

1964

DIAMOND DRILL REPORT

UNDOOLYA GAP COPPER PROSPECT

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SUMMARY

A Diamond drill hole at the Undoolya Gap Copper Prospect intersected limestone and dolomite, a basic extrusive rock of doleritic texture, and a sequence of interbedded carbonates, grey pyritic siltstone and tuffaceous breccia. Minor copper mineralisation occurs in dolomite overlying dolerite and in dolerite.

INTRODUCTION

This report details the geological information from one diamond drill hole at the Undoolya Gap Copper prospect.

LOCATION AND ACCESS

From Alice Springs the prospect is 22 road miles east along a graded dirt road; its Military Grid reference is 197,000 E, 2,055,800 N.

HISTORY

Traces of copper minerals were discovered in 1965 by D. Drogemuller, who brought the occurrence to the attention of the Resident Geologist, Alice Springs. Although the showings were too low grade to be worked, Drogemuller was advised by the Resident Geologist to apply to the Director of Mines, Darwin, for diamond drilling to ascertain the nature and origin of the mineralisation.

PREVIOUS INVESTIGATION

The general geology of the area is described by Forman and Milligan (1966) and Wells, Ranford, Stewart, Cook and Shaw (1965). Youles (1965) examined the prospect and recommended the drilling.

GEOLOGY

The prospect occurs in the Gillen Member, which is the lower unit of the Bitter Springs formation of Upper Proterozoic age, and which overlies the Heavytrees Quartzite. Wells et al describe the lithology of the member.

"....the Gillen Member consists mainly of dolomite, with lesser amounts of sandstone, siltstone and shale. Most of the dolomite is in the middle and upper parts of the unit.... Siltstone is present throughout the member, but most of it is found at or near the base. It is commonly white or green, less often red or brown, slightly micaceous, laminated to thin bedded, tough, and has interbeds of green micaceous shale. Sandstone is not common..... It is white to pale grey, friable, poorly bedded, medium to coarse grained, and slightly kaolinitic." Chert beds, basic volcanics and tuffaceous sediments have since been observed in the member.

In the vicinity of the prospect, where the rocks strike northeast and dip 70° southeast, only the lower part of the member is present. Overlying the Heavytrees Quartzite there are 200-300ft. of mainly siltstone and then 500-600ft. of mainly dolomite and with basic igneous rock near the top. Within the dolomite there are occasional continuous thinly bedded chert-rich intervals, generally 1"-3" thick, and these become more numerous towards the top.

The basic rock is doleritic in texture and about 40ft. thick; it is generally strongly weathered at the surface and underlies a strike valley within the dolomite. Within the dolerite there are intervals that are hard, fine grained, reddish brown, blocky and with epidotised clots and vesicles. Associated with one of these intervals is a lens of red and black banded jasper which is parallel in attitude to the dolomite. This lens has a flat top and convex bottom, and is a sediment developed on the top of a lava flow. The features generally show that the dolerite is extrusive.

Surface Mineralisation

Malachite and chalcocite occur in the base of the dolomite overlying the dolerite in an interval varying from 3" to 12" thick, which has been traced for 3000 feet along strike. No samples have been assayed but the grade is estimated at 1% copper.

Thin sections of the dolomite show secondary chalcocite and iron oxides with haloes of malachite associated with thin beds of chert-rich dolomite; the chert is very fine grained and these beds exhibit plastic flow features.

DRILLING RESULTS

One diamond drill hole was put down in 1965 by Mines Branch, N.T.A. to examine the occurrence below the weathered zone. The drill hole was sited to intersect the dolomite/dolerite contact at 250ft; however this contact was encountered at 150ft.9" and it was decided to drill on to examine the footwall section below the dolerite.

From 147'9" to 150'9" and from 288'3" to 290'0" minor chalcopyrite is disseminated in the dolomite.

Dolerite was intersected from 150'9" to 288'3" from 291' to 294' and from 297'6" to 301'. There are small jasper bands at 158', 186' and 243'. The band at 158' is in a similar position to the jasper lens noted on the surface.

Much of the dolerite from 150' to 210' contains dark grey clots, some of which have centres of jasper quartz or calcite and occasionally a little chalcopyrite. Very small amounts of chalcopyrite are also present in the jasper band at 158' and sporadically throughout the dolerite.

