TR8-72-81

12. MADAM HOWARD PLAINS BARYTES DEPOSIT

by D. I. Groves

INTRODUCTION

The area just NW of the Strahan-Zeehan Road Junction contains numerous small barytes deposits occurring in two main mineralized zones (Figure 25). A plane-table survey and surface mapping were conducted in this area to determine the nature and extent of the barytes deposits. Three diamond drill bore holes have been drilled into the main deposit and the results are incorporated in this report.

The deposits are situated approximately 2 miles NW of Queenstown and are accessible to four-wheel drive vehicles from the main Queenstown-Zeehan Highway by means of two tracks which generally follow the lines of lode, Topographically the area is one of undulating marshy plains with several small hills controlled locally by more resistant formations.

The southern occurrence of barytes was first discovered in 1910 by A. S. Wesley and T. Cook, and was contained in an old lease 4016/M of 80 acres as a reward claim. Colonial Barium Co. Pty. Ltd. held the section in February 1919 and W. J. W. Strong in September 1919. The lode also extends into lease 4873/M taken up by W. H. Wesley in 1910. The deposit was worked from an adit and several trenches, the Colonial Barium Co. marketing 275 tons of ore valued at £1235 between 1916 and 1918 and the Tasmanian Barium Co. 638 tons valued at £1966 between 1919 and 1920.

The northern occurrence is contained in three old 10 acre sections: 4773/M, 4774/M and 4775/M granted originally to A. S. Wesley and T. Cook in 1910. They were subsequently held by A. S. Lilbourne in 1916, T. W. Cook in 1918 and the Queenstown Barium Mining Co. N.L. in 1920, the latter Company marketing 175 tons of barytes valued at £525. The deposits were worked from 3 short adits and several shallow trenches.

Total barytes marketed from these deposits was 1336 tons which realized a price of £4067.

GENERAL GEOLOGY

The host rocks for the barytes deposits are cleaved Cambrian volcanics, sandstone and slate with a regional strike approximately N-S. These are faulted against easterly-striking Silurian sediments just south of the Zeehan and Strahan Road Junction. The fault line trends just north of east and brings Florence Quartzite, Amber Slate and Crotty Quartzite into contact with the Cambrian sequence.

The Cambrian sequence in this area forms a tight, almost vertical fold with elongate N-S limbs and tight closure. A large mass of keratophyrite occurs on each limb at equivalent horizons relative to the axial region of the fold and lenses out to the north and south. It is inferred from the limited exposure available that small subparallel folds with a possible wavelength of one mile are superimposed on the major structure.

