COMMONWEALTH OF AUSTRALIA.

DEPARTMENT OF NATIONAL DEVELOPMENT.

BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS.

RECORDS.

1961/157

VISIT TO GRANITES GOLDFIELD, OCTOBER, 1960

by

P.W. Crohn

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SUMMARY

Portion of the Granites Goldfield has been re-surveyed in order to delineate areas warranting further prospecting. As a result, a limited programme of costeaning and long-hole drilling is recommended.

INTRODUCTION

The Granites locality was visited from October 26th to November 2nd, 1960, and portion of the goldfield was re-surveyed in order to delineate areas warranting further prospecting.

Gold was first discovered in this area in 1900, and the total recorded production to date is about 13,500 ozs of gold, of which more than half was won during the period 1945-1951. At present, the greater part of the field is covered by leases held by Mr. D. King; Mr. King and one assistant are the only permanent white residents on the field.

The workings on the field can be divided into three main groups, comprising :

1. The Bunkers Hill - Chapman's Hill workings;
2. The Golden Shoe - Longbottom - Bullakitchie workings, about 3 miles west-north-west of Bunkers Hill;
3. The Ivy workings, about one mile west-south-west of the Golden Shoe.

The records of early production do not always state the source of the ore, but it is believed that, out of the total of 13,500 ozs, at least 8,000 ozs came from the Bullakitchie workings and another 2,000 to 3,000 from the Golden Shoe, Longbottom, and other nearby workings. The Bunkers Hill - Chapman's Hill workings probably accounted for about 2,000 ozs ; production from the Ivy workings was negligible.

BUNKERS HILL-CHAPMAN'S HILL AREA

Geology

The Bunkers Hill - Chapman's Hill area was examined in greatest detail, as the lodes of this area, consisting mostly of narrow, rich, quartz stringers, appeared most suitable for small-scale mining operations of the type envisaged by Mr. King. The area had previously been examined by P. Hossfeld (A.G.G.S.N.A. Reports, N.T., No's 30 and 43).

The least weathered rocks exposed in this area are tightly folded and sheared schists and quartzites. Generally muscovite is the dominant constituent of the schists, with garnet and (?)chiastolite as common accessories. However, in the weathered outcrops, many of the rocks have the appearance of shales or phyllites, so that it is not possible to decide whether metamorphism originally affected all or only some of these sediments. All the beds of this area appear to have undergone comparable deformation, and impregnation by iron oxides, but a belt with an average width of some 400 feet, passing through Bunkers Hill and Chapman's Hill, appears to contain a higher proportion of interbedded quartzites and of intruded quartz veins than the rocks on either side. There are not enough exposures to determine whether this corresponds to a stratigraphic division, as suggested by Hossfeld. Structurally, the area is much more complex than Hossfeld's mapping suggests. The regional strike of the beds ranges from west-north-west at Bunkers Hill to north-north-east at the southern extremity of Chapman's Hill, and dips are dominantly to the south-west and west at steep angles. No sign could be found of the major syncline postulated by Hossfeld. Instead, a number of minor folds were found, ranging from fairly tight to isoclinal and pitching variously to the north-west or to the south-east at all angles up to vertical. At least some of the beds must thus be overturned, but none of the fold axes could be traced for any distance along the strike.

Zones of shearing and impregnation by iron oxides generally trend parallel to the strike of the beds, but again can rarely be traced for more than a few chains along the strike. Both the breccias and the ironstone-quartz bodies described by Hossfeld are of this type, but they are smaller and less continuous than his map indicates. At several localities, the noses of steeply pitching minor folds were found to be selectively replaced by concentrations of iron oxides, and it seems likely that the ironstone-quartz bodies conform to an echelon arrangement rather than to a strict alignment on major structural features.

Two types of igneous rocks have been found within this area. One consists of small pegmatite veins commonly sub-parallel to the bedding of the surrounding sediments and commonly less than one foot wide; these are well represented in the Jumping Frog and Golden Centre areas. The other comprises larger outcrops of medium-grained, even-grained granite, in part sheared and impregnated with iron oxides, which are well represented in the southern portion of Chapman's Hill. As far as is known, the auriferous lodes are not directly related to either of these groups of rocks.