The greater thickness of dolerite intersected compared to that at the surface is due to strike faulting (figure 2).

From 288' to 360' dolerite is interbedded with carbonates, siltstone and breccia. The breccia contains irregularly rounded fragments of dolerite, basalt, vesicular basalt and epidotised vesicular basalt, and angular to subrounded fragments of carbonates, siltstone and mudstone in an off-white pyritic tuffaceous matrix. At 307' the core showed a volcanic bomb of basalt, $1\frac{1}{2}$ " long, $\frac{3}{4}$ " wide and pear-shaped. It consisted of dark green medium grained basalt with a pale green fine grained margin (c 1/32" thick.)

Much of the dark grey siltstone in the breccia and interbedded with the other rocks is pyritic and cherty; the pyritic occurs in the coarser grained portions of the siltstone.

ASSAY RESULTS

The only results available are from semi-quantitative spectrographic analyses for copper, lead, zinc, cobalt and nickel on sludge samples collected over 10' intervals from 220' onwards. These are given in the log and shown graphically in figure 2.

Throughout the dolerite, from 220' to 300' the metal values show similar distribution patterns. The general step down in values at 240'-250' (in particularly cobalt and nickel) coincides with the absence of visible chalcopyrite from 243'9" onwards, and a textural change at that depth.

From 300' to 360' through the sediments, the lead values show a maximum at 320'-330' (interbedded pyritic calcareous siltstone and carbonates with minor tuffaceous breccia), however the order of values is low.

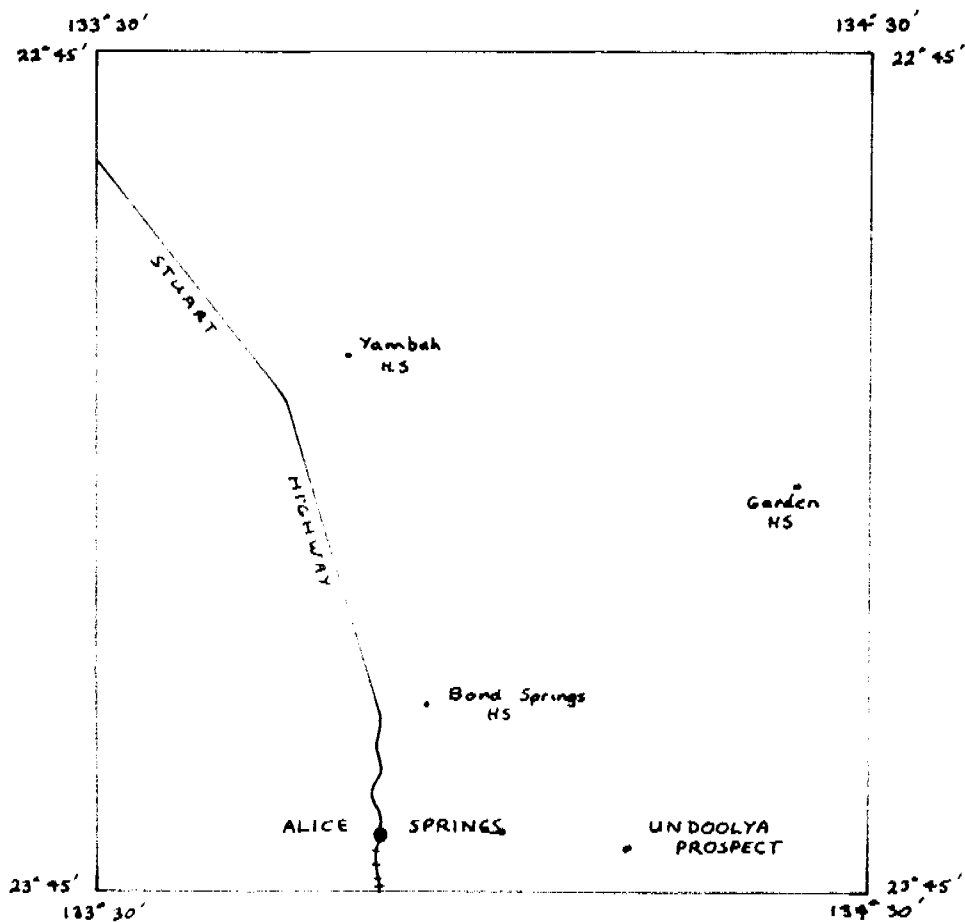
CONCLUSIONS

As pyrite and chalcopyrite are disseminated in chert-rich carbonate rocks and siltstones and are also present in basic volcanics and tuffaceous sediments, this mineralisation is at least in part directly related to the volcanicity.

