

JULIAN MINING COMPANY LTD.

895050

FIELD OFFICE:
1396 FIFTH AVENUE
PRINCE GEORGE, B.C.
PHONE 564-2940

SUITE 1207
409 GRANVILLE STREET
VANCOUVER, B.C.
PHONE 681-2345

November 13th, 1963

Mr W.C. Mainwaring,
Managing Director,
Julian Mining Company Limited
1207-409 Granville Street,
Vancouver 1, B.C.

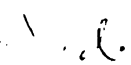
Dear Sir:

Enclosed with this letter is Bob
Adamson's final report for 1963 on the Thorn Property.
This is the major new mineral find made by Julian
prospectors this season.

We consider this prospect an interesting
mineral find and, subject to a critical analysis of the
information now on hand, we will probably recommend
further work next season.

A copy has been forwarded to Glenn
Waterman, and we will have available further copies
next week at Vancouver, for distribution and filing,

yours truly,


Roderick Macrae

THORN PROPERTY REPORT

NOVEMBER 1963

R. S. ADAMSON, B.A.SC.

CONTENTS

Introduction	Page 1
General Geology	Page 1
Zone A	Page 2
Geology	Page 2
Diamond Drilling	Page 4
Zone B	Page 5
Conclusions	Page 6
Recommendations	Page 7
Appendix	
Drill Sections	
Drill Hole Logs	
Zone A Geology map	

INTRODUCTION

The THORN copper property was discovered by Julian Mining Co. prospectors Francis Foran and Barry Watson in August of 1963. For their efforts both men maintain a portion of the vendor's interest in the property.

The claim group is situated on a northwesterly flowing unnamed branch of the Sutlahine River. The mineral showings covered by twenty-two claims lie on the northeast flank of this deeply incised valley, a few hundred feet above the creek. The nearest centres of supply and communication are Juncau 60 miles to the west, Atlin 78 miles to the northwest, and Telegraph Creek 76 miles to the southeast. The property is best serviced from these centres by float aircraft to Trapper Lake which lies seven miles southeast, thence by helicopter to the property. Should the deposit develop into a body of economic significance, an access road 35 miles long to navigable water at Tulsequah on the Taku River would have to be built.

Work done to date on the property took place during the month of August of this year. Zone A was geologically mapped, sampled with four pack sack drill holes, and to a minor degree hand trenched. In addition, detailed prospecting of the claim group between Zones A and B on both sides of the main creek up to the location lines paralling the main creek was carried out. During this program Zone B was discovered under very difficult prospecting conditions, resulting from both the steep terrain and the extremely thick vegetation in the valley.

GENERAL GEOLOGY

The Tulsequah map sheet in which the THORN property lies has only recently been mapped by the Canadian Geological Survey on a four mile to the inch scale. However, with the exception of a preliminary geological map released in 1960, the information gathered has not yet been published. This preliminary map

coupled with data noted during this year's Taku Project program serves to provide a satisfactory regional geological appraisal of the THORN Property.

The THORN mineral deposits lie within Upper Triassic volcanic flows and pyroclastics, only two miles east of rocks of the largely granitic Coast Range batholithic complex. The volcanic rocks represent an important segment of the southwest limb of a northwesterly trending geosyncline. During the Tertiary, molten material of an acidic composition entered the geosyncline, essentially along or paralleling its axis, forming rhyolite porphyry stocks with related sills and dykes. As a result of this Tertiary vulcanism, the relatively competent Upper Triassic volcanic rocks buffered against the Coast Range batholithic mass, were faulted, sheared, and brecciated probably prior to and contemporaneous with the emplacement of the rhyolite porphyry bodies.

Tertiary mineralizing fluids migrating along these faults, significantly sharply contrary to the regional northwest trend, deposited themselves primarily in an environment of an open space nature where suitable temperature and pressure conditions prevailed. It is postulated that the larger faulted structures provided initial access for rhyolite porphyry dykes and plugs, which in turn were the source of mineralizing fluids that emanated along lesser structures. Finally, later basalt and andesite dykes cut this entire assemblage.

ZONE A

Geology

Zone A, the initial discovery on the claim group, is underlain by volcanic rocks, of both acid and basic composition. The mineralized zone has been uncovered along a strike length of 700 feet and exhibits extreme variation in width, grade, and nature along this length. Copper occurs in three separate types of environment within the zone:

- a) Erratically disseminated in massive vuggy white vein quartz.
- b) With quartz stringers along shear zones in andesite tuff.
- c) With replacement quartz in a brecciated rhyolite.

Tuffaceous Andesites, the most common rock, is Upper Triassic in age. The bedding of tuffs and related rocks has not been positively ascertained but is felt on cursory evidence to trend N 50° W. Rhyolite, the most singularly interesting rock type on the zone, is thought to be Tertiary and related to the plug of Granodiorite porphyry and the very large Tertiary rhyolite porphyry dykes which outcrop in the main creek 300 feet below the zone. The rhyolite, suspected to be of sill and dyke origin, is for the most part thoroughly brecciated in sharply angular fashion. However, the rhyolite intersected in the drill holes has an unbrecciated core, in part porphyritic. Andesite tuffs flanking the rhyolite reveal a noticeable lack of brecciation although the tuffaceous nature of the basic volcanics may disguise this fracture. Rhyolites varying in colour from grey to pale green to a distinctive pink, is the host for most of the copper mineralization of potentially economic grade.

Metallic minerals present on the zone are pyrite; the most widespread, chalcopyrite, and galena in minor amounts. Tetrahedrite and sphalerite have been identified but are rare. Quartz is the dominant gangue mineral with probably four generations. Grey quartz and blue quartz are of a replacement nature, the latter carrying the most important copper values. White quartz and a glassy white quartz occurring as veinlets and stringers also contain some chalcopyrite but usually in erratic fashion. Other gangue minerals present in the zone are barite, siderite and minor calcite. The probable sequence of mineralization is as follows:

- a) Introduction of grey quartz, chalcopyrite, and much pyrite into a brecciated rhyolite, filling the interstices.

- b) Entry of white quartz veinlets and stringers with erratic disseminated chalcopyrite and pyrite; probably a minor mineralizing phase.
- c) A pulsation of blue quartz carrying most of the chalcopyrite, minor siderite, and perhaps pyrite entered the brecciated rhyolite breccia.
- d) A glassy white quartz with disseminated pyrite, large blebs of erratic chalcopyrite, minor siderite was introduced usually as stringers and veinlets of comb quartz along shears and fractures and as large vuggy quartz veins.
- e) Coarse barite with erratically distributed galena, pyrite, minor chalcopyrite, siderite and very minor calcite entered the zone as veins from small to very large. Galena occasional as coarse vein material accompanied this mineralizing phase.

Pyrite occurs, liberally disseminated and as stringers, throughout all rocks with the exception of some of the basalt dyke material.

The deposit is primarily structurally controlled with mineralization entering breccia zones and shear zones along faults. In that the important mineralization occurs in rhyolite, the deposit may be considered to a lesser extent to be lithologically controlled. However, it is suggested that the rhyolite itself is localized along a fault or within a fault zone. And further, the degree of mineralization within the rhyolite is contingent upon the rhyolite being brecciated, probably by faulting. It should be noted however that much of the brecciated rhyolite is copper barren even though the favourable blue quartz is present in the matrix of the breccia.

ZONE A

Diamond Drilling

Four holes totalling 232 feet were drilled on the zone with a pack sack drill.

Pack sack hole No. 1 was collared to sample the stringer showing on the northern face, typical of the quartz stringers in andesite tuff type of environment. Sporadic chalcopyrite was intersected throughout the drill hole but nothing of any economic importance.

Two holes were spotted on the southern face and the remaining hole was collared 150 feet southeasterly up the hill to sample the mineralized brecciated rhyolite showing. The drilling has indicated that at least two of the favourable brecciated rhyolite structures are present on the zone. The grey rhyolite breccia initially intersected in Holes 2, 3 and 4 contains interesting values in copper. On the other hand, the pink rhyolite cut in Holes 1 and 2, and touched in Hole No. 3 is barren except for a two foot section in Hole No. 1. This pink rhyolite was not reached in Hole No. 4. However, a possible third rhyolite is indicated in this hole, sporadically mineralized.

ZONE B

Zone B, located approximately a mile downstream and also on the northeast slope of the main creek, differs markedly from Zone A. The showing consists principally of several very large angular boulders lying in a branch creek. Some of these boulders are probably outcrop but due to the extremely thick vegetation positive outcrop identification has not been realized. The boulders are a very hard competent quartz rock containing very finely disseminated tetrahedrite and pyrite. No other metallic minerals have been discovered within these boulders. Six character samples taken from this zone average 0.202 oz. gold, 8.01 oz. silver, and 1.20% copper.

A thousand feet upstream from this showing toward Zone A, what is suspected to be a lean section of the same vein outcrops in another branch creek.

The only rock exposed in the creek is a black smoky quartz, likely reflecting very finely diffused tetrahedrite. An average assay of four character samples taken from this showing is 0.012 oz. gold, 1.5 oz. silver, and 0.15% copper.

Of paramount interest on Zone B is that the only outcrops found in the thick brush in this area, on both occasions were mineralized. Significant float material located among the boulders in the main creek are thought to have their origin in the vicinity of the B zone. This float consists of a single large boulder of massive chalcopyrite and several smaller boulders of massive tetrahedrite, typically assaying 0.045 oz. gold, 0.45 oz. silver, and 5.60% copper. Galena and sphalerite occur to a minor extent in other boulders.

