COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS

RECORDS:

1946/34

REPORT ON THE CHESNEY MINE, COBAR, N.S.W.

by

C.J. Sullivan

15928/65

REPORT ON

THE CHESNEY MINE, COBAR, N.S.W.

1946/34.

History.

The mine was first worked for gold from 1887 to 1896 during which period were produced some 10,000 tons of ore averaging 7 to 8 dwt. gold per ton. This ore came from the upper zone which had been leached of copper and enriched in gold. About 6,000 tons of gold-copper ore were produced from 1901 to 1903 and in 1904, the property was sold to the Great Cobar Syndicate; from then to the time of the closing of the Great Cobar Mine in 1918, Chesney and Great Cobar ore were treated in the same smelter. Andrews (N.S.W. Mines Dept. Rpt. Min. Res. No.17) states that incomplete figures show that the mine produced some 240,000 tons or ore from 1904 to 1911, the grade being unkown.

De-watering and equipment of the mine ~~was~~ were undertaken in 1942 at the request of the Commonwealth Government in order to help augment Australian copper supplies. Initially, the Commonwealth agreed to advance £27,000 towards the expense of this work, the terms of the agreement between the Commonwealth and the Company being set out in a memorandum from Mr. J.M. Newman to the General Manager of the Company dated 10.6.42. Although the information is not available in Cobar, it is evident that the advance of £27,000 was subsequently increased the amount shown below being £36,748.19.9, which may include interest.

1st Period of Operation.

Statement 1 which was recently supplied by the Sydney Office of the Company sets out the important facts concerning the Commonwealth advance and gives the results of the mining operations carried out during 1943 and 1944. At the end of that year, mining ceased, but by arrangement with the Commonwealth, the mine was kept unwatered until it was re-opened on 5th August, 1946.

It is evident from the statement that from the treatment of 61,294 tons of ore, a profit of £21,617.15.8 was made equivalent to 7/0½ per ton. This profit was made partly from relatively low-grade copper ore, the remainder of which it is not now intended to mine; the mining of this ore was assisted by the payment of a special subsidy of £20 per ton making the total price £120 per ton against a present price of £95 per ton.

2nd period of Operation.

The Company began mining again on 5th August, 1946, apparently under a further agreement with the Commonwealth whereby the Company was to retain the first £10,000 profit. There is no copy of this agreement on the field. At present there are 26 men employed on the mine and the output for October was 1,596 tons of ore. Statement 2 below shows the result ofthis operation to 27th October, 1946, which is the last period for which figures have been compiled.

Statement 2.

Results of Chesney Operations from 5.8.46 to 27.10.46.

Tons treated	Head Val.	% Recov.	Value of metals recov.	Prof.
3690	Au. 3.69 dwt. per ton	80.47	£5,711.19.1	£3,027.7.2.
	Cu. 3.00 per cent.	95.50	9,587. 0.5	

Statement 3 below shows an analysis of Chesney costs over this period of operation.

Statement 3.

Dissection of Chesney Costs 5.8.46 to 27.10.46

Ore Extraction	£1	9 10	
Development		2 1	
D. Drilling		8	
Treatment		16 1	
Smelting, refin., realisat.		15 8	48/8
Gold tax		2 6	
Operat. Prof.		16 5	66/10
Total value of ore.	£4	3 3	

Values based on gold @ £10.15.3 per oz., copper @ £95 per ton, silver @ 4/7 per oz.

The total chesney costs on this field, i.e. apart from the smelting and refining charges, have fallen from an average of 48/8 per ton to 44/6 for the last month and it is believed that the cost may be reduced to 40/- as production settles down.

Further Financial Considerations.

1. The Chesney ore is treated in the same plant as that dealing with the New Cobar production, and for the period 27.11.45 to 27.10.46 the New Cobar mine produced 56,659 tons of ore or approximately 5,000 tons per month. The milling costs are distributed between Chesney and New Cobar ore while overhead costs are distributed over the total tonnage from the mines and this enables the Chesney costs to be kept at a reasonable figure.

2. Statement 4 below shows that the Chesney ore is the richest being mined from the three deposits at the present time and also shows the highest profit per ton.

Statement 4.

Mine.	Value per ton recovered.	Operating cost	Operating. profit.
New Occident. (a)	£2 13 7	£2 9 3	4 4
New Cobar (b)	3 6 1	2 19 10	6 3
Chesney. (c)	4 3 3	3 6 10	16 5

(a) Calculated on a throughput of 28,234 tons from 15.4.46 to 27.10.46.

