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RELINQUISHMENT REPORT

FOR E.L.'s 2/84 AND 37/84

Prepared by:

Queensland Mines Limited

for

Pioneer Concrete (Tasmania) Pty Ltd

CONTENTS

1. Introduction

EL's 2/84 and 37/84 were granted on the 30.4.84 and 1.10.84 respectively. They were applied for as part of Pioneer Concrete Services' Limited Tasmania wide search for resources of silica for metallurgical use. The exploration has ranged from general rock sampling through to detailed drilling.

The exploration was conducted by geological consultants and this report is a distillation of their findings.

The main target was the quartzites within the Forth Metamorphics (Precambrian), which had previously been explored by BHP in its search for suitable material for their ferro silicon operations at Bell Bay.

Whilst much of the quartzite is of a quality suitable for silica production the beds are often thin, making the mining costs too high. However, at certain localities, namely Dunham's Prospect and Hopkins Prospect possible folding and faulting has increased the thickness, thereby reducing the dilution and making them more attractive to mine.

BHP in its exploration of EL 18/75 was looking for production levels of 50,000 tonnes per year, and were unsuccessful. Pioneer however, is looking at lower levels of production and has concluded that both the Dunham's Prospect and the Hopkins Prospect are suitable deposits.

2. Tenements

The localities of the two Exploration Licences are shown in Figure 1, and the details described in Table 1.

E.L. No.	Granted	Area	Period
2/84	30/4/84	45 sq km	12 months
37/84	1/10/84	99 sq km	12 months

TABLE 1

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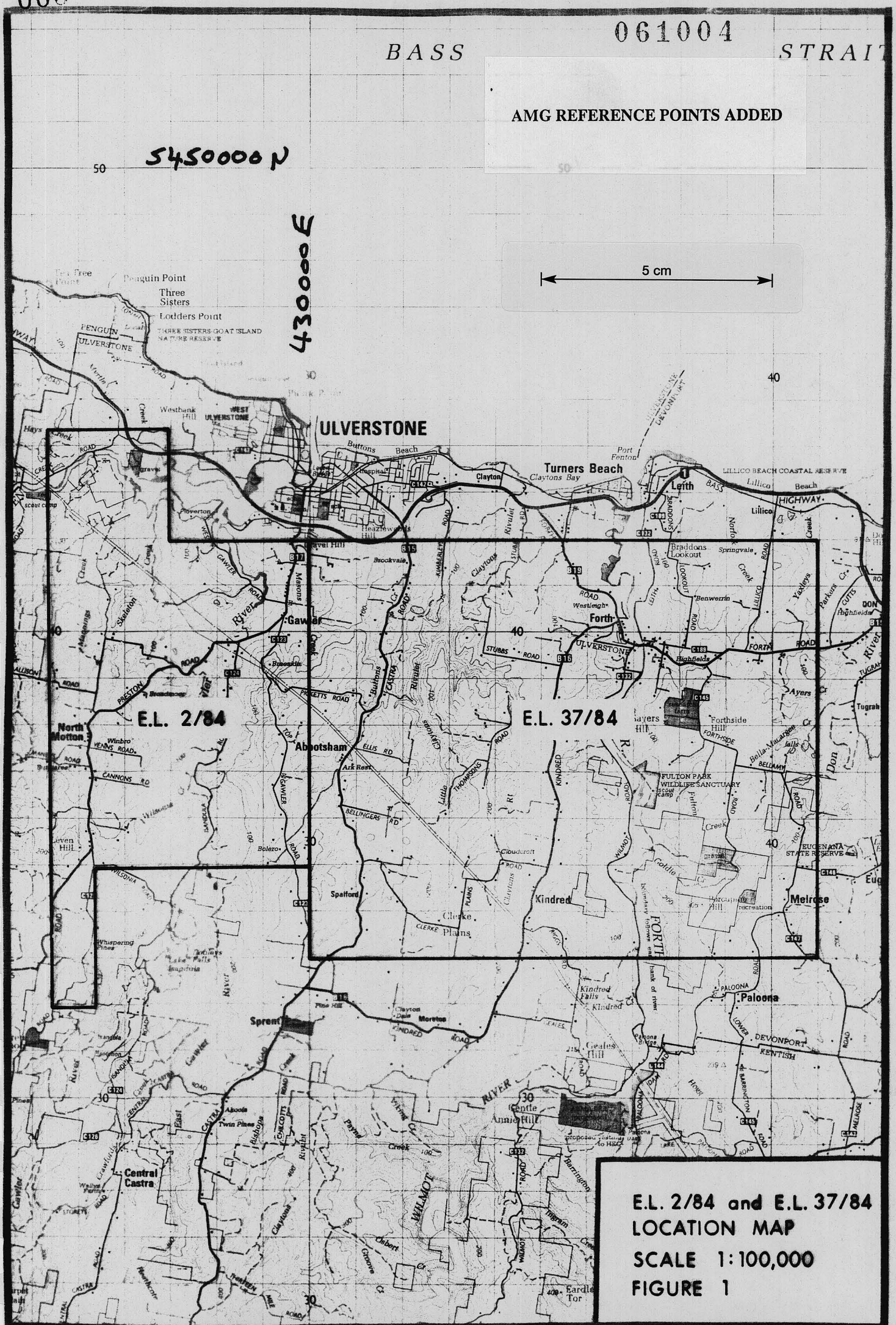
AMG REFERENCE POINTS ADDED

5450000 N

430000 E

5 cm



E.L. 2/84 and E.L. 37/84
LOCATION MAP
SCALE 1:100,000
FIGURE 1

3. Geology

The target quartzites are of Precambrian age and are known as the Forth Metamorphics. Being part of a predominantly fine to medium grained clastic sequence most of the quartzite is micaceous and is associated with mica schist and amphibolites.

In some areas the quartzite has undergone leaching and silicification, and it is this mechanism that has produced the high quality silica deposits which are the subject of this exploration.

BHP studied this phenomenon in its final report on EL 18/75.

4. Work Carried Out

The work carried out comprised:

1. Reconnaissance Sampling
2. Detailed Sampling and Drilling Dunham's Prospect
3. Detailed Sampling and Drilling Hopkins Prospect

4.1 Reconnaissance Sampling

M. Ware, an Adelaide based geological consultant conducted a small reconnaissance programme in the area. Rock chip sample locations are shown on Figure 2. The rock chip sample locations are identified, and their corresponding assays listed in Table 2.

More detailed investigations were undertaken (Area 1 etc in Figure 2).

Area 1: Reference. Kindred Sheet 4243

Grid DQ373373. Land Portions 6979 and 6995.

A prominent knob of quartzite which crops out immediately north of the area drilled was investigated by the BHP Co. Ltd in 1977 in relation to defining a quartzite reserve suitable for ferrosilicon production at Temco. Their investigations proved a small tonnage of relatively pure quartzite within an area now identified as Mineral Lease 941P/M. South of the P/M the quartzite crops out sporadically along a narrow ridge striking approximately 155° and dipping west at 45° to 50°.

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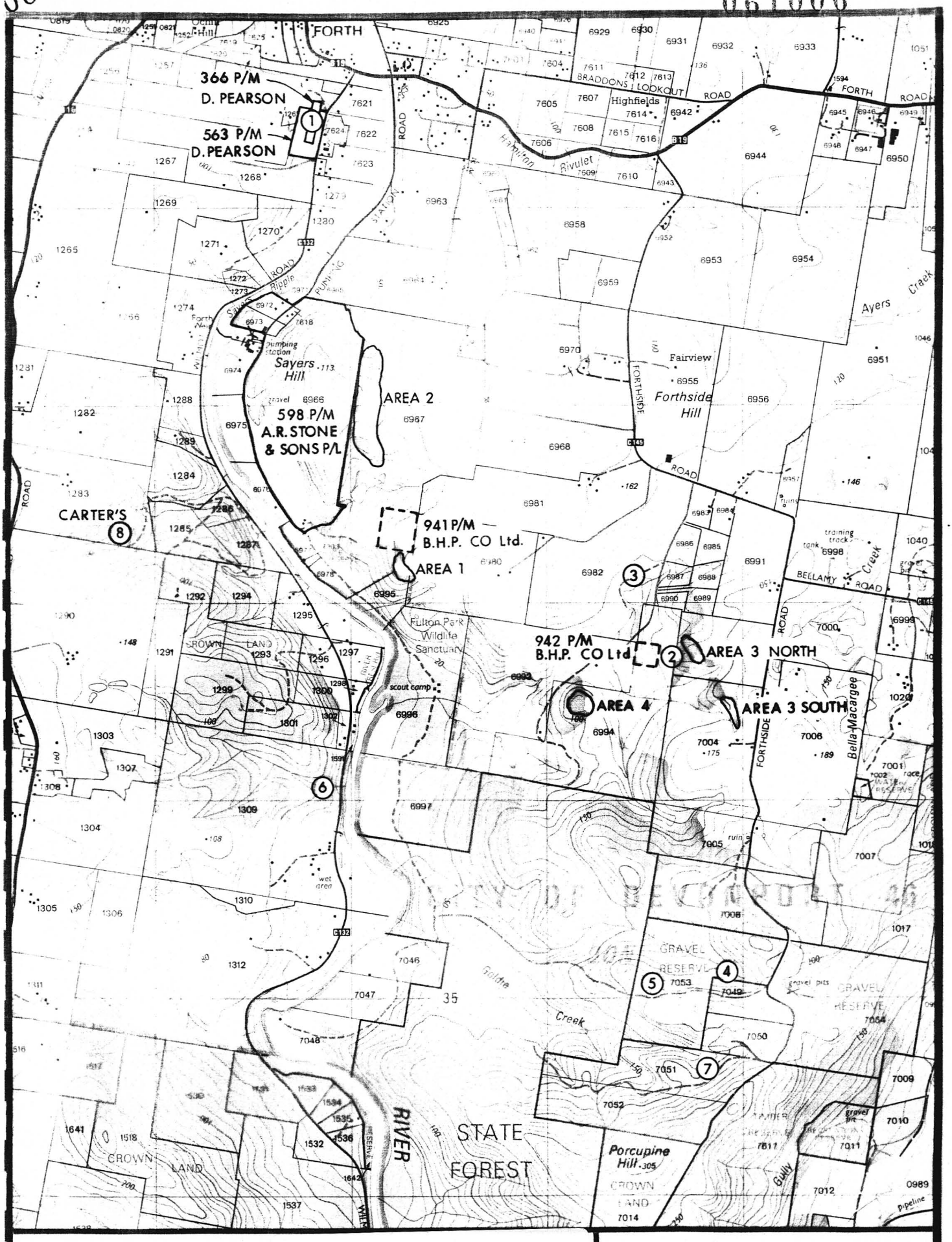


LEGEND

Quartzite outcrops

① Rock chip sample locations

QUARTZITE OUTCROPS & CHIP SAMPLES - FORTH

SCALE 1:25,000

FIGURE 2

Sample identification: Refer Figure 2

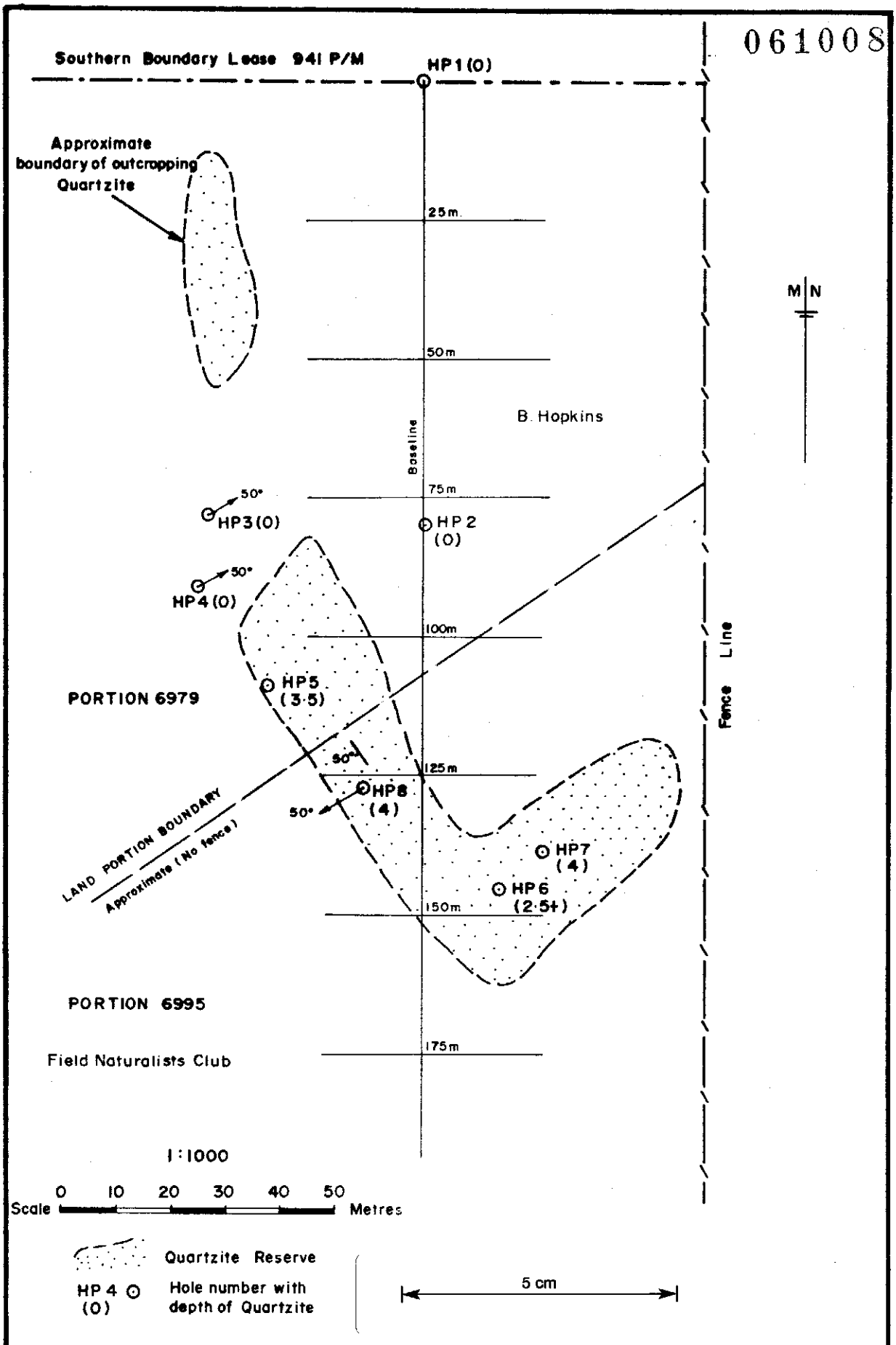
1. Pearson Quartzite. Forth. Dunham's Prospect.
2. Fulton Creek Quartzite. Area A. Disused Workings.
3. Fulton Creek Quartzite. Area B. 350 metres from area A.
4. Flaggy Quartzite. North of Goldie Creek.
5. Higher sequence of beds, same area as above. Flaggy quartzite.
6. Quartzite bed in Forth Meta. schists, 3.7 kilometres south of Pearson quartzite at higher stratigraphic level.
7. Porcupine Hill quartzite. Worked as road fill.
8. Carter's Deposit.

Sample No	Al_2O_3	Fe_2O_3	K_2O	Na_2O	CaO	SiO_2 *	MgO
		%					
1	0.04	0.01	0.01	0.01	<0.01	99.92	<0.01
2	0.06	0.04	0.03	0.01	<0.01	99.85	<0.01
3	0.02	0.01	0.01	0.01	<0.01	99.94	<0.01
4	0.64	0.11	0.22	0.01	<0.01	99.01	<0.01
5	0.10	0.05	0.04	0.01	<0.01	99.79	<0.01
6	2.10	0.24	0.53	0.07	<0.01	96.94	0.11
7	2.50	0.37	0.98	0.04	<0.01	95.91	0.19
8	0.04	0.02	<0.01	<0.01	<0.01	99.90	<0.01

*Value determined by difference

TABLE 2

CHEMICAL ANALYSES -CHIP SAMPLES



AREA 1

ROBERTS QUARTZITE OUTCROP and LOCATION OF DRILL HOLES — FORTH

FIGURE 3

Six percussion holes sited along the ridge (Refer Figure 3) proved the quartzite to be present only where outcropping and generally less than 4 meteres in vertical thickness. In depth the quartzite passes to quartz sands which are variably micaceous.

Sand is again present, in conjunction with red basaltic clay soil in some areas, along the ridge from surface where there is no quartzite outcropping.

Limited analysis of the quartzite (Refer drill hole HP7) indicates a relatively low alumina content considered to reflect the presence of a few percent of mica. In general the quartzite is exceptionally hard, white to cream in colour, is variably schistose or massive and shows evidence of secondary silicification and leaching to varying degrees.

Area 2: Reference. Kindred Sheet 4243

Grid DQ370377. Land Portion 6967.

An intermittent line of quartzite outcrops over a 700 metre strike length (strike 160° to 170°) were investigated by shallow percussion drilling to the north of Area 1 and to the south of Dunham's Prospect, Figure 6.

