								295.0	0.06	0.05	0.03	<0.1	<0.1	14.7	0.11	0.002		0.01
	295.8	298.0	2.2	100	SERPENTINOUS CARBOANTE			296.0	0.10	0.06	0.03	<0.1	0.2	15.8	0.45	0.004		0.02
					Pale grey, green and black, comprising a chaotic mixture of pale													
					grey (earlier?) carbonate (calcite-dolomite) and pale green, black													
					(later?) serpentinous carbonate. No visible scheelite. Intersected													
					by later(?) calcite veins. Banded in places, possibly not bedding,													
					at 10-35° to c.a. Few irregular breaks. Gradational transition to:													
	298.0	300.0	2.0	100	SERPENTINE-CARBONATE-MAGNETITE		298.0	299.0	0.02	0.03	0.09	<0.1	0.7	5.2	0.85	0.003		<0.01
					Dark grey-green;serpentine, carbonate (calcite-dolomite) interspersed			300.0	0.04	0.03	0.06	<0.1	0.7	8.2	1.03	0.006		<0.01
					with black magnetite and lesser dark red-brown sphalerite. Latter													
					is disseminated in lots up to 1cm across. Trace pyrite - one clot													
					seen 1.5 x 0.4cm. No visible scheelite. Unbedded. Broken along													
					few carbonate-coated joints.													
	300.0	302.6	2.6	100	SERPENTINOUS CARBONATE													
					Pale green and grey; grey carbonate mostly calcite, early formed(?)													
					partly replaced by serpentinous green carbonate. Grey carbonate													

RENISON LIMITED

PAGE 8

DIAMOND DRILL RECORD

HOLE NUMBER : SD 16

LOGGED BY : P. ROBERTS

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn					% Fe				
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL	% Cu	% As	% S	~~% Pb~~	% Zn	% Bi	g/t Ag	% WO3
				is partly banded, possibly parallel bedding at 10° to c.a.													
				Includes several dark grey stylolites oriented near parallel to													
				banding. Few irregular breaks.		302.0	303.0	0.04	0.03	0.04	<0.1	0.9	6.5	1.26	0.004		<0.01
302.6	308.8	6.1	98	SERPENTINE-PYRRHOTITE-MAGNETITE		303.0	304.0	0.19	0.02	0.02	<0.1	0.1	19.0	0.19	0.006		<0.01
				Green-black, unbanded. Comprises green-black serpentine, disseminated			305.0	0.20	0.02	0.02	<0.1	0.5	19.1	0.75	0.007		<0.01
				pyrrhotite and magnetite with lesser pyrite. Intersected by numerous			306.0	0.18	0.03	0.03	<0.1	1.6	16.2	1.64	0.006		<0.01
				calcareous veinlets. Minor red-brown sphalerite 302.6-303.6m. No			307.0	0.26	0.03	0.18	<0.1	8.0	19.5	0.46	0.014		<0.01
				visible scheelite. Core competent down to 307.7m, broken on slickensided			308.0	0.02	<0.01	0.09	<0.1	2.9	8.6	0.05	0.005		<0.01
				serpentinous joints below that point.													
308.8	312.0	2.6		HORNFELSED SHALE													
				Dark grey, unbedded; minor blebs and veins of pyrite, up to 0.5cm													
				thick. Few calcareous veinlets, variously oriented. Badly broken													
				on slickensided joints. 0.6m core loss.													
312.0	313.5	1.5	100	BRECCIA													
				Comprises fragments of pale grey quartzite and dark grey hornfelsed													
				shale. Intersected by variously oriented calcite andlesser pyrite													
				veinlets. Minor, fine grained pyrite also patchily disseminated													
				in the matrix. Broken along few, irregular fractures													
313.5	316.1	2.6	100	CALCAREOUS SHALE													
				Grey, unbedded. Effervesces very strongly under acid. Appears													
				contorted (despite lack of bedding) - may be brecciated also.													
				Includes numerous calcite veinlets, and lesser pyrite in veins up													
				to 0.5cm thick. Partly competent, partly broken on slickensided													
				graphitic joints.													
316.1	317.5	1.4	100	BRECCIA		316.0	317.0	0.01	0.01	0.02	<0.1	1.0	3.9	0.03	0.005		<0.01
				Consists of fragments of strongly calcareous shale and minor			318.0	0.01	<0.01	0.02	<0.1	0.2	2.2	0.01	0.003		<0.01
				quartzite set in a calcareous and/or pyritic and clayey matrix.													
				Cut by calcite veinlets. Very soft and incompetent lower 30cm.													
317.5	331.7	12.8		TOURMALINE GRANITE													
				White to pale grey, fine to medium grained, sub-porphyritic with feldspar													
				phenocrysts averaging 0.5mm across; grainsize increases with depth;													
				comprises approximately equal proportions of quartz and feldspar													
				with 5-10% disseminated black tourmaline. Trace muscovite.													
				Atypical appearance compared to other granite intersections-looks													

DIAMOND DRILL RECORD

HOLE NUMBER : RD 16

LOGGED BY : P. ROBERTS

	INTERVAL (m)		RECOVERY		DESCRIPTION	FORM			% Sn.									
	FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO$_3$
					altered - possibly silicified. Broken along numerous rough joints.													
					1.4 m core loss at 324.0-325.4m													
					<u>317.5-319.7m</u> Veined by green chloritic (?) veinlets. Badly broken in places on soft clayey fractures. Includes hornfelsed. partly brecciated sedimentary fragments at 318.3 - 318m - xenolithic material(?).													
					END OF HOLE 331.7m													

DETAILED CORE RECOVERIES

~~DIAMOND DRILL RECORD~~

HOLE NUMBER : SD16

LOGGED BY : P. Roberts

	INTERVAL (m)		RECOVERY		DESCRIPTION								FORM.			% Sn									
	FROM	TO	m	%	FROM	TO	M	%	FROM	TO	M	%		FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO3
	0.0	3.0	1.5	50	130.7	133.7	3.0	100	256.7	259.7	3.0	100	Core recovery over complete hole = 314.2m (94.7%)												
		4.7	1.6	94		136.7	3.0 m	100		262.7	3.0	100													
		7.7	2.5	83		139.7	3.0	100		265.7	3.0	100													
		10.7	1.9	63		142.7	3.0	100		268.7	3.0	100													
		13.7	1.0	33		145.7	3.0	100		271.7	3.0	100													
		16.7	2.8	93		148.7	3.0	100		274.7	3.0	100													
		19.7	2.9	97		151.7	3.0	100		277.7	3.0	100													
		22.7	2.9	97		154.7	3.0	100		280.7	3.0	100													
		25.7	3.0	100		157.7	3.0	100		283.7	3.0	100													
		28.7	3.0	100		16007	3.0	100		286.7	3.0	100													
		31.7	3.0	100		163.7	3.0	100		289.7	3.0	100													
		34.7	2.9	97		166.7	3.0	100		292.7	3.0	100													
		37.7	2.9	97		169.7	3.0	100		295.7	3.0	100													
		40.7	2.3	77		172.7	2.2	73		298.7	3.0	100													
		46.7	4.2	70		175.7	2.9	97		301.7	3.0	100													
		49.7	2.9	97		178.7	3.0	100		304.7	3.0	100													
		52.7	2.9	97		181.7	3.0	100		307.7	3.0	100													
		55.7	2.2	73		184.7	3.0	100		310.7	2.4	80													
		58.7	2.9	97		187.7	3.0	100		313.7	2.9	97													
		61.7	2.3	77		190.7	3.0	100		316.7	3.0	100													
		64.7	0.8	27		193.7	3.0	100		319.7	3.0	100													
		67.7	2.0	67		196.7	3.0	100		322.7	3.0	100													
		70.7	2.9	97		199.7	3.0	100		325.7	1.6	53													
		73.7	3.0	100		202.7	3.0	100		328.7	3.0	100													
		76.7	2.9	97		205.7	2.3	77		331.7	3.0	100													
		79.7	3.0	100		208.7	3.0	100																	
		87.7	3.0	100		211.7	3.0	100																	
		85.7	3.0	100		214.7	2.9	97																	
		88.7	3.0	100		217.7	3.0	100																	
		94.7	6.0	100		220.7	3.0	100																	
		97.7	3.0	100		223.7	3.0	100																	
		100.7	2.9	97		226.7	3.0	100																	
		103.7	3.0	100		229.7	3.0	100																	
		106.7	3.0	100		232.7	3.0	100																	
		109.7	3.0	100		235.7	3.0	100																	
		112.7	3.0	100		238.7	3.0	100																	
		115.7	3.0	100		241.7	3.0	100																	
		118.7	2.9	97		244.7	3.0	100																	
		121.7	3.0	100		247.7	3.0	100																	
		124.7	3.0	100		250.7	3.0	100																	
		127.7.	3.0	100		253.7	3.0	100																	
		130.7	3.0	100		256.7	3.0	100																	

RE[illegible]ON LIMITED – DRILL CORE RECO[illegible]

HOLE NUMBER	SD 17
PURPOSE	To test magnetite skarn mineralization near hanging wall quartzites between SD13 andSD15 and to test for granite north of skarn zone.
LOCATION	St. Dizier
COLLAR R.L.	2180.9
CO-ORDINATES	5367 486.0 N 345 312.9 E
LENGTH	299.7m
HOLE SIZE	0-29.0m HW (3.0-29.0m HW reamed over HQ) 29.0-299.7m HQ
DATE DRILLED	30/9/81 - 29/10/81
SIGNIFICANT CORE LOSS ZONES	0.0-59.6m 28.9m loss 263.7-283.0m 6.9m loss, also significant core losses throughout rest of hole.
ORE ZONE GROUND CONDITIONS	Poor, 6.9m (34% of intersection) of core lost in magnetite-bearing zone.
LOGGED BY	P. Roberts
COMMENTS	This hole encountered poor ground conditions throughout except in the unmineralized carbonate. Skarn mineralization occurs in a fault zone or, at least, an open fracture system, which strikes near parallel to the hole; some unmineralized carbonate has been leached and weathered to at least 230m below surface. The hole intersected granite from the skarn, and therefore a complete mineralized intersection was not obtained.

SURVEY			From – To	Distance D	VERTICAL		HORIZONTAL	
Depth	Bearing	Dip			D.Sin.Dip	R.L.	D.Cos.Dip	Prog. Total
(m)	(AMG)							
Collar	349.1°	-57.7°	0.0- 21.0	21.0	17.7	2163.2	11.2	11.2
42.0	344°	-58°	21.0- 51.0	30.0	25.4	2137.8	15.9	27.1
60.0	343°	-58°	51.0- 73.0	22.0	18.7	2119.1	11.7	38.8
86.0	343°	-59°	73.0- 98.0	25.0	21.4	2097.7	12.9	51.7
110.0	345°	-59.8°	98.0-128.0	30.0	25.9	2071.8	15.1	66.8
146.0	350°	-59°	128.0-158.5	30.5	26.1	2045.7	15.7	82.5
171.0	342°	-59°	158.5-190.5	32.0	27.4	2018.3	16.5	99.0
210.0	assume 341.5°	-59°	190.5-222.0	31.5	27.0	1991.3	16.2	115.2
234.0	341°	-60°	222.0-247.5	25.5	22.1	1969.2	12.8	128.0
261.0	332° *	-59°	247.5-273.0	25.5	21.9	1947.3	13.1	141.1
285.0	337° *	-59.8°	273.0-292.4	19.4	16.8	1930.5	9.8	150.9
299.7	357°	-59.8°	292.4-299.7	7.3	6.3	1924.2	3.7	154.6

* these surveys may have been affected by proximity to magnetite-bearing rocks.

SUMMARY – ASSAY DATA

LODE NAME	FROM	TO	LENGTH (m)	AVERAGE WEIGHTED ASSAYS													B.C.A.
				Sn.	Acid Sol. Sn.	Cu.	As.	S.	Pb.	Zn.	Bi.	WO$_3$	Ag g/t				
	268.0	269.0	1.0	0.40								0.02					
	278.0	281.0	3.0	0.28								<0.01					

NWPS 27344

64 083

031

HOLE No **SD 17**

SCALE 0 20 40 metres

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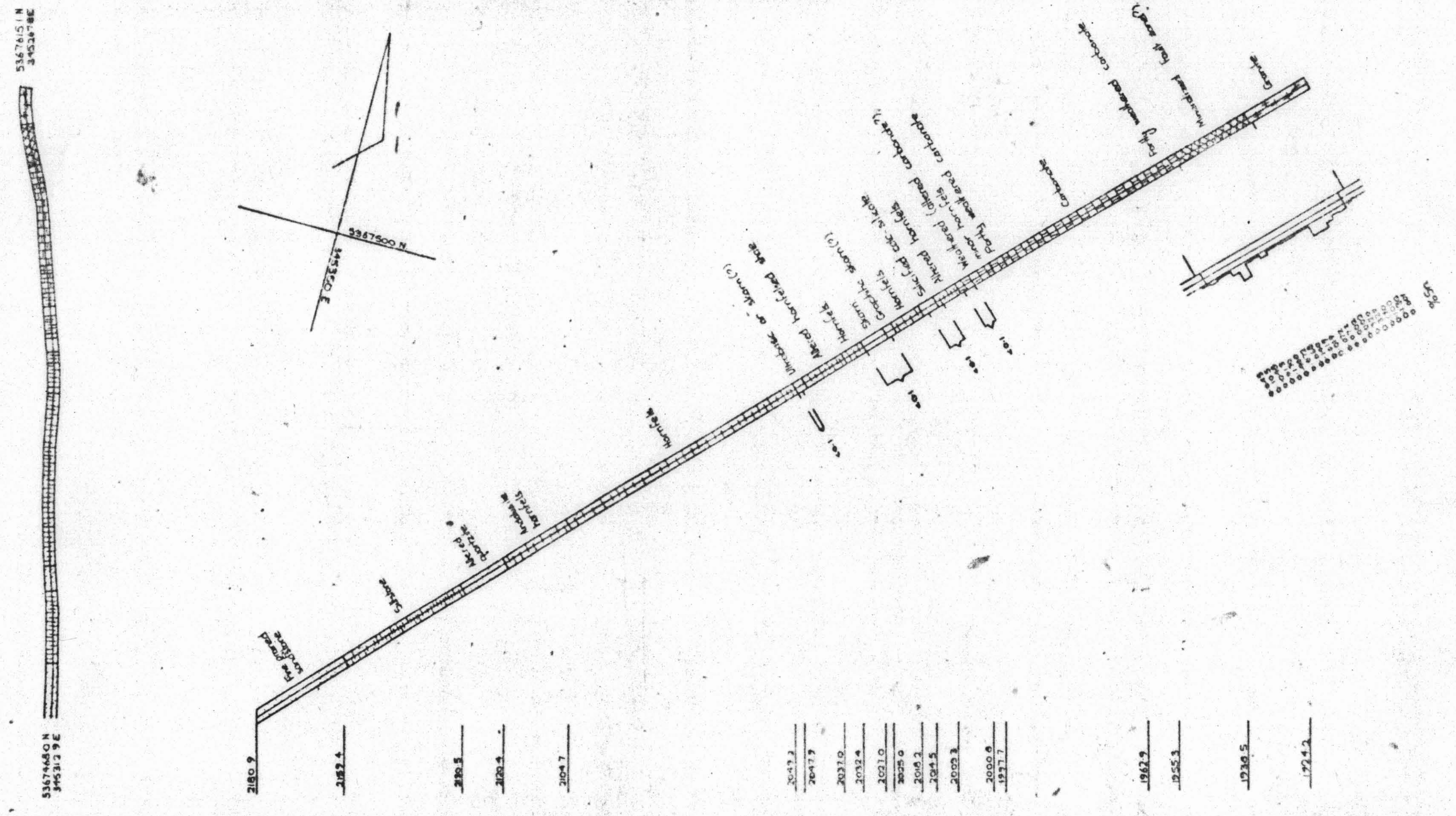
DIAMOND DRILL HOLE PLOT

5 cm



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PAGE 1

DIAMOND DRILL RECORD

HOLE NUMBER : SD 17

LOGGED BY : P. Roberts

NWPS

	INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn									
	FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO$_3$
	0.0	25.9	13.0	50	FINE GRAINED SANDSTONE Very pale brown, bedded, generally soft and friable. Minor grey siltstone. Down to 14.7m, includes patchy minor fine grained sulfides, disseminated and in veinlets, with patchy tourmalinized zones - brown black tourmaline in veins ± quartz and in blebs (1-5mm diameter) with fine muscovite. Below 14.7m, very minor pyrite generally in veinlets, only trace patchy muscovite. BCA'S (below 15m) 30-35°. Very badly broken on bedding and joints. 12.9m core loss.													
	25.9	59.6	17.7	53	SILTSTONE Cream, pale grey, laminated, soft and friable (weathered) at top, becoming harder with depth and darker grey. Very minor pyrite in veinlets. BCA'S 35-40°. Very badly broken on bedding and joints. 16.0m core loss.													
	59.6	71.8	10.8	89	ALTERED QUARTZITE White to mottled, very pale brown; including fine grained mica and minor brown tourmaline in streaks and blebs, and minor patchy pyrite, finely disseminated and in thin veins. Banded (bedding?). BCA'S 25-40°, average 30°. Broken on bedding and rough joints. 1.4m core loss. 62.6-63.0m Andalusite-bearing hornfels, dark grey, laminated, with disseminated andalusite throughout. Minor veinlet pyrite. 66.5-66.65m Andalusite-bearing hornfels as above, but with abundant fine grained disseminated muscovite.													
	71.8	89.8	15.7	87	ANDALUSITE HORNFELS Dark grey, weakly bedded or unbedded, comprising dark grey hornfelsed shale. Abundant disseminated andalusite (?) laths averaging 0.5x3.0m. Some of core has a sheen due to very fine grained mica (?). Minor coarse grainde pyrite in pod-like veins ± quartz up to 1cm thick. B.C.A'S 20-35°, averaging ~30°. Broken to badly broken on joints. 2.3m core loss.													
	89.8	154.6	59.8	92	HORNFELS Dark grey, hornfelsed siltstone, largely bedded, non-calcareous. Numerous quartz veins 0.5-1.0cm thick, some near-parallel bedding commonly irregular (ptygmat ically folded ?), lesser thinner veins													

DIAMOND DRILL RECORD

HOLE NUMBER : SD 17

LOGGED BY : P. Roberts

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn.									
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO.
				of pyrite. From 119.0m downwards, patchy disseminated flecks and laths - soft dark green-black, mostly ≤1mm long - associated with a slight increase in quartz and pyrite veining. BCA'S 90-98.3m (bedding?), 40-70°, average 50°; 98.3-101.3m, 35-45°, 102.5-106.5m, 20-25°, 106.5-107.1m, contorted; 107.6-108.7m (bedding?), 30° average; 112.4-113.8m, 20-30°, 114.2-123.0m, 20-30°; 124.9-132.5m, 30° average; 132.5-145.1m, 35-40°; 145.1-145.8m, 30°; 145.8-148.0m, bedding not very clear, at least partly contorted. Broken to badly broken mostly on irregular joints, some coated by clay, quartz, rarely serpentine; rare bedding breaks. 5.0m core loss.													
				97.1-98.1m Calc-silicate, pale coloured, includes fine mica, flecks of green serpentine, spots of tourmaline (?), interbedded with hornfels at lower contact.													
				108.8m Quartz vein, 2cm thick, with brown flecks of tourmaline, or possibly cassiterite (?), 1mm diameter.													
				134.8-135.2m Pale grey quartzite (?)													
				141.8-142.7m Pale grey quartzite (?), bedded, with very fine grained muscovite. Colour boundary (marking contact) near parallel to bedding.													
				148.0-154.6m Very badly broken zone, includes 2.9m core loss. Broken on irregular joints. At 149.0-149.5m, altered quartzite (?), very fine micaceous (muscovite(?), small (3mm) grains of slightly pinkish brown tourmaline (?). From 151.4m downwards, includes some clayey material and calc-silicate e.g. soft yellow-brown and micaceous at 152.5m, white tremolite (?) veining in hornfels at 154.0m.													(ppm).
154.6	157.0	2.2	92	ULTRABASIC OR SEARN (?)		154.6	155.6	0.044	<0.01	440	<20		<50	2500	<100	2	15
				Dark green, hard, ultrabasic-like rock - serpentine with abundant disseminated and veinlet pyrite interspersed with minor, pale coloured hornfels-quartzite. The serpentine rock contains 10-20% sulfide, is weakly to moderately magnetic, and includes thin veins (0.5cm thickness average) of chrysotile asbestos. Includes patches of moderately soft mauve-brown mineral. Chaotic texture particularly 155.7-157.0m.		155.6	157.0	0.008	0.02	900	<20		<50	1600	<100	1	<10

RENISON LIMITED

DIAMOND DRILL RECORD

HOLE NUMBER : SD 17
LOGGED BY : P. Roberts

	INTERVAL (m)		RECOVERY		DESCRIPTION	FORM			% Sn									
	FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu	% As	% S	% Pb	% Zn	% Bi	g/t Ag	% WO$_3$
	157.0	168.4	11.1	97	ALTERED HORNFELSED SHALE Dark grey, bedded(?). Abundant fine grained (0.5mm) mica (muscovite?). Cross-cut by numerous veinlets of white carbonate (partly calcite) and very soft talcose clay, both commonly parallel bedding. Lesser veins and blebs of serpentine. Minor serpentinous/talcose clay and pale grey to clear, moderately hard mineral with radiating acicular habit. Minor vein quartz lower 1.5m, associated with harder and less broken core. BCA'S 20-45°, average 40°. Numerous breaks, generally on talcose clay-coated surfaces, predominantly parallel to bedding.													
	168.4	174.0	4.7	84	HORNFELS Dark grey, hard. Comprises alternating patches of massive, hard and brittle, dark grey hornfels cross-cut by pyrite veinlets, and medium grey bedded (?) hornfels containing abundant white to pale grey, lath-like and equant grains ranging from 0.5mm to up to 1cm. Thelatter rock is similar to "graphitic skarn" described in SD14 (252.4m). Minor vein quartz. Very minor werpentine associated with the thicker pyrite veinlets. BCA'S(?) 35°. Broken along pyrite-coated joints and few other irregular breaks. 0.9m core loss													(ppm)
	174.0	180.3	5.7	90	SKARN Grey-green, hard crudely banded. Finely granular texture-"grainsize" 0.5mm. Boundaries between bands commonly marked by stylolite-like features filled with black, soft, shining non-magnetic mineral (graphite?). Non-magnetic. Partly weakly calcareous and cut by numerous calcite veinlets. Green colour may be derived from fine grained diopside. Banding at 30-40° to c.a. Few irregular breaks. 179.5m Includes abundant, large (0.5cm) crystals of grey, vitreous mineral.		174.0	175.0	0.056	0.01	<20	<10		<50	260	<100	<1	15
								176.0	0.060	"	20	"		"	120	"	"	<10
								177.0	0.050	"	20	"		"	90	"	"	10
								178.0	0.012	"	60	"		"	450	"	"	15
								179.0	0.045	"	<20	"		"	120	"	2	20
								180.0	0.044	"	20	"		"	110	"	"	160
								181.0	0.013	"	80	"		"	2300	"	<1	<10
	180.3	182.5	2.1	95	GRAPHITIC SKARN (?) Medium grey with numerous, small pale grey lath-like grains and larger, more equant grains (cf. 179.5m) set in a grey or green-grey matrix. Similar to "graphitic skarn" described in SD14 (252.4m). Includes rare, small (0.5-1mm), bright green grains and trace pyrite Black mineral (graphite?) as above in thin veinlets (VCA'S average 40°).													

DIAMOND DRILL RECORD

HOLE NUMBER : SD 17

LOGGED BY : P. Roberts

NWPS

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn									
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g t Ag	% WO3
182.5	190.7	5.4	66	HORNFELS													
				Dark grey, hard; weakly bedded (BCA'S40-45°), weakly calcareous top													
				2.0m, unbedded, non-calcareous and extremely badly broken below													
				that point. Minor pyrite on joint facings and disseminated. Some													
				core break surfaces are slickensided and graphitic 2.8m core loss.													
190.7	194.9	3.1	74	SILICIFIED CALC-SILICATE(?)				(p.p.m.)									(ppm)
				Dark to pale grey, hard, banded (bedding?). Very minor pyrite and													
				serpentine in thin veinlets. Non-calcareous. Down to 193.2m hard,		192.0	193.0	50		280	>0		<50	16	<100	2	<10
				smooth surfaced core, few breaks; below that point, comprises a			194.0	65		950	<20		<50	3800	100	3	10
				network of friable white quartz and carbonate (?) veins with			195.0	8		260	"		50	150	<100	1	<10
				interstices filled with soft, grey-green material, and is very			196.0	10		120	"		50	100	<100	2	10
				badly broken. Some slickensided fracture surfaces. BCA'S(?) 35°													
				1.1m core loss.													
194.9	201.0	4.6	75	ALTERED HORNFELS													
				Grey, hard, mostly unbedded (banding, where seen, 10-25° to c.a.),													
				possible breccia texture. Minor pyrite in veinlets and blebs, some													
				with serpentine. Non-calcareous. Minor vein quartz. Very badly													
				broken. 1.5m core loss.													
				195.2-196.8m Calc-silicate(?), pale greenish white hard, Buff coloured gragments (?), 1-2cm across, set in a pale green matrix. 1.0m core loss.													
201.0	210.8	8.4	86	WEATHERED/ALTERED CARBONATE(?), MINOR HORNFELS													
				Pale yellow and black. Pale yellow material varies from having		202.0	203.0	4		40	<20		<50	80	<100	<1	25
				granular texture (grainsize ≤ 0.5mm) and being moderately hard to a			204.0	<4		20	<20		<50	60	<100	<1	40
				soft and sandy textured material (more weathered?). Includes rounded			205.0	<4		20	<20		<50	60	<100	2	15
				black fragments of hornfels (?) ≤ 4cm across. Numerous white and													
				green-grey milky quartz veins. Non-calcareous. Possible breccia													
				textures in places. Hornfels crossed by numerous pyrite ± serpentine													
				veinlets, and also includes veins of soft, puggy serpentinous (?)													
				material. Below 207.7m, no hornfels. Extremely badly broken.													
				1.4m core loss.													
				2019.9-202.0m Veined by muscorite, flakes up to 2mm across.													
				207.4-208.6m Hard, pale yellow-brown-grey, brecciated, finely pitted. Veined by white and green-grey chalcedony.													
210.8	214.2	2.7	79	PARTLY WEATHERED CARBONATE													
				Buff and pale grey, calcareous. Where weathered, soft, crumbly and													
				sandy textured, veined by chalcedony or quartz. Badly broken.													
				0.7m core loss.													

DIAMOND DRILL RECORD

HOLE NUMBER : SD 17
LOGGED BY : P. Roberts

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn.									
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO3
214.2	254.7	37.8	93	CARBONATE Grey, hard, calcareous. Not bedded but some irregular banding and stylolites. Commonly has granular or spotted texture, dark spots ≤1mm in paler groundmass; some of darker spots may contain Mg-silicates (e.g. forsterite). Minor apple green serpentinous carbonate in patches or veins. Traces of pyrrhotite in small, short veins, usually enclosed in small elongate patches of non-calcareous, soft green-black material, which is often mantled, in turn, by white carbonate. Broken on irregular fractures and infrequent joints coated with silica ± lesser soft, white, calcareous material. 219.8-220.4m Badly broken zone, including soft, silty white material and white quartz. 220.4-222.4m White quartz, crossed by numerous white fractures (similar to siliceous zone in SD15, 317.0-326.2m) 222.4-222.9m Badly broken zone, similar to 219.8-220.4m, including serpentine. 227.5-236.1m Includes patches of relatively coarsely crystalline dolomite, 1-2mm grainsize, also vein/altered zone, 20-40cm thick comprising white, soft, calcareous material enclosing small, pale brown, soft lath-like grains 0.5x3.0mm (average), and white carbonate "eyes" 1-3mm across. VCA ~ 10°. 245.2-246.8m Weathered carbonate. Sandy texture, includes dark spots of Mg-silicates, partly serpentinized. 1.4m core loss. 247.3-248.6m Includes patched of crystalline dolomite (cf. 227.5-236.1m).													
254.7	263.7	6.7	74	PARTLY WEATHERED CARBONATE Partly fresh carbonate as above. Where weathered, sandy textured green (serpentinous) and crumbly. Calcareous. From 256.2m, veined with increasing intensity, downwards by white and greenish black chalcedony; these appear to have filled open fractures.													(ppm)
263.7	283.0	12.7	65	MINERALIZED FAULT ZONE? Complex assemblage of magnetite, serpentine, fibrous, pale green		263.0	264.0	0.043	0.06	40	<70		<50	7500	<40	1	20
							265.0	0.105	0.14	60	"		<50	35000	"	1	<10
							266.0	0.048	0.05	20	"		<50	5900	"	<1	15
							267.0	0.018	0.01	60	"		<50	2200	"	<1	25

DIAMOND DRILL RECORD

HOLE NUMBER : SD 17

LOGGED BY : P. Roberts

INTERVAL (m) FROM	TO	RECOVERY m	%	DESCRIPTION	FORM.
				tremolite-actinolite, soft, pale green silty material (weathered serpentine?). No banding or bedding visible. Magnetite is patchy, little below 280.6m. Extensively veined by quartz and chalcedony (open-space filling). Broken on irregular fractures. 6.9m core loss. 276.8-277.6m Quartz-rich zone. Contact appears to be at shallow angle to c.a., but difficult to be sure because of broken core.	
283.0	299.7	14.1	84	GRANITE Pale yellow, comprising quartz, feldspars, minor, disseminated tourmaline, trace fluorite coating some joints. Fine grained (0.5-1.0mm) at top with rare quartz and feldspar phenocrysts (<6mm). Phenocryst abundance increasing with depth until 295.9m, where gradational change to medium to coarse grained granite with minor pale green-grey (chloritized?) mica. Very badly broken throughout, particularly top 3.0m which consists of all rounded core pieces. 2.6m core loss, mostly in medium to coarse grained granite.	
				End of Hole 299.7m	

FROM	TO	% Sn TOTAL	% Sn ACID SOL.	% Cu.	% As	% S.	% Pb.	% Zn.	% Bi	g/t Ag	ppm % WO
267.0	268.0	0.170	0.17	240	<20		50	1300	<100	3	75
	269.0	0.400	0.42	100	"		<50	900	300	<1	150
	270.0	0.072	0.07	20	"		<50	360	100	<1	60
	271.0	0.068	0.08	20	"		<50	3200	<100	1	70
	272.0	0.140	0.16	20	"		<50	5500	100	<1	25
	274.0	0.019	0.02	<20	"		<50	100	<100	<1	15
	276.0	0.072	0.08	20	"		<50	200	<100	<1	35
	278.0	0.002	<0.01	40	"		"	100	"	<1	10
	280.0	0.320	0.25	180	70		"	1700	"	2	70
	281.0	0.190	0.19	40	<20		"	400	"	<1	75
	282.0	0.100	0.09	80	90		50	1200	1900	<1	70
	283.0	0.130	0.10	40	50		<50	1400	300	"	100
	284.0	0.001	<0.01	<20	<20		"	20	<100	"	15

RENISON LIMITED

PAGE

DETAILED CORE RECOVERIES

~~DIAMOND DRILL RECORD~~

HOLE NUMBER : SD 17

LOGGED BY : P. Roberts

	INTERVAL (m)		RECOVERY		DESCRIPTION								FORM			% Sn									
	FROM	TO	m	%	FROM	TO	M	%	FROM	TO	M	%		FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO3
	0.0	6.0	2.1	35	216.6	124.6	3.0	100	211.8	212.2	0.1	25													
		7.6	0.9	56		127.6	2.9	97		214.6	2.0	63	Core recovery over complete hole = 238.2m (79.5%)												
		10.6	1.8	60		129.1	1.4	93		217.6	3.0	100													
		13.6	1.4	47		130.6	1.5	100		220.4	2.7	96													
		16.6	1.6	53		133.6	2.9	97		223.6	3.2	100													
		19.6	0.9	30		136.6	3.0	100		226.6	3.0	100													
		21.1	0.9	60		139.6	3.0	100		229.6	3.0	100													
		25.6	3.1	69		142.6	3.0	100		232.6	3.0	100													
		28.6	2.4	80		144.1	1.5	100		235.6	3.0	100													
		34.6	2.2	37		147.8	3.7	100		239.6	3.0	100													
		37.0	2.1	88		148.7	0.9	100		241.6	3.0	100													
		38.4	1.4	100		151.0	1.5	65		244.6	3.0	100													
		43.6	2.5	48		151.6	0.6	100		247.6	1.6	53													
		46.2	1.7	65		153.7	0.5	24		253.6	4.8	80													
		49.6	2.0	59		154.6	0.35	39		256.6	3.0	100													
		55.6	1.5	25		159.0	4.1	93		259.6	1.2	40													
		58.0	1.5	63		160.6	1.4	88		262.6	2.7	90													
		60.0	1.1	55		163.6	3.0	100		265.6	2.8	93													
		62.5	2.5	100		165.6	3.0	100		268.6	2.4	80													
		65.5	2.6	87		169.6	3.0	100		271.6	2.9	97													
		69.6	3.6	88		172.6	2.4	80		274.6	1.3	43													
		71.6	1.5	75		174.0	1.1	79		277.6	1.3	43													
		73.0	1.4	100		175.6	1.3	81		280.6	1.1	37													
		75.0	2.0	100		178.6	2.8	93		283.6	2.1	70													
		78.0	2.7	90		181.6	2.8	93		286.6	2.4	80													
		82.6	3.7	60		184.2	2.6	100		187.8	1.2	100													
		85.6	2.6	87		187.6	2.2	65		189.6	1.8	100													
		87.4	1.1	61		189.2	1.3	81		291.2	1.6	100													
		91.6	4.2	100		190.6	0.1	7		293.2	2.0	100													
		93.0	1.3	93		193.3	1.7	63		295.6	2.4	100													
		96.6	3.2	89		195.0	1.6	94		296.9	1.3	100													
		97.8	1.2	100		196.6	0.7	44		297.4	0.5	100													
		100.6	2.5	89		199.0	2.4	100		297.7	0.2	67													
		103.0	2.4	100		199.8	0.3	38		299.7	0.4	20													
		103.9	0.9	100		200.0	0.15	75																	
		106.5	2.1	81		202.0	1.8	90																	
		109.6	3.1	100		205.0	3.0	100																	
		112.6	3.0	100		205.6	0.2	33																	
		114.2	1.4	68		205.8	0.8	67																	
		117.3	2.8	90		208.6	1.8	100																	
		119.1	1.8	100		211.6	2.5	83																	
		121.6	2.5	100		211.8	0.2	100																	