(b) Calculated on throughput of 56,659 tons from 27.11.45 to 27.10.46.

(c) Calculated on throughput of 3,690 tons from 5.8.46 to 27.10.46.

3. It is understood that the company is at present working on an overdraft from the Commonwealth Bank and has very limited cash reserves. This position has apparently been brought about by the continued payment of dividends without regard to the building up of reserves and by the unexpected fall in grade of the New Occidental ore. Thus, it is reported that over £100,000 per annum was paid out in dividends for a number of years prior to and during the war. It appears likely that

the Company has spent the £16,000 shown in statement 1 as being due to the Commonwealth. The Company may not make much profit from the New Occidental and New Cobar operations for some time as the margin is at present small and both these mines are faced with considerable development and exploration charges. A new discovery of major proportions by diamond drilling would of course change the whole outlook and might enable the Company to re-organise its capital structure and place itself on a sounder basis.

The Ore body and Workings.

The plans and sections of the mine have not yet been finalised and there is still much information to be added to them. So that this report can be followed however, a preliminary longitudinal section of the mine and a plan of No. 6 level are being forwarded.

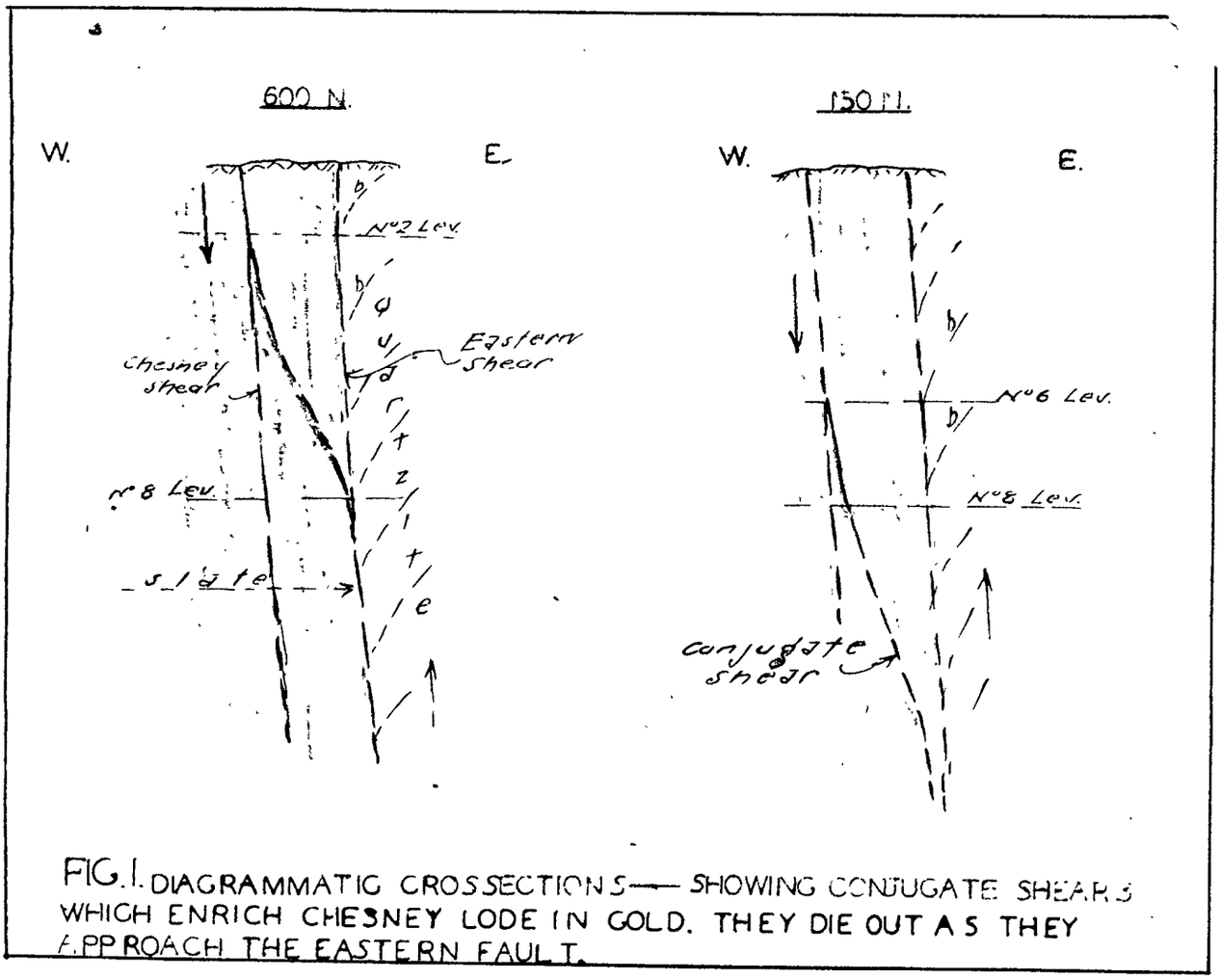


FIG. 1. DIAGRAMMATIC CROSSECTIONS — SHOWING CONJUGATE SHEARS WHICH ENRICH CHESNEY LODE IN GOLD. THEY DIE OUT AS THEY APPROACH THE EASTERN FAULT.

As will be noted from the section, an orebody some 600 feet in length has been opened by eight levels to a total depth of 925 feet. The plan of No. 6 level illustrates broadly, the arrangement of ore in the mine. The central 300 feet of the lode strikes at N.14 deg. W. and dips steeply (85 deg.) to the east. It is in a shear parallel in strike and dip with a reverse fault occupied by the Eastern Lode which is unpayable. The central portion of the Chesney lode shear contains low to medium grade copper mineralisation with a low gold content.

At either end of the central lode,, cross shears striking approximately N.30 deg. W. intersect the main lode system and carry the ore with them. The cross shears strike and dip towards the eastern fault and may be described as conjugate shears joining the

eastern fault to the Chesney shear. The eastern fault is a major feature which extends well north of the Chesney mine and also southward to the Occidental Mine, a distance of 1.25 miles. The deposits on this shear or fault are predominantly gold-bearing and in conformity with this, the cross feeders from the eastern lode have produced considerable gold enrichment where they intersect the Chesney lode. (See fig. 1) As will be seen from the longitudinal section, the pitch of the line joining the top of the two gold shoots and of the top of the intersection of the cross shears with the Chesney shear is at approximately 50 degrees to the southward which corresponds closely with the pitch of the hanging wall quartzite across the face of the eastern fault. Low-grade mineralisation extends on the surface well to the south of the present Chesney workings and it is considered that there is a good chance of finding further gold shoots in this direction where further conjugate shears may break across from the eastern fault to the Chesney shear.