The quartzite is similar to that encountered in Area 1 and at a number of localities is indistinguishable from the Dunham quartzite. The quartzite is however discontinuous and confined to small remanents, the larger of which may be 50 to 100 square metres in area. As in Area 1, the quartzite is thin, ranging from 1 to 4 metres thick beneath outcrop, and is underlain by sands which are commonly micaceous. In the absence of outcrop the section is generally clayey top soil underlain by quartz sands. Massive bedded quartzites outcrop to the west of the area drilled and thick basaltic soils cover cropping land to the adjacent east.

Area 3: Reference. Kindred Sheet 4243

Grid DQ387368. Land Portion 6992-
Refer Fig. 4
Grid DQ388366. Land Portion 7004-
Refer Fig. 5

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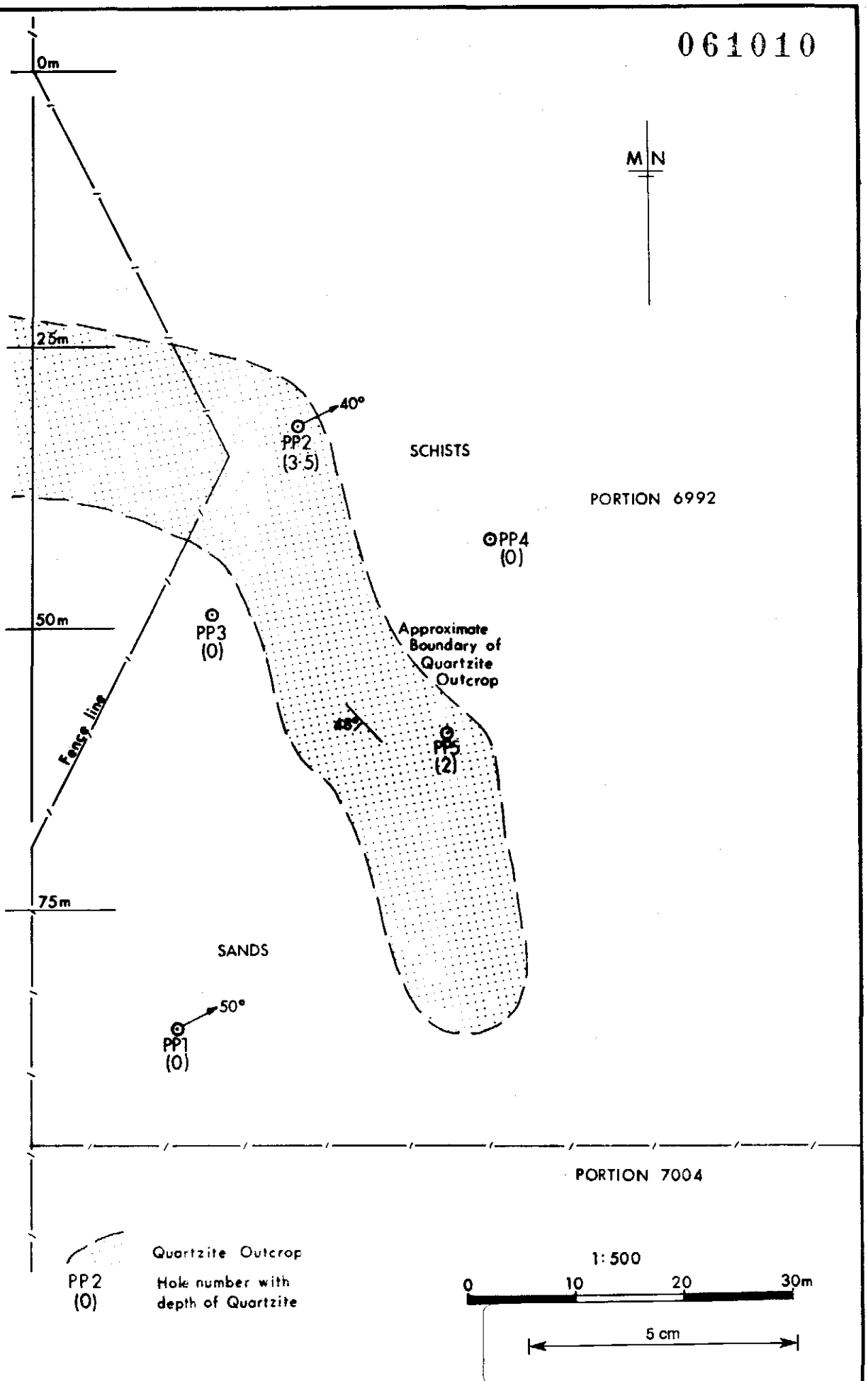
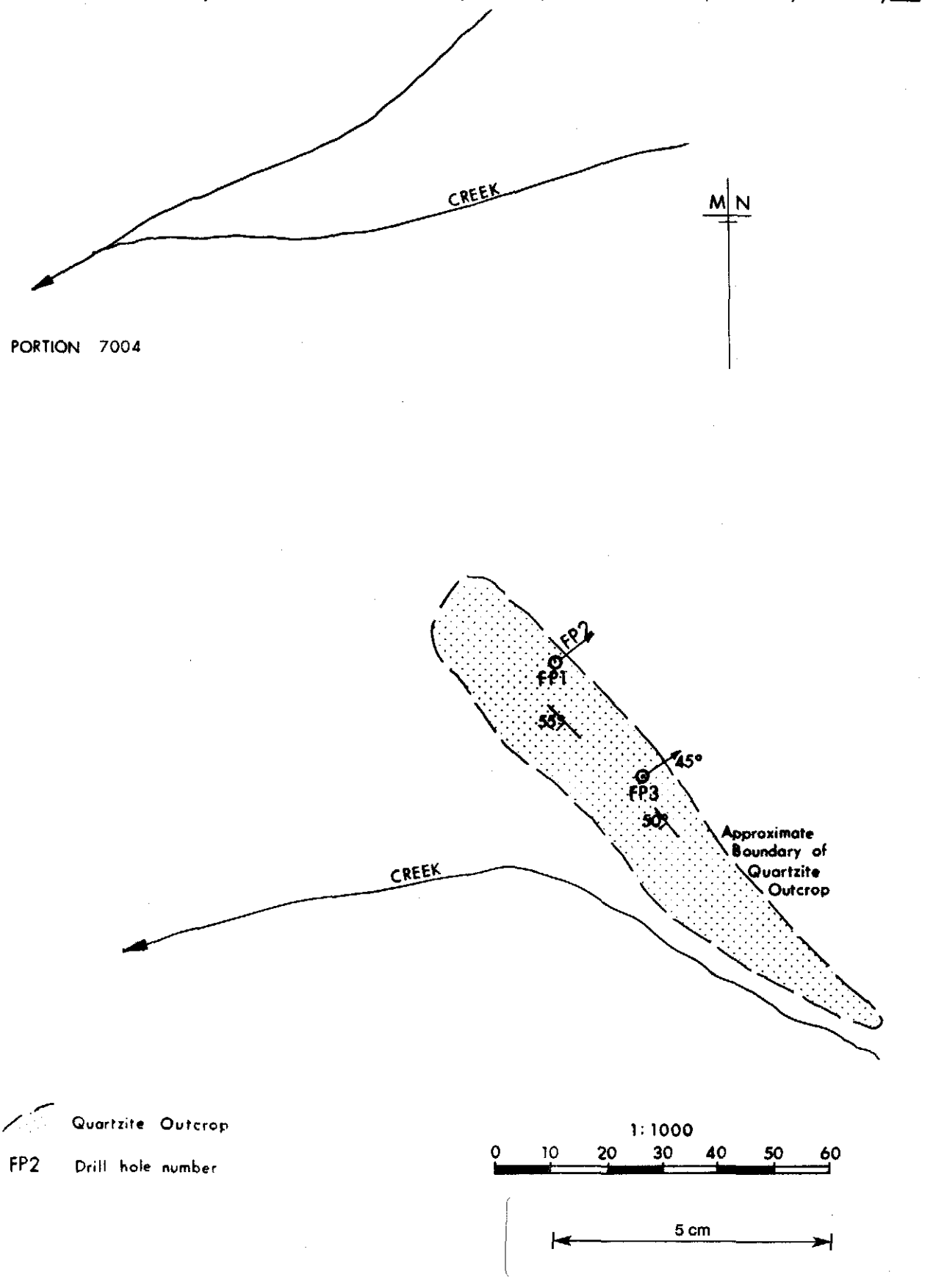


AREA 3 NORTH - QUARTZITE OUTCROP
and LOCATION OF DRILL HOLES - FORTH

FIGURE 4



AREA 3 SOUTH - QUARTZITE OUTCROP
and LOCATION OF DRILL HOLES - FORTH

FIGURE 5

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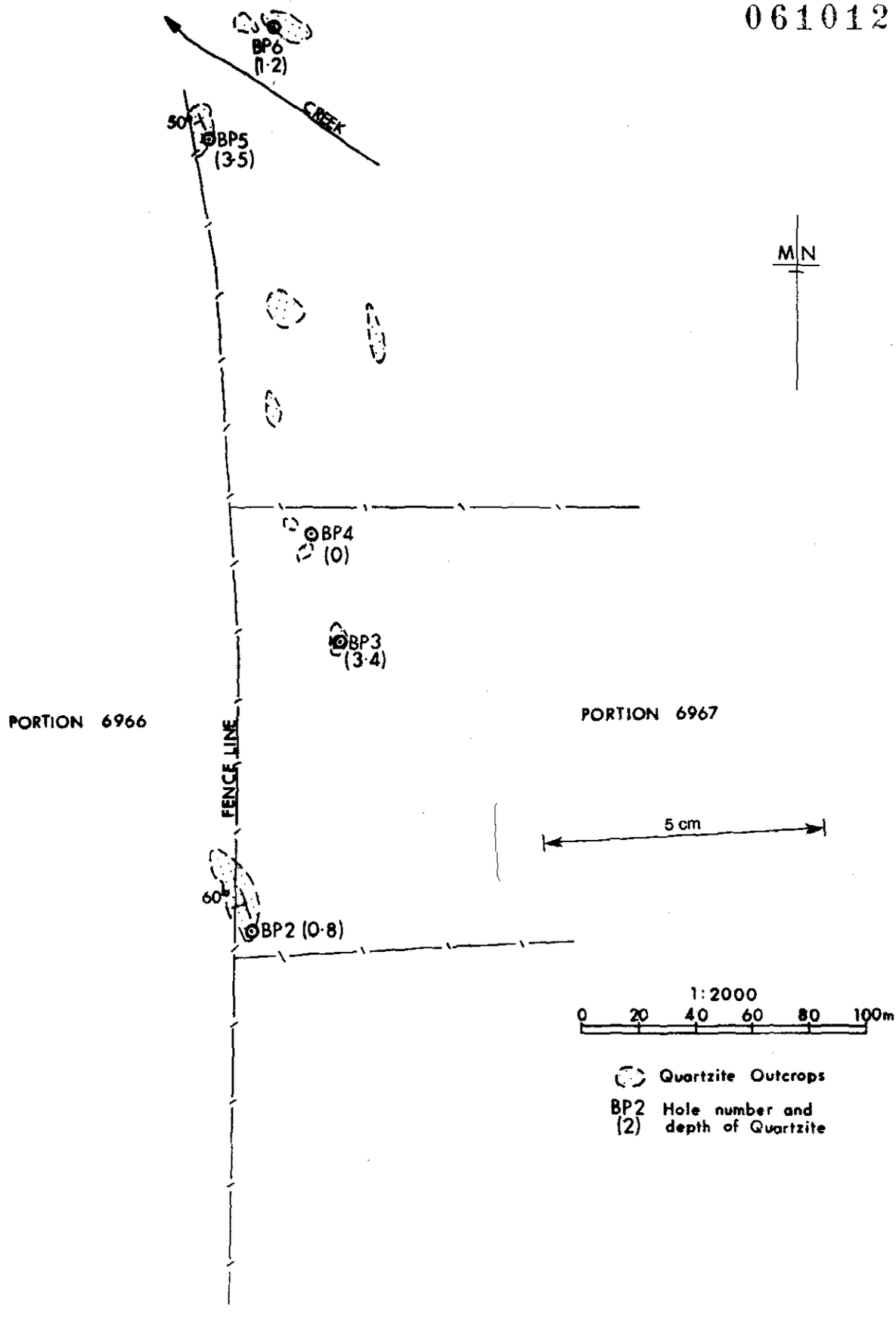

AREA 2 - SHOWING QUARTZITE OUTCROPS and LOCATION OF DRILL HOLES - FORTH

FIGURE 6

The south-eastern extension of a relatively pure quartzite bed within a BHP Co. Ltd Lease, 942P/M, was investigated by percussion drilling. The bed with an approximate strike of 130°to 150° and 50° westerly dip crops out on the side of two hills, transacted by a small creek, over a distance of 400 metres.

Drilling indicated that the quartzite is a relatively thin horizon of secondary silicified and leached material formed within a bed of relatively unconsolidated micaeous quartz sand. The bed is underlain by quartz mica schist.

Due to the limited thickness of the quartzite, which is not anticipated to exceed approximately 5 metres, available tonnages in the area are small. The quartzite is however expected to maintain acceptable purity near the surface and be comparable in properties to the Dunham quartzite.

Area 4: Reference. Kindred Sheet 4243

Grid DQ382365. Land Portion 6994

Patches of white to cream massive quartzite occur on a hill immediately south of an old dwelling and outbuildings on the above land portion. The outcrops resemble silcrete and when drilled proved to be a thin cap of pure quartzite underlain by weathered mica schists.

Similar occurrences were noted at numerous localities within the Forth district and in particular silcrete caps are exposed at surface and in section at the site of an old graphite mine located to the west of Forth. The graphite was won from graphitic schists worked from an adit driven into the schist beds beneath the silcrete cap.

Follow up investigations were conducted on Dunham's Prospect and Hopkin's Prospect (when the title to PM 941 was changed)

4.2 Detailed Sampling and Drilling Dunham's Prospect

A detailed drilling programme was supervised by M. Ware on this prospect during July 1984. Wares reportis attached as Appendix 1.

4.3 Detailed Sampling and Drilling Hopkins Prospect

A detailed drilling programme was supervised by R. Wright on this prospect during October 1985. Wright's report is attached as Appendix 2.

5 Conclusions

The exploration programme conducted by Pioneer over these EL's produced similar results to those of BHP. However the smaller annual production requirements of Pioneer make both the Pearson's and Hopkins' area attractive.

APPENDIX 1

PEARSON QUARTZITE DEPOSIT

FORTH TASMANIA

M.D. Ware

23rd July, 1984

1. Introduction.

Selected beds of quartzite of exceptional purity, at least in outcrop, are known to occur within the Precambrian Forth Metamorphics in the vicinity of the Forth township, Tasmania, and in the area to the immediate south thereof.

One such occurrence within the Forth town boundary has been worked for some 20 to 30 years on a small,intermittent,basis to yield high grade quartzite for use either as a filler material, or for either metallurgical or refractory purposes. This deposit, currently controlled by D.D.O.Pearson under two Private Mines 563P/M and 366P/M , was drilled by the writer on the 12th. to 14th. July, 1984 , to ascertain the boundaries of the quartzite and to determine the quality of the deposit at depth.

The results of the programme are presented herein

2. Location

Forth 1:100000 Topographic Map Sheet 8115, 1979.

Grid. 5439500mN., 436800mE.

Kindred 1:25000 Topographic Sheet 4243, 1983.

Land Sections1262 (owned by Pearson)

1598 (owned by Smith. To the south of 1262)

1259 (part section. Ownership unknown.)

3. Drilling Programme.

The quartzite beds strike approximately 095^0 and dip at 50-60 degrees to the west. Consequently to maximize the drilling intersections holes were, in the majority of instances, depressed 50 to 60 degrees (from the horizontal) on a bearing of 095^0.

Drilling was undertaken using an Atlas Copco, 601,Air Trak Rig with down-the-hole hammer and 112mm. tungsten carbide bits. A total of 13 holes were drilled over the deposit all within the boundaries of land owned by D.D.O.Pearson.

Drill logs are appended as Table 1.

4 Sampling and Chemical Analyses.

Chip and dust samples were collected on a continuous basis with sub-samples obtained over intervals representing varying lithology or degree of silicification, (and possibly therefor chemical purity), or over intervals of normally 3 metres where no visible change in the nature of the material was evident.

Samples were retained for reference following screening over a 1.0mm. screen to remove excessive fines. Selected samples were submitted for analysis following removal of the magnetic iron, using a hand magnet, washing in some cases, and drying at 105°C. All of the magnetic iron removed from the samples was considered to be contamination from the drill bits which registered exceptionally high rates of wear while drilling in the upper silicified zone of quartzite.

Chemical results are given in Table 2.

5. Discussion.

5.1. Geology and Physical detail of deposit.

The quartzite bed strikes approximately 005° to the south of the access track and trends slightly easterly, possibly to around 030°, to the north thereof. Dips are generally consistent between 50° and 60° west and jointing is well developed roughly perpendicular and at right angles to the bedding, and in at least two directions with easterly dip oblique to the bedding.

The quartzite bed is bounded to the east and west by clays and sands with a basaltic soil horizon abutting the western margin.

To the north and south the bed disappears, in outcrop, toward the ends of a wooded ridge and thense beneath the alluvium flat.

