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AMOCO MINERALS AUSTRALIA COMPANY

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PROGRESS REPORT

JANUARY TO JUNE 1983

AMOCO/CSR JOINT VENTURE

PART EXPLORATION LICENCE 15/76

DUNDAS, TASMANIA

G.L. KARY, P.A. JONES

JUNE 1983

REPORT 358

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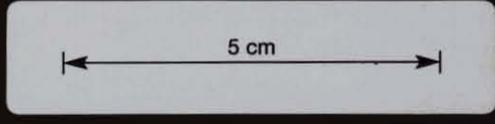
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Project Location

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SUMMARY AND CONCLUSIONS

Exploration target for the prospect is a large Irish style carbonate hosted lead-zinc-silver orebody.

Exploration Licence 15/76 was granted to CSR for the period of six months from August 1976 with further 12 month renewals subject to Mines Department approval. Amoco negotiated a joint venture with CSR to farm into a 58 square kilometer portion of EL 15/76 embracing the prospective Gordon Limestone sequence to the east of Amoco's adjoining EL 4/78. The tenement embraces potential shale or carbonate hosted basemetal prospects.

McIntyre Mines (Aust) Pty Ltd conducted a shallow soil sampling program and a self potential survey on the Mariposa prospect. Results from the SP program proved to be of little use and due to the shallow sampling depths the soil sampling survey failed to

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delineate the anomalous zone coincident with the Mariposa line of workings.

Geophoto Resources Consultants conducted VLF-EM Turair, ground magnetometer and both shallow soil sampling and limited bedrock sampling programs over an area called Amber Creek (incorporating portions of the Leatherwood and King Billy grids). A number of geophysical responses were delineated and soil sampled with latter bedrock sampling obtaining peak values of 0.26% zinc and 0.11% lead.

Precambrian basement sediments are overlain by Cambrian sediments and volcanics which are localized within graben structures. These are in turn overlain by Lower Ordovician conglomerate. Transgressive upon these units are Ordovician to Devonian basinal units including sandstones, siltstones, shales, dolomites and limestones.

A bridge on the old Mariposa tramway was repaired to allow continued access to the Bannockburn prospect.

Detailed geological mapping of the Mariposa grid is in progress. A number of major faults have been defined which have offset the main mineralized horizon by up to 75 meters.

Thirty composite rockchip samples were taken within the joint venture area. Seven are from the Mariposa prospect with the remaining 23 samples from various locations within the area.

Hydraulic auger sampling continued on the Bannockburn grid.

A number of old workings in the Amber Creek area were located and sampled. Rockchip values are slightly anomalous and observed trenches appear to follow minor ironstone occurrences.

Fifteen costeans were trenched in the area, four at Black Jacks and eleven at Mariposa. Encouraging results were obtained at

both prospects. A total of 308 meters were excavated at Black Jacks. Assays are up to 6.0% lead, 2.5% zinc and 4.5 g/t silver over a two meter sample interval. At Mariposa a total of 660 meters were excavated and samples returned assays up to 7.8% lead, 15.8% zinc and 1300 g/t silver over the two meter sample interval. Both prospects require additional and infill costeans to define the limit of observed mineralization.

A major stream sediment (-80 mesh) and panned concentrate program was completed within the joint venture area. Work by Amoco in addition to a previous survey by McIntyre Mines has shown that the highly anomalous values obtained from the Dundas River (up to 2100ppm tin, 5% zinc and 20g/t silver) are due to contamination from the old Dundas workings ten kilometers upstream. Anomalous values not obviously due to contamination from the Dundas River will be followed up during the summer field season.

John Bishop of Mitre Geophysics was contracted to compile all relevent geophysical data for the joint venture area. Anomalous responses delineated from these data have been summarized on a prosect by prospect basis. At Black Jacks a Turam conductor lies coincident with a strong geochemical response which was detailed by costeaning. At Mariposa a zone of high chargeability and a 0.5 milligal gravity anomaly occurs coincident with the mine workings. VLF surveys conducted at Amber Creek produced poor results due to thick ~~gluvioglacial~~ gluvio-glacial deposits. A complete report of the compilation is appended.

Amoco geophysicist P. Staples has completed his interpretation of the EM-37 survey conducted by Geoterrex late last year on the Mariposa prospect. A poor to moderate west dipping conductor has been delineated coincident with the previously defined gravity response. The anomaly is centered at 67150E and is strongest on lines 59300N and 59400N but is complicated by the fact that the eastern edge of the conductor lies within the loop.

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Four aeromagnetic responses (anomalies C,J,K and L) warranting ground follow up were delineated from the West Coast Aeromagnetic Survey conducted by Geoex for the Tasmanian Mines department. Ground traverses over the magnetic responses delineated anomalies varying from 30 to 120 gammas. A number of ground traverses were soil sampled at 25 meter stations with the samples being assayed for copper, lead, zinc, silver, tin, gold, nickel, chromium, cobalt and tungsten. Further soil sampling and ground magnetic traverses may be required to confirm the location of a number of magnetic zones.

Infill gridding and sampling on 100 meter spacings will be conducted on the Bannockburn grid, initially on the southern portion of the grid encompassing a zone of workings within the limestone with later infill around workings to the northwest. Detailed geological mapping will continue on the Mariposa, Black Jacks and Bannockburn prospects.

An airphoto interpretation of major structures relating to the limestone sequence will be conducted as lead-zinc occurrences within the Zeehan area and the major Irish style zinc-lead deposit are clearly genetically related to major crustal fractures acting as mineralized conduits.

Airborne EM and Turam responses delineated in the Mitre Geophysics survey will be ground checked using a VLF or Genie EM method.

Trial traverses of dipole-dipole IP and VLF will be conducted over mineralized zones on both the Mariposa and Black Jacks prospects.

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INTRODUCTION

This report details work conducted under joint venture between CSR Pty Limited and Amoco Minerals Australia Company on part EL 15/76. Amoco negotiated a joint venture with CSR to farm-in to a 58 square kilometer portion of EL 15/76 (Figures 1 and Enclosure 1) earning a 50% interest in the property over a period of three years.

Details of all work conducted prior to January 1983 were submitted previously by CSR in their October 1981 to February 1982, January to June 1982 and July to December 1982 six monthly reports to the Mines Department.

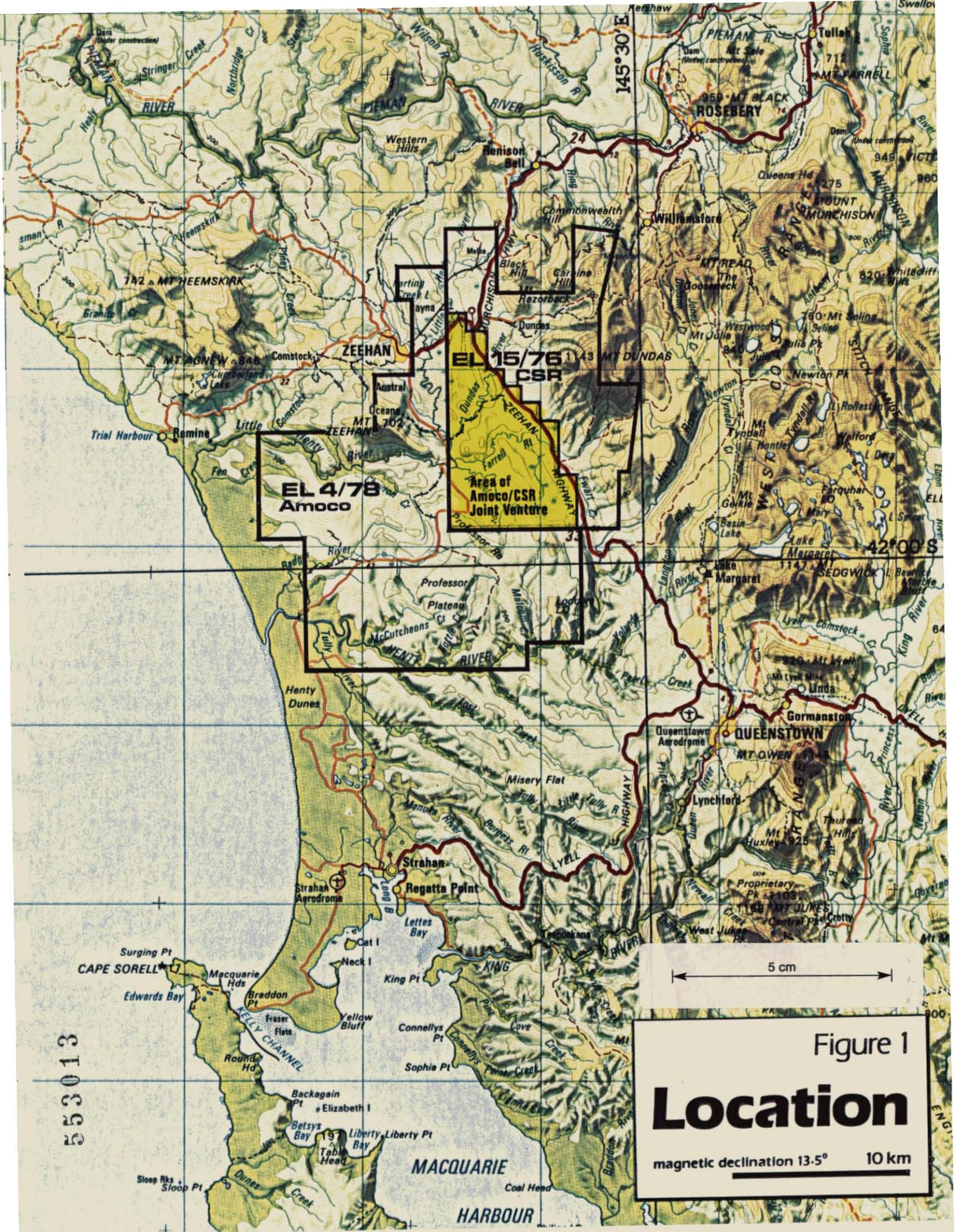
The joint venture area is considered to have excellent potential for a Irish style carbonate hosted lead-silver deposit or a shale hosted lead-zinc deposit.

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LOCATION AND ACCESS

Exploration Licence 15/76 abuts Amoco's tenement EL 4/78 (Figure 1) three kilometers east of the town of Zeehan of (population approximately 5000). The Emu-Bay Railway and a sealed road connect Zeehan with the port of Burnie located 140 kilometers to the north. Access within the tenement is relatively good for Western Tasmania as a number of logging tracks and a sealed highway traverse the prospective dolomite-limestone horizons which form topographic lows. Bombadier access is necessary on some grids to conduct the exploration programs.

Zeehan is the service town for the Renison Tin Mine and no difficulties would be anticipated with respect to power, water, labor and transport should a mine be developed. The area has an annual rainfall of 250 centimeters.



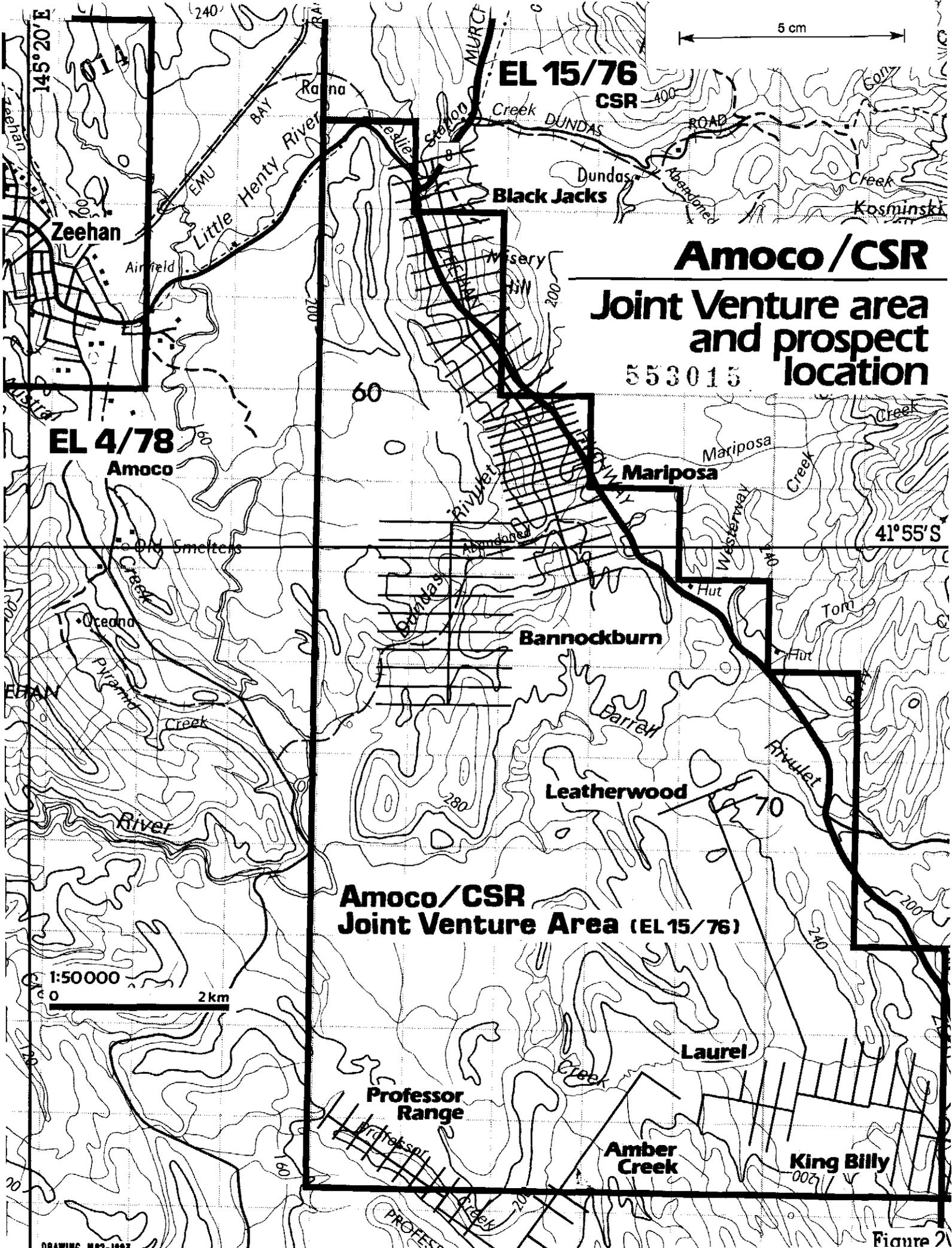
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Figure 1
Location
 magnetic declination 13.5° 10 km

DESCRIPTION OF THE PROPERTY AND OWNERSHIP

Amoco Minerals Australia Company negotiated a joint venture with CSR Pty Ltd to farm in to a 58 square kilometer portion of EL 15/76 embracing of the prospective Gordon Limestone sequence to the east and southeast of Amoco EL 4/78 (Figure 2 and Enclosure 1). Exploration Licence 15/76 was granted to CSR for the period of six months from August, 1976. Renewal of the tenement for further periods of twelve months is subject to Mines Department approval of previous exploration and proposed programs.

Exploration Licence 15/76 will be due for reduction on August 2, 1984.



5 cm

EL 15/76
CSR

Zeehan

Black Jacks

Amoco / CSR

**Joint Venture area
and prospect
location**

553015

EL 4/78
Amoco

Mariposa

41° 55' S

Bannockburn

Leatherwood

Amoco / CSR
Joint Venture Area (EL 15 / 76)

1:50000

2 km

Laurel

Professor Range

Amber Creek

King Billy

HISTORY AND EXPLORATION TO DATE

A detailed description of the mining history and exploration carried out within the joint venture area has been summarized in three previous Amoco progress reports on the CSR Joint Venture, Dundas Tasmania:-

October 1981 to February 1982	Amoco Report 287
January 1982 to June 1982	Amoco Report 311
July 1982 to December 1982	Amoco Report 339

Previous geophysical surveys conducted by Geophoto (1972), Rio Tinto (1959), Tenneco (1972), McIntyre Mines (1971) and the BMR (1950) have been compiled and synthesized by Mitre Geophysics. The report is included as Appendix 4.

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REGIONAL GEOLOGY

Large blocks of Pre-Cambrian sediments form the basement complexes of both northwest and central Tasmania. These are overlain by Cambrian volcanics and marine sediments which host the Rosebery-Hercules, Mt Lyell and MacIntosh (Que River) orebodies.

Overlying these rocks is a sequence of Cambrian to Devonian basinal sediments. This sequence hosts the Renison and Cleveland orebodies.

The above units were intruded by granites during the Devonian and Carboniferous times which introduced the tin mineralization. During the Jurassic and Tertiary periods the sequence was blanketed by basic volcanics. Recent fluvial and Pleistocene glacial erosion have produced the present topography.

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Major folding and block faulting are particularly evident in the Zeehan region. Uplift and folding accompanied accumulation of thick piles of sediment and volcanic material in various troughs during the Cambrian period. The Ordovician was marked by the onset of terrestrial and shallow marine sedimentation (the Owen Conglomerate, Moina Sandstone, and Gordon Limestone). The major deformation accompanied the Paleozoic Tabberaberan orogeny and large northwest trending fold structures were formed.

LOCAL GEOLOGY

Minor Pre-Cambrian Oonah Formation basement rocks comprised of schists, quartzites, siltstones, shales, spillitic lavas and pyroclastics, form an infaulted block within the Cambrian Dundas Group in the central eastern portion of the project area.

7. Cambrian sedimentation appears confined to fault bounded blocks or graben structures abutting the Pre-Cambrian Tyennan Block to the east. The rocks are predominantly rapidly deposited, shallow water sediments including argillites, grits, conglomerates, greywackes and shales with minor cyclical volcanic sedimentation (agglomerates, tuffs and tuffaceous cherts and shales).

The Ordovician to Devonian strata of the Zeehan Basin occur within a series of synclinal structures with north-west axial trends. Mt Zeehan Conglomerate at Mt Misery was deposited within

a graben structure in the Lower Ordovician period and is transgressively overlain by micaceous siltstones, tubicolular sandstones, grits and minor shales. These transgressive units are time equivalents of the Moina Sandstone which was deposited within the Zeehan Basin. The Moina Sandstone is overlain disconformably by the Ordovician Gordon Limestone. The disconformity is occasionally marked by a white quartz conglomerate followed by an interbedded sequence of siltstones, dolomites, minor sandstone and limestone. The Gordon Limestone is comprised of interbedded limestones and dolomites with numerous breccia horizons and zones of clastic sedimentation including fossiliferous calc-arenites, siltstones and shales. Siluro-Devonian sediments within the basin are fossiliferous marine, coarse grained and cross-bedded quartzose sandstones, siltstone, minor quartzites, and dolomitic to pyritic shales and siltstones.

Extensive Tertiary and Quaternary deposits blanket much of the prospective dolomite and shale units.

The Zeehan area has been intensely disturbed by the Paleozoic Tabberaberan orogeny which caused major north-west folding and faulting. East and north-west trending fault systems are considered to have been contemporaneous. North, northeast striking faults are thought to have developed in post Permian times.

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MINERALIZATION

Exploration within the prospective Gordon Limestone has been modelled on the Irish type carbonate hosted sedimentary exhalative lead zinc deposits at Silvermines, Tynagh and Navan. Mineralization, lithological and structurally controlled occurs as both epigenetic and syngenetic bodies within carbonate hostrocks. The deposits are found in proximity to the locus of major basement sutures¹ (Silvermines fault equivalent) and similar intersecting dilation faults which act as feeder zones for the mineralizing fluids. The mineralization occurs as both coarse and fine grained pyrite galena and sphalerite in a carbonate matrix. The syngenetic deposits occur as lenses associated with sedimentary breccias which have slumped into sub-basinal depressions within the limestone whereas the epigenetic mineralization is generally found in close proximity to major basement sutures.

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Joint Venture Area

Details of the type and extent of mineralization indicate the major parameters (lithologic, structural and mineralization) fit the Irish model. The major northwest trending basement suture - the Balstrup Fault, cuts the Zeehan Basin to the north of Oceana before trending southeast into the Mariposa area. Emanating from this major crustal break are a number of dilation fault zones which cut the Mariposa Limestone sequence in the vicinity of two zones of mineralization (observed from the trenching program). The two horizons which contain galena and sphalerite-cerussite and anglesite from the oxidised zone, within a siderite minor pyrite matrix lie concordant to bedding and are strongly associated with carbonate breccias. (West zone : assaying up to 10 meters at 11.1% lead, 1.2% zinc and 74g/t silver. East zone : assaying up to 8 meters at 3.3% lead, 6.2% zinc and 395g/t silver).

Breccias have also been observed on the Black Jacks prospect (north of Mariposa) and the Bannockburn prospect (southwest of Mariposa) both being associated with highly anomalous geochemistry.

Similarities in setting and observed mineralization between the joint venture area and the Irish deposits indicates the potential for finding a large tonnage syngentic sedimentary lead zinc silver orebody, or alternatively a number of moderate tonnage orebodies.

WORK CONDUCTED BY AMOCO

Work during the period entailed data collection, synthesis of previous work, access improvements, geologic mapping, costeaning and geophysical and geochemical surveys. Exploration was concentrated on a regional scale during the summer period and centered on the Mariposa, Bannockburn and Black Jacks prospects as the weather deteriorated towards winter.

Access

Minor upgrading of the old Mariposa tramway to the Bannockburn prospect southwest of the Mariposa prospect was necessary as a bridge had deteriorated to an unsafe condition.

Geological Mapping

Detailed geological mapping is continuing on the Mariposa grid. Numerous northeast trending faults cut the limestone sequence,

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one of which offsets the main mineralized horizon by approximately 75 meters to the east. The costeaning program has delineated subcropping fossil breccias, calcareous slump siltstones and calcareous arenites similar to those observed on the Oceana Prospect in EL 4/78.

Analytical Techniques

Rockchip, bedrock geochemical, regional soil and stream sediment and panned concentrate samples were dried, crushed and pulverized and despatched to Comlabs Pty Ltd in Adelaide for analysis for copper, lead, zinc, silver and tin. Costean samples were sent to Analabs in Tasmania for both preparation and analysis for basemetals and tin.

Analysis for basementals was by AAS after hydro chloric acid digestion and tin was by XRF.

Rockchip samples were analyzed for an additional 12 elements, tungsten arsenic, antimony and barium by XRF and gold, nickel, cobalt, bismuth, molybdenum, vanadium, cadmium and manganese by AAS. Costean samples were analyzed for an additional three elements, cadmium and manganese by AAS and antimony by XRF. The regional stream samples are analyzed for the following additional elements - gold, nickel and chromium and regional soil samples for gold, nickel, cobalt, chromium and tungsten.

Check assays on every twentieth sample were carried out by Amdel in Adelaide.

Rockchip Geochemistry

Regional:

Regional sampling has been conducted in conjunction with the stream sediment sampling program with all documented workings being located and compositely sampled. Locations and results are plotted on Enclosure 3 and listed in Table 1.

TABLE 1 REGIONAL ROCKCHIP AND DUMP SAMPLING - CSR JOINT VENTURE AREA

SAMPLE	AMG CO-ORD	ROCK TYPE	Cu	Pb	Zn	Ag	Sn	Au	Sb	Ni	Co	Bi	Mo	V	Cd	Mn	W	As	Ba	U
Amber Creek Workings:																				
79814	3699- 53516	Siltstone breccia & quartzose	12	170	60	<1	10	<0.05	4	26	4	<4	<4	40	<1	135	10	50	135	
79815	3696- 53518	Ironstone ferruginous zone	20	60	1150	<1	<4	<0.05	4	120	22	<4	<4	50	<1	620	10	34	55	
North Henty Workings:																				
92451	3681- 53513	Ironstone	8	14	600	<1	<4	<0.05	4	75	22	<4	<4	30	<1	4500	20	42	<10	
92452	3681- 53513	Ironstone	8	300	450	2	8	<0.05	4	220	50	<4	<4	30	<1	1700	<10	115	50	
92453	3681- 53513	Ironstone	8	34	240	2	<4	<0.05	10	115	28	<4	<4	30	<1	2650	10	80	60	
Westerway Creek:																				
92454	3697- 53559	Ironstone	10	38	410	2	6	<0.05	16	70	18	<4	<4	<10	<1	1.8%	<10	75	115	
United Ag-Pb Workings:																				
92459	3688- 53519	Sandstone/phyllite-qtz veined	8	<4	80	<1	<4	<0.05	4	<4	<4	<4	<4	40	<1	8	<10	6	95	
92460	3688- 53519	Qtz sandstone	4	<4	10	<1	<4	<0.05	6	<4	<4	<4	<4	60	<1	10	<10	<2	100	
92461	3688- 53519	Ironstone	40	4	980	<1	<4	<0.05	4	110	18	<4	<4	140	<1	340	15	490	20	
92462	3688- 53519	Ironstone	50	4	960	<1	<4	<0.05	<4	110	20	<4	<4	220	<1	330	10	520	25	
Australasian Workings - Black Jacks:																				
92464	3657- 53624	Ferruginous clay	170	280	1100	<1	<4	0.10	8	36	12	60	<4	140	<1	230	<10	125	100	6
92465	3657- 53624	Ferruginous siltstone	14	250	16	1	6	<0.05	14	18	<4	30	<4	120	<1	8	<10	80	430	18
United Ag-Pb Workings:																				
92466	3688- 53519	Ironstone	12	8	44	<1	<4	<0.05	<4	16	16	75	<4	110	<1	760	15	42	60	<4
92467	3698- 53517	Ferruginous Qtz plus chlorite	6	<4	20	<1	<4	<0.05	<4	20	8	20	<4	40	<1	90	<10	<2	10	<4
92479	3656- 53548	Carbonaceous sandstone plus galena	26	2200	155	2	<4	<0.05	18	14	<4	14	<4	10	1	14	35	26	250	
92483	3655- 53550	Limestone Ca/Sd veined	50	640	145	3	4	<0.05	10	22	<4	12	<4	30	1	14	<10	6	440	
92484	3655- 53550	Limestone Ca/Sd veined	4	95	12	<1	<4	<0.05	<4	4	<4	110	6	40	<1	110	<10	3	35	
92485	3655- 53550	Quartzite-chromite? xtls	2	4	4	<1	<4	<0.05	4	6	<4	14	6	<10	<1	120	<10	<2	10	
92486	3655- 53550	Quartz pyrite galena?	14	110	6	5	6	<0.05	6	14	<4	10	<4	<10	<1	14	<10	<2	250	
92487	3658- 53548	Breccia carbonaceous	14	95	6	1	<4	<0.05	6	18	<4	14	<4	<10	<1	20	<10	2	400	
92488	3658- 53548	Siltstone, galena carbonaceous	26	660	125	1	6	<0.05	18	22	<4	12	<4	30	<1	16	<10	22	290	
92489	3658- 53548	Sediment breccia carbonaceous	16	800	100	1	<4	<0.05	20	16	<4	14	<4	30	<1	14	<10	20	370	
92490	3658- 53548	Quartzite galena in cleavage	4	760	75	1	<4	<0.05	12	8	<4	12	<4	10	<1	8	<10	6	90	

Three workings lie in the Amber Creek area and include the following:

North Henty - max values:	300ppm Pb,	600ppm Zn,	2ppm Ag,	8ppm Sn
United Ag-Pb - " "	8ppm Pb,	980ppm Zn,	<1ppm Ag,	<4ppm Sn
East Amber - " "	170ppm Pb,	1150ppm Zn,	<1ppm Ag,	10ppm Sn

The Australasian workings are found in the north of the Joint Venture area between lines 62600N and 62800N on the Black Jacks prospect at approximately 67050E (maximum values: 280ppm Pb, 1100ppm Zn, 1ppm Ag, 6ppm Sn). Rockchip at the Australasian workings are also plotted on Enclosure 13 and listed in Table 2.

Further rockchip sampling was conducted on outcropping minor galena mineralization on the lower reaches of Farrel Rivulet and also on an ironstone (within limestone) on Westerway Creek, a tributary of the Farrel.

Lower Farrel Rivulet - max values:	0.22% Pb,	155ppm Zn,	5ppm Ag,	6ppm Sn
Westerway Creek " "	38ppm Pb,	410ppm Zn,	2ppm Ag,	6ppm Sn

Mariposa:

Additional rockchip sampling has been conducted on the Mariposa prospect (Enclosure 9). Seven samples including ironstones from the line of lode, ferruginous siltstone from a zone approximately 100 meters east of the lode and ferruginous quartzites and ironstones from elsewhere on the grid were assayed (Table 3).

Bedrock Geochemistry

A Jackro 200 hydraulic auger mounted on a J5 Bombadier was used to penetrate thick gravel and talus deposits blanketing much of the prospective horizons. Areas inaccessible to the Bombadier were sampled using a hand auger. A total of 435 bedrock samples were taken from the joint venture area, 342 at Bannockburn the

The Amber Creek area in the southern part of the Joint Venture area.



Looking east across the Professor Range. North Henty workings center left.

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TABLE 2 BLACK JACKS - COMPOSITE ROCKCHIP RESULTS

SAMPLE	CO-ORD	ROCK TYPE	As	Sb	Sn	W	Cu	Pb	Zn	Ni	Bi	Co	Cd	Mn	Ag	Mo	V	Au	Ba	U
66635	62009N 67432E	Ironstone - Limonite Dump Sample	55	<4	<4	<10	16	50	640	115	<4	48	<1	<4	20	<4	20	<0.05		
66636	61995N 67444E	Ironstone Flat Outcrop?	55	6	10	<10	6	12	145	20	<4	8	<1	90	<1	<4	10	<0.05		
66637	61998N 67516E	Ironstone Dump/Outcrop?	55	6	<4	20	12	60	370	16	<4	<4	<1	130	<1	<4	10	<0.05		
66638	62018N 67516E	Ironstone Float	60	8	4	<10	6	8	22	16	<4	6	<1	125	<1	<4	10	<0.05		
78035	62400N 67695E	Ironstone Float/Outcrop	-	-	<4	<10	14	20	615	-	-	-	-	980	<1	-	-	-	85	
92464	62670N 67050E	Ironstone	125	8	<4	<10	170	280	1100	36	60	12	<1	230	<1	<4	140	0.10	100	6
92465	62670N 67050E	Ironstone	80	14	6	<10	14	250	16	18	30	<4	<1	8	1	<4	120	<0.05	430	8

TABLE 3 - MARIPOSA - ROCK CHIP SAMPLES

NO. SAMPLE	CO-ORDINATES	ROCK TYPE	Cu	Pb	Zn	Ag	Sn	Au	Sb	Ni	Co	Bi	Mb	V	Cd	Mn	W	As	Ba	
1	78036	59626N:67185E	Ore dump, composite sample	1.3%	26.5%	40.0%	150	<4	<0.05	8600	12	6	10	<4	10	2000	14	<10	500	15
2	78037	59620N:67156E	Black dolomite outcrop	28	650	790	2	4	<0.05	22	16	6	6	<4	30	2	16	10	32	290
3	78038	59623N:67144E	Dolomite abutting SSt	40	910	140	2	8	<0.05	16	14	<4	<4	4	20	<1	10	<10	46	340
4	78039	59696N:67264E	Limestone	6	32	190	<1	<4	<0.05	6	10	<4	<4	<4	20	<1	400	<10	5	135
5	78040	58990N:67322E	Ironstone (dump)	120	2.20%	2.55%	30	28	<0.05	70	18	4	<4	<4	20	80	7.9%	<10	100	2650
6	78041	58810N:67107E	Ferrug. sandy clays	48	430	1900	1	<4	<0.05	38	14	6	<4	<4	60	<1	350	<10	90	300
7	78042	58844N:67088E	Orange clays	440	3300	3800	<1	6	<0.05	230	55	18	4	6	80	<1	750	<10	290	260
8	78043	58850N:67051E	Orange clays	46	300	290	<1	6	<0.05	20	18	<4	<4	<4	50	<1	90	<10	140	340
9	78044	58510N:66953E	V. ferrugin. gossany shales	44	185	60	<1	<4	<0.05	4	16	<4	<4	<4	40	<1	24	<10	18	380
10	78045	58390N:66986E	Gossany ironstained quartzite	12	115	26	<1	8	<0.05	10	8	<4	4	<4	50	<1	20	<10	42	145
11	78046	58488N:67054E	Cherty qtzite + fine sst	26	4500	620	3	<4	<0.05	12	6	<4	<4	<4	20	2	1650	<10	125	55
12	78047	58586N:67104E	Orange sandy clays	200	690	1900	<1	4	<0.05	210	80	24	<4	<4	40	<1	650	10	220	210
13	78048	58666N:67126E	Orange sandy clays	360	1700	1850	1	6	<0.05	95	250	28	<4	<4	40	<1	800	<10	870	360
14	78049	58700N:67122E	Mottled black & orange dol	260	165	270	10	4	<0.05	100	150	<4	<4	<4	110	<1	40	<10	165	380
15	78050	58764N:67118E	Orange clays	660	2100	2800	10	<4	<0.05	100	35	16	<4	14	40	3	4000	<10	70	350
16	78480	59794N:67115E	Ferruginous quartzite	10	270	270	<1	4	<0.05	4	42	6	4	12	10	<1	1300	<10	6	75
17	78481	59804N:67110E	Limestone silicified	6	120	210	<1	8	<0.05	<4	16	<4	18	10	20	<1	930	<10	2	55
18	78482	59796N:67109E	Breccia. Limestone silicified	10	270	270	<1	<4	<0.05	10	65	22	6	10	20	<1	3850	10	12	195
19	78483	59808N:66728E	Pisolitic ironstone	18	55	90	<1	8	<0.05	16	<4	<4	28	<4	70	<1	1200	<10	42	75
20	92491	59100N:67180E	Ironstone	30	180	350	1	4	<0.05	14	48	28	<4	<4	50	<1	570	<10	140	65
21	92492	59100N:67180E	Ferruginous silstone	18	28	32	<1	4	<0.05	4	12	<4	<4	<4	30	<1	50	<10	5	280
22	92493	59080N:67075E	Ironstone - line of lode	44	3.4%	2350	11	30	<0.05	20	18	<4	<4	<4	20	4	11.0%	<10	<50	135
23	92500	58955N:67075E	Ironstone - near 2 adits	240	3.85%	1.10%	72	<4	<0.05	150	55	65	40	6	20	44	8.7%	<10	200	70
24	73701	58866N:67090E	Ferruginous clay	120	500	2200	1	10	<0.05	115	46	20	24	6	100	<1	170	<10	230	890
25	73702	58858N:66775E	Quartzite - hematitic	12	<4	28	<1	6	<0.05	<4	4	<4	10	6	10	<1	26	<10	<2	20
26	73703	58900N:67700E	Ironstone - pisolitic	160	8	65	2	<4	<0.05	<4	30	36	34	4	40	<1	1150	<10	44	105

Note : Results in ppm unless indicated

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remaining 93 are from reconnaissance soil lines over four magnetic anomalies (C,J,K and L) defined from the Geoex 1982 airborne survey. Sampling at Bannockburn is continuing with all accessible areas having been Jackro sampled at 25 meter intervals and the remainder of the grid being hand auger sampled. The reconnaissance lines traversing the magnetic anomalies were also sampled using a hand auger at 25 meter intervals.

Bannockburn:

All possible Jackro sampling has been completed on both the eastern and western sides of the Dundas River. Hand auger sampling of the remainder of the grid is nearing completion. Two samples 100 meters from old workings on line 57800N returned massive coarse grained slugs of galena from within a dark grey, carbonaceous siltstone. Updated lead and zinc maps are included (Enclosures 15 and 16).

Costeaming

Fifteen costeams totalling 968 meters were excavated on the joint venture area using both JCB and O & K hydraulic excavators. Four trenches totalling 308 meters were excavated on the Black Jacks prospect and 11 trenches totalling 660 meters excavated on the Mariposa prospect. The trenches varied in depth from 0.5 to 5 meters and were mapped in detail at a scale of 1:200 and sampled over 2 meter intervals (excepting L58900N:67050-67070E which was sampled at 5 meter intervals).

The trenches were designed to test previously defined bedrock geochemical and geological targets. The initial excavator, a JCB 909 was replaced with the lighter O & K excavator after the JCB proved too heavy for swampy conditions. Difficulties were encountered with excessively deep fluvioglacial gravels (up to 5 meters) and fresh limestone occurring within 2 meters of surface. Due to the unsafe depth of many trenches, geological and geochemical sampling was conducted on material excavated and deposited in piles representing two meter intervals.

030

Backhoe excavating trenches
at Mariposa.



Looking southeast towards Queenstown across the Mariposa
prospect.

031

At Black Jacks strongly anomalous values were obtained in all four trenches (Table 4) with the best intersection occurring on line 61000N (8m of 3.2% Pb, 1.6% Zn, 5.8g/t Ag). Airphoto structural interpretation indicates the mineralization occurs at the northern end of a fault bound limestone block. Further costeans to the south are warranted to test for a continuation of the mineralized horizon. The mineralization in general is associated with pyritic breccia zones and to a lesser extent with laminated pyritic limestone. Detailed geological and geochemical logs of the trenches are included (Appendix 1). Enclosure 14 shows the location on costeans at the Black Jacks grid.