Grade of Central Section.

The exact grade of the central 300 feet of lode which has been mined in places over a width of 15 to 30 feet, is difficult to determine, as very little assay information is available. Much of this section of the ore body was mined by the Great Cobar company because of its siliceous nature to mix with the basic ore from the Great Cobar Mine. Some of it was mined during the war by the present company but exploitation of this part of the mine has now ceased. In the following calculations and in those shown on the longitudinal section, the money values given are the values on the field, i.e. the total value of the concentrate to this company, allowing for the transport to Port Kembla, smelting, refining, realisation and gold tax. On this basis, 1 dwt. gold is deemed by the operating staff to be worth 9/- and 1 per cent copper, 12/-. During 1943, the Company milled close to 21,000 tons of ore from the Chesney Mine of an average grade of 1.62 dwt. gold per ton and 2.2 per cent copper for a recovery of 1.23 dwt. gold per ton and 2.13 per cent copper, and according to stope sections supplied by the company, some 14,000 tons of this may have been derived from the central section of the mine. On the basis given above, the head value of the 21,000 tons would be 41/- per ton, but if as is probable, some 7,000 tons of the ore came from the richer northern and southern gold shoots, the grade of the ore from the central section would be somewhat lower. An examination of the available assay information indicates that the richer portions of the oreshould average 40/- to 45/- per ton which is in reasonably close agreement with the above figures. Allowing for the inevitable losses in the plant and taking into account the fact that the operating cost is not likely to fall below 40/- per ton, it is unlikely that any substantial profit can be expected from this section of the mine.

Grade and Tonnage in Northern and Southern Gold Pipes.

Grade.

Again, the assay plans available are extremely limited and the best estimates of grade can probably be made from the milling results. From 29.11.43 to 26.11.44, when a large proportion of the total of 38,888 tons of ore was drawn from these stopes, the average head value was 3.6 dwt. gold per ton and 2.9 per cent copper from which 2.87 dwt. gold per ton and 2.17 per cent copper were recovered, equivalent to 52/- per ton. The 3,069 tons of ore treated this year which has all come from the north and south gold pipes, has yielded an average of 2,89 dwt. gold per ton and 2.85 per cent copper, equivalent to 60/- per ton. This agrees closely with the available assay information allowing for a 95 per cent. recovery of copper and an 80 per cent recovery of gold, and it is thus believed that the average recoverable grade of the gold pipes can be expected to be in the vicinity of 2.9 dwt. gold per ton and 2.8 per cent copper.

