

NORTHERN TERRITORY GEOLOGICAL SURVEY

TECHNICAL REPORT

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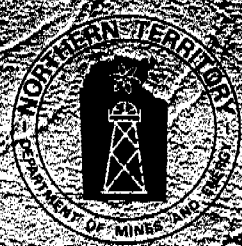
GS 80/55

DIAMOND DRILLING INVESTIGATIONS

JIMMY'S KNOB MINE, N.T.

BY

A. W. NEWSON



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Department of Mines and Energy

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DEPARTMENT OF MINES AND ENERGY
DECEMBER 1980

AWN/DMW:250
11.1H

<u>CONTENTS</u>	<u>PAGE</u>
Summary	1
Introduction	1
Location and Access	1
Geology	2
Diamond Drilling Results	2-3
Conclusions	4
References	4

- Appendix -
1. Drill Log Summaries D.D.H.'s 1-3
 2. Assay Results - Split Core
 3. Assay Results - Sludge Samples D.D.H.1
 4. Petrographic Descriptions by AMDEL

<u>Plate</u>		<u>Scale</u>
1.	Location Plan	1:100,000
2.	Jimmy's Knob N.T. Surface Plane	1:500
3.(a)	Drill Section, D.D. Holes 1 & 2	1:500
3.(b)	Drill Section, D.D. Hole 3.	1:500

SUMMARY

Following an application for drilling assistance at Jimmy's Knob tin mine in February, 1978, Drilling Section, Department of Mines and Energy, drilled three diamond drill holes totalling 227 metres in May-June 1978.

Scattered high grade tin mineralization occurs in quartz veins in intrusive igneous rocks and to a lesser extent in quartz veins in black shale adjacent to the intrusives. The drilling programme was designed to test the persistence of one of these quartz veins and to also determine whether the intrusive rocks contain disseminated cassiterite in significant quantities.

Drilling indicated that the mineralized quartz vein persists to a vertical depth below workings of at least 20 metres but appears to be terminated at or near the shale/intrusive contact. Limited assay results suggest the intrusive rocks contain no significant disseminated tin mineralization.

INTRODUCTION

An application for dilling assistance at ^{MC's} ~~MS~~ 155B and 156B was made by the leaseholder, A.M. Lee in February 1978. A diamond drilling programme of 200 metres was subsequently approved. Diamond drilling was carried out in May and June, 1978 and consisted of three holes totalling 227 metres.

LOCATION AND ACCESS

See Newton (1978)

GEOLOGY

This has been briefly summarised in Newton (1978). Recent revision of stratigraphic units by B.M.R. geologists have the tenements areas now underlain by shales, greywackes, siltstones and tuffs of the Lower Proterozoic Gerowie Tuff and Kapalga/Mt. Bonnie Formation.

DIAMOND DRILLING RESULTS

Three holes totalling 227 metres were completed by the Drilling Section. Good core recovery was generally achieved apart from core loss in near surface material and quartz vein intersections. All core was geologically logged and three samples were forwarded to AMDEL for petrographic analysis. 25 sludge samples and 42 split core samples were assayed at the East Point Laboratories, Department of Transport and Works.

D.D.H.1 was inclined 65° on a bearing of 160° magnetic and drilled to a depth of 100 metres. Feldspar and mica rich intrusive igneous rocks were intersected between the surface and approximately 63 metres, after which mid-grey chloritic, partially silicified shales and siltstones were intersected to the end of the hole. Several narrow barren quartz veins were intersected and the main quartz-cassiterite lode was intersected between 20.65 and 23.4 metres. The lode consisted of broken quartz with hematite, limonite, red-brown clay material and some coarse cassiterite. An assay of 1.5% Sn was recorded over the interval 22.1 to 22.9 metres. Much of the igneous material intersected was of a very coarse grained pegmatitic nature with some finer grained phases. The igneous rocks were composed dominantly of microcline and biotite with lesser plagioclase and quartz in some sections.

AWN/DMW:250
11.1H

Sericitization of feldspar and chloritization of biotite was commonly observed. No significant tin values were recorded in the igneous rocks between 0 and 35 metres in split core samples. Two high sludge sample values were recorded between 34 and 36 metres and between 40 and 42 metres within the igneous rock intersections but these may have been a result of contamination from material from the lode zone rather than due to disseminated tin in the pegmatitic rock. Minor pegmatite veining noted near the end of the hole could be an indication of a second intrusive body occurring in close proximity.

D.D.H.2 was sited effectively in the same location as D.D.H.1 and was a vertical hole drilled to a depth of 67 metres. The pegmatitic intrusive was intersected between the surface and 18 metres, below this the hole continued in siltstones shales and greywackes to 67 metres. No significant quartz lode material was encountered and it would appear that the lode intersected in D.D.H.1 has been terminated at or near the northern intrusive/sediment contact. No samples were assayed from this hole.

D.D.H3 was inclined 65° on a bearing of 180° . The hole was designed to test for lateral extensions of the quartz-cassiterite lode intersected in D.D.H.1. Accessibility determined the actual siting of this hole. Unfortunately, the hole had to be terminated while still in sediments so no conclusive results were obtained.

CONCLUSIONS

Diamond drilling has indicated that a small, high-grade quartz-cassiterite lode persists to a vertical depth of 20 metres below current workings but appears to be terminated at or near the northern intrusive/sediment contact.

Initial sampling of the intrusive rocks suggests that they carry little disseminated tin mineralization.