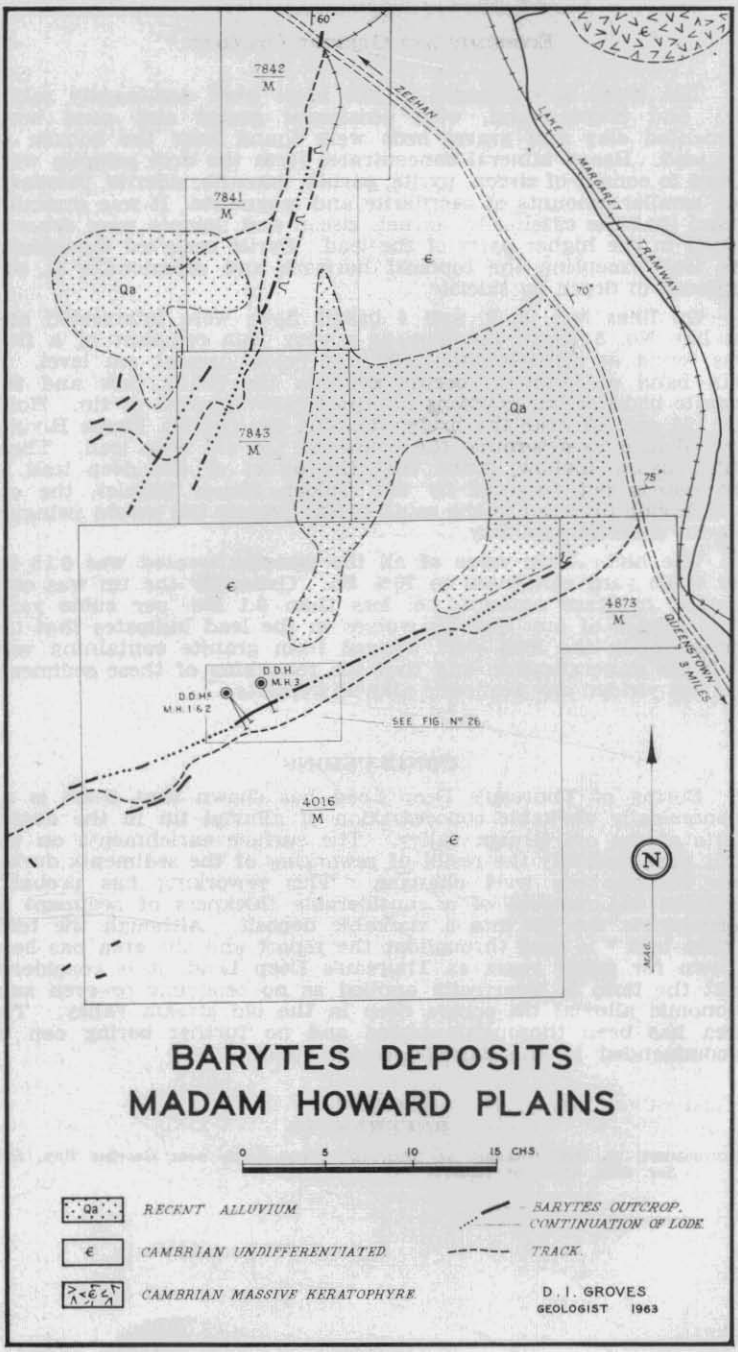


FIGURE 25.

The massive keratophyre was described by Solomon (1960). It is pink-brown in colour and contains distinctive amygdales filled with chlorite and specks of galena and rimmed by albite. The phenocrysts are dominantly altered albite laths up to 4 mm long with minor corroded quartz crystals and irregular masses of chlorite with dark rims. The groundmass comprises extremely fine grained quartz and feldspar with rare pyrite and apatite.

The remainder of the Cambrian sequence is poorly exposed and deeply weathered, but scattered outcrops of slate, probable greywacke and keratophyre are evident. The only recognizable sedimentary unit is the " Miners Slate ", originally described by Bradley (1954) from Lynch Creek, which occurs in a band about ½ mile wide approximately ¼ mile north of the fault contact with the Silurian sequence. This unit typifies the Cambrian succession as it outcrops in isolated lenses merging into other lithologies along its strike.

The host rock for the major barytes deposit in the southern section is a keratophyre which may represent the lenticular extension, into the closure of the fold, of the massive keratopyhyre exposed to the north. The keratophyre penetrated in D.D.H. MH1 is extremely variable in texture and grain size. It generally consists of twinned and untwinned albite laths from 0.5 to 4 mm in length which have been severely altered to chlorite, sericite and carbonate in a fine felsitic groundmass. Lath-shaped aggregates of fine radiating albite are common and may represent re-crystallization or replacement of primary albite phenocrysts. Several phenocrysts are bent or cracked due to a weak cleavage along which small patches of sericite are aligned. Several of the albite phenocrysts are corroded and rimmed with colourless orthoclase or crystalline quartz and minor epidote occurs marginal to the phenocrysts in several places.

Rhombic sections of carbonate, varying from 0.1 to 0.25 mm in length are extremely common in some sections, and pyrite crystals are abundant up to 0.25 mm in length. In thin section of specimen No. 63-279 a small irregular patch of green fibrous talc (?) encloses several albite laths, and small stringers of talc (?) are present in other sections. A small fine-grained, ovoid fragment (0.5 mm in diameter) in thin section 63-279 exhibits rough perlitic cracking and may be a fragment of devitrified glass. Quartz phenocrysts are extremely rare, although an undulose quartz crystal with nearly hexagonal outlines occurs in one section.

Numerous small veinlets are present in all sections and generally consist of quartz and carbonate with minor pyrite and some marginal albite. Irregular areas of finely crystalline quartz and feldspar occur in places and obliterate the porphyritic structure of the rock. These probably formed as irregular pockets of hot solution alteration during the later stages of lava crystallization.

