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COMMONWEALTH ALUMINIUM CORPORATION LIMITED

EXPLORATION DEPARTMENT

E.L.7/74 - MOINA

AREAS COVERED BY MOINA SHEETS 1, 2, 3

1979 UPDATE

and

MOINA SHEET A

REPORT ON ALL INVESTIGATIONS TO AUGUST, 1979

MICROFILMED

OPEN FILE

P.W. ASKINS.

August, 1979.

133002

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*TAS-79-356 to 373	Geological sections, north-south sections.
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1. INTRODUCTION

This report is an update of all activities in Moina Sheets 1 to 3, previously comprehensively reported in "Askins, P.W., September, 1978, E.L. 7/74 Moina, Areas covered by Moina Sheets 1, 2, 3. Report on all investigations to September, 1978". This report also covers all activities on the Moina Sheet A area, east of Moina Sheet 1 (east of the Shepherd and Murphy Mine).

At the renewal date of 18th July, 1979 the previous area of 488 km^2 was reduced to 405 km^2 by relinquishing an area east of Mayberry and a small area of overlap of the National Park in the south west of the licence area. The present E.L. boundary is as shown on Fig. 2.

The Exploration Licence was transferred from Comalco Ltd. to the name of Commonwealth Aluminium Corporation Ltd., early in 1979.

2. LITERATURE

An update of all references pertinent to the area is appended.

3. GRIDDING

Extra areas were gridded on Sheet 1 and Sheet A. The present extent of gridding is shown on Figs. 3A and 3B.

Slopes read during the gridding for Sheets 1 and A are shown on plans TAS-78-234 and 245.

The grid extensions for Sheet 1 were carried out under contract by Poltock Bros. The starting points for each grid line were adjusted to their correct position using as a basis the survey of the original grid by Urban Planners & Surveyors.

The eastern most part of Moina Sheet A (lines 2700E to 3200E) were also cut under contract, but the remainder of the grid was done by Comalco personnel. The Moina Sheet A grid lines have been constructed to an unknown extent at 5° west of magnetic north presumably due to compass variability.

4. GEOLOGICAL MAPPING

Moina Sheet 1, Shepherd & Murphy area has been completely revised and includes mapping of the grid extensions. See plan TAS-79-302. Moina Sheet A mapping is on TAS-79-280.

5. LEASE TENEMENTS

Sheet A Area.

The area of Sheet A is partially covered by several mineral leases. These are shown on Fig. 4. Leases which are currently under option to Comalco are shown in red.

The tenement situation, particularly with regard to option negotiations, has proved to be very difficult and complex. No attempt will be made to give a detailed account here.

At present Comalco has an option agreement with V.J. Woodhouse and L.J. Singleton over leases 6M/72 and 8M/72. A copy of the option agreement is in appendix 13. Originally lease 7M/72 was included in the agreement but the lease was forfeited by a Mr. M.T. Ellis and is now lease 66M/78. Leases 6M/72 and 8M/72 are under exemption from labour covenant until December 3rd, 1979.

Comalco has attempted but failed to negotiate an option over lease 138M/69 held by J. Johnson. The main hitch to an agreement has been a current tribute agreement over the lease held by L.J. Singleton. Whilst negotiations proceeded we were verbally permitted to grid and map the lease area.

No formal negotiations over the small leases 24M/60 and 17M/60 have been attempted, but in both cases the owners consented verbally to allow us permission to grid and map the area. In the case of 24M/60 we are no longer permitted entry.

Copies of survey plans for all leases are held in the Devonport office, except for 6M/72 which has not been completely surveyed.

Sheet 3 Area. (Lea River Area)

A mineral lease 23M/64, 40 acres held by a D.G. Clark of West Pennant Hills, N.S.W., covers the Stormont mine. According to the Registrar of Mines the application diagram shows that the open cut adit is almost in the centre of the lease.

We were previously unaware that this lease existed. No-one to our knowledge has worked the lease for the past 4 years.

A search was made for the lease peg, stated to be in the SW corner 2.4 miles 220° magnetic from the confluence of the Iris and Lea Rivers, but the peg could not be found.

6. GEOLOGY OF MOINA SHEET A AREA

Details of the geology of this sheet are on plan TAS-79-280.

In summary there are Cambrian acid pyroclastics ("porphyries") and clastics overlain unconformably(?) by thin Roland Conglomerate with Moina sandstone above. All of these rocks have been affected by Tabberabberan folding and faulting and various degrees of mineralization and metasomatism are associated with the Devonian Dolcoath granite which must occur at shallow depth. Tertiary basalt covers much of the area to the south.

A number of east west quartz veins carrying wolframite and lesser cassiterite occur in the area. These include the All Nations lode, the Lawkemlaw, the Pig and Whistle. A small lens or pipe like body of brecciated quartz and conglomerate at the conglomerate-Cambrian porphyry contact carries wolframite at the Lawson & Rileys. Full details of the mineralization in these lodes is in various Mines Department publications and unpublished reports, and no attempt will be made to cover that data here.

Thin greisen bordered veinlets and fractures are common in the Cambrian porphyry, particularly in the zone of the Bismuth Creek Fault which cuts through the area. The Iris mine is an eluvial tin-tungsten mine covering lease 138M/69, now largely worked out. The cassiterite and wolframite in the eluvium are derived from weathering of the greisenized porphyry, probably from a more intensely greisenized area which may have existed under the conglomerate only a short distance above the present ground surface.

A model of the style of greisen alteration and mineralization which was thought to occur is in Fig. 11. Mineralization in greisen stockworks was envisaged (a) in the Bismuth Creek Fault zone and (b) surrounding the quartz lodes, and (c) in a carapace below the conglomerate which could have acted as an impermeable trap for mineralizing fluids rising from the granite below.

Holes SMD 26 and 27 were drilled to test for greisen stockwork in the Bismuth Creek Fault zone, but did not intersect any significant greisenization nor mineralization (see section 13, Diamond Drilling), but more greisenization could have occurred in the now eroded carapace below the pre-existing conglomerate above the fault.

A greisen stockwork could occur below the All Nations lode, corresponding to an I.P. resistivity high and magnetic low, as discussed elsewhere. We had planned to drill this target, however the lease 7M/72 covering this area was forfeited and we do not any longer hold tenement in the bulk of this area.

Petrographic descriptions of the completely altered sericitized porphyry outcrop immediately under the conglomerate, and relatively unaltered porphyries from elsewhere, are in Appendix 14.

Some surface rock sample analyses from this area are in Section 8, Rock Samples.

The Moina deep lead probably commences south of the Bismuth Creek Fault and flows into the Shepherd and Murphy Mine area. Results of testing in this possible lead are in Section 10.

7. WRIGGLITE STUDIES

T. Waite completed his honours thesis (Waite, 1978) and petrographically described and analysed wrigglite and associated calc-silicate rocks, limestone and 'quartzites'. It is the most comprehensive set of petrographic descriptions and whole-rock analyses available to date.

Dr. T.A.P. Kwak from La Trobe University is continuing studies on the wrigglite. A partial report on his studies of the area

is in Kwak (1978). Some miscellaneous analyses of greisenized granite are in Appendix 1.

A Mr. J. Wright has commenced a PhD study at La Trobe University on the mineralization of the region as a whole. No data are yet available from this study. See Appendix 2 for some details.

Dr. Shen-Su-Sun of the CSIRO Mineral Science Labs, North Ryde has samples from Moina for sulphur isotope studies, see Appendix 3. No results are yet available.

Dr. D. Green of the Department of Mines has been carrying out microprobe work on the distribution of Sn in wrigglite. Details available to date are in the section on Beneficiation.

8. ROCK ANALYSES

Surface Rock Sampling, S & M area.

Samples which were collected by G. Weste in 1975, were not previously analysed for Sn, W. The prior analyses and details of locations are in Appendix 10 of the previous report. Analyses for Sn, W and other miscellaneous elements are in Appendix 4.

Samples from the eastern costean at the S & M mine were not previously analysed. They have been analysed for Sn, W. Results are in Appendix 5.

Tin varies up to a maximum of 7200 ppm over 1 metre, in these samples. The average Sn, W contents for each area are:

(a) primary crusher site: 2700 ppm Sn, 730 ppm W

(b) near main shaft: 1900 ppm Sn, 660 ppm W

(c) immediately east of main shaft: 3100 ppm Sn, 1550 ppm W including the 7200 ppm Sn analysis over one metre, and another sample with 5400 ppm W over one metre

(d) eastern costean in wrigglite: 2870 ppm Sn, 1490 ppm W with maximum values of 6000 ppm Sn, 4200 ppm W in one sample over 2 metres.

The highest Be analysis so far found from the S & M area, 1000 ppm, was obtained in sample 1023, primary crusher area.

Rare earths in fluorite in wrigglite, S & M area.

A check on the rare earth content of the Moina fluorite was made. A beneficiated sample relatively rich in fluorite from the Department of Mines (R 731 grind B, NICFC) was analysed by Amdel.

CaF_2	35.8%	(SIE code E3)
Sn	1650 ppm	(XRF code B1)
W	2450 ppm	(XRF code B1)
Y	30 ppm	(emission spectro, semi-quant.)
La	<50 ppm	(emission spectro, semi-quant.)
Ce	<300 ppm	(emission spectro, semi-quant.)
Yb	<1 ppm	(emission spectro, semi-quant.)

Because these main rare earths were not detected by emmission spectroscopy no analyses for the remainder of the rare earths were attempted.

Moina Sheet A, analyses.

A few rock analyses from the Iris Mine area are in Appendix 5A.

The head grade of eluvium is 2500 ppm Sn and 2000 ppm W, so it is reasonable to expect that the Sn and W content of the bedrock below would be less than this.

The small actinolite rock outcrop on the Dolcoath road (presumably a metasomatized calcareous rock interbedded in the Cambrian pyroclastics) carries only 500 ppm W and negligible quantities of other elements.

9. GEOCHEMICAL SOIL SAMPLING

Moina Sheet A Area.

Two trial lines of samples were taken in this area and subsequently all of the area in lease 6M/72 was soil sampled. The remainder of the area has not been sampled mainly because of the contamination in the extensive old eluvial workings, but also because we did not gain formal options over some of the leases in the area.

The trial lines were at 2100E and 2700E; all analytical data plus method of sampling and analysis techniques are plotted on plan TAS-79-246. Line 2100E was sampled at various depths; the results are plotted on plan TAS-79-247. Tin and tungsten do not show any clear trend towards concentration at either

the top or bottom of the soil/weathered rock profile. The highest values close to bedrock are 540 ppm Sn and 390 ppm W, so the bedrock content can be expected to be lower than this.

Data for lease 6M/72 are also plotted on TAS-79-246, and contours for tin, tungsten and bismuth are on plans TAS-79-343, 344, 342 respectively. A distinct Bi and W anomaly trends south east from the old Lawson & Rileys Mine. It was thought possible that a vein system might be responsible for this anomaly; there is very poor outcrop. However hand trenching failed to locate any significant mineralization in the underlying Cambrian "porphyry", so the anomaly is probably due to slopewash scree moving downslope from the pipe like mineralization at the Lawson & Riley's.

10. TRENCHING AND AUGERING, MOINA SHEET A AREA

Lease 6M/72

Costeaning was attempted in the distinct W - Bi anomaly trending south east from the Lawson & Riley Mine but the bulldozer got bogged on the Old Dolcoath Road and the contract was terminated. Instead a long trench to bedrock was dug by hand - this revealed barren Cambrian "porphyry" with only one barren quartz vein a few cm wide with a greisen alteration selvedge. The anomaly is therefore probably due to a scree from the Lawson & Riley mine; no further work will be carried out. A log of the trench is shown as an inset on plan TAS-79-280.

Trenching, Moina Deep Lead.

A distinct resistivity low trending north west from 2100E/1100S to 1400E/500S was thought to correspond to the Moina deep lead. Where the deep lead was worked up slope from the Shepherd and Murphy lodes (on Sheet 1) it carried high cassiterite and wolframite values. The source of these values must be upstream in the original creek, and the upstream watershed is interpreted to be the area now covered by the Iris Mine and Lawkemlaw mine. The present topography over much of the area is possibly similar to the pre basalt topography because basalt has only just been eroded off this region. On the basis of topography and mapped geology it was therefore thought that the resistivity low was the Moina deep lead where basalt was thin or absent.

Trenching with a hired O & K RH9LC hydraulic trench digger was attempted to test for buried cassiterite/wolframite in the deep lead. However the main section of the deep lead was not reached; only variously weathered basalt with one patchy inter-

bedded alluvium layer was found. Alluvium was carefully panned down and analysed and found to be almost barren of cassiterite or tungsten minerals. No other valuable heavy minerals were found, see microscope determination, Appendix 6. Because of basalt overburden greater than 5m thick the relatively small size (guestimate 38000m^3 of 0.7% Sn (see Appendix 6)), means that the deep lead is likely to be of a size to interest only a small company.

The position and logs of all trenches are shown on plan TAS-79-280. Analytical and other data is in Appendix 6.

Augering, alluvium area.

A few hand auger holes were dug in alluvium covered areas on lines 2500E, 2600E around 900S to 1025S. Data on the samples is in Appendix 7. Some alluvium rich in coarse cassiterite and wolframite occurs at 2600E/900S and 925S, but from geological mapping the potential alluvial area is only about 45,000m^2 in area, and from the augering it is about 1m deep, and hence is of a size only to interest a small scale miner.

11. PROTON PRECESSION MAGNETOMETER SURVEYS

(Note for gammas, read nanoteslas (nT)).

Sheet 1, Shepherd & Murphy area.

The southern extensions of the grid were covered by ground proton precession magnetics, as was done previously i.e. using a Geometrics G 816 proton precession magnetometer (or equivalent) mounted on a 3 metre high pole, readings every 25m along north south lines spaced 50m apart. The data has been added to drawing TAS-78-139 and the contours added to drawing TAS-77-78.

No significant extensive anomalies related to possible skarn mineralization were found.

Sheet 2, Iris River Area.

A survey was made over the area around the Tea Tree Creek skarn body, where previously there was only fluxgate data. This was done to better define possible drill targets. Data has been added to drawing TAS-78-142 and contours added to TAS-77-80.

The distinct fluxgate anomalies were confirmed - the anomalies are relatively small 200m x 50m and 100m x 50m but were thought

to warrant drilling because (a) the skarn nearby, outcropping and intersected in Mines Department holes DOM2, 3 is very pyrite rich - this is interpreted to be near surface alteration of pyrrhotite. Although this skarn contains only 0.2% Sn, concealed skarns could be tin - pyrrhotite rich; (b) the anomalous areas are basalt covered. One hole (SMD 31) was subsequently drilled. For results see below.

Sheet 3, Lea River Area.

No proton precession survey had been previously carried out on this sheet. An area around Fletcher's Adit and east of Stormont Gold - Bismuth Mine was surveyed, in order to better define possible drill targets. Data and contours are on plans TAS-79-250 and 251 respectively.

One anomaly is about 75 x 150m in dimension centred at 2800W/1550S. It is covered by basalt and could be due to gold rich skarns as at Stormont, however its relatively small size does not make it an attractive target at this stage.

The area north of Stormont including Fletchers Adit has only spotty anomalies - this and the limited outcrop suggests that only skarn remnants remain on calc-silicate rock (transitional between original sandstone and limestone). Nevertheless spotty high Au and Sn values were obtained in rock samples from this area collected in previous years, so the area might be worthy of future further evaluation in conjunction with the anomaly at 2800W/1550S.

Sheet A area.

The entire gridded area was covered in the usual manner. Data and contours are plans TAS-79-248 and 249.

A weak magnetic low (coloured blue) is centred on the All Nations Lode, and has the same trend as the lode. This is interpreted to be due to hydrothermal alteration (obliteration) of pre-existing magnetite in the Ordovician sandstone and conglomerate and possibly in Cambrian rocks at shallow depth. An Induced Polarisation Survey (see below) shows a resistivity high in the same area, so it is thought that if the source is not merely barren altered silicified sandstone adjacent to the All Nations Lode then a stockwork of perhaps Sn - W mineralized quartz-greisen could exist at shallow depth.

A weak magnetic high coloured orange-red shades passes irregularly through the Bismuth Creek Fault zone. This is interpreted to be

a single NE-SW trending Cambrian slightly magnetic tuff unit folded and faulted and altered in the Fault zone. Alteration is assumed to be magnetite destructive in the fault zone because of the distinct breaks in the magnetic high along the fault. The overall sense of displacement of the unit is east block north, the opposite to the sense of displacement of the skarn at the Shepherd & Murphy Mine. This implies a complex history of movement on the fault. Based on magnetics this Cambrian unit passes into the southern most gridded areas of Sheet 1, but is overlain by younger rocks in this area.

12. ELECTRICAL INDUCED POLARISATION SURVEYS (by G. Weste)

SHEET 1, SHEPHERD & MURPHY AREA

A time domain gradient array survey was carried out over southern extensions to the Moina Sheet 1 grid. The aims of the survey were to (i) obtain information on the structure of the area (ii) determine the thickness of Tertiary basalt cover (iii) to detect any pyrrhotite skarn bodies.

Readings were taken every 25 metres along north-south grid lines 100 metres apart using a 25 metre potential dipole. Resistivity and chargeability data were plotted as profiles (Drgs. No. TAS-78-147 and 148) to overlay the geology sheet. Contour plans were drawn from the profiles (Drgs. Nos. TAS-78-145 and TAS-78-146). I.P. extensions to the east on this sheet are described with the Sheet A data.

Resistivity

Most of the southern extensions are basalt covered and show low resistivity and low gradients. In places (e.g. at 550E/700S and 500E/850S) small resistivity highs indicate that the prebasaltic relief was quite irregular and that the basalt now only forms a very thin cover over these particular locations. Resistivities over the rest of the basalt indicate a moderate thickness (probably 20-30 metres). However, deep lead material of similar low resistivity underlies the basalt and if the deep lead is present to any depth than the basalt maybe less than 20 metres thick.

Sandstone outcrops in the southern most part of the area. The data indicates a east-south-east to east trend in the south west corner of the sheet. Skarn outcrops on the south west margin of the sheet at 00/1300S. The data indicates that this body probably continues to the east. A narrow east west high resistivity trend lies just to the north of the skarn. This may be due to greybilly or sandstone (a chargeability high here indicates sandstone). The basalt-sandstone contact swings to the north west under shallow cover between 400m east and 800m east.

The lowest resistivities trend south east as a broad feature from the outcropping deep lead at 1200E/250S through 1700E 800S.

Chargeability

Chargeabilities over the basalt show characteristic low profiles with a few "kicks" (corresponding to small resistivity highs) over areas where the basalt is thin.

Where sandstone outcrops to the south chargeabilities show trends corresponding to those shown by the resistivity.

MOINA SHEET A.

A survey similar to that described above was carried out over part of the east portion of Sheet 1 into Sheet A. The aims of the survey were to:

1. follow the Bismuth Creek Fault and associated deep lead to the south east.

2. to gain information on the structures.

Data is plotted as overlay profiles (Drgs. No. TAS-79-306 and 307) and as contour plans (Drgs. No. TAS-79-303 and 308).

Resistivity

The Bismuth Creek Fault shows as a resistivity low trending south east and flanked by similarly trending resistivity highs. The strong highs to the south of the fault are due to conglomerate whilst the less pronounced highs north of the fault appear to be due to Cambrian porphyries.

In the east of the sheet and immediately to the south of the sandstone a broad area of low resistivity occurs. This low is pinched out by sandstone/conglomerate high resistivities to the east and is probably caused by basalt overlaying deep lead which is terminated at about 2300E/1150S.

Cambrian volcanics in the centre of the sheet show broad east-west trends. Similar trends are shown by the more resistive conglomerates and sandstones to the north. These trends are truncated by an erosional scarp in the north-west of the sheet.

A distinctive broad high trends east-west in the centre of the sheet. The low gradients indicate a lens shaped body and the high resistivities indicate conglomerate or silicified rocks as the source. This high swings north-west with the outcrop indicating a source within the Ordovician rocks.

Chargeability

Chargeabilities over the area are somewhat confusing due to instrument malfunction.

However a series of highs corresponding to the resistivity highs are caused by pyrite in the lowermost Ordovician sandstone.

A broad high also corresponds with the broad resistivity high in the north of the sheet.

13. DIAMOND DRILLING

Drilling continued on various targets using Comalco personnel and equipment. The drill was either a Joy 22HD mounted on a 6 x 6 GMC truck or a skid/trailer mounted Longyear 38.

Geological logs and analyses are in Appendix 8 and 9 .

Aims and summary of results of each hole are:

SMD 24 1380W/010S, 75° towards 215°M, depth 169.80m.
This hole was sited east of Bismuth Creek angled towards the fault, designed to further test the complex skarn zone, then explore for vein stockworks associated with the fault and mineralized greisenized granite. Very difficult drilling conditions were encountered and the holes were abandoned before target depths. Ultimately we lost over 80m of rods, 2 barrels, recovery gear and casing due to difficulties in Hugo's fault at about 86m.

A summary log of the hole is:

0	-	86m	Moina sandstone
86	-	89m	Fault zone (Hugo's fault)
89	-	98m	Wrigglite, altered weathered
98	-	125m	Wrigglite, calc-silicate rock, interbedded
125	-	126m	Sandstone
126	-	143m	Wrigglite
143	-	170m	Calc-silicate rock
170m			(Hole abandoned with 3m core in barrel down the hole)

Analyses for the wrigglite are typical of results elsewhere. However up to 7000 ppm Sn over 2.05 metres occurs in leached altered skarn. No concentration of sphalerite as in SMD 13 and 16 was intersected; the highest Zn value is 1.7% over 3.1 metres at 143.65m in calc-silicate rock.

SMD 25 1380W/010S, 65° towards 215°M, depth 44.80m.
This hole was commenced in an attempt to redrill the targets attempted in SMD 24, but difficult drilling caused the hole to be abandoned at 44.80m after penetrating only sandstone.

SMD 26 2150E/675S, vertical, depth 202m.
Designed to test for possible tin-tungsten mineralization in broken argillized greisenized Cambrian acid pyroclastics and clastics within the Bismuth Creek Fault zone on Sheet A. The hole was sited in lease 8M/72 which we hold under option. No mineralization nor greisenization was intersected; granite was not intersected.

A summary log is:

0	-	12m	Completely weathered tuff, very clayey
12	-	20m	Slightly to moderately weathered tuff
20	-	60m	Porphyritic quartz chlorite? welded tuff, very broken, locally pyritic.
60	-	162m	Tuffaceous siltstone-sandstone, well bedded.
162	-	202m	Porphyritic quartz hornblende? welded tuff some barren quartz veining at 162, and after 180.

Much of the core was analysed as a check against fine cassiterite not readily visible to the eye. The highest values occur in the topmost weathered rock - 240 ppm Sn and 100 ppm W; elsewhere values are negligible.

SMD 27 1900E/575S, vertical, depth 73m.

This hole is on Sheet A, outside the leased areas, within the Bismuth Creek Fault zone, and as for SMD 26, was designed to test broken argillized greisenized Cambrian acid pyroclastics and clastics. Unfortunately, as in SMD 26, no mineralization nor greisenization was intersected.

A summary log is:

0	-	14m	Completely weathered tuff, (clay).
14	-	73m	Porphyritic quartz hornblende(?) welded tuff, locally very broken and pyritic.

SMD 28 900E/025N, 65° towards 040°M, depth 101m.

The aim of the hole was to test a relative magnetic low trending NW through the centre of the main wrigglite body; this low was previously drilled with SMD 15, vertical, but had apparently missed the target. It was thought that the low could be due to altered and weathered wrigglite in a fault zone paralleling the Bismuth Creek Fault - altered wrigglite could carry cassiterite in in discreet recoverable grains rather than locked in garnet and magnetite.

A summary log is:

0	-	18m	Basalt with some included weathered brecciated wrigglite (? flow foot breccia)
18	-	32m	Wrigglite, HW - CW
32	-	38m	Wrigglite, MW - Frst.
38	-	42m	Wrigglite and calc-silicate rock, interbedded
42	-	44m	Calc-silicate rock, pale, in part wollastonite rich
44	-	48m	Wrigglite
48	-	50m	Calc-silicate rock, some hornfels (metasiltstone).

50	-	58m	Wrigglite, some calc-silicate rock
58	-	60m	Calc-silicate rock
60	-	91m	Wrigglite, some interbedded calc-silicate rock towards 91m
91	-	95m	Calc-silicate rock
95	-	101m	Wrigglite, calc-silicate rock, interbedded
101m			Hole abandoned due to mechanical breakdown.

The hole failed to intersect altered or weathered wrigglite or thick deep lead or any other feature which might explain the magnetic low. In fact the wrigglite at this point is the thickest and deepest in the whole area drilled to date.

Analyses of wrigglite from SMD 28 are typical of those found elsewhere.

SMD 29 1100E/050N, 55° towards 000°M, depth 122m.

The hole was designed to test wrigglite in an area with many scheelite bearing feldspar veinlets and also penetrate the Bismuth Creek Fault zone from the western side, to evaluate the nature of the skarn in the fault zone. It was thought that there may be altered skarns with free cassiterite or a stockwork of mineralized veinlets in the fault zone.

A summary log is:

0	-	23m	Wrigglite, many scheelite bearing veinlets
23	-	95m	Calc-silicate rock with many scheelite bearing feldspar veinlets, and some quartz-wolframite-cassiterite veinlets to 78m
95	-	96m	Wrigglite
96	-	100m	Limestone breccia in Bismuth Creek Fault
100	-	122m	Moina sandstone with no Sn, W mineralization

Tungsten occuring as scheelite/wolframite in veinlets in wrigglite and calc-silicate rock averages 1760 ppm from surface to 83.5m including 0.6m of 1.07% and 0.9m of 1.7%; tin averages 2180 ppm in wrigglite from surface to 23m and only 330 ppm in the calc-silicate rock below. It is possible that an E-W trending vertical "stockwork" of veinlets occurs here. With photometric sorting as a possible beneficiation method this area may warrant further exploration.

SMD 30 1100E/150S, 50° towards 180°M, depth 126m.

The hole was designed to test for possible quartz-cassiterite-wolframite stockworks in sandstone between No's 2 and 5 lodes. The target area lies within the general pay shoot area which plunges west within the east-west lodes.

A summary log is:

0	-	71m	Moina sandstone, only minor quartz veinlets with minor wolframite. Some calc-silicate layers to 45m.
		71m	Old working - in No.5 lode not shown on mine plans.
71	-	126m	Moina sandstone, only minor veinlets as above
		126m	Old working - No.4 lode. Barrel lost, hole abandoned. Working is at or close to No.3 level.

The hole did not penetrate through to No.2 lode, but because of the difficulty of drilling in old mine workings, plus the lack of significant veining in the core drilled, no further drilling was attempted.

There is one intersected interval of 0.55 metres at 62.45m of quartz veins carrying 1.46% Sn but elsewhere quartz veins are volumetrically insignificant and/or are relatively unmineralized. Much of the surrounding sandstone was analysed to check for non visible cassiterite but generally values do not exceed a few hundred ppm for Sn and for W.

SMD 31 1400W/700S, vertical, depth 41m.

Three drill sites on magnetic anomalies in the Tea Tree Creek area were cleared with a small dozer. Hole SMD 31 was the first site The target was pyrrhotite bearing skarns with possible significant Sn content. Since pyrrhotite skarn was not intersected the other two drill sites at 1300W/775S and 1275W/625S were not used.

A summary log is:

0	-	11m	Basalt
11	-	17m	Calc-silicate rock and magnetite skarn, interbedded
17	-	41m	Calc-silicate rock and hornfels (metasiltstone) interbedded.

The magnetite skarn is not wrigglite and contains only about 1% CaF_2; also Sn does not exceed 900 ppm and W does not exceed 75 ppm. The content of other elements including Be, Bi, Au is also negligible.

Stormont drill target.

Whilst the dozer was available preparing sites at Tea Tree Creek one site was prepared at 2800W/1550S, on a magnetic anomaly which could have a gold rich skarn source. This target has a relatively low priority because of its potential size and no hole has yet been drilled.

14. WRIGGLITE TONNAGES AND GRADES

A. GENERAL

A preliminary calculation of the tonnage and grade of wrigglite at Moina was made in September 1976 and included in the 1978 report.

Revised calculations have been made on the basis of extra drilling and a more refined interpretation of the geology.

All sections previously presented have been revised; these plus additional north-south sections form plans TAS-79- These north-south sections have not been used for the revised calculations; instead oblique sections approximately normal to the fold directions and faulting have been used.

B. SUMMARY

The total wrigglite resource is

"indicated" tonnage	26,500,000t
grade	approx. 18% CaF_2, 0.1% Sn, 0.1% W
Overburden over "indicated" wrigglite	8,500,000t
Ratio "indicated" wrigglite to overburden	3 : 1

The deposit is probably the largest single fluorite resource in Australia.

C. METHODS, ASSUMPTIONS

(a) Plans, sections

Based on all available drilling data, outcrop geology and underground mapping by the Mines Department. Structure contours on the base of the wrigglite and on the base of Tertiary alluvium and/or basalt were constructed. These are plans TAS-79- and . The structure contours are necessarily very interpretive in places due to the paucity of data, but show clearly that there are a series of anticlines and synclines, with axes trending NW sub parallel to the Bismuth Creek Fault, with probably vertical axial planes, and with plunges varying from about 65° NW close to the lodes in the south east to perhaps subhorizontal in the north west of the area. Close to the mine there seem to be more folds and steeper plunges than away from the mine but this might be partly an apparent feature due to the lack of data points.

Structure contours on the base of the wrigglite and on the fault in the area east of Bismuth Creek were also constructed; see plan TAS-79-

Geological sections along lines A to G normal to the folds were constructed, plans TAS-79- . These use the best fit of information from outcrop geology drill hole exposures, underground mapping of the Mines Department, the structure contour data, and on assumption that wrigglite is approximately outlined by the 62 500nT contour of the proton precession total field.

(b) Tonnage calculations:

Tonnage calculations are shown in Appendix 12. Tonnages are quoted as "indicated" in accordance with Aus. I.M.M. usage. The degree of faulting and folding in the prebasalt rocks and the rugged pre basalt relief make accurate "measured" tonnage calculations impossible. Closer spaced drill holes will be necessary to obtain "measured" tonnages. The "indicated" tonnage requires testing by further drill holes before it can be quoted with confidence.

The tonnage quoted is only in the main body of wrigglite; it does not include (i) the complexly faulted folded and altered skarn east of Bismuth Creek beneath Hugo's Fault (ii) deep wrigglite and pyrrhotite skarn intersected in SMD 5 and SMD 9 west of line 500E (iii) the wrigglite bodies on sheet 2 intersected in SMD 17 and in SMD 23.

Amongst the assumptions in the calculations are:

(i) only open pittable wrigglite calculated. Where the overburden/wrigglite ratio exceeds about 2.5 : 1, the wrigglite is not included in the calculation.

(ii) density of wrigglite 3.3

(iii) density of overburden 2.5 (basalt, some Tertiary alluvium and sediment.)

(iv) open pit slope 45°.

(v) in many places there is a grade boundary between wrigglite and fluorite bearing calc-silicate rock. Only mineralized rock with an approximate bulked average analysis of greater than 10% CaF_2 has been included in the calculation.

(c) Grade

The grade of wrigglite is approximate only, since only eight drill holes have penetrated "indicated" wrigglite. Table 1 summarizes weighted average grades. Average grade for the

whole wrigglite deposit is visually estimated from this table.

TABLE 1

WEIGHTED AVERAGE ANALYSES

DIAMOND DRILL HOLES, MOINA, WITHIN "INDICATED" WRIGGLITE

Hole No.	From metres	To metres	Interval metres	CaF_2 %	Sn ppm	W ppm	Remarks
ML 2	43.3	50.4	7.1	17.8	ca 800	ca 400	
	50.4	61.0	10.6	11.6	ca1400	ca 150	
	61.0	82.9	21.9	19.2	ca1500	ca 800	
	43.3	82.9	39.6		1350	540	bulked sample analysis
SMD 6	22.75	83.05	60.30	17.6	1400	910	
	22.75	67.70	44.95	19.5	1540	930	
SMD 7	1.00	55.00	54.00	20.9	1450	1030	
SMD 10	38.75	88.50	49.75	17.6	1320	535	0.35 interval of rich vein excluded
	38.75	76.00	37.25	19.2	1300	500	
SMD 11	31.00	74.00	43.00	16.9	1525	1020	1.35 interval of nil core recovery excluded.
	31.00	60.70	29.70	19.4	1540	1010	
SMD 15	33.00	105.00	72.0	18.0	1470	1250	
SMD 28	29.00	90.60	61.60	20.3	1740	940	
	90.60	101.00	10.40	10.1	1110	560	
	29.00	101.00	72.00	18.8	1650	890	
SMD 29	0.00	23.25	23.25	20.8	2180	2260	

Note: All intervals except for SMD 29 are approximate true thicknesses.

15. BENEFICIATION STUDIES

DEPARTMENT OF MINES INVESTIGATIONS

The Tasmania Department of Mines has continued beneficiation studies.

Scheelite and cassiterite concentration project, investigation R 758

Results have been received for initial work on this one tonne parcel of wrigglite from surface dumps. The entire one tonne has now been ground and processed.

This sample was collected by P. Askins and deliberately slightly biased by selection of pieces of wrigglite containing feldspar veinlets. This was done in an effort to raise the head grade of scheelite and so make beneficiation tests a little easier.

Head assays by the Mines Department R 758 are:

	19th May, 1978	1st February, 1979
Sn	0.3%	0.27%
WO_3	0.16%	0.19%
S	0.8%	0.8%
Ca	12.7%	12.8%
Fe (total)	21.2%	21.2%
Fe (soluble)	20.4%	20.4%

A complex grinding, tabling, magnetics and vanner circuit (plus some conventional flotation for sulphide recovery not cassiterite recovery) resulted in some significant conclusions, details of which are in Appendix 10.

(a) conventional gravity techniques are capable of producing a concentrate being 0.11% of the original mass containing 16.8% of the overall WO_3 at a grade of 24.8% WO_3 and 12.5% of the overall Sn at a grade of 31.2% Sn.

(b) 85% of the fluorine finishes in the vanner tailing product. The vanner tailing is 66.1% of the original mass and contains 59.1% of the original Sn and 51.9% of the original WO_3; That is about half of the Sn and WO_3 in the original sample reports with the fluorite and other calc-silicate minerals.

(c) the magnetic concentrate is 29.7% of the original mass and contains 20.2% of the original Sn and 14.4% of the original WO_3 and 11.7% of the original fluorine.

My comments are:

The Sn product from this study is as black cassiterite, and the WO_3 is as cream scheelite.

The Sn contained in the magnetite is about 20% of the overall Sn and is probably not recoverable. At least 12% of the Sn and17% of the WO_3 should be recoverable by conventional means as a by-product of fluorite flotation, but a critical question is how much of the Sn and WO_3 is irrecoverable (say finely dispersed in garnet or other calc-silicate minerals) in the vanner tailing where most of the fluorite is present.

The future direction of the investigations will be on the vanner tailings, as outlined in the letter 6th March 1979 in Appendix 10.

David Green has done some initial work on the vanner tailing to determine the tin distribution; his results are in Appendix 10. The work to date suggests that some cassiterite occurs as minute inclusions (not solid solution) in garnet and in fluorite. The results of the bulk of this study are awaited.

BILLITON INVESTIGATION

A 5kg sample was sent to Billiton Research Arnhem, via The Shell Company of Australia Ltd. Brief results of their investigation are in Appendix 11.

026

133027

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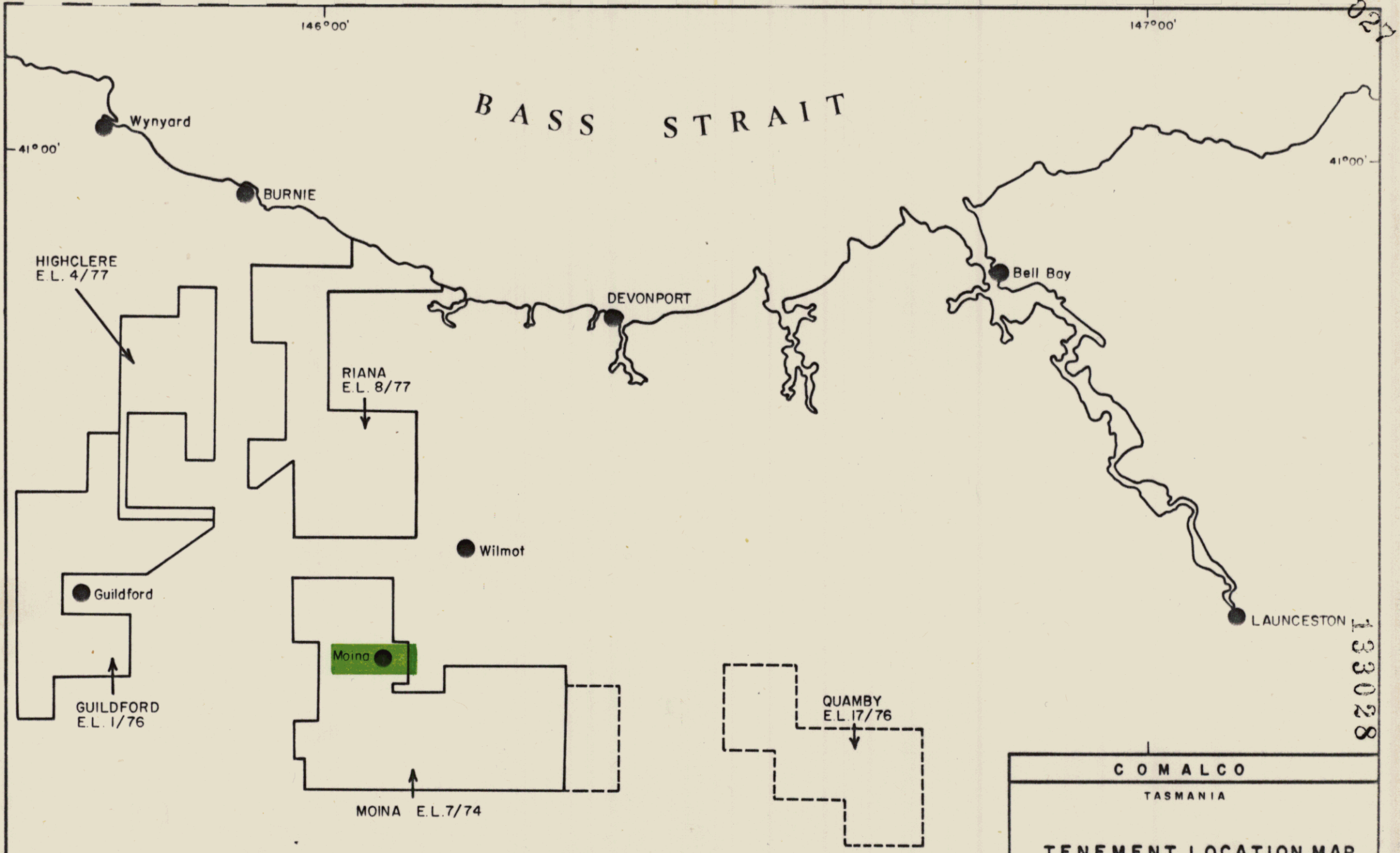


FIG. 1

COMALCO

TASMANIA

TENEMENT LOCATION MAP

Area covered in this report

Compiled: P.A.	Revised: July, 1979	Drawn: M.A.
Date: October, 1978	Scale: 1:500,000	Drg No. TAS-78-215

021

E33028

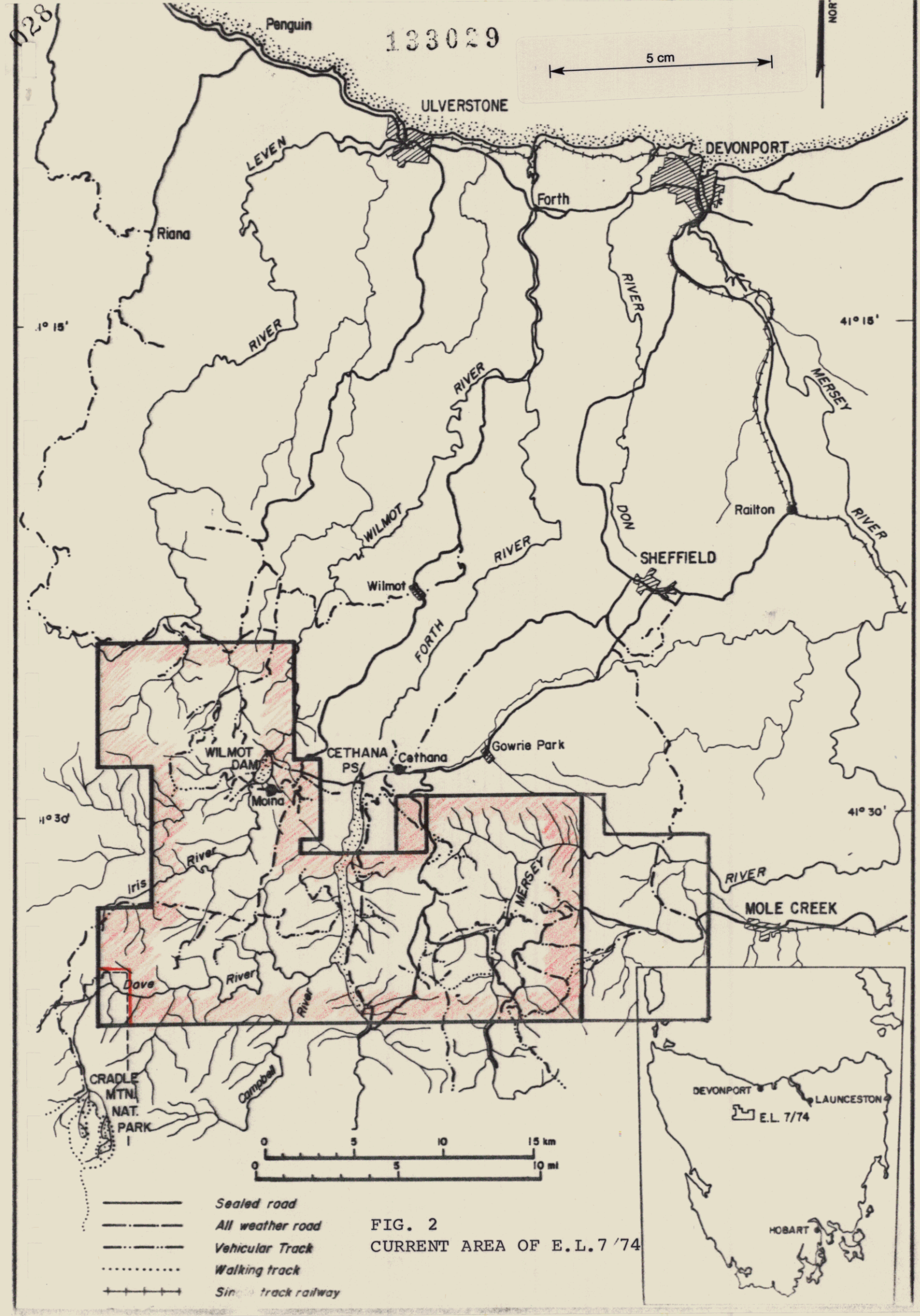


FIG. 2
CURRENT AREA OF E.L.7/74

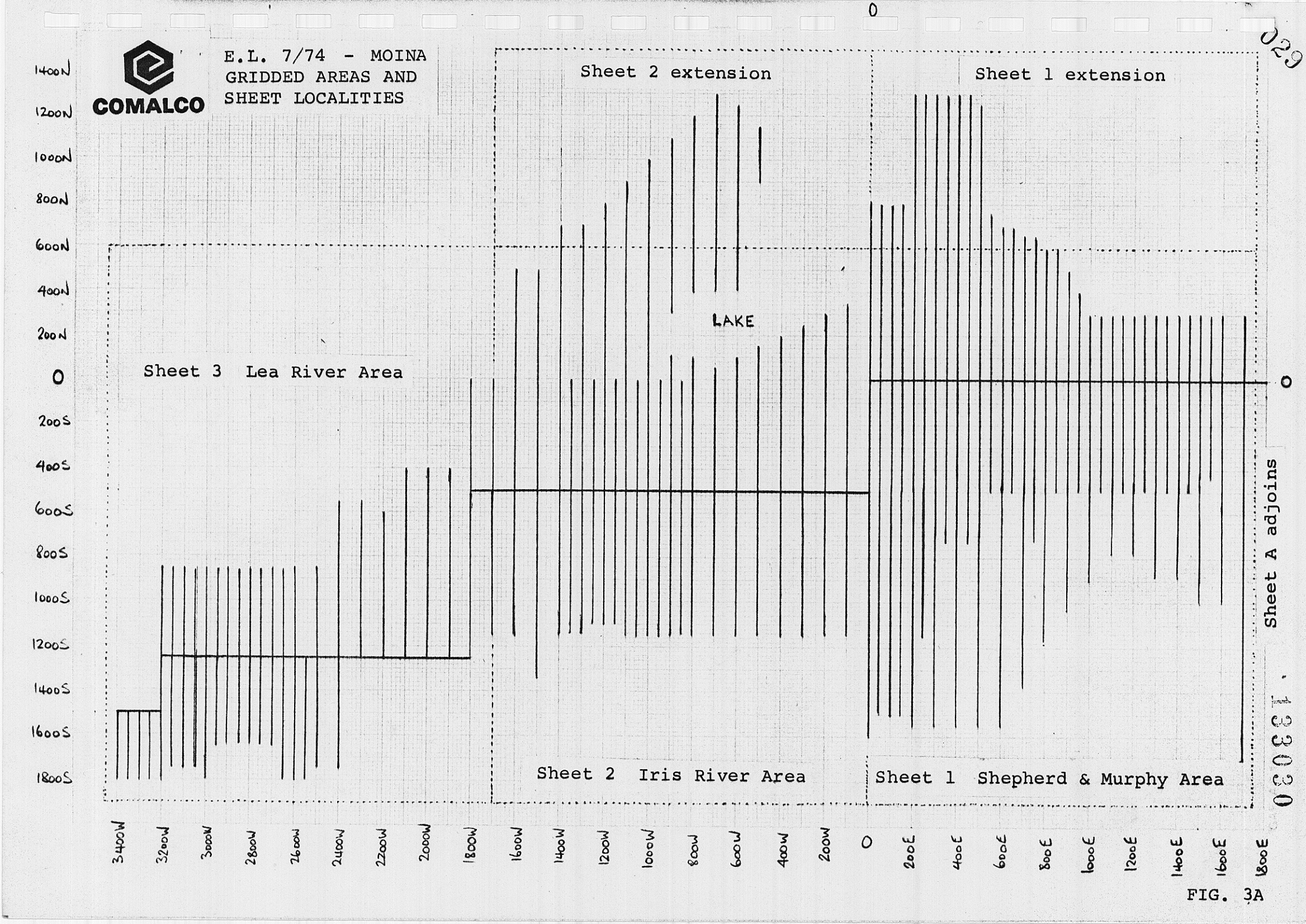
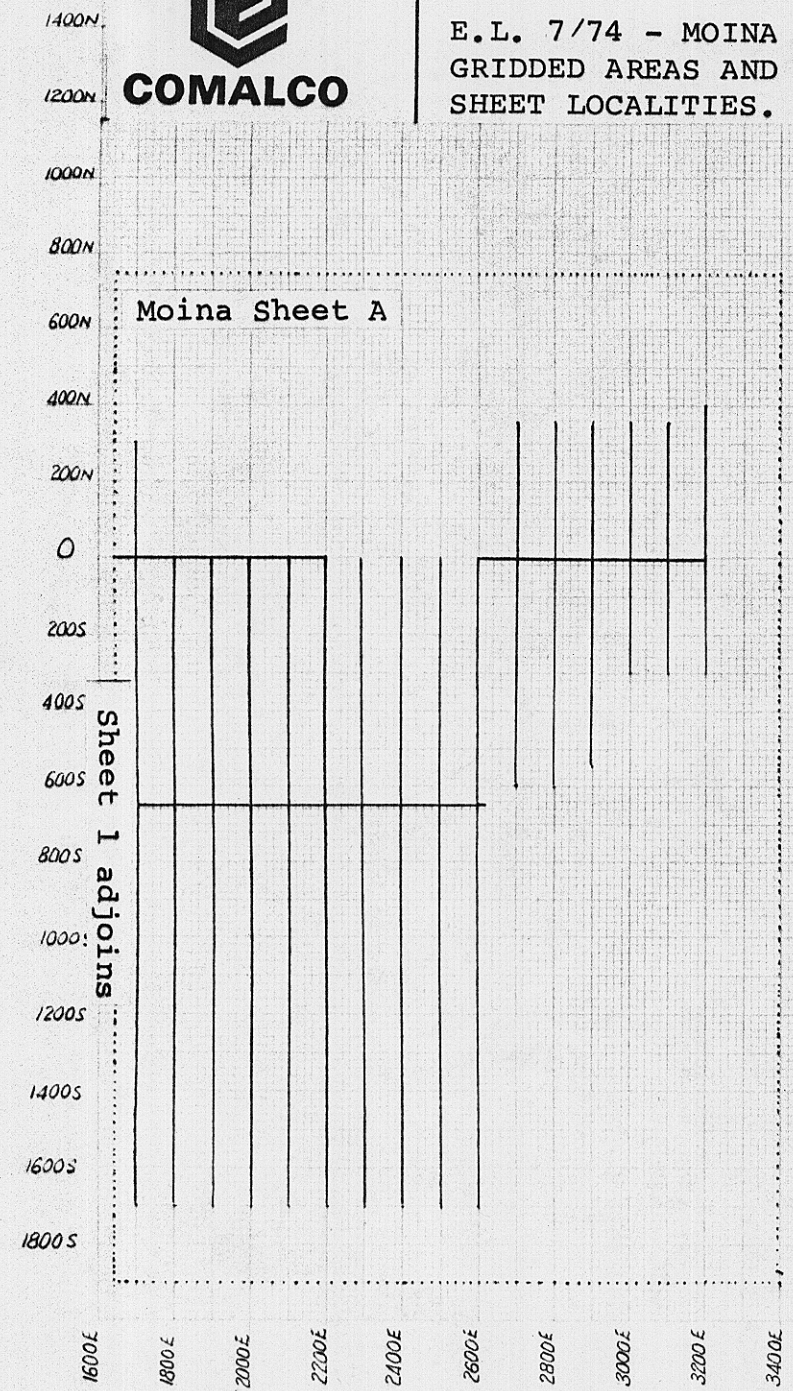

COMALCO
E.L. 7/74 - MOINA
GRIDDED AREAS AND
SHEET LOCALITIES
Sheet 2 extension
Sheet 1 extension
LAKE
Sheet 3 Lea River Area
Sheet 2 Iris River Area
Sheet 1 Shepherd & Murphy Area
Sheet A adjoins
1400N
1200N
1000N
800N
600N
400N
200N
0
200S
400S
600S
800S
1000S
1200S
1400S
1600S
1800S
3400W
3200W
3000W
2800W
2600W
2400W
2200W
2000W
1800W
1600W
1400W
1200W
1000W
800W
600W
400W
200W
0
200E
400E
600E
800E
1000E
1200E
1400E
1600E
1800E

FIG. 3A

030

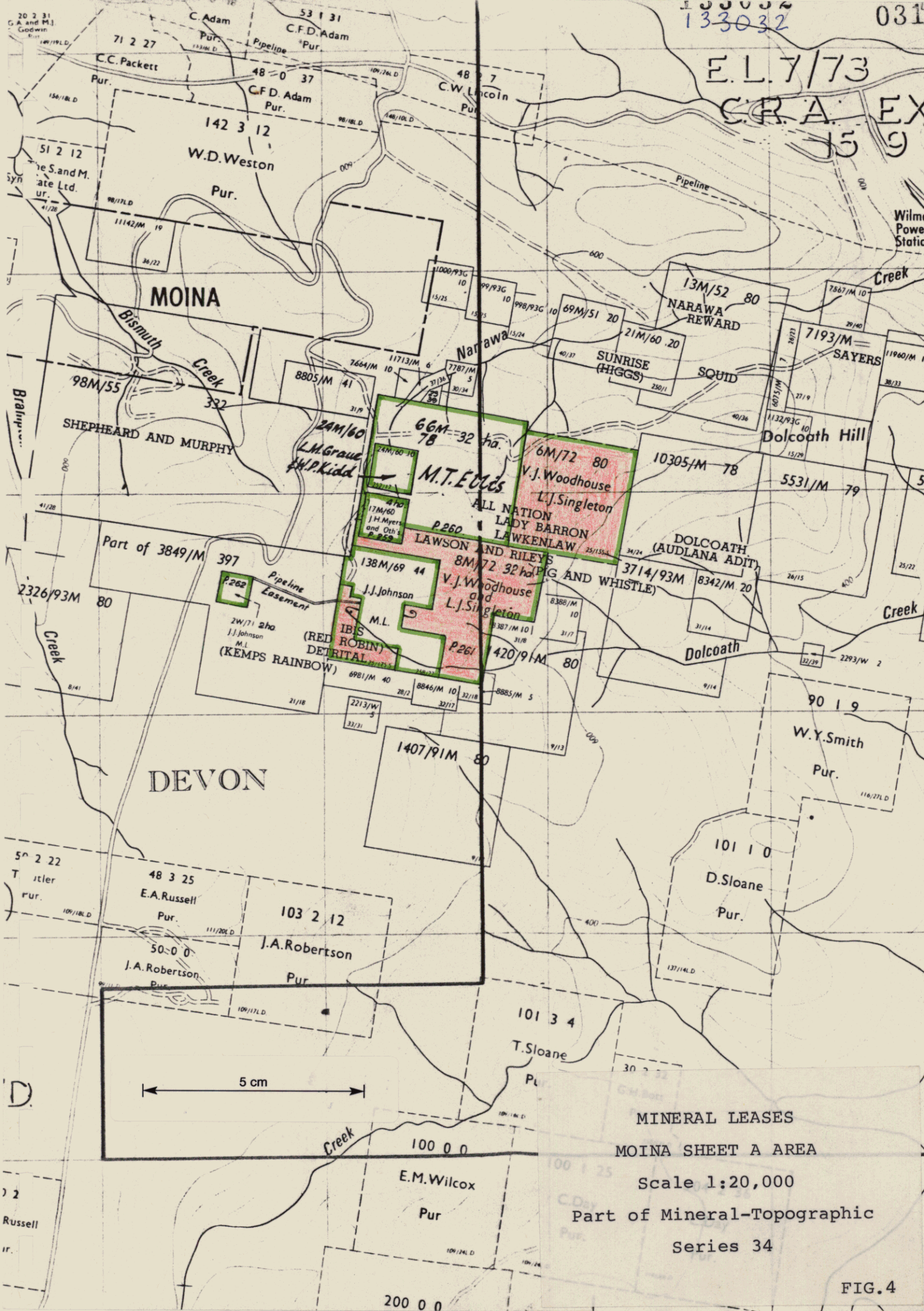
COMALCO

E.L. 7/74 - MOINA
GRIDDED AREAS AND
SHEET LOCALITIES.