Due to the limited drilling programme and problems of drill site accessibility drilling to check the lateral extent of the quartz-cassiterite lode has been inconclusive.

REFERENCES

- Newton, A.W. 1978 Notes on the Mundic and Deans
Camp tin mines, Burrundie area,
N.T.
Northern Territory Geological
Survey Report GS 78/1

APPENDIX IJIMMY'S KNOB N.T.DRILL LOG SUMMARIES D.D.H.'s 1-3

D.D.H.1
Interval
(metres)

0 - 20.65	Feldspar-mica rich very coarse grained <u>pegmatitic intrusive</u> . Barren quartz vein 11.2 - 11.4m, highly broken, oxidised zone 11.4 - 12.0m.
20.65 - 23.40	Broken <u>quartz vein</u> with hematite, limonite, red-brown clay and some coarse cassiterite. (Recovery 60%).
23.40 - 37.70	Feldspar-mica <u>pegmatitic intrusive</u> , generally very coarse grained with some medium-coarse grained phases. Quartz veins with hematite, limonite, cassiterite? in intervals 21.1 - 21.3m and 30.4 - 30.5m. Oxidised zone with quartz, hematite and limonite 34.5 - 35.2m.
37.70 - 38.30	Dark grey chloritic <u>siltstone?</u>
38.30 - 59.70	Feldspar-mica <u>pegmatitic intrusive</u> 42.0 - 42.1m., 45.0 - 45.1m., Barren quartz veins. 46.4 - 47.4m., Series of barren quartz veins. 47.4 - 48.2m. 51.5 - 52.0m., Highly fractured and oxidised, friable zones. 53.5 - 53.9m., Quartz veining, some pyrite near 53.9m.

38.30 - 59.70	56 - 56.3m., Quartz vein with iron-stained fractures. 59.4 - 59.45m., Quartz vein with pyrite. 59.6 - 59.7m., Minor sulphide zone.
63.50 - 100.45	Mid grey chloritic, slightly silicified <u>shale</u> and tuffaceous? <u>siltstone</u> . 100.25 - 100.35m., Pegmatitic vein, feldspar-sericite-pyrite.
<u>D.D.H.2</u>	
<u>Interval</u>	
(metres)	
0 - 17.80	Feldspar-mica rich <u>pegmatitic intrusive</u> some finer grained sections near contact may be altered sediments.
17.80 - 37.5	Fawn and pink interbedded <u>chloritic siltstone and shale</u> . Grades into:-
37.5 - 44.5	<u>Greywacke</u> with some <u>shale</u> interbeds.
44.5 - 45.5	<u>Greywacke</u> with abundant quartz veining, some brecciated chloritic shale fragments, minor pyrite with the quartz.
45.5 - 53.8	<u>Greywacke siltstone</u> with a few bands of chloritic carbonaceous shales.
53.8 - 67.4	Black <u>chloritic, carbonaceous shale</u> with a few bands of greywacke siltstone.

D.D.H.3Interval

(metres)

0 - 0.85	Fawn, oxidised, leached, broken <u>shale</u> .
0.85 - 17.5	Dark grey, broken, partly oxidised <u>shale</u> with minor siltstone interbeds.
17.5 - 18.05	Broken <u>quartz</u> and <u>shale</u> material, some limonitic clay material.
18.05 - 59.1	Dark grey, broken, partly oxidised <u>shale</u> with minor siltstone interbeds. 30 - 34m., Series of minor quartz veins in shale.

APPENDIX 2JIMMY'S KNOB N.T.ASSAY RESULTSSPLIT CORE - D.D.H.1

<u>INTERVAL</u> (metres)	<u>Sn</u> (ug/g)	<u>INTERVAL</u> (metres)	<u>Sn</u> (ug/g)
		<u>SPLIT CORE - D.D.H.3</u>	
0 - 1	50		
1 - 2	-50	17.5 - 18.05	-100
2 - 3	-50	30.0 - 34.0	-100
3 - 4	-50	23.4 - 24.4	- 50
4 - 5	50	24.4 - 25.5	- 50
5 - 6	-50	25.4 - 26.4	- 50
6 - 7	-50	26.7 - 27.4	- 50
7 - 8	50	27.4 - 28.4	- 50
8 - 9	-50	28.4 - 29.4	- 50
9 - 10	70	29.4 - 30.4	- 50
10 - 11	-50	30.4 - 31.4	- 50
11 - 12	-50	31.4 - 32.4	- 50
12 - 13	-50	32.5 - 33.4	- 50
13 - 14	-50	33.4 - 34.4	- 50
14 - 15	-50	34.4 - 35.4	- 50
15 - 16	-50	46.4 - 46.9	- 50
16 - 17	-50	46.9 - 47.4	- 50
17 - 18	-50	53.5 - 54.0	- 50
18 - 19	-50	56.0 - 56.5	- 50
19 - 20	-50	59.3 - 59.8	- 50
20.7 - 21.2	-100		
21.2 - 22.1	-100		
22.1 - 22.9	1.5%		
22.9 - 23.4	-100		

NOTE: Values for W and Ag were less than 0.1% and less than 2 gm/tonne respectively for all samples.