In view of the association between volcanics and stratified ore deposits (c.f. the succession at H.Y.C. deposits and Mt. Isa) the results obtained at the Undoolya prospect indicate that a regional survey of the Gillen Member is warranted.

REFERENCES

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- YOULES I.P., 1965
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Unpublished report.
Resident Geologist's Office.
N.T.A. Alice Springs.

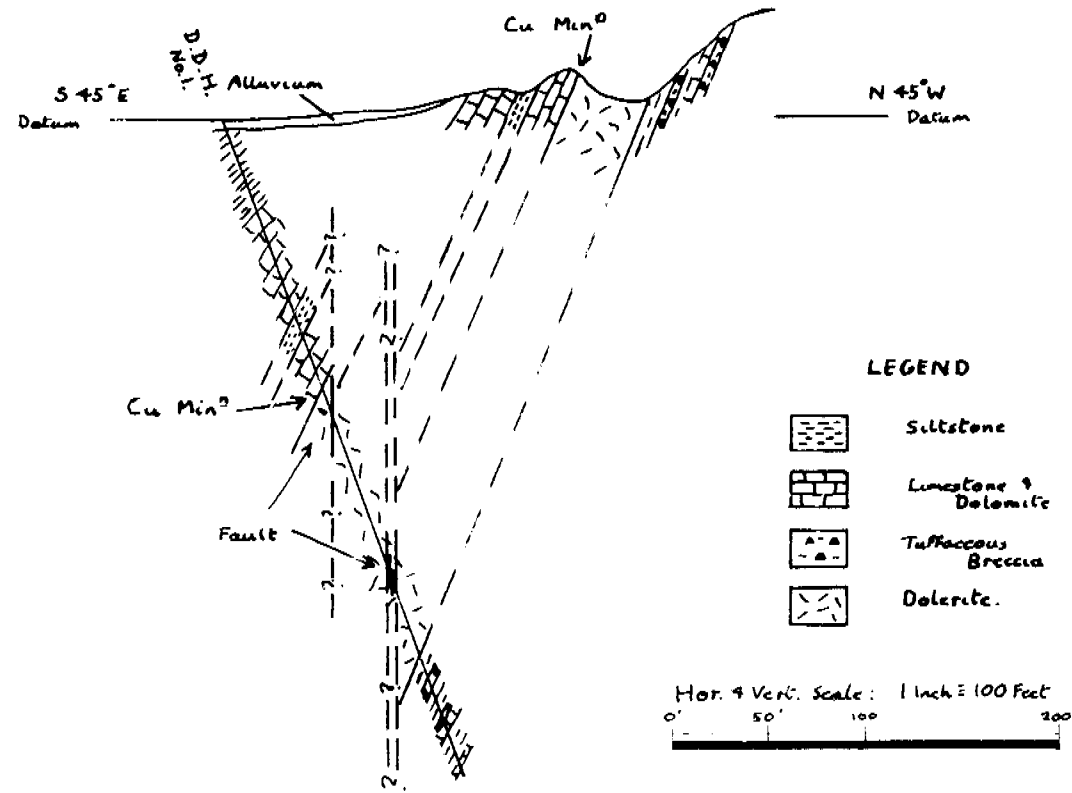


LOCALITY PLAN

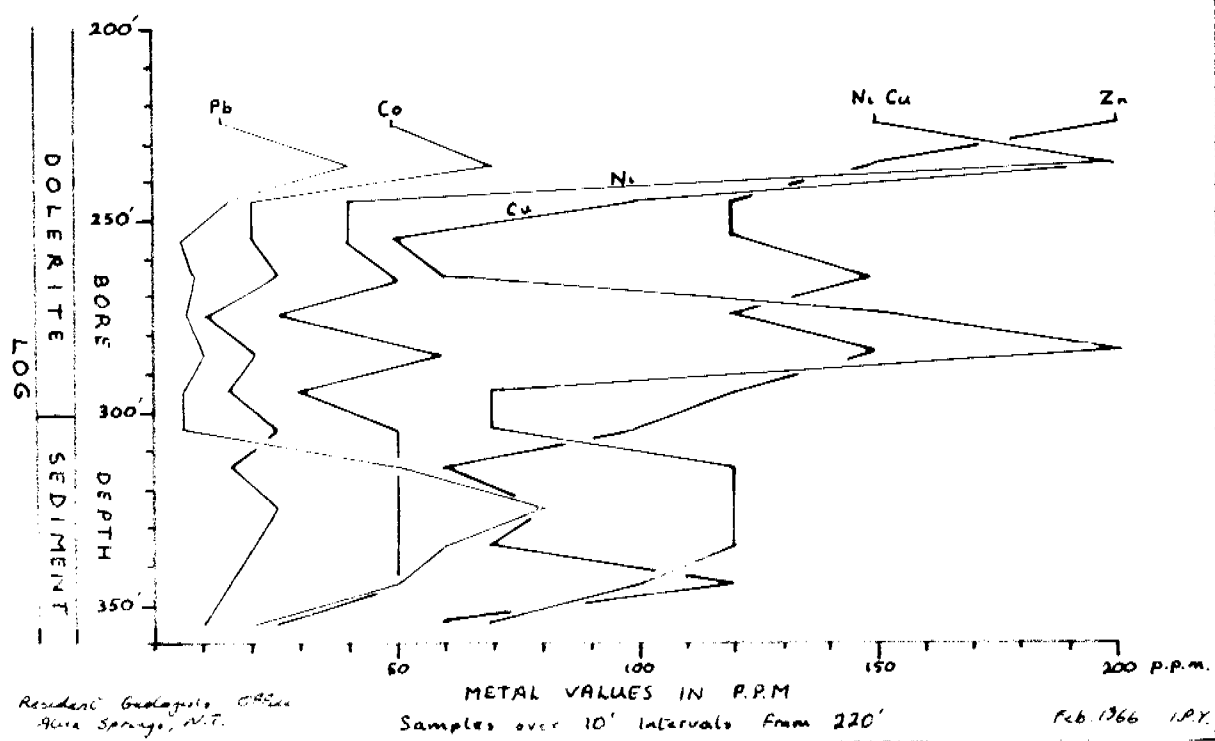
UNDOOLYA COPPER PROSPECT

Scale 15.78 Miles to 1 Inch.

GENERALISED SECTION
THROUGH DRILL HOLE



METAL DISTRIBUTION IN
SLUDGE SAMPLES



Resident Geologist, ORS
Alva Springs, N.T.

METAL VALUES IN P.P.M
Samples over 10' intervals from 220'

Feb. 1966 I.P.Y.

GEOLOGICAL LOG OF DRILL HOLE

PROJECT UNDOOLYA GAP No. 1.

HOLE No. M

LOCATION 13 Miles due East of Alice Springs

REMARKS

COORDINATES Military Grid 197,000E, 2,055,800N

R.L. GROUND

ANGLE FROM HORIZONTAL 70°

DIRECTION 315°

DESCRIPTION OF CORE	R. CASING	DEPTH	LOG	LIFT & CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS
Fairly well graded, disaggregated fine grained agglomerate - chips of siltstone + quartz in lst. matrix		0-9"	NX	9"			
6" fine grained agglomerate, 6" limestone (grey) with thin white calcite veins		9-12"		12"			