Tonnage.

As will be seen from the section, the northern gold pipe remains largely intact between Nos. 5 and 7 levels. The No. 7 level is being driven underneath the ore which has been outlined at this level by diamond drilling. A rise has to be extended from No. 7 to No. 5 level and a moderate amount of other development has to be carried out. Although there is no definite assurance that the ore will continue between these levels, there is a reasonable expectation that this block will yield 50,000 tons of a grade similar to that which during the past two months yielded an operating profit of 16/5 per ton (17/5 for the latter month). In addition, there may be 2,000 to 3,000 tons of ore to be obtained from the southern gold pipe above No. 8 level while the shoot is continuing strongly underfoot and is in fact, lengthening. It is intended to sink the shaft to No. 9 level within the next 12 months and a lift of 150 feet could be expected to yield approximately 25,000 tons of ore without excessive development costs.

Estimated Profits and Return of Commonwealth Capital.

From conversations with the Underground Manager, it is gathered that it is intended to maintain an output of 1,500 to 2,000 tons per month unless any unforseeable difficulties arise. From the information given above it will be seen that including ore expected from the southern shoot down to No. 9 level, there should be about 75,000 tons to be won above the No. 9 level which is approximately 4 years ore supply at 1,500 tons per month, and it is anticipated that the ore should be of the grade which has produced an operating profit for the past two months of 16/5 per ton. From conversations with the Secretary of the Company, it is gathered that the Company is entitled to charge depreciation on the plant and also interest on the capital which it has invested in the project, and this would reduce the operating profit. Taking these factors into account and allowing for uncertainties regarding the grade of the ore, it is reasonable to anticipate that a nett profit of 10/- per ton will be made on the ore, which on 75,000 tons would amount to £37,500. The Company has already earned some £3,000 profit, leaving £7,000 to cover the £10,000 due to the Company. This would leave about £30,500 which would almost liquidate the debt to the Commonwealth and would leave the Company with an operating mine and some valuable equipment, fully paid off.

In making the above estimate, a number of uncertainties cannot be allowed for. Thus it has been assumed that metal prices for the next four years, will remain at about the present level and that any changes in the hours of work will not unduly affect costs. The same remarks apply to the cost of supplies which the management expects to show an upward trend.

Conclusion.

Considerable doubt is felt as to whether the Company at present has the £16,700 shown in statement 1 as being due to the Commonwealth; it has probably been spent elsewhere. This point could, of course, be better verified from other sources. I am given to understand by the management that with a limited profit on both the New Occidental and New Cobar operations, a sudden demand for cash at this stage might seriously embarass the Company. However, the mine has 4 years probable ore in sight, which, within the limits inherent in any mining venture, could reasonably be expected to yield sufficient profit to nearly pay off the indebtedness to the Commonwealth within that period. During this time, the Company is likely to be struggling to maintain the overall operation on a profitable basis and it was gathered from the Directors, who recently visited the field, that repayment of the money will be avoided if possible. If the Occidental and New Cobar mines failed, the Chesney could not be worked at a profit but it is considered that every effort will be made by the Company to maintain itself on the field, as it considers that possible undiscovered orebodies represent large potential assets.

Though the chances are that Occidental and New Cobar operations will continue for the next four years, if projected drilling below the No. 14 level at Occidental is successful, it is probable that the shaft there will have to be stripped for some 2,000 feet which the underground department estimates would cost about £60,000 and would take about 8 months to complete. During this period the Occidental would not be producing (present output approximately 6,000 tons per month) and the overheads would presumably be distributed over the smaller tonnages won from the New Cobar and Chesney mines. Some of the men from the Occidental could be utilised on the other two mines, thus helping the position but the net result for the Chesney operation is likely to be a fall in profit as it would be asked to take a much larger share in carrying the whole organisation.

However, in spite of the uncertainties enumerated, it is believed that the Chesney Mine is likely to earn sufficient profit to repay the Commonwealth, provided the mine is made to carry only reasonable costs.

C.J. Sullivan.

(sgd.) C.J. SULLIVAN.
Geologist.