133031

FIG.3B


E.L.7/73
C.R.A. EX
MOINA
DEVON
Bismuth Creek
Narawa Creek
Dolcoath Creek
Pipeline
Pipeline Easement
66M/78 32 ha.
M.T.Eccs
6M/72 80
V.J.Woodhouse
L.J.Singleton
ALL NATION
LADY BARRON
LAWKENLAW
LAWSON AND RILEYS
8M/72 32 ha
V.J.Woodhouse and L.J.Singleton
138M/69 44
J.J.Johnson
M.L.
IBIS (RED ROBIN) DETRITAL
(KEMPS RAINBOW)
24M/60
L.M.Graue
W.P.Kidd
17M/60
J.H.Myers and Oth's
2W/71 2ha
J.J.Johnson
M.L.
13M/52 80
NARAWA REWARD
69M/51 20
21M/60 20
SUNRISE (HIGGS)
SQUID
7193/M
SAYERS
Dolcoath Hill
10305/M 78
5531/M 79
DOLCOATH (AUDLANA ADIT)
3714/93M
(PIG AND WHISTLE)
8342/M 20
1420/91M 80
1407/91M 80
98M/55
SHEPHEARD AND MURPHY
Part of 3849/M 397
2326/93M 80
48 3 25
E.A.Russell
Pur.
103 2 12
J.A.Robertson
Pur
50 0 0
J.A.Robertson
Pur.
142 3 12
W.D.Weston
Pur.
48 0 37
C.F.D.Adam
Pur.
C.C.Packett
Pur.
C.Adam
Pur.
C.F.D.Adam
Pur.
71 2 27
53 1 31
48 2 7
C.W.Lincoln
Pur.
51 2 12
S.and M.
Ltd.
Pur.
90 1 9
W.Y.Smith
Pur.
101 1 0
D.Sloane
Pur.
101 3 4
T.Sloane
100 0 0
E.M.Wilcox
Pur
200 0 0
5 cm
MINERAL LEASES
MOINA SHEET A AREA
Scale 1:20,000
Part of Mineral-Topographic
Series 34
FIG.4

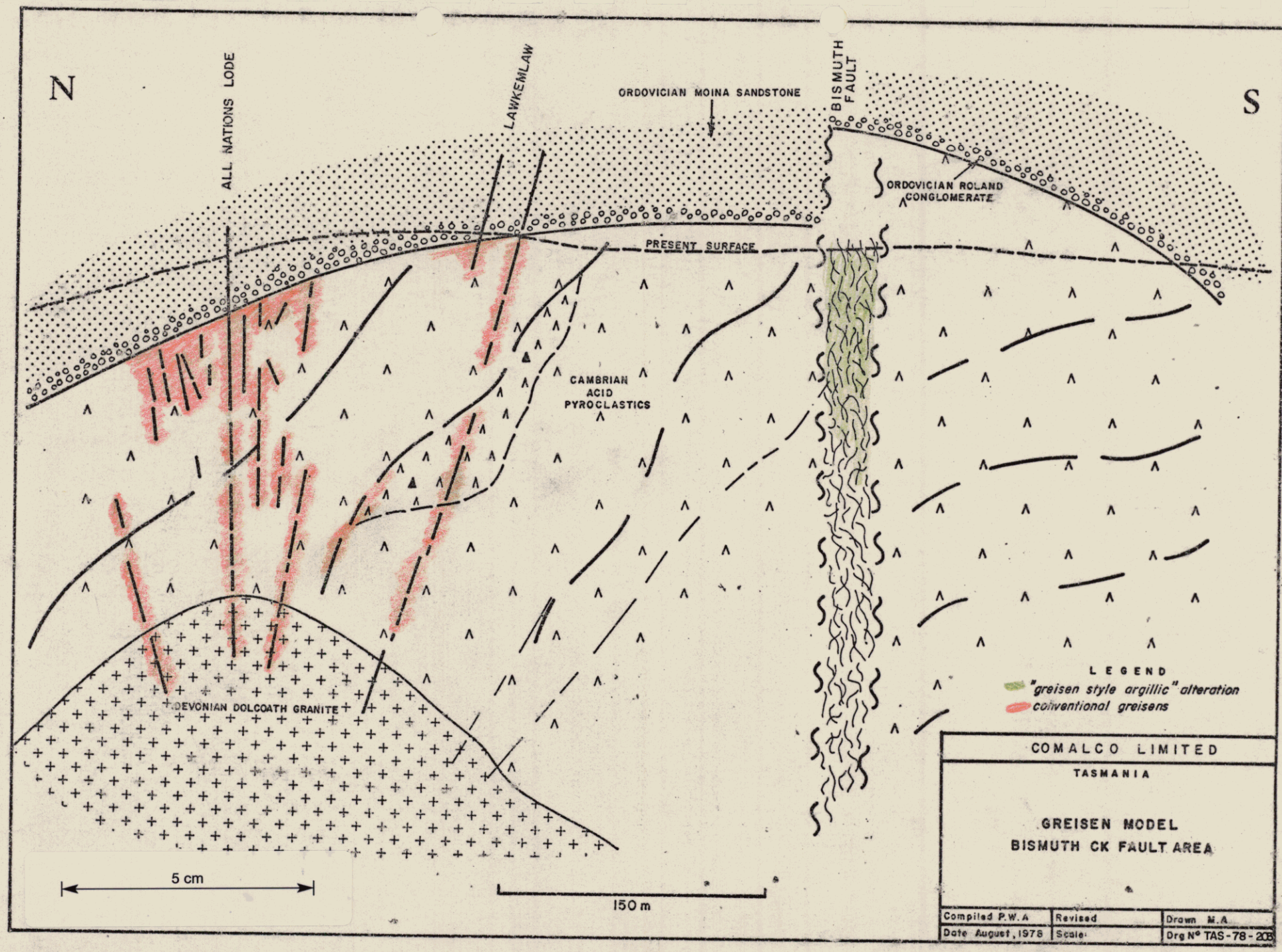


FIG. 11

032

133033

133034 033

GEOLOGICAL MAP
SHEPHERD & MURPHY AREA

SCALE 0 100 200 300 400 500 FT.

LEGEND

TERTIARY — BASALT
ORDOVICIAN — JUNEE GROUP — GORDON R. LIMESTONES; TUBICOLAR QUARTZITES

GEOLOGICAL BOUNDARIES
STRIKES & DIPS
ADITS
TRENCHES
LODES
ROADS
FORM LINES (20 FT. INTERVALS)

To Hilltop
Main Road
To Moina
BISMUTH
MINE OFFICE
No 3 ADIT
No 2 ADIT
MAIN SHAFT
No 1 ADIT
GODWIN'S ADIT
No 6 BRANCH LODE
LODE
APPROX. COURSE OF SUB-BASALTIC LEAD
ALLUVIAL WORKS
OLD TRAM FORMATION
CREEK
CROWN LAND
OPEN CUT (Stanley Alluvial)
SHAFT 2360' 30 degrees
No 5 LODE
No 4 LODE
No 4 CREEK DRIVE
No 3 LODE
No 2 LODE
No 1 LODE
OPEN CUT
OPEN CUT

53M 51 20 M.T.T. MG. CO. N.L. M.L.
37M 53 30 M.T.T. MG. CO. N.L.
11973 M 20 M.T.T. MG. CO. N.L. M.L.
33M 52 30 M.T.T. MG. CO. N.L.
10795 M 20 MOINA TUNGSTEN TIN MG. CO. N.L. M.L.
46M 51 20 M.T.T. MG. CO. N.L. M.L.
45M 51 20 M.T.T. MG. CO. N.L. M.L.

N

0 50 100m

5 cm

Reduced from

DEPARTMENT OF MINES — TASMANIA		
FIELD WORK		GEOLOGIST
PLAN		DRAUGHTSMAN
DATE	JULY 1958	HOBART
FILE No	1354--37	

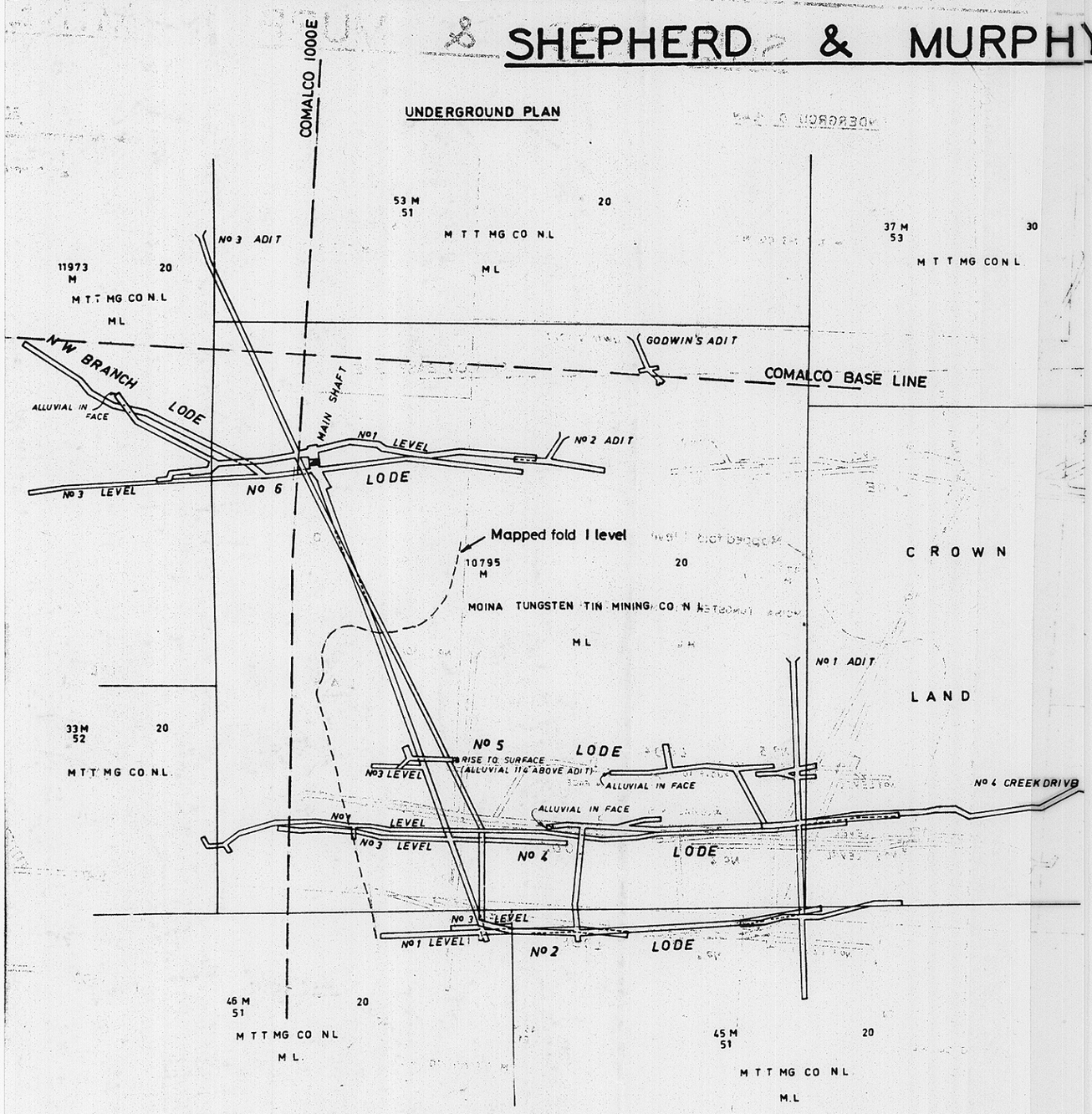
79-1389 (Vol 1)

FIG. 12

133035 034

SHEPHERD & MURPHY MINE — MOINA

UNDERGROUND PLAN



5 cm

0 50 100m

Reduced from

DEPARTMENT OF MINES — TASMANIA		
FIELD WK	F. BLAKE	GEOLOGIST
PLAN	K L KENDALL	DRAUGHTSMAN
DATE	JULY 1955	HOBART
FILE NO	1353 - 37	

REDRAWN APRIL 1973 BY B E COOK

SCALE

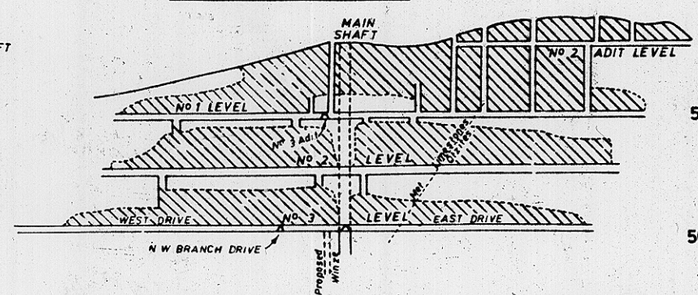
0 100 200 300 400 500 FT

STOPING

N

COMALCO 1000 E

SECTION ALONG No 6 LODE



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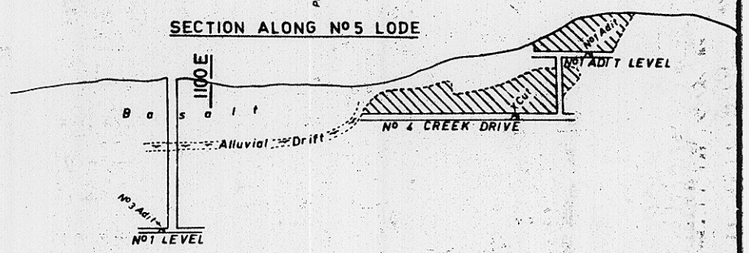
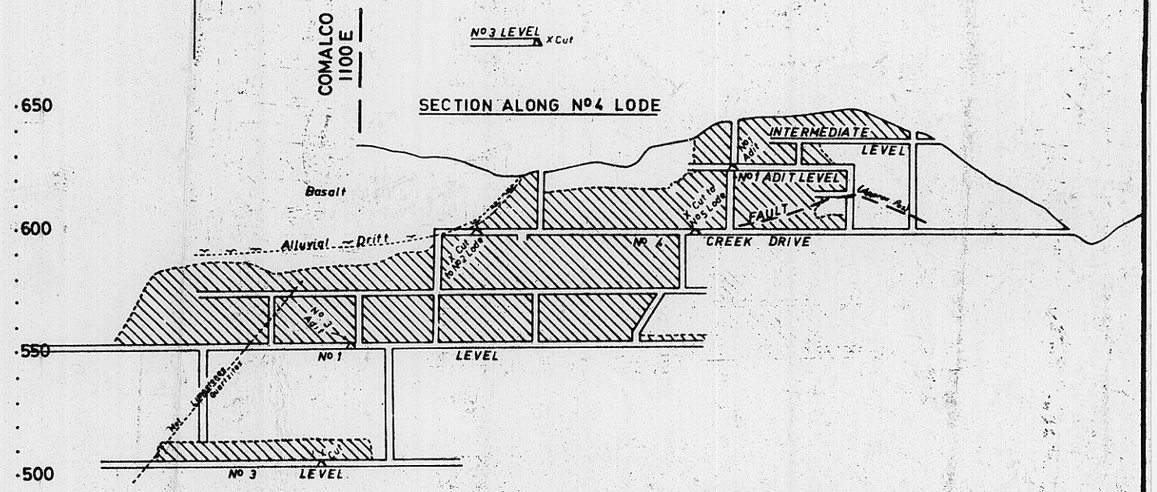


COMALCO 1100 E

No 3 LEVEL X Cut

SECTION ALONG No 4 LODE



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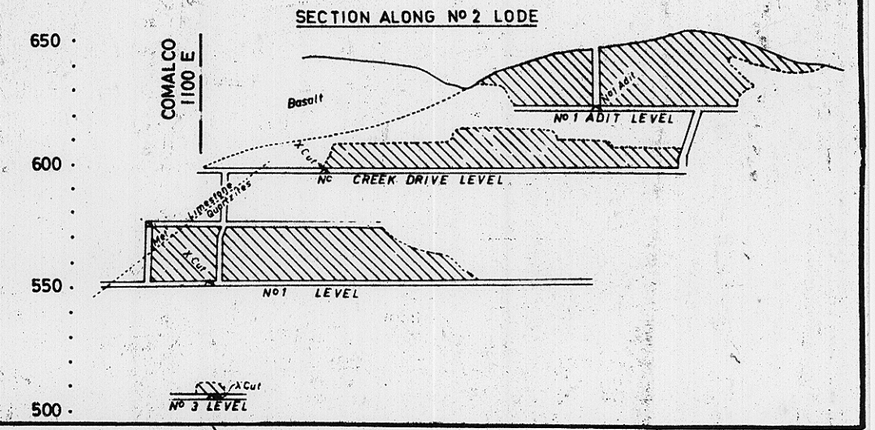
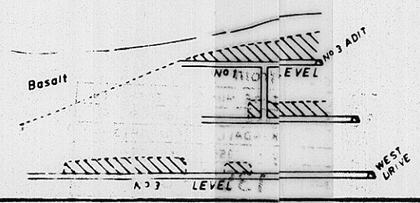


SECTION ALONG N.W. BRANCH LODE



79-1389 (Vol 1).

FIG. 13

035

APPENDIX 1 Miscellaneous data, greisenized granite, Moina. 133036

La Trobe University

BUNDOORA / VICTORIA / AUSTRALIA 3083
TELEGRAMS AND CABLES: LATROBE MELBOURNE

DEPARTMENT OF GEOLOGY
TELEPHONE 478 3122

10th July, 1978.

Mr. P.W. Askins,
Senior Geologist,
Comalco Limited,
Exploration Department,
P.O. Box 691,
DEVONPORT, TAS. .. 7310.

Dear Paul,

Enclosed please find the bulk chemical analysis results for the Moina greisen samples from ML-1. The values are provisional as numbers 774, 776, 779, 778 and 810 are a bit too high. Some F may have been absorbed while measuring CO_2 and/or H_2O^+. I am enclosing a rough graph of wt % Na_2O, K_2O, Be and Sn vs distance from contact. As you can see the greisenization at about 780 could perhaps be predicted by the decreasing abundance of Na_2O. Texturally there are also good correlations with type of muscovite vs proximity to greisen. I have still a lot of work to do on this including calculating mole atom abundances and applying density data. I hope you will keep this data confidential until I finish.

The samples of the skarns, quartzite and limestone should be analyzed for F, W, Sn, Be etc., the major elements will be done here. The mica from 780 ("780 M") needs Li and F values at least. The granite samples were crushed in a W-free mill as a check on the previous analyses. Here W analyses are needed.

Sincerely,

Teunis A.P. Kwak.

PS. The pulps are being sent by a separate parcel.

Encl.

Morna Samples.

	774	776	779	780	784	788	795	809	812	815	825	830	839	856	862	870
SiO_2	76.16	73.51	62 64	44.23	74.15	76.96	76.12	76.94	75.52	77.69	76.72	78.02	75.22	75.54	76.11	76.64
TiO_2	0.03	0.03	0.05	0.10	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.04	0.03	0.04	0.03	0.03
Al_2O_3	11.21	11.43	18.99	27.86	10.98	12.70	12.86	12.37	12.28	10.52	11.54	11.19	12.09	12.17	11.94	11.84
Fe_2O_3	0.00	0.19	1.36	2.15	1.10	0.42	0.70	0.91	0.49	0.92	0.45	0.48	0.41	0.29	0.09	0.00
FeO	4.63	4.37	3.78	5.08	4.35	1.12	1.09	0.77	1.54	1.45	1.84	1.05	1.57	1.36	1.35	1.32
MnO	0.10	0.17	0.19	0.18	0.26	0.04	0.03	0.03	0.06	0.08	0.04	0.03	0.07	0.05	0.03	0.03
MgO	0.10	0.15	0.10	0.35	0.16	0.12	0.14	0.14	0.13	0.08	0.04	0.06	0.15	0.13	0.09	0.07
CaO	0.01	1.29	1.68	2.22	0.51	0.41	0.62	0.30	0.46	0.52	0.60	0.54	0.55	0.53	0.48	0.51
Na_2O	0.23	0.22	0.30	0.45	0.20	1.38	0.48	0.56	2.03	1.83	1.86	2.47	2.40	2.76	2.54	2.93
K_2O	3.68	3.98	6.50	9.61	3.67	4.95	4.52	4.90	5.10	4.19	4.83	4.24	4.81	4.87	5.09	4.99
P_2O_5	0.05	0.00	0.00	0 02	0.00	0.05	0.01	0.00	0.00	0.00	0.00	0:00	0.00	0.00	0.00	0.00
S	1.17	0.56	0.00	0.54	0.02	0.05	0.21	0.09	0.06	0.07	0.02	0.03	0.04	0.00	0.04	0.00
H_2O^+	1.62	1.34	1.56	2.40	0.34	1.76	1.84	1.30	1.08	0.78	0.99	1.08	0.66	0.71	0.50	0.99
H_2O^-	0.26	0.15	0.11	0.25	0.35	0.38	0.46	0.93	0.35	0.18	0.29	0.19	0.27	0.21	0.27	0.31
CO_2	2.52	3.17	1.58	0.99	2.11	0.37	0.39	0.17	0.93	1.07	0.83	0.72	0.74	0.61	0.56	0.66
tal	101.74	100.54	98.84	96.70	99.24	100.76	99.51	99.45	100.07	99.42	100.09	100.13	99.02	99.27	99.06	100.34
S=O	0.59	0.24	0.00	0.27												
tal	101.16	100.26	98.84	96.42	99.23	100.73	99.41	99.41	100.04	99.39	100.08	100.12	99.00	99.27	99.06	100.34
F	0.34	1.35	2 27	3.43	0.51	0.46	0.60	0.29	0.41	0.38	0.47	0.38	0.37	0.38	0.33	0.70
tal	101.50	101.61	101.11	99.85	99.74	101.19	100.01	99.70	100.45	99.77	100.55	100.40	99.37	99.65	99.39	101.04

A. Analysis for W, Sn, F, Be, etc. (major elements to be done at La Trobe)

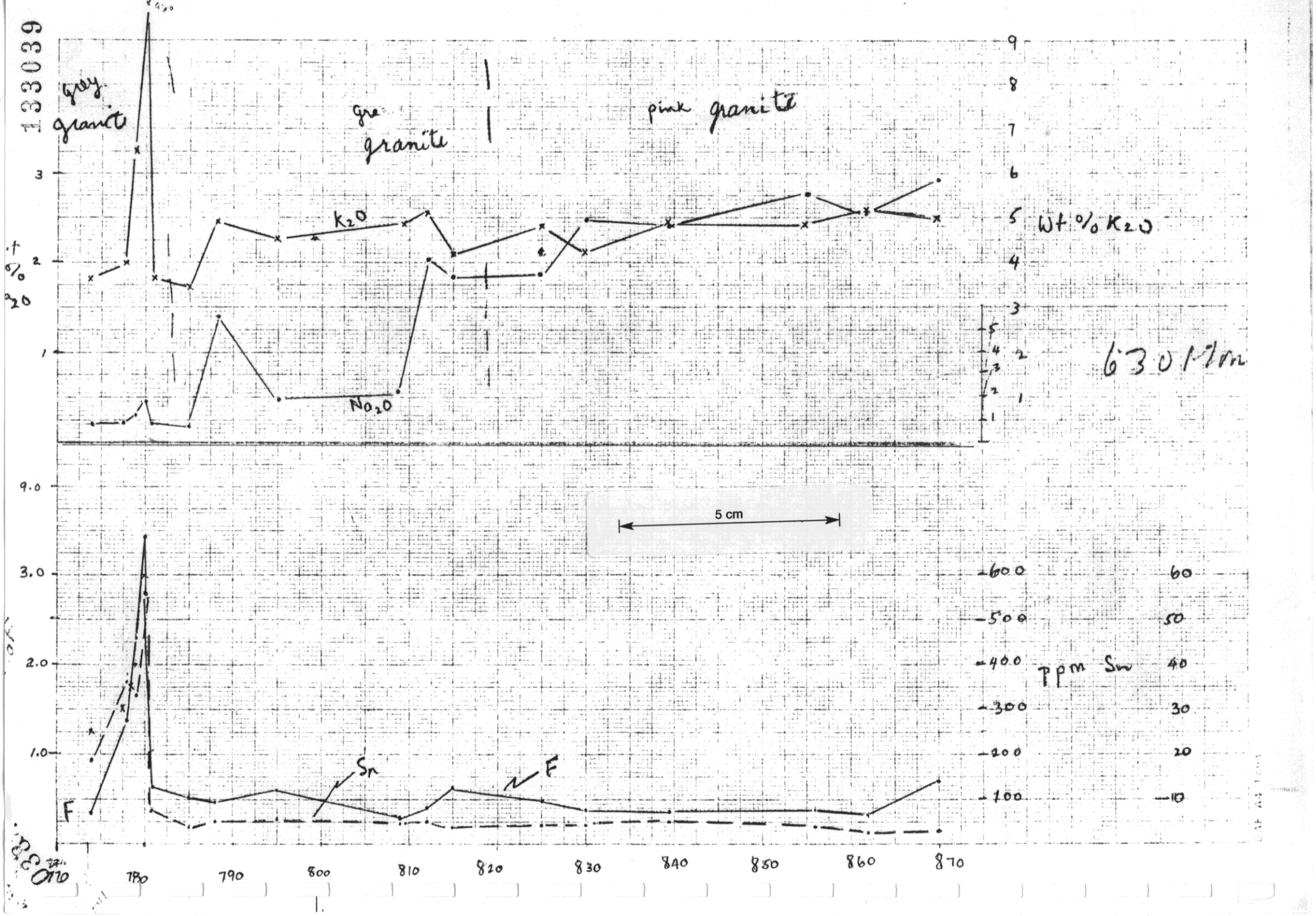
1. IRTS River 1st
2. IRTS River silstone interlayered with (1)
3. SMD 5 62m Whole rock
4. SMD 5 46.5m wrigglite - Whole rock
5. SMD 5 56m Green layer in Calc-sil.
6. SMD 5 56m highly fractured rock whole rock
7. SMD 5 56m Calc-sil next to 5 above
8. SMD 12 111.36-111.46 Whole rock
9. SMD 12 110.08-110.18 Whole rock
10. SMD 12 106.02-106.13 Whole rock
11. SMD 12 104.18-104.29 Whole rock
12. SMD 12 99.13-99.20 Whole rock
13. SMD 12 97.50-97.59 Whole rock
14. SMD 12 96.19-96.28 Whole rock
15. SMD 12 93.00-93.09 1st - unmetamorphosed (unreplaced)
16. SMD 12 93.00-93.09 1st wrigglite mass along fractures in (15)
17. SMD 12 92.0 -92.12 1st
18. SMD 12 92.0-92.12 Calc-sil. replacement of (17)
19. SMD 12 83.32-83.48 Whole rock - 1st

B. Analysis for F + Li

870M - muscovite from greisen 970 ft. down ML-1

C. Analyses for W

856 WR
870 WR } granite samples
776 WR


133039
grey granite
gre granite
pink granite
K2O
Na2O
Wt % K2O
630 Mm
5 cm
ppm Sn
Sn
F
770
780
790
800
810
820
830
840
850
860
870

039

133040

amdel

The Australian Mineral Development Laboratories

Flemington Street, Frewville, South Australia 5063
Phone Adelaide 79 1662, telex AA 82520

Pilot Plant: Osman Place, Thebarton, Sth. Aust
Phone Adelaide 43 8053
Branch Offices: Perth and Sydney
Associated with: Professional Consultants Australia Pty Ltd

Please address all correspondence to Frewville.
In reply quote: AC 3/1/4/0 - 3653/78

NATA CERTIFICATE 11 May 1978

Mr P. Askins,
Comalco Exploration Pty Ltd.,
P O Box 691,
DEVONPORT TAS 7310

REPORT AC 3653/78

YOUR REFERENCE:	PA/MOINA/ML1
IDENTIFICATION:	As listed
DATE RECEIVED:	17 April 1978

Enquiries quoting AC 3653/78 to the Manager please

D. K. Rowley
Manager
Analytical Chemistry Division

for R. E. Wilmshurst
Acting Managing Director

cc Mr A. Bartlett
Comalco
95 Collins St
Melbourne 3000

hjj

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040

133041

AMDEL ANALYTICAL SERVICE — REPORT AN 3653/78 — PAGE 1

NATA CERTIFICATE — XRF ANALYSIS CODE B1 — RESULTS IN PPM

SAMPLE		SN	W
ML1	at 774ft.	85	1350
	776	360	940
	779	330	310
	780	560	120
	781	75	1800
	785	36	1850
	788	50	740
	795	55	640
	809	46	200
	812	50	1000
	815	40	1300
	825	44	1650
	830	44	740
	839	50	1250
	856	40	520
	862	26	1500
	870ft.	30	1800
DETN LIMIT		(4)	(10)

Note: All W analyses should be ignored because a tungsten sieb mill was used for grinding samples at Latrobe University.

P. Askins, 1978.

Three samples were reground in a tungsten free mill and analysed as follows (Amdel report 232/79, 22.8.78)

ML1	776 ft	20 ppm W
	856 ft	50 " "
	870 ft	30 " "

Results are semi-quantitative. Elements apparently present in concentrations of economic

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES 133042

REPORT AN 3653/78

x = not detected at the limits quoted.
Results in ppm unless otherwise stated. Detection limits in brackets.

Sample No.	Be (1)	Y (10)	Sc (3)	Mo (3)	Yb (1)				
ML1 774'	15	10	x	x	10				
76	10	10	x	x	5				
79	10	10	3	3	5				
80	10	10	10	3	10				
81	10	10	3	x	15				
85	10	10	x	15	10				
88	10	10	x	x	10				
795	10	10	x	x	5				
809	10	10	3	x	10				
12	10	10	3	10	10				
15	10	10	3	10	10				
25	10	10	3	x	10				
30	10	10	x	10	5				
39	10	10	x	x	5				
56	10	10	x	x	15				
62	10	10	x	7	10				
870	10	10	x	x	15				

Results are semi-quantitative. Elements apparently present in concentrations of economic interest should be redetermined by an appropriate accurate anal

04

Ec 7/74 MOINA ANALYT

133043

amdel

The Australian Mineral Development Laboratories

Flemington Street, Frewville, South Australia 5063
Phone Adelaide 79 1662, telex AA 82520

Pilot Plant Osman Place, Thebarton, Sth Aust
Phone Adelaide 43 8053
Branch Offices Perth and Sydney
Associated with Professional Consultants Australia Pty Ltd

Please address all correspondence to Frewville
In reply quote AC 3/1/4/0 - 4640/78

NATA CERTIFICATE 31 July 1978

The Director,
Comalco Exploration Limited,
P O Box 691,
DEVONPORT TAS 7310

REPORT AC 4640/78

YOUR REFERENCE:	PA/MOINA/ML1
IDENTIFICATION:	As listed
DATE RECEIVED:	28 June 1978
NOTE:	Due to the small quantity of sample received, it has been more convenient to determine Li by emission spectroscopy Code A4.

Enquiries quoting AC 4640/78 to the Manager please

D. K. Rowley
Manager
Analytical Chemistry Division

for. Norton Jackson
Managing Director

cc Mr A. H. Barlett
Comalco Limited
GPO Box 2773Y
Melbourne 3001

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043

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES

133044

FORM 38

REPORT AN 4640/78

x = not detected at the limits quoted. Results in ppm unless otherwise state
Detection limits in brackets

Sample No. PA/MO/NA/NL	Li (1)	B (3)	Sample No.			Sample No.		
774	250	x						
76	250	x						
79	300	x						
80	700	x						
81	150	x						
85	200	x						
88	150	x						
795	150	x						
809	100	x						
12	150	x						
15	150	x						
25	100	x						
30	100	x						
39	100	x						
56	100	x						
62	70	x						
870	80	x						

Results are semi-quantitative. Elements apparently present in concentrations of economic interest should be redetermined by an appropriate accurate analytical technique.

044

133045

COMMONWEALTH ALUMINIUM CORPORATION

LABORATORY REPORT

Sample: Expl^n: Pulps of Drill Core - PA/T/Mouna ML

Report No.: AP-16 (1-17)

Submitted by: P. Askins Devonport Tas.

Requisition No.: 1203

Comm. ✓
Cont.
Conc. ✓

ANALYSIS

	SAMPLE	% F.						
1	ML1, 774 ft.	0.34						
2	776	1.35						
3	779	2.27						
4	780	3.43						
5	781	0.61						
6	785	0.51						
7	788	0.46						
8	795	0.60						
9	809	0.29						
10	812	0.41						
11	815	0.38						
12	825	0.47						
13	830	0.38						
14	839	0.37						
15	856	0.38						
16	862	0.33						
17.	870 ft	0.70						

Copies to: 1. P.A. 2. A.H.B. 3. W.H.A. 4. JCN/JAE.

Chief Chemist: [signature]

Date: 9/5/78

133046 cc 7/74 MOINA ANALYT DRILLING Pa-

amdel
The Australian Mineral Development Laboratories
Flemington Street, Frewville, South Australia 5063
Phone Adelaide 79 1662, telex AA 82520

Pilot Plant: Osman Place, Thebarton, Sth. Aust
Phone Adelaide 43 8053
Branch Offices: Perth and Sydney
Associated with: Professional Consultants Australia Pty. Ltd

Please address all correspondence to Frewville.
In reply quote: AC 3/1/4/0 - 232/79

NATA CERTIFICATE 22 August 1978

Mr P. Askins,
Comalco Exploration Limited,
P O Box 691,
DEVONPORT TAS 7310

REPORT AC 232/79

YOUR REFERENCE:	PA/MOINA/KWAK
IDENTIFICATION:	As listed
DATE RECEIVED:	17 July 1978
NOTE:	There has been insufficient material to determine Sn & W by XRF Code B1 on samples 1 - 19. These have been analysed by XRF Code B2.

Enquiries quoting AC 232/79 to the Manager please

D. K. Rowley
Manager
Analytical Chemistry Division

for Norton Jackson
Managing Director

Note:
Samples submitted by Kwak for analysis already pulped, for research purposes. Source of most samples unknown at August 1979
P.W.A.

cc A.H.Bartlett
Comalco
95 Collins Street
MELBOURNE 3000

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048

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES

133047

FORM 38

REPORT AN 232/79

ANALYSIS ppm

Sample N°	Sn	W						
1	<20	50						
2	<20	<50						
3	280	2400						
4	1000	2100						
5	180	130						
6	940	500						
7	220	190						
8	<20	<50						
9	130	160						
10	900	<50						
11	950	100						
12	660	530						
13	780	480						
14	200	100						
15	100	<50						
16	620	240						
17	30	<50						
18	310	<50						
19	<20	50						
776 WR	-	20	Re-grinds ML1					
856 WR	-	50						
870 WR	-	30						

METHOD: B1/B2

047

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES

133048

FORM 38

REPORT AN 232/79

ANALYSIS ppm

Sample N°	Li							
1	5							
2	25							
3	100							
4	65							
5	25							
6	30							
7	15							
8	20							
9	50							
10	5							
11	10							
12	130							
13	75							
14	10							
15	10							
16	50							
17	5							
18	30							
19	15							
870M	770	Muscovite concentrate from MC1 at 870ft.						

METHOD: C4

048

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES

133049

REPORT AN 232/79

x = not detected at the limits quoted.
Results in ppm unless otherwise stated. Detection limits in brackets.

Sample No.	Be (1)	Y (10)	Sc (3)	Mo (3)	Yb (1)	B (3)			
1	15	410	15	x	14	x			
2	210	610	15	x	13	510			
3	4010	1010	15	210	15	13			
4	3010	610	17	3010	10	x			
5	1010	610	210	15	15	13			
6	400	710	17	710	8	3010			
7	80	510	16	x	18	x			
8	40	1010	13	x	10	13			
9	710	70	17	x	15	15			
10	610	610	15	x	15	1510			
11	3010	610	17	x	15	2010			
12	4010	510	14	710	15	410			
13	3010	410	13	15	13	510			
14	2010	610	310	x	14	1510			
15	710	410	13	x	12	13			
16	4010	410	14	610	12	2010			
17	310	410	13	x	13	x			
18	1010	610	15	x	14	1610			
19	15	510	17	x	13	13			

Results are semi-quantitative. Elements apparently present in concentrations of economic

043

133050

APPENDIX 2

STUDIES BY J. WRIGHT.

Exploration Department,
P.O. Box 691,
DEVONPORT. TAS. 7310.

19th March, 1979.

Mr. J. Wright,
Department of Geology,
La Trobe University,
BUNDOORA. VIC. 3083.

Dear Jim,

Thank you for your letter of 9th March concerning your proposed Ph.D project at Moina.

Your outline of your proposed work seems fine to me; I have no doubt the project might become more specific as it progresses.

Our Exploration Manager, A.H. Bartlett, has indicated that he is willing for you to undertake these studies so long as we are kept fully informed of the progress of your investigations and the results of your studies are made available to us. He has also indicated that we cannot assist financially nor with logistics such as vehicles. We will however be able to assist you with accomodation in a Comalco house at Wilmot free of charge if you desire. The house has a kitchen and you can prepare your own meals at your own cost.

I look forward to meeting you in May; we will pick you up at the airport when you arrive.

Yours sincerely,

P.W. Askins.
Senior Geologist.

050

La Trobe University
BUNDOORA / VICTORIA / AUSTRALIA 3083
TELEGRAMS AND CABLES: LATROBE MELBOURNE

DEPARTMENT OF GEOLOGY
TELEPHONE 478 3122

133051

9th March, 1979.

Mr. P. Askins,
Comalco Exploration Pty. Ltd.,
P.O. Box 691,
DEVENPORT, TAS. .. 7310.

Dear Paul,

Teunis phoned you recently, Monday, 5th March I believe, regarding graduate studies which I would like to undertake at Moina.

This letter is just by way of an introduction to myself and what I hope to do in the Moina area.

I have recently commenced duties with La Trobe University as a Demonstrator in Geology. I am also registered with the University as a Ph.D candidate and will pursue my research activities in association with my normal staff duties.

What I hope to be able to do initially is to look at and sample the Moina deposit and other mineralization in the Moina area. My ultimate aim would be to establish a mineralization process and history, determine physico-chemical parameters of mineralizing fluids, suggest fluid origin (activated groundwater and/or magmatic) and assess the role of sulphur in the hydrothermal system.

Techniques which I consider to be applicable to this study are:

1) Geological mapping
2) Drill core inspection
3) Petrology
4) Bulk and trace chemistry, as required
5) Fluid Inclusion studies
6) Sulphur Isotope work
7) Probe work, Oxygen Isotopes and radioactive dating could be applied when the methods are considered practicable.

I intend to start systematic field work in August, the mid-year holiday period. I would also like to make a short orientation visit in May to collect preliminary samples and get a "feel" for the area. When I have clarified my timetable and established definite timings I will contact you again.

... 2.

Mr. Paul Askins

9th March, 1979.

Any comments you care to make on this project or its organizational aspects would be received with interest.

I look forward to meeting you in the near future.

Yours sincerely,

J. Wright.

052

APPENDIX 3

133053

STUDIES BY DR. SHEN-SU-SUN.

Exploration Department,
P.O. Box 691,
DEVONPORT. TAS. 7310.

19th March, 1979.

Dr. Shen-Su-Sun,
C.S.I.R.O.,
Mineral Science Laboratories,
NORTH RYDE. N.S.W. 2113.

Dear Dr. Sun,

As arranged with Teunis Kwak, I have today air-freighted to you (Ansett, consignment note no.K 47953) a suite of sample from Moina for a pilot sulphur isotope study.

The samples are progressing upwards (see schematic cross section):-

ML1-777	- greisenized granite
SMD 10 - 102.50	- metasomatised impure sandstone
PA/T/MOINA 11	- "wrigglite" (fluorite-magnetite skarn) with pyritic in the layers
PA/T/MOINA 12	- "wrigglite" with pyrite in fractures
SMD 14 - 38	- limestone with dark dolomitic layers which contain very fine grained pyrite/ pyrrhotite

Away from the main deposite:-

PA/T/MOINA 7	- framboidal pyrite in sandstone
PA/T/MOINA 13	- similar to SMD 14 - 38
SMD 9 - 102.50	- pyrrhotite rich skarn
SMD 13 - 93.50	- sphalerite rich skarn
PA/T/MOINA 10	- pyrite rich skarn

2/...

053

133054

Attached are some notes on the deposite which might assist your understanding of the area.

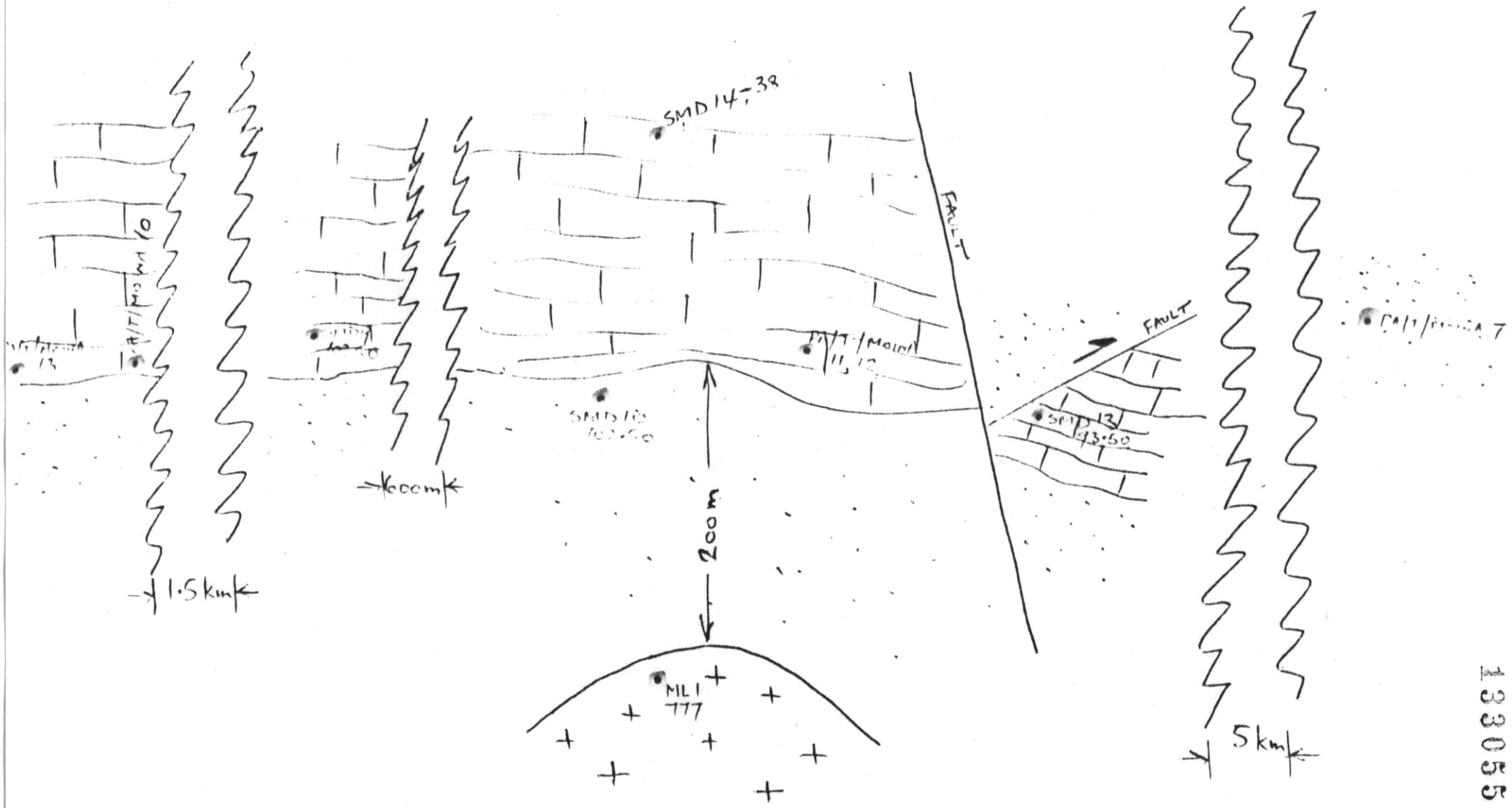
Thank you very much for your co-operation in undertaking this study; I look forward to the results.

Yours sincerely,

P.W. Askins.
Senior Geologist.

MOINA - SCHEMATIC CROSS SECTION SHOWING RELATIVE SAMPLE LOCATIONS

054



133055

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APPENDIX 4

133056

ADDITIONAL ANALYSES

MOINA AREA, SAMPLES COLLECTED BY G. WESTE 1975.

07/0705/01	Beside collar ML 1 calc-silicate garnet rock MW-HW.	Shepherd & Murphy Area
02	3 m SW of 01.wrigglite with bismuthinite veinlets and minor quartz veins.	
03	Near 01, calc-silicate rock ,HW.	
04	6 m W of ML 1 on track, fine grained wrigglite MW.	
05	11 m W of ML 1 on track, fine grained wrigglite MW.	
06	15 m W of 05 on track, fine grained wrigglite MW.	
07	20 m W of 06, fine grained wrigglite HW.	
08	15 m N of S & M shaft, fine grained wrigglite from waste rock dump SW.	
09	15 m W of S & M shaft, quartzite from waste rock dump SW.	
10	15 m W of S & M shaft, calc-silicate and wrigglite from waste dump MW.	
11	15 m W of S & M shaft, wrigglite from waste rock dump SW.	
12	At main S & M shaft, wrigglite SW.	
13	At main S & M shaft, wrigglite SW.	
14	10 m S of 13, calc-silicate and wrigglite MW.	
15	3 m W of 14, calc-silicate and wrigglite MW.	
16.	50 m W of S & M shaft top 3 cm of fine sediment in old water tank.	
17	50 m W of S & M shaft bottom 2 cm of fine sediment in old water tank.	
18	10 m S of Stormont Mine, calc-silicate on track MW.	Stormont
19	Few m SW of Stormont Mine, skarn on track MW.	
20	Few m NW of 19 skarn MW.	
21	Stormont cut W end massive skarn MW.	
22	SW along strike and 2 m NE across strike from 21,MW	
23	NE side of Stormont adit and 3-4 m NE across strike from 22 MW.	
24	Tin spur mine skarn.	
25	Bell Creek where it crosses HEC road to Wilmot dam wall - panned concentrate (not analysed).	
26	Bismuth Creek outlet to Lake Gairdner - panned concentrate (not analysed).	
27	Brampton Creek at crossing of Moina road - panned concentrate (not analysed).	
28	Iris River at crossing of Moina road - panned concentrate (not analysed).	
29 & 30	Boulders of calc-silicate from Bismuth Creek outlier E of Bismuth Creek, MW.	Shepherd & Murphy Area

07/0705/1001			Rock chip grab sample from E end S & M main crusher outcrop.
1002			Rock chip grab sample from W end S & M main crusher outcrop.
1003			Boulders of banded calc-silicate on track S of mine.
1004	0- 1 m	HW-CW	Continuous chip sample across wrigglite (+ minor calc-silicate) behind S & M primary crusher. Each sample take over 1 metre interval on bearing 170° M commencing at N end of exposure. Sampling carried out to observe effect of weathering on F content of wrigglite.
1005	1- 2		
1006	2- 3		
1007	3- 4		
1008	4- 5		
1009	5- 6		
1010	6- 7	HW	
1011	7- 8		
1012	8- 9		
1013	9-10	MW	
1014	10-11		
1015	11-12		
1016	12-13		
1017	13-14		
1018	14-15		
1019	15-16		
1020	16-17		
1021	17-18		
1022	18-19	SW	
1023	19-20		
1024	20-21		
1025	0- 1 m		Continuous chip sample traverse through SW hard wrigglite exposed 1 metre S of S & M main shaft W to E traverse at about 60° M.
1026	1- 2		
1027	2- 3		
1028	3- 4		
1029	4- 5		
1030	5- 6		
1031	0- 1 m		Continuous W to E chip sample traverse located immediately to E of S & M main shaft at 30° M. Outcrop poor. Rocks MW – HW.
1032	1- 2		
1033	2- 3		
1034	3- 4		
1035	3- 5		
1036	5- 6		
1037	6- 7		
1038	7- 8		
1039	8- 9		
1040	9-10		
1041	10-11		

057

133058

AMDEL ANALYTICAL SERVICE REPORT AN 4675/79 PAGE 1

NATA CERTIFICATE XRF ANALYSIS CODE B1 RESULTS IN PPM

SAMPLE	SN	W
07/0705/ 1	140	60
07/0705/ 2	1450	620
07/0705/ 3	95	55
07/0705/ 4	1550	600
07/0705/ 5	1350	150
07/0705/ 6	2150	520
07/0705/ 7	3950	280
07/0705/ 8	1050	1600
07/0705/ 9	100	70
07/0705/10	1650	760
07/0705/11	1250	2100
07/0705/12	1850	150
07/0705/13	1950	620
07/0705/14	1850	1150
07/0705/15	1150	230
07/0705/16	1500	2400
07/0705/17	1400	300
07/0705/18	210	95
07/0705/19	220	35
07/0705/20	130	140
07/0705/21	55	<10
07/0705/22	36	40
07/0705/23	22	15
07/0705/24	10	15
07/0705/29	38	<10
07/0705/30	120	35
1001	1700	3350
1002	1500	290
1003	680	110
1004	2600	2450
1005	2600	1500
1006	3050	2050
1007	3050	2000
1008	2550	820
1009	2800	310
1010	2250	450
1011	2600	300
1012	6300	410
1013	1200	280
1014	1700	290
1015	1450	300
1016	1250	230
1017	2550	640
1018	3350	410
1019	1650	390
1020	1800	400
1021	3000	250
1022	2900	440
1023	3250	400
1024	4800	960
1025	1600	1000
1026	1750	600
1027	1950	360
1028	1550	330
1029	1350	780
1030	3250	900
1031	2750	860
1032	7200	2050
1033	3100	800
1034	3200	1400
1035	3450	800
1036	2900	520
1037	2000	410
1038	2550	1000
1039	2800	1950
1040	2600	5400
1041	1750	1900

DETN LIMIT	(4)	(10)

DETN LIMIT	(4)	(10)

Telephone 43 8053
Branch Laboratory: Perth

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91B

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES

058

133059

REPORT AC 4675/79

x = not detected at the limits quoted

Results in ppm unless otherwise stated. Detection limits in brackets.

Sample No.	Be (1)	Mo (3)	Sc (3)	Ta (100)	Yb (1)	Ce (300)	La (50)	Nb (20)	Y (10)	Mn (10)
0705/1	3	15	10	x	10	x	x	x	10	>10000
2	2150	150	7	x	10	x	x	x	50	1000
3	140	7	10	x	10	x	x	20	70	>10000
4	3200	210	4	x	3	x	x	x	30	5000
5	11010	150	7	x	5	x	x	x	40	3000
6	3200	810	5	x	4	x	x	x	20	3000
7	2150	150	4	x	3	x	x	x	30	2000
8	4000	15010	8	x	4	x	x	x	30	5000
9	11010	310	10	x	8	x	1000	x	50	1700
10	14010	310	8	x	4	x	500	x	40	5000
11	31010	31010	8	x	5	x	x	x	40	3000
12	12000	31000	4	x	3	x	x	x	20	3000
13	11510	150	5	x	4	x	x	x	20	3000
14	2200	410	10	x	4	x	500	x	40	3000
15	11010	210	8	x	4	x	x	x	30	10000
11	2200	21010	8	x	4	x	1000	20	50	20000
17	170	410	7	x	3	x	x	x	40	10000
18	11510	x	15	x	8	x	1000	x	70	30000
19	170	x	7	x	6	x	x	x	40	30000
20	21000	x	210	x	5	x	1500	30	40	20000
21	130	x	5	x	3	x	x	x	20	10000
22	150	x	15	x	5	x	x	x	40	>10000
23	210	x	7	x	2	x	x	x	20	>10000
24	3	215	5	x	8	x	x	x	40	1600
29	170	5	7	x	2	x	x	x	30	>10000
0705/30	170	31000	10	x	8	x	x	x	50	10000
1001	21000	51000	4	x	5	x	x	x	10	20000

Results are semi-quantitative. Elements apparently present in concentrations of economic interest should be redetermined by an appropriate accurate analytical technique.

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES

133060

REPORT AC 4675/79

x = not detected at the limits quoted

Results in ppm unless otherwise stated. Detection limits in brackets.

Sample No.	Be (1)	Mo (3)	Sc (3)	Ta (100)	Yb (1)	Ce (300)	La (50)	Nb (20)	Y (10)	Mn (10)
1002	3	1	16	x	5	x	x	x	30	500
3	17	115	110	x	5	x	50	x	50	1000
4	40	70	16	x	4	x	150	x	20	200
5	40	70	16	x	4	x	50	x	20	200
6	30	60	13	x	3	x	x	x	10	200
7	40	60	15	x	4	x	50	x	10	300
8	40	50	14	x	3	x	x	x	10	300
9	300	115	15	x	3	x	x	x	20	300
10	10	115	18	x	4	x	50	x	50	200
11	250	110	15	x	4	x	x	x	20	200
12	250	100	14	x	3	x	x	x	20	150
13	200	110	15	x	3	x	x	x	20	150
14	40	20	14	x	3	x	x	x	20	150
15	800	60	15	x	3	x	x	x	20	300
16	300	40	15	x	3	x	x	x	20	200
17	200	20	14	x	2	x	x	x	10	200
18	200	115	14	x	3	x	x	x	20	250
19	250	110	14	x	2	x	x	x	10	200
20	200	40	15	x	3	x	x	x	20	300
21	150	20	14	x	2	x	x	x	10	200
22	200	20	14	x	2	x	x	x	20	300
23	100	20	16	x	3	x	x	x	20	300
24	30	15	16	x	2	x	x	x	20	100
25	70	20	15	x	2	x	x	x	20	300
26	200	70	15	x	2	x	x	x	20	200
27	300	15	15	x	2	x	x	x	20	200
28	150	20	15	x	2	x	x	x	20	200

Results are semi-quantitative. Elements apparently present in concentrations of economic interest should be redetermined by an appropriate accurate analytical technique.

91B

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES

060

133061

REPORT AC 4675/79

x = not detected at the limits quoted

Results in ppm unless otherwise stated. Detection limits in brackets.

Sample No.	Be (1)	Mo (3)	Sc (3)	Ta (100)	Yb (1)	Ce (300)	La (50)	Nb (20)	Y (10)	Mn (10
1029	2	1	5	x	3	x	x	x	30	200
30	1	1	6	x	3	x	x	x	30	200
31	2	1	6	x	3	x	50	x	30	200
32	2	2	6	x	2	x	x	x	30	200
33	1	1	6	x	3	x	x	x	30	100
34	1	3	6	x	2	x	x	x	20	300
35	1	5	7	x	3	x	x	x	30	300
36	5	2	6	x	2	x	x	x	30	200
37	1	4	10	x	3	x	x	x	40	300
38	1	3	6	x	2	x	x	x	20	200
39	1	5	6	x	3	x	x	x	30	200
40	1	2	6	x	2	x	x	x	30	200
041	2	1	5	x	2	x	x	x	20	200

Results are semi-quantitative. Elements apparently present in concentrations of economic interest should be redetermined by an appropriate accurate analytical technique.

