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DIAMOND DRILLING AT MARANBOY TINFIELD NORTHERN TERRITORY, 1958-1959

by

N.J. MacKay.

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SUMMARY

Eleven diamond drill holes, totalling 5,646 feet in length, were drilled at the Maranboy Tinfield in the Northern Territory between March, 1958 and November, 1959 by the Bureau of Mineral Resources. Drilling was concentrated on two mining leases in order to ascertain whether the known ore-shoots extend or repeat at depth.

At Anaconda lease all eight drill holes penetrated the quartz-tourmaline lode; three of these drill holes intersected tin ore. Two of the three drill holes at Osman lease penetrated the lode but only traces of cassiterite were present.

The results of the drilling and of underground exploration by United Uranium N.L. have shown (a) that the known ore-shoots do not extend to 250 feet below the ground surface, (b) that there are large blank zones in the main lode below the outcropping ore-shoots, and (c) that there is a possible repetition of the Anaconda ore-shoot at depth which should be examined by underground work.

INTRODUCTION

The Maranboy Tinfield is situated 40 miles south-east of the township of Katherine in the Northern Territory. Access to the field is by 14 miles of all-weather gravel road from the Stuart Highway and the Darwin/Larrimah railway line.

The geology of the field is described in Bulletin No. 37 (Walpole, 1958) by the Bureau of Mineral Resources.

The Maranboy lodes are fine-grained quartz-tourmaline fissure-lodes which are infillings of a conjugate set of fractures. The ore mineral is cassiterite and the main ore-shoots are lenticular bulges up to 400 feet in length and ranging in width from 8 to 25 feet.

Walpole (pp. 37-38) states:

"The pattern of lenticular bulges in which the known ore-shoots occur along the strike suggests that similar bulges may exist in the

direction of dip. If so, individual shoots cannot be expected to continue at depth, but are likely to be replaced by new shoots. If the shape of the shoots was controlled initially by irregularities on the opposing faces of the lode channel, then the pitch of the shoots may be irregular and the repetitions at depth may not follow any recognisable pattern."

Under agreement with United Uranium N.L. who held options over Anaconda and Osman leases, two diamond drilling programmes were carried out on the field by the Bureau of Mineral Resources. The aim was to investigate the extension or repetition at depth of the outcropping Anaconda and Osman ore-shoots.

The first programme consisted of five drill holes, which were drilled between March, 1958 and October, 1958 at Anaconda lease. Six drill holes, three more at Anaconda lease and three at Osman lease, formed the second programme. This was carried out between December, 1958 and November, 1959. The total length of the eleven drill holes was 5,646 feet, and two diamond drills operated during most of the above periods.

Appendix 1 is the diamond drilling logs (logged by N.J. MacKay and J. Hays), and Appendix 2 gives the tin assay results.

DRILLING RESULTS

Anaconda Lease

Eight drill holes, totalling 4,226 feet in length, were drilled at Anaconda lease. Plate 1 shows the surface geology and positions of the drill holes, Plates 2 to 5 are cross sections along the drill holes, and Plate 6 is a longitudinal projection showing the lode intersections.

The drilling results are tabled below:

Drill Hole			Lode Intersection			
Lease	No.	Length	From To	Drill Width	True Width	Assay (% tin)
Anaconda	1	361 ft.	283' 0" - 285' 9"	2'9"	2' 0"	0.02
			304' 6" - 318' 3"	13'9"	10' 0"	0.19
Anaconda	2	397 ft.	(292' 0" - 294' 0"	2'0"	1' 3"	2.18)
			(294' 0" - 305' 6"	11'6"	7' 9"	0.04)
Anaconda	3	500 ft.	367' 0" - 370' 0"	3'0"	2' 0"	0.02
			450'10" - 467'11"	17'1"	12' 6"	1.51
Anaconda	4	517 ft.	421' 6" - 461' 7"	40'1"	28' 0"	0.05
			482'11" - 491' 6"	8'7"	6' 0"	1.47
Anaconda	5	704 ft.	597' 2" - 601' 8"	4'6"	3' 0"	0.01
			620' 0" - 631' 9"	11'9"	8' 0"	0.01
			663' 3" - 679' 3"	16'0"	10' 6"	0.03
Anaconda	6	727 ft.	(671' 0" - 683' 0"	12'0"	7' 3"	1.56)
			(683' 0" - 700' 0"	17'0"	10' 3"	0.06)
Anaconda	7	497 ft.	458' 0" - 470' 0"	12'0"	8' 0"	0.43
Anaconda	8	523 ft.	415' 6" - 419' 0"	3'6"	2' 3"	0.14
			470' 0" - 485' 6"	11'6"	8' 0"	0.05

Intersections of tin ore were made in only three drill holes. These were:

(a) Anaconda No. 3, 12' 6" drill width of 1.51% tin.

(b) Anaconda No. 4, 6' 0" drill width of 1.47% tin.

(c) Anaconda No. 6, 7' 3" drill width of 1.56% tin.

A hole was drilled in 1955 by Red Terror N.L. at Anaconda lease (Plate 1). The length of the hole was 400 feet, and the main lode was struck between 298 and 303 feet. The intersected lode, 3 ft. 6 ins. wide, assayed 1.41% tin at a depth of about 280 feet below the surface (Plate 6).

The drill holes are spaced close enough for some definite conclusions to be drawn:

(a) The main lode extends to the 600 feet level at Anaconda Lease.

(b) The outcropping Anaconda ore-shoot does not extend to the 250 foot level. If the ore-shoot cuts out not far below the bottom of the abandoned workings (76 feet), there is a

blank zone in the lode above the 250 foot level of approximately 150 feet.

(c) There is possibly another ore-shoot below the outcropping Anaconda ore-shoot, extending from about the 300 foot level to the 600 foot level, as shown by drill holes No's. Red Terror, 3, 4, and 6 (Plate 6). The lode intersections indicate a grade of 1.5% to 2% tin for the ore-shoot. The length of the ore-shoot is about 250 feet at the 400 foot level, but it may be considerably less at the 600 foot level.

(d) The eastern section of the main lode at the Anaconda lease has been closely faulted.

Osman Lease

Three drill holes, totalling 1,420 feet in length, were drilled at Osman lease. The surface geology and cross sections along the drill holes are shown on Plates 7 to 10.

The drilling results are tabled below:

Drill Hole			Lode Intersection				
Lease	No.	Length	From	To	Drill Width	True Width	Assay (%tin)
Osman	1	501 ft.	409' 0" - 417' 9" 439' 0" - 442' 6"		8' 9" 3' 6"	6' 6" 2' 6"	0.02 0.05
Osman	2	603 ft.	-	-	-	-	-
Osman	3	316 ft.	284' 6" - 297' 0"		12' 6"	8' 6"	0.10

In 1958 United Uranium N.L. sank a vertical shaft at Osman lease to a depth of 250 feet. A cross-cut to the south at the 125 foot level struck 17 feet of lode assaying 1.72% tin. Plate II shows the underground work done by United Uranium N.L.

The main exploration was carried out on the 250 foot level where the lode is displaced by a number of faults. The only section of the lode at this level carrying significant amounts of cassiterite is at the eastern end of the workings on the northern side of the Howlett Fault.

Drill holes No's. 1 and 3 penetrated the main lode but there were only traces of cassiterite present in the intersections. Drill hole No. 2 did not intersect the main lode. The Howlett Fault is vertical at this position and the drill passed through a zone where the lode is faulted out by this fault.

No pattern of repetition of the outcropping Osman ore-shoot is indicated as no intersection of lode containing significant amounts of cassiterite was made. There are a number of cross-faults displacing the main lode, and no further drilling is recommended. The Osman ore-shoot apparently cuts out between the 125 and 250 foot levels.

CONCLUSIONS

The eight drill holes at Anaconda lease and the three drill holes and underground workings at Osman lease have shown that the outcropping ore-shoots do not extend to the 250 foot level. The large blank zones in the main lode below the outcropping ore-shoots discourage further exploration at depth.

There is a possible repetition of the Anaconda ore-shoot between the 300 foot and 600 foot levels. This should be examined by underground work before any further conclusions are drawn. No further diamond drilling is recommended.

REFERENCE

Walpole, B.P., 1958 - The Maranboy Tinfield, N.T. Bur. Min. Resour. Aust. Bull. 37.

APPENDIX I

DIAMOND DRILLING LOGS, MARANBOY TINFIELD

D.D.H. No. 1, ANACONDA LEASE

Survey Data:

Collar Coordinates: 875 N, 645 W (Plate 1)

	At surface	At 194'	At 290'	At 360'
Bearing:	200°	199°30'	205°	206°30'
Inclination:	-60°	-56°	-55°	-52°

Commenced Drilling: 27th March, 1958

Completed Drilling: 24th May, 1958

Core Recovery: 68%.

From	To	Footage Drilled	Footage Recovered	Description of Core
0'	17'0"	17'0"	6'0"	Rubble and fractured reddish-brown greywacke with interbedded siltstone.
17'0"	62'0"	45'0"	22'9"	Fine to medium grained speckled greywacke and interbedded siltstone. Bedding angle 45°.
62'0"	158'0"	96'0"	66'4"	Interbedded reddish-brown greywacke and siltstone. At 85'3" - quartz-tourmaline stringers.
158'0"	213'6"	55'6"	40'6"	Speckled greywacke, fine to medium grained, with some interbedded reddish-brown siltstone.
213'6"	238'6"	25'0"	18'3"	Red and grey siltstone, some quartz stringers. At 236'6" - 3" quartz-tourmaline lode.
238'6"	281'3"	42'9"	31'9"	Interbedded speckled greywacke and siltstone. Bedding angle 50°-55°.
281'3"	283'0"	1'9"	1'1"	Brecciated reddish-brown siltstone.
283'0"	285'9"	2'9"	1'9"	Fine grained quartz-tourmaline lode, brecciated in places, some quartz stringers.

From	To	Footage Drilled	Footage Recovered	Description of Core
285'9"	301'9"	16'0"	9'9"	Brecciated reddish-brown siltstone with some interbedded greywacke, several thin (up to 1½") veinlets of quartz-tourmaline lode.
301'9"	303'3"	1'6"	1'2"	Fine grained greywacke. At 302'7" - 4" quartz breccia.
303'3"	304'6"	1'3"	7"	Sheared greywacke, 3" quartz breccia.
304'6"	311'6"	7'0"	5'5"	Fine grained quartz-tourmaline lode, brecciated and hematitic in places, some quartz stringers.
311'6"	315'6"	4'0"	3'10"	Fine grained quartz-tourmaline lode, brecciated, some cassiterite in quartz stringers.
315'6"	316'6"	1'0"	10"	Sheared chloritic siltstone.
316'6"	318'3"	1'9"	1'4"	Fine grained quartz-tourmaline lode, brecciated and hematitic in places.
318'3"	325'9"	7'6"	4'11"	Sheared reddish-brown greywacke and siltstone. At 321' - 3" quartz breccia.
325'9"	337'6"	11'9"	8'9"	Red and greyish-green siltstone with some interbedded speckled greywacke, several quartz-tourmaline stringers.
337'6"	338'6"	1'0"	10"	Fine grained quartz-tourmaline lode, some cassiterite in quartz stringers.
338'6"	351'6"	13'0"	10'9"	Red and greyish-green siltstone, some quartz stringers.
351'6"	361'0"	9'6"	8'6"	Interbedded speckled greywacke and siltstone, some quartz stringers. At 355'6" - 4" fine grained quartz-tourmaline lode.
361'0"				End of hole.

D.D.H. No. 2, ANACONDA LEASE

Survey Data:

Collar Coordinates: 787 N, 460 W. (Plate 1)

	At surface	At 145'	At 257'
Bearing:	200°M	204°30'	198°
Inclination:	-60°	-57°	-55°

Commenced Drilling: 14th April, 1958
Completed Drilling: 5th June, 1958
Core Recovery: 66%.

From	To	Footage Drilled	Footage Recovered	Description of Core
0'	82'0"	82'0"	15'0"	Rubble and weathered reddish-brown siltstone.
82'0"	154'0"	72'0"	28'6"	Interbedded reddish-brown greywacke and siltstone, mottled in places. Bedding angle 40°. At 83' - 6" quartz-tourmaline lode. At 137' - 3" quartz-tourmaline lode.
154'0"	227'3"	73'3"	59'6"	Reddish-brown greywacke with some interbedded siltstone, mottled grey in places. Some quartz veinlets. At 167'4" - 3" quartz-tourmaline lode. At 189'6" - 3" quartz breccia.
227'3"	232'9"	5'6"	4'1"	Medium grained reddish-brown greywacke with some quartz stringers. 231'6" - 232'9" Quartz-tourmaline lode.
232'9"	287'6"	54'9"	52'1"	Medium grained reddish-brown greywacke with some interbedded siltstone, mottled green in places.
287'6"	292'0"	4'6"	2'1"	Sheared chloritic greywacke.
292'0"	295'0"	3'0"	2'8"	Brecciated quartz-tourmaline lode with many quartz stringers showing some cassiterite.
295'0"	299'7"	4'7"	3'6"	Brecciated and indurated sediments with some stringers of quartz-tourmaline lode (up to 2").