REN[illegible]ON LIMITED – DRILL CORE RECO[illegible]D

HOLE NUMBER	SD 18
PURPOSE	To test skarn zone at depth at western end of fourth lease
LOCATION	St. Dizier
COLLAR R.L.	2188.09
CO-ORDINATES	5367505.79N, 345442.01E
LENGTH	132.6m
HOLE SIZE	HW 0 - 1.0m HQ 1.0 - 132.6m
DATE DRILLED	9.11.81 - 18.11.81
SIGNIFICANT CORE LOSS ZONES	
ORE ZONE GROUND CONDITIONS	
LOGGED BY	D. KILPATRICK
COMMENTS	Hole was terminated because of excessive westerly drift

SURVEY			From – To	Distance D	VERTICAL		HORIZONTAL	
Depth (M)	Bearing AMG	Dip °			D.Sin.Dip	R.L.	D.Cos.Dip	Prog. Total
COLLAR	355	55°	0 - 18	18	14.74	2173.35	10.32	10.32
36m	348	56°	18 - 45	27	22.38	2150.97	15.10	25.42
54m	347	56°	45 - 65	20	16.58	2134.39	11.15	36.57
76m	344	57.5°	65 - 87	22	18.55	2115.84	11.82	48.39
98m	339	57°	87 - 113.5	26.5	22.72	2093.62	14.43	62.82
129m	332	59.75	113.5-129	15.5	13.39	2080.23	7.81	70.63

SUMMARY – ASSAY DATA

LODE NAME	FROM	TO	LENGTH (m)	AVERAGE WEIGHTED ASSAYS													B.C.A.
				Sn.	Acid Sol. Sn.	Cu.	As.	S.	Pb.	Zn.	Bi.	WO_3	Ag g/t				

NWPS 273aa

RENISON LIMITED

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DIAMOND DRILL RECORD

HOLE NUMBER : SD 12
LOGGED BY : D. KILPATRICK

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn.									
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO3
0	74	67	76	Hornfelsed siltstone + shales. Grey to dark grey fine grained (silt-sized) very broken core of banded and massive hornfelsed chiastolite pyrite shales and siltstone. Occasional zones of leached grey core with chiastolite spots and red-brown mica, Sulphides, mostly pyrite are occasional to common and comprise up to 5% of core as fine disseminated material in fissures and large crystals (up to 5mm). BCA = 15° 13.0m - 16.0m, dark grey coloured section- (?) tourmalinized. 19.0m - 25.0m, very poor core - mostly sludge banded soft grey and green grey siltstone and mudstone. Tourmaline replacing pyrite BCA= 38° 25.0m - 42m, Core becomes more regularly banded, pale grey, slightly schistose chiastolite, pyrite siltstone. 42m - 46m, Dark grey clayey mudstone and grey chiastolite pyrite siltstone (schistose) At 52m, (?) pyrite occurs are radiating fan-shaped crystals in fracture planes. B.C.A.= 25° Below 50m the core is slightly more competent. Chiastolite crystals average 2-3mm length and orientation appears random - often replaced from centre outward by very fine grained orange-yellow mineral. Core occasionally schistose with pale grey mudstone interbeds up to 1.0m wide e.g. 50.0 - 51.0m Abundent pyrite (?) and other sulphides occur in veins and fissures between 55m - 57m. Around 60m red-brown mica and pyrite infill cracks. Schistoscity is quite apparent with parallel orientation of platy andlinear minerals in hornfels. Micas occasionally show crenulation cleavage - Sericitic alteration is abundent in some sections.													
74	121.1	30	63	Graphitic hornfels fine grained severelydeformed dark grey core with abundent quartz veining. and graphite. Graphite is abundent in some horizons e.g. 72m, 82m. Banding becomes more regular below 94.0m. 93.1 - 93.9m - very broken clayey zone. 98.9 - 101.9m (0.8m recovered) very altered green, grey and orange clays with mica and quartz and intense veining. B.C.A. 30° 101.9 - 103.6m - (1.7m recovered). graphitic grey black fine grained schistose, very broken core (RQD=10%) Pyrite is common in veins quartz veining abundent. 103.6 - 105.8 (2.0m recovered) weakly banded green black chlorite-biotite bands and grey blotchy clayey (?) quartz-feldspar bands with occasional horizons of green grey clay and abundant clay filled veinlets. Pyrite is associated with biotite in veins. All non-													

RENISON LIMITED

DIAMOND DRILL RECORD

HOLE NUMBER : SD 78

LOGGED BY : D. KILPATRICK

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn.									
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO$_3$
				105.8 - 114.0m (3.6m recovered) Very altered clay rich horizon very													
				broken, intensively veined (RQD=10%) Brittle soft grey green-blue													
				clay mineral is common. Some pale grey and white soft clays may													
				have been feldspar. Some fine, grey (?) ex-shales, intensely veined -													
				no chiastolite. Some large veins display a zoned contact with the													
				"country rock - quartz-tourmaline vein in chlorite, phlogopite													
				bearing host". B.C.A. = [illegible]													
				114 - 121.1 (5.5m. recovered) Graphitic mostly fine grained and													
				evenly banded with minor (?) chiastolite, nodules. Upper section													
				is very schistose. Suphides are common on fracture planes. BCA=32°													
				115.2m Intrusive quartz plagioclase K-feldspar chlorite porphyry-													
				sharp bulbous contact.		120.9	121.9	0.51	0.06	0.01	<0.1	1.50	<0.01	0.02	.008	2	0.01
121.1	122.0	0.9	90	**Magnetite: horizon**		121.9	122.8	0.36	0.07	0.05	<0.1	3.50	<0.01	0.03	.003	3	0.01
				(Basic dyke (?)) 40-50% Magnetite. Rest is vitreous green mineral		122.8	124.5	0.10	0.02	0.22	<0.1	3.20	<0.01	0.94	.002	4	0.02
				((?) olivine or serpentine) The zone has an alteration halo at each		124.5	125.2	0.11	0.03	0.02	<0.1	1.00	<0.01	1.00	.002	2	<0.01
				contact. Quartz chlorite and clay minerals occur on the contact													
122.0	125.2	3.2	100	(?) Basic dyke (3.2m recovered) (?) Basic dyke, mostly clay													
				chlorite hornblende and biotite. 123.2-123.5m; Mineralized zone													
				30% sphalerite (?). Dyke is generally irregularly banded with													
				mottled sericitized bands and grey fine grained material and chlorite													
				zones.													
125.2	132.6	7.4	100	Graphitic Hornfels (7.4 metres recovered). Grey black graphitic													
				hornfelsed country rock. Some zones have appearance of dolertie.													
				Some very altered or completely altered to (?) chiastolite.													
				BCA = 43° (124m), 43° (130m), 32° (136m), 28° (142m)													
				HOLE TERMINATED DUE TO EXCESSIVE WESTERLY DRIFT:													

REN[illegible]ON LIMITED - DRILL CORE RECO[illegible]

HOLE NUMBER	SD 18A
PURPOSE	To test skarn zone at depth at western end of fourth lease
LOCATION	St Dizier
COLLAR R.L.	2188.13
CO-ORDINATES	5367503.42N, 345442.64E
LENGTH	286.3m
HOLE SIZE	HW 0-9m HQ 9-144m NQ 144-286.3m
DATE DRILLED	19.11.81 - 13.12.81
SIGNIFICANT CORE LOSS ZONES	0-5m (50%) 151.2-154.25m (68%) 112-123m (67%) 237.4-238.6 m (25%) 147.8-150.0m (55%)
ORE ZONE GROUND CONDITIONS	Good, RQD = 80 - 100%
LOGGED BY	D. Kilpatrick
COMMENTS	

SURVEY			From – To	Distance D	VERTICAL		HORIZONTAL	
Depth M	Bearing AMG	Dip°			D.Sin Dip	R.L. 2188.13	D.Cos.Dip	Prog. Total
COLLAR	004	54.5°	0-7	7	5.70	2182.43	4.06	4.06
14	001	54.5	7-30.5	23.5	19.13	2163.3	13.65	17.71
47	002	54.0	30.5-59.0	28.5	23.06	2140.24	16.75	34.46
71	357	54.75	59.0-81.5	22.5	18.37	2121.87	12.99	47.45
92	352	55.0	81.5-104.0	22.5	18.43	2103.44	12.91	60.36
116	348	55.5	104.0-126.0	22.0	18.13	2085.31	12.46	72.82
136	337	55.0	126.0-143.0	17.0	13.93	2071.38	9.75	82.57
150	335	55.25	143.0-164.0	21.0	17.25	2054.11	11.97	94.54
178	327	56.0	164.0-193.0	29.0	24.04	2030.07	16.22	110.76
208	interp 340	56.0	193.0-220.0	27.0	22.38	2007.69	15.10	125.86
232	interp 353	55.5	220.0-247.0	27.0	22.25	1985.44	12.60	138.46
262	006	54.5	247.0-274.0	27.0	21.98	1963.46	15.68	154.14
286	002	54.5	274.0-286.3	12.3	10.01	1953.45	7.14	161.28

SUMMARY – ASSAY DATA

LODE NAME	FROM	TO	LENGTH (m)	AVERAGE WEIGHTED ASSAYS													B.C.A.
				Sn.	Acid Sol. Sn.	Cu.	As.	S.	Pb.	Zn.	Bi.	WO_3	Ag g/t				
	204	227	23	0·38	0·28	0·11	<0·1	1·9	<0·01	0·36	0·016	0·09	<1				

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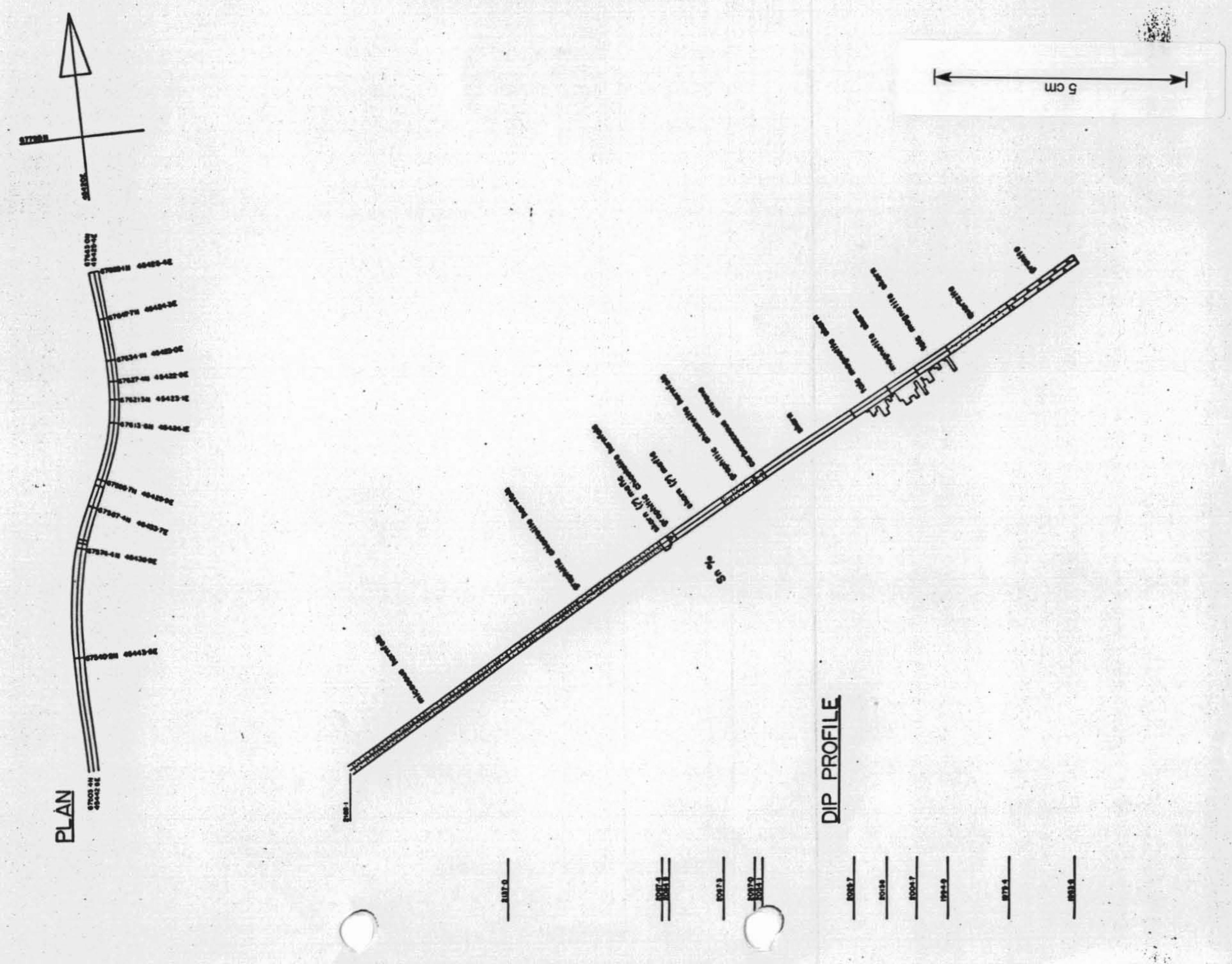
RENISON LIMITED

DIAMOND DRILL HOLE PLOT

HOLE NO. : SD18A

SCALE 1:1000



RENISON LIMITED

DIAMOND DRILL RECORD

HOLE NUMBER : SD 18A
LOGGED BY : D. Kilpatrick

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn.									
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	[illegible]
0	62.8	54.6	87	MICACEOUS HORNFELS Banded soft, grey micaceous quartz - chiastolite - siltstone and occasional mudstone, leached and sericitized. Sulphides, mostly pyrite, become common with fine to coarse grained material always in fissures. Leaching appears to have removed softer minerals of up to 4mm diameter((?)immature volcanic sediment). Abundent fine grained sericite. The core is very broken with numerous fracture planes of random orientation. Banding averages 0.5 - 2.0cm width and each is separated by thin (< 1mm) lamellae of secondary mica; banding is a function of grainsize and proportion of silica. Chiastolite is usually not prominent but may be more abundant than recognised; possibly retrogressed to sericite. Chiastolite becomes more noticably abundent toward the base (54m - 62.8m). Banding in this horizon is more obvious with a coarser grainsize. Pyrite is more common. B.C.A. 5m 27°, 10m 23°, 15m 37°, 20m 30°, 25m 35°, 30m 33°, 35m 25°, 40m 18°, 45m 32°, 50m 28°, 55m 34°, 60m 30°. Gradational contact to													
62.8	123.5	52.2	87	GRAPHITIC CHIASTOLITE HORNFELS Black to dark grey banded rock of graphite in a quartz-clay matrix with abundent chiastolite, as disseminated grains (≤2mm). Occasional graphite-poor, quastz-clay horizon, eg. 71.3 - 73.2m. Graphite becomes less dominant with depth. Pyrite veining is abundent (especially 80m - 90m) and sometines occurs as radiating crystals. Light grey, chiastolite hornfels and pyrite with rare (?) sphalerite between 85m - 91m. 712.0 - 122.9m; Altered interbanded yellow and dark grey clays - very soft. The core is very broken (RQD = 0-20%). Bedding to core axis angle at 65m 40°, 70m 27°, 75m 32°, 85m 32°, 90m 28°, 95m 26°, 100m 30°, 110m 37°, 115m 40°, 120m 34°.													
123.5	126.2	2.3	85	SULPHIDIC .. (?)MAFIC HORIZON		123.5	124.5	0.11	0.01	0.15	<0.1	7.0	<0.01	7.76	.001	5	<0.01
				Mineralized core of dense, altered, possibly mafic material, poorly banded with wavy and undulating interbands of sulphides and altered (?) pyroxenes and clays - non carbonaceous. Sulphides are mostly massive sphalerite with minor chalcopyrite. Bedding to core axis angle at 125m is 47°.		124.5	125.5	0.12	0.01	0.84	<0.1	8.6	<0.01	2.62	.003	14	<0.01
						125.5	126.5	0.06	0.02	0.05	<0.1	2.9	<0.01	2.59	.002	2	<0.01

DIAMOND DRILL RECORD

HOLE NUMBER SD 18A

LOGGED BY D. Kilpatrick

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn.									
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO
126.2	128.5	2.3	100	GRAPHITIC CHIASTOLITE HORNFELS													
				Black and dark grey mostly fine-grained, banded siltstone (sub-													
				conchoidal fracture) with fine quartz and clay interbeds. Pyrite													
				occurs on fracture planes and within veins.													
128.5	147.6	17.2	90	(?) MAFIC HORIZON													
				Altered, coarse-grained, crystalline, grey, mostly poorly banded core													
				of intermediate or basic material. Chiastolite is present, especially		137.4	138.4	0.04	0.01	<0.01	<0.1	0.2	<0.01	0.12	.003	1	<0.01
				obvious at upper section where crystals are up to 15mm long. These		138.4	139.2	0.04	<0.01	<0.01	<0.1	<0.1	<0.01	0.11	.003	1	0.01
				tend to be localised in distinct bands. Other finer grained		139.2	140.2	0.04	<0.01	0.05	1.4	0.9	<0.01	0.46	.002	1	0.09
				chiastolite occurs throughout. Some horizons are very leached													
				and pitted. Pits often contain hard, crystalline, resinous, non-													
				calcareous, brown or yellow-green mineral ((?)epidote). These also													
				occur on fracture planes. 138.1 - 139.4m Horizon of leached,													
				fine-grained,banded, pale green-grey, hard material with minor													
				sphalerite. Serpentine alteration is common. 139.7m; Graphite													
				vein - pure graphite 0.5cm wide.													
				B.C.A. 130m 30°, 135m 26°, 140m 35°, 145m 37°.													
				Sharp contact at...													
147.6	160.2	10.8	87	GRAPHITIC CHIASTOLITE HORNFELS													
				Fine and coarse grained, dark grey to black, very broken core													
				containing minor sphalerite and pyrite and arsenopyrite (especially													
				at upper contact) 151.2-152.0m (?)Calc-silicate horizon; contains													
				quartz, feldspars, (orthoclase and microcline or plagioclase), and		151.2	152.0	0.03	0.01	0.03	0.1	0.5	<0.01	0.32	.032	<1	0.11
				possible altered garnets or amphiboles in nodules (0.5cm wide)													
				and is strongly altered.													
				B.C.A. at 150m 37°, 155m 32°, 160m 39°.													
160.2	163.7	3.5	100	CALC - SILICATE HORIZON													
				Altered quartz, feldspar, calc-silicate rock of pale green-grey and		160.0	161.0	0.02	<0.01	0.04	6.3	0.7	<0.01	0.32	.002	2	<0.01
				grey colours, with a distorted appearence and widely ranging		161.0	162.0	0.02	0.01	<0.01	<0.1	0.1	<0.01	0.15	.003	1	<0.01
				grainsize. The core is irregularly banded, blotchy and is chloritized.		162.0	163.0	0.03	<0.01	<0.01	<0.1	0.1	<0.01	0.08	.005	1	0.02
				Sulphides include pyrrhotite, pyrite and arsenopyrite. Carbonate		163.0	163.7	0.02	<0.01	0.02	<0.1	0.3	<0.01	0.04	.003	<1	<0.01
				veining is abundant. Very competant core.													
163.7	198.5	34.8	100	CARBONATE ROCK													
				Strongly banded grey and dark-grey core of interlaminated dark		163.7	165.0	0.01	0.01	0.03	<0.1	0.4	<0.01	0.1	.004	1	[illegible]
				siliceous hornfels and chert and paler calcareous skarn and		165.0	166.0	<0.01	<0.01	0.01	<0.1	0.7	<0.01	0.11	.007	1	<0.01
				abundant calcite veining (av. width 0.8cm). The core is strongly		166.0	167.0	<0.01	0.01	0.01	<0.1	1.1	<0.01	0.02	.004	<1	<0.01
				serpentinised throughout.		167.0	168.0	<0.01	0.01	0.01	<0.1	0.9	<0.01	0.02	.006	<1	<0.01

DIAMOND DRILL RECORD

HOLE NUMBER : SD 18A

LOGGED BY : D. Kilpatrick

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn.									
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% A
				Some hornfels units appear in the upper zones becoming rare with		168.0	169.0	<0.01	0.01	<0.01	<0.1	0.9	<0.01	0.01	.005	<1	<0.01
				depth. A fine grained blue-grey (?) manganese mineral occurs		169.0	170.0	<0.01	0.02	<0.01	<0.1	0.8	<0.01	<0.01	.006	<1	<0.01
				commonly throughout, on joint surfaces. Some horizons contain		170.0	171.0	<0.01	0.02	0.01	<0.1	0.6	<0.01	<0.01	.005	<1	<0.01
				abundent disseminated sulphides mainly pyrrhotite and a black, finely		171.0	172.0	<0.01	<0.01	<0.01	<0.1	1.0	<0.01	0.01	.006	<1	<0.01
				crystalline, non-magnetic, submetallic mineral. (0.5cm) and		172.0	173.0	<0.01	<0.01	0.01	<0.1	1.6	<0.01	0.01	.007	<1	0.01
				magnetite. Some localised tourmalinization and also some		173.0	174.0	<0.01	<0.01	0.01	<0.1	0.6	<0.01	0.01	.007	<1	<0.01
				recrystallised calcite horizons. The calcite may all be secondary		174.0	175.0	<0.01	<0.01	<0.01	<0.1	1.1	<0.01	<0.01	.009	<1	<0.01
				from a primary dolomitic matrix. 186.7m - Pyrrhotite-bearing,		175.0	176.0	<0.01	<0.01	0.02	<0.1	0.6	<0.01	0.15	.006	<1	<0.01
				calcareous intrusive - contains 10-20% pyrrhotite. Cuts sharply		176.0	177.0	<0.01	<0.01	0.01	<0.1	0.1	<0.01	0.12	.009	<1	<0.01
				across main foliation. Other similar bands occur but are generally		177.0	178.0	<0.01	<0.01	0.01	<0.1	0.1	<0.01	0.08	.002	<1	<0.01
				sub-parallel to the foliation. Magnetite becomes common below		178	179	<0.01	<0.01	<0.01	<0.1	0.4	<0.01	<0.01	.010	<1	<0.01
				196m where it occurs in localised veins or occasionally inter-		179	180	<0.01	<0.01	<0.01	<0.1	0.3	<0.01	<0.01	.007	<1	<0.01
				laminated with the host.		180	181	<0.01	<0.01	<0.01	<0.1	0.3	<0.01	<0.01	.009	<1	<0.01
				B.C.A. 165m 40°, 170m 15°, 175m 30°, 180m 20°, 185m 36°,		181	182	<0.01	<0.01	<0.01	<0.1	0.2	<0.01	<0.01	.008	<1	<0.01
				190m 27°, 195m 35°.		182	183	<0.01	<0.01	0.01	<0.1	0.9	<0.01	<0.01	.009	<1	<0.01
						183	184	<0.01	<0.01	0.01	<0.1	1.0	<0.01	<0.01	.011	<1	<0.01
1985	236.2	37.1	98	MAGNETITE SKARN;		184	185	<0.01	<0.01	<0.01	<0.1	0.4	<0.01	<0.01	.008	<1	<0.01
				Serpentinized, tourmalinized, magnetite skarn with minor pyrrhotite.		185	186	<0.01	<0.01	<0.01	<0.1	0.9	<0.01	<0.01	.007	<1	<0.01
				Apple green to yellow-green, talc/serpentine, inter-laminated with		186	187	<0.01	<0.01	0.01	<0.1	1.0	<0.01	<0.01	.006	<1	<0.01
				dark grey, blotchy magnetite skarn (HCL test-very slight or		187	188	<0.01	<0.01	0.01	<0.1	0.7	<0.01	0.01	.009	<1	<0.01
				negative) in poorly banded core. Occasional horizons of non-		188	189	<0.01	<0.01	<0.01	<0.1	0.9	<0.01	<0.01	.003	<1	<0.01
				calcareous fine-grained, pale grey, leached siliceous material.		189	190	<0.01	<0.01	0.01	<0.1	0.8	<0.01	<0.01	.003	<1	<0.01
				212.6 - 223.6m. Dark grey to black banded core of magnetite in		190	191	<0.01	<0.01	0.01	<0.1	0.9	<0.01	0.01	.005	<1	<0.01
				(?) non-calcareous matrix. Some magnetite has black, crumbly		191	192	<0.01	<0.01	<0.01	<0.1	0.5	<0.01	0.01	.006	<1	<0.01
				appearence in upper zone. Calcite veining is common. Pyrrhotite		192	193	<0.01	<0.01	<0.01	<0.1	1.4	<0.01	<0.01	.005	<1	<0.01
				occurs commonly as interfingering bands parallel to the main		193	194	<0.01	<0.01	<0.01	<0.1	1.2	<0.01	<0.01	.005	<1	<0.01
				foliation. Pyrite and chalcopyrite occurs to a minor extent on		194	195	<0.01	<0.01	<0.01	<0.1	0.6	<0.01	<0.01	.005	<1	<0.01
				joints planes. 223.6 - 236.0m. Serpentinous magnetite skarn.			196	<0.01	<0.01	<0.01	<0.1	0.3	<0.01	0.01	.005	<1	<0.01
				Magnetite and irregularly interlaminated white material((?)dolomite)			197	<0.01	<0.01	0.01	<0.1	0.3	<0.01	0.01	.003	<1	<0.01
				with lesser pyrrhotite. A green-blue mineral occurs on some joints			198	<0.01	0.01	0.01	<0.1	1.4	<0.01	0.57	.004	<1	0.01
				planes. Talc/serpentine alteration increases with brecciation and			198.5	0.01	<0.01	0.01	<0.1	2.6	<0.01	0.27	.002	<1	0.01
				veining toward the base of the unit. 236.0 - 236.2m; zone of			199	0.01	<0.01	0.01	<0.1	1.4	<0.01	1.93	.005	<1	<0.01
				brecciation. Very angular fragments of skarn in chlorite serpentine			200	<0.01	0.01	0.01	<0.1	0.3	<0.01	0.53	.003	<1	<0.01
				matrix. B.C.A. 210m 28°, 215m 27°, 220m 48°,			201	0.04	0.04	0.02	<0.1	0.2	<0.01	0.50	.002	<1	0.01
							202	0.01	0.02	0.01	<0.1	1.8	<0.01	2.75	.003	<1	<0.01
236.2	259.8	21.7	.92	QUARTZITE		202	203	0.03	0.03	0.01	<0.1	0.6	<0.01	1.19	.002	<1	0.01
				grey to pale grey, fine grained strongly banded core of inter-			204	0.08	0.07	0.01	<0.1	1.7	<0.01	2.78	.003	<1	<0.01
				laminated quartzite, phlogopite-quartzite and leached clay rich			205	0.33	0.33	0.06	0.2	0.9	<0.01	1.05	.004	<1	[illegible]
				lamellae and bands. The first two metres below the upper contact			206	0.26	0.27	0.04	0.1	0.2	<0.01	0.12	.004	<1	[illegible]
				contain brecciated skarn and quartzite and is a transition zone			207	0.14	0.15	0.03	<0.1	0.2	<0.01	0.12	.003	<1	[illegible]
				between the two units.		207	208	0.53	0.58	0.02	<0.1	0.1	<0.01	[illegible]	.005	<1	[illegible]

DIAMOND DRILL RECORD

HOLE NUMBER : SD 184

LOGGED BY : D. Kilpatrick

INTERVAL (m) FROM	TO	RECOVERY m	%	DESCRIPTION	FORM.
				Pyrite is occasional to common and other sulphides are rare. Stringers of granite have intruded the quartzite near the lower contact. The abundence of Ti-biotite increases towards the granite contact. B.C.A. 240m 28°. 245m 33°. 250m 26°. 255m 41°. Sharp contact to	
259.8	286.3	26.2	99	GRANITE Medium grained quartz, feldspar, biotite, tourmaline rock of pale yellow colour due to alteration of feldspars. The rock is fine grained almost aplitic at the contact. Thin greissen veins are subparallel to the core axis. Sulphides are rare. The core is moderately broken.	
				HOLE TERMINATED AT 286.3m	

FROM	TO	% Sn. TOTAL	% Sn. ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO₃
	209	0.53	0.56	0.03	<0.1	0.1	<0.01	0.01	.027	1	0.03
	210	0.34	0.35	0.02	<0.1	0.4	<0.01	0.76	.023	1	0.02
	211	0.12	0.13	0.01	<0.1	0.1	<0.01	0.28	<.001	1	0.01
	212.0	0.23	0.17	0.12	<0.1	4.5	<0.01	1.11	[illegible]	<1	0.03
212.0	212.6	0.04	0.02	0.01	<0.1	0.2	<0.01	0.02	.006	2	0.01
212.6	213	0.15	0.17	0.05	<0.1	1.1	<0.01	1.45	.016	2	0.01
	214	0.08	0.09	0.16	<0.1	2.1	<0.01	1.14	.031	2	0.01
	215	0.40	0.26	0.33	<0.1	2.0	<0.01	0.08	.007	2	0.02
	216	0.60	0.13	0.03	<0.1	0.3	<0.01	0.05	.007	<1	0.03
	217	0.60	0.23	0.45	<0.1	1.8	<0.01	0.44	.065	3	0.07
	218	0.49	0.18	0.11	<0.1	1.8	<0.01	0.05	.021	1	0.04
	219	0.48	0.29	0.28	<0.1	3.8	<0.01	0.05	.022	1	0.21
	220	0.60	0.45	0.22	<0.1	3.9	<0.01	0.05	.019	<1	0.13
	221	0.36	0.35	0.13	0.4	3.9	<0.01	0.09	.024	1	0.24
	222	0.13	0.09	0.13	<0.1	5.6	<0.01	0.10	.022	<1	0.12
	223	0.70	0.54	0.09	<0.1	1.9	<0.01	0.03	.016	2	0.11
223.0	223.6	0.43	0.31	0.14	<0.1	5.2	<0.01	0.02	.012	1	0.13
223.6	224	0.15	0.15	0.03	<0.1	0.5	<0.01	0.03	.006	<1	0.15
	225	0.25	0.22	0.03	<0.1	0.8	<0.01	0.02	.016	<1	0.09
	226	0.42	0.22	0.05	0.9	2.3	<0.01	1.10	.019	1	0.22
	227	0.42	0.27	0.01	<0.1	<0.1	<0.01	0.02	.010	<1	0.25
	228	0.08	0.06	0.03	<0.1	0.3	<0.01	0.02	.015	<1	0.03
228	229	0.07	0.05	0.22	<0.1	5.5	<0.01	0.03	.151	<1	0.05
	230	0.13	0.08	0.08	<0.1	1.0	<0.01	0.02	.013	<1	0.10
	231	0.22	0.19	0.08	0.1	1.9	<0.01	0.03	.015	<1	0.12
	232	0.01	0.04	0.01	<0.1	<0.1	<0.01	0.05	.003	<1	0.02
	233	0.01	0.02	0.01	<0.1	<0.1	<0.01	<0.01	.001	<1	0.01
	234	0.09	0.05	0.05	<0.1	2.0	<0.01	0.01	.017	<1	0.01
	235	0.54	0.49	0.03	0.8	1.7	<0.01	0.02	.051	<1	0.22
	236	0.02	0.03	0.06	<0.1	1.9	<0.01	0.05	.092	<1	0.02
	237	0.02	0.02	0.06	<0.1	2.3	<0.01	0.03	.020	1	<0.01
237	238	0.01	0.02	0.07	0.2	3.5	<0.01	0.03	.020	1	0.03
238	239	0.01	0.02	0.01	<0.1	0.6	<0.01	0.01	.050	<1	[illegible]
239	240	0.01	0.02	0.02	<0.1	0.6	<0.01	0.04	.011	1	0.01

KENISON LIMITED - DRILL CORE RECORD

HOLE NUMBER	SD 19
PURPOSE	Test easterly extension of skarn zone
LOCATION	St. Dizier
COLLAR R.L.	2205.1
CO-ORDINATES	5367731.8N 345567.0E
LENGTH	322.5
HOLE SIZE	0-3m HW 3-322.5m HQ
DATE DRILLED	25.3.82 - 30.4.82
SIGNIFICANT CORE LOSS ZONES	0-43.4m 24% recovery 47.0-70.8 70% recovery 128.7-153.0 51% recovery
ORE ZONE GROUND CONDITIONS	
LOGGED BY	D. KILPATRICK
COMMENTS	* oriented dips of joint planes, veins, etc. are with respect to east-west strike and northerly dip of quartzite Bearing at 211.0m affected by magnetic (148) taken at 164

SURVEY			From - To	Distance D	VERTICAL		HORIZONTAL	
Depth	Bearing	Dip			D.Sin.Dip	R.L.	D.Cos.Dip	Prog. Total
(m)	AMG							
collar	175°	- 66.5°						
47.5	173°	66.8°						
78.0	173°	- 67.0°						
109.0	169°	- 67.2°						
142.5	167°	- 68.1°						
175.5	168°	- 68.3°						
211.0	(148) 164	- 67.8°						
246.0	160°	67.8°						
280.0	163°	68.0°						
296.0	166°	68.0°						
322.0	163°	67.8°						

SUMMARY – ASSAY DATA

LODE NAME	FROM	TO	LENGTH (m)	AVERAGE WEIGHTED ASSAYS													B.C.A.
				Sn.	Acid Sol. Sn.	Cu.	As.	S.	Pb.	Zn.	Bi.	WO_3	Ag g/t				
	195	204	9.0	0.10	0.10	0.06	<0.1	1.2		0.64	0.006	<0.01	2				
	200	204	4.0	0.15	0.16	0.03	<0.1	0.6		0.95	0.007	<0.01	2				