Overall the quartzite outcrops for some 275 metres with the best outcrop in the central and southern portions of Pearson's land where the ridge is at its highest elevation, and where over the years a number of small mining operations have been undertaken.

The oldest and largest operation was at one time working the eastern edge of the quartzite where the natural topography plunges to the south and east exposing some 9 metres of hard pure quartzite. The working face was established over approximately 20 metres along strike, to a height of 9 metres, as a series of shallow benches.

More recent operations have in general been sporadic, badly sited, and poorly worked. They consist of up to 7 separate shallow shot holes, or gougings,

over a 200 metre strike length, with a single more substantial quarry measuring 30 metres long, 12 to 18 metres wide, and 4 to 5 metres deep. At its maximum the quartzite bed is approximately 32 metres thick near the southern boundary of Pearson's property. (Section 1262). The same bed reduces to around 23 metres thick near the northern boundary.
To the south of Section 1262 the quartzite is likely to thin moderately over the remaining 55 metres of known outcrop and to the north to wedge out within 40 metres of Pearson's boundary.
In depth the drilling has shown the quartzite to revert from a dense, hard, secondary silicified quartzite to a softer white or brown (organic) quartzose/sand lithilogy.
Where the ridge is at its highest elevation, in the vicinity of holes 3, 5, and 12, (refer figure 1), hard quartzite extends down to 13 metres, vertical, however with declining elevation to the north the silicified horizon reduces to between 3 and 4 metres near the northern boundary of section 1262.
Beneath the silicified zone the material drilled-up as sand with an abrupt and markedly different degree of cementation being evident to that of the upper horizon. The true physical nature of this material is difficult to guage from the drilling and its suitability for the project cannot be adequately assessed. Hence that material described as sand in the drilling logs has not been considered in the reserve calculations although it may in part be suitable, particularly on chemical grounds.
In outcrop, material from the base of the old quarry on the eastern side of the quartzite, from a depth of 9 metres, is thought to be similar to the material which drilled-up as sand. In hand specimen the material is suggary in texture, somewhat friable and may in part decrepitate in handling. It is however, at this depth, chemically suitable for the project and thus its handling properties should be assessed at an early stage of mining.
In the quarries and pits the quartzite tends to vary from pure white to cream and slightly iron stained in colour with occasional banding of darker material. The staining has derived from the adjacent basalt and appears to be both shallow and of little chemical consequence.

5.2. Chemistry.

Although secondary silicified and leached the hard quartzite shows little chemical variation within the horizon of interest.
Analyses of the hard quartzite show the material to be free of calcium,

sodium, and potash. Iron levels are 0.03% or lower(generally less than 0.01%) and alumina contents are expected to maintain around 0.05% increasing to a maximum of around 0.17% near the base of the silicified and leached zone. The titanium content has analysed consistently low, averaging around 0.02%. Those samples randomely selected and washed prior to analysis do not appear to have been chemically upgraded and although material contaminated during mining by the basaltic soil may benefit from washing it is apparent that uncontaminated material will not require such treatment on chemical grounds. The white sand analysed from hole FH10 showed similar characterics to the hard quartzite throughout the deposit suggesting further that this material requires a physical assessment when possible.
With depth however the sand is expected to increase in both alumina and potash, as shown by the analysis of sample 13 (Hole 3 at 30 metres), and thus there will be a chemical limit to project grade material with depth somewhat prior to the physical limits of mining the deposit.
The leaching and indeed the silicification in the deposit may in part be related to the permanent water table which in itself will ultimately delineate in lower level of mining in the area.

6. Reserves.

The quartzite reserve has been calculated within Pearson's land (Section 1262) from the drilling and mapping data by assigning reserves to one of three parallelopiped blocks each of average width, horizontal as in outcrop, of average depth of quartzite (vertical depth from drilling and outcrop), and over a distance measured by mapping.
Each block dips at 60^0 to the west and since totally confined within land owned by Pearson it has been assumed that the block it totally minable.
A probable reserve has been assigned to the area of outcrop to the south of Pearsons property based upon the drilling data and substantial exposure in the vicinity and a further small possible tonnage is considered immediately to the north of section 1262 on limited data and exposure.
Data relevant to the calculations are shown in figure 1 and tables 3 and 4.
Using a bulk density of 2.6, in situ reserves at the Pearson Deposit are; 80000 tonnes of proved reserve, 35000 tonnes of probable reserve, and a possible 6400 tonnes of quartzite on the most northern tip of the lease. In terms of accessibility and visibility the latter tonnage may be environmentally unattainable.

TABLE 1. Drill Hole Logs. Pearson Deposit, Forth.

Drill Hole No.	Bearing	Depression	Depth Metres.	Description
FH1	095°	50°	0 - 6.0	Pure white, hard, quartzite
			6.0	Small band of brown sand
			6.2-8.9	Hard white quartzite.
			8.9-9.5	Soft, brownish, quartz sand.
			9.5	Water and mud. Probable underlying sequence.
FH2	275°	64°	0 - 4.0	Soft, wet, quartz sand.
			4 - 6.1	Hard white quartzite.
			6.1	Water, hole abandoned.
FH3	095°	54°	0 - 4.8	Basaltic Clay soil.
			4.8-6.8	Brown clay
			6.8-7.15	Brown sand.
			7.15-16.8	Hard, white quartzite.
			16.8-34.2	Pure white quartz sand. Hole abandoned in same.
FH4	095°	60°	0 - 3.0	Broken white quartzite. Hole in previously "shot" ground and continually caving. Abandoned.
FH5	095°	58°	0 - 1.9	White to brownish quartzite.
			1.9-9.5	Hard white quartzite.
			9.5-15.5	Quartz sand. White and yellow. Hole abandoned in same.
FH6	095°	52°	0 - 3.0	Basaltic clay soil.
			3.0-3.5	Brown sand.
			3.5-7.2	Yellow and white sand.
			7.2-14.0	Hard white quartzite.
			14.0-15.0	Tan quartz sand. Hole abandoned in same.

TABLE 1. contd. Drill Hole Logs. Pearson Deposit.

Drill Hole No.	Bearing	Depression	Depth Metres	Description
FH7	095°	55°	0 - 3.5	Hard white quartzite.
			3.5-5.0	Medium hard yellowish quartzite
			5.0-7.0	Semi compacted white sand.
			7.0	Water. Hole abandoned.
FH8	095°	55°	0 - 5.5	Hard white quartzite.
			5.5-6.0	Brown quartz sand. Hole abandoned in same.
FH9	095°	55°	0- 2.5	Red sandy basalt soil.
			2.5-3.0	Hard white quartzite.
			3.0-3.5	Yellow quartz sand.
			3.5-4.0	White quartz sand
			4.0-5.0	Hard white quartzite.
			5.0-6.2	Medium hard brown quartzite.
			6.2-6.6	Brownish quartz sand. Hole abandoned in same.
FH10	110°	65°	0 - 3.0	Hard white quartzite.
			3.0-3.5	White quartz sand. Hole abandoned in same.
FH11		Vertical	0 - 3.5	Sand and white clay of underlying sequence.
FH12	095°	50°	0 -12.5	Hard white quartzite.
			12.5-17.5	Slightly darker white quartzite.
			17.5-18.5	Softer and slightly darker quartzite/quartz-sand. Hole abandoned in same.
FH13	255°	60°	0 - 5.2	Hard white quartzite.
			5.2-6.2	Brown quartzite and water. Hole abandoned.

****

Table 2. Chemical Analyses. %

Sample No. and Hole	Depth Metres	Al_2O_3	K_2O	Fe_2O_3	TiO_2	CaO	Na_2O
1/1	0–3.5	0.04	–0.01	–0.01	0.03	–0.01	–0.01
2/1	3.5–6.1	0.04	–0 01	–0.01	0.02	–0.01	–0.01
3/1	6.1–8.9	0.17	–0.01	0.03	0.03	–0.01	–0.01
4/5 *	0–3.5	0.04	–0.01	–0.01	0.02	–0.01	–0.01
5/5 *	3.5–6.5	0.02	–0.01	–0.01	0.01	–0.01	–0.01
6/5 *	6.5–9.5	0.06	0.01	–0.01	0.02	–0.01	–0.01
7/12	9.5–12.5	0.02	0.01	–0.01	0.02	–0.01	–0.01
8/12*	12.5–15.5	0.04	–0.01	–0.01	0.02	–0.01	–0.01
9/13	0–3.2	0.17	–0.01	–0.01	0.02	–0.01	–0.01
10/13	3.2–5.2	0.11	–0.01	–0.01	0.02	–0.01	–0.01
11/8	3.5–5.5	0.06	–0.01	0.05	0.02	–0.01	–0.01
12/10	3.5(Sand)	0.06	–0.01	–0.01	0.03	–0.01	–0.01
13/3	30.0(Sand)	2.0	0.43	0.14	0.03	–0.01	0.02

* Samples washed prior to analysis.

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Table 3. Drilling Data. Quartzite Intersections.

Drill Hole No.	Horizontal Penetration East . Metres	Vertical Depth Metres	True Thickness Metres
FH1	8.8	6.5	8.0
FH2 *	2.7 (west)	5.2	0.7
FH3	9.4	13.5	8.3
FH4 **	-	-	-
FH5	8.7	8.1	8.0
FH6	7.2	11.0	6.3
FH7	5.2	4.1	4.4
FH8	5.5	4.5	4.8
FH9	2.5	4.8	1.8
FH10	2.8	2.8	2.6
FH11	0	0	0
FH12	11.5	13.2	16.4
FH13	2.5 (west)	4.5	1.0

* Abandoned in water

** Abandoned due to shot and broken ground.

Table 4. Quartzite Reserves. Pearson Property-Forth

Block No.	Width Metres	Depth Metres	Distance Metres	Volume Metres^3	Tonnage Tonnes	
1	35	11.0	45	17325	45045	
2	24	5.0	60	7200	18720	
3	26	4.0	60	6240	16224	
				30765	79989	(Proved)
Property to South						
	30	9.0	50	13500	35100	(Probable)
Property to North						
	20	3.0	40	2400	6420	(Possible)

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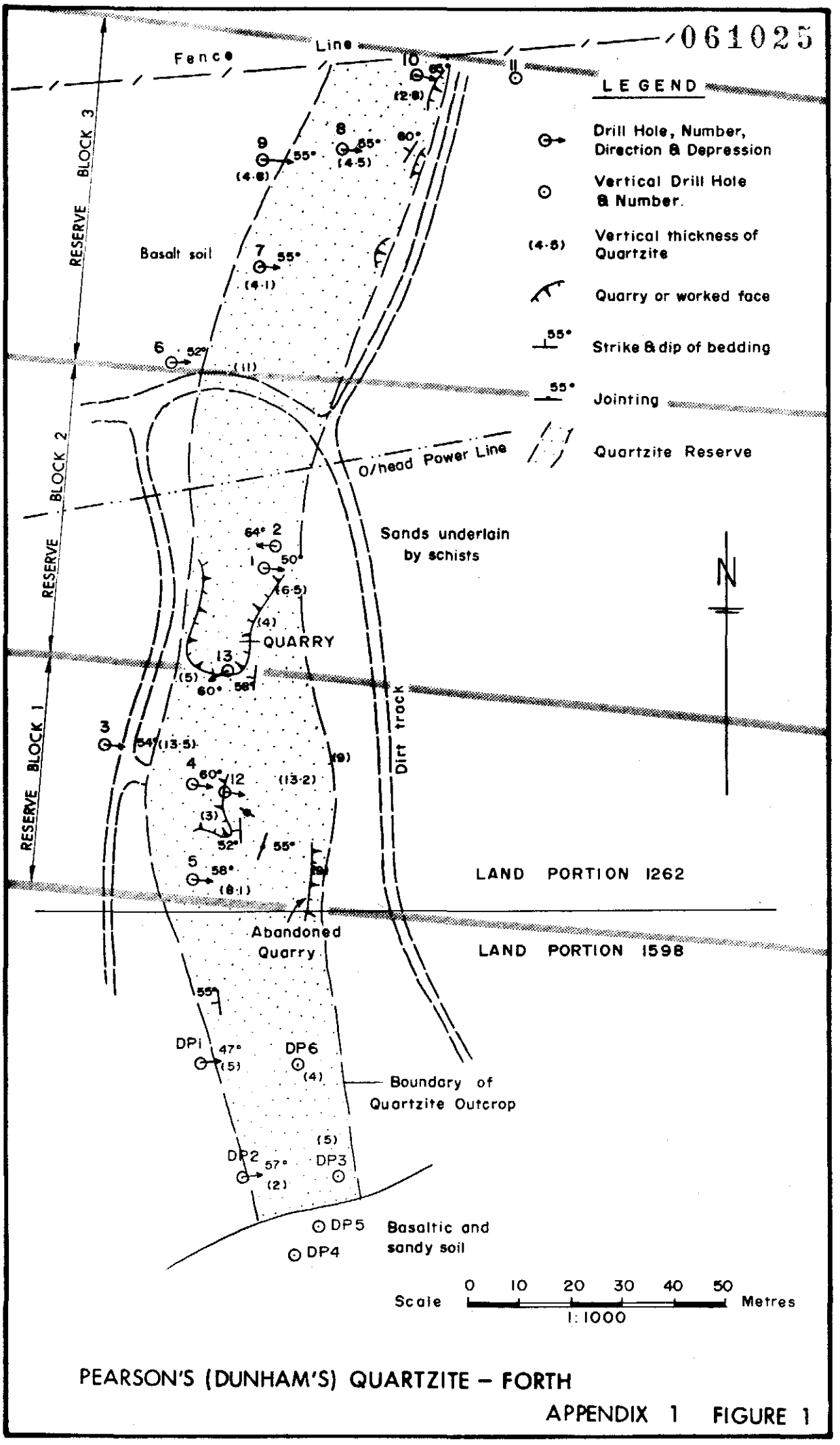

PEARSON'S (DUNHAM'S) QUARTZITE – FORTH

APPENDIX 1 FIGURE 1

APPENDIX 2

HOPKINS QUARTZITE DEPOSIT

M.L. 1206 P/M

FORTH NORTHERN TASMANIA

PERCUSSION DRILLING PROGRAMME

OCTOBER 1985

R.G. Wright

November 1985

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HOPKINS QUARTZITE DEPOSIT -
PERCUSSION DRILLING PROGRAMME

LIST OF FIGURES

LIST OF APPENDICES

1. INTRODUCTION

An evaluation of the Hopkins Quartzite Prospect was requested by Mr. J. S. Noakes, Chief Geologist, Queensland Mines on behalf of Picon Exploration Pty. Ltd.

The deposit occurs on land owned by Mr. E. R. Hopkins of Forth and is held by him under Mineral Lease 1206 P/M of 2 Hectares. In the past the ground was covered by ML 941 P/M of 3 Hectares previously held by the Broken Hill Proprietary Company Ltd.

2. PREVIOUS WORK

The Hopkins quartzite deposit was mapped and test drilled by E.M.P. in February, 1977 as part of their investigation of E.L. 18/75 - Forth, Tasmania. This work showed that high grade quartzite occurs as surface, silcrete-type crusts over leached, micaceous and mica-poor Precambrian quartzite.

The high grade surface quartzite was found to extend from 6 to 10 metres below the surface. Below this depth the alumina content increased above 0.8% Al_2O_3 due to the presence of unleached mica.

The deposit was considered to be too small and to have too erratic a distribution of pure quartzite to be of use as feedstock for the Bell Bay ferro-silicon plant.

3. GEOLOGY

A number of small but high-grade quartzite deposits are known within the Proterozoic quartzite of the Ulverstone and Forth Metamorphics.

Regional investigation by E.M.P. located two main deposits - the John's and Hopkin's deposits, both situated south of and close to the township of Forth.

The Hopkins deposit occurs on a south plunging fold nose which forms part of major south plunging anticlinorium. (Refer Figure 1 and the Devonport 1:63,360 geological sheet).

4. DRILLING PROGRAMME

A total of 21 vertical percussion holes were drilled on the deposit to infill between the earlier E.M.P. drilling.

The programme was carried out by G & G Drilling of Ulverstone between 9-15th October, 1985.

An Atlas Copco 601 track-mounted, down-hole hammer rig was used with an Atlas Copco 700 CFM 150 PSI Compressor.

A total of 168.2m was drilled at an average penetration rate of 9m/hour using a 100mm diameter bit.

The drilling confirmed the shape and high silica, low Fe_2O_3, Al_2O_3 content of the surface quartzites.

The base of the quartzite crust was found to have a very sharp contact with the underlying leached micaceous quartzites.

The long grid western edge of the quartzite is vertical or steep west dipping unlike the 40-50° dips seen in outcrop. Possibly this edge of deposit is a fault contact. The sharp cut-off on the grid southern edge may also be due to faulting.

Good grade quartzite persisted further along Section 1080N than expected. Possibly further limited reserves of quartzite are present beneath the soil cover in this area.

5. RESERVE ESTIMATE

The results from the previous B.H.P. drilling have been combined with those from the recent drilling in this estimation of overall grade and tonnage.

Details of the reserve calculation are shown on Tables 1-3 inclusive. (At a cut-off grade of 98.0%SiO_2).