APPENDIX 5

Analyses, Costeans, S & M Mine

AMDEL ANALYTICAL SERVICE REPORT AN 5099/79

NATA CERTIFICATE XRF ANALYSIS CODE B1

	SAMPLE	SN	W ppm
RD/TAS/S & M/	25S/1038E	940	1500
	25S/1040E	2850	880
	25S/1042E	1600	760
	25S/1044E	4450	1550
	25S/1046E	5700	2000
	25S/1048E	6000	4200
	25S/1050E	2650	1150
	25S/1052E	1650	820
	25S/1054E	2300	1050
	25S/1056E	3550	1500
	25S/1058E	1750	2200
	25S/1060E	2850	1700
	25S/1062E	2250	1000
	27S/1064E	3000	1700
	27S/1068E	1550	290
	27S/1072E	360	900
	27S/1075E	300	160
	27S/1080E	300	780
	27S/1085E	380	960
	27S/1089E	450	540
	27S/1091E	340	1050
	27S/1093E	580	580
	27S/1095E	390	6400
	27S/1097E	450	200

COMALCO LIMITED
APPENDIX 5A

PROJECT ..... No. 133063

SUBJECT Rock Analyses, Moina Sheet A

PREP. BY P. Askins DATE Aug 79 SHEET 1 OF 1

SAMPLE No. PA/T/MOINA/-	DESCRIPTION	ANALYSES, ppm										
		Sn	W	Bi	Be	Au	Ge	Sc	Ta	Y	La	Yb
1	Greisenized acid pyroclastic from spoil heap below concentrator plant lease 138M/69 (Iris Mine area).	150	<50	20	10	<0.05	<3	50	<100	50	<100	<1
2	Greisenized acid pyroclastic from backhoe pit approx 20m NW of concentrator plant (~2220E/580S)	100	<50	30	10	<0.05	<3	20	<100	30	<100	<1
3.	Head sample of eluvium in concentrator plant at 9 Dec 1976. Eluvium is from about 200m SE of plant ie. ~2120E/750S.	2500	2000	50	10	<0.05	<3	50	<100	100	<100	<1
4.	Tailings from first trommel in concentrator plant.	100	<50	20	10	<0.05	<3	20	<100	10	<100	<1
9.	Actinolite rich skarn on old Dolcoath Road at 3020E/060N	30	500	2	100		<3	40	<100	30	<100	<1
		Other analyses: Cu 100, Pb 100, Zn 500, Cd <3, Ag 0.1, Mo 100, As <50, Sb <30, Ga 25, In <10, Th <100, Ce <300, Nb <20, Zr 150, Ni 200, Co 70, V 200, Cr 200, Mn 5000, Ba 800, Sr 200, Ti 10000.										

All analyses by Amdel. Au by AAS code C3, all others by semi quant. emission spectro.

APPENDIX 6
COMALCO LIMITED

PROJECT Moina No. 133064

SUBJECT Trenching, Moina Sheet A, deep lead.

PREP. BY P.W. Askins. DATE August, 1979 SHEET 1 OF 2

SAMPLE NO.	DESCRIPTION	ORIGINAL MASS g.	CONCENTRATE MASS g.	CONC. XRF ANALYSES.	
				Sn ppm	W ppm
T1 - 2	TRENCH 1 depth 2.25 - 2.70m Clayey horizon with qtz. pebbles.	11.0	44.30	2550	30
T1 - 4	" 1 " 2.25 - 2.70m Clayey horizon with qtz. pebbles.	9.5	46.85	780	20
T2 - 1	" 2 " 2.30 - 3.05m Blue clay (CW vesic basalt).	4	24.85		
T2 - 2	" 2 " 3.05 - 3.70m Sand becoming gravelly	7	45.95	580	30
T2 - 3	" 2 " 3.50 - 3.70m Gravel.	7.5	4.15		
T3 - 2	" 3 " 2.80 - 3.40m Blue clay (CW vesic basalt)	4.5	5.60	50	10
T3 - 3	" 3 " 3.40 - 3.95m Sand becoming gravelly	8.5	45.15	2300	40
T3 - 4	" 3 " 3.75 - 3.95m Gravel	9	41.35	2550	25
T4 - 2	" 4 " 2.80 - 3.40m Blue clay (CW vesic basalt)	5	14.05	75	10
T4 - 3	" 4 " 3.40 - 4.00m Gravel - sand	7.5	35.90	360	25
T4 - 4	" 4 " 3.80 - 4.00m Gravel	8	37.50	470	20
T5 - 2	" 5 " 2.90 - 3.60m Blue clay	5	13.95	70	20
T5 - 3	" 5 " 3.60 - 3.80m Gravel - sand	8	32.05	560	30
T5 - 4	" 5 " 3.80 - 4.00m Cream clay	8	33.75	180	<10
T5 - 5	" 5 " 4.00 - 4.65m Gravel - sand	12	58.70	1050	40
T5 - 8	" 5 " 4.45 - 4.65m Gravel	12	43.95	1300	30
T13 - 2	" 13 " 2.40 - 3.15m Clayey bluish alluvium + sand	7	36.45	400	30
T13 - 3	" 13 " 2.85 - 3.15m Sand	6.5	50.70	350	20
T14 - 2	" 14 " 2.25 - 2.55m Sand	6.5	35.62	200	10
T15 - 1	" 15 " 1.20 - 1.70m Sand	7.5	38.10	190	10
T22 - 1	" 22 " 0 - 1.0m Soil/gravel Worked by Chinese?	10	15.40	12	<10
T21 - 1	"	7	20 approx.	1.38%	580
T24 - 1	" 24 " 2.60 - 2.90m Black clayey sand	6.5	10.55	130	10

COMALCO LIMITED

PROJECT ..... No. 133065

SUBJECT .....

PREP. BY ..... DATE ..... SHEET 2 OF 2

SAMPLE NO.	DESCRIPTION	ORIGINAL MASS g.	CONCENTRATE MASS g.	CONC. XRF ANALYSES Sn ppm	CONC. XRF ANALYSES W ppm
T2-3 IR	TRENCH 2 depth 3·50-3·70m Iron cemented sand/gravel			44	<10
T3-4 IR	" 3 " 3·75-3·95m Iron cemented sand/gravel			34	<10
T4-4 IR	" 4 " 3·80-4·00m Iron cemented sand/gravel			22	<10
T5-3 IR	" 5 " 4·45-4·65m Iron cemented sand/gravel			12	10
T5-8 IR	" 15 " 1·20-1·70m Iron cemented sand/gravel			20	<10
T15-1 IR				<4	<10

APPENDIX 6, Continued

MOINA DEEP LEAD

Estimate of total volume payable alluvium in flat areas above Cradle Mountain Road:

750m x 50m x 1m

length width depth at base of lead

= $37500m^3$

Assume an optimistic 50,000 tonnes at say 0.75% Sn

i.e. 375t Sn @ $13,000/t

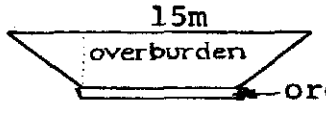
i.e. $4,875,000 total value in the ground

In ground value of ore is approximately $100/t

Overburden:

Say 15m, removal at $3/t

overburden area 50 x 15 + 15 x 15 for 45° batter



= $975m^2$

ore area 50 x 1 = $50m^2$

overburden/ore ratio 20 : 1

i.e. for every 1t ore removed cost of mining is approximately $65.

Beneficiation: Simple gravity at say $10/t

Total cost mining and beneficiation, approx. $75/t

Operating profit therefore $25/t

Hence for 50,000t total operating profit before tax etc is

50,000 x 25 = $1,250,000.

This total value would interest a small syndicate only.

P66

MASTER

133067

amdel

The Australian Mineral Development Laboratories

Flemington Street, Frewville, South Australia 5063
Phone Adelaide 79 1662, telex AA 82520

Pilot Plant Osman Place, Thebarton, Sth Aust
Phone Adelaide 43 8053
Branch Offices Perth and Sydney
Associated with Professional Consultants Australia Pty Ltd

Please address all correspondence to Frewville
In reply quote: GS 3928/79

12 April 1979

COMALCO Limited,
Post Office Box 691,
DEVONPORT, Tas. 7310.

Attention: P. Askins

REPORT GS 3928/79

YOUR REFERENCE:	PA/T/SMD 27
MATERIAL:	One panned concentrate
IDENTIFICATION:	Sample T2-3
DATE RECEIVED:	30 March 1979
WORK REQUIRED:	Semi-quantitative determination of mineralogy (MG1)

Investigation and Report by: Sylvia Whitehead

Manager, Geological Services Division: Dr Keith J. Henley

for Norton Jackson,
Managing Director.

cc COMALCO Limited,
GPO Box 2773Y,
Melbourne, Vic. 3001.
Attention: A.W. Bartlett.

meo/1

067

133068

DETERMINATION OF HEAVY MINERALS IN PANNED CONCENTRATE

1. INTRODUCTION & PROCEDURE

A sample of panned concentrate (T2-3) was submitted for semi-quantitative estimate of the mineralogy.

The sample was first separated in tetrabromoethane to remove quartz and other 'light' minerals and, as the heavy fraction was found to contain abundant moderately large limonitic grains, these were also removed.

The remaining heavy fraction was treated with hydrochloric acid in a zinc crucible to test for cassiterite, but this was not found. Portion of the heavy fraction was mounted and a polished briquette prepared for identification of the opaque minerals (PS27522). Another portion was microscopically examined by transmitted light in a temporary oil mount for identification of non-opaque minerals. A semi-quantitative estimate of the minerals present was determined by a brief grain count.

2. RESULTS

Weight of sample	3.90 g
Weight of heavy fraction (with large limonite fragments)	1.77 g
Weight of heavy fraction without large limonite fragments	0.67 g
% heavy fraction (for identification of minerals)	17.2% of whole sample

Semi-quantitative estimate of minerals in the heavy fraction (17.2% of whole sampl

	%
Zircon	73
Leucoxene and completely altered ilmenite	12
Goethite	7
Rutile	5
Topaz	3
Tourmaline	Trace
Chromite	Trace

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COMALCO LIMITED

133069

PROJECT APPENDIX 7 No.

SUBJECT AUGER SAMPLES, MOINA SHEET A

PREP. BY P. ASKINS DATE Aug 79 SHEET 1 OF 1

GRID CO-ORDS	DEPTH	UNDRIED ORIGINAL MASS kg	DRIED PANNED CONCENTRATE MASS, g	NOTES ON CONCENTRAT
2500E / 900S	0 – 0.5	0.80	18.4	
	0.5 – 1.0	1.69	20.5	
/925S	0 – 0.5	0.98	20.0	
	0.5 – 1.0	0.89	17.6	
	1.0 – 1.5	1.04	17.2	
	1.5 – 2.0	1.92	20.6	
/950S	0 – 0.5	1.38	23.5	
	0.5 – 1.0	1.13	25.9	
/975S	0 – 0.5	1.31	26.5	
	0.5 – 1.0	1.33	22.4	
/1000S	0 – 0.5	1.18	26.5	
2600E / 900S	0 – 0.5	1.21	24.2	
	0.5 – 1.0	2.36	19.6	approx 5% by vol crs. ct, wf.
	1.0 – 1.5	1.35	11.4	" 5% " " " " "
/925S	0 – 0.5	1.28	11.6	" 15% " "
	0.5 – 1.0	1.45	14.3	" 2% " " " " "
	1.0 – 1.5	1.53	21.1	
	1.5 – 2.0	2.25	27.1	
	2.0 – 2.5	1.90	30.7	
/950S	0 – 0.5	1.33	28.0	
/975S	0 – 0.5	1.57	19.6	" 1% " " " " "
1000S	0 – 0.5	1.37	20.3	
1025S	0 – 0.5	1.20	25.6	
1050S	0 – 0.5	1.53	29.1	

None of the concentrates have been analysed All are stored at Devonport

083

133070

APPENDIX 8

DIAMOND DRILL LOGS, MOINA

NOTES:

A. Bedding angles quoted are measured from the core axis

B. Abbreviations used:

(a) Grain sizes

f	very fine grained	grains not visible to naked eye.
f	fine grained	less than 1 mm
m	medium grained	1 - 10 mm
crs	coarse grained	1 - 2 cm
crs	very coarse grained	2 cm +

(b) Minerals, etc

ct	cassiterite		
wf	wolframite		
gn	galena		
sl	sphalerite		
py	pyrite		
po	pyrrhotite		
fl	fluorite		
chl	chlorite		
jts	joints	frs	fractures

070

133071

(c) Degrees of Chemical Weathering:

CW	Completely weathered	* Crumbles and disintegrates when gently shaken in water.
HW	Highly weathered	* All of fabric weathered. * Iron oxide staining permeates the fabric grain boundaries. * Weakened to the extent that pieces the size of 5 cm diameter core can be broken and crumbled by hand. * Gives a dull sound when struck with a hammer. * Does not disintegrate when soaked in water
MW	Moderately weathered	* Most of the fabric weathered. * Iron oxide staining permeates the fabric grain boundaries. * Pieces the size of 5 cm diameter core cannot be easily broken by hand. * Does not ring when struck with a hammer.
SW	Slightly weathered	* Some of the fabric weathered (Much felspar weathered to clay/ sericite). * Fine grained rocks may have a bleached appearance. * Iron oxide staining not usually throughout the fabric. * Strength approaches that of fresh rock. * Rings when struck with a hammer.
Frst.	Fresh with limonite stained joints	* Fabric not weathered. * No iron oxide staining in the fabric. * Joint faces are superficially coated or stained with limonite. (Possibly also stained with manganese oxides).
Fr	Fresh	* Fabric not weathered. * Joints not limonite stained (but may be coated with other minerals including chlorite, calcite, pyrite, quartz or clay.)

No sulphide minerals such as pyrite are present in any rock which is more weathered than slightly weathered. In a slightly weathered rock most sulphides are usually converted to oxides, carbonates, etc.

COMALCO LIMITED
DRILL HOLE LOG

TAS-78-118

071

Page 1 of 5

HOLE No: SMD 24

PROJECT: MOINA

LOCATION: 1380E/010S

ORIENTATION: 75° → 215°M
74° @ 30.00 ; 75° @ 60.00 ; 73° at 90.00

CORE SIZE: 0-2.60 H
2.60 - 55.00 NQ
55.00 - 169.80 BQ

Core split ✓
Geophys log:- None
Photographed ✓

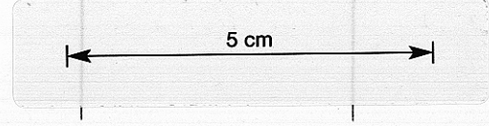
DATE DRILLED: APR 1978
LOGGED BY: P.ASKINS
SCALE: 1:250

FROM	TO	GRAPHIC LOG	ROCK NAME	ORIGINAL ROCK (If different to rock name)	RECOVERY	WEATHERING	COLOUR	GRAIN SIZE	FABRIC TEXTURE COMPOSITION	MINERALIZATION (Sulphides cassiterite etc)	SCHEELITE by UV lamp	reaction to dilute HCl	BEDDING	FRACTURES BRECCIATION VEINING ETC	REMARKS
	3.00		SANDSTONE		80% 25% 63%	SW-MW	iron stained	m	Compact, siliceous. Some tubicoles around 4-5m, and 8m. Silty wispy layers increase with depth	Much dissem py. Up to 10% locally. Often occupies crackled microfractures. Py on jts.	NIL	NIL	Tubicoles sub parallel to core	Py on jts where not weathered. Py rich veinlet, 5.50→ Core very broken in places	
					88% 66%	Frst-MW locally most intense weath due to py.	off-white								
					84%								80° 15.00	Veins rare. Barren qtz 0.5cm 90° at 17.80→	
					88%								75° 18.00		
	21.00				93%										
			SANDSTONE + SILTSTONE			Frst-MW as above	off-white, greys, to khaki	f-m	Sandstone as above with much fine dark silty layers.	Dissem py similar to above and py on joints	NIL	NIL	Very well bedded in pl 80° 21.00 65° 22.00 70° 24.75	As above	
	26.25														
		M	SANDSTONE + HORNFELS	SANDSTONE + SILTSTONE	98%	Frst-SW	hornfls is dk brown	f-m	Dk hornfels occurs 26.25-26.75, 28.00, 29.00-29.35; is pebbly locally. Has crs mica, greisen like at 29.25	Much dissem py + po? in metasiltst.	NIL	NIL	65° 27.25		
	29.35	M			93%										

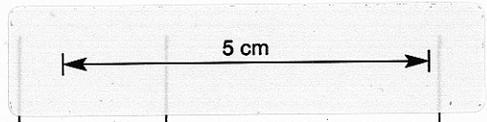
E30072

Depth	Interval	Lithology	Lithology	Lithology	Lithology	Frst-MW	white to brown	m		highly pyritic	NIL	NIL		Very broken
30	30.60	SANDSTONE		79% 35%	Frst-MW	white to brown	m		highly pyritic	NIL	NIL		Very broken
35		HORNFELS	SILTSTONE	95% 95% 58%	mostly Frst locally up to MW	buff	f-m	Well bedded, spotted texture, brown specks (indistinct compositionally. cleavage incipient in places	Much py in pl, mostly along frs	NIL	NIL	45° 33 40° 35 35° 38.25 Cleavage 30° 36.35 in opposite sense to bedding	
39.20	40.00	SS-SLTST		88%	Frst	off-white	f-m	ss irreg + lensoidal, bioturbated		NIL	NIL	15°	
40	41.95	SANDSTONE		44% 84%	Frst-SW	"	m	leached, porous	1% ~1mm dissem black mag + black marcasite?	NIL	NIL	15°	
45	45.45	SANDSTONE-SILTSTONE		82%	Frst-SW	off-white to buff	f-crs	As at 39.20-40.00 but some crs ss grains		NIL	NIL	10°-20° 43 30° contact at 45.45	
48.20		SANDSTONE			"	off-white to iron stained	m-crs	leached, porous, similar to 40-41.95. Qtz grains up to 4mm in pl	Dissem black altered ? marcasite some conc along bedding	NIL	NIL	15°	
50	53.25	SANDSTONE-SILTSTONE		94% 96%	"	off white	f-m	Similar to 39.20-40.00. Compact resembles quartzite to 49.50		NIL	NIL	35° 51	
55	56.50	SANDSTONE		20% 60% 91%	Frst	bluish	m	Some crs qtz grains	1-5% dissem f py	NIL	NIL	50°	
	57.90	SILTSTONE			Frst-Fr	cream	f	Has some bioturbated ss beds towards 57.90	Some f py along 'crackles'	NIL	NIL	50° 57.30	
		QUARTZ			Fr	white	m-crs	Essentially barren	some chlorite	NIL	NIL	Irreg contact 58.40	
58.40	61.40	SANDSTONE-SILTSTONE		88%	Frst			Similar to above, compact, siliceous	Some dissem + some clots py	NIL	NIL		
60	64.40	SILTSTONE		88%	Frst			Similar to 56.50-57.90	Some f py along ss beds	NIL	NIL	10° 64	
65		SANDSTONE		87% 83% 96% 83% 72% 91% 73%	Frst			Compact, siliceous Tends to quartzite : places. Some silty patches	Some f-m py dissem giving specked appearance Very minor quartz veinlets, barren				
70													
75													

5 cm



133073



75					95%									
					86%									
80									Locally leached porous broken towards 83.25			45° 785o		
	83.25				30%									
85		CHLORITIC SANDSTONE	SANDSTONE	61% / 40%	Frst-Fr			Sandstone as above but with medium green matrix of f chl		NIL	NIL		Calcite filled frs 25° at 84.70	
	86.25													
90		WRIGGLITE	LIMESTONE	21% / 95% / 94%	CA & HW-CW	hem stained	f	Remnant wrigglite texture visible in places. Probably similar to below but very weathered, porous		NIL	NIL			
95				53% / 5%										
	99.00													
	100.00			88%	CA SW		f	Typical wrigglite texture, but all altered		NIL	NIL			
100	101.00	CS ROCK + WRIGGLITE	IMPURE LIMESTONE	44%	CA Fr?	green	f	Now largely chlorite		NIL	NIL			
		BRECCIA		7%		dark grey	f	Brecciated porous leached equivalent of above Resembles sinter		NIL	NIL			
	104.25													
105		CS ROCK + WRIGGLITE	IMPURE LIMESTONE	11% / 54% / 27%	CA Fr?	green	f	As at 100-101		NIL	NIL			
	107.25													
	108.20	WRIGGLITE	LIMESTONE	93%	CA SW			As at 99-100 Some crs CS rock with ± fl clear, ± sch		√in vein	NIL		Prominent pink felds vein 10cm 40°	
110	110.25	CALC SILICATE ROCK	IMPURE LIMESTONE	79%	CA HW?	med green	f-m	Broken leached porous completely chloritized Patchy hematite. Probably altered equiv of CS 107.25-108.20		NIL	NIL			
				55%	CA Fr?	med & pale green	f-m	Ditto but mostly not leached. locally less altered; some altered wrigglite		trace sch near 112	NIL			
	112.00													
	112.90			88%	Frst	green	f-m			NIL	NIL	60° 112.90	Some pink feld veinlets at 20°	
	113.95	WRIGGLITE	LIMESTONE		Frst	grey	f	Relatively unaltered		NIL	NIL			
115	116.25	CS ROCK + WRIGGLITE			SW-HW up to CA		f-m	variably altered, locally leached, hematitic		trace dissem f	NIL			
		WRIGGLITE + CS ROCK		79%	Frst		f-m	approx equal proportions		tr in pl		60° 117.40 60° 118.40	some feld veinlets	
	119.60													
120														

120	121.25	M	CS ROCK		97%	SW-HW to CA		f-m	pale CS rock replaced in most pl with dk khaki chlorite	tr	NIL			
		~ M	WRIGGLITE + CS ROCK	interbedded LST + IMPURE LST		Frst	greys greens	f-m	Predominently wrigglite Overall unaltered	in veinlets	NIL		Some pink feld veinlets	
125	125.25	M												
	126.45	M	CS ROCK			Frst-HW NA-CA	pale		pale CS rock overall unaltered but locally brecciated altered as at 119.60	NIL 121.25	NIL			
130		~ M ~	WRIGGLITE + CS ROCK	interbedded LIMESTONE + IMPURE LIMESTONE		Frst NA			Main CS layers are 126.80-127.10 129.00-129.25 131.45-131.95 Predominently wrigglite after 132	dissem f locally abund also common in vnlts	NIL		feld veins + vnlts thru out at various angles. Veinlets sub parallel core to 20° 136.25-139.65	
135		~			93%									
140		~ M ~												
	143.65	~												
145		M	CALC SILICATE ROCK	IMPURE LIMESTONE, CALC SILTSTONE	88%	Frst NA	pale green	f-m	Wrigglite virtually absent. Locally leached + altered	nearly all scheelite confined to veinlets	NIL	45° 145	Much scheelite 146.75 in zone either side of 147.10 5cm feld vein 90°	no sphalerite obvious, to account for 1.7% Zn analysis.
150		M			87%							70° 149		
							bluish	f-m	Tends to hornfels					
155		M				Frst HA	green	f-m	Altered, leached			70° 156		
						Frst-NA	pale grn							
160		M				MA-HA Frst	green	f-m	Altered, leached			60-70° 160		
165		M												

5 cm

165

M CALC SILICATE ROCK

169.80

170

END OF HOLE

45° 168

5 cm

HOLE ABANDONED LOST BARREL etc, BROKE AT ~86m IN WIDENED CAVITY DUE TO WHIPPING.

175

COMALCO LIMITED
DRILL HOLE LOG

5 cm

TAS-78-118

HOLE No: SMD 25 | LOCATION: 1380E / 010S | CORE SIZE: 0 – 3.25 H, 3.25 – 44.80 NQ | DATE DRILLED: JUNE 78

PROJECT: MOINA | ORIENTATION: 65° → 215°M | Core split ✓ Geophys log: None Photographed: ✓ | LOGGED BY: P. ASKINS | SCALE: 1:250

FROM	TO	GRAPHIC LOG	ROCK NAME	ORIGINAL ROCK (If different to rock name)	RECOVERY	WEATHERING	COLOUR	GRAIN SIZE	FABRIC TEXTURE COMPOSITION	MINERALIZATION (Sulphides cassiterite etc)	SCHEELITE by UV lamp	reaction to dilute HCl	BEDDING.	FRACTURES BRECCIATION VEINING ETC	REMARKS
0	25.00		SANDSTONE		0% 82% 88% 73% 93% 94%	Frst-SW			Identical to that in SMD 24 Locally tubicoles eg 0° at 9.00 Locally softer MW-HW siltstone	f py along microfractures with crackled appearance. Crs py in patches, and in places along joints.	NIL	NIL	50°-70° 23.00 defined by thin silty layers	Rare thin quartz veins; Qtz 2cm, 70° 19.50– ctg ± crs py	
25.00			SANDSTONE + SILTSTONE		91% 85% 57%	SW-HW			Similar to that in SMD 24.	Crs py in patches in ss; scattered in small fractures Locally f-m dissem & leached 'out	NIL	NIL			

130217

30					89%							60° 32·50
	34·30											
35		FAULT BRECCIA ?	SILTSTONE?			SW-CW	dk grey-black	f-cs	deformed mash of silty material nearly black chlorite, much py, some po (slightly magnetic)	NIL	NIL	
	36·45											
		SANDSTONE			97%	SW-CW			Similar to above 34·30 but very broken, totally iron stained and HW-CW in places.			
40		SILTSTONE			88%							
					34%							
	44·80											
45		END OF HOLE										HOLE ABANDONED DUE TO DIFFICULT DRILLING CONDITIONS
50												

5 cm

133078

078

COMALCO LIMITED
DRILL HOLE LOG

5 cm

TAS-78-118

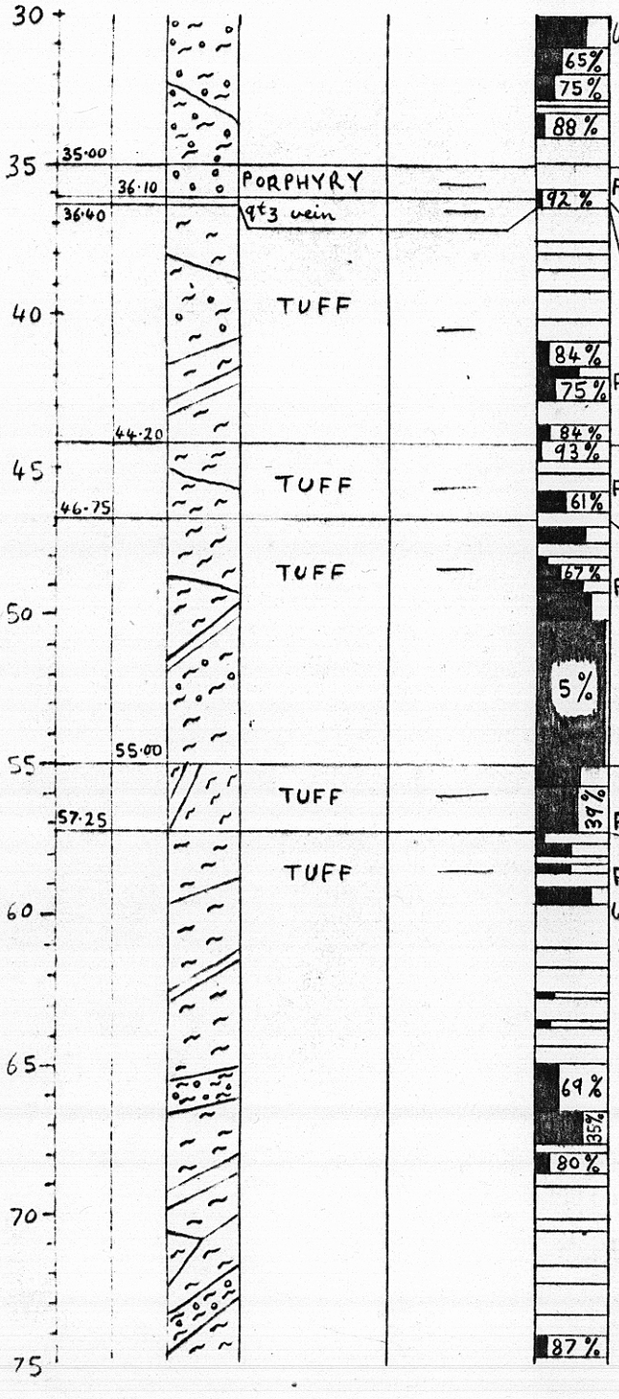
HOLE No: SMD 26 PROJECT: MOINA	LOCATION: 2050E 675 S (MOINA SHEET A) ORIENTATION: VERTICAL	CORE SIZE: 0-49.25 NQ 49.25-201.40 BQ core split ✓; geophys logged NO; photographed ✓	DATE DRILLED: 1978 LOGGED BY: T. Waite SCALE: 2cm = 5m

FROM	TO	GRAPHIC LOG	ROCK NAME	ORIGINAL ROCK (If different to rock name)	RECOVERY % (80 40 20)	WEATHERING	COLOUR	GRAIN SIZE	FABRIC TEXTURE COMPOSITION	MINERALIZATION (Sulphides cassiterite etc)	SCHEELITE by UV lamp	reaction to dilute HCl	BEDDING	FRACTURES BRECCIATION VEINING ETC	REMARKS
NO CORE			ONLY SLUDGE		75% 57% 22%										
12.00	16.85		TUFF	—	90% 81%	SW locally HW	Grey-Brown	f-m	Prominent foln. of black wisps & flattened, qtz. phenocrysts (abundant). Few rk frags. Fe st on fractures.	< 1% mag. (black wisps)	NIL		Lith^al layering 35° at 15.30 foln. 35° at 15.20	qtz-rich veinlets with soft white clay either side.	
20.00			PORPHYRY	TUFF ASH FLOW?	63%	MW to CW	Orange-Brown	f-m	qtz. grains + rk frags (qtz-rich) distinct in soft clay. Black wisps, no foln.	Colour due to Fe st probably after py. < 1% mag (black wisps)	NIL		Lith^al layering 40° at 18.70 Fe st displays Leisegang rings	Very thin, white-yellow, soft veinlets	
	28.00		LITHIC TUFF	—	79% 85% 88% 80% 93%	SW to Frst	Grey	f-m	Foln. of black wisps and dark spots. qtz. grains and rk frags (light coloured) are prominent. rk frags are angular. Irregular patches of altered rock, rich in py, ep, & chl.	Disseminated f-crs py & locally patches of f-crs py. Fe st decreases with depth.	NIL		Lith^al layering + foln 45° at 24.45	Few thin, white, soft veinlets + fractures 1mm wide.	Epidote + Chlorite
			PORPHYRITIC TUFF	—	80%	Frst	Grey	f-m	Distinct foln of black	Locally, disseminated	NIL		foln 40° at 28.30	py, qtz, white mica-rich fracture 0° at 33.45	

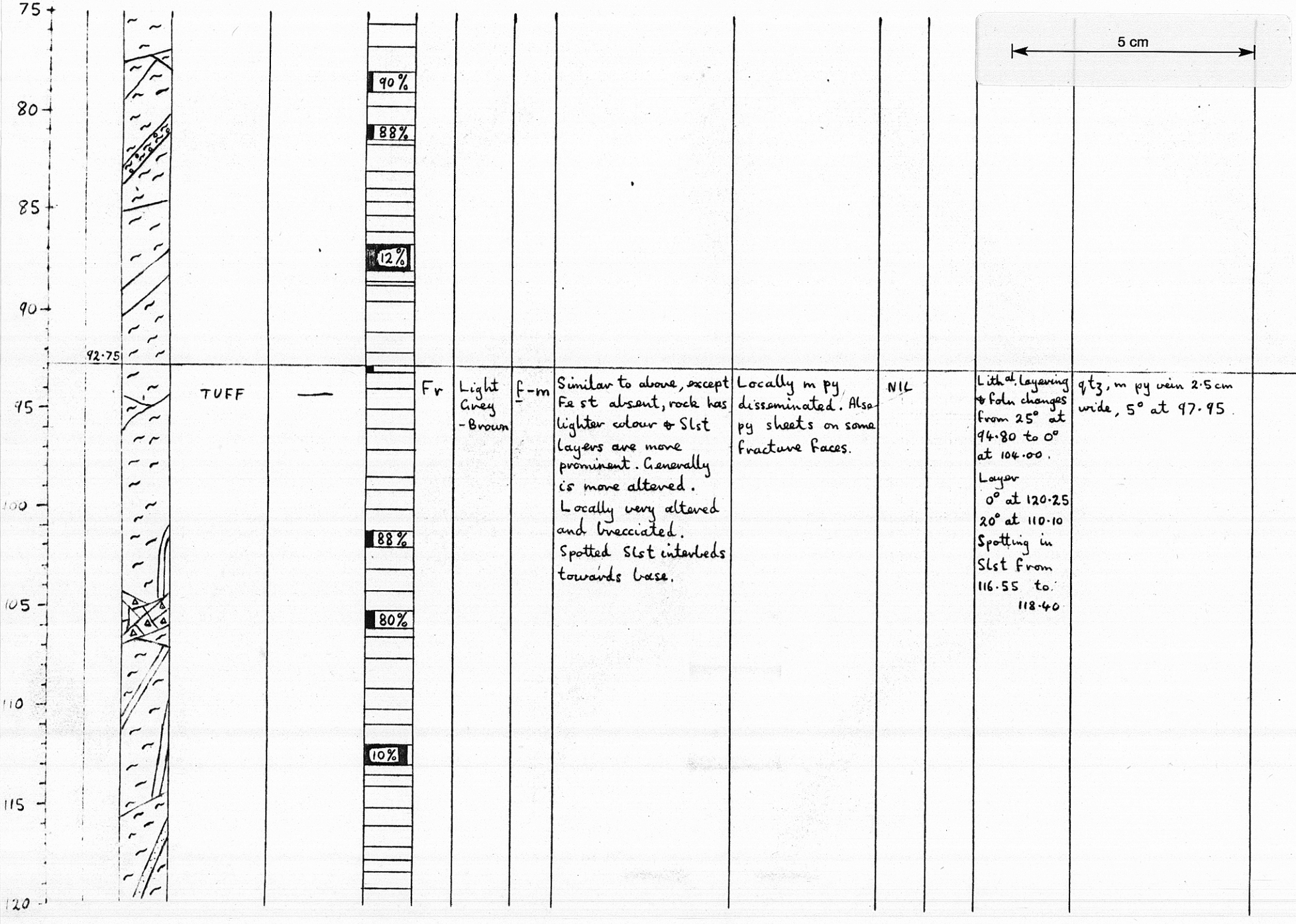
page 1 of 5

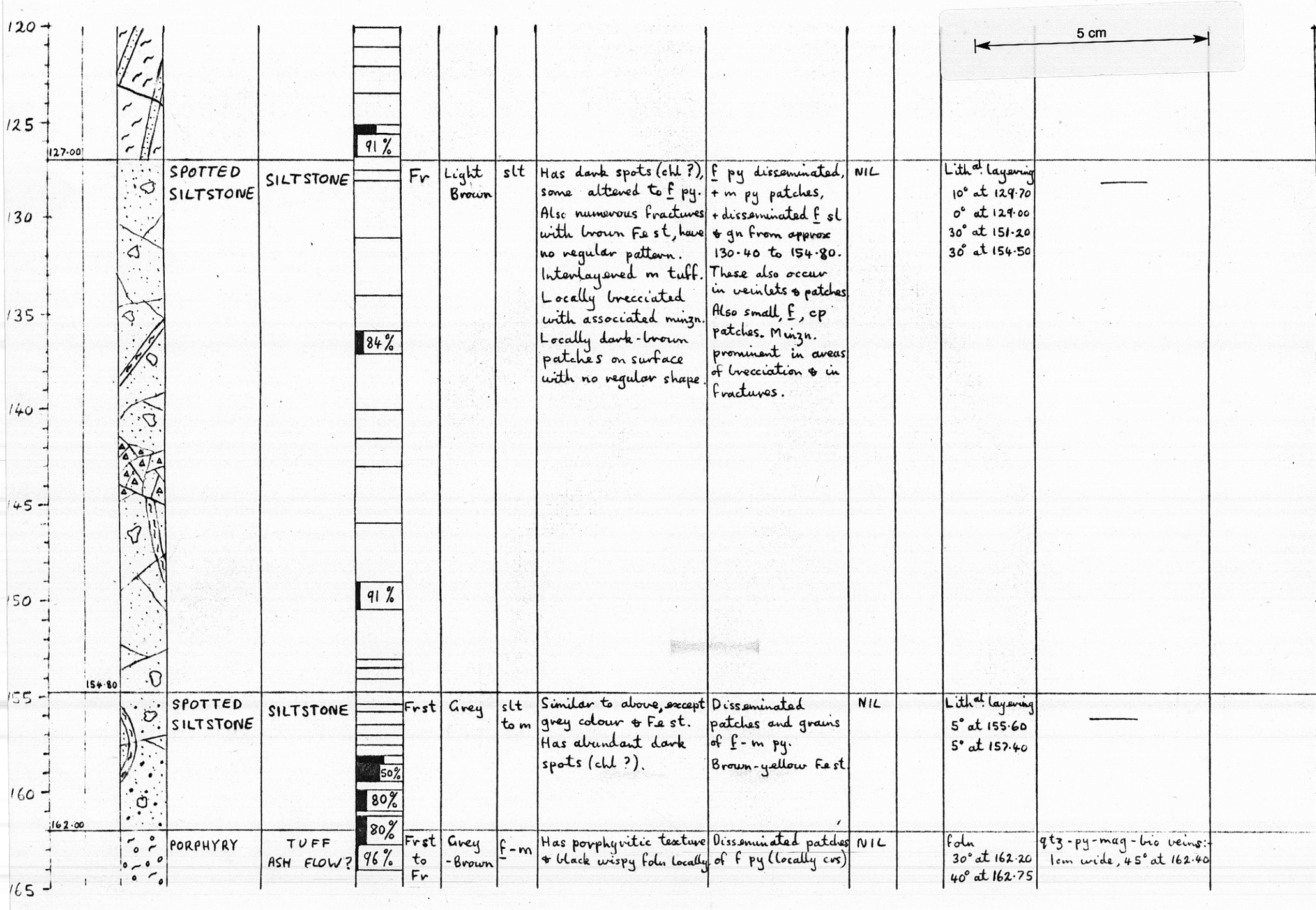
133079

5 cm

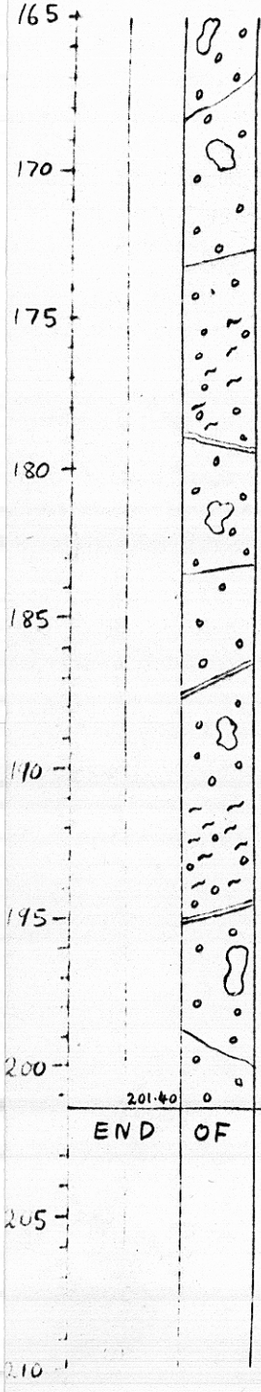


locally SW			wisps and spots. qtz grains prominent in grey matrix.	f-crs py. Bright-yellow Fe st on fractures.					
Frst	Grey-Green	f-m	No distinct foln. Abundant qtz granules. Locally altered (chloritized). Also cleavage present.	Locally, disseminated f-m py + crs py patches in fractures	NIL	—	qtz, chl-rich vein (2mm across) 75° at 35·05 qtz vein at 35·75		
Fr	White-Grey	f	py, chl, + green altn. prod. after As, Sb or Bi sulphide.	f-m py patches	NIL	—	—		
Frst	Grey-Brown	f-m	foln of black wisps & spots. Locally porphyritic with upto 3mm qtz pebbles.	Disseminated m-crs py. Fe st along fractures is orange-brown.	NIL	Lithal layering 25° at 43·35 foln 45° at 38·00 35° at 43·00	f-crs py, chl-rich fracture 5° at 37·00		
Frst	Green-yellow	f-m	foln of black wisps + flattened qtz. phenocrysts. Alteration gives greenish colour + sheen on Fr surfaces. Breaks rel. easily. Few qtz. grains	f-f disseminated py + m py patches. Fe st along fractures is orange-brown	NIL	foln 30° at 44·50 30° at 45·80	—		
Frst	Grey	f-m	foln of black wisps, dark spots + flattened rk frags. Slightly altered. Locally porphyritic with upto 3mm qtz pebbles.	Bright yellow Fe st on fractures	NIL	foln + lithal layering (?) 30° at 47·50	—		
Fr to Frst	Grey	f	Cleavage, lithal layering + wispy foln. No distinct mineral grains visible.	Rare m & f py patches. Fe st minor.	NIL	Lithal layering 25° at 56·85 foln 20° at 56·70			
Frst locally SW	Grey-Brown	f-m	Prominent lithal layering with grey, f, Slst layers av. 2cm wide, locally upto 30cm wide, and interlayered m porphyritic tuff, locally upto 20 cm wide, with black wispy foln in layers, parallel to lithal layering. foln absent in f layers. Tuff layers have m, white, qtz grains.	Rare f-m py disseminated. Bright orange-yellow Fe st on fractures. Between 70·95 and 74·05 Fe st absent, but py (marcasite?) sheets on fracture faces common.	NIL	Lithal layering + foln 45° at 62·00 45° at 62·70 50° at 60·60 45° at 68·95 Slst layer 30cm wide, 45° at 89·15 to 89·60.	—		


75
80
85
90
95
100
105
110
115
120
92.75
90%
88%
12%
88%
80%
10%
TUFF
Fr
Light Grey - Brown
f-m
Similar to above, except Fe st absent, rock has lighter colour & Slst layers are more prominent. Generally is more altered. Locally very altered and brecciated. Spotted Slst interbeds towards base.
Locally m py disseminated. Also py sheets on some fracture faces.
NIL
Lith.al. Layering & Foln changes from 25° at 94.80 to 0° at 104.00.
Layer 0° at 120.25
20° at 110.10
Spotting in Slst from 116.55 to 118.40
qtz, m py vein 2.5 cm wide, 5° at 97.95
5 cm



127.00	SPOTTED SILTSTONE	SILTSTONE	91 %	Fr	Light Brown	slt	Has dark spots (chl ?), some altered to f py. Also numerous fractures with brown Fe st, have no regular pattern. Interlayered m tuff. Locally brecciated with associated mingn. Locally dark-brown patches on surface with no regular shape.	f py disseminated, + m py patches, + disseminated f sl & gn from approx 130.40 to 154.80. These also occur in veinlets & patches. Also small, f, cp patches. Mingn. prominent in areas of brecciation & in fractures.	NIL		Lith^{al} layering 10° at 129.70 0° at 129.00 30° at 151.20 30° at 154.50	—
154.80	SPOTTED SILTSTONE	SILTSTONE	84 % 91 %	Frst	Grey	slt to m	Similar to above, except grey colour & Fe st. Has abundant dark spots (chl ?).	Disseminated patches and grains of f-m py. Brown-yellow Fe st.	NIL		Lith^{al} layering 5° at 155.60 5° at 157.40	—
162.00	PORPHYRY	TUFF ASH FLOW?	50% 80% 80% 96 %	Frst to Fr	Grey-Brown	f-m	Has porphyritic texture & black wispy foln locally	Disseminated patches of f py (locally cvs)	NIL		foln 30° at 162.20 40° at 162.75	qtz-py-mag-bio veins: 1cm wide, 45° at 162.40



qtz phenocrysts prominant. Foln locally due to flattening of qtz phenocrysts. Locally, irregularly altered with amp & ep? patches & associated mag minzn (possibly only remobilized as original rock is locally magnetic). Local alteration around central mineral at 200.50.

cas in qtz veins. Pale-brown Fe st.

30° at 177.00	20 cm wide (little mag) 45°
30° at 181.90	1.5 cm wide (mag rich) 70°
20° at 191.75	2 cm wide (mag rich) 45°
0° at 195.35	2 cm wide (little mag) 50°
40° at 197.80	15 cm wide (ers py) 90°
10° at 200.05	10 cm wide (little mag) 45°
20° at 200.60	2.5 cm wide (little mag) 50°
	4.5 cm wide (mag rich)
	2 cm wide (mag rich) 45°
	1.5 cm wide (mag rich) 30°
	1 cm wide (little mag) 45°
	30 cm wide (py, no mag) 80°
	28 cm wide (little mag) 45°
	15 cm wide (py rich, no mag) 40°
	7 cm wide (py + mag rich) 90°
	? wide (no py, no mag)
	? wide (little mag)
	3 cm wide (mag rich) 20°
	4 cm wide (mag rich) 80°
	10 cm wide (mag rich) 40°
	py, cp, sl or gn? vein 1.5 cm wide 80°
	sl + gn veinlet
	py vein 2.5 cm wide
	Fractures
	py rich 15°
	mag rich 60°
	little mag 40°
	50°
	py rich 10°

from 162.75 - 164.00	
at 165.20	
at 165.80	
at 166.35	
at 166.85	
at 168.20	
at 169.40	
at 171.30	
at 181.30	
at 182.40	
at 182.50	
at 183.45	
from 184.80 - 185.20	
40° at 185.35	
90° at 187.35	
from 188.45 - 189.00	
from 190.20 - 190.60	
20° at 190.95	
80° at 192.00	
40° at 193.60	
at 196.20	
at 196.25	
80° at 196.45	
at 172.40	
at 177.15	
at 178.05	
at 178.95	
at 200.20	

E230083

5 cm

COMALCO LIMITED
DRILL HOLE LOG

TAS-78-118

083

HOLE No: SMD 26A
PROJECT: MOINA

LOCATION: 2050E 675S (MOINA SHEET A.)
ORIENTATION: VERTICAL

CORE SIZE: 0-2.0 H; 2.0-8.5 A; 8.5-13.5 NQ
core split ✓; geophys logged NO; photographed ✓

DATE DRILLED: 1978
LOGGED BY: T. Waite
SCALE: 2cm = 5m

FROM	TO	GRAPHIC LOG	ROCK NAME	ORIGINAL ROCK (If different to rock name)	RECOVERY % (80 40 20)	WEATHERING	COLOUR	GRAIN SIZE	FABRIC TEXTURE COMPOSITION	MINERALIZATION (Sulphides cassiterite etc)	SCHEELITE by UV lamp	reaction to dilute HCl	BEDDING	FRACTURES BRECCIATION VEINING ETC	REMARKS
	0.25		SOIL/GRAVEL						Organic A horizon 0-10cm, then clayey brown soil with rk frags. to 1cm.		NIL				
			PORPHYRY	TUFF ASH FLOW?	80%	CW	Grey	f-m	Orig. fabric recogble. in places - has relict qtz. grns otherwise clayey. Locally shaley inclusions - possibly are CW rk frags.	—	NIL		—	—	
5 6.00															
	8.75		PORPHYRY	TUFF ASH FLOW?	90% 72%	CW locally HW	Orange - Brown	f-m	Similar to above except for colour	Colour due to Fast probably after py.	NIL		—	—	
9.50			TUFF	—		CW locally HW & MW	Brown - Grey	f-m	Wispy foln. Possibly CW rk frags. Fast + crs qtz.	—	NIL		Wispy foliation 10° at 9.20	White & orange-brown veinlets 1mm wide & soft	
10	10.50		TUFF	—		MW	Brown - Grey	f-m	Faint, dark wispy foln. Also f qtz.	—	NIL		Wispy foliation 10° at 10.00	White - yellow veinlets 1mm wide & soft	
			TUFF	—		MW locally CW	Grey - Brown	f-m	Distinct foln., due to dark wisps & Fr flattened qtz phenocrysts. Cleavage.	—	NIL		Foln + cleavage 0° at 10.65	White veinlets 1mm wide & soft.	
END OF HOLE	13.50				80%										

5 cm

133084

COMALCO LIMITED
DRILL HOLE LOG

TAS-78-118

084

HOLE No: SMD 27 | LOCATION: 1900E 575S (MOINA SHEET A) | CORE SIZE: 0-55.20 NQ, 55.20-73.50 BQ | DATE DRILLED: 1978

PROJECT: MOINA | ORIENTATION: VERTICAL | core split ✓; geophys logged NO; photographed | LOGGED BY: T. Waite | SCALE: 2cm = 5m

FROM	TO	GRAPHIC LOG	ROCK NAME	ORIGINAL ROCK (If different to rock name)	RECOVERY % (80 40 20)	WEATHERING	COLOUR	GRAIN SIZE	FABRIC TEXTURE COMPOSITION	MINERALIZATION (Sulphides cassiterite etc)	SCHEELITE by UV lamp	reaction to dilute HCl	BEDDING	FRACTURES BRECCIATION VEINING ETC	REMARKS
	1.00		SOIL/CLAY	—		Fr	Black/Cream	cl	Soil has grass + sticks.	—	NIL		—	—	
			CLAY	—		Fr	Creamy-White	cl-Cbl	Contains cobbles locally and pebbles throughout.	—	NIL		—	—	
8.25															
	11.80		SANDY-CLAY	—		CW	Yellow-Brown	cl-Cbl	Similar to above, except colour (Fest) and abundance of pebbly and crs sand	—	NIL		—	—	
14.50			PORPHYRY	—	60%	HW	Brown	slt-Pbl	Main grainsize is slt with abundant pebbly & crs sand.	—	NIL		—	—	
	17.50		PORPHYRY	—	90% 83% 80%	MW	Grey	slt-crs	crs sand in silty matrix. f bio flakes + cherty rk frags. Crumbles easily probably due to alteration & not weathering as py remains.	Disseminated f-crs py.	NIL		—	—	
			PORPHYRITIC TUFF	—	80% 64% 90% 41% 67% 78%	Frst locally MW	Grey	f-crs	Similar to above, but locally has foln due to black wisps & flattened qtz phenocrysts, also has Fest & is only locally altered (crumbles) showing alteration away from fractures. Is more altered towards	Disseminated f-crs py & also in patches particularly on fracture faces (44.60). Locally f mag. patches. Locally f bismuthite Locally bio patches (49.70). Large	NIL		foln 40° at 22.95 25° at 26.45 25° at 29.20 20° at 35.95 15° at 37.70 20° at 41.50 20° at 42.90 35° at 47.50	- Cherty layer (?) 3mm thick, grey, 10° at 27.65 - f porphyry layer 5° at 33.45 - act-rich fractures 80° at 38.15 90° at 42.35 85° at 45.70 (+ py) - py rich fracture 10° at 47.50	

5 cm

085

SMD 27 page 2 of 2.

30
35
40
45
50
55
60
65
70
75

78%
75%
71%
58%
48%
69%
92%
77%
80%
71%
92%
86%
89%
73%
94%
95%
75%
83%
86%
64%
97%

73.50
END OF HOLE

top & first towards base. Soft, yellow-white clay on fracture faces. Several f, siliceous, grey & angular rk frags.

act + mag + qtz alteration clod at 52.85. Locally ep + mag alteration clods & fractures particularly below 54.00.

20° at 48.00
20° at 51.05
15° at 53.30
30° at 64.80
15° at 66.00
10° at 67.90

- qtz + bio + py + mo vein, at 49.90 (? wide)
- qtz + bio + py ± mag veins
  - at 50.35 (5 cm wide)
  - at 51.65 (3 mm wide)
  - 80° at 53.00 (2 cm wide)
  - 80° at 60.45 (20 cm wide)
  - at 66.30 (? wide)
  - at 67.30 (? wide)
  - at 67.50 (? wide)
  - at 73.20 (? wide)
- ep + mag - rich fracture 40° at 57.15
- py + mag - rich fracture 40° at 54.65.