At Mariposa strongly anomalous values (Table 5) were obtained from all 11 trenches (Enclosure 10) The best zone of mineralization lies on the western side of the valley along strike from and within the old Mariposa workings near the contact of the Ordovician Gordon Limestone and Silurian Crotty Quartzite Assays from this zone include an interval of 10 meters grading 11.1% lead, 1.2% zinc and 74.5 g/t silver within ironstones. A second zone occurs within the limestone sequence parallel to the faulted contact with the Cambrian Dundas Formation. Assays from this zone include an interval of 8 meters grading 3.3% lead, 6.2% zinc and 395 g/t silver occurring within black massive decomposed limestone and limestone breccias. Additional costeans are warranted in order to define the strike extent of the trenched mineralization. Detailed geological and geochemical logs of the trenches are included (Appendix 2).

Stream Sediment Geochemistry

A regional stream sediment program collecting 114 minus 80 mesh and panned concentrate samples was completed over the joint venture area. The strongly anomalous values from the Dundas River can be traced back to contamination from old mines upstream. A program of detailed follow up was commenced during the period but will not be completed until the 1983/84 summer. One of the better samples runs up to 0.5% lead, 0.4% zinc, 20 g/t

032

TABLE 4 - BLACK JACKS COSTEAN GEOCHEMISTRY

NORTHING	EASTING	MINERALIZATION
61400N	67524 - 56 = 2m of	1.11% Pb, 2.86% Zn, 4.5 g/t Ag
	67308 - 12 = 4m of	0.04% Pb, 1.95% Zn, 1.0 g/t Ag
	67320 - 22 = 2m of	1.40% Pb, 2.0% Zn, 11.0 g/t Ag
61150N	67230 - 32 = 2m of	0.92% Pb, 0.44% Zn, 43 g/t Ag
	67244 - 52 = 8m of	0.95% Pb, 0.46% Zn, 5 g/t Ag
61000N incl. and "	67238 - 36 = 2m of	0.41% Pb, 1.07% Zn, 10 g/t Ag
	67226 - 06 = 20m of	1.74% Pb, 1.17% Zn, 6.6 g/t Ag
	67226 - 18 = 8m of	3.16 Pb, 1.58% Zn, 5.8 g/t Ag
	67214 - 12 = 2m of	1.18% Pb, 0.60 Zn, 25 g/t Ag
	67210 - 06 = 4m of	1.34% Pb, 1.84% Zn, 3.3 g/t Ag
	67198 - 96 = 2m of	0.27% Pb, 1.30 Zn
62000N	67309 - 311E = 2m of	3.4% Pb, 1.3% Zn, 25 g/t Ag

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TABLE 5 MARIPOSA-COSTEAN GEOCHEMISTRY

NORTHING	EASTING	MINERALIZATION
59600N incl.	67172 - 67202 67172 - 67186 67194 - 67202	= 30m of 1.01% Pb, 1.84% Zn, 13.07 g/t Ag = 14m of 1.36% Pb, 3.05% Zn, 16.64 g/t Ag = 8m of 1.35% Pb, 1.11% Zn, 19.63 g/t Ag
59091N	67074 - 67076	= 2m of 1.83% Pb, 0.43% Zn, 12.0 g/t Ag
59400N incl.	67318 - 67332 67320 - 67324	= 14m of 1.06% Pb, 2.32% Zn, 32.4 g/t Ag = 4m of 1.69% Pb, 5.83% Zn, 39.5 g/t Ag
59200N and and	67342 - 67334 67322 - 67320 67142 - 67120	= 8m of 3.3% Pb, 6.2% Zn, 395 g/t Ag = 2m of 0.8% Pb, 1.4% Zn, 29 g/t Ag = 22m of 1.0% Pb, 0.2% Zn, 63.5 g/t Ag
59100N and	67166 - 67162 67152 - 67150	= 4m of 0.8% Pb, 0.9% Zn, 3.3 g/t Ag = 2m of 0.2% Pb, 1.9% Zn, 7.5 g/t Ag
59046N	67138 - 67136	= 2m of 0.4% Pb, 1.1% Zn, 5 g/t Ag
59000N and	67325 - 67323 67098 - 67096	= 2m of 0.9% Pb, 1.7% Zn, 13 g/t Ag = 2m of 0.5% Pb, 1.3% Zn, 10 g/t Ag
58950N and	67080 - 67078 67072 - 67062	= 2m of 1.5% Pb, 0.8% Zn, 54 g/t Ag = 10m of 11.1% Pb, 1.2% Zn, 74.5 g/t Ag
58900N and	67094 - 67082 67078 - 67072	= 12m of 1.5% Pb, 1.2% Zn, 7.4 g/t Ag = 6m of 2.2% Pb, 1.9% Zn, 52 g/t Ag

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silver and 680 g/t tin and drains the region near magnetic anomaly J. Two samples draining the northwestern area of the Amber Creek grid run 3.9% and 1.7% chromium. It is reported that minor placer chromite deposits occur within the sediments lying stratigraphically above the Gordon Limestone possible anomalous chromium values. Enclosure 4 shows sample locations and anomalous assay results for lead-zinc, copper-silver, tin-gold and nickel-chromium are plotted on Enclosures 5 thru 8. All other assays are included as analytical results sheets (Appendix 3).

Geophysics (Previous Exploration)

Mitre Geophysics was contracted to compile and synthesize previous geophysical data conducted by Geophoto (1972), Rio Tinto (1959), Tenneco (1972), McIntyre Mines (1971) and the BMR (1950) (Appendix 4). Anomalous responses delineated from these surveys have been summarized on a prospect by prospect basis.

Black Jacks: Three very weak and poorly defined HEM-701 (Tenneco) conductive zones were delineated over the southern portion of the prospect. Three Turam conductors were observed between lines 60400N and 61200N. The northern most response lies coincident with a very strong (Amoco) lead and zinc bedrock geochemical anomaly which was later confirmed by costeaning returning values of 61000N/67226-67206 = 20m of 1.74% zinc, 6.6g/t silver including 67226-67218 = 8m of 3.16% lead, 1.58% zinc, 5.8g/t silver. An ~~SP~~ trough lies slightly to the west of the conductor axis and is semi-coincident with the above mentioned geochemistry.

Mariposa: A zone of high chargeability (up to 25 milliseconds) occurs coincident with the mine workings and appears to be truncated to the north by a fault and offset to the south (before continuing south to the Nevada workings). A 0.5 milligal gravity response is also located coincident with the mine workings. It extends some 75 meters north from the most northerly drillhole and some 50 meters south of the

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southernmost hole. This previous gravity survey was very restricted and covered an area of only 300 by 400 meters. The IP survey was also restricted and covered an area of only 300 by 400 meters. The IP survey was also restricted to the southern portion of the limestone below line 59300N. None of the surveys adequately covered the eastern faulted contact of the Gordon Limestone, furthermore an IP trend due to abundant pyrite within the basal 50 meters of the unit was observed within the Amber Slate occurring stratigraphically above the Silurian Crotty Quartzite.

Bannockburn: Very poor (limited in areal extent) surveys were conducted on the Bannockburn prospect with no obvious anomalous responses delineated. The 1971 HEM-701 survey delineated a well defined zone southwest of the grid within the Amber Slate Formation. No follow up work was conducted on this zone.

Amber Creek Area: Numerous VLF anomalies and trends were outlined by this area with limited follow up hand and mechanical auger surveys being conducted. Mitre Geophysics concludes that where thick fluvioglacial deposits lie (as Amber Creek) on top of the Gordon Limestone then VLF will not penetrate the surficial cover to adequately scan the bedrock.

CSR JV Area: The helicopter borne EM-701 survey was conducted over the remainder of the joint venture area (1971) returning numerous anomalies and anomalous trends from the Professor Range prospect. No follow up work has been conducted.

Geophysics (Amoco Program)

EM-37:

Geoterrax was contracted to conduct an electromagnetic (Geonics EM-37) survey over the Mariposa prospect utilizing a 500 by 350 meter loop configuration (Appendix 5). Amoco geophysicist P. Staples completed his interpretation of the data which is

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included in this report (Appendix 6). He suggests the survey delineated a poor to moderate west dipping conductor coincident with Amoco's previously defined gravity response (Enclosure 11). The anomaly is centered at 57150E and is strongest on lines 59300N and 59400N however, the response may be complicated by the fact that the eastern edge of the conductor lies within the loop.

Gravity:

Costean work at the Mariposa prospect has shown that a correlation may exist between depth to fresh limestone (Enclosure 12) and Amoco's previously defined gravity response. Modelling of the overburden response as indicated by the trenching will be conducted and compared to the observed gravity. The overburden signature will then be removed from the gravity response to isolate the residual gravity picture.

Aeromagnetic Follow Up:

Four aeromagnetic responses (numbered Anomaly C, J, K and L) were delineated from the West Coast Aeromagnetic Survey conducted by Georex for the Tasmanian Mines Department Figure 3. The anomaly centers were taken from 1:50 000 contour maps and plotted onto 1:25 000 topographic sheets and then located on the ground using a Geometrics G816 or Scintrex MP-2 magnetometer. Profiles across the anomalies including soil sample results, (where completed) have been included (Appendix 7). Anomalies have been found to occur up to 250 meters east of their plotted locations. Reconnaissance magnetic and soil lines are spaced at 150 to 200 meter intervals perpendicular to the anomalous trends. The traverses are located on the 1:25 000 nanoTesla aeromagnetic map as supplied by CSR (Enclosure 2). Further ground magnetic surveys are required to accurately locate the anomalies. A summary of the follow up program is as follows:

Anomaly C: Three parallel reconnaissance lines of 400, 350 and 600 meters in length (150 meters apart) were surveyed over the anomalous response. A 20 gamma response was delineated over a

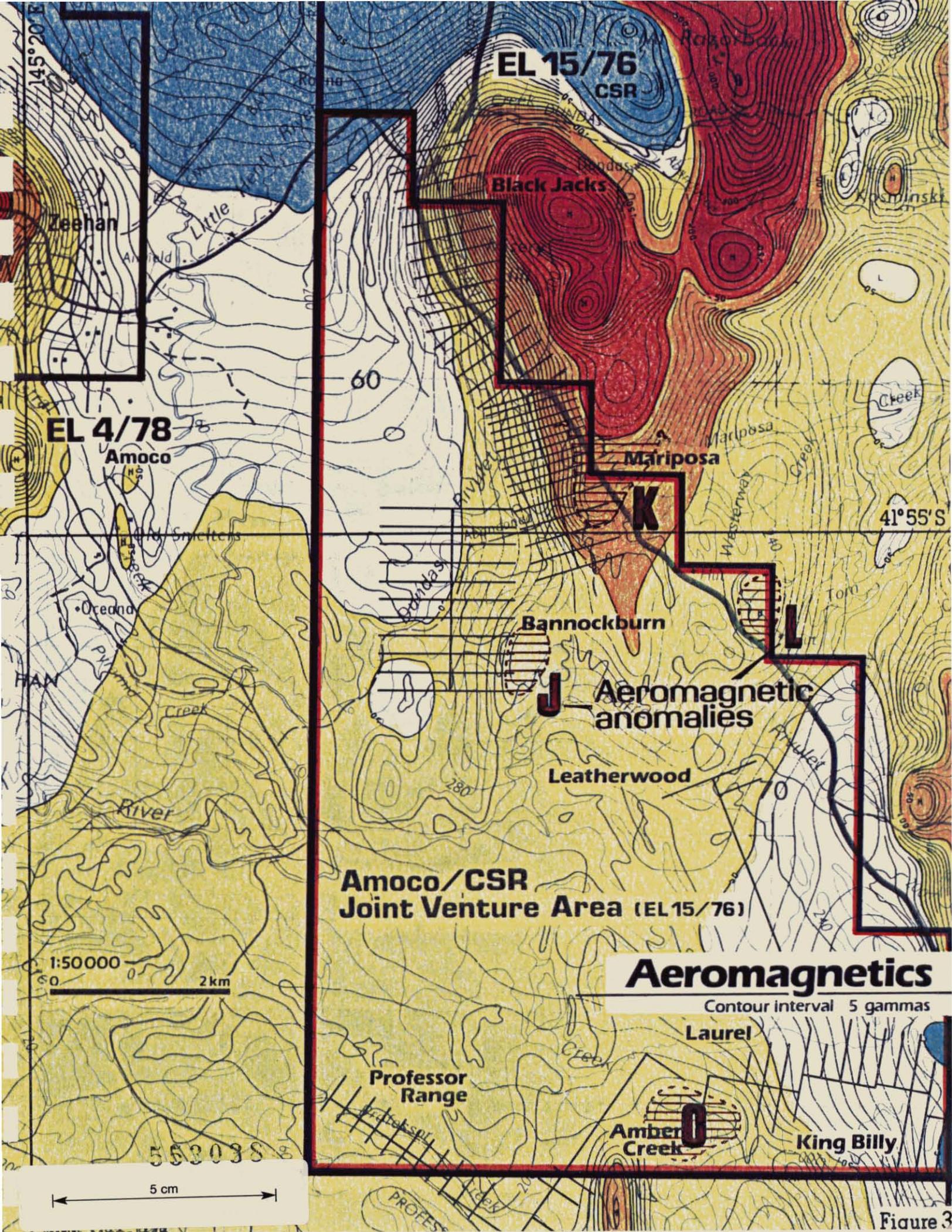


Figure 3

width of 125 meters on line B.

Assay results from the two sampled lines (A,C) are of low tenor with the most anomalous value (124ppm Pb) occurring on line A at the southern end of the line. No obvious correlation exists between the magnetic anomaly and assay trends.

Additional work is required to detail this response further as it would appear that the bulk of the anomaly remains untested.

Anomaly J: Two parallel reconnaissance lines of 1050 and 525 meters length (spaced approximately 200 meters apart) were surveyed across the anomaly. A regional high of 25 to 30 gammas is observed over approximately 900 meters in width.

Soil samples were taken at 25 meter intervals on only 200 meters of line B returning very low values (maximum 28ppm Pb). Additional work is required in this region as anomaly J lies within the headwaters of a tributary on the Farell River containing highly anomalous stream sediment values (up to 0.5% Pb, 0.4% Zn, 20g/t Ag and 140g/t Sn in panned concentrates and 0.2% Pb, 0.2% Zn, 8g/t Ag and 680g/t Sn in the -80 mesh stream sample).

Anomaly K: The anomalous trend lies at the southeastern corner of the Mariposa grid from 57800N northwards. Recent ground surveys have only partially defined two parallel zones of up to 130 gammas with the anomalous trends being open to the north and northeast with the western anomaly increasing in amplitude and the eastern one decreasing. The tight regional gradient observed in Figure 3 on the western flank of the airborne anomaly (K) masks the second sharply defined response delineated on lines B,C and D. Both anomalous trends have semi-coincident copper-lead-zinc geochemistry with values ranging up to 200 ppm lead, 330 ppm zinc, 150 ppm copper and 20 ppm tin. Further sampling is necessary to close off the anomalies.

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Anomaly L: Three parallel 500 meter reconnaissance lines spaced 100 meters apart were surveyed across the anomalous trend. Two lines, A and B delineated a 20 to 35 gamma anomaly over 200 meters in width and strike length of less than 200 meters. A small discrete tin anomaly of 26 ppm occurs coincident with the magnetic anomaly.

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EXPLORATION POTENTIAL

The tenement is considered to have excellent potential for the location of Irish style carbonate hosted lead-zinc orebodies.

PROPOSED PROGRAM

Infill gridding to 100 meter spacings is proposed on the southern portion on the Bannockburn grid encompassing a zone of workings within the limestone. Further infill gridding is proposed encompassing another zone of workings to the northwest.

Geological and culture mapping will continue on the Mariposa, Black Jacks and Bannockburn prospects.

Hand auger geochemical sampling will be completed on the Black Jacks, Bannockburn and Mariposa prospects. Jackro sampling will be conducted on infill lines on the Bannockburn prospect and initiated on the southern grids (Leatherwood to Professor Range). Programs will concentrate on structurally anomalous areas similar to those found from most Irish zinc-lead deposits.

042

Further costeaning is proposed on the Mariposa and Black Jacks grids to detail mineralization encountered to date and on the Bannockburn prospect to enhance knowledge of the geology and mineralization.

An airphoto interpretation of major structures relating to the limestone sequence will be conducted as lead-zinc occurrences within the Zeehan area and the major Irish style zinc-lead deposit are clearly genetically related to major crustal fractures acting as mineralizing conduits.

Airborne EM and Turam responses delineated from Mitre Geophysics compilation survey require ground checking using a VLF EM method.

Additional reconnaissance lines across airborne magnetic anomalies are proposed to more accurately define their location, extent, amplitude and geochemical response.

Trial traverses of dipole-dipole IP and VLF will be conducted over mineralized zones on both the Mariposa and Black Jacks prospects to ascertain their usefulness for further exploration.

SIGNED:


G.L. KARY & P.A. JONES

043

DUNDAS JOINT VENTURE

28

EXPENDITURE FOR THE SIX MONTHS TO MAY 31, 1983

Salaries and Wages	14,020.58
Benefits	1,040.51
Supplies Office	(1,034.16)
Cookery	2,042.92
Field Office Rent	270.00
Field Supplies	418.53
Freight	615.62
Travel	(787.60)
Communications	559.36
Geophysics	5,843.52
Other Contractors	9,290.23
Equipment Operation and Rental	10,561.46
Drafting Maps	22.05
Outside Services	2,747.37
Consultants	2,729.50
Assays	9,768.50
Entertainment	-
Property Payments	(150.00)
Overheads	5,795.84
	<u>63,754.23</u>

T. J. Conquest
T. J. CONQUEST,
Accountant.

APPENDIX 1

BLACK JACKS - DETAIL COSTEAN PLANS

Block Jacks

Costean L61000N 67250-67194E

Scale 1:200 1cm = 2.0m

Py - Pyrite e/w - complete
 Gn - Galena H/w - high
 SL - Sphalerite s/w - slight
 Cer - Cerussite B - Breccia

Eu	Pb	Zn	Ag	Sn	Sb	Mn	Cd	GEOLOGY	INTERVAL
475	340	60	0.5	X	24	20	X		Limestone - black c/w, massive
75	2300	2000	0.5	X	57	30	15.5		
35	2700	2650	1.0	X	38	30	27.5	Py, Cer	Limestone - black c/w, poorly layered, minor silty horizons - up to 10% Py, minor Cerussite. Pyrite concentrated in silty horizons.
125	2650	1350	0.5	X	43	35	7.5	Py	
210	2380	785	1.5	X	75	35	5.0	Py	
235	3400	2450	1.0	X	80	35	20.0		67240E
65	4100	107%	1.0	X	86	35	75	Py, Gn	Limestone - black c/w, poorly layered, up to 15% Py, minor Gn.
115	4500	3000	11.0	X	109	80	100		
100	0.62%	0.50%	29	X	50	20	80		
90	150	185	21	X	4	20	110		Limestone - black + orange mottled appearance, c/w, very ferruginous overburden.
65	125	165	19	X	3	15	0.5		67230E
165	1200	355	10.5	X	14	15	8.0		Sandy Limestone - black + orange mottled c/w, very ferruginous overburden
100	1.71%	1.28%	2.5	X	60	30	20.5		Silty Limestone - black-brown c/w, poorly layered
100	6.02%	2.52%	4.5	X	300	20	700		Ironstone - Green/Brown, highly fractured
115	3.42%	1.66%	1.0	X	120	30	650	Py, Gn	
675	1.50%	0.85%	15	X	100	25	215		67220E - Silty Limestone - Green/black c/w, well laminated Pyrite (up to 3% Py with 1% Gn minor brecciation)
100	2200	1800	11.5	X	31	15	22.5	Cer	Siltstone - brown/orange c/w, ferruginous, finely laminated, trace cerussite, very ferruginous overburden
85	210	265	3.5	X	16	15	1.5		
255	1.18%	0.60%	2.5	X	128	15	75	SL	Breccia - c/w, angular white sandy fragments in a light to dark grey matrix. Fragments 1-10mm. Trace SL
35	6800	7200	2.5	X	52	20	95	Py	
75	1.64%	2.52%	3.0	X	94	20	380	Py, SL, Gn	67210E - Limestone - black c/w, up to 10% Py along possible siderite horizons, minor SL + Gn
115	1.04%	1.16%	3.5	X	70	25	190	Py	
125	265	305	2.5	X	16	15	4.0		Limestone - black c/w, minor angular white clay fragments, up to 1% Py, trace Gn
245	1900	450	2.0	X	15	25	6.5		
95	3250	3350	1.0	X	17	30	25.0	Py, Gn	
40	7600	3800	1.0	X	42	35	90	Py, Cer	67200E - Limestone - black/green, well bedded Py (5%) trace cerussite
15	2700	1.30%	X	X	30	25	135	Py	
20	315	1450	X	X	12	25	4.5	Py, Gn	Limestone - black/dark grey, well laminated, minor silt content, good slumping & micro-faulting evident, well bedded Py, minor siderite 15-20% Py, trace Gn
									67190E

L

NO SAMPLE

W

Black Jacks Prospect

5 cm

553046

BLACKJACKS COSTEAN

61000 N

Cu	Pb	Zn	Ag	Sn	Sb	Mn	Cd	GEOLOGY	INTERVAL
								Not Sampled	
105	450	325	0.5	X	8	30	3.0		Silty Limestone - Dark brown, c/w, massive
190	275	170	1.0	X	5	25	X		Siltstone - Brown, c/w, well laminated
25	60	390	0.5	X	X	25	X		
35	80	360	0.5	X	4	20	0.5		Silty Limestone - Grey, c/w, poorly laminated trace Py
145	195	1150	0.5	X	4	25	2.5		
60	220	125	X	X	4	15	X		Siltstone/Limestone - Interlayered brown laminated c/w siltstone and black non-laminated c/w limestone up to 1% Py
15	35	625	X	X	3	25	X		
40	1200	2850	1.0	X	15	30	22.0		Limestone - Black c/w, massive
45	1250	2400	1.0	X	17	35	23.0		
35	725	1950	1.5	X	13	30	10.5		
20	985	2250	0.5	X	3	25	17.0		Silty Limestone - Dark brown to black c/w, well laminated. Up to 3% Py, trace Gn.
25	1400	4950	1.5	X	13	25	25.5		
20	1150	1850	1.5	X	7	20	16.0		Siltstone - Dark brown c/w, well laminated, minor limestone, up to 1% Gn, in siltstone
30	1.4%	2.0%	11.0	X	25	15	130		
25	300	1750	1.0	X	9	30	4.0		
30	440	2500	0.5	X	10	40	5.0		Limestone - Black, c/w, poorly layered. Up to 5% Py
15	420	1650	0.5	X	X	20	10.5		
25	575	1850	0.5	X	6	15	11.5		
30	410	1.62%	1.0	X	22	25	105		Limestone - Black to dark grey, c/w, poorly layered. trace Py, minor SL
30	410	2.27%	1.0	X	26	40	140		
30	1250	2900	1.0	X	12	25	60		Siltstone - Brown, c/w, finely laminated, minor sandy horizons, trace Py
50	405	680	0.5	X	3	10	7.5		Siltstone - Brown, c/w, finely laminated, 5% Py
90	365	315	0.5	4	3	15	4.0		
265	365	125	0.5	X	3	15	3.5		Siltstone - Brown/green, H/W, massive, slightly ferruginous, highly fractured
30	75	695	X	X	X	10	0.5		Siltstone - Brown, H/W, minor fragments mixed with overlying gravels
25	45	1200	X	5	X	5	X		Limestone - Dark brown to black c/w, poorly layered
30	30	855	1.0	X	X	10	X		
20	25	1350	X	3	5	5	X		Siltstone - Brown to Green, H/W, ferruginous, minor black c/w, limestone horizons, well fractured
40	45	780	0.5	X	X	35	X		
25	55	70	0.5	X	6	2200	X		Limestone - Black, c/w, sandy, 1% Py
25	60	465	X	4	3	35	X		
90	655	600	1.0	X	17	15	2.0		Limestone - Black, c/w, minor brecciation, contorted bedding, trace Py
35	210	1500	0.5	3	5	25	2.5		Limestone - Black, c/w, massive
70	715	3750	0.5	X	13	20	9.0		Ironstone - Brown, H/W, ferruginous
60	865	1400	0.5	X	9	20	9.5		
65	450	695	1.0	4	5	15	5.0		Limestone - Black, c/w, poorly layered, up to 5% Py
65	2800	1250	1.0	X	14	25	26.0		
90	525	520	0.5	X	8	20	8.0		
30	1200	1500	0.5	3	9	20	30.0		
45	675	1400	0.5	X	8	25	14.5		
25	295	2300	1.0	X	3	30	1.5		Limestone - Black, c/w, massive, trace Py
25	405	1550	0.5	X	X	40	3.5		Limestone - Black, c/w, minor sandy horizons 15% Py in sandy lenses
30	405	1150	X	X	4	35	8.0		
25	260	1650	X	X	X	55	2.0		Limestone - Dark grey to black, c/w, variably silty, up to 10% Py
20	1950	4050	0.5	X	8	30	35.0		
20	875	4400	X	3	6	45	3.5		Siltstone - Greeny brown c/w, poorly laminated, minor c/w black limestone lenses trace Py
25	1.11%	2.86%	4.5	X	29	20	145		Limestone - Black, c/w, massive, slightly sandy
25	2050	1500	X	5	10	35	21.0		
25	490	2250	0.5	X	3	35	8.0		Limestone - Black c/w, poorly laminated, up to 1% Py

Humic & clay overburden

W

BlackJacks Grid

L 61400N COSTEAN

67250-67348E

Scales: Vertical 1:200
Horizontal 1:500

Legend

- Py - Pyrite
- Gn - Galena
- SL - Sphalerite
- Cer - Cerussite

Weathering in Rocks
c/w - complete (essentially clay)
H/W - High
slw - slight
fresh - competent, unweathered rock

- △ - Breccia
- ⊂ - overlying gravels

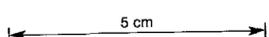
047

553048

BLACKJACKS COSTEAN

61400 N

047



Cu	Pb	Zn	Ag	Sn	Sb	Mn	Cd	GEOLOGY	INTERVAL
30	65	185	1.0	X	3	35	0.5	Sandy Limestone - Black, s/w, variably sandy, highly fractured, all samples are angular and ≤ 8 cm in size	
45	100	395	1.0	X	X	30	2.0		
35	100	355	0.5	X	5	30	0.5	Sandy Limestone - Black, s/w, variably sandy, non-fractured.	
45	275	700	1.0	X	8	35	3.5		
20	345	170	1.0	3	X	60	X	Limestone - Black to dark brown, c/w, massive	67330 E
15	80	130	0.5	X	X	250	X	Limestone - Dark grey, H/W to S/W, massive	
10	150	125	0.5	X	X	525	X	Limestone - Grey, fresh, minor carbonaceous horizons moderate siderite/calcite veining	
30	7450	8200	11.5	3	7	950	34.0	Limestone - Light grey, fresh, fine grained, minor dark grey patches	
15	1000	950	2.0	X	X	1450	5.0	Limestone - Light grey, c/w, massive, minor siderite veining	
20	0.90%	6500	9.0	X	X	4750	33.0	Limestone - Mottled light and dark grey, ^{fresh} heavy siderite veining, trace Gn	67320 E
20	265	635	1.5	X	X	345	2.5	Limestone - Light grey, fresh, massive, smooth outcrop surface	Gn
15	75	330	1.0	X	X	420	1.0		
20	50	80	1.0	X	X	205	0.5	Silty Limestone - Black, fresh, poorly bedded strike 160°, dip 75° W	
20	60	130	1.0	X	X	115	X	Limestone - Light grey, fresh, smooth outcrop surface	67310 E
20	336%	1.25%	25	X	9	1050	X		
15	415	665	1.5	X	3	1700	X	Limestone - Black, fresh, moderate siderite veining	
30	55	70	1.0	X	X	160	X	Dolomite - Black, fresh, finely crystalline, minor Py Minor light grey, fresh limestone	Py
20	55	80	0.5	X	X	170	X		
20	35	55	0.5	X	X	170	X	Limestone - Banded, black, fine grained and light grey fossiliferous horizons, fresh	67300 E
25	55	155	1.0	X	X	245	X	Limestone - Black, fine grained, fresh, minor siderite veining	
15	40	75	1.0	X	X	175	X	Limestone - Light grey, fresh, worm burrows and crinoid stems	
20	35	120	1.0	X	X	155	X	Limestone - Light grey, fresh, well laminated	
35	90	910	1.0	X	X	30	X	Limestone? - Black, c/w, massive	
35	95	200	1.5	X	X	140	X	Limestone - Black, fresh, fine grained, massive	67290 E
40	150	250	1.5	X	X	95	1.0	Limestone - Light grey, fresh, minor carbonaceous horizons. Minor siderite veins trending 070°/09° E. Bedding 160°/60° W	
20	110	345	1.5	X	3	300	X		
30	260	715	1.5	X	X	510	1.0	Limestone - Dark grey, well bedded, fresh	
40	200	1300	2.0	X	3	240	1.0	Limestone - Black, fresh, slightly sandy, moderate siderite veining	67280 E
25	50	385	1.0	X	X	400	X		
65	90	7500	1.5	X	4	950	35.5	Limestone/Dolomite - fresh light grey limestone to dark grey finely crystalline dolomite, minor siderite veins trace Py	Py
15	85	110	1.0	X	3	715	X		
20	90	95	1.5	X	X	900	X		

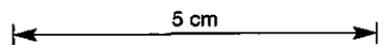
U

W

Black Jacks Grid L 62000 N
67275 - 67239 E

Legend - AS L 61000 N, 61150 N to 61400 N
/// - Fractured

BLACKJACKS COSTEAN 62000 N 553049



049

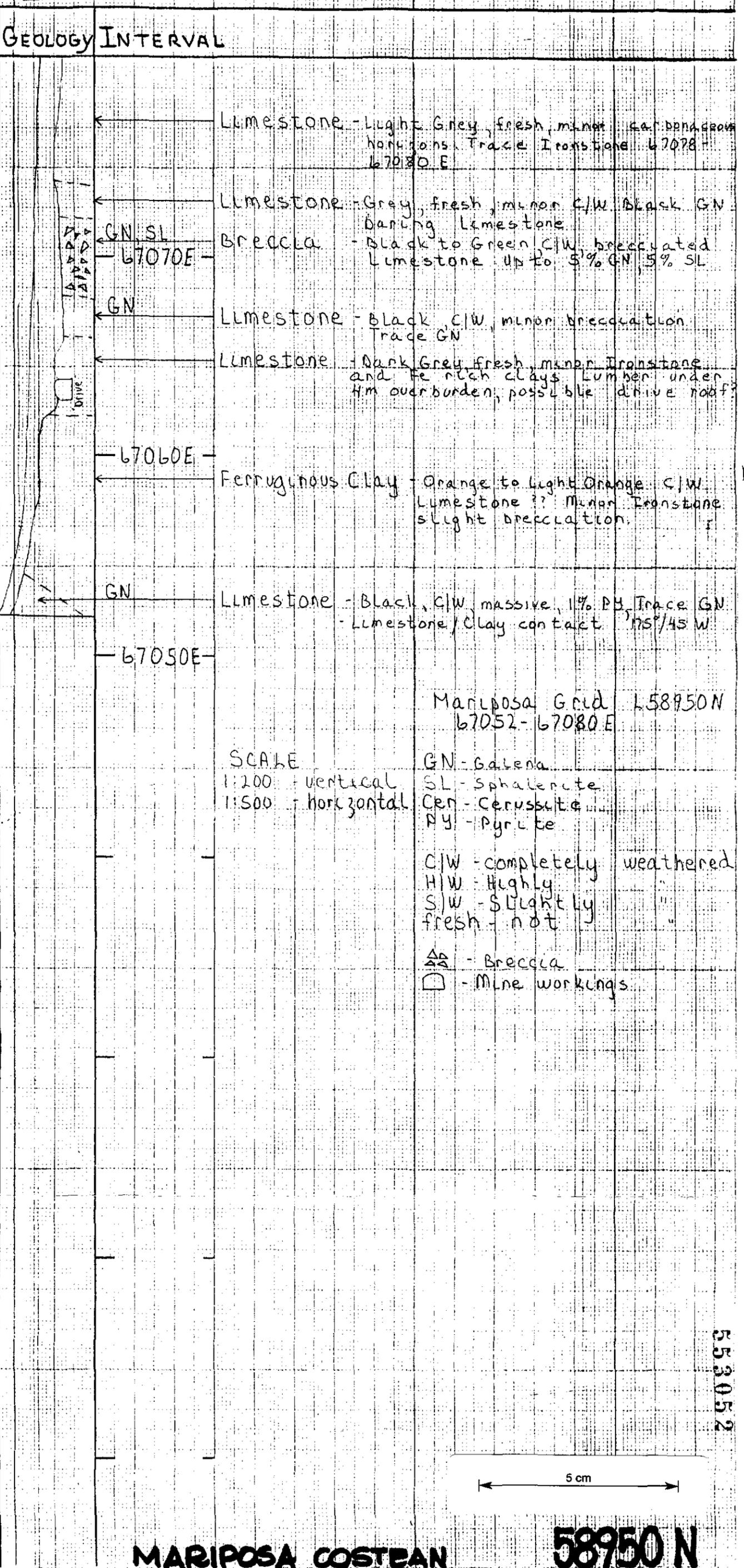
APPENDIX 2

MARIPOSA - DETAIL COSTEAN PLANS

051

L 58950 N

Cu	Pb	Zn	Ag	Sn	Sb	Mn	Cd
90	1.45%	765	54	X	14	7300	2.0
15	1500	275	115	X	X	625	1.5
20	2450	420	3.0	X	5	2000	1.0
45	3.77%	1.36%	33	X	27	245	125
70	15.5%	2.20%	205	X	86	205	135
60	11.9%	5850	59	X	37	195	90
30	6.58%	0.96%	44	X	24	245	200
190	16.6%	1800	17	19	78	540	X
220	1.35%	6800	14.5	3	6	1.75%	7.5
90	3350	5650	6.5	X	37	500	2.0
85	2400	7000	4.5	8	9	90	5.0
210	6300	5800	5.5	6	42	290	2.0
220	6000	5100	7.5	X	41	205	2.5
40	5800	2550	9.5	X	32	20	19.5



MARIPOSA COSTEAN

58950 N

055

L 59091 N

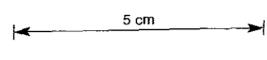
Cu	Pb	Zn	Ag	Sn	Sb	Mn	Cd	GEOLOGY	INTERVAL
10	255	450	X	X	X	220	0.5	Overburden	Limestone - Dark to Light grey, minor siderite veins. Trace PY. - very poor sample.
40	1350	270	1.0	X	3	25	0.5		← 6711DE - Clay - light grey, very viscous - at maximum reach of machine
10	65	35	X	X	X	35	X		← Sandstone - Rusty brown, poorly consolidated at maximum reach of machine. Recent tan banded clays.
25	230	115	X	X	X	35	X		
10	70	60	X	X	X	20	X		
5	160	150	X	X	X	20	X		Limestone - Black, H/W to S/W, fine grained, minor brachiopods.
35	1750	960	2.0	X	X	50	175		← 67100E - Limestone - Brown to Black, C/W, massive.
20	150	120	1.5	X	X	15	X		
20	60	65	1.0	X	X	205	X		
15	40	65	1.0	X	X	305	X		Limestone - Black, fresh, very fine grained, minor dolomite.
								NO T. SAMPLE	
10	60	145	X	3	X	45	X	NO T. SAMPLE	← 67090E -
10	120	295	X	X	X	35	X		
10	140	210	X	X	X	45	X		
10	65	65	X	X	X	110	X		Cer. Limestone - Dark grey, fresh, fine grained, very hard. Trace Cer.
10	135	475	X	X	X	85	0.5		
20	205	140	X	X	5	205	X		← 6708DE - Limestone - Black C/W, minor ferruginous horizons.
25	2400	370	3.5	X	21	65	X		
25	2200	1600	14.0	X	22	1700	X		Silty Limestone - Orange/Red C/W, very ferruginous, well laminated.
35	1.38%	4300	12	6	21	1.38%	0.5		Ironstone
									W
									← 67070E -

Mariposa Grid L 59091 N
67074 - 67114 E

GN - Galena
SL - Sphalerite
PY - Pyrite
Cer - Cerussite

C/W - Completely weathered
H/W - Highly
S/W - slightly
fresh - not weathered

A_r - Breccia
S_o - Gravel



MARIPOSA COSTEAN

59091 N

056

59100N

Cu	Pb	Zn	Ag	Sn	Sb	Mn	Cd	GEOLOGY	INTERVAL
10	45	35	X	X	X	105	X		
5	40	25	X	X	X	90	X		Limestone - Light Grey, fresh, minor silicified horizons
15	55	35	X	X	X	130	X		Silty Limestone - Dark Grey, fresh, fine grained
10	45	25	X	X	X	155	X		
10	45	30	X	X	3	175	X		Limestone - Black, fresh, very fine grained, possibly silicified
15	60	50	X	X	X	125	X		-L7190E-
15	60	60	X	X	X	160	X		Limestone - Dark Grey to Black, fresh, slightly carbonaceous. Bedding 155°/80°W
10	50	35	X	X	X	195	X		
5	40	50	X	X	3	145	X		Limestone - Light Grey, fresh, well laminated. Minor dark grey horizons. Bedding 170°/0°
20	95	85	X	X	X	20	X		Siltstone - Orange, silty, ferruginous, minor limestone
25	110	70	X	X	X	30	X		-L7180E-
20	60	75	X	X	X	55	X		Siltstone - Brown-Green, silty, slightly ferruginous, minor brachiopod molds
15	70	95	X	X	X	70	0.5		Coral - Black silty, silicified, 80% coral. Bedding 160°/90°
10	60	90	X	X	X	145	X		Silty Limestone - Dark grey, fresh, Bedding 150°/75°W
15	110	120	X	X	X	145	X		Siltstone - Black, fresh, graphitic, minor siderite veining
15	90	175	X	X	X	115	0.5		-L7170E-
65	1550	1650	10	X	8	50	10.5		Silty Limestone - Black, H/W, fine grained, finely laminated. Minor Light Grey Limestone horizons. Bedding 155°/75°E
90	5900	1.03%	2.5	X	24	125	9.5		Limestone - Brown, silty, slightly sandy
145	104%	0.81%	4.0	X	27	55	210		Limestone - Black, silty, graphitic, minor brown sandy horizons
30	175	125	X	X	3	90	0.5		-L7160E-
	NO SAMPLE								
85	885	1000	2.0	X	7	15	8.0		Limestone - Dark Grey, silty, massive, very poor sample
55	705	3050	1.5	X	21	45	7.5		Limestone - Black to Dark Green, silty, with minor Breccia zones up to 20% PY
80	2550	4850	4.0	3	29	25	34.5		-GN, Cer, PY
85	2850	1.91%	7.5	X	29	30	105		Limestone - Black to Grey, silty, massive, up to 25% PY, Trace GN, Cer
									-L7150E-

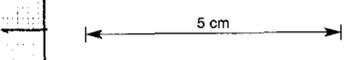
SCALE
 1:200 vertical
 1:500 horizontal

MARIPOSA Grid L 59100N
 67150 - 67200E

GN - Galena
 SL - Sphalerite
 PY - Pyrite
 Cer - Cerussite

C/W - Completely weathered
 H/W - Highly
 S/W - Slightly
 fresh - not

✓ - Bedding attitude
 X - overturned bedding
 Δ - Breccia



MARIPOSA COSTEAN

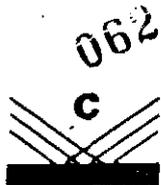
59100 N

53056

APPENDIX 3

STREAM SEDIMENT SURVEY - ANALYTICAL RESULT SHEETS

553062



COMLABS Pty. Ltd.
COMPUTERISED ANALYTICAL LABORATORIES

Head Office and
Central Laboratory
305 SOUTH ROAD,
MILE END SOUTH
STH. AUST. 5031
TEL: (08) 43 5722
TELEX: AA89323



NATA REGISTERED No. 1528

OUR REF: COM 830931

YOUR REF: Des. 4383 O/N 9390

Mr. P. Jones,
Amoco Minerals Aust. Ltd,
61 Counsel Street,
ZEEHAN. TAS. 7469.,

24.5.83

Dear Phil,

RE: JOB COM 830931

Enclosed are the assays for the samples delivered to our
laboratory on the 9th May, 1983.