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11.1H

APPENDIX 3JIMMY'S KNOB N.T.ASSAY RESULTSSLUDGE SAMPLES - D.D.H.1

<u>INTERVAL</u> (metres)	<u>Sn</u> (ug/g)	<u>INTERVAL</u> (metres)	<u>Sn</u> (ug/g)
22 - 24	-50	48 - 50	-50
24 - 26	-50	50 - 52	-50
26 - 28	-50	52 - 54	-50
28 - 30	-50	54 - 56	-50
30 - 32	-50	56 - 58	-50
32 - 34	70	58 - 60	-50
34 - 36	760	60 - 62	-50
38 - 38	-50	62 - 64	-50
38 - 40	50	64 - 66	-50
40 - 42	440	66 - 68	-50
42 - 44	-50	68 - 70	-50
44 - 46	-50	70 - 72	-50
46 - 48	-50		

- denotes less than.

Note: Values for W and Ag were less than 0.1% and less than 2gm/tonne respectively for all samples.

APPENDIX 4

PETROGRAPHIC DESCRIPTIONS BY AMDEL

AWN/DMW:250
11.1H

Sample: AWN/3; TSC20799

Location: Jimmy's Knob, D.D.H.1 - 25.90m.

Rock Name: Muscovite-feldspar-quartz-porphyry

Altered micromonzonite

Hand Specimen:

A fine-grained, pale pink coloured rock containing abundant potash feldspar as indicated by microchemical tests.

Thin Section:

This rock is comprised mainly of a fine-grained, equigranular (typical grain size between 0.2 and 1mm) feldspar intergrowth with interstitial, degraded biotite. Feldspar is comprised of approximately equal proportions of polysynthetically twinned microcline and pervasively sericitized plagioclase. Both the microcline and plagioclase tend to form euhedral to subhedral, prismatic crystals but in many cases the plagioclase has been completely or almost completely replaced by finely divided sericite. Some plagioclase crystals contain highly sericitized cores and relatively unaltered margins but for the most part the microcline has a relatively fresh, unaltered character. Locally the microcline lacks polysynthetic twinning and contains a fine, ribbon perthitic intergrowth which also, at least in some cases, shows pervasive sericitization.

The biotite has a highly degraded, fibrous character and a weakly pleochroic, yellowish-brown colour. Much of the biotite is also intergrown with finely divided iron oxides which imparts a translucent, reddish-brown colour to it. Iron oxides are also concentrated along grain margins and narrow fracture surfaces. Although the rock does not have an intensely fractured character some evidence of deformation is present with fractured feldspar crystals showing dislocated and broken shapes.

This is a fine-grained, shallow intrusive rock with a monzonitic composition which has suffered pervasive sericitization of plagioclase.

Sample: AWN/4; TSC20800

Location: Jimmy's Knob, D.D.H.1 - 61.5m

Rock Name: Granite Rock

Altered (?) syenite

Hand Specimen

A massive, greenish-grey coloured rock containing two red feldspar veins approximately 2mm wide at both ends of the core interval. Microchemical tests show that the rock contains abundant potash feldspar and the red veins also consist of potash feldspar.

Thin Section

This rock is comprised mainly of altered feldspar which has been largely replaced by finely divided sericite-clay leaving irregular feldspar remnants. Sericite-clay has a fine, flaky texture and for the most part has completely replaced the original feldspar, leaving only localised, irregular remnants. Most of the feldspar remnants exhibit a gridiron twinning typical of microcline, although some untwinned remnants are also present.

Finely divided chlorite flakes generally below 0.1mm in length are disseminated through the rock and exhibit a pale green, weakly pleochroic colour with anomalous interference colours. At least some of these chlorite flakes contain cores of degraded biotite, suggesting that most, if not all, of the chlorite is an alternation product of biotite.

AWN/DMW:250
11.1H

One of the red, potash feldspar-rich veins was included in the thin section and consists of turbid feldspar crystals intergrown with interstitial sericitic patches and minor granular quartz. Traces of quartz were also noted within the main body of the rock as small, disseminated crystals below 0.1mm in size, and very narrow fracture linings.

Opagues are disseminated through the rock as anhedral grains and granular aggregates which are generally associated with the disseminated chlorite flakes.

This is a highly altered rock which appears to be a potash feldspar-rich rock which has suffered pervasive sericitization.

Sample: AWN/2; TSC20798

Location: Jimmy's Knob, D.D.H.2 - 6.8m
Rock Name: Muscovite-feldspar-quartz-porphyry
Altered (?) diorite

Hand Specimen

A massive rock comprised of dark grey to black, lath-shaped crystals with a random orientation intergrown with angular, interstitial areas having a pale tan to reddish-brown colour.

Thin Section

In thin section the dark grey to black lath-shaped crystals can be seen to consist of randomly oriented biotite flakes with the interstitial areas consisting of finely divided sericite-clay intergrowths. Textural evidence as to the original mineral replaced by the fine, sericite-clay intergrowths is completely lacking but it is considered likely that the original mineral was probably feldspar. The biotite flakes have fibrous, degraded characters and a yellowish-brown, weakly pleochroic colour. This biotite also contains very fine, acicular crystals believed to be rutile or anatase crystallographically oriented along cleavage traces producing a fine, cross-hatch texture in basal sections like that observed in the biotite of sample AWN/1 (TSC20797).

Apatite comprises a significant proportion of this rock (approximately 10%) forming euhedral, prismatic crystals up to 1mm in length. Minor quartz is also present as irregular inclusions within the angular, interstitial sericite-clay fillings. Minor opaques are disseminated through the rock as anhedral grains and

AWN/DMW:250
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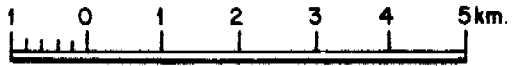
finely granular aggregates. Opaques are also intergrown with the biotite, locally forming incipient, finely granular coronas. Minor opaques also form granular fracture and vein fillings.