From	To	Footage Drilled	Footage Recovered	Description of Core
299'7"	302'0"	2'5"	2'4"	Brecciated sediments partially replaced by quartz-tourmaline hornfels.
302'0"	305'6"	3'6"	2'11"	Brecciated greywacke with many quartz and quartz-tourmaline stringers (transition zone).
305'6"	321'11"	16'5"	13'9"	Fractured reddish-brown greywacke and siltstone, some quartz stringers, Bedding angle 45°.
321'11"	323'3"	1'4"	1'1"	Fine grained quartz-tourmaline lode.
323'3"	367'0"	43'9"	38'3"	Interbedded reddish-brown greywacke and siltstone, 338'0" - 339'6" Traces of quartz-tourmaline in the sediments.
367'0"	367'10"	10"	8"	Brecciated quartz-tourmaline lode, with quartz stringers containing some cassiterite.
367'10"	382'6"	14'8"	13'3"	Fractured reddish-brown greywacke and siltstone.
382'6"	388'9"	6'3"	5'6"	Slump breccia? Fragments of greywacke and siltstone in silty matrix; quartz veins and stringers showing chlorite(?) and kaolin in cavities.
388'9"	397'0"	8'3"	7'3"	Interbedded greyish-brown greywacke and siltstone.
397'0"				End of hole

D.D.H. No. 3, ANACONDA LEASE

Survey Data:

Collar Coordinates: 966N, 586 W. (Plate 1)

	At surface	At 200'	At 300'	At 400'	At 495'
Bearing:	200°M	201°	201°30'	206°45'	206°30'
Inclination:	-60°	-56°	-57°	-56°	-56°

Commenced Drilling: 28th May, 1958
Completed Drilling: 1st August, 1958
Core Recovery: 94%.

From	To	Footage Drilled	Footage Recovered	Description of Core
0'	5'5"	5'5"	-	Rubble
5'5"	8'10"	3'5"	0"	5" quartz-tourmaline lode with quartz-tourmaline stringers containing some cassiterite. 2" reddish-brown siltstone.
8'10"	59'6"	50'8"	47'0"	Medium grained reddish-brown and greyish-brown greywacke and interbedded siltstone, with some kaolin-filled fractures up to ½" in width. Bedding angle 50°.
59'6"	132'0"	72'6"	66'0"	Medium grained greyish-brown speckled greywacke with interbedded reddish-brown siltstone.
132'0"	253'2"	121'2"	116'6"	Fine to medium grained greywacke and interbedded siltstone. Bedding angle 45°. 149'-150' Strong quartz veining and brecciation. 173'3"-173'6" Fine grained quartz-tourmaline lode. 183'6"-184'0" Fine grained quartz-tourmaline lode.
253'2"	263'0"	9'10"	9'6"	Reddish-brown siltstone. 256'0"-256'6" Quartz-tourmaline lode. 261'0"-261'3" Fine grained quartz-tourmaline lode.
263'0"	300'6"	37'6"	36'8"	Medium grained speckled greywacke with some interbedded siltstone. Bedding angle 45°.
300'6"	367'0"	66'6"	64'0"	Fractured dark-brown siltstone with some interbedded red greywacke. 301'8"-302'2" Quartz-tourmaline lode fragments. 313'0"-313'6" Quartz-tourmaline lode fragments. 319'7"-320'0" Quartz tourmaline lode fragments. 363'7"-364'0" Quartz-tourmaline lode fragments.
367'0"	370'0"	3'0"	3'0"	Fine grained quartz-tourmaline lode.

From	To	Footage Drilled	Footage Recovered	Description of Core
370'0" -	446'9"	76'9"	76'6"	Reddish brown greywacke and siltstone, mottled in places. Bedding angle 50°. 426'0"-426'9" Strongly brecciated, with quartz veinlets.
446'9" -	450'10"	4'1"	3'10"	Brecciated greywacke and siltstone.
450'10" -	452'0"	1'2"	1'2"	Fine grained quartz-tourmaline hornfels.
452'0" -	454'10"	2'10"	2'9"	Brecciated quartz-tourmaline lode, with some bismuth oxide, hematite, and cassiterite along fractures.
454'10" -	461'0"	6'2"	5'11"	Massive quartz-tourmaline lode, brecciated in places, with stringers of quartz and hematite.
461'0" -	463'2"	2'2"	1'5"	461'0"-462'2" Brecciated quartz-tourmaline lode, with quartz, hematite, and cassiterite in stringers. 462'2"-462'11" No core (?strongly brecciated) 462'11"-463'2" Quartz-hematite breccia.
463'2" -	465'11"	2'9"	2'8"	Brecciated quartz-tourmaline lode, with stringers of quartz and hematite.
465'11" -	466'11"	1'0"	1'0"	Fine grained massive quartz-tourmaline lode.
466'11" -	467'11"	1'0"	1'0"	Brecciated siltstone partially replaced by quartz-tourmaline hornfels (transition zone).
467'11" -	471'10"	3'11"	3'5"	Sheared and brecciated greyish-red greywacke and siltstone, with many quartz veinlets and kaolin in fractures.
471'10" -	492'3"	20'5"	19'8"	Fractured red greywacke with some interbedded siltstone, mottled in places, some quartz stringers.

From	To	Footage Drilled	Footage Recovered	Description of Core
492'3" -	500'0"	7'9"	7'8"	Mottled reddish-brown greywacke, fine grained, some quartz stringers. At 490'8"-1" fractured quartz-tourmaline stringers.
500'0"				End of hole.

D.D.H. No. 4, ANACONDA LEASE

Survey Data:

Collar Coordinates: 889 N, 415 W, (Plate 1)

	At surface	At 200'	At 300'	At 400'	At 500'
Bearing:	200°M	206°30'	207°	209°	209°30'
Inclination:	-60°	-58°	-59°	-59°	-59°

Commenced Drilling: 12th June, 1958
Completed Drilling: 9th August, 1958
Core Recovery: 96%.

From	To	Footage Drilled	Footage Recovered	Description of Core
0' -	26'9"	26'9"	17'0"	Rubble and weathered reddish-brown greywacke, mottled in places.
26'9" -	62'4"	35'7"	33'0"	Grey and reddish-brown greywacke, fine and medium grained.
62'4" -	05'9"	43'5"	43'5"	Red-brown greywacke, fine and medium grained, with some interbedded siltstone. Bedding angle 50°-60°. 66'-76'9" Some quartz stringers
105'9" -	90'0"	84'3"	84'0"	Mottled reddish-brown greywacke with some interbedded siltstone. Bedding angle 60°. At 133' - 1" fine grained quartz-tourmaline hornfels.
190'0"-27	'3"	81'3"	80'6"	Mottled reddish-brown interbedded greywacke and siltstone. Bedding angle 45°-50°.

From	To	Footage Drilled	Footage Recovered	Description of Core
				193'0"-193'8" Fine grained quartz-tourmaline hornfels. 240'-241' Fine grained quartz-tourmaline hornfels.
271'3" -	273'3"	2'0"	1'6"	Brecciated quartz-tourmaline lode, with quartz stringers.
273'3" -	329'6"	56'3"	55'0"	Mottled reddish-brown interbedded greywacke and siltstone, some quartz stringers. Bedding angle 45°.
329'6" -	334'3"	4'9"	4'9"	Brecciated reddish-brown greywacke, numerous quartz stringers.
334'3" -	396'9"	62'6"	62'0"	Reddish-brown greywacke with some interbedded siltstone, mottled in places, some quartz stringers and quartz breccia. Bedding angle 40°.
396'9" -	401'9"	5'0"	5'0"	Quartz breccia (fault). Fragments of greywacke and siltstone in quartz matrix; quartz veins and stringers showing quartz and kaolin in cavities.
401'9" -	421'6"	19'9"	19'9"	Reddish-brown interbedded greywacke and siltstone, mottled in places, some quartz stringers. Bedding angle 40°. 414'6"-415'0" Quartz tourmaline lode.
421'6" -	423'0"	1'6"	1'6"	Massive fine grained quartz-tourmaline lode.
423'0" -	424'4"	1'4"	1'4"	Mottled red greywacke, with quartz stringers.
424'4" -	427'1"	2'9"	2'5"	Brecciated fine grained quartz-tourmaline lode, with quartz-hematite stringers. 425'2"-425'8" Brecciated red greywacke with quartz stringers.

From	To	Footage Drilled	Footage Recovered	Description of Core
427'1" -	430'2"	3'1"	3'1"	Massive fine grained quartz-tourmaline lode, with quartz-hematite stringers.
430'2" -	433'0"	2'10"	2'10"	Brecciated fine grained quartz-tourmaline lode, many parallel quartz stringers, hematite and some bismuth oxide in fractures.
433'0" -	439'7"	6'7"	6'6"	Massive fine grained quartz-tourmaline lode, many tiny quartz-hematite stringers.
439'7" -	442'7"	3'0"	2'10"	Brecciated fine grained quartz-tourmaline lode, some quartz-hematite stringers.
442'7" -	443'0"	5"	5"	Altered grey greywacke (transition zone).
443'0" -	448'4"	5'4"	5'1"	Massive fine grained quartz-tourmaline lode, some quartz stringers, small "horses" of country rock up to 4" in width.
448'4" -	451'2"	2'10"	2'8"	Brecciated fine grained quartz-tourmaline lode, abundant quartz-hematite stringers, jasperised in places.
451'2" -	453'0"	1'10"	1'10"	Massive fine grained quartz-tourmaline lode, some quartz stringers.
453'0" -	456'0"	3'0"	3'0"	Brecciated fine grained quartz-tourmaline lode, abundant quartz-hematite stringers, jasperised in places, some bismuth oxide on fractures.
456'0" -	459'8"	3'8"	3'7"	Brecciated medium grained quartz-tourmaline lode, abundant quartz stringers, some bismuth oxide on fractures.
459'8" -	461'7"	1'11"	1'11"	Massive fine grained quartz-tourmaline lode, some quartz stringers, grading into altered greywacke (transition zone).

From	To	Footage Drilled	Footage Recovered	Description of Core
461'7" -	63'5"	1'10"	1'10"	Sheared red greywacke, abundant quartz stringers.
463'5" -	64'10"	1'5"	1'3"	Mottled red and grey siltstone, some quartz stringers. Bedding angle 45°.
464'10" -	465'10"	1'0"	1'0"	Red siltstone partially replaced by quartz-tourmaline hornfels.
465'10" -	70'6"	4'8"	4'5"	Red siltstone, mottled in places, some quartz stringers.
470'6" -	72'0"	1'6"	1'6"	Quartz-tourmaline hornfels.
472'0" -	73'5"	1'5"	1'5"	Interbedded red siltstone and brown greywacke.
473'5" -	75'0"	1'7"	1'6"	Hard, fine-grained quartz-tourmaline lode.
475'0" -	79'9"	4'9"	4'6"	Red siltstone, mottled in places, some quartz stringers.
479'9" -	82'11"	3'2"	3'1"	Red siltstone and greywacke partially replaced by quartz-tourmaline hornfels.
482'11" -	90'2"	7'3"	6'9"	Brecciated quartz-tourmaline lode, abundant quartz stringers containing hematite, bismuth oxide, and some cassiterite. Strongly brecciated at 486'-486'9". Fine grained at 488'9"-489'3".
490'2" -	91'6"	1'4"	1'4"	Brecciated red sediments partially replaced by quartz-tourmaline lode. Lode angle 45°.
491'6" -	94'7"	3'1"	3'0"	Mottled red and grey fine-grained greywacke, fractured in places. 492'3" - 492'8" Fine-grained quartz-tourmaline lode.
494'7" -	495'3"	8"	8"	Brecciated quartz-tourmaline lode.

From	To	Footage Drilled	Footage Recovered	Description of Core
495'3" -	01'6"	6'3"	5'11"	Mottled red, grey, and green medium-grained greywacke, some quartz-hematite stringers. Bedding angle 45°.
501'6" -	17'0"	15'6"	15'1"	Speckled reddish-brown greywacke. 506'-506'5" Fine grained quartz-tourmaline lode.
517'0"				End of hole.

D.D.H. No. 5, ANACONDA LEASE

Survey Data:

Collar Coordinates: 1000 N, 365 W (Plate 1)

	Surface	At 50'	At 200'	At 300'	At 400'	At 500'	At 600'	At 650'
Bearing:	200°M	204°	207°	207°30'	211°	213°	217°	218°
Inclination:	-60°	-58°	-58°	-57°	-58°	-57°	-59°	-58°

Commenced Drilling: 12th August, 1958
Completed Drilling: 25th October, 1958
Core Recovery: 95%

From	To	Footage Drilled	Footage Recovered	Description of Core
0' -	29'0"	29'0"	25'0"	Rubble and fractured mottled interbedded greywacke and siltstone.
29'0" -	63'0"	34'0"	31'6"	Mottled interbedded medium grained greywacke and siltstone, some quartz stringers. Bedding angle 40°.
63'0" -	83'6"	20'6"	19'6"	Pink and grey siltstone with bands of fine grained greywacke.
83'6" -	93'9"	46'3"	44'9"	Speckled greywacke, medium and fine grained. At 93'6" - 3" weathered micaceous rock. At 120'6" - 3" quartz veinlet.