Yours sincerely,
COMLABS PTY LTD

per :

c.c.: NORTH SYDNEY

063



ANALYTICAL REPORT

JOB COM830931

O/N : 4383

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Ag	Cr	Sn	Stream Sec panned conc
88210 B	140	4900	2600	85	13	1350	60	
88211 B	220	880	4300	110	20	2400	140	
88212 B	100	3450	2200	100	7	340	70	
88213 B	90	2200	1800	85	8	820	130	
88214 B	100	3900	2200	90	9	370	65	
88216 B	8	44	22	4	<1	24	10	
88217 B	16	50	65	20	<1	40	12	
88218 B	8	46	140	12	<1	75	<4	
88219 B	6	6	12	10	<1	80	<4	
88220 B	22	12	34	14	<1	110	<4	
88221 B	8	48	75	4	<1	120	10	
88222 B	4	12	10	4	<1	130	6	
88223 B	4	<4	80	4	<1	200	4	
88225 B	4	<4	42	4	<1	200	14	
88226 B	10	50	32	8	<1	70	<4	
88227 B	6	34	38	6	<1	65	<4	
88228 B	2	<4	4	4	<1	160	4	
88229 B	12	14	85	38	<1	430	6	
88230 B	4	<4	14	4	<1	390	<4	
88231 B	6	22	16	6	<1	110	4	
88232 B	4	6	4	4	<1	85	4	
88233 B	2	<4	20	4	<1	1300	8	
88234 B	135	2900	2700	125	8	670	200	
88235 B	18	270	120	18	<1	660	44	
88236 B	580	6000	3400	165	13	770	100	

54



553064

ANALYTICAL REPORT

JOB COM830931

O/N : 4383

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Ag	Cr	Sn	Stream Sed panned. conc.
88237 B	10	34	60	16	<1	55	6	
88238 B	10	22	70	26	<1	70	6	
88239 B	12	24	70	22	<1	65	6	
88240 B	8	20	60	22	<1	65	<4	
88241 B	6	16	38	20	<1	55	<4	
88242 B	8	50	85	22	<1	130	6	
88243 B	2	6	6	4	<1	95	4	
<hr/>								
88158 A	6	36	46	<4	<1	4	<4	Stream Sed -80 mesh
88159 A	2	16	22	<4	<1	8	8	
88160 A	6	36	60	<4	1	6	<4	
88161 A	2	8	14	<4	<1	6	6	
88162 A	2	16	18	<4	<1	8	4	
88163 A	4	14	16	<4	<1	8	8	
88164 A	4	22	20	<4	<1	8	6	
88165 A	2	8	16	<4	<1	8	<4	
88166 A	6	38	55	<4	<1	4	<4	
88167 A	10	75	125	14	<1	14	10	
88168 A	6	70	65	10	<1	85	10	
88169 A	2	22	12	<4	<1	6	8	
88170 A	2	18	12	<4	<1	4	4	
88171 A	2	30	22	<4	1	<4	6	
88172 A	6	16	24	<4	2	6	8	
88173 A	4	40	32	<4	<1	4	8	
88174 A	4	46	40	<4	1	8	8	
88175 A	4	46	16	<4	<1	10	<4	

065-



ANALYTICAL REPORT

553065

JOB COM830931

O/N : 4383

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Ag	Cr	Sn	Stream sed -80 fraction
88210 A	90	1800	1550	105	7	430	210	
88211 A	80	1550	1000	105	5	150	180	
88212 A	125	1500	1150	80	5	240	430	
88213 A	100	1900	1350	120	7	140	190	
88214 A	155	1650	1200	70	8	320	680	
88215 A	32	900	340	26	3	34	80	
88216 A	6	55	14	4	<1	8	10	
88217 A	24	80	50	16	<1	12	14	
88218 A	10	36	40	10	<1	10	10	
88219 A	10	24	14	6	<1	20	4	
88220 A	12	22	16	6	<1	22	8	
88221 A	8	130	120	6	1	22	16	
88222 A	4	28	20	4	<1	16	4	
88223 A	2	14	10	<4	<1	6	8	
88224 A	6	26	32	<4	<1	8	6	
88225 A	10	44	20	4	11	6	6	
88226 A	4	22	14	4	<1	8	6	
88227 A	8	65	40	4	<1	4	18	
88228 A	4	16	12	<4	<1	10	12	
88229 A	6	26	22	4	<1	55	12	
88230 A	8	22	28	4	<1	80	8	
88231 A	4	18	14	4	<1	10	4	
88232 A	6	24	14	<4	<1	10	4	
88233 A	6	18	18	4	<1	130	8	
88234 A	95	1250	1250	110	4	180	280	

066

553066



ANALYTICAL REPORT

JOB CON830931

O/N : 4383

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Ag	Cr	Sn	Stream Sed 8-80 fractio
88235 A	20	230	130	14	<1	100	8	
88236 A	550	1650	670	110	7	290	195	
88237 A	12	38	32	10	<1	10	<4	
88238 A	12	75	60	10	<1	12	12	
88239 A	12	24	30	16	<1	12	10	
88240 A	6	24	10	6	<1	18	<4	
88241 A	12	44	36	14	<1	16	<4	
88242 A	24	38	60	16	<1	65	4	
88243 A	6	34	22	10	<1	12	8	

Method of Analysis : Cu Pb Zn Ni : AAS1
 Cr : AAS2
 Ag : AAS3
 Au : AAS5A
 Sn : XRF1

067

553067



COMLABS Pty. Ltd.
COMPUTERISED ANALYTICAL LABORATORIES

Head Office and
Central Laboratory
305 SOUTH ROAD,
MILE END SOUTH
STH. AUST. 5031
TEL.: (08) 43 5722
TELEX: A489323



NATA REGISTERED No. 1526

OUR REF.: COM 830889
YOUR REF.: Des. 4381 O/N 9388

Mr. P. Jones,
Amoco Minerals Aust. Ltd,
61 Counsel Street,
ZEEHAN. TAS. 7469,

11.5.83

Dear Phil,

RE: JOB COM 830889

Enclosed are the assays for the samples delivered to our
laboratory on the 4th May, 1983.

Yours sincerely,
COMLABS PTY LTD

per :

c.c.: NORTH SYDNEY

068



ANALYTICAL REPORT

JOB COM830889

O/N : 4381

SAMPLE	Results in ppm	Stream panned	Sample conc.
	Sn		
88158 B	8		
88159 B	6		
88160 B	6		
88161 B	4		
88162 B	<4		
88163 B	<4		
88164 B	6		
88165 B	<4		
88167 B	55		
88168 B	14		
88170 B	4		
88171 B	<4		
88173 B	30		
88174 B	4		
88175 B	4		

Method of Analysis : Sn : XRF1

069

553069



- 7 -



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ANALYTICAL REPORT

JOB COM830889

O/N : 4381

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag	Ni	Cr	Au
88158 B	4	80	110	1	<4	110	<0.05
88159 B	<2	28	28	<1	<4	110	<0.05
88160 B	4	60	40	1	<4	80	<0.05
88161 B	2	14	12	<1	<4	100	<0.05
88162 B	2	<4	6	<1	<4	160	<0.05
88163 B	2	<4	8	<1	<4	140	<0.05
88164 B	2	<4	4	<1	<4	125	<0.05
88165 B	2	<4	4	<1	<4	170	<0.05
88167 B	4	<4	32	1	4	320	<0.05
88168 B	6	12	10	<1	6	250	<0.05
88170 B	4	155	480	1	<4	46	<0.05
88171 B	6	70	30	<1	<4	160	<0.05
88173 B	6	22	12	<1	<4	470	<0.05
88174 B	4	14	8	<1	<4	100	<0.05
88175 B	4	44	110	<1	<4	80	<0.05

Method of Analysis : Cu Pb Zn Ni : AAS1
 Cr : AAS2
 Ag : AAS3
 Au : AAS5A



COMLABS Pty. Ltd.
COMPUTERISED ANALYTICAL LABORATORIES

553070

Head Office and
Central Laboratory
305 SOUTH ROAD,
MILE END SOUTH
STH. AUST. 5031
TEL: (08) 43 5722
TELEX: AA89323



NATA REGISTERED No. 1526

OUR REF: COM 830819
YOUR REF: Despatch 4380

Mr. P. Jones,
Amoco Minerals Aust. Ltd,
61 Counsel Street,
ZEEHAN. TAS. 7469,

3.5.83

Dear Phil,

RE: JOB COM 830819

Enclosed are the assays for the samples delivered to our
laboratory on the 27th April, 1983.

Yours sincerely,
COMLABS PTY LTD

per :

c.c.: NORTH SYDNEY

071

553071



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ANALYTICAL REPORT

JOB COM830819

O/N : 4380

SAMPLE	Results in ppm					Stream	Sediments	Sn
	Cu	Pb	Zn	Ag	Ni	panned	conc.	
88044 B	14	155	120	<1	20	38	0.10	4
88045 B	8	145	90	1	4	60	<0.05	10
88047 B	12	130	38	1	<4	150	<0.05	38
92377 B	6	<4	30	1	8	5000	<0.05	<4
92378 B	6	<4	80	<1	16	1.40%	<0.05	4
92379 B	4	<4	10	<1	8	1350	<0.05	<4

Method of Analysis : Cu Pb Zn Ni : AAS1
 Cr : AAS2/ZA
 Ag : AAS3
 Au : AAS5A
 Sn : XRF1

072

553072



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STH. AUST. 5031
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TELEX: AA89323



NATA REGISTERED No. 1526

OUR REF.: COM 830763
YOUR REF.: Des. 4378 O/N E 9382

Mr. P. Jones,
Amoco Minerals Aust. Co.,
61 Counsel Street,
ZEEHAN TAS 7469,

27.4.83

Dear Phil,

RE: JOB COM 830763

Enclosed are the assays for the samples delivered to our
laboratory on the 19th April 1983.

Yours sincerely,
COMLABS PTY LTD

per :



ANALYTICAL REPORT

JOB COM830763

O/N : 4378

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Ag	Stream Sediment panned conc.
88027 B	4	12	4	<4	<1	"
88028 B	4	4	14	10	<1	"
88029 B	4	10	6	<4	<1	"
88030 B	4	<4	6	6	<1	"
88031 B	4	10	22	8	<1	"
88032 B	8	75	36	16	1	"
88033 B	4	6	12	12	<1	"
88034 B	4	16	8	<4	<1	"
88035 B	4	20	8	4	<1	"
88036 B	4	8	6	6	1	"
88037 B	4	6	4	<4	<1	"
88038 B	4	<4	8	<4	<1	"
88039 B	4	<4	12	<4	<1	"
88040 B	6	20	28	12	<1	"
88041 B	6	26	38	10	1	"
88042 B	6	26	22	14	<1	"
88043 B	6	38	140	16	<1	"
88048 B	12	200	290	32	1	"
88049 B	10	120	300	24	1	"
88050 B	10	320	360	14	<1	"
88051 B	32	710	880	16	3	"
88052 B	30	1300	700	22	2	"
88027 A	4	12	8	<4	<1	Stream Sediments
88028 A	4	10	8	<4	<1	"
88029 A	6	24	16	6	<1	"

075

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 553075
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ANALYTICAL REPORT

JOB COM830763

O/N : 4378

Results in ppm

SAMPLE	Sn	Cr	Au	Stream Sediments panned conc.
88027 B	6	44	<0.05	"
88028 B	14	48	<0.05	"
88029 B	4	240	<0.05	"
88030 B	8	95	<0.05	"
88031 B	<4	230	<0.05	"
88032 B	<4	20	<0.05	"
88033 B	4	90	<0.05	"
88034 B	4	30	<0.05	"
88035 B	<4	36	<0.05	"
88036 B	<4	50	<0.05	"
88037 B	6	75	<0.05	"
88038 B	10	240	<0.05	"
88039 B	4	270	<0.05	"
88040 B	4	100	<0.05	"
88041 B	4	100	<0.05	"
88042 B	4	65	<0.05	"
88043 B	4	90	<0.05	"
88048 B	<4	55	<0.05	"
88049 B	6	28	<0.05	"
88050 B	<4	380	<0.05	"
88051 B	6	150	<0.05	"
88052 B	10	210	<0.05	"
<hr/>				
88027 A	6	10	<0.05	stream Sediments -80 mesh
88028 A	4	6	<0.05	"
88029 A	8	20	<0.05	"

c 076

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ANALYTICAL REPORT

JOB COM830763

O/N : 4378

Results in ppm

SAMPLE	Sn	Cr	Au	Stream Sediments -80 mesh
88030 A	<4	10	<0.05	
88031 A	6	24	<0.05	
88032 A	10	12	<0.05	
88033 A	8	10	<0.05	
88034 A	12	6	<0.05	
88035 A	<4	8	<0.05	
88036 A	6	8	<0.05	
88037 A	4	4	<0.05	
88038 A	6	32	<0.05	
88039 A	12	46	<0.05	
88040 A	8	14	<0.05	
88041 A	4	14	<0.05	
88042 A	6	12	<0.05	
88043 A	10	12	<0.05	
88044 A	6	12	<0.05	
88045 A	4	10	<0.05	
88046 A	22	8	<0.05	
88047 A	14	6	<0.05	
88048 A	4	20	<0.05	
88049 A	14	28	<0.05	
88050 A	8	50	<0.05	
88051 A	4	14	<0.05	
88052 A	6	80	<0.05	

Method of Analysis : Sn : XRF1
Cr : AAS2
Au : AASSA



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TELEX: AA89323



NATA REGISTERED No. 1526

OUR REF: COM 830634
YOUR REF: Despatch 4377 Order E 9375

Mr. P. Jones,
Amoco Minerals Aust. Ltd,
61 Counsel Street,
ZEEHAN. TAS. 7469,

12.4.83

Dear Phil,

RE: JOB COM 830634

Enclosed are the assays for the samples delivered to our
laboratory on the 5th April, 1983.

Yours sincerely,
COMLABS PTY LTD

per : 

c.c.: NORTH SYDNEY

079

553079



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- 7 -



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ANALYTICAL REPORT

JOB COM830634

O/N : 4377

Stream Sediments Results in ppm

-80 mesh	SAMPLE	Ni	Cr	Au
	92377 A	8	1.75%	<0.05
	92378 A	20	3.90%	<0.05
	92379 A	<4	500	<0.05

Method of Analysis :

Ni	:	AAS1
Cr	:	AAS2/AAS4 Fusion
Au	:	AAS5A

080

553080



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TELEX: AA80323



NATA REGISTERED No. 1526

OUR REF: COM 830622
YOUR REF: Despatch 4376 Order E 9374

Mr. P. Jones,
Amoco Minerals Aust. Ltd,
61 Counsel Street,
ZEEHAN. TAS. 7469,

8.4.83

Dear Phil,

RE: JOB COM 830622

Enclosed are the assays for the samples delivered to our
laboratory on the 31st March, 1983.

Yours sincerely,
COMLABS PTY LTD

per :

c.c.: NORTH SYDNEY

081

553081



ANALYTICAL REPORT

JOB COM830622

O/N : 4376

SAMPLE	Results in ppm					Stream Sediments
	Cu	Pb	Zn	Ag	Sn	
92225 A	6	10	6	<1	<4	
92226 A	10	20	12	<1	4	
92225 B	6	8	6	<1	<4	
92226 B	4	6	4	<1	<4	

Method of Analysis : Cu Pb Zn : AAS1
 Ag : AAS3
 Sn : XRFL

082



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- 17 -



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ANALYTICAL REPORT

JOB COM830622

O/N : 4376

Results in ppm *Stream Sediments*

SAMPLE	Ni	Cr	Au
92225 A	6	36	<0.05
92226 A	<4	40	<0.05
92225 B	<4	160	<0.05
92226 B	<4	140	0.10

Method of Analysis : Ni : AAS1
Cr : AAS2
Au : AAS5A

033

553083



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NATA REGISTERED No. 1526

OUR REF.: COM 830546
YOUR REF.: O/N E 9369 Des. 4375

Mr. G. Kary,
Amoco Minerals Aust. Ltd.,
61 Counsel Street,
ZEEHAN TAS 7469,

6.4.83

Dear Greg,

RE: JOB COM 830546

Enclosed are the assays for the samples delivered to our
laboratory on the 24th March 1983.

Yours sincerely,
COMLABS PTY LTD

per :

c.c.: Mr. B. Roxburgh



ANALYTICAL REPORT

JOB COM830546

O/N : 4375

 Results in ppm *Stream Sediments*

SAMPLE	Cu	Pb	Zn	Ag	Au	Ni	Cr	Sn
92201 A	14	22	18	1	0.10	<4	38	<4
92202 A	10	22	18	1	<0.05	<4	34	<4
92203 A	16	40	60	1	<0.05	16	18	6
92204 A	12	22	16	<1	<0.05	<4	16	<4
92205 A	22	40	40	<1	<0.05	8	30	<4
92206 A	10	16	22	1	<0.05	<4	6	6
92207 A	12	22	26	<1	<0.05	<4	10	<4
92208 A	12	16	24	1	<0.05	<4	14	<4
92209 A	26	42	140	1	<0.05	42	28	6
92210 A	26	32	50	1	<0.05	18	16	4
92211 A	24	50	60	<1	<0.05	18	24	4
92212 A	28	44	100	1	<0.05	34	22	4
92213 A	18	40	50	<1	<0.05	12	22	<4
92214 A	22	65	70	1	<0.05	20	20	4
92215 A	20	38	70	1	<0.05	18	20	6
92216 A	18	32	70	1	<0.05	12	20	<4
92217 A	16	42	36	1	<0.05	<4	18	6
92218 A	24	40	44	1	<0.05	8	16	4
92219 A	14	24	36	1	<0.05	<4	12	<4
92220 A	14	28	42	1	<0.05	6	6	4
92221 A	14	16	26	1	<0.05	8	6	4
92222 A	8	22	24	1	<0.05	<4	8	4
92223 A	6	18	26	1	<0.05	4	8	6
92224 A	4	14	20	1	<0.05	<4	4	<4
92227 A	4	10	20	1	<0.05	<4	4	<4

553085



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ANALYTICAL REPORT

JOB COM830546

O/N : 4375

Results in ppm *Stream Sediments*

SAMPLE	Cu	Pb	Zn	Ag	Au	Ni	Cr	Sn
92228 A	4	12	28	1	<0.05	<4	8	<4
92229 A	6	10	26	1	<0.05	<4	28	4
92230 A	8	20	26	1	<0.05	<4	8	6
92231 A	8	16	20	1	<0.05	<4	18	4
92232 A	10	34	42	1	<0.05	<4	32	4
92233 A	6	12	16	1	<0.05	8	110	<4
92234 A	4	12	16	1	<0.05	4	100	6
92235 A	4	14	20	1	<0.05	6	65	<4
92236 A	4	12	20	1	<0.05	<4	150	<4
92237 A	2	12	20	1	<0.05	<4	75	<4
92238 A	2	10	18	1	<0.05	<4	30	4
92239 A	4	10	22	1	<0.05	<4	50	<4
92240 A	4	18	24	1	<0.05	<4	70	<4
92241 A	2	6	16	1	<0.05	<4	32	4
92242 A	6	70	60	1	<0.05	<4	760	<4
92243 A	14	100	30	1	<0.05	<4	34	<4
92244 A	10	95	32	1	<0.05	<4	140	4
92245 A	4	10	18	1	<0.05	<4	75	<4
92246 A	8	12	20	2	<0.05	4	44	<4
92247 A	6	40	44	1	<0.05	12	540	4
92248 A	50	180	140	1	<0.05	14	75	10
92249 A	8	16	28	2	<0.05	8	1000	4
92250 A	4	6	20	1	<0.05	<4	24	4
92251 A	4	10	18	1	<0.05	<4	4	<4
92252 A	2	4	16	1	<0.05	<4	18	4

085

086



ANALYTICAL REPORT

JOB COM830546

O/N : 4375

SAMPLE	Results in ppm Stream Sediments							
	Cu	Pb	Zn	Ag	Au	Ni	Cr	Sn
92253 A	6	18	20	1	<0.05	<4	20	4
92254 A	8	16	26	1	<0.05	4	14	4
92255 A	14	30	80	1	<0.05	38	18	4
92256 A	14	80	50	1	<0.05	22	16	4
92257 A	12	22	48	1	<0.05	24	28	4
92258 A	12	24	44	1	<0.05	18	22	<4
92259 A	14	125	130	1	<0.05	18	18	<4
92260 A	<2	10	22	1	<0.05	<4	14	4
92261 A	6	18	24	1	<0.05	<4	12	6
92262 A	6	20	20	1	<0.05	<4	22	<4
92263 A	8	70	40	1	<0.05	8	4	<4
92264 A	4	6	12	<1	<0.05	8	4	6
92265 A	12	24	20	1	<0.05	10	22	<4
92266 A	18	32	28	1	0.10	14	20	6
92267 A	10	18	18	1	0.10	8	16	<4
92268 A	46	30	100	1	<0.05	60	30	<4
92269 A	38	44	70	2	<0.05	32	28	<4
92270 A	10	22	24	1	<0.05	14	16	6
92271 A	12	18	32	1	<0.05	18	16	6
92272 A	32	34	44	8	<0.05	18	30	<4
92273 A	10	8	20	1	<0.05	8	16	4
92274 A	6	12	20	1	<0.05	6	12	4
92275 A	6	12	18	1	0.05	8	8	<4
92276 A	4	10	8	1	0.10	<4	12	6
92277 A	4	6	16	1	<0.05	8	18	<4



ANALYTICAL REPORT

JOB COM830546

O/N : 4375

Results in ppm Stream Sediments

SAMPLE	Cu	Pb	Zn	Ag	Au	Ni	Cr	Sn
92278 A	4	12	16	1	<0.05	8	12	4
92201 B	4	8	42	1	<0.05	10	2800	<4
92202 B	4	6	22	1	<0.05	4	280	<4
92203 B	4	10	32	1	<0.05	10	105	6
92204 B	4	16	60	1	<0.05	8	105	4
92205 B	8	16	44	1	<0.05	16	65	<4
92206 B	4	6	16	1	0.10	10	65	<4
92207 B	2	4	20	1	0.10	14	85	<4
92208 B	4	<4	14	1	<0.05	10	100	<4
92209 B	12	32	90	1	<0.05	38	70	<4
92210 B	6	8	30	1	<0.05	20	65	<4
92211 B	10	28	140	1	<0.05	60	55	<4
92212 B	12	20	110	1	<0.05	50	65	4
92213 B	8	12	30	1	<0.05	18	145	4
92214 B	6	22	30	1	<0.05	20	75	8
92215 B	6	14	50	<1	<0.05	32	65	6
92216 B	8	14	65	<1	<0.05	26	80	6
92217 B	6	16	30	<1	<0.05	14	65	6
92218 B	4	8	20	<1	<0.05	6	70	<4
92219 B	4	8	24	<1	<0.05	12	105	6
92220 B	4	10	30	<1	<0.05	<4	60	4
92221 B	<2	<4	12	<1	<0.05	<4	65	<4
92222 B	2	<4	12	<1	<0.05	<4	145	<4
92223 B	<2	<4	16	<1	<0.05	<4	260	<4
92224 B	<2	<4	26	<1	<0.05	<4	640	4

PC



ANALYTICAL REPORT

JOB COM830546

O/N : 4375

SAMPLE	Results in ppm						Stream Sediments	
	Cu	Pb	Zn	Ag	Au	Ni	Cr	Sn
92227 B	<2	<4	12	<1	<0.05	<4	800	<4
92228 B	2	<4	12	<1	<0.05	<4	110	<4
92229 B	<2	<4	14	<1	<0.05	<4	125	<4
92230 B	<2	8	18	<1	<0.05	<4	350	<4
92231 B	<2	8	20	<1	<0.05	4	240	<4
92232 B	4	28	75	<1	<0.05	4	100	<4
92233 B	2	<4	16	<1	<0.05	<4	130	6
92234 B	<2	<4	18	<1	<0.05	<4	140	<4
92235 B	<2	<4	20	<1	<0.05	<4	130	<4
92236 B	<2	16	26	<1	<0.05	<4	120	<4
92237 B	<2	6	16	<1	<0.05	<4	130	<4
92238 B	2	<4	12	<1	<0.05	<4	175	4
92239 B	2	6	50	<1	<0.05	8	3000	4
92240 B	2	22	16	<1	<0.05	<4	90	4
92241 B	2	50	30	<1	<0.05	<4	180	4
92242 B	2	48	70	<1	<0.05	<4	195	4
92243 B	4	32	90	<1	<0.05	<4	750	<4
92244 B	6	32	90	<1	<0.05	<4	100	<4
92245 B	2	<4	44	<1	<0.05	4	360	8
92246 B	2	<4	16	<1	<0.05	<4	190	4
92247 B	14	30	190	1	<0.05	26	2.50%	12
92248 B	14	50	70	1	<0.05	10	230	<4
92249 B	4	<4	12	<1	<0.05	4	750	<4
92250 B	4	<4	12	<1	<0.05	<4	830	<4
92251 B	4	<4	10	<1	<0.05	4	180	4



ANALYTICAL REPORT

JOB COM830546

O/N : 4375

Results in ppm *Stream Sediments*

SAMPLE	Cu	Pb	Zn	Ag	Au	Ni	Cr	Sn
92252 B	2	<4	10	<1	<0.05	<4	80	<4
92253 B	2	<4	10	<1	<0.05	<4	95	<4
92254 B	6	4	20	<1	<0.05	8	95	<4
92255 B	16	26	120	<1	<0.05	44	32	4
92256 B	8	34	40	<1	<0.05	20	50	<4
92257 B	6	16	55	1	<0.05	34	50	4
92258 B	8	12	36	<1	<0.05	22	50	<4
92259 B	8	150	80	1	<0.05	28	70	4
92260 B	4	10	20	<1	<0.05	16	65	<4
92261 B	4	6	16	<1	<0.05	6	95	<4
92262 B	2	8	22	<1	<0.05	<4	360	<4
92263 B	105	1700	8	23	<0.05	<4	95	24
92264 B	16	250	155	2	<0.05	<4	90	4
92265 B	8	4	26	<1	<0.05	4	36	<4
92266 B	8	4	22	<1	0.10	6	50	<4
92267 B	6	6	22	1	<0.05	10	65	<4
92268 B	28	12	90	<1	<0.05	40	55	4
92269 B	12	10	36	<1	<0.05	14	50	<4
92270 B	8	8	24	1	<0.05	6	80	<4
92271 B	10	12	42	<1	<0.05	16	60	<4
92272 B	2	<4	14	<1	<0.05	<4	55	4
92273 B	4	<4	14	<1	<0.05	<4	75	<4
92274 B	4	8	26	<1	<0.05	6	65	6
92275 B	4	8	26	<1	<0.05	8	50	10
92276 B	4	12	65	<1	<0.05	8	50	4



ANALYTICAL REPORT

JOB COM830546

O/N : 4375

Results in ppm Stream Sediments

SAMPLE	Cu	Pb	Zn	Ag	Au	Ni	Cr	Sn
92277 B	6	<4	<4	<1	<0.05	<4	65	<4
92278 B	2	6	6	<1	<0.05	<4	55	4
92595 B	200	9300	3.10%	39	<0.05	14	350	105
92596 B	8	10	20	1	<0.05	<4	570	36

Method of Analysis : Cu Pb Zn Ni : AAS1
 Cr : AAS2
 Ag : AAS3
 Au : AAS5A
 Sn : XRF1

553091



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NATA REGISTERED No. 1528

OUR REF: COM 830360

YOUR REF: O/N E 9358 Des. 4374

Mr. P. Jones,
Amoco Minerals Aust. Co.,
61 Counsel Street,
ZEEHAN TAS 7469,

9.3.83

Dear Phil,

RE: JOB COM 830360

Enclosed are the assays for the samples delivered to our
laboratory on the 28th February 1983.

Yours sincerely,
COMLABS PTY LTD

per : 

c.c.: Mr. S. Fowler



ANALYTICAL REPORT

JOB COM830360

O/N : 4374

Results in ppm

SAMPLE	Sn	Stream Sediments
92137 A	36	
92138 A	4	
92139 A	<4	
92140 A	<4	
92141 A	4	
92142 A	6	
92143 A	<4	
92144 A	4	
92145 A	<4	
92146 A	4	
92147 A	<4	
92148 A	<4	
92149 A	6	
92150 A	8	
92151 A	<4	
92152 A	<4	
92153 A	<4	
92154 A	<4	
92155 A	4	
92156 A	6	
92157 A	6	
92158 A	6	
92159 A	105	
92160 A	140	
92161 A	4	

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ANALYTICAL REPORT

JOB COM830360

O/N : 4374

Results in ppm

SAMPLE	Sn	Stream Sediments
92162 A	<4	
92163 A	6	
92164 A	<4	
92165 A	<4	
92166 A	100	
92167 A	170	
92168 A	8	
92169 A	<4	
92170 A	6	
92171 A	4	
92172 A	6	
92173 A	<4	
92174 A	<4	
92175 A	8	
92176 A	4	
92177 A	8	
92178 A	6	
92179 A	<4	
92180 A	<4	
92181 A	<4	
92182 A	6	
92183 A	250	
92184 A	4	
92185 A	230	
92186 A	2150	

094



ANALYTICAL REPORT

JOB COM830360

O/N : 4374

Results in ppm

SAMPLE	Sn	Stream sediments
92187 A	18	
92188 A	<4	
92189 A	4	
92190 A	990	
92191 A	<4	
92192 A	<4	
92193 A	16	
92194 A	180	
92195 A	4	
92196 A	<4	
92197 A	4	
92198 A	<4	
92199 A	4	
92200 A	6	
<hr/>		
92169 B	6	PC
92170 B	4	
92171 B	<4	
92172 B	<4	
92173 B	<4	
92174 B	<4	
92175 B	6	
92176 B	4	
92177 B	4	
92178 B	4	
92179 B	<4	



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ANALYTICAL REPORT

JOB COM830360

O/N : 4374

Results in ppm

SAMPLE	Sn
92180 B	4
92181 B	<4
92182 B	<4
92183 B	95
92184 B	16
92185 B	70
92186 B	220
92187 B	6
92188 B	<4
92189 B	<4
92190 B	95
92191 B	<4
92192 B	<4
92193 B	6
92194 B	125
92195 B	<4
92196 B	4
92197 B	<4
92198 B	<4
92199 B	4
92200 B	<4

Stream Sediments *pc*

Method of Analysis : Sn : XRFI

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ANALYTICAL REPORT

JOB COM830360

O/N : 4374

Results in ppm

Stream Sediments

SAMPLE	Cu	Pb	Zn	Ni	Cr	Ag	Au
92137 A	42	900	870	40	30	4	<0.05
92138 A	16	50	80	20	48	<1	<0.05
92139 A	10	44	32	12	16	1	<0.05
92140 A	10	24	22	6	48	<1	<0.05
92141 A	8	28	28	<4	26	<1	<0.05
92142 A	8	50	55	<4	22	<1	<0.05
92143 A	4	12	10	<4	6	<1	<0.05
92144 A	6	18	22	8	10	<1	<0.05
92145 A	6	12	20	<4	8	<1	<0.05
92146 A	8	26	36	16	14	<1	<0.05
92147 A	6	14	22	10	8	<1	<0.05
92148 A	4	6	14	<4	6	<1	<0.05
92149 A	8	24	28	<4	26	<1	<0.05
92150 A	18	75	95	<4	4	<1	<0.05
92151 A	2	6	8	<4	10	<1	<0.05
92152 A	4	12	16	<4	8	<1	<0.05
92153 A	6	105	110	<4	6	<1	<0.05
92154 A	4	12	16	<4	8	<1	<0.05
92155 A	6	20	18	8	10	<1	<0.05
92156 A	6	30	14	<4	8	<1	<0.05
92157 A	8	24	24	<4	8	<1	<0.05
92158 A	14	22	80	8	24	<1	0.30
92159 A	65	820	1100	16	26	10	0.30
92160 A	115	1700	2300	14	85	13	0.25
92161 A	20	95	150	20	30	1	<0.05

ANALYTICAL REPORT

097

JOB COM830360

O/N : 4374

SAMPLE	Results in ppm					Stream Sediments	
	Cu	Pb	Zn	Ni	Cr	Ag	Au
92162 A	8	34	44	4	90	<1	<0.05
92163 A	10	95	80	6	28	<1	<0.05
92164 A	4	<4	12	<4	<4	<1	<0.05
92165 A	4	18	18	6	8	<1	<0.05
92166 A	55	510	1000	<4	80	9	0.25
92167 A	65	800	790	16	32	15	0.40
92168 A	8	14	18	10	10	<1	<0.05
92169 A	12	28	26	6	12	<1	<0.05
92170 A	4	14	20	<4	8	<1	<0.05
92171 A	6	12	10	<4	8	<1	<0.05
92172 A	4	10	12	<4	12	<1	<0.05
92173 A	110	38	75	12	10	<1	<0.05
92174 A	75	38	60	12	16	<1	<0.05
92175 A	60	38	75	28	34	<1	<0.05
92176 A	65	46	90	16	22	<1	<0.05
92177 A	60	30	55	18	32	<1	<0.05
92178 A	12	46	28	10	14	<1	<0.05
92179 A	38	46	60	18	16	<1	<0.05
92180 A	16	50	70	22	18	<1	<0.05
92181 A	8	14	16	4	18	<1	<0.05
92182 A	10	50	65	16	16	<1	<0.05
92183 A	70	1000	950	110	390	4	<0.05
92184 A	8	150	60	8	10	<1	<0.05
92185 A	75	1450	1000	130	36	3	<0.05
92186 A	160	1900	1250	85	300	8	<0.05

ANALYTICAL REPORT

098

JOB COM830360

O/N : 4374

Results in ppm

Stream Sediments

SAMPLE	Cu	Pb	Zn	Ni	Cr	Ag	Au
92187 A	42	120	150	28	12	1	<0.05
92188 A	6	10	8	<4	4	<1	<0.05
92189 A	18	18	18	<4	14	<1	<0.05
92190 A	130	4800	1800	85	65	15	<0.05
92191 A	38	24	26	<4	6	<1	<0.05
92192 A	190	18	22	<4	16	<1	<0.05
92193 A	42	300	125	22	12	<1	<0.05
92194 A	70	2300	1200	160	75	6	<0.05
92195 A	6	14	18	<4	160	<1	<0.05
92196 A	10	14	18	<4	22	<1	<0.05
92197 A	12	34	40	8	8	<1	<0.05
92198 A	20	32	24	10	16	<1	<0.05
92199 A	170	44	95	24	20	<1	<0.05
92200 A	12	30	24	12	10	<1	<0.05
92169 B	4	<4	8	<4	90	<1	<0.05
92170 B	4	14	12	6	40	<1	<0.05
92171 B	4	4	8	<4	70	<1	<0.05
92172 B	2	4	10	<4	340	<1	<0.05
92173 B	26	28	85	22	120	<1	<0.05
92174 B	14	26	60	14	85	<1	<0.05
92175 B	16	28	80	20	110	<1	<0.05
92176 B	10	20	55	32	130	<1	<0.05
92177 B	18	16	46	18	220	1	<0.05
92178 B	4	16	20	8	200	<1	<0.05
92179 B	12	24	70	32	135	<1	<0.05

Pc

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ANALYTICAL REPORT

JOB COM830360

O/N : 4374

SAMPLE	Results in ppm						Stream Sediments	
	Cu	Pb	Zn	Ni	Cr	Ag	Au	
92180 B	8	105	870	50	2300	1	<0.05	
92181 B	8	8	14	10	190	<1	<0.05	
92182 B	4	12	36	12	145	<1	<0.05	
92183 B	110	5500	2200	90	80	12	<0.05	
92184 B	6	70	220	16	85	1	<0.05	
92185 B	110	6000	2700	120	140	11	<0.05	
92186 B	160	8500	3700	95	80	18	<0.05	
92187 B	12	75	50	14	32	1	<0.05	
92188 B	2	10	8	<4	36	<1	<0.05	
92189 B	4	14	20	<4	48	<1	<0.05	
92190 B	115	6000	2800	110	1500	12	<0.05	
92191 B	10	22	20	4	60	<1	<0.05	
92192 B	12	14	20	6	55	<1	<0.05	
92193 B	6	50	38	12	1500	1	<0.05	
92194 B	120	5200	2800	120	160	12	<0.05	
92195 B	8	12	8	<4	260	<1	<0.05	
92196 B	4	8	14	4	1350	<1	<0.05	
92197 B	4	12	26	6	270	<1	<0.05	
92198 B	4	4	22	4	2200	<1	<0.05	
92199 B	20	18	50	16	200	<1	<0.05	
92200 B	4	8	20	10	95	<1	<0.05	

Method of Analysis : Cu Pb Zn Ni : AAS1
 Cr : AAS2
 Ag : AAS3
 Au : AAS5A

553100



COMLABS Pty. Ltd.
COMPUTERISED ANALYTICAL LABORATORIES

Head Office and
Central Laboratory
305 SOUTH ROAD,
MILE END SOUTH
STH. AUST. 5031
TEL: (08) 43 5722
TELEX: AA89323



NATA REGISTERED No. 1526

OUR REF: COM 830315

YOUR REF: O/N 9353 D/N 4373

Mr. P. Jones,
Amoco Minerals Aust. Ltd.,
61 Counsel Street,
ZEEHAN TAS 7469,

25.2.83

Dear Phil,

RE: JOB COM 830315

Enclosed are the assays for the samples delivered to our
laboratory on the 21st February 1983.