The unpredictable variation in the thickness of the surface high-grade crust suggests that the reserve should be placed in the "probable" category.

A probable, undiluted geological reserve for the Hopkins Prospect is estimated to be:

134,000 tonnes @ 99.2%SiO_2, 0.08%Al_2O_3 and 0.07%Fe_2O_3.

R.G. Wright,

Consulting Geologist.

REFERENCE

Exploration Licence 18/75, Forth, Tasmania - Final Report.

Unpublished B.H.P. Co. Ltd. report to the Tasmanian Department of Mines.

032

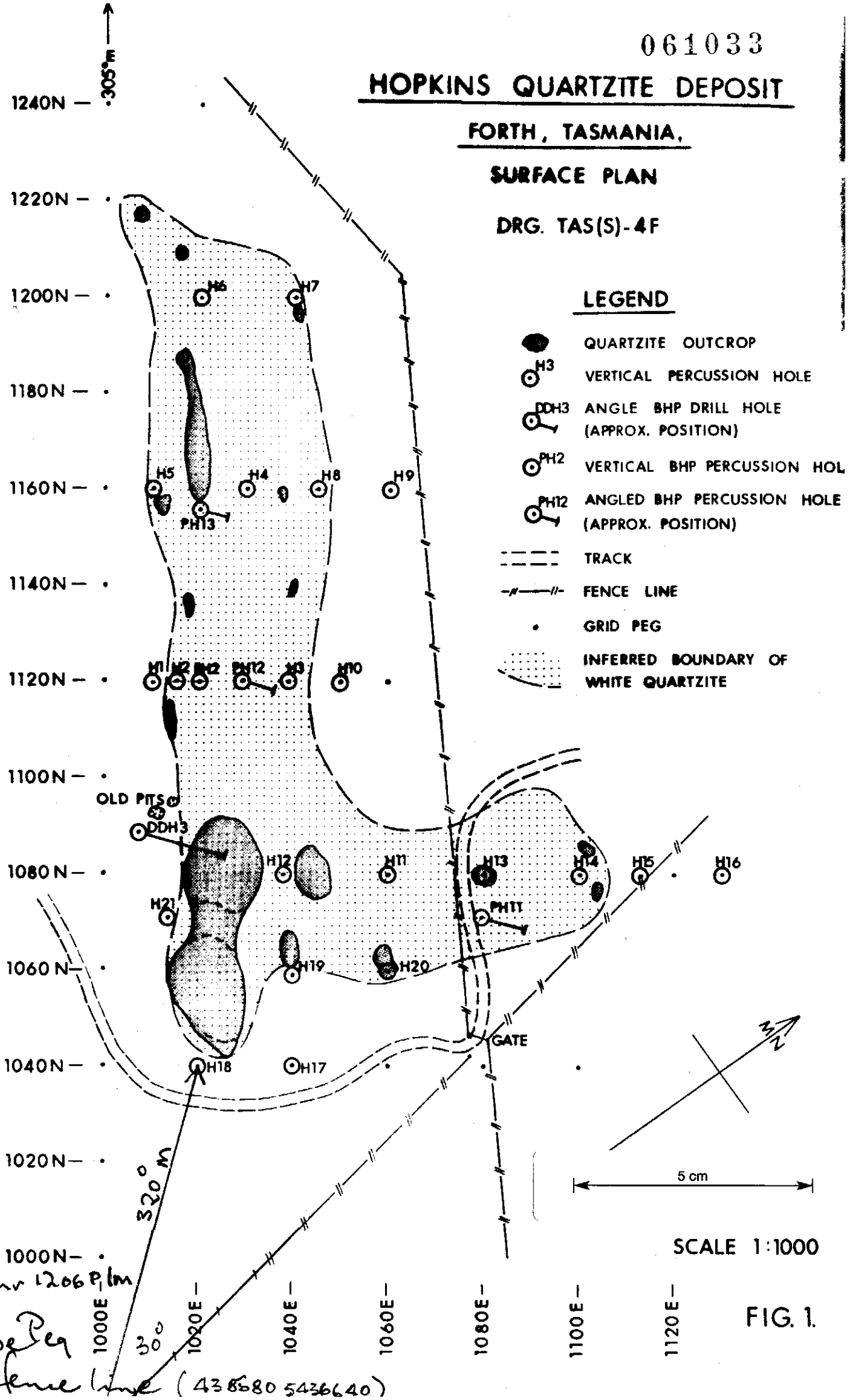
061033

HOPKINS QUARTZITE DEPOSIT

FORTH, TASMANIA.

SURFACE PLAN

DRG. TAS(S)-4F



LEGEND

- QUARTZITE OUTCROP
- H3 — VERTICAL PERCUSSION HOLE
- DDH3 — ANGLE BHP DRILL HOLE (APPROX. POSITION)
- PH2 — VERTICAL BHP PERCUSSION HOL
- PH12 — ANGLED BHP PERCUSSION HOLE (APPROX. POSITION)
- TRACK
- FENCE LINE
- GRID PEG
- INFERRED BOUNDARY OF WHITE QUARTZITE

SE cnr 1206 P/lm

Lease Peg on fence line (438680 5436640)

FIG. 1.

HOPKINS QUARTZITE DEPOSIT

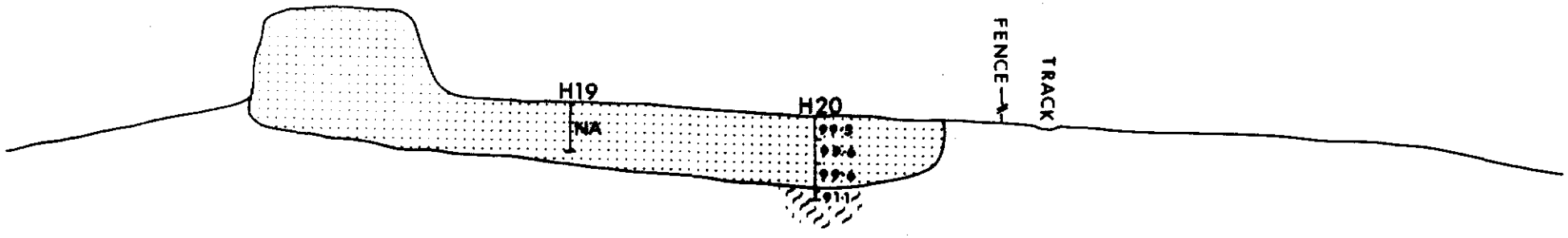
FORTH, TASMANIA.

DRG. TAS(S)-5F

SECTION 1060N

LEGEND

- H20 (99.5 / 99.3) — PERCUSSION DRILL HOLE; % SILICA ASSAYS
- NA — NOT ASSAYED
- DDH3 — APPROX. POSITION OF BHP DRILL HOLE
- INFERRED BOUNDARY OF >98% SILICA QUARTZITE
- MICACEOUS SCHISTS AND QUARTZITE



5 cm

SCALE 1:500

1060N

0061034

1000E — 1020E — 1040E — 1060E — 1080E — 1100E — 1120E

FIG. 2.

HOPKINS QUARTZITE DEPOSIT

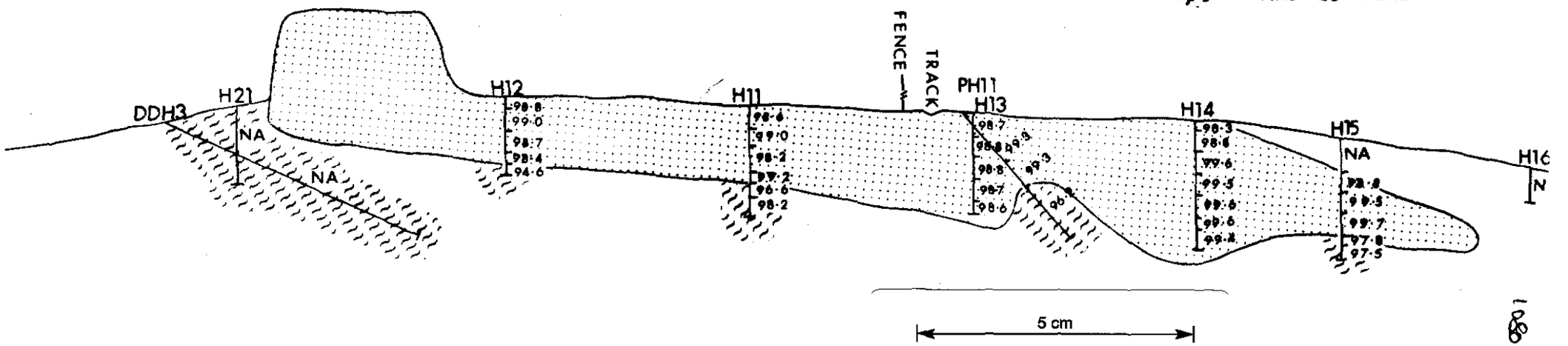
FORTH, TASMANIA.

DRG. TAS(S)-6F

SECTION 1080N

LEGEND

- H20 — PERCUSSION DRILL HOLE
- 99·5 / 99·3 — % SILICA ASSAYS
- NA — NOT ASSAYED
- DDH3 — APPROX. POSITION OF BHP DRILL HOLE
- INFERRED BOUNDARY OF >98% SILICA QUARTZITE
- MICACEOUS SCHISTS AND QUARTZITE



SCALE 1:500

1080N

061035

1000E — 1020E — 1040E — 1060E — 1080E — 1100E — 1120E

FIG. 3.

035

HOPKINS QUARTZITE DEPOSIT

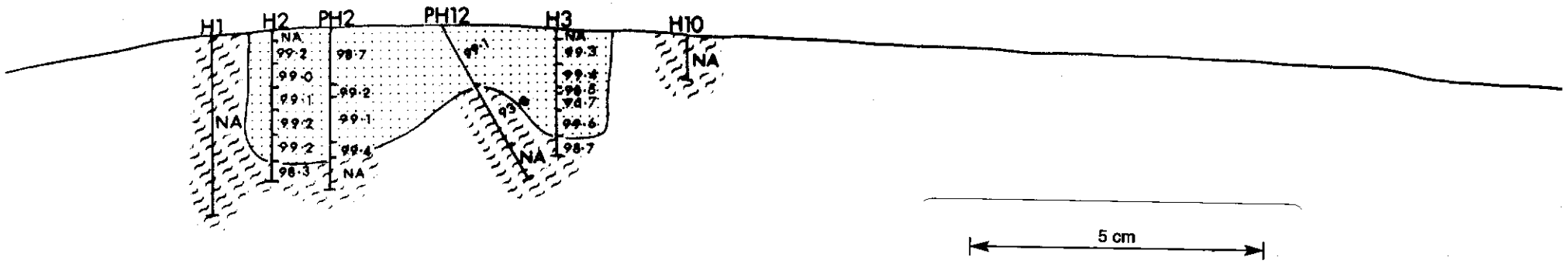
FORTH, TASMANIA.

DRG. TAS(S)-7F

SECTION 1120N

LEGEND

H20 (99·5 / 99·3)	PERCUSSION DRILL HOLE — % SILICA ASSAYS
NA	NOT ASSAYED
DDH3	APPROX. POSITION OF BHP DRILL HOLE
	INFERRED BOUNDARY OF >98% SILICA QUARTZITE
	MICACEOUS SCHISTS AND QUARTZITE



0610039

1120N

SCALE 1:500

1000E — 1020E — 1040E — 1060E — 1080E — 1100E — 1120E

FIG. 4.

036

HOPKINS QUARTZITE DEPOSIT

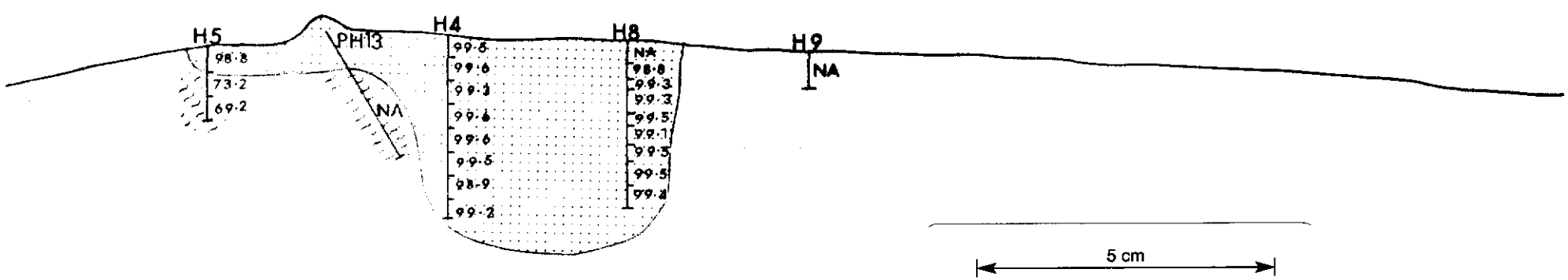
FORTH, TASMANIA.

DRG. TAS(S)-8F

SECTION 1160N

LEGEND

- H20 (99·6 / 99·3) — PERCUSSION DRILL HOLE; % SILICA ASSAYS
- NA — NOT ASSAYED
- DDH3 — APPROX. POSITION OF BHP DRILL HOLE
- INFERRED BOUNDARY OF >98% SILICA QUARTZITE
- MICACEOUS SCHISTS AND QUARTZITE



SCALE 1:500

1000E 1020E 1040E 1060E 1080E 1100E 1120E

FIG. 5.

061037

1160N

HOPKINS QUARTZITE DEPOSIT

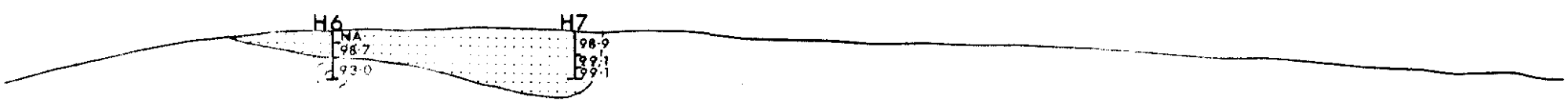
FORTH, TASMANIA.

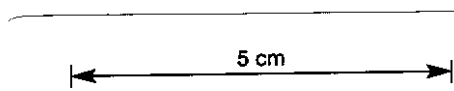
DRG. TAS(S)-9F

SECTION 1200N

LEGEND

H20 (99·5 / 99·3)	PERCUSSION DRILL HOLE — % SILICA ASSAYS
NA	NOT ASSAYED
DDH3	APPROX. POSITION OF BHP DRILL HOLE
	INFERRED BOUNDARY OF >98% SILICA QUARTZITE
	MICACEOUS SCHISTS AND QUARTZITE





SCALE 1:500

1000E — 1020E — 1040E — 1060E — 1080E — 1100E — 1120E

FIG. 6.

038

061039

TABLE 1

THICKNESS & AVERAGE GRADES OF QUARTZITE

ABOVE CUT-OFF OF 98.0% SiO_2

Drill Hole	Sample Length Metres	Drill Indicated Grade		
		% SiO_2	% Al_2O_3	% Fe_2O_3
PH2	11	99.0	0.05	0.27
PH11	9 (inclined at 50°)	99.3	0.05	N.A.
PH12	6 (inclined at 60°)	99.1	0.05	N.A.
H2	10	99.1	0.08	0.07
H3	8.5	98.9	0.31	0.05
H4	15.5	99.4	0.06	0.04
H5	2	98.8	0.12	0.07
H6	1	98.7	0.39	0.10
H7	3.8	99.0	0.04	0.09
H8	12.3	99.3	0.02	0.06
H11	6.6	98.6	0.20	0.04
H12	6	98.8	0.02	0.03
H13	9.1	98.7	0.07	0.06
H14	12	99.3	0.09	0.05
H15	5.6	99.4	0.16	0.12
H20	6	99.6	0.04	0.04

TABLE 2

A. ESTIMATION OF AVERAGE GRADE WEIGHTED BY DRILL SAMPLE LENGTHS

Section	Sample Length Metres	Drill Indicated Grades		
		%SiO_2	%Al_2O_3	%Fe_2O_3
1060N	6	99.6	0.04	0.04
1080N	48.3	99.0	0.09	0.06
1120N	35.5	99.0	0.12	0.14
1160N	29.8	99.3	0.05	0.05
1200N	4.8	98.9	0.11	0.09
Total/ Averages	124.4	99.1%	0.09%	0.08%

B. ESTIMATION OF AVERAGE GRADE WEIGHTED BY SECTION AREAS

Section	Area Sq.Metres	Drill Indicated Grades		
		%SiO_2	%Al_2O_3	%Fe_2O_3
1060N	368	99.6	0.04	0.04
1080N	893	99.0	0.09	0.06
1120N	271	99.0	0.12	0.14
1160N	301	99.3	0.05	0.05
1200N	101	98.9	0.11	0.09
	1934	99.2%	0.08%	0.07%

040

061041

TABLE 3

ESTIMATION OF UN-DILUTED GEOLOGICAL RESERVE

Sections	A_1 Sq.M.	A_2 Sq.M.	$A_1 \times A_2$	$\sqrt{A_1 \times A_2}$	Volume = $\frac{d}{3}(A_1 + A_2 + \sqrt{A_1 \times A_2})$	Tonnes at assumed S.G. of 2.5
1060N-1080N	368	893	328624	573	12,227	30,600
1080N-1120N	813	271	242003	492	22,080	55,200
1120N-1160N	271	301	81571	286	11,440	28,600
1160N-1200N	301	101	30401	174	7,680	19,200
					53,427 cubic metres	133,600 tonnes

d = distance between sections.