099

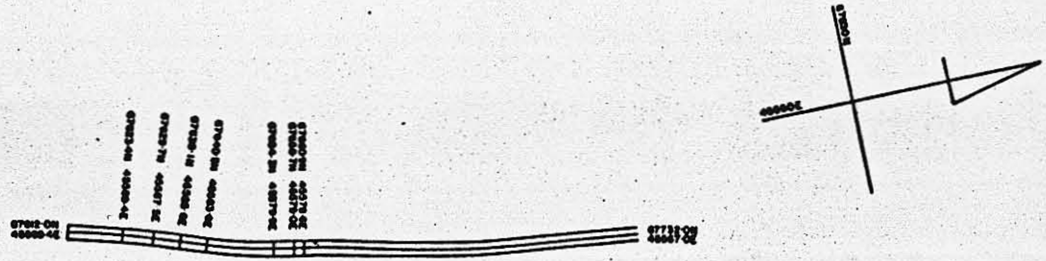
64 101

HOLE NO : SD19

RENISON LIMITED

DIAMOND DRILL HOLE PLOT

PLAN



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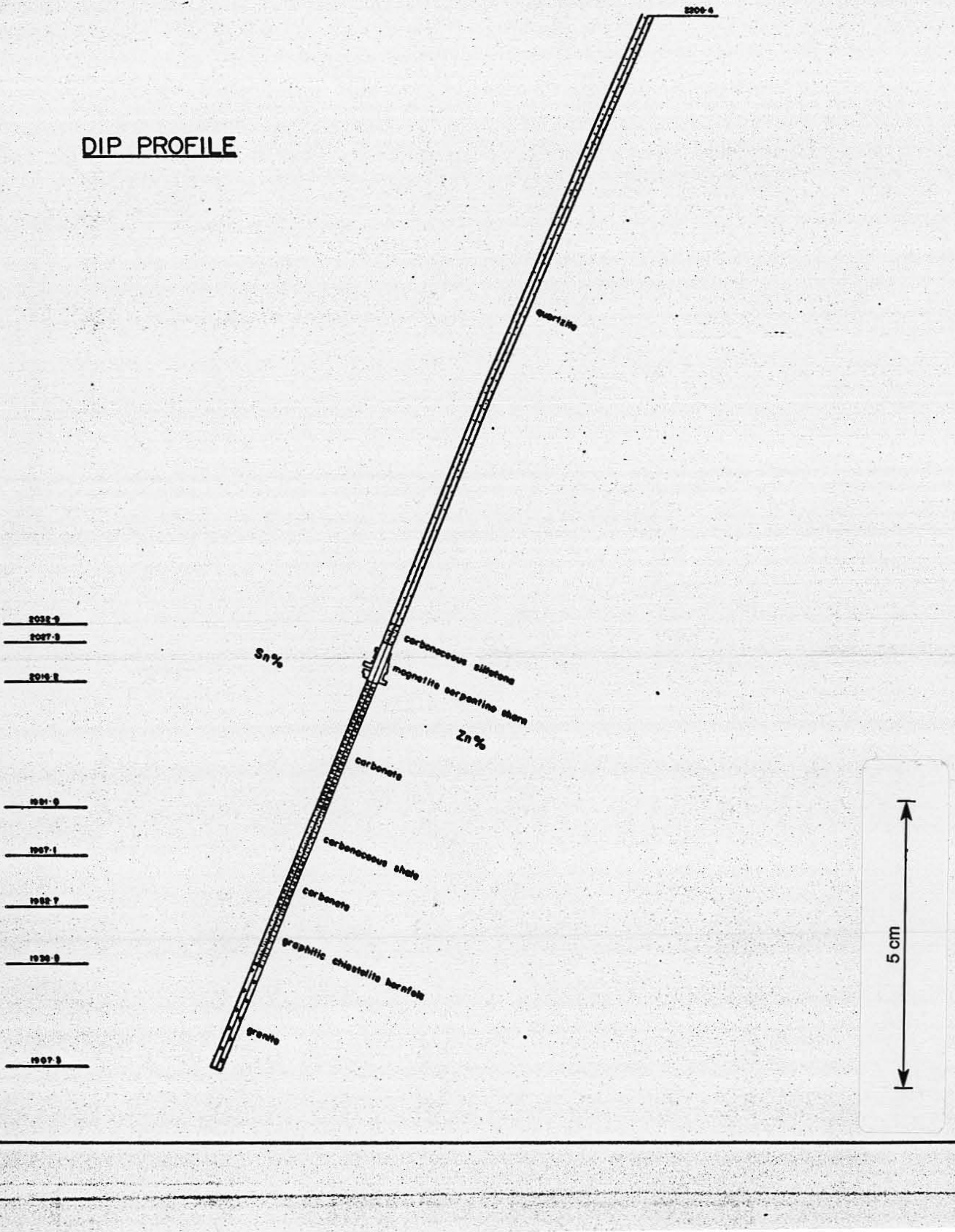


RENISON LIMITED

PAGE 1

DIAMOND DRILL RECORD

HOLE NUMBER : SD 19

LOGGED BY : D. KILPATRICK

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn.									
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO3
0	0.3	0.15	50	Soil and Micaceous Siltstone; Chocolate brown weathered micaceous siltstone and topsoil													
0.3	136.9	129.5	70	Oonah Quartzite - fine grained silty grey micaceous siltstone and quartzite with interlaminated dark grey silty shale with biotite. Core includes fine muscovite (<0.1mm) and needles of (?) tourmaline recrystallised fine biotite and tourmaline. Grainsize of the core varies from mud to siltsize. The rock is often strongly banded probably original sedimentary bedding; dipping 30° to core axis (true dip steeply north, striking east-west) Rare of occasional patches of very fine disseminated pyrite. Finer dark grey shaly bands often appear leached and pitted. Occasional bands of very hard hornfels material at 29.0-29.3m, 39.2-40.0m, 55.5-56.0m. Dark blue grey basalite appearance. From around 40m the core becomes gradually harder and more siliceous with depth. Joint planes are common but orientation random. At 63m, banding in the softer micaceous siltstone is pale grey mica and tourmaline bearing quartz bands and red brown biotite, (?) phlogopite. At this depth core varies from hard grey spotted, banded quartzite to soft yellow grey clayey siltstone. Below 70m, the core contains slightly more abundent disseminated sulphide and has occasional veins of recrystallised quartz some of these appear to have minor (?) dolomite and perhaps siderite. Sulphide and tourmaline are common on joint planes. Phylogopite, muscovite are common. Below 74m, the core has a greenish pale grey fine grained appearance, containing less coarse tourmaline, phlogopite and quartz except in occasional micaceous siliceous siltstone or very fine quartzite. Banding still readily apparent - mostly fine <5mm wide. Banding is caused by occasional dark quartz tourmaline horizon yellow creamy clay and interbedded greenish grey fine chloritic siltstone													

RENISON LIMITED

DIAMOND DRILL RECORD

HOLE NUMBER : SD 19
LOGGED BY : D. KILPATRICK

NWPS

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn.								
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO3
				95-100m, Slickensides - slickensided joint plane 27° to core axis (true dip 40° south) slickensides plunge at 40° to 145 AMG													
				92-94m, Veining 55° to core axis. Contains clays and mica and quartz - (?)ex-pegmatite veins.													
				Pegmatite veins at 103.2-103.25m (58°S) and 108.1-108.15m (68°N)													
				Occasional bands of recrystallised quartz/tourmaline rock, sometimes subparallel to the main banding.													
				Below 100m, chlorite bands are sometimes serpentinous. Core generally somewhat silicified and sulphide filled fractures more common. Sulphides mostly pyrite associated with phlogopite. (see 111.4-113.0m). Bedding 35°-40° to core axis.													
				121-125m, section of very broken core, fragments average small cobble size.													
				126.8-127.3m, tourmalinised quartzite Black quartzite mostly massive silicified fine tourmaline needles.													
				128.7-129.2. Very altered section. Quartz vein with alteration haloe of quartz, clays and muscovite.													
				131.4-131.5m; slickensided joint plane dips 38° to core axis (30°S true dip). Plunge of slickensides 145 AMG at 30°. Bedding dip 40° to core axis (~75°N true dip)													
				Random pegmatite veining and phlogopite tourmaline veining (60° to core axis, 7°S true dip).													
				132.8-140.0 very broken possibly crushed zone - (? fault) - of coarse fragments. Ranges from large pebbles to small gravel size fragments in puggy clay. Clay contains mica. Bedding at 139.3 ~20° to core axis c.f bedding at 143m 30°-35° to core axis.													
				Below 150m the core becomes much more altered and silicified - occasional very altered (?) pegmatite bands of clay, quartz and sometimes sulphide. Also contains some red-brown phlogopite-like mica. Bands average 60° to core axis, Bedding to core axis angle is 48°. Fine silty bands now completely gone to yellow clay some metamorphic "spotting" present.													

RENISON LIMITED

PAGE 3

DIAMOND DRILL RECORD

HOLE NUMBER : SD 19
LOGGED BY : D. KILPATRICK

	INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn.									
	FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO3
					156.0-156.4m; occasional altered													
					pegmatite veins; 50° to core axis (almost horizontal -													
					true dip).													
					161.5m - small aplite band dipping													
					NE at 55° to core axis. Bedding at 163.5 is 23° to													
					core axis. 162.7-163.0m quartz vein with phlogopite,													
					muscovite pyrite and chlorite.													
					165-168m core contains serpentine													
					mica, silicified quartz. 167.5m Bedding to core axis													
					angle 40°.													
					173.6-180.0 Very altered zone. Yellow													
					creamy silty clay with dull brown red or flesh coloured													
					micaceous siltstone bands and blobs of red-brown phlogopite													
					and bands of quartz with coarse phlogopite muscovite													
					and pyrite. Quite broken. RQD 40%													
					Below this the core has grey transluscent													
					appearance and may contain minor calcareous component.													
					Very weakly effervescent in HCL. The core is multiply													
					veined (SE. 34° to core axis) and jointed (E30° to core													
					axis). Some horizons appear to be sheared e.g. 183.4-													
					183.6m, 184.0-184.4m, 185.8-186.2m													
					184.6-192.8m, very broken zone													
					RQD = 20%													
	186.9	192.6	4.8	84	Carbonaceous Siltstone dark grey to black very fine		186	187	0.01	<0.01	0.02	<0.1	0.4		0.03	0.003	1	[illegible]
					grained carbonaceous siltstone.		/	188	0.02	<0.01	0.01	-	1.1		0.03	.005	1	
					180.0-192.6m, possibly carbonaceous			189	0.02	<0.01	0.02	-	1.1		0.04	.003	1	
					but more leached than above but more leached, very altered.			190	0.02	<0.01	0.02	-	0.6		0.24	.003	1	
					Contains minor pyrite, tourmaline. Mostly yellow clay			191	0.02	<0.01	0.03	-	0.4		0.03	.003	2	
					and quartz some blue-grey clay. Abundent veining.			192	0.03	<0.01	0.04	-	6.5		0.03	.005	2	
								193	0.03	<0.01	0.03	-	3.9		0.05	.005	2	
	192.6	204.6	12.0	100	Magnetite Serpentine Skarn - Banded green, yellow-green			194	0.02	<0.01	0.04	-	3.3		0.02	.004	2	
					and grey black core of black massive magnetite with			195	0.04	0.01	0.02	-	0.8		0.03	.004	1	
					fine sulphide and asbestos veins, massive green serpentine,			196	0.09	0.08	0.12	-	1.8		0.37	.004	3	[illegible]
					blue-green magnetite-clay-carbonate and white, pink			197	0.05	0.02	0.17	-	5.7		0.07	.007	3	[illegible]
					or pale green carbonate bands. The magnetite contains			198	0.06	0.05	0.01	-	0.2		0.42	.007	1	[illegible]
					occasional sphalerite, pyrite and pyrrhotite. The carbonate does not effervese in cold HCl.			199	0.03	0.02	0.08	-	0.4		0.51	.003	2	[illegible]
								200	0.05	0.05	0.01	-	0.3		0.67	.005	1	[illegible]
								201	0.27	0.30	0.03	-	0.6		0.86	.012	2	[illegible]
								202	0.01	<0.01	0.03	-	0.6		0.58	.003	1	[illegible]
								203	0.19	0.21	0.02	-	0.3		0.61	.007	2	[illegible]
								204	0.13	0.14	0.03	-	1.1		1.74	.005	3	-

DIAMOND DRILL RECORD

HOLE NUMBER : SD 19

LOGGED BY : D. KILPATRICK

	INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn									
	FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO3
	204.6	243.0	38.4	100	Carbonate silicified banded dark grey and pale													
					grey interlaminated carbonaceous siltstone, chloritised													
					siliceous siltstone. Banding is undulating between		205	206	0.01	<0.01	0.02	<0.1	0.7		0.03	0.005	3	[illegible]
					20°-40° to core axis (av 25° to core axis). Bands average			207	0.01	"	0.01	"	1.2		0.02	.007	2	"
					10mm width often <1mm. Serpentine veining sometimes			208	0.01	"	0.01	"	0.5		0.02	.005	3	"
					carries sulphide mostly pyrite. Sulphides occasionally			209	0.01	"	0.01	"	0.8		0.02	.005	3	"
					interlaminated with darker siliceous carbonate bands.			210	<0.01	"	0.02	"	0.5		0.03	.006	4	0.02
					All core effervesces strongly. Banding near upper contact			211	0.01	0.01	0.01	"	0.9		0.02	.006	3	<0.01
					is undulating almost parallel to core axis. Jointing			212	0.01	<0.01	0.01	"	1.7		0.03	.005	3	<0.01
					in this zone (205.3-206.8m) is 40° to core axis.			213	0.03	"	0.04	"	1.6		0.02	.006	5	"
					Stylolites at 205.2m (?) Intrafolial			214	<0.01	"	<0.01	"	0.1		0.01	.006	4	"
					slumping also within upper section.			215	0.01	"	0.01	"	0.1		0.01	.007	4	"
					Between 206.8-210.0m BCA is 20°.			216	0.01	"	<0.01	"	0.1		0.01	.006	4	"
					Core is strongly banded white and grey carbonate with			217	<0.01	"	0.01	"	0.1		0.01	.005	3	"
					serpentine and occasional interbands of sulphide. All			218	<0.01	"	0.01	"	<0.1		0.01	.006	4	"
					core effervesces strongly.			219	<0.01	0.01	0.02	"	<0.1		"	.007	4	"
					210.0-211.9m; pale grey banded carbon-			220	<0.01	<0.01	0.01	"	0.4		"	.005	3	"
					ate with minor dark grey siliceous siltstone than above.			221	0.01	"	0.01	"	0.3		"	.004	2	"
					Core axis angle 40°. The carbonaceous bands effervesce			222	0.01	"	0.01	"	1.0		"	.003	1	"
					strongly but the siliceous bands do not.			223	<0.01	"	<0.01	"	1.8		"	.004	2	"
					211.9-222.3; Massive carbonate -			224	<0.01	"	0.01	"	0.5		"	.006	3	"
					pale grey to white speckled weakly magnetic core. Semi-			225	<0.01	"	<0.01	"	<0.1		"	.006	4	"
					continuous or interfingering white (?) stylolite horizons			226	0.02	"	0.01	"	<0.1		"	.006	4	"
					Sinuous and massive serpentine veining occurs between			227	<0.01	"	0.01	"	<0.1		"	.005	3	"
					214.5-216.8m			228	<0.01	"	<0.01	"	0.2		"	.007	2	"
					Below 216.8m, the serpentine appears			229	0.01	"	0.01	"	0.2		"	.005	3	"
					to have been leached and altered to pale grey green			230	<0.01	"	0.01	"	0.2		"	.006	[illegible]	"
					micaceous siliceous material and further leached and			231	<0.01	"	<0.01	"	0.5		"	.005	[illegible]	"
					altered to vugs with remnant beige siliceous framework.			232	<0.01	"	0.01	"	0.3		"	.006	"	"
					Core is less reactive to acid becoming non-reactive			233	<0.01	"	0.01	"	0.2		"	.006	"	"
					last 3 metres. Disseminated sulphides vary from minor			234	0.03	"	0.01	"	0.4		"	.006	[illegible]	"
					to some bands of abundent pyrite with serpentine or			235	0.01	"	0.01	"	0.4		0.02	.005	3	
					magnetite..			236	0.01	"	0.02	"	0.5		0.01	.007	[illegible]	"
					220.4-220.7m, Weakly magnetic -			237	"	"	0.02	"	0.8		0.05	.002	1	"
					speckled grey core.			238	"	"	0.01	"	0.7		0.66	.001	1	"
					222.3-223.8m, very altered weathered			239	"	"	0.02	"	1.7		1.59	.003	1	
					carbonate and leached magnetite bearing carbonate (weakly			240	"	"	0.01	"	<0.1		[illegible]	.001	<1	"
					magnetic) mostly competent rock-minor pyrite.			241	"	"	0.03	"	<0.1		[illegible]	.002	1	"
					223.8-243.0; Silicified carbonate -			242	"	"	0.02	"	1.0		[illegible]	.002	1	[illegible]
					pale grey and white leached banded jointed veined carbonate			243	"	"	0.02	"	1.5		0.07	.002	1	[illegible]
					with horizons of silicified carbonate and opaline silicate.			244	"	"	0.05	"	1.3		[illegible]	.003	1	"
					Stylolite horizons common. Some vugs filled with clays			245	"	"	0.02	"	1.3		[illegible]	.003	<1	"
					and opaline green silica.													

DIAMOND DRILL RECORD

HOLE NUMBER : SD 19

LOGGED BY : D. KILPATRICK

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn									
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO3
				Core is quite broken in places (?BCA 40° - Stylolites make interpretation difficult) Jointing and veining are irregular and random. Jointing average 35° to core axis - dipping NE. Very broken zone between 233.8-236.0m - crushed with slickensides. Joint plane averages 10°-20° to core axis. - no orientation possible. Minor magnetite and disseminated pyrite. Green-grey clayey silicate material is common. A second smaller crush zone occurs between 238.3-238.5m. Minor disseminated and veined sulphides. Gradational contact over ½ metre.													
243.0	257.9	12.7	85	Carbonaceous Shale Dark grey fine grained siliceous shales with (?) carbonaceous veining (non-reactive to acid). Serpentine alteration is common - dark green black. 243.2-243.4m, crush zone with abundent coarse pyrite. Core carries only minor disseminated pyrite and some in veins. Some slickensided joint planes between 245m-246m. 248.1-253.0m, Possible silicified basaltic horizon - deuse pale grey material of fine (?) quartz, altered feldspar, and lenses of sulphide and mafics - alteration products of original inclusions: contains disseminated pyrite and pyrrhotite and is weakly magnetic. Strongly foliated with occasional interbands of siliceous carbonaceous shale (eg between 250.4-253.0)													
257.9	273.4	15.5	100	Carbonate pale grey banded carbonate rock contains interlaminated pale grey carbonate and dark grey or black tourmaline magnetite or serpentine bands. Black stylolite horizons and lenses of green-yellow serpentine. Contains abundent carbonate veins. Two shale horizons occur between 261.3-261.5m and 263.2-264.4m. Pyrite is common on joint planes. The second shale unit is overturned at the upper contact. Banding is strong but irregular with common interfingering and flame structure. Irregular network of veining and large clasts derived from soft sediment brecciation. Also wavy stylolilic-like banding. Banding au 43° to core axis - quite irregular.													

DIAMOND DRILL RECORD

HOLE NUMBER : SD 19
LOGGED BY : D. KILPATRICK

	INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn.									
	FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO$_3$
	273.4	285.4	11.4	95	**Carbonaceous Shale** Banded grey (?) carbonaceous shale. Grey to black strongly banded or laminated fairly competent core of grey siliceous shaly siltstone with fine darker mafic lamellae, minor serpentine - average band width 0.8cm - some graded bedding; fine siltstone to (?) carbonaceous mudstone. The finer bands have been recrystallised to form the coarser (?) dolomite material - grains up to 3mm. These bands sometimes carry minor disseminated pyrite grains. Banding toward the base of this unit becomes almost gneissic in appearance. Fine interfingering lamellae of grey and black siliceous bands with (?) recrystallised lenses (≤2mm of some siloceous material. Toward the base of the unit the core becomes more altered and deformed. BCA 35°-55° (BCA is quite variable - higher angles with depth). The last one metre is leached to pale grey-white silicate framework with minor tourmaline.													
	285.4	286.1	0.7	100	**Breccia** Dark grey green coarse breccia consisting of dark grey-green siltstone matrix with pebble-size angular fragments up to 3cm. Some fragments show poor degree of rounding. Fragment appear to be grey fine grained siliceous siltstone. Irregular slickensided joint planes present.													
	286.1	292.8	6.5	97	**Graphitic Chiastolite Hornfels** - Mostly competent dark grey to black fine banded hornfelsed (?) siltstone with fine grey siliceous graphitic matrix and abundent porphyroblastic (?) altered chiastolitic lenses - mostly gone to mica or chlorite. (up to 3mm long) Red-brown phlogopite mica is common. Occasional bands of more graphite rich material. Minor disseminated and sometimes more granular pyrite associated with veins.													
	292.8	322.5	28.2	95	**Granite** Altered fine to medium grained pale grey granite of mostly quartz and feldspar (au 0.5mm) with biotite (au 2mm) and occasional tourmaline nodules up to 2.5cm. Granite is banded near the contact with pegmatite like horizons - coarse grained with graphic intergrowths of quartz and feldspar (BCA ~70°). Alteration of feldspars to green chloritic material common. Very broken and altered at contact.													

DIAMOND DRILL RECORD

HOLE NUMBER : SD 19

LOGGED BY : D. KILPATRICK

	INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn.									
	FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO3
					Granite becomes medium-coarse grained with occasional finer grained horizons. Minor disseminated pyrite. Very irregular and non-uniform for the 30m of recovered granite - Hole may be sub-parallel to granite-sediment contact.													
					314.3m - vein of pyrite shows a few crystalline grains of (?) MoS_2. (up to 6mm across)													
					316-317m and 321-322m; Abundent disseminated biotite and its chloritised alteration product.													
					Hole terminated in granite at 322.5m.													

RE[illegible]ON LIMITED - DRILL CORE REC[illegible]

HOLE NUMBER	SD 20
PURPOSE	TEST EASTERLY EXTENSION OF SKARN ZONE
LOCATION	ST. DIZIER
COLLAR R.L.	2204.2
CO-ORDINATES	5367752.1 N 345622.4 E
LENGTH	340.6m
HOLE SIZE	HQ 0 - 340.6m
DATE DRILLED	3.5.82 - 3.6.82
SIGNIFICANT CORE LOSS ZONES	0-35.2m 27% recovery
ORE ZONE GROUND CONDITIONS	GOOD
LOGGED BY	D. KILPATRICK

SURVEY			From – To	Distance D	VERTICAL		HORIZONTAL	
Depth	Bearing	Dip			D.Sin Dip	R.L.	D.Cos.Dip	Prog Total
0	156.0	70.0°	0-15.5	15.5	14.6	2189.6	5.3	5.3
31	156	70.0	-47.0	31.5	29.6	2160.0	10.8	16.1
63	155	70.0	-80.0	33.0	31.0	2129.0	11.3	27.4
97	153	70.0	-119.5	39.5	37.1	2091.9	13.5	40.9
142	151	70.0	-163.0	43.5	40.9	2051.0	13.5	54.4
184	150	70.0	-197.5	34.5	32.4	2018.6	11.8	66.2
211	149	70.3	-233.5	36.0	33.9	1984.7	12.1	78.3
256	149	70.5	-268.0	34.5	32.5	1952.2	11.5	84.8
280	150	70.7	-295.0	27.0	25.5	1926.7	8.9	93.7
310	151	71.0	-325.0	30.0	28.4	1898.3	9.8	108.5
340	146	70.3	-340.6	15.6	14.7	1883.6	5.3	113.8

COMMENTS

All jointing planes given as angle to core axis and oriented with respect to an assumed steeply north dipping bedding e.g. 50°W refers to a joint plane at 50° to the core axis and that plane has a westerly dip with respect to the north dipping bedding plane.

The drill hole intersected an unusual, but tin-barren, sulphide rich skarn at 229.2 - 234.4m. Deeper in the hole, more typical magnetite skarn was intersected at 261.7 - 267.0m and 294.5 - 313.6m; both intersections are stanniferous and low in acid soluble tin, with the first intersection containing appreciable amounts of sphalerite (see below).

SUMMARY - ASSAY DATA

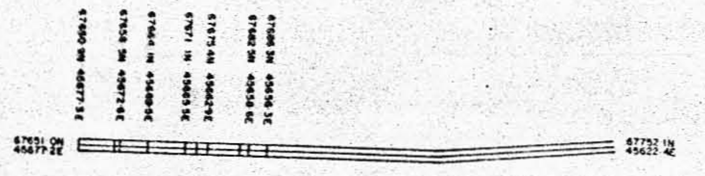
LODE NAME	FROM	TO	LENGTH (m)	AVERAGE WEIGHTED ASSAYS													B.C.A.
				Sn.	Acid Sol. Sn.	Cu.	As.	S.	Pb.	Zn.	Bi.	WO_3	Ag g/t				
	262	267	5	0.33	0.06	0.08	<0.1	1.5	<0.01	1.47	0.010	0.01	5				
	299.5	307.5	8	0.35	0.05	0.07	<0.1	3.0	<0.01	0.04	0.031	0.07	3				

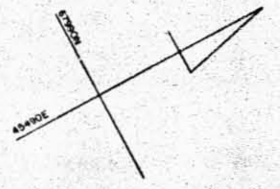
RENISON LIMITED

DIAMOND DRILL HOLE PLOT

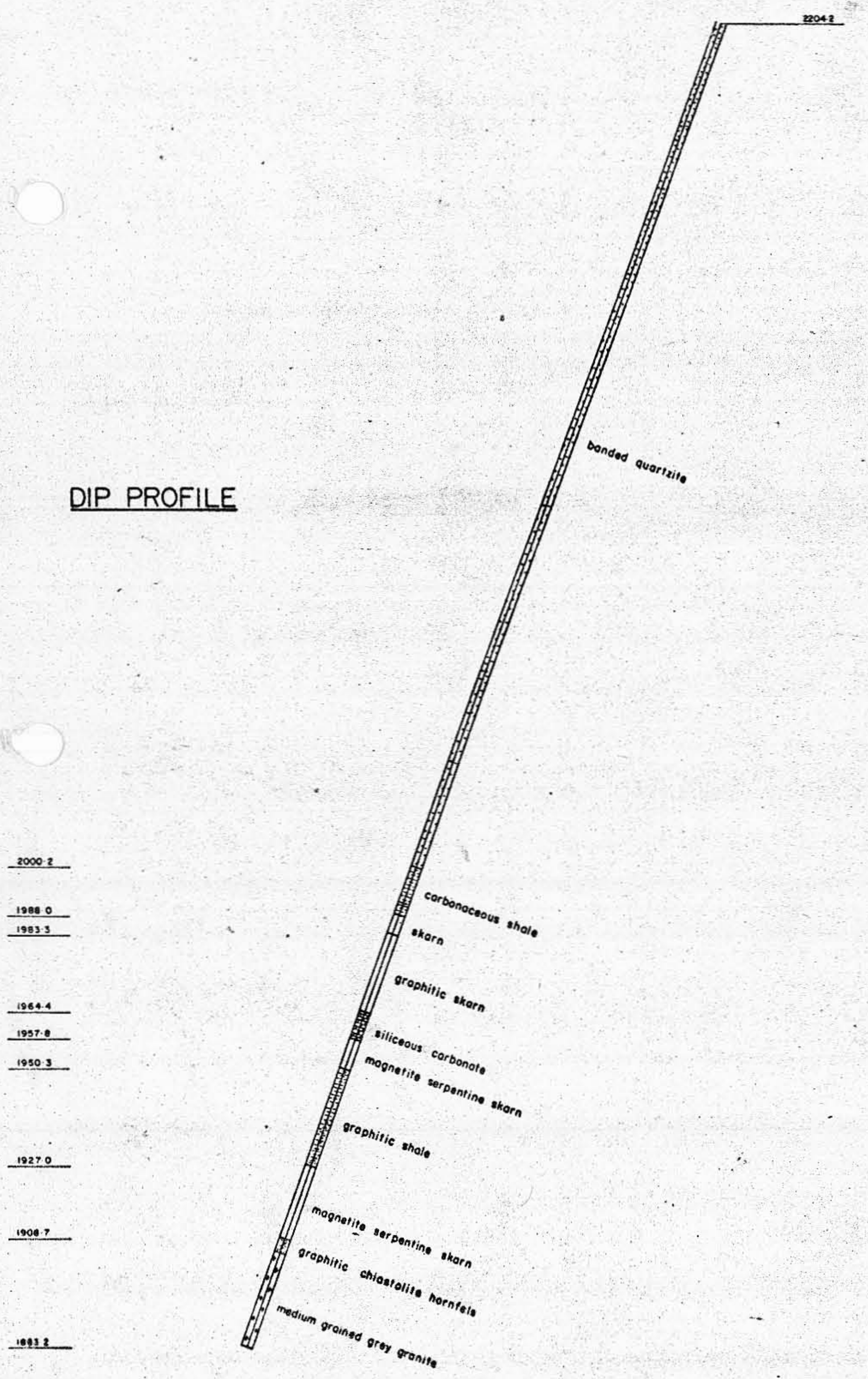
HOLE NO.: SD20

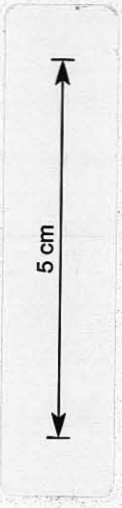
PLAN





DIP PROFILE





SCALE 1:1000

DIAMOND DRILL RECORD

HOLE NUMBER : SD 20
LOGGED BY : D. KILPATRICK

NWPS

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM			% Sn									
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu	% As	% S	% Pb	% Zn	% Bi	g/t Ag	% WO3
0	35.2	9.7	27	Greenishgrey Banded Metasiltstone; greenish-grey, broken, strongly laminated core (RQD~20%) of interbanded dark greenish grey biotite-rich fine siltstone, quartzite and minor mica-rich grey siltstone. The core displays a metamorphic texture with abundant needle-like or tabular crystals, now altered biotite (possibly originally chiastolite). Disseminated pyrite is common throughout - occasional pyrite on joint surfaces. BCA at 12m 35°, 27m 15°, 34m 28°, Jointing at 33m 50^{0}W, 55^{0}E *(see comments)													
35.2	35.5	0.3	100	Alteration Zone; very altered horizon of sulphur coloured micaceous gritty clay and inter-laminated quartzite. Minor disseminated pyrite. (A second, similar zone occurs between 37.0 - 37.2m)													
35.5	216.8	180.3	100	Banded Quartzite; banded sometimes micaceous quartzite consisting of pale greystrongly laminated quartzite, micaceous quartzite and quartzite-mica-clay horizons Band width 3 - 12mm. The core is multiply veined - most veins carry pyrite. Veining is irregular. Veining and alteration decrease with depth. Core retains metamorphic texture with a spotty appearance probably due to metamorphic recrystallization. Yellow sulphurous colour persists to depth and is associated with veins, joints and clay horizons. Core becomes more siliceous with fewer mafic horizons and disseminated muscovite. B.C.A.: 39m 35°, 47m 28°, 52m 25°, 56m 28°, 62m 22°, 71m 26°, 78m 31°, 87m 29°, 93m 38°, 103m 34°, 106m 27°. 113.8 - 118.0 Clay rich horizon of strongly banded core with pale grey quartzite (0.8cm) and dark leached mica rich lamellae (0.3cm). B.C.A. 111m 30°, 118.0 mff. Banded quartzite with interlaminated dark (?)biotite horizons. Abundant veining mostly carries sulphide - rare chalcopyrite in quartz vein at 1170m. B.C.A. 121m 46°, 130m 38°, 138m 34° Leached zones of 0.1m at 118m and 119m have siderite colouration. Metamorphic spotting persists below this level. Occasional veins of red-brown mica between 122 - 138m													

DIAMOND DRILL RECORD

HOLE NUMBER : SD 20

LOGGED BY : D. KIPATRICK

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn.									
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO3
				Sulphides are common on joint planes, occasionally in small		220	221	0.01	<0.01	0.02	<0.1	0.4	<0.01	0.02	0.001	1	0.01
				lenses. Large quartz veins occur around 135 - 137m			222	<0.01	"	0.03	"	0.3	"	0.02	<0.001	1	0.01
				jointing dips 28°W and 35°W.			223	0.01	"	0.02	"	0.2	"	0.03	0.002	1	0.01
				Other jointing planes; 39m 45°W, 60°NW; 41m 68°N;			224	<0.01	"	0.02	"	0.3	"	0.02	0.002	<1	<0.01
				47m 32°SE; 50m 48°SE, 39°W, 44°SE 30°NE: 54m 61°SW, 60m			225	"	"	0.03	"	0.4	"	0.02	0.002	1	0.01
				37°SW, 74m 50°NNE 50°N, 64°NE, 67°NNW; 107m 58°NNE,			226	"	"	0.04	"	0.3	"	0.02	<0.001	<1	0.01
				49°NE.			227	"	"	0.02	"	0.0	"	0.02	0.003	1	0.02
				The sulphurous colouring persists through the quartzite			228	"	"	0.03	"	0.1	"	0.02	0.008	3	0.01
				Core has metamorphic appearance with recrystallisation and			229	"	"	0.05	"	0.3	"	0.02	0.005	3	0.01
				secondary mica pervasive. Banding is more diffuse below			230	"	"	0.06	"	1.7	"	0.03	0.007	2	0.01
				120m - occasionally lensing and interfingering and			231	"	"	0.16	"	7.9	"	0.03	0.006	3	<0.01
				crossing original sedimentary bedding.			232	"	"	0.23	"	14.3	"	0.02	0.006	4	<0.01
				148.0m; Tourmaline vein with(?) arsenopyrite			233	"	"	0.23	"	16.8	"	0.02	0.004	3	0.01
				1634-171.4, The core has undergone some deformation.			234	0.02	0.02	0.23	"	10.8	"	0.05	0.004	3	0.01
				Between 163.4 -166.0 the core is very broken. Between			235	0.07	0.02	0.03	"	0.7	"	0.05	0.002	2	<0.01
				166.0 -166.6 m and 168.4- 170.8m the rock has been dis-			236	0.05	<0.01	0.03	"	1.2	"	0.11	0.002	2	<0.01
				rupted and contains deformed and brecciated block cemented			237	0.04	0.01	0.02	"	0.5	"	0.06	0.003	2	0.01
				and intruded by quartz. Another horizon of similar mat-			238	0.11	0.03	0.02	"	1.1	"	0.10	0.003	2	<0.01
				erial occurs at 174.8 - 175.8m.			239	0.03	<0.01	0.02	"	0.6	"	0.08	0.004	2	0.01
				180.0 - 192m; The core contains numerous			240	0.03	"	0.03	"	2.0	"	0.30	0.003	2	<0.01
				quartz and quartz/tourmaline/topaz and quartz/ topaz/			241	0.02	"	0.06	"	3.4	"	0.25	0.004	2	<0.01
				tourmaline veins and also abundant secondary mica bands			242	0.02	"	0.02	"	1.6	"	0.07	0.002	1	0.01
				and zones associated with jointing			243	0.02	"	0.04	"	2.6	"	0.16	0.004	1	0.01
				1906 -191.2m, Granitic quartz-topaz-tourmaline dyke-			244	0.02	"	0.03	"	1.5	"	0.34	0.002	2	<0.01
				minor disseminated pyrite sub-parallel to bedding			245	0.05	0.01	0.01	"	0.3	"	0.04	0.001	1	0.01
				Second small vein at 191.4m			246	0.04	<0.01	0.01	"	0.1	"	0.04	0.001	1	<0.01
				193.9 -194.0 m, broken zone - not sheared.		246	247	0.07	<0.01	0.02	"	0.3	"	0.03	0.003	<1	0.01
				Sulphide bearing veins common throughout.		247	248	0.04	<0.01	0.04	"	0.5	"	0.03	0.002	1	0.01
				Below 200m, the quartzite appears somewhat leached-			249	0.04	<0.01	0.04	"	0.7	0.01	0.03	0.002	1	0.01
				paler colour.			250	0.02	0.02	0.04	"	2.3	"	0.02	0.002	1	0.01
				203m, tourmaline lens with (?) arsenopyrite			251	0.02	<0.01	0.07	"	2.5	"	0.01	0.004	1	<0.01
				215.5 -215.7m, band of dark fine grained			252	0.02	<0.01	0.03	"	1.1	"	0.03	0.002	1	0.01
				shale.			253	0.03	<0.01	0.05	"	1.0	"	0.02	0.003	1	0.01
				B.C.A.: at 111m 30°, 121m 46°, 130m 38°, 138m 34°,			254	0.02	<0.01	0.03	"	0.1	"	0.01	<0.001	1	0.01
				142m 44°, 148m 38°, 158m 40°, 166m 41°, 175m 31°,			255	0.01	<0.01	0.01	"	0.1	"	0.03	0.002	1	0.02
				183m 31°, 191m 39°, 200m 51°.			256	0.03	"	0.03	"	2.1	"	0.09	0.002	1	<0.01
				Gradational contact to			257	0.03	"	0.02	"	2.9	"	0.07	0.002	1	"
							258	0.03	"	0.03	"	2.8	"	0.12	0.002	1	"
216.8	229.2	12.4	100	Fine grained (?) Calcareous Shale; fine grained dark grey													
				to black weakly banded core with abundant veining, mostly													
				quartz, occasional fine carbonace ous veinlets, lesser													
				sulphide veins (mostly pyrite, minor pyrrhotite and chal-													
				copyrite, rare arsenopyrite.) Some sulphides on joint													