ECONOMIC GEOLOGY

Barytes Deposits

The barytes deposits are lenticular bodies generally lying in two main zones: a southern zone trending at 60°M and a northern zone at 20°M. Small irregular patches of barytes with variable orientation are also common. The barytes is extremely pure,

with minor contamination by quartz (see Table), and is not generally associated with the strong quartz veining prevalent throughout the area.

Analyses of Barytes Lodes
(from Blake, 1928)

Constituents	(1)	(2)	(3)
Ignition loss	0.50	0.40	0.30
SiO_2	0.40	0.70	0.80
$BaSO_4$	99.40	98.80	98.60
$Fe_2O_3+Al_2O_3$	0.04	0.06	0.08
	100.34	99.96	99.78

(1) Selected sample from open cut, Southern workings.
(2) Bulk sample from open cut, Southern workings.
(3) Selected sample from Northern workings.

Southern Deposit

The main deposit occurs as a series of lenticular bodies, varying from 1 inch to 12 feet in width and extending over a length of some 31 chains on a trend of 60°M.

A small adit has been driven on the eastern extremity of the lode and a 6 inch vein of barytes is exposed. Twenty feet south of the adit a small trench has been excavated exposing a 2 feet wide lode of barytes. Similar shallow trenches have been cut along the lode for a distance of 18 chains, then the lode has been cut for a length of 195 feet over an average width of 10 feet and a maximum depth of 15 feet. The lode walls are poorly defined with a central zone of barytes some 5 to 6 feet thick and subsiduary parallel lodes forming a total thickness of up to 12 feet. The lode is then sporadically exposed for a further 11 chains to the west but only small pockets of barytes occur. The lodes generally dip vertically to very steeply to the north and are approximately parallel to probable bedding directions in the area.

A further lode of barytes occurs some 2 chains west and 1 chain south of the open cut and has been cut by 3 trenches. This is subparallel to the main lode and extends some 4 chains to the west with a width of 4 feet in places. Several small lenses of barytes occur to the SW of the main lode but are economically unimportant. A small lode also occurs to the west of the main lode and is unique in this area as it is almost at right angles to the main lode.

Northern Deposit

The main deposit in this area is a discontinuous barytes lode trending approximately 200°M over a distance of 21 chains. This lode has been worked from 3 adits and a series of shallow trenches.

The first adit, occurring at the head of an old tramway, now disused, was driven towards the SW, the entrance bearing approximately 220°M. The second adit occurs some 3 chains to the south on a bearing of 275°M as an open trench for 50 feet and an adit for 18 feet. Only a few stringers of barytes are exposed, although a drive was driven from the portal for 22 feet on a bearing of 190°M and followed a lode averaging 1 foot 3 inches in width. Four chains further south a third adit was driven for 56 feet on a