APPENDIX I

PERCUSSION DRILL LOGS

042

061043

DRILL HOLE: H1

PROSPECT: Hopkins Quartzite Deposit, Forth, Tas.

GRID CO-ORDS: 1120N 1010E

FINAL DEPTH: 15.5m

DATE DRILLED: 10.10.85

HOLE ANGLE: Vertical

DRILLER: G. Gleeson, G & G Drilling, Ulverstone.

FROM	TO	DESCRIPTION
0	4	Surface quartzite gravel grading into grey-pale purple sands and clays.
4	7	Yellow white, red brown to pale brown soft, leached micaceous schists and quartzite.
7	10	Pale yellow to pale brown fine-grained soft leached micaceous schists and quartzite.
10	13	Pale orange, soft, leached fine-grained schistose quartzite.
13	15½	Pale yellow to pale green soft micaceous quartzite.

043

061044

DRILL HOLE: H2

PROSPECT: Hopkins Quartzite Deposit, Forth, Tas.

GRID CO-ORDS: 1120N 1015E

FINAL DEPTH: 13m

DATE DRILLED: 10.10.85

HOLE ANGLE: Vertical

DRILLER: G. Gleeson, G & G DRILLING, Ulverstone.

FROM	TO	DESCRIPTION
0	1	Surface quartzite gravel and sandy clay
1	3	Loose broken quartzite in brownish clay to about 2.75m then into hard white quartzite.
3	5	Hard white quartzite
5	7	Hard white quartzite to 5.6m then into grey brown, slightly softer quartzite.
7	9	Pale brown, hard quartzite.
9	11	Pale brown, hard quartzite with a 50cm band of soft brown to pale brown micaceous quartzite between 9.5-10m depth. Strong water inflow at 10m.
11	13	Soft yellow micaceous quartzite and schists.

044

061045

DRILL HOLE: H3

PROSPECT: Hopkins Quartzite Deposit, Forth, Tas.

GRID CO-ORDS: 1120N 1039E

FINAL DEPTH: 11m

DATE DRILLED: 10.10.85

HOLE ANGLE: Vertical

DRILLER: G. Gleeson, G & G Drilling

FROM	TO	DESCRIPTION
0	0.5	Loose surface quartzite gravel and sand.
0.5	3	White hard quartzite
3	5	Hard white quartzite
5	5.4	Hard white quartzite
5.4	7	Grey brown, slightly ferruginous quartzite which grades into white quartzite again from about 6.5m depth.
7	9	Hard white quartzite grading into pale yellow-brown quartzite from about 8.5m.
9	11	Pale yellow-brown quartzite which becomes slightly darker orange yellow with depth. At 10.7m the quartzite becomes suddenly softer and pale to dark brown in colour.

045

061046

DRILL HOLE: H4

PROSPECT: Hopkins Quartzite Deposit, Forth, Tas.

GRID CO-ORDS: 1160N 1030E

FINAL DEPTH: 15.5m

DATE DRILLED: 10.10.85

HOLE ANGLE: Vertical

DRILLER: G. Gleeson of G & G Drilling

FROM	TO	DESCRIPTION
0	2	Hard white quartzite with a 10cm band of grey brown micaceous quartzite between 1.4-1.5m depth.
2	4	Hard white quartzite
4	6	Pale brown quartzite which becomes white between 5.0-5.2 depth. Returns to hard white quartzite again from 5.5m.
6	8	Pure white, hard quartzite.
8	10	Pure white quartzite as above to 9.7m depth when the pale brown colouration comes back in.
10	12	Grey brown to pale brown hard quartzite which becomes lighter in colour at depth. Grades into white quartzite again between 11.8-12m.
12	14	Brown quartzite grading into grey micaceous quartzite between 12.2-12.4m. From 12.4m depth the quartzite changes in colour from pale brown to white and pale yellow.
14	15.5	Brown hard quartzite with minor very fine-grained, grey? mica-rich bands. Water encountered at 15.5m depth - rods became temporarily jammed as stopped the hole.

046

061047

DRILL HOLE: H5

PROSPECT: Hopkins Quartzite Deposit, Forth, Tas.

GRID CO-ORDS: 1160N 1010E

FINAL DEPTH: 6m

DATE DRILLED: 14.10.85

HOLE ANGLE: Vertical

DRILLER: G. Gleeson, G & G Drilling, Ulverstone.

FROM	TO	DESCRIPTION
0	2	Pale cream to white moderately hard quartzite - becomes soft, brown suddenly at 1.9m.
2	4	Soft brown, fine-grained, leached micaceous quartzite.
4	6	Soft, pale brown to yellow white leached micaceous quartzite as above.

04.

061048

DRILL HOLE: H6

PROSPECT: Hopkins Quartzite Deposit, Forth, Tas.

GRID CO-ORDS: 1200N 1020E

FINAL DEPTH: 4m

DATE DRILLED: 14.10.85

HOLE ANGLE: Vertical

DRILLER: G. Gleeson, G & G Drilling, Ulverstone.

FROM	TO	DESCRIPTION
0	1	Loose surface quartzite scree and loamy soil.
1	2	Hard white quartzite
2	4	Pale grey-brown quartzite - broken and difficult to drill to about 3m, thereafter soft brown, leached micaceous quartzite to 4m depth.

048

061049

DRILL HOLE: H7

PROSPECT: Hopkins Quartzite Deposit, Forth, Tas.

GRID CO-ORDS: 1200N 1040E

FINAL DEPTH: 4m

DATE DRILLED: 14.10.85

HOLE ANGLE: Vertical

DRILLER: G. Gleeson, G & G Drilling, Ulverstone

FROM	TO	DESCRIPTION
0	0.2	Surface quartzite gravel and soil
0.2	2	White, moderately hard quartzite to about 1.9m when hole passes into 0.1m of soft pale brown micaceous quartzite.
2	3	Pale brown to cream moderately hard quartzite
3	4	Brown to pale brown soft micaceous quartzite.

049

061050

DRILL HOLE: H8

PROSPECT: Hopkins Quartzite Deposit, Forth, Tas.

GRID CO-ORDS: 1160N 1045E

FINAL DEPTH: 14m

DATE DRILLED: 14.10.85

HOLE ANGLE: Vertical

DRILLER: G. Gleeson, G & G Drilling, Ulverstone.

FROM	TO	DESCRIPTION
0	1.7m	Surface quartzite gravel and sands
1.7	3	Pale brown grading into white hard quartzite.
3	4	White hard quartzite
4	6	Pale brown to white hard quartzite
6	6.8	Hard white quartzite - with a 0.2m band of soft brown micaceous quartzite between 6.8-7.0m depth.
6.8	8.5	Pale grey brown moderately soft quartzite which becomes lighter coloured with depth.
8.5	10	Pale brown hard quartzite
10	12	Pale brown very hard quartzite with traces of very fine-grained, grey ?mica-rich bands. Water encountered at 10m.
12	14	Very hard, brown to pale brown quartzite.

050

061051

DRILL HOLE: H9

PROSPECT: Hopkins Quartzite Deposit, Forth, Tas.

GRID CO-ORDS: 1160N 1060E

FINAL DEPTH: 3m

DATE DRILLED: 14.10.85

HOLE ANGLE: Vertical

DRILLER: G. Gleeson of G & G Drilling, Ulverstone.

FROM	TO	DESCRIPTION
0	1m	Surface black loamy soil with quartzite fragments.
1	3	Red-brown basaltic clay with sparse fragments of quartzite. Very slow progress with hammer drill.

051

061052

DRILL HOLE: H10

PROSPECT: Hopkins Quartzite Deposit, Forth, Tas.

GRID CO-ORDS: 1120N 1050E

FINAL DEPTH: 4m

DATE DRILLED: 14.10.85

HOLE ANGLE: Vertical

DRILLER: G. Gleeson of G & G DRILLING, ULVERSTONE

FROM	TO	DESCRIPTION
0	2m	Surface quartzite scree and sandy loams.
2	3	Pale brown, leached soft quartzite. Water encountered at 3 m depth.
3	4	Pale brown, grey, soft leached quartzite.

052

061053

DRILL HOLE: H11

PROSPECT: Hopkins Quartzite Deposit, Forth, Tas.

GRID CO-ORDS: 1080N 1060E

FINAL DEPTH: 10m

DATE DRILLED: 14.10.85

HOLE ANGLE: Vertical

DRILLER: G. Gleeson of G & G Drilling, Ulverstone.

FROM	TO	DESCRIPTION
0	2	White hard quartzite
2	3.5	White hard quartzite
3.5	6	White hard quartzite
6.0	6.6	White hard quartzite
6.6	8.2	Pale brown, slightly softer quartzite
8.2	10.0	Brown to red brown, soft, fine grained leached quartzite.

053

061054

DRILL HOLE: H12

PROSPECT: Hopkins Quartzite Deposit, Forth, Tas.

GRID CO-ORDS: 1080N 1038E

FINAL DEPTH: 7m

DATE DRILLED: 15.10.85

HOLE ANGLE: Vertical

DRILLER: G. Gleeson, G & G Drilling, Ulverstone.

FROM	TO	DESCRIPTION
0	1m	Hard white quartzite - became dark brown suddenly at 1m due to a thin clay-filled joint?
1	3	Hard white quartzite
3	5	Hard white quartzite
5	6	Hard white quartzite
6	7	Dark, chocolate-brown, soft, micaceous quartzite. Water inflow from 6.5m depth.

C 054

061055

DRILL HOLE: H13

PROSPECT: Hopkins Quartzite Deposit, Forth, Tas.

GRID CO-ORDS: 1080N 1080E

FINAL DEPTH: 9.1m

DATE DRILLED: 15.10.85

HOLE ANGLE: Vertical

DRILLER: G. Gleeson, G & G Drilling, Ulverstone.

FROM	TO	DESCRIPTION
0	2m	Hard white to pale yellow quartzite
2	4	Hard white to pale yellow quartzite
4	6	Hard white to pale yellow quartzite - becomes yellower with depth from about 5m.
6	8	Hard white to pale yellow quartzite.
8	9.1	Hard white quartzite to 9.1m. Problems with drill rods jamming at this depth in a crack or joint. Hole was collapsing and binding the rods so drilling was abandoned. Water encountered at 9.1m depth.

055

061056

DRILL HOLE: H14

PROSPECT: Hopkins Quartzite Deposit, Forth, Tas.

GRID CO-ORDS: 1080N 1100E

FINAL DEPTH: 12m

DATE DRILLED: 15.10.85

HOLE ANGLE: Vertical

DRILLER: G. Gleeson, G & G Drilling, Ulverstone.

FROM	TO	DESCRIPTION
0	1m	Hard white quartzite
1	3	Pale brown, soft, leached quartzite which becomes harder at 1.5m depth.
3	5	Hard white quartzite which becomes pale yellow after 4.5m depth.
5	7	White hard quartzite
7	9	Hard white quartzite which becomes yellowish from about 8.5m.
9	10	Pale yellowish-white hard quartzite. Water intersected at 10m.
10	12	Pale yellowish-white hard quartzite.

056

061057

DRILL HOLE: H15

PROSPECT: Hopkins Quartzite Deposit, Forth, Tas.

GRID CO-ORDS: 1080N 1113E

FINAL DEPTH: 11m

DATE DRILLED: 15.10.85

HOLE ANGLE: Vertical

DRILLER: G.Gleeson, G & G Drilling, Ulverstone.

FROM	TO	DESCRIPTION
0	3.4	Red brown to yellow brown soft leached micaceous quartzite below 1m of red surface soil with quartzite fragments.
3.4	5.0	Pale yellow to pale brown soft leached quartzite
5.0	7.0	Pale yellow to white moderately hard quartzite - sample has some contamination from surface red brown quartzite.
7.0	9.0	White moderately hard quartzite
9.0	9.6	White moderately hard quartzite with 1-2mm flakes of green muscovite present at 9.6m depth.
9.6	11.0	White hard quartzite with 5mm flakes of greenish muscovite.

057

061058

DRILL HOLE: H16

PROSPECT: Hopkins Quartzite Deposit, Forth, Tas.

GRID CO-ORDS: 1080N 1130E

FINAL DEPTH: 3.1m

DATE DRILLED: 15.10.85

HOLE ANGLE: Vertical

DRILLER: G. Gleeson, G & G Drilling, Ulverstone

FROM	TO	DESCRIPTION
0	3.1m	Red brown densely packed basaltic clay. Difficult and slow to hammer drill - no bedrock intersected.

058

061059

DRILL HOLE: H17

PROSPECT: Hopkins Quartzite Deposit, Forth, Tas.

GRID CO-ORDS: 1040N 1040E

FINAL DEPTH: 4m

DATE DRILLED: 15.10.85

HOLE ANGLE: Vertical

DRILLER: G. Gleeson, G & G Drilling, Ulverstone.

FROM	TO	DESCRIPTION
0	1	Surface loamy soil with quartzite boulders
1	4	Very soft, yellow-brown to pale brown leached micaceous fine-grained quartzite.

059

061060

DRILL HOLE: H18

PROSPECT: Hopkins Quartzite Deposit, Forth, Tas.

GRID CO-ORDS: 104ON 1020E

FINAL DEPTH: 4m

DATE DRILLED: 15.10.85

HOLE ANGLE: Vertical

DRILLER: G. Gleeson, G & G Drilling, Ulverstone

FROM	TO	DESCRIPTION
0	4m	Yellow-brown, soft fine-grained micaceous quartzite.

060

061061

DRILL HOLE: H19

PROSPECT: Hopkins Quartzite Deposit, Forth, Tas.

GRID CO-ORDS: 1059N 1040E

FINAL DEPTH: 4m

DATE DRILLED: 15.10.85

HOLE ANGLE: Vertical

DRILLER: G. Gleeson, G & G Drilling, Ulverstone

FROM	TO	DESCRIPTION
0	2.4	Grey-brown, soft micaceous quartzite
2.4	2.9	Hard quartzite band
2.9	4.0	Pale brown soft micaceous quartzite.

061

061062

DRILL HOLE: H20

PROSPECT: Hopkins Quartzite Deposit, Forth, Tas.

GRID CO-ORDS: 1060N 1060E

FINAL DEPTH: 7m

DATE DRILLED: 15.10.85

HOLE ANGLE: Vertical

DRILLER: G. Gleeson, G & G Drilling, Ulverstone

FROM	TO	DESCRIPTION
0	2m	White hard quartzite
2	4	Pure white hard quartzite
4	6	Pure white hard quartzite
6	7	Dark chocolate brown, soft fine-grained micaceous quartzite. Changed suddenly from hard quartzite at 6m depth.

062

061063

DRILL HOLE: H21

PROSPECT: Hopkins Quartzite Deposit, Forth, Tas.

GRID CO-ORDS: 1071N 1014E

FINAL DEPTH: 7m

DATE DRILLED: 15.10.85

HOLE ANGLE: Vertical

DRILLER: G.Gleeson, G & G Drilling, Ulverstone.

FROM	TO	DESCRIPTION
0	4	Pale brown to brown, soft, fine-grained micaceous quartzite.
4	7	Pale yellow-brown, soft, fine-grained micaceous quartzite.