Cobar,
21st November, 1946.

STATEMENT 1.

NEW OCCIDENTAL GOLD MINES NO LIABILITY.

PAST INFORMATION OF CHESNEY MINE.

1.	The total Capital cost involved in preparing Chesney Mine for production was (includes cost of Unwatering; Plant etc)	£54,623 9 8
2.	towards which this Company contributed	£17,874 9 11
3.	and the Commonwealth Government advanced	£36,748 19 9
4.	Up to the present the Company has repaid the Commonwealth	£5,000 0 0
5.	leaving a balance of	£31,748 19 9

The Chesney Mine started production on 25th January, 1943, and operated until 24th December, 1944.

The production results during this period were as follows -

	Period from 25.1.43 to 28.11.43.	Period from 29.11.43 to 26.11.44	Period from 27.11.44 to 24.12.44.	Total.
Tons Treated	20,985	38,888	1,421	61,294
Gold Fine Ozs.	1,288.7819	5,589.3383	301.6608	7,179.7810
Silver Fine Ozs.	2,888.6875	6,418.0240	256.1080	9,562.8195
Copper Tons.	447.3059	844.3272	36.4367	1,328.0698
Value of Production.				
Gold	£13,467 15 4	£59,088 10 1	£3,323 13 0	£75,879 18 5
Silver	381 15 6	848 3 9	34 4 5	1,264 3 8
Copper	51,916 19 6	90,622 9 11	3,719 6 6	146,258 15 11
				£ 223,402 18 0

STATEMENT 1 contd.

PAST INFORMATION OF THE CHESNEY MINE.

As you are aware, Mr. M. Hackett, Cost Investigator, acting on instructions from the Commonwealth Government of Australia, conducted an Accounting investigation into our results and a statement was recently compiled which shows, viz :-

Surplus from Productive operations from 25.1.43 to 24.12.45.	£21,617 15 8
Expenses (unwatering etc.) from 25.12.45 to 5.8.46.	£4,879 18 8
Balance available to Commonwealth:	£16,737 17 0

It should be noted that these figures were compiled on the basis of a certain agreement with the Commonwealth Government under which, inter alia, there are charges for depreciation (12½%), royalty, etc. Further, the Chesney Mine operations were credited with a special Copper Subsidy of £20 per ton, which amounted to £10,889.4.8.

Apart from the above expenditure, the Company had to 25.11.45 spent £1,749.3.9 in its Geological Exploration compaign on the Chesney Mine.

Sydney,

30th October, 1946.

Main Shear

In lode E. of Main Shear

14/- ore | 11/- ore and less | 9/- ore | 14/- ore | Tr only

No Caunters: on this level

Cu leached

Level 1 101.03'

Beginning of Caunters

Approx. base of zone leached of Copper Carbonates

Caunter shears

15/- to 22/- ore

10/- to 18/- | Cu ore 6/- to 22/-

Level 2

20/- ore | Tr only

Northern limit of Caunter shears

Southern limit of Caunter shears

Pitch of F.W. Beds

Level 3 365.32'

Pitch of Gold Shoots

Caunters shears and Pitch of H.W. Quartzite

unpayable

35/- p ton

Level 4 465.25' — No Assays available

Approx. position of South Stope 18/- to 22/- ore Cu only

No Assay Information

Level 5 562.26' — Collapsed — No information

Probably 140/- to 145/- ore

Beginning of Countershears?

Probable Northern Limit

50000 Tons Ore

Marginal Copper Ore (@£100/ton)

Approx. 30/- Ore

Southern Limit of Countershears

Level 6

35/- and > 35/- ore

20/- to 30/- Cu ore Tr Au only

Tr Au only

20/- Cu ore

Level 7

25/- to 30/- Cu ore

Northern Limit of Caunters

Possible Shoot?

unpayable

unpayable

More D.D. needed to prove this change of pitch

Tr. Au only

No Assay Information

12/- to 28/- Cu Tr Au only

No information

Level 8 929.40'

Pitch of F.W. Beds

25000 Tons ore

Proposed No 9 Level

Ore values calculated on basis of 1% Cu = 12/- and 1 dwt Au = 9/-
These are Values on Field Oct '46 allowing for transport, smelting, refining, realisation

- indicates numerous samples 7.3% Cu
- " predominant Cu area 35/- to 40/- p ton
- " numerous Gold Assays > 3.5 dwt/ton
- " predominant Au Area 35/- to 90/- p ton
- " Area mined by N.O.G.M., N.L.

