ABERFOYLE MINES

ORE RESERVE ASSESSMENT

AS AT

MARCH 11, 1980

Indicated mineable ore reserves

107800 tonnes @ 0.42% Sn   0.43% WO_3

ENDORSED BY :   Mine Geologist .... *(signature)*

                        Underground Manager .... *(signature)*

                        Manager .... *(signature)*

GEOLOGICAL RESERVES

ENDORSED BY :   Chief Mine Geologist ....

SUMMARY

Mineable ore reserves at 11th March, 1980 were 107,800 tonnes at 0.42% Sn and 0.43% WO_3 composed as follows :

	Tonnes	%Sn	%WO_3	MTU Sn	MTU WO_3
Aberfoyle	65260	0.54	0.27	35200	17600
Storeys Creek	11180	0.04	0.93	400	10400
Lutwyche	31360	0.30	0.60	9400	18800
TOTAL	107800	0.42	0.43	45000	46800

A detailed tabulation of ore reserves, level by level is attached. The classification categories and constraints are defined in the following text.

Description of Ore Type

Mineralization throughout occurs as cassiterite and wolframite in quartz veins ranging in width from a few cm up to 2 metres. Both vein width and grade of mineralization can vary widely over short distances along the strike and dip.

Ore reserve tonneages and average grades are those resulting from the aggregation of individual ore reserve blocks, defined for each vein by lateral development and regular intervals along strike.

All tonneages are calculated using a density of 2.56 tonnes/m^3 for both quartz vein and waste dilution.

All grades are derived from visual estimates along all development openings, of the proportion of mineralization in the quartz. These estimates are reconciled with actual production grades achieved and after the appropriate factoring and allowance for mullock sorted, the grades are applied to the ore reserve.

Sampling and assaying cannot be successfully applied to the sporadic (nuggety) mineralization.

RESERVE CLASSIFICATIONS

In decreasing order of confidence, reserves are classified as -
Measured, Indicated or Inferred.

Measured Reserves   -   Those whose tonnage and grade can be estimated
with a high level of confidence. Variability of
grade and vein width precludes this level of
confidence, and hence no reserves are reported
to this classification.

Indicated Reserves   -   Those defined at least in part, by development
in quartz veining. Quartz tonnages are calculated
from observed vein widths and distances along
strike and dip exposed by level and rise
development. Indicated ore extends to 6 metres
beyond such development for blocks developed on
one side only (except that no strike or dip
extensions are made to blind level or rise
development respectively), and as shown in the
diagram for blocks developed on two or more sides.

6m   6m   6m

Rise

Indicated Ore
Limit

6m

Level
Development

6m   6m   6m   6m
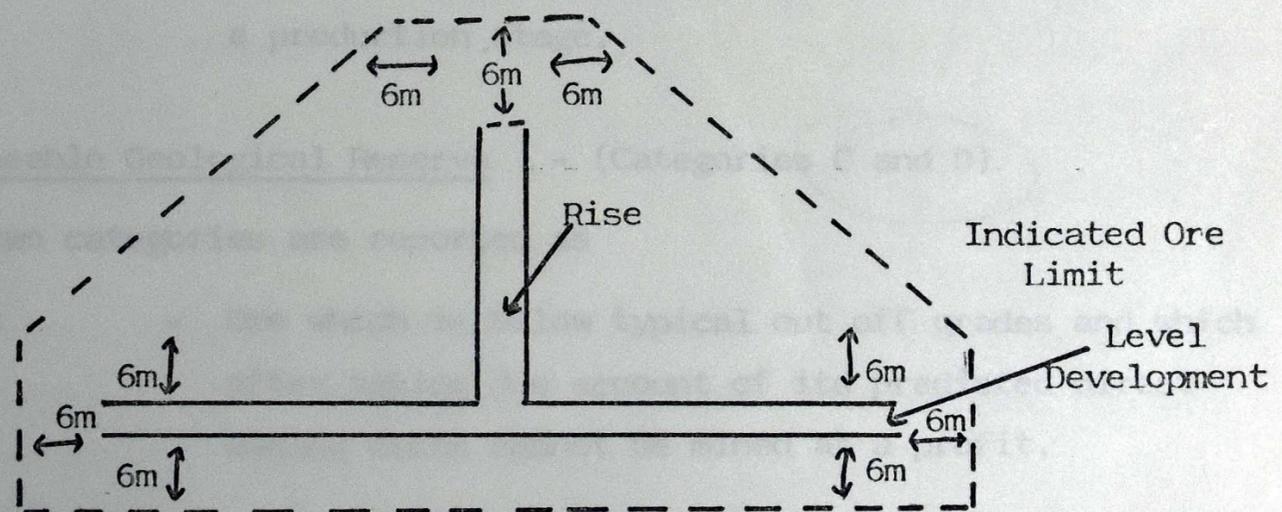
Where circumstances indicate an appropriate level
of confidence, data from diamond drill holes,
adjacent stoping, crosscutting etc., may be used
to extend Indicated ore limits, but only in
conjunction with development on at least one side
of the block.