063

061064

APPENDIX II

ASSAY RESULTS - ANALABS

REPORT NUMBER 34.5 08 3335

064

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

061065

Phone (09) 458 7999 | 52 Murray Road, Welshpool, W.A. 6106 | Telex AA92560

ANALYTICAL REPORT No. 34.5 08 3335

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

Queensland Mines Ltd
8th Floor FCA House
50 Margaret St
Sydney NSW 2000

ORDER No.	PROJECT

DATE RECEIVED	RESULTS REQUIRED
17.10.85	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
		3	68

STATE OF SAMPLES (REFER BELOW)	SAMPLE NUMBERS	PRE-TREATMENT: DRY	CRUSH	SPLIT	PULVERISE	SIEVE	OTHER SEE REMARKS	NONE	ANALYSIS: REFER TO ANALYSIS SECTION	PREPARATION	METHOD
3	H2-H20	1		2					Whole Rock Analysis		

REMARKS

RESULTS TO Attn: J. Noakes

RESULTS TO Attn: R.G. Wright
29 Mungaerlar Crt.
DEVONPORT Tas. 7310

STATE OF SAMPLES		ANALYSIS — PREPARATION				ANALYSIS — METHOD	
whole core	WC	perchloric acid	A1	cold acid	CA	atomic absorption	AAS
split core	SC	hydrochloric acid	A2	specific sulphide	SS	x-ray fluorescence	XRF
cutting	CU	nitric acid	A3	other mixed acids	Mo	spectrophotometry	SPEC
rock	Ro	aqua regia	A4	alkaline attack	AA	colorimetry	COL
soil	SO	nitric-perchloric	A5	volatilization	VO	chromatography	CHR
pulp	PU	HF mixture	A6	ignition	IG	titration	TTN
water	WA	HF under pressure	A7	pressed powder (XRF)	PP	other chemicals means	CHEM
tissue	Ti	fusion	A8	glass fusion (XRF)	GF	miscellaneous	MISC
stream sediment	SS					fluorescence	FLUOR
heavy mineral	HM					inductively coupled plasma	ICP

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065

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

061066

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	34.5 08 3335	13.11.85		1 OF

TUBE No.	SAMPLE No.	Na2O	MgO	Al2O3	SiO2%	SiO2%	P2O5%	K2O	CaO
1	H 02 01-03	40	70	500	–	99.2	X	70	160
2	H 02 03-05	80	100	1100	–	99.0	0.014	115	640
3	H 02 05-07	100	70	550	–	99.1	0.007	70	190
4	H 02 07-009	140	70	550	–	99.2	0.007	70	100
5	H 02 09-11	115	190	1200	–	99.2	0.007	110	240
6	H 02 11-13	150	400	5150	–	98.8	0.011	1450	130
7	H 03 0.5-03	75	70	350	–	99.3	X	60	130
8	H 03 03-05	80	80	350	–	99.4	X	55	170
9	H 03 05-05.4	40	220	3850	–	98.5	0.021	65	560
10	H 03 05.4-07	130	70	13200	–	96.7	0.066	65	130
11	H 03 07-09	115	50	1150	–	99.6	X	50	100
12	H 03 09-11	120	70	1400	–	98.7	0.011	95	170
13	H 04 00-02	85	40	400	–	99.5	X	65	90
14	H 04 02-04	80	60	400	–	99.6	X	55	130
15	H 04 04-06	80	30	1150	–	99.3	0.007	40	90
16	H 04 06-08	75	90	250	–	99.6	X	35	240
17	H 04 08-10	120	70	400	–	99.6	X	90	190
18	H 04 10-12	150	50	350	–	99.5	X	70	140
19	H 04 12-14	90	350	450	–	98.9	X	85	1450
20	H 04 14-15.5	90	90	850	–	99.2	[illegible]	[illegible]	[illegible]
21	H 05 00-02	160	230	1150	–	98.8	X	[illegible]	[illegible]
22	H 05 02-04	1900	4250	174000	–	73.2	[illegible]	[illegible]	[illegible]
23	H 05 04-06	2100	8000	190000	–	[illegible]	[illegible]	[illegible]	[illegible]
24	H 06 01-02	210	250	3850	–	[illegible]	X	500	[illegible]
25	H 06 02-04	510	1200	40000	–	93.0	[illegible]	[illegible]	[illegible]

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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066

061067

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	84.5 08 3335	13.11.85		2 OF 9

TUBE No.	SAMPLE No.	Na2O	MgO	Al2O3	SiO2%	SiO2%	P2O5%	K2O	CaO
1	H 07 0.2-02	310	70	400	-	98.9	X	125	120
2	H 07 02-04	330	50	500	-	99.1	X	40	130
3	H 07 04-06	220	50	300	-	99.1	X	40	160
4	H 07 06-07.2	15	120	400	-	98.8	X	40	90
5	H 08 00-02	55	100	300	-	99.3	X	50	80
6	H 08 02-04	25	100	300	-	99.3	X	85	230
7	H 08 04-06.8	20	50	100	-	99.5	X	55	100
8	H 08 06.8-08.5	40	50	150	-	99.1	X	55	100
9	H 08 08.5-10	75	40	100	-	99.5	X	40	70
10	H 08 10-12	75	70	150	-	99.5	X	55	140
11	H 08 12-14	65	60	400	-	99.4	X	55	130
12	H 11 00-02	20	110	450	-	98.6	X	50	280
13	H 11 02-03.5	15	60	250	-	99.0	X	50	170
14	H 11 03.5-06	15	90	4350	-	98.2	X	80	400
15	H 11 06-07.6	20	70	1350	-	99.2	X	65	220
16	H 11 06.6-08.2	15	510	1450	-	96.6	X	200	1000
17	H 11 08.2-10	15	90	1000	-	98.2	1.007	90	160
18	H 12 00-01	40	70	350	-	98.8	X	40	140
19	H 12 01-02	25	50	150	-	99.0	X	40	90
20	H 12 02-04	X	100	250	-	99.1	X	40	100
21	H 12 04-06	25	50	150	-	98.4	X	40	120
22	H 12 06-08	155	250	3650	94.6		1.021	285	260
23	H 12 00-02	25	50	550	98.7	-	X	50	80
24	H 12 02-04	20	70	200	98.8	-	X	110	90
25	H 12 04-06	20	50	450	98.8	-	X	70	80

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
- = element not determined

AUTHORISED OFFICER

067

061068

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	34.5 08 3335	13.11.85		3 OF 9

TUBE No.	SAMPLE No.	Na2O	MgO	Al2O3	SiO2%	SiO2%	P2O5%	K2O	CaO
1	H 13 06-08	20	50	500	98.7	-	X	55	150
2	H 14 08-09.1	20	80	950	98.6	-	X	55	200
3	H 14 00-01	35	140	6500	98.3	-	0.007	80	220
4	H 14 01-02	35	70	400	98.8	-	X	65	140
5	H 14 03-05	20	40	350	99.6	-	X	35	60
6	H 14 05-07	25	40	450	99.5	-	X	40	60
7	H 14 07-09	25	40	300	99.6	-	X	35	90
8	H 14 09-10	20	40	450	99.6	-	X	35	60
9	H 14 10-12	25	70	500	99.4	-	X	55	190
10	H 15 03.4-05	25	100	4350	98.8	-	X	85	60
11	H 15 05-07	20	60	800	99.5	-	X	55	70
12	H 15 07-09	40	40	300	99.7	-	X	30	60
13	H 15 09-09.6	115	970	10300	97.8	-	X	3200	80
14	H 15 09.6-11	130	1130	12000	97.5	-	X	4050	80
15	H 20 00-02	25	90	950	99.5	-	X	100	60
16	H 20 02-04	20	60	300	99.6	-	X	40	80
17	H 20 04-06	15	90	70	99.6	-	X	150	70
18	H 20 06-11	160	2800	30200	91.1	-	0.021	8850	150
19									
20									
21									
22									
23	DETECTION	5	10	50	0.1	0.1	0.007	5	10
24	DUPLICATION								
25	H 10.00	100	100	100	199	400	400	100	100

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit

AUTHORISED

068

061069

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	34.5 08 3335	13.11.85		4 OF 9

TUBE No.	SAMPLE No.	TiO2	Cr	MnO	Fe2O3	Co	ZrO2	Cd	Pb
1	H 02 01-03	700	10	5	1100	205	240	X	X
2	H 02 03-05	200	5	X	450	140	190	X	5
3	H 02 05-07	150	5	X	420	165	250	X	5
4	H 02 07-09	350	5	X	600	155	310	X	X
5	H 02 09-11	350	5	5	860	190	270	X	X
6	H 02 11-13	250	5	5	4850	140	75	X	X
7	H 03 0.5-03	150	5	25	700	120	230	X	X
8	H 03 03-05	150	X	X	430	115	490	X	X
9	H 03 05-05.4	250	X	X	520	140	400	X	X
10	H 03 05.4-07	200	5	15	430	110	190	X	X
11	H 03 07-09	100	5	X	560	130	300	X	X
12	H 03 09-11	500	5	5	5650	135	380	X	X
13	H 04 00-02	150	X	X	360	135	160	X	X
14	H 04 02-04	100	X	X	370	130	280	X	X
15	H 04 04-06	300	X	X	210	110	360	X	X
16	H 04 06-08	50	X	X	370	165	160	X	X
17	H 04 08-10	150	X	X	440	110	180	X	X
18	H 04 10-12	250	X	X	520	125	200	X	X
19	H 04 12-14	3150	X	5	680	110	320	X	X
20	H 04 14-14.5	750	X	X	500	55	360	X	X
21	H 05 00-02	2200	X	5	740	150	260	X	X
22	H 05 02-04	7000	40	5	8050	35	340	X	X
23	H 05 04-06	2550	35	20	18300	25	270	X	X
24	H 05 01-13	1550	5	5	1000	120	280	X	X
25	H 05 13-14	3100	5	15	3000	150	300	X	X

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit

AUTHORISED

069

061070

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	34.5 08 3335	13.11.85		5 OF 9

TUBE No.	SAMPLE No.	TiO2	Cr	MnO	Fe2O3	Co	ZrO2	Cd	Pb
1	H 07 0.2-02	2350	X	5	680	190	270	X	X
2	H 07 02-03	1950	X	5	1550	170	300	X	X
3	H 07 03-04	800	X	5	600	150	320	X	X
4	H 08 01.7-03	5850	X	20	1220	145	310	X	X
5	H 08 03-04	1500	X	5	530	165	300	X	X
6	H 08 04-05	400	X	X	460	160	410	X	X
7	H 08 06-06.8	450	X	X	460	160	250	X	X
8	H 08 06.8-08.5	3200	X	X	510	130	390	X	X
9	H 08 08.5-10	750	X	X	440	140	250	X	X
10	H 08 10-12	800	X	5	490	140	240	X	X
11	H 08 12-14	700	X	5	770	125	230	X	X
12	H 11 00-02	300	X	5	500	140	410	X	X
13	H 11 02-03.5	150	X	X	370	130	220	X	X
14	H 11 03.5-06	250	X	X	460	125	220	X	X
15	H 11 06-06.6	150	X	X	350	95	310	X	X
16	H 11 06.6-08.2	250	5	5	1060	150	520	X	X
17	H 11 08.2-10	150	5	X	550	150	130	X	X
18	H 12 00-01	400	X	X	390	150	190	X	X
19	H 12 01-02	150	X	X	250	85	230	X	X
20	H 12 02-03	150	X	X	240	110	380	X	X
21	H 12 03-04	150	X	X	300	130	390	X	X
22	H 12 04-05	4150	15	5	750	120	330	X	X
23	H 12 05-06	250	10	5	620	120	370	X	X
24	H 12 06-07	150	5	X	580	195	170	X	X
25	H 12 07-08	150	X	5	430	120	370	X	X

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit

AUTHORISED

070

061071

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	34.5 08 3335	13.11.85		6 OF 9

TUBE No.	SAMPLE No.	TiO2	Cr	MnO	Fe2O3	Co	ZrO2	Cd	Pb
1	H 13 06-08	150	5	5	640	150	260	X	X
2	H 13 08-09.1	150	5	5	890	245	170	X	X
3	H 14 00-01	650	5	105	640	155	330	X	X
4	H 14 01-03	650	5	20	480	145	340	X	X
5	H 14 03-05	200	5	5	410	120	180	X	X
6	H 14 05-07	200	X	X	490	120	310	X	X
7	H 14 07-09	150	X	5	530	120	250	X	X
8	H 14 09-10	150	X	X	630	110	220	X	X
9	H 14 10-12	150	X	5	710	150	320	X	X
10	H 15 03.4-05	550	5	5	3050	110	230	X	X
11	H 15 05-07	200	5	X	680	125	230	X	X
12	H 15 07-09	200	X	X	350	120	140	X	X
13	H 15 09-09.6	500	X	X	3000	130	40	X	X
14	H 15 09.6-11	600	5	5	2450	130	55	X	X
15	H 20 00-02	150	5	X	500	105	250	X	X
16	H 20 02-04	200	X	X	270	95	300	X	X
17	H 20 04-05	200	X	X	340	125	230	X	X
18	H 20 06-07	3350	10	5	5250	90	440	X	X
19									
20									
21									
22									
23	DETECTION	50	5	5	10	5	7	0.5	5
24	DIGESTION								
25	DUPLICATE	103	103	103	103	103	401	103	103

Results in ppm unless otherwise specified
T = element present, but concentration too low to measure
X = element concentration is below detection limit

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071

061072

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	34.5 08 3335	13.11.85		7 OF 9

UBE No.	SAMPLE No.	Bi	LOI%						
1	H 02 01-03	X	0.53						
2	H 02 03-05	X	0.72						
3	H 02 05-07	X	0.65						
4	H 02 07-09	X	0.57						
5	H 02 09-11	X	0.48						
6	H 02 11-13	X	0.50						
7	H 03 0.5-03	X	0.53						
8	H 03 03-05	X	0.39						
9	H 03 05-05.4	X	0.83						
10	H 03 05.4-07	X	1.78						
11	H 03 07-09	X	0.40						
12	H 03 09-11	X	0.47						
13	H 04 00-02	X	0.34						
14	H 04 02-04	X	0.28						
15	H 04 04-06	X	0.46						
16	H 04 06-08	X	0.28						
17	H 04 08-10	X	0.27						
18	H 04 10-12	X	0.30						
19	H 04 12-14	X	0.46						
20	H 04 14-15.5	X	0.46						
21	H 05 00-02	X	0.67						
22	H 05 02-04	X	4.63						
23	H 05 04-06	X	4.44						
24	H 06 01-03	X	0.53						
25	H 06 03-05	X	0.86						

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit

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072

061073

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	34.5 08 3335	13.11.85		8 OF 9

TUBE No.	SAMPLE No.	Bi	LOI%
1	H 07 0.2-12	X	0.61
2	H 07 0[illegible]	X	0.44
3	H 07 [illegible]	X	0.61
4	H 08 01.[illegible]-03	X	0.34
5	H 08 [illegible]	X	0.35
6	H 08 04-[illegible]	X	0.41
7	H 08 06-0[illegible].8	X	0.38
8	H 08 06.8-08.5	X	0.46
9	H 08 08.5-10	X	0.33
10	H 08 10-12	X	0.33
11	H 08 12-14	X	0.34
12	H 11 00-02	X	1.16
13	H 11 02-0[illegible].5	X	0.88
14	H 11 03.5-06	X	1.19
15	H 11 06-0[illegible].6	X	0.55
16	H 11 06.6-08.2	X	2.28
17	H 11 [illegible] 10	X	1.27
18	H 12 00-0[illegible]	X	1.01
19	H 12 01 [illegible]	X	0.93
20	H 12 03-[illegible]	X	1.06
21	H 12 05-[illegible]	X	1.42
22	H 12 [illegible]	X	4.41
23	H 12 [illegible]	X	1.10
24	H 12 07-[illegible]	X	0.95
25	H 12 [illegible]	X	1.00

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit

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073

061074

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	34.5 08 3335	13.11.85		9 OF 9

TUBE No.	SAMPLE No.	Bi	LOI%
1	H 13 06-08	X	1.09
2	H 13 08-09.1	X	1.08
3	H 14 00-01	X	1.39
4	H 14 01-03	X	0.97
5	H 14 03-05	X	0.24
6	H 14 05-07	X	0.32
7	H 14 07-09	X	0.22
8	H 14 09-10	X	0.19
9	H 14 10-12	X	0.35
10	H 15 03.4-05	X	0.37
11	H 15 05-07	X	0.23
12	H 15 07-09	X	0.15
13	H 15 09-09.6	X	0.38
14	H 15 09.6-11	X	0.40
15	H 20 00-02	X	0.27
16	H 20 02-04	X	0.24
17	H 20 04-06	X	0.17
18	H 20 06-07	X	3.76
19			
20			
21			
22			
23	DETECTION	5	0.01
24	DIGESTION		
25	METHOD	103	408

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
– element not determined

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APPENDIX 3

REGIONAL DRILL HOLE LOGS

AREAS 1, 2, 3 & 4

075

AREA 1

061076

DRILLHOLE LOG

HOLE No. HP1
PAGE No. 1/3

PROJECT: Silica - Tasmania
PLAN REFERENCE: Kindred Sheet 4243
FEATURE: South of Temco Lease & Quartzite
CO-ORDINATES: DQ 373373
LOCATION: Boulder Outcrop. Refer Figure 3
ANGLE FROM HORIZ.: 90 DIRECTION:

DESCRIPTION	LOG	DEPTH m	STRUCTURES/ANALYSES	DEPTH m
Red clay. basalt soil	~	0		
	~	1		
	~	2		
Sand with hard white & cream quartzite float.	. o .	3		
white, yellow & red sands	. .	4		
TRACES white clay & mica	. .	5		
	. .	6		
HP4		0		
Red clay, basalt soil	~	1		
	~	2		
	~	3		
	~	4		
	—	5		
Minor Quartzite float hense as above	~	6		
	~	7		
	~	8		
		9		

REMARKS: Property of BRIAN Hopkins (PORTION 6979)
Soon into Field Naturalists Club.
(PORTION 6995)

LOGGED BY: M. Ware
DATE LOGGED: 16-10-84
DRILLER: G & G. Drilling
DRILL: ROC 601 AIR TRAK.
DATE STARTED:
DATE FINISHED:
CORE STORED:

076

AREA 1

061077

DRILLHOLE LOG

HOLE No. HP3
PAGE No. 2/3

PROJECT: Silica - Tasmania
FEATURE:
LOCATION: Afar figure 3.
PLAN REFERENCE: Kindred 4 x 43
CO-ORDINATES: D.9 373373
ANGLE FROM HORIZ.: DIRECTION:

DESCRIPTION	LOG	DEPTH m	STRUCTURES/ANALYSES	DEPTH m
Sandy Top soil		0		
		1		
SAND. Cream to RED		2		
		3		
		4		
HP4				
Top Soil, Red. clayey		0	Hole bears 070° @ 50° Depression	
		1		
Micaceous White SAND.		2		
		3		
		4		
		5		
		6		
		7		
HP5.		0		
Hard White Quartzite.		1	On Outcrop.	
		2		
		3		
SAND & WATER @ 4 metres		4		

REMARKS:

LOGGED BY: M. Moore
DATE LOGGED: 16-10-84
DRILLER: G & G. Drilling
DRILL: ROC 601 AIR TRAK.
DATE STARTED:
DATE FINISHED:
CORE STORED:

AREA 1

061078

DRILLHOLE LOG

HOLE No. HP6

PAGE No. 3/3

PROJECT: Silica Tasmania

PLAN REFERENCE: Kindred Sheet 4243

FEATURE:

CO-ORDINATES: DQ 873373

LOCATION: As per figure 3.