Date: October, 1946

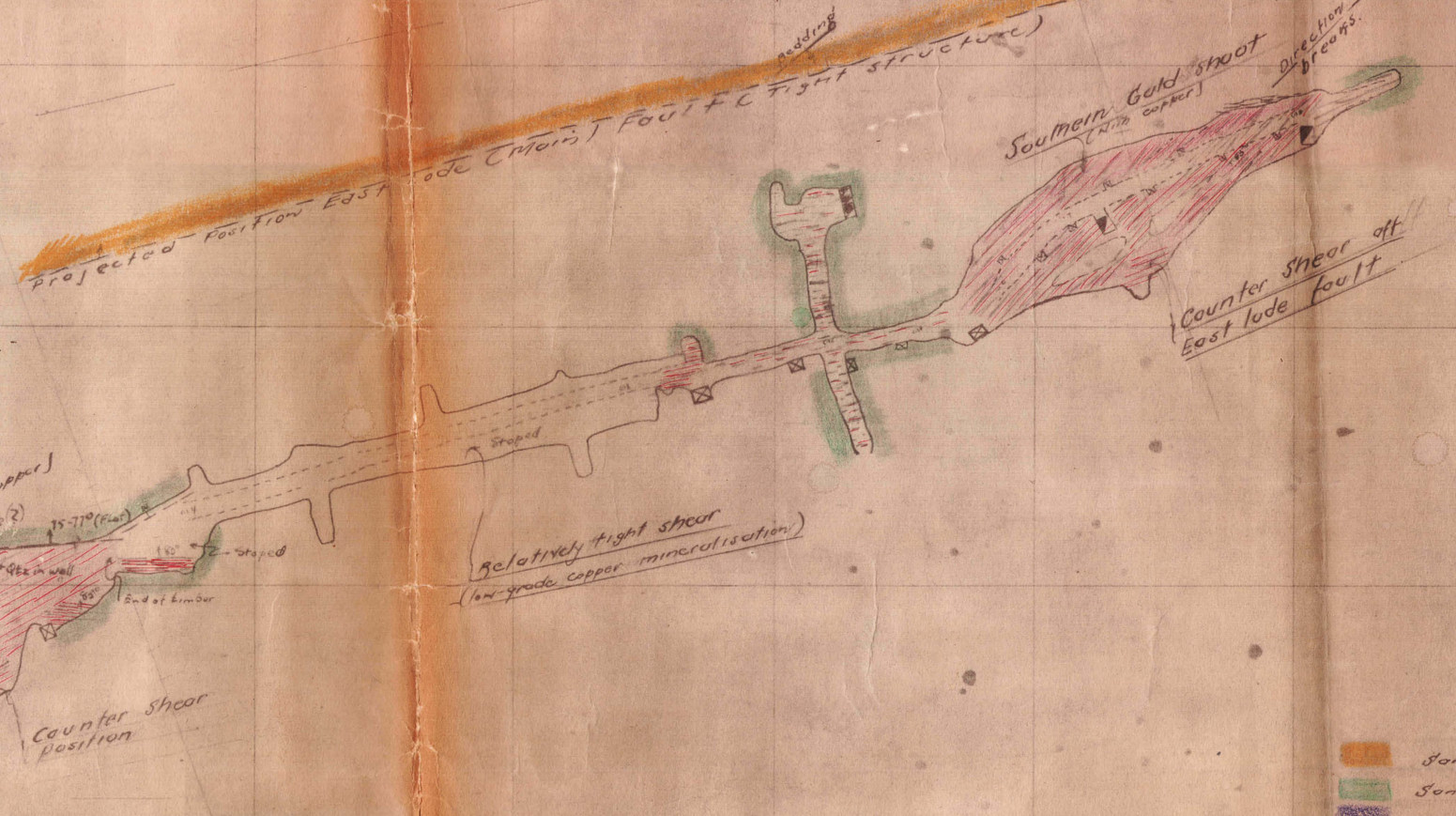
Scale 1" = 30ft

NEW OCCIDENTAL MINE

CHESNEY MINE

LONGITUDINAL SECTION

RECORD 1946/34



LEGEND

- Sandstone and quartzite
- Sandy slates
- Medium slates
- Fine grained slates
- Gold shoot
- Copper ore
- Mineralisation - including quartz and chert
- Shearing
- Jointing
- Bedding
- Axis of bedding

CHESNEY — No 6 LE

G.L.