6" conglomerate - 6" limestone		12-19"		9"			
Grey limestone		19-28"		9"			
Mostly grey limestone - some carbonate agglomerate		28-32"		4"			
Grey limestone		32-36"		4"			
Red brown silt shale - chips of CO		36-40"		3"			
Red brown silt shale occasional chips of carbonate		40-44"		36"			
Red brown shale - occasional angular chips of carbonate		44-50"		10"			
Red brown shale - occasional angular chips of grey dolomite, + some small calcite veins		50-56"		60"			
Red brown shale etc. as above		56-62"		60"			
Red brown shale etc.		62-66"		80"			
Cream coloured calcareous clay with occasional pseudomorphs limonite, etc. pyrite		66-72"		46"			
Grey Dolomite with calcite veins		72-78"		57"			
Grey Dolomite with calcite veins + chert		78-84"		93"			
Grey Dolomite with calcite veins		84-90"		90"			
Grey Dolomite with calcite veins + chert		90-96"		116"			
Limestone and dolomite + chert		96-102"		116"			
Limestone and Dolomite (Reworked) (to 101') + chert		102-100"					

DRILL NO. 6	EXPLANATION	HEAD OFFICE
TYPE: EDCO	CASING IN HOLE DURING DRILLING	LOGGED BY: I. G. FRUCKS
DRILLER: S. BERGER	REVISIONS	DRAWN BY: I. G. FRUCKS
COMMENCED: 22-10-65		CHECKED BY:
COMPLETED: 19-11-65		SHEET 1 OF 4
		DRAWING NO. F53/14-24A

BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT UNDOOYA GAP No 1.