DIAMOND DRILL RECORD

HOLE NUMBER : SD 20

LOGGED BY : D. KILPATRICK

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM			% Sn.									
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO$_3$
				planes- mostly pyrite. Occasional horizons of quartzite		258	259	0.02	<0.01	0.03	<0.1	0.2	<0.01	0.07	0.003	1	0.03
				or very siliceous shale with reddy brown staining. All			260	0.02	<0.01	0.11	"	0.7	"	0.05	0.002	3	0.01
				core appears to be silicified and with diffuse banding			261	0.02	<0.01	0.87	"	3.3	"	0.24	0.003	16	0.01
				Moderately distinct lower contact.			262	0.04	0.01	0.11	"	1.1	"	0.38	0.003	4	0.01
							263	0.12	0.03	0.19	"	1.6	"	1.23	0.005	5	<0.01
229.2	234.4	5.2	100	Skarn ; Dark grey green, irregularly banded skarn with			264	0.35	0.15	0.08	"	2.8	"	4.09	0.013	4	0.02
				abundant pyrrhotite (magnetic (?)), magnetite,pyrite,			265	0.51	0.05	0.02	"	0.5	"	0.89	0.010	3	0.01
				numerous sinous veins of chalcopyrite and rare MoS_2.			266	0.20	0.02	0.10	"	2.4	"	0.93	0.016	4	0.01
				Sulphides decrease from massive (30% sulphide at upper			267	0.48	0.06	0.03	"	0.2	"	0.22	0.004	3	0.01
				contact) to interlaminated with mafic minerals (3-10%S).			268	0.03	<0.01	0.10	"	1.6	"	0.18	0.003	2	0.01
				Occasional veins of siderite sometimes with pyrite.			269	0.02	<0.01	0.02	"	1.9	"	0.05	0.003	2	0.01
							270	0.01	<0.01	0.02	"	2.1	"	0.04	0.003	1	0.01
							271	0.01	0.01	0.04	"	2.6	"	0.08	0.001	1	0.01
234.4	254.8	20.4	100	Graphitic Skarn; Dark grey or green-grey competent core			272	0.01	0.01	0.05	"	3.0	"	0.03	0.002	1	0.01
				of interlaminated graphite skarn with poikilitic epidote-			273	0.01	0.01	0.06	"	2.1	"	0.02	0.002	1	0.01
				clinozoisite laths (see SD14 252.1-252.6m) and yellow			274	0.01	0.01	0.05	"	2.5	"	0.10	0.002	1	0.01
				green to dark grey green bands of more siliceous(?)			275	0.01	0.01	0.03	"	3.3	0.02	0.01	0.003	1	0.01
				diopside skarn.			276	0.01	0.01	0.05	"	2.9	0.01	0.01	0.002	1	0.01
				Graphitic skarn contains large bladed crystals up to			277	0.01	0.01	0.06	"	3.9	"	0.39	0.001	1	0.01
				2cm. x 0.4cm. in a matrix of graphitic (?)diopside-			278	0.01	0.01	0.06	"	3.3	"	0.01	0.002	1	0.01
				phlogopite-garnet. Occasional(?) garnet as large			279	0.01	0.01	0.05	"	3.6	"	0.04	0.004	1	0.01
				ragged grains 2cm. x 1 cm. (e.g. 235.6m.). The poikolitic			280	0.01	0.01	0.04	"	3.1	"	0.02	0.003	1	0.01
				horizons occur between 234.4 - 235m, 236.6 -238.2m, and			291	0.01	0.01	0.06	"	3.6	"	0.07	0.003	1	0.01
				245.2 -247.6m.			282	0.01	0.01	0.05	"	3.4	"	0.27	0.002	1	0.01
				The greenish (?)diopside skarn horizons have a mottled			283	0.01	0.02	0.04	"	1.6	"	0.11	0.003	1	0.01
				appearance of (?)recrystallised quartz and garnet grains			284	0.01	0.01	0.07	"	3.5	"	0.03	0.002	1	0.01
				e.g. 235m, and finer pyrrhotite (magnetic) grains-e.g.			285	0.01	0.01	0.03	"	2.1	"	0.04	0.002	1	0.01
				236m, in a banded matrix of diopsidic skarn or pale			286	0.09	0.01	0.03	"	2.9	"	0.03	0.001	1	0.01
				grey skarn with very fine grained porphyroblastic grains			287	0.41	0.01	0.04	"	2.9	0.02	0.02	0.002	1	0.02
				of (?)mafic minerals. Some sections of the core			288	0.05	0.01	0.04	"	2.9	0.02	0.02	0.003	1	0.01
				effervesce weakly.			289	0.03	0.01	0.04	"	2.7	0.02	0.05	0.002	1	0.01
				224.7 -244.9m and 245.1 -245.3m: bands of pink			290	0.01	0.01	0.03	"	1.3	0.01	0.07	0.002	1	0.01
				(?)garnet-siderite or wollastonite with greenish			291	0.02	0.01	0.04	"	2.0	0.02	0.05	0.002	1	0.01
				diopside and small green lensoid mafic nodules			292	0.01	0.01	0.04	"	1.3	<0.01	0.05	0.002	1	0.01
				up to 6mm x 4mm.			293	0.01	0.01	0.05	"	0.8	"	0.08	0.003	1	0.01
				247.6 -254.8m: fine grained black competent			294		0.01		"		"				
				graphitic skarn with abundant sulphide veins (pyrite		294	294.5	0.02	0.01	0.07	"	0.9	"	0.26	0.002	1	0.01
				and chalcopyrite.)		294.5	295.5	0.03	<0.01	0.03	"	0.9	"	0.54	0.003	1	<0.01
							296.5	0.06	0.01	0.03	"	1.0	"	0.17	0.005	2	<0.01
							297.5	0.09	0.04	0.06	"	1.4	"	0.16	0.004	3	0.01
							298.5	0.08	0.04	0.02	"	0.8	"	0.09	0.004	2	0.01
							299.5	0.06	0.03	0.09	"	2.2	"	0.06	0.011	2	0.01

DIAMOND DRILL RECORD

HOLE NUMBER SD20
LOGGED BY : D.KILPATRICK

KAPS

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM			% Sn									
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu	% As	% S	% Pb	% Zn	% Bi	g/t Ag	% WO3
				247.4-248.7m; Abundant porphyroblastic grains of grey crystalline minerals, (?)andalusite. Also occurs at 252.6 - 254.8m.													
254.8	261.7	6.9	100	Banded Quartzite ; Pale greenish grey siliceous core. Minor carbonate component-effervesces at upper contact which has some (?)siderite. Core contains abundant fine disseminated pyrite, pyrrhotite and sphalerite (up to 5%S). Skarn horizons occur between 257.6-257.8m and 258-260.6m. These are similar to the diopside skarn above, with green and pink colouring and contains patches of abundant disseminated and veining pyrite and chalcopyrite. Below the skarn horizons the quartzite contains bands of grey (?)chiastolite shale and veins of pyrrhotite and pyrite. A sharp lower contact occurs which is subparallel to the core axis for 0.5 metre.													
261.7	267.0	5.3	100	Magnetite Serpentine Skarn; black and green-grey core of massive magnetite with pyrrhotite and sphalerite with irregular bands of serpentine-talc. Abundant quartz veining and replacements; often stained. The massive magnetite has a pisolitic texture (e.g.264-264.3m. 265.3 - 266.0m : broken zone. Sharp contact.													
267.0	269.5	2.5	100	Broken Zone: Very broken zone (RQD = 0%) of pyritic graphite shale. Small skarn horizon at upper contact. The core is sheared, slickensided and distorted, Possible fault zone.													
269.5	294.5	25.0	100	Graphitic Shale; Grey black very fine grained core of siliceous, weakly magnetic graphitic shale with abundant small lenses of poorly formed (?)chiastolite (3mmx2mm) and abundant pyrite and chalocpyrite veining. Veining constitutes up to 20% of rock. Quartz veins and tension gashes also common.													

DIAMOND DRILL RECORD

HOLE NUMBER : SD20
LOGGED BY : D. KILPATRICK

NWPS

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn.									
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g t Ag	% WO3
				Red-brown mica at 275.5m associated with quartz vein-													
				minor amount above, more common below this level.													
				289.0 - 294.5m ; graphitic shale with minor mica.													
				Jointing planes occur approximately 35-55° to core axis.													
				290.3 - 291.7m ; graphitic shale with black friable													
				looking material- quite competent, non-magnetic,possible													
				some specular hematite.													
				291.7 - 294.5m; chiastolite bearing, micaceous													
				graphitic shale. Bands of grey speckled chiastolite and													
				fine disseminated pyrite.													
294.5	313.6	19.1	100	Magnetite Skarn; Pale green-grey to dark green grey skarn		299.5	300.5	0.34	0.08	0.15	<0.1	4.5	<0.01	0.05	0.021	4	0.01
				with widely variable texture. The upper 1.5m is non-			301.5	1.05	0.05	0.14	"	5.6	"	0.03	0.012	4	0.02
				mineralised carbonate. Below this the unit contains zones of			302.5	0.30	0.08	0.05	"	1.8	"	0.04	0.014	3	0.03
				abundant magnetite, chalcopyrite and pyrite. Magnetite horizons occur- between 299.6 -			303.5	0.15	0.06	0.06	"	0.7	"	0.04	0.007	3	0.01
				303.4m, 304.1 - 306.5m, 307.8m, 309.2 - 313.6m. The			304.5	0.16	0.06	0.09	"	2.2	"	0.04	0.008	3	0.15
				last horizon contains abundant pyrrhotite as well as			305.5	0.54	0.06	0.04	"	1.3	"	0.04	0.024	3	0.24
				chalc opyrite, pyrite and magnetite.			306.5	0.17	0.07	0.17	"	5.8	"	0.05	0.022	4	0.02
							307.5	0.11	0.05	0.09	"	2.0	"	0.04	0.047	3	0.05
							308.5	0.05	0.03	0.14	"	4.3	"	0.04	0.123	4	0.03
313.6	316.8	3.2	100	Chiastolite Hornfels ; grey, fine grained hornfelsed shale			309.5	0.08	0.06	0.11	"	1.9	"	0.03	0.012	3	0.07
				containing siliceous grey hornfels and interbanded quartz			310.5	0.06	0.04	0.21	"	5.2	"	0.05	0.059	4	0.03
				and zones of abundant disseminated sulphide; pyrrhotite,			311.5	0.05	0.04	0.08	"	2.5	"	0.04	0.019	3	0.03
				pyrite, chalcopyrite.			312.5	0.05	0.03	0.23	"	6.3	"	0.04	0.023	3	0.01
							313.5	0.04	0.02	0.13	"	2.6	"	0.04	0.015	2	0.06
316.8	317.3	0.5	100	Altered Granite; grey medium grained chloritised biotite													
				granite.													
317.8	340.6	22.8	100	Granite; grey medium-grained biotite bearing granite													
				317.8 - 325.8m; Very broken and greisenised													
				greenish yellow granite with tourmaline nodules. This													
				horizon is banded at upper contact. 320m - 323m contains													
				minor crystalline fluorite.													
				Terminated in fresh granite at 340.6m.													

INTRA-OFFICE MEMORANDUM

TO: CHIEF RESEARCH METALLURGIST
FROM: TECHNICAL ASSISTANT
DATE: 13th November, 1981.
SUBJECT: INITIAL LABORATORY TESTS ON ST. DIZIER DRILL CORE SAMPLES.

SUMMARY

Samples from St. Dizier were subjected to metallurgical testwork in the laboratory. Testwork began with magnetic separation after a primary grind as the tin was known to be associated with magnetite. This was followed by further grinding of the magnetic fraction to liberate the tin values so that gravity concentration and cassiterite flotation could be attempted. Some degree of success was obtained from gravity concentration but poor results with the cassiterite flotation. More testwork is required.

E. PRINCE

1.5 Metallurgical testwork on some St. Dizier samples was requested by Mr. P. Roberts, Geology. Samples of core rejects were obtained and the following composites prepared from different drill hole intersections.

SAMPLE	D.D.H.	INTERSECTION	%Sn	% ACID SOLUBLE Sn	% WO_3	% Fe	SAMPLE WEIGHT (g)
EPB	SD 10	224-225m	0.76(?)	0.86(?)	0.18	16.3	975
EPC	SD 13	215-216m	1.45	0.56	0.08	26.3	405
EPD	SD 14	201-202m	0.99	1.01	0.05	20.5	557
EPE	SD 15	266-267m	1.03	0.45	0.11	36.1	578
EPF	SD 15	302-303m	0.91	0.68	0.01	46.3	710
EPG	SD 13	206-211m	0.57	0.31	N/A	18.6	2175

The St. Dizier samples contained fine grained tin associated with large amounts of magnetite and some pyrrhotite. It was decided to try magnetic separation to isolate tin values and then try other methods of separation on the products having the greater tin distribution.

2. PROCEDURE and RESULTS

Each of samples EPB, EPC, EPD, EPE and EPF were rolls crushed to pass 1.68mm, then the samples were ground in the laboratory ball mill to pass 300μ. They were then sized into the fractions -300/+106μ, -106/+38μ, and -38μ in preparation principally for magnetic separation. Magnetic separation of these fractions took place in a laboratory Davis Tube with a current flow of 1.5A in all cases.

More extensive testwork was carried out on EPG with a coarser grind followed by magnetic separation. The magnetics were then further ground before testwork to concentrate the tin. Details of this procedure are given in 2.4 below.

2.1 EPB

Fractions -300/+106μ and -106/+38μ were magnetically separated into magnetic and non magnetic products. The -38μ fraction was cyclosized into fraction -38+6μ and then magnetically separated. The results are given in Appendix A.

2.2 EPC and EPF

Fractions -300/+106μ and -106/+38μ were magnetically separated and the -38 fraction left untreated. The results are given in Appendix B (EPC) and Appendix C (EPF).

2.3 EPD and EPE

Fractions -300/+106μ and -106/+38μ were both magnetically separated and the -38μ fraction cyclosized to give fractions -38/+26, -26/+20, -20/+14, -14/+9 and -9/+6, which were then magnetically separated.

The results are given in Appendix D (EPD) and Appendix E(EPE).

2.4 EPG

This was a larger sample than the others, so that testwork could be carried out on each size fraction. The sample was a weighted composite of 5 x 1 metre intersections which was rolls crushed to minus 1.68mm then reduced in size by ball milling for a short time to produce a wide range of size fractions. The sample was then fully sized from minus 1.68mm to +6μ, the fractions then magnetically separated and all products assayed for Total Sn, Soluble Sn and Fe.

The results are given in Appendix F.

EPG 1

This sample was a weighted composite of EPG -1680/+1200, -1200/+850, -850/+600, -600/+425 MAGNETICS. This was completely reduced in size to -38μ in the laboratory ball mill. The -38μ fraction was cyclosized for desliming and to produce individual spigot fractions. These were magnetically separated and assayed for Total Sn, Soluble Sn., Fe and, where possible, WO_3.

The results are given in Appendix G.

EPG 2

This was a weighted composite of EPG -1200/+850, -850/+600, -600/+425 MAGNETICS. This was reduced in size to -75μ which was screened and then cyclosized into the size fractions -75/+38 and -38/+6. The fractions were separated into magnetics and non magnetics in the Davis Tube.

The non magnetics of -75/+38 fraction were treated on the laboratory superpanner to produce CONC 1, CONC 2 and Tail products.

The non magnetics of the -38/+6 fraction were tested for ammenability to cassiterite flotation. The test results were very poor with low grades and recoveries, however the sample size was small and more testwork is required.

Detailed results are given in Appendix H.

3. DISCUSSION

With the samples having between 0.57 and 1.45% Sn, but only relatively small weights, there was insufficient sample in most cases to test alternative routes for tin recovery other than gravity methods using the superpanner. In general, the magnetic separation tests showed that the tin tended to be associated with the magnetics. However, with very fine grinding increasing amounts of tin were liberated giving the possibility of some significant tin concentration.

4. RECOMMENDATION

Further testwork is required to investigate the complex mineralogy (cassiterite and soluble tin, arsenic, etc) and to test alternative recovery methods, such as cassiterite flotation, suitable for fine particle treatment.

PB			IN SIZE FRACTIONS								OVERAL	
ze ction	Product	% WT	Sn		Sol. Sn		Fe		WO_3		Sn	
			%	% distn.	%	% distn.	%	% distn.	%	% distn.	%	% c
Total	assay head		0.76		0.86		16.3		.175			
0	assay head	100.00	0.33	100.00	0.38	100.00	11.1	100.00			0.33	0
0/+106	magnetics	36.67	2.08	98.36	2.10	98.38	36.8	80.08	0.44	92.72	2.08	48
	non-mags	63.33	0.02	1.64	0.02	1.62	5.3	19.92	0.02	7.28	0.02	0
	assay head		0.76		0.88		16.8					
	calc head		0.77	100.00	0.78	100.00	16.85	100.00	0.17	100.00		
/+38	magnetics	28.17	2.37	97.89	2.27	95.70	4.89	79.32	0.50	90.74	2.37	21
	non-mags	71.83	0.02	2.11	0.04	4.30	5.0	20.68	0.02	9.26	0.02	0
	assay head		0.69		0.79		16.0					
	calc head		0.68	100.00	0.66	100.00	17.4	100.00	0.15	100.00		
	assay head		0.83		0.89		15.7					
/+6	magnetics	27.17	2.19	82.78	2.09	82.10	47.7	78.76			2.19	11.
	non-mags	72.83	0.17	17.22	0.17	17.90	4.8	21.24			0.17	17.
	assay head								0.19			
	calc head		0.71	100.00	0.69	100.00	16.46	100.00				
	calc head		0.98	100.00	0.38	100.00	16.1	100.00			0.98	14.

EPC		IN SIZE FRACTIONS									OVERAL	
ize action	Product	% WT	Sn		Sol. Sn		Fe		WO_3		Sn	
			%	% distn.	%	% distn.	%	% distn.	%	% distn.	%	%
Total	assay head	100.00	1.45	100.00	0.56	100.00	26.25	100.00	0.08		1.45	1
00/+106	magnetics	71.02	1.32	82.63	0.45	80.33	40.3	98.02			1.32	
	non-mags	28.98	0.68	17.37	0.27	19.67	2.0	1.98			0.68	
	assay head		1.17		0.42		29.1		0.07			
	calc head		1.13	100.00	0.40	100.00	29.2	100.00				
6/+38	magnetics	58.49	1.50	53.87	0.49	58.49	48.3	97.42			1.50	
	non-mags	41.51	1.81	46.13	0.49	41.51	1.8	2.58			1.81	
	assay head		1.62		0.49		28.5		0.08			
	calc head		1.63	100.00	0.49	100.00	29.0	100.00				
B	assay head		1.67	100.00	0.78	100.00	21.0	100.00	0.10	100.00	1.67	

EPF		IN SIZE FRACTIONS									OVERAL	
ze ction	Product	% WT	Sn		Sol. Sn		Fe		WO_3		Sn	
			%	% distn.	%	% distn.	%	% distn.	%	% distn.	%	% (
Total	assay head		0.91		0.68		46.3		0.01			
0	assay head	100.00	1.05	100.00	0.72	100.00	45.1	100.00	0.01		1.05	
0/+106	magnetics	80.14	0.84	75.50	0.58	75.49	61.5	98.77			0.84	
	non-mags	19.86	1.10	24.50	0.76	24.51	3.1	1.23			1.10	1
	assay head		0.88		0.66		49.5		0.01			
	calc head		0.89	100.00	0.62	100.00	49.9	100.00				
6/+38	magnetics	76.98	0.66	56.34	0.44	53:48	64.1	98.26			0.66	1
	non-mags	23.02	1.71	43.66	1.28	46.52	3.8	1.74			1.71	
	assay head		0.90		0.63		50.0		0.01			
	calc head		0.90	100.00	0.63	100.00	50.2	100.00				
	assay head		0.98	100.00	0.80	100.00	33.6	100.00	0.02	100.00	0.98	2

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APPENDIX D

EPD		IN SIZE FRACTIONS									OVERAL	
			Sn		Sol. Sn		Fe		WO_3		Sn	
ize ction	Product	% WT	%	% distn.	%	% distn.	%	% distn.	%	% distn.	%	%
Total	assay head	100.00	0.99	100.00	1·01	100·00	20.5	100.00	0.05	100.00	0.99	1
0/+106	magnetics	54.80	0.94	53.02	0.98	51.93	26.8	70.96			0.94	
	non-mags	45.20	1.01	46.98	1.10	48.07	13.3	29.04			1.01	
	assay head		0.97		1.14		20.7		0.05			
	calc head		0.97	100.00	1.03	100.00	20.7	100.00				
6/+38	magnetics	45.98	0.88	43.32	0.90	41.95	30.5	66.80			0.88	
	non-mags	54.02	0.98	56.68	1.06	58.05	12.9	33.20			0.98	1
	assay head		0.93		1.10		20.5		0.05			
	calc head		0.93	100.00	0.99	100.00	21.0	100.00				
38	assay head		1.07		1.22		20.2		0.05		1.07	3
8/+26	magnetics	59.20	0.97	50.49	1.06	51.82	42.8	76.01			0.97	
	non-mags	40.80	1.38	49.51	1.43	48.18	19.6	23.99			1.38	
	calc head		1.14	100.00	1.21	100.00	33.3	100.00				

EPD **122**		SIZE FRACTIONS									OVERA	
			Sn		Sol. Sn		Fe		WO_3		S	
Size Fraction	Product	% WT	%	% distn.	%	% distn.	%	% distn.	%	% distn.	%	%
-26 +20	magnetics	51.32	1.02	44.34	1.11	43.18	40.8	71.55			1.02	
	non-mags	48.68	1.35	55.66	1.54	56.82	17.1	28.45			1.35	
	assay head											
	calc head		1.18	100.00	1.32	100.00	29.3	100.00				
20 +14	magnetics	43.55	0.83	40.01	0.96	40.24	32.5	66.91			0.83	
	non-mags	56.45	0.96	59.99	1.10	59.76	12.4	33.09			0.96	
	assay head											
	calc head		0.90	100.00	1.04	100.00	21.1	100.00				
14 +6	magnetics	36.48	0.84	35.31	0.92	34.47	34.6	62.64			0.84	
	non-mags	63.62	0.88	64.69	1.00	65.53	11.8	37.36			0.88	
	assay head											
	calc head		0.87	100.00	0.97	100.00	20.1	100.00				
6	calc head		1.18	100.00	1.13	100.00	17.5	100.00			1.18	

EPE		II SIZE FRACTIONS									OVERAI	
			Sn		Sol. Sn		Fe		WO_3		Sn	
ize action	Product	% WT	%	% distn.	%	% distn.	%	% distn.	%	% distn.	%	%
Total	assay head		1.03		0.45		36.1		0.11			
00	assay head	100.00	0.72	100.00	0.29	100.00	40.3	100.00	0.08	100.00	0.72	
00/+106	magnetics	74.23	1.02	88.55	0.36	83.16	52.0	97.27			1.02	
	non-mags	25.77	0.38	11.45	0.21	16.84	4.2	2.73			0.38	
	assay head		0.89		0.34		39.6		0.10			
	calc head		0.86	100.00	0.32	100.00	39.7	100.00				
06/+38	magnetics	68.96	1.07	71.88	0.33	73.82	54.5	97.43			1.07	
	non-mags	31.04	0.93	28.12	0.26	26.18	3.2	2.57			0.93	
	assay head		1.04		0.33		38.9		0.10			
	calc head		1.03	100.00	0.31	100.00	38.6	100.00				
38	assay head		1.29		0.73		27.7		0.14		1.29	
38/ +26	magnetics	83.19	0.95	45.29	0.22		62.0	98.65			0.95	
	non-mags	16.81	5.68	54.71			4.2	1.35			5.68	
	calc head		1.75	100.00			52.3	100.00				
26 +20	magnetics	91.61	0.88	53.15	0.23		61.1	99.23			0.88	
	non-mags	8.39	8.47	46.85			5.2	0.77			8.47	
	calc head		1.52	100.00			56.4	100.00				

EPE		IN SIZE FRACTIONS									OVERALL	
			Sn		Sol. Sn		Fe		WO$_3$		Sn	
ze ction	Product	% WT	%	% distn.	%	% distn.	%	% distn.	%	% distn.	%	% d
+14	magnetics	69.36	0.81	47.58	0.38	76.79	55.9	97.46			0.81	
	non-mags.	30.64	2.02	52.42	0.26	23.21	3.3	2.54			2.02	
	calc head		1.18	100.00	0.34	100.00	39.8	100.00				
+9	magnetics	56.33	0.72	40.94	0.47	68.41	55.6	95.60			0.72	
	non-mags	43.67	1.34	59.06	0.28	31.59	3.3	4.40			1.34	
	calc head		0.99	100.00	0.39	100.00	32.8	100.00				
6	magnetics	63.12	0.74	51.98	0.58	75.62	55.2	96.92			0.74	1
	non-mags	36.88	1.17	48.02	0.32	24.38	3.0	3.08			1.17	1
	calc head		0.90	100.00	0.43	100.00	35.95	100.00				
	calc head		1.37	100.00			16.9	100.00			1.37	21

EPG		IN SIZE FRACTIONS									OVERAL	
ze ection	Product	% WT	Sn		Sol. Sn		Fe		WO_3		Sn	
			%	% distn.	%	% distn.	%	% distn.	%	% distn.	%	% (
otal	assay head	100.00	0.57	100.00	0.31	100.00	18.6	100.00				
80+1200	magnetics	73.90	0.94	98.52	0.33	96.89	27.5	97.13			0.94	
	non-mag's	26.10	0.04	1.48	0.03	3.11	2.3	2.87			0.04	
	calc head		0.70	100.00	0.25	100.00	20.9	100.00				
0+850	magnetics	64.65	0.78	94.07	0.43	94.02	27.2	93.43			0.78	1
	non-mags	35.35	0.09	5.93	0.05	5.98	3.5	6.57			0.09	
	calc head		0.54	100.00	0.30	100.00	18.8	100.00				
+600	magnetics	60.78	0.82	92.03	0.48	93.70	28.4	92.44			0.82	1
	non-mags	39.22	0.11	7.97	0.05	6.30	3.6	7.56			0.11	
	calc. head		0.54	100.00	0.31	100.00	18.7	100.00				
+425	magnetics	59.81	0.85	92.00	0.51	91.56	29.8	91.92			0.85	8
	non-mags	40.19	0.11	8.00	0.07	8.44	3.9	8.08			0.11	0
	calc head		0.55	100.00	0.33	100.00	19.4	100.00				

EPG		IN SIZE FRACTIONS									OVER
Size raction	Product	% WT	Sn		Sol. Sn		Fe		WO$_3$		S
			%	% distn.	%	% distn.	%	% distn.	%	% distn.	%
25+300	magnetics	56.38	0.90	87.91	0.54	90.88	31.4	91.65			0.90
	non-mags	43.62	0.16	12.09	0.07	9.12	3.7	8.35			0.16
	calc head		0.58	100.00	0.34	100.00	19.3	100.00			
00+212	magnetics	51.06	0.91	81.89	0.54	81.25	35.6	90.50			0.91
	non-mags	48.94	0.21	18.11	0.13	18.75	3.9	9.50			0.21
	calc head		0.57	100.00	0.34	100.00	20.1	100.00			
2+150	magnetics	48.47	0.90	74.48	0.52	76.53	38.1	89.73			0.90
	non-mags	51.53	0.29	25.52	0.15	23.47	4.1	10.27			0.29
	calc head		0.59	100.00	0.33	100.00	20.6	100.00			
0+106	magnetics	44.40	0.88	66.75	0.50	66.63	42.4	89.43			0.88
	non-mags	55.60	0.35	33.25	0.20	33.37	4.0	10.57			0.35
	calc head		0.58	100.00	0.33	100.00	21.0	100.00			

EPG		1. SIZE FRACTIONS									OVERAI	
			Sn		Sol. Sn		Fe		WO3		Sn	
ize action	Product.	% WT	%	% distn.	%	% distn.	%	% distn.	%	% distn.	%	%
J6+75	magnetics	40.77	0.82	55.10	0.45	59.60	46.0	89.03			0.82	
	non-mags	59.23	0.46	44.90	0.21	40.40	3.9	10.97			0.46	
	calc head		0.61	100.00	21.1	100.00						
+53	magnetics	35.24	0.79	42.15	0.42	45.84	50.3	87.53			0.79	
	non-mags	64.76	0.59	57.85	0.27	54.16	3.9	12.47			0.59	
	calc head		0.66	100.00	0.32	100,00	20.2	100.00				
+38	magnetics	32.90	0.82	37.50	0.42	39.16	50.3	87.57			0.82	
	non-mags	67.10	0.67	62.50	0.32	60.84	3.5	12.43			0.67	
	calc head		0.72	100.00	0.35	100.00	18.9	100.00				
3.	assay head		0.87		0.53		13.2				0.87	1
+26	magnetics	58.70	0.57	24.33	0.24	41.54	60.3	89.83			0.57	
	non-mags	41.30	2.52	75.67	0.48	58.46	9.7	10.17			2.52	
	Calc head		1.37	100.00	0.34	100.00	39.4	100.00				

EPG		IN SIZE FRACTIONS									OVERALI	
			Sn		Sol. Sn		Fe		WO_3		Sn	
ze tion	Product	% WT	%	% distn.	%	% distn.	%	% distn.	%	% distn.	%	% d
+20 -	magnetics	62.76	0.78	36.77	0.38	45.09	57.6	91.77			0.78	
	non-mags'	37.24	2.26	63.23	0.78	54.91	8.7	8.23			2.26	
	calc head		1.33	100.00	0.53	100.00	39.4	100.00				
-14 14	magnetics	28.95	0.85	28.47	0.46	31.37	50.8	85.54			0.85	
	non-mags	71.05	0.87	71.53	0.41	68.63	3.5	14.46			0.87	
	calc head		0.86	100.00	0.42	100.00	17.2	100.00				
9	magnetics	22.22	0.79	21.38	0.40	22.66	51.5	83.06			0.79	C
	non-mags	77.78	0.83	78.62	0.39	77.34	3.0	16.94			0.83	1
	calc head		0.82	100.00	0.39	100.00	13.8	100.00				
	magnetics	20.34	0.68	16.96	0.35	15.70	55.1	81.94			0.68	0
	non-mags	79.66	0.85	83.04	0.48	84.30	3.1	18.06			0.85	1.
	calc head		0.81	100.00	0.45	100.00	13.7	100.00				
	calc head		0.82		0.72		31.3				0.82	10.