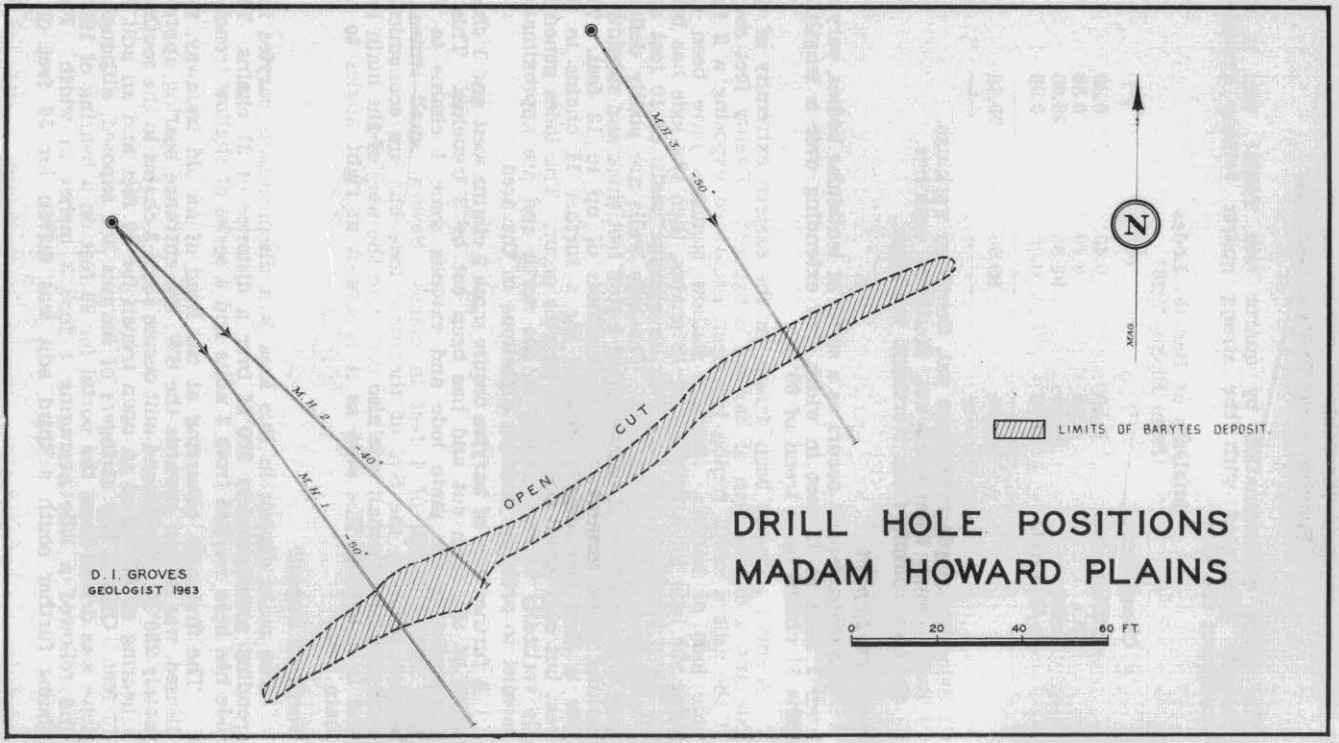

5 cm
M.H.3 -50°
M.H.2 -40°
M.H.1 -50°
OPEN CUT
N
MAG.
LIMITS OF BARYTES DEPOSIT.
DRILL HOLE POSITIONS
MADAM HOWARD PLAINS
0 20 40 60 FT.
D. I. GROVES
GEOLOGIST 1963

FIGURE 26.

bearing of 285°M. At 10 feet from the end, a cross-cut was driven for 10 feet to the SW and 44 feet to the NE. At 25 feet along the latter a rise was taken out to the surface, a distance of 30 feet.

Several small discontinuous barytes lodes occur to the west of the main deposit and have been tested by short trenches.

Minor Mineralization

Extensive quartz veining occurs throughout the area with individual veins up to several hundred feet in length although generally smaller. These appear to have random orientation. Small quartz carbonate veins are common in the drill cores and are generally either subparallel to small barytes veins in the core or fill irregular fractures in the keratophyre. In places these small veins contain abundant disseminated pyrite. In D.D.H.M.H.1, two small veins of quartz and carbonate contain radiating masses of platy hematite. Irregular veinlets and pockets of well crystallized purple fluorite occur in association with rhombic calcite in all cores but were not seen in the field.

CONCLUSIONS AND RECOMMENDATIONS

The barytes lodes occur along distinct mineralization trends but are markedly lenticular in plan, varying in width from twelve feet to fractions of an inch. Three diamond drill holes were drilled to intersect the main deposit at depths between 100 and 150 feet: summary logs of these holes are given in the following section. Only minor amounts of barytes were intersected although distinct zones of mineralization were found at equivalent horizons in each hole (Fig. 27). Available information suggests that the deposits are lenticular in section as well as in plan and do not contain sufficient high grade barytes for large scale mining operations. Further drilling on these lodes is not recommended.

APPENDIX

Drilling Results

Summary Core Log D.D.H.: M.H. No. 1.

Location: 30 chains W. of Zeehan Road just N of Strahan Road Junction.
Bearing: 145°M.
Dip: 50°.
Depth: 230 feet.