Yours sincerely,
COMLABS PTY LTD

per :

c.c.: Mr. S. Fowler



ANALYTICAL REPORT

JOB COM830315

O/N : 4373

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag	Ni	Cr	Au
92101 B	<2	14	12	<1	<4	140	<0.05
92102 B	<2	22	48	<1	<4	470	<0.05
92103 B	<2	<4	16	<1	<4	790	<0.05
92104 B	14	24	110	<1	22	210	<0.05
92105 B	<2	<4	22	<1	<4	880	<0.05
92106 B	24	46	350	<1	85	450	<0.05
92107 B	2	<4	20	<1	<4	170	<0.05
92108 B	32	55	420	<1	100	380	<0.05
92109 B	<2	<4	6	<1	<4	120	<0.05
92110 B	<2	<4	16	<1	<4	500	<0.05
92111 B	6	36	36	<1	<4	160	<0.05
92112 B	6	16	80	<1	<4	1200	<0.05
92113 B	<2	<4	6	<1	<4	290	<0.05
92114 B	<2	75	28	<1	<4	140	<0.05
92115 B	<2	<4	34	<1	<4	1850	<0.05
92116 B	4	42	100	<1	<4	95	<0.05
92117 B	<2	55	42	<1	<4	440	<0.05
92118 B	<2	24	40	<1	<4	170	<0.05
92119 B	<2	<4	26	<1	<4	160	<0.05
92120 B	830	1.05Z	3.2Z	20	16	130	<0.05
92121 B	4	240	150	<1	<4	310	<0.05
92122 B	<2	12	220	<1	22	2.20Z	<0.05
92123 B	440	5800	1.40Z	11	16	230	<0.05
92124 B	<2	26	20	<1	<4	400	<0.05
92125 B	<2	<4	10	<1	<4	90	<0.05



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ANALYTICAL REPORT

JOB COM830315

O/N : 4373

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag	Ni	Cr	Au
92126 B	<2	<4	10	<1	6	590	<0.05
92127 B	<2	<4	6	<1	6	50	<0.05
92128 B	<2	<4	10	<1	4	50	<0.05
92129 B	4	44	10	1	<4	80	<0.05
92130 B	28	290	80	6	<4	180	<0.05
92131 B	<2	220	230	<1	6	2050	<0.05
92132 B	10	1300	1300	2	14	110	<0.05
92133 B	10	80	160	1	<4	230	<0.05
92134 B	<2	16	20	<1	18	270	<0.05
92135 B	75	3500	1450	7	110	210	<0.05
92136 B	46	2000	1050	5	95	3000	<0.05
92137 B	65	520	850	6	20	200	<0.05
92138 B	<2	48	42	<1	12	140	<0.05
92139 B	<2	26	50	<1	18	70	<0.05
92140 B	<2	<4	12	<1	6	490	<0.05
92141 B	<2	20	70	<1	8	85	<0.05
92142 B	<2	30	60	<1	10	150	<0.05
92143 B	<2	22	42	<1	6	85	<0.05
92144 B	<2	10	60	<1	10	110	<0.05
92145 B	<2	8	28	<1	14	22	<0.05
92146 B	40	38	60	3	34	130	<0.05
92147 B	4	10	46	<1	18	120	<0.05
92148 B	<2	14	16	<1	8	90	<0.05
92149 B	<2	6	36	<1	8	100	<0.05
92150 B	No sample						
92151 B	<2	<4	4	<1	8	130	<0.05



ANALYTICAL REPORT

JOB COM830315

O/N : 4373

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag	Ni	Cr	Au
92152 B	<2	<4	6	<1	10	150	<0.05
92153 B	<2	<4	6	<1	<4	190	<0.05
92154 B	No sample						
92155 B	8	26	65	<1	32	60	<0.05
92156 B	4	6	32	<1	14	2000	<0.05
92157 B	2	12	18	<1	6	130	<0.05
92158 B	12	42	180	<1	24	80	<0.05
92159 B	70	520	2200	7	14	185	<0.05
92160 B	140	1200	2200	9	16	500	0.30
92161 B	6	22	36	<1	10	150	<0.05
92162 B	4	12	30	<1	8	240	<0.05
92163 B	6	32	55	<1	10	250	<0.05
92164 B	4	12	20	<1	6	85	<0.05
92165 B	8	10	16	<1	12	50	<0.05
92166 B	90	640	1100	7	14	240	<0.05
92167 B	16	190	110	2	<4	130	<0.05
<hr/>							
92101 A	14	310	42	1	6	20	<0.05
92102 A	8	210	110	1	8	10	<0.05
92103 A	22	65	70	<1	12	18	<0.05
92104 A	32	60	190	<1	40	70	<0.05
92105 A	18	42	36	<1	24	60	<0.05
92106 A	130	110	520	<1	170	80	<0.05
92107 A	6	22	32	<1	10	30	<0.05
92108 A	130	145	660	<1	190	100	<0.05
92109 A	2	4	12	<1	<4	8	<0.05
92110 A	4	28	20	<1	<4	24	<0.05

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ANALYTICAL REPORT

JOB COM830315

O/N : 4373

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag	Ni	Cr	Au
92111 A	20	160	190	<1	12	18	<0.05
92112 A	24	50	130	<1	32	60	<0.05
92113 A	4	4	12	<1	<4	10	<0.05
92114 A	6	60	50	<1	6	18	<0.05
92115 A	4	28	30	<1	<4	12	<0.05
92116 A	12	75	130	2	26	26	<0.05
92117 A	8	85	60	<1	<4	18	<0.05
92118 A	12	75	60	1	16	26	<0.05
92119 A	16	165	130	1	12	20	<0.05
92120 A	85	2500	500	12	10	38	<0.05
92121 A	32	680	460	2	10	32	<0.05
92122 A	6	95	140	<1	4	250	<0.05
92123 A	85	3300	800	11	6	30	<0.05
92124 A	8	95	175	<1	<4	<4	<0.05
92125 A	<2	<4	4	<1	<4	8	<0.05
92126 A	4	6	12	<1	<4	34	<0.05
92127 A	4	6	12	<1	<4	8	<0.05
92128 A	2	8	10	<1	<4	8	<0.05
92129 A	46	650	1000	3	<4	6	<0.05
92130 A	55	660	110	10	<4	10	<0.05
92131 A	36	770	880	2	22	60	<0.05
92132 A	34	4400	1400	9	28	12	<0.05
92133 A	22	250	410	5	<4	12	<0.05
92134 A	14	300	50	4	6	18	<0.05
92135 A	120	4400	1200	20	60	120	<0.05

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ANALYTICAL REPORT

JOB COM830315

O/N : 4373

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag	Ni	Cr	Au
92136 A	26	610	210	4	24	40	<0.05

Method of Analysis : Cu Pb Zn Ni : AAS1/1A
 Cr : AAS2
 Ag : AAS3
 Au : AAS5A



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ANALYTICAL REPORT

JOB COM830315

O/N : 4373

Results in ppm

SAMPLE	Sn
92101 B	38
92102 B	75
92103 B	<4
92104 B	20
92105 B	70
92106 B	20
92107 B	14
92108 B	24
92109 B	16
92110 B	8
92111 B	175
92112 B	44
92113 B	6
92114 B	6
92115 B	34
92116 B	4
92117 B	95
92118 B	4
92119 B	16
92120 B	210
92121 B	26
92122 B	6
92123 B	75
92124 B	90
92125 B	8



ANALYTICAL REPORT

JOB COM830315

O/N : 4373

Results in ppm

SAMPLE	Sn
92126 B	<4
92127 B	6
92128 B	8
92129 B	6
92130 B	80
92131 B	12
92132 B	<4
92133 B	20
92134 B	14
92135 B	26
92136 B	60
92137 B	155
92138 B	4
92139 B	10
92140 B	4
92141 B	4
92142 B	4
92143 B	12
92144 B	<4
92145 B	4
92146 B	4
92147 B	8
92148 B	10
92149 B	6
92151 B	10

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ANALYTICAL REPORT

JOB COM830315

O/N : 4373

Results in ppm

SAMPLE	Sn
92152 B	6
92153 B	6
92155 B	4
92156 B	10
92157 B	<4
92158 B	8
92159 B	90
92160 B	115
92161 B	6
92162 B	<4
92163 B	<4
92164 B	10
92165 B	8
92166 B	80
92167 B	32
92101 A	18
92102 A	18
92103 A	6
92104 A	32
92105 A	12
92106 A	55
92107 A	12
92108 A	42
92109 A	10
92110 A	<4

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ANALYTICAL REPORT

JOB COM830315

O/N : 4373

Results in ppm

SAMPLE	Sn
92111 A	24
92112 A	20
92113 A	8
92114 A	8
92115 A	8
92116 A	10
92117 A	20
92118 A	10
92119 A	16
92120 A	18
92121 A	22
92122 A	6
92123 A	18
92124 A	4
92125 A	4
92126 A	6
92127 A	<4
92128 A	<4
92129 A	34
92130 A	70
92131 A	16
92132 A	12
92133 A	44
92134 A	18
92135 A	100

**ANALYTICAL REPORT**

JOB COM830315

O/N : 4373

Results in ppm

SAMPLE Sn

92136 A 30

Method of Analysis : Sn : XRF1

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00 III

APPENDIX 4*

EVALUATION OF GEOPHYSICAL SURVEYS CARRIED OUT WITHIN PART EL 15/76
by Mitre Geophysics

* Appendix 4 includes maps in folded form which accompany the
Enclosures

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MITRE GEOPHYSICS PTY LTD

MINERAL EXPLORATION AND ENGINEERING CONSULTANTS

BUGGS LANE ELLIOTT TASMANIA 7325 PHONE 004-363143

AN EVALUATION OF THE GEOPHYSICAL SURVEYS

CARRIED OUT WITHIN THE AMOCO/CSR JOINT VENTURE IN E.L. 15/76

PRIOR TO 1981.

for

AMOCO MINERALS AUSTRALIA COMPANY

by

Dr J.R. Bishop

AM/MG83/02b
April, 1983.



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TABLES and FIGURES

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Figure	12	Geophoto VLF survey at Amber Creek (1:10,000 scale)
Figure	13	Geophoto Turair survey, southern Joint Venture area (1:10,000 scale)



SUMMARY

This is an edited version of an earlier report (AM/MG83/02). Only geophysical surveys located within E.L. 15/76 have been included in this report.

The Zeehan mining field on the west coast of Tasmania was worked around the turn of the century for silver-lead-zinc. The deposits were mostly small and shallow-seated fissure veins. Prior to Amoco's exploration program, there had been little systematic searching for a strata-bound lead-zinc deposit within the limestones near Zeehan. Although such a target was the stated aim of several of the preceding lease holders, the area in general and several prospects in particular had not been well investigated.

The first surveys, gravity and magnetics, were carried out by the BMR for North Broken Hill at the Mariposa prospect in 1950: gravity anomalies coincided with the known mineralisation, but the magnetics was not of assistance. In 1971, CGG carried out an IP survey at Mariposa for MacIntyre Mines: the known mineralisation was contained within one chargeability anomaly, but drilling elsewhere along the zone, and into an adjacent one, failed to produce any interesting intersections.

The Bannockburn area was investigated by Rio Tinto in 1959 using gravity, magnetics and EM. However the work was ineffectual, using short but widely spaced lines and no conclusions about the potential of this area can be made from these surveys.

In 1971, a helicopter-borne EM survey (using Scintrex's HEM-701 system) was carried out for Tenneco by Scintrex. It covered the Black Jack's, Mariposa and Bannockburn grids and the south west corner of the joint venture area, as well as areas outside the lease. Anomalies were recorded at Black Jack's, near Bannockburn and in the south west corner. All of these were weak and consistent with responses from superficial conductors.

Tenneco followed up some of the better HEM anomalies, at Black Jack's, with Turam and SF surveys and one test line of gravity. The Turam produced anomalies indicative of conductive overburden but these are along strike from some interesting geochemical anomalies (Jones, pers. com.) and it is possible that some of these EM anomalies (ground or airborne) may be due to the surface weathering of (potentially mineralised) calcareous units. The SF was not diagnostic (ie, either no anomalies, or false responses from topography, etc.). No gravity anomaly was recorded, but such small tests are inconclusive.

A second helicopter EM survey was flown in 1973. This was a Turair survey for Texins Development which covered all of the joint venture area except for Black Jack's and the western two thirds of Bannockburn. Several anomalies were recorded in the southern part of the lease. Like the HEM-701 survey, all were weak and indicative of superficial conductors. None of these



anomalies has been followed up and although several occur within an area surveyed with VLF in 1971 (by Geophoto for Texins), none can be said to have been located by the VLF (which also recorded only weak anomalies).

Gravity has been the most successful of the above surveys, responding directly to mineralisation at Mariposa. IP surveys conducted by Amoco have apparently recorded high background values; however the IP at Mariposa defined two definite zones, of which the strongest part of one coincided with the known mineralisation. SP has been shown to be inapplicable in areas with a cover of conductive material. Similarly the EM surveys appear to have responded mainly, if not exclusively, to the overburden.

There have been big improvements in the EM technique since the early 1970's, however it is quite possible that the target mineralisation (a massive lead-zinc body) will not be very conductive. Nevertheless it is recommended that the more prospective (ie, better positioned) of the EM anomalies (from both the NEM-701 and Turair surveys) be located with a modern EM system such as PEM. Other recommendations arising from this evaluation are, to routinely use gravity and IP as reconnaissance and detailing exploration tools and, in particular, to continue the gravity survey at Mariposa to the south and north. A high sensitivity magnetic survey over this grid should help assess the usefulness of the technique.



INTRODUCTION

The Amoco/CSR joint venture area within E.L. 15/76 encompasses some of the old workings in the south eastern part of the Zeehan silver-lead-zinc mining field, as well as several other areas known to contain carbonate sequences which are considered to be favourable sites for base metal mineralisation.

Lead was discovered at Zeehan in 1882, and in the late 1880's to 1890's, the field was intensively worked. However by 1913 most of the systematic mining had ceased. Based on Blissett's (1962) figures, Both and Williams (1968) have estimated a total production of 200,000 tons of lead, 27,000,000 ozs of silver and 2,700 tons of zinc.

Exploration for base metals in the area (as distinct from prospecting) commenced in 1946 when Zeehan Explorations (a joint venture between North Broken Hill and Broken Hill South) began to assess many of the old workings. (This resulted in the reopening of the Oceana mine which was worked until 1960.) Subsequent explorers in the general area include: Rio Tinto (late 1950's) New Consolidated Gold Fields (SPL 25, late 1960's), Texins Development (E.L. 7/68; Work carried out by Geophoto), Tenneco (E.L. 44/70) and McIntyre Mines (SPL 46, early 1970's). Most of these companies tried some form of geophysics on their leases.

This report is a compilation and evaluation of all the geophysics carried out within the Amoco/CSR joint venture area prior to Amoco's taking up an interest in 1981.

EXPLORATION TARGET AND GEOLOGIC SETTING

Most of the old workings on the Zeehan field were on fissure veins, controlled by faults or fractures; these were usually small and were invariably found to peter out at relatively shallow depths (Blissett, 1962). However some, such as the Oceana, contained diagenetic (or replacement) Pb-Zn mineralisation within carbonate sequences and this is the expected form for any economic deposit in the joint venture area.

The main carbonate sequences occur in the Ordovician Gordon Limestone, however other prospective sequences occur within the Proterozoic (Donah Quartzite), Cambrian (Crimson Ck) and the Siluro-Devonian sediments. The prospective areas are poorly exposed, these rocks having decomposed to clays or shales near the surface where they often form swampy button-grass flats. There are also widespread Tertiary and Quaternary deposits covering some prospective ground (Jones, 1979).

The Zeehan area has been highly disturbed by folding and faulting of Tabberabberan age and "the Ordovician to Devonian strata of the Zeehan Basin occur within a series of synclinal structures with north, northwest axial trends" (Jones, 1979). The beds dip generally steeply to the east and west.



When considering the application of geophysics to an exploration program, it is often useful to try and categorise the type of ore body being sought, thus enabling the geophysicist to estimate the likely physical characteristics of the target.

An economic base metal deposit in the Zeehan area would probably be of the 'Irish-type', ie, the mineralisation would occur as epigenetic feeder zones including replacement veinlets, stockwork zones and cavity infilling, as well as syndiagenetic and stratiform ore. There would be relatively high silver content (although not to be compared with the silver mined at Zeehan in the basement rocks). Unlike the Irish deposits, there would probably not be abundant pyrite.

The only geophysical case history I have found dealing with the Irish-type deposits was written by Seigel in 1966. In this paper, which was largely written to promote the then relatively new technique of IP, Seigel states that following the discovery of the Tynagh lead-zinc-silver orebody in Ireland, several similar deposits were found by IP. The use of other methods was not discussed except that Seigel pointed out that for two of the bodies (not orebodies at the time of Seigel's paper) the disseminated mineralisation would not have shown EM responses. However Gustafson and Williams (1981) have noted that there are similarities between the 'Irish' deposit and the Mississippi Valley type, and there are a limited number of geophysical case histories over this kind of deposit.

Callahan and McMurray (1967) described the results of 32 years of geophysical experiments on Mississippi type deposits (ie, mostly flat-lying zinc-lead deposits, usually overlain by a thick cover of sediments). They concluded that down hole methods, in particular Applied Potential, were the most useful. Magnetics, EM, SP, and IP were not successful. They did not try gravity, but considered it would not be useful on theoretical grounds. However the authors were aware that their results should not be regarded as universal truths and pointed out that similar style, but near-surface deposits had been detected by geophysics in Ireland and in Canada.

The Irish discovery has been mentioned above. Lajoie and Klein (1979) showed that IP was successful at Pine Point in Canada because of the very low geologic noise levels (orebodies were defined by chargeability values above 5ms!). Again EM was not effective (using much more modern equipment than that described by Callahan and McMurray) and gravity was useful for detailing deposits but not for exploration since mineralisation sometimes occurred in sink holes where unconsolidated sediments reduced the overall density contrast. Pyrrhotite is sometimes an ore accessory; at Pine Point and Lajoie and Klein (1979) show a well defined 30 gamma magnetic anomaly over a deposit. However magnetics was not pursued owing to the difficulty of obtaining low noise data in the auroral zone which is subject to severe magnetic storm activity.



An economic deposit in the joint venture section of E.L. 15/76 would be expected to be a strata bound, steeply dipping(?), tabular shaped body, probably dissected by faults; it would contain a higher proportion of lead than zinc. Such a body should be polarisable, dense and possibly conductive. A limited number of petrophysical measurements from adjacent deposits (Collins, 1980) has suggested that there are marked density and conductivity contrasts between ore and host rock, but not of chargeability (where both were chargeable) nor of magnetic susceptibility (where both were non-magnetic). Surface surveys have confirmed the chargeable nature of the country rock but have also shown that EM methods, employed to respond to the conductivity contrast, may be hampered by conductive surface conditions. Similarly, the gravity method may respond to the gangue mineral siderite (density 3.83-3.88g/cc) or be adversely affected by caverns and clays in the near surface limestones.

The geophysical surveys considered in this report have been evaluated in the light of these observations.

GEOPHYSICAL SURVEYS

The first geophysical surveys at Zeehan were conducted by the Imperial Geophysical Experimental Survey (IGES) over the Silver King and South King mines in 1929; these old workings lie partly within Amoco's E.L. 4/78. The techniques tried were the equipotential method and self potential; no success was obtained with the former (quite possibly because of the absence of ore) and a strong anomaly from the latter was found to be due to a graphitic shale band (Edge and Laby, 1931). Although geophysics was being successfully applied at the nearby Mt Lyell copper field in the 1930's, a gap of nearly twenty years occurred before geophysics was again tried at Zeehan.

Several grids have been established in the joint venture area; all have been covered by some sort of geophysical survey by previous explorers. Three of the grids have been named after old workings in the limestones; these are the Black Jack's, Mariposa and Bannockburn grids. All three are shown as old lead-silver prospects on the Zeehan 1 mile geological sheet but none are mentioned in the explanatory notes (Blissett, 1962).

MARIPOSA

The Mariposa mine is a series of old prospects on the eastern side of the Zeehan syncline (the western side of which contains the Oceana and Austral workings). The mineralisation occurs in westerly dipping limestone near its western contact with the Crotty Quartzite.

At the request of the North Broken Hill Co., the BMR carried out magnetic and gravimetric surveys at Mariposa (Loh, 1950). The magnetic results were inconclusive, the survey being much



effected by ferrous debris. However quite interesting gravity results were obtained: a linear gravity anomaly (maximum value 0.5mgal) closely paralleled, but did not coincide with, the apparent 'line of lode'. Loh's figure 4 shows several drill holes (drilled to the west into west dipping rocks ?) testing the gravity anomalies (although presumably drilled beforehand): all showed some mineralisation. (Blissett (1962), stating that this drilling was done by Zeehan Explorations, noted that "no encouraging indications of mineralisation" were intersected. It is also worth noting that Blissett's description of the old workings varies significantly from that quoted by Loh (1950).)

In the reports from MacIntyre Mines who subsequently took up the area, reference is made to a 100,000 ton 'orebody' defined by the Zeehan Explorations drilling (eg, Pollock, 1970).

Whether or not there is mineralisation here of a sufficient quantity to be 'interesting', the gravity results suggest that it is a useful method for this style of deposit. The residual contours are reproduced in Figure 9 and these indicate a continuation of the zone of interest to the south.

This continuation was apparently confirmed some twenty years later when an IP survey was undertaken by CGG for MacIntyre Mines (Omnes, 1971). SP measurements were also taken but the method was not successful and the results were not presented. (The SP was apparently a repeat of a survey made by MacIntyre themselves in 1969-70, (Pollock, 1970). Both surveys recorded anomalies which apparently coincided with topographic features within the Crotty Quartzite.)

The IP survey used the gradient array over lines spaced 200ft apart. Several moderate but well defined chargeability anomalies were recorded (20 plus ms): resistivities were mostly less than 500 ohm-m but the lows generally did not coincide with the chargeability anomalies. CGG interpreted a total of 16 anomalies however these all essentially fall into two zones: an easterly one, the central part of which overlies known mineralisation, and a western zone which occurs to the south (west) of the 'main' zone and which may be an offset (faulted) extension of it (see Figure 9). The lack of coincident resistivity lows suggests that there is no massive mineralisation near the surface (unless it is sphalerite-rich).

(The report by Omnes (1971) also deals with an area termed 'anomaly 1'; this unimaginatively named prospect is on the western slopes of Mt Dundas, outside of the Joint Venture area.)

MacIntyre drilled four holes on the Mariposa grid (Eates, 1972): two holes into each of the two zones. (Superposition of the holes onto the chargeability maps suggests that, given a westerly dip, the east-facing holes have adequately tested the anomaly at each position, with the possible exception of DDH 4. Holes 3 and 4 tested the mineralisation along the Gordon Limestone/Crotty Quartzite contact: the anomalies were explained by "patchy pyrite



mineralisation, very minor galena mineralisation, thin bands of graphitic shale in the quartzite, and probable graphitic material in the limestone" (DDH4 ended in limestone and may not, from the drill hole section, have reached the source of the IP anomaly; although it appears to have adequately tested a gravity high and it intersected mineralisation between 106 and 127ft.)

Holes 1 and 2 tested the south western zone which was "found to be due to graphitic shale with minor pyrite near the base of the amber shale" (Bates, 1972). Following these disappointing results, McIntyre dropped the lease.

Mariposa was included in Tenneco's HEM survey and in Texin's Turair survey (both described below): no anomalies were recorded by either surveys.

BLACK JACK'S

Black Jack's is a grid over limestone, north and along strike of the Mariposa grid. The grid was part of Tenneco's E.L. 44/70, when McIntyre Mines were exploring the Mariposa area.

Tenneco defined their target as being a "large replacement deposit" within the limestones and they flew a helicopter-borne EM survey in 1971 (using Scintrex's HEM-701 system), over most of the known limestone occurrences in their E.L. (see Figure 7); only weak anomalies were recorded from the survey. At Black Jack's, only the southern portion was covered, where three conductive zones were defined: these were "very weak and poorly defined and as a result no quantitative analysis has been made" (Gedde, 1972). Follow up surveys of Turam and SP were made over one of these zones (the easternmost zone). Howland-Rose (1972) interpreted four conductive zones from the Turam results which he (correctly) describes as "a series of north to north-north-west trending, shallow, weak conductors". They appear to be located on the eastern edge of a weakly conductive slab (eg, swamp) or rock type.

The SP surveys recorded several negative responses of 100 to 200mv, the larger 'anomalies' mostly occurred at the grid boundaries, ie they did not correlate with the EM indications and may be reflecting topographic changes.

One test line of gravity was run over an EM anomaly (Shirley, 1972); the reduced gravity profile tends to mirror image the topographic profile which suggests that the wrong density value has been used for the corrections. The data should be reprocessed to properly evaluate the method (since it is highly unlikely that the raw data is available, resurveying is recommended). Figure 10 shows the SP contours and the Turam responses at Black Jack's.

The other HEM-701 zones, over (alluvial covered) Amber Slate and Florence Quartzite, immediately to the west of the old Black Jack's prospect, do not appear to have been followed up.



BANNOCKBURN

Rio Tinto Australian Exploration conducted some gravity, EM and magnetics in the Bannockburn area (the coverage is shown in Figure 11). The work was presented in a short (1 page) report by Boniwell (1959), titled "...surveys in the Mariposa Area,..". The magnetic profiles are missing from the copy held by Amoco. The data is not easily interpreted in the form presented (small scale profiles), however it does not appear to have been a very well implemented survey. The dip angle EM method used was probably not a very sensitive technique for detecting buried conductors beneath a conductive (ie, swampy) surface and the traverses were too short to obtain useful gravity data. Boniwell noted one small magnetic anomaly which correlated with an EM response.

While this survey would doubtless have detected any large, near surface deposit, Boniwell's conclusions that any further work should depend on favourable results from a geochemical survey cannot be supported, especially so given the likely nature of the 'cover' referred to by Boniwell. (In the same year, a government geologist recommended drilling this area (Hughes, 1959).)

The 1971 MEM-701 survey for Tenneco covered the Bannockburn area, but no responses were recorded over the grid which covers the areas of both known and suspected limestone (see Figure 7). A well defined zone recorded to the south west of the grid over Amber Slate, has apparently not been followed up.

PROFESSOR RANGE/AMBER CREEK/LAUREL/KING BILLY

The (inferred) limestones at the southern edge of the joint venture area (and which extend into E.L. 4/78) have been broadly covered by the following Amoco/CSR grids: Professor Range, Amber Creek, Laurel and King Billy. This area was investigated for Texins Development by Geophoto Resources under the name of the Amber Creek Prospect within E.L. 7/68. Johnston (1974) noted a "two fold exploration approach"; the first of which was a VLF survey over the grid. The results are shown in Figure 12, but since the VLF technique does not produce meaningful results in areas with clayey overburden, the anomalies are not considered significant. Shallow augering over these anomalies revealed no interesting geochemical anomalies. Magnetics was also carried out on some lines of the Amber Creek Prospect (600 to 800 ft apart) but the results, which I have not sighted, apparently showed "no significant anomalies".

Geophoto's second exploration approach, deep augering, followed a Tursair survey flown in 1973. The coverage and anomalies from this survey are shown in Figure 13; apart from one response near the Zeehen Highway, all the other responses (within the lease) were concentrated in the southern portion of the joint venture area. Two anomalies, 21 and 26, were considered significant (since they were in the right area). Although the depth estimates for these



anomalies of 125 and 115m respectively (Howland-Rose, 1973) "excluded the possibility of conductive moraine response", there was no encouragement from the deep sugar sampling (to 15m).

The results from the sugaring program lead Geophoto to conclude that the geochemical anomalies were due to sulphide grains within the overburden and it was recommended that Texins Development should drop the lease (Johnston, 1974).

CONCLUSIONS AND RECOMMENDATIONS

(It is appreciated that subsequent work, carried out for Amoco, may well have answered or altered some, or all, of the suggestions made here.)

On the Mariposa grid, both chargeability (from a gradient array IP survey) and gravity responded to mineralisation. The best responses were over the old workings and these have been (?) adequately explored by North Broken Hill drill holes. An extension of the gravity survey to the south and north to cover the chargeability zones is recommended.

At Black Jack's, Tenneco used Turam and SP, with one test line of gravity, to follow up (some) anomalies from the HEM-701 survey. The Turam anomalies were apparently caused by superficial conductors; there were no diagnostic responses from the SP and no gravity anomaly was recorded. Gravity cannot be properly assessed by reading only one line and the results from Black Jack's may not have been correctly processed since the profile mirrored the topography.

Those (HEM-701) anomalies not followed up at Black Jack's, lie to the west of the prospect, over (partially covered) Siluro-Devonian sediments which may contain calcareous units and which may therefore be prospective: the anomalies are, however, weak.

The Bannockburn area was not effectively investigated by Rio Tinto: the short lines precluded any thorough appreciation of the gravity method and the dip-angle EM technique would not be effective in areas with conductive overburden such as probably occur at Bannockburn. Magnetics would be unlikely to be a 'first-pass' discriminator of mineralisation.

A conductive zone detected by the HEM-701 survey off the south-west corner of Amoco's Bannockburn grid has not been followed up. Although weak, the anomalies overlie apparently 'uncovered' upper Silurian sediments, thus the zone may be worth pursuing if the rock types are considered prospective.

Much of the joint venture area was covered by Texins' (through Geophoto) Turair survey, although Black Jack's and the western two thirds of Bannockburn were not covered. There has been no ground follow up of any of the anomalies from this survey. Some fall within the area covered by Geophoto's VLF survey where there was no obvious correspondence (superimpose Fig. 13 on Fig. 12),



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but most of the anomalies lie outside of Geophoto's and Amoco's grids. Thus presumably, the anomalies are not over the most prospective locations; however it has been noted that calcareous units occur in the adjacent formations and, since most of these units are not covered by button grass swamps (which are generally confined to the limestone), any EM responses are more likely to be due to bedrock conductors. Although all of the anomalies recorded in the survey were weak, it has been my experience that Turair may record such responses over quite good conductors. Further, it is possible that those EM anomalies (both flown and ground) defining superficial conductors may be significant if they locate the (weathered) surface expression of calcareous units.

To summarise the results of the various surveys described above; gravity surveys appear to be worthwhile even though 'false' anomalies can be obtained from siderite, adjacent caverns, etc. Similarly IP can be a useful method: at Mariposa, the chargeability results outlined the known mineralisation and did not indicate a noisy background (unlike the core tests recorded in Collins, 1980). The SP and VLF methods which account for a large proportion of the data, are not applicable in areas of conductive cover, even if this cover is only one or two metres thick. The role of magnetics has not been proven: susceptibility measurements of (fresh) core which contains significant intersections of Pb/Zn mineralisation should help resolve the question. Any magnetic tests over old prospects (where there is a known resource), should be undertaken carefully, since the ferrous debris common in these areas can make such surveys useless: mounting the sensor on a 4 or 5m pole will (where practicable) often overcome the problem.

EM methods have improved considerably since the surveys described above were carried out, but it is not clear that EM responses can be expected from even economic quantities of mineralisation of the type sought. Test surveys of suitable methods (such as the Crane PEM owned by Amoco) over the Mariposa deposit should help solve this question. Later generation helicopter EM systems such as Dighem have a much improved capability for discriminating bedrock conductors from superficial responses, however such surveys are not recommended for these areas, unless it is accepted that deposits may be missed or not recognised, because of the conductive surface conditions and the (relatively) poor conductivity of the ore.

John Bishop

J.R. Bishop
June, 1983.



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SUMMARY OF GEOPHYSICAL SURVEYS ON THE ANDCO/CSR
JOINT VENTURE AREA PRIOR TO 1981.