5 cm

for 33086

COMALCO LIMITED
DRILL HOLE LOG

5 cm

TAS-78-118

HOLE No: SMD 28
PROJECT: MOINA

LOCATION: 900E / 018N
ORIENTATION: 65° → 040°M

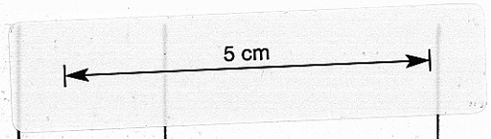
CORE SIZE: 0 – 34.00 NQ
34.00 – 101.00 BQ
Core split ✓
Geophy's log: NO
Photographed: ✓

DATE DRILLED: DEC '78
LOGGED BY: P. ASKINS
SCALE: 1:250

FROM	TO	GRAPHIC LOG	ROCK NAME	ORIGINAL ROCK (If different to rock name)	RECOVERY (80 40 20)	WEATHERING	COLOUR	GRAIN SIZE	FABRIC TEXTURE COMPOSITION	MINERALIZATION (Sulphides cassiterite etc)	SCHEELITE by UV lamp	reaction to dilute HCl	BEDDING	FRACTURES BRECCIATION VEINING ETC	REMARKS
		V	BASALT		0%				Very little recovered						
		V													
		V													
		V							Resembles baked shale at base						
14.30	15.00	~	WRIGGLITE			HW	variable	f	Boulder		NIL	—			
		V	BASALT		53%	Frst mostly	dk green	f	Agglomeratic – frags up to 5cm. Weath frags of wrigglite for	few cm at base					
17.70		~	WRIGGLITE	LIMESTONE	28%	CW	reddish browns	f – m	Typical textures. Interbedded CS layers increase in less weathered wrigglite		NIL by lamp	NIL		Pink feld veinlets not common	
		~			11%										
		~			55%										
		~			25%	HW									
		~													
		~													

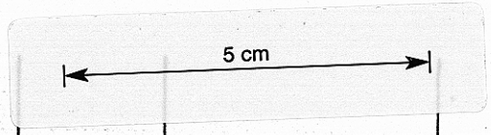
5
10
15
20
25
30

E30087



30					25%	HW								
					91%	mostly MW								
35			WRIGGLITE	LIMESTONE	94%									
					79%									
					74%									
						mostly Frst-SW								
40					24%								55° 39.50	
	41.70													
	42.50		CS ROCK	IMP. LST.	93%	Frst-MW	buffs	f		trace sch veinlets 2	tr	NIL	46°58° 42.00	
	44.00		WOLL HNFLS	CALC. SLTST	60%	Fr	white	f-m	white, massive woll rich rock		NIL	NIL		Many x-cutting green veinlets
	44.50		CS ROCK				buffs		As above, 41.70-42.50		NIL	NIL		
45			WRIGGLITE	LIMESTONE		Fr	grey	f-f			dissem + in veinlets	NIL		Many laumontite and feld veinlets variable orientations 46.50 47.00
	48.30													
	49.80		CS ROCK	IMP. LST.		Fr	buffs	f-m	Has some impure woll hornfels		tr in vnlts	NIL	60° 48.70 70° 49.50	
50									Typical textures 51.65 Calc silicate rich					
			WRIGGLITE	LIMESTONE	87%	Fr			53.90		dissem + in vnlts locally rich			Pink felds veinlets common at various orientations
55					86%									
									58.75 CS rich 59.60					
60					98%									
					98%									
65														
70														
75														

E33088



75													
80			WRIGGLITE										
85	85.30												
			CS ROCK + WRIGGLITE	interbed. IMP LST + LST	95%	Fr	pale green etc + grey	f-m	Interbedded	as above	NIL	very irregular 60°-70°? 86.00	Pink feld veinlets relatively common
90	90.60				97%								
			CS ROCK	IMP LST CALC SILTS		Fr	pale greens	f-m	Some off-white with wollastonite? Wrigglite virtually absent	as above	NIL	70°-90° distinct but bioturbated	Feld veinlets up to 2cm wide at high angles
	94.65												
95	96.10		WRIGGLITE	LST		Fr	grey	f-f	As above	as above	NIL		Ditto
			CS ROCK	IMP LST		Fr	pale greens	f-m	Some interbedded wrigglite	as above	NIL	70°?	Ditto
	99.15				95%								
100	101.00		WRIGGLITE	LST	75%	Fr	grey	f-m	Some CS rock, which are altered to khaki chlorite? after 99.80	—	NIL	70°	Ditto
			HOLE TERMINATED DUE BROKEN GEAR ON MAIN DRIVE OF JOY 22HD RIG.										
105													

089

COMALCO LIMITED
DRILL HOLE LOG

5 cm

TAS-78-118

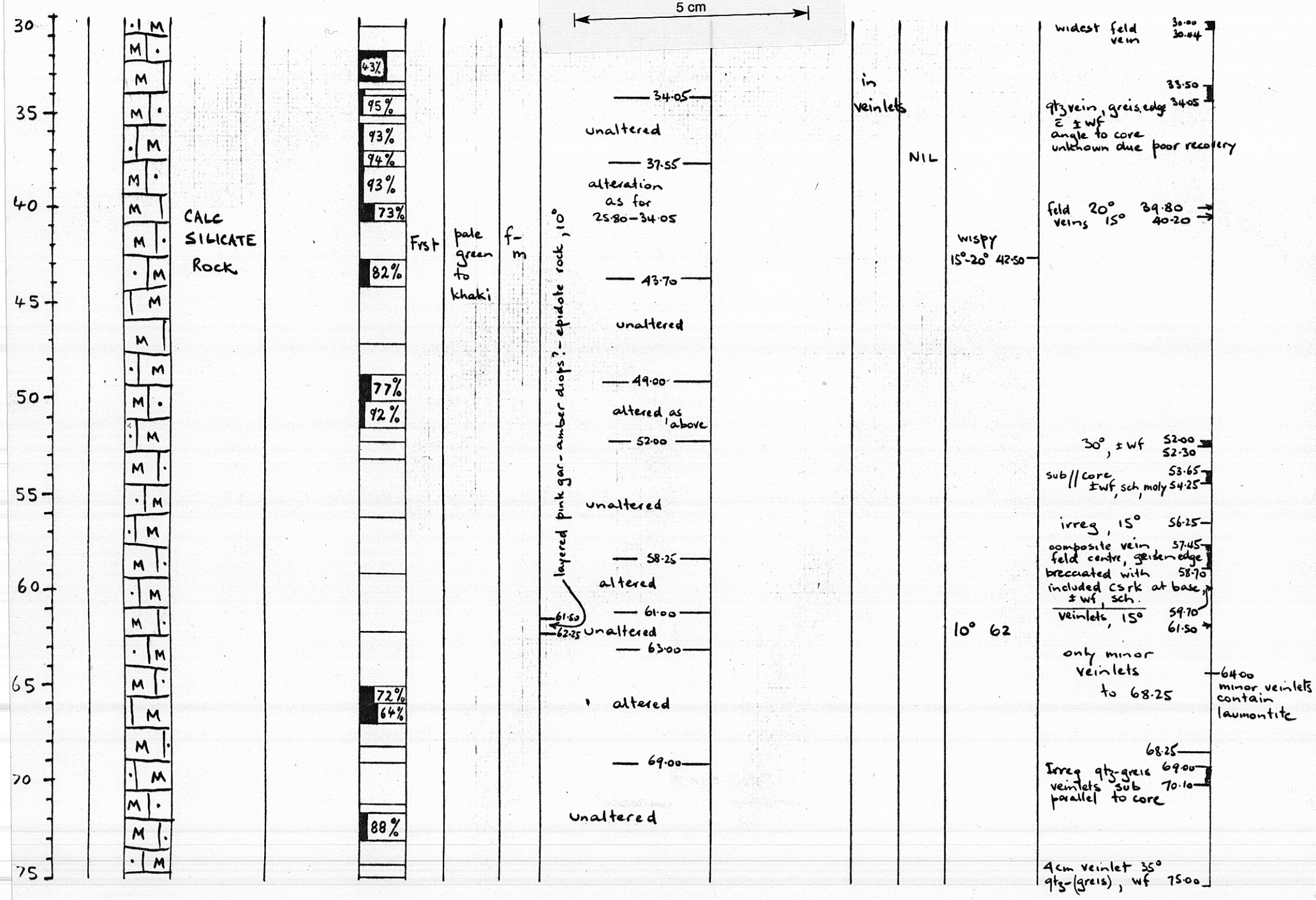
HOLE No: SMD 29	LOCATION: 1100E / 050N	CORE SIZE: 0-3.00 H; 3.00-26.25 NQ; 26.25-122.25 BQ	DATE DRILLED: DEC '78
PROJECT: MOINA	ORIENTATION: 55° → 000° M	Core split: ✓ Geophys logged: no Photographed: ✓	LOGGED BY: P. ASKINS
			SCALE: 1:250

FROM	TO	GRAPHIC LOG	ROCK NAME	ORIGINAL ROCK (If different to rock name)	RECOVERY (80 40 20)	WEATHERING	COLOUR	GRAIN SIZE	FABRIC TEXTURE COMPOSITION	MINERALIZATION (Sulphides cassiterite etc)	SCHEELITE by UV lamp	reaction to dilute HCl	BEDDING	FRACTURES BRECCIATION VEINING ETC	REMARKS
			WRIGGLITE	LIMESTONE	0%, 80%, 30%, 77%	Frst-CW	brown	f-m	Typical wrigglite textures. Increasing bioturbated beds of calc-silicate rock towards 23.25		in veins trace dissem	NIL		Many veins/veinlets, mostly pink feldspar with scheelite, molybdenite, wolframite trace fluorite; widths usually < 3cm e.g 35° 3.00	
					33%, 86%, 51%, 74%	Sw-HW								e.g sub parallel to core → 7.50 – 8.50	
					94%, 78%, 38%, 96%	Frst-SW locally	dark grey						No reliable bedding seen	qtz-musc greisen vein 17.90 – 18.10; 2cm feld vein 45° 19.40; e.g. 45° 22.65	
	23.25		CALC-SILICATE ROCK	IMPURE LIMESTONE	83%, 91%, 92%, 82%, 71%, 66%	Frst	pale green to khaki	f-m	Mostly massive gar-diops rock — 25.80 — More fractured, greenish, in places. Alteration to chl +/or amphiboles.		dissem 27.00 elsewhere in veinlets	NIL		Veins, veinlets as above; e.g. 20° → 28.60 – 29.94	

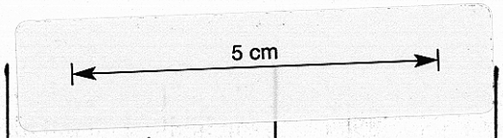
5 10 15 20 25 30

Page 1 of 4

133090


5 cm
30
35
40
45
50
55
60
65
70
75
CALC SILICATE Rock
43%
95%
93%
94%
93%
73%
82%
77%
92%
72%
64%
88%
Frst
pale green to khaki
f-m
layered pink gar - amber drops? - epidote rock, 10°
34.05
unaltered
37.55
alteration as for 25.80–34.05
43.70
unaltered
49.00
altered as above
52.00
unaltered
58.25
altered
61.00
61.50
62.25
unaltered
63.00
altered
69.00
unaltered
in veinlets
NIL
wispy 15°-20° 42.50
10° 62
widest feld vein 30.00 30.44
33.50
qtz vein, greis edge c̄ ± wf 34.05
angle to core unknown due poor recovery
feld 20° 39.80
veins 15° 40.20
30°, ± wf 52.00 52.30
sub // core ± wf, sch, moly 53.65 54.25
irreg, 15° 56.25
composite vein 57.45
feld centre, greisen edge
brecciated with included csrk at base, ± wf, sch. 58.70
veinlets, 15° 59.70 61.50
only minor veinlets to 68.25
64.00 minor veinlets contain laumontite
68.25
Irreg qtz-greis 69.00
veinlets sub parallel to core 70.10
4cm veinlet 35°
qtz-(greis), wf 75.00

133091



75							very broken					qtz-(greis) vein 10°, wf 75.40–75.90		
												2 similar veinlets 60° 77.80		
80		CALC-SILICATE ROCK		95%										
				67%										
				53%			unaltered			rare		83.50 veins and scheelite rare below 83.50		
85								86.25						
				92%			altered							
								90.25						
				96%			unaltered							
90				95%				92.25						
							softer, leached							
	94.85			81%										
95		WRIGGLITE	LIMESTONE	79%	MW Frst	blue grey	f-f	massive		NIL	NIL		absent	
	96.44	LIMESTONE BRECCIA		70%	SW?			Sub rounded fragments of f lst to 5cm in dk reddish brown matrix of weath rock flour		NIL	✓			BISMUTH CREEK FAULT
	98.25				Fr			as above but matrix blue-grey, fresh		NIL	✓			
100	100.00	SANDSTONE			Fr	off white to creamy brown		Similar to sandstone intersected in other holes	Patches rich in py. Irregular fractures with py.			60° 100.75		
105														
110														
								113.50 Tends to siltstone 114.80	Py dissem thru out but especially below 118.50			60° 114.00		
115									118.50				118.50	
120														

120

12235

SANDSTONE

Fr

Crackled with microfractures containing f Py

END OF HOLE

125

5 cm

COMALCO LIMITED
DRILL HOLE LOG

5 cm

TAS-78-118

093 Page 1 of 4

HOLE No: SMD 30

PROJECT: MOINA

LOCATION: 1100E | 150S

ORIENTATION: 50° → 180°M
50° at 40.00; 53° at 80.00; 54° at 120.00

CORE SIZE: 0-11.30 NO CORE
11.30-49.00 NQ
49.00-125.20 BQ
Core split: ✓
Geophys log: none.
Photographed: ✓

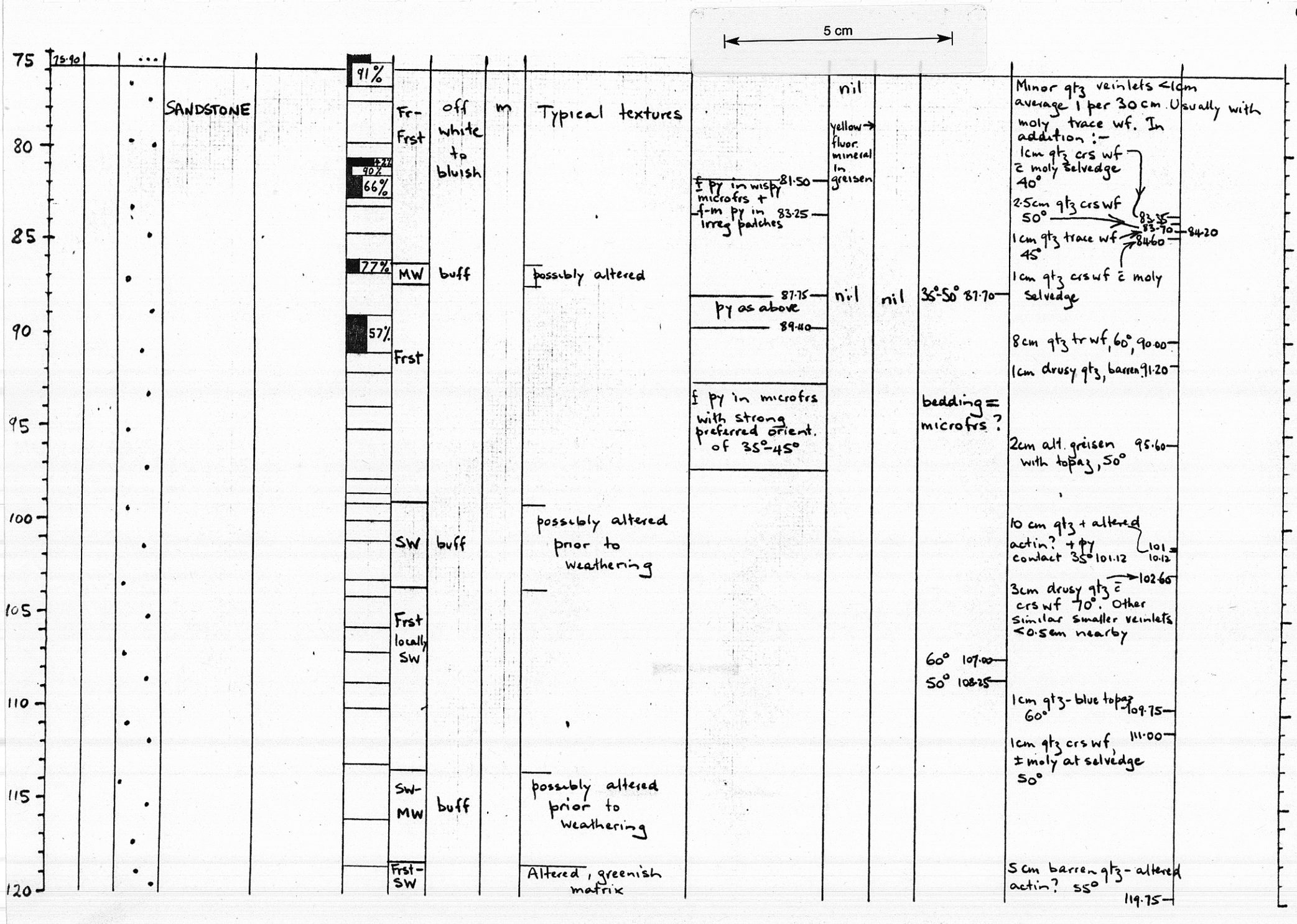
DATE DRILLED: JAN '79
LOGGED BY: P. ASKINS
SCALE: 1:250

FROM	TO	GRAPHIC LOG	ROCK NAME	ORIGINAL ROCK (If different to rock name)	RECOVERY	WEATHERING	COLOUR	GRAIN SIZE	FABRIC TEXTURE COMPOSITION	MINERALIZATION (Sulphides cassiterite etc)	SCHEELITE by UV lamp	reaction to dilute HCl	BEDDING.	FRACTURES BRECCIATION VEINING ETC	REMARKS
	11.30	V V V V	NO CORE	BASALT	0%										
11.50			BASALT			Frst	blue	f-m	massive						
	19.90	· · ·

Depth	Interval	Lithology	Lithology	Lithology	Lithology	Lithology	Lithology	Lithology	Lithology	Lithology	Lithology	Lithology	Lithology	Lithology
30		M	HORNFELS/ CALC-SILICATE Rock	SILT-S.S/ CALC. SILTST.		MW-SW	brown-bluish	f-m	Typical textures; hornfels (metasitstone) interbedded with calc-silicate rock		nil except in veinlet	nil	20° 30.00 distinct, elsewhere less distinct	30.10 one qtz-greisen veinlet 5mm, 35° containing scheelite
35	36.80	M			22%	HW-CW								
		M				MW-SW								
37.80			SS.-SILTST.			HW SW	brown green	m	Altered, with green matrix containing ±f.py		nil	nil	45°	
	39.55	M	S.S.-QTZITE		84%	HW	brown	m-crs	Broken silicified sandstone with irreg x-cutting vnlts of weath. greenish slick'd chl.		nil	nil		chl rich fractures ± greisen vnlts
40	42.60		S.S.-SILTST			SW-MW	off-white to brown	m			nil	nil	not distinct	some vnlts chlorite, rare greisen vnlts
	44.50		SANDSTONE (+ CS rock?)		82%	SW-MW	greenish	m	Irreg silicified and chloritized in patches and veinlets (chl largely replaces CS minerals?)		nil	nil		as above
45	46.10				95%	SW-MW	"	m	Ditto but not obviously silicified.		nil	nil		as above
			SANDSTONE-SILTSTONE		82% 97% 78% 77% 96%	SW	pale buff buff	f-m	Some spotting due to ? andalusite, ? chloritoid etc locally		nil	nil	80° 48.50 90° 49.50	2cm qtz 90° 47.40 2cm qtz, ct, 70° 49.00 Minor greisen veinlets
55	55.20													
			SANDSTONE		72%	Frst-SW	off-white to pale buff, bluish	m	Typical textures	locally pyritic	nil	nil	80° 59.60	Very minor quartz veinlets 57.20 Frs 10° thin purple fluorite coats 58.70 1cm qtz vein, c̄ ± crs purple fl, 40° 59.90 2 veins 35° 45° opposite senses 62.45 5cm. qtz ± crs ct, wf 63.00 3cm drusy qtz 45° greisen selvedge 65.55 7cm drusy qtz 45°, barren 66.80 Minor greisen + qtz veinlets thru out
60						SW-MW	brown			altered greenish matrix				
65					78%	Frst-SW	off white, pale buff, bluish							
70	71.80													
	73.75		MINE WORKINGS		7% 40%				Some wood recovered.					Workings lower than on published plans
75			S.S.-SILTST		54%	MW-HW	orange	f-m	Recovered broken orange clay + clayey leached sandstone					No 5 lode

5 cm

133095


5 cm
75
80
85
90
95
100
105
110
115
120
75.90
SANDSTONE
91%
42%
90%
66%
77%
57%
Fr-Frst
MW
Frst
SW
Frst locally SW
SW-MW
Frst-SW
off white to bluish
buff
buff
m
Typical textures
possibly altered
possibly altered prior to weathering
possibly altered prior to weathering
Altered, greenish matrix
f py in wispy microfrs + f-m py in irreg patches
81.50
83.25
py as above
87.75
89.40
f py in microfrs with strong preferred orient. of 35°-45°
nil
yellow → fluor. mineral in greisen
nil
nil
35°-50°
87.70
bedding = microfrs?
60°
107.00
50°
108.25
Minor qtz veinlets <1cm average 1 per 30 cm. Usually with moly, trace wf. In addition:-
1cm qtz crs wf ± moly selvedge 40°
2.5cm qtz crs wf 50°
83.35
83.70
84.20
1cm qtz trace wf 45°
84.60
1cm qtz crs wf ± moly selvedge
8cm qtz tr wf, 60°, 90.00
1cm drusy qtz, barren 91.20
2cm alt. greisen with topaz, 50° 95.60
10 cm qtz + altered actin? + py contact 35° 101.12
101.10
102.60
3cm drusy qtz ± crs wf 70°. Other similar smaller veinlets <0.5cm nearby
1cm qtz-blue topaz 60°
109.75
1cm qtz crs wf, ± moly at selvedge 50°
111.00
5cm barren qtz-altered actin? 55°
119.75

120

125

130

135

140

145

150

155

160

165

SANDSTONE

Frst-SW

Frst

off-white

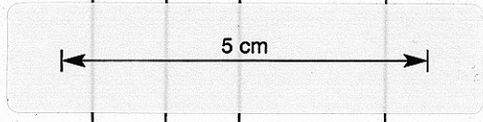
m

Altered, greenish matrix

5cm qtz-chl moly, 45°. Some moly dissem adjacent to vein ↘123.95

125.20

END OF HOLE
INTERSECTED
OLD WORKINGS



No 4 lode at or close to No 3 level

COMALCO LIMITED
DRILL HOLE LOG

5 cm

TAS-78-118

HOLE No: SMD 31	LOCATION: 1400W / 700S (Tea Tree Creek Area)	CORE SIZE: 0 – 1.75 H; 1.75 – 20.10 NQ; 20.10 – 41.40 BQ	DATE DRILLED: FEB '79
PROJECT: MOINA	ORIENTATION: Vertical	Geophys log: none; Photographed: ✓; Core split: ✓	LOGGED BY: P. ASKINS
			SCALE: 1:250

FROM	TO	GRAPHIC LOG	ROCK NAME	ORIGINAL ROCK (if different to rock name)	RECOVERY (80 40 20)	WEATHERING	COLOUR	GRAIN SIZE	FABRIC TEXTURE COMPOSITION	MINERALIZATION (Sulphides cassiterite etc)	SCHEELITE by UV lamp	reaction to dilute HCl	BEDDING	FRACTURES BRECCIATION VEINING ETC	REMARKS
	6.00		BASALT		8%	SW	blue	m	Massive NO CORE. Clay reported by driller. ? weathered bas or sediment between basalt flows.?						
7.30			CALC SILICATE RK		36%	MW	iron stained	f-m	Silty texture		nil	nil		Irreg dk veinlets, some qtz veinlets	Boulder in basalt
	9.50		BASALT		55%	Sw	blue		massive		—	—			
11.00			CALC SILICATE RK		69%	HW-CW SW-MW	pale greens	f-m	massive, consists of pyrox + amphib.? well bedded bioturbated		nil	nil	80°-90°		
	12.00		CALC SIL RK + MAGNETITE SKARN	interbedded limestone + calc. siltstone		Fr	pale green cs layers dk green to black	f-m m	Irreg beds ½-5 cm wide of pale cs + magnetite, some py As above but cs layers are dark green hornblende/actinolite rich.		nil nil	nil nil	80°-90° 75°-80°	Minor py veinlets 1cm qtz ± py, cp? 14.70 – 45° Ditto 16.10 –	
17.00	23.00		CALC SILICATE ROCK + HORNFELS	calc siltstone + siltstone	81% 76%	Fr	black ↓ paler	f-m	Some mag skn layers at top but most black material is f bio?		only in veinlets nil	nil	70°	Irreg vnlts py + ? bio, dark, relatively common at top. 1cm qtz 65° c̄ ± sch. 19.20 – 19.50 qtz stringer c̄ sch	
			HORNFELS + SILTSTONE SANDSTONE	Siltstone + Sandstone	77%	Fr	grey locally greenish	f-m	Variable textures, well bedded, silty locally but sandy m more massive commonly. Locally greenish tending to cs rk.				80°	Laumontite common in fractures esp in sandstone	

133098

133099

Depth														
30		M ·· ···· ·	HORNFELS + SILTSTONE						resembles m qtzite with patchy m green calc-silicate mins + black dissem f bio? + mag.					
35		M ·· ···· ·	SANDSTONE			Fr	grey to greenish	f-m		e.g. py bearing locally 32.50 33.00	only in stringers	nil	80°	Trace trace sch in qtz stringers in places eg 31.80, 35.00, 41.20
40	41.40	M ·· ···· ·			73%									
			END OF HOLE											
45														

31.80

35.00

41.20

5 cm

099

133100

APPENDIX 9

DIAMOND DRILL CORE ANALYSES

HOLE No. SMD 24

PROJECT MOINA

COMALCO

ANALYSES OF SPLIT CORE, ppm

x indicates below limit of detection

DATE 1978

ANALYTICAL LAB		AMDEL															
ANALYTICAL METHOD		SIE CODE E3	XRF CODE B1		AAS CODE C1	SEMI-QUANT'IVE SPECTROGRAPHIC CODE A1				AAS CODE C1			AAS CODE C3	SEMI-QUANTITATIVE SPECTROGRAPHIC CODE A1		
DETECTION LIMIT		0.02	4	10	10	3	1			2	1		0.05	10	3	10
FROM E	TO E	CaF2 %	Sn	W	Bi	Mo	Be	Cu	Pb	Zn	Cd	Ag	Au	Y	Sc	Mn
27.50																
28.50	1.00	0.14	4	x	10	x	10			180	x			30	10	3000
29.00	0.50	0.16	12	x	x	x	15			110	x			20	8	3000
29.35	0.35	0.82	65	50	x	x	20			85	x		x	10	4	7000

101

	Int.	CaF_2	Sn	W	Bi	Mo	Be	Cu	Pb	Zn	Cd	Ag	Au	Y	Sc	Mn
40.00																
41.95	1.95	<0.04	x	x	x	15	2			330	x			10	5	700
45.45																
46.75	1.30	<0.04	14	15	10	5	1			120	x		x	x	x	150
48.20	1.45	<0.04	20	20	10	7	2			210	x			x	3	300

133102

	Int	CaF_2	Sn	W	Bi	Mo	Be	Cu	Pb	Zn	Cd	Ag	Au	Y	Sc	Mn
81·25																
82·25	1·00	<0·04	70	40	10	×	2			80	×			×	3	60
84·20	1·95	<0·04	880	95	60	×	15			310	×			20	4	200
86·25	2·05	0·04	800	270	150	25	50			390	×		0·55	10	4	150
91·10	4·85	0·18	440	190	30	×	10			310	×			10	3	5000
94·10	3·00	0·18	500	190	170	5	10			270	×			10	4	4000
99·00	4·90	9·70	1700	230	330	×	50			500	×			10	4	4000
100·00	1·00	1·18	3450	200	650	×	100			1050	1			10	5	3000
101·00	1·00	0·60	1700	150	560	×	50			1600	3			10	5	2500
104·25	3·25	0·16	300	160	220	×	10			1250	5		×	10	4	5000
107·25	3·00	9·75	2700	150	720	×	100			780	×			×	3	3000
108·20	0·95	17·6	1300	370	490	5	200			200	×			×	3	3000
110·25	2·05	1·82	7000	210	380	×	250			160	×		×	10	4	3000
112·00	1·75	9·50	920	180	80	×	40			250	×			10	4	3000
112·90	0·90	5·20	840	140	20	×	150			100	×			10	4	4000
113·95	1·05	22·3	1700	500	490	20	400			130	×		×	10	5	4000
116·25	2·30	12·7	1250	250	530	10	400			150	×			10	4	4000
119·60	3·35	21·4	1600	500	470	15	400			110	×			10	4	3000

	Int	CaF_2	Sn	W	Bi	Mo	Be	Cu	Pb	Zn	Cd	Ag	Au	Y	Sc	Mn
121·25	1·65	4·30	260	130	60	x	20			60	x			10	3	3000
123·25	2·00	21·9	1850	640	370	20	300			140	x			10	5	4000
125·25	2·00	23·0	1550	1000	380	30	400			150	x			10	5	4000
126·45	1·20	5·50	520	210	90	10	150			50	x			20	5	3000
128·25	1·80	22·6	1300	1350	590	20	300			270	x			10	3	3000
130·25	2·00	22·1	1900	800	520	15	200			130	x			x	x	3000
132·25	2·00	18·0	2300	1100	450	7	300			150	x			10	4	3000
134·25	2·00	20·4	1700	1500	330	50	250			140	x			10	4	3000
136·25	2·00	24·6	1050	1250	330	70	300			250	x			10	4	3000
138·25	2·00	18·6	1350	6000	210	150	200			240	x		x	10	4	3000
139·65	1·40	17·2	800	4850	220	500	150			320	x			10	6	3000
141·65	2·00	21·8	520	2650	500	80	300			220	x			10	4	3000
143·65	2·00	19·6	540	1100	320	60	200			380	x			10	4	3000
146·75	3·10	3·22	580	1650	980	80	100			1·7%	70			10	5	4000
147·10	0·35	5·06	520	1·36%	350	20	80			250	x			10	10	4000
149·90	2·80	2·80	500	260	850	10	80			150	x			10	5	4000
152·65	2·75	5·10	540	230	100	30	80			65	x			10	5	5000
154·15	1·50	15·0	480	240	20	30	250			75	x			10	6	4000
156·10	1·95	6·00	640	1700	x	20	300			80	x			10	6	4000
157·40	1·30	7·60	470	50	10	30	200			70	x		x	10	4	4000
159·40	2·00	1·98	560	410	x	20	80			85	x		x	10	6	10000
161·40	2·00	1·02	560	20	x	5	70			75	x			10	6	4000
163·85	2·45	0·58	600	x	x	x	80			100	x			10	5	4000

	Int	CaF_2	Sn	W	Bi	Mo	Be	Cu	Pb	Zn	Cd	Ag	Au	Y	Sc	Mn
165·85	2·00	3·32	560	270	x	25	80			75	x			20	10	4000
167·80	1·95	0·70	580	20	x	x	50			60	x			10	5	5000
169·80	2·00	1·32	660	25	x	3	80			55	x			20	5	5000

133105

HOLE No. SMD 25

PROJECT

COMALCO

ANALYSES OF SPLIT CORE, ppm

x indicates below limit of detection

DATE

ANALYTICAL LAB		AMDEL											
ANALYTICAL METHOD			XRF	CODE BI									
DETECTION LIMIT			4	10									
FROM TO E	INTERV. E	CaF_2 %	Sn	W	Bi	Mo	Be	Cu	Pb	Zn	Bi		

5
10
15
20
25
30

	CaF_2	Sn	W	Bi	Mo	Be	Cu	Pb	Zn	Bi	
34·30											
36·45	2·15		22	25				440	15	1950	X

133107

HOLE No. SMD 26

PROJECT MOINA

COMALCO

ANALYSES OF SPLIT CORE. ppm

x indicates below limit of detection

DATE 23/2/79

ANALYTICAL LAB		AMDEL											
ANALYTICAL METHOD		XRF CODE B1		AAS, C1 XRF, B1 10 AAS 4 XRF	AAS CODE C1				AAS CODE C2				
DETECTION LIMIT		4	10		2	5	2	1	1				
FROM m TO	INTERV. m	Sn	W	Bi	Cu	Pb	Zn	Cd	Ag				
13.20													
14.90	1.70	8	15	<10	8	8	80						
16.65	1.75	4	15	<10	12	12	95						
18.40	1.75	10	10	<10	42	38	55						
20.00	1.60	14	10	<10	38	25	55						
22.00	2.00	12	20	<10	12	5	85						
24.00	2.00	14	15	<10	55	15	75						
26.00	2.00	30	15	<10	75	150	200						
28.00	2.00	10	15	<10	80	10	75						
30.00	2.00	6	15	<10	22	5	80						

	Int.	Sn	W	Bi	Cu	Pb	Zn	Cd	Ag
35.00									
36.10	1.10	6	25	<10	18	28	50		
36.40	0.30	8	<10	<10	480	12	45		
37.20	0.80	48	25	<10	170	28	60		
44.20									
46.45	2.25	14	40	<10	8	55	100		
66.40									
67.90	1.50	26	25	<10	65	18	130		
70.50									
72.30	1.80	<4	<10	<10	25	12	100		

133109

109

	Int.	Sn	W	Bi	Cu	Pb	Zn	Cd	Ag
80.65 – 82.30	1.65	<4	20	<10	22	5	75		
85.30 – 86.75	1.45	8	20	<10	12	5	60		
95.00 – 95.95	0.95	6	30	<10	25	300	860		
98.05 – 98.40	0.35	4	30	<10	22	65	160		
104.25 – 105.25	1.00	8	45	<10	20	50	65		
108.65 – 109.55	0.90	8	15	<10	30	55	150		

133110

	Int.	Sn	W	Bi	Cu	Pb	Zn	Cd	Ag
130.40									
132.15	1.75	8	30	<10	18	100	90		<1
134.15	2.00	8	35	<10	20	100	140		<1
135.15	1.00	6	30	<10	15	100	150		<1
137.15	2.00	4	30	<10	20	380	2300		1
138.95	1.80	6	30	<10	10	380	1200		1
140.15	1.20	<4	40	<10	5	500	720		1
142.15	2.00	<4	30	<10	15	130	1550		<1
144.15	2.00	<4	40	<10	20	260	2300		<1
146.15	2.00	<4	60	<10	10	500	600		<1
147.15	1.00	<4	55	<10	5	700	400		<1
149.15	2.00	4	45	<10	8	4800	660		8
151.00	1.85	<4	120	<4	25	1300	620	<1	
153.10	2.10	<4	55	<4	22	170	160	<1	
154.80	1.70	<4	30	<4	42	190	130	<1	
156.40									
157.60	1.20	<4	20	<4	12	540	220	<1	
162.75									
164.40	1.65	8	<10	<4	150	65	48	<1	

	Int.	Sn	W	Bi	Cu	Pb	Zn	Cd	Ag
168·15									
168·60	0·45	14	20	<4	35	45	50	<1	
182·75									
184·80	2·05	<4	10	<4	2	240	48	<1	
185·65	0·85	12	<10	<4	2	50	58	<1	
188·35									
190·00	1·65	12	20	<4	8	80	70	<1	
192·00	2·00	8	15	<4	5	50	65	<1	
194·15	2·15	12	15	<4	2	50	65	<1	

133112

HOLE No. SMD 26A

PROJECT MOINA

COMALCO

ANALYSES OF SPLIT CORE, ppm

x indicates below limit of detection

DATE 23/2/79

ANALYTICAL LAB		AMDEL											
ANALYTICAL METHOD		XRF CODE B1		AAS CODE C1									
DETECTION LIMIT		4	10	10	2	5	2						
FROM m TO	INTERV. m	Sn	W	Bi	Cu	Pb	Zn						
0.25	0.25	240	100	10	12	18	32						
2.00	1.75	150	85	20	30	15	65						
4.00	2.00	12	85	<10	38	15	100						
6.00	2.00	14	40	<10	15	15	85						
8.75	2.75	55	100	20	30	25	70						
10.50	1.75	8	10	<10	5	12	90						
12.00	1.50	8	10	<10	2	8	90						
13.50	1.50	16	35	<10	5	12	65						

HOLE No. SMD 27

PROJECT MOINA

COMALCO

ANALYSES OF SPLIT CORE. ppm

x indicates below limit of detection

DATE 12/4/79

ANALYTICAL LAB		AMDEL												
ANALYTICAL METHOD		XRF CODE B1		AAS CODE C1										
DETECTION LIMIT		4	10	2	5	2								
FROM m TO	INTERV. m	Sn	W	Cu	Pb	Zn								
1.00														
3.00	2.00	90	100	48	8	20								
4.75	1.75	26	55	22	25	18								
6.75	2.00	55	45	25	25	90								
8.25	1.50	46	70	22	35	18								
9.00	0.75	70	60	45	32	32								
11.00	2.00	40	85	50	80	40								
13.00	2.00	22	40	30	35	65								
15.00	2.00	30	60	20	42	18								
17.00	2.00	14	35	15	28	100								
19.30	2.30	28	15	2	20	120								
21.00	1.70	14	10	8	18	95								
23.00	2.00	50	20	8	22	95								
25.20	2.20	22	15	20	18	120								
27.00	1.80	50	30	30	20	140								
28.70	1.70	44	30	32	20	95								

HOLE No. SMD 28

PROJECT

COMALCO

ANALYSES OF SPLIT CORE, ppm

x indicates below limit of detection

DATE

ANALYTICAL LAB	AMDEL																
ANALYTICAL METHOD	SIE CODE E3	XRF CODE B1			SEMI-QUANT'IVE SPECTROGRAPHIC CODE A1									SEMI-QUANTITATIVE SPECTROGRAPHIC CODE A1		
DETECTION LIMIT	0.02	4	10		3	1								10	3	10
FROM m TO	INTERV. m	CaF_2 %	Sn	W	Bi	Mo	Be	Cu	Pb	Zn	Cd	Ag	Au	Y	Sc	Mn
17.70																
	7.30	2.6	1600	410		10	80							20	4	5000
25.00																
	4.00	10.0	940	290		10	10							30	4	10000
29.00																

	Int	C-F₂	Sn	W	Bi	Mo	Be	Cu	Pb	Zn	Cd	Ag	Au	Y	Sc	Mn
30																
32.00	3.00	23.1	1650	330		7	20							20	4	10000
34.00	2.00	27.1	1350	490		15	40							20	4	5000
35																
36.00	2.00	23.6	1800	310		10	50							30	5	3000
38.10	2.10	21.0	2100	350		x	50							30	6	3000
40.00	1.90	16.7	1600	420		x	100							30	6	5000
40																
41.70	1.70	15.6	1550	210		x	100							30	6	5000
44.50	2.80	6.8	1150	320		x	50							30	4	5000
45																
46.50	2.00	19.6	1850	480		x	100							30	5	3000
48.30	1.80	18.9	3550	400		x	150							30	4	3000
49.80	1.50	5.6	1050	120		x	50							40	4	7000
50																
51.65	1.85	24.3	2200	600		30	250							20	4	5000
53.90	2.25	17.5	2950	600		20	80							30	5	5000
55																
56.20	2.30	18.3	3050	580		10	100							20	4	3000
58.75	2.55	25.9	2200	1350		25	250							30	7	5000
59.60	0.85	12.6	1850	350		50	100							50	10	6000
60																
61.00	1.40	28.4	1750	1500		100	250							20	5	5000
63.00	2.00	27.0	2300	2050		100	250							20	5	4000
65.00	2.00	27.5	1550	2400		200	250							20	5	5000
65																
67.00	2.00	26.3	1000	780		70	250							20	6	5000
69.00	2.00	24.1	940	2100		100	200							20	5	4000
70																
71.00	2.00	22.1	1250	980		80	250							30	5	5000
73.00	2.00	22.2	1150	840		30	150							10	4	4000
75																
75.00	2.00	21.0	1200	740		20	100							20	4	5000

	Int	CaF_2	Sn	W	Bi	Mo	Be	Cu	Pb	Zn	Cd	Ag	Au	Y	Sc	Mn
75																
77.00	2.00	18.6	1450	470		5	150							20	5	7000
79.00	2.00	16.6	1750	1450		40	100							30	10	5000
80 — 81.00	2.00	24.1	1250	3350		30	150							30	8	5000
83.00	2.00	26.6	1550	2700		40	150							20	7	5000
85.30	2.30	22.3	1950	880		20	200							20	7	5000
85 — 87.80	2.50	16.4	1200	700		20	150							30	7	5000
90.60	2.80	10.9	1900	560		30	150							20	6	7000
90 — 92.60	2.00	7.1	920	720		200	60							50	10	7000
94.65	2.05	5.5	760	370		70	70							40	10	10000
95 — 96.10	1.45	20.5	1050	760		400	150							50	8	5000
97.55	1.45	7.4	1600	380		50	100							30	8	8000
99.15	1.60	9.3	1100	480		30	80							20	5	5000
100 — 101.00	1.85	13.4	1400	680		30	200							30	6	5000
105																

133117

HOLE No. SMD 29

PROJECT MOINA

COMALCO

ANALYSES OF SPLIT CORE, ppm

x indicates below limit of detection

DATE

ANALYTICAL LAB		AMDEL															
ANALYTICAL METHOD		SIE CODE E3	XRF CODE B1			SEMI-QUANT'IVE SPECTROGRAPHIC CODE A1				AAS CODE C1				SEMI-QUANTITATIVE SPECTROGRAPHIC CODE A1		
DETECTION LIMIT		0.02	4	10	4	3	1			2	1			10	3	10
FROM E	TO E	INTERV. E	CaF_2 %	Sn	W	Bi	Mo	Be	Cu	Pb	Zn	Cd	Ag	Au	Y	Sc	Mn
0.00	7.50	7.50	24.3	3000	1050	400	100	300			560	x			10	5	3000
8.50		1.00	32.2	2200	6700	240	100	300			760	x			10	7	3000
10.50		2.00	19.4	1700	1750	430	60	200			1250	x			10	5	3000
12.70		2.20	17.5	1750	1250	320	80	500			940	x			10	6	3000
14.70		2.00	32.3	1400	2350	370	300	300			500	x			20	5	2500
17.00		2.30	20.9	2050	3550	380	300	400			2000	4			10	5	3000
18.90		1.90	12.9	1750	1100	110	40	250			900	x			10	5	2500
20.90		2.00	13.9	1950	5700	180	800	300			250	x			10	5	3000
23.25		2.35	11.8	1700	2200	390	200	250			550	x			10	5	2500
25.80		2.55	8.00	660	1400	150	200	250			80	x			10	6	10000
28.60		2.80	3.66	420	940	280	30	80			95	x			10	5	7000
30.00		1.40	10.0	340	3150	90	2000	150			80	x			10	6	3000

	Int	CaF_2	Sn	W	Bi	Mo	Ba	Cu	Pb	Zn	Cd	Ag	Au	Y	Sc	Mn
31·75	1·75	6·55	330	1300	330	400	150			70	x			10	6	7000
33·50	1·75	2·10	360	150	560	20	200			110	x			10	8	10000
34·05	0·55	5·05	60	8600	26	50	60			20	x			x	4	1000
35·55	1·50	1·62	350	230	18	x	80			70	x			10	6	5000
37·55	2·00	0·93	390	460	18	50	60			55	x			10	5	5000
39·74	2·19	2·04	330	1700	6	x	100			70	x			10	5	5000
41·70	1·96	2·28	360	1700	x	x	80			70	x			10	6	5000
43·70	2·00	0·20	360	90	x	x	60			60	x			10	5	3000
46·50	2·80	1·37	320	1800	4	100	80			55	x			10	5	4000
48·50	2·00	1·33	310	1200	4	20	60			50	x			10	5	3000
52·00	3·50	1·74	370	200	x	x	100			80	x			10	5	4000
53·65	1·65	2·34	270	250	x	150	80			55	x			10	5	4000
54·25	0·60	7·50	320	1·07 %	x	1000	80			85	x			10	5	3000
56·25	2·00	1·93	340	210	6	150	100			65	x			10	6	7000
57·45	1·20	2·28	360	1350	x	1000	100			70	x			10	6	10000
58·70	1·25	13·4	150	9800	130	500	80			38	x			10	6	5000
59·95	1·25	6·95	330	5600	x	150	100			60	x			10	6	7000
61·90	1·95	3·62	350	270	26	60	250			65	x			10	5	5000
63·90	2·00	3·66	470	85	120	3	150			60	x			10	5	7000
65·00	1·10	15·8	210	110	860	100	300			80	x			10	5	5000
67·00	2·00	19·5	390	1250	620	150	150			100	x			10	6	3000
69·00	2·00	10·5	280	640	65	1000	250			120	x			10	6	2000
70·10	1·10	13·4	85	1150	6	10	150			80	x			10	5	5000
72·00	1·90	5·45	310	95	20	3	150			100	x			10	7	7000
73·00	1·00	6·45	400	95	20	7	100			120	x			10	5	5000
75·00	2·00	7·85	270	1600	x	300	100			90	x			20	6	5000

	Int	CaF_2	Sn	W	Bi	M_o	Be	Cu	Pb	Zn	Cd	Ag	Au	Y	Sc	Mn
75.90	0.90	11.8	120	1.71%	x	2000	100			60	x			20	7	3000
78.00	2.10	7.80	240	330	8	40	100			70	x			20	6	5000
80.00	2.00	3.72	270	1950	4	200	80			110	x			10	5	5000
82.00	2.00	5.70	280	480	4	80	100			65	x			10	5	4000
83.50	1.50	6.05	330	1300	6	100	100			75	x			20	7	4000
86.25	2.75	5.44	320	40	4	x	100			80	x			10	6	4000
88.25	2.00	5.46	280	55	10	60	100			130	x			10	5	3000
90.25	2.00	4.00	250	60	18	x	100			230	x			10	6	3000
92.25	2.00	0.42	310	45	x	x	80			95	x			10	5	5000
94.85	2.60	0.31	390	60	x	x	100			120	x			10	5	3000
96.44	1.59	19.6	1800	180	800	40	300			260	x			x	3	3000
98.25	1.81	0.28	140	120	70	x	70			220	x			10	4	3000
100.00	1.75	0.06	55	75	24	x	60			270	1			10	4	3000
102.00	2.00	0.04	4	75	4	x	30			55	x			10	5	1000
104.00	2.00	0.05	x	55	x	x	50			65	x			20	6	3000

133121

NO ANALYSES

HOLE No. SMD 30

PROJECT

COMALCO

ANALYSES OF SPLIT CORE, ppm

x indicates below limit of detection

DATE

ANALYTICAL LAB: AMDEL

ANALYTICAL METHOD: XRF

DETECTION LIMIT: CODE B1 & B2 FOR RESULTS >1%

			4	10

FROM / TO	INTERV.	CaF_2 %	Sn	W
19·90				
21·00	1·10		380	230
23·70	2·70		310	45
25·70	2·00		230	10
27·60	1·90		210	20
29·75	2·15		210	360

	Int.	CaF_2	Sn	W
31·50	1·75		85	260
33·45	1·95		55	30
35·55	2·10		110	150
36·80	1·25		130	160
37·80	1·00		120	290
39·55	1·75		48	100
41·00	1·45		55	100
42·60	1·60		70	70
44·50	1·90		80	170
46·10	1·60		90	250
47·50	1·40		32	80
49·00	1·50		220	230
51·80	2·80		42	110
53·90	2·10		65	85
55·20	1·30		48	55
57·20	2·00		48	60
58·80	1·60		55	140
61·00	2·20		50	80
62·45	1·45		40	55
63·00	0·55		1·46%	500
64·55	1·55		85	25
66·20	1·65		180	40
68·50	2·30		130	520
70·80	2·30		48	35
71·60	0·80		36	40
73·75				
	2·15		70	80

	Int	CaF_2	Sn	W
75.90				
78.00	2·10		240	80
79.95	1·95		32	60
81.50	1·55		60	55
83.45	1·95		70	2750
86.20	2·75		820	140
87.20	1·00		95	75
89.05	1·85		44	35
93.00				
95.00	2·00		44	110
99.00				
100.90	1·90		42	50
102.70	1·80		28	310
109.75				
111.00	1·25		46	780
113.50				
115.50	2·00		14	20
120.00				

	Int	CaF_2	Sn	W
122.00	2.00		85	35
123.50	1.50		12	40
125.20	1.70		390	20

120
125
130
135

HOLE No. SMD 31

PROJECT

COMALCO

ANALYSES OF SPLIT CORE, ppm

x indicates below limit of detection

DATE

ANALYTICAL LAB		AMDEL																
ANALYTICAL METHOD		SIE CODE E3	XRF CODE B1		S-Q'IVE SPECT'IC CODE A2	SEMI-QUANT'IVE SPECTROGRAPHIC CODE A1			SEMI-QUANT'IVE SPECTROGRAPHIC CODE A2			S-Q'IVE SPECT'IC CODE A2	AAS CODE C3	SEMI-QUANTITATIVE SPECTROGRAPHIC CODE A1			S-Q'IVE SPECT'IC CODE A2
DETECTION LIMIT		0.02	4	10	1	3	1		1	20		0.1	0.05	10	3	10	1
FROM / TO	INTERVAL	CaF_2 %	Sn	W	Bi	Mo	Be	Cu	Pb	Zn	Cd	Ag	Au	Y	Sc	Mn	Ge
9.50																	
11.00	1.50	0.75	450	15	15	x	15		25	1000		0.5	x	30	5	10000	x
12.00	1.00	0.95	900	65	250	x	30		25	100		1.5	0.05	30	8	10000	3
14.00	2.00	1.05	660	x	700	x	40		25	100		0.4	0.15	50	8	5000	15
16.00	2.00	1.10	860	x	500	x	20		25	100		0.4	x	40	7	4000	7
17.00	1.00	1.25	580	10	300	x	10		20	200		0.4	x	30	6	4000	5
19.00	2.00	0.40	540	30	50	x	15		20	500		0.3	x	150	15	5000	3
21.00	2.00	0.45	200	75	20	x	15		25	500		0.4	x	50	8	5000	x
23.00	2.00	0.35	110	25	5	x	7		25	100		0.3	x	70	7	3000	x
24.00	1.00	0.40	42	20	4	x	2		30	x		0.4	x	150	7	1500	x

	Int	CaF_2	Sn	W	Bi	Mo	Be	Cu	Pb	Zn	Cd	Ag	Au	Y	Sc	Mn	Ga
30.40 – 31.40	1.00	0.25	28	25	5	x	2		25	20		0.4	x	30	4	1500	1?
32.30 – 34.00	1.70	0.35	55	15	x	x	2		20	20		0.3	x	100	15	2000	x

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APPENDIX 10

DEPARTMENT OF MINES BENEFICIATION

INVESTIGATION R 758

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133129

Exploration Department,
P.O. Box 691,
DEVONPORT. TAS. 7310.

19th April, 1979.

Mr. H.K. Wellington,
Chief Chemist & Metallurgist,
Department of Mines,
287 Wellington Street,
SOUTH LAUNCESTON. 7250.

Dear Mr. Wellington,

R 758 - Moina Wrigglite.

We have asked our Technical Services Department to comment on the results of your program to date, but they cannot offer much constructive comment because of their lack of experience in this particular field.

My comments are that:

(1) fluorite flotation before the other complex gravity techniques would reduce the volume of material treated, and then enable tin and tungsten to be produced as by products of fluorite.

(2) can you investigate the possiblity of photometric preconcentration of the scheelite bearing pink fledspar veinlets before further treatment? I am thinking of the rather dramatic beneficiation techniques used at Mt. Carbine in North Queensland (see attached article).

Concerning the work to be done by David Green, the wrigglite as supplied to you is typical and coarser material does not exist. If David has any specific requirements for rock types it would be best if he contacted me directly.

Yours faithfully,

P.W. Askins.
Senior Geologist.

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M 1588

133130

cc 7/74 MOINA BENEFICIATION

Pa - W1

DEPARTMENT OF MINES—TASMANIA

TELEPHONES:
Metallurgical Research .. ..
Laboratory .. .. ..
Mines Inspection .. .. ..
Explosives & Inflammable Liquids
44 2431-2 (2 lines)

LAUNCESTON OFFICES
287 WELLINGTON STREET
SOUTH LAUNCESTON 7250

27th April 1979

Comalco Ltd,
Exploration Dept.,
P.O. Box 691,
Devonport, TAS 7310

R758: Moina Wrigglite.

Dear Mr. Askins,

Thank you for your letter dated 19th Apr'79 and attached account of the Mt. Carbine operation.

Regarding your suggestions:-

1. From the Amdel work fine grinding is necessary to recover the fluorite hence to do that first would jepodize the gravity recovery. However at the present stage of this project I believe your suggestion of fluorite removal is worth applying to middling products as a next stage in the furtherance of this project.

2. Regarding ore sorting, the Mt. Carbine operation is exceptional in that the separation by the sorter is between quartz (which carries the scheelite and wolframite) and the country rock rather than between economic minerals and non economic ones.

   We have not the facilities to investigate colourimetric sorting but as the pink veins are quite small I would imagine sorting would have to be done at quite a fine size whereas sorting is better suited to larger sized material. However if you think a separation based on colour is possible it would be worth getting Ore-Sorters views.

Yours faithfully,

(H. K. Wellington)
Chief Chemist & Metallurgist.

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M 1588

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DEPARTMENT OF MINES—TASMANIA

TELEPHONES:
Metallurgical Research .. ..
Laboratory .. .. .. } 44 2431-2 (2 lines)
Mines Inspection .. .. ..
Explosives & Inflammable Liquids

LAUNCESTON OFFICES
287 WELLINGTON STREET
SOUTH LAUNCESTON 7250

5th February 1979

Comalco Ltd,
Exploration Department,
P.O. Box 691,
Devonport 7310
TASMANIA.

R758 - Moina Wrigglite Project

Dear Sir,

Please find attached a copy of the above report showing the progress made with the tonne sample. The distribution of metals in the products is similar to that achieved in R745 but now we have sufficient of these products to further examine them.

Yours faithfully,

(H. K. Wellington)
Chief Chemist & Metallurgist.

131 M 1588

133132

DEPARTMENT OF MINES—TASMANIA

LAUNCESTON OFFICES
287 WELLINGTON STREET
SOUTH LAUNCESTON 7250

TELEPHONES:
Metallurgical Research .. ..
Laboratory .. .. ..
Mines Inspection .. .. ..
Explosives & Inflammable Liquids
44 2431-2 (2 lines)

1st February 1979.

R758

MOINA WRIGGLITE PROJECT

Introduction:

This investigation, undertaken at the request of Comalco Ltd., is a further examination of the Moina Wrigglite deposit, as was undertaken and recorded in reports R731 and R745. In this investigation, an attempt has been made to concentrate both the scheelite and cassiterite present in the wrigglite ore.

Sample (772456):

A head sample, obtained from the 1 tonne sample after crushing, mixing and riffling, gave the following results when subjected to chemical analysis.

S.Fe.	20.4 %
T.Fe.	21.2 %
Ca	12.8 %
S	0.8 %
WO_3	0.19 %
Sn	0.27 %
F	8.6 %

Method:

1. The 1 tonne sample supplied, was jaw and roll crushed to -10mm prior to sampling.

2. Successive grinding and concentration techniques were used to reduce the whole of the 1 tonne sample bulk to a nominal particle size of -53um.

3. An outline of the concentration process (see flowsheet) used is as follows. The -10mm ore was initially ball mill ground to -300um, with the + 170um fraction being fed to a wet magnetic sxparator. The non magnetics from this operation were then concentrated on a table, whilst the magnetic fraction was placed in closed circuit with a ball mill, 170 um screen and magnetic separator. That is, the magnetics, to escape from the circuit were required to be ground to -170 um.

The table concentrate product was subjected to sulphide flotation with the flotation tailing being fed to a dry, high intensity, magnetic separator. This total process was repeated at 105 um, 75 um and nominally at 53 um. A 3" Warman cyclone was adopted to replace the 53 um vibrating screen as the screen proved to be totally inadequate and inefficient to handle the quantity of material required at such a fine particle size. A further refinement in the treatment method of the material nominally - 53um was the use of a vanner rather than a table for gravity concentration.

All products from each successive grind, with the exception of the final dry non magnetic concentrate in each case, were reground to the next lowest size for reconcentration, until the total mass was reduced to nominally - 53um.

Results Obtained.

Table 1. Overall Balance.

Fraction	Percent				Percent Distribution		
	Mass	WO_3	Sn	F	WO_3	Sn	F
M/S 10 M/A	29.722	0.08	0.19	3.5	14.4	20.2	11.7
V T	66.116	0.13	0.25	11.4	51.9	59.1	85.0
T 5 T	3.442	0.40	0.54	8.3	8.3	6.6	3.2
F 5 C	0.456	<0.02	0.12	0.61	Trace	0.2	0.1
M/S 11 M/A1	0.042	8.8	2.3	0.84	2.2	0.3	Tr.
M/S 11 M/A2	0.110	9.6	2.7	1.1	6.4	1.1	Tr.
M/S 2N	0.011	11.1	40.6	12.8	0.7	1.6	Tr.
M/S 4N	0.017	19.8	39.8	8.8	2.1	2.4	Tr.
M/S 6N	0.024	26.3	40.6	3.7	3.8	3.5	Tr.
M/S 8N	0.004	27.4	47.5	0.52	0.7	0.7	Tr.
M/S 11N	0.056	28.2	21.7	1.7	9.5	4.3	Tr.
Head	100	(0.17)	(0.28)	(8.9)	100	100	100
Head Assay		0.19	0.27	8.6			

Table 11 WO_3 and Sn Concentration

Fraction	Percent			Percent Distribution	
	Mass	WO_3	Sn	WO_3	Sn
M/S 10 M/A	29.722	0.08	0.19	14.4	20.2
V T	66.116	0.13	0.25	51.9	59.1
F 5 C	0.456	<0.02	0.12	Trace	0.2
Tailings	96.294	(0.11)	(0.23)	66.3	79.5
T 5 T	3.442	0.40	0.54	8.3	6.6
M/S 11 M/A1	0.042	8.8	2.3	2.2	0.3
M/S 11 M/A2	0.110	9.6	2.7	6.4	1.1
Middlings	3.594	(0.78)	(0.63)	16.9	8.0
M/S 2N	0.011	11.1	40.6	0.7	1.6
M/S 4N	0.017	19.8	39.8	2.1	2.4
M/S 6N	0.024	26.3	40.6	3.8	3.5
M/S 8N	0.004	27.4	47.5	0.7	0.7
M/S 11N	0.056	28.2	21.7	9.5	4.3
Concentrates	0.112	(24.8)	(31.2)	16.8	12.5
Head	100	0.17	(0.28)	100	100

Table 111 Concentration Summary

Fraction	Percent			Percent Distribution	
	Mass	WO_3	Sn	WO_3	Sn
Concentrates	0.112	(24.8)	(31.2)	16.8	12.5
Middlings	3.594	(0.78)	(0.63)	16.9	8.0
Tailings	96.294	(0.11)	(0.23)	66.3	79.5

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Table 1V **Final Magnetics.** **M/S 10 M/A**

Fraction um	Mass g		Percent					Percent Distribution	
	Run 1	Run 2	Mass	Mass Cum.	S.Fe.	Fe^{++}	Ratio $\frac{Fe^{++}}{S.Fe}$,	S.Fe.	Fe^{++}
-600+300	Tr.	Tr.	Tr.	Tr.					
-300+212	Tr.	Tr.	Tr.	Tr.					
-212+150	Tr.	Tr.	Tr.	Tr.	29.5	10.1	0.34+	3.2	3.3
-150+106	0.1	0.1	0.2	0.2					
-106+ 75	0.8	0.8	1.6	1.8					
- 75+ 53	1.9	1.8	3.7	5.5					
- 53+ 38	5.0	4.9	9.9	15.4	30.1	10.5	0.35+	5.9	6.2
C/S 1*	5.6	5.8	11.4	26.8	57.6	18.1	0.31	13.1	12.3
C/S 2	7.9	7.8	15.7	42.5	48.3	16.0	0.33	15.1	15.0
C/S 3	9.0	8.9	17.9	60.4	54.0	17.4	0.32	19.3	18.5
C/S 4	7.3	7.2	14.5	74.9	57.2	18.8	0.33	16.5	16.2
C/S 5	3.0	2.9	5.9	80.8	60.9	19.6	0.32	7.2	6.9
O/F	9.4	9.8	(19.2)	100	(51.5)	(18.9)	(0.37)+	19.7	21.6
Head	50.0	50.0	100	-	50.2	16.8	0.33	100	100

* C/S at 19°C + High ratio figure is due to the presence of ball mill iron.