HOLE No 1
LOCATION

CO-ORDINATES 197,000E 2,055,800N

REMARKS

R.L. GROUND

ANGLE FROM HORIZONTAL 70°

DIRECTION 315°

DESCRIPTION OF CORE	R.L.	DEPTH	LOG	LIFT & CORN RECOVERY %	SAMPLES	REMARKS	ASSAYS
	CASING	SIZE OF CORE					
Limestone + Dolomite	10	8x					
Limestone and Dolomite (clayey in parts and reworked + chert)	10	8x		108'			
Red brown shale & calcite veins	10						
Red brown shale & calcite veins	10			100'			
Limestone + Dolomite (Reworked)	10						
Limestone & Dolomite (Reworked) with thin (<3") silica rich bands	10	140'		89			
Grey limestone & Dolomite with thin silica rich bands Bedding 60°	10	130'		113'			
Grey limestone + Dolomite Bedding 65°	10	140'		122'			
Grey limestone + Dolomite Bottom 3' contains ev. small amt of chalcopryrite in veins. Bottom 1ft. also chalcopryite	10	150'		82"			
Decomposed Dolerite. Occasional blebs of enclitic	10						
Decomposed Dolerite. Some small calcite veins. Occasional very small blebs of chalcopryite. 1" jasper band at 60' G core, cut by fault at 70'	10	160'		104"			
Decomposed Dolerite. Some calcite veins. Scattered dark grey clots	10			78"			
Weathered Dolerite - strongly decomposed in places.	10	170'		Est. 47"			
Weathered Dolerite - strongly veined by calcite	10			53"			
Weathered Dolerite strongly veined by calcite. Very badly broken	10	180'		63"			
Weathered Dolerite 1/2" vein of red & white banded jasper, with 1" crystallized layer 30" below. v. badly broken	10	190'		78" 93"			
Dolerite - some jasper in clots - scattered chalcopryite	10			81" 100"			
	10	200'		54" 100"			

DRILL NO 6
TYPE P.D.C.O.
DRILLER S. BERGER
COMMENCED
COMPLETED

EXPLANATION
CASING IN HOLE DURING LOGGING

HEAD OFFICE
LOGGED BY I.G. FAUKS
DRAWN BY I.G. FAUKS
CHECKED BY
SHEET 2 OF 9
DRAWING NO F53/14-25A

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: **UNDOOLYA GAP No 1**

REMARKS

HOLE No. **J**

COORDINATES: **197,000 E, 2,055,800 N**

R.L. GROUND

LOCATION

ANGLE FROM HORIZONTAL **70°**

DIRECTION **315°**

DESCRIPTION OF CORE	R.L. CASING	DEPTH SIZE OF CORE	LOG	DIP	SAMPLES	REMARKS					ASSAYS
						Sludge Samples in P.P.M.					
						Cu	Pb	Zn	Co	Ni	
<u>Dolerite</u>		119' / 100									
<u>Dolerite</u> Joints open, some with calcite Traces chalcopyrite.		210		81° / 100							
<u>Dolerite</u> - strongly veined by calcite	AX 220			44° / 92							
<u>Dolerite</u> - mod. calcite veins around 227' calcite veins have dark grey selvage similar to clots in dolerite earlier.		230		117° / 100		150	15	200	50	150	
<u>Dolerite</u> - few calcite veins Traces chalcopyrite + hematite		240		115° / 98		200	40	150	70	200	
<u>Dolerite</u> Textural change 224' 3" 1/2" Jasper band		250		30° / 100							
<u>Dolerite</u> - badly broken + weathered much calcite veining + infilling of brecciated dolerite.		250		92° / 83		100	15	120	20	40	
<u>Dolerite</u> - weathered + broken		260		95° / 86		50	6	120	30	40	
<u>Dolerite</u> - some calcite veining Core badly broken		270		73° / 84		60	8	150	25	50	
<u>Dolerite</u> - badly broken + brecciated. Breccia cemented by calcite		270		6° / 22							
<u>Dolerite</u> - v. badly broken badly broken - calcite infilling		280		18° / 67							
<u>Dolerite</u> - fresh core broken		280		32° / 46		150	7	120	10	25	
<u>Dolerite</u> - weathered, veined by calcite; core severely broken		280		82° / 91		200	10	150	20	60	
<u>Dolerite</u> - fragment of mudstone limestone (some dolomite, chert); trace py, cpy. Angular to subrounded fragments (cl) of dolerite carbonate, mudstone grey shale, - matrix clay + silt, pg. (tuffaceous) <u>Dolerite</u> - vesicular		290		110° / 100							
<u>Breccia</u> - as 289' above		290		92° / 94		70	6	120	15	30	
<u>Dolerite</u> - altered		300		73°							