AREA/DATE	OPERATOR/METHOD	COMPANY	COMMENT
MARIPOSA, 1950.	BMR: Gravity	NEH	Anomaly (?) coincident with mineralisation
	" Magnetics	"	Inconclusive, effected by iron debris
1971.	CGG: IP	MacIntyre	Chargeability anomaly over mineralisation
"	" SP	"	Not diagnostic
"	Scintrex: HEM-701	MacIntyre	No anomalies
1973.	" Turair	Texins	No anomalies
BLACK JACK'S, 1971.	Scintrex: HEM-701	Tenneco	Several weak anomalies
1972.	" Turan	"	Several shallow, weak conductors
"	Tenneco: SP	"	Anomalies may be due to topography
"	Shirley: Gravity	"	Inconclusive
BANDOCKBURN, 1959.	Rio Tinto: Gravity	Rio Tinto	Inconclusive
"	" Magnetics	"	? not sighted
"	" EM	"	Inconclusive
1971.	Scintrex: HEM-701	Tenneco	Some (weak) anomalies adjacent to grid
PROFESSOR RANGE/ AMBER CREEK/LAUREL/ KING BILLY, 1972.	Geophoto: VLF	Texins	Several weak anomalies, probably superficial
1973.	Scintrex: Turair	"	Several weak anomalies

APPENDIX 5

EM 37 LOGISTICS AND PROFILES
by Geoterrex

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LOGISTICS REPORT

FOR AN

EM-37 SURVEY

AT

ZEEHAN, TASMANIA

ON BEHALF OF

AMOCO MINERALS AUSTRALIA COMPANY

GEOTERREX PTY. LTD.

JOB NO. 85-1456

DECEMBER, 1982

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- 1.3 Personnel
- 1.4 Equipment

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- 2.2 Data Presentation

APPENDIX A: Equipment Specifications

APPENDIX B: EM-37 Plotting and Interpretation Conventions.

1. INTRODUCTION:

1.1 General.

Geoterrex Pty. Ltd. conducted an electromagnetic survey on behalf of Amoco Minerals Australia Co. near Zeehan, Tasmania between 9th December and 23rd December, 1982.

Four grids were surveyed in the area:

- a) OCEANA grid (1 loop)
- b) AUSTRAL grid (1 loop)
- c) NORTH AUSTRAL grid (1 loop)
- d) MARIPOSA grid (1 loop)

1.2 Terrain - Geophysical Conditions.

Generally the terrain over the grids was quite rugged with swamps and dense vegetation hindering progress. In many cases, inadequate line-cutting proved to be a major problem. Cultural effects were all but absent in all areas. The ground proved to be extremely resistive with the swamps providing the only surficial conductivity.

1.3 Personnel.

Geoterrex supplied two men for the survey:

John Peacock (Snr. Geophysicist/crew chief) and Alan King (Snr. Geophysicist). Amoco supplied several field assistants to help lay out the transmitter loops.

1.4 Equipment.

Geoterrex supplied the Geonics EM-37 unit, cassette logger and HP-85, all peripherals, sufficient wire for two transmitting loops and a 4WD vehicle.

2. SURVEY DETAILS:

2.1 Field Operations.

Details of the coverage on each grid are given below:

a) OCEANA grid

1 transmitter loop

Loop 1 : 1400E/ 1700E/ 3000N/ 3650N

8 lines:	L2900N	1150E-1650E	(500m @ 50m stns)
	L3100N	"	"
	L3200N	"	"
	L3300N	"	"
	L3400N	"	"
	L3500N	"	"
	L3600N	"	"
	L3700N	"	"

b) AUSTRAL grid

1 transmitter loop

Loop 2 : 1375E/ 1050E/ 550N/ 1250N

9 lines:	L 500N	1100E-1700E	(600m @ 50m stns)
	L 600N	"	"
	L 700N	"	"
	L 800N	1100E-1750E	(650m @ 50m stns)
	L 900N	1100E-1750E	"
	L1000N	1100E-1700E	(600m @ 50m stns)
	L1100N	"	"
	L1200N	"	"
	L1300N	"	"

c) NORTH AUSTRAL grid

1 transmitter loop

Loop 3 : 1050E/ 1375E/ 2150N/ 2850N

9 lines:	L2100N	1000E-1700E	(700m @ 50m stns)
	L2200N	1100E-1700E	(600m @ 50m stns)
	L2300N	"	"
	L2400N	"	"
	L2500N	800E-1700E	(900m @ 50m stns)
	L2600N	850E-1700E	(850m @ 50m stns)
	L2700N	1100E-1700E	(600m @ 50m stns)
	L2800N	1100E-1800E	(700m @ 50m stns)
	L2900N	1100E-1700E	(600m @ 50m stns)

d) MARIPOSA grid

Loop 4 : 67250E/ 67600E/ 58800N/ 59600N

7 lines:	L58900N	66950E-67550E	(600m @ 50m stns)
	L59000N	"	"
	L59100N	"	"
	L59200N	"	"
	L59300N	"	"
	L59400N	"	"
	L59500N	"	"

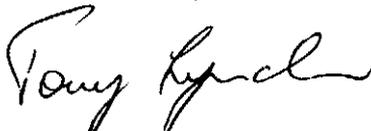
SURVEY DETAILS cont.

Throughout the survey only the 25 Hz transmitter pulse and an integration time of 41 sec. were used. Both polarities of the Z and X components were taken to fully compensate for any DC offset.

2.2. Data Presentation.

The data was recorded on cassette and plotted each evening on the HP-85. Final computer-drawn report-sized plots were presented upon completion of the survey.

Respectfully submitted,



for
JOHN PEACOCK,
Geophysicist.

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553134

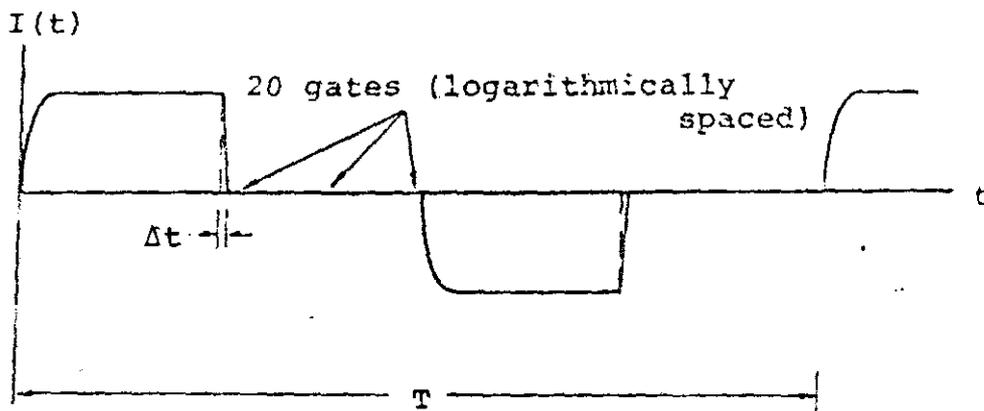
Appendix A

EQUIPMENT SPECIFICATIONS

Transmitter

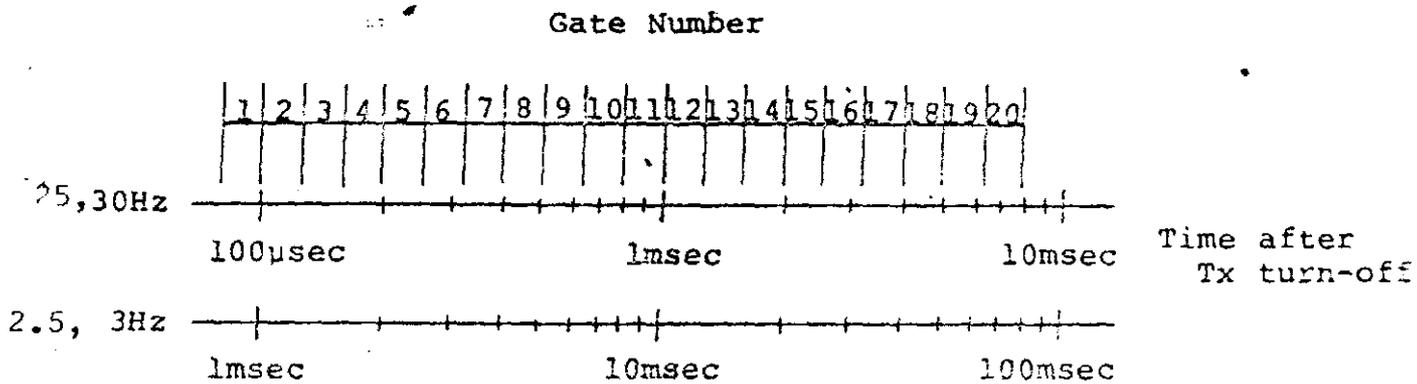
- Current Waveform - See Fig. 1
- Repetition rate - 3Hz or 30Hz in countries using 60Hz power line frequency; 2.5Hz or 25Hz in countries using 50Hz power line frequency; all four base frequencies are switch selectable.
- Turn-off time (Δt) - fast linear turn-off of maximum 300 μ sec. at 20 amps into 300x600m loop. Decreases proportionally with current and (loop area)^{1/2} to minimum of 20 μ sec. Actual value of Δt read on front panel meter.
- Transmitter loop - any dimensions from 40x40m to 300x600m maximum at 20 amps. Larger dimensions at reduced current. Transmitter output voltage switch adjustable for smaller loops. Value of loop resistance read from front panel meter; resistance must be greater than 1 ohm on lowest voltage setting to prevent overload.
- Transmitter protection - circuit breaker protection against input over-voltage; instantaneous solid state protection against output short circuit; automatically resets on removal of short circuit. Input voltage, output voltage and current indicated on front panel meter.
- Transmitter output voltage - 150 volts (zero to peak) maximum;
20 volts (zero to peak) minimum
- Transmitter output power - 2.8 kw maximum
- Transmitter wire supplied - 1800m. #10 copper wire PVC insulated with nylon jacket; transmitter wire contained on 6 reels (supplied); 2 reel winders supplied.
- Transmitter motor generator - 5 HP Honda gasoline engine coupled to 120 volt, 3 phase, 400Hz alternator. Approximately 8 hours continuous operation from full (built-in) fuel tank.

- Measured quantity - time rate of decay of magnetic flux along 3 axes.
- Sensor - air-cored coil of bandwidth 40 kHz; 100cm dia. by 7x5cm cross-section. Coil holder supplied to facilitate measurement along 3 axes.
- Time channels - 20 time channels with locations and widths as shown in Fig. 2. Successive operation at 30Hz, then 3Hz, effectively gives 30 channels covering range from 80 usec. to 80 msec.
- Output display - 4 digit plus sign LED display; display also shows channel number and gain.
- Integration time - 2^n cycles at 30Hz; n=4,6,8,10,12,14 (switch selectable); similar integration times at other base frequencies.
- Receiver output noise referred to input - typically 1.5×10^{-10} volt/m² at last gate at 30Hz with integration time of 34 seconds. Noise will be higher during intense local spherics activity.
- Output connector - all 20 channels in analogue format and house-keeping functions in digital format available from output connector.
- Synchronization to Tx - any of the following (switch selectable)
 (1) reference cable
 (2) primary pulse
 (3) 27 MHz radio link (40 channels)
 (4) high stability (oven controlled) quartz crystals.
- Noise rejection circuitry - Selective clipping of atmospheric noise pulses at all times. Audio output of Rx coil (transmitter pulse blanked out) is available on built-in loud speaker for ready identification of interference.
- Receiver batteries - 12 volt rechargeable Gel-cell; 9 hours continuous operating time at 17°C. Two batteries and a battery charger supplied to permit charging of second battery from transmitter motor-generator during survey.



Transmitter Current Waveform

FIG. 1



Gate Location and Widths

FIG. 2

BANDWIDTH OF EM-37 SYSTEM

2.5 Hz Repetition Rate

<u>CHANNEL</u>	<u>BEGINNING</u>	<u>END</u>	<u>CATE WIDTH</u>	<u>MID-CATE</u>
1	.800	.970	.17	.885
2	.970	1.21	.24	1.09
3	1.21	1.58	.37	1.40
4	1.58	1.95	.37	1.77
5	1.95	2.44	.49	2.20
6	2.44	3.16	.72	2.80
7	3.16	3.93	.77	3.55
8	3.93	4.92	.99	4.43
9	4.92	6.34	1.42	5.63
10	6.34	7.90	1.56	71.2
11	7.90	9.62	1.72	8.76
12	9.62	12.12	2.50	10.87
13	12.12	15.87	3.78	14.00
14	15.87	19.57	3.67	17.77
15	19.57	24.57	5.00	22.1
16	24.57	31.77	7.20	28.2
17	31.77	39.57	7.80	35.7
18	39.57	49.57	10.00	44.6
19	49.57	63.77	14.20	58.67
20	63.77	79.37	15.60	71.6

ALL TIMES ARE IN MILLISECONDS FROM END OF RAMP.

BANDWIDTH OF EM-37 SYSTEM

25 Hz Repetition Rate

<u>CHANNEL</u>	<u>BEGINNING</u>	<u>END</u>	<u>GATE WIDTH</u>	<u>MID-GATE</u>
1	.080	.097	.017	.0885
2	.097	.121	.024	.109
3	.121	.158	.037	.140
4	.158	.195	.037	.177
5	.195	.244	.049	.220
6	.244	.316	.072	.260
7	.316	.393	.077	.355
8	.393	.492	.099	.443
9	.492	.634	.142	.563
10	.634	.790	.156	.712
11	.790	.962	.172	.876
12	.962	1.212	.250	1.087
13	1.212	1.587	.378	1.400
14	1.587	1.957	.367	1.777
15	1.957	2.457	.400	2.21
16	2.457	3.177	.720	2.82
17	3.177	3.957	.780	3.57
18	3.957	4.957	1.000	4.46
19	4.957	6.377	1.420	5.677
20	6.377	7.937	1.560	7.16

ALL TIMES ARE IN MILLISECONDS FROM END OF RAMP.

Appendix B

EM-37 PLOTTING AND
INTERPRETATION CONVENTIONS

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The Geotrex fixed-loop time-domain convention system has been designed with consistency in mind. Given the great diversity of grid and loop orientations, it is most important that anomalies are of a predictable shape.

To fully understand the convention, four basic rules must be laid down:

- 1) The vertical primary field (Z component) is positive within any loop. To be consistent with a Cartesian co-ordinate system, the Z^+ direction is defined as 'up', i.e. the field vectors point up within the loop and down when outside the loop.
- 2) The X component is defined as that which points along the grid lines. Depending upon which direction the lines run, W or S is defined as X^+ .
- 3) Using a right hand orientation where X^+ is direction of the middle finger, and Z^+ is the direction of the thumb, then Y^+ is the direction defined by the index finger.
- 4) North or East is always plotted to the right on the page.

With these four rules, the shapes of the half space responses for late times for all three components are uniquely defined as shown in Figures 1, 2, 3a and 3b.

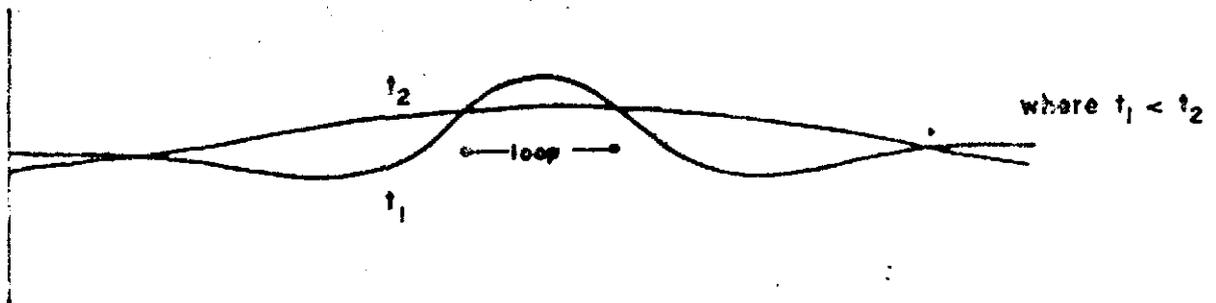


Fig. 1 Half-space response : Z component

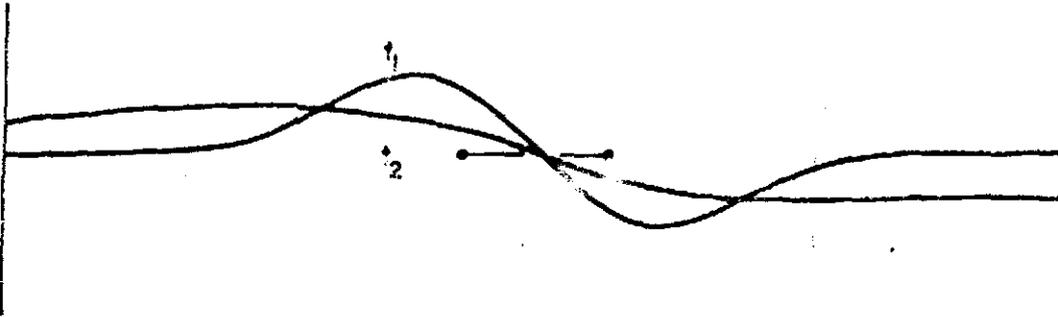


Fig. 2 Half-space response : X Component

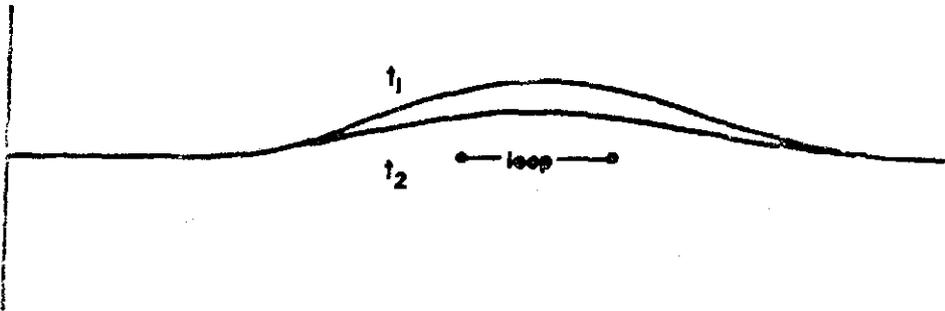


Fig. 3(a) Half-space response : Y component
(Positive half of loop)

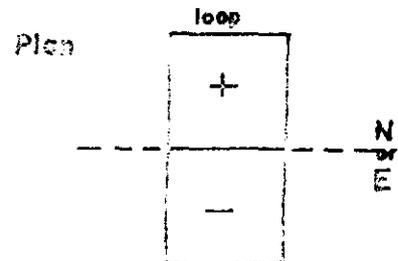


Fig. 3(b) Half-space response : Y component
(Negative half of loop)

Note: Unlike the Z component, there is only one maxima or minima for the Y component for a homogeneous half-space.

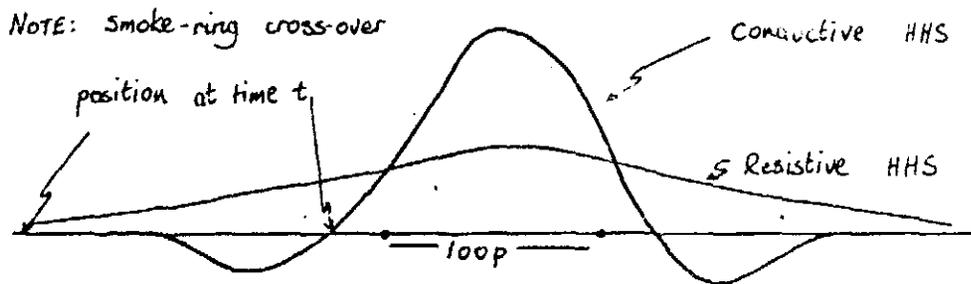


Fig 4. Comparison of conductive and resistive homogeneous half-space responses for Z-component.

A conductive homogeneous half-space is characterised by an early channel high amplitude response with a slow migration of the smoke-ring crossover from the loop.

By comparison, a resistive HHS will exhibit a lower early channel amplitude response and a rapid migration of the smoke-ring.

Note that the rate of decay of the channel amplitude responses for both conductive and resistive HHS is the same, and is proportional to $t \cdot \exp(-5/2)$.

The migration of the smoke-ring determines the detection of a conductor with respect to time and space. For example, a conductor located beyond the smoke-ring in a relatively conductive environment will not be energised by intermediate times but may be evident at late times if the smoke-ring has passed beyond it. In short, only conductors within the limits of the smoke-ring at a given time can possibly be detected.

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The response due to a confined conductor is closely related to the aforementioned half-space responses and to the conductor's position with relation to the loop. Figures 5, 6, 7a and 7b show the responses for a vertical plate.

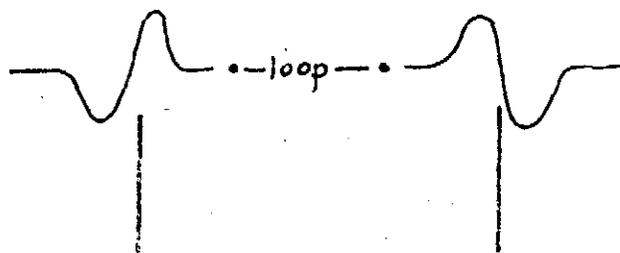


Fig. 5 Vertical conductor: Z component

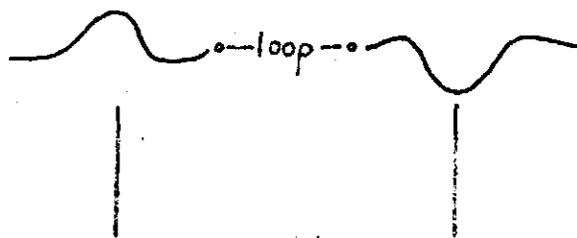


Fig. 6. Vertical conductor: X Component

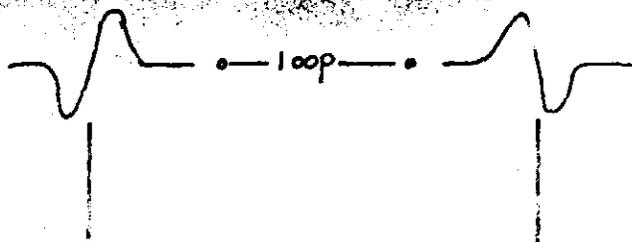
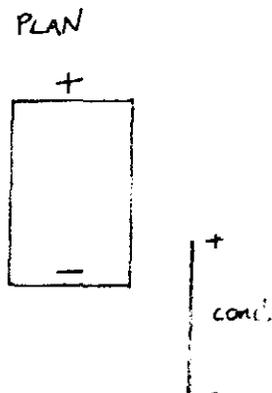


Fig. 7a Vertical conductor: Y component
(Positive side of conductor.)



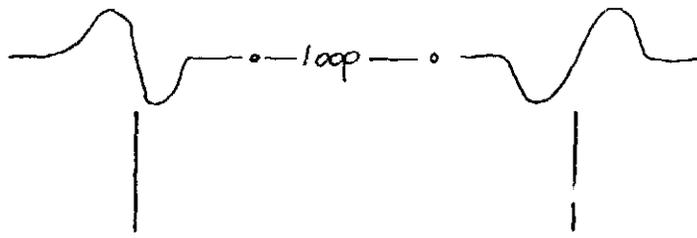


Fig. 7b Vertical conductor : Y component
(Negative side of conductor)

When the dip of the conductor is allowed to vary, the responses become more complicated. Figures 8 through to 12 show how the dip effects the vertical and horizontal components.

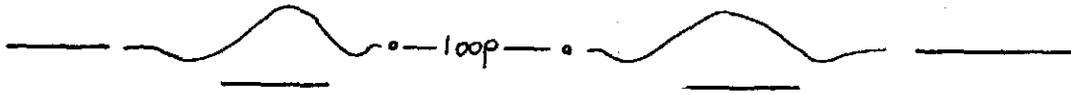


Fig. 8 Horizontal conductor : Z component

NOTE: Late-time response character both inside and outside loop the same.

NOTE: difference of amplitude

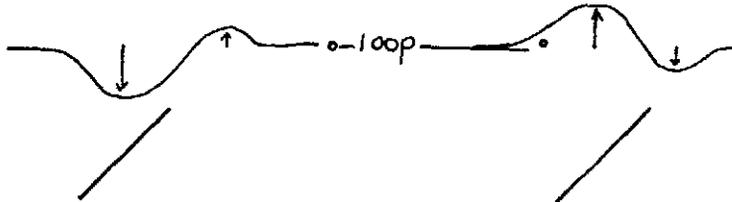


Fig. 9. Dipping conductor : Z component

NOTE: That the positive shoulders in Fig 9. are on the loop side of the anomaly.

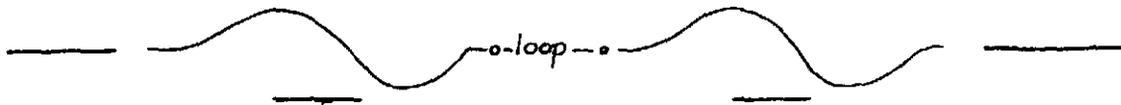


Fig. 10. Horizontal conductor : X component

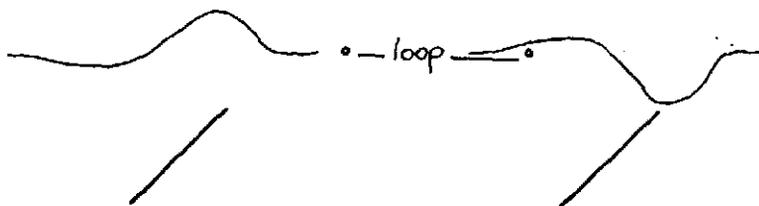


Fig. 11. Dipping conductor : X component

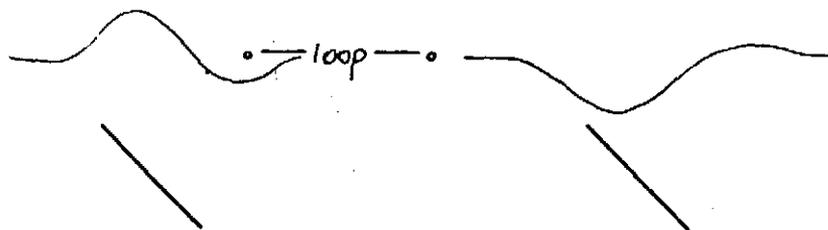


Fig. 12 Dipping conductor : X component

By remembering the shapes of the responses for these few simple geometrics, the identification of false anomalies can be avoided.

In conclusion, by identifying features which appear to have stable (non-diffusing) responses with respect to an appreciable length of time one can isolate confined targets from the half-space. After these interesting features have been identified, the geometry of the situation can be ascertained.

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GEOTERREX WEEKLY PRODUCTION REPORT

PROJECT No. 85-1456 TYPE OF SURVEY EM37

	DATE	PRODUCTION			
DAY	Dec 5/82				
DAY	Dec 6/82	AK flies Syd → Devonport		Airfare \$169.90	
DAY	Dec 7/82				
SDAY	Dec 8/82				
WSDAY	Dec 9/82	JP flies Syd → Devonport	S	Airfare \$169.90 Excess baggage \$7.00	paid 2x\$15
DAY	Dec 10/82	Road L 3700 } L 3600 } 1150E → 1650E L 3500 } Loop 1 - Oct 22 } 35 stations	P	Fuel \$776	paid 2x\$15
JRDAY	Dec 11/82	at @ 5:00am to reposition with loop offset Loop broken overnight Road L 2900N } 1650E → 1150E Loop 1 L 3100N } these lines were very poorly cut - very slow going 2 stations	P		paid 2x\$15

553147

MODIFICATION: Hotel Name - Hotel Cecil

Period - Bill paid by Client or Geotrex?

EQUIPMENT HIRE: Company Hired From -

Period -

ORDERING: Attach Pink Copy of Order to this report.

S: JP - John Parrock } crew
 AK - Alan King }

N.B. Breakfasts paid for by Amoco
 \$15 covers remaining meals

PARTY CHIEF: 

1 - N.P.

GEOTERREX WEEKLY PRODUCTION REPORT

CLIENT Amoco PROJECT No. 85-1456 TYPE OF SURVEY EM-37

	DATE	PRODUCTION			
	Dec 12/82	Read L 3200 N } Loop 1 L 3300 N } L 3400 N } Moderate tension 36 stations	1150° → 1650°	P	
DAY	Dec 13/82	Reverse L 3600 N } Loop 1 L 3500 N } Read L 1300 } Loop 2 L 1200 }	1500° → 1150° 1100° → 1700°	P	Fuel # 9.38
DAY	Dec 14/82	Read L 1100 N } L 1000 N } Loop 2 L 900 N } L 800 N }	1100° → 1700° 1100° → 750°	P	Fuel # 9.38
WEDSDAY	Dec 15/82	Read L 700 N } Loop 2 L 600 N } L 500 N } These lines are not easy going	1100° → 1700°	P	
THURSDAY	Dec 16/82	Rain all day		S	
DAY	Dec 17/82	Read L 2100 N } L 2200 N } L 2300 N } L 2400 N }	1200° → 1700° 1100° → 1700°	P	Fuel # 9.00
URDAY	Dec 18/82	Read L 2900 } L 2800 } L 2700 }	1100° → 1700° 1100° → 1800° 1100° → 1700° swampy - difficult to set up	P	

ACCOMMODATION: Hotel Name -

Period - Bill paid by Client or Geotrex?

EQUIPMENT HIRE: Company Hired From -

Period -

ADDITIONAL ORDERS: Attach Pink Copy of Order to this report.

Notes: Area very bad for loop effect.

PARTY CHIEF: [Signature]

55115

GEOTERREX WEEKLY PRODUCTION REPORT

CLIENT Amoco PROJECT No. 85-1456 TYPE OF SURVEY EM 37

	DATE	PRODUCTION			Misc.
	Dec 19/82	Read $\left. \begin{matrix} L 2600 N \\ L 2500 N \end{matrix} \right\} \begin{matrix} 850 E \\ 800 E \end{matrix} \rightarrow 1700 E$ Loop 3 Lines originally cut in some areas. 39 stations light rain all day P			paid 2x\$15
	Dec 20/82	Read $\left. \begin{matrix} L 58900 N \\ L 59000 N \end{matrix} \right\} 66950 E \rightarrow 67550 E$ Rain in morning delays start Loop 4 - Miriposa - logged over Area - very difficult striking 28 stations 1/25 KP			paid 2x\$15
	Dec 21/82	Read $\left. \begin{matrix} L 59100 N \\ L 59200 N \\ L 59300 N \end{matrix} \right\} 66950 E \rightarrow 67550 E$ Loop 4 40 stations			paid 2x\$15
WEDAY	Dec 22/82	AK and Mark (of Amoco) Read $\left. \begin{matrix} L 59400 N \\ L 59500 N \end{matrix} \right\} 67550 E \rightarrow 66950 E$ JP deathly ill with flu (stays @ hotel) Park equipment and roll up loop. 28 stations			paid 2x\$15
THURSDAY	Dec 23/82	JP and AK drive Zecharia → Devonport S	2 airfares 2x\$169.90 Fuel \$21.60 Fuel \$11.40		can work \$120 paid 2x\$15
FRI DAY	Dec 24/82				
SATURDAY	Dec 25/82				

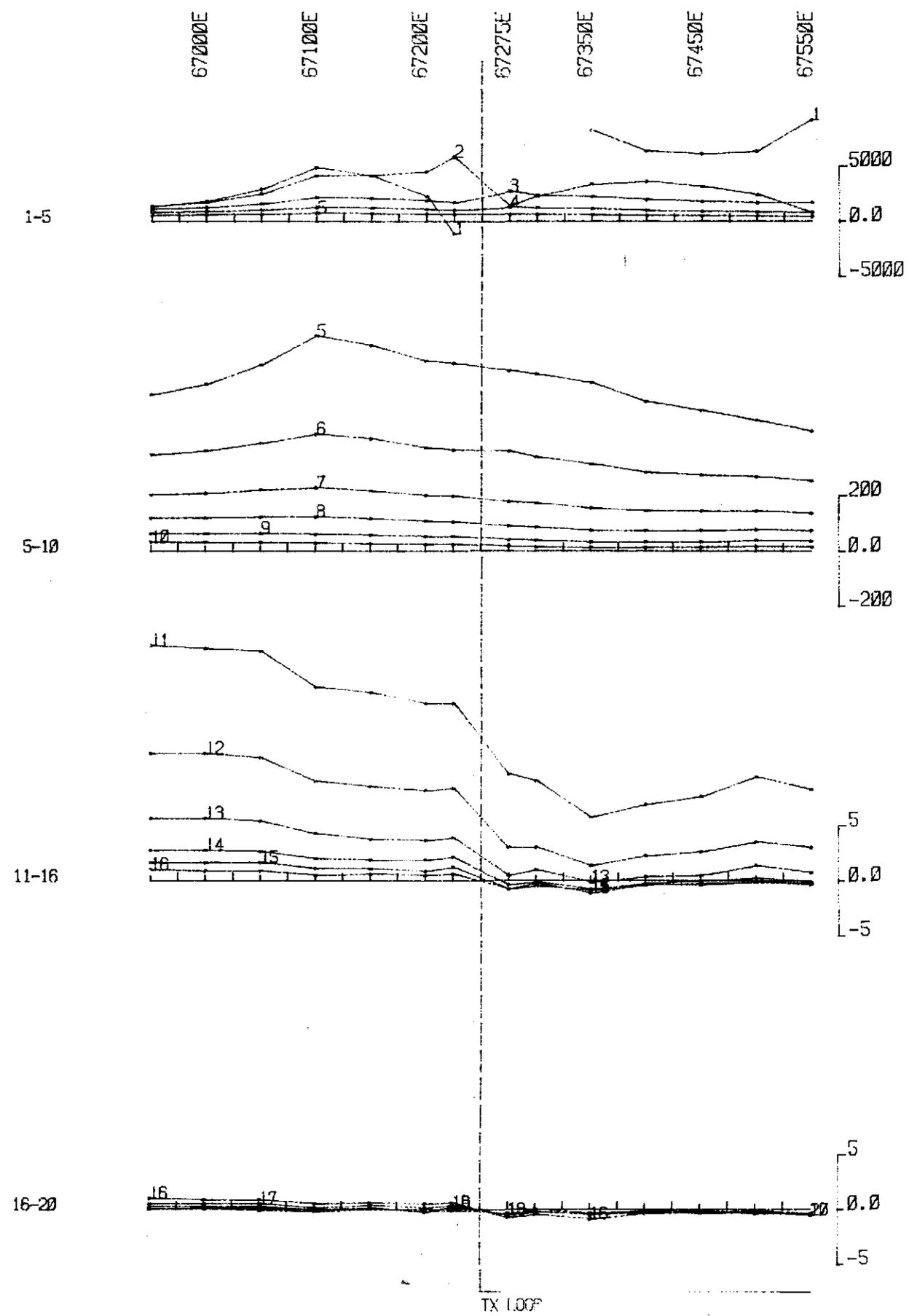
553149

ACCOMMODATION: Hotel Name - Period - Bill paid by Client or Geoterrex?
 EQUIPMENT HIRE: Company Hired From - Period -

BASE ORDERS: Attach Pink Copy of Order to this report.