Simulated D/T Assay 1. 85.2% 2. 83.6%

i.e. average Davis Tube magnetics of 84.4% containing 58.3% S.Fe, 19.2% Fe^{++} and a ratio of 0.33

133135

Whilst entrainment of slime appears to be a characteristic of the Eriez drum magnetic separator, the intimate nature of the minerals occurring with the magnetite in the wrigglite ore have also aided the achievement of only a very poor magnetite concentrate, which was found to contain only 84.4 percent magnetics. 14.4 percent of the overall WO_3 and 20.2 percent of the overall Sn in the ore has been retained in this product M/S 10 M/A.

Table V1 Sizing - Vanner Tailing (V T)

Fraction µm	Mass (g)	Percent Mass	Percent Mass Cum	% Sn	% WO_3	% Dist Sn	% Dist WO_3
-600+300	0.1	Tr.	Tr.				
-300+150	0.3	0.1	0.1	0.26	0.22	2.3	3.7
-150+106	1.8	0.3	0.4				
-106+ 75	8.9	1.8	2.2				
- 75+ 53	18.9	3.8	6.0	0.19	0.09	2.9	2.6
- 53+ 38	49.4	9.9	15.9	0.20	0.05	7.9	3.8
C/S1 *	7.7	1.5	17.4				
C/S2	39.8	8.0	25.4	0.23	0.07	8.8	5.1
C/S3	66.5	13.3	38.7	0.22	0.09	11.7	9.2
C/S4	72.5	14.5	53.2	0.29	0.18	16.8	20.1
C/S5	35.7	7.1	60.3	0.31	0.21	8.8	11.5
O/F	(198.4)	39.7	100	(0.26)	(0.14)	40.8	44.0
Head	500	100	-	(0.25)	(0.13)	100	100

* (C/S at 19°C.)

The WO_3 and Sn distributions of the vanner tailing product show that 49.6 and 55.5 percent of the WO_3 and Sn respectively in this product are unrecoverable by conventional gravity methods. That is, 25.7 percent of the overall WO_3 and 32.8 percent of the overall Sn would be unrecoverable by gravity concentration.

Table V Sizing - Vanner Conc. Table Tail (T 5 T)

Fraction	Mass (g)	Percent Mass	Percent Mass Cum	% WO_3	% Sn	% Dist WO_3	% Dist Sn
+75	0.7	0.2	0.2				
+53	1.8	0.6	0.8	0.06	0.30	2.5	9.1
+38	43.4	15.6	16.4				
C/S1	38.1	13.7	30.1	0.10	0.38	3.4	9.6
C/S2	77.1	27.7	57.8	0.14	0.37	9.7	19.0
C/S3	59.8	21.5	79.3	0.63	0.58	33.9	23.1
C/S4	25.5	9.2	88.5				
C/S5	6.6	2.4	90.9	1.3	1.1	37.7	23.6
O/F	25.4	9.1	100	(0.57)	(0.92)	12.8	15.6
Head	278.4	100	-	(0.40)	(0.54)	100	100

(C/S @ 20°C)

This product T 5 T, contains 8.3 percent of the overall WO_3, and 6.6 percent of the overall Sn in the ore, of which, 4.1 percent of the WO_3 and 2.6 percent of the Sn is unrecoverable by gravity means because of its fine particle size.

Flotation Concentrate (F 5 C)

Chemical analysis of this sulphide concentrate gave the following results.

WO_3	<0.02	%
Sn	0.12	%
Cu	0.34	%
Zn	13.8	%
Pb	0.15	%
Bi	1.7	%
Fe	8.7	%
Sb	<0.01	%
S	42.9	%
As	5.0	g/tonne
Au	1.25	g/tonne
F	0.61	%

Fraction	% Mass	% S	% Distribution
F 5 C	0.456	42.9	25.0
Head	100	0.80	100

Gravity concentration, followed by sulphide flotation has resulted in the recovery of only 25 percent of the sulphur (present in the wrigglite ore) at a grade of 42.9 percent sulphur and in a mass of 0.46 percent.

Conclusions

1. Gravity concentration of the wrigglite ore has produced a concentrate of mass 0.11 percent, containing 16.8 percent of the overall WO_3 at a grade of 24.8 percent WO_3 and 12.5 percent of the overall Sn at a grade of 31.2 percent Sn. This result is similar to that achieved previously in investigation R745, but is more meaningful, as a greater sample mass was subjected to concentration.

2. 85 percent of the fluorine present in the sample, has finished in the vanner tailing product, while a further 11.7 percent has been retained in the magnetic concentrate M/S 10 M/A.

3. The flotation concentrate product F5C was found to contain 13.8 percent zinc, 1.7 percent bismuth and 0.34 percent copper. It was also found to contain only a trace of WO_3, but 0.12 percent Sn.

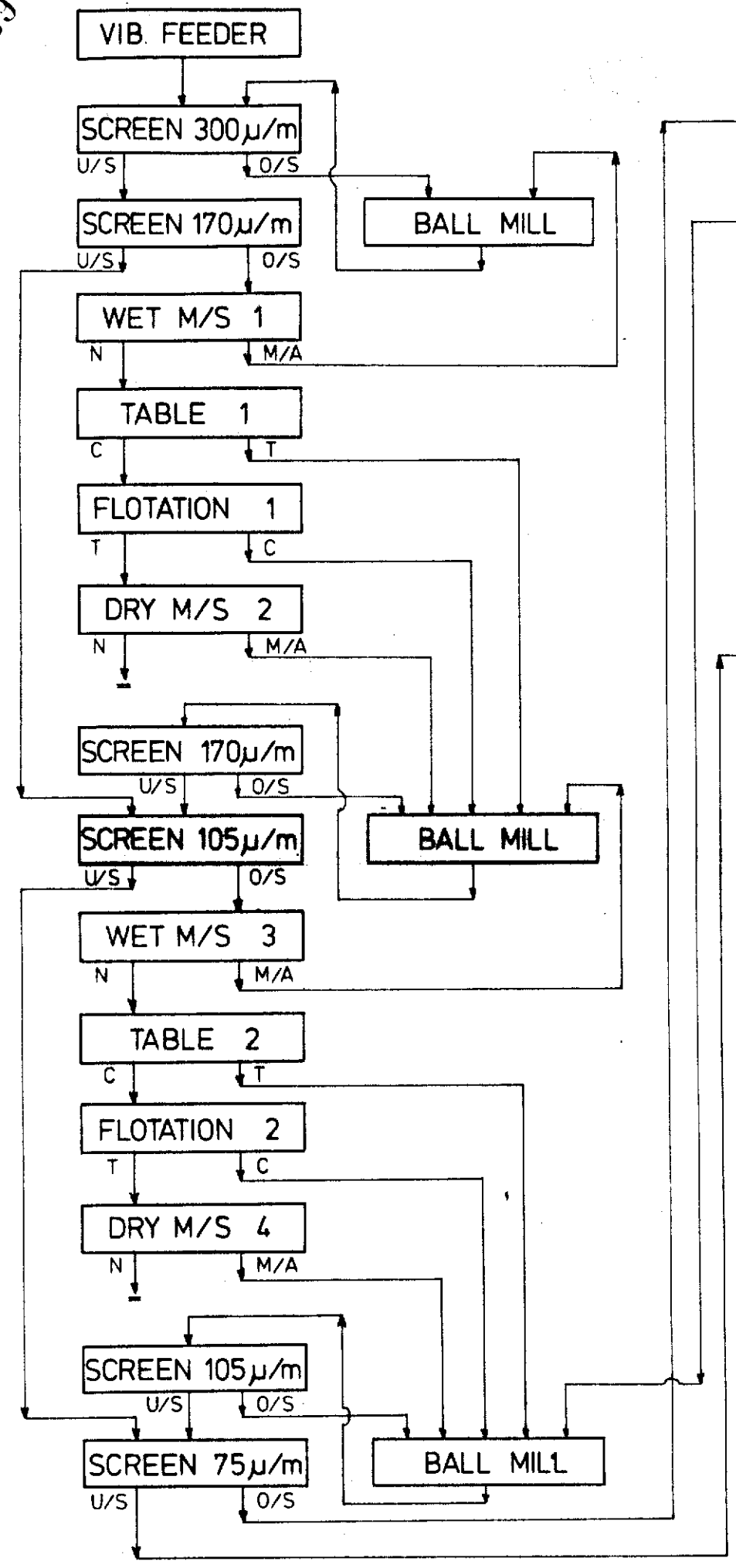
Flowsheet

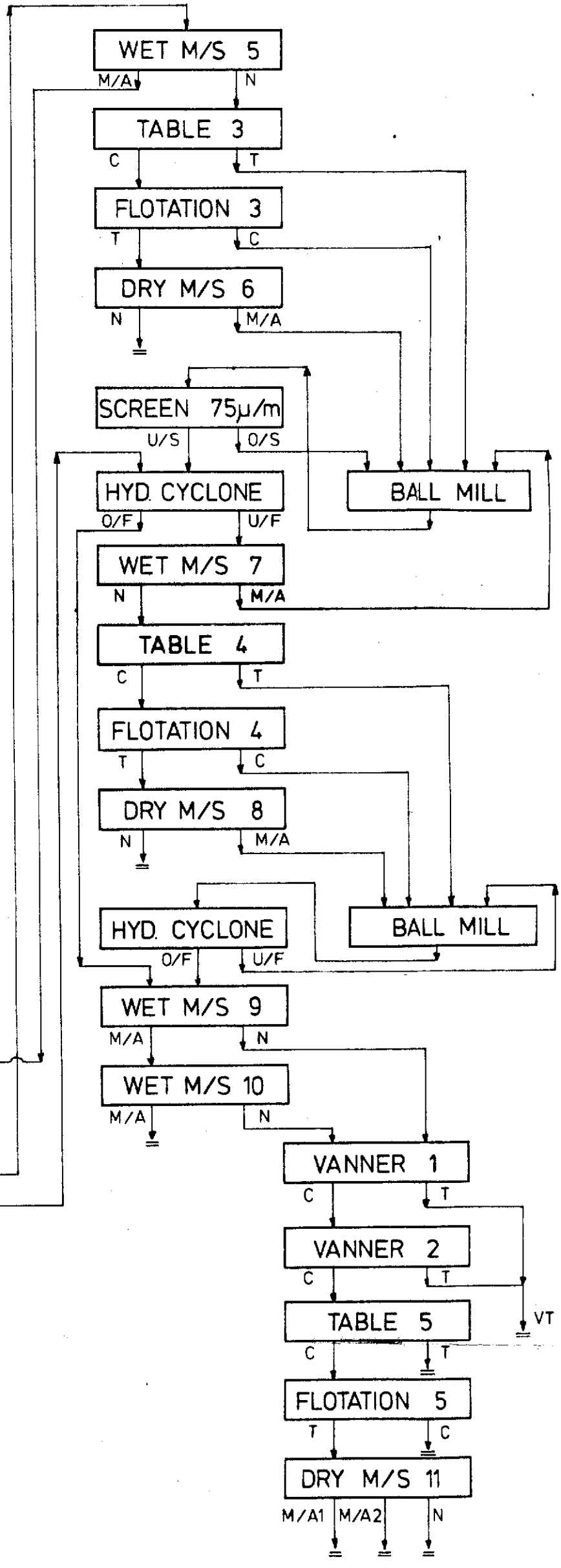
Equipment Used

(a) Lockers vibrating feeder.
(b) Sweco screen.
(c) Denver 305 X 305 mm ball mill.
(d) Eriez Lub. Drum type wet magnetic separator.
(e) Deister laboratory table.
(f) Denver laboratory flotation cell.
(g) Rapid, high intensity dry magnetic separator.
(h) 3" Warman cyclone.
(i) Fieldhouse vanner.

Metallurgist..K Austin.....

(H.K. Wellington)
Chief Chemist & Metallurgist.





FLOWSHEET R758

Moina Wrigglite Project

K. J. AUSTIN

4479

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M 1588

133141 E27/74 MOINA BENEF

DEPARTMENT OF MINES—TASMANIA

TELEPHONES:
Metallurgical Research .. ..
Laboratory .. .. ..
Mines Inspection .. .. ..
Explosives & Inflammable Liquids
} 44 2431-2 (2 lines)

LAUNCESTON OFFICES
287 WELLINGTON STREET
SOUTH LAUNCESTON 7250

6th March 1979

Comalco Ltd,
Exploration Dept,
P. . Box 691,
Devonport 7310
TASMANIA.

Attn. Mr. P W. Askins

R758: Moina Wrigglite.

Dear Mr. Askins,

We have had our mineralogist, David Green, examine the vanner tailings (R758, VT) to give us a guide on how to proceed. His report is encouraging in that he thinks the fluorite is largely free and should readily separate by flotation.

Although to date we have not attempted fluorite flotation in this project we feel that at this point we must consider it because removing it will concentrate the other minerals.

David Green has also raised the question concerning Amdel's reported tin in solid solution with the garnet. He says this has been challenged by other mineralogists hence at this stage the question of tin in the garnet crystal is not proved.

From previous work on this wrigglite (R731 & R745) we are selecting coarse grained materials similar in composition to R758 VT for further mineralogical study. David Green also requests some pieces of coarse ore for a study of the garnet. Could you supply some specimens to me for this work?

From the foregoing you will see that as our next step we are looking at the flotation of fluorite from the vanner tailing. Have your Technical Services Dept. any comments? As I feel the more minds that are deployed on this difficult project the more likely is a solution.

I expect it will be a week or two before we begin any ore-dressing on the vanner tailing.

Yours faithfully,

(H. K. Wellington)
Chief Chemist & Metallurgist.

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Exploration Department,
P.O. Box 691,
DEVONPORT. TAS. 7310.

4th May, 1979.

The Director of Mines,
Department of Mines,
G.P.O. Box 124B,
HOBART. TAS. 7001.

Attention Dr. David Green.

Dear David,

Enclosed are samples of wrigglite and calc-silicate rock from Moina for your microprobe examination.

PA/T/MOINA 15 is a calc-silicate rock with irregular patches of dark wrigglite. It is from the same mine dump as the one tonne bulk sample submitted to the lab in Launceston for beneficiation tests.

SMD 6 at 39.60 is "pure wrigglite" and SMD 6 at 40.10 is a calc-silicate layer adjoining magnetite rich skarn. Analyses for intervals containing these pieces of core are attabhed.

For extra interest SMD 24 at 109.75 is altered leached skarn from an interval containing a high Sn assay.

Analyses for this interval are:

SMD 24 108.20 - 110.25 i.e. 2.05m
Sn 7000 ppm
W 210
Zn 160
Cd <1
Au <0.05
Bi 380
Be 250
Mo <3
Y 10
Sc 4
Mn 3000 ppm
CaF_2 1.82%

2/...

I hope these samples are sufficient for the investigation - if not please don't hesitate to contact me and I can arrange for more or different samples.

We have no objection if a charge is made for the microprobe - we welcome any information which will increase our understanding of the deposit.

With many thanks.

Yours sincerely,

P.W. Askins.
Senior Geologist.

Mineral analysis data from bore core samples

Bore No.	Depth Metres From	To	Log	Pb ppm	W ppm	Bi ppm	Sn ppm	Mo ppm	Cu ppm	Zn ppm	Be ppm	CaF_2 %	Ag ppm	Au ppm	Remarks
SMD 6	21.35	22.75		8	130	360	1600	-4	150	270	250	18.0			
6	22.75	23.50		14	580	640	1850	-4	170	310	200	19.0			
6	23.50	24.75		6	450	310	2000	-4	35	120	250	17.5			
6	24.75	26.15		12	640	400	1950	-4	95	100	250	19.4			
6	26.15	28.00		14	540	290	1050	-4	15	90	150	8.4			
6	28.00	29.15		10	720	440	2050	-4	28	130	150	16.0			
6	29.15	29.50		10	720	360	1250	6	38	130	150	28.5			
6	29.50	30.80		12	410	560	1950	-4	50	120	250	19.5			
6	30.80	32.15		14	230	290	760	6	12	50	300	8.6			
6	32.15	33.90		14	1050	880	1950	8	190	120	250	21.5			
6	33.90	34.50		16	380	390	1750	-4	10	42	200	9.2			
6	34.50	35.50		18	660	660	2100	-4	15	100	250	20.0			
6	35.50	36.40		12	700	880	3350	10	35	110	250	16.0			
6	36.40	38.00		12	480	640	2050	6	32	100	250	15.5			
6	38.00	39.00		20	640	210	2550	12	30	100	500	15.0			
6	39.00	40.00		12	860	900	1700	90	90	90	500	24.5			
6	40.00	41.00		12	1550	400	2700	80	35	60	300	21.5			
6	41.00	42.00		4	2650	680	1150	160	160	100	250	30.0			
6	42.00	43.00		6	4600	600	1300	110	50	120	250	30.0			
6	43.00	44.00		10	860	660	1200	75	48	140	250	24.5			
6	44.00	45.00		10	1100	470	1500	90	18	140	300	24.5			
6	45.00	46.00		12	600	700	1100	16	18	120	300	23.0			
6	46.00	47.00		6	980	700	1400	-4	15	150	200	20.5			
6	47.00	48.00		6	740	600	1100	16	18	160	200	20.5			
6	48.00	49.00		-4	940	600	1150	170	8	160	250	25.0			
6	49.00	50.00		8	1050	680	1050	14	18	160	300	24.5			
6	50.00	51.00		4	740	600	1050	24	32	220	150	15.5			
6	51.00	52.00		6	880	470	900	4	8	170	150	17.0			
6	52.00	53.00		-4	860	620	1000	-4	10	200	200	17.5			
6	53.00	54.00		12	840	440	1250	10	85	200	250	17.5			
6	54.00	55.00		-4	1000	390	1200	26	28	140	250	19.0			
6	55.00	56.00		10	1750	600	1650	34	85	110	200	20.5			
[illegible]	[illegible]	[illegible]		6	700	330	1700	42	28	110	[illegible]	16.0			

13144

143

144

133145 E-7/71 MOINA

05 2211

NOTE:- ALL CORRESPONDENCE TO BE ADDRESSED TO THE DIRECTOR OF MINES BENEFICIATION

DEPARTMENT OF MINES

TELEPHONE: [redacted]
30 8033

G.P.O. BOX 124 B
HOBART
TASMANIA 7001

22nd May, 1979

Mr. P. Askins,
Exploration Department,
Comalco Limited,
P.O. Box 691,
DEVONPORT
Tasmania. 7310

Dear Sir,

R.758 (R.745 and R.731)

Moina "Wrigglite"

(Preliminary report on samples submitted from Launceston Laboratories)

** Please find enclosed a copy of a memo from Dr. D.C. Green to the Director of Mines, Hobart concerning the above.

Yours faithfully,

(C.J. Symons)
DIRECTOR OF MINES

145

133146 w/ 12-

DCG:GM

22nd May, 1979

Director of Mines
HOBART

R.758 (R.745 and R.731)

Moina "Wrigglite"

(Preliminary report on samples submitted from Launceston Laboratories)

The problem concerns the nature of the tin (and tungsten) remaining in the Vanner tail and other fine-grained separation products.

Amdel (Ore-dressing report R.745) regarded the tin content as held partly in garnet as a solid solution (45%) and as cassiterite of very fine grain size (55%). Thus almost half the tin in the head sample is considered to be not susceptible to any physical methods of beneficiation. The tin content of garnets reported by Amdel ranged from < 0.1% to 1.3% (70 analyses - 20 below detection limit).

It is difficult to envisage where the 1.3% Sn reported would fit in the orthosilicate garnet structure in view of the distinctive bonding characteristics of Sn; further, the variable reported tin content suggests that the solid solution hypothesis may be in error. The only occurrence in the literature of substantial (~2%) tin content in andradite is from the Langkawi Is (pers. comm by Sweatman in Hosking, 1974 - 4th World Conference on Tin) (courtesy P. Collins).

New electron microprobe analyses made at the C.S.L. (University of Tasmania) confirmed that the tin content of about 12 randomly selected andradite garnets from R.745 T4M and R.758 T5T was below the level of detection (<0.2%) but a chance intersection gave an analysis of ~10% Sn. On reducing the size of the area scanned by the electron beam to 10 square

microns, a value of 45.7% SnO_2 was obtained (based on the height of the $L_\alpha Sn$ peak on the low energy side of the $K_\alpha Ca$ peak - see attached photograph.) Inspection of the image at high magnification showed that the tin occurred as lamellar inclusions of about 5μ * 1.5μ, presumably of cassiterite.

It is suggested that much of the "combined" tin is held in minute inclusions, crystallographically controlled, rather than in solid solution or as an exsolution feature.

The very small grain size of the cassiterite does not suggest any easy metallurgical separation technique. Cassiterite also occurs as grains of $< 10\mu$ surrounded by fluorite. This form of tin is readily separated by fine grinding but beneficiation is difficult as already reported.

Most of the fluorite in the samples sent from Launceston should be readily separated by flotation. The coarser samples contain as much as 50% composite diopside - amphibole - quartz grains with minor magnetite, pyrite and chalcopyrite.

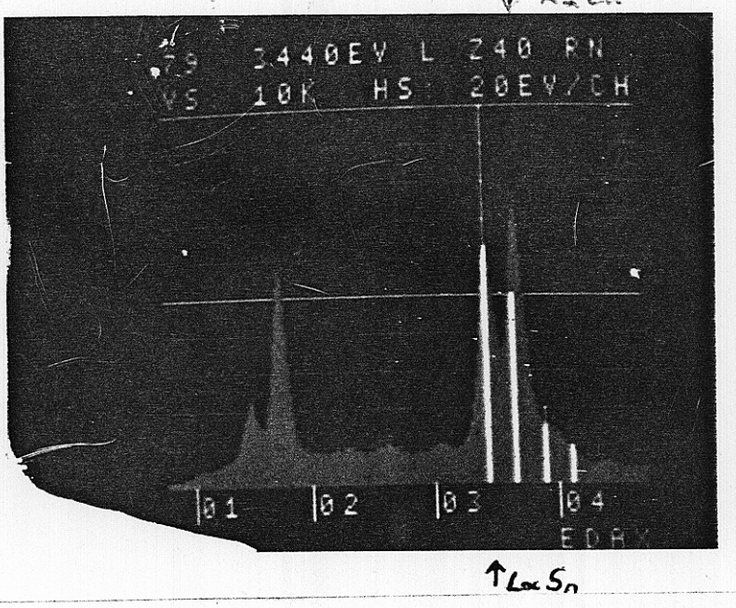
Further work (24/5/79) is planned on the four samples sent directly from Comalco Exploration Department by Paul Askins.

David Green.

(D.C. Green)
MINERALOGIST/
PETROLOGIST

147

133148



148

APPENDIX 11

133149

BILLITON BENEFICIATION RESULTS

The Shell Company of Australia Limited

Incorporated in Victoria. Registered User of Shell and other Trade Marks

METALS DIVISION

Your ref

Our ref AHO DMH/1:KNW:lsc

Date June 27, 1979

Shell Corner
155 William Street
P.O. Box 872K
Melbourne 3001

Cable Address Shell Melbourne
Telex Nos 30560 — 30973
Telephone —
Switchboard — 609 1711
Direct Line — 609 Ext 5687

Comalco Limited
Exploration Department
P.O. Box 691
DEVONPORT TAS. 7310

Dear Paul,

MOINA

We have received only a brief summary of results (appended) from Billiton Research, Arnhem (BRA) and to date these results do not look too hopeful. We will ascertain from BRA whether additional results are available and future proposals, if any.

Regards,

K.N. West

encl.

MOINA

The following is a summary of the results gathered so far from scouting physical upgrading testwork:

Wrigglite

Head analysis: 7.8% F (16% CaF_2), 0.14% W, 0.20% Sn, 40% Fe_2O_3.

Heavy liquid separation test on size fraction with bromoform and iodide methylene showed that 50% wt. reports to the heaviest fraction (sp. gr. greater than 3.3). No enrichment of tin obtained in one of the three fractions. A 2 x enrichment and concentration of CaF_2 in intermediate density fraction (recovery 68%) and a 2 x enrichment with 83% recovery of WO_3 in the heaviest fraction was obtained.

Mineralogical analysis of heaviest fraction revealed the presence of magnetite as most dominant mineral (greater than 50%). Traces of scheelite and wolframite were found as tungsten bearing minerals. Fluorite was present up to 25%. All minerals are generally intimately intergrown with each other and with gangue and sulphides. No tin bearing minerals were identified.

Magnetic separation tests were unsuccessful in an attempt to upgrade either Sn or WO_3.

APPENDIX 12

WRIGGLITE INDICATED TONNAGE CALCULATIONS

Sections used for the tonnage calculations are Fig's 6 to 10 attached. (These are merely part of the sections on plans TAS-79-). Each figure shows the area of wrigglite and the area of overburden used for each of the blocks on Fig. 5, attached.

The broad assumptions for the calculations are listed in the text. It must be emphasised that the figures cannot be quoted with confidence because of the relative lack of drill or surface information and the consequent interpretive nature of the sections in many places.

B BLOCK. 25m SE and 50m NW of Section B

Wrigglite 75m x area on section B = 75 x 11,000 = 825,000m^3

Overburden 75m x area on section B = 75 x 7075 = 530,625m^3

C BLOCK. 50m either side of Section C

Wrigglite 100m x area on section C = 100 x 22,300 = 2,230,000m^3

Overburden 100m x area on section C = 100 x 4375 = 437,500m^3

D BLOCK. 50m either side of Section D

Wrigglite 100m x area on section D = 100 x 23,300 = 2,330,000m^3

Overburden 100m x area on section D = 100 x 7025 = 702,500m^3

E BLOCK. 50m either side of Section E

Wrigglite 100m x area on section D = 100 x 18,200 = 1,820,000m^3

Overburden 100m x area on section D = 100 x 10,100 = 1,010,000m^3

F. BLOCK. 50m either side of Section F

Wrigglite 100m x area on section F = 100 x 9050 = 905,000m^3

Overburden 100m x area on section F = 100 x 7850 = 785,000m^3

TOTAL VOLUME WRIGGLITE 8,110,000m^3

Take density of wrigglite as 3.3

∴ TOTAL TONNES WRIGGLITE, indicated 26,763,000t

say 26,500,000t

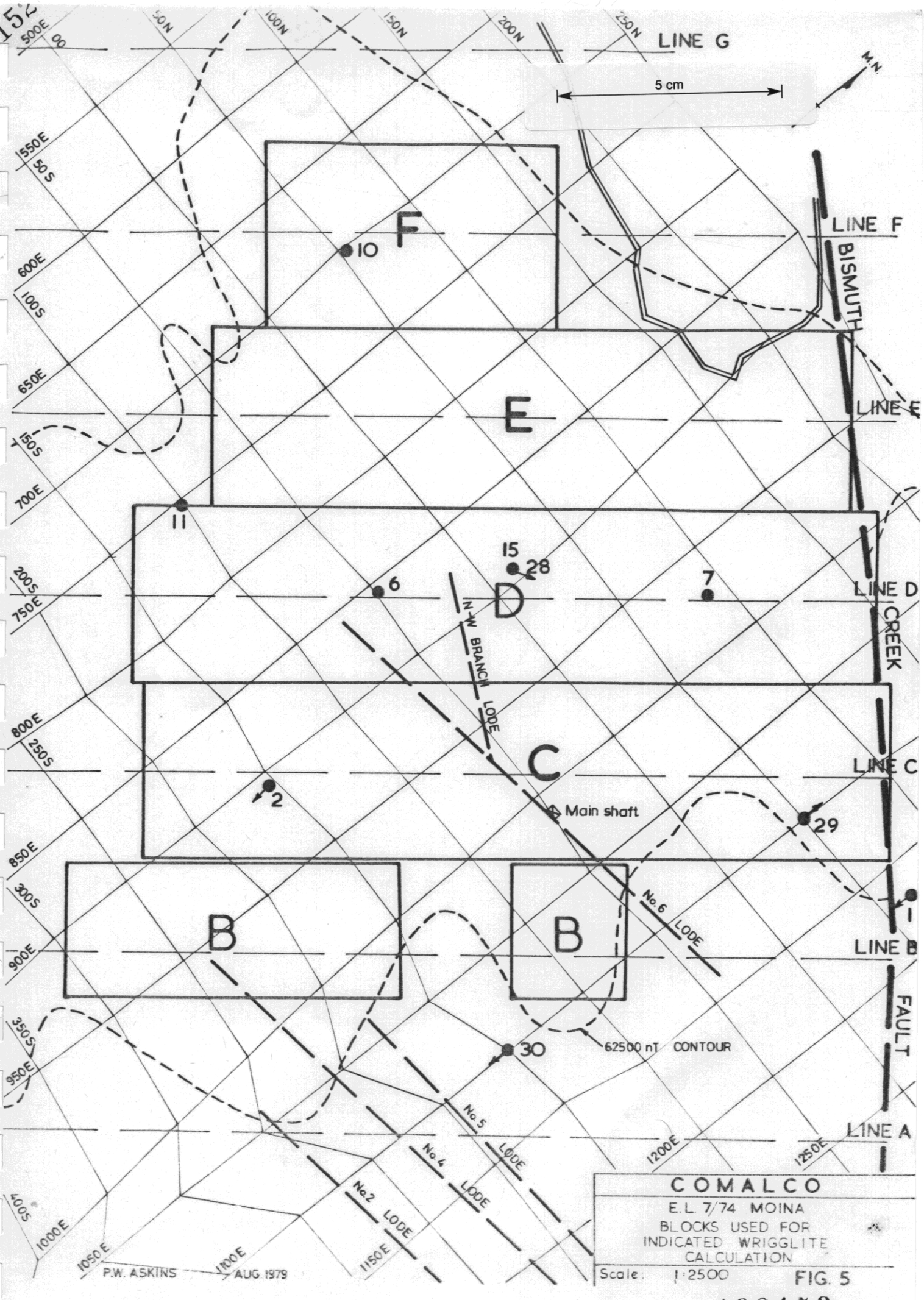
TOTAL VOLUME OVERBURDEN 3,465,625m^3

Take density of overburden as 2.5

∴ TOTAL TONNES OVERBURDEN over indicated wrigglite 8,664,000t

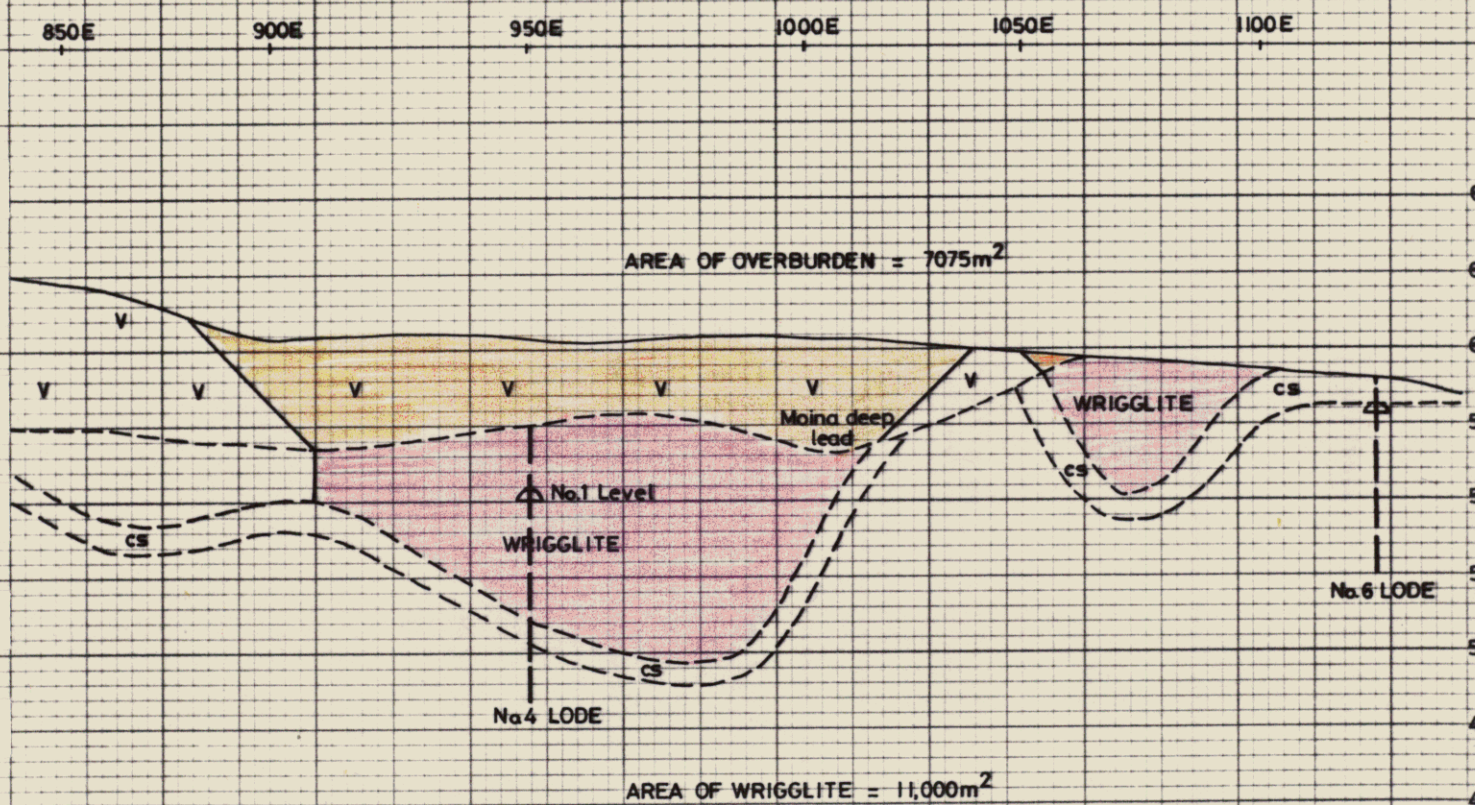
say 8,500,000t

∴ Ratio indicated wrigglite to overburden 3.0 : 1


LINE G
5 cm
M.N
LINE F
BISMUTH
LINE E
LINE D
CREEK
LINE C
LINE B
FAULT
LINE A
F
E
D
C
B
B
10
11
15
28
6
7
2
29
1
30
Main shaft
N.W. BRANCH LODE
No.6 LODE
No.5 LODE
No.4 LODE
No.2 LODE
62500 nT CONTOUR
500E
550E
600E
650E
700E
750E
800E
850E
900E
950E
1000E
1050E
1100E
1150E
1200E
1250E
00
50S
100S
150S
200S
250S
300S
350S
400S
50N
100N
150N
200N
250N
P.W. ASKINS
AUG. 1979
COMALCO
E.L. 7/74 MOINA
BLOCKS USED FOR INDICATED WRIGGLITE CALCULATION
Scale: 1:2500
FIG. 5

133153

133154



5 cm

COMALCO

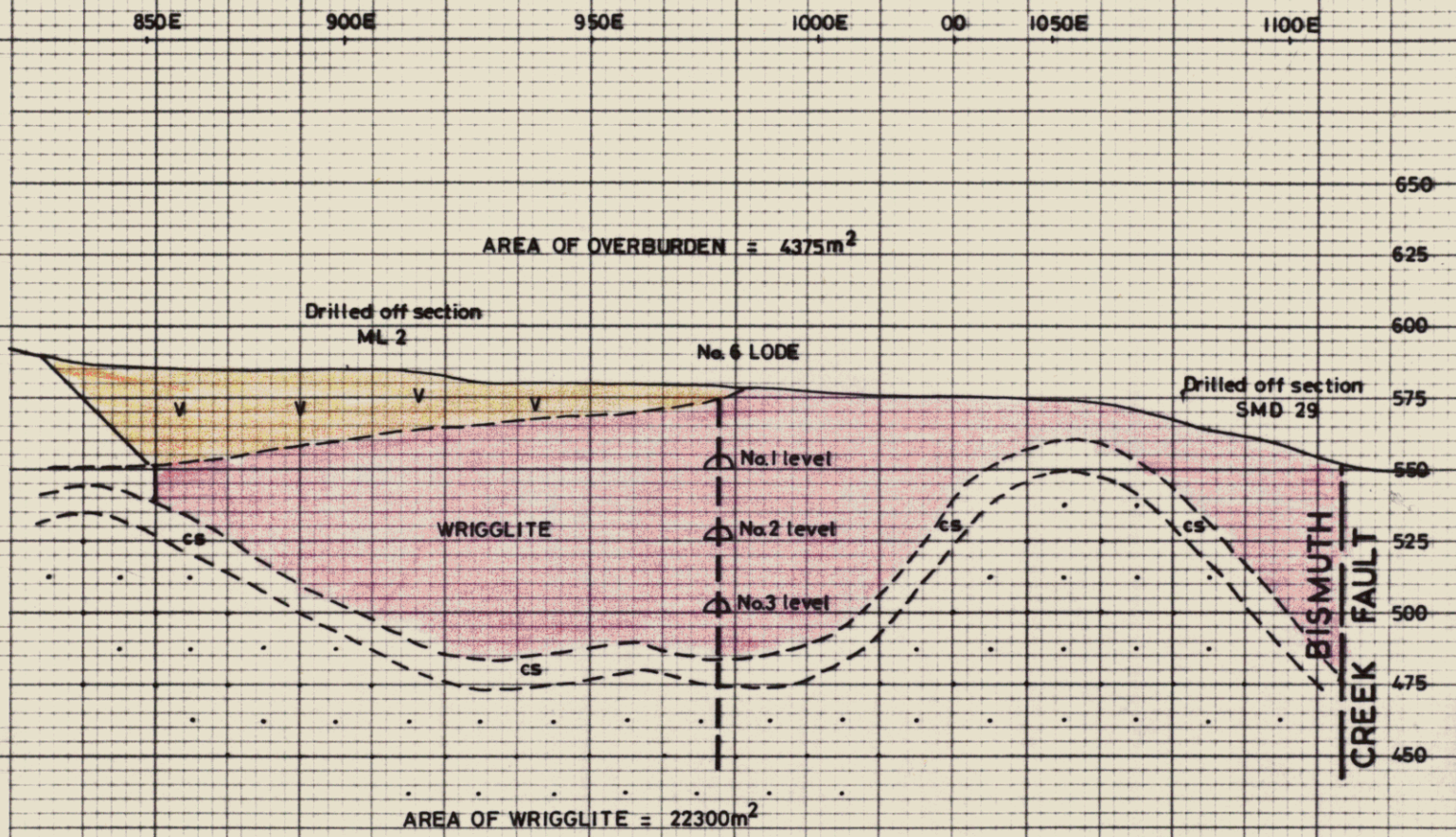
INDICATED WRIGGLITE

SECTION B 153

P.W.ASKINS
AUG. 1979

FIG. 6

133155



5 cm

COMALCO

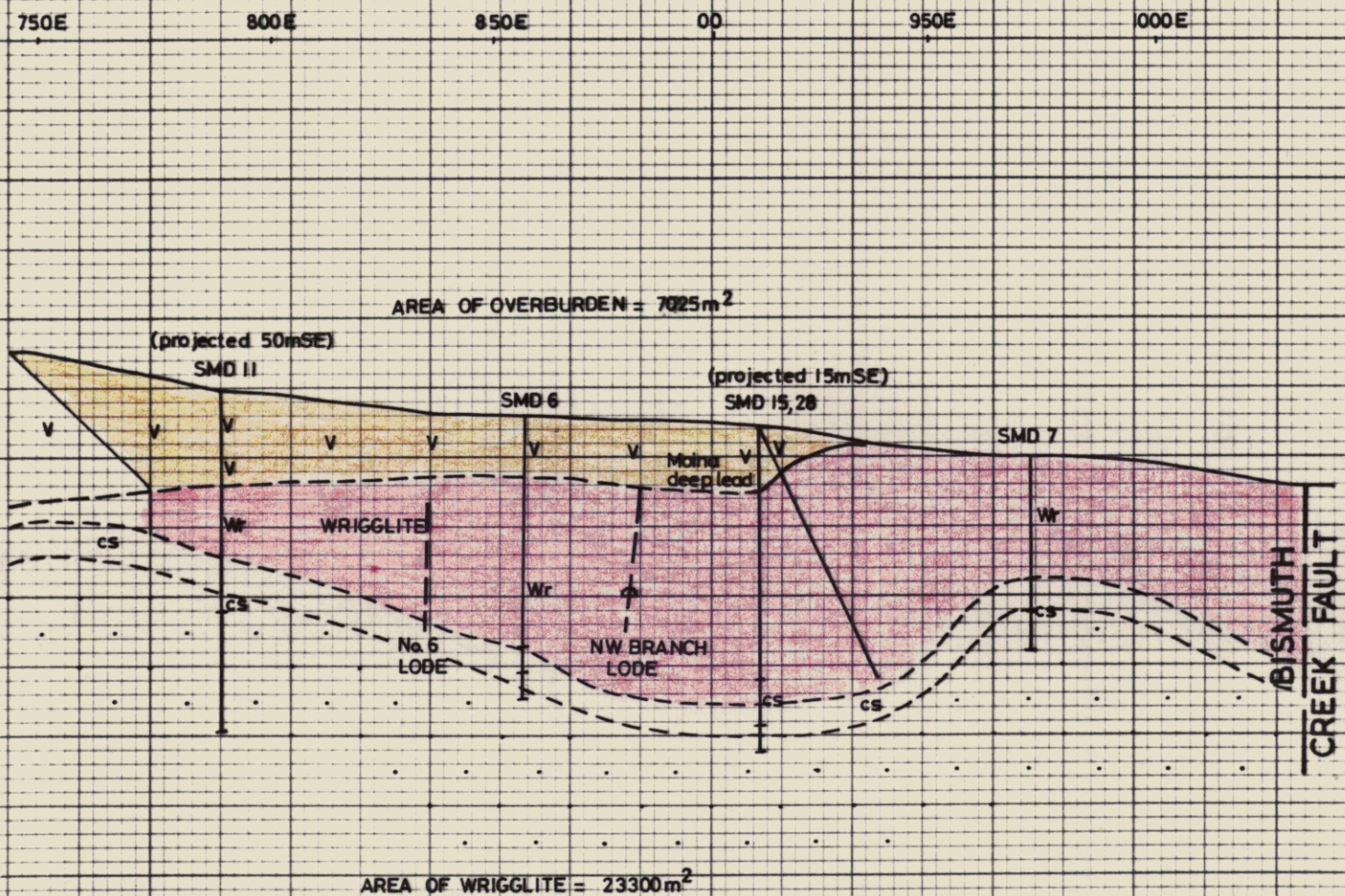
INDICATED WRIGGLITE

SECTION C 154

P.W.ASKINS
AUG. 1979.

FIG. 7

133156



5 cm

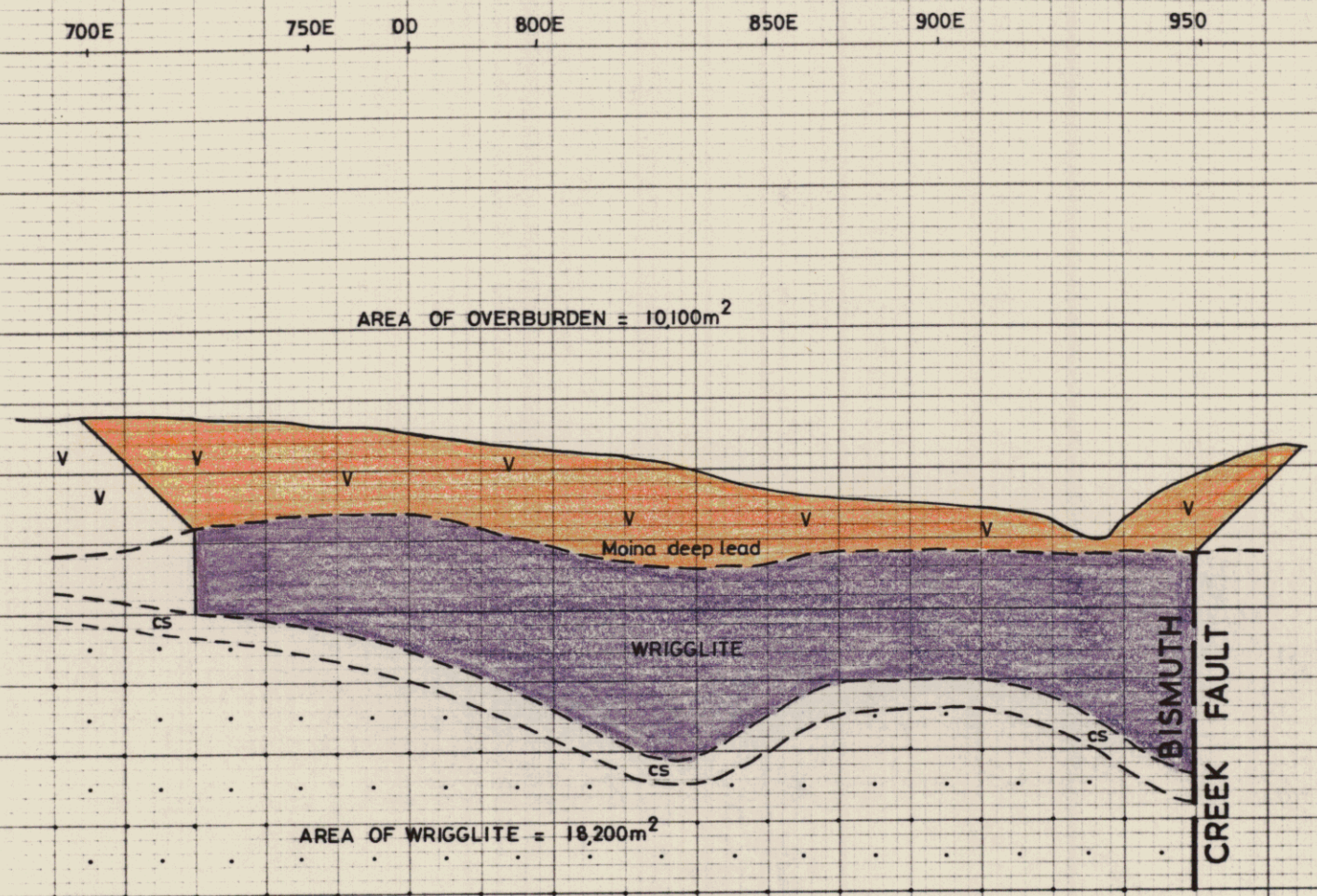
COMALCO

INDICATED WRIGGLITE SECTION 26 155

P.W. ASKINS
AUG. 1979.

FIG. 8

133157



5 cm

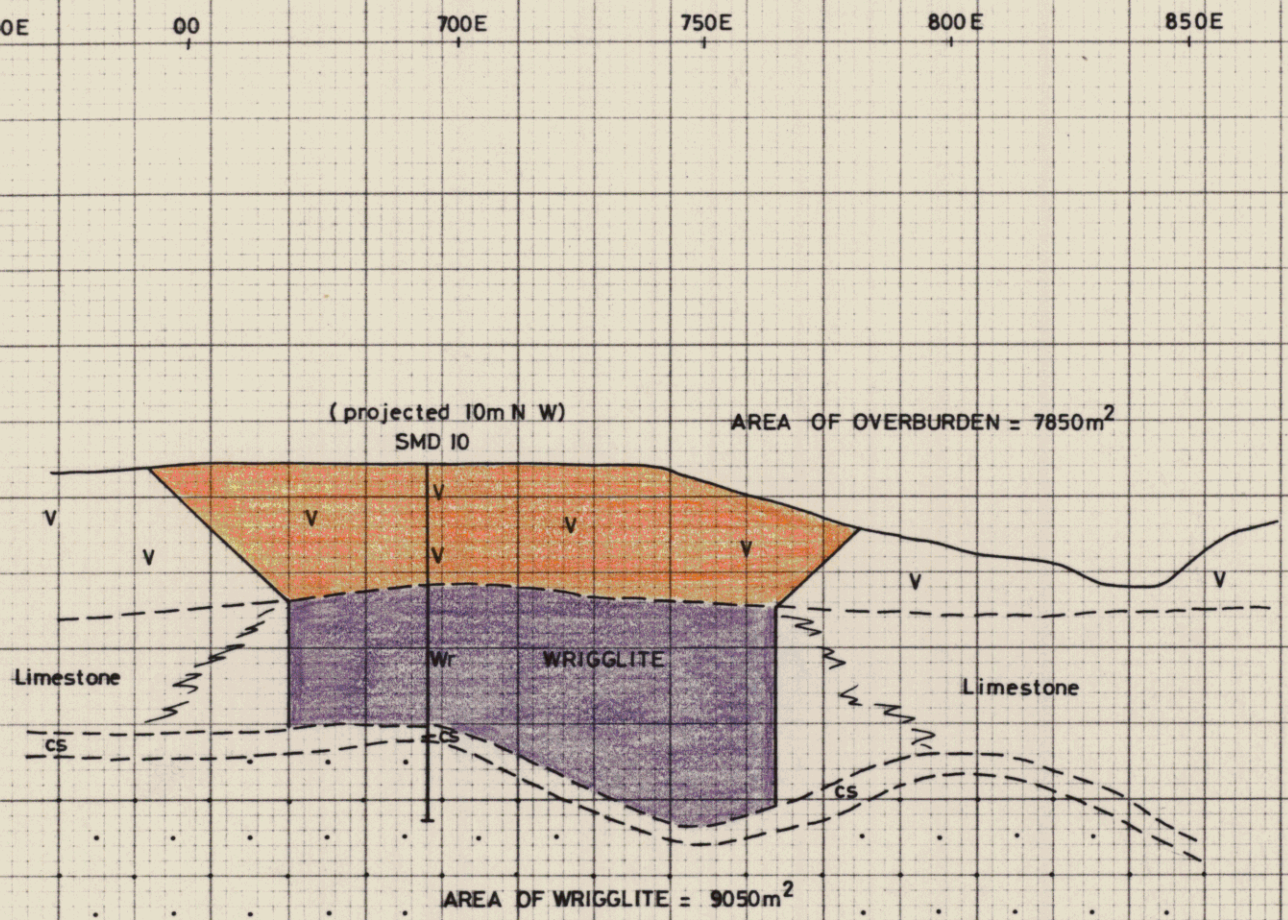
COMALCO

INDICATED WRIGGLITE
SECTION E 150

P.W. ASKINS
AUG. 1979

FIG. 9

133158



5 cm

COMALCO

INDICATED WRIGGLITE

SECTION F 157

P.W.ASKINS
AUG. 1979

FIG. 10

APPENDIX 14

133159

Petrographic descriptions of altered and unaltered "porphyry", Moina Sheet A.

Central Mineralogical Services

CMS

231 Magill Road
Maylands. S.A. 5069
Telephone 42 5659

11th July 1978

Mr. R. Poltock,
Geologist,
Comalco Ltd.,
P.O. Box 691,
DEVONPORT. TAS. 7310

REPORT CMS 78/7/3

YOUR REFERENCE:	RP/T/MOINA
DATE RECEIVED:	5.7.78
SAMPLE NOS.:	2470E 275S, 2300E 650S, 2600E 350S
SUBMITTED BY:	R. Poltock
WORK REQUESTED:	Petrology

H.W. Fander.

H.W. Fander, M.Sc.

Copy to :
Mr. A.H. Bartlett,
Exploration Manager,
Comalco Ltd.,
95 Collins Street,
MELBOURNE. VIC. 3000

153

CENTRAL MINERALOGICAL SERVICES ~~PTY. LTD.~~

Date 11.7.78 133160

SAMPLE REPORT (Mineralogy, Petrology, Ore Microscopy)

IDENTIFICATION
2470E 275S
SERICITISED PORPHYRITIC RHYOLITE

Job No. CMS 78/7/3 Date Received: 5.7.78

Reference RP/T/MOINA

Sample No. 2470E 275S

Nature of Sample: Hand specimen

DESCRIPTION **SECTION No.** 24519

a. Hand Specimen:

White, fine-grained porphyritic rock.

b. Microscopic:

This is a thoroughly sericitised porphyritic rhyolite; because of the sericitisation, which has rendered the feldspars unrecognisable, the rock cannot be precisely classified and thus the term rhyolite is used in a broad sense. The fabric suggests that the rock was intrusive.

Deeply embayed, corroded phenocrysts of quartz are randomly scattered through the rock; sericite pseudomorphs after feldspar laths are quite numerous, and are randomly orientated (i.e. no flow-orientation). Their shapes are more suggestive of plagioclase than K-feldspar but this is speculative; they have a thin rim of leucoxene.

The groundmass is even-grained and felsitic, composed of small interlocking quartz patches with intergrown fine sericite. Apart from leucoxene, there are traces of zircon and isolated small green tourmaline crystals.

The sericitisation is regarded as a pervasive, low-temperature phase akin to greisening.

H.W. Fander, M.Sc.

163

133161

CENTRAL MINERALOGICAL SERVICES PTY. LTD.

Date 11.7.78

SAMPLE REPORT (Mineralogy, Petrology, Ore Microscopy)

IDENTIFICATION
2300E 650S
PORPHYRITIC BIOTITE-RHYOLITE

Job No. CMS 78/7/3 Date Received: 5.7.78

Reference RP/T/MOINA

Sample No. 2300E 650S

Nature of Sample: Hand specimen

DESCRIPTION **SECTION No.** 24520

a. Hand Specimen:

Grey, fine-grained porphyritic rock. K-feldspar stain test positive (groundmass).

b. Microscopic:

This is a porphyritic biotite-rhyolite; its dark color is mainly due to pervasive metasomatism, which introduced ferromagnesian minerals.

There are random phenocrysts of deeply-embayed, corroded quartz and albite; the albite is cloudy and fairly extensively argillised. Biotite flakes are scattered through the rock and most are chloritised; pseudomorphous aggregates of metasomatic minerals represent former ?hornblende, and consist of microgranular epidote, dark actinolite, and chlorite, also occurring as non-pseudomorphous patches. Euhedral crystals of primary magnetite are relatively conspicuous.