Economic Geology

None of the workings in this area give much indication of the type of material which originally carried the high gold values, as the lodes have generally been removed completely. According to Mr. King, this material was essentially iron-stained quartz, distinct both from the major outcropping quartz reefs and from the larger zones of iron-impregnation in the sediments.

From north to south the main groups of workings are as follows:-

To the south and south-east of Bunkers Hill, several shafts and small open cuts were sunk on narrow leaders trending north-west to west-north-west, parallel to the strike of the sediments. However, production from this area appears to have been small, and a 115-foot adit driven into this hill did not intersect any payable lodes.

At Jumping Frog, assays of up to 5 dwts. per ton over widths of 42 inches are recorded by Hossfeld from a north-east trending costean, but no further development has been carried out in this vicinity.

At Golden Centre, which has been the largest producer in this area in recent years, a small cluster of quartz veins was worked by means of shafts and open stopes over a length of about 60 feet and to a depth of about 30 feet. These veins had an average strike of 090 degrees, and cut across the strike of the surrounding sediments at an angle of about 30 degrees.

About 150 feet north-east of Mr. King's present living quarters, three closely spaced shallow shafts were sunk on a quartz leader which does not appear to have been more than an inch or two wide. The alignment of these shafts indicates a north-westerly trend for this leader, inclined at almost 45 degrees to the strike of the adjoining sediments.

Two similar leaders have been exposed in shafts and open cuts about 100 feet west of the present battery. These show easterly and north-easterly strikes, cutting across the bedding of the sediments at 20 degrees and 60 degrees respectively.

At the Burdekin Duck, which was the most important mine in this area prior to 1940, workings comprise shafts and stopes to the surface over a length of about 100 feet and to a maximum depth of more than 80 feet. The lode here trends north-north-west, roughly parallel to the strike of the sediments, although the outline of the stopes can be seen to transgress the bedding on a small scale.

In the extreme southern portion of the area, the Golden Eagle and Southern Cross Workings consist of shafts and open cuts up to 30 feet deep. The trend of the lodes, as indicated by the alignment of the workings, is again roughly parallel to the strike of the surrounding beds, which here is east-north-east.

It will thus be seen that the known auriferous lodes of this area, although apparently all lying roughly at the same stratigraphic horizon, range in strike from north-south to east-west, and cut across the bedding of the surrounding sediments at angles ranging from zero to about 60 degrees.

Recommendations.

As the outcropping formations of this area have been well prospected, any further work would have to be by costeaning, drilling or underground development. The wide range of attitudes of the known lodes, combined with their small horizontal and vertical dimensions, makes it very doubtful if the area warrants any systematic exploration at depth. However, if it is desired to carry out some further work, two lines of attack offer a chance of discovering additional lodes without excessive expenditure :

Firstly, long-hole drilling from existing underground workings, notably the Golden Centre and the shafts west of the present battery. As the attitudes of any undiscovered lodes cannot be predicted, such drilling should take the form of complete rings of holes, spaced 45 degrees apart, and reaching to the maximum possible distance in all directions.

Secondly, there is scope for some additional costeaning within the favourable belt of sediments. This should be concentrated within an area 1,000 feet long and 150 feet wide, extending from the Jumping Frog to the shafts west of the present battery. Again, to make certain of not missing any lodes, two sets of costeans at right angles would be required, instead of the usual practice of costeaning at right angles to the trend of the sediments only. If this work is undertaken, it should be begun in the vicinity of the Golden Centre workings and gradually extended outwards.

GOLDEN SHOE - LONGBOTTOM - BULLAKITCHIE AREA

Geology

In the Golden Shoe - Longbottom - Bullakitchie area, conditions are entirely different from those at Bunkers Hill and Chapman's Hill. In this area, a single main mineralised zone has been traced intermittently for a total distance of more than a mile, and the strike of this lode changes gradually from east-north-east at the western end to west-north-west at the eastern end. The dip is steeply to the north, generally at angles of 70 - 85 degrees.

The lode is conformable to the regional trend of the surrounding sediments but the exposures are too poor to be certain that it is always conformable to the bedding on a small scale. Some zones of tight minor folding were recorded by geologists of Mount Isa Mines Ltd from diamond drill holes put down in 1941 and 1948 to test this lode, but it is not possible at present to assess the importance of these zones in the regional picture.