PARTY CHIEF: 

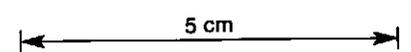
VERTICAL COMPONENT B (Z)



EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)



nanovolts per metre squared

TX LOOP SIDES : 58300N 67250E
 : 59600N 67600E
TX LOOP SIZE : 350m X 300m
TX TURN OFF TIME : 294
CURRENT : 10.2A
FREQUENCY : 25 Hz
INTEGRATION TIME : 10
SYNC MODE : CRYSTAL
HORIZONTAL SCALE : 1:5000
SURVEYED BY : J.P. A.K
DATE : 20-DEC-1982

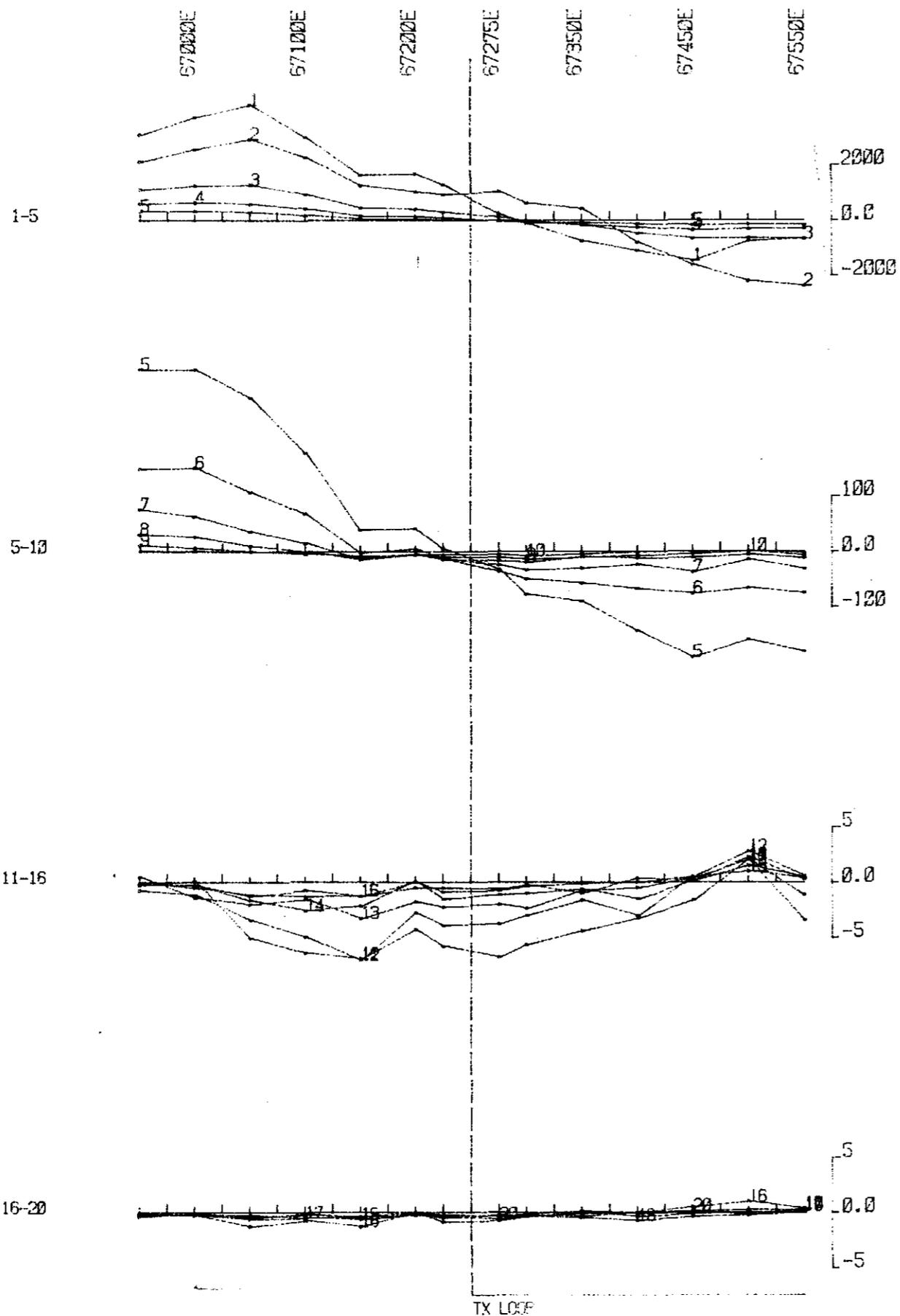
	SURVEYED AND COMPILED BY	PROJECT NO.
	GLOTTERREX PTY. LTD.	35-1456

CLIENT : Amoco Minerals Aust.
PROJECT : MARIPOSA
AREA : Zeehan Tas.
LINE : 58900N
TX LOOP : 4

Z

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HORIZONTAL COMPONENT B (X)



EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

nanovolts per metre squared

TX LOOP SIDES : 58800N 67250E
: 59600N 67600E
TX LOOP SIZE : 350m X 800m
TX TURN OFF TIME : 204
CURRENT : 10.2A
FREQUENCY : 25 Hz
INTEGRATION TIME : 12
SYNC MODE : CRYSTAL
HORIZONTAL SCALE : 1:5000
SURVEYED BY : J.P. A.K
DATE : 20-DEC-1982

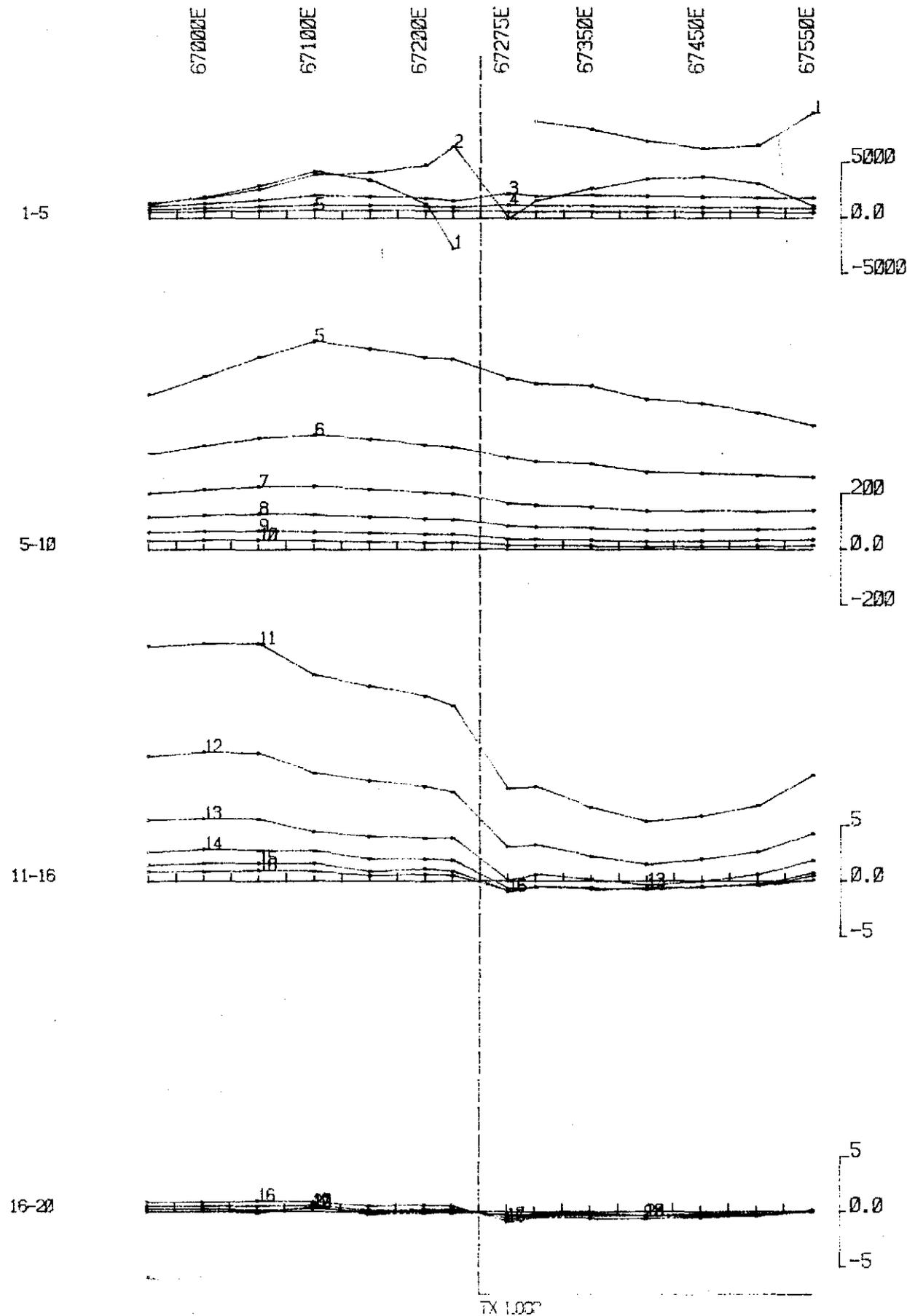


SURVEYED AND COMPILED BY : GEOTREX PTY. LTD. PROJECT NO. : 35-1456

CLIENT : Amoco Minerals Aust.
PROJECT : MARIPOSA
AREA : Zeehan Tas.
LINE : 58900N X
TX LOOP : 4

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VERTICAL COMPONENT B (Z)



EM-37
FIXED
TRANSMITTER
SURVEY

ELECTROMOTIVE FORCE INDUCED BY
SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

nanovolts per metre squared

TX LOOP SIDES : 58800N 67250E
: 59600N 67600E
TX LOOP SIZE : 350m X 800m
TX TURN OFF TIME : 294
CURRENT : 10.2A
FREQUENCY : 25 Hz
INTEGRATION TIME : 10
SYNC MODE : CRYSTAL
HORIZONTAL SCALE : 1:5000
SURVEYED BY : J.P.A.K
DATE : 20-DEC-1982



SURVEYED AND COMPILED BY
GEOTREX PTY. LTD.

PROJECT NO.
35-1456

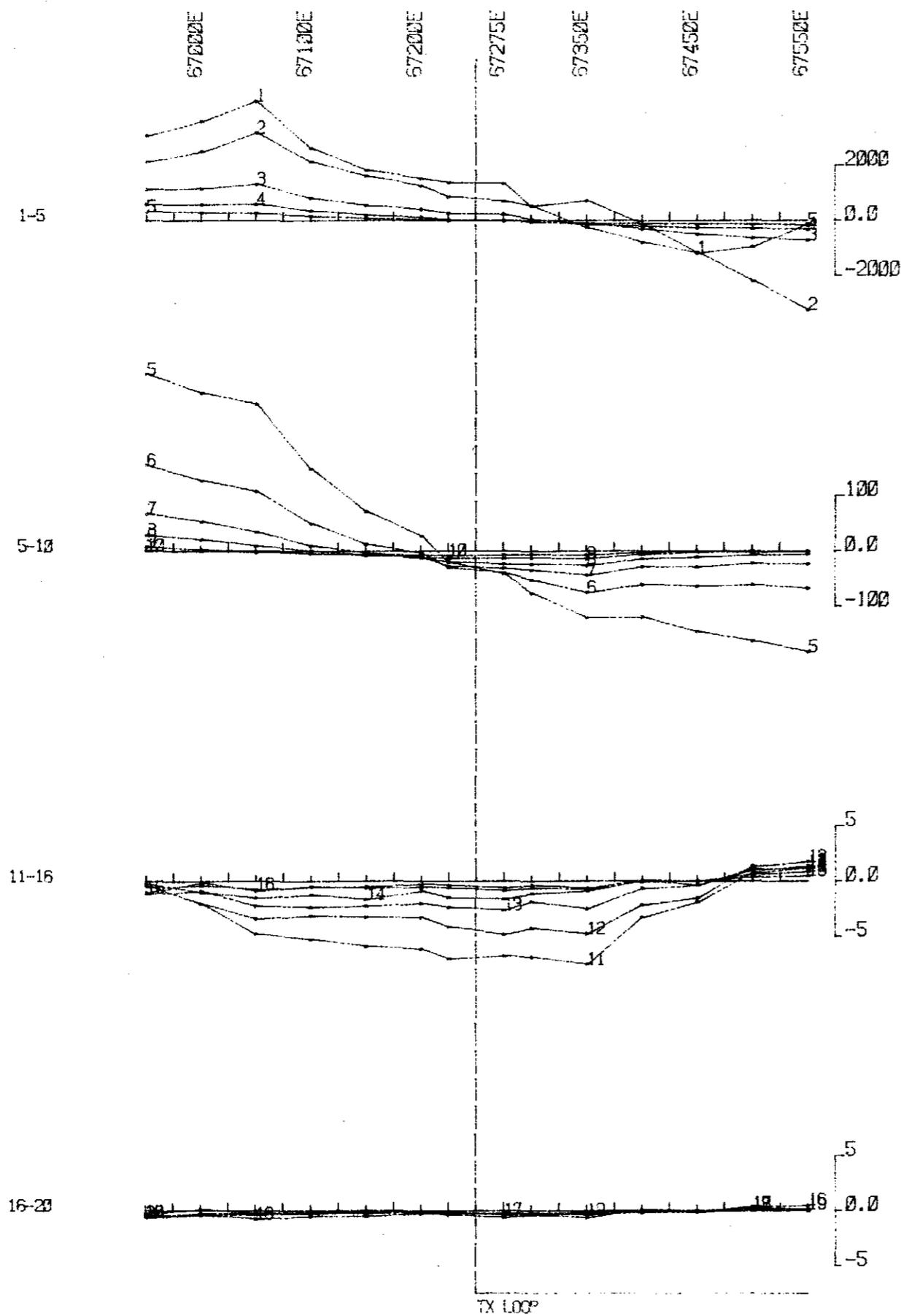
CLIENT : Anco Minerals Aust.
PROJECT : MARIPOSA
AREA : Zeehan Tas.
LINE : 59000N
TX LOOP : 4

Z

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HORIZONTAL COMPONENT B (X)



EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

nanovolts per metre squared

TX LOOP SIDES : 58300N 67250E
: 59600N 67600E
TX LOOP SIZE : 350m X 330m
TX TURN OFF TIME : 294
CURRENT : 10.2A
FREQUENCY : 25 Hz
INTEGRATION TIME : 10
SYNC MODE : CRYSTAL
HORIZONTAL SCALE : 1:5000
SURVEYED BY : J.P. A.K
DATE : 20-DEC-1982

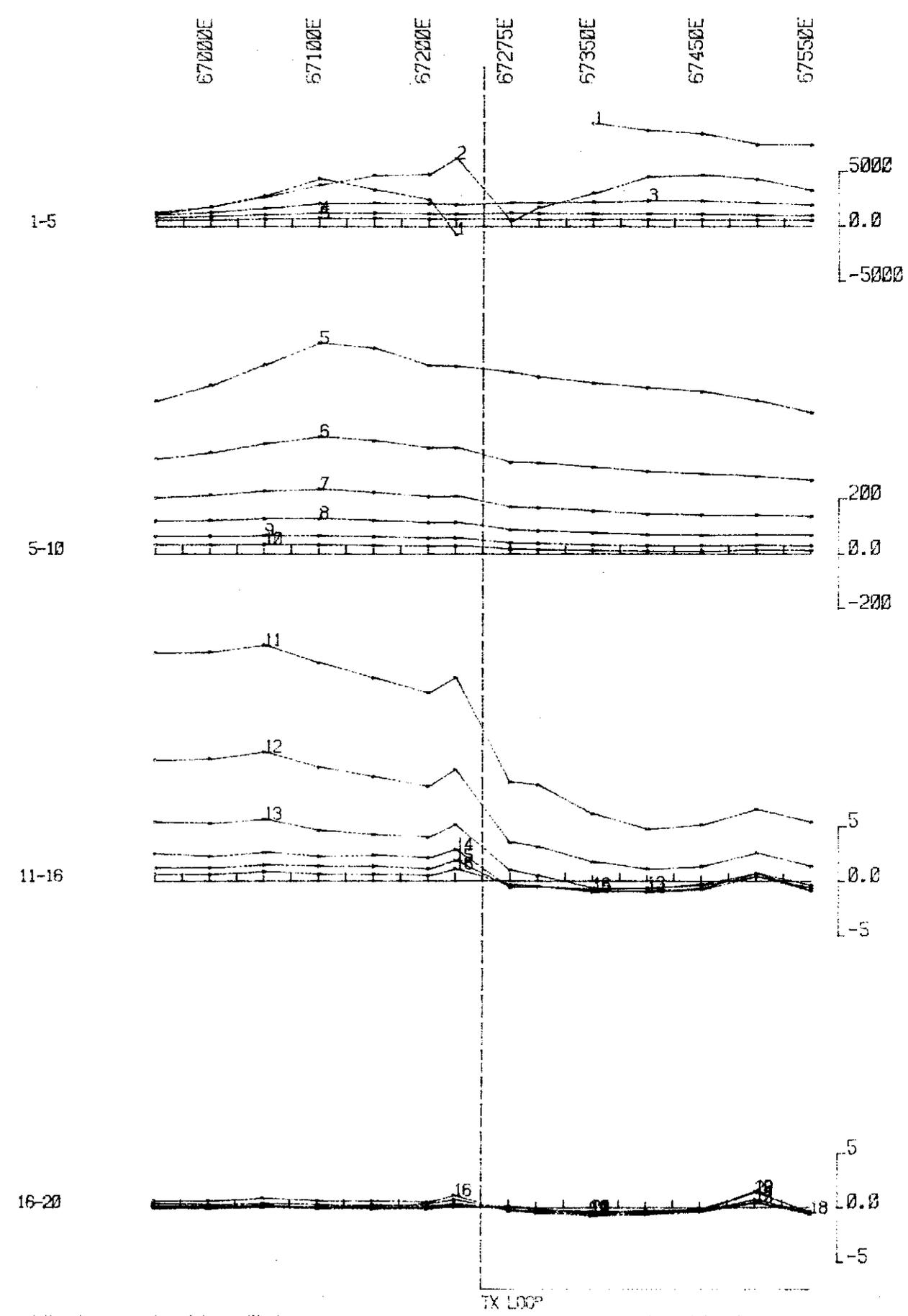


SURVEYED AND COMPILED BY
GEOTREX PTY. LTD. PROJECT NO.
85-1456

CLIENT : Amco Minerals Aust.
PROJECT : MARIPOSA
AREA : Zeehan Tas.
LINE : 59000N X
TX LOOP : 4

159T

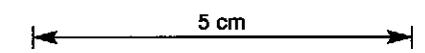
VERTICAL COMPONENT B (Z)



EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)



nanovolts per metre squared

TX LOOP SIDES : 58300N 67230E
: 50600N 67500E
TX LOOP SIZE : 350m X 300m
TX TURN OFF TIME : 294
CURRENT : 10.2A
FREQUENCY : 25 Hz
INTEGRATION TIME : 12
SYNC MODE : CRYSTAL
HORIZONTAL SCALE : 1:5000
SURVEYED BY : J.P. A.K
DATE : 21-DEC-1982

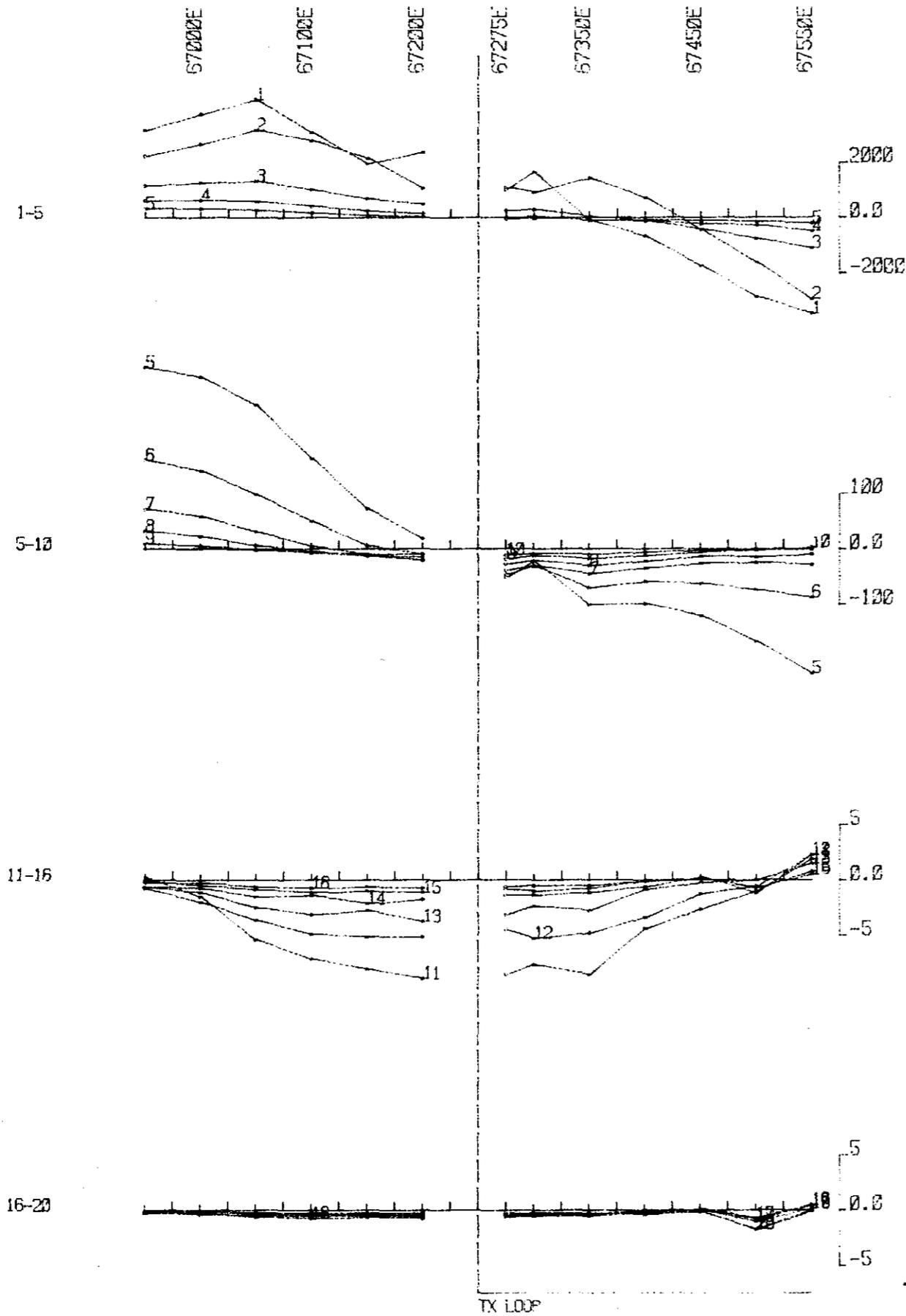


SURVEYED AND COMPILED BY
GEOTREX PTY. LTD. PROJECT NO.
35-1456

CLIENT : Anaco Minerals Aust.
PROJECT : MARIPOSA
AREA : Zeehan Tas.
LINE : 59100N Z
TX LOOP : 4

151

HORIZONTAL COMPONENT B (X)



EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

nanovolts per metre squared

5 cm

TX LOOP SIDES : 58830N 67250E
: 59600N 67600E
TX LOOP SIZE : 350m X 300m
TX TURN OFF TIME : 294
CURRENT : 10.29
FREQUENCY : 25 Hz
INTEGRATION TIME : 17
SYNC MODE : CRYSTAL
HORIZONTAL SCALE : 1:5000
SURVEYED BY : J.P.A.K
DATE : 21-DEC-1982

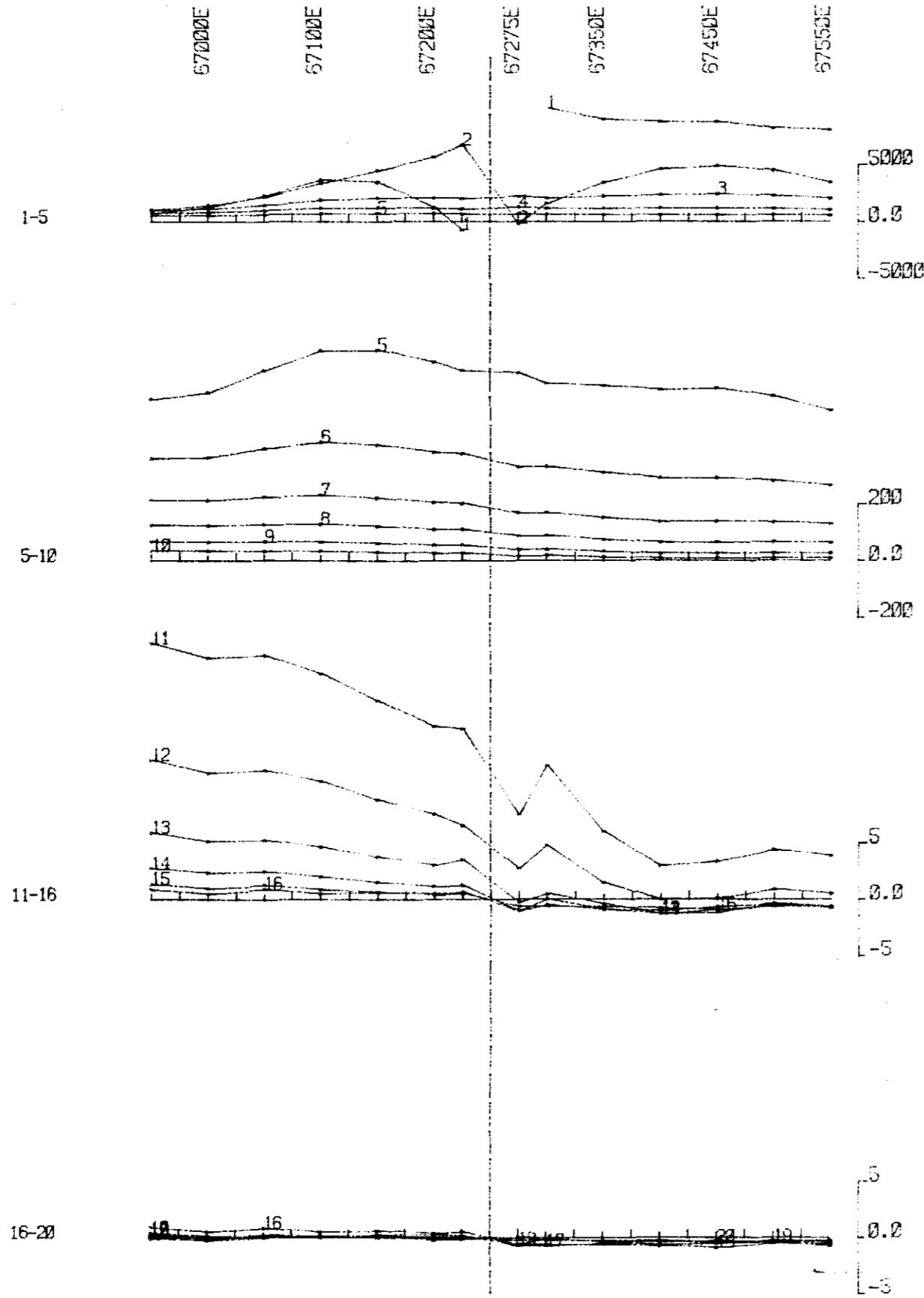


SURVEYED AND COMPILED BY
GEOTERREX PTY. LTD.

PROJECT NO.
35-1455

CLIENT : Amoco Minerals Aust.
PROJECT : MARIPOGA
AREA : Zeehan Tas.
LINE : 59100N X
TX LOOP : 4

VERTICAL COMPONENT B (Z)



EM-37

FIXED
TRANSMITTER
SURVEY

ELECTROMOTIVE FORCE INDUCED BY
SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

nanovolts per metre squared

5 cm

TX LOOP SIDES : 58300N 67250E
 : 59500N 67600E
TX LOOP SIZE : 300m X 800m
TX TURN OFF TIME : 294
CURRENT : 12.2A
FREQUENCY : 25 Hz
INTEGRATION TIME : 12
SYNC MODE : CRYSTAL
HORIZONTAL SCALE : 1:5000
SURVEYED BY : J.P. A.K.
DATE : 21-DEC-1982

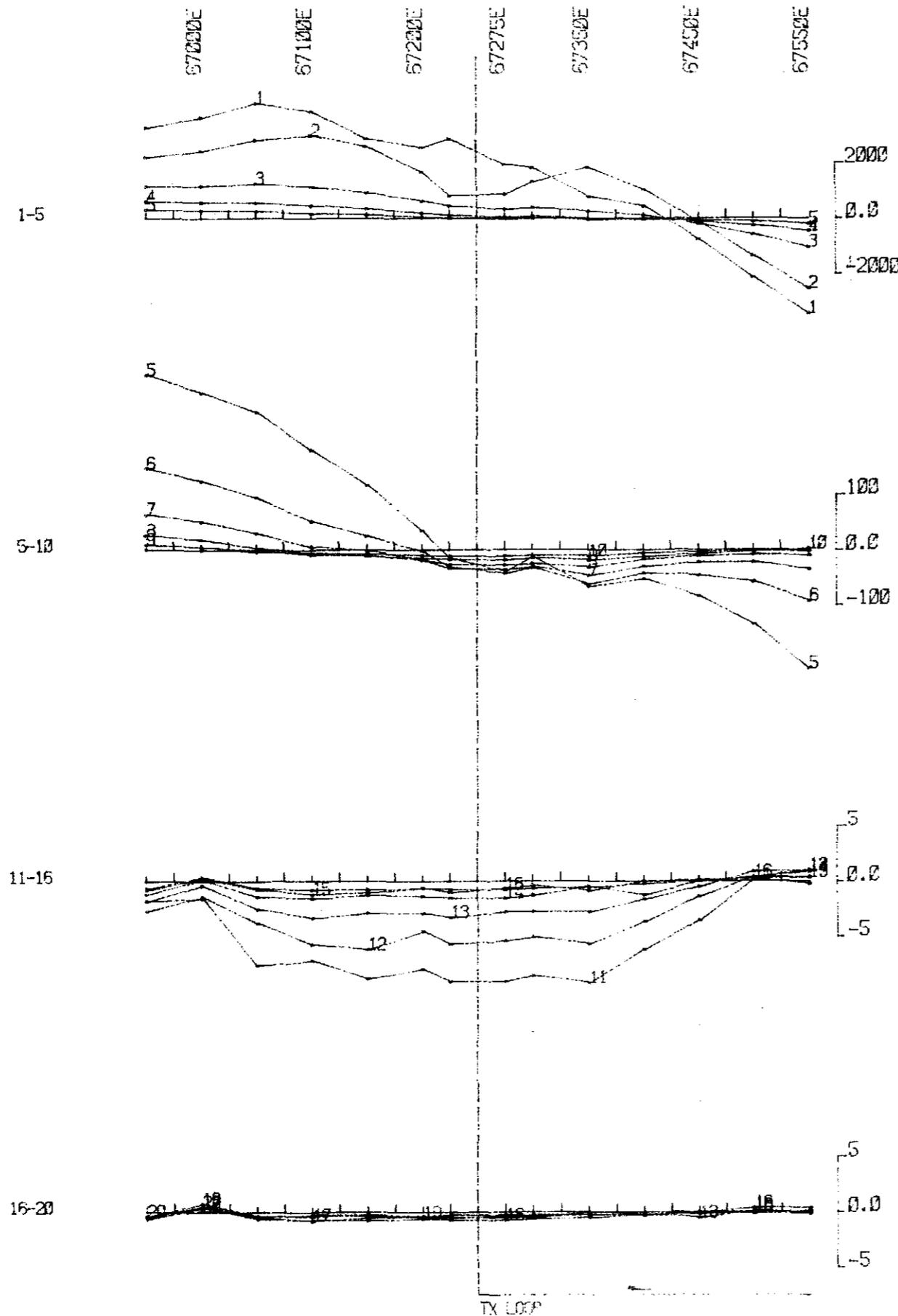


SURVEYED AND COMPILED BY
GEOTREX PTY. LTD.

PROJECT NO.
85-1456

CLIENT : Anaco Minerals Aust.
PROJECT : MARIPOSA
AREA : Zeehan Tas.
LINE : 58200N

HORIZONTAL COMPONENT B (X)



EM-37
FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY
SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

nanovolts per metre squared

5 cm

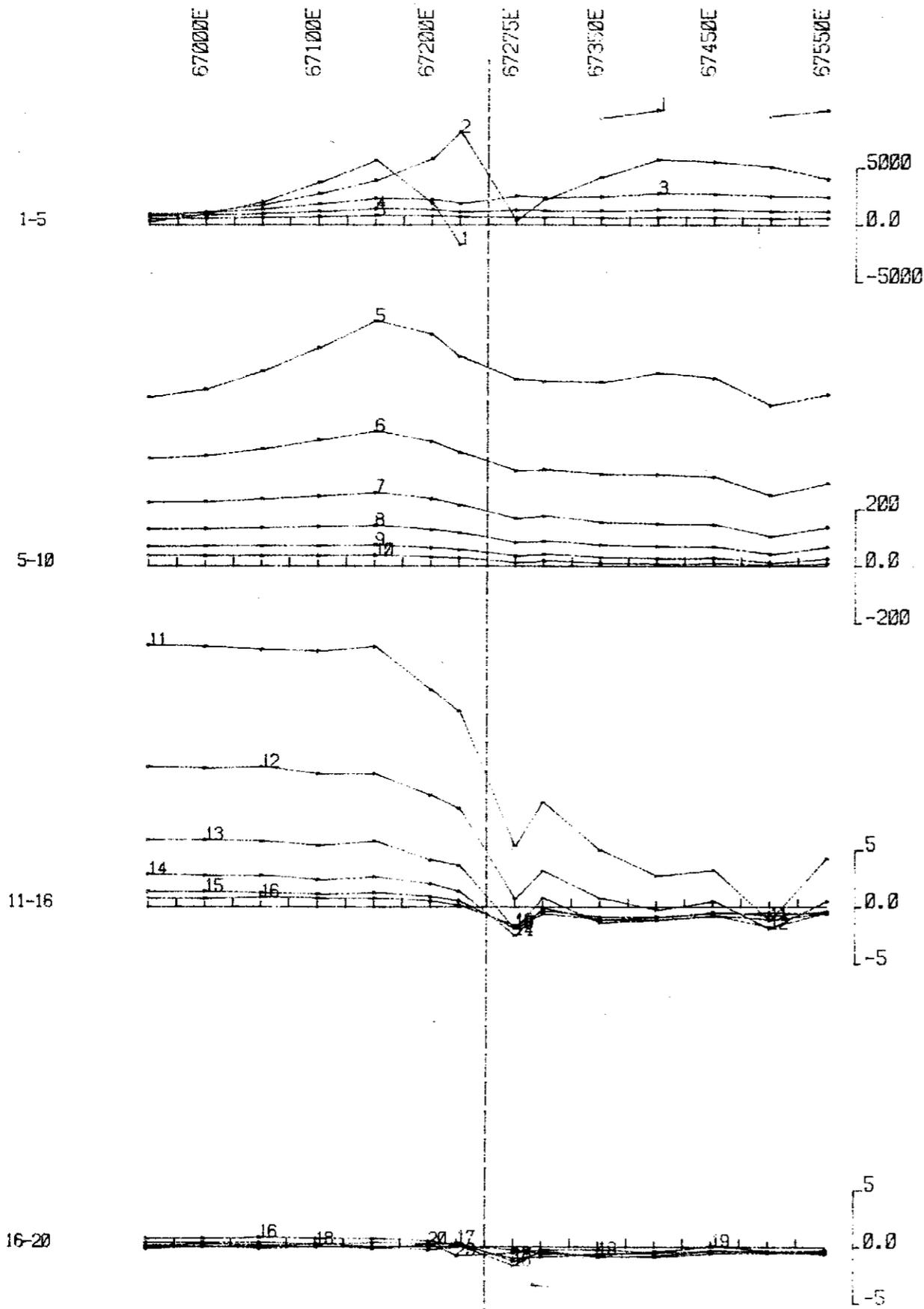
TX LOOP SIDES : 58300N 67250E
 : 59600N 67500E
TX LOOP SIZE : 350m X 800m
TX TURN OFF TIME : 294
CURRENT : 12.2A
FREQUENCY : 25 Hz
INTEGRATION TIME : 12
SYNC MODE : CRYSTAL
HORIZONTAL SCALE : 1:50000
SURVEYED BY : J.P. S.K.
DATE : 21-DEC-1982



SURVEYED AND COMPILED BY : GEOTREX PTY. LTD. PROJECT NO. : 20-1496

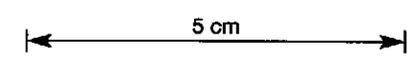
CLIENT : Amoco Minerals Aust.
PROJECT : MARIPOSA
AREA : Zeehan Tos.
LINE : 59200N X
TX LOC : 4

VERTICAL COMPONENT B (Z)



EM-37
FIXED
TRANSMITTER
SURVEY

ELECTROMOTIVE FORCE INDUCED BY
SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)