EPG 1			IN SIZE FRACTIONS								OVER	
Size raction	Product	% WT	Sn		Sol. Sn		Fe		WO_3		Sn	
			%	% distn.	%	% distn.	%	% distn.	%	% distn.	%	%
38	assay head	100.00	0.76		0.22		32.0					
38 +20	magnetics	84.80	0.53	40.75	0.15	64.53	61.6	94.73			0.53	9
	non-mags.	15.20	4.30	59.25	0.46	35.47	19.1	5.27			4.30	13
	assay head											
	calc head		1.10		0.20		55.14					
20 +14	magnetics	48.98	0.52	35.68	0.20	40.68	55.4	89.56			0.52	5.
	non-mags	51.02	0.90	64.32	0.28	59.32	6.2	10.44			0.90	10.
	assay head											
	calc head		0.71		0.24		30.30					
14 +9	magnetics	42.67	0.51	31.64	0.13	27.12	58.6	90.09			0.51	3.
	non-mags	57.33	0.82	68.36	0.26	72.88	4.8	9.91			0.82	8.
	assay head											
	calc head		0.69		0.20		27.76					
9+6	magnetics	42.12	0.47	28.94	0.14	24.74	59.2	88.13			0.47	2.
	non-mags	57.88	0.84	71.06	0.31	75.26	5.8	11.87			0.84	6.
	assay head											
	calc head		0.68		0.24		28.29					
	calc head	100.00	0.71		0.28		27.37				0.71	39.9

EPG 2		IN SIZE FRACTIONS									OVERA	
Size raction	Product	% WT	Sn		Sol. Sn		Fe		WO_3		Sn	
			%	% distn.	%	% distn.	%	% distn.	%	% distn.	%	%
TOTAL	assay head	100.00	0.74		0.34		28.0		<0.01			
+75	assay head		0.38		0.05		12.3				0.38	
-75 +38	magnetics	57.00	0.61	49.96	0.23	55.95	53.4	92.55	<0.01		0.61	1
	non-mags	43.00	0.81	50.04	0.24	44.05	5.7	7.45	<0.01		0.81	1
	assay head		0.71		0.29		32.9					
	calc head		0.70		0.23		32.9					
-75 +38	non-mags											
	<u>Superpanned</u>											
	Conc 1	5.88	5.58	40.42	0.12	2.97	42.2	45.61			5.58	
	Conc 2	11.99	1.50	22.15	0.69	34.82	5.5	12.12			1.50	
	Tail	82.13	0.37	37.43	0.18	62.21	2.8	42.27			0.37	
	calc head		0.81		0.24		5.44					
38	assay head		0.81		0.37		27.2		<0.01			
38/+6	magnetics	51.13	0.55	32.41	0.22	39.00	60.3	89.71	<0.01		0.55	1
	non-mags	48.87	1.20	67.59	0.36	61.00	7.24	10.29			1.20	3
	assay head											
	calc head		0.87		0.29		34.37					
38 +6	non-mags											
	<u>Tin Float</u>											
	Rougher Conc	3.39	0.86	2.43	0.08	0.75	19.7	9.23			0.86	0
	Rougher Tails	96.61	1.21	97.57	0.37	99.25	6.8	90.77			1.21	29
	calc head		1.20									
	calc head		0.73		0.48		17.25				0.73	26

EPG 2		IN SIZE FRACTIONS									OVERA	
Size raction	Product	% WT	As		Sol. Sn		Fe		WO_3		Sn	
			%	% distn.	%	% distn.	%	% distn.	%	% distn.	%	%
TOTAL	assay head	100.00	0.2									
+75	assay head		0.07									
-75 +38	magnetics	57.00	0.16	39.86								
	non-mags	43.00	0.32	60.14								
	assay head		0.24									
	calc head		0.23									
-75 +38	non-mags											
	Superpanned											
	Conc 1	5.88	7.3	96.11								
	Conc 2	11.99	0.09	2.42								
	Tail	82.13	0.008	1.47								
	calc head		0.45									
38	assay head		0.23									
38/+6	magnetics	51.13	0.09	15.09								
	non-mags	48.87	0.53	84.91								
	assay head											
	calc head		0.30									
38 +6	non-mags											
	Tin Float											
	Rougher Conc	3.39	0.65	4.13								
	Rougher Tails	96.61	0.53	95.87								
	calc head		0.53									
	calc head		0.13									

[redacted]

132

DIAMOND DRILL RECORD

HOLE NUMBER : SD H5

LOGGED BY :

INTERVAL (m)		RECOVERY		DESCRIPTION	~~FORM~~			% Sn.									
FROM	TO	m	%		Fe	FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO₃
					14.9	161.2	162	0.07	0.10	0.01	<0.1	1.6	<0.01	2.81	0.006	1	<0.01
					12.7	162	163	0.08	0.08	0.01	"	1.4	"	2.80	0.015	<1	<0.01
					16.5	163	164	0.12	0.11	0.01	"	0.9	"	1.77	0.002	1	<0.01
					24.7	164	165	0.18	0.20	0.02	"	2.0	"	3.87	0.013	3	<0.01
					11.4	165	166	0.08	0.08	0.02	"	0.2	"	0.64	0.012	1	0.01
					30.5	166	167	0.16	0.12	0.01	"	1.2	"	2.26	0.011	3	<0.01
					23.1	167	168	0.16	0.12	<0.01	"	0.1	"	0.36	0.031	2	0.01
					4.5	168	169	0.03	0.04	0.02	"	0.2	"	0.57	0.007	1	<0.01
					22.1	169	170	0.14	0.11	<0.01	"	<0.1	"	0.29	0.004	1	0.01
					14.4	170	171	0.04	0.03	0.01	"	<0.1	"	0.07	0.005	2	0.01
					18.5	171	172.8	0.14	0.11	0.01	"	<0.1	"	0.06	0.015	2	0.03

133

DIAMOND DRILL RECORD

HOLE NUMBER : SD H6

LOGGED BY :

	INTERVAL (m)		RECOVERY		DESCRIPTION	~~FORM~~			% Sn.									
	FROM	TO	m	%		Fe	FROM	TO	TOTAL	ACID SOL	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g t Ag	% WO
						12.6	78.6	81.3	0.06	0.05	0.07	< 0.1	0.2	< 0.01	0.32	0.004	2	< 0.22

RENISON LIMITED

DIAMOND DRILL RECORD

HOLE NUMBER : SD H7

LOGGED BY : --

INTERVAL (m)		RECOVERY		DESCRIPTION	~~FORM.~~ Fe			% Sn.									
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g : Ag	[illegible]
					5.7	54.8	56	0.05	0.02	0.01	<0.1	0.7	<0.01	0.64	0.005	1	0.01
						56	57	NOT ENOUGH SAMPLE									
					20.1	57	58	0.40	0.21	<0.01	<0.1	<0.1	<0.01	0.07	0.008	2	0.01
					7.3	58	59	0.13	0.07	0.01	"	0.1	"	0.20	0.005	< 1	<0.01
					7.7	59	60	0.09	0.08	0.01	"	<0.1	"	0.05	0.005	< 1	<0.01
					9.1	60	61	0.11	0.10	0.05	"	0.6	"	0.16	0.003	2	0.02
					29.8	61	62	0.32	0.34	0.02	"	<0.1	"	0.06	0.003	1	0.02
					44.8	62	63	0.46	0.48	0.01	"	0.3	"	0.68	0.004	< 1	0.02
					13.0	63	64.6	0.09	0.12	0.05	"	0.6	"	1.13	0.008	< 1	0.01

RENISON LIMITED

DIAMOND DRILL RECORD

HOLE NUMBER : SD H6

LOGGED BY :

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM.			% Sn									
FROM	TO	m	%		Fe	FROM	TO	Sn TOTAL	SSn ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g t Ag	% W.O.
					0.8	33	36	<0.01	0.01	<0.01	<0.1	<0.1	<0.01	0.01	0.007	1	<0.01
					0.2	36	38	"	<0.01	<0.01	"	"	"	0.01	0.002	1	"
					0.2	38	40	"	"	<0.01	"	"	"	0.01	0.003	1	"
					1.2	40	42	"	"	0.01	"	"	"	0.01	0.002	1	"
					0.2	42	44	"	"	<0.01	"	"	"	0.01	0.003	1	"
					0.3	44	45	"	0.01	"	"	"	"	0.01	0.003	2	"
					0.1	45	46	"	<0.01	"	"	"	"	<0.01	0.004	<1	"
					0.2	46	47	"	"	"	"	"	"	0.01	0.004	2	"
					0.2	47	48	"	"	"	"	"	"	<0.01	0.005	2	"
					0.4	48	50	"	"	"	"	"	"	0.01	0.004	2	"
					0.1	50	51	"	"	"	"	"	"	0.02	0.005	1	"
					0.2	51	52	"	"	0.01	"	"	"	0.02	0.005	1	"
					0.3	52	53	"	"	<0.01	"	"	"	0.01	0.004	<1	"
					0.3	53	54	"	"	<0.01	"	"	"	0.01	0.003	2	"
					0.1	54	55	"	"	<0.01	"	"	"	0.01	0.004	1	"
					<0.1	55	56	"	0.03	0.01	"	"	"	0.01	0.033	9	0.01
					27.1	56	57	0.03	0.01	0.46	0.8	16.6	"	0.03	0.003	1	0.11
					0.4	57	59	<0.01	0.03	<0.01	<0.1	<0.1	"	0.01	0.003	2	<0.01
					0.4	59	60	"	0.01	0.01	"	"	"	0.01	0.005	<1	<0.01
					0.3	60	61	"	0.01	<0.01	"	"	"	0.01	0.003	1	<0.01
					0.6	61	62	"	0.02	0.01	"	"	"	0.01	0.004	<1	<0.01
					4.0	62	63	"	<0.01	0.01	"	0.2	"	0.46	0.002	<1	<0.01
					21.1	63	64	0.14	0.01	0.01	"	0.3	"	0.03	0.002	<1	0.01
					6.7	64	65	0.03	0.04	0.01	"	<0.1	"	0.04	0.002	1	<0.01
					6.9	65	66	0.05	0.12	<0.01	"	<0.1	"	0.02	0.004	<1	<0.01
					4.9	66	69	0.05	0.06	0.01	"	0.1	"	0.08	0.003	<1	<0.01
					7.7	69	70	0.03	0.01	0.03	"	2.3	"	0.06	0.003	<1	0.01
					10.5	70	72	0.10	0.03	0.03	"	2.8	"	0.04	0.005	<1	0.04
					12.3	72	74	0.03	0.09	0.07	"	5.3	"	0.02	0.016	<1	0.01
					17.5	74	76	0.56	0.04	0.06	"	2.8	"	0.02	0.016	<1	0.02
					10.1	76	78	0.01	0.05	0.06	"	4.1	"	0.01	0.013	<1	0.02
					7.9	78	80	0.01	0.02	0.03	"	1.4	"	0.01	0.004	<1	0.03
					8.3	80	81	0.01	0.01	0.04	"	1.4	"	0.03	0.020	1	0.02
					6.6	81	84	0.01	0.03	0.04	"	1.1	"	0.01	0.006	<1	0.04
					8.2	84	85	0.01	0.02	0.04	"	1.3	"	0.02	0.018	<1	0.02
					14.6	85	86	0.03	<0.01	0.22	0.1	5.0	"	0.02	0.006	3	0.03
					0.2	86	87	<0.01	<0.01	0.01	<0.1	<0.1	"	0.01	0.004	1	<0.01
					19.2	87	89	0.03	0.08	0.14	<0.1	6.6	"	0.02	0.013	2	0.04

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MINERALOGY AND PETROGRAPHY OF A TIN AND TUNGSTEN-BEARING SERPENTINITE SKARN

Renison Limited
Tasmania

3/89/0-GS3965/82 March 1982

SD 16

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31 March 1982

GS 3/89/0

Renison Limited,
PO Box 20,
ZEEHAN, Tas. 7469

Attention: L.A. Newnham
Chief Geologist

REPORT GS 3965/82

YOUR REFERENCE: PAR/cs/3450 - Letter 26 January 1982

MATERIAL: Crushed chips

IDENTIFICATION: Samples 1-6

DATE RECEIVED: 28 January 1982

WORK REQUIRED: Petrographic and microprobe identification of tin and tungsten minerals and host-rocks

Investigation and Report by: Dr Michael Farrand
X-ray Diffraction Analysis by: Dr Roger Brown
Electron-probe Microanalysis by: Peter Schultz

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MINERALOGY AND PETROGRAPHY OF A TIN AND TUNGSTEN-BEARING SERPENTINITE SKARN

1. INTRODUCTION

Six samples of crushed rock from diamond drill core were received from Renison Limited. The material is from the same deposit as samples A, B and C reported on in CS Reports 5619/81 and 6129/81 and consists of a hydrothermally altered serpentinite in which tin-tungsten mineralisation may have been introduced during the formation of a skarn.

Petrological descriptions of the samples were requested, together with identification and estimated proportions of tin and tungsten minerals.

2. PROCEDURE

Experience with Sample A emphasised the importance of instrumental identification of tin-bearing phases in the rock and samples were prepared for X-ray diffraction scans and electron-probe microanalysis as well as for transmitted light mineralogy and reflected light microscopy. Portions of the samples were screened at 10, 18, 36, 72 and 150 mesh. Chips were selected from the +10 mesh fraction, mounted in epoxy resin and sectioned to make polished thin sections for optical work. Portions of the -18+36 mesh fractions were mounted in resin and polished for electron-probe scanning.

Portions of the head samples were powdered and scanned by X-ray diffraction. The minerals identified are listed, with semi-quantitative abundances, for each of the samples. Several peaks for the spacing of major crystallographic planes could not be correlated with confidence with sets of peaks relating to known and listed minerals. Minerals which were checked agains the charts but which could not be identified are listed below.

Ludwigite
Chalopyrite
Vonsenite
Ilvaite
Marcasite
Arsenopyrite
Varlamoffite
Sphalerite
Talmakite
Brucite
Elbaite
Stannite
Schoenfliesite
Wykmannite
Szarbelyite
Fluoborite
Mulsite

Sample data are as follows:

Sample	Total Sn, %	Acid-Soluble Sn, %	WO_3, %	PTS	PS
1	0.40	0.03	0.04	C35530	30775
2	0.04	0.01	0.39	C35531	30776
3	0.96	0.66	0.24	C35532	30777
4	0.04	0.02	0.36	C35533	30778
5	0.26	0.24	0.21	C35535	30779
6	0.26	0.03	0.01	C35535	30780

3. RESULTS

3.1 Sample 1 224-225 m.

X-ray Diffraction Scan:

Mica (biotite or phlogopite)	CD
Serpentine (antigorite)	CD
Magnetite	CD
Chlorite	SD
Scheelite	A
Amphibole (monoclinic)	A
Fluorite	Tr

Semi-quantitative Abbreviations:

D = Dominant. Used for the component apparently most abundant, regardless of its probable percentage level.

CD = Co-dominant. Used for two (or more) predominating components both or all of which are judged to be present in roughly equal amounts.

SD = Sub-dominant. The next most abundant component(s) providing its percentage level is judged above about 20.

A = Accessory. Components judged to be present between the levels of roughly 5 and 20%.

Tr = Trace. Components judged to be below about 5%.

Petrography - PTS C35530

The range of lithologies represented by chips of this material is quite wide in both mineralogy and grain size. Four main categories are distinguished: micaceous, amphibolitic, chloritic and magnetic. The lithological types are not mutually exclusive.

The mica is colourless to pale green with an optic axial angle so small as to make the mica virtually uniaxial. It is a phlogopite and occurs in moderately well-shaped flakes up to 2 mm in length and also as poorly-shaped grains down to about 0.05 mm across. Some chips are almost monomineralic but there are usually patches of a green or pale yellow chlorite present and mica also occurs with amphibole and, more rarely, magnetite.

The main amphibole is colourless and monoclinic. It has a moderate birefringence and is poorly prismatic in shape. It sometimes forms fan-shaped aggregates. It is probably a tremolite. It occurs as almost monomineralic aggregates but is also associated with mica, chlorite and magnetite. Grain size is variable but approximates 0.25 mm.

A second amphibole is orthorhombic and forms sheaves of acicular crystals up to 2 mm long. It is anthophyllite and is usually associated with chlorite and magnetite.

The chloritic lithology consists of a mass of fine-grained platy minerals of low birefringence and includes alteration products which are strictly serpentines rather than chlorites. A variety of true chlorites is present including colourless, yellow and green types. Some of the chlorite exhibits an anomalous blue polarisation colour between crossed polarisers and is thus of penninite type. Antigorite is identified from its low birefringence and fibrous habit. Some chlorites form fine, felted masses, others form radiating rosettes. Chlorites and serpentines occur in both mica-rich and amphibole-rich lithologies but are most abundant in rock chips composed largely of opaque minerals, magnetite and pyrrhotite.

A paragenesis consisting chiefly of the latter two minerals has been called the magnetic lithology and will be described more fully in the next section.

The opaque minerals occur in granular, fibrous, bladed, massive and interstitial forms and as the filling of fine veinlets. Some of the occurrences of bladed forms are arranged as rosettes, interstitial to radiating plates of chlorite.

Opaque minerals occur in all the lithologies present but tend to be less abundant in micaceous and amphibolitic rocks than in chloritic and serpentine rocks, in which they may constitute almost the whole of the rock chip. Occasionally fine-grained siderite accompanies magnetite. Grain sizes vary between individual particles down to 0.02 mm across to large masses occupying almost the whole of a chip, about 3 mm across.

Three occurrences of minerals infrequently encountered in the chips are noted. One occurs only in one chip and consists of a few highly fractured grains of high birefringence and refractive index. These are possibly the humite identified in the X-ray diffraction scan but the fragments are too small for optical identification. The second rare mineral is isotropic, has a low refractive index and two sets of cleavages intersecting at about 90°. The mineral occurs in a chip composed almost entirely of mica and measures 2.5 mm in longest diameter. It is probably fluorite. This mineral also occurs in other chips associated with pyrrhotite. In its closest association it forms a rim round the pyrrhotite between the latter and a chloritic gangue. There is a narrow reaction rim around the fluorite composed of a yellow amorphous mineral. Fluorite also occurs as irregular and regular patches, the latter consisting of short strips en echelon in a fine-grained chlorite felt. In places the array of strips is curved to produce an open foliated texture. Some patches are as much as 0.15 mm in diameter but most are about 0.05 mm across. Pyrrhotite is usually adjacent or in the close vicinity of the fluprite.

The third mineral is garnet. It occurs only in one of the chips examined as grains of only moderate crystal outline in a micaceous lithology. Grain size is about 0.15 mm.

Cassiterite was not identified postively by optical means. A few very fine grains with high birefringence were identified as possible cassiterite but were too small for conclusive identification. Cassiterite was identified by the electron-probe.

Mineragraphy:

In reflected light the main opaque minerals are identified as magnetite and pyrrhotite with minor chalcopyrite and sphalerite and very minor galena.

The magnetite consists of grains, veinlets, patches and acicular prisms and varies in grain size, from 0.2 mm to 5 mm. Bladed magnetite forms radiating bundles of lath-like grains, often with irregular wider patches along their lengths. Patches of magnetite have lobate margins and are often well-crystallised in the centre with a poorly-crystalline margin. Individual grains of magnetite are dispersed interstitially through the silicate minerals. Radiating bladed magnetite is often interstitial to flakes of mica.

Large masses of magnetite and pyrrhotite are often crystallised together in intimate association. Masses of either or both minerals are often substantial enough to form the major part of a chip, usually with a gangue of chlorite or antigorite. It is this association which was referred to as the 'magnetic lithology' in the section on petrography.

The form of occurrence and grain size of pyrrhotite is similar to that of magnetite, with the addition that in a few chips the pyrrhotite occurs as a foliated mass.

Chalcopyrite occurs as fine-grained, irregular crystals which are occasionally locked in gangue but usually associated with either magnetite or pyrrhotite. Grain size is in the order of 0.05 mm to 0.005 mm.

Sphalerite often, but not always, forms compound grains with chalcopyrite. Grain size is almost always smaller than that of the chalcopyrite and does not usually exceed 0.02 mm.

Galena was observed at only one location. It occurred with a group of chalcopyrite and sphalerite grains and was included within or marginal to the sphalerite.

Electron-probe Microanalysis - PS30775:

Tin is contained in iron-bearing cassiterite. The cassiterite occurs as extremely fine-grained inclusions, usually about 2 to 5 μm across but occasionally up to 20 μm in diameter, in grains of serpentine which also contain iron oxide inclusions, in calcite and in magnetite.

The cassiterite always contains iron, up to a few percent, but does not contain magnesium.

Tungsten was not detected during scanning by electron-probe.

Examination under Ultra-violet Light:

A few grains of scheelite fluoresced in a half portion of the head sample. None were seen when the polished thin section was viewed under the ultra-violet lamp.

Mineralogy of the Tin and Tungsten:

1. Tin.

The tin content of the sample is almost entirely located in extremely fine-grained cassiterite. The electron-probe microanalysis shows that the cassiterite contains up to a few percent of iron but no detectable magnesium. Grain sizes are usually in the order of 2 to 5 μm although grains up to 20 μm diameter are occasionally encountered. The gangue is usually chlorite.

Since the conclusion in the earlier reports on samples A, B and C (GS5619/81 and 6129/81) had been that schoenfliesite was possibly the major tin-bearing mineral in the ore, the mineral was carefully sought in the samples presently under investigation. However, it was not detected by optical or instrumental techniques in any of the samples in the current batch. Considerable variation is apparent between samples.

The relatively low percentage of acid-soluble tin in the assay of sample 1 may be contained in minerals so sparse that they were not detected optically or instrumentally. However, the electron-probe does not discriminate between oxides and hydroxides and it is possible that some of the cassiterite detected may be hydrated.

2. Tungsten.

The presence of scheelite was detected both by X-ray diffraction and by examination of the untreated sample in ultra-violet light. The relatively low concentration of tungsten in the sample is almost certainly contained in the scheelite.

3.2 Sample 2 233-234 m.

X-ray Diffraction Scan:

Mica (biotite or phlogopite)	D
Magnetite	SD
Fluorite	A
Sellaite? (MgF_2)	A
Serpentine (lizardite)	A
Amphibole (?anthophyllite)	Tr-A
Unknowns	

Petrography - PTS C35531:

Variations of the mica-rich lithology make up the most abundant chips in the sample. Fluorite is common as irregular grains up to 0.15 mm across and in patches up to 2mm across, occurring as inclusions within masses of fine-grained mica. Sellaite (MgF_2) occurs in an identical form to fluorite and its presence has been tentatively confirmed by X-ray diffraction. Patches of sellaite are up to 2 to 5 mm wide while individual grains average about 0.5 mm across. The finest grains are only a few microns across but by far the most part of the sellaite is coarser than 0.1 mm in grain size. It occurs in a gangue of mica, sometimes with fluorite and sometimes with magnetite and chlorite.

The magnetite-chlorite paragenesis is less distinct in this sample than in sample 1 and co-exists with the mica-rich paragenesis in the same chips. Both fluorite and sellaite are present in the paragenesis.

Very little of the amphibole-rich lithology is represented in this sample. One chip is composed largely of amphibole and contains in addition granular magnetite and a little sellaite.

Tin is not abundant in this sample and no tin-bearing minerals were recognised.

Mineragraphy:

Both magnetite and pyrrhotite are finer-grained in this sample than in sample 1. No large masses are present and where the quantity of iron mineral is high it usually consists of an open aggregate of grains in the order of 0.05 mm across. Pyrrhotite aggregates in particular are very irregular and grain margins are lobate with extensions interstitial to the silicates.

Chalcopyrite is not common in this sample but in one chip forms an unusually coarse-grained intergrowth with pyrrhotite. Areas of chalcopyrite are up to 0.15 mm across.

Sphalerite was only observed at the point of the pyrrhotite-chalcopyrite intergrowth and the maximum grain size was 0.035 mm.

No galena was observed.

Electron-probe Microanalysis - PS30776:

No tin-bearing mineral was detected.

Tungsten is contained in wolframite grains, about 0.1 to 0.3 mm in diameter. The wolframite occurs as inclusions in iron oxide phases.

Examination under Ultra-violet Light:

Only one grain of scheelite fluoresced in a half portion of the head sample. No fluorescence was seen in the polished thin section.

Mineralogy of the Tin and Tungsten:

1. Tin.

The low tin content of the sample was not detected by optical, XRD or EPMA techniques.

2. Tungsten.

The tungsten content of the sample, although significant, is below the detection limit of the X-ray method. Wolframite was not recognised optically, possibly due to its indistinctive optical properties. The detection of wolframite by the electron-probe and the virtual absence of scheelite shown by ultra-violet light suggests that in sample 2 the tungsten is contained in wolframite of moderate grain size, between 0.1 and 0.3 mm.

3.3 Sample 3 247-248 m.

X-ray Diffraction Scan:

Mica (biotite or phlogopite)	D
Serpentine (?antigorite)	A-SD
Magnetite	A-SD
Fluorite	Tr
Unknowns	

Petrography - PTS C35532:

A lithology which has only rarely been encountered in this suite of samples so far is common among the percussion chips of sample 3. It consists of mica, magnetite and a mineral with a faint brown pleochroism, polysynthetic twinning, high birefringence, high refractive index, an optic axial angle close to 90° and a positive optical sign. From the X-ray diffraction scan it is a mineral in the series humite-clinohumite. The extinction angle is not diagnostic since the structurally monoclinic members of the series are optically orthorhombic. The optic axial angle is highest in clinohumite, however, and that is probably the identity of the mineral occurring in the rocks of this suite.

The mica-rich paragenesis is again much more common among the chips than the amphibole-rich lithology. Both coarse and fine-grained mica occur, in different chips, the grain size of the flakes varying between a few microns and 1 mm in length. The clinohumite only occurs in the coarse-grained chips, where it is often more abundant than the mica.

Clinohumite and opaque minerals, dominantly magnetite, form a two-phase paragenesis in some chips. However, mica, opaques and clinohumite constitute a more common paragenesis. Grain size of clinohumite is about 0.5 mm.

The chlorite-opaques lithology is represented among the chips, both with and without mica. It is less common than the mica-rich parageneses.

The few occurrences of amphibole comprise patches of poorly-sorted grains mainly about 0.5 mm in length but including coarser grains up to 1 mm long. The patches occur in a dominantly chloritic lithology.

The high soluble tin content of this sample is not the result of a high content of schoenfliesite, as was anticipated. If the sample used for making the polished thin section is representative of the whole sample in which almost 1% Sn was detected, the only optically identifiable source for it is in a fibrous red-brown mineral attached to, and contained in pockets within, masses of opaque iron oxide.

The fibres grow from the margin of the oxide in a matrix of a chloritic mineral of low birefringence and low refractive indes. Many of the chips contain oxide with the fibrous mineral which could possibly amount to about 1% of the whole material. The fibres are too fine-grained to be identified optically but are possibly cassiterite. The solubility of a large proportion of the tin in hot *aqua regia* is due either to the poorly crystalline nature of the cassiterite, to its partially hydrated composition or to the fact that cassiterite itself is slightly soluble in the acid and, when present as fibres, even true cassiterite is partially dissolved.

Scheelite occurrs as two grains about 0.3 mm in diameter and as one patch about 0.5 mm across containing rather irregular and fragmentary scheelite.

Mineragraphy:

Magnetite occurs as individual grains with a fairly good external shape but an open interior, often with a sieve texture. The grains of about 0.5 mm diameter are loosely to closely aggregated into patches 5 mm across.

Pyrrhotite occurs in forms similar to those of the magnetite and is often intergrown with patches of magnetite. It also occurs as ragged grains interstitial to silicate minerals and as the filling of fine veinlets a few microns across.

Pyrrhotite intergrowths with chalcopyrite are more common and coarser-grained than in sample 2. Patches of chalcopyrite measure up to 0.5 mm across.

Smaller patches of sphalerite, cubanite and arsenopyrite are also intergrown with pyrrhotite and chalcopyrite.

Electron-probe Microanalysis - PS30777:

Tin is contained in manganiferous magnetite with a fibrous structure. The magnetite grains are about 300 to 700 μm across. Individual fibres are about 20 μm across. Tin concentrations are commonly about 5% but are occasionally as high as 10%. No magnesium is present.

A minor amount of tin occurs in extremely fine-grained (<5 μm) inclusions of cassiterite in magnesium-iron silicate, probably chlorite.

Tungsten occurs in large grains of scheelite, in a gangue of alumino-silicates.

Examination under Ultra-violet Light:

Many grains of scheelite fluoresced in the sample, some of them of coarse grain size. One grain about 1 mm across and two about 0.5 mm across occurred in the polished thin section.

Mineralogy of the Tin and Tungsten:

1. The major proportion of the tin is contained in an iron-manganese oxide phase with a fibrous structure. The electron-probe scan detected this mineral as part of a grain in which the fibres are massed. This was not visible optically. The fibrous material radiating from the edges of opaque minerals which is extremely prominent when viewed in transmitted light in thin section only outcrops on a polished surface as fine points. When these were probed with the electron beam some were found to carry substantial tin, others a little tin and in many the tin was below the limit of detection.

   Even within a small radius the composition of the ore and ore minerals is very variable. The variation probably encompasses both the radiating fibres and the fibrous material in the massive patches of oxide, mainly magnetite, which were found by EPMA to be the major source of tin in the sample.

   Iron and iron-manganese oxides are probably the source of tin which is soluble in boiling *aqua regia*. The small amount of acid-insoluble tin in the sample is accounted for by the presence of extremely fine grains of cassiterite (<5 μm). These grains are contained in a magnesium-iron silicate, probably chlorite.

2. Tungsten.

   There is little doubt that the tungsten content of the sample is contained in the scheelite detected optically, by the electron-probe and in ultra-violet light. This is probably below the detection limit of the X-ray technique. The scheelite occurs in grains up to nearly a millimetre in diameter but these often consist of a mass of finer grains about 0.05 mm in diameter. For the purposes of beneficiation the ore could be treated at the coarser grain size. Gangue minerals include chlorite, mica and magnetite.

3.4 Sample 4 248-249 m.

X-ray Diffraction Scan:

Mica (biotite or phlogopite	D
Serpentine (lizardite)	A
Magnetite	A
Amphibole (monoclinic)	A
Fluorite	Tr
?Humite/clinohumite	Tr
Unknowns	

Petrography - PTS C35533:

The lithologies present among the chips of this sample are micaceous, amphibolitic, chloritic and rich in clinohumite. The opaque mineral content of the sample as a whole is low. The chlorite-rich paragenesis is not abundant but amphibole is more common than in the two samples last described.

A little fibrous material round a few of the relatively sparse opaque masses may account for the low tin content of the sample.

Five grains over 1 mm across fluoresce under ultra-violet light in the polished thin section. The fluorescence is weak, however, and is seen under the microscope to originate from masses of fine, poorly-defined and irregularly-shaped grains which include scheelite but consist largely of chlorite, clinohumite and opaque minerals. Clinohumite is quite abundant.

Mineragraphy:

Magnetite is present as extremely well-shaped crystals about 0.35 mm across. The crystals are often amalgamated into patches up to 3.5 mm across. The patches have many inclusions of silicates, giving a sieve texture in places.

Pyrrhotite occurs as scattered grains of irregular shape and fine grain size, about 0.005 mm, and as large irregular masses up to 1.5 mm across, often intergrown with magnetite and chalcopyrite. Pyrrhotite grains and masses are of poor shape and tend to be interstitial to both magnetite and silicates.

Chalcopyrite is usually intergrown with pyrrhotite in irregular grains up to 0.2 mm across.

More rarely it occurs as independent grains about 0.03 mm across. In one chip chalcopyrite forms a rim round pyrrhotite which is in contact with magnetite grains.

Sphalerite was not recognised in this sample but galena wa observed as two moderately well-shaped crystals 0.1 mm in diameter enclosed in silicate grains.

Arsenopyrite was observed in one chip as a few irregular grains up to 0.25 mm across at the margin of a mass of pyrrhotite.

In the same chip four grains of a pale grey-white mineral between 0.2 mm and 0.02 mm across were enclosed in magnetite. The mineral is soft with a poor polish and a surface tarnish. It has a fain red internal reflection and a weak anisotropism from grey to a faint brown colour. It is possibly zinkenite.

Fine-grained interstitial material adjacent to the above material is a sulphide or sulphosalt too tarnished for identification.

Electron-probe Microanalysis - PS30778:

No tin was detected in the sample.

A grain of scheelite was observed, measuring 0.15 × 0.6 mm. The grain was free.

Examination in Ultra-violet Light:

This sample had the highest visible content of scheelite in the whole suite. Very many grains up to 2.5 mm across fluoresced strongly. Five grains were seen in the polished thin section. Their fluorescence was weak.

Mineralogy of the Tin and Tungsten:

1. Tin.

   The tin content of the sample is too insignificant to be detected either optically or instrumentally without prior concentration.
2. Tungsten.

   The tungsten occurs in patches containing scheelite. The patches are up to 2.5 mm across but the individual grains of scheelite are varied in size, including grains below 0.05 mm. The other minerals involved are silicates such as chlorite and clinohumite which would probably not prevent beneficiation at the coarser grain size but include iron oxides and sulphides which would affect any magnetic treatment which might be contemplated.

3.5 Sample 5 281 - 282 m.

X-ray Diffraction Scan:

Mica (biotite or phlogpite)	D
Magnetite	SD
Serpentine (lizardite)	A
Amphibole (monoclinic)	A
Fluorite	Tr
Unknowns	

Petrography - PTS C35534:

The mica-rich paragenesis is subordinate to the amphibolitic lithology in this sample. Clinohumite and chlorite are quite abundant and opaque minerals moderately so. A wide range of chloritic and serpentine minerals are present.

Grains of scheelite, about 0.5 mm in diameter are present and probably account for the tungsten content of the sample. In one weakly fluorescent patch about 3 mm across, fine grains (about 0.05 mm) of scheelite are closely interlocked with grains of amphibole of about the same grain size. The appreciable tin content is less easily accounted for. No schoenfliesite has been identified and only a little of the fibrous mineral which may be a form of cassiterite is present. The sampling problem is always present with percussion chips.

A small amount of carbonate forms a rim round one chip of almost isotropic yellow chlorite.

Mineragraphy:

Magnetite occurs as large irregular masses, up to 2.5 mm across, with lobate margins and open interior. In some chips the magnetite has the fibrous texture encountered in sample 1. Well-crystallised magnetite is often surrounded by poorly-crystalline material with a blue-grey reflectivity. Internal reflections are brown rather than red and the material is probably goethite. Magnetite is also present as independent grains about 0.1 mm in diameter.

Pyrrhotite is less common than magnetite and of poorer shape.

In independent grains up to 0.35 mm across pyrrhotite is interstitial to the silicate gangue. When it occurs in masses pyrrhotite is usually intergtown with magnetite and sometimes with chalcopyrite. Pyrrhotite often forms rims to magnetite grains and the reverse relationship is sometimes observed.

Chalcopyrite is not abundant but occurs as inclusions in pyrrhotite up to 0.35 mm in diameter.

Electron-probe Microanalysis - PS30779:

Tin is contained in fibrous, manganiferous magnetite. Tin values are variable but average about 5%. The fibrous magnetite is closely interlocked with silicate phases.

Tungsten occurs in scheelite grains measuring up to 0.3 × 0.4 mm.

Examination in Ultra-violet Light:

Many scheelite grains fluoresced in the head sample; most were of fine grain size than in sample 4, about 0.5 mm. The polished thin section contains three grains of about 0.5 mm diameter and one weakly fluorescent chip about 3 mm across.

Mineralogy of the Tin and Tungsten:

1. Tin.

The tin is contained in the fibrous, manganiferous magnetite which is not distinguishable optically from the normal fibrous magnetite in the sample, of which it makes up a minor proportion.

2. Tungsten.

Scheelite is identifiable optically, by fluorescence in ultra-violet light and in the electron-probe. It is certainly the source of the tungsten in the sample and occurs with a silicate gangue in grain sizes down to 0.5 mm. Scheelite-rich patches contain grains down to 0.05 mm in diameter but could be treated as one grain.