From	To	Footage Drilled	Footage Recovered	Description of Core
129'9" -	9'0"	59'3"	58'0"	Interbedded medium and fine grained greywacke and siltstone. Bedding angle 45°-50°. At 184'9" - 2" quartz-tourmaline node.
189'0" -	92'4"	3'4"	3'1"	Red speckled greywacke, in places brecciated, with stringers of quartz and quartz-tourmaline.
192'4" -	3'0"	10'8"	10'0"	Speckled medium grained greywacke.
203'0" -	7'0"	34'0"	32'0"	Interbedded speckled greywacke and siltstone. Bedding angle 50°. 218'6" - 218'9" Many quartz-tourmaline stringers.
237'0" -	2'0"	25'0"	24'6"	Red speckled medium and fine grained greywacke, bleached grey along fractures, some quartz stringers up to ½" wide.
262'0" -	7'6"	25'6"	24'9"	Interbedded greywacke and siltstone, mottled in places. Bedding angle 50°.
287'6" -	09'6"	12'0"	11'6"	Grey and red coarse grained greywacke(?) with some interbedded fine grained greywacke and siltstone. Many angular feldspar fragments in greywacke.
299'6" -	5'3"	55'9"	54'0"	Interbedded speckled greywacke and siltstone, mainly red in colour with some grey beds. At 318'9" - 3" quartz-tourmaline stringers. At 325' - 2" quartz stringers. 331'-333' scattered quartz stringers in greywacke.
355'3" -	10"	15'9"	15'3"	Hard dark-grey greywacke, medium and fine grained, with several quartz stringers.

From	To	Footage Drilled	Footage Recovered	Description of Core
371'0" -	87'6"	16'6"	16'0"	Grey and red speckled greywacke, medium and fine grained, with some quartz stringers.
387'6" -	80'0"	92'6"	89'0"	Interbedded medium and fine grained greywacke with some bands of siltstone. Bedding angle 50°. 423'8"-424'2" Brecciated quartz-tourmaline lode.
480'0" -	81'6"	1'6"	1'6"	Red greywacke, brecciated in places; numerous quartz stringers, up to 1" in width, at 15° to the drill core.
481'6" -	92'0"	10'6"	10'3"	Mottled speckled medium grained greywacke.
492'0" -	99'8"	7'8"	7'4"	Altered greywacke, impregnated with much quartz and hematite particularly from 496' to 499'8".
499'8" -	01'0"	1'4"	1'4"	Brecciated fine-grained quartz-tourmaline lode.
501'0" -	02'11"	1'11"	1'10"	Red fine grained greywacke
502'11" -	503'6"	7"	7"	Fine grained quartz-tourmaline lode.
503'6" -	07'6"	4'0"	4'0"	Mottled fine grained greywacke.
507'6" -	09'6"	2'0"	1'11"	Brecciated quartz-tourmaline lode.
509'6" -	10'4"	10"	10"	Mottled fine grained greywacke.
510'4" -	11'3"	11"	10"	Fine grained quartz-tourmaline lode.
511'3" -	15'0"	3'9"	3'6"	Mottled fine grained greywacke.
515'0" -	16'6"	1'6"	1'6"	Fine grained quartz-tourmaline lode.
516'6" -	33'8"	17'2"	16'0"	Mottled fine grained greywacke. Bedding angle 50°-55°. At 533' - 1" quartz breccia stringer.

From	To	Footage Drilled	Footage Recovered	Description of Core
533'8" -	6'9"	43'1"	41'9"	Interbedded speckled medium and fine grained greywacke with some bands of siltstone. 541'10"-542'7" Quartz-tourmaline lode with quartz stringers 549'6" - 54[illegible]8" Quartz-tourmaline stringers.
576'9" -	78'9"	2'0"	2'0"	Red speckled medium grained greywacke.
578'9" -	97'2"	18'5"	18'0"	Interbedded medium and fine grained greywacke with some bands of siltstone. 586'6"-587'3" Quartz-tourmaline lode. 588'3"-589'1" Quartz tourmaline lode. 595'3" - 596'[illegible] Quartz stringers [illegible] in width, at 20° to the drill core.
597'2" -	01'8"	4'6"	4'2"	Fine grained quartz-tourmaline lode; some quartz stringers and some greywacke impregnated with quartz-tourmaline hornfels.
601'8" -	6'0"	4'4"	4'3"	Red speckled medium grained greywacke with some quartz stringers.
606'0" -	07'6"	1'6"	1'3"	Fine grained quartz-tourmaline lode with some quartz stringers.
607'6" -	8'6"	11'0"	10'6"	Red mottled medium grained greywacke with some quartz stringers. 614'6" - 6[illegible]' Quartz veinlet 1" in width, almost parallel to the drill core.
618'6" -	20'0"	1'6"	1'6"	Hard dark-grey medium and fine grained greywacke
620'0" -	22'10"	2'10"	2'9"	Massive fine grained quartz-tourmaline lode with some dark-grey greywacke partially replaced by quartz-tourmaline.
622'10"-6[illegible]	3'3"	3'5"	3'3"	Fine grained quartz-tourmaline lode, brecciated in places.

From	To	Footage Drilled	Footage Recovered	Description of Core
626'3" -	27'3"	1'0"	1'0"	Quartz breccia. Fragments of quartz and quartz-tourmaline lode in matrix of hematite, quartz and bismuth oxide. At 30° angle to drill core.
627'3" -	28'11"	1'8"	1'8"	Fine grained quartz-tourmaline lode.
628'11"	631'5"	2'6"	2'3"	Altered greywacke impregnated by stringers containing quartz, quartz-tourmaline, bismuth oxide and hematite.
631'5" -	31'9"	4"	4"	Fine grained quartz-tourmaline lode.
631'9" -	36'3"	4'6"	4'2"	Red speckled greywacke, brecciated in places and with many quartz stringers.
636'3" -	56'6"	20'3"	19'6"	Mottled medium and fine grained greywacke with some bands of siltstone and some stringers of quartz and hematite. Bedding angle 45°. 651'7"-651'11" Quartz-tourmaline lode at 40° to drill core.
656'6" -	63'3"	6'9"	6'6"	Hard dark-red siltstone. Bedding angle 50°. 659'8"-660'5" Quartz tourmaline lode.
663'3" -	66'5"	3'2"	3'0"	Very fine grained quartz-tourmaline lode with some quartz stringers. 664'2"-664'9" Altered hard dark-red siltstone.
666'5" -	72'6"	6'1"	5'11"	Brecciated quartz-tourmaline lode, many stringers containing quartz, hematite and bismuth oxide.
672'6" -	75'0"	2'6"	2'6"	Dark-grey greywacke impregnated with fine grained quartz-tourmaline lode and quartz-hematite stringers.
675'0" -	9'3"	4'3"	4'2"	Altered greywacke with bands of brecciated quartz-tourmaline impregnations and many quartz

From	To	Footage Drilled	Footage Recovered	Description of Core
				Veinlets.
679'3"	683'7"	4'4"	3'9"	Speckled dark-grey greywacke with some stringers of quartz and quartz-tourmaline.
683'7"	704'0"	20'5"	19'8"	Red and grey speckled medium grained greywacke with some bands of siltstone. Some quartz stringers in places. 686'6"-686'9" Quartz-tourmaline lode. 690'7"-690'9" Quartz-tourmaline lode.
704'0"				End of hole.

D.D.H. No. 6, ANACONDA LEASE

Survey Data:

Collar Coordinates: 1070 N, 540 W (Plate 1)

	At surface	At 190'	At 350'	At 500'	At 600'	At 715'
Bearing:	200°M	203°30'	204°30'	203°30'	207°	204°
Inclination:	-60°	-60°	-62°	-63°	-62°	-62°

Commenced Drilling: 16th December, 1958
Completed Drilling: 17th April, 1959
Core Recovery: 97%.

From	To	Footage Drilled	Footage Recovered	Description of Core
0'	15'6"	15'6"	8'6"	Sandy rubble.
15'6"	22'6"	7'0"	7'0"	Fine grained reddish-brown greywacke sandstone, massive, leached along joints. Bedding angle 50°.
22'6"	317'0"	294'6"	290'6"	Predominantly tuffaceous medium to fine grained red-grey greywacke with shaly intercalations at 22'6"-34'3", 42'10"-55'9" and 129'-143'. Bedding angle 40°. Epidotic or chloritic from 315'.

From	To	Footage Drilled	Footage Recovered	Description of Core
317'0"	319'0"	2'0"	2'0"	Intraformational breccia. Flat shale pebbles in sandy greywacke matrix. Epidotic?
319'0"	324'0"	5'0"	5'0"	Greywacke slate, epidotic? Bedding angle 45°.
324'0"	336'0"	12'0"	12'0"	Slump breccia?, intermingled fragments of sandstone and shale.
336'0"	341'0"	5'0"	5'0"	Mottled reddish-grey slate, epidotic? to 330'. Bedding angle 45°
341'0"	386'6"	45'6"	45'0"	Greywacke, red-grey, medium grained and massiv Bedding angle 45° on shaly bands.
386'6"	444'4"	57'10"	57'2"	Mottled slaty siltstone. Bedding angle 40°.
444'4"	447'0"	2'8"	2'8"	Greywacke band.
447'0"	457'8"	10'8"	10'5"	Mottled and shattered slaty siltstone.
457'8"	462'2"	4'4"	4'1"	As above but brecciated - may be intraformational. Quartz stringer at 457'8". Cleavage 15°-20° to core.
462'0"	469'0"	7'0"	7'0"	Greywacke.
469'0"	488'6"	19'6"	19'6"	Mottled slaty siltstone. Bedding angle 45°.
488'6"	517'0"	28'6"	28'6"	Greywacke.
517'0"	557'0"	55'0"	55'0"	Mottled red-grey slate. Brecciated and quartz veined at 517'6", 518'6" and 522'. Bedding angle 40°.
557'0"	660'6"	103'0"	103'0"	Interbedded greywacke and slate, mottled from 620'-635' Bedding angle 40°. Thin lode stringers between 618' and 622'.
660'6"	671'0"	10'6"	10'0"	Mottled slate with some lode stringers.

From	To	Footage Drilled	Footage Recovered	Description of Core
671'0"	674'3"	3'3"	1'3"	Quartz-tourmaline lode, massive and compact, very fine grained.
674'3"	678'0"	3'9"	3'9"	Quartz-tourmaline lode with some cassiterite in quartz-hematite stringers - well brecciated from 676' to 678'.
678'0"	683'0"	5'0"	4'6"	Quartz-tourmaline lode with some cassiterite in quartz-hematite stringers, less brecciated than above.
683'0"	686'0"	3'0"	3'0"	Quartz-tourmaline lode, well brecciated, many quartz veins.
686'0"	689'6"	3'6"	3'6"	Quartz-tourmaline lode, massive and compact, with few quartz-hematite stringers.
689'6"	694'3"	4'9"	4'9"	Quartz-tourmaline lode, well brecciated, with abundant quartz-hematite stringers cutting brecciated lode.
694'3"	697'0"	2'9"	2'9"	Quartz-tourmaline lode less brecciated than above.
697'0"	700'0"	3'0"	3'0"	Transition from quartz-tourmaline lode into slate.
700'0"	727'0"	27'0"	24'0"	Reddish mottled slate and siltstone with sandy bands, badly broken, few thin quartz stringers at 720'.
727'0"				End of hole.

D.D.H. No. 7, ANACONDA LEASE

Survey Data:

Collar Coordinates: 1008 N, 680 W (Plate 1)

	At surface	At 200'	At 320'	At 450'
Bearing:	200°M	207°	207°	209°
Inclination:	-60°	-57°	-55°	-55°

Commenced Drilling: 2nd May, 1959
Completed Drilling: 3rd July, 1959
Core Recovery: 92%.

From	To	Footage Drilled	Footage Recovered	Description of Core
0'	35'0"	35'0"	-	Badly broken ground; drilled, cemented and redrilled.
35'0"	55'0"	20'0"	20'0"	Interbedded medium to coarse grained red-grey greywacke and slate, well jointed; thin quartz stringers along some joints.
55'0"	102'0"	47'0"	47'0"	Predominantly medium to coarse grained greywacke with some slaty bands.
102'0"	151'0"	49'0"	49'0"	Dark red-grey slate and fine grained greywacke, with chlorite or epidote on joints. Slump structures at 112'.
151'0"	210'0"	59'0"	59'0"	Medium grained red-grey greywacke interbedded with mottled slate, few thin quartz veinlets. Bedding angle 45°-30°. 166'-166'6" Quartz-tourmaline lode.
210'0"	285'0"	75'0"	75'0"	Mottled and banded red-grey slate. Bedding angle 30°-45°. 263'-264' Quartz-tourmaline lode. Slump breccia(?) at 240'.

From	To	Footage Drilled	Footage Recovered	Description of Core
285'0" -	447'0"	162'0"	162'0"	Interbedded medium to coarse grained greywacke and mottled slate, beds from 1 foot to 6 feet thick. Slump structure at 296 feet. 6" quartz-tourmaline lode and brecciation at 312'. 3" quartz-tourmaline lode in 316'. Bedding angle 45° at 300 feet, 60° at 399 feet.
447'0" -	448'0"	1'0"	1'0"	Red slate, slightly brecciated.
448'0" -	453'0"	5'0"	5'0"	Coarsely brecciated red slate with very little tourmalinisation, some bismuth oxide on joints.
453'0" -	458'0"	5'0"	5'0"	More finely brecciated than above, no tourmalisation, ferruginised.
458'0" -	463'0"	5'0"	5'0"	Finely brecciated tourmalinised slate, some quartz veinlets (transition lode).
463'0" -	467'0"	4'0"	4'0"	Well brecciated quartz-tourmaline lode, no blocks of country rock.
467'0" -	470'0"	3'0"	3'0"	Well brecciated quartz-tourmaline lode.
470'0" -	497'0"	27'0"	20'6"	Interbedded red-grey medium grained greywacke and slate. 3" quartz-tourmaline lode stringers at 475' and 477'.
497'0"				End of hole.