ANGLE FROM HORIZ.: 90 DIRECTION:

FLUID	BIT	DESCRIPTION	LOG	DEPTH m	STRUCTURES/ANALYSES	CORE LOSS	CASING	WATER	DEPTH m
		Sandy Top Soil		0					
		Hard White Quartzite		1	Surrounded by rocky quartzite outcrop.				
		Medium/Hard Quartzite		2					
		Sand - Hole Caved.		3					
		HP7		0	10 metres from HP6.				
		Minor Soil Cover then		1					
		Hard white quartzite with		2	0.12% Al_2O_3				
		some cream quartzite bands		3	0.14% Al_2O_3				
				4	0.15% Al_2O_3				
		Sand. White to yellow. No mica		5	0.17% Al_2O_3				
		HP8.		0					
		VERY Hard White & Cream		1	Bed Strikes 150° @ 50° West.				
		Quartzite becoming		2					
		softer @ 4 metres prior		3					
		to abrupt quartzite/sand		4					
		boundary.		5					
		Reddish brown sand.							
		HP9		0					
		Red clay Soil		1	18 Metres from S-W Corner of Temco Lease				
		Micaceous Sand. Red, brown		2					
		Khaki & Cream.		3					
				4					

REMARKS:

LOGGED BY: M. Ware

DATE LOGGED: 16-10-84

DRILLER: GGG Drilling

DRILL: ROC 601 Air Trak.

DATE STARTED:

DATE FINISHED:

CORE STORED:

078

AREA 2. 061079

DRILLHOLE LOG

HOLE No. BP1
PAGE No. 1/2

PROJECT: Silica - Tasmania
FEATURE: Quartzite Outcrop.
LOCATION: Forth E.A 37/84 Refer fig 6.

PLAN REFERENCE: KINGRED SHEET 4243.
CO-ORDINATES: D9 390 377 (Refer Figure
ANGLE FROM HORIZ.: 90 DIRECTION: 060°

SAMPLES	DESCRIPTION	LOG	DEPTH m	STRUCTURES/ANALYSES
	Very Hard, White massive Quartzite		1	
	As Above. - Slightly darker. fine grained			
	Clay Band & white powdery silica	Clay	2	
	Fine Sand. White, brown & red.		3	
			4	
	BP2 Vertical hole			
	Location: S.W. Corner Paddock Refer Figure			
	Beds strike 160°: Dip. 60° West.			
	Quartzite Outcropping.			
	HARD White Quartzite - Silcrete.		0	
	Cream & RED SANDS.		1	
			2	
			3	
	B.P.3. Sited on Outcrop.			
	Location - Refer Figure			
	Very HARD White Quartzite		0	
			1	
			2	
	Red Clay Band.	Clay	3	
	HARD White Quartzite			
	RED SAND		4	

REMARKS:
Lloyd BADCOCKS PROPERTY.
LAND PORTION 6967

LOGGED BY: M Ware
DATE LOGGED: 18-10-84
DRILLER: G & G Drilling
DRILL: ROC 601 AIR TRACK
DATE STARTED:
DATE FINISHED:
CORE STORED:

079

AREA 2.

061080

DRILLHOLE LOG

HOLE No. B.P. 4
PAGE No. 2/2

PROJECT: Silica - Tasmania
FEATURE:
LOCATION: Forest Rd 37/84 Refer figure 6

PLAN REFERENCE: Kindred Sheet 42 43
CO-ORDINATES: DQ 270 382
ANGLE FROM HORIZ.: DIRECTION:

FLUID	BIT	DESCRIPTION	LOG	DEPTH m	STRUCTURES/ANALYSES	CORE LOSS	WATER	DEPTH m
		No outcrop although 8 metres from outcrop of dense quartzite - massive.		0				
		Clayey Top Soil		1				
		Micaceous Sand fine to medium grain size.		2				
				3				
				4				
		BP 5 Location. Refer Figure Outcrop of massive - slightly schistose white quartzite.		0				
		HARD. Green to white Quartzite		1				
		Water at 2.6 metres →		2				
		Becomming Sandy		3				
		Sand. No obvious mica		4				
				5				
		BP 6 Outcropping quartzite over 30 x 20 metres.						
		Sandy Top Soil		0				
		Soft Cream Quartzite.		1				
		Micaceous Sands.		2				
				3				
				4				
				5				

REMARKS: Lloyd Badcocks Property.
Land Portion 6967

LOGGED BY: M. Ware
DATE LOGGED: 18-10-84
DRILLER: G & G Drilling
DRILL: ROC 601 Air Track
DATE STARTED:
DATE FINISHED:
CORE STORED:

080

AREA 3.

061081

DRILLHOLE LOG

HOLE No. PP 1
PAGE No. 1/2

PROJECT: Silica - Tasmania
FEATURE: Works on side of hill.
LOCATION: Refer Figure 4

PLAN REFERENCE: Kindred SHEET 4243
CO-ORDINATES: DP 392368
ANGLE FROM HORIZ.: 90 DIRECTION:

FLUID	DIT	DESCRIPTION	LOG	DEPTH m	STRUCTURES/ANALYSES	CORE LOSS	CASING	DEPTH m
		Brown clay-soil & sand		1				
		Sand. (Red/Yellowish)		2				
				3				
				4				
		PP2.		0	Hole bears 060° @ 40° Depression			
		very hard white crystalline Quartzite		1				
		minor mica →		2	Outcropping Quartzite.			
		Sand sand						
		softer cream quartzite		3				
		sand + clay/sand		4				
		PP3.		0				
		weathered mica schist	S S S	1				
		Cream micaceous sand		2				
				3				
				4				
		Os Above.		5				
				6				
				7.				

REMARKS: Reginald Keith Parsons's Property
Portion 6992

LOGGED BY: M. Abare
DATE LOGGED: 17-10-84
DRILLER: G & G. Drilling
DRILL: ROC 601 Air Track.
DATE STARTED:
DATE FINISHED:
CORE STORED:

081

AREA 3

061082

DRILLHOLE LOG

HOLE No. PP4

PAGE No. 2/2

PROJECT: Silica Tasmania

PLAN REFERENCE: Kindred Sheet 4243

FEATURE:

CO-ORDINATES: DQ 387368

LOCATION: Refer figure 4

ANGLE FROM HORIZ.: DIRECTION:

FLUID	BIT	DESCRIPTION	LOG	DEPTH m	STRUCTURES/ANALYSES	CORE LOSS	CASING	DEPTH m
		Reddish basaltic clay soil		1				
		Tan micaceous sands. (Schists)		2				
				3				
				4				
		PP5.		0	Outcropping Quartzite			
		Hard white quartzite						
		Thin sand band →		1	STRIKE 135° @ 48° W			
				2				
		Micaceous Sand.		3				
				4				
				5				
				6				
				7				

REMARKS:

Edencion of Tenco lease area within same Quartzite beds.

LOGGED BY: M. Wake

DATE LOGGED: 19.10.84

DRILLER: G&G Drilling

DRILL: ROC 601 Mk Trak.

DATE STARTED:

DATE FINISHED:

CORE STORED:

082

AREA 3

061083

DRILLHOLE LOG

HOLE No. FP1
PAGE No. 1/1

PROJECT: Silica - Tasmania
PLAN REFERENCE: Kingston 4243
FEATURE: Quartzite Rd. Strike bears 155°/55°W
CO-ORDINATES: DQ 388 566
LOCATION: Refer Figure 5
ANGLE FROM HORIZ.: 90 DIRECTION:

FLUID	BIT	DESCRIPTION	LOG	DEPTH m	STRUCTURES/ANALYSES	CORE LOSS	CASING	DEPTH m
		VERY HARD, Fine grained, dense white Quartzite		1	0.05% Al_2O_3			
				2	0.08% Al_2O_3			
				3	0.08% Al_2O_3			
		Cream at 4 metres →		4	0.04% Al_2O_3			
		Damp Quartzite as above → HARD White Quartzite		5	0.20% Al_2O_3			
		Light tan MICACEOUS SAND		6				
		FP2 Same Site as FP1 Hole bears 045° @ 45° Depression		0				
		Thin Quartzite cap (200mm) then Fine white SAND		4				
		FP3 Hole bears 000° @ 45° Depression		0	Bold Outcrop. Strikes 130°/50°W True WIDTH 10 metres Outcrop shows strong schistose nature although recrystallized & massive.			
		SANDY Soil		1				
		VERY HARD. White to Cream Quartzite		2				
		Semi-consolidated quartz sand.		3				
				4				

REMARKS: R.G. FISHER'S PROPERTY. FORTHSIDE LAND PORTION 4004.

LOGGED BY: M WARE
DATE LOGGED: 18-10-84
DRILLER: G & G DRILLING
DRILL: ROC 601 AR TRAK.
DATE STARTED:
DATE FINISHED:
CORE STORED:

083

AREA 4.

061084

DRILLHOLE LOG

HOLE No. EP1

PAGE No. 1/1

PROJECT: Silica - Tasmania

PLAN REFERENCE: Kindred Sheet 4243

FEATURE:

CO-ORDINATES: D.G 382 365.

LOCATION: On hill behind Dl lease

ANGLE FROM HORIZ.: DIRECTION:

CORE	BIT	DESCRIPTION	LOG	DEPTH m	STRUCTURES/ANALYSES	CORE LOSS	CASING	DEPTH m
		Very hard, white, dense, Quartzite		1	Sited on Quartzite Outcrop No bedding.			
				2				
		Brown weathered micaschist	S S S S	3 4 5				

REMARKS: Property owned by FORBES. (Forrinside) Portion 6994

LOGGED BY: M. Ware

DATE LOGGED: 21-10-84

DRILLER: C & G. Drilling

DRILL: ROC 601 Air Track.

DATE STARTED:

DATE FINISHED:

CORE STORED:

084

061085 Appendix 4

ADDENDUM TO

RELINQUISHMENT REPORT FOR

E.L.'s 2/84 AND 37/84

Prepared by:
Queensland Mines Limited
for
Pioneer Concrete (Tasmania) Pty Ltd

January 1986

CONTENTS

1. Introduction.

The Allison Prospect encompasses an area of previously worked white chert exposed along, and on the flanks of, a ridge south of the Allison Golf Course. (Reference Forth 1:100000 Series No. 8115. Grid: 255434). The area lies within Pioneer Concrete Tas. Pty. Ltd. Exploration Licence E.L.2/84. (See figure 1)

The main area subjected to prior mining is substantially confined to a "saddle" on the ridge beneath the overhead transmission lines and to the area immediately to the south thereof. Mining activities consisted of the removal of a thin surface layer of chert, over a wide area, which was recovered by "strip and scrape" mining as a gravel sized product.

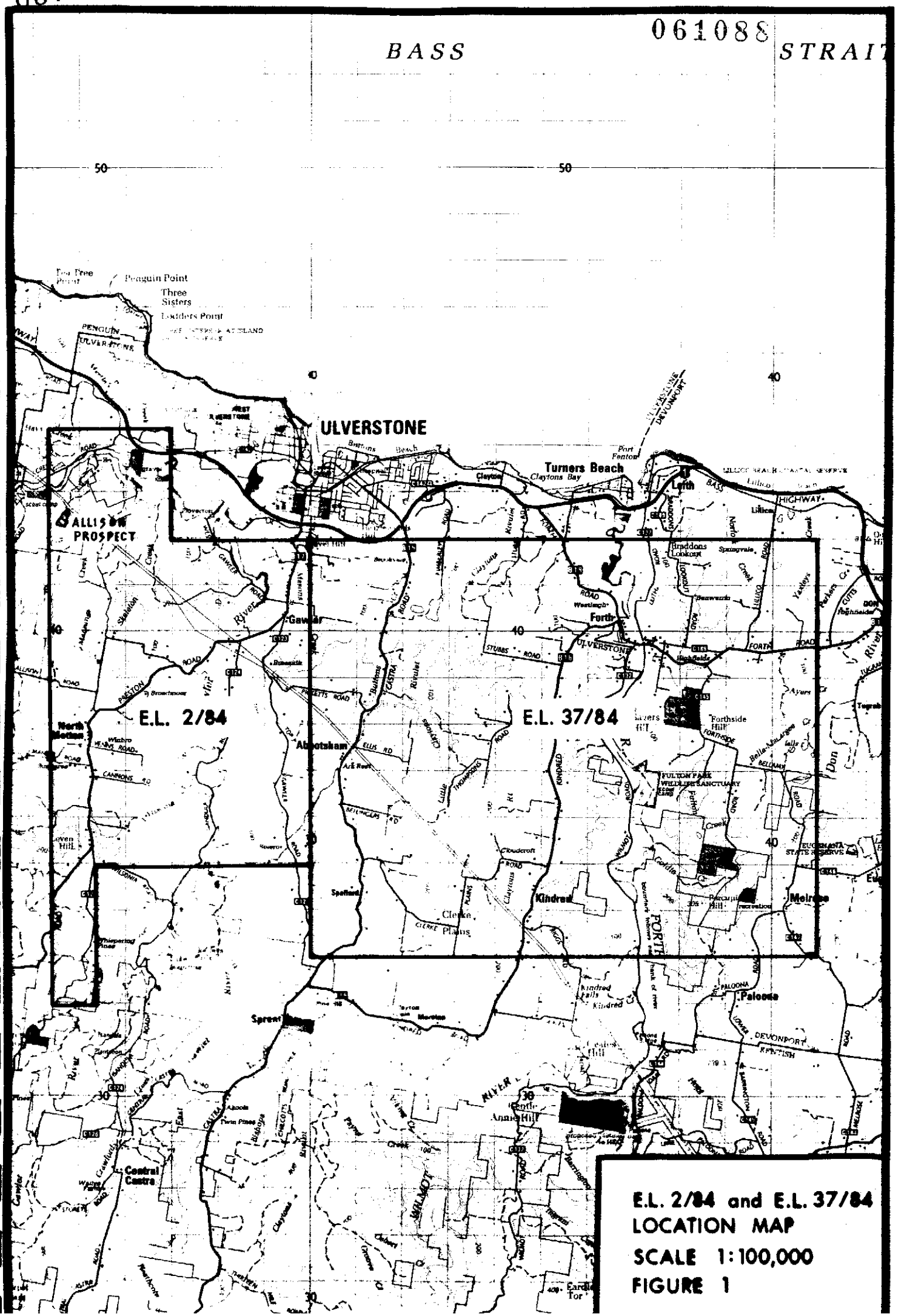
Commonly within the previously worked area clays and mudstones are evident beneath a thin layer of chert suggesting, in the vicinity of the saddle at least, a limited real thickness of chert in this area. To the south however the ridge rises some 40 to 50 metres over a distance of 500 metres to a massive white chert outcrop on the southern end of the ridge suggesting a possible thickening of the chert horizon. There is no definite outcrop between the worked area and the southern mass of chert. Chert gravel is however common particularly along an existing pony track and larger lumps of chert "float" are sporadically encountered.

Grab samples of chert from both the worked area and the southern outcrop provided excellent chemical results with low levels of iron, alumina and calcium being present.

The prospect was thus considered worthy of further investigation to determine the overall tonnage and grade of silica available therein. Consequently the ridge was drilled during May, 1984, and the results of the investigation are presented herein.

087

061088



E.L. 2/84 and E.L. 37/84
LOCATION MAP
SCALE 1:100,000
FIGURE 1

2. Nature of Investigation.

The prospect was drilled using an Atlas Copco ROC 601 Air Trak rig on a nominal grid of 50 metre southerly intervals commencing near to the southern extremity of the former worked area and moving progressively toward the main chert outcrop some 500 metres to the south. Lateral extensions from the main drill line, which followed an existing pony track, were set roughly square thereto as dictated by the topography. Drill sites were surveyed by compass and tape.

Drilling samples were recovered on a continuous basis and cuttings were sub-sampled at intervals reflecting either a colour or lithological change. A total of 28 sites were investigated by drilling the locations of which are shown on figure 2.