3.6 Sample 6 306 - 307m.

X-ray Diffraction Scan:

Serpentine (lizardite)	D
Pyrrhotite	A
Pyrite	A
Siderite?	Tr-A
Calcite?	Tr
Magnetite?	Tr
Mica?	Tr
Quartz?	Tr

Petrography - PTS C35535:

This sample is unlike any of the samples previously described. The chips consist only of serpentine, chlorite, carbonate and opaque minerals.

The platy minerals include green and brown types but are mainly pale yellow-brown and virtually isotropic. Most grains consist of a felted mass of fine flakes but some coarser-grained and fibrous forms do occur.

The carbonate forms veins, patches and regular intergrowths with the serpentine minerals. Grain sizes up to 0.1 mm are present.

Cassiterite occurs in patches of irregular grains, some of which are 0.5 mm across. It is a well-crystallised, foxy-red cassiterite and, from the assays received, very little of it is soluble in hot *aqua regia*. It occurs within serpentine minerals by itself or associated with magnetite.

No schoenfliesite was identified and no tungsten-bearing mineral was seen.

Mineragraphy:

Neither magnetite nor pyrrhotite are well-shaped in this sample. They both form irregular, rather poorly crystalline masses with an open, skeletal texture, and are also present as the filling of an irregular, branching system of veinlets of various widths. Both minerals are closely intergrown in places and inclusions of one occur within the other. A paler, less anisotropic pyrrhotite is present as independent grains and as rims to darker pyrrhotite.

Chalcopyrite is also intergrown with pyrrhotite. Grains of about 0.1 mm occur within and at the margins of pyrrhotite grains in veins and patches.

Sphalerite is abundant in this sample, more abundant than chalcopyrite and much more abundant than was encountered in the samples previously described. It occurs in many of the chips with both magnetite and pyrrhotite but not attached to either. It forms irregular, open patches up to 1 mm across and contains oriented inclusions of both chalcopyrite and pyrrhotite. The inclusions have probably exsolved from the sphalerite and measure between 0.01 and 0.001 mm in length.

Marcasite occurs at one point as fairly well-shaped crystals up to 0.35 mm across.

Electron-probe Microanalysis - PS30780

Tin is contained in fine-grained (<10 μm) inclusions in serpentine, associated with similarly fine-grained iron oxide inclusions. Because of the spread of reflected electrons it is not possible to determine whether excited magnesium radiation originates from the extremely fine-grained tin-bearing particles or from the surrounding serpentine. In view of the high proportion of acid-insoluble tin in the sample, the small inclusions are probably cassiterite rather than schoenfliesite.

No tungsten-bearing phases were detected in the sample.

Examination under Ultra-violet Light:

A few grains of scheelite fluoresced under ultra-violet light in the head sample. The scheelite content appears to be of the same order of magnitude as that of sample 1. No fluorescent grains occurred in the polished thin section.

Mineralogry of the Tin and Tungsten:

1. Tin.

The tin occurs in micron-sized particles, which are probably cassiterite, contained in a serpentine gangue. The small amount of acid-soluble tin could possibly be contained in schoenfliesite but is perhaps more likely to be in the iron-manganese oxide phase.

2. Tungsten.

The low tungsten content of the sample is contained in rare grains of scheelite.

4. COMMENT

The most prominent feature of the samples is their diversity. Not only do the litholgical characteristics vary from sample to sample but also the nature of the tin-bearing phases and, to a lesser extent, the tungsten-bearing phases. Considering also sample A which was described in Report GS 5619/81 and samples B and C, described in Report GS 6129/81, the tin-bearing minerals so far identified comprise:

1. Cassiterite.
2. Iron-bearing cassiterite.
3. Schoenfliesite.
4. Iron-manganese schoenfliesite.
5. Tin-bearing iron-manganese oxide.

The suggestions made on the basis of the investigation of the earlier batches of samples, that schoenfliesite is the major tin-bearing mineral, are no longer valid in the light of the present investigation. The diversity of the tin-bearing phases, together with the extremely fine grain size of many of them, presents considerable metallurgical problems.

Although there is a general tendency for the tin minerals to be associated with either pyrrhotite or magnetite, the association is neither close nor consistent enough to guarantee a good recovery based on the magnetic separation of a coarse-grained rougher concentrate followed by further milling and a second magnetic separation of a non-magnetic tin concentrate. It is possible that both the tin-bearing iron-manganese oxide and the iron and manganese-rich schoenfliesite have strong, but different, magnetic susceptibilities.

There appear to be two main approaches to the problem but both are likely to involve high costs. The first is to mill extremely fine and attempt to separate different tin-bearing fractions by physical beneficiation methods. The second is to try and extract the tin hydrothermally or pyrometallurgically. A programme of metallurgical tests could be formulated to investigate these possibilities if required.

PETROGRAPHY OF TIN-BEARING SKARN

Renison Limited
Tasmania

3/89/0-GS6512/82 June 1982

SD 18A

153

64 153

The Australian
Mineral Development
Laboratories

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SA 5063
In reply quote:

30 June 1982

GS 3/89/0

Renison Limited,
PO Box 20,
ZEEHAN, Tas. 7469.

Attention: L.A. Newnham

REPORT GS 6512/82

YOUR REFERENCE: Letter DJK/sjd/300 of 9 June 1982

MATERIAL: Percussion chips

IDENTIFICATION: B1 - B6

DATE RECEIVED: 10 June 1982

WORK REQUIRED: Petrography, identification of Sn and W host minerals

Investigation and Report by: Dr Michael Farrand
Electron-probe Microanalysis by: Peter Schultz

Chief - Geological Services Section: Dr Keith J. Henley
Manager, Mineral and Materials Sciences Division: Dr William G. Spencer

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jd/9

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PETROGRAPHY OF A TIN-BEARING SKARN

1. INTRODUCTION

A further six samples of a tin, tungsten and zinc-bearing skarn were received from Renison Limited with a request for petrographic descriptions and identification of the host minerals of the tin and tungsten and their relationship with the rest of the paragenesis.

2. PROCEDURE

Samples of chips of +10 mesh and -18+72 mesh were riffled out of portions of each sample and were mounted in epoxy resin. Polished thin sections for microscopic examination were prepared from the +10 mesh chips and polished mounts from the -18+72 material for electron-probe microanalysis. Each sample was scanned for an hour by electron-probe microanalysis.

Specimen and polished section numbers are:

	PTS No.		PTS No.
B1	44770	B4	44773
B2	44771	B5	44774
B3	44772	B6	44775

3. RESULTS

3.1 Microscopic Examination

Sample: B1; PTS44770 123.5 - 126.5m

Petrography:

The rock chips in this sample are largely of the types identified previously as the chondrodite-humite lithology and the carbonate lithology.

The mineral which is probably clino-humite occurs occasionally as strongly zoned and almost euhedral crystals up to 4 mm long but occurs more commonly as highly fragmented and altered grains down to about 0.1 mm across, closely interlocked with opaque and isotropic amorphous material. This type of lithology also contains quite abundantly a mineral of low birefringence which forms rosettes and cruciform shapes which are like a four-fold twin. It is probably sellaite but might be unusually well-crystallised antigorite.

The second, less abundant, major lithology consists of a carbonate which is probably magnesite. Grain size is normally less than 0.1 mm but occasional crysalts are up to 0.5 mm across. It is closely crystallised with opaque and amorphous minerals.

Rarer minerals include fluorite which in one chip occurs as a single crystal 1.2 mm in diameter. It is bordered by a rim of sellaite up to 0.5 mm thick which has, in part, a fibrous habit.

A second accessory mineral which is more abundant than fluorite, and more significant economically, is sphalerite. This occurs as large, irregular grains and patches which are probably of replacement origin.

The coarsest grain measured was 2.7 mm across. Two of the chips consist entirely of sphalerite.

Mineragraphy:

The reflecting minerals in this sample are radically different from those identified earlier in samples from this suite.

A few small, irregular grains of pyrrhotite are present, both as independent grains in silicate gangue and as fine inclusions in sphalerite but the large masses of pyrrhotite observed in other specimens are absent from sample B1.

The major sulphide phase is the sphalerite. It is a deep red-brown colour in transmitted light, in places so deep as to be almost opaque. In reflected light it is strongly reflecting and only shows red-brown internal reflections at edges and along fractures. Two types of oriented inclusions about 0.02 mm long are present; the first is brownish and anisotropic and is probably pyrrhotite, the second is creamy-yellow and anisotropic and is probably cubanite. There is a gradation in colour between the two types of inclusion and the amount of copper present is probably somewhat variable.

The second most abundant sulphide is pyrite. It occurs as irregular and fragmented grains up to 1.5 mm across. In some chips the pyrite is poorly crystalline, in others it is slightly anisotropic and is possibly tending towards the marcasite structure.

Chalcopyrite is not abundant but forms large, irregular, skeletal and fragmented masses in a few chips. One irregular patch associated with poorly crystalline pyrite measured over 2 mm across and in one chip thin stringers of chalcopyrite in fractures and along grain boundaries of silicates occurred discontinuous for 1.3 mm.

Within the large patch of chalcopyrite which, as mentioned above, is associated with poorly crystalline pyrite, there is also a small patch of arsenopyrite about 0.2 mm across, consisting of irregular and interlocking grains about 0.05 mm across.

No tin or tungsten-bearing minerals were identified optically.

Sample: B2; PTS44771 160 - 162 m.

Petrography:

The clino-humite lithology is the only one represented in these chips.

Accessory minerals are sellaite, in grains up to 1.5 mm in diameter with acicular inclusions, and a little carbonate, probably magnesite, in grains up to 2 mm in diameter.

Mineragraphy:

The reflecting minerals, sphalerite, cubanite, arsenopyrite and chalcopyrite occur occasionally in this specimen. In one chip all four minerals occur closely interlocked in a single patch 0.3 mm across included in silicate gangue. More often the sulphides occur as scattered, irregular grains. They are not abundant.

Even rarer are a few fine grains of pyrite about 0.05 mm across.

No tin or tungsten minerals were recognised.

Sample: B3; PTS44772 211 - 214 m.

Petrography:

Clino-humite is again the dominant mineral in these chips but there is a large amount of isotropic to very weakly birefringent material which includes flurite and sellaite and also, probably, antigorite.

Carbonate is not abundant in the specimen but there is a considerable amount of opaque material.

Mineragraphy:

The reflecting minerals in this specimen mark a return to the lithologies encountered in batches of samples described in earlier reports. Large masses of pyrrhotite and magnestite are abundant. Pyrrhotite occurs as irregular masses, often intergrown with magnetite, up to 0.5 mm across. Magnetite includes the fibrous forms which were evident in specimens described in other reports and with which the tin-bearing phase has been identified.

Arsenopytie, closely crystallised with pyrrhotite in one chip, pyrite with pyrrhotite in another and a few grains of sphalerite in a third chip are accessory sulphides.

Sample: B4; PTS44773 214-218m.

Petrography:

The transparent minerals in this sample are of a type which occurred in samples described earlier. The clino-humite and sellaite lithologies are still present but are less dominant and subject to much replacement. The magnetic, antigoritic and, particularly, the amphibolitic lithologies have become more important in this specimen. The amphibole is tremolite and consists of bundles or sheaves of ragged, altered, lath-shaped crystals. It is partly replaced by opaque material in many of the chips.

A little carbonate is present, some of it with colloidal textures.

Mineragraphy:

In reflected light the three iron phases, magnetite, pyrrhotite and pyrite are virtually the only reflecting phases present. Of these, magnetite is the most abundant and occurs as irregular masses, as mosaics of almost euhedral grains and as sheaves of radiating fibres. Pyrrhotite occurs as scattered, skeletal grains and as patches within masses of magnetite. A few occurrences of fibrous pyrrhotite were observed among patches of fibrous magnetite. Pyrite occurs as a patchy replacement of pyrrhotite, often observed with magnetite as well, and as masses of monomineralic pyrite. It is also present as a filling of fractures and grain boundaries in silicate rock.

A few grains of chalcopyrite about 0.02 mm across, scattered sparsely through one chip, represent the only other reflecting mineral.

The source of the 0.5% Sn was not identified.

Sample: B5; PTS44774 218-222 m.

Petrography:

The clino-humite lithology is again substantial in this sample. Other lithologies present are the tremolitic, the antigoritic and the magnetic. Much of the mineralogy is obscured by fine-grained and patchy opaque material.

Mineragraphy:

Magnetite occurs in irregular masses up to 0.5 mm in diameter but is more common as bundles of fine-grained fibres and fine dusty particles arranged in rectangular and irregular patterns.

Pyrrhotite is less common and occurs in a similar way to the magnetite. Patches of pyrrhotite often occur within areas of magnetite.

Pyrite is less common still and occurs as fine inclusions and patches within grains of pyrrhotite and as the filling of fine veinlets in one chip composed of fine-grained antigorite and ragged magnetite and pyrrhotite grains and fibres.

The host minerals for tin, tungsten and zinc were not identified optically.

Sample: B6; PTS44775 222 - 227 m.

Petrography:

The clino-humite lithology is dominant in this sample but has been strongly replaced by opaque material along grain boundaries and fractures. Chips of tremolite rock carry a great deal of opaque material, some of it in very fine acicular forms. Antigorite rocks also contain opaque material.

Mineragraphy:

The dominant reflecting mineral is magnetite, in massive, patchy and acicular form. Pyrrhotite is much less common and occurs as irregular patches in a few of the chips and as occasional patches within magnetite. Pyrite occurs sparsely as fine-grained inclusions and patches within pyrrhotite grains.

In one chip a few irregular grains of chalcopyrite about 0.05 mm across are interlocked with pyrrhotite grains.

In another chip a few grains of arsenopyrite about 0.02 mm across occur in a group in the absence of any other sulphide.

No tin, tungsten or zinc host minerals were identified.

3.2 Electron-probe Microanalysis

Sample: B1

Neither tin nor tungsten-bearing minerals were detected by EPMA.

Sample: B2

Neither tin nor tungsten-bearing minerals were detected by EPMA.

Sample: B3

Tin was detected in schoenfliesite grains about 10 µm diameter. The schoenfliesite contains about 1.5% manganese but no iron above the detection limit of about 200 ppm. The particles of schoenfliesite were included in and between the fibres of a mass of fibrous magnetite.

Sample: B4

Tin was detected in both cassiterite and schoenfliesite in this sample. Cassiterite grains were included in spongy magnetite and varied between 2 µm and 20 µm in grain size. Schoenfliesite grains were contained in the same material and measured about 10 µm in diameter.

No tungsten was detected.

Sample: B5

Tin was again detected as both cassiterite, in grains about 10 µm in diameter, and schoenfliesite, in grains between 2 µm and 20 µm in diameter. Both tin minerals were included in magnetite.

No tungsten was detected in the sample.

Sample: B6

In this sample tin is present as cassiterite in grains between 1 µm and 10 µm in grain size, included in patchy and acicular magnetite. Tin values were also detected within the magnetite itself. The distribution of tin was patchy and uneven and might be due either to a variable concentration in solid solution in the magnetite or to the presence of groups of inclusions too fine to be resolved by the electron beam (about 1 µm across).

No tungsten was detected in the sample.

3.1 Examination in Ultra-violet Light

The untreated samples and the polished thin sections were examined under an ultra-violet lamp with the following results:

Sample: B1

No scheelite observed.

Sample: B2

Many grains of scheelite fluoresced brightly in the head sample but none were observed in the polished thin section.

Sample: B3

A few grains of scheelite fluoresced dully. These are probably fragmentary grains such as were observed in an ealier batch of samples. No scheelite was observed in the thin section.

Sample: B4

A few grains of poorly-fluorescent scheelite were observed in the head sample but none in the section.

Sample: B5

A few grains of poorly-fluorescent scheelite were observed in the head sample but none in the section.

Sample: B6

Many grains of scheelite were observed in the head sample but these were of the poorly-fluorescent, probably fragmented type. No scheelite was observed in the polished thin section.

6265.

RENISON LIMITED 82-1835R

LOCALITY MAP

GEOLOGIST :
DRAUGHTSMAN : E Vickers
DATE :

SCALE · 1:50,000 METRES
MAP 1 1,000,000
1000 0 1000 2000

REVISION
5 cm

DRAWING No.
1.

64 165

6265

LEGEND

GEOLOGY

Upper Proterozoic Oonah Formation

Puo-h	Hanging Wall Quartzites
Puo-s ▨	Skarn - Carbonate Unit Magnetite - bearing Ironstone (Gossan ?)
Puo-f	Footwall Slates

IGNEOUS ROCKS

+ +	Fine to medium grained granite - adamellite (Heemskirk Granite)

SYMBOLS

70°	Bedding, with dip.
80°	Overturned bedding, with dip.
	Vertical bedding
20°	Vein or joint, with dip.
	Vertical vein or joint.
y	Direction of younging (from cross-bedding)
— —	Geological contact - position approximate.
—?—	Geological contact - position inferred.
F—F	Fault, position approximate, showing dip orientation.
F —?— F	Fault, position inferred.
	Mapped outcrop location.

DIAMOND DRILL HOLES

○———┤	Located or surveyed by Renison.
○- - - -┤	Not located by Renison.

6266

64 166

RENISON LIMITED

82-1835R

ST. DIZIER AREA

INTERPRETATIVE GEOLOGY MAP

GEOLOGIST	: P.A.R. & D.K.
DRAUGHTSMAN	: T.G.D.S.
DATE	: July, 1982
REVISIONS	

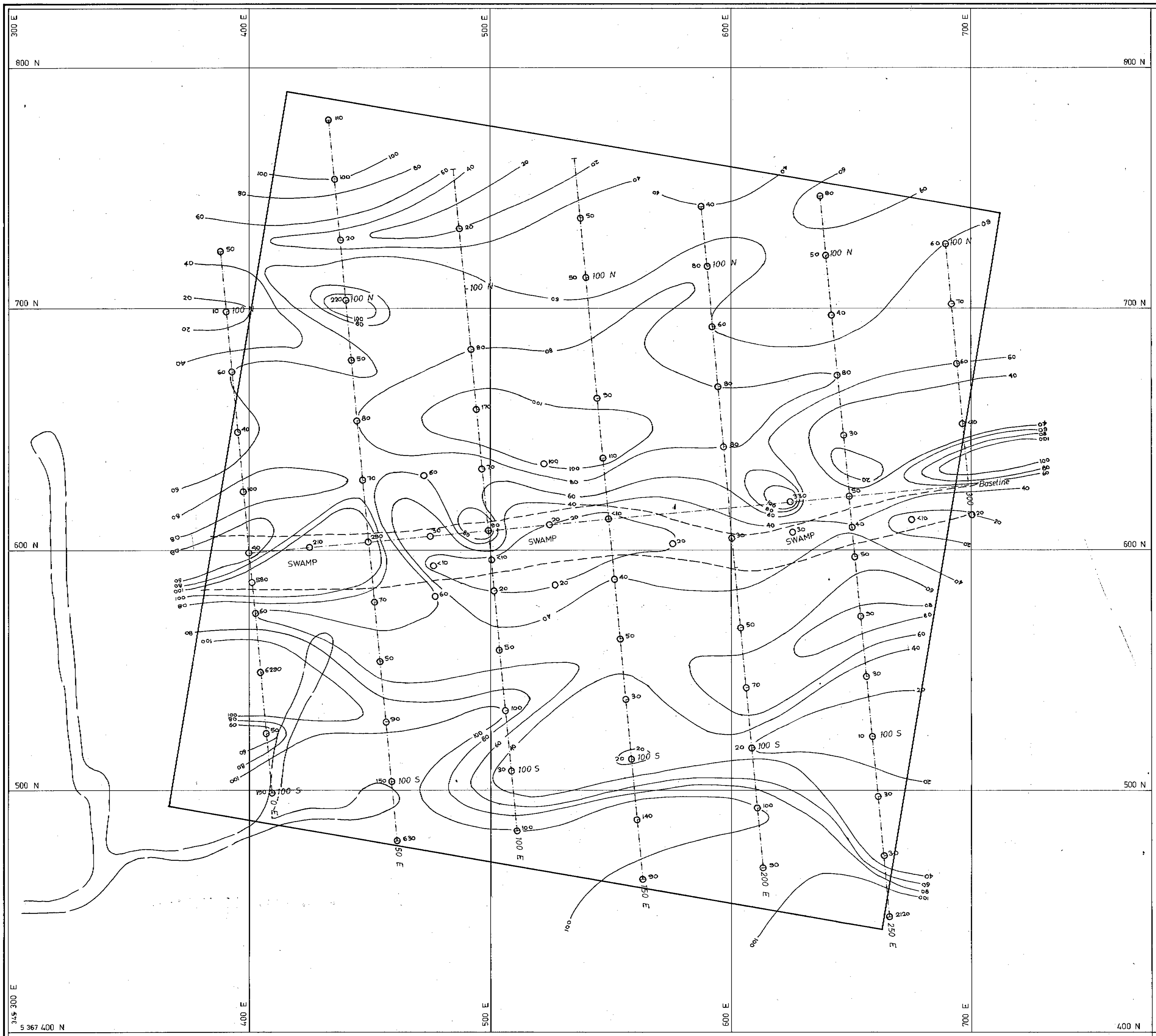
SCALE 1:1000 METRES

20 0 20 40

5 cm

DRAWING No. 2.

6266



64 167

RENISON LIMITED 82-1835R

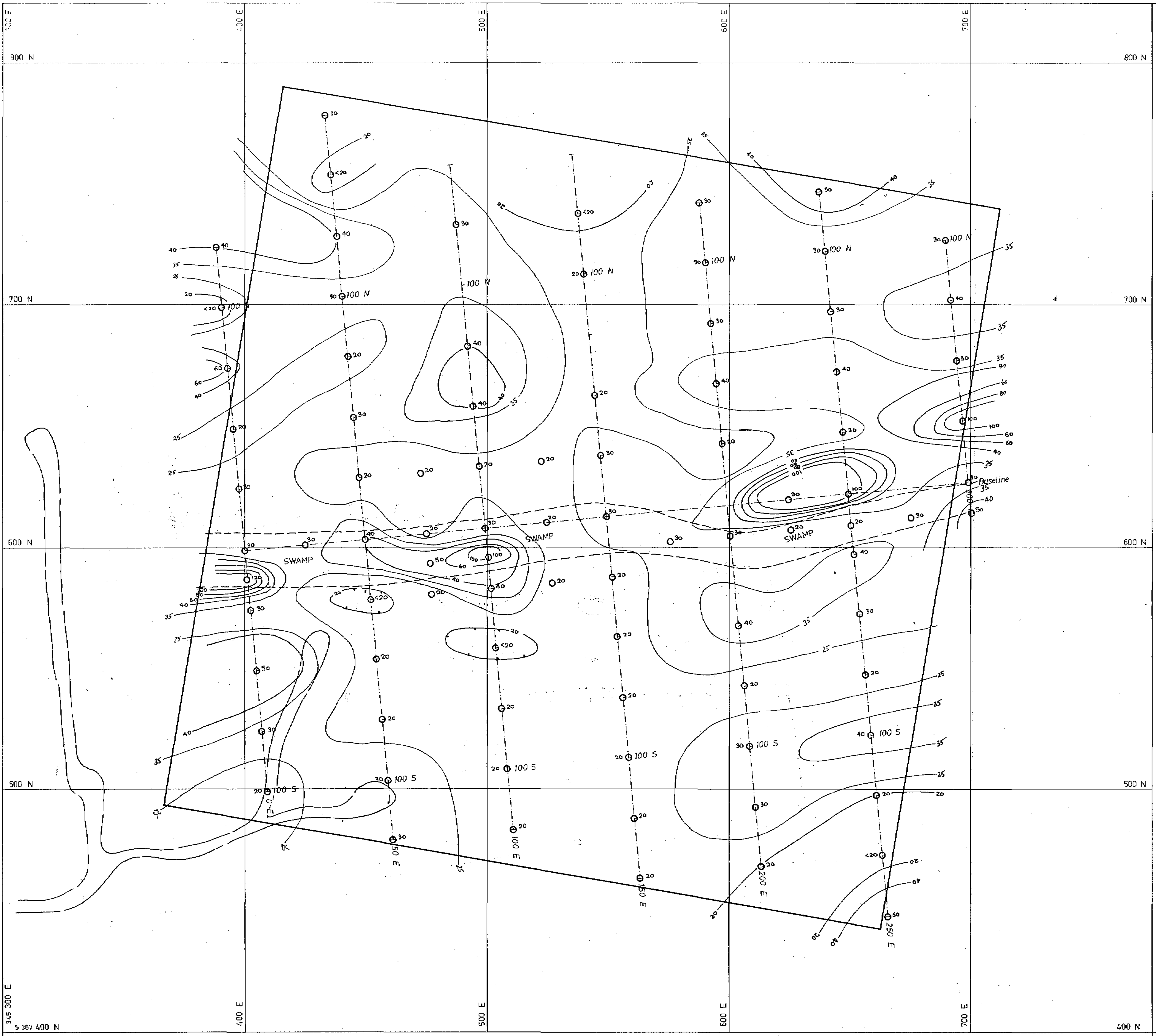
ST DIZIER AREA
FOURTH LEASE
BEDROCK GEOCHEMISTRY. Sn ppm.

GEOLOGIST : D. Kilpatrick
DRAUGHTSMAN : A. White
DATE : April 1982
REVISIONS

SCALE 1: 1000METRES

DRAWING No. 3 A.

6267



64 168

RENISON LIMITED 82-1835R

ST DIZIER AREA
FOURTH LEASE
BEDROCK GEOCHEMISTRY. WO_3 ppm

GEOLOGIST : D. Kilpatrick
DRAUGHTSMAN : A. White
DATE : April 1982
REVISIC

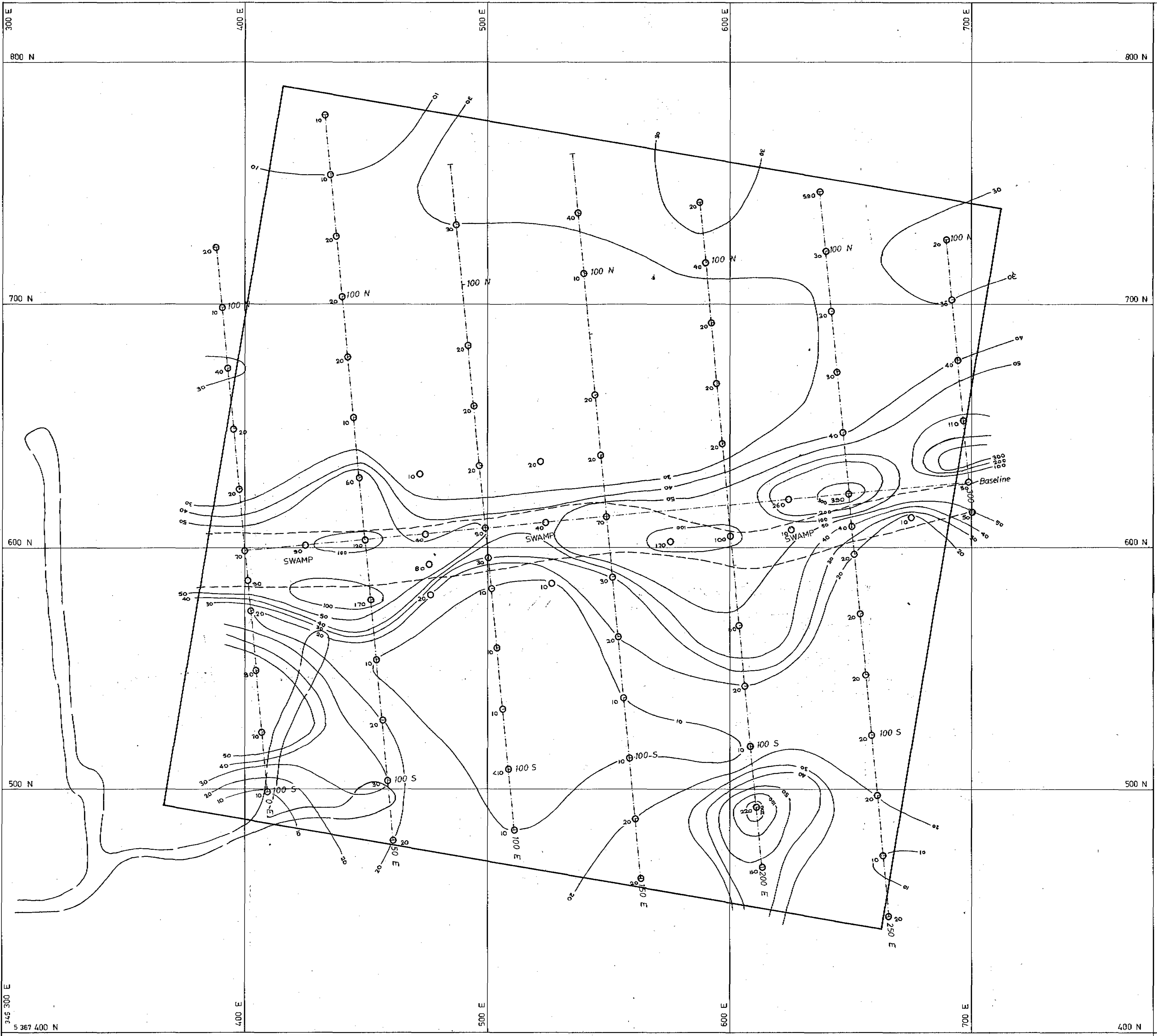
SCALE 1: 1000METRES

20 0 20 40

5 cm

DRAWING No.
3 B.

6268



64 169

RENISON LIMITED 82-1835R

ST DIZIER AREA
FOURTH LEASE
BEDROCK GEOCHEMISTRY. As ppm.

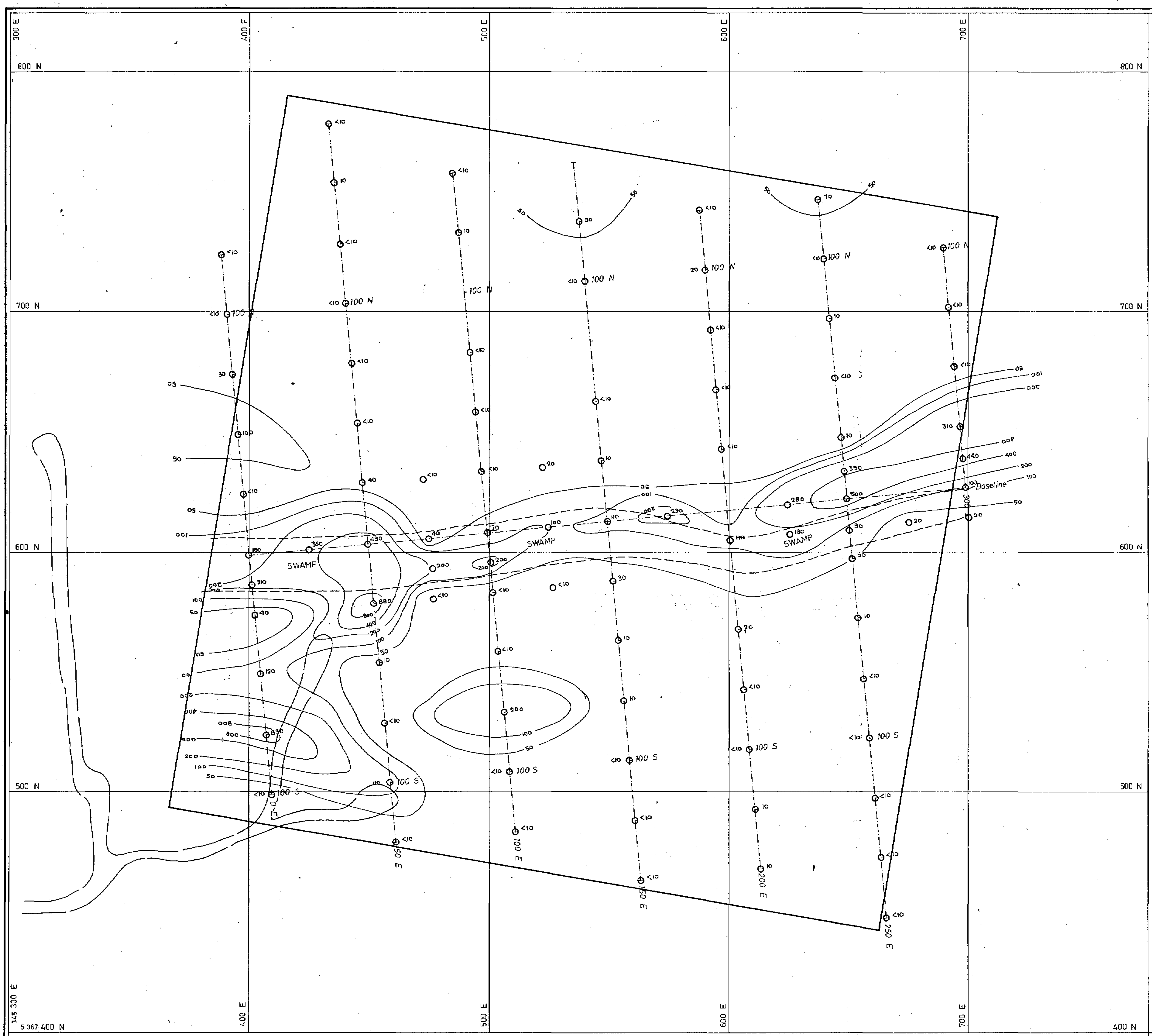
GEOLOGIST : D. Kilpatrick
DRAUGHTSMAN : A. White
DATE : April 1982

SCALE 1: 1000 METRES
20 0 20 40

REVISIONS
5 cm

DRAWING No.
3 C.