D.D.H. No. 8, ANACONDA LEASE

Survey Data:

Collar Coordinates: 850 N, 320 W (Plate 1)

	At surface	At 200'	At 300'	At 400'	At 500'
Bearing:	200°M	208°	209°	207°	204°
Inclination:	-60°	-57°	-57°	-58°	-55°

Commenced Drilling: 13th July, 1959
Completed Drilling: 5th October, 1959
Core Recovery: 87%.

From	To	Footage Drilled	Footage Recovered	Description of Core
0'	40'0"	40'0"	10'0"	Red-grey greywacke with slaty intercalations. Bedding angle 30°.
40'0"	86'0"	46'0"	46'0"	Finely interbedded siltstone and greywacke. Bedding angle 45°.
86'0"	86'1"	1"	1"	Thin tourmalinised quartz-breccia.
86'1"	26'0"	39'11"	39'9"	Coarsely interbedded siltstone and greywacke, siltstone with mottled weathering. 2' beds. Bedding angle 45°. Thin quartz veinlets at 118'.
126'0"	27'0"	1'0"	1'0"	Slump breccia in siltstone.
127'0"	40'0"	13'0"	13'0"	Predominantly siltstone.
140'0"	41'0"	1'0+	1'0"	Quartz vein sealing cracks.
141'0"	55'0"	14'0"	14'0"	Interbedded siltstone and greywacke. Quartz veinlets at 147'-148'.
155'0"	69'0"	14'0"	14'0"	Grades into siltstone.
169'0"	80'0"	11'0"	11'0"	Interbedded siltstone and greywacke. Slump brecciation in siltstone. 170'-180' Quartz-tourmaline lode.
180'0"	43'0"	63'0"	63'0"	Predominantly siltstone with few interbeds of greywacke. Bedding angle 40°. Quartz veinlets at 232' and 233'.

From	To	Footage Drilled	Footage Recovered	Description of Core
243'0"	276'0"	33'0"	33'0"	Mostly greywacke with few 6" siltstone interbeds. Much slump material at 250'-255'.
276'0"	278'6"	2'6"	2'6"	Tourmalinised and brecciated siltstone.
278'6"	288'0"	9'6"	5'0"	Broken interbedded siltstone and greywacke.
288'0"	288'9"	9"	9"	Quartz breccia.
288'9"	300'0"	11'3"	5'0"	Broken interbedded siltstone and greywacke.
300'0"	308'0"	8'0"	8'0"	Predominantly greywacke.
308'0"	326'0"	18'0"	18'0"	Predominantly siltstone, brecciated with quartz veinlets sealing cracks at 312'-320'.
326'0"	336'0"	10'0"	10'0"	Sedimentary breccia, may be intraformational slump structures at 334'. Fragments of slate, less than $\frac{1}{4}$" in diameter, in silty matrix.
336'0"	406'0"	70'0"	58'3"	Predominantly siltstone with some interbedded greywacke.
406'0"	409'0"	3'0"	3'0"	Greywacke with siltstone slump material.
409'0"	413'0"	4'0"	4'0"	Brecciated siltstone.
413'0"	415'6"	2'6"	2'6"	As above but more siliceous.
415'6"	419'0"	3'6"	3'6"	Brecciated quartz-tourmaline lode, very siliceous at 417'.
419'0"	421'0"	2'0"	2'0"	Siliceous brecciated siltstone.
421'0"	426'0"	5'0"	5'0"	Siltstone, reddish, mottled and brecciated; grading into very fine grained greywacke.

From	To	Footage Drilled	Footage Recovered	Description of Core
426'0" -	440'0"	14'0"	14'0"	Fine to medium grained grey wacke with a few chlorite mottling quartz veinlets. Epidotised joint parallel to core from 435' - 438'.
440'0" -	452'0"	12'0"	11'0"	Greywacke becomes silty in places.
452'0" -	456'0"	4'0"	1'6"	Badly broken core consisting of 1' of quartz-tourmaline cuttings and 6" of siltstone cuttings.
456'0" -	465'0"	9'0"	6'0"	Silty greywacke-medium to fine grained.
465'0" -	466'0"	1'0"	1'0"	Brecciate quartz-tourmaline lode.
466'0" -	474'0"	8'0"	8'0"	Fine to medium grained greywacke and siltstone.
474'0" -	475'6"	1'6"	1'6"	Transition from siltstone to brecciated quartz-tourmaline lode.
475'6" -	477'0"	1'6"	1'0"	Badly broken brecciated quartz-tourmaline lode.
477'0" -	485'6"	8'9"	8'0"	Slightly brecciated quartz-tourmaline lode, some quartz-hematite veinlets.
485'6" -	486'6"	1'0"	1'0"	Red siltstone, badly fractured.
486'6" -	487'0"	6"	6"	Tourmalinised quartz breccia.
487'0" -	493'0"	6'0"	3'3"	Mostly fragments of red siltstone with a small amount of quartz-tourmaline lode.
493'0" -	494'0"	1'0"	1'0"	Transition material from tourmalinised breccia to fractured greywacke.
494'0" -	497'6"	3'6"	3'6"	Badly fractured.
497'6 " -	499'0"	1'6"	1'0"	Red greywacke.

From	To	Footage Drilled	Footage Recovered	Description of Core
499'0"	523'0"	24'0"	18'0"	Siltstone with few anastomosing thin quartz veinlets. Epidotised on joints and in patches.
523'0"				End of hole.

D.D.H. No. 1, OSMAN LEASE

Survey Data:

Collar Coordinates: 1327 N, 1560 W (Plate 7)

	At surface	At 200'	At 300'	At 400'	At 500'
Bearing:	200°M	209°(?)	205°	206°	206°
Inclination:	-60°	-55°	-54°	-56°	-55°

Commenced Drilling: 16th January, 1959
Completed Drilling: 20th March, 1959
Core Recovery: 98%.

From	To	Footage Drilled	Footage Recovered	Description of Core
0'	40'0"	40'0"	30'0"	Rubble and fractured reddish-brown siltstone and slate. Sandy band at 35'. Bedding angle 60°. Mottled due to weathering from 0'-50'.
40'0"	83'6"	43'6"	43'6"	Reddish-brown siltstone. 81'-82' Grey slate.
83'6"	189'0"	105'6"	105'6"	Interbedded reddish-brown greywacke and siltstone. Bedding angle 50°. Mean thickness of bands 2'. 101'-104' Fault?, quartz veined and brecciated. 164'-165' and 169'-170' Mottled around joint pattern.
189'0"	200'0"	11'0"	11'0"	Dominantly reddish-brown greywacke with thin slaty interbeds. Bedding angle 50°.
200'0"	217'0"	17'0"	17'0"	Dominantly reddish-brown slaty siltstone.

From	To	Footage Drilled	Footage Recovered	Description of Core
217'0"	222'0"	5'0"	5'0"	Dominantly reddish-brown greywacke. 1" brecciated quartz vein, inclination to core 63°.
222'0"	232'0"	10'0"	10'0"	Interbedded reddish-brown greywacke and siltstone. Bedding angle 50°.
232'0"	239'0"	7'0"	7'0"	Red-grey greywacke. Bedding angle 50°.
239'0"	250'0"	11'0"	11'0"	Interbedded reddish-brown greywacke and slate. Bedding angle 55°. 2" quartz-tourmaline lode at 247'.
250'	298'0"	48'0"	48'0"	Slaty reddish-brown siltstone with sandy bands. Epidotised along joints and in patches. Bedding angles 50°-60°. 261'-262' Epidote band.
298'0"	310'6"	12'6"	12'6"	Predominantly reddish-brown greywacke with few slate bands. Bedding angle 55°.
310'6"	371'0"	60'6"	60'6"	Predominantly reddish-brown slaty siltstone with mottling along joint pattern. Bedding angle 50°.
371'0"	372'8"	1'8"	1'8"	Dark-grey fine grained silicified siltstone.
372'8"	378'0"	5'4"	5'4"	Reddish-brown slaty siltstone. Bedding angle 55°.
378'0"	384'0"	6'0"	6'0"	Crush zone - quartz veined, contused, brecciated material with some fragments of quartz-tourmaline lode.
384'0"	402'0"	18'0"	18'0"	Quartz breccia (fault) with fragments of quartz-tourmaline lode and contused slaty siltstone. Some bismuth oxide along joints.

From	To	Footage Drilled	Footage Recovered	Description of Core
402'0"	409'0"	7'0"	7'0"	Slaty siltstone. Small breccia band at 407'.
409'0"	417'9"	8'9"	8'9"	Quartz-tourmaline lode, brecciated and with some siltstone fragments.
417'9"	501'0"	83'3"	83'3"	Sandy reddish-brown slate with thin bands of greywacke. Brecciated at 426'-426'6". Bedding angle 50°. 439'-442'6" Brecciated slate with some quartz-tourmaline.
501'0"				End of hole.

D.D.H. No. 2, OSMAN LEASE

Survey Data:

Collar Coordinates: 1170 N, 1203 W (Plate 7)

	At surface	At 100'	At 200'	At 450'	At 575'
Bearing:	200° M	204°	201°	207°	207°
Inclination:	-60°	-62°	-59°	-59°	-57°

Commenced Drilling: 1st June, 1959
Completed Drilling: 10th November, 1959
Core Recovery: 95%

From	To	Footage Drilled	Footage Recovered	Description of Core
0'	25'0"	25'0"	9'0"	Badly broken red-grey siltstone.
25'0"	26'0"	1'0"	1'0"	Quartz tourmaline lode.
26'0"	35'0"	9'0"	9'0"	Red-grey siltstone.
35'0"	45'0"	10'0"	10'0"	Fine grained red-grey greywacke. Quartz breccia at 41'.
45'0"	73'0"	28'0"	28'0"	Predominantly red-grey siltstone, with possible slump structures. Thin quartz veins in cracks at 69' and 72'.
73'0"	125'0"	52'0"	52'0"	Interbedded siltstone and medium grained greywacke. Mottled weathering in siltstone

From	To	Footage Drilled	Footage Recovered	Description of Core
				picking out slump structures. Bedding angle 45°.
12[illegible]'0"	163'0"	38'0"	38'0"	Interbedded siltstone and fine grained greywacke.
163'0"	182'0"	19'0"	19'0"	Mostly medium to coarse grained greywacke with few 1' siltstone bands.
182'0"	210'0"	28'0"	28'0"	Mostly finely banded and massive siltstone beds with thin (3"-6") greywacke interbeds.
210'0"	215'0"	5'0"	5'0"	Grades into interbedded siltstone and greywacke.
215'0"	245'0"	30'0"	30'0"	Medium-coarse grained greywacke with thin siltstone interbeds. Quartz veins at 225'.
245'0"	274'0"	29'0"	29'0"	Predominantly siltstone showing variegated weathering, few thin greywacke bands. Bedding angle 45°.
274'0"	285'0"	11'0"	11'0"	Medium grained greywacke.
285'0"	340'0"	55'0"	55'0"	Interbedded siltstone and greywacke, beds 2'-3'.
340'0"	365'0"	25'0"	25'0"	Mostly medium to fine grained greywacke with thin siltstone beds.
365'0"	405'0"	40'0"	40'0"	Interbedded siltstone and greywacke, few thin quartz veins. 3" quartz breccia at 401'. Bedding angles 30°-45°.
405'0"	460'0"	55'0"	55'0"	Mottled siltstone with numerous greywacke interbeds. Brecciated and scaled and quartz veinlets at 410', 412', 415', 420', 427'.
460'0"	465'0"	5'0"	5'0"	Kaolinised siltstone with possible breccia.
465'0"	470'0"	5'0"	5'0"	Quartz breccia (fault).

From	To	Footage Drilled	Footage Recovered	Description of Core
470'0"	476'0"	6'0"	3'0"	Kaolinised fault breccia, no fragments of quartz-tourmaline lode in breccia.
476'0"	524'0"	48'0"	40'9"	Interbedded siltstone and greywacke, strongly kaolinised, white when fresh and weathering to khaki. Bedding angles 40°-45°. Kaolinisation patchy, all core badly broken. Some of the kaolin may be washed in from 460'-476'.
524'0"	561'0"	37'0"	30'0"	Slightly kaolinised, decomposed greywacke with thin silty bands.
561'0"	576'0"	15'0"	15'0"	Broken mottled siltstone with thin kaolinised greywacke bands. Bedding angle 30°.
576'0"	603'0"	27'0"	27'0"	Shattered greywacke and siltstone with few scattered quartz veinlets. 3" quartz-tourmaline lode at 577'. No kaolinisation. Blotchiness of siltstone may be caused by differential weathering of slump material.
603'0"				End of hole.

D.D.H. No. 3, OSMAN LEASE

Survey Data:

Collar Coordinates: 940 N, 1010 W (Plate 7)

	At surface	At 155'	At 275'
Bearing:	200°M	206°	212°
Inclination:	-60°	-58°	-58°

Commenced Drilling: 16th April, 1959
Completed Drilling: 21st May, 1959
Core Recovery: 97%.