Inferred Reserves   -   Those which extend 6 metres beyond Indicated ore
limits unless development information suggests
otherwise. Where extensive development and/or
diamond drilling information is available, inferred
ore may be judged to extend beyond the 6 metre limit.

2.

DEFINITIONS

1. ## Geological Reserves

   Mineralization which is potentially mineable, but without regard to
   profit. Mining plans need not have been developed.

   The geological reserves are subdivided into indicated reserves
   (Categories A, B, C, D.), and inferred reserves (Category E),
   depending on the degree of confidence with which tonnage and grade
   can be estimated.

   The indicated geological reserve is further subdivided into diluted
   indicated mineable (at a profit) reserves (Categories A and B), and
   non-mineable geological reserves (Categories C and D).

2. ## Diluted Mineable Ore Reserve

   Ore (diluted) above an appropriate cut off grade which can be mined
   at a profit.

   Category A   - Ore which is economically accessible at present costs -
                    ore which is developed to either the stope development
                    or production stage.

   Category B   - Ore which is economically accessible at moderately
                    increased costs (sandfill, development, rehabilitation)
                    i.e. requires moderate additional expenditure to reach
                    a production stage.

3. ## Non-Mineable Geological Reserve   - (Categories C and D)

   These two categories are reported as

   Sub-Ore   - Ore which is below typical cut off grades and which
                    after taking due account of its predicted direct
                    mining costs cannot be mined at a profit.

   Planned Loss - Reserve blocks either sub-ore or above cut off grade,
   Non-Recoverable but are non recoverable due to location i.e. shaft
                    pillars,stope pillars, level pillars, hazardous
                    previously abandoned areas.

4. ## Dilution

   Owing to the nature of narrow vein mining it becomes impractical to stope
   at widths less than about one metre. Consequently stoping of narrow veins
   will result in planned waste dilution.

   Planned dilution for Aberfoyle Mine and Lutwyche is estimated as the
   difference between the average vein width and a 1.22 metre stoping width.
   No account is taken of waste sorting from the ore stream.

At Storeys Creek where vein widths more nearly approximate the stoping width an historical dilution estimate can be made from production records of vein and stope width, and this estimate is considered to be more accurate than that for Aberfoyle Mine. For vein widths in excess of 1.22 metres, no dilution is added. ✕

5. Extraction Loss

Ore grade mineralization left as remnants as a result of the mining method. Open stope mining at Storeys Creek Mine neccessitates the leaving of random support pillars, the location and size depending on ore grade and ground conditions. It is estimated that 10% of the reserve blocks will be left as stope pillars.

Aberfoyle and Lutwyche stopes are mostly cut and fill mining, and require level pillars of 2.44 metres. Roof pillars are not required if there is no development on the level above a stope block.

6. Cut-Off Grade

The cut-off grade is that grade at which the value of production is equal to the cost of production.

✕ The mine costs, mill recoveries, and metal prices as outlined in the 1980 plan were used as the basis for determining cut off grades.

Total production cost per tonne ore milled		$89
Mill Recoveries	Sn	80%
	WO_3	80%
Metal Prices	Sn	$125/MTU
	WO_3	$125/MTU

Waste sorted from ore stream at Aberfoyle - 10% of ore hoisted, equivalent to a 10% upgrading in head grade. Planned waste sorting from Lutwyche is estimated to be 10%.

Thus the cut-off grade for Sn or WO_3 at Aberfoyle and Lutwyche becomes :

$$\frac{89}{125 \times 0.80 \times 1.10} = 0.80\%$$

Waste sorted from the ore at Storeys Creek averages 5%, equivalent to a 5% upgrading in head grade.

Thus the cut-off grade for Sn or WO_3 at Storeys Creek becomes :

$$\frac{89}{125 \times 0.80 \times 1.05} = 0.85\%$$

④

RECONCILIATION

Aberfoyle Mine

	Tonnes	%Sn	%WO$_3$	MTU Sn	MTU WO$_3$
(a) Reserves 28 Feb.1979	85150	0.6	0.2	51100	17000
(b) Reserves 11 Mar.1980	65260	0.54	0.27	35200	17600
(c) Ore extracted	26410	n o t	m e a s u r e d		
(b + c - a)	+ 6520				

Reduction of reserves at Aberfoyle resulted from depletion of known reserves by production.