This is a highly altered rock which is believed to have been originally a plagioclase and biotite-rich rock in which the plagioclase has been completely replaced by sericite-clay.

13° 30'

JIMMYS KNOB AREA N.T. LOCATION PLAN

SCALE 1 : 100 000



13° 35'

JIMMYS KNOB



ML 155B

ML
156 B

Burrundie
Siding

TN

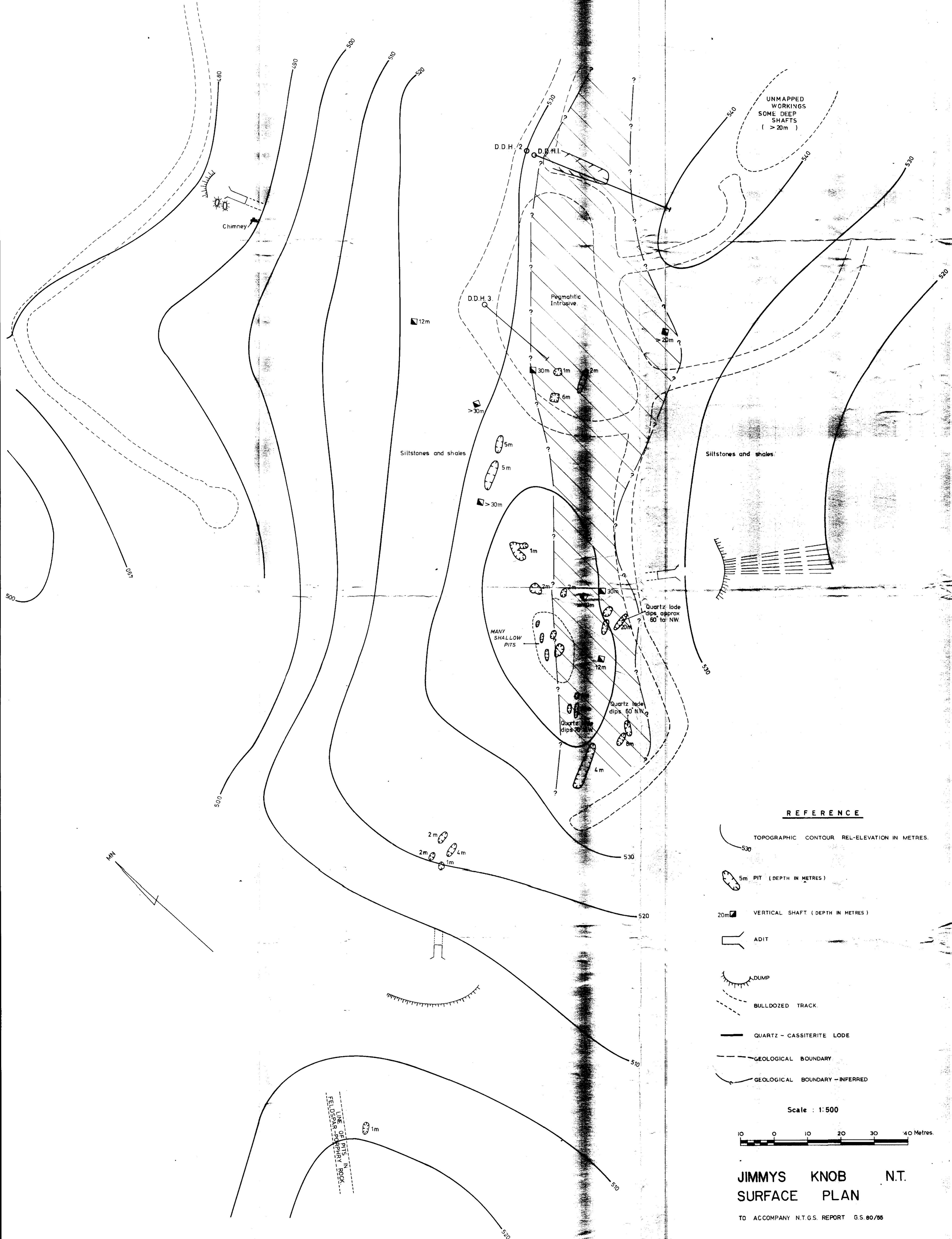


13° 40'

Stuart

Highway

131° 45'