From	To	Footage Drilled	Footage Recovered	Description of Core
0'	19'6"	19'6"	9'9"	Interbedded slate and greywacke, reddish-grey, badly broken. Several thin quartz-tourmaline lodes.
19'6"	33'0"	13'6"	13'6"	Dominantly red weathered medium grained greywacke.
33'0"	94'0"	61'0"	61'0"	Interbedded slate (70%) and greywacke (30%), reddish-grey. Slump structures(?) at 74'. Bedding angle 60°.
94'0"	139'0"	45'0"	45'0"	Reddish-grey slate with variegated rectangular weathering pattern. Bedding angle 50°.
139'0"	257'0"	118'0"	118'0"	Interbedded slate (70%) and greywacke (30%), reddish-grey, badly broken at 145'-150'. Bedding angles 50°-60°.
257'0"	272'0"	15'0"	15'0"	As above, with thin stringers of quartz-tourmaline lode. Brecciated at 264', 266' and 271'. Slumping(?) at 266'.
272'0"	277'0"	5'0"	5'0"	Brecciated and quartz veined red slate.
277'0"	284'6"	7'6"	7'6"	Red-grey greywacke with thin quartz breccia stringers.
284'6"	286'0"	1'6"	1'6"	Transition zone of tourmalinised slate.
286'0"	296'0"	10'0"	10'0"	Quartz-tourmaline lode, brecciated and quartz veined, with considerable iron staining. Some bismuth oxide on joint planes.
296'0"	297'0"	1'0"	1'0"	Transition zone of tourmalinised slate.
297'0"	316'0"	19'0"	19'0"	Interbedded dark-grey slate and greywacke, strongly fractured.
316'0"				End of hole

APPENDIX 2

TIN ASSAY RESULTS, DIAMOND DRILLING, MARANBOY TINFIELD

D.D.H. No. 1, ANACONDA LEASE

From	To	Footage Drilled	Footage Recovered	Assay Result (% tin)
283'0" -	283'9"	9"	5"	0.02
283'9" -	284'6"	9"	8"	0.02
284'6" -	285'9"	1'3"	8"	0.02
303'3" -	304'3"	1'0"	5"	0.03
304'3" -	305'0"	9"	6"	0.01
305'0" -	306'9"	1'9"	1'5"	0.03
306'9" -	308'0"	1'3"	1'2"	0.04
308'0" -	309'3"	1'3"	5"	0.04
309'3" -	310'0"	9"	8"	0.01
310'0" -	311'6"	1'6"	1'5"	0.02
311'6" -	312'9"	1'3"	1'2"	0.40
312'9" -	313'3"	6"	6"	0.77
313'3" -	315'6"	2'3"	2'2"	0.51
315'6" -	316'6"	1'0"	10"	0.02
316'6" -	317'3"	9"	7"	0.13
317'3" -	318'3"	1'0"	9"	0.24
318'3" -	320'0"	1'9"	5"	0.12
337'6" -	338'6"	1'0"	10"	0.84
355'6" -	355'10"	4"	4"	0.17

D.D.H. No. 2, ANACONDA LEASE

From	To	Footage Drilled	Footage Recovered	Assay Result (% tin)
227'3" -	228'9"	1'6"	9"	0.01
228'9" -	230'1"	1'4"	1'2"	0.01
231'6" -	232'9"	1'3"	1'1"	0.02
287'6" -	292'0"	4'6"	2'1"	0.01
292'0" -	294'0"	2'0"	1'10"	2.18
294'0" -	295'0"	1'0"	10"	0.04
295'0" -	297'4"	2'4"	1'6"	0.02
297'4" -	298'1"	9"	8"	0.01
298'1" -	298'7"	6"	5"	0.01
298'7" -	299'7"	1'0"	11"	0.01
299'7" -	300'6"	11'	10'	0.01
300'6" -	302'0"	1'6"	1'6"	0.03
302'0" -	303'0"	1'0"	10"	0.01
303'0" -	304'0"	1'0"	8"	0.25
304'0" -	305'6"	1'6"	1'5"	0.04
321'11" -	323'3"	1'4"	1'1"	0.10
338'0" -	339'6"	1'6"	4"	0.01
367'0" -	367'10"	10"	8"	1.35

D.D.H. No. 3, ANACONDA LEASE

From	To	Footage Drilled	Footage Recovered	Assay Result (% tin)
367'0"	370'0"	3'0"	3'0"	0.02
450'10"	452'0"	1'2"	1'2"	0.43
452'0"	454'10"	2'10"	2'9"	4.94
454'10"	456'8"	1'10"	1'10"	0.31
456'8"	458'7"	1'11"	1'8"	0.52
458'7"	461'0"	2'5"	2'5"	0.41
461'0"	463'2"	2'2"	1'5"	2.85
463'2"	465'11"	2'9"	2'8"	0.60
465'11"	466'11"	1'0"	1'0"	0.53
466'11"	467'11"	1'0"	1'0"	0.46

D.D.H. No. 4, ANACONDA LEASE

From	To	Footage Drilled	Footage Recovered	Assay Result (% tin)
421'6"	424'4"	2'10"	2'10"	0.06
424'4"	427'1"	2'9"	2'5"	0.06
427'1"	430'2"	3'1"	3'1"	0.03
430'2"	433'0"	2'10"	2'10"	0.01
433'0"	436'0"	3'0"	3'0"	0.03
436'0"	439'0"	3'0"	2'11"	0.03
439'0"	441'4"	2'4"	2'2"	0.01
441'4"	443'5"	2'1"	2'0"	0.02
443'5"	448'4"	4'11"	4'9"	0.02
448'4"	451'2"	2'10"	2'8"	0.03
451'2"	453'0"	1'10"	1'10"	0.04
453'0"	456'0"	3'0"	3'0"	0.29
456'0"	459'8"	3'8"	3'7"	0.02
459'8"	461'7"	1'11"	1'11"	0.02
464'10"	465'10"	1'0"	1'0"	0.02
470'6"	472'6"	2'0"	2'0"	0.01
473'5"	475'0"	1'7"	1'6"	0.02
479'9"	482'11"	3'2"	3'1"	0.02
482'11"	487'0"	4'1"	3'10"	0.05
487'0"	489'3"	2'3"	2'1"	4.95
489'3"	491'6"	2'3"	2'2"	0.54
491'6"	492'8"	1'2"	1'2"	0.01

D.D.H. No. 5, ANACONDA LEASE

From	To	Footage Drilled	Footage Recovered	Assay Result (% tin)
499'8"	501'0"	1'4"	1'4"	0.01
507'6"	509'6"	2'0"	1'11"	0.01
510'6"	509'6"	11"	10"	0.01
515'0"	516'6"	1'6"	1'6"	0.01
597'2"	601'8"	4'6"	4'2"	0.01
606'0"	607'6"	1'6"	1'3"	0.01
620'0"	624'6"	4'6"	4'4"	0.01
624'6"	628'3"	3'9"	3'8"	0.01

From	To	Footage Drilled	Footage Recovered	Assay Result (% tin)
628'3"	631'9"	3'6"	3'3"	0.01
663'3"	666'5"	3'2"	3'0"	0.10
666'5"	671'9"	5'4"	5'3"	0.01
671'9"	674'10"	3'1"	3'0"	0.03
674'10"	679'3"	4'5"	4'4"	0.01

D.D.H. No. 6, ANACONDA LEASE

From	To	Footage Drilled	Footage Recovered	Assay Result (% tin)
671'0"	674'3"	3'3"	1'3"	0.21
674'3"	678'0"	3'9"	3'9"	1.42
678'0"	683'0"	5'0"	4'6"	2.55
683'0"	686'0"	3'0"	3'0"	0.05
686'0"	689'6"	3'6"	3'6"	0.05
689'6"	693'0"	3'6"	3'6"	0.11
693'0"	694'3"	1'3"	1'3"	0.15
694'3"	697'0"	2'9"	2'9"	0.03
697'0"	700'0"	3'0"	3'0"	0.03

D.D.H. No. 7, ANACONDA LEASE

From	To	Footage Drilled	Footage Recovered	Assay Result (% tin)
448'0"	453'0"	5'0"	5'0"	0.26
453'0"	458'0"	5'0"	5'0"	0.09
458'0"	463'0"	5'0"	5'0"	0.52
463'0"	467'0"	4'0"	4'0"	0.22
467'0"	470'0"	3'0"	3'0"	0.56

D.D.H. No. 8, ANACONDA LEASE

From	To	Footage Drilled	Footage Recovered	Assay Result (% tin)
412'0"	415'6"	3'6"	3'6"	0.01
415'6"	419'0"	3'6"	3'6"	0.14
474'0"	477'0"	3'0"	2'6"	0.09
477'0"	480'6"	3'6"	3'3"	0.06
480'6"	485'6"	5'0"	4'9"	0.03
485'6"	490'0"	4'6"	3'9"	0.02

D.D.H. No. 1, OSMAN LEASE

From	To	Footage Drilled	Footage Recovered	Assay Result (% tin)
371'0"	372'8"	1'8"	1'8"	0.01
378'0"	381'0"	3'0"	3'0"	0.01
381'0"	385'0"	4'0"	4'0"	0.01
385'0"	388'0"	3'0"	3'0"	0.01
388'0"	391'0"	3'0"	3'0"	0.01
391'0"	394'0"	3'0"	3'0"	0.02
394'0"	398'0"	4'0"	4'0"	0.01
398'0"	402'0"	4'0"	4'0"	0.01
402'0"	406'0"	4'0"	4'0"	0.01
406'0"	410'0"	4'0"	4'0"	0.02
410'0"	414'0"	4'0"	4'0"	0.01
414'0"	417'9"	3'9"	3'9"	0.02
439'0"	442'6"	3'6"	3'6"	0.05

D.D.H. No. 2, OSMAN LEASE

From	To	Footage Drilled	Footage Recovered	Assay Result (% tin)
462'6"	467'6"	5'0"	5'0"	0.01
467'6"	470'9"	3'3"	3'3"	0.05
470'9"	475'0"	4'3"	3'3"	0.06
475'0"	480'0"	5'0"	4'9"	0.02
480'0"	485'0"	5'0"	4'9"	0.02
485'0"	490'8"	5'8"	5'3"	0.05
490'8"	495'0"	4'4"	4'0"	0.26
495'0"	500'0"	5'0"	5'0"	0.03
500'0"	506'0"	6'0"	4'0"	0.15

D.D.H. No. 3, OSMAN LEASE

From	To	Footage Drilled	Footage Recovered	Assay Result (% tin)
273'0"	277'0"	4'0"	4'0"	0.02
284'6"	289'6"	5'0"	5'0"	0.04
289'6"	294'6"	5'0"	5'0"	0.16
294'6"	297'0"	2'6"	2'6"	0.11

PLATE I

SURFACE GEOLOGY
ANACONDA LEASE
MARANBOY TINFIELD, NORTHERN TERRITORY

Howlett Fault

MINING LEASE 267

MINING LEASE 263

Lease Boundary

Lease Peg

DDH 1 -60°
DDH 2 -60°
DDH 3 -60°
DDH 4 -60°
DDH 5 -60°
DDH 6 -60°
DDH 7 -60°
DDH8 -60°
Red Terror DDH -73°

Scattered outcrops of greywacke and siltstone.

Greywacke

Lode Rubble

Heavy lode float

No 1 Open Cut

No 1 Shaft

Free cassiterite in surface outcrop

Bismuth rich crush zone
Small lode stringers

No 2 Open Cut

No 3 Open Cut

No 4 Open Cut

No 5 Open Cut

No 2 Shaft

Medium and fine grained greywacke

Contorted, fractured, fine-grained and medium-grained greywacke.

Dense quartz tourmaline lode with parallel quartz stringers and veinlets

Strongly fractured silicified, fine grained sandstone and medium grained greywacke.

Quartz stringers in contused sandstone.

Interbedded medium and fine grained sandstone

Strongly fractured medium-grained greywacke.

Strongly jointed lode Irregular replacement and width.

Quartz filled breccia.

Sandstone

Rich ore on hanging wall

Banded lode

No outcrop

Building

Road

To Government Survey

Scattered outcrops of medium and fine grained greywacke and siltstone.

