24.

UR 1945/24-27

Rosebery,
Tasmania.

31st January, 1945.

The Director of Mines,
Hobart.

ASBESTOS ON PIEMAN RIVER.

Dear Sir,

Within a few days you will be receiving 13 samples of asbestos which I should like you to have tested for me. The locality in which they were found appears to be a new one for this mineral. It is situated about 2½ miles downstream from the Pieman Railway Bridge, on the right bank of the river. For some distance either side of the occurrence, the stream runs approximately N-S, parallel to the strike of the country.

Unfortunately, the outcrop has not been worked sufficiently to expose fresh material, but we are sending samples along for testing so that we may have an indication as to whether it is worth our while to go on with the job of developing the occurrence. Most of the samples are iron stained and all of them must show a weakening of the fibre due to weathering. Various types of material have been submitted, and we should like to know what possibilities if any, there are of using the different varieties. We should also be obliged if you gave us the price per ton, dressed, of the different classes of useful fibre among the samples. From these figures we could gauge the possibility of profitably working the deposit.

The mineral occurs in lenticular pockets and in veins of various widths in a uralitised dolerite (so-called diabase), probably of Ordovician or Silurian age. From its association with dolerite, the possibility of its being chrysotile is eliminated. It is, therefore, probably a variety of actinolite, some of which, in coarse, columnar aggregates, was found in the locality.

Quartz is fairly plentiful in the asbestos-bearing veins, some of it being in parallel growth with the fibres and some in clots external to the latter. However, it appears that this mineral is less plentiful as one gets further away from the contact of the dolerite with the surrounding, dense slatey rock.

If possible, we should like to know the optical properties and chemical composition of the fibres, so that the true nature of the mineral species may be established.

Following are details of the 13 labelled specimens submitted :

Sample 1. Slip-fibre. Probable axinite in wall-rock.

Sample 2. Cross-fibre and slip-fibre.
Columns of quartz parallel to fibres, probably cementing them in the vicinity and making them too brittle. Much has the appearance of wood-asbestos. (Large specimen).

Sample 3. Cross-fibre.

Sample 4. Slip-fibre, probably too brittle.

Sample 5. Cross-fibre and slip-fibre, probably less brittle than that of sample 4.

Sample 6. Country-rock; dolerite, probably uralitised. i.e., so-called diabase.

Sample 7. Relatively clean and fresh fibre, some of it suitable for optical and chemical tests.

Sample 8. Fibre containing much quartz. Could this be separated, and would it be of any use?

Sample 9. Weathered fibre. Quartz external.

Ssmple 10. More or less woody fibre.

Sample 11. Broken fibre.

Sample 12. Fibre which should tease out well in perfectly fresh specimens.

Sample 13. Fibre mixed with country-rock. Quality of fresh fibre would probably be good.

Thanking you in anticipation,

I am,

Yours faithfully,

(sgd) W.B. Dallwitz.

26.

8th March, 1945.

MEMORANDUM:

Report on Asbestos Samples from Pieman River Submitted by W.B. Dallwitz.

I have examined the asbestos samples submitted by Mr. W.B. Dallwitz and report as follows:-

The asbestos is an amphibole (actinolite) not the chrysotile variety of serpentine. Heated in a closed tube the fibre yields absorbed moisture but not copious combined water as does chrysotile.

Examined under the microscope the mineral has a pale green colour with distinct pleochroism, c yellowish green and a,b, bluish green, Absorption c>b,a. Refractive index about 1.64. The fibres appear rough when immersed in nitrobenzine (RI 1.545) and quite smooth when immersed in monochlornaphthalene (RI 1.64). The R.I. of the mineral is probably 1.64 ± 0.02. Double refraction is strong, but was not quantitatively determined owing to the indeterminate thickness of the very fine fibres. But in any case the D.R. is much too high for chrysotile but of the right order of magnitude for actinolite. Extinction is approximately straight.

A chemical analysis of the fibre has been requested from the Chief Chemist.

Mr. Dallwitz's provisional identification of axinite in sample 1 is confirmed by blowpipe tests.

A thin section was made of the country rock, sample 6, which was named in the field, dolerite (diabase). This rock is a pyroxenite consisting mainly of augite with subordinate plagioclase, uralite, ilmenite, magnetite and chromite, and secondary serpentine. The age of this rock is probably post-Silurian for it resembles ultra-basic rocks believed of this age found elsewhere in the state.

With regard to sample 8, the fibre would probably separate satisfactorily in the normal crushing and aspirating treatment. Once separated it should be of similar quality to the rest.

For future reference, these samples numbered 1 to 13 by Mr. Dallwitz have been given the official numbers 43X1 to 43X13 respectively.

SWCAREY

GOVERNMENT GEOLOGIST.

The Director of Mines,
HOBART.

27

6th June, 1945.

Dear Sir,

An asbestos sample (your No. 5) forwarded by you on 31st January has been analysed in the Department's laboratory with result shown in column 1 of the table below:

The optical determination of the mineral as actinolit and not chrysotile is confirmed.

Some other analyses of actinolite are included for comparison. Column 11 is a fibrous actinolite from Sulzbach which very closely resembles the Pieman River actinolite. The proportion of FeO is unusually high, the highest of which any record, but the combined FeO-MgO is normal, indicating that the Pieman River actinolite is at the extreme end of the actinolite-tremolite series. Fe_2O_3 is also unusually high which may be due to partial oxidation of these outcrop specimens. General experience is that increasing iron content reduces the spinning quality. However, the mineral has better heat and acid resisting properties than chrysotile and is particularly suitable for filter pads for filtering acid, fruit juices and the like.

	1	11	111	1V	V
SiO_2	53.32	54.60	56.88	56.96	54.88
MgO	15.10	16.98	26.43	22.33	18.94
FeO	13.25	12.80	3.26	2.24	-
CaO	11.68	12.81	12.35	11.44	12.15
Al_2O_3	1.46	-	1.84	6.77	2.60
Fe_2O_3	2.86	-	0.48	2.45	10.04
MnO	0.15	1.16	tr.	-	-
TiO_2	0.10	-	-	-	-
P_2O_5	tr.	-	-	-	-
Loss at 105°	0.40	-	-	-	-
Ignition loss	1.60	0.61	-	0.31	1.29
	99.92	100.76	98.96	100.05	99.81

1 Actinolite asbestos Sample 43X5 collected W.B. Dallwitz, Pieman River, 2½ miles downstream from E.B.R. Bridge (Ignition loss possible low owing to partial oxidation of FeO.)

11 Fibrous Actinolite, Sulzbach.

111 Actinolite, Felling, Austria.

1V Actinolite, Amelia Co., Virginia.

V Actinolite asbestos Section 7232M, Beaconsfield Tas. (N.B. FeO assayed as Fe_2O_3.)

Yours faithfully,

DIRECTOR OF MINES

Mr. W.B. Dallwitz,
ROSEBERY.