REFERENCE

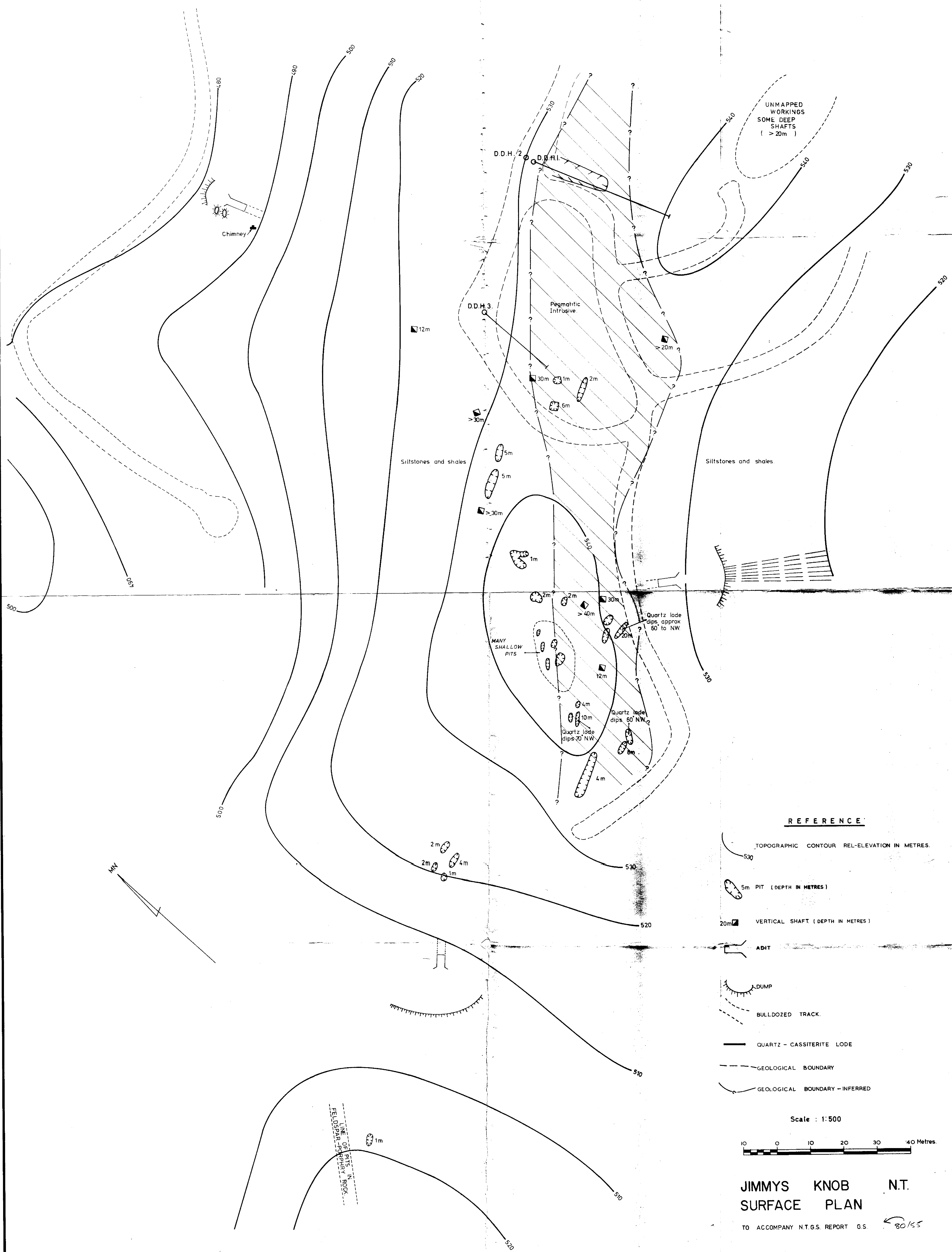
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- 5m PIT (DEPTH IN METRES)
- 20m VERTICAL SHAFT (DEPTH IN METRES)
- ADIT
- DUMP
- BULLDOZED TRACK
- QUARTZ - CASSITERITE LODGE
- GEOLOGICAL BOUNDARY
- GEOLOGICAL BOUNDARY - INFERRED

Scale : 1:500



JIMMYS KNOB N.T. SURFACE PLAN

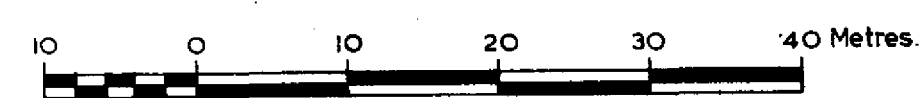
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REFERENCE

- TOPOGRAPHIC CONTOUR REL-ELEVATION IN METRES.
- 5m PIT (DEPTH IN METRES)
- 20m VERTICAL SHAFT (DEPTH IN METRES)
- ADIT
- DUMP
- BULLDOZED TRACK
- QUARTZ - CASSITERITE LODGE
- GEOLOGICAL BOUNDARY
- GEOLOGICAL BOUNDARY - INFERRED

Scale : 1:500



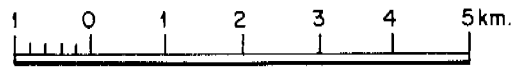
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TO ACCOMPANY N.T.G.S. REPORT G.S. 80/35