1100 N
1000 N
900 N
800 N
700 N
600 N
500 N
400 N

1000 W
900 W
800 W
700 W
600 W
500 W
400 W
300 W
200 W
100 W

True North
Mag North

40 20 0 40 80 120 FEET
SCALE

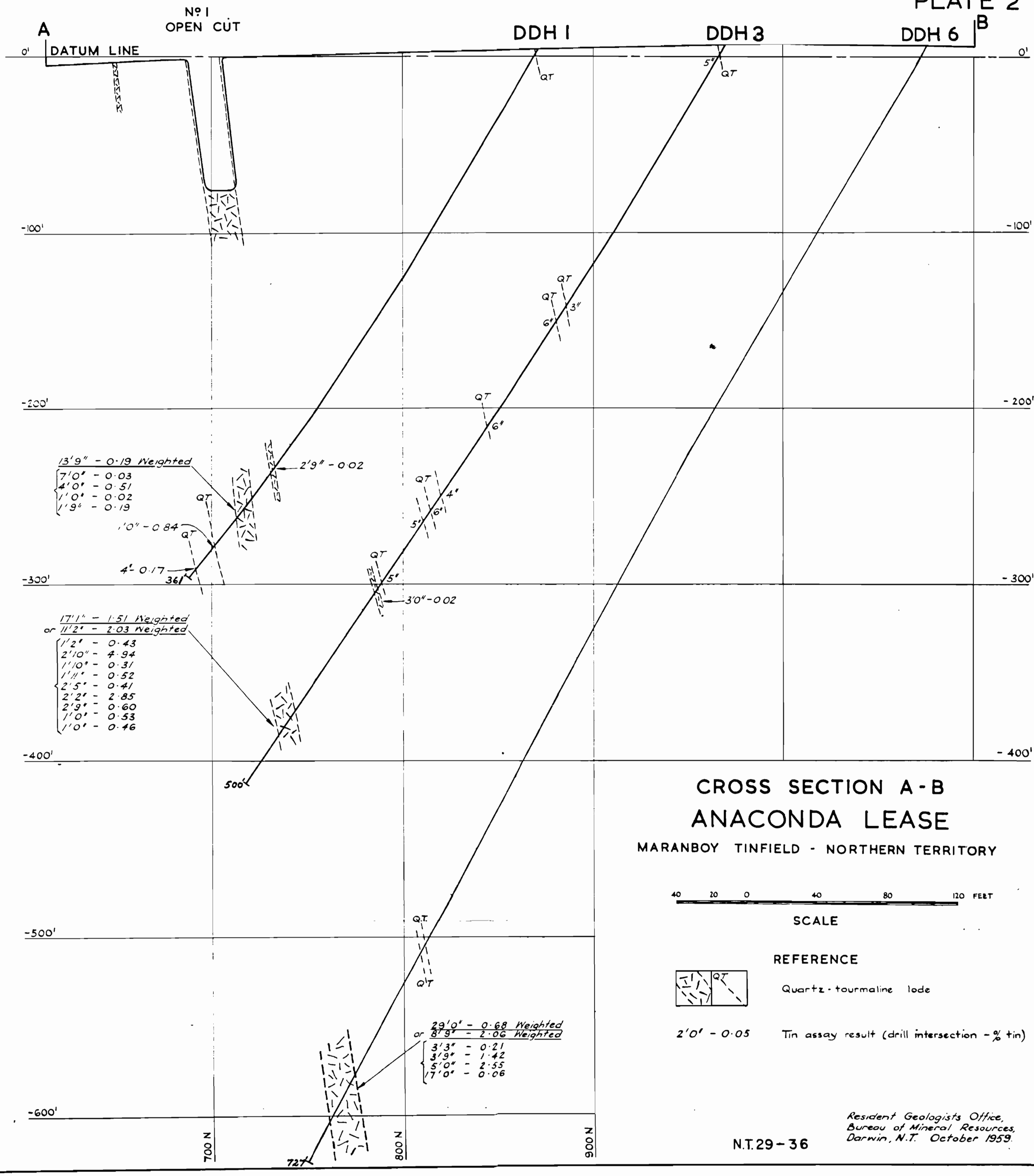
REFERENCE

- Established Geological boundary - position accurate.
- Established Geological boundary - position approximate
- 60 Strike and dip of strata.
- Joint patterns.
- F 45 F Established fault - position accurate with dip.
- F F Inferred fault.
- L Stringer of quartz - tourmaline lode.
- 160 Contour line (in feet).
- Water course.
- A Section line.
- Open cut.
- Dump.
- Shaft.
- -60° Diamond drill hole, with inclination.
- Alluvium.
- Quartz - filled breccia.
- Quartz - tourmaline lode.
- Q Quartz vein.

Resident Geologists Office,
Bureau of Mineral Resources,
Darwin, N.T. October 1959.

N.T.29-35

PLATE 2



CROSS SECTION A-B
ANACONDA LEASE
MARANBOY TINFIELD - NORTHERN TERRITORY

40 20 0 40 80 120 FEET

SCALE

REFERENCE

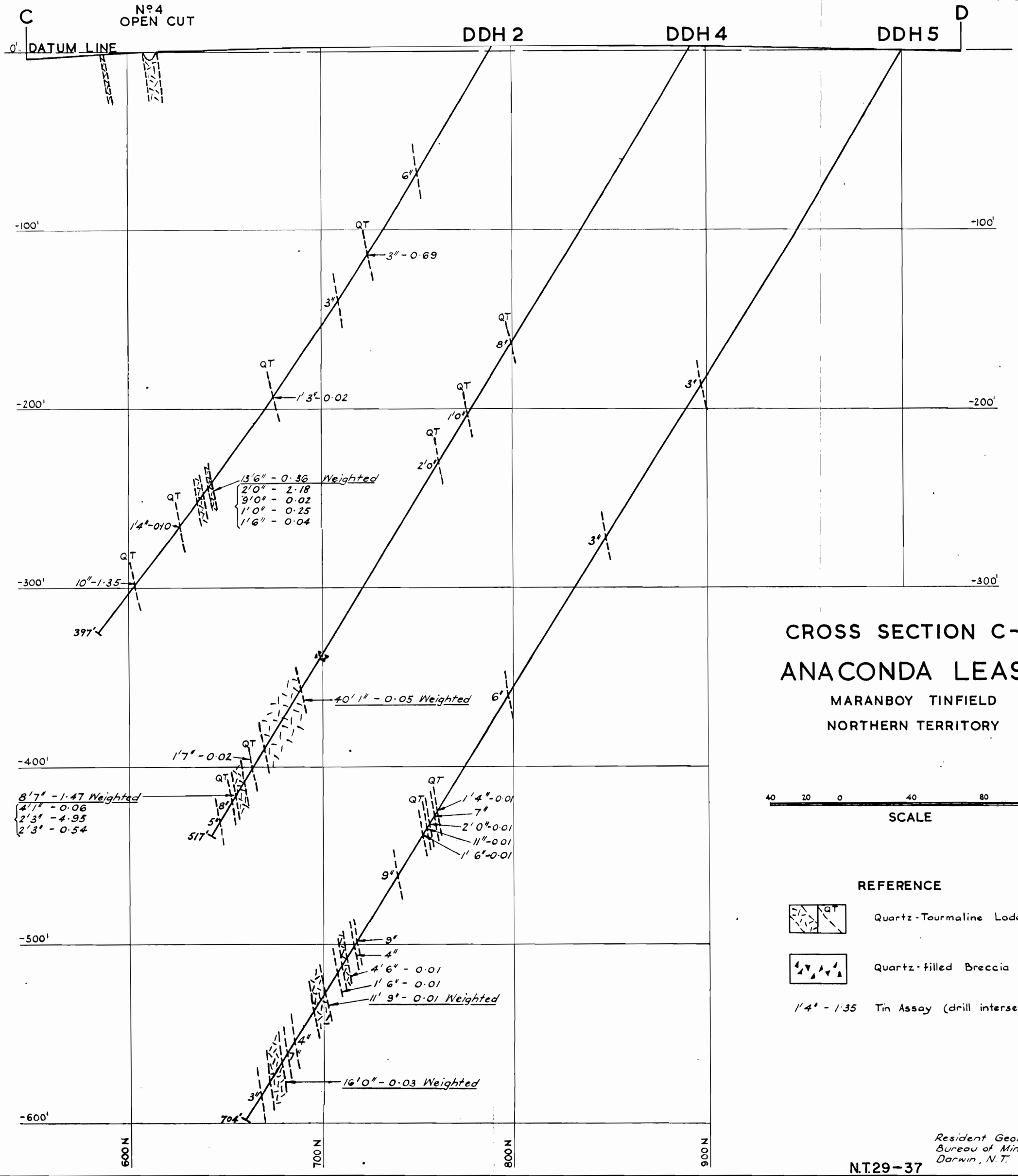
QT — Quartz - tourmaline lode

2'0" - 0·05 — Tin assay result (drill intersection - % tin)

N.T. 29-36

Resident Geologists Office,
Bureau of Mineral Resources,
Darwin, N.T. October 1959.

PLATE 3



CROSS SECTION C-D

ANACONDA LEASE

MARANBOY TINFIELD

NORTHERN TERRITORY

40 20 0 40 80 120 FEET

SCALE

REFERENCE

QT — Quartz-Tourmaline Lode

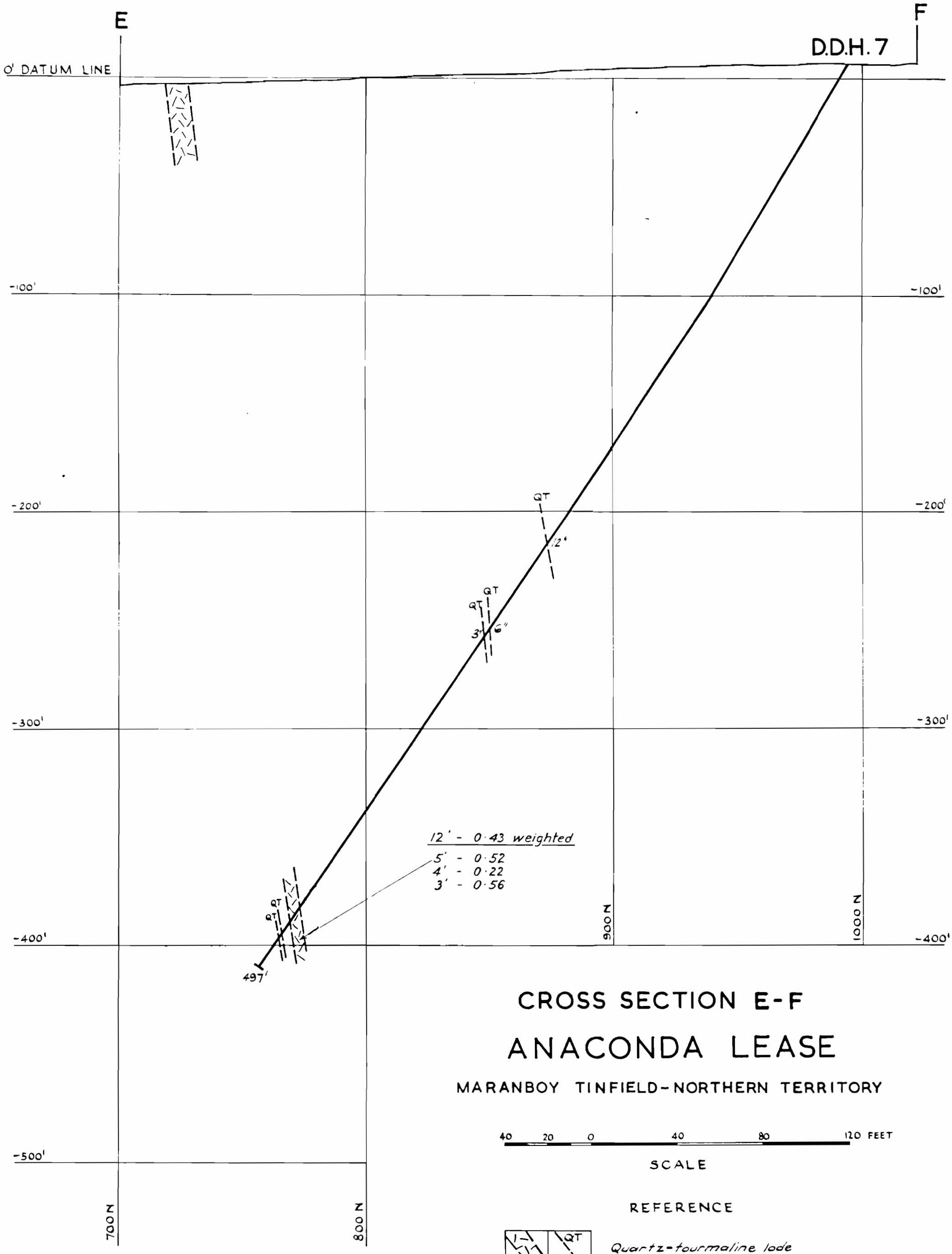
Quartz-filled Breccia

1'4" - 1.35 Tin Assay (drill intersection - % tin)

Resident Geologists Office,
Bureau of Mineral Resources,
Darwin, N.T. October 1959