The overall increase of 6520 tonnes above the 28th February, 1979 ore reserves is principally due to the mining of additional strike length of veins outside the original reserve blocks, and an additional 5710 tonnes in stopes 4-52.3-137 (Category A) and 5-54.5-130 (Category B) defined by development on 4 level. This has been offset by the effect of high grading Category A stopes 4-47.9-127, 4-50.2-144, 5-55.8-131, and 5-60-154 causing 2960 tonnes of lower grade areas of the stopes to be downgraded to sub-ore. Shrink stope 3-55.6-148 (500 tonnes) was removed from Category A to C as high costs would be required to extract the frozen ore from this stope. Also Category B stopes 2-60.4-164, 6-61.2-132, 8-58.6-129 and 9-55.8-107 totalling 5750 tonnes were downgraded to Category C due to low grades, or high costs required to bring the stopes into production.

Storeys Creek Mine

	Tonnes	%Sn	%WO$_3$	MTU Sn	MTU WO$_3$
(a) Reserves 28 Feb.1979	3750	-	0.95	-	3600
(b) Reserves 11 Mar.1980	11180	0.04	0.93	400	10400
(c) Ore extracted	12200	n o t	m e a s u r e d		
(b + c - a)	+19630				

This increase in the Storeys Creek Mine ore reserves is a result of additional veining being exposed and extracted as stoping proceeds along strike and dip of a vein, and by the upgrading of Category C blocks to Category A as they are opened up for development. As well as upgrading Category C blocks on 9 and 11 levels, this development has also exposed additional tonnage.

Lutwyche

	Tonnes	%Sn	%WO$_3$	MTU Sn	MTU WO$_3$
(a) Reserves 28 Feb.1979	23250	0.3	0.9	7000	20900
(b) Reserves 11 Mar.1980	31360	0.3	0.6	9400	18800
(c) Ore extracted	6270	n o t	m e a s u r e d		
(b + c - a)	+14380				

Of the 6270 tonnes extracted approximately 500 tonnes were derived from open stoping of Footwall Vein. The remainder has come from level drive, stope drive, and rise development. Additional ore has been defined on Footwall Vein due to rise and stope drive development, and on Battery Vein as a result of level development on 13 and 12 levels, in addition to stope drive and rise development.

A small tonneage of 880 tonnes has been defined above 12 level on Battery Vein as 12 level development and rising to 11 level proceeds.

A 2.44 metre high horizontal pillar above and below the level has been declared an extraction loss for all Lutwyche veins.

Based on the milling results of a 1000 tonne bulk sample mined from Battery Vein and Footwall Vein, and a study of visual grades for all the Lutwyche veins, the wolfram grade has been reduced from 0.9% quoted in the 28th Feb.,1979 ore reserve statement to 0.6%.

ORE POTENTIAL

Exploration development and diamond drilling is being concentrated on 13 and 12 levels at Lutwyche. Level development on South Battery Vein is advancing on a wide (76 cm average) well mineralized vein. It is possible that a considerable increase in strike length of Battery Vein may be defined. Development has exposed 40m of North Battery Vein on 12 level. This vein averages 40 to 50 cm in width and is well mineralized. A rise on this vein between 12 and 11 levels has advanced 6m above 12 level. The vein has widened to between 60 and 70 cm with strong cassiterite mineralization.

A diamond drilling programme is in progress to determine the presence of Kookaburra Veins on 13 level and to locate the faulted extension to Footwall Vein.

At the Aberfoyle Mine studies are being made of a number of Category C stopes with above cut off grade, for the purpose of determining if it is possible to upgrade any of these stopes to Category A. Apart from this the potential for additional ore reserves at Aberfoyle Mine is low.

Also the potential for additional ore reserves at Storeys Creek is low.