No work of any kind other than prospecting has been done on Zone B so that possible width of the mineralization and geological controls are not yet known.

CONCLUSIONS

The deposit is tentatively classified as epithermal on the basis of the following characteristics:

- a) Generally open space filling, exemplified by shearing, brecciation, both vuggy and comb varieties of much of the quartz.
- b) Mineral association indicative of a low temperature environment.
- c) Radical variation in grade and width of mineralization within the deposit.
- d) General lack of alteration of the wall rocks, except for innumerable tiny pyrite stringers in fractures.

Zone A lacks any significant values in precious metals whereas Zone B contains appreciable gold and silver. This indicates that precious metal content in a given zone is a direct reflection of tetrahedrite mineralization with the zone.

In view of the predominantly structural control of the mineralized zones, further search for similar zones in the valley should be concentrated along favourable structural features such as faults and perhaps unconformities.

The nature of this type of deposit is such that a very large tonnage is not likely to be found on the staked ground. However, a number of small high grade zones may lie within the claim group and the surrounding valley, hidden beneath the thick vegetation. Therefore, in that ground access to the area is as yet nonexistent and that the area is relatively isolated, an economic proposition for this deposit would be contingent upon finding other deposits in the Sutlahine watershed; this with a view to feeding a mill in the Sutlahine valley from more than one source.

RECOMMENDATIONS

- A. In conjunction with further work on the THORN Group of mineral claims, a program of intense prospecting in the valley of the THORN property is recommended, as well as prospecting in the general area of the Sutlahine River watershed.
- B. With regard to the search for additional mineralized zones on the claim group, the six central claims, largely including that area between both zones and flanking the main creek up to both location lines, have been prospected in considerable detail. Detailed prospecting of the remaining sixteen claims is recommended.

Because of the thickness of the vegetation on the property, outcrops are scattered and well hidden. Therefore, a limited geochemical survey to cover the six central claims would be in order to complement the prospecting.

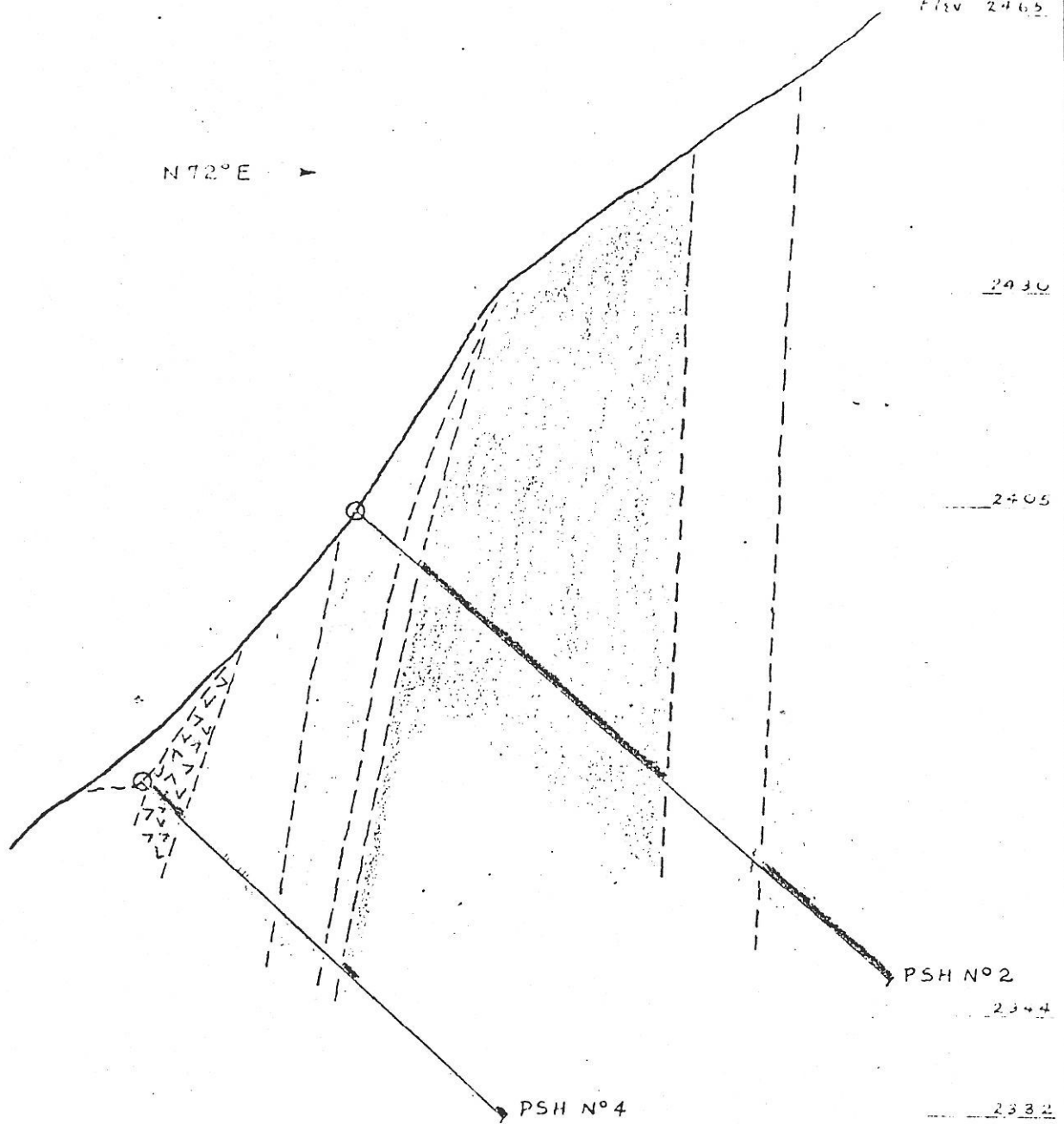
- C. Further work on Zone A should include the following:
- a) Approximately 300 feet of pack sask diamond drilling; extend PSH No. 4 to intersect the intersection of the pink rhyolite cut in PSH No. 2, an additional drill hole beneath PSH No. 4, a drill hole down slope and beneath PSH No. 1, a hole on the south end of the zone to test for possible extension, and a drill hole beyond the massive barite vein at the north end of the zone.
 - b) More detailed geological mapping of the zone. Considerably more outcrop has been uncovered since the present chain, compass and clinometer mapping due to a forest fire which swept through the area.
 - c) Hand trenching on the northeast slope of the zone above the major gully, on both north and south extension areas and in the talus area below the zone.
- D. Zone D should be explored along strike by a series of trenches between the main zone and its probable extension approximately 1000 feet southeasterly. Geological mapping, sampling, and pack sask drilling of favourable mineralization may be considered following the trenching.
- E. A rapid survey with chain and compass or preferably a plane table along the main creek is recommended to tie in property geology, Zone A, Zone B, Zone B extension, and the geochemical work.

Respectfully submitted, by



Robert S. Adamson, B.A.Sc.
Geological Engineer for
Julian Mining Co. Ltd.