N.T.29-37

PLATE 4



CROSS SECTION E-F

ANACONDA LEASE

MARANBOY TINFIELD-NORTHERN TERRITORY

40 20 0 40 80 120 FEET

SCALE

REFERENCE

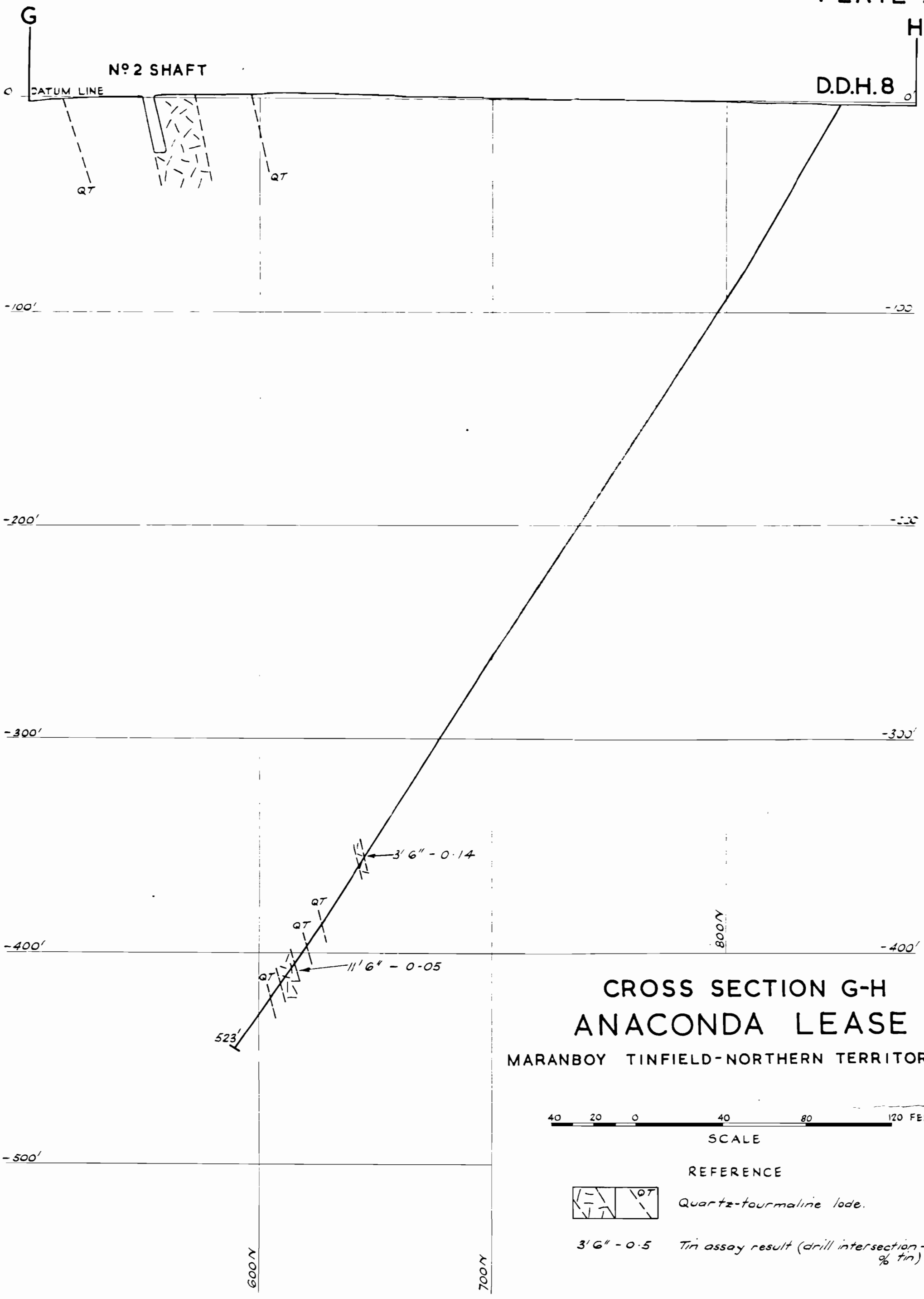
QT — Quartz-tourmaline lode

5' - 0·52 Tin assay (drill intersection - % tin)

N.T.29-38

Resident Geologists Office,
Bureau of Mineral Resources,
Darwin, N.T. April, 1959.

PLATE 5



CROSS SECTION G-H
ANACONDA LEASE
MARANBOY TINFIELD - NORTHERN TERRITORY

40 20 0 40 80 120 FEET

SCALE

REFERENCE

QT — Quartz-tourmaline lode.

3' 6" - 0.5 — Tin assay result (drill intersection - % tin)

Resident Geologists Office
Bureau of Mineral Resources
Darwin, N.T. October 1959.

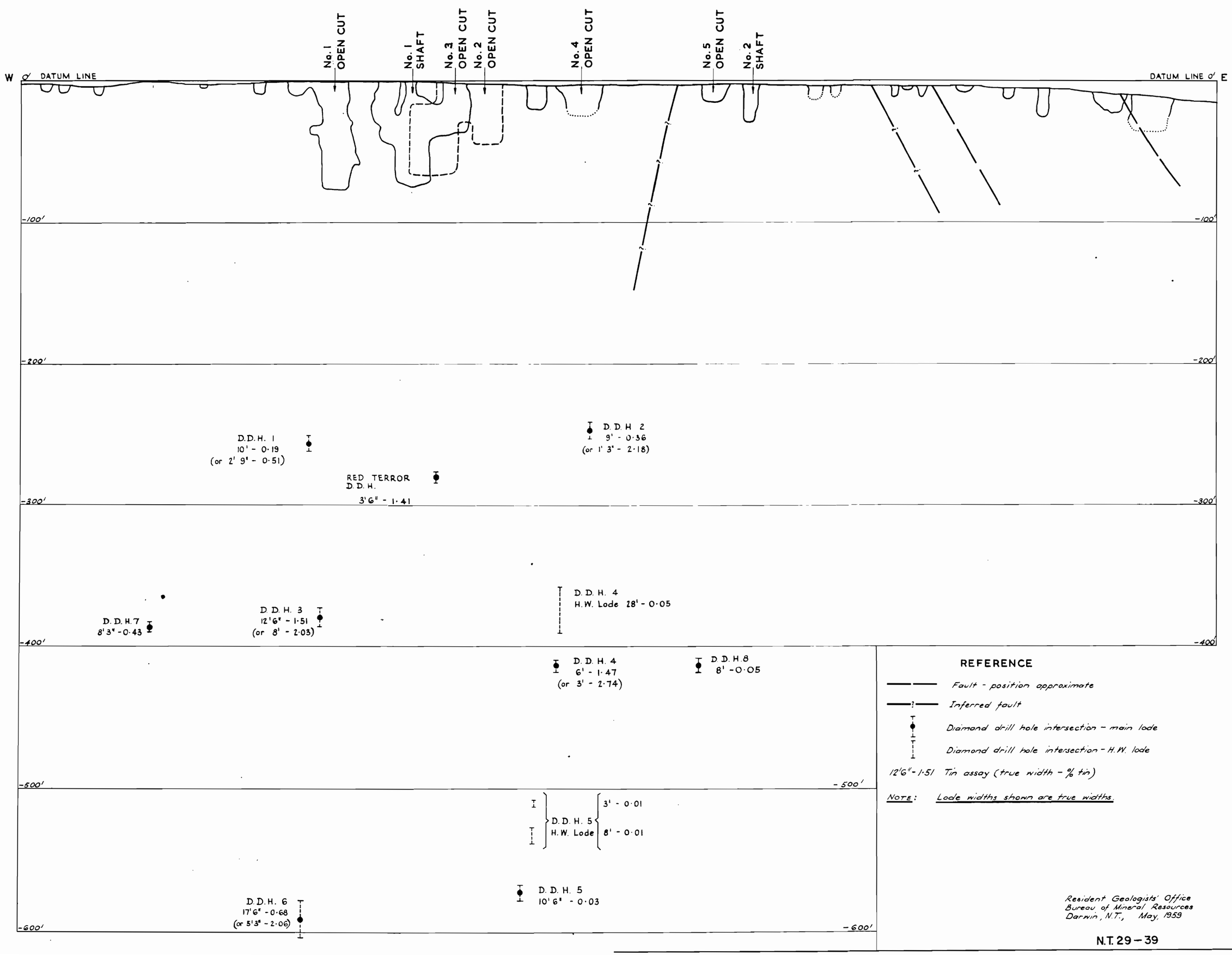
N.T. 29 – 39

PLATE 6

LONGITUDINAL PROJECTION IN PLANE OF MAIN LODE
ANACONDA LEASE

MARANBOY TINFIELD, NORTHERN TERRITORY

40 20 0 40 80 120 FEET
SCALE



REFERENCE

——— Fault - position approximate

—?— Inferred fault

Diamond drill hole intersection - main lode

Diamond drill hole intersection - H.W. lode

12'6"-1·51 Tin assay (true width - % tin)

NOTE: Lode widths shown are true widths.

Resident Geologists' Office
Bureau of Mineral Resources
Darwin, N.T., May, 1959

N.T. 29 – 39

PLATE 7

SURFACE GEOLOGY
OSMAN LEASE

MARANBOY TINFIELD, NORTHERN TERRITORY

SCALE

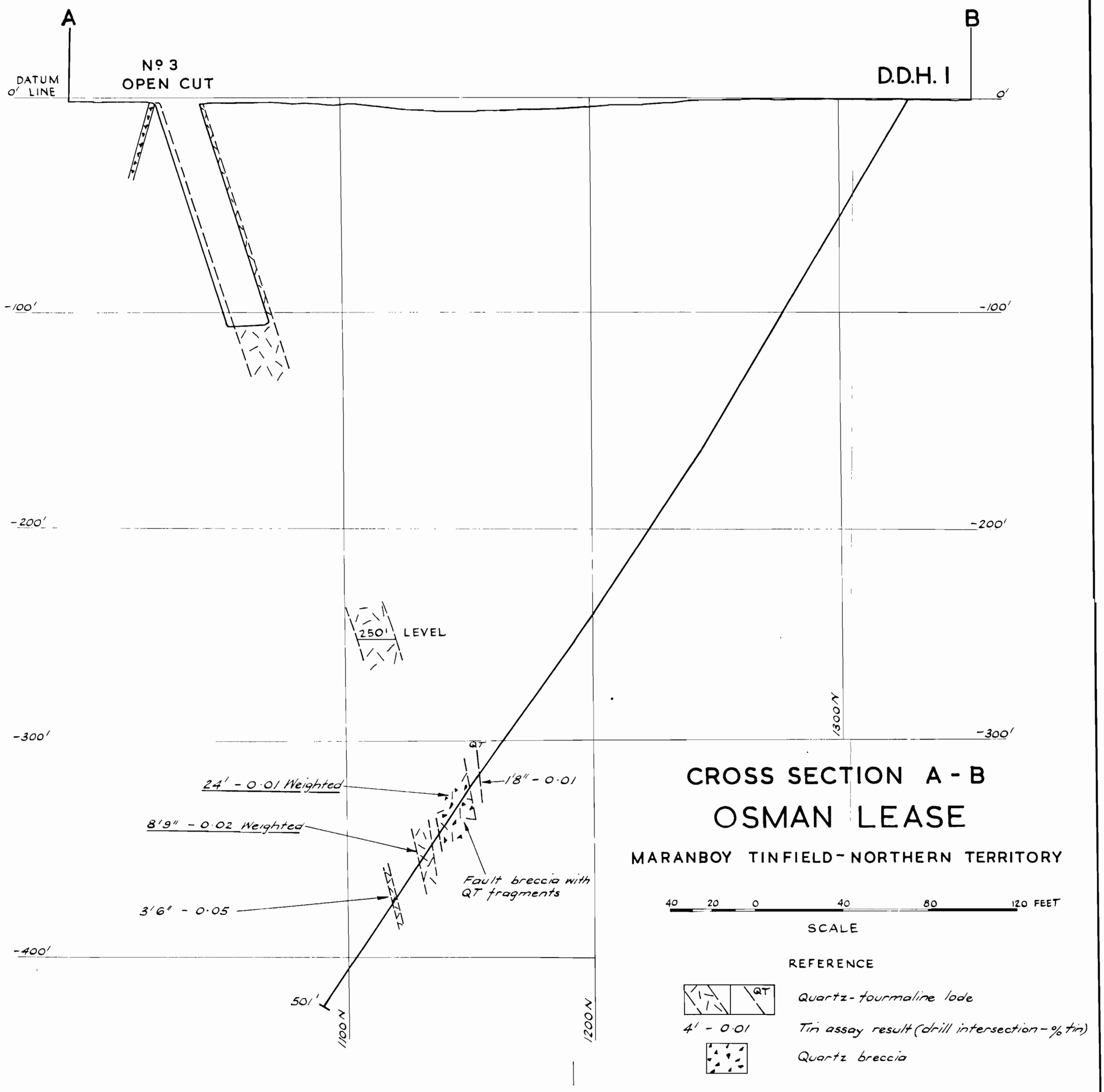
REFERENCE

- Established geological boundary position accurate.
- Established geological boundary position approximate
- Strike and dip of strata.
- Strike and dip of joints
- Joint patterns
- Established fault - quartz filled.
- F — F Established fault - position approximate
- F — ? — F Inferred fault.
- L — L Stringer of quartz - tourmaline lode.
- Q — Q Quartz vein.
- A — Section line.
- Open cut.
- Dump.
- Shaft.
- DDH 1 -60° Diamond drill hole with inclination.
- 180 Contour line (in feet)
- Alluvium
- Quartz breccia.
- Quartz-tourmaline lode.

N.T.29-40

Resident Geologists Office
Bureau of Mineral Resources,
Darwin, N.T. October 1959.