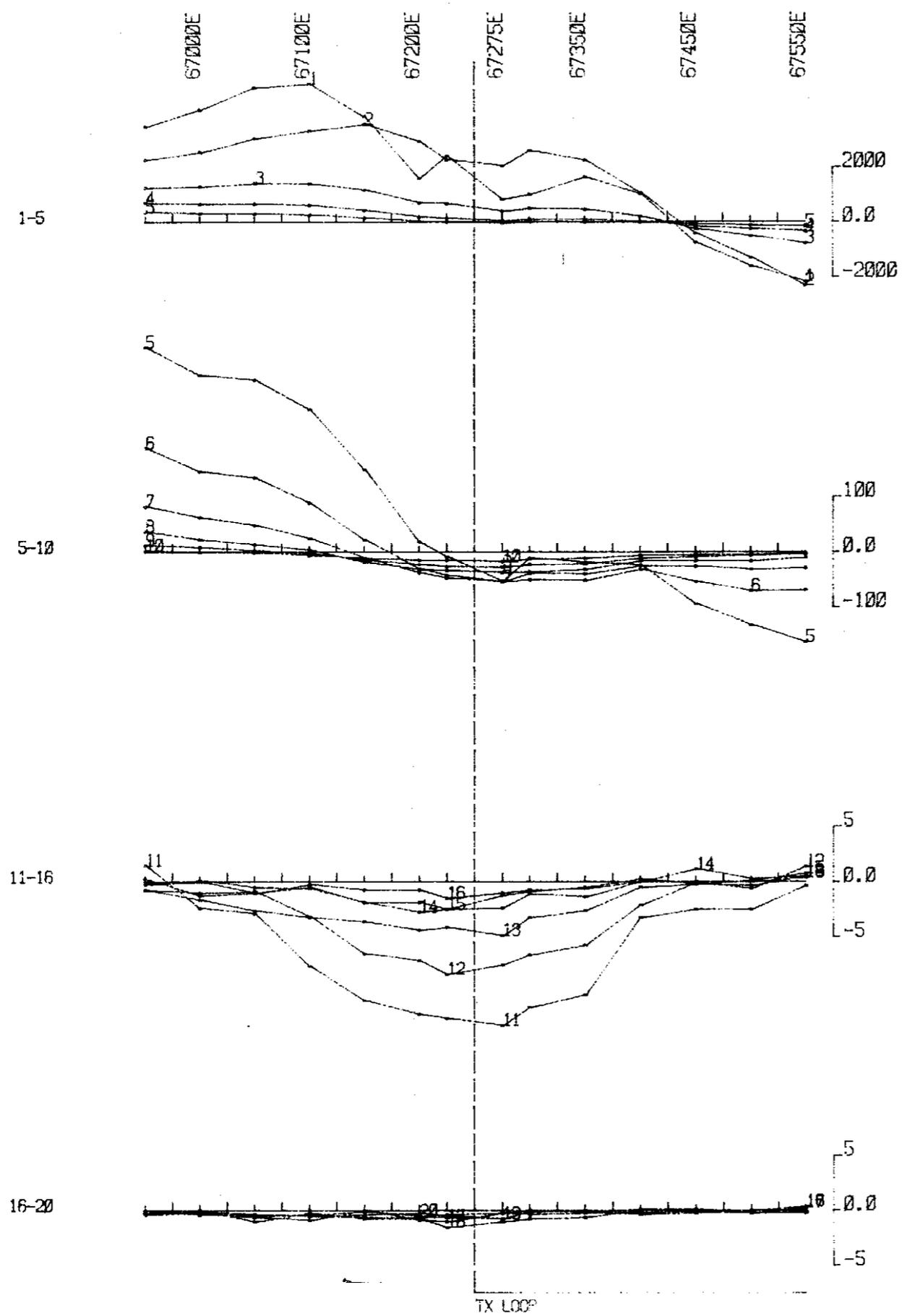
nanovolts per metre squared

TX LOOP SIDES : 58300N 67250E
 : 59600N 67600E
TX LOOP SIZE : 300m X 200m
TX TURN OFF TIME : 294
CURRENT : 10.21
FREQUENCY : 25 Hz
INTERSTION TIME : 17
SYNC MODE : CRYSTAL
HORIZONTAL SCALE : 1:5000
SURVEYED BY : J.P. A.K
DATE : 21-DEC-1982

	SURVEYED AND COMPILED BY	PROJECT NO.
	GEOTREX PTY. LTD.	35-1456
CLIENT	: Amoco Minerals Aust.	
PROJECT	: MARIPOSA	
AREA	: Zeehan Tas.	
LINE	: 59300N	Z

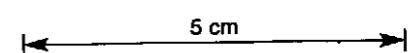
158
851

HORIZONTAL COMPONENT B (X)



EM-37
FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY
SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

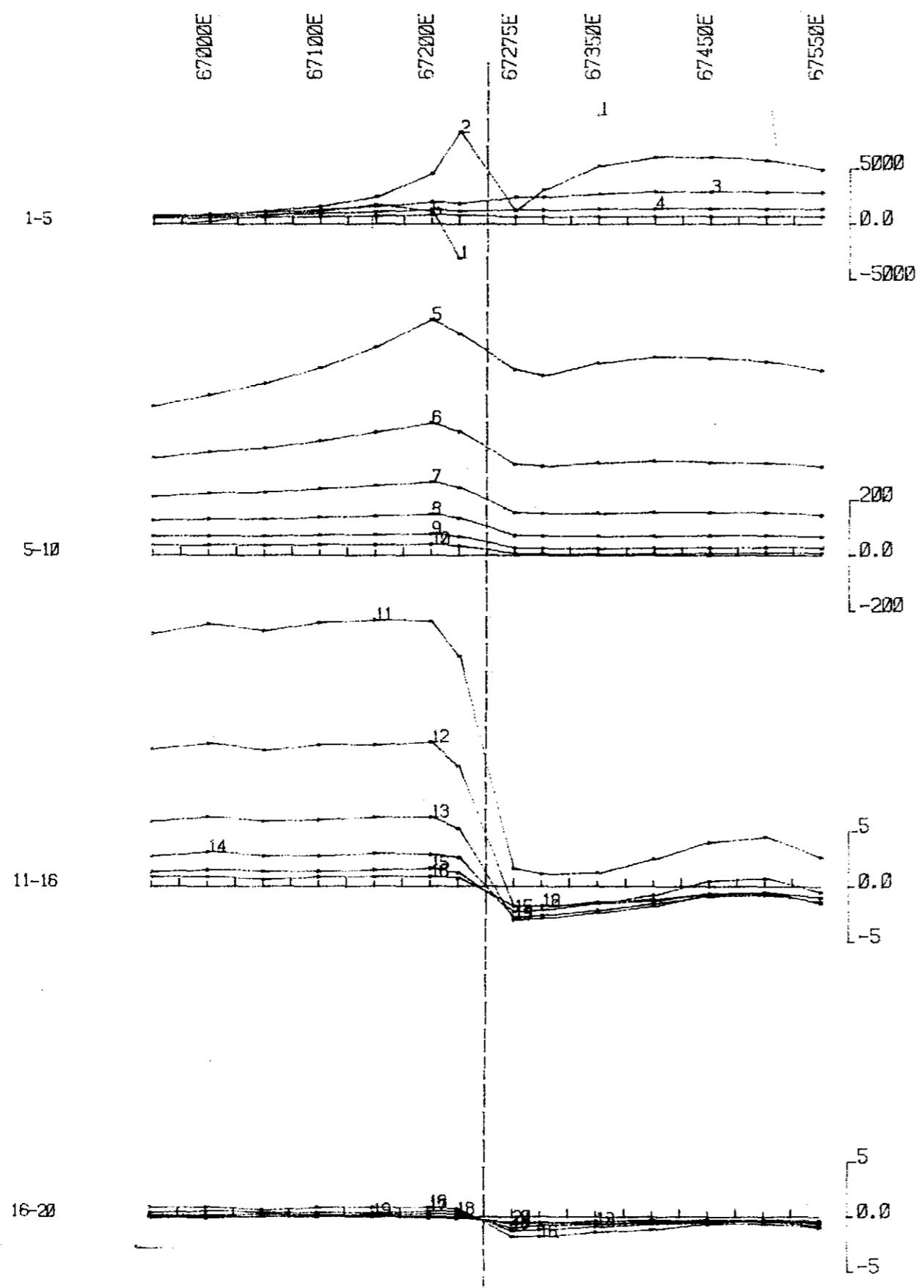


nanovolts per metre squared

TX LOOP SIDES : 58300N 67250E
 : 59600N 67600E
TX LOOP SIZE : 350m X 800m
TX TURN OFF TIME : 294
CURRENT : 12.2A
FREQUENCY : 25 Hz
INTEGRATION TIME : 12
SYNC MODE : CRYSTAL
HORIZONTAL SCALE : 1:5000
SURVEYED BY : J.P. A.K
DATE : 21-DEC-1982

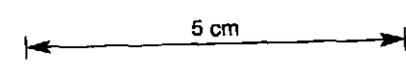
	SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.		PROJECT NO. 35-1456
	CLIENT : Amco Minerals Aust.	PROJECT : MARIPOSA	AREA : Zeehan Tas.
LINE : 59300N			X
TX LOOP : 4			

VERTICAL COMPONENT B (Z)



EM-37
FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY
SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)



nanovolts per metre squared

TX LOOP SIDES : 58800N 67250E
 : 59600N 67600E
TX LOOP SIZE : 350m X 200m
TX TURN OFF TIME : 294
CURRENT : 10.2A
FREQUENCY : 25 Hz
INTEGRATION TIME : 10
SYNC MODE : CRYSTAL
HORIZONTAL SCALE : 1:5000
SURVEYED BY : J.P. -A.K
DATE : 22-DEC-1982



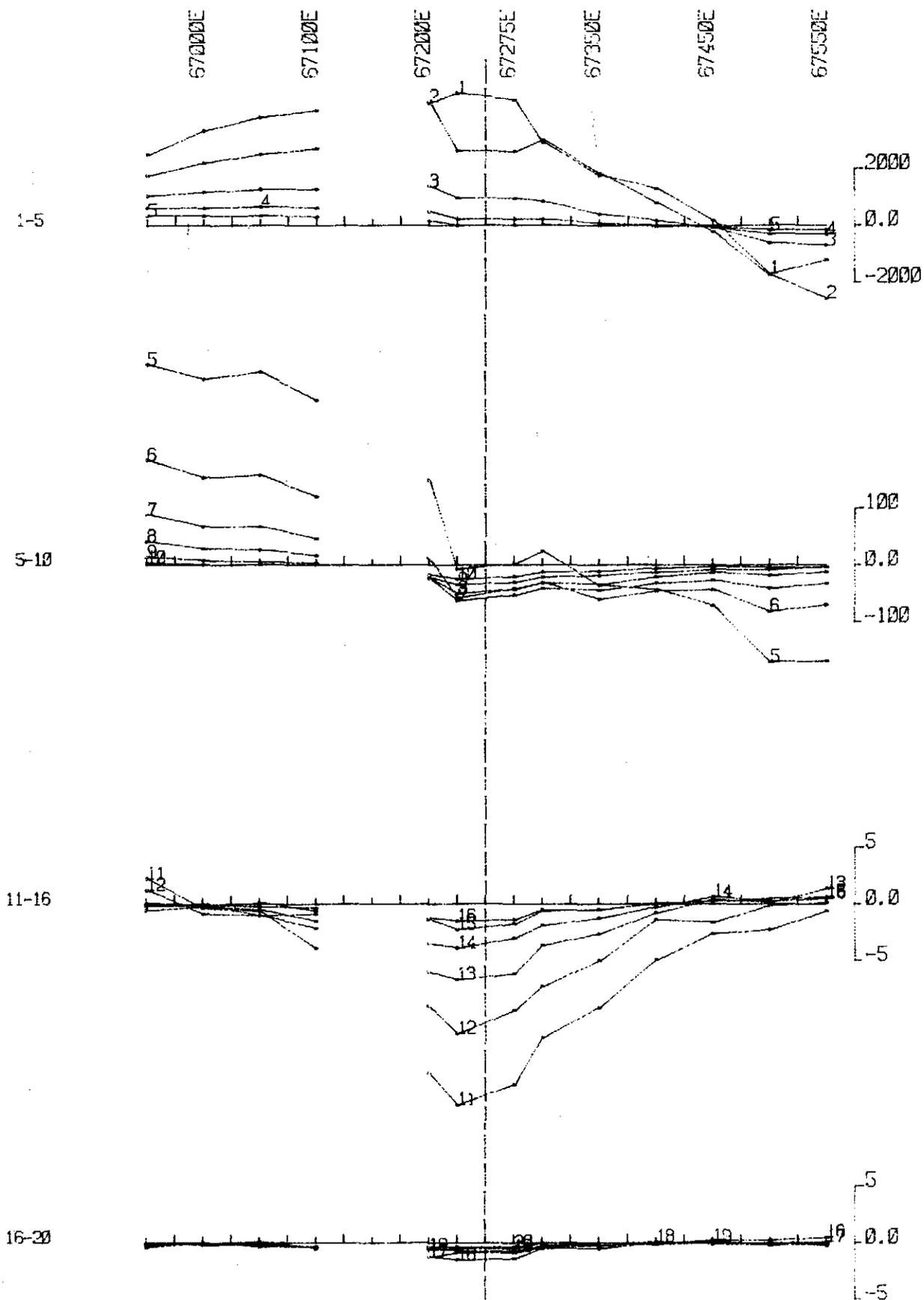
SURVEYED AND COMPILED BY : GEOTREX PTY. LTD.
PROJECT NO. : 85-1456

CLIENT : Amoco Minerals Aust.
PROJECT : MARIPOSA
AREA : Zeehan Tas.
LINE : 59400N

1691

553161

HORIZONTAL COMPONENT B (X)



EM-37
FIXED
TRANSMITTER
SURVEY

ELECTROMOTIVE FORCE INDUCED BY
SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

nanovolts per metre squared

5 cm

TX LOOP SIDES : 58300N 67250E
 : 59600N 67600E
TX LOOP SIZE : 350m X 200m
TX TURN OFF TIME : 204
CURRENT : 10.20
FREQUENCY : 25 Hz
INTEGRATION TIME : 10
SYNC MODE : CRYSTAL
HORIZONTAL SCALE : 1:5000
SURVEYED BY : J.P. A.K
DATE : 22-DEC-1982



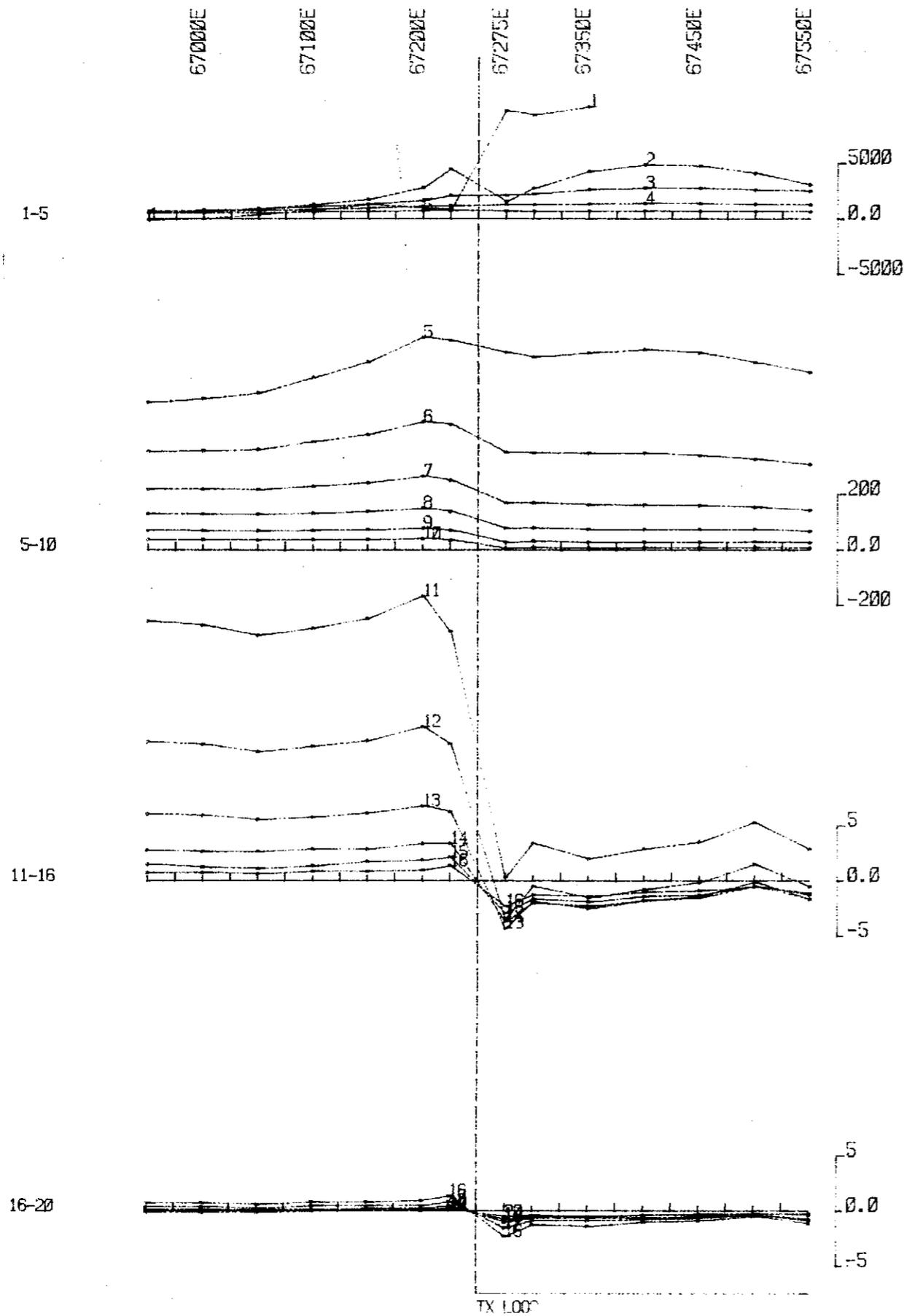
SURVEYED AND COMPILED BY
GEOTREX PTY. LTD.

PROJECT NO.
85-1456

CLIENT : Anco Minerals Aust.
PROJECT : MARIPOCA
AREA : Zeehan Tas.
LINE : 59400N X

191

VERTICAL COMPONENT B (Z)



EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

nanovolts per metre squared

TX LOOP SIDES : 58800N 67280E
: 59500N 67600E
TX LOOP SIZE : 370m X 320m
TX TURN OFF TIME : 294
CURRENT : 10.2A
FREQUENCY : 25 Hz
INTEGRATION TIME : 10
SYNC MODE : CRYSTAL
HORIZONTAL SCALE : 1:5000
SURVEYED BY : J.P. LAKE
DATE : 22-DEC-1982



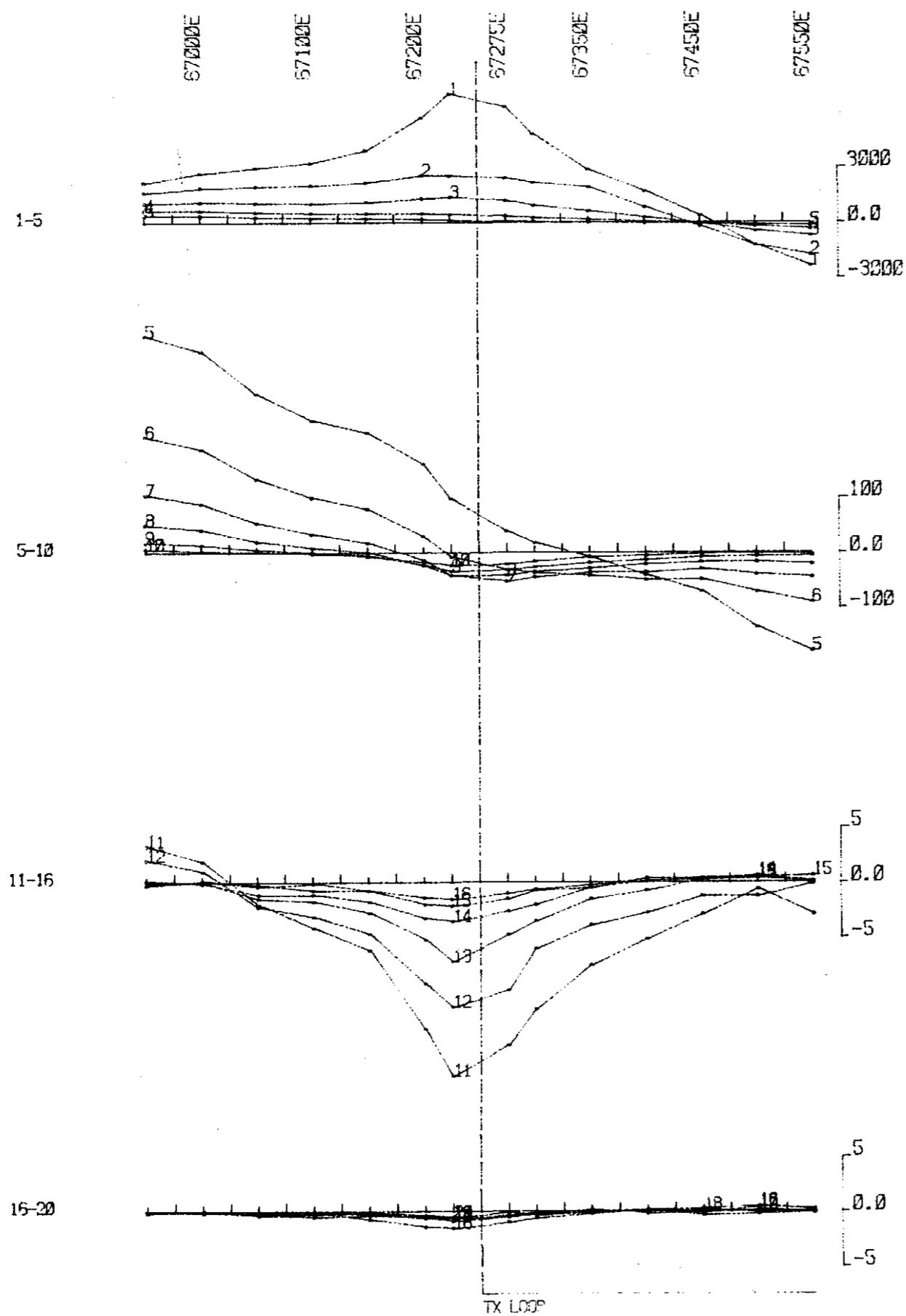
SURVEYED AND COMPILED BY
GLOTTERREX PTY. LTD.

PROJECT NO.
85-1456

CLIENT : Amoco Minerals Aust.
PROJECT : MARIPOSA
AREA : Zeehan Tas.
LINE : 59500N Z
TX LOOP : 4

162 291 10

HORIZONTAL COMPONENT B (X)



EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

nanovolts per metre squared

TX LOOP SIDES : 68300N 67250E
: 59500N 67600E
TX LOOP SIZE : 350m X 320m
TX TURN OFF TIME : 29.1
CURRENT : 12.29
FREQUENCY : 25 Hz
INTERSTITION TIME : 10
SYNC MODE : CRYSTAL
HORIZONTAL SCALE : 1:5000
SURVEYED BY : J.P. A.K.
DATE : 22-DEC-1982

 SURVEYED AND COMPILED BY GEOTREX PTY. LTD. PROJECT NO. 85-1456

CLIENT : Amoco Minerals Aust.
PROJECT : MARIPOSA
AREA : Zeehan Tas.
LINE : 59500N X
TX LOOP : 4

1691

APENDIX 6

EM 37 SURVEY - MEMO

by P. Staples

165
Ampco Minerals Australia Company

Date: MAY 24, 1983

To: B. ROXBURGH
P. JONESLocation: SYDNEY
TASMANIA

File Ref:

From: P.J. STAPLES

Location: PERTH

File Ref:

Subject: ZEEHAN EM-37 SURVEY

A preliminary assessment of the results of the Zeehan EM-37 Survey suggest there are a number of conductive zones worthy of follow-up investigation. In all cases, other than on the Austral and North Austral grids these responses are complicated by "loop effects". "Loop effects", in general, appear related to surficial changes, such as large contrasts in horizontal weathering conditions and related conductivity, and would be reduced with smaller transmitter loops. Large loop surveys carried out in areas with surficial problems, such as this, would give better results, if the transmitter loop were of the same length as the target.

On the Mariposa grid there is a conductive response which is centered at approximately 67,150E. The suggested source is a body, of generally poor conductivity, with a moderate westerly dip from 67,300E. The strongest response occurs on lines 59,300N and 59,400N.

Contour maps of the EM-37 responses on the North Austral and the Mariposa grids have been completed and accompany this report.



P.J. STAPLES

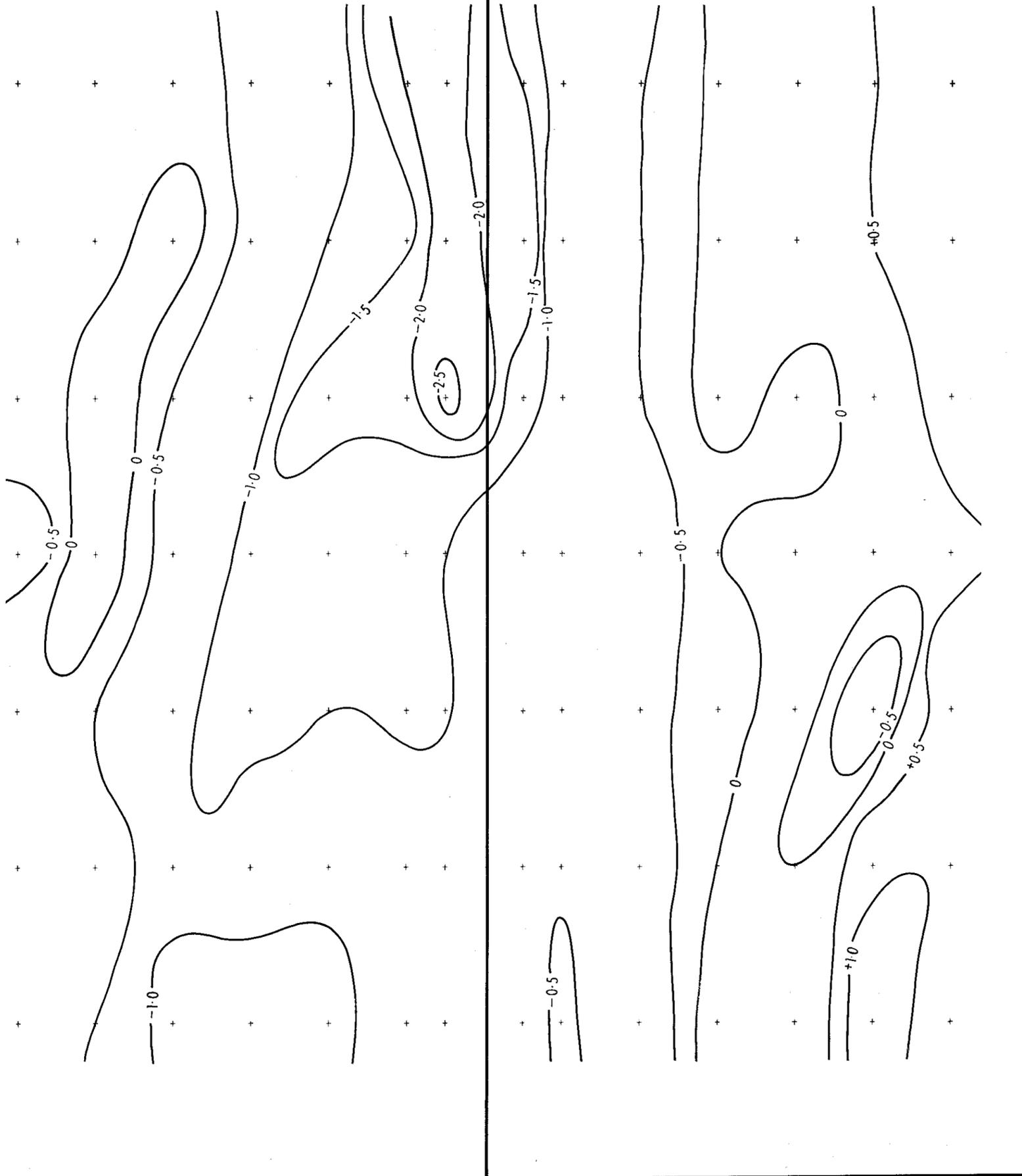
Project Geophysicist

59200N

59200N

67250E

67250E



100m

5 cm

MARAPOSA EM-37 SURVEY
Channel 15
East Component

Scale: 1:2500

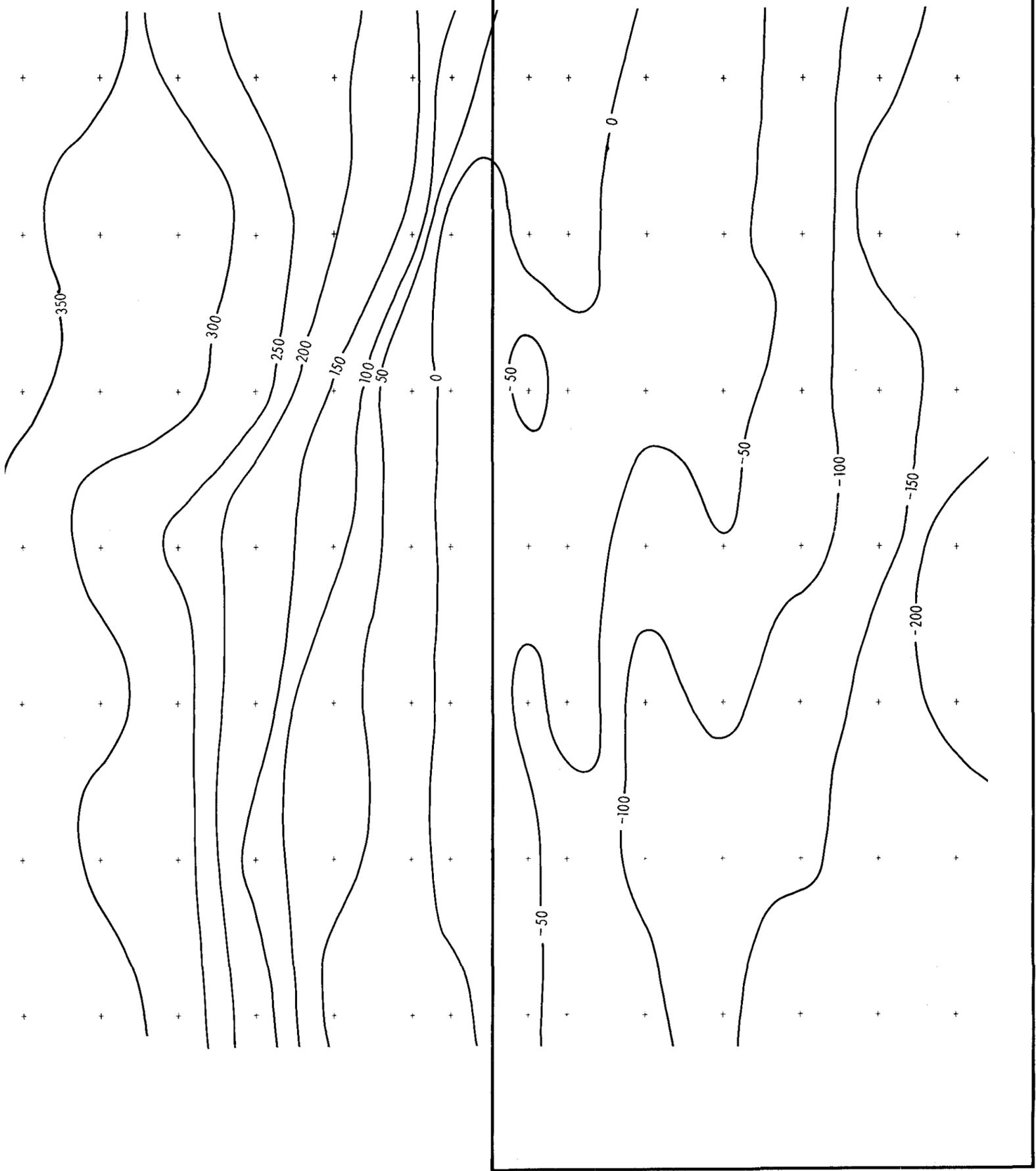
00 108

59200N

59200N

67250E

67250E



100m

5 cm

MARAPOSA EM-37 SURVEY
Channel 15
East Component

Scale: 1:2500

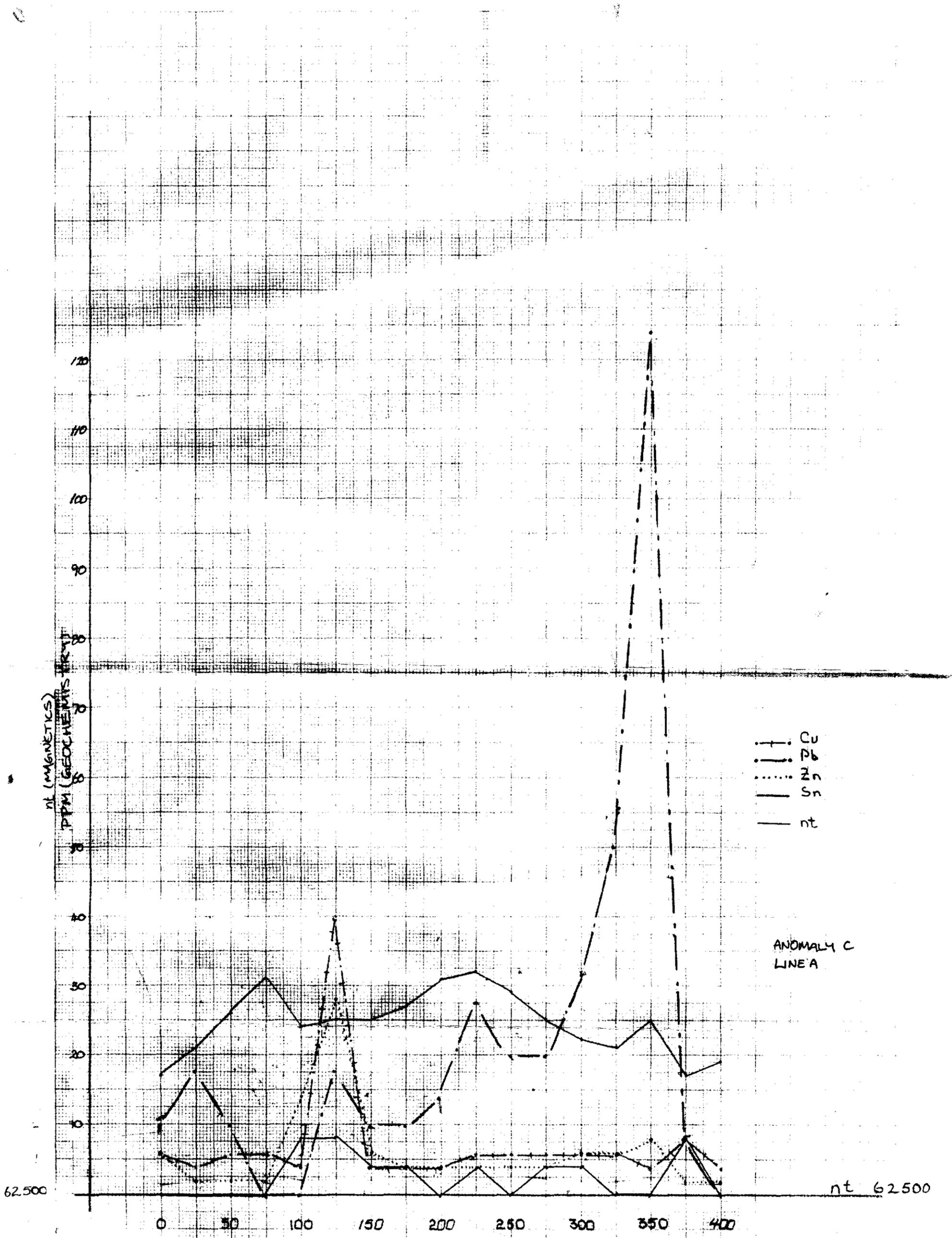
891899

108

APPENDIX 7

FOLLOW-UP OF AEROMAGNETIC ANOMALIES C, J, K AND L - GROUND
MAGNETICS AND SOIL GEOCHEMISTRY PROFILES

170



SOUTHING

ANOMALY C

LINE A

553170

CC 171

PPM (GEOCHEMISTRY)
N x 10 (MAGNETICS)