6269



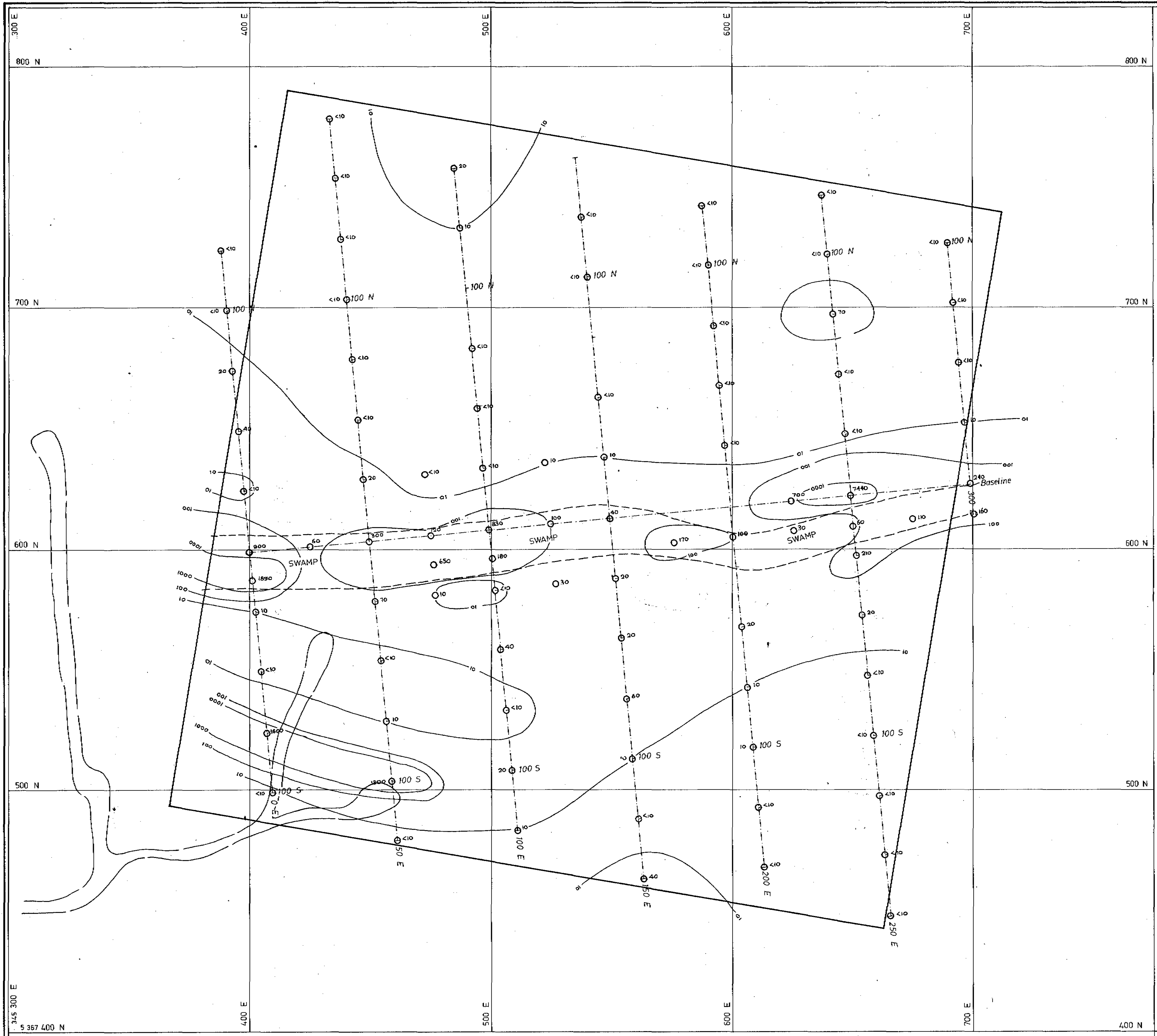
64 170

RENISON LIMITED 82-1835R

ST DIZIER AREA
FOURTH LEASE
BEDROCK GEOCHEMISTRY. Cu ppm.

GEOLOGIST : D. Kilpatrick	SCALE 1: 1000METRES
DRAUGHTSMAN : A. White	20 0 20 40
DATE : April 1982	
REVISIOI 5 cm	DRAWING No. 3 D.

6270



64 171

RENISON LIMITED 82-1835R

ST DIZIER AREA
FOURTH LEASE
BEDROCK GEOCHEMISTRY. Zn ppm.

GEOLOGIST : D. Kilpatrick
DRAUGHTSMAN : A. White
DATE : April 1982

SCALE 1: 1000METRES

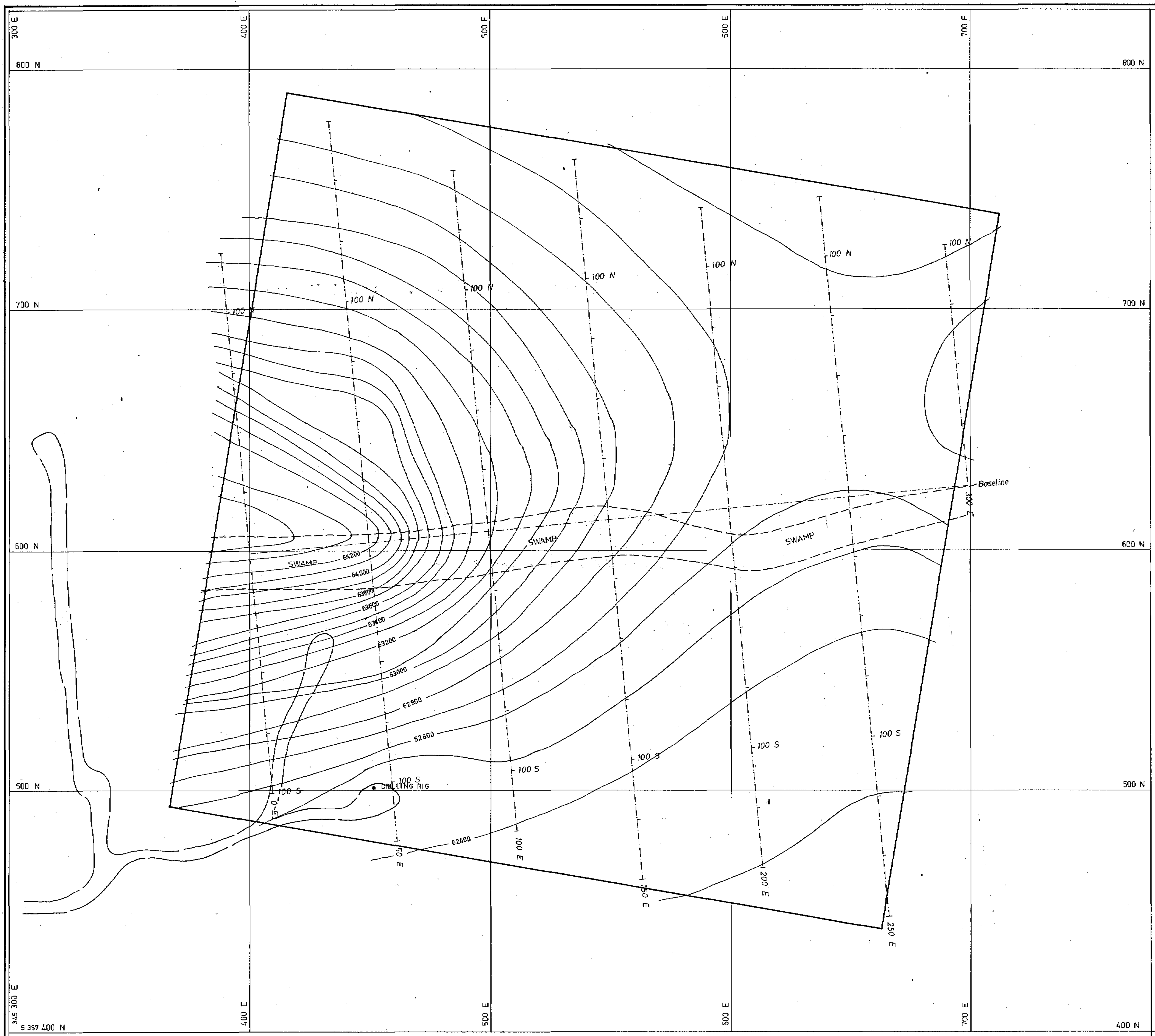
20 0 20 40

REVISION(

5 cm

DRAWING No.
3 E.

6271



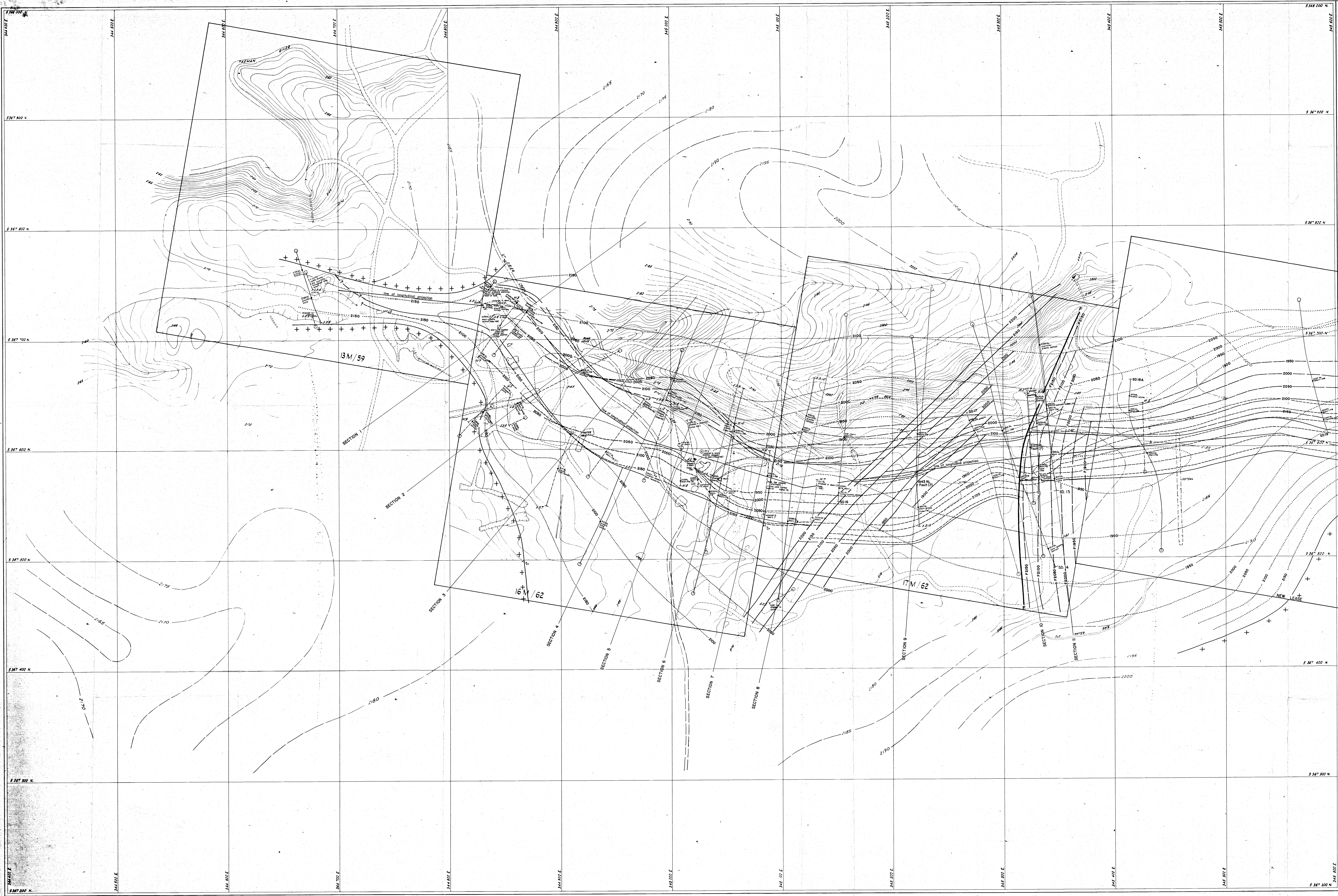
64 172

RENISON LIMITED 82-1835R

ST DIZIER AREA
ML 65M/81
PROTON MAGNETOMETER SURVEY

GEOLOGIST : D. Kilpatrick	SCALE 1: 1000METRES
DRAUGHTSMAN : A. White	20 0 20 40
DATE : Nov. 1982	
REVISION 5 cm	DRAWING No. 4.

6272



64 173

LEGEND

CONTOURS

·····2150·········	Top of Granite
– –1950– – –	Skarn F.W.
—1900— —	Skarn H.W.
—F2000—	Fault

Contour Interval 50m.

GEOLOGY

+ +	Granite contact	interpreted
——	Skarn contact	
F——F	Fault	

DIAMOND DRILL-HOLES

⊖——┤	Located or surveyed by Renison.
⊖- - -┤	Not located by Renison.

RENISON LIMITED 82-1835R

ST. DIZIER AREA

STRUCTURAL CONTOUR MAP

GEOLOGIST	: P.A.R. & D.K.
DRAUGHTSMAN	: T.G.D.S.
DATE	: July 1982
REVISION	

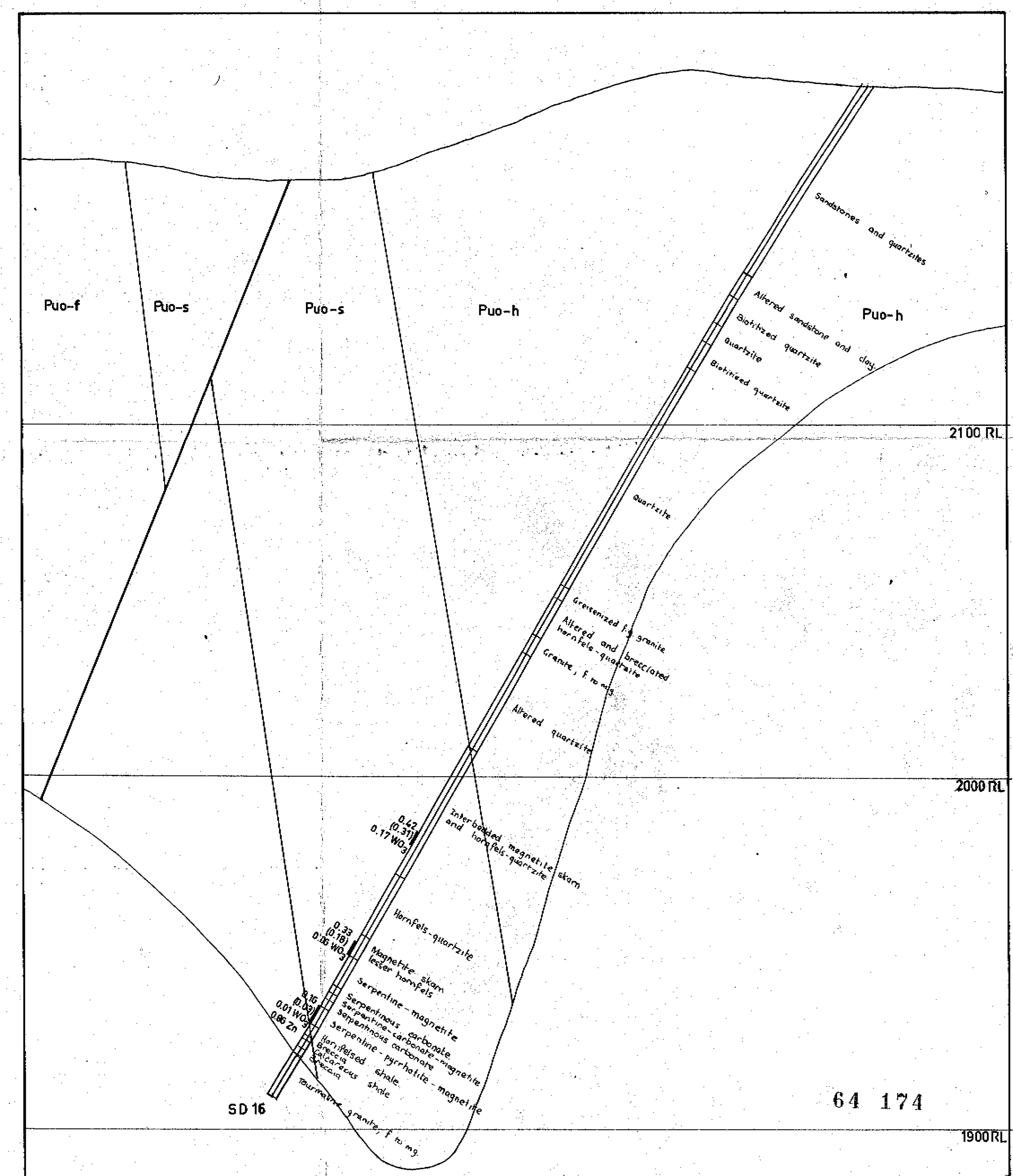
SCALE 1:1000 METRES
20 0 20 40

5 cm

DRAWING No. 5.

6275

6275



64 174

RENISON LIMITED 82-1835R

SD 16 CROSS-SECTION

GEOLOGIST : DJK

DRAUGHTSMAN :

DATE : JULY 1982

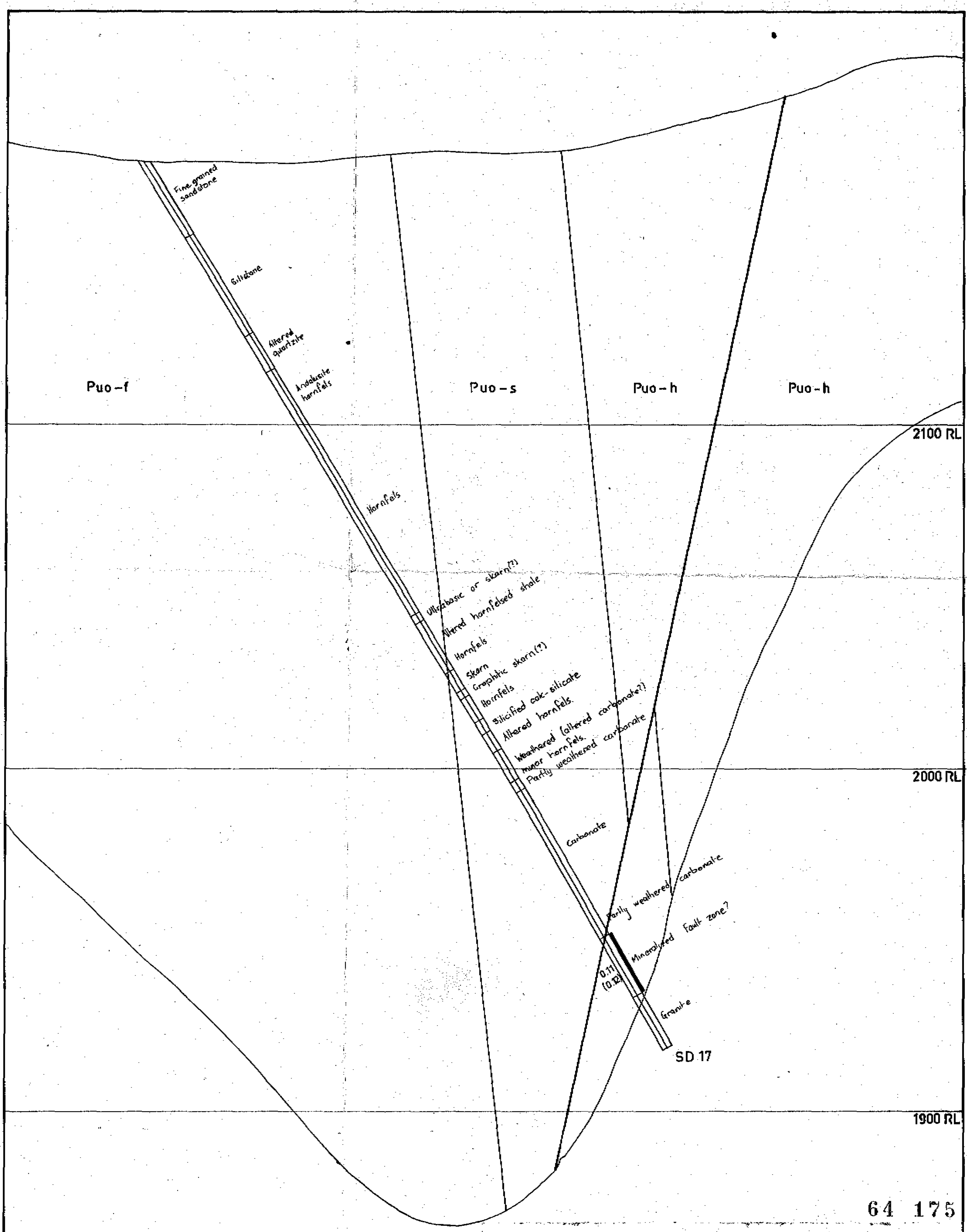
REVISIONS

SCALE 1:1000 METRES

5 cm

DRAWING No. 6.

6273



64 175

RENISON LIMITED 82-1835R

SD17 CROSS SECTION

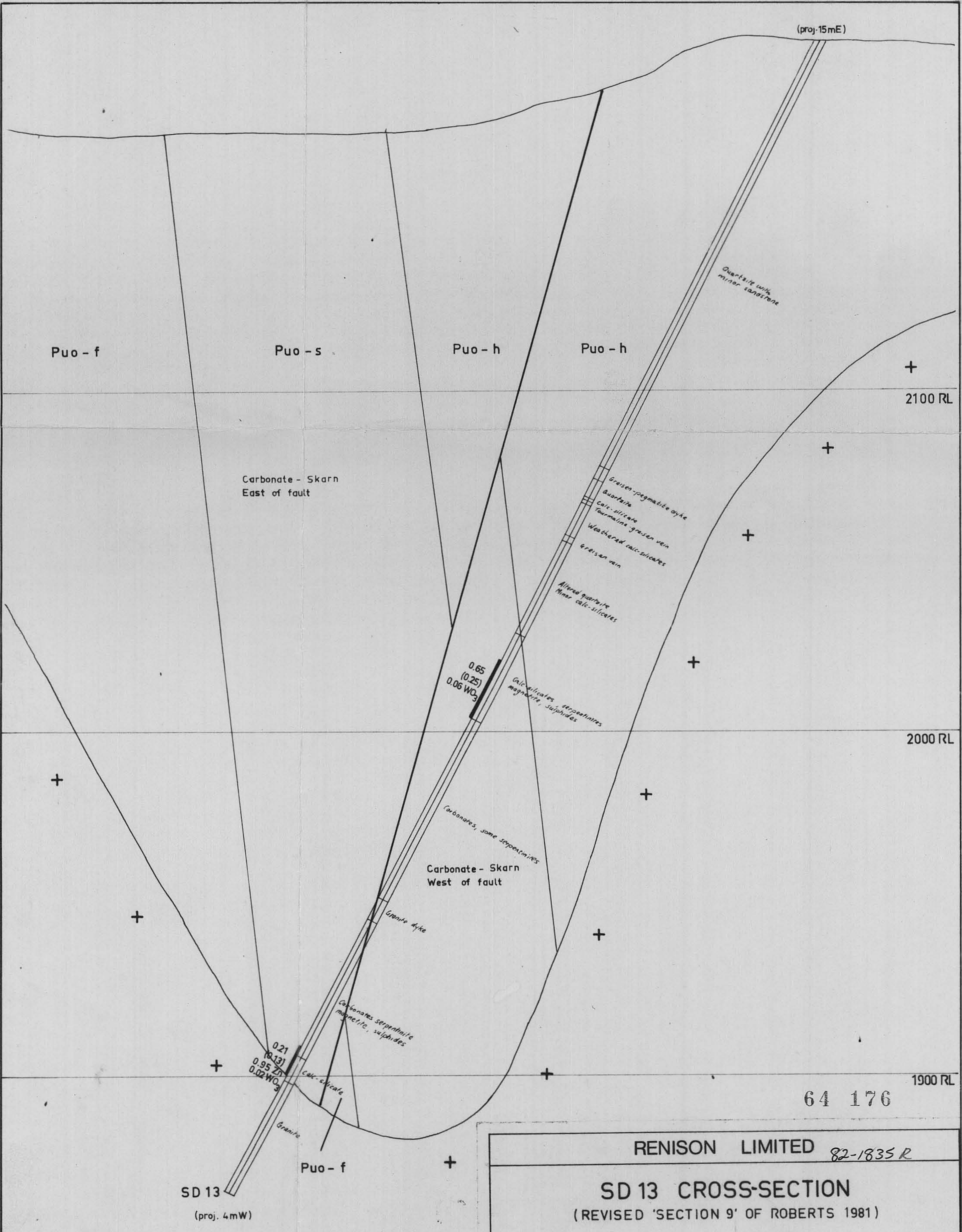
GEOLOGIST : DJK
DRAUGHTSMAN :
DATE : JULY 1982

SCALE 1:1000 METRES

REVISIONS

5 cm

DRAWING No. 7



64 176

RENISON LIMITED 82-1835 R

SD 13 CROSS-SECTION

(REVISED 'SECTION 9' OF ROBERTS 1981)

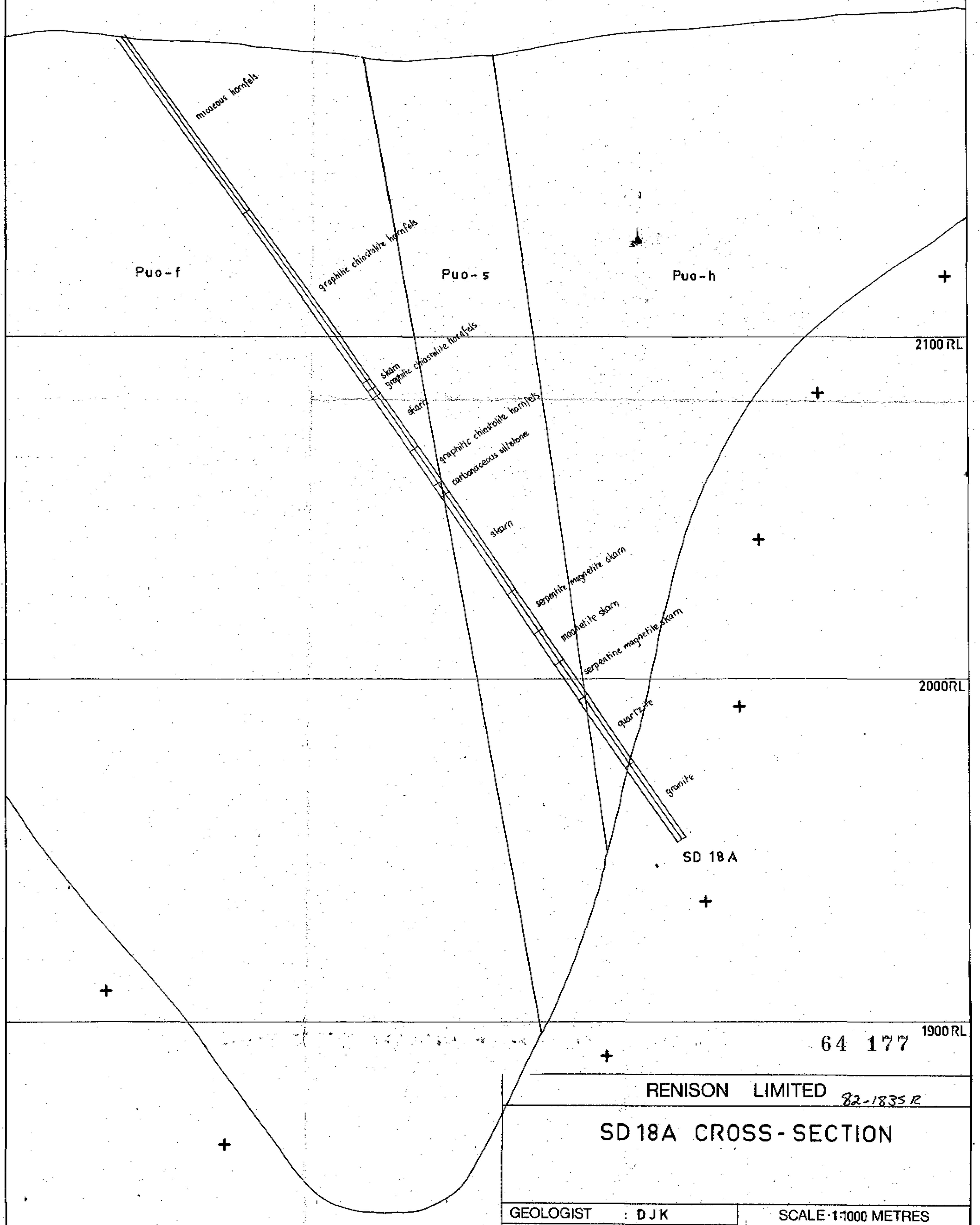
GEOLOGIST : DJK
DRAUGHTSMAN :
DATE : JULY 1982
REVISIONS

SCALE · 1:1000 METRES

5 cm

DRAWING No. 8.

6287



64 177

RENISON LIMITED

82-1835 R

SD 18A CROSS-SECTION

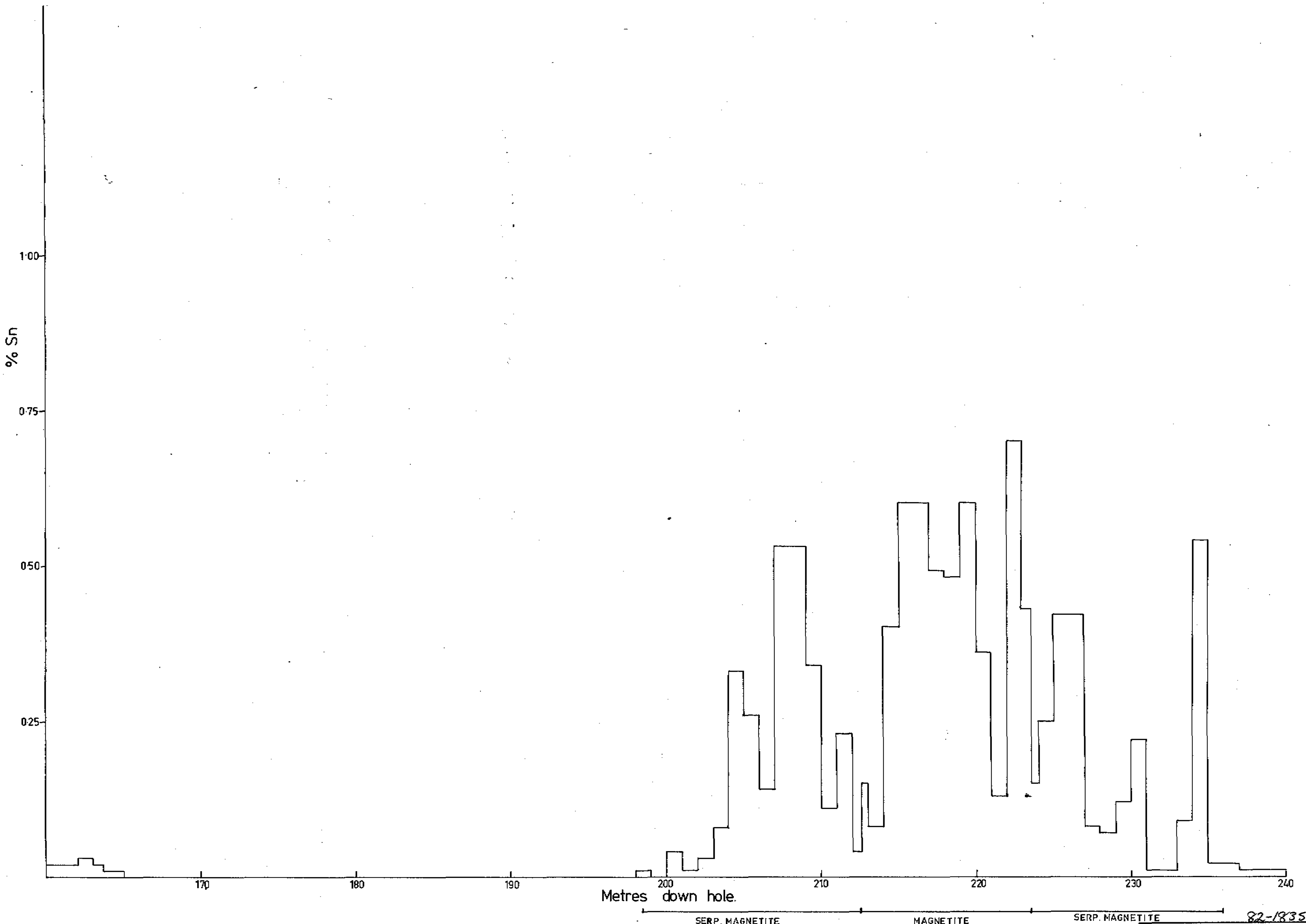
GEOLOGIST	: DJK
DRAUGHTSMAN	:
DATE	: JULY 1982

SCALE 1:1000 METRES

REVISIONS

5 cm

DRAWING No. 9.

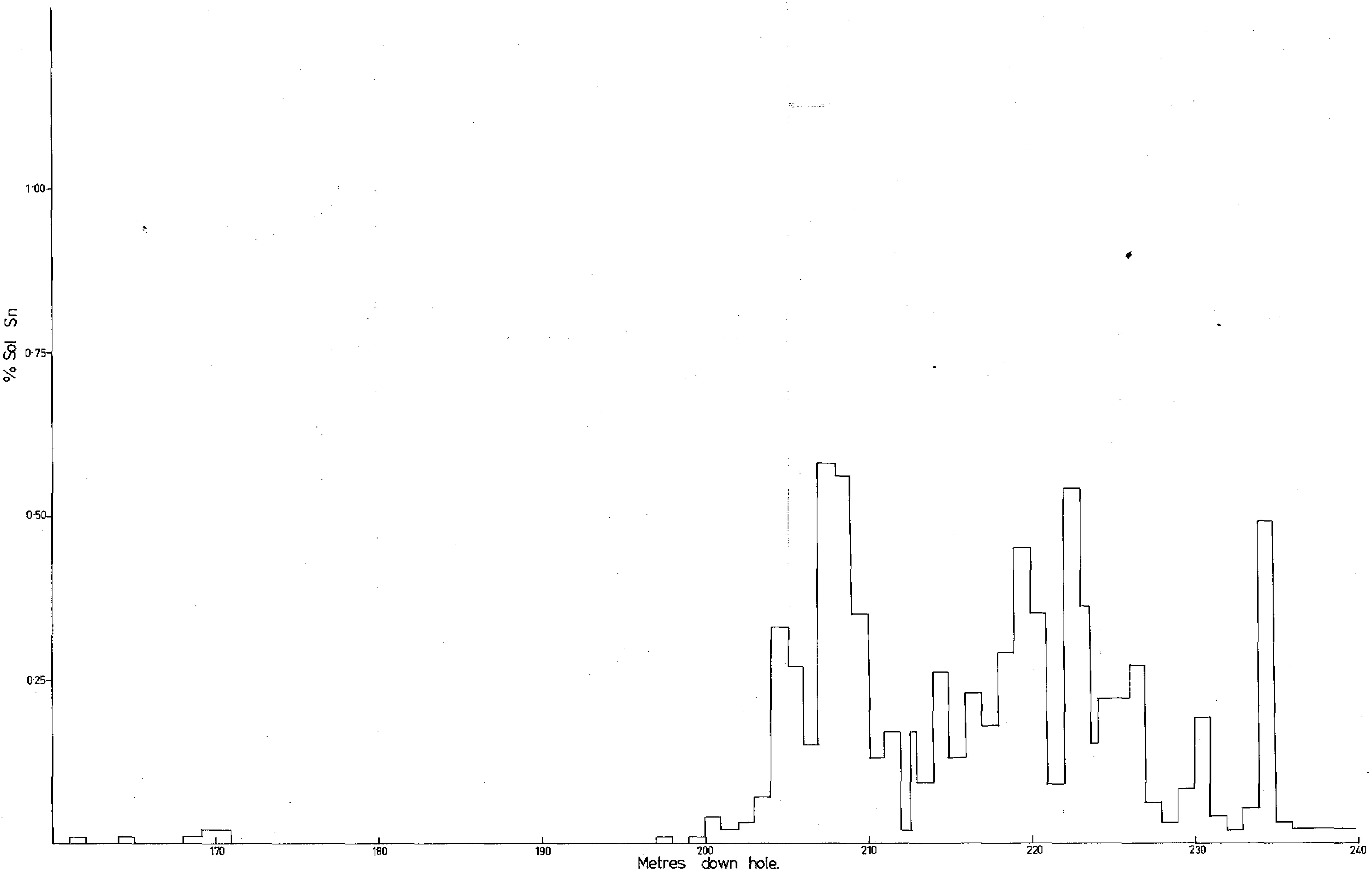


82-1835R

RENISON LTD.