In the drill logs, the unaltered rocks are described as quartz schists, mica schists and garnetiferous schists, with minor pegmatite dykes and some quartz veins. The lode formation itself is not described in detail in any of the available reports. It appears to consist largely of quartz and calcite veinlets and disseminated sulphides, mainly pyrite, pyrrhotite and arsenopyrite, in sheared and altered schists.

Economic Geology

In several sections of the main lode, values of from 5 to 10 dwts of gold per ton have been recorded over widths of up to 10 feet. Diamond drilling by Anglo-Queensland Mining Pty Ltd in 1941 and 1948 proved the persistence of this mineralisation to depths of at least 400 feet, but the Company did not exercise an option it held over the area at the time. A summary of the results of this drilling is given in the appendix. In addition, two very rich zones of quartz leaders, about 200 feet in length, occurred on the northern flank of the main zone in the Bullakitchie area, but these have now been completely mined out.

Recommendations

The drill hole intersections obtained by Anglo-Queensland Mining Pty Ltd were generally too deep to be of immediate interest to Mr. King, but they can be used as pointers towards areas where further work may reveal payable shoots at shallower depths. The best localities for such work appear to be on the western extensions of the existing workings at both the Bullakitchie and Golden Shoe workings. Long-hole drill holes, depressed at angles of 30 - 45 degrees to the south, should be put in at peg II at the Golden Shoe, and, according to the results obtained, at 30 or 50 foot intervals for 100 feet to the west. Similar holes should be put down at pegs III and IV at the Bullakitchie, and, according to the results obtained, at two or three intervening points.

For deeper exploration, the section of the Golden Shoe workings between Harry's Shaft and the Air Shaft is regarded as having the best prospects, but this section is reported to be stoped out to a depth of about 130 feet. If a diamond drill were available, holes from Peg I, depressed at 50 and 55 degrees to the south, would intersect this lode at depths of 150 and 180 feet, respectively. Failing this, a new shaft, probably in the south wall of the lode, would be the only means of testing this section, as the old workings, according to Mr. King, are entirely unsafe and would be almost impossible to clean out.

ACKNOWLEDGEMENTS

The writer is indebted to Mt Isa Mines Ltd for permission to quote the drilling results listed in the appendix.

REFERENCES

HOSSFELD, P.S. 1938 : Preliminary Report on The Granites Goldfield, Central Australia. A.G.G.S.N.A. Report, N.T., No. 30.

_____ 1940 : The Gold Deposits of The Granites - Tanami District, Central Australia. Ibid No.43.

APPENDIX

THE GRANITES

Lode Intersections by Diamond Drill Holes.