From— ft.	in.	To— ft.	in.	Recovery %	Geological
0	0	32	0	30	Weathered, cleaved keratophyre with large phenocrysts.
32	0	56	0	69	Pink cleaved keratophyre with large phenocrysts and sporadic thin quartz and carbonate veins.
56	0	131	6	87	Pink to grey, cleaved and well fractured keratophyre with moderately large phenocrysts. Numerous small quartz, carbonate and pyrite veins, two containing abundant platy hematite.

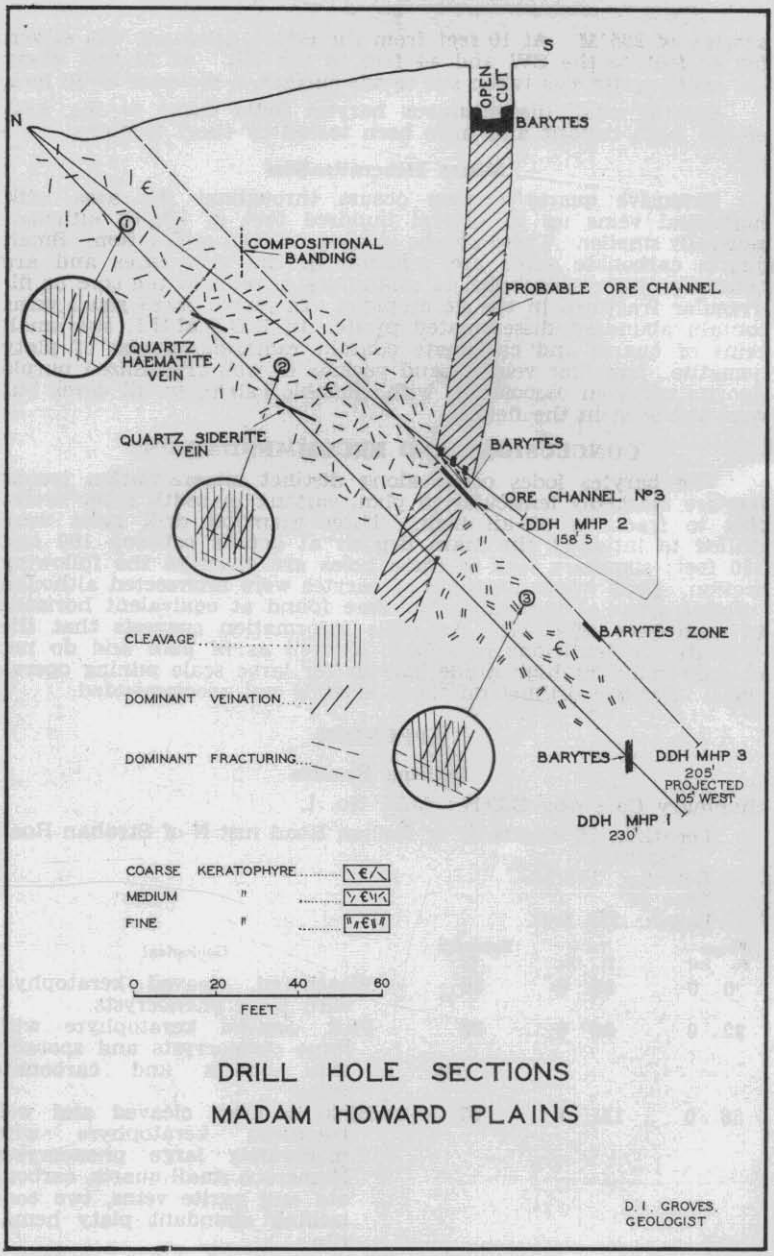
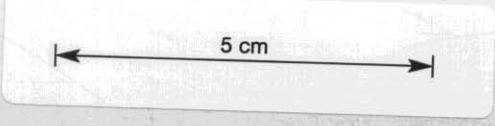

S
N
OPEN CUT
BARYTES
COMPOSITIONAL BANDING
PROBABLE ORE CHANNEL
QUARTZ HAEMATITE VEIN
QUARTZ SIDERITE VEIN
BARYTES
ORE CHANNEL Nº3
DDH MHP 2
158' 5
BARYTES ZONE
CLEAVAGE
DOMINANT VEINATION
DOMINANT FRACTURING
BARYTES
DDH MHP 3
205'
PROJECTED
105' WEST
DDH MHP 1
230'
COARSE KERATOPHYRE
MEDIUM "
FINE "
0 20 40 60
FEET
DRILL HOLE SECTIONS
MADAM HOWARD PLAINS
D. I. GROVES.
GEOLOGIST

FIGURE 27.