The groundmass is of typically felsitic texture, consisting of poorly-defined interlocking patches of K-feldspar, minor quartz, and abundant fine secondary chlorite and sericite. Accessory apatite occurs.

Compositionally this rock tends towards the intermediate types (e.g. trachyte-microsyenite), and contrasts with 2470E 275S. It is very probably intrusive.

H.W. Fander, M.Sc.

161

133162

CENTRAL MINERALOGICAL SERVICES ~~LIMITED~~

Date 11.7.78

SAMPLE REPORT (Mineralogy, Petrology, Ore Microscopy)

IDENTIFICATION
2600E 350S
ALTERED PORPHYRITIC RHYOLITE

Job No. CMS 78/7/3 Date Received: 5.7.78

Reference RP/T/MOINA

Sample No. 2600E 350S

Nature of Sample: Hand specimen

DESCRIPTION **SECTION No.** 24521

a. Hand Specimen:

Grey, fine-grained porphyritic rock. K-feldspar stain test positive (groundmass).

b. Microscopic:

A fairly severely but selectively altered porphyritic rhyolite; the groundmass is relatively little affected, but most pehnocrysts have been replaced.

As is usually the case, the quartz phenocrysts (strongly corroded, embayed) are preserved; they are not abundant. Feldspars however, now consist of pseudomorphous aggregates of small, well-defined hydromuscovite ("sericite") flakes, with occasional embedded small tourmaline crystals, and are common. Thin laths of a ferromagnesian mineral (?hornblende) are represented by aggregates of small brown biotite flakes; these, and the feldspars, shows some flow-orientation.

The groundmass is felsitic, composed of interlocking small K-feldspar patches and minor quartz; there are small clusters of phlogopitic biotite and muscovite, with matted texture. Accessory minerals include zircon and apatite. Ultrafine sericite and biotite occurs throughout the groundmass. The introduction of muscovite-hydro-muscovite, phlogopitic biotite and tourmaline represents a metasomatic, greisening phase.

This rock is not unlike 2300 E 650S, though the replacive mineral assemblage is different.

H.W. Fander, M.Sc.

PLANS

Note: New plans are shown with an asterix, (*) others are revised versions of plans in the 1978 report.

*TAS-78-234 Moina Sheet 1, grid line slopes.
*TAS-78-245 Moina Sheet A, grid line slopes.
TAS 76-53 Contour and grid location survey Shepherd & Murphy Grid. Data sheet.
TAS 76-53A Contour and grid location survey Shepherd & Murphy Grid. Contours.
*TAS-79-302 Moina Sheet 1, Shepherd & Murphy Area, Geology.
*TAS-79-280 Moina Sheet A, Geology.
*TAS-79-246 Moina Sheet A, Soil Geochemistry, data sheet.
*TAS-79-247 Moina Sheet A, Trial line 2100E, Soil Geochemistry profiles.
*TAS-79-343 Moina Sheet A, Soil Geochemistry, tin contours.
*TAS-79-344 Moina Sheet A, Soil Geochemistry, tungsten contours.
*TAS-79-342 Moina Sheet A, Soil Geochemistry, bismuth contours.
TAS-78-139 Moina Sheet 1, Proton Precession Magnetic Data.
TAS-77- 78 Moina Sheet 1, Proton Precession Magnetic Contours.
TAS-78-142 Moina Sheet 2, Proton Precession Magnetic Data.
TAS-77- 80 Moina Sheet 2, Proton Precession Magnetic Contours.
*TAS-79-250 Moina Sheet 3, Proton Precession Magnetic Data.
*TAS-79-251 Moina Sheet 3, Proton Precession Magnetic Contours.
*TAS-79-248 Moina Sheet A, Proton Precession Magnetic Data,
*TAS-79-249 Moina Sheet A, Proton Precession Magnetic Contours.
TAS-78-148 Moina Sheet 1, E.I.P. Time Domain Gradient Array, Chargeability Profiles.
TAS-78-147 Moina Sheet 1, E.I.P. Resistivity Profiles.
TAS-78-146 Moina Sheet 1, E.I.P. Chargeability Contour Plan.
TAS-78-145 Moina Sheet 1, E.I.P. Resistivity Contour Plan.
*TAS-79-307 Moina Sheet A, E.I.P. Chargeability Profiles.
*TAS-79-306 Moina Sheet A, E.I.P. Resistivity Profiles.
*TAS-79-308 Moina Sheet A, E.I.P. Chargeability Contours.
*TAS-79-303 Moina Sheet A, E.I.P. Resistivity Contours.
*TAS-79-376 Moina Sheet 1, Structure Contours on Base of Limestone or wrigglite.
*TAS-79-375 Moina Sheet 1, Structure contours on Base of Tertiary rocks.
*TAS-79-356 to 373 Geological sections, north-south sections.
*TAS-79-374 Geological sections, along lines A to G, S & M area.

0/M2/01/033 Moina SW-NE Drill Section Line 1
0/M2/01/034 - - - - - -
0/M2/01/035 - - - - - -
0/M2/01/042 - Section 1450 E Lithology
0/M2/01/044 - Section 1450 E Assays
0/M2/01/058 - SW-NE Drill Section Line 1 Geology
0/M2/01/059 - - - - Line 2 -
0/M2/01/107 Moina Section 975E Assays
0/M2/01/109 - - 1150E Lithology
0/M2/01/145 - - - Assays

200mE 400mE 600mE 800mE 1000mE 1200mE 1400mE 1600mE

600mN 400m N 200mN Base L. 200m S 400m S 600m S 800m S 1000m S 1200m S 1400m S 1600m S 1800m S

500 S 100 S 1100

+5 +6 +9 +7 +8 +9 +7 +5 +9 +4 -6 -9 -3 =2 ±9 +18 +12 +22 +12 +18 +12 +25 +4 +30 +10 +5

+6 +6 +8 +13 +14 +13 +9 +8 +8 +5 -2 +2 0 0 ±6 +21 +13 +18 +4 +3 +8 +5

+1 +3 +5 +9 +12 +16 +10 +6 +8 +5 +2 +1 -7 -1 ±2 +8 +18 +10 +3 +3 +3 0 -5 +19

+4 +3 +7 +9 +9 +12 +8 +7 +7 +11 -2 -6 +1 -3 0 +3 +4 +1 +3 0 0 +15 0

+14 +14 +8 +11 +9 +11 +18 +13 0 +5 +8 +4 +7 0 +5 +2 +2 +5 0 +5 0°

+13 +12 +16 +12 +8 +13 +10 +8 0 +3 +4 ±1 +1 +2 +5 0 0 0°

+16 +12 +10 +12 +11 +13 +7 +10 +4 0 +1 0 -1 +2 -3 +5 0 0 0°

+11 +8 +10 +11 +9 +10 +10 ±8 -1 0 =3 -5 -3 -6 0 0 0°

+4 +7 +6 +6 +7 ±13 -6 -2 =9 -6 0 0°

-4 0 -2 +2 +13 ±15 +2 -10 -15 ±2 -6 0 0°

-15 -8 -5 -3 +7 +13 +10 +12 ±5 0 -6

-16 -12 -9 -4 +4 ±7 +15 ±1 =4 -9

-18 -10 -7 -5 0 +7 ±20 -3 =2

-16 -5 -5 -2 +12 +17 ±12 +3

-5 -2 -4 -3 +12 +7 +17 ±10

+2 -5 -6 -5 +6 +5 +9 +17

-3 -5 -7 -7 +3 ±16 +18

+6 -5 -6 -6 -5 +20 +22

+2 +2 -6 -11 -7 ±30

+2 -9 -10 +27 -15 -8 +5

+16 +20 +26 -2 +21 +2 ±2

+23 +28 +16 +14 ±16 ±7 ±3

00 200mE 400mE 600mE 800mE 1000mE 1200mE 1400mE 1600mE

COMALCO 79-1389

E.L. 7/74 TASMANIA 133164

MOINA, SHEET 1

GRID LINE SLOPES

5 cm

Compiled:	Revised:	Drawn: O Hedditch
Date: Dec. 1978	Scale: 1:2,500	Drg No: TAS-78-234

2134

1700mE 1800m E 1900mE 2000mE 2100m E 2200mE 2300mE 2400mE 2500mE 2600mE 2700m E 2800mE 2900m E 3000m E 3100m E 3200mE 3300mE

600mN 400m N 200m N Base L. 200m S 400m S 600mS 800m S 1000m S 1200mS 1400mS 1600m S 1800mS

COMALCO

49-1389

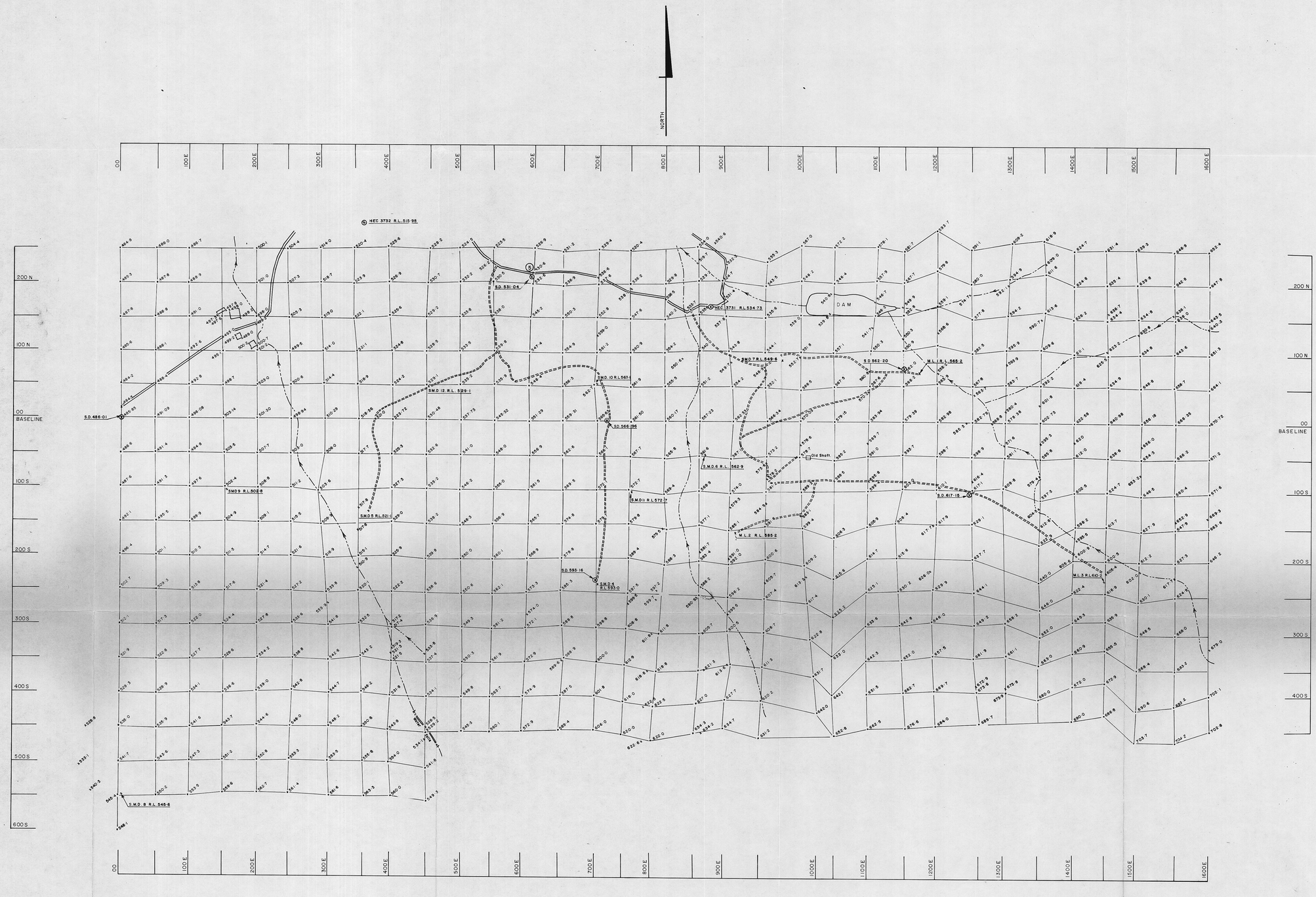
E.L 7/74 TASMANIA 133165

MOINA SHEET A

GRID LINE SLOPES

5 cm

Compiled: R Poltock	Revised:	Drawn: O Hedditch
Date: Dec 1978	Scale: 1 : 2,500	Drg No: TAS-78-245



NOTE:
All R.L.s at ground points are ground level except Base Line where levels are on 100mm x 50mm. pegs up to 1250 then on top of 25mm x 25mm stakes to 1500.

ML 1, SMD 12, – Diamond Drill Hole Collars.
SD. – Star Dropper Reference Point.

Revision: Contours south of Baseline 1250 – 1350 amended 15/6/77

133166

5 cm

Datum for Levels: HEC Bench marks 3731 & 3732

79-1359

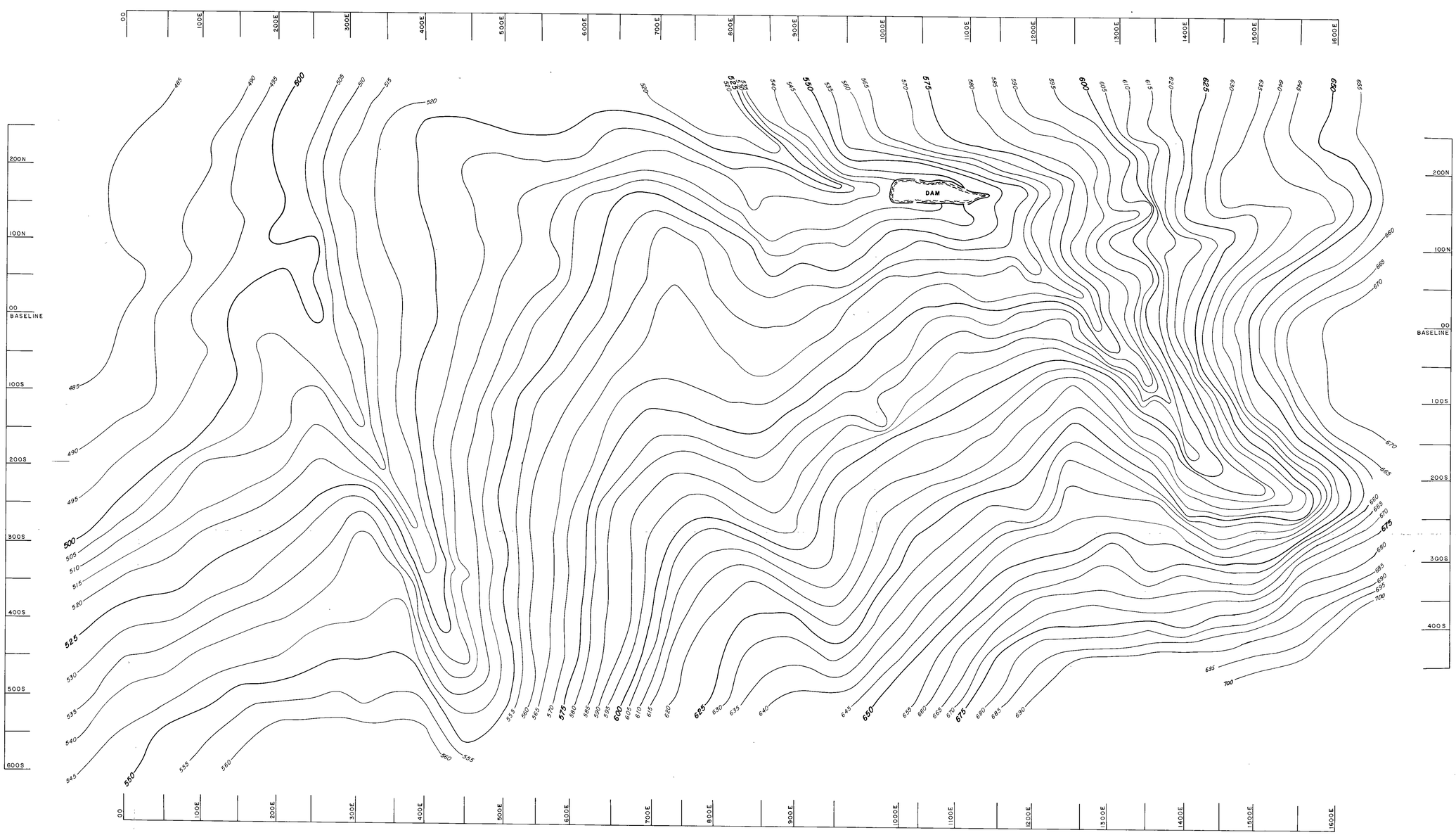
COMALCO LIMITED

TASMANIA

CONTOUR & GRID LOCATION SURVEY E.L.7/74 MOINA TASMANIA SHEPHERD & MURPHY GRID DATA SHEET

2136

Compiled: Urban Planners & Surveyors/Tasmania	Revised: August 1979 August, 1977	Drawn: M. Attwell
Date: 16/9/76	Scale: 1:2,500	Drg N° TAS – 76 – 53



133167

5 cm

Overlay to data plan TAS / 76 / 53.

Datum for Levels, HEC Bench marks 3731 & 3732. 79-1389

COMALCO LIMITED

TASMANIA

CONTOUR & GRID LOCATION SURVEY
E.L.7/74 MOINA TASMANIA
SHEPHERD & MURPHY GRID
CONTOURS 2137

Compiled Urban Planners & Surveyors / Tasm.'a	August 1979 Revised: August, 1977	Drawn. M. Attwell
Date 16/9/76	Scale 1:2500	Drg N° TAS-76-53A

COMALCO 1780

123168 E.L. 7/74 TASMANIA 79-1389 Vol 2/2

"MOINA" SHEET 1
SHEPHERD & MURPHY AREA
GEOLOGY

2138

Compiled: G Weste, R. Poltock P. Askins, T. Waite	Revised:	Drawn: O. Hedditch	
Date: July 1979	Scale: 1 : 2500	Drg No.: TAS - 79-302	

LEGEND

QUATERNARY

- Alluvium
- bs — Basalt soil

TERTIARY

- (Tb) Basalt. Massive flows and agglomerates.
- (Tgb) Greybilly. (also gravels, cobbles of Deep Lead at S & M mine)
- (Ts) Clays, sands and minor gravels.

ORDOVICIAN

- GORDON LIMESTONE (Og) — Fine grained Limestone.
- Calcarenite.
- MOINA SANDSTONE (Om) — Sandstones. "Tubicular" quartz sandstone and fine "quartzites." Tends to Siltstone at top of sequence.

METAMORPHOSED, METASOMATISED EQUIVALENTS (DEVONIAN)

- Magnetite chlorite rock with sulphides
- "Wrigglite". Minor calc silicate rocks
- Calc silicate (garnet pyroxene) rocks. Minor wrigglite and metasiltstone ("Transition beds")
- Calc silicate rock, metasiltstone, limestone. Finely bedded.
- Meta siltstones (hornfels).

KEY

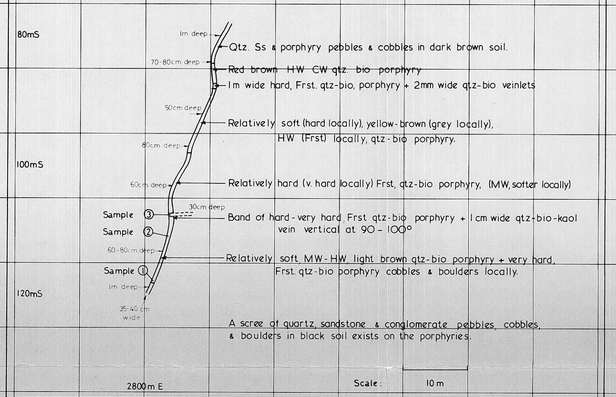
- Bridge
- Adit with number
- SMD 5 — Diamond drill hole. Holes vertical unless indicated.
- Waste rock pile
- Fault (approx.) (Dashed where concealed or inferred)
- Fence
- Shearing
- 25 / 070 — Strike Dip of bedding
- Syncline
- Anticline
- Costean or trench
- Change of slope (scarp)
- Definite geological boundary
- Approximate geological boundary
- Road
- Gravel track (4 W.D.)
- Creek
- Excavation or cliff
- Sh — Sink hole
- SD — Steel droppers survey marks with R.L. (Urban Planners & Surveyors)
- Wet under foot
- Trench (hydraulic trench digger dug 1979) with log from surface in metres. Trench now filled

Frst — Fresh with limonite stained joints
SW — Slightly weathered
MW — Moderately weathered
HW — Highly weathered
CW — Completely weathered

NOTES:
1. Previous map of this area: TAS-76-45
2. Grid from 250N to 550S is shown as surveyed. Grid beyond this is not surveyed and is shown as a regular pattern.

5 cm

INSET DETAILS OF HAND DUG TRENCH BELOW LAWSON & RILEY'S MINE, JULY, 1979.



E.L. 7/74 COMALCO

E.L. 7/73 ASARCO

7M/72 6M/72 24M/60 17M/60 8M/72 13BM/69

LIMIT OF GRIDDING

GRAVEL PIT

Water race

All Nations open stope

sheared silty Ss

HEC PICKET PTL 15

PIG & WHISTLE

Change to dark soil & dark qtz porph (S of line)

Ss fractured

TRENCH - 1m. deep

qtz wf veins, greisen zones & qt 270°

ΔCgl blocks

BESWICK'S SHOW

BISMUTH CREEK FAULT ZONE

Workings grl, Cgl, Ss, porph, qtz veins (minM)

SMD 27

SMD 26

Ss, Cgl, porph, blocks, grl

Ss, Cgl, sand, grl

Ss Cgl blocks

grl porph qtz veins

Costean

Tertiary sand, ash?

sand grl Ss blocks

Large peg

Ss Cgl porph blocks

grl Cgl Ss T19 T20 T21 T22 T23 T24 T25 T26 T27

Tea tree swamp

Ss (pebbly) T18 boulders

Cgl Ss scree T17

Cgl Ss scree T16

Cgl Ss scree T1 T2 T3 T5

grl Cgl scree

sand grl T2 T5 T6 T7 T8 T9 T10 T11

grl sand T11

Ss pebbles

T15 T14 T13 T12

Sand auger

Slst bed facing S.E.

porph scree

Cgl Ss, sand, grl

Cgl or gbilly? Ss

ΔBas grl

Ss sand grl

Cgl or gbilly? Ss

ΔBas

Ss qtz veins sand grl porph

Ss, qtz veins, sand, grl

Ss, Cgl

sand grl

Ss sand (little)

Highly weathered BASALTIC DEEP LEAD

Ss, Bas

ΔBas, Ss

porph, qtz grl

porph, Gr

porph, grl

porph, veinlets

porph, qtz veins

Mill

IRIS

gravel

Scheelite joint face

soft clay alteration

sand grl Cgl porph Ss porph

gbilly sand

Cgl gbilly

Sand, grl, Cgl, porph blocks

Ss, Cgl, porph, grl

Ss, Cgl, porph, qtz veins

Ss, Cgl, porph, blocks, grl

sand, grl Ss, Cgl blocks

porph scree

grl Cgl Ss boulders

Cgl Ss scree

grl Cgl Ss cobbles

Large peg

Tea tree

mossy

wet

Tea tree

porph Cgl grl

ΔCgl porph

ΔCgl porph

ΔCgl porph

1700mE 1800mE 1900mE 2000mE 2100mE 2200mE 2300mE 2400mE 2500mE 2600mE 2700mE 2800mE 2900mE 3000mE 3100mE 3200mE 3300mE

400mN 200mN Base L 200mS 400mS 600mS 800mS 1000mS 1200mS 1400mS 1600mS 1800mS

2700mE	2800mE	2900mE	3000mE	3100mE	3200mE
12 25 (-1,3)	20 30	4 15	24 30	22 20	4 40
-4 (5,5,2)	-4	-4	-4	-4	4
14 10 (-1,7)	12 20	12 15	46 20	36 35	8 40
-4 (5,-2,2)	-4	-4	-4	-4	-4
12 30 (-1,-2)	26 40	18 25	24 30	90 35	4 -10
-4 (5,-2,-2)	-4	-4	-4	-4	-4
22 210 (7,14)	160 80	16 30	40 40	30 60	28 140
16 (110,22,20)	6	-4	-4	-4	6
20 65 (-1,-2)	32 85	12 20	24 50	4 30	55 130
-4 (5,9,2)	-4	-4	-4	-4	10
14 10 (-1,4)	16 15	20 55	30 70	8 10	28 220
-4 (5,-2,-2)	-4	-4	-4	-4	60
30 25 (-1,2)	14 25	22 40	14 65	14 15	34 160
-4 (5,3,-2)	-4	-4	-4	-4	85
60 55 (-1,-2)	28 35	22 35	40 15	14 100	22 110
4 (8,-2,2)	-4	-4	-4	-4	30
4 35 (-1,-2)	20 35	46 40	34 130	22 90	10 55
-4 (5,8,5)	-4	-4	6	6	-4
30 70 (-1,4)	18 35	24 30	16 45	12 40	12 60
8 (5,8,2)	-4	-4	-4	4	12
26 60 (-1,6)	24 45	16 15	20 100	22 65	12 45
-4 (5,-2,-2)	-4	-4	4	10	6
30 40 (-1,-2)	55 40	12 30	-4 -10	16 45	10 50
4 (5,-2,2)	-4	-4	-4	-4	18
40 90 (-1,7)	16 40	16 35	6 40	10 130	16 55
-4 (5,7,2)	-4	-4	-4	10	8
24 45 (-1,2)	14 55	12 40	18 45	14 110	12 50
-4 (5,10,2)	-4	-4	-4	6	4
55 55 (-1,6)	14 25	20 65	16 80	10 50	10 75
4 (5,7,5)	-4	-4	-4	-4	-4
12 40 (-1,2)	24 50	8 25	20 130	12 90	4 75
-4 (5,-2,2)	4	-4	6	-4	-4
18 50 (-1,-2)	32 85	20 55	14 80	12 60	8 60
-4 (2,3,2)	10	-4	-4	-4	-4
28 65 (-1,2)	38 470	26 50	24 120	10 60	8 75
4 (2,-2,2)	55	-4	6	-4	-4
28 100 (-1,2)	26 460	10 240	20 110	14 55	8 75
10 (5,10,2)	18	55	6	-4	4
10 55 (3,2)	46 900	10 340	12 65	12 70	6 60
-4 (28,3,15)	140	46	-4	-4	-4
4 300 (11,2)	22 220	20 240	18 270	12 95	8 50
4 (45,44,50)	26	46	48	12	8
22 170 (3,2)	16 330	22 200	14 220	6 65	18 95
18 (5,26,5)	55	65	55	12	8
10 130 (-1,7)	10 75	18 130	14 230	6 95	18 160
8 (5,19,12)	12	16	120	20	12
22 300 (8,40)	10 280	10 110	10 180	8 110	14 90
65 (10,50,20)	-4	12	55	44	-4
16 240 (10,17)	10 180	4 30	18 170	14 110	16 120
26 (8,30,12)	4	-4	16	28	16
14 -10 (-1,2)	14 250	12 170	16 180	8 180	8 55
-4 (5,-2,2)	24	8	32	32	8
10 120 (10,5)	14 190	10 150	8 230	10 170	14 110
28 (40,22,28)	12	4	-4	50	10
30 330 (8,8)	32 230	16 340			
8 (15,22,30)	6	4			
42 400 (8,5)	34 190	30 640			
10 (10,19,40)	4	150			
24 260 (10,4)	32 160	25 150			
4 (10,12,28)	10	16			
34 180 (12,5)	32 190	26 150			
12 (10,16,30)	6	24			
65 320 (12,6)	24 190	10 110			
30 (15,15,38)	8	14			
36 160 (4,7)	65 120	10 140			
24 (18,17,50)	10	10			
22 120 (2,-2)	26 130	18 110			
12 (12,20,42)	14	14			
18 190 (1,-2)	28 130	16 75			
16 (10,22,40)	14	-4			
32 150 (1,3)	26 110	20 85			
16 (12,17,40)	12	4			
28 110 (1,-2)	22 110	24 65			
16 (15,22,23)	6	4			
44 140 (1,2)	28 120	26 80			
42 (12,20,38)	12	-4			
26 85 (2,2)	34 180	24 75			
16 (10,17,30)	10	8			

100 65 (-3)		
-10 (2,8,5)		
100 290 (10)		
45 (12,30,5)		
540 390 (18)		
15 (5,20,5)		
170 270 (8)		
65 (25,22,12)		
140 270 (22)		
90 (35,32,22)		
48 130 (12)		
35 (15,28,65)		
100 95 (6)		
28 (20,18,48)		
32 55 (3)		
20 (25,32,8)		
110 65 (3)		
110 (32,12,30)		
6 -10 (-3)		
-10 (18,32,15)		
14 -10 (3)		
-10 (15,15,25)		
-4 10 (-3)		
-10 (2,25,2)		
60 45 (-3)		
-10 (5,8,2)		
8 10 (-3)		
-10 (5,140,16)		
-4 -10 (-3)		
-10 (170,20,80)		
-4 -10 (-3)		
-10 (80,-5,150)		

NOTES
1. Samples collected in C horizon by hand auger where necessary
2. -80 mesh fraction analysed by Amdel For line 2100E - by XRF for Sn, W and by AAS after hot acid digestion for Cu, Pb, Zn, Bi, Mo. For all other lines - by XRF for Sn, W, Bi, As, Pb and by AAS for Cu, Zn, Mo
3. Key ppm Sn | W (Mo As) / Bi | (Cu Pb Zn)
4. "-4" means "less than 4"
5. Extra data for upper soil horizons exists for line 2100E This data is plotted on plan TAS-79-247

5 cm

COMALCO

79-1359

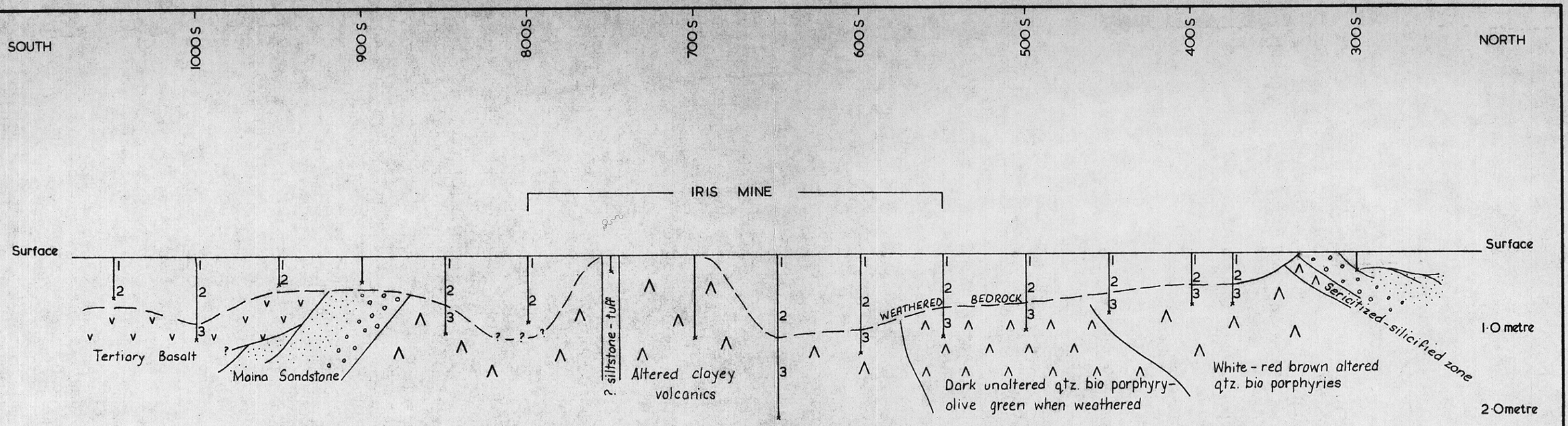
EL 7/74 TASMANIA 133170

MOINA SHEET A

SOIL GEOCHEMISTRY

DATA SHEET 2140

Compiled T Waite	Revised	Drawn O Hedditch	
Date Feb 1979	Scale 1 2,500	Drg No TAS-79-246	



Sn	W	Bi	Sn	W	Bi	Sn	W	Bi	Sn	W	Bi	Sn	W	Bi	Sn	W	Bi	Sn	W	Bi	Sn	W	Bi	Sn	W	Bi	Sn	W	Bi	Sn	W	Bi	Sn	W	Bi	Sn	W	Bi	Sn	W	Bi	Sample No.
<4	<10	<10	<4	<10	<10	16	10	<10	60	45	<10	<4	<10	<10	8	20	<10							200	800	180	450	410	15	290	260	10	210	640	840	210	490	<10	50	170	<10	180	240	12	100	65	<10	1
<4	<10	<10	4	<10	<10	8	10	<10				4	10	<10	14	<10	<10							140	960	85	190	390	65	340	260	45	440	310	60	490	560	15	240	340	<10	800	400	15				2
WEATHERED BEDROCK			<4	<10	<10							<4	10	<10				6	<10	<10	110	65	110	32	55	20	100	95	28	48	130	35	140	270	90	170	270	65	540	390	15	100	290	45				WEATHERED BEDROCK - 3

Cu	Pb	Zn	Cu	Pb	Zn	Cu	Pb	Zn	Cu	Pb	Zn	Cu	Pb	Zn	Cu	Pb	Zn	Cu	Pb	Zn	Cu	Pb	Zn	Cu	Pb	Zn	Cu	Pb	Zn	Cu	Pb	Zn	Cu	Pb	Zn	Cu	Pb	Zn	Cu	Pb	Zn	Sample No.
60	8	110	55	32	75	2	270	15	5	8	2	12	25	5	5	15	8							10	10	12	5	5	8	5	10	8	35	30	20	8	18	5	5	18,8	5	20	5	2	8	5	1
80	<5	150	70	30	85	5	140	15				2	20	5	15	15	25							18	18	25	15	22	22	15	18	25	22	28	15	10	15	5	5	22,2	5	15	5				2
WEATHERED BEDROCK			70	20	80							2	25	2				18	32	15	32	12	30	25	32	8	20	18	48	15	28	65	35	32	22	25	22	12	5	20,5	12	30	5				WEATHERED BEDROCK - 3

133171

79-1389

COMALCO

E.L. 7/74 TASMANIA

MOINA SHEET A 2141

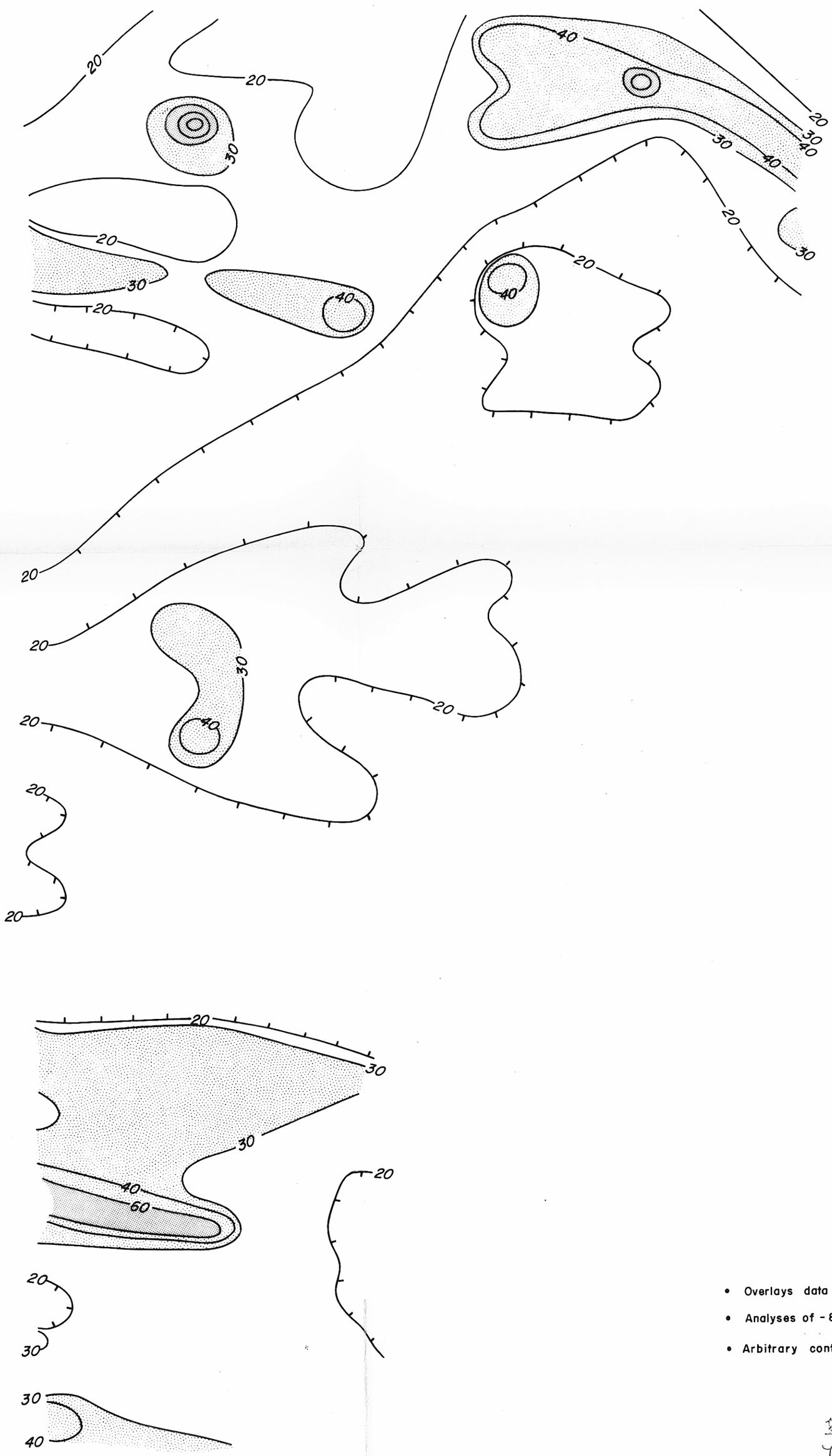
TRIAL LINE 2100E

SOIL GEOCHEMISTRY, PROFILES

Compiled: R. Poltock	Drawn: Q. Hedditch
Date: Feb. 1979	Drg. No.: TAS-79-247

2600m E
2700m E
2800m E
2900m E
3000m E
3100m E
3200m E

600 m N
500 m N
400 m N
300 m N
200 m N
100 m N
000
100 m S
200 m S
300 m S
400 m S
500 m S
600 m S



5 cm

- Overlays data sheet TAS-79-246
- Analyses of -80 mesh fraction of C Horizon by XRF
- Arbitrary contours of 20,30,40,60 ppm Sn

133172
79-1389

C O M A L C O

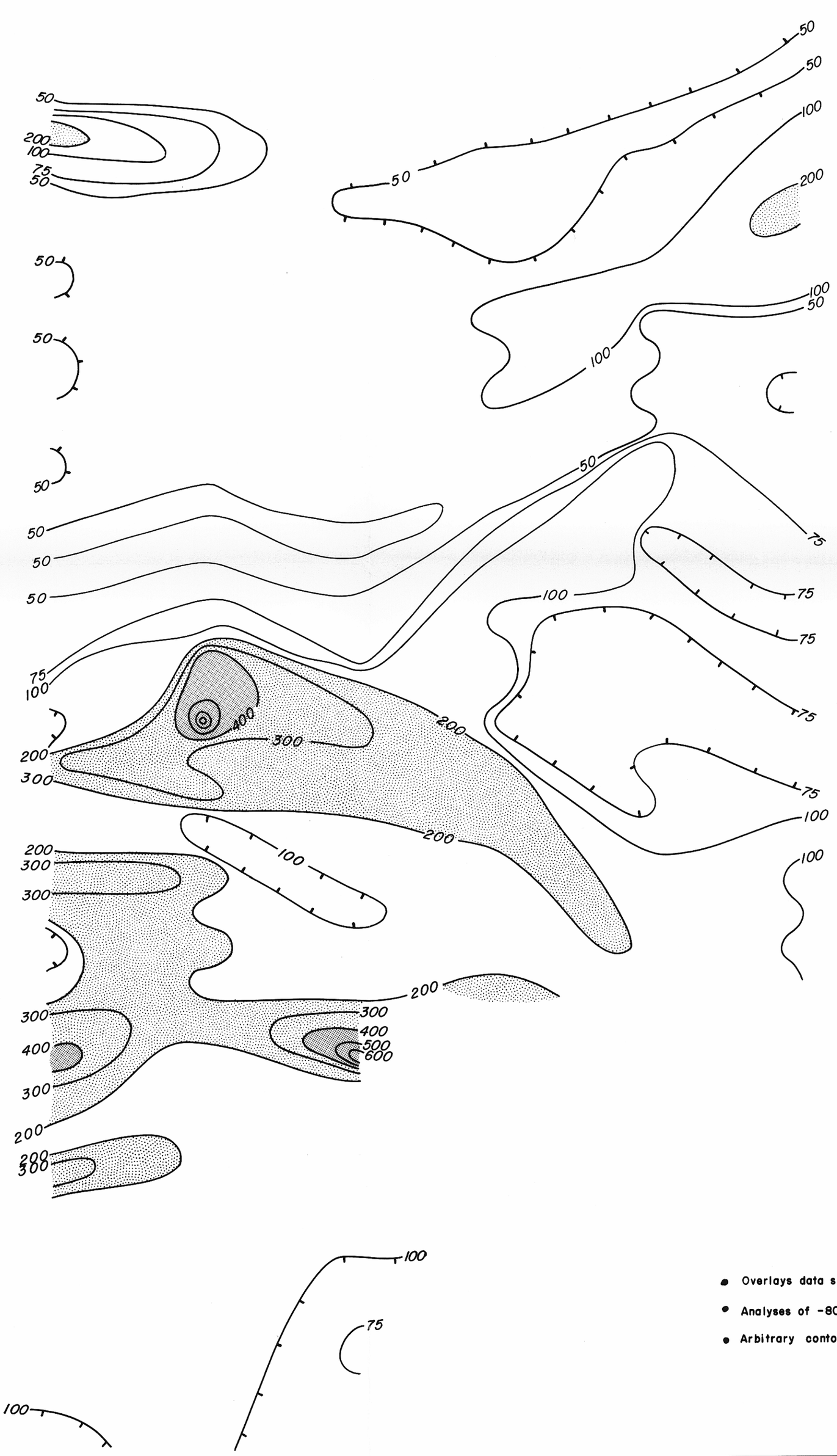
E.L. 7/74 TASMANIA

Part of MOINA SHEET A
LEASED AREA
SOIL GEOCHEMISTRY
TIN, ppm CONTOURS 2142

Compiled: P.W.A.	Revised:	Drawn: M.A.
Date: August, 1979	Scale: 1:2500	Drg N° TAS-79-343

2600 m E
2700 m E
2800 m E
2900 m E
3000 m E
3100 m E
3200 m E

600 m N
500 m N
400 m N
300 m N
200 m N
100 m N
000
100 m S
200 m S
300 m S
400 m S
500 m S
600 m S



- Overlays data sheet TAS-79-246
- Analyses of -80 mesh fraction of C Horizon by XRF
- Arbitrary contours of 50, 100, 200, 300, 400, ppm W.

5 cm

79-1389

133173.

C O M A L C O

E.L 7/74 TASMANIA

Part of MOINA SHEET A
LEASED AREA
SOIL GEOCHEMISTRY
TUNGSTEN, ppm CONTOURS

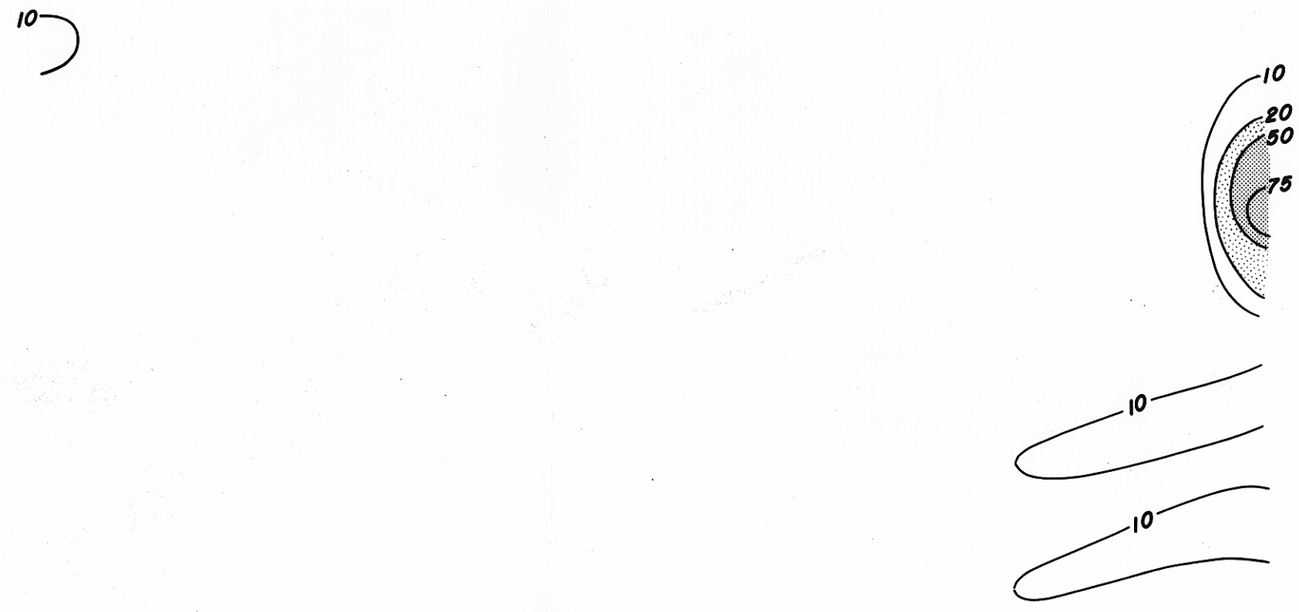
2143

Compiled: P.W.A	Revised:	Drawn: M.A.
Date: August 1979	Scale: 1:2500	Drg N° TAS-79-344

2600mE 2700mE 2800mE 2900mE 3000mE 3100mE 3200mE

600 mN 500 mN 400 mN 300 mN 200 mN 100 mN 000

100 mS 200 mS 300 mS 400 mS 600 mS



- Overlays data sheet TAS-79-246
- Analyses of -80 mesh fraction of C Horizon by XRF.
- Arbitrary contours of 10, 20, 40, 50, 75, 100 ppm Bi.

79-1389

133172

5 cm

C O M A L C O

E.L. 7/74 TASMANIA

Part of MOINA SHEET A
LEASED AREA
SOIL GEOCHEMISTRY
BISMUTH, ppm CONTOURS

2144

Compiled: P.W.A.	Revised:	Drawn: M.A.
Date: August 1979	Scale: 1:2500	Drg N° TAS-79-342

1977 SURVEY

This Section (300mN and above) from 1977 survey

NB: FIGS in brackets are from 1977 survey

NB A * This reading should possibly be 61990
Compare with fluxgate values where there is no negative anomaly

1978 SURVEY

1979 Survey

100mE	200mE	300mE	400mE	500mE	600mE	700mE	800mE	900mE	1000mE	1100mE	1200mE	1300mE	1400mE	1500mE	1600mE
62046	62041	62065	62041	62008	62010	62090	62243	62087	62228	62068	62133	61995	62115	61985	62027	62080											
62047	62105	62065	62088	62064	62094	62039	62093	62127	62128	62104	62108	62060	62208	62089	62102	62128											
62133	62119	62111	62157	62077	62079	62028	62052	62107	62113	62189	62191	61891	62069	62106	62058	62127	62099										
62269	62089	62066	62001	62071	62119	62016	62212	62094	62136	62133	62223	62061	62020	62064	62069	62093	62102										
62036	62246	62045	62128	62109	62026	62010	62959	62071	62088	62098	62182	61675	62023	61999	62009	62080	62096	62085									
62052	62039	62346	62040	62151	62084	62116	62103	62061	62179	62167	62116	62004	61039	61961	61975	62079	62094	61955									
62069	62086	62025	61998	62073	62174	62022	62050	61992	62112	62042	62082	62003	61969	61940	62002	62090	62087	62049									
62068	62052	62163	62035	62033	62036	62021	62059	61999	61834	62072	62038	62175	61934	61827	62004	62042	62062	62060									
62076	62031	62075	62062	62047	62054	62169	62086	61910	62130	61190 A *	62006	62078	61990	62017	62031	62010	62053	52369	62102								
	62064	62066	62065	62057	62069	62444	62003		62086	62092	61974	62166	62015	61956	62023	62057	62003	62058	62053	62104								
	62080	62091	62053	62074	62034	61986	62089		62016	62133	61987	62208	62017	62125	62019	62050	62032	62088	62084	62073								
	62067	62089	62065	62084	62063	62095	62198	62070	62128	62083	62171	62129	61552	62108	61966	62075	62128	62117	62103								
62104	62079	62064	62037	62123	62044	62134	62071	61938	62104	62099	62119	62185	61872	62120	62009	62103	62165	61288	62182								
	(62069)	(62072)	(62031)	(62109)	(62050)	(62108)	(62051)	(61925)	(62079)	(62089)	(62079)	(62161)	(61870)	(62064)	(61995)	(62077)	(62125)	(62170)	(62097)	62097	62054	62050	62005	62048	62155	62196	62190	62199	62246	62262	62254	62301	
62110	62103	62080	62051	62166	62087	62175	61976	61932	62094	62142	62104	62256	61977	62178	62047	62094	62201	62287	62292	62150	62970	62022	62001	62021	62092	62143	62091	62209	62252	62254	62281	62269	
62103	62118	62149	62066	62075	61999	62104	62068	62069	62036	62124	62082	62256	62343	61888	61874	61748	62056	62340	62534	62333	61913	61917	61976	61998	62095	62194	62128	62379	62195	62291	62251	62262	
62085	62087	62122	62067	62100	62076	62098	62015	61943	61923	62140	62066	62215	62340	62302	62265	62299	62412	62067	63145	62607	61859	61799	61926	62037	62080	62174	62136	62119	62322	62308	62251	62283	
62104	62104	62058	62185	62055	62137	62093	62064	62022	61859	61783	62079	62170	62395	62330	62180	62390	62471	63129	62835	62478	61767	61513	61738	62072	62101	62128	62209	62118	62201	62252	62393	62286	
62168	62121	62095	62078	62121	62192	62320	62109	62137	61981	62127	62067	62218	62394	6245-	62368	62399	62701	62822	64142	62106	Dam	61134	61608	61963	62095	62228	62280	62323	62409	62333	62300	62311	
62109	62109	62114	61927	62113	62103	62878	62107	62114	61971	62050	62165	61952	62459	62738	62819	63504	63744	63125	65263	63719	61111	60671	61317	61860	62172	62296	62036	62360	62298	62270	62321	62355	
62162	62135	62106	62083	62112	62190	62095	61914	62156	62075	62041	62229	62533	62790	63011	63229	63730	64455	64915	65646	66449	61937	59348	60850	61904	62263	62381	62456	62421	62181	62429	62375	62403	
62175	62182	62180	62225	62173	62225	62178	62108	62099	62089	62129	62378	62824	63138	63331	63269	63478	63778	65260	69118	66351	69809	64105	60031	61831	62329	62528	62603	62740	63366	62347	62429	62444	
62177	62205	62185	62298	62323	62327	62179	62191	62098	62015	62141	62314	62923	63442	63560	63654	63690	63167	63557	69448	66635	65523	70190	64071	61788	62446	62674	62912	62845	62556	62489	62478	62492	
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62130	62192	62340	62481	62709	62919	62757	62329	62142	62019	61715	62135	62266	62597	62875	62976	63489	64788	63504	63882	66310	63975	60047	60795	61652	62742	63336	63471	63502	62985	62740	62524	62518	62572
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62271	62385	62469	62495	62656	63141	63436	62792	62311	62079	61959	61855	62010	62435	62795	63728	64111	63764	65313	63140	63316	64342	60375	61020	61809	62037	63005	62850	64271		63004	62566	62457	62441
62314	62462	62583	62573	62598	62883	63548	62966	62451	62006	62032	62044	62065	62443	62092	64545	64553	64183	64658	63845	63530	66625	60467	60971	61812	61938	62166	62150	64562	64212	63114	62525	62438	62333
62319	62564	62762	62511	62456	62618	63353	63302	62372	62259	62113	62158	62110	62358	62156	63932	64165	66144	63916	64366	64107	67414	65720	61091	61582	61888	62045	61912	64816	65474	63410	62498	62355	62260
62307	62524	62743	62566	62381	62344	62997	63607	62985	62345	62266	62269	62177	62304	62748	64305	63886	66877	62256	64168	62798	61711	62973	61151	61651	61855	61993	61835	64584	67771	64052	62449	62308	62245
62262	62415	62530	62481	62246	61845	62629	63842	63409	62445	62437	62380	62224	62322	62857	62861	63280	64021	62541	63408	62887	61093	60384	61336	61612	61848	61958	61794	61336	65974	64154	62330	62142	62200
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62046	62052	62012	61972	61940	61926	61777	61642	61617	62114	62176	62161	62610	62696	62717	62447	62739	62948	63434	63310	62918	62360	61906	61838	61783	61934	61990	62057	61870	61736	61941	62126	61934	62060
62054	62053	62229	62016	61805	61862	62191	61357	61610	61927	62072	61942	62342	62431	62510	62647	62558	62800	62891	63079	62446	62027	61968	61869	61931	61914	62012	62118	61867	61839	61998	62174	62070	62046
62123	62042	62025	62034	61874	61951	62007	61395	61606	61833	62004	61893	62082	62267	62395	62477	62608	62508	62786	62362	61902	61995	61956	61885	61962	62012	62035	62077	61982	62134	62073	62189	62135	62036
62216	62072	62071	62045	61843	61999	62000	61762	61639	61261	61928	61936	61893	62080	62297	62346	62449	62833	63223	62259	61777	62043	61935	61931	61975	62049	62040	62084	62045	62084	62093	62275	62200	62098
62089	62103	62120	62055	62008	61997	62028	61583	63134 B *	62201	61547	61946	61896	61998	62262	62211	62275	62684	62731	62526	61742	62039	62010	61986	62022	62067	62026	62092	62095	62098	62165	62244	62290	62108
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62119	62221	62104	62079	62042	62015	62008	60598	62132	62017	61986	61818	61877	62031	62128	62085	62009	62115	62151	61421	61822	61932	62021	62001	62075	62019	62104	62133	62135	62168	66279	62337	62321	62252
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	62150	62145	62033	62114	62104	62083	62050	61998	61834	61922	61816	61828	61876	61925	61921	61981	61944	61936	61916	61963	61934	62134	62115	62027	61874	62018	62123	62225	62213	62127	62083	62511	62393
	62259	62137	62149	62119	62106	62060	62066	62102	62037	61956	61928	61846	61907	61999	62015	61989	61944	61945	61963	62129	62090	62152	62176	61982	62000	61958	62103	62023	61986	62217	62046	62528	62416
	62100	62153	62137	62097	62104	62091	62104	62122	62098	61984	61948	61895	61928	62004	62022	61992	61969	61986	62013	62085	62115	62236	62265	61847	62065	61951	62143	62071	62128	62165	62148	62541	62412
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	61914	62148	62164	62065	62070	62127	62165	62098	62121	62042	62016	61920	61966	62032	62088	62013	61992	62038	62060	62135	62100	61882	62033	62376	62135	62186	62060	62125	62160	62180	62212	62307	62316
	62085	62123	62169	62093	62115	62131	62135	62123	62105	62072	62076	61905	61896	62026	62024	62045	62032	62057	62026	62156	62238	61993	62028	62051	62037	62043	62169	62090	62069	62150	62166	62150	62260
	62192	62158	62146	62035	62099	62152	62170	62161	62158	62076	62098	61983	62009	61974	62003	62093	62071	62108	62081	62188	62178	61955	61984	62142	62040	62182	62084	62160	62162	62125	62325	62214	62279
	62176	62124	62156	62164	62072	62171	62162	62169	62176	62042	62140	62028	62026	62014	62092	62182	62200	62111	62186	62209	62209	61944	62020	62138	62072	62100	62200	62365	62116	62224	62314	62344	62280
	62221	62156	62181	62211	62116	62210	62196	62203	62198	62095	62105	62069	62104	62026	62102	62154	62172	62158	62177	62218	62300	62052	62026	62205	62272	62107	62198	62312	62483	62293	62306	62230	62245
	62384	62284	62285	62233	62228	62215	62205	62275	62253	62085	62113	62133	62089	62084	62098	62144	62139	62087	62195	62233	62250	62094	62046	62202	61997	62190	62219	62154	62136	62197	62278	62366	62275
	62484	62342	62372	62279	62242	62249	62270	62326	62332	62105	62092	62090	62095	62098	62123	62309	62125	62203	62192	62229	62243	62157	62076	62275	62235	62008	62260	62317	62392	62326	62154	62291	62280
	62501	62378	62363	62307	62270	62287	62290	62411	62402	62177	62167	62120	62140	62107	62111	62214	62213	62158	62206	62260	62271				62180	62262	62263	62262	62386	62246	62247	62389	62462
	62332	62348	62400	62324	62302	62284	62305	62329	62319	62241	62260	62146	62164	62070	62156	62236	62206	62180	62180	62243	62280				62193	62127	62211	62411	62349	62350	62467	62403	62463
	62205	62306	62365	62436	62325	62278	62263	62313	62210	62258	62288	62120	62244	62152	62160	62229	62254	62120	62160	62285						62187	62272	62251	62505	62438	62389	62476	62607
	62188	62256	62330	62300	62320	62263	62246	62250	62232	62288	62292	62400	62532	62173	62192	62266	62265	62244	62230	62320						62212	62309	62405	62490	62453	62362	62417	62625
	62178	62176	62278	62290	62301	62252	62260	62216	62233	62324	62280	62207	62327	62203	62268	62235	62263	62223	62203										62402	62581	62557	62555	62435
	62161	62178	62193	62262	62270	62230	62244	62231	62204	62269	62290	62247	62282	62283	62283	62225	62220	62241	62274										62450	62760	62745	62516	62450
	62121	62147	62171	62200	62251	62240	62250	62230	62222	62255	62285	62318	62232	62301	62293	62305	62261	62265												62783	62798	62442	62603
	62144	62170	62180	62194	62242	62227	62233	62225	62280	62221	62241	62255	62292	62222	62205	62287	62298	62292												62731	62804	62624	62712
	62150	62184	62190	62161	62218	62219	62208	62201	62270	62205	62226	62217	62215	62201	62217	62297	62269	62291															62706
	62164	62202	62222	62187	62228	62211	62201	62205	62252	62209	62227	62195	62200	62204	62260	62282	62289	62304															62588
	62251	62263	62257	62202	62230	62216	62221	62234	62224	62232	62222	62210	62270	62229	62236	62295	62326																62461
	62206	62277	62318	62231	62236	62201	62194	62222	62232	62224	62210	62234	62257	62145	62192	62321	62320																62240
	62190	62330	62393	62319	62239	62191	62211	62214	62261	62214	62223	62268	62292	62229	62283	62353	62346																62222
	62163	62273	62328	62405	62259	62213	62222	62235	62267	62227	62233	62230	62244	62254	62281	62342	62376																62195
	62256	62170	62117	62373	62300	62240	62238	62243	62252	62268	62290	62246	62274	62257	62276	62376																	62215
	62370	62135	62149	62296	62301	62236	62233	62245	62260	62280	62277	62268	62246	62275	62309	62376																	62296
	62878	62122	62095	62187	62250	62226	62220	62250	62253	62288	62219	62248	62220	62292	62330																		62331
	62813	62128	62089	62170	62203	62237	62241	62272	62250	62300	62290	62321	62283	62297	62326																		62354
	62245	62168	62167	62166	62200	62242	62240	62268	62265	62318	62345	62390	62360	62335	62389																		62191
	62001	62164	62180	62176	62233	62241	62251	62284	62296	62305	62335	62377	62408	62367	62359																		62348
	62102	62173	62195	62199	62194	62267	62274	62278	62287	62347	62334	62376	62399	62393																			62314
	62114	62220	62192	62210	62193	62263	62265	62300	62317	62339	62338	62385	62368	62396																			61945
	62119	62266	62265	62245	62230	62294	62294	62323	62318	62363	62357	62390	62323	62802																			62232
	62442	62427	62301	62241	62230	62310	62294	62339	62347	62385	62386	62410	62364	62411																			62526
	62981	62259	62309	62278	62257	62320	62319	62363	62357	62406	62420	62376	62380																				62490
	62625	62366	62368	62315	62356	62347	62341	62396	62390	62419	62432	62388	62412																				62486
	62268	62443	62415	62343	62350	62382	62401	62412	62425	62438	62420	62416	62413																				62471
	62513	62528	62468	62378	62367	62428	62435	62449	62474	62451	62467	62432	62407																				62278
		62606	62558	62444	62467	62486	62470	62489	62492	62483	62474	62433	62437																				62385
		62656	62608	62533	62569	62472	62500	62536	62550	62496	62500	62453	62449																				62501
		62728	62676	62636	62602	62570	62568	62584	62557	62506	62518	62470	62466																				62434
		62792	62797	62711	62715	62618	62594	62571	62625	62562	62573	62510	62486																				62117
																																	62253
																																	62441
																																	62417
																																	62295

600mN
400mN
200mN
000
200mS
400mS
600mS
800mS
1000mS
1200mS
1400mS
1600mS

5 cm

NOTE
1. Instrument Geometric G816 Proton Precession Magnetometer
2. Instrument mounted on 3m pole.
3. Readings taken between 25.11.76 and 8.12.76 except where shown.
4. This plan overlays TAS-76-46
5. B * This reading should possibly be 62134 which would compare with proton G836 data.