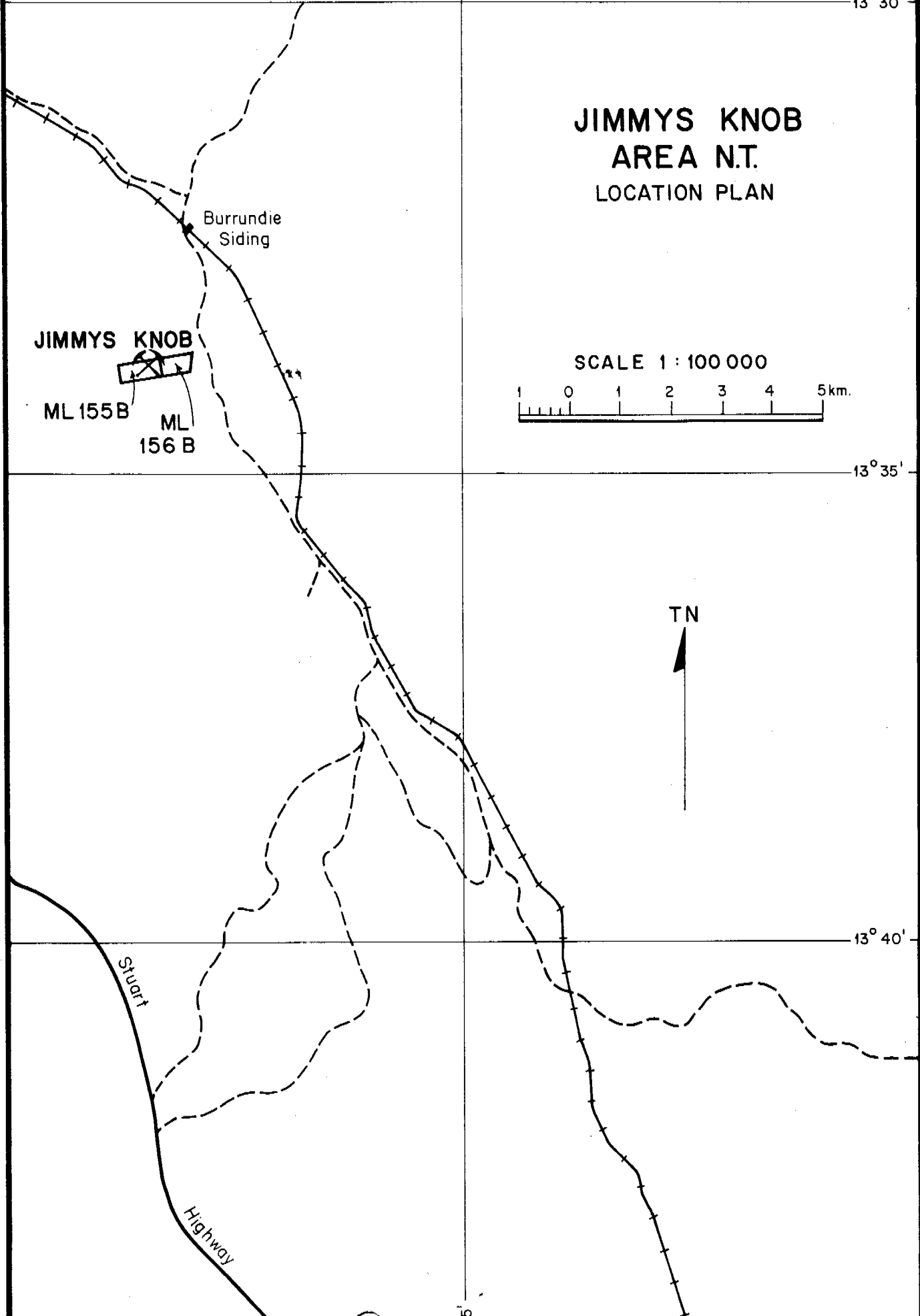
13° 30'

JIMMYS KNOB AREA N.T. LOCATION PLAN

SCALE 1 : 100 000



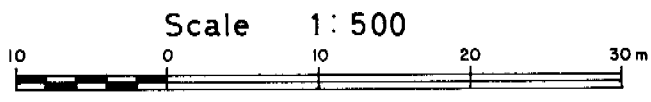
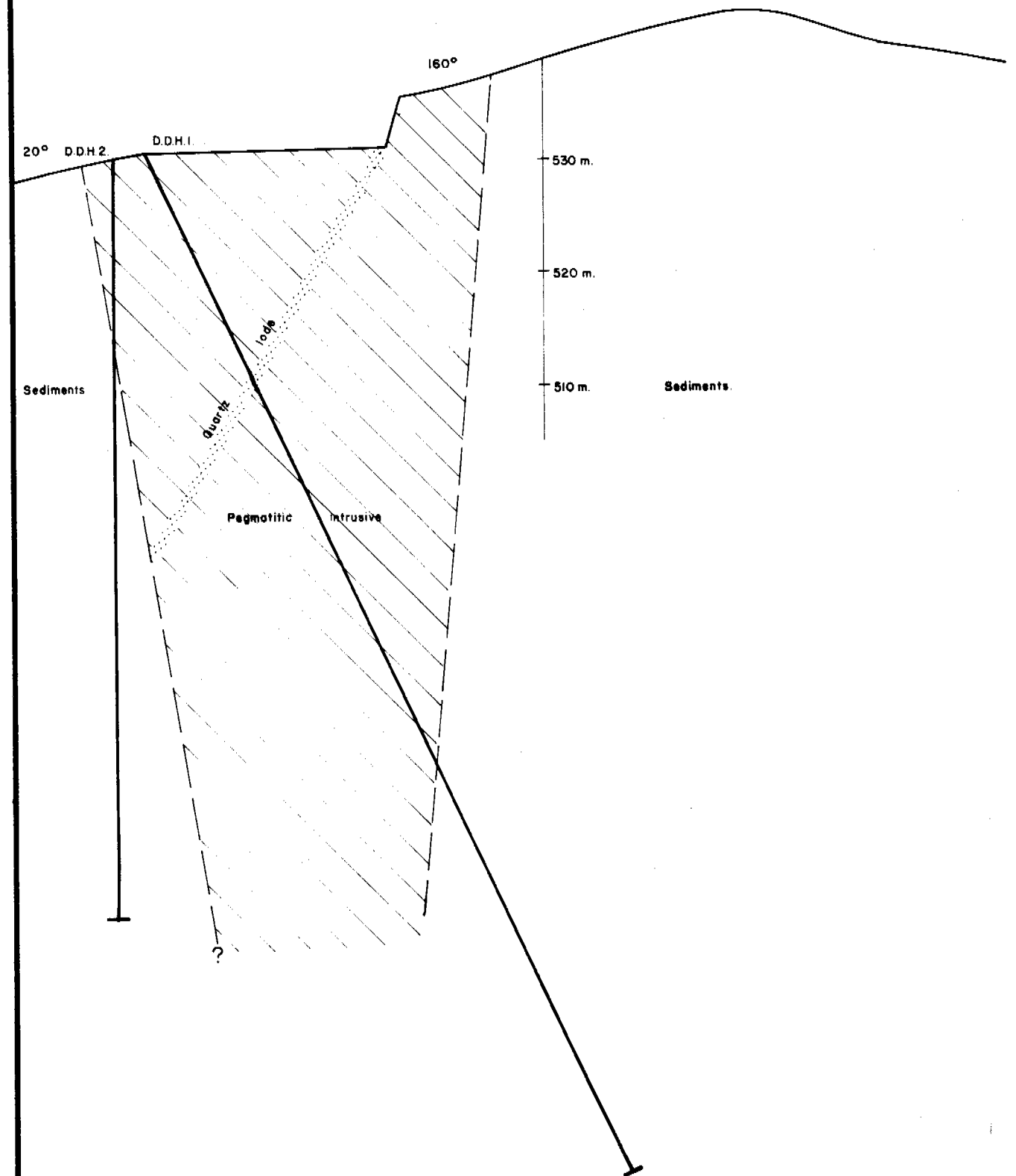
13° 35'