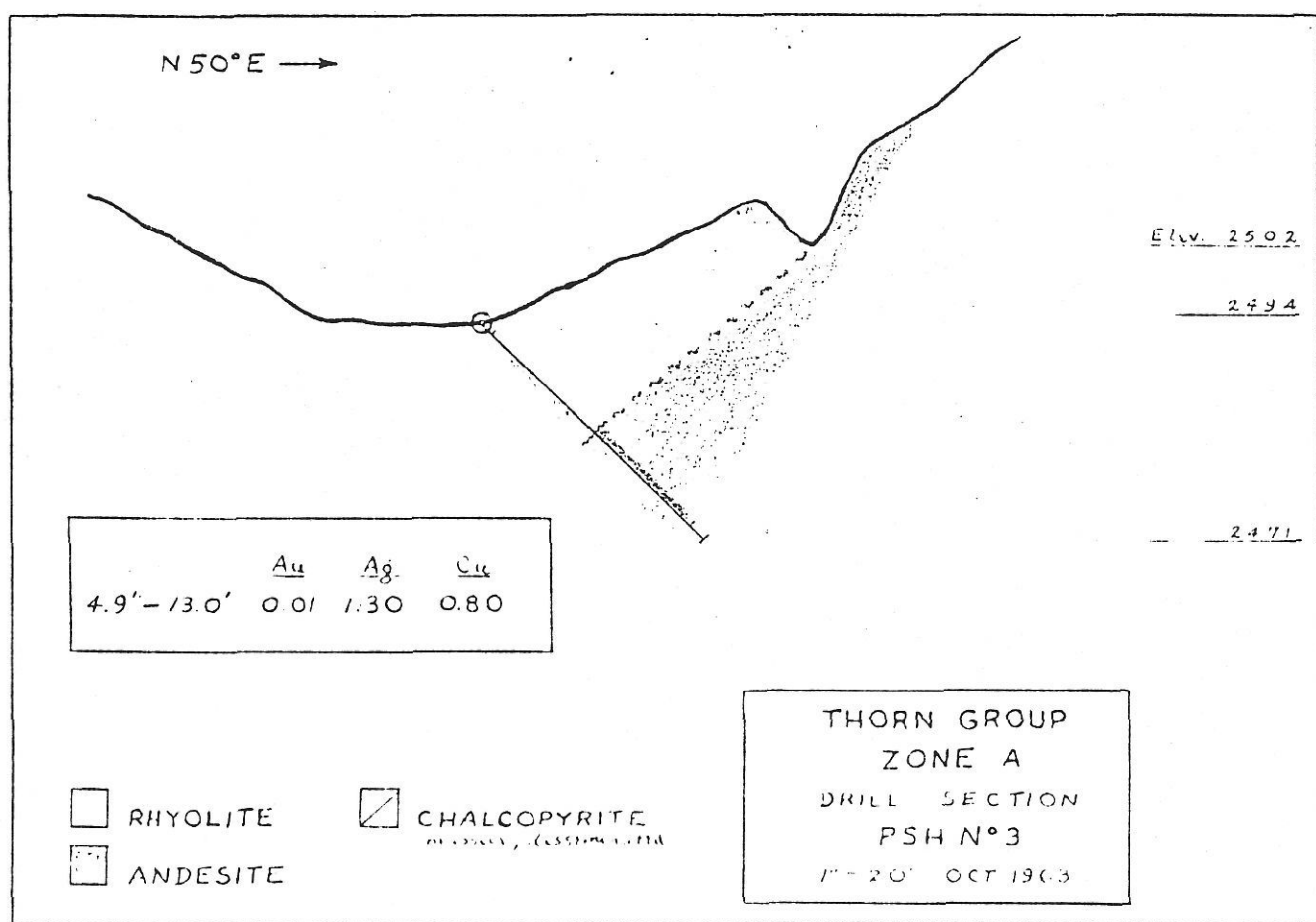
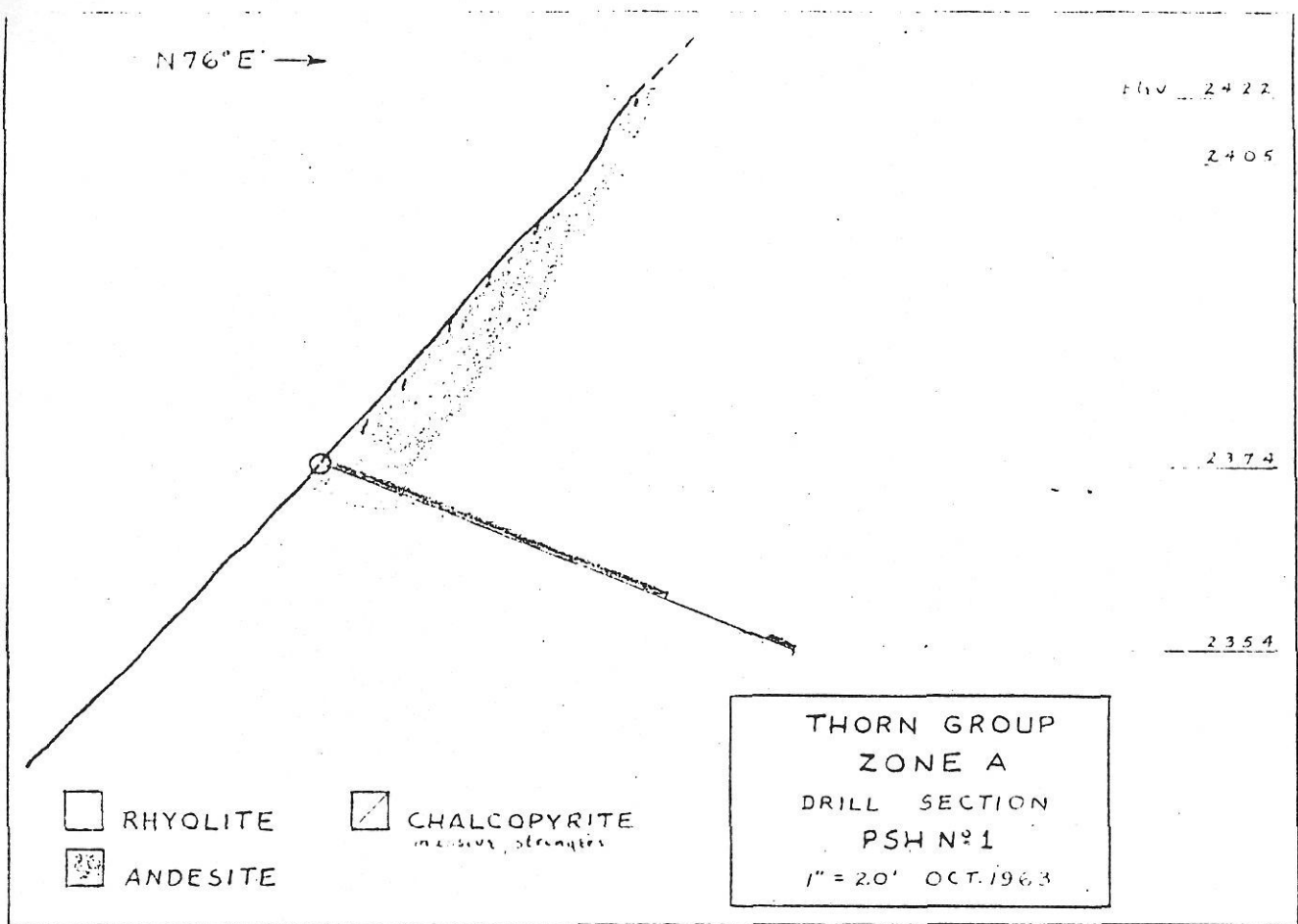
N 72° E



		Au	Ag	Cu
PSH No 2	0' - 7.8'	0.04	5.85	2.40
PSH No 4	6.2 - 11.8	0.005	0.40	0.68
	11.8 - 16.8	Tr	0.45	0.50
	16.8 - 22.8	0.005	0.25	0.40
	22.8 - 29.3	0.005	0.40	2.10
	50.3 - 54.8	Tr	0.55	0.95

- RHYOLITE
- CHALCOPYRITE
- ANDESITE
- PYROXENITE

THORN GROUP
 ZONE A
 DRILL SECTION
 PSH Nos 214
 1" = 20' OCT 1963



DRILL HOLE LOGS

Drill Hole No.	PSH No. 1	Started	August 21, 1963
Collar Elevation	2374	Completed	August 24, 1963
Bearing	N 76° E	Core	Ex
Dip	- 22°	Recovery	77%
Length	56.3 ft.		

0' - 2'1"	CASING CORE - ANDESITE	Recovery 8"
	Medium green tuffaceous rock with dark green basalt matrix. Core contains considerable disseminated pyrite and occasional chalcopyrite bleb. Random quartz stringers throughout core.	
2'1" - 2'6"	ANDESITE AND RHYOLITE BRECCIA	3"
	Primarily a medium green andesite breccia but large sharply angular fragments of rhyolite prominent. Breccia has a siliceous matrix with prominent glassy quartz stringers. Considerable disseminated pyrite with occasional chalcopyrite bleb throughout.	
2'6" - 2'8"	ANDESITE	1.5"
	Medium green rock with tiny basaltic veinlets - fine pyrite stringers throughout core.	
2'8" - 3'9"	ANDESITE TUFF	4"
	Medium green fragmental rock with some dark green basaltic matrix apparent although matrix primarily siliceous. Numerous quartz veinlets carrying blebs of pyrite throughout.	
3'9" - 5'3"	ANDESITE AND RHYOLITE BRECCIA	8"
	Sharply angular white rhyolite and green andesite fragments in dark green basaltic matrix - disseminated and stringers of pyrite usually in basalt matrix. Hint of chalcopyrite at ends of core where dark brown limonitic stain is prominent.	
5'3" - 6'6"	RHYOLITE BRECCIA	4"
	Very sharply angular fragments of rhyolite with dark green almost black basalt matrix. Fragments of rhyolite fit to neighbour suggesting brecciation in site. Much pyrite as blebs with basaltic matrix.	
6'6" - 7'2"	ANDESITE AGGLOMERATE	4"
	Sharply angular andesite fragments with dark green matrix - fragments contain much disseminated pyrite. Considerable malachite staining at end of core on fracture - core generally broken.	
7'2" - 8'6"	ANDESITE AGGLOMERATE	10"
	Fairly solid core - medium green fragments with basalt matrix cut by prominent white quartz veinlets. Tiny pyrite stringers throughout fragments and matrix.	
8'6" - 9'2"	ANDESITE	4"
	Disseminated pyrite, tiny pyrite stringers and quartz stringers throughout core.	