COMALCO LIMITED 79-1389

EL 7/74 TASMANIA 133175

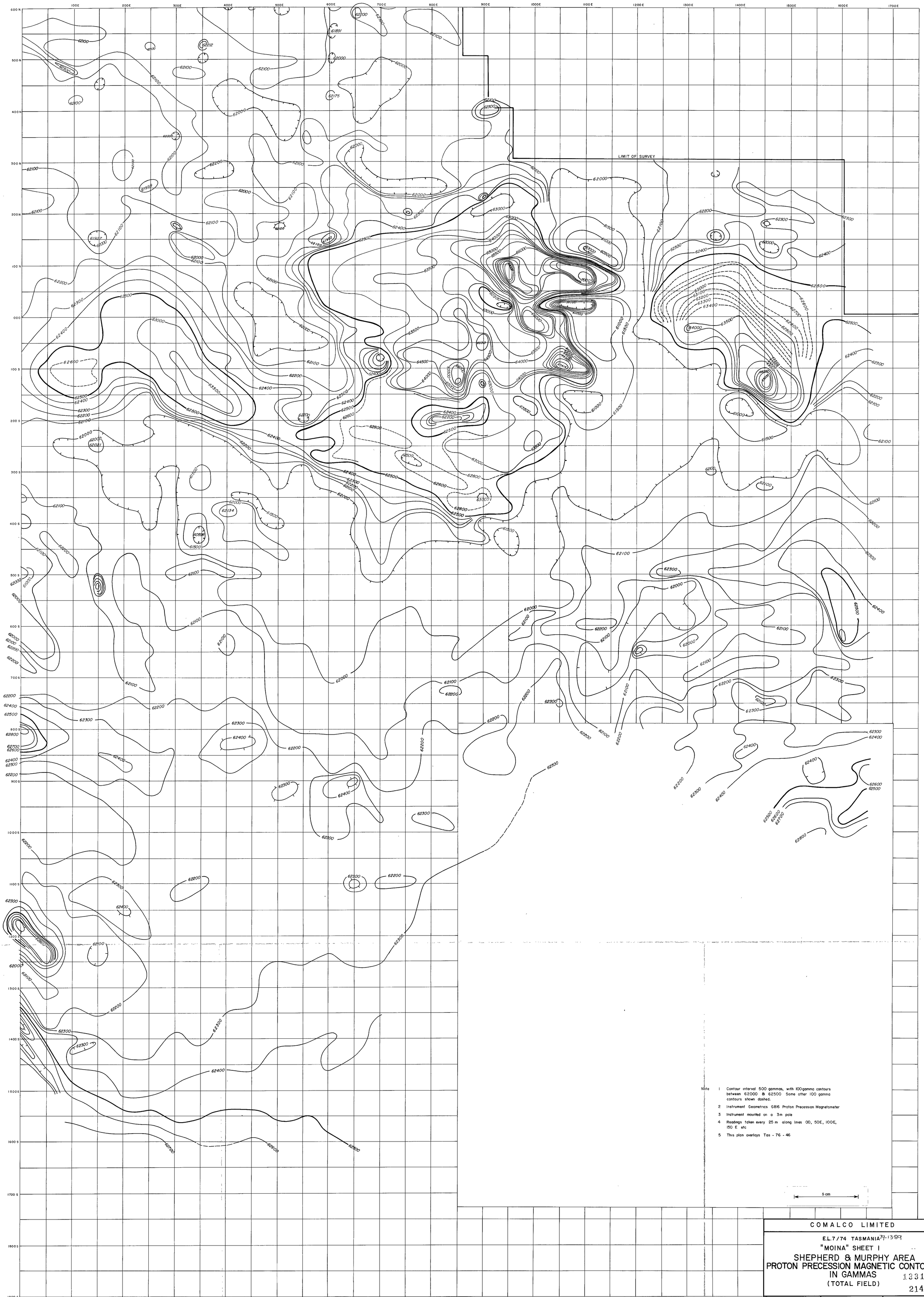
"MOINA" SHEET 1

SHEPHERD & MURPHY AREA

PROTON PRECESSION MAGNETIC DATA IN GAMMAS

(TOTAL FIELD) 2145

Compiled R.Poltock. P.Askins.	Revised: Feb 1979	Drawn: C.Hamel.
Date: June, 1978	Scale: 1:2,500	Drg Nº TAS-78-139



Note
1. Contour interval 500 gammas, with 100 gamma contours between 62000 & 62500. Some other 100 gamma contours shown dashed.
2. Instrument Geometrics G816 Proton Precession Magnetometer
3. Instrument mounted on a 3m pole
4. Readings taken every 25 m along lines 00, 50E, 100E, 150 E etc
5. This plan overlays Tas - 76 - 46

5 cm

0 100 200 300 400 metres
SCALE

COMALCO LIMITED

E.L. 7/74 TASMANIA 79-1389

"MOINA" SHEET 1

SHEPHERD & MURPHY AREA PROTON PRECESSION MAGNETIC CONTOURS IN GAMMAS (TOTAL FIELD)

133176
2146

Compiled: P.W. Askins	Revised: Aug. 1979	Drawn M. Attwell
Date October, 1977	Scale 1: 2,500	Drg N° TAS-77-78

1600mW 1400mW 1200mW 1000mW 800mW 600mW 400mW 200mW 000

600mN

| | | |

BASE LINE IRIS GRID
500mS 1880mW to 000

HIGH GRADIENT

ZONE OF 62000 HIGH GRADIENT

LIMIT OF SURVEY

(to 1250S)

NOTE:

1 Contour interval 100 gammas
2 Instrument Geometrics G816 Proton Precession Magnetometer
3 Instrument mounted on 3m pole
4 Readings taken every 25m along Lines 500W, 550W, 600W, 650W, etc
5 This plan overlays TAS-76-47

5 cm

SCALE 0 100 200 300 400 metres

COMALCO LIMITED

EL 7/74 TASMANIA
"MOINA" SHEET 2
IRIS RIVER AREA
PROTON PRECESSION MAGNETIC CONTOURS
IN GAMMAS
(TOTAL FIELD)

79-1389
133178
2148

Compiled: P Askins	Revised: Aug. 1979	Drawn: M. Attwell.
Date: July, 1977	Scale 1:2,500	Drg N° TAS-77-80

600m N
400m N
200m N
000
200m S
400m S
600m S
800m S
1000m S
1200m S
1400m S
1600m S
1800m S

3400m W
3200m W
3000m W
2800m W
2600m W
2400m W
2200m W

61989	61881	61866	61728	61739	61676	62143	62226	62394	61946	62054	61965	62006
62081	61848	61915	61956	61279	62490	62125	62261	62429	61823	61939	62008	62105
62001	61851	61953	61903	61581	62557	62578	62306	62231	61947	61917	62000	62008
62026	61984	61941	62037	61894	63143	62145	62346	61980	61957	61942	62008	62010
61981	61961	61962	61905	62418	63167	62496	62300	62098	62507	61953	61997	62073
61997	62127	62565	61763	62376	61576	62099	62186	62060	62453	62089	62017	62045
61954	61990	62078	62914	61632	61963	61910	62315	61959	61986	62182	61999	61967
61934	61985	61873	61864	61921	62488	63511	62112	62133	61998	61477	62013	62028
61942	61884	61874	61702	61700	61522	64411	61633	61118	61206	62029	62737	62267
61984	61893	62235	61913	61855	61758	61540	62156	61786	61783	62883	62573	62314
61956	62003	61814	62067	61904	61840	61700	61558	61489	61825	61835	62063	62106
61823	61861	61821	61794	61881	61900	61847	61839	61460	61780	61888	62012	62083
61855	61816	61948	61881	61902	61921	61846	61868	61281	61962	61969	62053	62219
61878	61846	61858	61877	61916	61931	61929	61962	61902	61959	61982	62066	62143
61871	61860	61954	61868	61891	61939	61956	62008	61541	62011	62014	62030	62170
61853	61880	61959	61876	61951	61981	61896	61937	61987	62039	62039	62023	62055
61968	61901	61851	61893	61986	61925	61510	61459	61149	62061	62136	62081	62065
					61929	61986	62146	61950	62122	62074	62149	62156
					62432	61930	62107	62183	62235	62099	62350	62226
					62176	62100	62348	62332	62285	62395	62042	62113
					62021	62175	62297	62458	62545	62260	62233	62210
					62049	61906	62216	62771	62181	62395	62237	62298
					62062	62019	62125	62747	63038	62087	62424	62224
					62070	61795	62119	62367	62301	62336	61739	62136
					62366	62083	62101	62007	62140	62127	62148	62007
					62331	62204	62027	62039	62185	62146	62238	62215
											62145	62283
											62051	62259
											61906	62184
											62197	62204

5 cm

COMALCO

E.L. 7/74 TASMANIA 79-1389

MOINA SHEET 3 133179

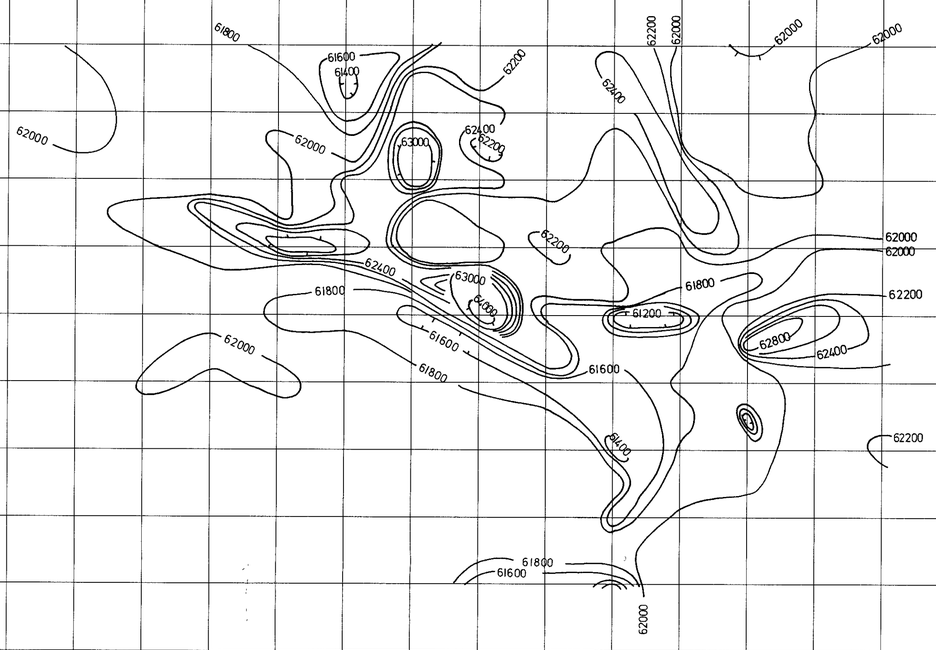
LEA RIVER AREA

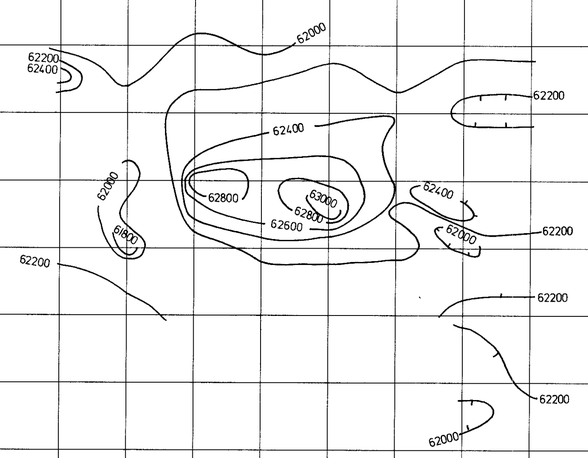
PROTON PRECESSION MAGNETIC DATA IN GAMMAS

(TOTAL FIELD) 2140

Compiled O Hedditch	Revised	Drawn O Hedditch
Date August, 1979	Scale 1:2500	Drg No TAS-79-250

600mN
400mN
200mN
000
200mS
400mS
600mS
800mS
1000mS
1200mS
1400mS
1600mS





3400m W
3200m W
3000m W
2800m W
2600m W
2400m W
2200m W

NOTES Contour interval 200 gammas.
Plan overlays data sheet plan TAS-79-250

5 cm

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EL 7/74 TASMANIA

79 1189

MOINA SHEET 3

123180

LEA RIVER AREA

PROTON PRECESSION MAGNETIC CONTOURS IN GAMMAS

(TOTAL FIELD)

2150

Compiled P W Askins	Revised	Drawn O Hedditch
Date Feb 1979	Scale 1 2500	Drg No · TAS - 79 - 251

600mN
400mN
200m N
000
200m S
400m S
600m S
800m S
1000m S
1200m S
1400m S
1600mS
1800mS

1800m E
2000m E
2200m E
2400m E
2600m E
2800m E
3000m E

* Steel peg 2m to West of 2700E / 575S

B.S. X

High gradients in the area

NOTES
1. Instrument used Geometrics G816 Proton Precession Magnetometer or Scintrex MP2 (give identical readings)
2. Sensor mounted on 3m pole
3. Readings taken 1978 1979 Many areas have been checked and re read due to instrument malfunction Readings in brackets are approximate corrected readings
4. B S is site for base station
5. * This reading assumed incorrect

5 cm

COMALCO LIMITED

EL 7/74 TASMANIA

79-1389

MOINA SHEET A

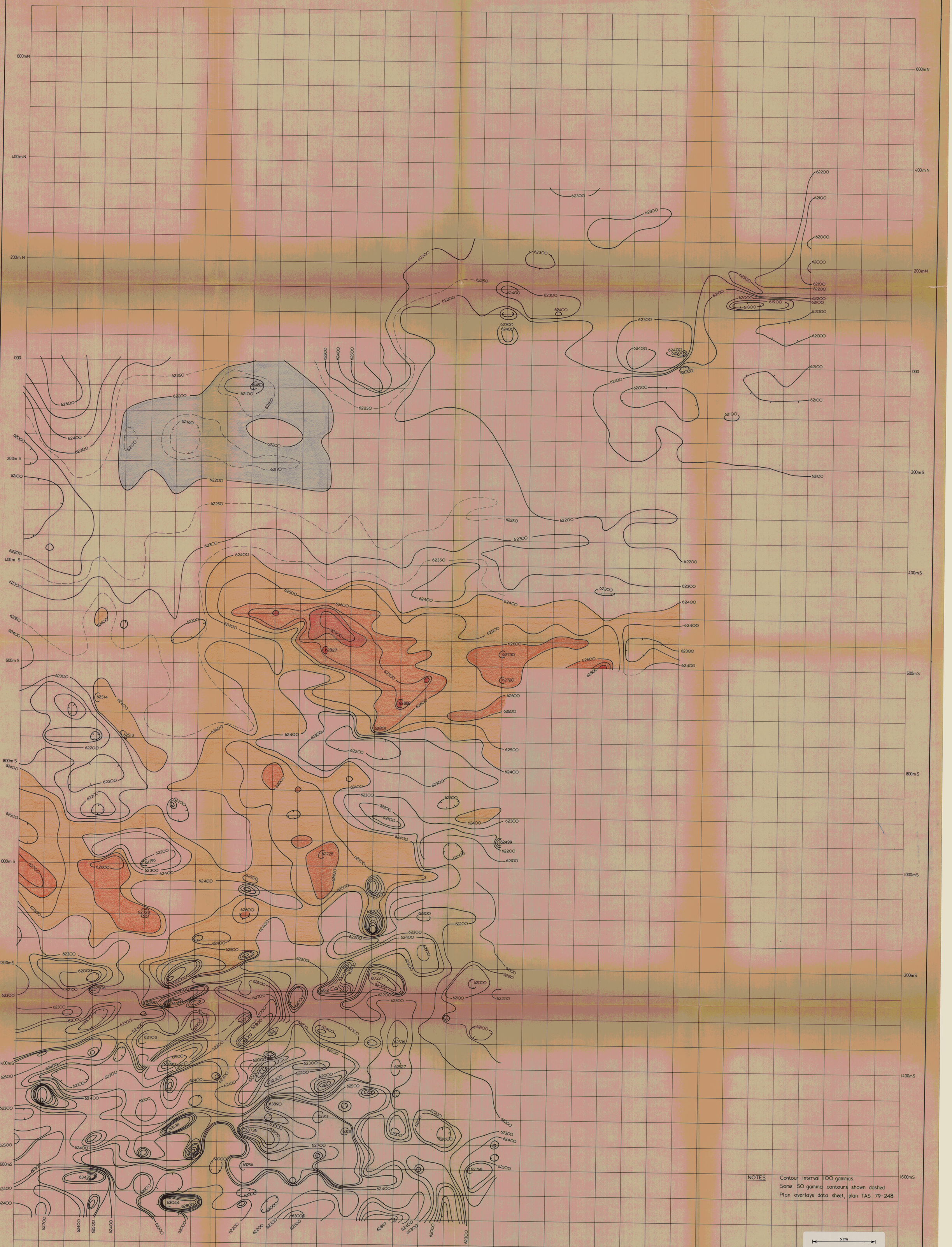
133181

PROTON PRECESSION MAGNETIC DATA IN GAMMAS

(TOTAL FIELD)

2151

Compiled P W Askins	Revised	Drawn O Hedditch
Date Feb 1979	Scale 1 2500	Drg No TAS - 79 - 248


600mN
400mN
200mN
000
200mS
400mS
600mS
800mS
1000mS
1200mS
1400mS
1600mS
1800mS
1800mE
2000mE
2200mE
2400mE
2600mE
2800mE
3000mE
NOTES
Contour interval 100 gammas
Some 50 gamma contours shown dashed
Plan overlays data sheet, plan TAS. 79-248
5 cm
COMALCO
E.L. 7/74, TASMANIA
79-1389
MOINA SHEET A
133182
PROTON PRECESSION MAGNETIC CONTOURS
IN GAMMAS
(TOTAL FIELD)
2152
Compiled R Poltock
P Askins
Revised
Drawn: O Hedditch
Date: February 1979
Scale: 1:2500
Drg. No. TAS-79-249

Line 00
Line 200 mE
Line 400 mE
Line 600 mE
Line 800 mE
Line 1000 mE
Line 1200 mE
Line 1400 mE
Line 1600 mE
Line 600 mN
Line 400 mN
Line 200 mN
Line 00
Line 200 mS
Line 400 mS
Line 600 mS
Line 800 mS
Line 1000 mS
Line 1200 mS
C2
C1
GRID NORTH
ALL GRID LINES AT 6 MILLISECONDS
Scale for each profile
26 24 22 20 18 16 14 12 10 8 6 4 2 0
CHARGEABILITY IN MILLISECONDS
Current electrode positions
5 cm
Equipment : Scintrex 3·5 kw transmitter & IPR7 receiver.
Operator G. Shovelton.
Readings taken every 2·5m along N-S grid lines 100m apart.
Potential dipole 25m
0 100 200 300 metres
Scale
C2 2150S/400E

COMALCO LIMITED 79-1389

EL 7/74 TASMANIA
MOINA SHEET I 123183

SHEPHERD AND MURPHY AREA
ELECTRICAL INDUCED POLARISATION
TIME DOMAIN - GRADIENT ARRAY
CHARGEABILITY PROFILES

2153

Compiled: G. Weste	Revised: G. Weste, Aug. 1979	Drawn: S. Hutchison
Date: July, 1978	Scale 1:2500	Drg. No: Tas - 78 - 148

Line 200 mE
Line 400 mE
Line 600 mE
Line 800 mE
Line 1000 mE
Line 1200 mE
Line 1400 mE
Line 1600 mE
Line 600mN
Line 400mN
Line 200mN
00
Line 200 mS
Line 400 mS
Line 600 mS
Line 800 mS
Line 1000 mS
Line 1200 mS
3000 a.m
3000 a.m
3000 a.m
3000 a.m
C2 750 N
C2
C2
C2
C1
C2
C1
C1
C1
C1
C1
C2
C2
2150S LINE
GRID NORTH

ALL GRID LINES AT 1000 a.m
Except where shown.

Scale for each profile

10,000 5000 2000 1000 500 200 100

RESISTIVITY IN OHMMETRES

C1 Current electrode positions

Scale

0 100 200 300 metres

5 cm

133184

COMALCO LIMITED 79-1389

EL 7/74 TASMANIA
MOINA SHEET I

SHEPHERD AND MURPHY AREA

ELECTRICAL INDUCED POLARISATION
TIME DOMAIN - GRADIENT ARRAY
RESISTIVITY PROFILES

2154

Compiled G Weste	Revised P.W Askins August, 1979	Drawn S Hutchison
Date July, 1978	Scale 1 2500	Drg No Tas - 78 - 147

Line 200mE
Line 400mE
Line 600mE
Line 800mE
Line 1000mE
Line 1200mE
Line 1400mE
Line 1600mE
C 750N
Line 400m N
Line 200m N
00
Line 200m S
Line 400mS
Line 600mS
Line 800m S
Line 1000m S
Line 1200m S
C 2150S
C1 Current electrode positions
Overlay to plan no Tas - 76 - 46
Contour interval 2 milliseconds
Grid North
5 cm
Scale
0 100 200 300 m

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79-1389

TASMANIA EL 7/74
MOINA SHEET 1

123185

SHEPHERD AND MURPHY AREA
ELECTRICAL INDUCED POLARISATION
TIME DOMAIN GRADIENT ARRAY

CHARGEABILITY CONTOUR PLAN

2155

Compiled G Weste	Revised G Weste Aug. 1979	Drawn S Hutchison
Date July, 1978	Scale 1 2500	Drg No Tas - 78 - 146

Line 200 mE
Line 400 mE
Line 600 mE
Line 800 mE
Line 1000 mE
Line 1200 mE
Line 1400 mE
Line 1600 mE
Line 400 mN
Line 200 mN
Line 200 mS
Line 400 mS
Line 600 mS
Line 800 mS
Line 1000 mS
Line 1200 mS
Line 1400 mS
Line 1600 mS
Line 1800 mS
C1
C2

- Current electrode positions
- Overlay to plan TAS - 76 - 46
- Contours at 200, 300, 400, 700, 1000, 1500, 2000, 3000, 4000, 6000 ohm metres
- Equipment Scintrex 25 kw transmitter
  Scintrex IPR7 receiver
- Potential dipole 25 metres
- Readings taken every 25 metres
- NW survey carried out by Scintrex
- E & S areas by Comalco

Grid North

Scale
0 50 100 150 200 m
5 cm

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79-1389

EL 7/74 TASMANIA
MOINA SHEET I
133186

SHEPHERD AND MURPHY AREA

ELECTRICAL INDUCED POLARISATION TIME DOMAIN - GRADIENT ARRAY RESISTIVITY CONTOUR PLAN 2150

Compiled: G Weste	Revised August, 1979	Drawn S Hutchison
Date June, 1978	Scale 1 2500	Drg No Tas - 78 - 145

1700m E 1800m E 1900mE 2000m E 2100m E 2200m E 2300m E 2400m E 2500m E 2600m E 2700mE 2800m E 2900mE 3000mE 3100m E 3200m E 3300mE 3400mE

600m N
400m N
200m N
00
200m S
400m S
600m S
800m S
1000m S
1200m S
1400m S
1600m S
1800m S

C1 850 N

C2
C1

C3

C3 2400 S
C1
C2

C2

NOTE : C1 Current electrode position.
Equipment: Scintrex 3.5 kw transmitter & IPR7 receiver.
Operator: G. Shovelton.
Readings taken every 25 m along N S grid lines 100 m apart.
Potential dipole 25metres.

5 cm

COMALCO

E.L. 7/74 TASMANIA

MOINA SHEET A

E.I.P. TIME DOMAIN GRADIENT ARRAY

CHARGEABILITY PROFILES

Compiled: G. Shovelton	Revised:	Drawn: O. Hedditch
Date: Sept. 1979	Scale: 1:2500	Drg. No. TAS-79-307

79-1389

133157

2157

1700m E 1800m E 1900m E 2000m E 2100m E 2200m E 2300m E 2400m E 2500m E 2600m E 2700m E 2800m E 2900m E 3000m E 3100m E 3200m E 3300m E 3400m E

600m N
400m N
200m N
00
200m S
400m S
600m S
800m S
1000m S
1200m S
1400m S
1600m S

C1 850N
C2
C1
C3
C1
C2
C3 2400S

600m N
400m N
200m N
00
200m S
400m S
600m S
800m S
1000m S
1200m S
1400m S
1600m S

1700m E 1800m E 1900m E 2000m E 2100m E 2200m E 2300m E 2400m E 2500m E 2600m E 2700m E 2800m E 2900m E 3000m E

NOTE:
C1 Current electrode position.
Equipment: Scintrex 3.5kw transmitter & IPR7 receiver.
Operator: G. Shovelton.
Readings taken every 2.5 along N.S grid lines 100m apart.
Potential dipole 25m.

5 cm

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E.L. 7/74 TASMANIA

79-1389

MOINA SHEET A

133188

E.I.P. TIME DOMAIN GRADIENT ARRAY

RESISTIVITY PROFILES

2158

Compiled: G.Shovelton	Revised:	Drawn: O. Hedditch
Date: Sept. 1979	Scale: 1:2500	Drg. No.: TAS-79-306

1800m E 2000m E 2200m E 2400m E 2600m E 2800m E 3000m E 3200m E

600mN 400mN 200mN 00 200mS 400mS 600mS 800m S 1000m S 1200m S 1400m S 1600m S

C 850 N

C C C C C C

NOTE: Contours drawn every 4 milliseconds.

C Current electrode position.

Equipment Scintrex 3·5 kw transmitter & IPR7 receiver.

Operator G. Shovelton.

Readings taken every 2·5m along N-S grid lines 100m apart.

Potential dipole 25 metres.

5 cm

N

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E.L. 7/74 TASMANIA

133189

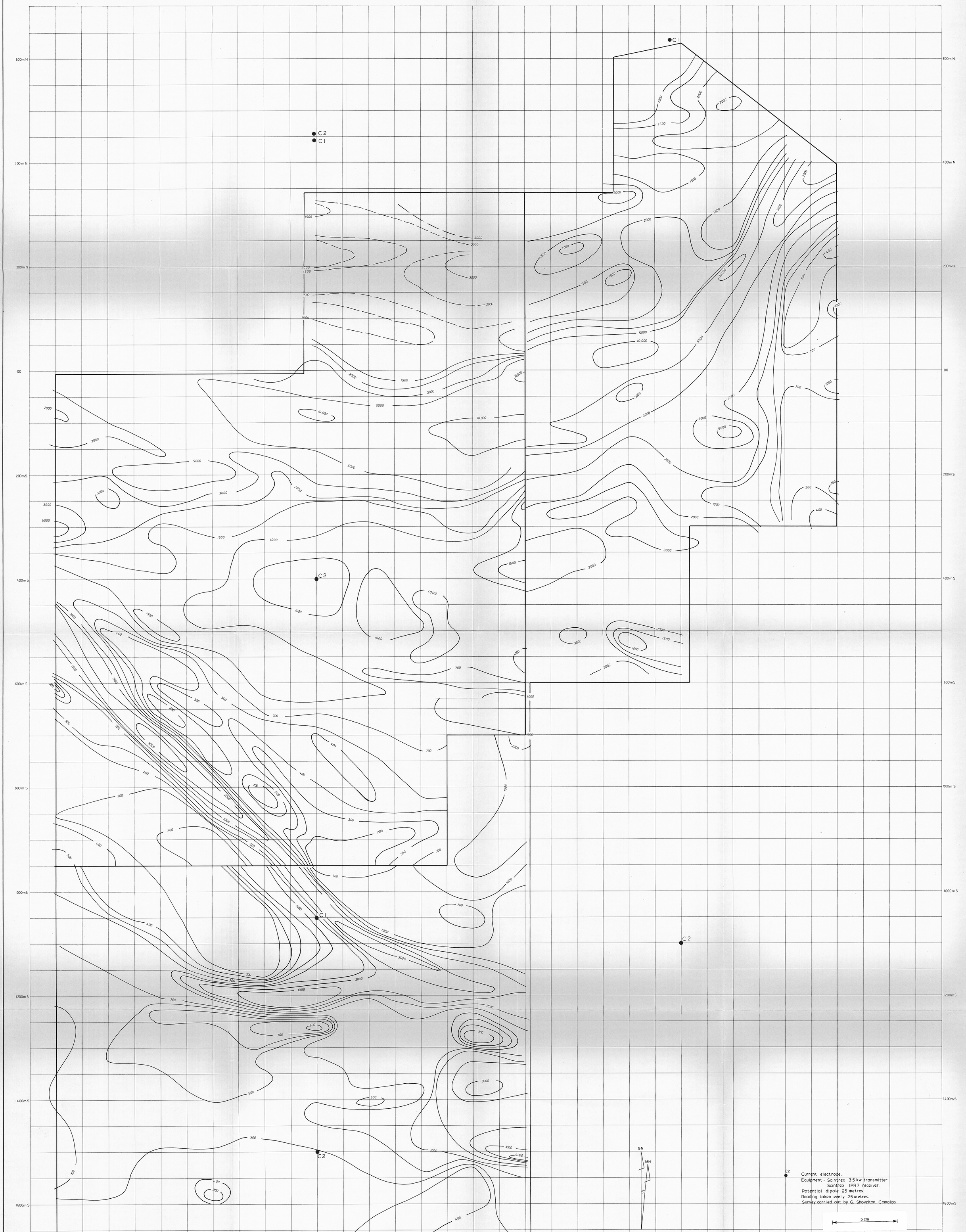
MOINA SHEET A

E.I.P. TIME DOMAIN GRADIENT ARRAY

CHARGEABILITY CONTOUR PLAN

2159

Compiled G Weste	Revised	Drawn O. Hedditch
Date Aug. 1979	Scale 1:2500	Drg. No. TAS 79 308



Note: Contours at 200, 300, 400, 500, 700, 1000, 1500, 2000, 3000, 5000, 10,000 ohm metres.

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TASMANIA

E.L. 7/74 MOINA

79-1389

133190

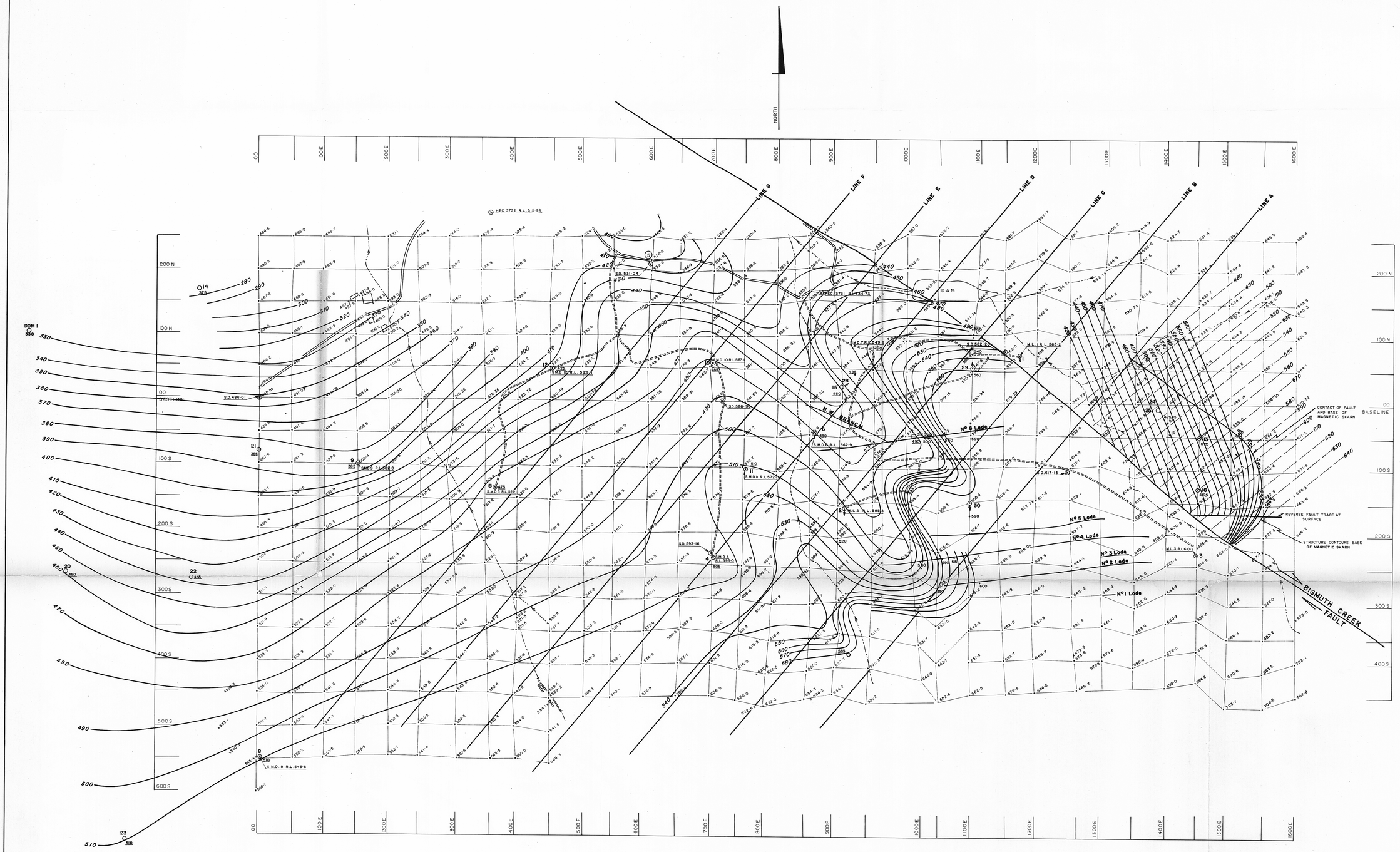
MOINA SHEET A

E.I.P. TIME DOMAIN GRADIENT ARRAY

RESISTIVITY CONTOUR PLAN

2160

Compiled: G Weste	Revised	Drawn O Hedditch
Date: August 1979	Scale 1 2500	Drg No TAS-79-303



NOTE:
All R.L.s at ground points are ground level except Base Line where levels are on 100mm x 50mm. pegs up to 1250 then on top of 25mm x 25mm stakes to 1900.

ML 1, SMD 12, – Diamond Drill Hole Collars.
SD. – Star Dropper Reference Point.

L E G E N D

- Drill hole
- 485 R.L. of base of Limestone or wrigglite
- 510 R.L. of base of calc silicate rock from Blake 1955
- Line D Section Line
- 620 Structure contours on reverse fault (Hugo's Fault)

Revision: Contours south of Baseline 1250 – 1350 amended 15/6/77

Datum for Levels: HEC Bench marks 3731 & 3732

79-1389

C O M A L C O

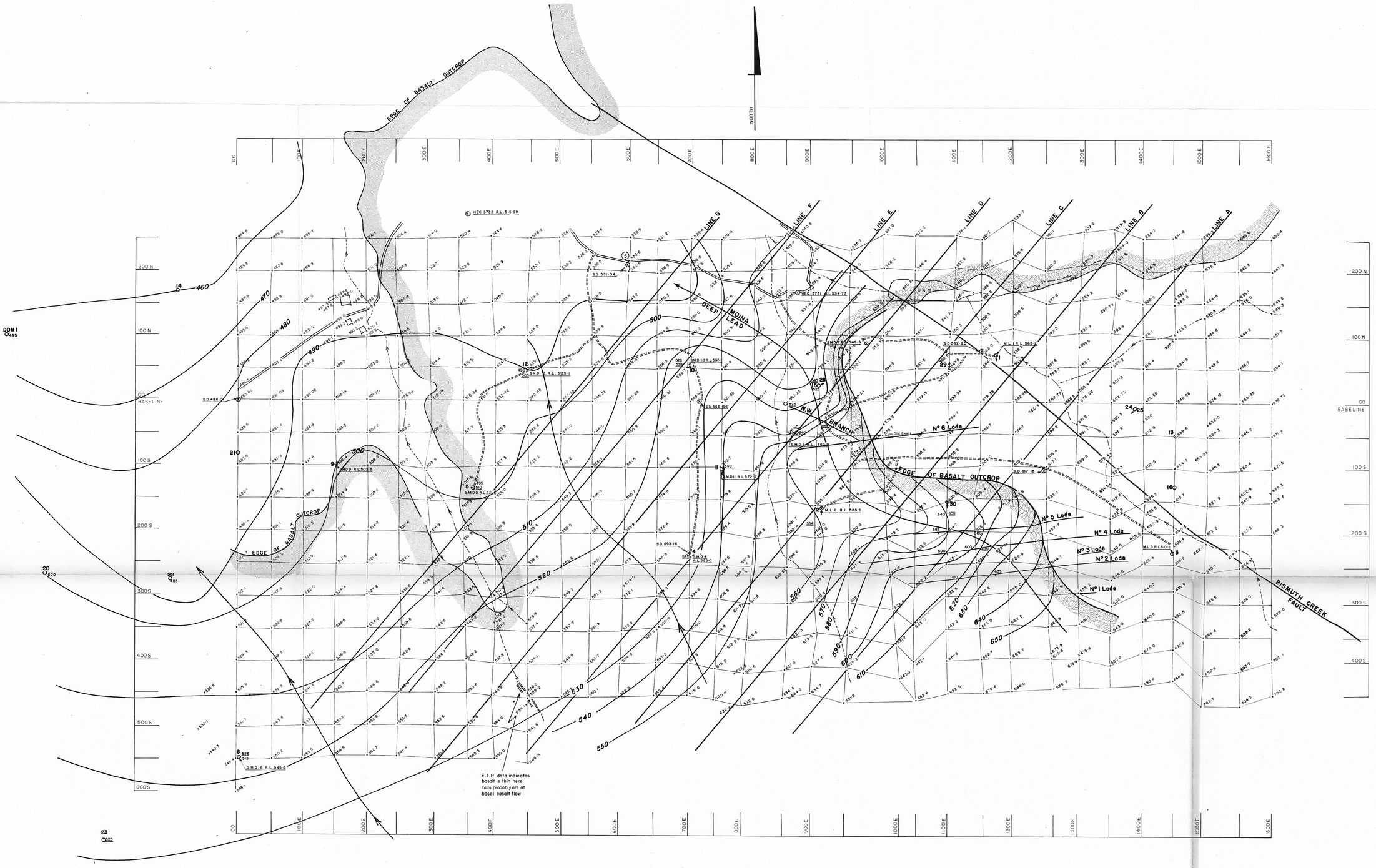
E.L 7/74 TASMANIA
MOINA SHEET 1
SHEPHERD & MURPHY AREA

133191

STRUCTURE CONTOURS ON BASE OF LIMESTONE OR WRIGGLITE
(Plus structure contours on Hugo's Fault)

2161

Compiled: P. W. A.	Revised:	Drawn: M. Attwell
Date: Sept, 1979	Scale: 1:2,500	Drg N° TAS-79-376



NOTE:
All R.L.s at ground points are ground level except Base Line where levels are on 100mm x 50mm pegs up to 1250 then on top of 25mm x 25mm stakes to 1500.

ML 1, SMD 12, – Diamond Drill Hole Collars.
SD. – Star Dropper Reference Point.

L E G E N D

525 / 530 — R.L. Base of Tertiary sediments (deep lead, mudstone etc) / R.L. Base of Tertiary basalt
100 — Hole number
530 — Structure contours of base of Tertiary rocks
LINE D — Section Line
Deep Lead

Revision: Contours south of Baseline 1250 – 1350 amended 15/6/77

5 cm

49-1389

Datum for Levels: HEC Bench marks 3731 & 3732

COMALCO

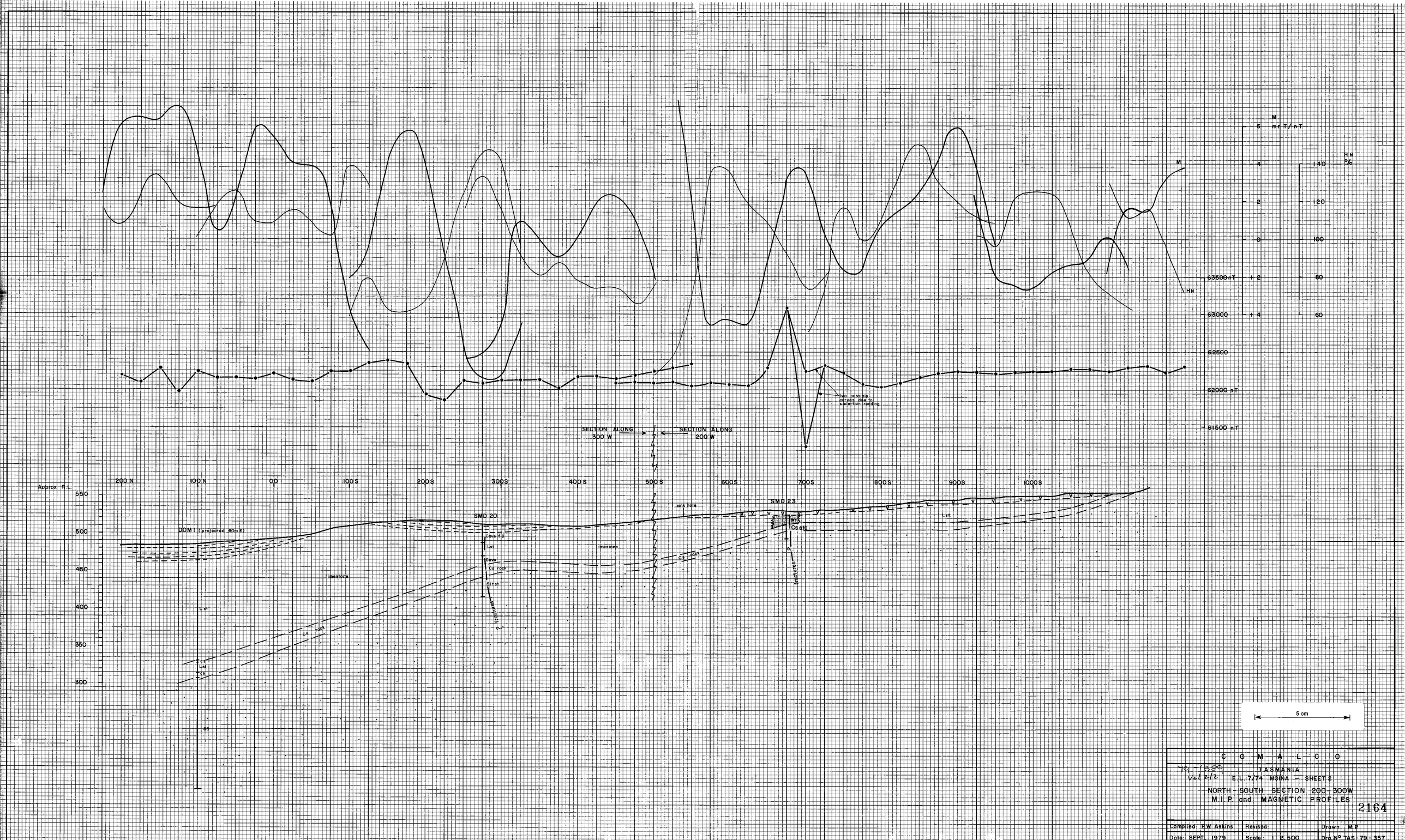
E.L 7/74 TASMANIA
MOINA SHEET 1 133192
SHEPHERD AND MURPHY AREA

STRUCTURE CONTOURS ON BASE OF TERTIARY ROCKS

2162

Compiled: P.W.A.	Revised:	Drawn: M. Attwell
Date: Sept., 1979	Scale: 1:2,500	Drg No TAS – 79 – 375


M
Hn
M
mmT/nT
4
2
0
-2
-4
140
120
100
80
60
40
%
62500
62000
61500
nT
Spot anomaly not present on adjacent 50m lines - maybe due to drill rods
400N
300N
200N
100N
00
100S
200S
300S
400S
500S
600S
700S
800S
900S
1000S
1100S
R.L. approx
600
570
550
500
490
480
470
450
400
350
300
250
SMD 14
SMD 21
SMD 22
projected 100m W ?
some dol's
limestone with dark dolomitic layers containing Cr ore
Po in dol list
limestone
Lst
Ca - rock
Ca rock
several holes
Lst
Ck
Wr
Slt
Ss
165m
NOTE
down-hole resistivity survey suggests coves lie close to hole
Wr
Ck
Ca rock
limestone
Ca rock
limestone
Ca rock
limestone
Ca rock
Ca rock
limestone
Ca rock
limestone
Ca rock
Ca rock
Ca rock



C O M A L C O

TASMANIA

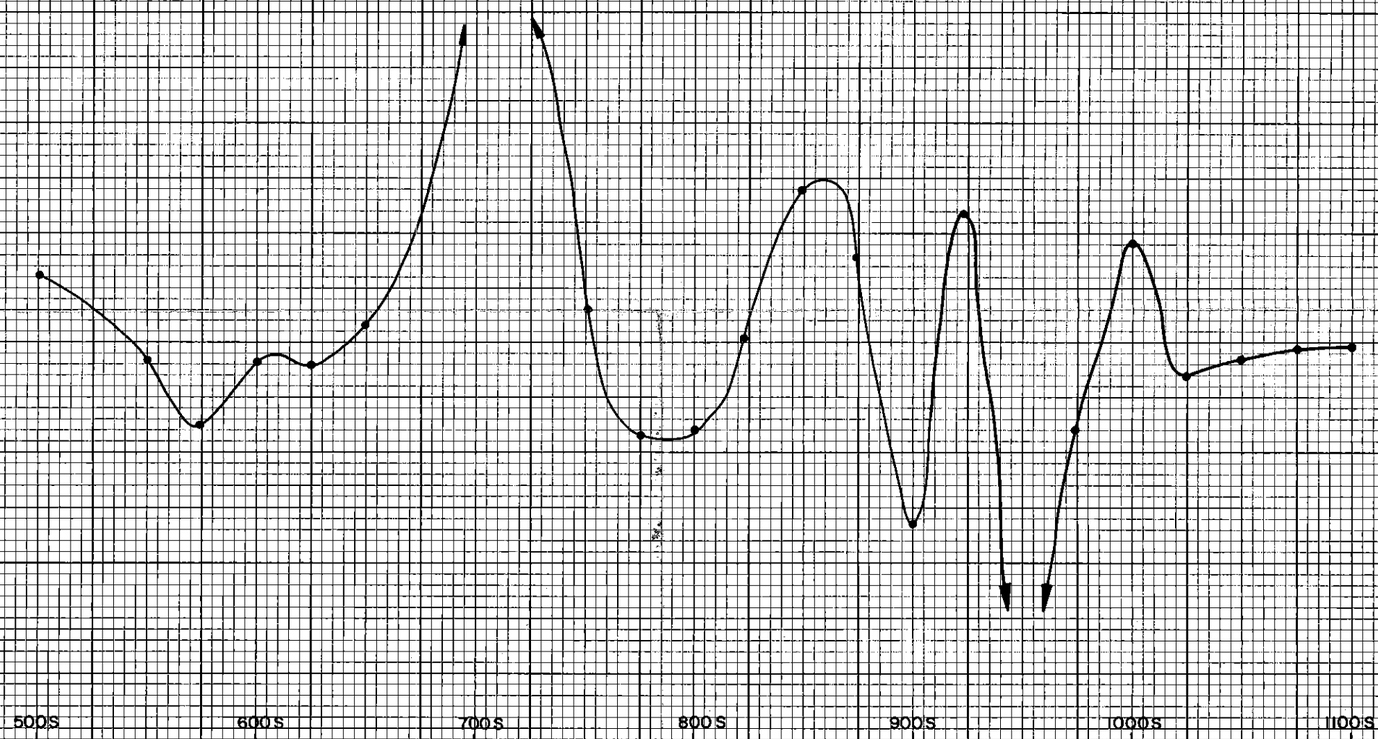
E.L. 7/74 MOINA — SHEET 2

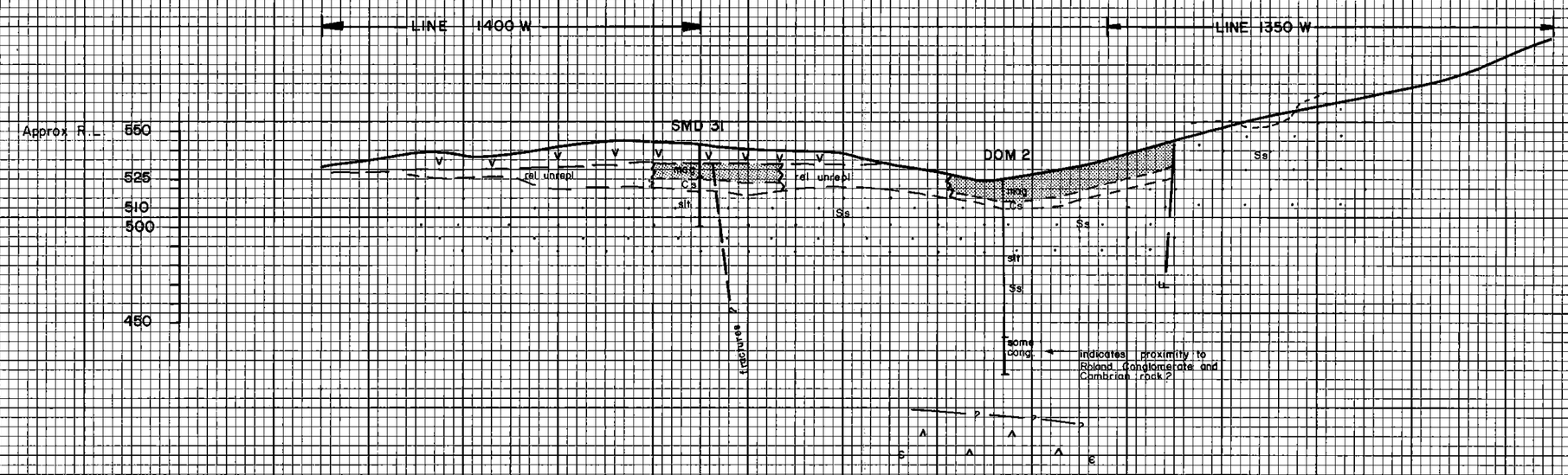
NORTH - SOUTH SECTION 200 - 300W

M.I.P. and MAGNETIC PROFILES

2164

Compiled: F.W. Askins	Revised:	Drawn: M.P.
Date: SEPT., 1979	Scale: 1:2,500	Drg. N° TAS - 79 - 357