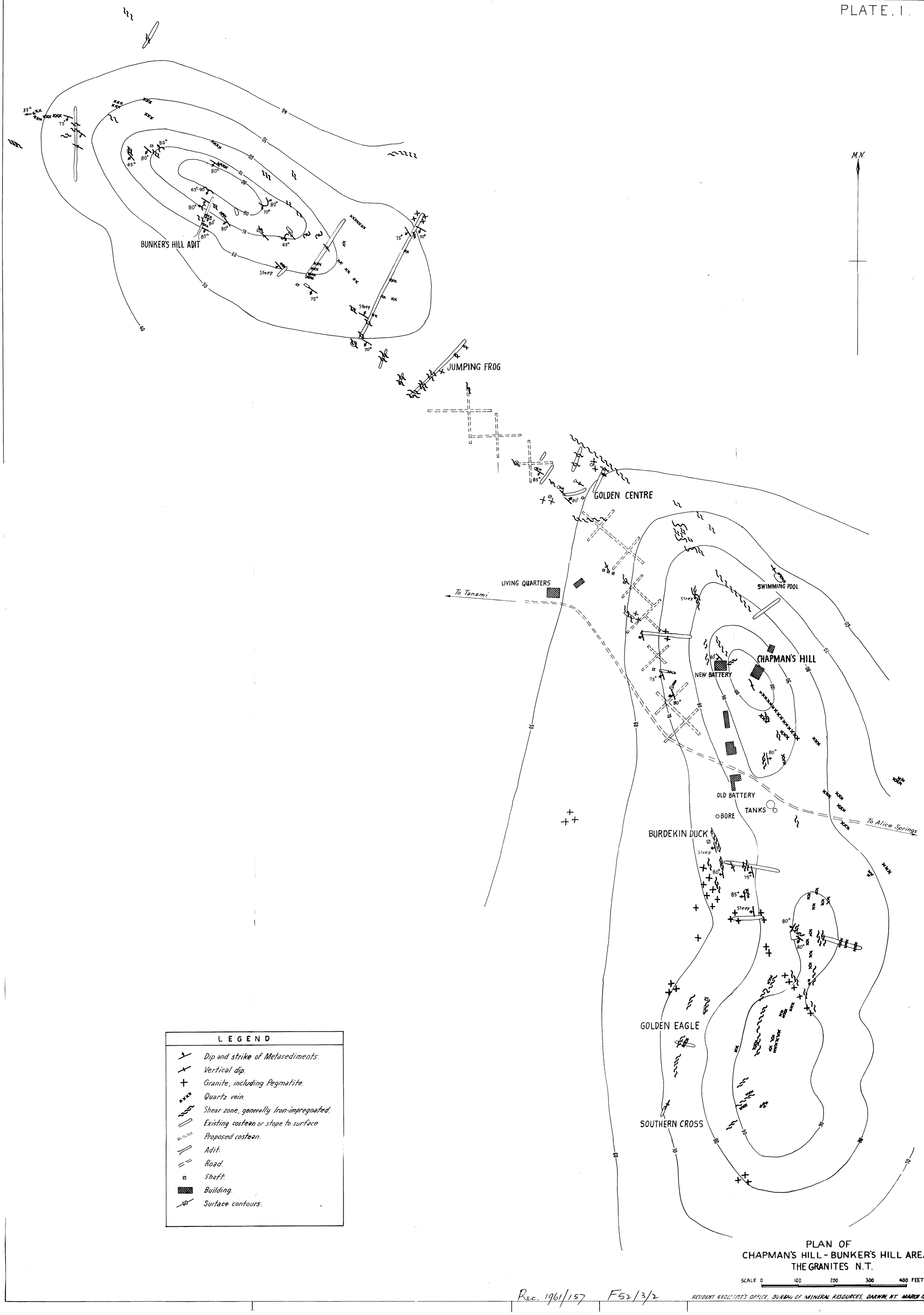
Anglo-Queensland Mining Pty. Ltd., 1941-1948.

Drill Hole	Inclined depth of intersection.		Assay Dwts. Au/ton	Estimated true thickness	Approximate vertical depth
Golden Shoe (GS) 1.	260'	- 264'	14.3	3'	200'
	264'	- 270'	4.0	4'6"	
	270'	- 275'	39.4	3'9"	
	275'	- 277'6"	1.1	1'10"	
GS. 2.	230'	- 240'	Trace.	7'	
	240'	- 247'	1.4	5'	180'
	247'	- 252'6"	Nil	3'6"	
	252'6"	- 261'6"	2.8	6'	
3. Bullamakobia (B)	250'	- 257'6"	Trace.	5'6"	
	257'6"	- 269'	0.1	9'	200'
	269'	- 277'6"	0.1	6'6"	
	277'6"	- 283'	6.1	4'6"	
4. (B)	221'6"	- 227'	0.6	5'3"	
	227'	- 235'	1.7	6'6"	
	235'	- 239'3"	3.9	3'6"	
	239'3"	- 243'6"	2.9-(10.1 incl.	3'6"	150' - 210'
	243'6"	- 246'4"	12.4 specimen	2'3"	
	246'4"	- 273'6"	0.7 gold).	22'6"	
	273'6"	- 279'	4.7	4'6"	
	279'	- 285'	11.0-(16.1 incl. specimen gold).	5'	
5. (B)	397'	- 407'	2.2	7'	
	407'	- 411'	15.0	3'	
	411'	- 415'	23.9	3'	350'
	415'	- 420'	12.6	3'6"	
	420'	- 425'	2.4	3'6"	
6. (GS)	506'	- 511'9"	0.4	4'	
	511'9"	- 515'	7.8	2'3"	420'
7. (GS)	218'6"	- 229'6"	0.2	9'	
	229'6"	- 238'	4.0	7'	
	238'	- 243'	4.2	4'	
	243'	- 248'	5.0	4'	180' - 200'
	248'	- 261'	1.2	10'6"	
	261'	- 269'	6.8	5'6"	
	269'	- 272'6"	3.6	3'	
8. (GS)	306'6"	- 313'6"	0.7	5'6"	
	313'6"	- 320'	1.2	5'	
	320'	- 346'6"	0.2	22'	250' - 280'
	346'6"	- 351'6"	1.1	4'	
	351'6"	- 357'9"	1.2	5'	
	357'9"	- 360'6"	0.2	2'3"	