PSH No. 1

9'2" - 10'5"	ANDESITE AND RHYOLITE BRECCIA	2"
	Pale grey andesite and pinkish white rhyolite fragments, both subangular with matrix of very dark green basalt. This assemblage in turn has been brecciated and cemented with white quartz. Disseminated pyrite and stringers in basaltic matrix.	
10'5" - 11'5"	BASALT - CHALCOPYRITE	100%
	Dark green rock, slightly brecciated with much glassy white quartz filling interstices and as veinlets. Quartz contains chalcopyrite blebs. Crystalline pyrite occurs principally in dark green basalt. Fairly solid core.	
11'5" - 13'4"	BASALT BRECCIA - CHALCOPYRITE	10"
	Dark green basalt fragments with glassy white quartz matrix. Quartz carries considerable chalcopyrite blebs. Malachite staining on fractures of badly broken core. Considerable pyrite in basalt.	
13'4" - 13'9"	BASALT	2"
	Badly broken core.	
13'9" - 14'5"	BASALT BRECCIA AND LIMONITE	4"
	Initial core dark green basalt breccia with glassy white quartz matrix. Remainder, rusty fragments.	
14'5" - 16'7"	ANDESITE AGGLOMERATE	10"
	Medium green andesite fragments with minor dark green basalt matrix. Considerable pyrite in basalt.	
16'7" - 18'5"	ANDESITE TUFF	1'3"
	Slightly brecciated, both dark green basalt and white quartz matrix. Numerous tiny pyrite stringers.	
18'5" - 20'5"	ANDESITE TUFF	23"
	Medium grey fragmental rock with dark green basaltic matrix. Considerable disseminated epidote and pyrite, also numerous pyrite stringers and veinlets.	
20'5" - 23'5"	ANDESITE TUFF	100%
	Rock essentially same as previous run.	
23'5" - 24'7"	ANDESITE TUFF	1'2"
	Same rock as previous run but drill encountering some limonitic material along fractures, minor chalcopyrite in these fractures.	
24'7" - 25'5"	ANDESITE TUFF	8"
	Tuffaceous nature of rock more obvious, still much pyrite throughout core.	
25'5" - 29'7"	ANDESITE TUFF	47"
	Medium grey fragments with minor dark green basaltic matrix. Few rhyolite fragments visible. Very well pyritized.	
29'7" - 32'5"	ANDESITE TUFF	28"
	Dark grey andesite with minor rhyolite fragments.	

PSH No. 1

32'5" - 36'	ANDESITE TUFF	40"
	Darker grey and coarser grained fragments than previous run. Basaltic matrix more apparent. Still very much pyrite throughout core.	
36' - 36'5"	ANDESITE TUFF	100%
	Same rock as previous run.	
36'5" - 37'8"	ANDESITE AGGLOMERATE	12"
	Large subangular fragments of dark grey andesite with darker basaltic matrix, minor quartz veinlets and heavily disseminated pyrite.	
37'8" - 39'2"	ANDESITE TUFF	100%
	Same rock as previous run except for grain size.	
39'2" - 40'9"	PINK RHYOLITE BRECCIA	14"
	Medium grey andesite tuff in minor quantities has been intruded by pink rhyolite. This assemblage in turn has been brecciated and cemented by glassy blue quartz. Further, this rock has been cut by stringers of white quartz. Much pyrite has accompanied both phases of quartz and perhaps also the rhyolite.	
40'9" - 43'6"	PINK RHYOLITE BRECCIA	100%
	Essentially same rock as previous run but andesite tuff content diminishes markedly. At 42'3" the pink rhyolite breccia has been invaded by a pale grey quartz. In this section sharply angular to subangular fragments of pink rhyolite are enclosed in a matrix of grey replacement type quartz. Pyrite is prominent throughout the core.	
43'6" - 45'7"	PINK RHYOLITE	19"
	No sign of any brecciation. Core cut by numerous small quartz stringers carrying considerable pyrite with a little chalcopyrite.	
45'7" - 48'6"	PINK RHYOLITE BRECCIA	17"
	Brecciated pink rhyolite with matrix of blue quartz, white quartz and light grey quartz. Blue quartz accompanied by heavy pyrite principal matrix material. This assemblage cut by grey quartz with apophyses of white quartz. Glassy white quartz veinlets in turn cut the grey quartz. Later generation of blue quartz veinlets carrying heavy chalcopyrite and pyrite. Note: Pale grey quartz surrounding subangular piece of blue quartz carrying pyrite.	
48'6" - 49'11"	PINK RHYOLITE BRECCIA	100%
	Same rock as previous run. 47'8" - 49'5" heavily disseminated chalcopyrite.	
49'11" - 50'3"	ANDESITE TUFF	100%
	Dark grey proceeding to darker grey fragments. Very heavily pyritized. Minor small quartz stringers.	

END OF HOLE

DRILL HOLE LOGS

Drill Hole No.	PSH No. 2	Started	August 24, 1963
Collar Elevation	2405	Completed	August 29, 1963
Bearing	N 72° E	Core	Ex
Dip	- 43°	Recovery	67.5%
Length	85.0 ft.		

- 0 - 1'3" CHALCOPYRITE IN QUARTZ Recovery 100%
 Largely blue quartz matrix in remnant brecciated bleached white rhyolite. Heavily disseminated blebs of chalcopyrite in the blue quartz. Rhyolite breccia very minor. Barite veinlet with disseminated chalcopyrite cuts breccia.
- 1'3" - 3'6" CHALCOPYRITE IN QUARTZ 100%
 Dominantly disseminated chalcopyrite in blue quartz with remnant fragments of white bleached rhyolite. Sporadic large angular fragments of chalcopyrite usually with coarse barite or siderite. This large coarse chalcopyrite is probably later than the generation of chalcopyrite with the blue quartz. Erratic galena present as well as stringers of chalcopyrite.
- 3'6" - 6'2" CHALCOPYRITE IN BARITE 1'7"
 Large crystals, mainly triangular, of chalcopyrite in coarse crystalline white barite - disseminated chalcopyrite within blue quartz in the matrix of a brecciated rhyolite also present, but minor. Occasional bleb of bornite.
- 6'2" - 7'9" QUARTZ WITH CHALCOPYRITE 9"
 Disseminated chalcopyrite in blue quartz with occasional angular remnant of white rhyolite. Blue quartz material slightly brecciated and filled with brown siderite.
- 7'9" - 9'6" QUARTZ AND CAVED MATERIAL 5"
 Very badly broken caved rock fragments. Core blue quartz with white rhyolite fragments. No visible chalcopyrite except in very badly broken rock. Very minor pyrite present.
- 9'6" - 10'6" PORPHYRITIC ANDESITE 5"
 Broken core. Medium grey rock with small pyroxene phenocrysts. Minor chalcopyrite in blue quartz stringers is present. Moderately disseminated and stringers of pyrite.
- 10'6" - 13'3" CAVED MATERIAL 3"
 Very badly broken material, zone ultimately cemented.
- 13'3" - 13'11" ANDESITE 100%
 Medium grey andesite slightly brecciated, may be somewhat tuffaceous instead, with dark green basalt matrix. Minor disseminated pyrite throughout core.
- 13'11" - 14'11" CAVED MATERIAL

PSM No. 2

- 14'11" - 25'6" RHYOLITE AND ANDESITE BRECCIA 7'
This section includes several runs of moderately broken core. Pale green rhyolite and medium to dark grey, somewhat tuffaceous andesite fragments cut by numerous blue quartz and minor later white quartz veins, up to $\frac{1}{2}$ inch. The blue quartz carries heavy crystalline pyrite. At approximately 17 feet, a 2" bluish white quartz vein with much disseminated chalcopyrite is visible cutting one of these blue quartz and pyrite veins perpendicularly. A 18'10" a pale grey rhyolite dyklet cuts the moderately brecciated rhyolite and andesite.
- 25'6" - 25'11" BASALT AND PYRITE 100%
Very heavily disseminated pyrite in dark green amorphous basalt. Tiny blue quartz stringers cut this rock at random angles.
- 25'11" - 29'7" ANDESITE TUFF 2'
Slightly brecciated dark grey andesite tuff with matrix of darker grey flow rock. Numerous stringers and veinlets randomly distributed blue quartz, white quartz and pyrite.
- 29'7" - 49'7" ANDESITE TUFF 18'8"
This section includes several runs. Fairly solid core for the most part. Medium to dark grey coarsely tuffaceous rock. Moderate pyrite disseminated and as stringers.
- 49'7" - 49'9" PINK RHYOLITE BRECCIA 2"
Core very badly shattered. Pale pink slightly brecciated rhyolite with siliceous matrix. Disseminated pyrite in matrix. Some dark grey fault gouge present.
- 49'9" - 51'9" PINK RHYOLITE BRECCIA 10"
Rock well brecciated - generally sharply angular fragments of pink rhyolite with matrix of white quartz and grey quartz. Breccia cut by veins of grey blue quartz with heavily disseminated pyrite. This assemblage in turn cut by glassy grey quartz veinlets.
- 51'9" - 52'9" PINK RHYOLITE BRECCIA 9"
Same rock as previous run.
- 52'9" - 53'7" PINK RHYOLITE 8"
Very slightly brecciated pale pink amorphous rhyolite. Core moderately broken. Glassy grey quartz veinlets, numerous.
- 53'7" - 54'6" PINK RHYOLITE 2"
Same rock as previous but very badly shattered core.
- 54'6" - 55'9" PINK RHYOLITE BRECCIA 3"
Broken core. Sharply angular fragments of rhyolite with matrix of dark grey quartz. Very minor disseminated pyrite in grey quartz.
- 55'9" - 57'5" PINK RHYOLITE BRECCIA 7"
Broken core, final inch very badly shattered. Pale pink moderately brecciated rhyolite with a dark grey to black quartz matrix. Core somewhat vuggy. Medium grey quartz stringers with pyrite in part by matrix type quartz.