32194

5 cm

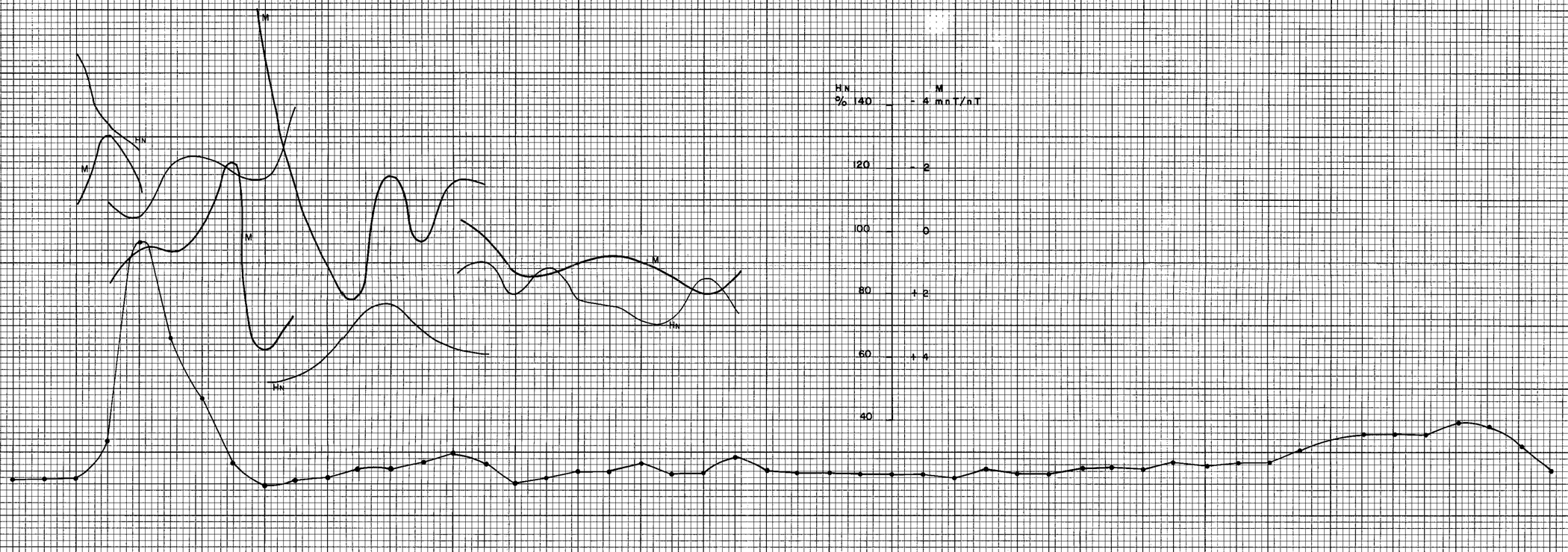
C O M A L C O

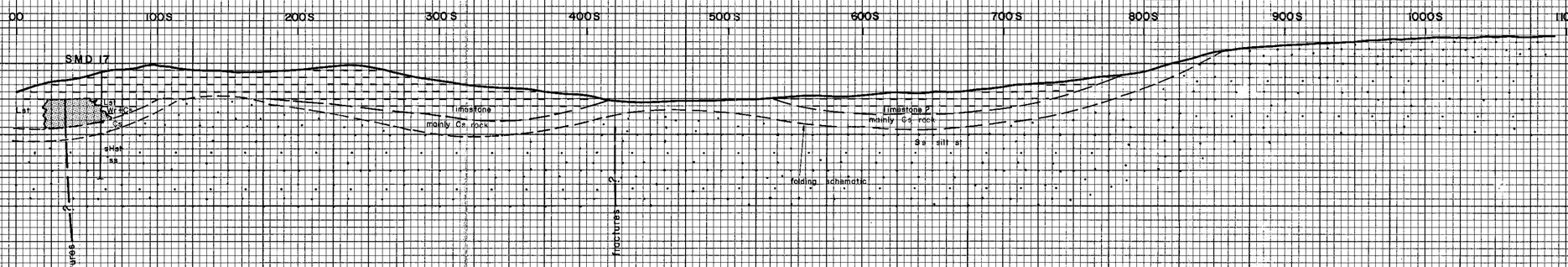
TASMANIA
E.L. 7/74 MOINA – SHEET 2
NORTH-SOUTH SECTION 1350-1400W
M.I.P. and MAGNETIC PROFILES

79-1580
Vol 2/2

2165

Compiled: P.W. Askins	Revised:	Drawn: M.P.
Date: SEPT, 1979	Scale: 1:2,500	Drg. No TAS-79-358





133195

5 cm

C O M A L C O

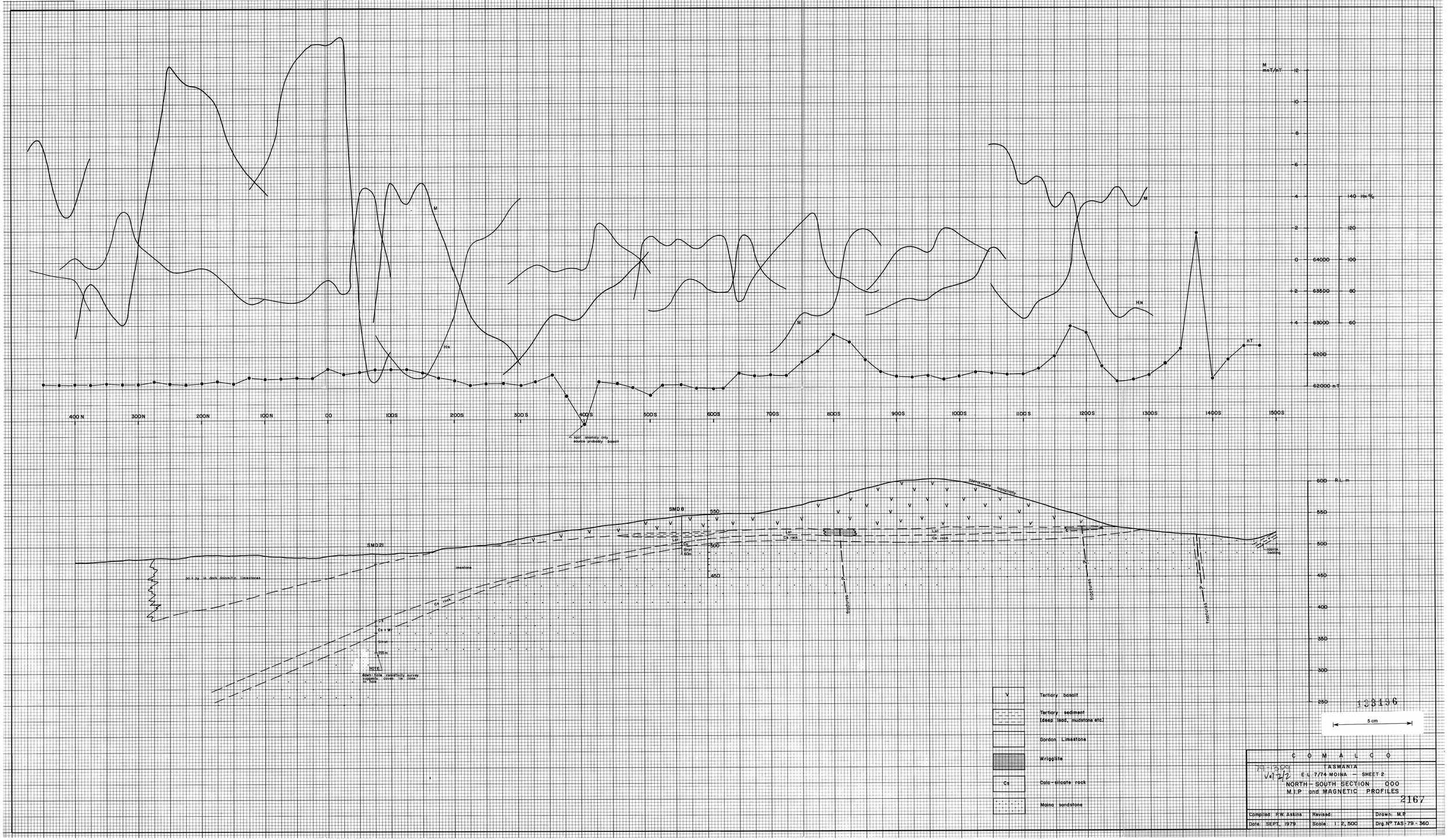
79-1389
Vol 2/2

TASMANIA
E.L. 7/74 MOINA - SHEET 2

NORTH - SOUTH SECTION 800W
M.I.P. and MAGNETIC PROFILES

2166

Compiled: R.W. Askins	Revised:	Drawn: M.P.
Date: SEPT. 1979	Scale: 1 2,500	Drg N° TAS-79 - 359



C O M A L C O

TASMANIA

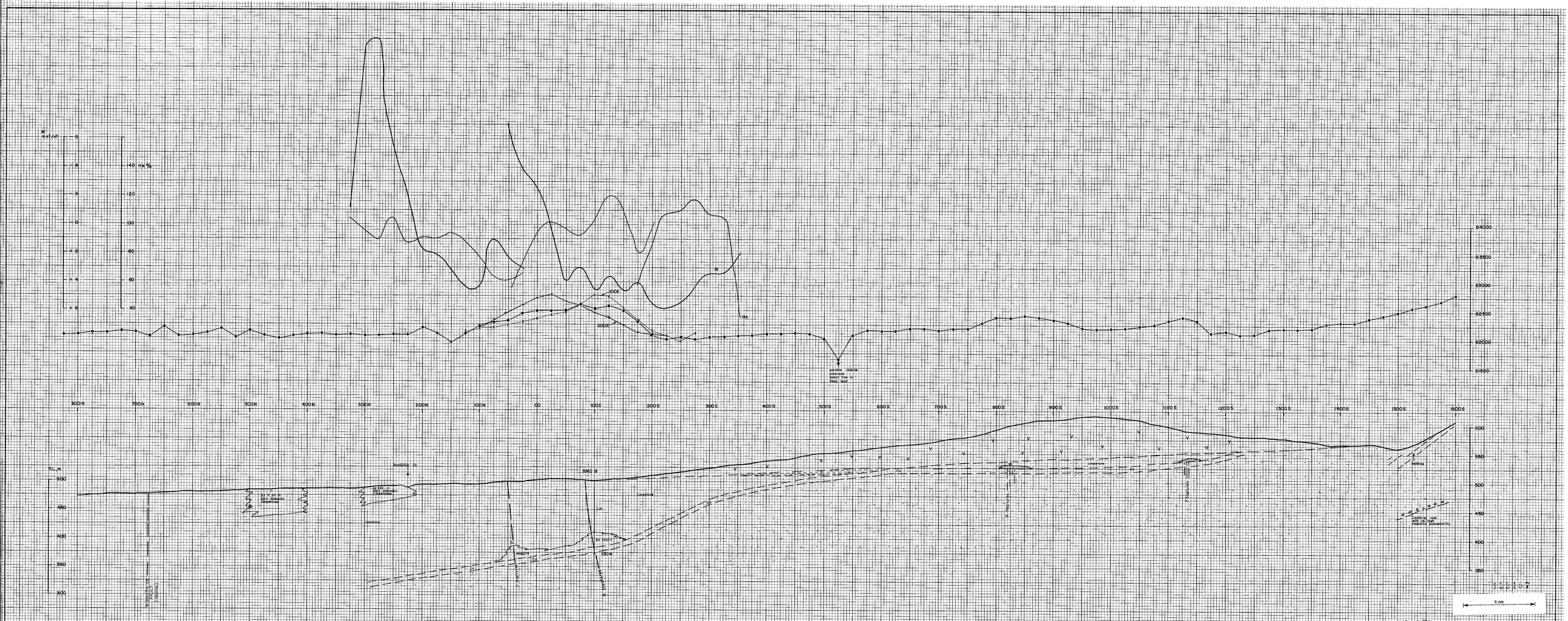
E.L. 7/74 MOINA — SHEET 2

NORTH - SOUTH SECTION 000

M.I.P and MAGNETIC PROFILES

2167

Compiled: P.W. Askins	Revised:	Drawn: M.P.
Date: SEPT., 1979	Scale: 1 : 2,500	Drg. Nº TAS-79-360



79-1389

COMALCO

TASMANIA

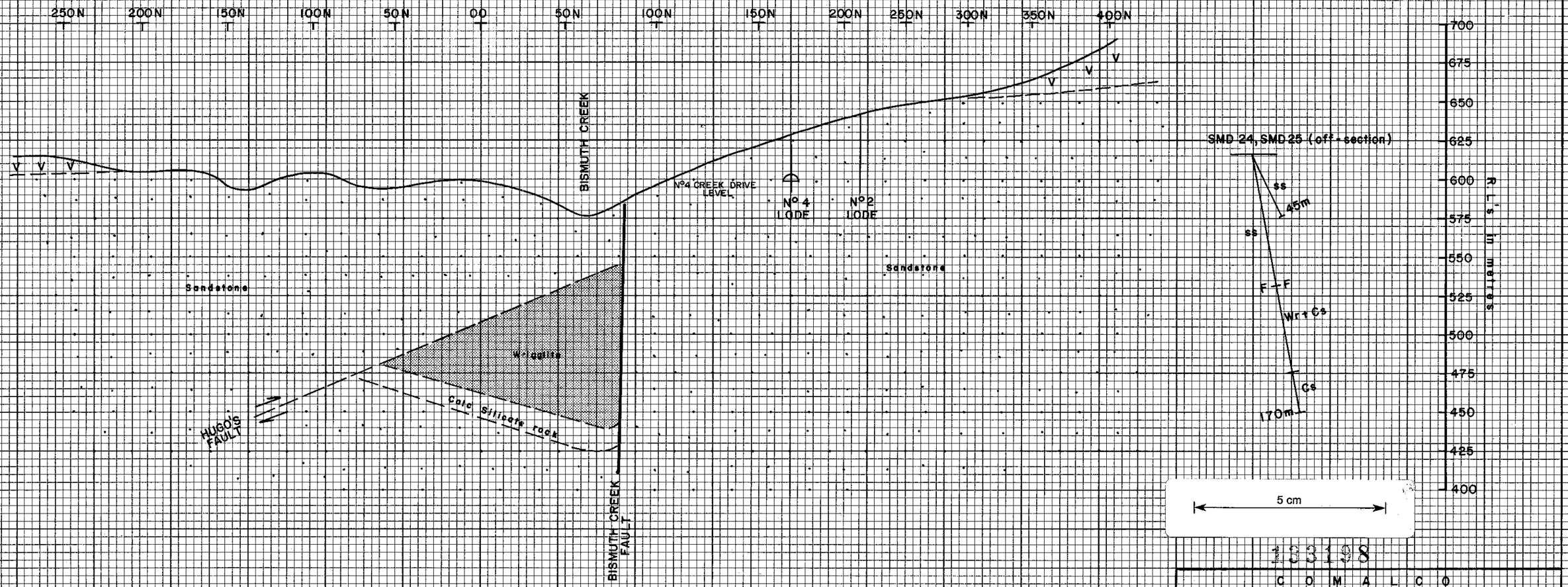
E.L. 7/74 MOINA — SHEET 1

NORTH - SOUTH SECTION 150E

M.I.P. and MAGNETIC PROFILES

2166

Compiled: P.W. Askins	Revised:	Drawn: M.P.
Date: SEPT., 1979	Scale: 1: 2,500	Drg. Nº TAS-79-361



133198

C O M A L C O

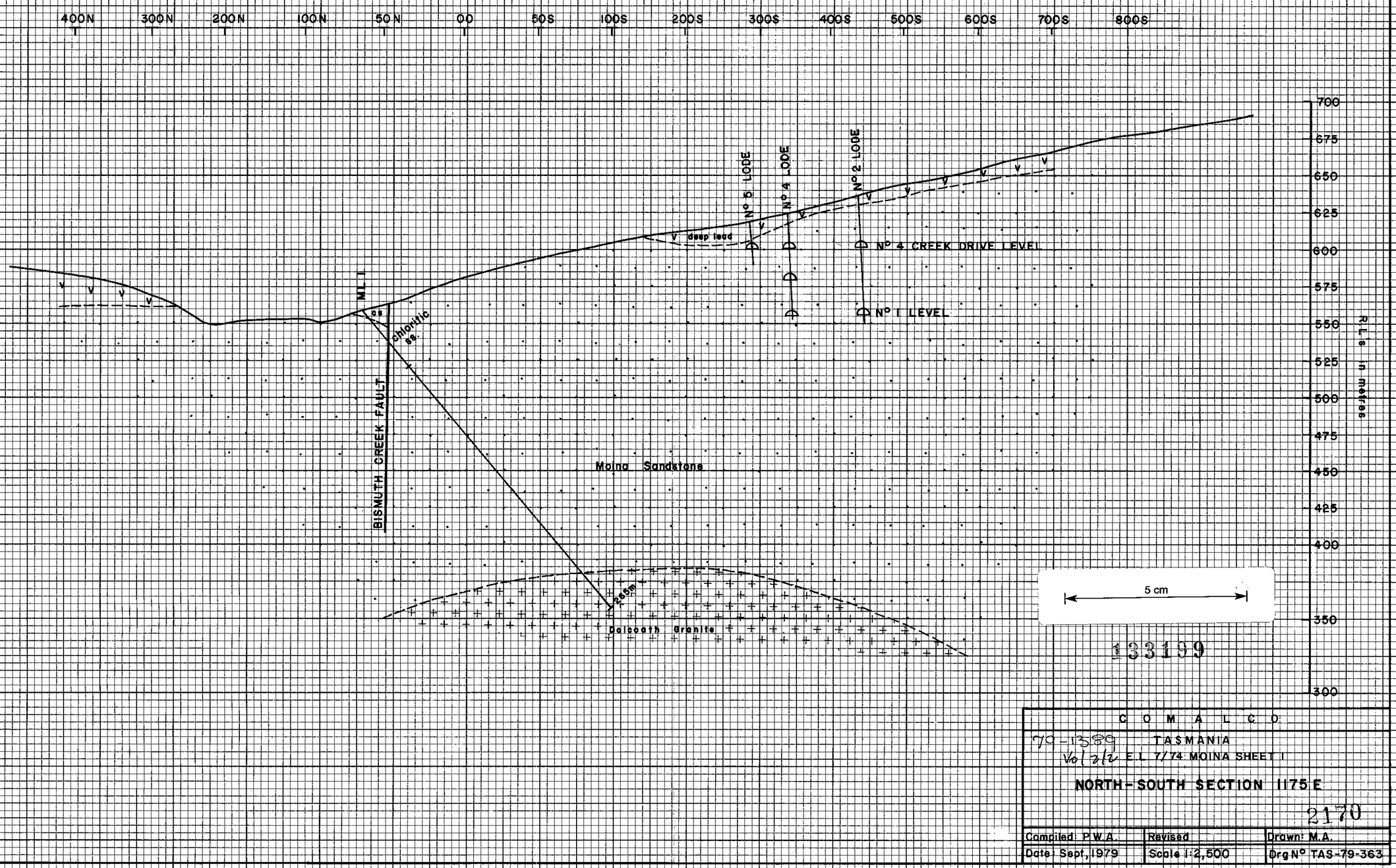
79-1389
Vol 2/2

TASMANIA
EL 7/74 MOINA SHEET 1

2169

NORTH - SOUTH SECTION 1350E

Compiled: P.W.A.	Revised:	Drawn: M.A.
Date: Sept, 1979	Scale 1:2,500	Drg Nº TAS-79-362



133199

C O M A L C O

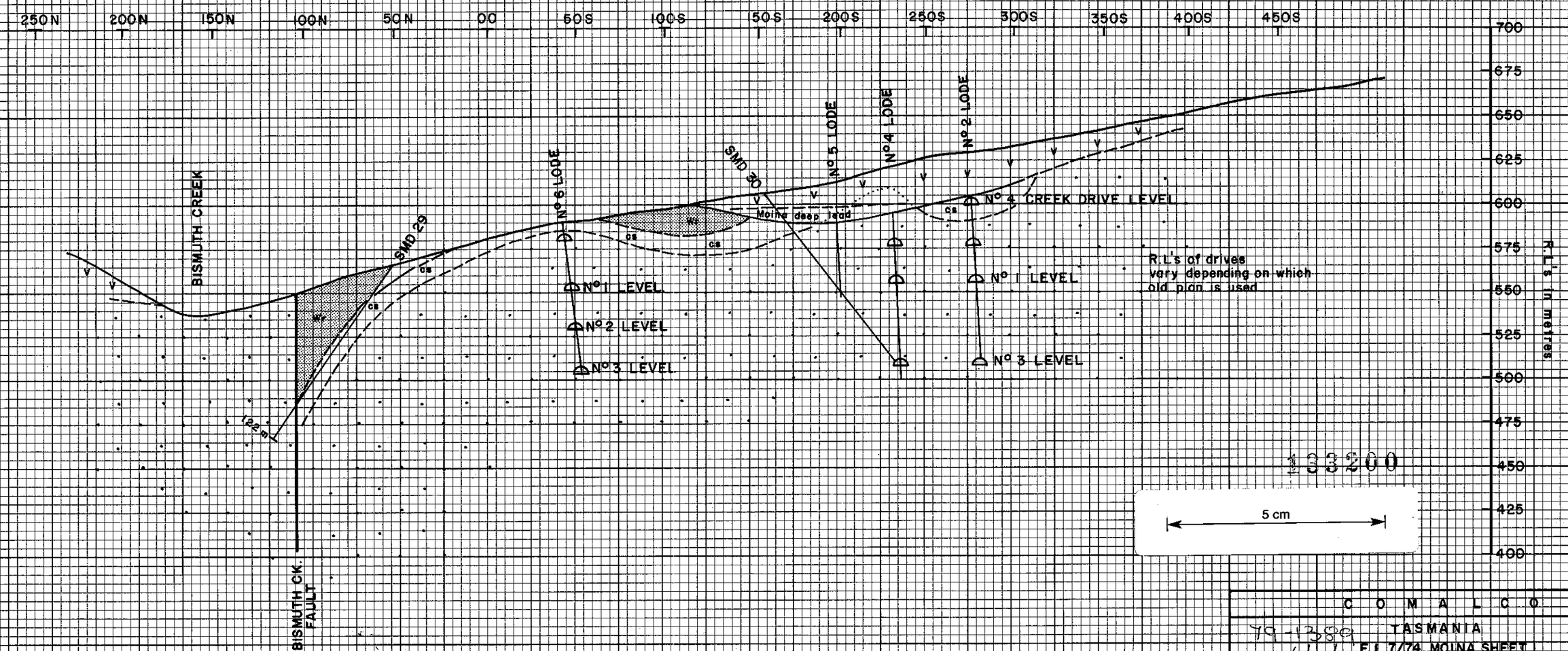
70-1389
Vol 2/2

TASMANIA
E.L. 7/74 MOINA SHEET 1

NORTH-SOUTH SECTION 1175 E

2170

Compiled: P.W.A.	Revised	Drawn: M.A.
Date: Sept, 1979	Scale 1:2,500	Drg N° TAS-79-363



133200

COMALCO

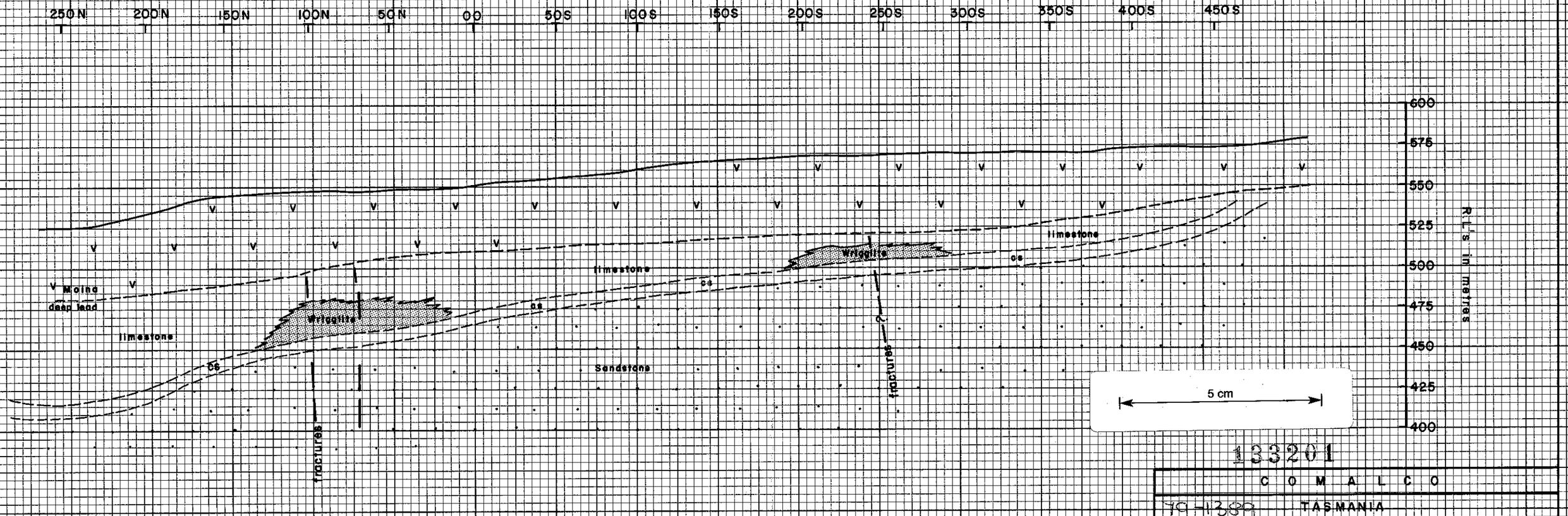
79-1389 TASMANIA

Vol 2/2 E.L 7/74 MOINA SHEET 1

NORTH-SOUTH SECTION 1100E

2171

Compiled: P.W.A.	Revised:	Drawn: M.A.
Date: Sept. 1979	Scale: 1:2,500	Drg Nº TAS-79-364



133201

C O M A L C O

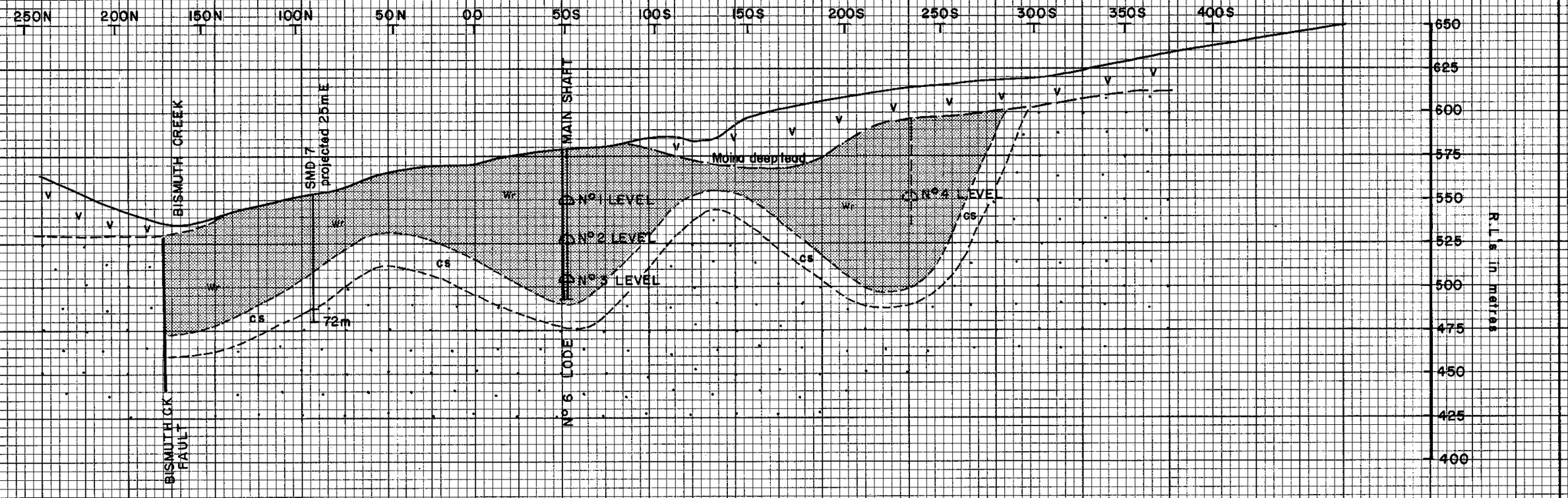
79-1388
Vol 2/2

TASMANIA
E.L. 7/74 MOINA SHEET 1

NORTH-SOUTH SECTION 600E

2172

Compiled: P.W.A.	Revised:	Drawn: M.A.
Date: Sept, 1979	Scale 1:2,500	Drg N° TAS-79-365



133202

COMALCO

79-1389
Vol 2/2

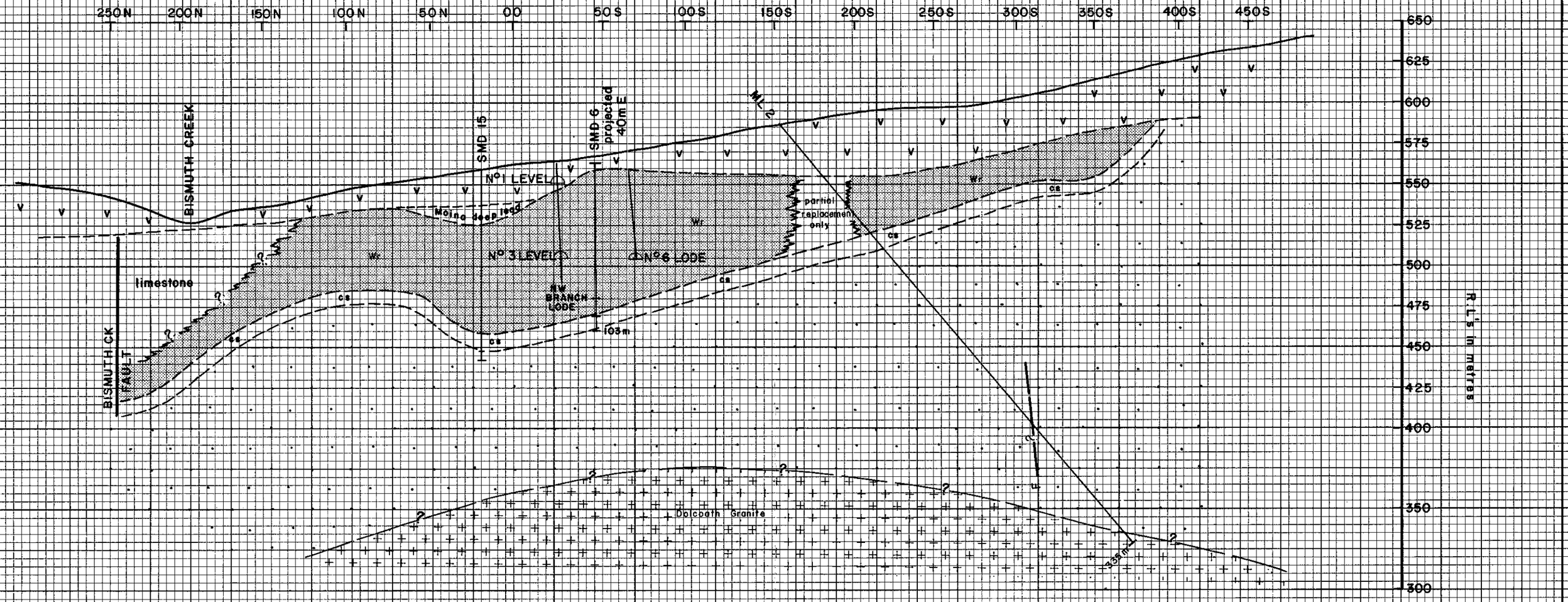
TASMANIA
E.L.7/74 MOINA SHEET 1

NORTH-SOUTH SECTION 10000E

2173

5 cm

Compiled: P.W.A.	Revised:	Drawn: M.A.
Date Sept, 1979.	Scale 1:2,500	Drg No TAS-79-366



133203

C O M A L C O

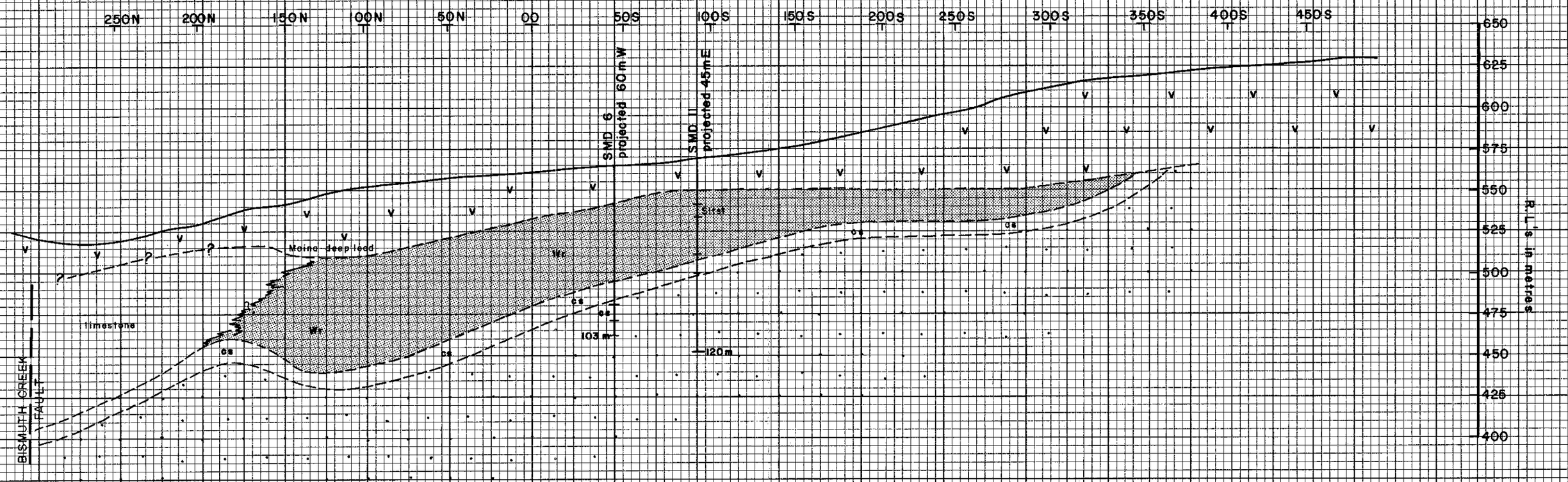
79-1389 Vol 2/2

TASMANIA
E.L. 7/74 MOINA SHEET 1

NORTH - SOUTH SECTION 900E

2174

Compiled: P.W.A.	Revised:	Drawn: M.A.
Date Sept. 1979	Scale 1: 2,500	Drg N° TAS-79-367



1332041

5 cm

COMALCO

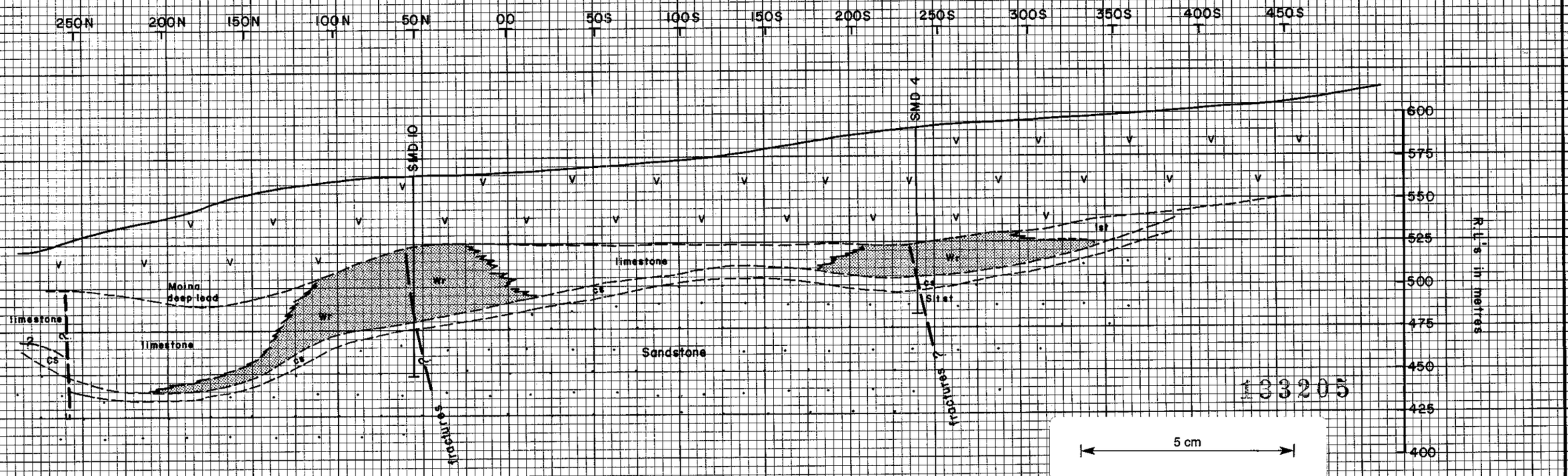
TASMANIA

79-1388 Vol 2/2 E.L 7/74 MOINA SHEET 1

NORTH - SOUTH SECTION 800E

2175

Compiled: P.W.A.	Revised:	Drawn: M.A.
Date: Sept. 1979	Scale 1:2,500	Drg Nº TAS-79-368



COMALCO

79-1389 Vol 2/2

TASMANIA

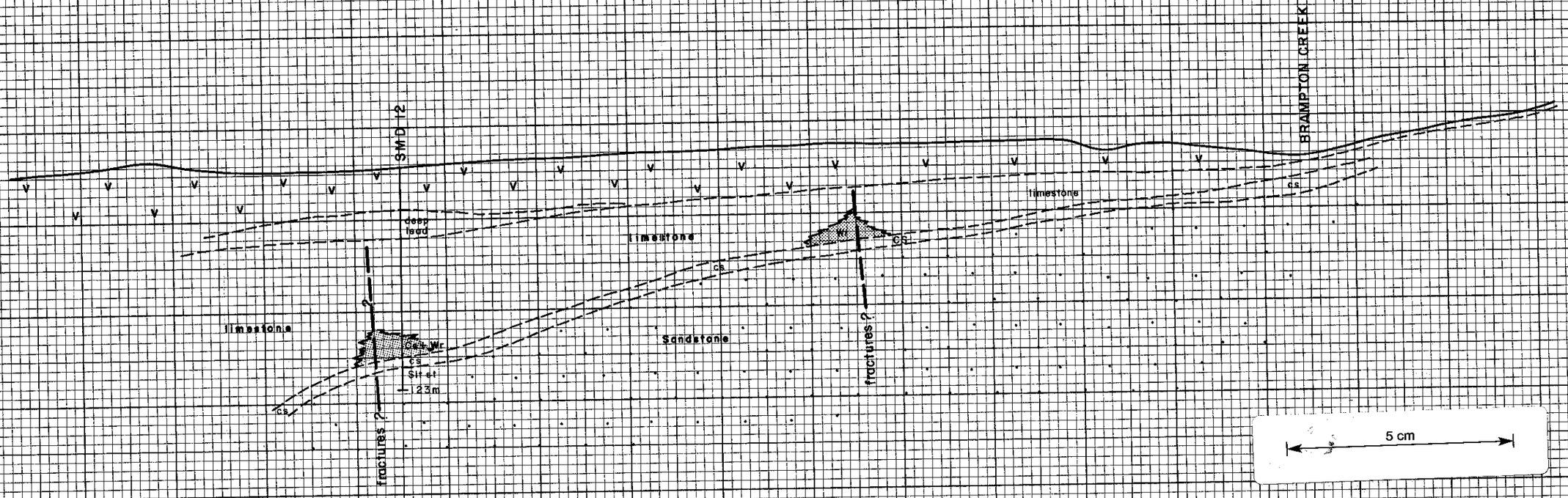
E.L. 7/74 MOINA SHEET 1

NORTH-SOUTH SECTION 700 E

2176

Compiled: P.W.A.	Revised:	Drawn: MA
Date Sept. 1979	Scale 1:2,500	Drg Nº TAS-79-369

250N 200N 150N 100N 50N 00 50S 100S 150S 200S 250S 300S 350S 400S 450S 500S 550S



600
575
550
525
500
475
450
425
400
R.L.'s in metres

5 cm

133206

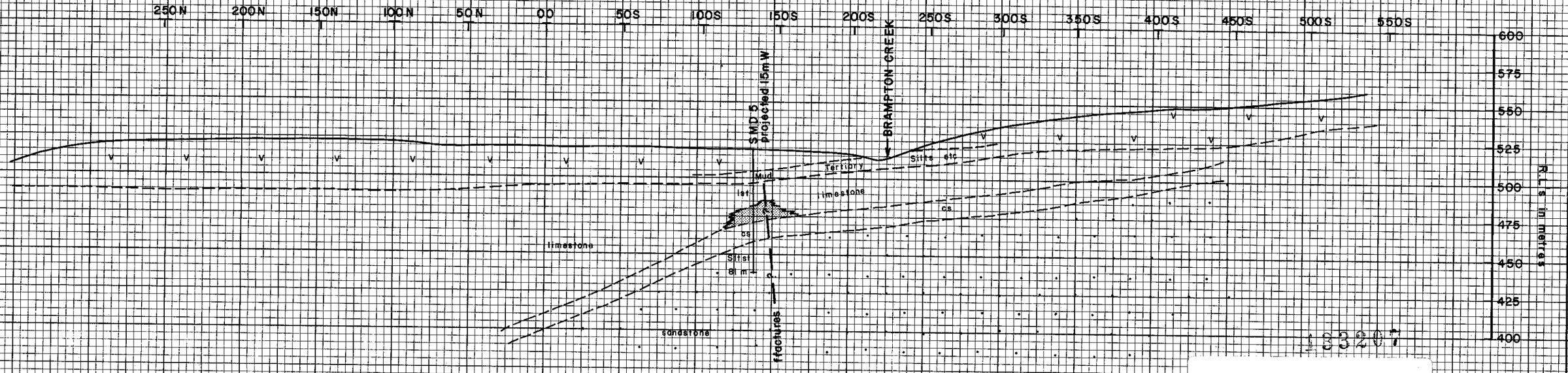
C O M A L C O

79-1389
Vol 2/1

TASMANIA
E.L. 7/74 MOINA SHEET 1

NORTH-SOUTH SECTION 450 E 2177

Compiled: P.W.A.	Revised:	Drawn: M.A.
Date: Sept, 1979	Scale 1:2,500	Drg N° TAS-79-370



C O M A L C O

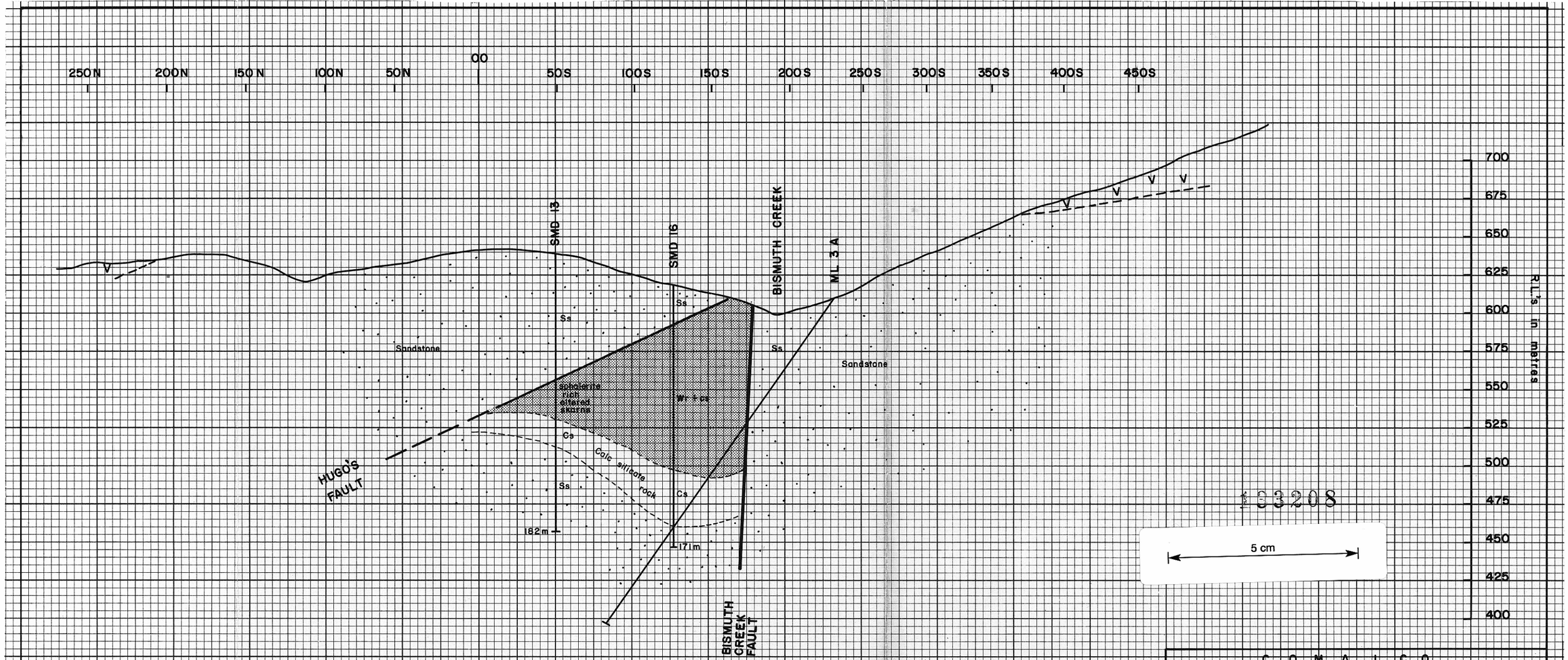
TASMANIA
E.L. 7/74 MOINA SHEET

YG-1339
Vol 2/2

NORTH-SOUTH SECTION 350 E

2178

Compiled: P.W.A.	Revised:	Drawn: M.A.
Date: Sept, 1979.	Scale: 1:2,500	Drg N° TAS-79-371



133208

C O M A L C O

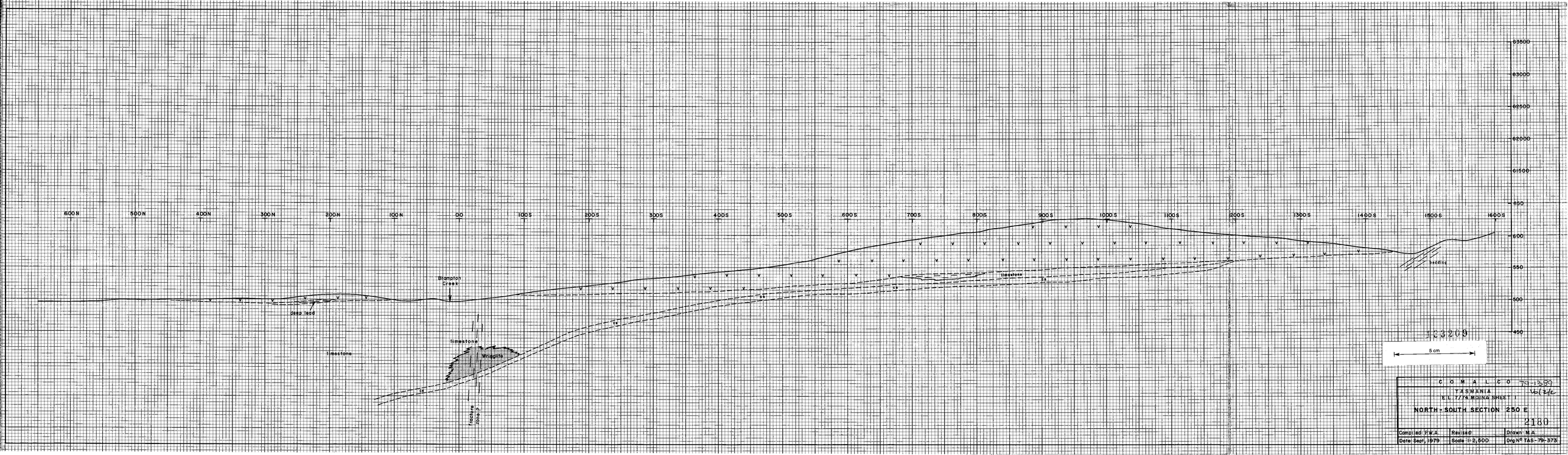
79-1389
Vol 2/2

TASMANIA
E.L. 7/74 MOINA SHEET 1

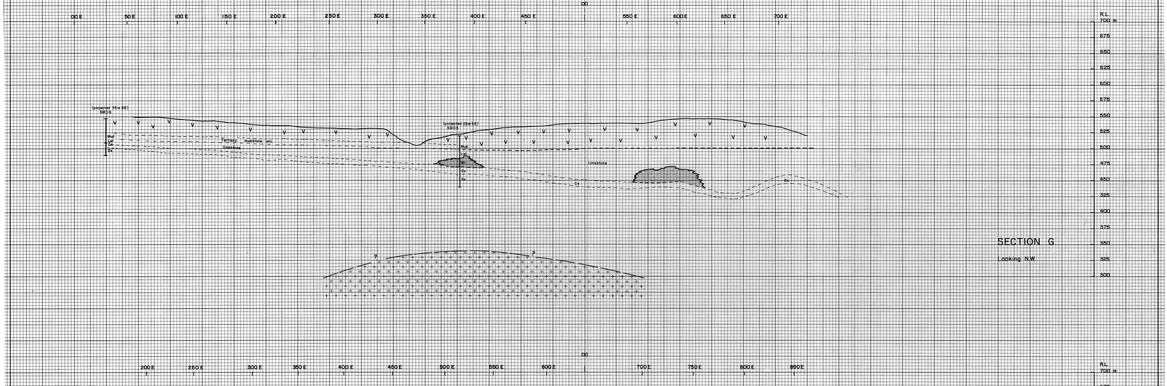
NORTH - SOUTH SECTION 1450E

2179

Compiled: P.W.A.	Revised:	Drawn: M.A.
Date: Sept, 1979	Scale: 1:2,500	Drg.N° TAS-79-372

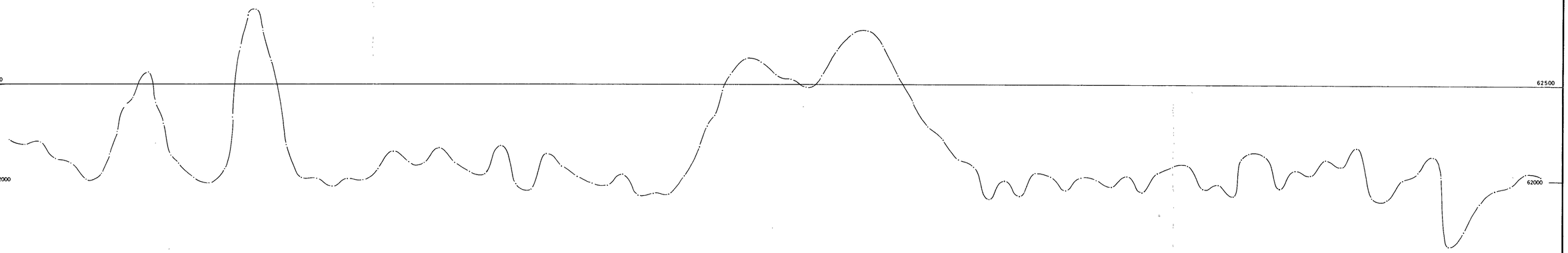


600 N
500 N
400 N
300 N
200 N
100 N
00
100 S
200 S
300 S
400 S
500 S
600 S
700 S
800 S
900 S
1000 S
1100 S
1200 S
1300 S
1400 S
1500 S
1600 S
63500
63000
62500
62000
61500
650
600
550
500
450
Brampton Creek
deep lead
limestone
limestone
Wrigglite
fracture zone ?
limestone
bedding
133209
5 cm
COMALCO
79-1389
TASMANIA
E.L. 7/74 MOINA SHEET 1
NORTH - SOUTH SECTION 250 E
2180
Compiled: P.W.A.
Revised:
Drawn: M.A.
Date: Sept, 1979
Scale 1:2,500
Drg No TAS-79-373


DD'
R.L. 700 m
Unnamed Creek
Tertiary sediments etc.
Limestone
Basalt
Unnamed Creek
Limestone
Limestone
Limestone

00 100N 200N 300N 400N 500N 600N 700N 800N 900N 1000N 1100N 1200N 1300N 1400N 1500N 1600N 1700N 1800N 1900N 2000N

65000 64500 64000 63500 63000 62500 62000 61500 61000 60500 60000



133211

5 cm

The Shell Company of Australia Limited METALS DIVISION	
E.L.7/74 MOINA SHEPHERD & MURPHY AREA PROTON PRECESSION MAGNETOMETRY SW - NE DRILL SECTION LINE 1 1542 1cm = 100 nT (magnetics) Scale : 1 2500 (horizontal axis)	
FIG No.	REPORT No.
ENCL. No.	DRG. No. D/MZ 01/033
DATE 14-8-80	AUTHOR
DRAWN O HEDDITCH	OFFICE DEVONPORT

2000N 2100N 2200N 2300N 2400N 2500N 2600N 2700N 2800N 2900N 3000N

65000
64500
64000
63500
63000
62500
62000
61500
61000
60500
60000

culture

133212

5 cm

The Shell Company of Australia Limited METALS DIVISION	
E.L.7/74 MOINA SHEPHERD & MURPHY AREA PROTON PRECESSION MAGNETOMETRY SW - NE DRILL SECTION LINE 1 1542	
1cm = 100 nT (magnetics) Scale . 1 2500 (horizontal axis)	
FIG. No.	REPORT No.
ENCL No.	DRG No D/MZ 01/034
DATE 14 - 8 - 80	AUTHOR
DRAWN O HEDDITCH	OFFICE DEVONPORT