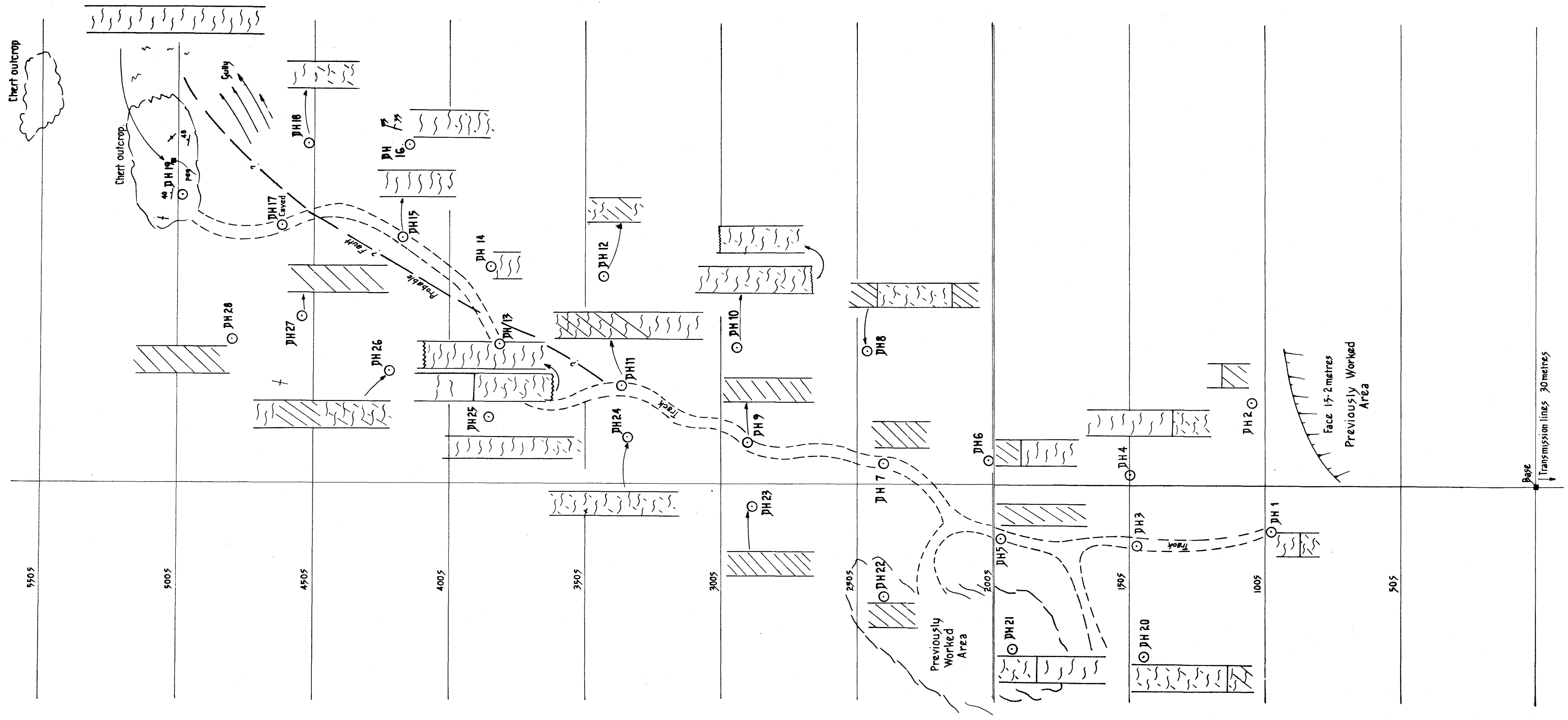
Of the samples taken all were retained for reference and an initial 12 samples were analysed using Inductively Coupled Plasma Atomic Emission Spectrometry for all the common silicate components. Analytical samples were prepared by screening at 1.0 millimetre, rejecting the undersize, splitting to obtain a representative sub-sample of approximately 100 grams followed by siebing in a tungsten carbide mill. Selected samples were washed prior to screening to remove adhearing clay.

Drilling logs are appended and chemical results, together with details of locality and treatment prior to analysis, are presented in Table 1.

Figure 2 presents a plan of the area drilled, detailing the drill hole locations, and indicates broadly the drill sections encountered.

083

061090



Drill Sections
SCALE : 1: 200

0
5m.

Chert

Chert & Clay

Clay or Mudstone

MN

5 cm

PIONEER CONCRETE (TAS) P/L

ALLISON PROSPECT EL 2/84

Author : M.Ware Date : May'84.

Scale 1:1000

0 50 metres

FIGURE 2

3. Results and Interpretation.

Drill intersections within the area show exceptional variability over relatively small distances and broadly reveal a complicated association of chert, secondary clays, and mudstone to be present throughout the ridge.

The chert lies at the base of the Barrington Chert sequence which overlies a series of rocks assigned as the Cateena Group. This Group consists of predominantly mudstones, sandstones, conglomerate, and volcanics which were deposited within a north-south linear trough during the early Cambrian.

Based upon broad stratigraphic rather than visual evidence the Cateena Group is thought to have suffered considerable erosion associated with gentle folding and minor faulting prior to deposition of the Barrington Chert. Thus the association of the chert and underlying sediments, which in the area drilled are represented by red/burgandy mudstones and secondary white clays, may be expected to be unpredictable particularly, as appears to be the case in this area, where the sediments have been affected by faulting and possibly thrusting along the boundary.

The drilling indicated that, with the exception of the southern chert outcrop, the chert is generally highly fractured and associated with considerable quantities of white clay which is present either as a coating along fine joint or fracture cracks in the chert or forms the bulk of a zone in which chert fragments may lie.

Sediments considered primary to the Cateena Group are mainly red/burgandy and possibly khaki mudstones as encountered in drill holes in the northern portion of the area drilled and on the eastern side of the track extending through the area.

North of the 350 metre grid only small discontinuous lenses of chert were encountered associated with white clay. Where the mudstone (Cateena) was intersected the chert was either totally absent or formed a metre capping over the mudstone. Where associated with white clay the chert is heavily fractured and with depth the percentage of clay rapidly increases.

South of the 350 metre grid a chert zone is apparent as intersected in holes 13, 14, 15, 16, 18, and 19. Drilling however to the north of the massive chert outcrop (hole 19) was particularly difficult due to extensive fracturing in the chert resulting in continual caving of drill holes. The fracturing is considered to be due to faulting along a line roughly outlined by the existing track with the fault passing down the gully immediately to the north of the massive chert outcrop.

The main chert outcrop covers an area of approximately 50 by 30 metres and is exposed over a vertical height of roughly 30 metres on the western side where the ridge plunges to a creek feeding the River Leven. Two smaller outcrops of similar material outcrop a further 50 and 130 metres to the south however they are possibly not directly connected.

Jointing within the outcrop is multidirectional ranging from east-west to slightly north of west, dipping to the south, in conjunction with the more common north north-east trend, with a westerly dip, which generally reflects the overall trend of the chert in the immediate area and conforms with the common trend observed in the Mt. Lorymer cherts some 7 kilometres to the south-west. (whether the main 010-025^{o} trend is in accordance with a bedding lamination has not been ascertained).

The massive outcrop is thought to be a substantial block of Barrington Chert, free of clay contamination, which has either been thrust or faulted against the Cateena sediments on the east and is separated from the heavily fractured cherts to the north by a fault. This outcrop represents the best chert available in the area and conservatively should yield some 100000 to 120000 tonnes of material.

On the basis of the analytical results it is apparent that the chert contains a relatively consistent percentage of soda, 0.2 to 0.3% range regardless of the percentage of the other variables, which is considered to be due to the presence of a discrete mineral, possibly a feldspar, which has not been identified.

Potash contents in the samples tend to increase as the level of alumina increases. As the potash is most likely present as a mica mineral an association of mica and clay, kaolinite, appears to be evident and thus with washing, as the clay is removed, the level of potash should decrease to a background level.

this level is possibly reflected in the analyses of samples from DH 19 of the massive chert outcrop. As these samples did not respond to washing they are regarded as representative of the best grade of chert available in this area and thus a general level of 0.35 to 0.45% K_2O may be anticipated.

Note that the analyses of material from hole 19 as drilled, that is analyses A1 and A3 when corrected for free moisture to a level of the dried samples, A2 and A4, are identical to the analyses after washing. Sample A5 similarly requires correcting to a combined moisture content of approximately 0.3%.

Iron levels in the chert are low and indeed remain so except where alumina values, representing contaminating clay, are high.

The only remaining element of significance is magnesium which ranges from 0.12% to 0.33% throughout. The magnesium level reflects the potash level in the same sample in the ratio of 1:2.7 to 1:3.0 in 9 of the 11 chert samples analysed, and only slightly above this ratio in the remaining two samples. This consistency strongly suggests that magnesium is tied to the potash possibly as a muscovite/paragonite assemblage. (the ratio is too low for pure paragonite).

When corrected for moisture, chert from the area analyses 98% to 99% SiO_2, 0.4% to 0.7% Al_2O_3 when free of clay, up to 0.1% Fe_2O_3, 0.35 to 0.45% K_2O, 0.22% Na_2O, and to 0.15% MgO. Material of this quality could reasonably be expected from the southern outcrop as intersected in drill hole 19 and some 100000 tonnes may be available. Further drilling would however be necessary to confirm the tonnage estimate however the grade is considered reasonably certain provided clay is not encountered.

The remainder of the area, as drilled, would be unlikely to yield any reasonable tonnage of chemically consistent material as it is unlikely that the clay contamination could be removed within a suitably sized product. Further considerable difficulty would be experienced in establishing an acceptable mining operation.

4. Conclusions.

The Allison Prospect is capable of yielding a probable 100000 tonnes of chert analysing in the range 98% to 99% SiO_2, 0.4% to 0.7% Al_2O_3, approximately 0.1% Fe_2O_3, 0.35% to 0.45% K_2O, 0.22% Na_2O, and 0.15% MgO. Calcium levels are negligible and titanium levels are expected to maintain less than 0.1%.

Only one select area within the prospect warrants mining for either silica or aggregate this being the prominent outcrop of chert on the southern end of the ridge investigated. This area is close to the western boundary of the E.L. and could not be worked without extending into the adjacent land currently leased to the scout movement. Small extensions of minable chert may possibly be found to the south of the outcrop outside of the exploration licence area.

In view of the limited size of the deposit and the marginal silica metal grade further attention at this stage does not appear warranted.

Michael D. Ware.
Geological & Ceramic Services P/L
June 1984.

094

amdel

Table 1 Allison Prospect.

061095

Analysis code H1/1 Report AC 4488/84 Page 1

NATA Certificate Results in percentages

	A1	A2	A3	A4	A5
SiO2	97.7	98.6	97.7	98.0	97.3
TiO2	0.08	0.07	0.07	0.07	0.10
Al2O3	0.39	0.38	0.60	0.67	0.58
Fe2O3	0.07	0.07	0.08	0.12	0.09
MnO	0.00	0.00	0.00	0.00	0.00
MgO	0.12	0.13	0.15	0.16	0.17
CaO	0.03	0.02	0.02	0.03	0.03
Na2O	0.20	0.20	0.21	0.22	0.23
K2O	0.33	0.35	0.40	0.45	0.47
P2O5	0.03	0.02	0.04	0.02	0.03
LOI	1.20	0.29	0.68	0.29	1.18
Totals	100.1	100.1	99.9	100.0	100.2

Total FE as Fe2O3

Hole	19	19	19	19	25
Depth(metres)	0-9	0-9	9-12	9-12	0-4.5
Treatment(+1.0mm.)	None	Wash Dried	None	Wash Dried	None
SiO_2 corrected.	98.6		98.1		98.2

035

amdel

TABLE 1 CHEMICAL ANALYSES Allison Prospect

061096

Analysis code H1/1 Report AC 4488/84 Page 2

NATA Certificate Results in percentages

	A6	A7	A8	A9	A10
SiO2	90.4	91.6	98.8	94.9	90.6
TiO2	0.41	0.37	0.15	0.20	0.26
Al2O3	5.70	4.90	0.36	2.64	3.78
Fe2O3	0.32	0.27	0.06	0.17	0.23
MnO	0.00	0.00	0.00	0.00	0.00
MgO	0.29	0.30	0.15	0.23	0.27
CaO	0.03	0.04	0.03	0.03	0.03
Na2O	0.26	0.26	0.23	0.26	0.25
K2O	0.79	0.82	0.44	0.66	0.81
P2O5	0.04	0.03	0.03	0.03	0.01
LOI	2.12	1.77	0.33	1.06	3.86
Totals	100.4	100.4	100.6	100.2	100.1

Total FE as Fe2O3

Hole	13	13	16	10	10
Depth(metres)	3.5-9	9-18	0-5	0-9	9-13.5
Treatment(+1.0mm.)	Wash Dried	Wash Dried	Wash Dried	Wash Dried	None

036

Table 1 Allison Prospect.

061097

amdel

Analysis code H1/1 Report AC 4488/84 Page 3

NATA Certificate Results in percentages

	A11	A12
SiO2	91.2	69.6
TiO2	0.30	0.99
Al2O3	4.96	16.0
Fe2O3	0.51	2.62
MnO	0.00	0.01
MgO	0.33	1.63
CaO	0.03	0.04
Na2O	0.27	0.24
K2O	1.02	3.80
P2O5	0.06	0.04
LOI	1.85	5.20
Totals	100.5	100.2
Cr2O3		0.015

Total FE as Fe2O3

Hole	8	8 (Bright green clay)
Depth(metres)	1.5-7	7-9
Treatment(+1.0mm.)	Wash Dried	Total sample- dried only

APPENDIX A. DRILL HOLE LOGS.

ALLISON PROSPECT- ULVERSTONE, TASMANIA.

Appendix A. Allison Prospect.

Drill Hole Logs.

Drill Hole	Depth (Metres)	Description
1	0 -1.5	White Chert
	1.5-3.0	White + light brown mottled clay
2	0 - 1.0	Top soil
	1 - 3.0	White + light brown mottled clay
3	0 -1.2	Top Soil
	1.2-3.0	White + grey fractured chert
	3.0-6.2	White chert + white clay
	6.2-6.7	Light brown sandy clay + minor white chert
4	0 - 3.05	White,grey chert- minor clay and iron staining.
	3.05-6.0	Pink + white chert, minor clay
	6.0-9.0	White chert and grey clay
5	0 - 6.0	White clay. Moist, bogged in hole. Abandoned.
6	0 -1.8	Red/brown clay
	1.8-6.0	Hard drilling. White/grey + minor pink chert
7	0 -3.0	Reddish clay/mudstone.
8	0 - 1.5	White clay
	1.5-7.0	Grey/white chert, minor white clay-possibly contamination
	7.0-9.0	Bright green and white clay.
9	0 -6.0	White, tan and finally red clays

Drill Hole Logs. contd.

Drill hole	Depth (Metres)	Description
10	0 -9.0	Greyish and minor white chert. Some white clay and minor iron staining on fracture planes. Section appears heavily fractured.
	9.0-13.5	As above with minor clay lumps.
	13.5-15.0	Similar with clay % increasing.
11	0-3.0	Pink/brown clay. Minor chert
	3.0-7.0	White clay + fractured greyish and iron stained chert.
	7.0-9.0	Grey and light brown fractured chert. Minor white clay.
	9.0-11.0	As above with clay increasing.
12	0 - 3.0	Minor chert followed by light brown clay then silicified red/ brown mudstone or reddish chert.
13	0 - 3.5	Minor grey chert + white clay
	3.5-9.0	Hard grey chert. Few % white soft lumps and minor brown clay.
	9.0-18.0	Grey to white chert. Some fracturing and iron staining on fracture planes. Few % of white, soft, lumps. (clay?)
14	0-1.5	Fractured chert. Caved at 1.5 metres and abandoned. Additional holes in close proximity also caving.
15	0 - 5.5	White chert, minor white clay Ground fractured and caving
16	0 - 4.5	White chert. Fractured with clay dusting on fracture planes
	4.5-5.0	Sandy zone. Hole Caved.

Drill Hole	Depth (Metres)	Description
17		Caved from surface
18	0 -3.0	Heavily fractured white chert.
	3.0-5.0	Fractured chert with traces of brown/grey mudstone.
19	0 -9.0	Greyish translucent chert. Fine clay dust and few white lumps, possibly clay.
	9.0-12.0	Similar. Limited degree of fracturing only.
	12.0-13.5	As above with minor cinnamon coloured chert.
20	0 -3.0	White + grey chert. Minor brownish clay.
	3.0-6.0	White + grey/brown chert. Some fracturing and minor white clay.
	6.0-7.0	Fracturing more evident.
	7.0-9.0	White clay + minor grey chert.
21	0 -3.0	Fractured greyish chert with traces of clay.
	3.0-7.5	Grey chert, heavily fractured. Holed caved at 7.5 metres.
22	0 - 3.0	White/grey semi-plastic clay followed by brown/purple mudstone.
23	0 -6.0	Tan and finally red/burgandy clay/mudstone.
24	0 -9.0	white to grey translucent chert. Fractured, minor clay and chlorite? Hole caved and abandoned.

Drill Hole	Depth (Metres)	Description
25	0–4.5	Very hard white and greyish, with minor cinnamon, chert. Minimal fracturing with fine dust on fracture planes.
	4.5–6.0	Soft, fractured, sandy area.
	6.0–9.0	Fractured grey chert with white clay on fracture planes.
26	0 –3.0	White chert on surface followed by white clay.
	3.0–4.5	White clay
	4.5–6.0	Hard grey chert.
	6.0–9.0	Grey chert with abundant white clay.
27	0 –3.0	Brown/khaki clay.
	3.0–6.0	Red/burgandy clay/mudstone
28	0 –3.0	Tan clay.
	3.0–6.0	Red/burgandy clay/mudstone.