13° 40'

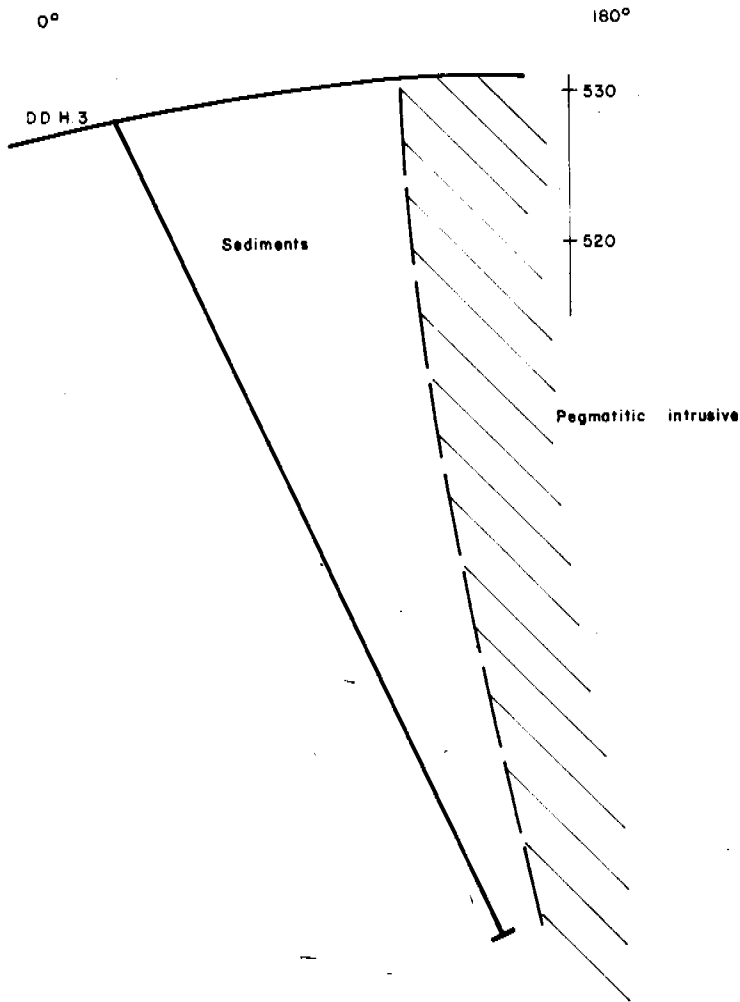
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131° 45'



DRILL SECTION
D.D.Holes. 1 *22*
JIMMYS KNOB. N.T.