SCALE	1: 200
DRAWN	D.K
DATE	April 1982
TITLE 10 A	SD 18A %Sn

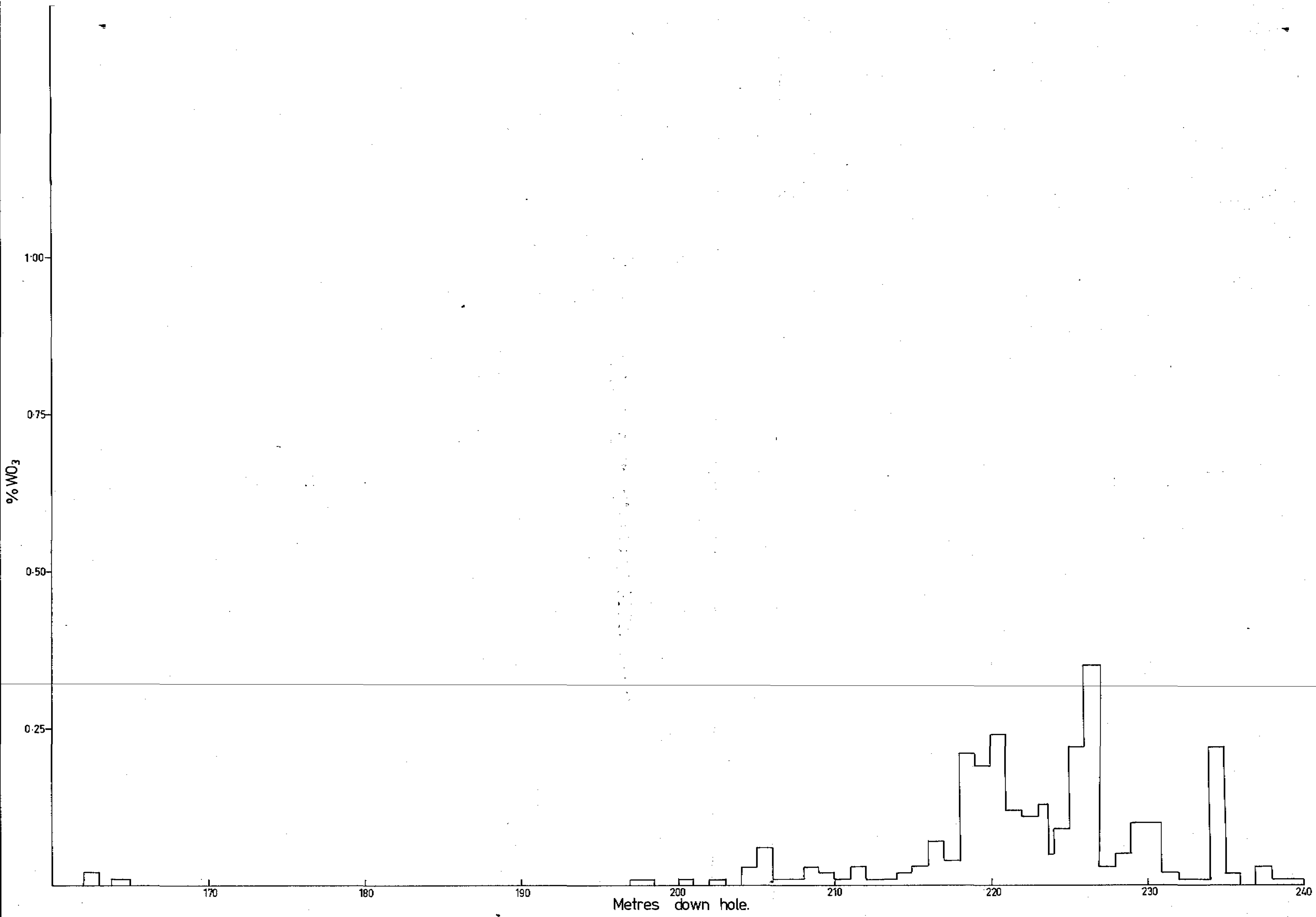
5 cm



5 cm

82-1835R

RENISON LTD.	
SCALE	1 : 200
DRAWN	D.K
DATE	April 1982
TITLE 10 B	SD 18A %Sol Sn

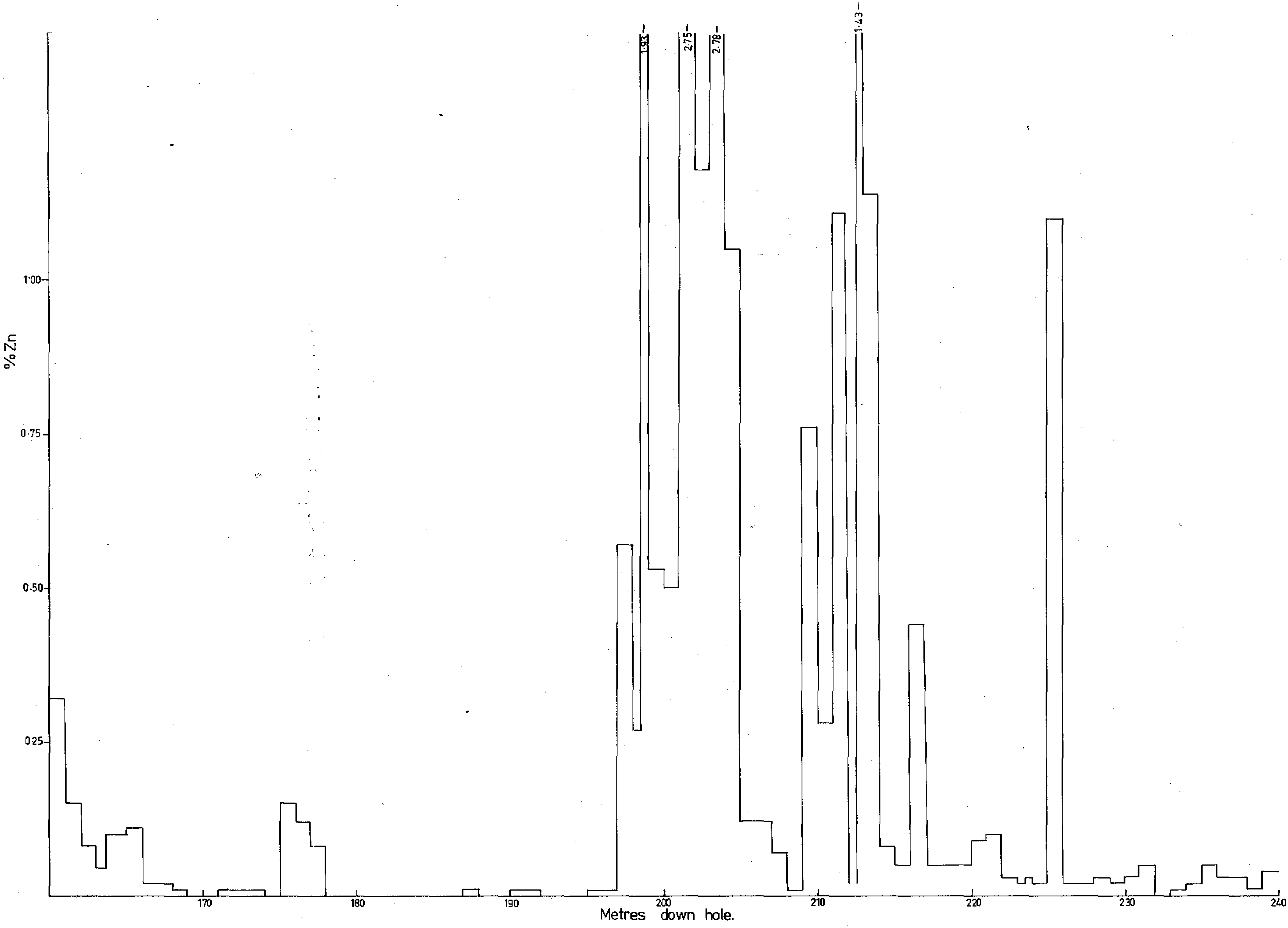


82-1835R

RENISON LTD.	
SCALE	1 : 200
DRAWN	D.K
DATE	April 1982
TITLE 10 C	SD 18A % WO$_3$

5 cm

64 180 6279

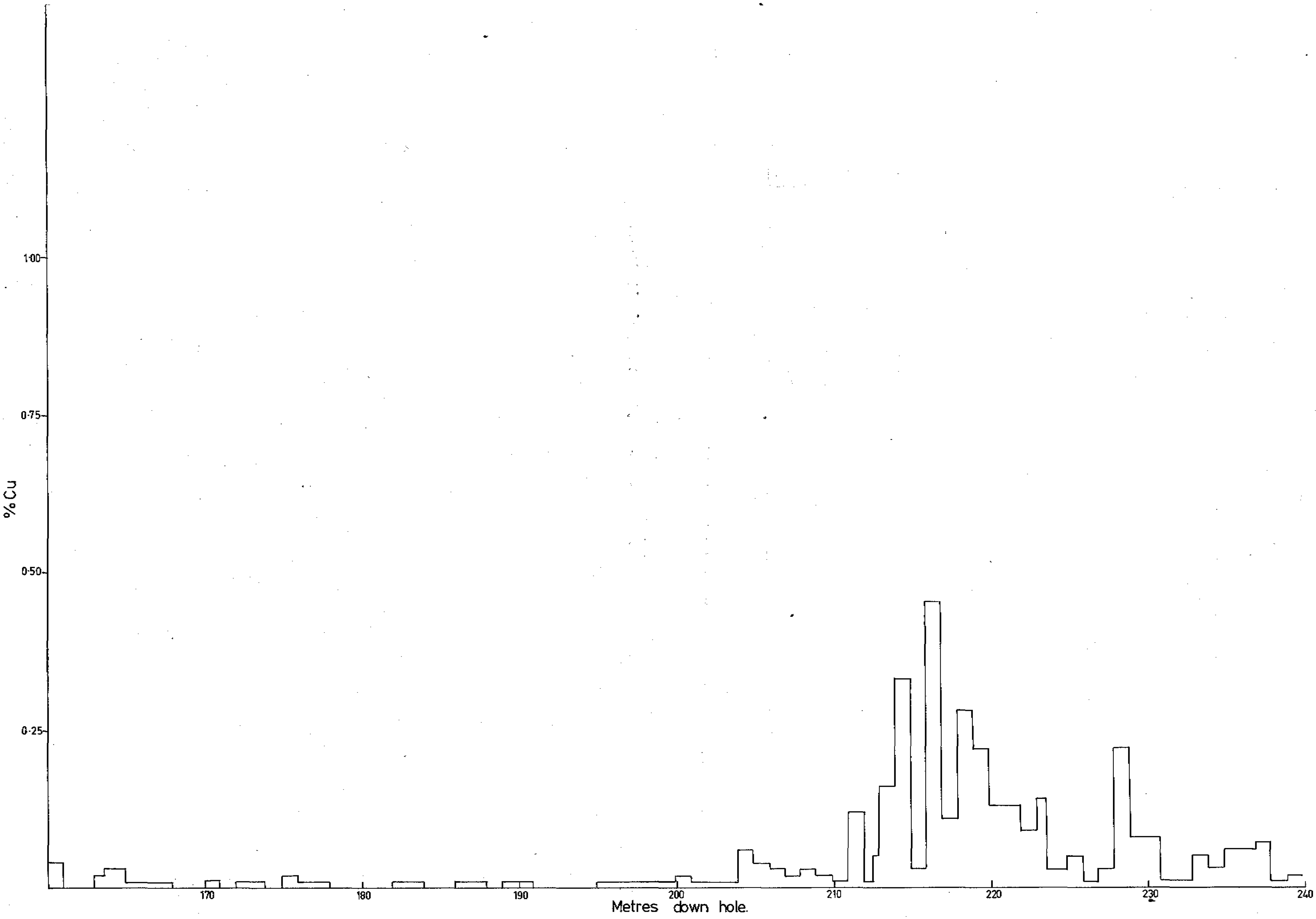


82-1835R

RENISON LTD.	
SCALE	1: 200
DRAWN	D.K
DATE	April 1982
TITLE 10 D	SD 18A %Zn

5 cm

64 181 6280



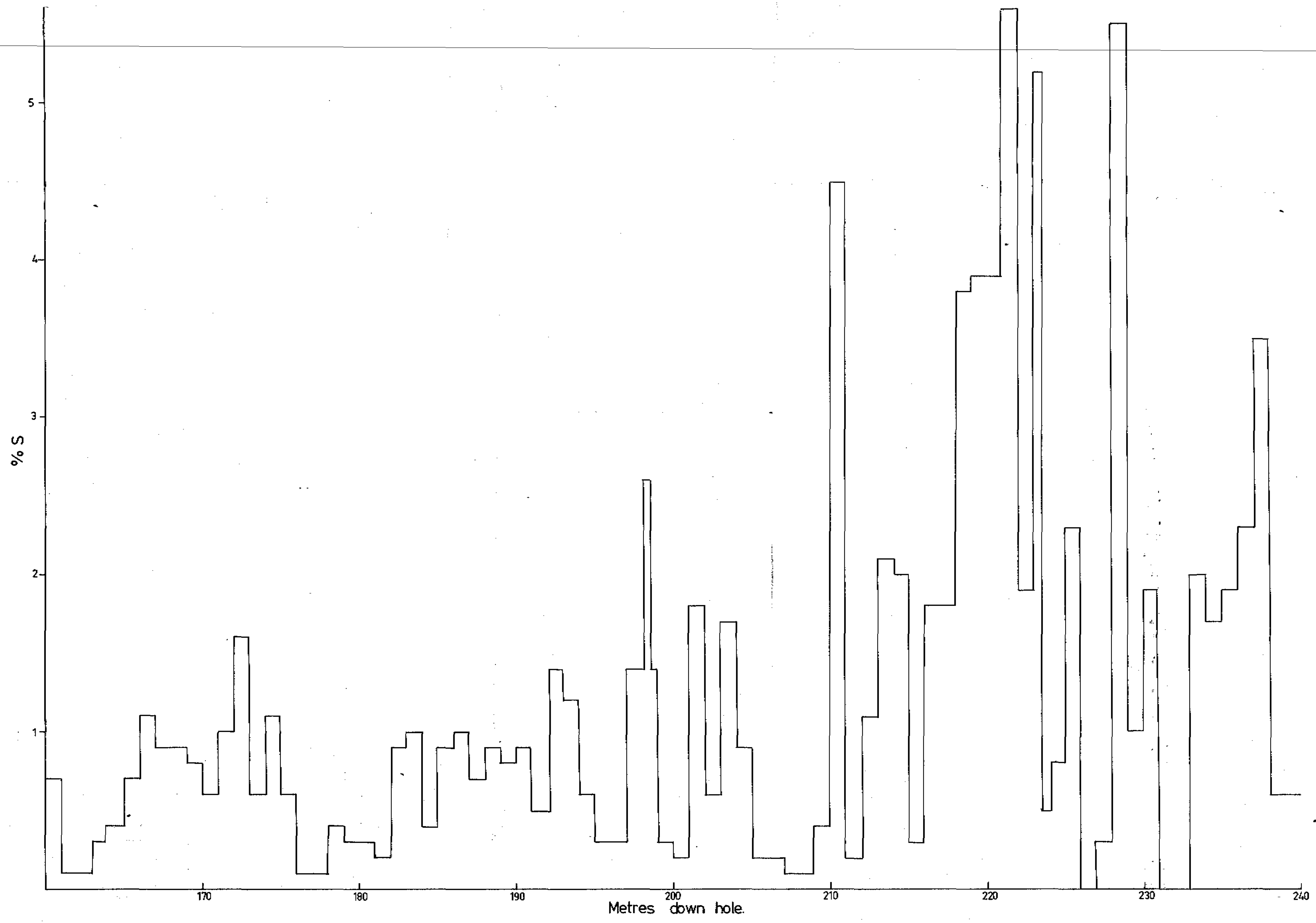
82-1835 R

RENISON LTD.	
SCALE	1 : 200
DRAWN	D.K
DATE	April 1982
TITLE 10 E	SD 18A %Cu

5 cm

64 182

6281



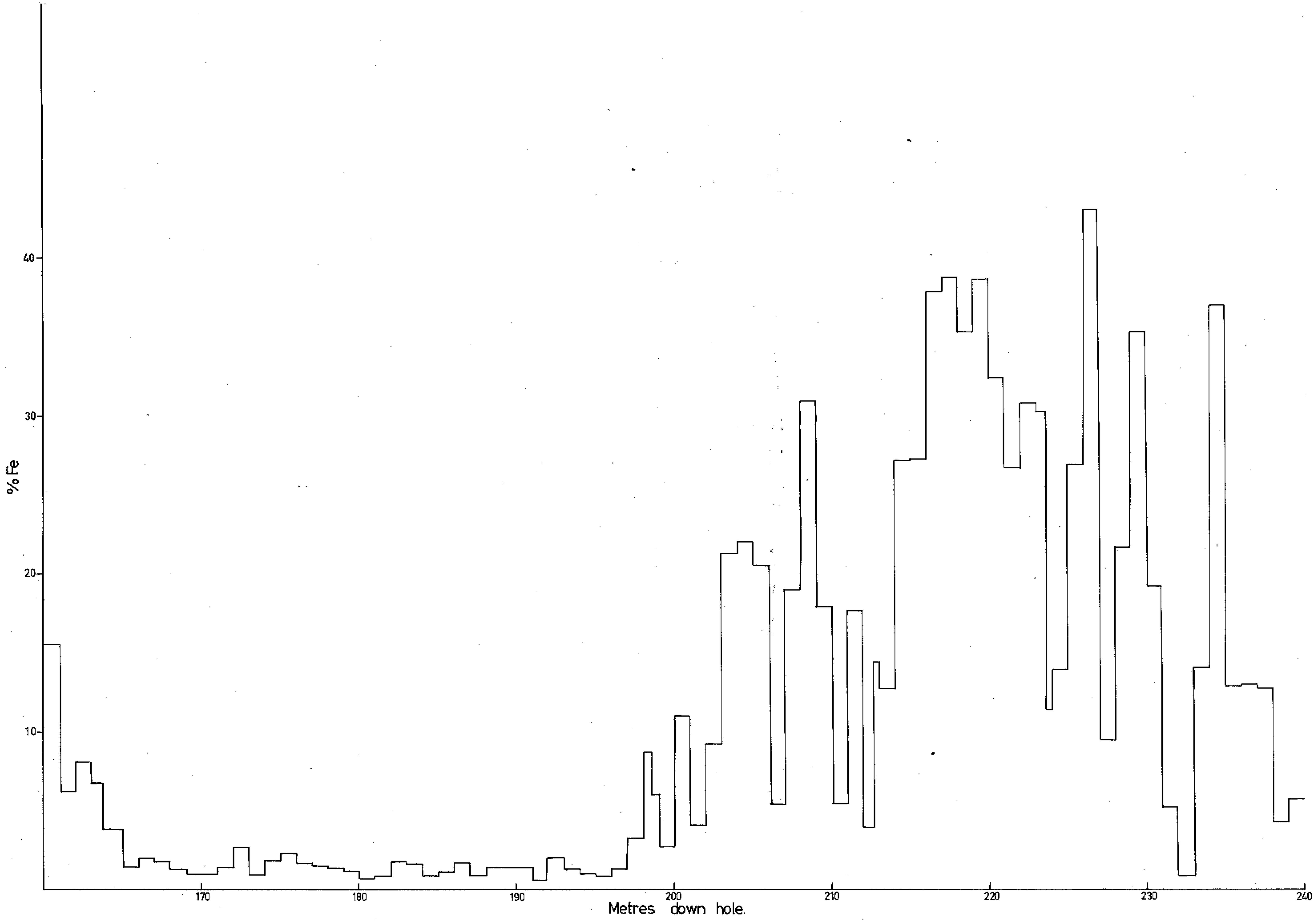
82-1835 R

64 183

5 cm

RENISON LTD.	
SCALE	1: 200
DRAWN	D.K
DATE	April 1982
TITLE 10 F	SD 18A % S

6282

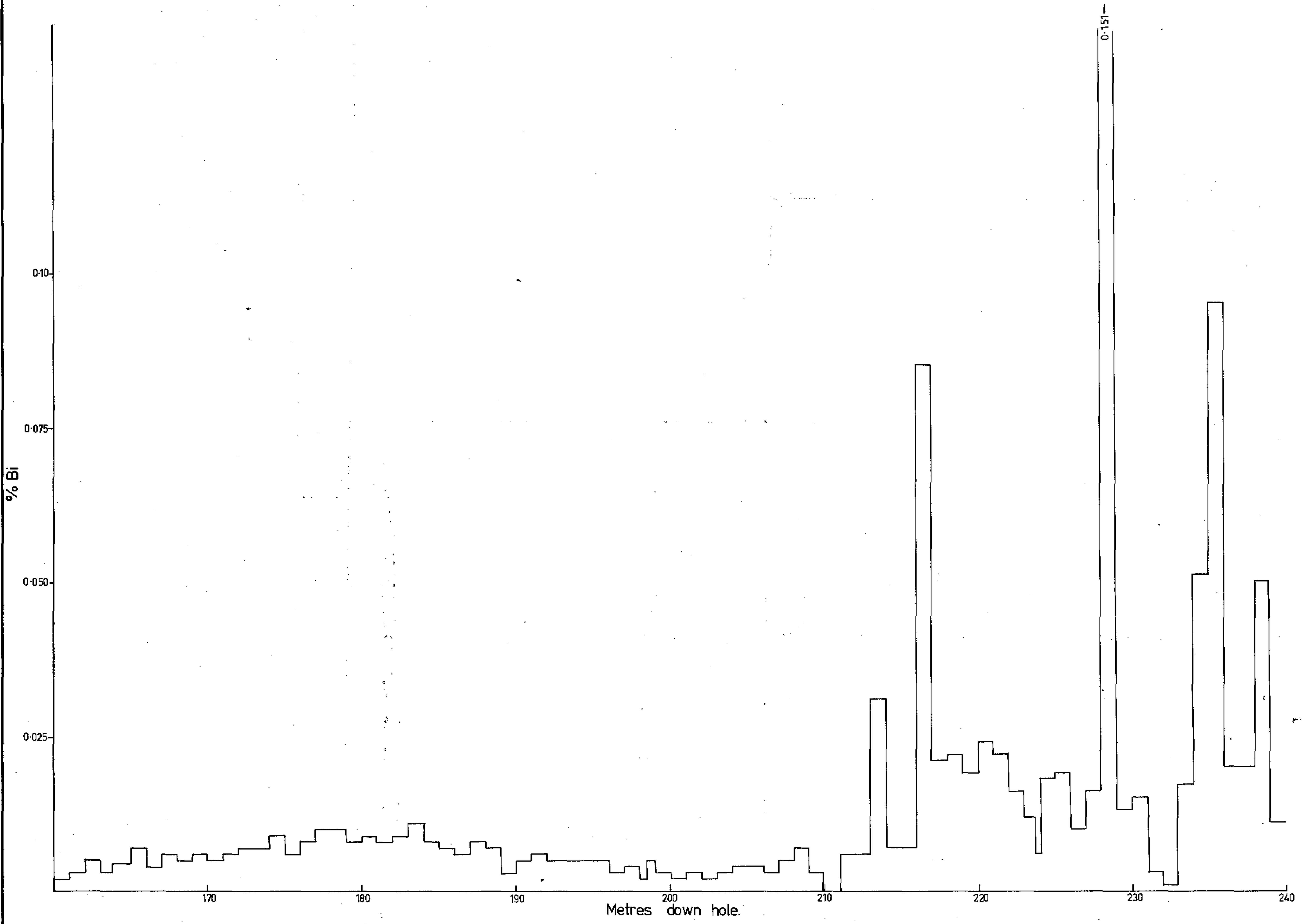


82-1835 R

RENISON LTD.	
SCALE	1: 200
DRAWN	D.K
DATE	April 1982
TITLE 10 G	SD 18A %Fe

5 cm

64 184 6283



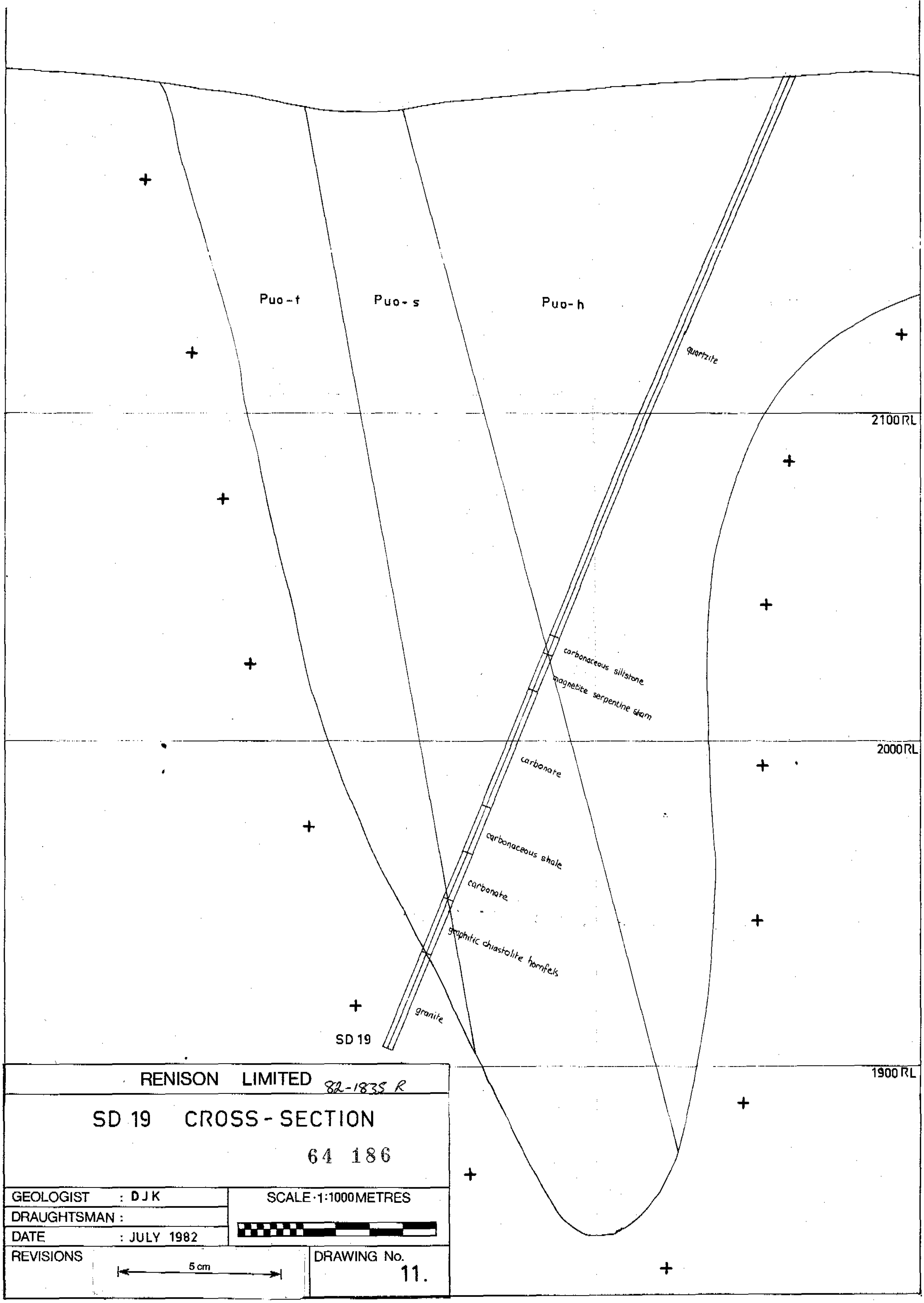
82-1835R

64 185

5 cm

RENISON LTD.	
SCALE	1: 200
DRAWN	D.K
DATE	April 1982
TITLE 10 H	SD 18A %Bi

6284



RENISON LIMITED 82-1835 R

SD 19 CROSS-SECTION

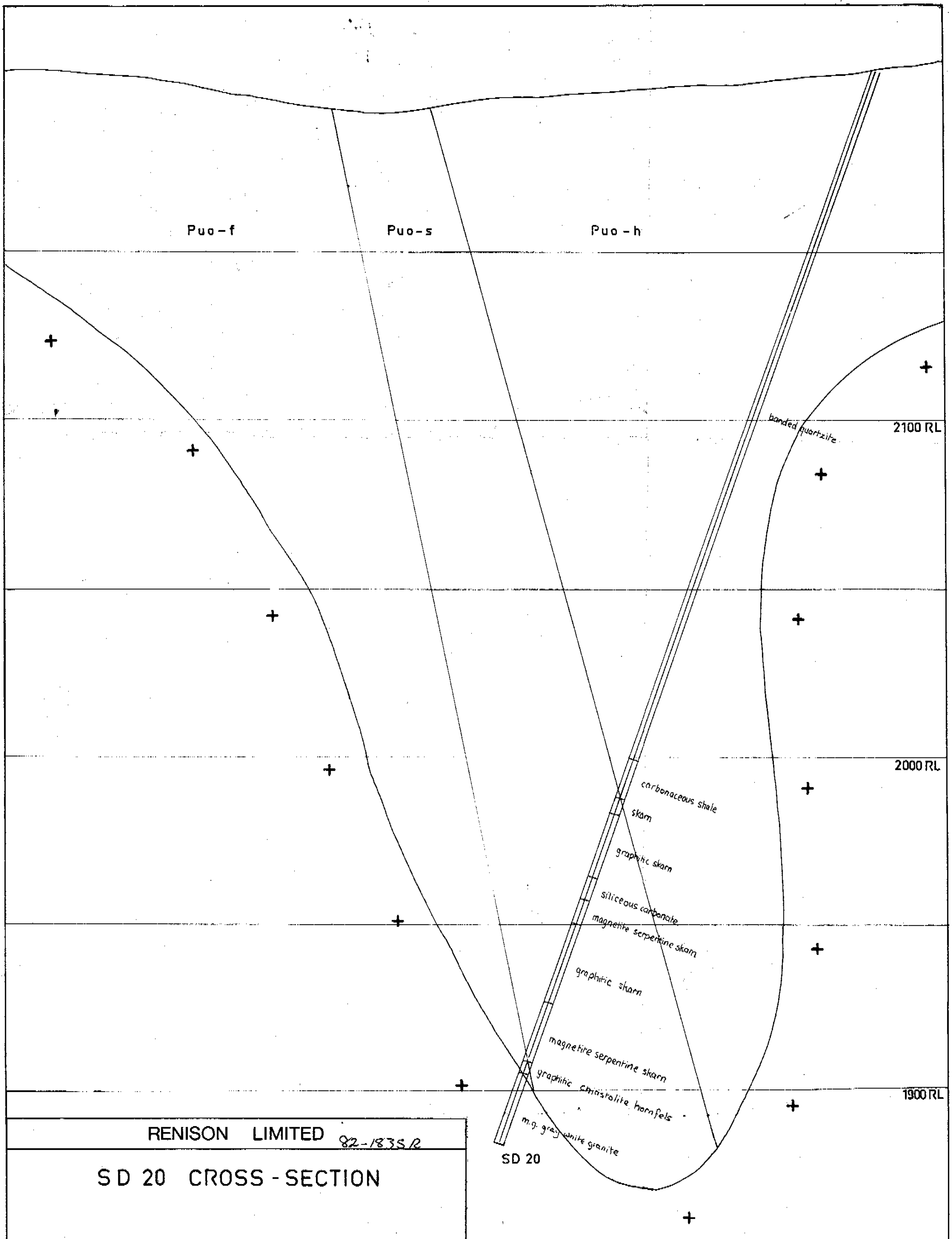
64 186

GEOLOGIST : DJK
DRAUGHTSMAN :
DATE : JULY 1982

SCALE 1:1000 METRES

REVISIONS 5 cm

DRAWING No. 11.



RENISON LIMITED 82-1835R

SD 20 CROSS-SECTION

GEOLOGIST : DJK	SCALE 1:1000METRES
DRAUGHTSMAN :	
DATE : JULY 1982	
REVISIONS 5 cm	DRAWING No. 12.

64 187

64 188

LEGEND

Diamond Drill Hole

Centre of skarn intersection or, where mineralized centre of mineralized intersection.

NOTE: Projected approximately normal to strike along cross-section reference line; vertical dashed lines indicate change in projection orientation; zero R.L. = S.L. - 2000m

RENISON LIMITED 82-1835 R

ST. DIZIER SKARN ZONE
LONGITUDINAL PROJECTION - LOOKING NORTH

GEOLOGIST : P.A.R. & D.K.
DRAUGHTSMAN : T.G.D.S.
DATE : JULY 1982
REVISIONS

SCALE 1:1000 METRES
20 10 0 10 20 30 40

5 cm

DRAWING NO. FIG. 13

This line marks where the lease boundary crosses the cross section reference line. An additional volume of potentially mineralised skarn within ML 65M/81 lies to the east of this line on this longitudinal.

6286