5 cm

From— ft.	in.	To— ft.	in.	Recovery %	Geological
131	6	138	6	92	Strongly mineralized keratophyre with high percentage of small quartz-carbonate-pyrite veins.
138	6	147	6	60	Very strongly mineralized zone with numerous veins of quartz, carbonate, pyrite and barytes (?).
147	6	230	0	80	Pale pink to grey keratophyre with small phenocrysts. Sporadic small quartz-carbonate and pyrite veins with some barytes. 161′ 5″—3″ banded veins of qartz and minor barytes. 191′ 5″—2″ vein of quartz and minor barytes. 207′ 7″—1″ vein of barytes. 211′ 3½″—4½″ vein of barytes with minor quartz.

Summary Core Log D.D.H.: M.H. No. 2.

Location: 30 chains W. of Zeehan Road, just N of Strahan Road Junction.

Bearing: 135°M.

Dip: 40°.

Depth: 158 feet 5 inches.

0	0	22	0	26	Very weathered keratophyre with large phenocrysts.
22	0	60	0	74	Green-grey to pink keratophyre with large phenocrysts. Sporadic quartz and carbonate veins containing minor hematite.
60	0	113	4	75.5	Pink to green-grey keratophyre with moderately large phenocrysts. Cleavage well developed in places. Small quartz carbonate and fluorite veins.
113	4	129	6	99	Strongly mineralized keratophyre with numerous small veins comprising quartz, carbonate, calcite, pyrite, fluorite and barytes. Several small patches of barytes between 128′ 2″ and 129′ 6″.
129	6	140	4	95	Intensively mineralized green-grey keratophyre with numerous quartz, carbonate and barytes veins.
140	4	158	5	66	Pale green-grey keratophyre with small phenocrysts. Strong fractures and minor carbonate veins.

Analysis of core from 128′ 2″ to 134′ 6″ (core recovery 83%) indicated:

$BaSO_4$: — 24.3%
FeO: — 3.3%

Summary Core Log D.D.H.: M.H. No. 3.

Location: 30 chains W of Zeehan Road, just N of Strahan Road Junction.

Bearing: 147°M.

Dip: 50°.

Depth: 205 feet.

From— ft.	in.	To— ft.	in.	Recovery %	Geological
0	0	20	0	20	Weathered keratophyre with large phenocrysts.
20	0	80	0	80	Pink to green very massive keratophyre with large phenocrysts. Sporadic quartz-carbonate veins and fractures.
80	0	98	9	82	Pale pink to green-grey keratophyre with moderately large phenocrysts. Higher proportion of small quartz-carbonate veins.
98	9	113	0	71.5	Pale green-grey keratophyre with marked increase in small quartz-carbonate fluorite veins.
113	0	125	6	92	Massive quartz veins containing carbonate, fluorite and barytes. At 124′ 5″ 1′ 1″ barytes vein containing abundant impurities.
125	6	137	6	85	Green-grey keratophyre with small veins of quartz, carbonate and barytes.
137	6	164	0	84	Pale green-grey massive keratophyre with moderately large phenocryts and quartz-carbonate veins.
164	0	170	0	87	Pale green-grey keratophyre with numerous quartz, carbonate and barytes veins.
					167′—7″ vein of quartz, carbonate barytes and albite.
					167′ 10″—2″ vein of barytes and barytes impregnation.
					169′ 8″—4″ vein of barytes and minor quartz and carbonate.

From— ft.	in.	To— ft.	in.	Recovery %	Geological
170	0	205	0	71.5	Pale green-grey keratophyre with moderately large phenocrysts. Minor quartz-carbonate veins with a little barytes and pyrite.

Analysis of core from 165' 3" to 170' (core recovery 95%) indicated:

$BaSO_4$:—13.6%
FeO:—2.8%

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