PLATE 8



CROSS SECTION A - B
OSMAN LEASE

MARANBOY TINFIELD - NORTHERN TERRITORY

40 20 0 40 80 120 FEET

SCALE

REFERENCE

QT — Quartz-tourmaline lode

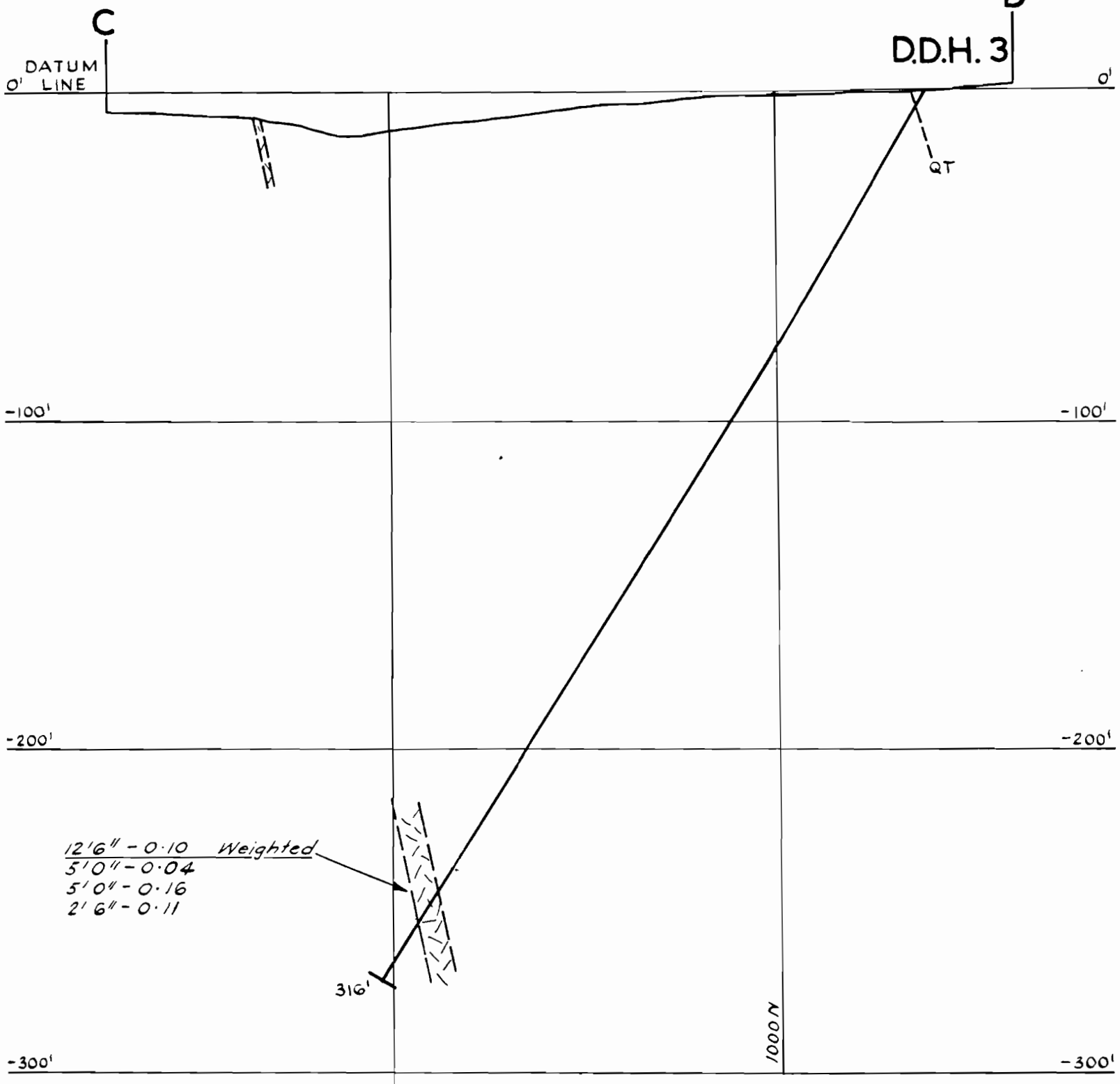
4' - 0·01 — Tin assay result (drill intersection - % tin)

Quartz breccia

N.T. 29-41

Resident Geologists Office
Bureau of Mineral Resources
Darwin, N.T. October, 1959

PLATE 9



CROSS SECTION C - D

OSMAN LEASE

MARANBOY TINFIELD - NORTHERN TERRITORY

40 20 0 40 80 120 FEET

SCALE

REFERENCE

QT — Quartz - Tourmaline lode

5'0" - 0·16 Tin assay result (drill intersection - % tin)

N.T. 29-42

Resident Geologists Office,
Bureau of Mineral Resources,
Darwin, N.T. April 1959.

PLATE 10

E

F

Nº 3 SHAFT

HOWLETT FAULT

DATUM LINE

D.D.H. 2

0'

0'

-100'

-100'

-200'

-200'

-300'

-300'

-400'

-400'

1100 N

Q.T.

3"

-500'

603'

900 N

1000 N

CROSS SECTION E-F

OSMAN LEASE

MARANBOY TINFIELD - NORTHERN TERRITORY

40 20 0 40 80 120 FEET

SCALE

REFERENCE

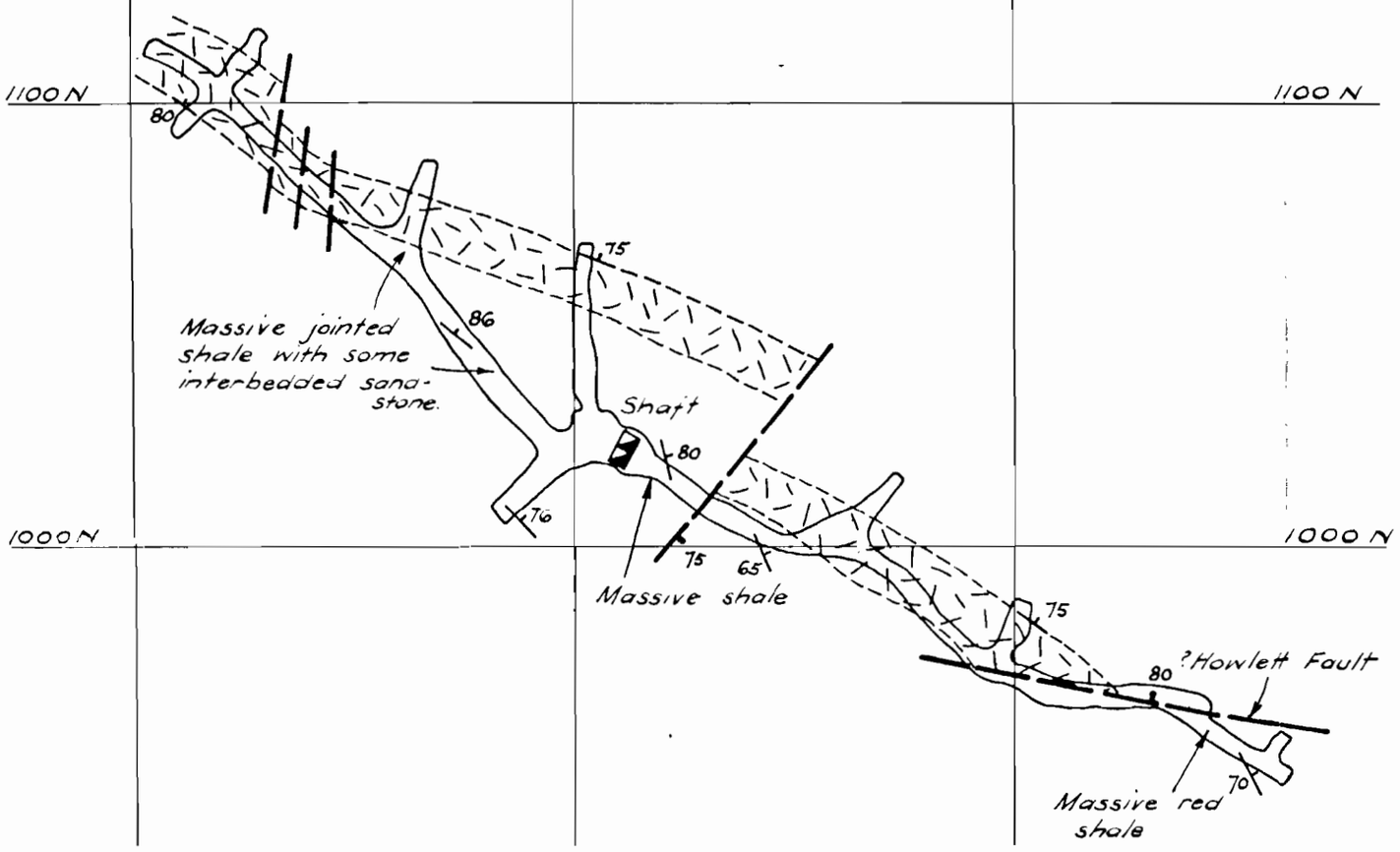
QT — Quartz-tourmaline lode

Quartz breccia

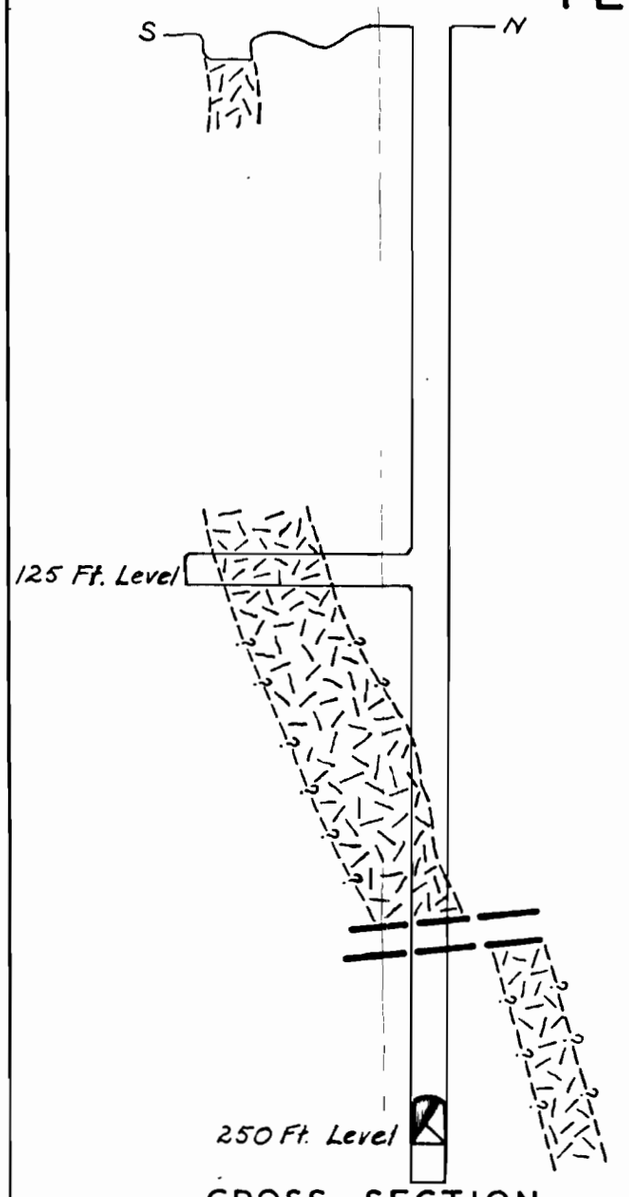
N.T 29-43

Resident Geologists Office,
Bureau of Mineral Resources
Darwin, N.T. October 1959.

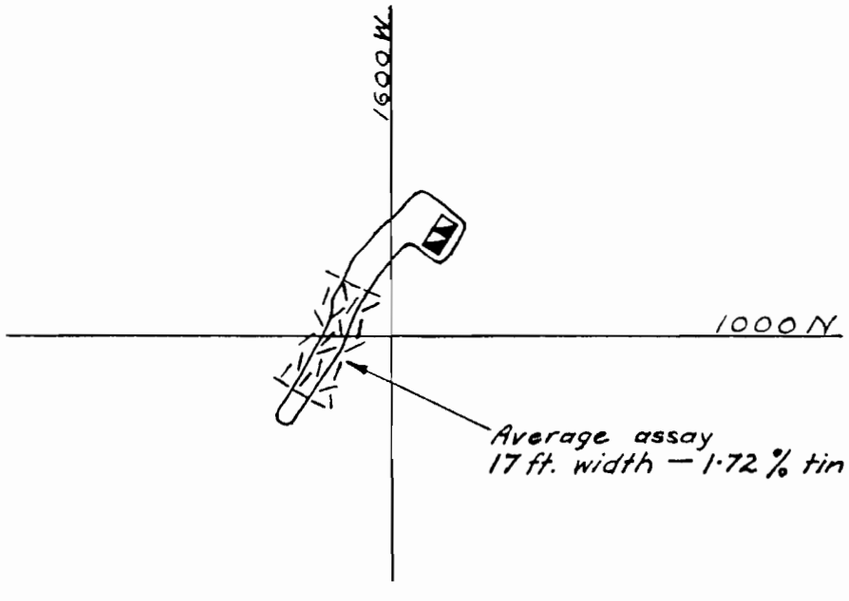
PLATE II



250 FOOT LEVEL PLAN



CROSS SECTION
UNITED URANIUM SHAFT



125 FOOT LEVEL PLAN

UNDERGROUND WORKINGS
UNITED URANIUM N.L.
OSMAN LEASE
MARANBOY TINFIELD - NORTHERN TERRITORY

40 20 0 40 80 120 FEET

SCALE

REFERENCE

Quartz - tourmaline lode.

75 Established fault, showing dip.

80 Strike and dip of strata.

N.T. 29-44

Resident Geologists Office,
Bureau of Mineral Resources,
Darwin, N.T. December 1959.