PSH No. 2

- 57'5" - 59'1" PINK RHYOLITE BRECCIA 8"
Broken core, final 5 inches very badly broken. Pale pink rhyolite has been twice brecciated. Initial matrix a grey white quartz and major matrix dark grey quartz. Core fairly vuggy in part.
- 59'1" - 60'1" CAVE MATERIAL AND SHATTERED CORE 1"
Very badly broken core.
- 60'1" - 62'0" PINK RHYOLITE BRECCIA 7"
Badly broken core. Pink rhyolite twice brecciated. Initial matrix white quartz, present matrix a grey blue quartz. Initial breccia fragments subangular while present breccia sharply angular. Minor stringers of pyrite.
- 62'0" - 62'9" PINK RHYOLITE BRECCIA 100%
Fairly solid core. Much pyrite disseminated through rhyolite fragments and as stringers cutting fragments. Blue-grey quartz veins with heavy pyrite cuts rhyolite through axis of drill core and cuts off pyrite stringers which lie within the rhyolite fragments. Blue-grey quartz also matrix for breccia. Glassy white quartz veins cut all blue quartz and rhyolite.
- 62'0" - 62'9" SAND SEAM
- 62'9" - 63'4" PINK RHYOLITE BRECCIA 5"
Badly broken core. Same rock as previous run. Much disseminated pyrite and stringers throughout.
- 63'4" - 64'1" PINK RHYOLITE BRECCIA 5"
Largely glassy grey quartz matrix material with minor remnant pale pink rhyolite fragments. Quartz contains much disseminated pyrite and pyrite stringers.
- 64'1" - 65'1" PINK RHYOLITE BRECCIA 10"
Moderately brecciated. Fragments sharply angular with medium grey to dark grey glassy quartz matrix. Later white somewhat vuggy quartz partially matrix material and veinlets. Disseminated pyrite throughout core.
- 65'1" - 70'1" ANDESITE TUFF 4'6"
This section includes several runs. Pale through medium to dark grey fragmental andesite. Cut by numerous grey blue quartz stringers. Much disseminated pyrite throughout core, also veins, veinlets and stringers with heavy pyrite.
- 70'1" - 85' ANDESITE 13'6"
This section includes several runs. Dark grey fine grained flow rock. Largely amygdaloidal but minor sections of porphyritic andesite with pyroxene phenocrysts.

END OF HOLE

DRILL HOLE LOGS

Drill Hole No.	PSH No. 3	Started	August 30, 1963
Elevation	2494	Completed	August 31, 1963
Bearing	N 50° E	Core	Ex
Dip	- 45°	Recovery	69.5%
Length	32.5 ft.		

6' - 7"	BASALT	Recovery 100%
	Dark blue-grey amorphous rock, cut by numerous tiny pyrite stringers.	
7" - 1'10"	BASALT	8"
	Same rock as previous run.	
1'10" - 2'11"	QUARTZ	11"
	Medium blue quartz with very minor remnant fragments of pale grey rhyolite. Much disseminated pyrite and many tiny pyrite stringers throughout core accompanied by darker blue quartz. Badly broken core.	
2'11" - 3'4"	GREY RHYOLITE BRECCIA	3"
	Pale grey highly siliceous rhyolite fragments with matrix of medium blue quartz. Numerous stringers of blue quartz with pyrite cut both the breccia fragments and matrix. Occasional bleb of chalcopyrite in these stringers.	
3'4" - 4'5"	GREY RHYOLITE	4"
	Grey highly siliceous fragments, very slightly brecciated with if any matrix generally a white quartz. Very many pyrite stringers and veinlets dominantly at 30° to the drill hole axis.	
4'5" - 4'11"	CAVED MATERIAL AND RUBBLE	1"
	Shattered fragments very rusty and limonitic.	
4'11" - 5'4"	GREEN RHYOLITE BRECCIA	3"
	Predominantly deep blue quartz matrix surrounding generally subangular fragments of pale green rhyolite. Principal trend of blue quartz veining and pyrite veinlets throughout core is 60° to the drill hole axis.	
5'4" - 5'9"	QUARTZ AND CHALCOPYRITE	100%
	Badly broken core with considerable limonitic fragments. Largely blue quartz with disseminated chalcopyrite and very minor sharply angular fragments of green rhyolite. The blue quartz in turn has been slightly brecciated and filled with a white quartz. Considerable disseminated pyrite throughout core,	
5'9" - 6'6"	QUARTZ BRECCIA AND CHALCOPYRITE	6"
	Dark blue quartz fragments containing disseminated chalcopyrite with matrix of glassy pale grey quartz also containing chalcopyrite. Cut by numerous tiny white quartz stringers.	
6'6" - 7'9"	GREY RHYOLITE	100%
	Pale grey amorphous rock with hint of pinkish cast. Very slightly brecciated in part. Considerable disseminated pyrite and tiny pyrite stringers through core.	

PSH No. 3

7'9" - 8'7"	GREY RHYOLITE	3"
	Very badly broken core. Same rock as previous run.	
8'7" - 9'3"	GREY RHYOLITE BRECCIA	4"
	Sharply angular fragments of pale grey rock with matrix of blue quartz containing much disseminated pyrite. Also pyrite veinlets up to 1/8" prominent.	
9'3" - 10'	QUARTZ PORPHYRY	5"
	Small dark grey crystalline quartz phenocrysts in groundmass of pale grey rhyolite. Cut by numerous dark blue quartz veinlets and stringers carrying much pyrite and chalcopyrite.	
10' - 12'1"	QUARTZ PORPHYRY	100%
	Tiny rounded, slight hint of angularity, glassy quartz pebbles surrounded by groundmass of pale green rhyolite. This cut by very tiny stringers of blue quartz with disseminated chalcopyrite.	
12'1" - 13'	QUARTZ	2"
	Pale blue quartz. Generally granular appearance on surface of core probably resulting from tiny quartz phenocrysts that were not replaced entirely by blue quartz as rhyolite was.	
13' - 14'10"	GREEN RHYOLITE PORPHYRY BRECCIA	100%
	Fragments of pale green rhyolite containing crystalline grey quartz phenocrysts with glassy quartz matrix. This assemblage cut by both dark blue and pale grey glassy quartz veinlets, the former carrying heavy pyrite while the latter is barren.	
14'10" - 16'5"	GREEN RHYOLITE	1'1"
	Slightly brecciated at initial part of run. Largely broken core. Pale green rock by few blue quartz veinlets with heavy pyrite. Heavy mud seam (fault) at end of run.	
16'5" - 16'11"	FAULT	1"
	Brown mud.	
16'11" - 18'5"	ANDESITE TUFF	9"
	Medium grey fragmental volcanic rock. Numerous tiny pyrite stringers cut drill core, some at 30° to drill hole axis, others parallel to the axis.	
18'5" - 19'2"	FRAGMENTS AND RUBBLE	3"
19'2" - 19'11"	ANDESITE TUFF	4"
	Same material as previously recovered core.	
19'11" - 20'11"	ANDESITE TUFF	8"
	Pale grey tuffaceous rock, slightly brecciated.	

PSH No. 3

20'11" - 30'7"

ANDESITE TUFF

8'8"

This section includes several runs. Pale grey to medium grey. Occasional piece of core slightly brecciated with random sharp fragments of pale pink rhyolite as well as dykelets of pink rhyolite. Numerous blue quartz stringers and veinlets with much pyrite. Disseminated pyrite. Core somewhat broken.

30'7" - 32'5"

PINK RHYOLITE BRECCIA

4"

Very badly shattered core and some caving rock. Pale pink moderately brecciated with moderately disseminated pyrite.

END OF HOLE

D

DRILL HOLE LOGS

Drill Hole No.	PSH No. 4	Started	August 31, 1963
Collar Elevation	2372	Completed	September 2, 1963
Bearing	N 71° E	Core	Ex
Dip	- 43°	Recovery	76.5%
Length	58.3 ft.		

- | | | |
|---------------|--|---------------|
| 0 - 8" | GREY RHYOLITE | Recovery 100% |
| | <p>Pale grey fine grained rhyolite with pinkish tint. Fine disseminated specks of chalcopyrite with chalcocite film around each speck randomly distributed throughout core. Rhyolite very slightly brecciated, sharply angular fragments with pale green siliceous matrix in part, otherwise grey quartz matrix. Some disseminated pyrite.</p> | |
| 8" - 6'3" | PYROXENITE | 100% |
| | <p>Dark green medium grained rock. Cut by blue quartz veinlets with heavy pyrite usually at 30° to drill hole axis. Lower contact with pale grey highly siliceous rhyolite distinguishable but contact diffused rather than sharp. Rhyolite later than pyroxenite suggested.</p> | |
| 6'3" - 7'5" | RHYOLITE BRECCIA | 100% |
| | <p>Sharply angular pale pink rhyolite fragments cemented by dark grey quartz with some finely disseminated pyrite. A later stage of pale grey to white quartz carrying a little chalcopyrite as blebs is visible surrounding sub-angular fragments of the dark grey quartz.</p> | |
| 7'5" - 9' | RHYOLITE BRECCIA AND CHALCOPYRITE | 100% |
| | <p>Sharply angular fragments of both pale pink and pale green rhyolite with a dark grey quartz matrix. Considerably more chalcopyrite in this section usually with later stage of white quartz. Pyrite associated with grey quartz.</p> | |
| 9' - 10'3" | GREY RHYOLITE BRECCIA AND CHALCOPYRITE | 9" |
| | <p>Initial 2" badly broken core, remainder fairly solid. Dark grey rhyolite fragments, highly siliceous with a matrix of very dark grey, almost black quartz containing numerous chalcopyrite blebs - slight bornite covellite film on chalcopyrite. Pyrite significantly absent from core.</p> | |
| 10'3" - 10'6" | GREY QUARTZ | 100% |
| | <p>Medium grey quartz with minor blue quartz stringers, disseminated pyrites, blebs of chalcopyrite with minor bornite.</p> | |
| 10'6" - 11'9" | GREY QUARTZ BRECCIA | 13" |
| | <p>Sharply angular fragments of grey quartz with blue quartz matrix - disseminated chalcopyrite in matrix.</p> | |
| 11'9" - 13'0" | BASALT AND RHYOLITE BRECCIA | 100% |
| | <p>Probably grey rhyolite subangular fragments in matrix of dark green basalt although difficult to ascertain whether highly siliceous rhyolite or basalt is matrix material. Basalt slightly porphyritic (pyroxene). Part of the rhyolite may be porphyritic, characterized by eyes of grey quartz crystals. Core thoroughly cut by numerous blue quartz veins, veinlets, stringers with blebs of chalcopyrite and later white barite veinlets carrying coarser chalcopyrite blebs.</p> | |