ABERFOYLE TIN LIMITED

DILUTED MINEABLE ORE RESERVE STATEMENT — ABERFOYLE MINE

Level	Indicated Geological Reserves (Categories A,B,C,D.)			Inferred Geological (Category E)		Non Mineable Geological Indicated Reserves (Quartz Tonnes)			Undiluted Indicated Mineable Reserve			Planned Waste Dilution	Extraction Loss (Pillars)	Indicated Diluted Mineable Reserve		
	Quartz Tonnes	Sn %	WO_3%	Ore Tonnes	Ore Grade CM%	Sub-Ore	Planned Loss (non recover.)	Sub-Total	Quartz Tonnes	Sn %	WO_3%	Tonnes	Tonnes	Ore Tonnes	Sn %	WO_3%
1	2920	2.23	0.51	*2.74* 2550	0.47	1520	550	2070	850	2.49	0.93	2790	77% — 0.28	3640	0.58	0.22
2	5010	2.28	0.87	*3.15* 4350	0.65	1770	300	2070	2940	2.24	1.32	10200	86% 1310 0.30	11830	0.50	0.30
3	4480	2.32	0.67	*2.99* 4650	0.67	1240	350	1590	2890	2.50	0.85	9240	83 980 0.31	11150	0.60	0.20
4	5320	3.14	0.71	*3.55* 1920	0.86	1560	1390	2950	2370	3.66	1.18	11270	84% 240 0.21	13400	0.64	0.20
5	9090	2.20	0.50	*3.18* 7000	0.44	5330	1250	6580	2510	2.87	0.87	8220	82.5 380 0.28	10350	0.67	0.20
6	6980	2.07	0.70	14840	0.53	3870	790	4660	2320	2.04	1.34	7360	—	9680	0.49	0.32
7	6670	1.71	0.45	1150	0.36	3080	3590	6670	—	—	—	—		—	—	—
8	8350	1.37	0.83	6400	0.56	5320	3030	8350	—	—	—	—		—	—	—
9	5760	1.29	0.78	6260	0.71	1590	3910	5500	260	2.70	1.60	1120		1380	0.50	0.31
10	930	1.97	1.76	300	0.63	60	70	130	800	1.90	1.90	3030	—	3830	0.40	0.40
11	600	1.03	0.69	—	—	110	490	600	—	—	—	—		—	—	—
12	1150	1.84	0.50	—	—	—	1150	1150	—	—	—	—		—	—	—
TOTAL	57260	2.00	0.68	49420	0.57	25450	16870	42320	14940	2.59	1.15	53230	2910	65260	0.54	0.27

ABERFOYLE TIN LIMITED

DILUTED MINEABLE ORE RESERVE STATEMENT — STOREYS CREEK MINE

Level	Indicated Geological Reserves (Categories A,B,C,D.)			Inferred Geological (Category E)		Non Mineable Geological Indicated Reserves (Quartz Tonnes)			Undiluted Indicated Mineable Reserve			Planned Waste Dilution	Extraction Loss (Pillars)	Indicated Diluted Mineable Reserve		
	Quartz Tonnes	Sn %	WO$_3$%	Ore Tonnes	Ore Grade CM%	Sub-Ore	Planned Loss (non recover.)	Sub-Total	Quartz Tonnes	Sn %	WO$_3$%	Tonnes	Tonnes	Ore Tonnes	Ore Grade Sn %	WO$_3$%
Adits	3650	0.1	0.5	350	-	-	3650	3650	-	-	-	-	-	-	-	-
1	1550	0.2	0.5	350	-	-	1400	1400	150	0.3	1.6	100	20	230	0.2	1.0
2	10350	0.1	0.6	1100	-	-	9750	9750	600	0.7	1.8	500	110	990	0.4	1.0
3	6400	0.2	0.5	650	-	250	6150	6400	-	-	-	-	-	-	-	-
4	3150	0.1	0.4	-	-	-	3150	3150	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	4950	-	0.5	900	-	500	4400	4900	50	-	2.0	50	10	90	-	1.0
7	6200	-	0.5	800	-	1950	3500	5450	750	-	1.6	600	130	1220	-	0.9
8	11050	-	0.5	2350	-	1650	8700	10350	700	-	1.6	550	120	1130	-	0.9
9	9900	-	0.6	1000	-	1550	6150	7700	2200	-	1.8	1800	400	3600	-	1.0
11	11150	-	0.6	3000	-	3950	4800	8750	2400	-	1.4	1950	430	3920	-	0.85
12	5800	-	0.6	6550	-	5550	250	5800	-	-	-	-	-	-	-	-
TOTAL	74150	0.04	0.55	17050	-	15400	51900	67300	6850	0.07	1.61	5550	1220	11180	0.04	0.93

ABERFOYLE TIN LIMITED

DILUTED MINEABLE ORE RESERVE STATEMENT — LUTWYCHE MINE

Level	Indicated Geological Reserves (Categories A,B,C,D.)			Inferred Geological (Category E)		Non Mineable Geological Indicated Reserves (Quartz Tonnes)			Undiluted Indicated Mineable Reserve			Planned Waste Dilution	Extraction Loss (Pillars)	Indicated Diluted Mineable Reserve		
	Quartz Tonnes	Sn %	WO$_3$%	Ore Tonnes	Ore Grade CM%	Sub-Ore	Planned Loss (non recover.)	Sub-Total	Quartz Tonnes	Sn %	WO$_3$%	Tonnes	Tonnes	Ore Tonnes	Ore Grade	
															Sn %	WO$_3$%
12	380	1.22	1.53	930	0.90	–	–	–	380	1.22	1.53	780	280	880	0.4	0.5
13	9450	0.94	1.97	8430	0.87	430	–	430	9020	0.97	1.94	20050	3680	25390	0.3	0.6
14	2940	0.92	2.02	9870	0.87	300	–	300	2640	0.98	1.95	5940	3490	5090	0.3	0.6
TOTAL	12770	0.94	1.97	19230	0.87	730	–	730	12040	0.98	1.93	26770	7450	31360	0.3	0.6