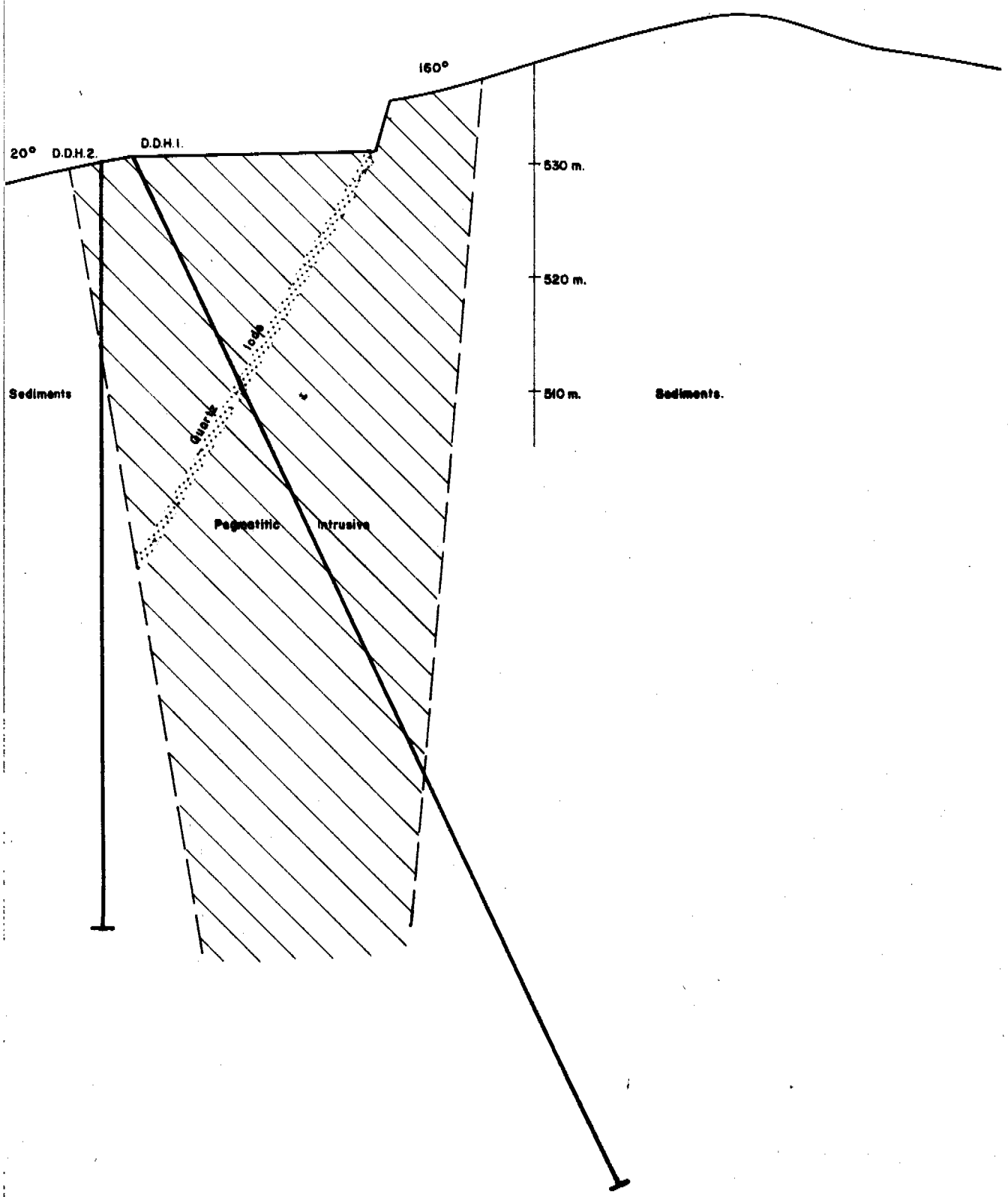
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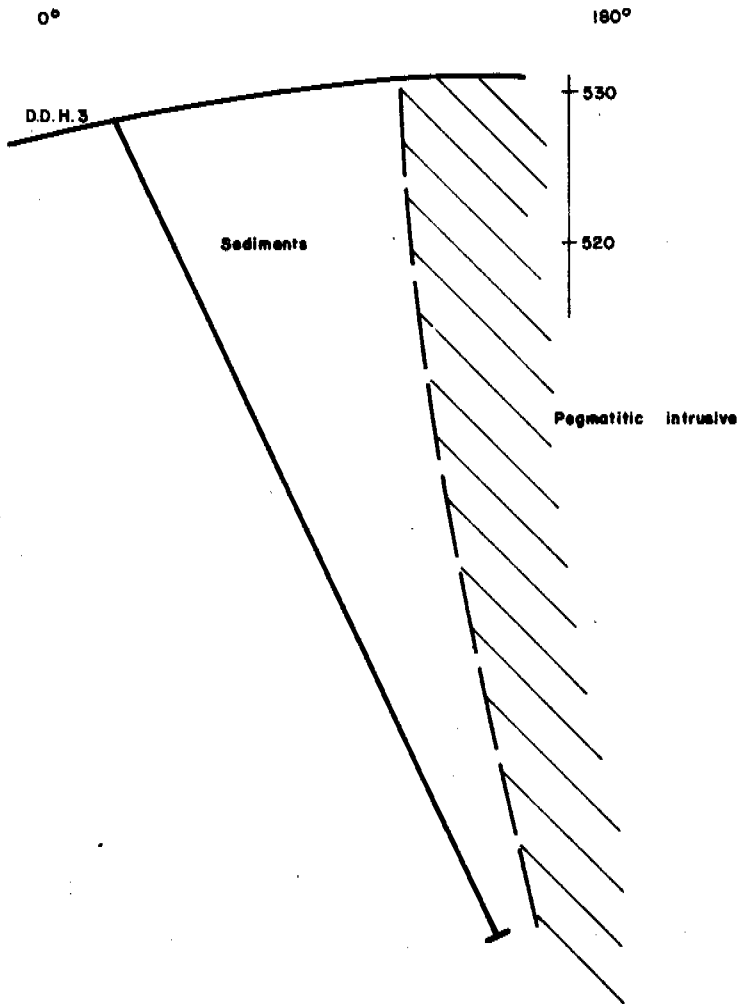
DRILL SECTION
D.D. Hole 3.
JIMMYS KNOB N.T.

Scale 1:500





**DRILL SECTIONS
D.D.Holes. 1 & 2
JIMMYS KNOB. N.T.**



DRILL SECTIONS
D.D. Holes. 3.
JIMMYS KNOB N.T.

Scale 1:500