PSH No. 4

- 13'0" - 13'5" PORPHYRITIC BASALT DYKE 100%
Dark green basalt with darker green pyroxene phenocrysts.
- 13'5" - 14'3" RHYOLITE BRECCIA 9"
Sharply angular small fragments of pale green rhyolite with matrix of grey larger sharply angular fragments of quartz. This rock has in part been rebrecciated and cemented with dark green basalt. Pyrite stringers throughout.
- 14'3" - 15'5" QUARTZ PORPHYRY 100%
Well defined tiny quartz crystals in a pale grey highly siliceous rhyolite or quartz. This pale grey material is in sharp contact at 45° to the drill hole axis with a darker grey highly siliceous rhyolite, also with quartz phenocrysts. Chalcopyrite with minor bornite along this contact. Chalcopyrite, some pyrite, heavily disseminated throughout core. Few specks of galena visible.
- 15'5" - 16'3" BASALT 100%
Dark green rock with numerous stringers of quartz and some pyrite. The quartz carries considerable chalcopyrite and minor bornite.
- 16'3" - 16'9" ANDESITE TUFF 100%
Green-grey probably fragmental rock with much both blue and white quartz veinlets carrying chalcopyrite. Some small fragments of pale green rhyolite also present in tuff.
- 16'9" - 18'9" GREEN RHYOLITE BRECCIA 1'1"
Pale green fragments of rhyolite, generally small with a matrix of grey to blue quartz containing a few specks of chalcopyrite and considerable pyrite. White veinlets of barite cut this rock in random fashion. Gouge and shattered core at end of run, probably fault zone.
- 18'9" - 20'8" GREY QUARTZ 9"
Generally broken core. Blue grey quartz slightly brecciated. Disseminated chalco and pyrite throughout quartz. Where brecciated small stringers of barite fill spaces.
- 20'8" - 21'8" GREEN RHYOLITE BRECCIA 100%
Small pale green rhyolite fragments in unknown matrix in turn has been somewhat brecciated and filled with blue quartz carrying pyrite and chalcopyrite. Later barite stringers also carry a little chalcopyrite but no pyrite.
- 21'8" - 22'8" GREEN RHYOLITE BRECCIA AND CHALCOPYRITE 100%
Many large blebs of chalcopyrite with pyrite throughout entire run. Rock essentially sharply angular fragments of pale green rhyolite in blue quartz matrix. Mineralization in latter material. Barite veinlets with chalcopyrite in latter part of run.
- 22'8" - 23'9" GREEN RHYOLITE BRECCIA AND CHALCOPYRITE 100%
Same rock as previous run.

PSH No. 4

23'9" - 25'2"	GREEN RHYOLITE BRECCIA	8"
	Fairly large angular fragments of pale green rhyolite with matrix of grey quartz carrying disseminated chalcopryrite and pyrite. Some stringers of blue quartz which may be contemporaneous with matrix material also present. At latter part of run angular fragments of chalcopryrite bearing blue quartz are surrounded by a glassy white quartz also carrying disseminated chalcopryrite. Fault gouge at end of run.	
25'2" - 26'5"	GREEN RHYOLITE BRECCIA AND CHALCOPRYRITE	100%
	Small to medium sharply angular fragments of pale green rhyolite with grey quartz matrix. Heavily disseminated chalcopryrite both in matrix material and many blue quartz veinlets cutting the core. This run characterized by extremely large blebs of massive chalcopryrite.	
26'5" - 26'7"	QUARTZ PORPHYRY AND CHALCOPRYRITE	100%
	Dull green crystalline quartz phenocrysts in pale green rhyolite matrix cut by blue quartz veining with large chalcopryrite blebs and pyrite.	
26'7" - 26'9"	FAULT	100%
	Blue grey gouge.	
26'9" - 27'	GREEN RHYOLITE BRECCIA	100%
	Generally subangular fragments of amorphous pale apple green rhyolite in a matrix of very dark blue quartz with pyrite and finely disseminated chalcopryrite.	
27' - 29'4"	PINK RHYOLITE BRECCIA AND CHALCOPRYRITE	2'1"
	Small, sharply angular fragments of pale pink rhyolite in predominantly dark grey quartz matrix with small disseminated blebs of chalcopryrite and pyrite. This assemblage in turn is cut by later veins of white quartz and barite carrying very large coarse blebs of chalcopryrite and a little pyrite.	
29'4" - 30'1"	GREY RHYOLITE BRECCIA	5"
	Pinkish tinted pale grey rhyolite fragmental rock with medium grey quartz matrix. Cut by blue quartz stringers carrying pyrite. Generally broken core.	
30'1" - 30'9"	GREY RHYOLITE BRECCIA	100%
	Same as previous run except more moderately brecciated.	
30'9" - 31'6"	GREY RHYOLITE BRECCIA	3"
	Badly broken core but same rock as previous run.	
31'6" - 32'5"	GREY RHYOLITE BRECCIA	100%
	Rock slightly brecciated. Pale grey rhyolite with pinkish cast. Occasional pyrite stringer.	
32'5" - 33'4"	ANDESITE TUFF	2"
	Sharply fragmental, dark green rock - heavy pyrite. Core badly broken.	

PSM No. 4

33'4" - 34'8"	ANDESITE TUFF	9"
	Medium grey, sharply angular fragmental rock. Disseminated pyrite and stringer.	
34'8" - 35'	ANDESITE	100%
	Medium grey-green flow rock, not fragmental.	
35' - 35'3"	GREY RHYOLITE BRECCIA	100%
	Pale grey rhyolite with slight pinkish cast, slightly brecciated with matrix of blue quartz, little pyrite.	
35'3" - 35'6"	GREY RHYOLITE BRECCIA	100%
	Pale grey to dark grey rhyolite - brecciated with matrix of darker grey quartz. This cut by numerous blue quartz veinlets carrying considerable pyrite.	
35'6" - 36'5"	GREY RHYOLITE BRECCIA	4"
	Same rock as previous run - however, occasional bleb of chalcopyrite in grey matrix quartz. Badly broken core.	
36'5" - 36'7"	GREY RHYOLITE BRECCIA	100%
	Same rock as previous run but somewhat less brecciated. Still carries considerable pyrite as veinlets of dark blue grey quartz. No visible chalcopyrite.	
36'7" - 37'5"	GREY RHYOLITE	7"
	Badly shattered core latter half of run. Core shatters along fracture planes at 70° to drill axis. Pyrite without quartz splayed on fracture faces.	
37'5" - 38'7"	GREY RHYOLITE	100%
	Grey green amorphous rhyolite with suggestion of dark green crystalline pyroxene phenocrysts. Many pyrite stringers.	
38'7" - 39'2"	GREY RHYOLITE	5"
	Very slightly brecciated with medium grey quartz matrix. Pale grey rock with hint of pinkish cast. Prominent fracture pattern still 70° to drill hole axis.	
39'2" - 40'9"	GREY RHYOLITE BRECCIA	9"
	Moderately brecciated, pale grey rhyolite fragments, dark grey quartz matrix with much disseminated pyrite. Prominent fracturing 60° to drill hole axis.	
40'9" - 42'2"	GREY RHYOLITE BRECCIA	6"
	Same rock as previous run. One piece of matrix core (1") with considerable finely disseminated pyrite and chalcopyrite.	
42'2" - 43'4"	GREY RHYOLITE BRECCIA	10"
	Some rusty limonitic sections but rock same as previous run including a little finely disseminated chalcopyrite in grey quartz matrix. Much disseminated pyrite throughout core.	