DRILL NO. 6	LOGGED BY J.P. Youles
TYPE EDCO	DRAWN BY J.P. Youles
NO. 5 BERGER	CHECKED BY
COMMENCED	SHEET 3 OF 4
COMPLETED	DRAWING NO. F53/14-26H

GEOLOGY AND GEOPHYSICS
GEOLOGICAL LOG OF DRILL HOLE

PROJECT: **UNDOOLYA GAP**

HOLE No: **N° 1**

LOCATION: **197,000 E 2,055,800 N.**

RECORD NO.:

DATE:

DIP FROM HORIZONTAL: **70°**

DIRECTION: **315°**

DESCRIPTION	SAMPLES	REMARKS					ASSAYS
		Sludge Samples in p.p.m.					
		Cu	Pb	Zn	Co	Ni	
<p>Maily red-brown mudstone, some breccia, as 289'</p> <p><u>Dolerite</u> <u>Breccia dolerite</u></p> <p>Breccia - fragments mainly grey siltstone dolerite and sandstone, matrix siltyish pyritic & tuffaceous.</p> <p>Thin interbedding of brown mudstone siltstone & sandstone some tuffaceous.</p> <p>Tuffaceous Breccia of thin interbedded grey siltstone & sandstone matrix calcareous some dissemin. Pyritic conoidal stamped, brecciated grey siltstone sandstone, mudstone. Occas. fragments dolerite as above, but badly weathered & broken limestone & dolomite.</p> <p>Interbedded limestone & dolomite & grey calc. siltstone & mudstone.</p> <p>Siltstone pyritic in part.</p> <p>Some thin breccia beds (tuffaceous)</p> <p>Breccia - fragments of mudstone, carbonate & dolerite in grey tuffaceous matrix</p> <p>at 337' 8" - 1" dolerite - appears as lava flow on reddish ls & dolom.</p> <p>Breccia - as at 330'</p> <p>Pyrite in siltstone fragments, in tuffaceous matrix</p> <p>Grey limestone & dolomite</p> <p>Some grey pyritic siltstone.</p> <p>Also fine bands of pyrite, etc.</p>	<p>AX</p> <p>114 100</p> <p>310</p> <p>108 95</p> <p>320</p> <p>112 87</p> <p>330</p> <p>99 100</p> <p>340</p> <p>96 89</p> <p>350</p> <p>118 91</p>	<p>70</p> <p>120</p> <p>120</p> <p>120</p> <p>100</p> <p>70</p>	<p>6</p> <p>50</p> <p>80</p> <p>60</p> <p>5</p> <p>20</p> <p>20</p>	<p>100</p> <p>60</p> <p>80</p> <p>70</p> <p>40</p> <p>60</p>	<p>25</p> <p>15</p> <p>25</p> <p>20</p> <p>15</p> <p>10</p>	<p>50</p> <p>50</p> <p>50</p> <p>50</p> <p>50</p> <p>25</p> <p>25</p>	<p>Volcanic bomb in core (of dolerite)</p>

NO. 6
BY: EDECO
FOR: S. BERGER
DATE: _____
COMPLETED

HEAD OFFICE
DIP BY: I. P. YOUNG
DRAWN BY: I. P. YOUNG
CHECKED BY:
SCALE: 4
DRAWING NO. F53/14-27A