Drill Hole	Inclined depth of intersection	Assay Dwts. Au/ton	Estimated true thickness	Approximate vertical depth
9. (GS)	319' - 323'	0.4	3'	270'
	323' - 328'6"	1.6	4'6"	
	328'6" - 334'	3.2	4'6"	
	334' - 339'	3.2	4'	
	339' - 343'	6.2	3'	
	343' - 347'	0.2	3'	
	347' - 352'	0.5	4'	
10. (B)	262' -285'	1.6	19'	210' - 270'
	285' - 289'3"	0.7	3'6"	
	289'3" - 294'	1.0	3'9"	
	294' - 299'6"	0.2	4'6"	
	299'6" - 305'	1.4	4'6"	
	305' - 310'	2.2	4'	
	*** 310' - 329'	0.9	11'6"	
	329' - 334'	3.5	4'	
	334' - 359'	0.1	20'	
	*** 310' - 316'	1.9	5'	
11. (B)	247' - 269'	0.2	17'	220'
	269' - 275'6"	0.5	5'	
	275'6" - 281'	7.2	4'	
	281' - 286'	7.3	3'6"	
	286' - 293'	0.1	5'	
12. (B)	292' - 316'	0.2	18'	230' - 300'
	316' - 337'	0.1	16'	
	337' - 363'	0.2	20'	
	363' - 371'6"	0.7	6'6"	
	371'6" - 376'6"	0.4	4'	
	376'6" - 403'	Trace	20'	
13. (B)	279'6" - 321'6"	Trace	32'	220' - 280'
	321'6" - 327'	0.3	4'	
	327' - 370'	Trace	33'	
14. Longbottoms (LB)	251'6" - 260'6"	0.6	7'	210'
	260'6" - 270'	7.7	7'6"	
	270' - 278'	0.3	6'	
	278' -298'	Trace	16'	
15. (GS)	290' - 293'	3.0	2'6"	260'
	293' - 296'	1.4	2'6"	
	296' - 299'	8.0	2'6"	
	299' - 302'	2.4	2'6"	
	302' - 305'	Nil	2'6"	
	305' - 308'	1.2	2'6"	
	308' - 311'	3.8	2'6"	
16. (GS)	236' - 276'	0.2	32'	210' - 260'
	276' - 278'	0.3	1'6"	
	278' - 281'	0.8	2'6"	
	281' - 283'	1.1	1'6"	
	283' - 286'	0.2	2'6"	
	286' - 288'6"	0.8	2'	
	288'6" - 291'6"	1.0	2'6"	
17. (B)	417' - 419'	1.2	1'6"	380'
	419' - 425'6"	0.9	5'	
	425'6" - 430'	6.5	3'3"	
	430' - 441'	0.2	8'	
	441' - 446'	8.4	3'9"	
	446' - 450'	3.6	3'	

Drill Hole	Inclined depth of intersection	Assay Dwts. Au/ton	Estimated true thickness	Approximate vertical depth
18. (B)	440'6" - 445'	2.2	3'6"	400'
	447' - 453'	3.7	4'6"	
	453' - 457'	6.3	3'	
	460'6" - 466'9"	11.0	4'9"	
	466'9" - 472'	12.3	4'	
	472' - 476'6"	0.1	3'6"	
	480'9" - 488'	2.9	5'6"	
	488' - 490'	1.8	1'6"	
19. (Lb)	286'9" - 288'	0.2	1'	240'
	288' - 289'9"	1.2	1'6"	
	289'9" - 293'	0.4	2'6"	
	293' - 333'9"	0.2	30'	
20. (Lb)	257' - 265'	2.4	6'	220'
	265' - 268'	Trace	2'3"	
	268' - 280'	2.2	9'	
	280' - 285'	Trace	3'9"	

PLATE. I.