PSH No. 4

43'4" - 44'5"	GREY RHYOLITE	5"
	Very badly shattered core, very slightly brecciated with white quartz matrix.	
44'5" - 45'4"	GREY RHYOLITE BRECCIA	8"
	Pale grey sharply angular rhyolite fragments with blue-grey quartz matrix containing considerable pyrite. Occasional barite veinlet. Badly broken core.	
45'4" - 46'7"	GREY RHYOLITE	13"
	Greenish grey, very slightly mottled green. Numerous pyrite stringers parallelling drill hole axis.	
46'7" - 50'3"	GREY RHYOLITE BRECCIA	2'3"
	Unbrecciated to 47'3", core otherwise well brecciated. Fairly large grey-green fragments in medium grey quartz matrix. Large blebs of pyrite in matrix material with occasional bleb of chalcopyrite. Also odd barren white barite veinlet. Fairly solid core to 48'5", otherwise broken.	
50'3" - 50'6"	GREY RHYOLITE BRECCIA	100%
	Large grey rhyolite fragments with slight pinkish cast in glassy grey quartz matrix. This breccia in turn has been slightly brecciated and a later grey-white quartz fills voids and occurs as prominent veinlets. Large blebs of chalcopyrite associated with this latter quartz generation which is of the comb variety in part.	
50'6" - 51'6"	GREY RHYOLITE BRECCIA AND CHALCOPYRITE	9"
	Same as previous run but considerably more chalcopyrite.	
51'6" - 52'3"	GREY RHYOLITE BRECCIA	5"
	Core generally broken. Same as previous run but less chalcopyrite, occurs as random blebs in glassy grey matrix. Considerably more prominent white barite veins.	
52'3" - 53'4"	GREY RHYOLITE BRECCIA AND CHALCOPYRITE	9"
	Both grey rhyolite and distinctive pale green rhyolite fragments. Suggestion that grey rhyolite was prime matrix material for green fragments. This was rebrecciated and filled with blue-grey quartz as matrix, also as veinlets. This quartz contains much disseminated chalcopyrite and pyrite.	
53'4" - 54'9"	RHYOLITE BRECCIA AND CHALCOPYRITE	100%
	Fairly solid core. Same rock as previous run but considerably more blue quartz matrix material, also much more disseminated fine chalcopyrite. Some prominent barite in core with occasional isolated blebs of chalcopyrite, no pyrite with the barite.	
54'9" - 55'4"	RHYOLITE BRECCIA	100%
	Same rock as previous run but no visible chalcopyrite, disseminated pyrite throughout.	

PSH No. 4

55'4" - 56'2"

GREY RHYOLITE

5"

Only slightly brecciated. No pale green fragments. Grey rhyolite has a slight pinkish cast. Minor blue quartz matrix with few veinlets.

56'2" - 57'3"

GREY RHYOLITE

6"

Same rock as previous run but totally unbrecciated. Core somewhat broken. Pyrite stringers throughout.

57'3" - 58'4"

BASALT

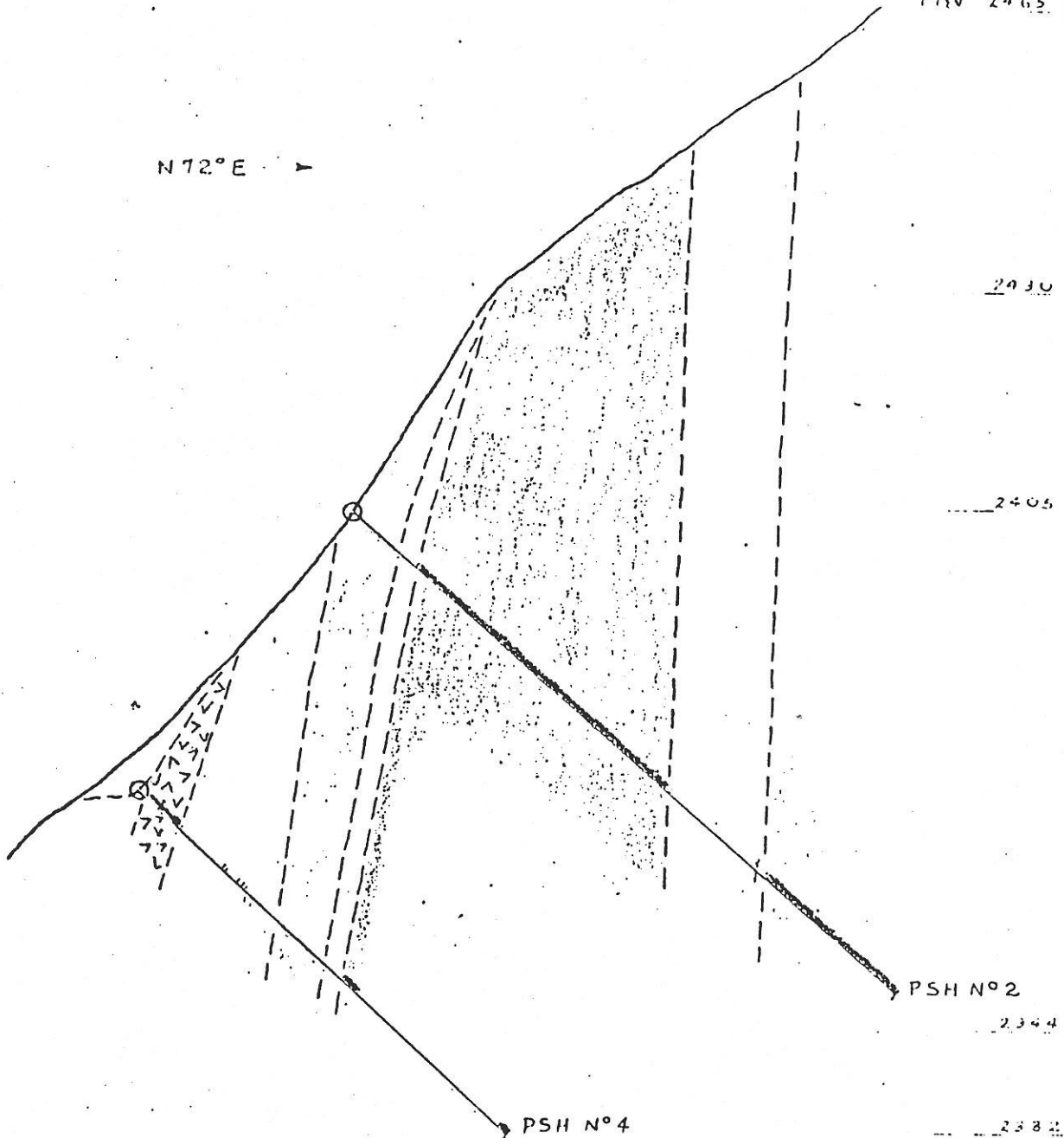
100%

Dark green amorphous rock, possibly dyke, in part a dark grey appearance. Considerable pyrite fractures.

END OF HOLE

Fig 2465

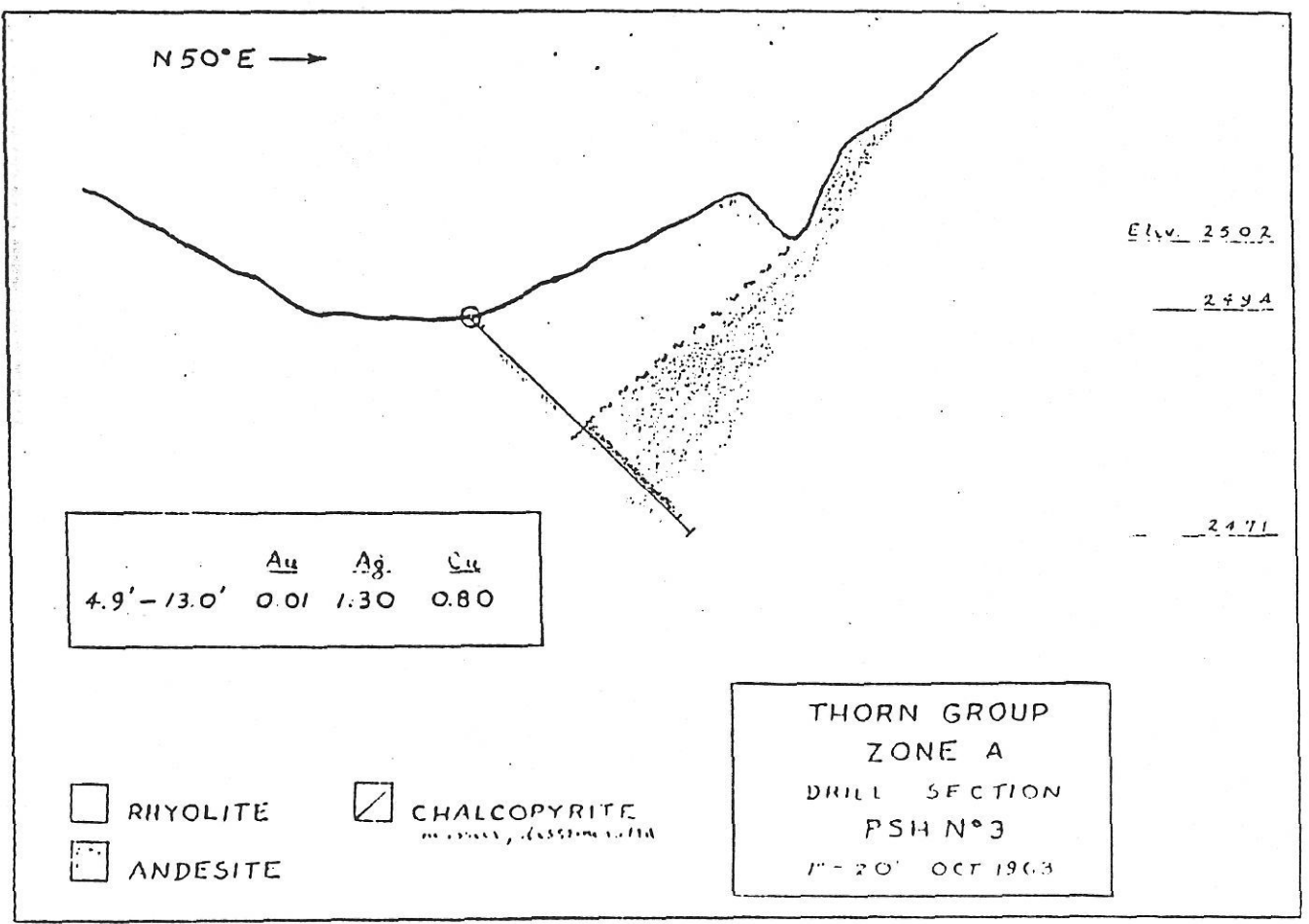
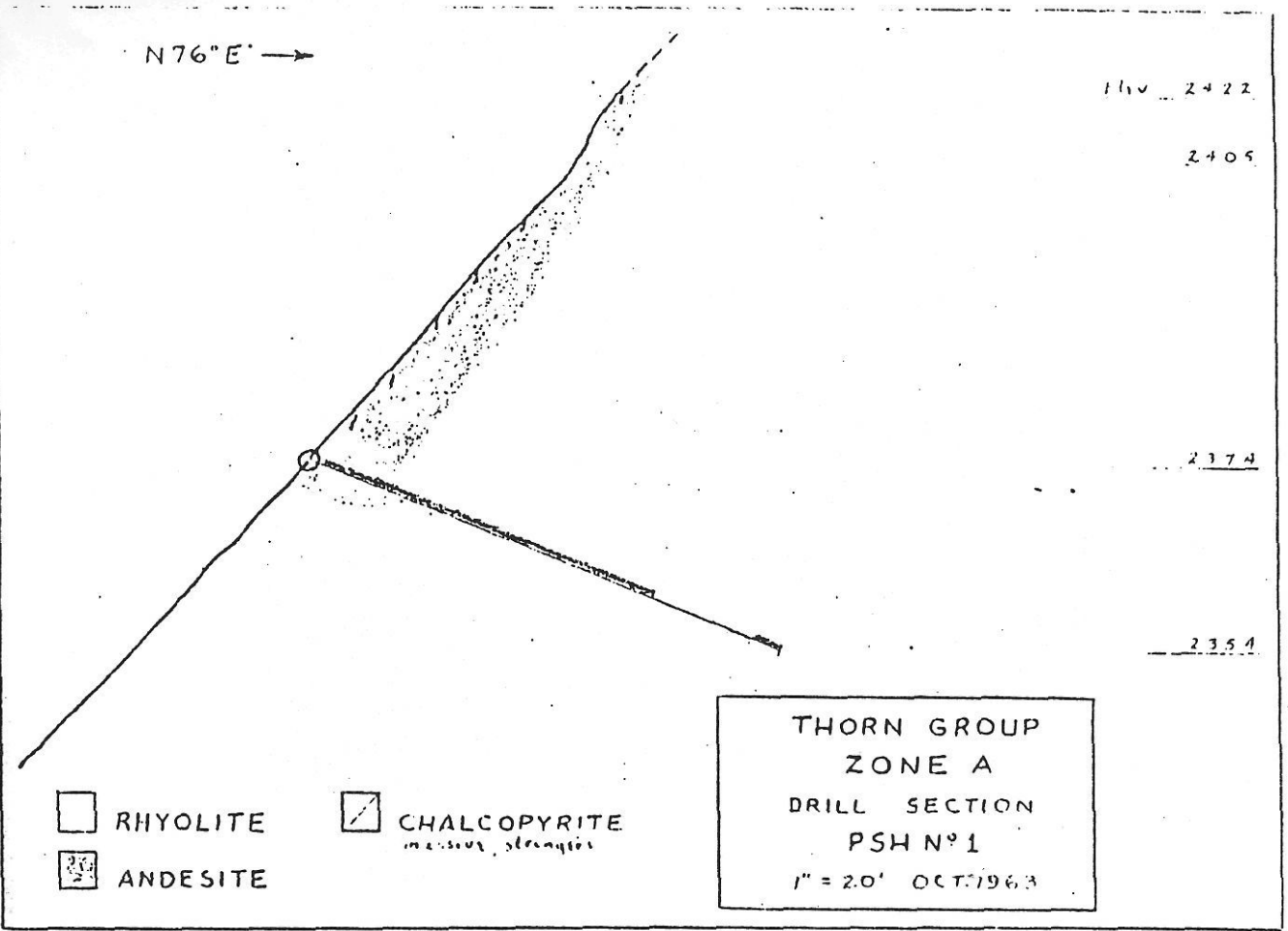
N72°E

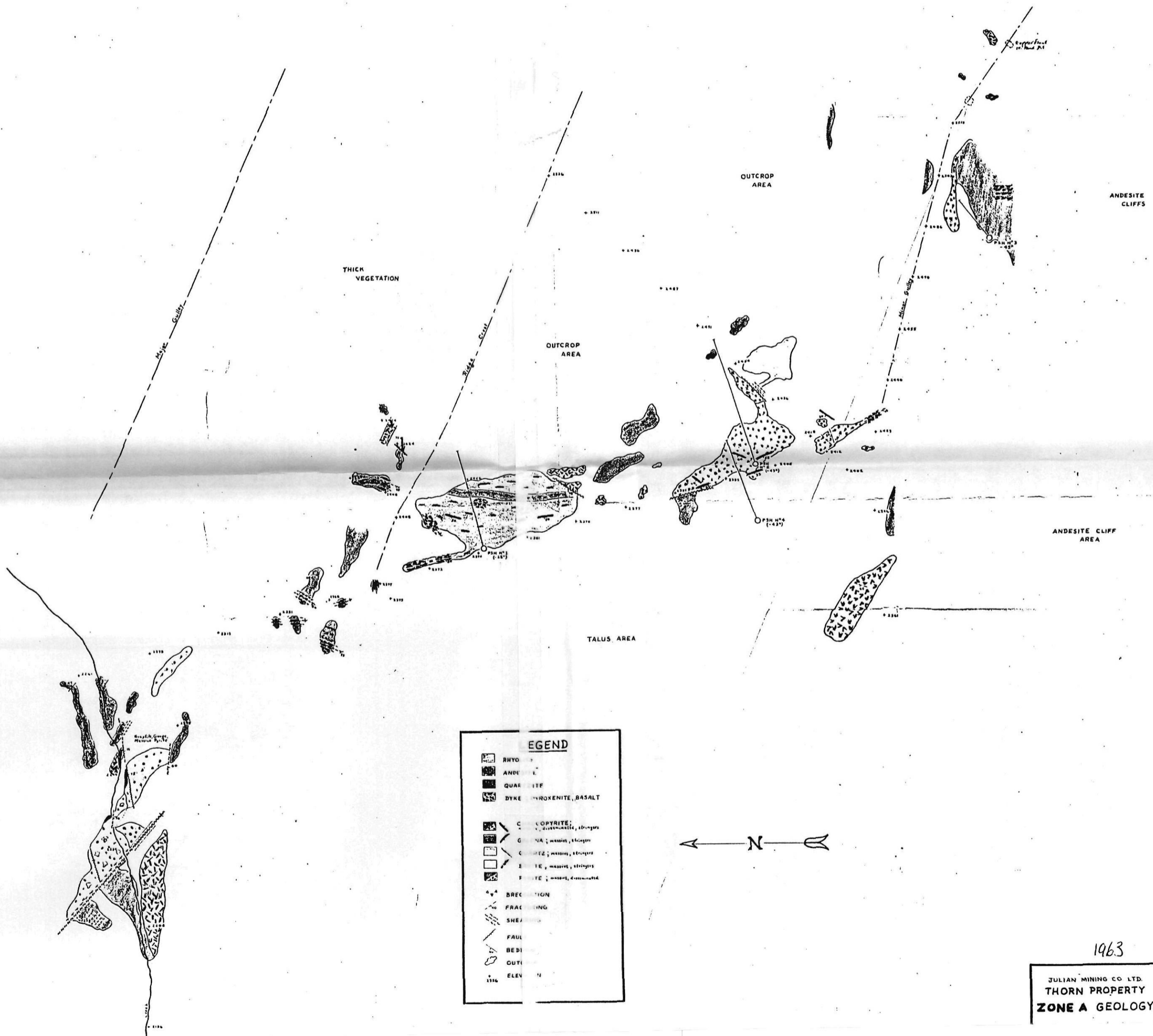


		Au	Ag	Cu
PSH N° 2	0' - 7.8'	0.04	5.85	2.40
PSH N° 4	6.2 - 11.8	0.005	0.10	0.68
	11.8 - 16.8	Tr	0.45	0.50
	16.8 - 22.8	0.005	0.25	0.40
	22.8 - 29.3	0.005	0.40	2.10
	50.3 - 54.8	Tr	0.55	0.95

- RHYOLITE
- CHALCOPYRITE
- ANDESITE
- PYROXENITE

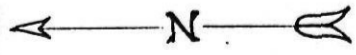
THORN GROUP
 ZONE A
 DRILL SECTION
 PSH N°s 214
 1" = 20' OCT 1963





LEGEND

[Symbol]	RHYOLITE
[Symbol]	ANDESITE
[Symbol]	QUARTZITE
[Symbol]	DYKE (PYROXENITE, BASALT)
[Symbol]	CHALCOPYRITE; masses, stringers
[Symbol]	GALENA; masses, stringers
[Symbol]	MAGNETITE; masses, stringers
[Symbol]	PYRITE; masses, disseminated
[Symbol]	BRECCIATION
[Symbol]	FRACTURING
[Symbol]	SHEARING
[Symbol]	FAULT
[Symbol]	BEDDING
[Symbol]	OUTCROP
[Symbol]	ELEVATION



1963
 JULIAN MINING CO. LTD.
 THORN PROPERTY
 ZONE A GEOLOGY