LEGEND

- Dip and strike of Metasediments.
- Vertical dip.
- Granite, including Pegmatite.
- Quartz vein.
- Shear zone, generally Iron-impregnated.
- Existing costean or stope to surface
- Proposed costean.
- Adit.
- Road.
- Shaft.
- Building.
- Surface contours.

PLAN OF CHAPMAN'S HILL - BUNKER'S HILL AREA THE GRANITES N.T.

SCALE 0 100 200 300 400 FEET

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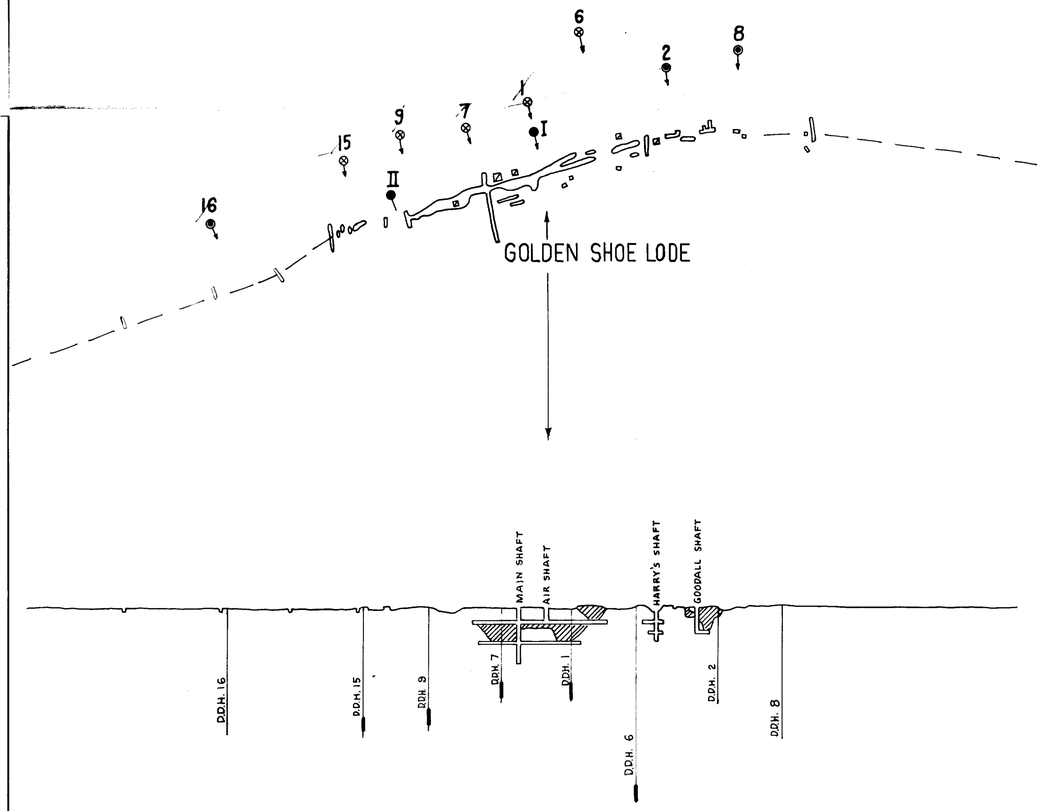
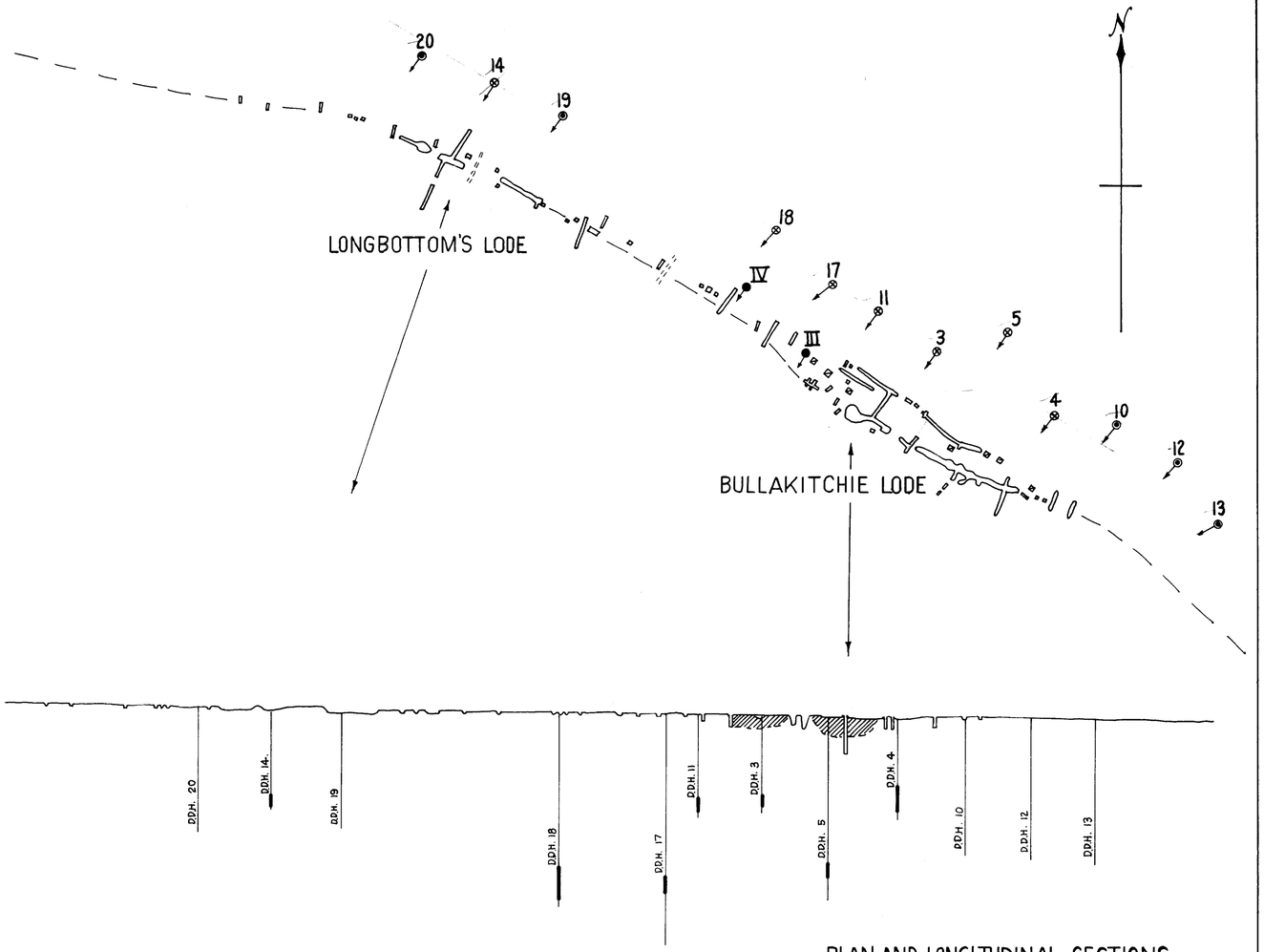
PLATE . 2.





L E G E N D

- 10 / 6 — Anglo-Queensland Mining Co. D.D.Holes, 1941-1948
- As above; Holes intersecting at least 3 feet of material of 4 dwt/ton or better. (plan.)
- IV — Proposed drill holes, October 1960.
- Approximate line of main lode.
- Shaft.
- Costean.
- Stopes. (in longitudinal section.)
- D.D. Hole, intersection of lode carrying at least 3 feet of material of 4 dwt/ton or better. (longitudinal sections.)

PLAN AND LONGITUDINAL SECTIONS
GOLDEN SHOE, LONGBOTTOM'S AND BULLAKITCHIE LODES
THE GRANITES N.T.

SCALE 0 200 400 600 800 1,000 FEET

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