50
40
30
20
10

0 50 100 150 200 250 300 350 400

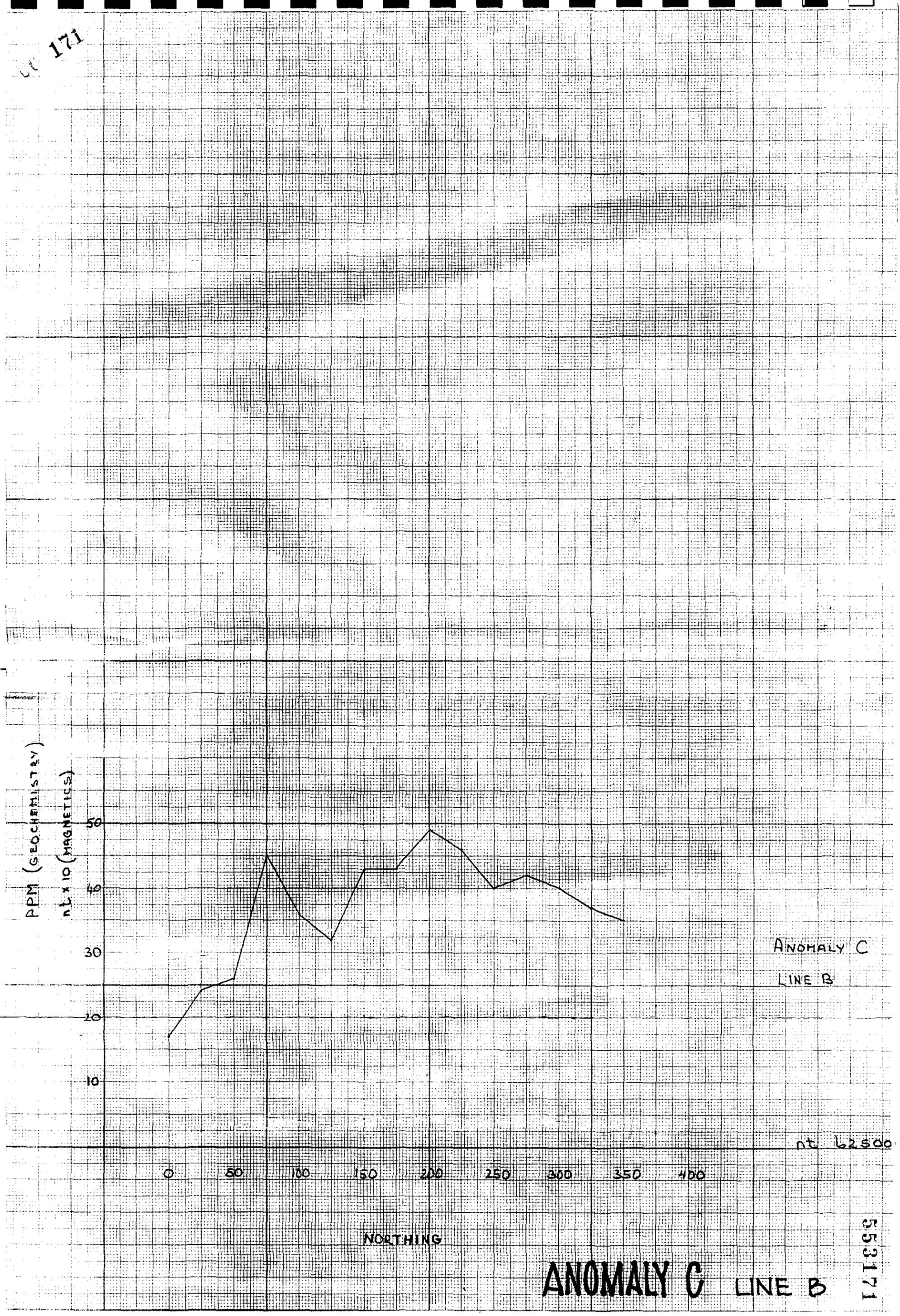
NORTHING

ANOMALY C
LINE B

nt 62500

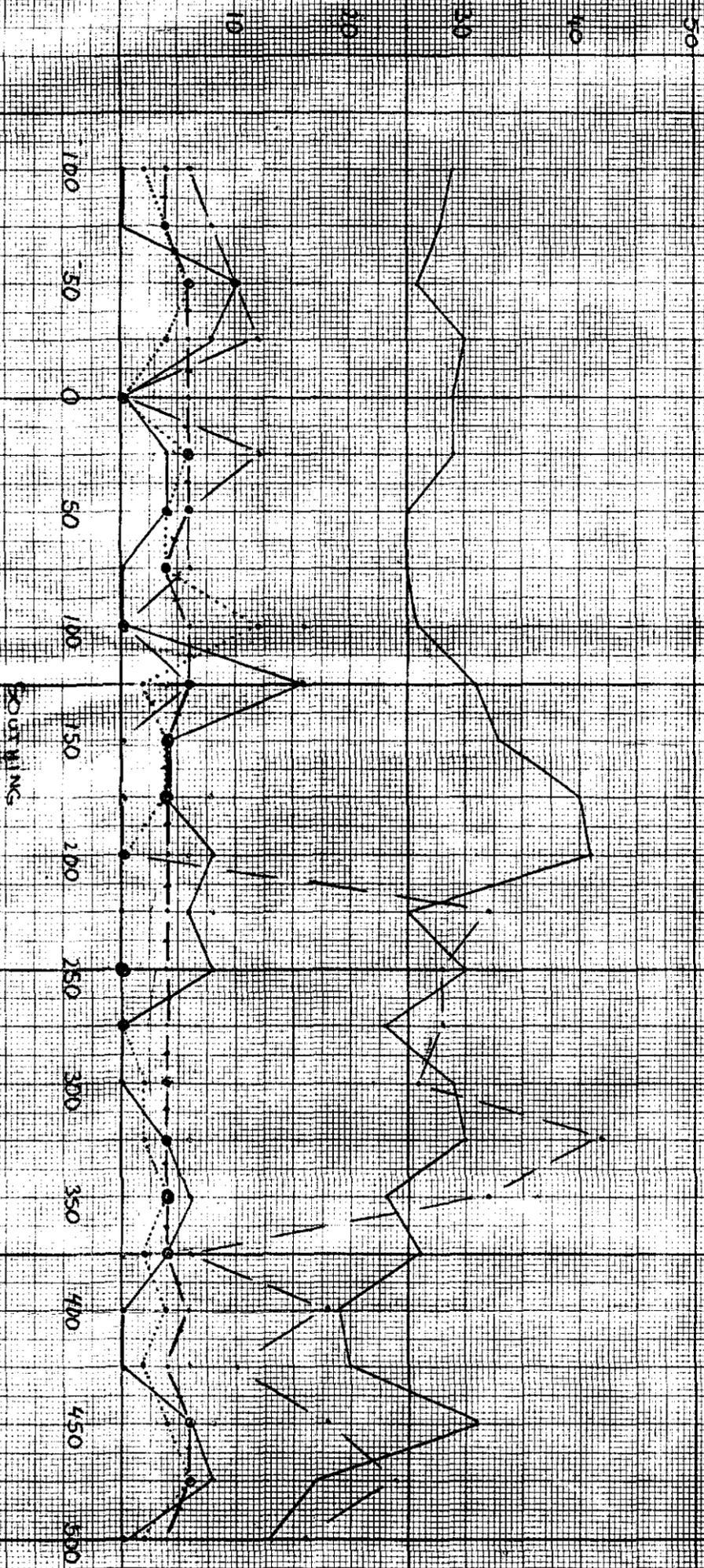
ANOMALY C LINE B

553171



P.P.M. (GEOCHEMISTRY)

1 - MC (MAGNETICS)

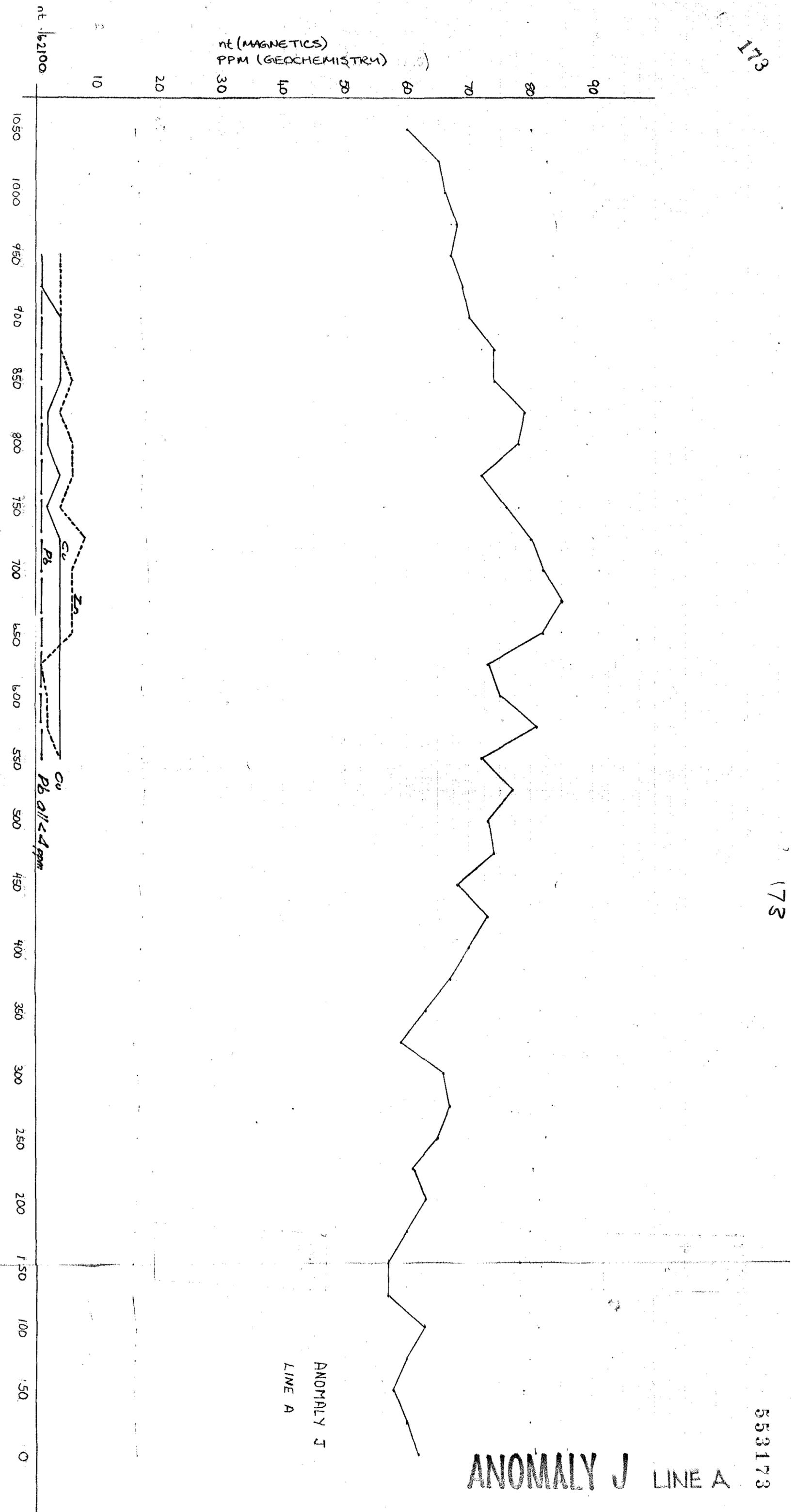


SOUNDINGS

NT 122400
 LINE C
 PROPERTY C
 LINE C
 CA
 PA
 SA
 MA

ANOMALY C LINE C

nt (MAGNETICS)
PPM (GEOCHEMISTRY)



ANOMALY J LINE A

ANOMALY J
LINE A

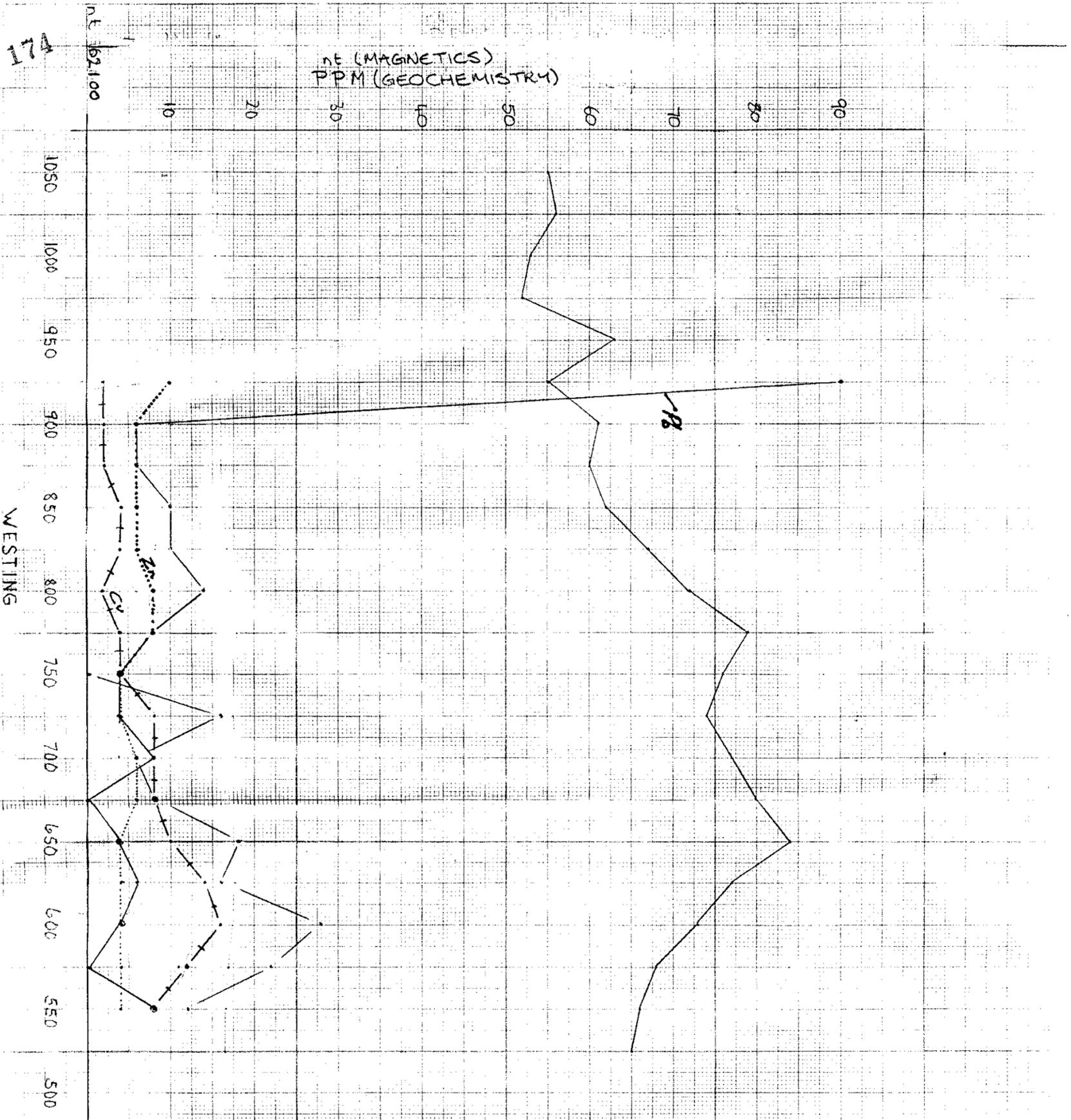
nt 162100

1050 1000 950 900 850 800 750 700 650 600 550 500 450 400 350 300 250 200 150 100 50 0

WESTING

Cu
Pb
Zn
Cu
Pb all < 4 ppm

1

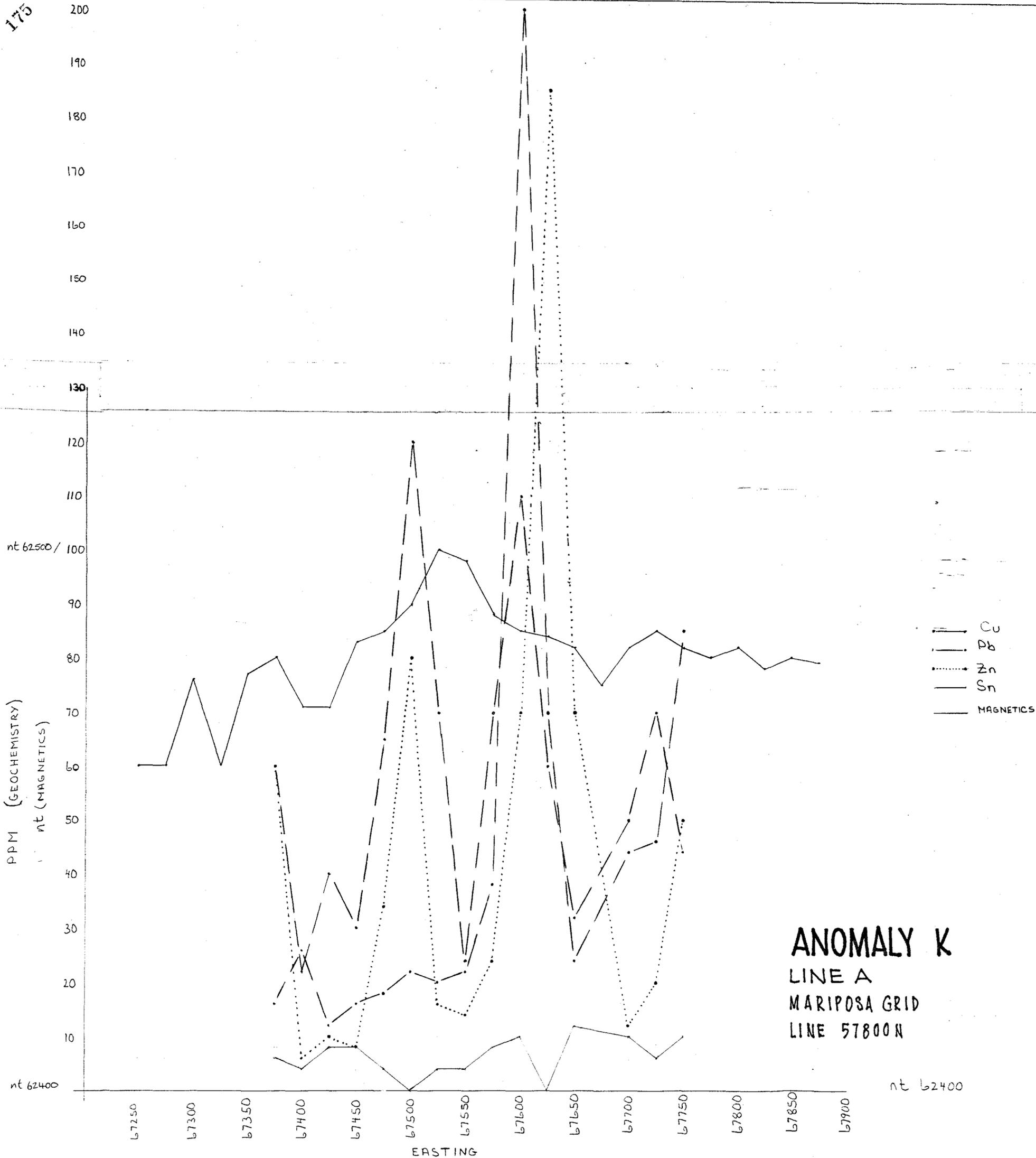


ANDOMALY J
LINE B

Cu
Pb
Zn
Sn
At

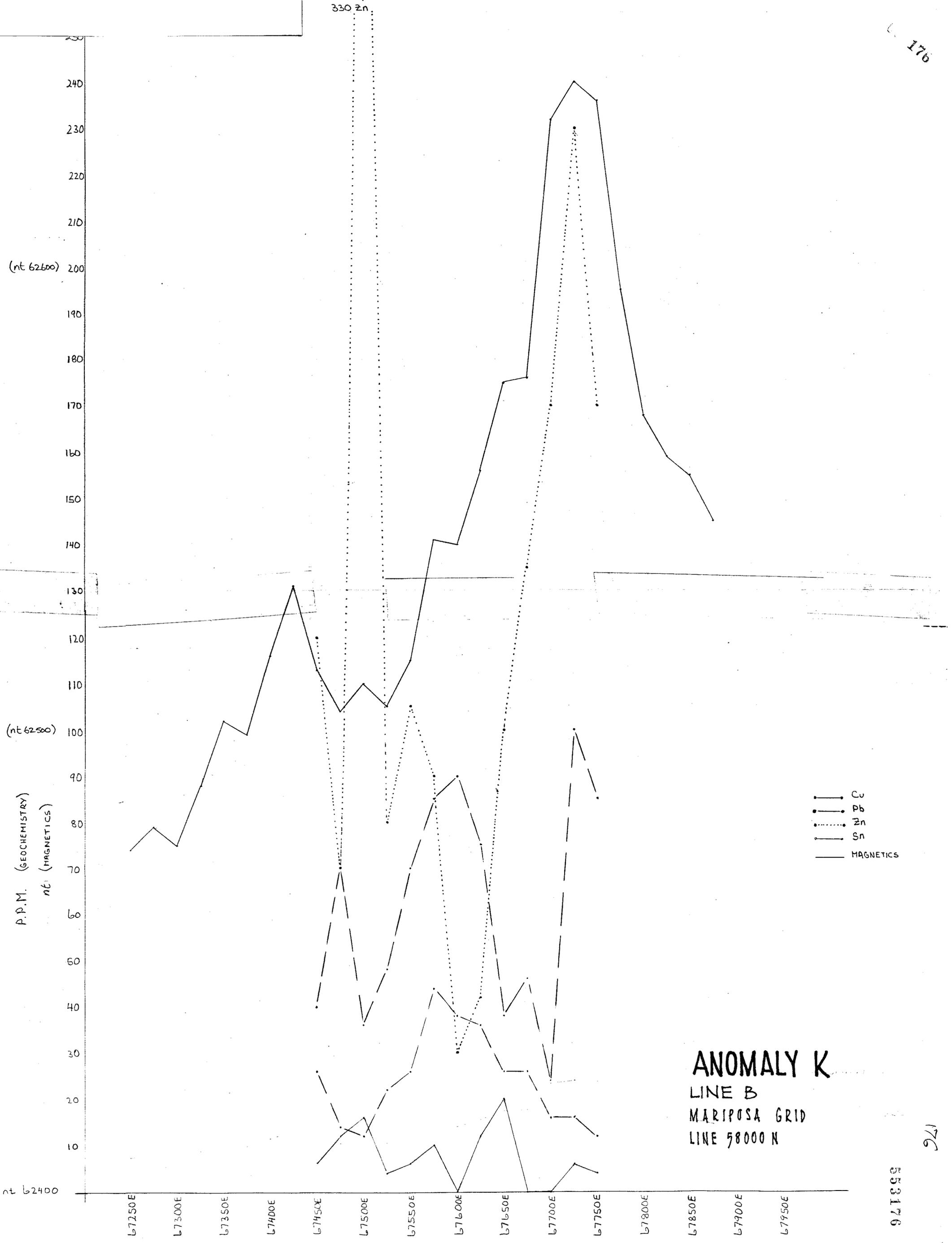
ANOMALY J LINE B

175

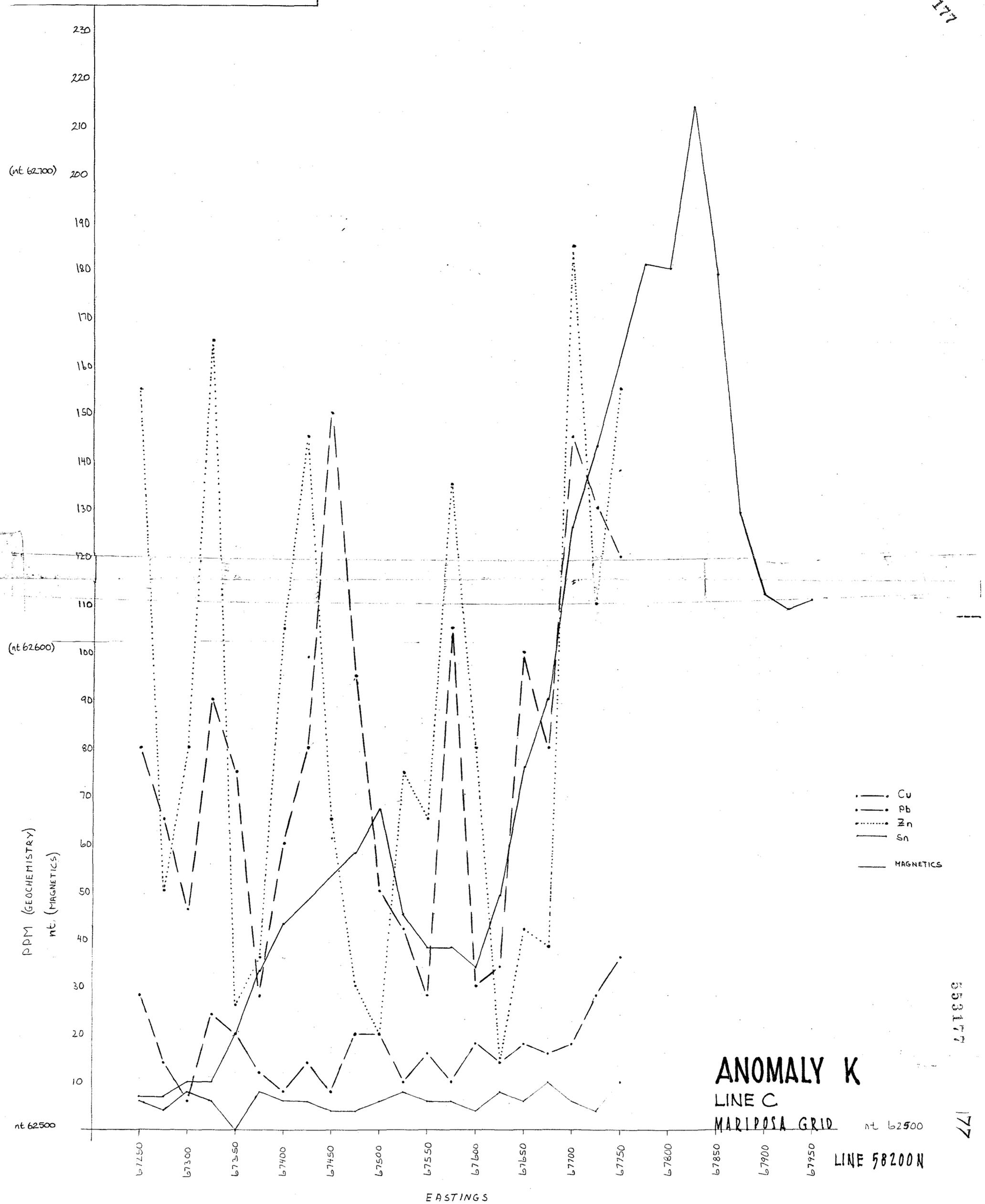


ANOMALY K
LINE A
MARIPOSA GRID
LINE 57800N

nt 62400



ANOMALY K
 LINE B
 MARIPOSA GRID
 LINE 58000 N



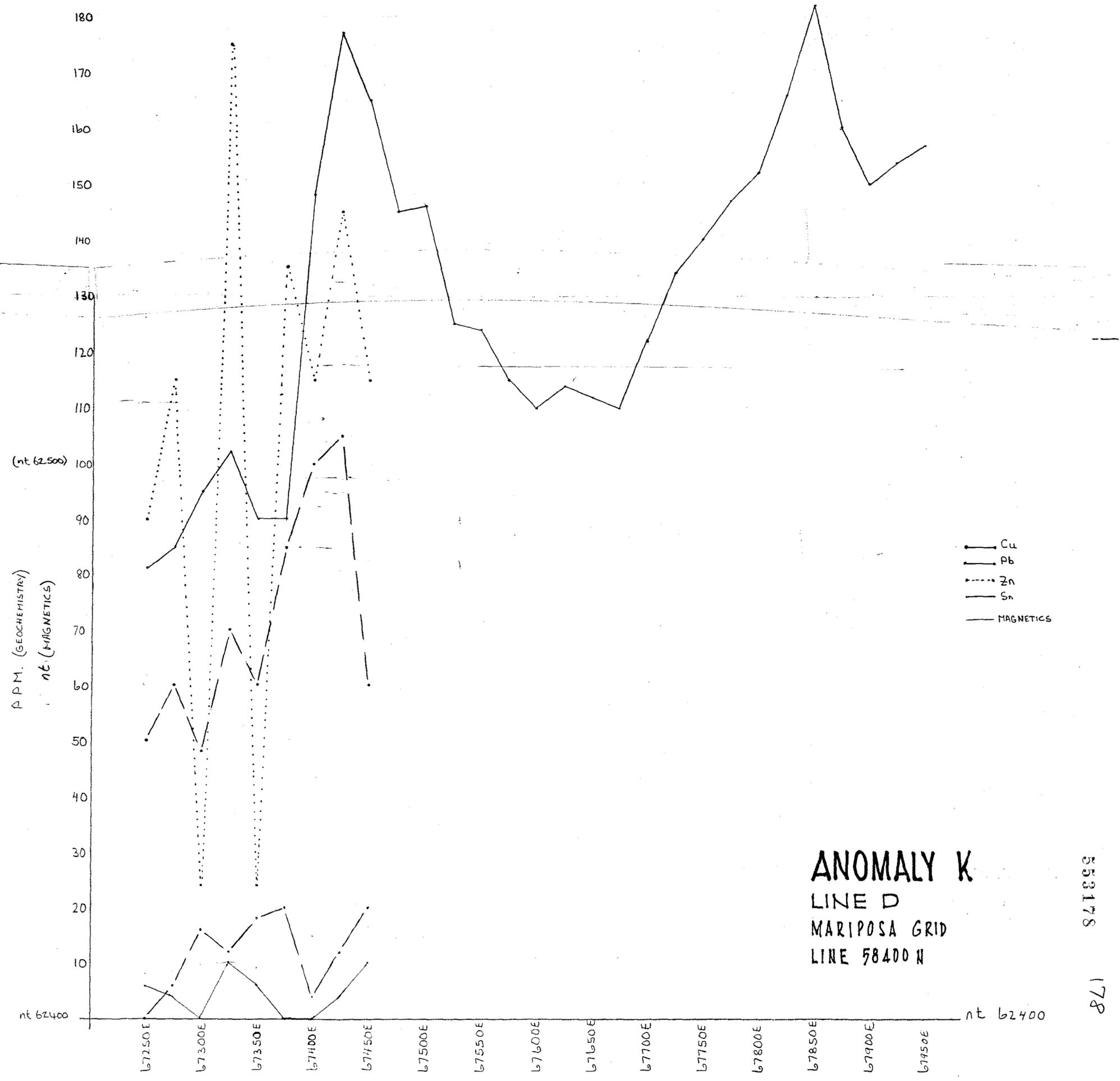
····· Cu
 - - - Pb
 - · - Zn
 ——— Sn
 ——— MAGNETICS

ANOMALY K

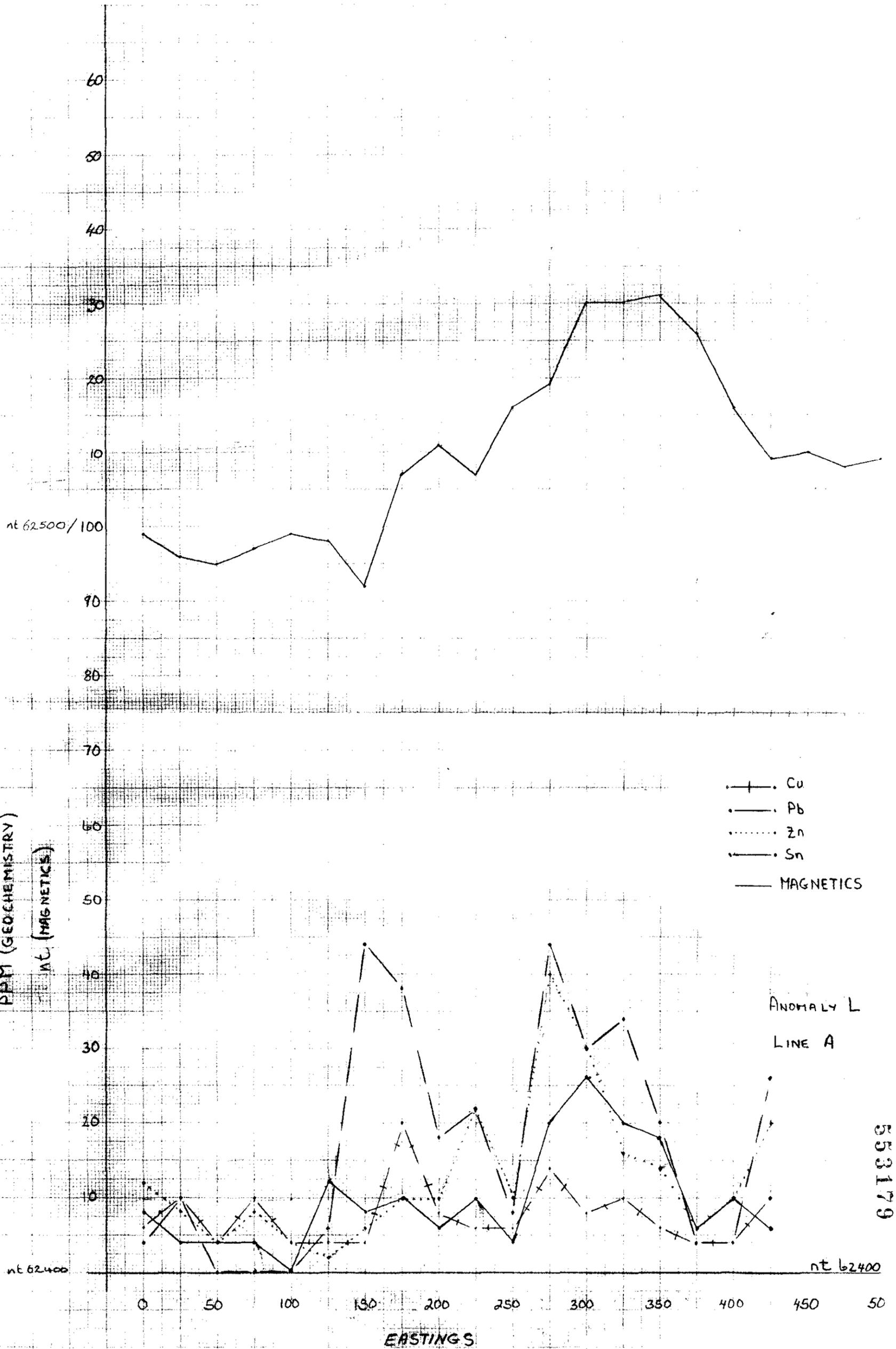
LINE C
 MARIPOSA GRID

LINE 58200N

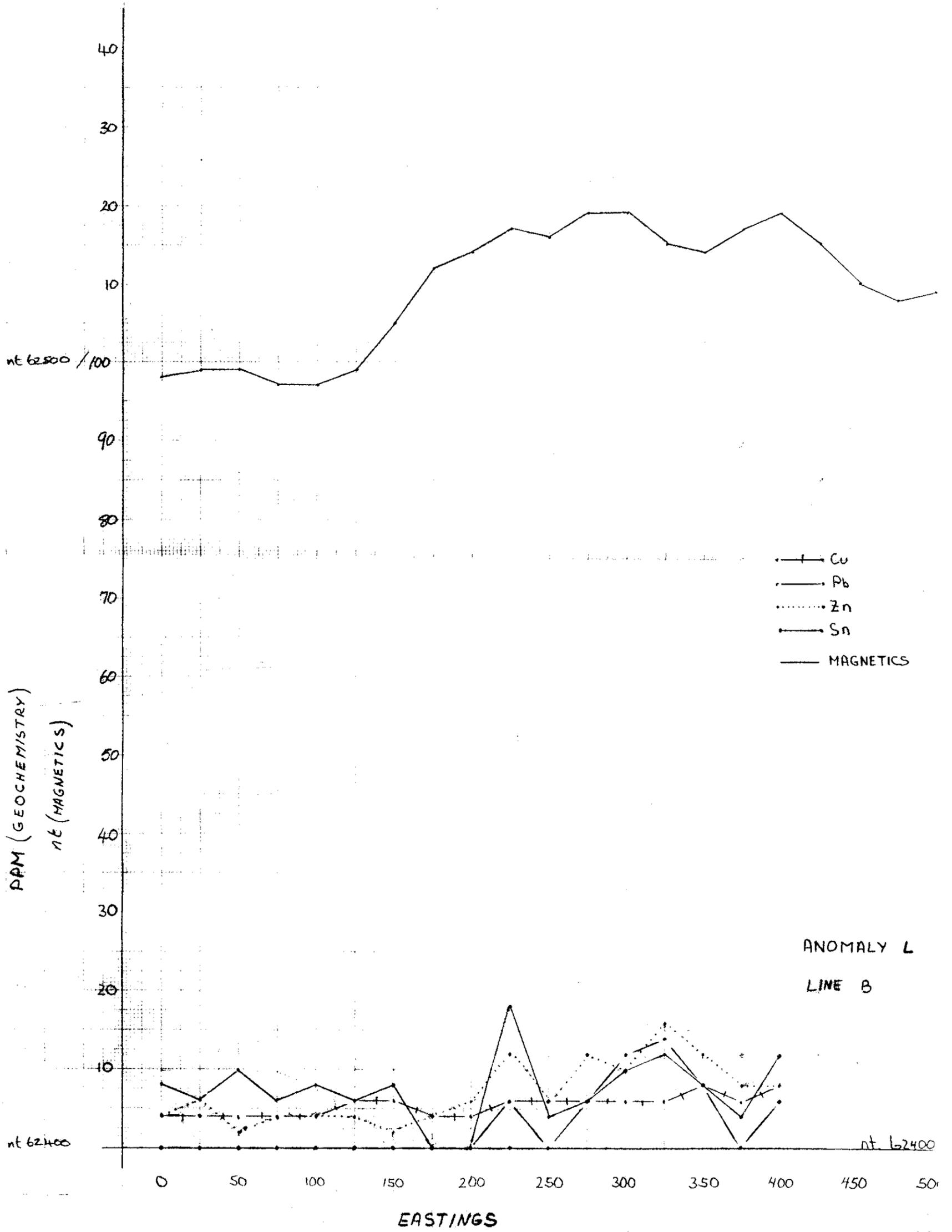
553177



ANOMALY K
LINE D
MARIPOSA GRID
LINE 58400 N



ANOMALY L LINE A



ANOMALY L
LINE B

ANOMALY L LINE B

NT 62500 / 100

PPM (GEOCHEMISTRY)
nT (MAGNETICS)

10 20 30 40 50 60 70 80 90 0 20 30

100 150 0 50 100 150 200 250 300 350 400

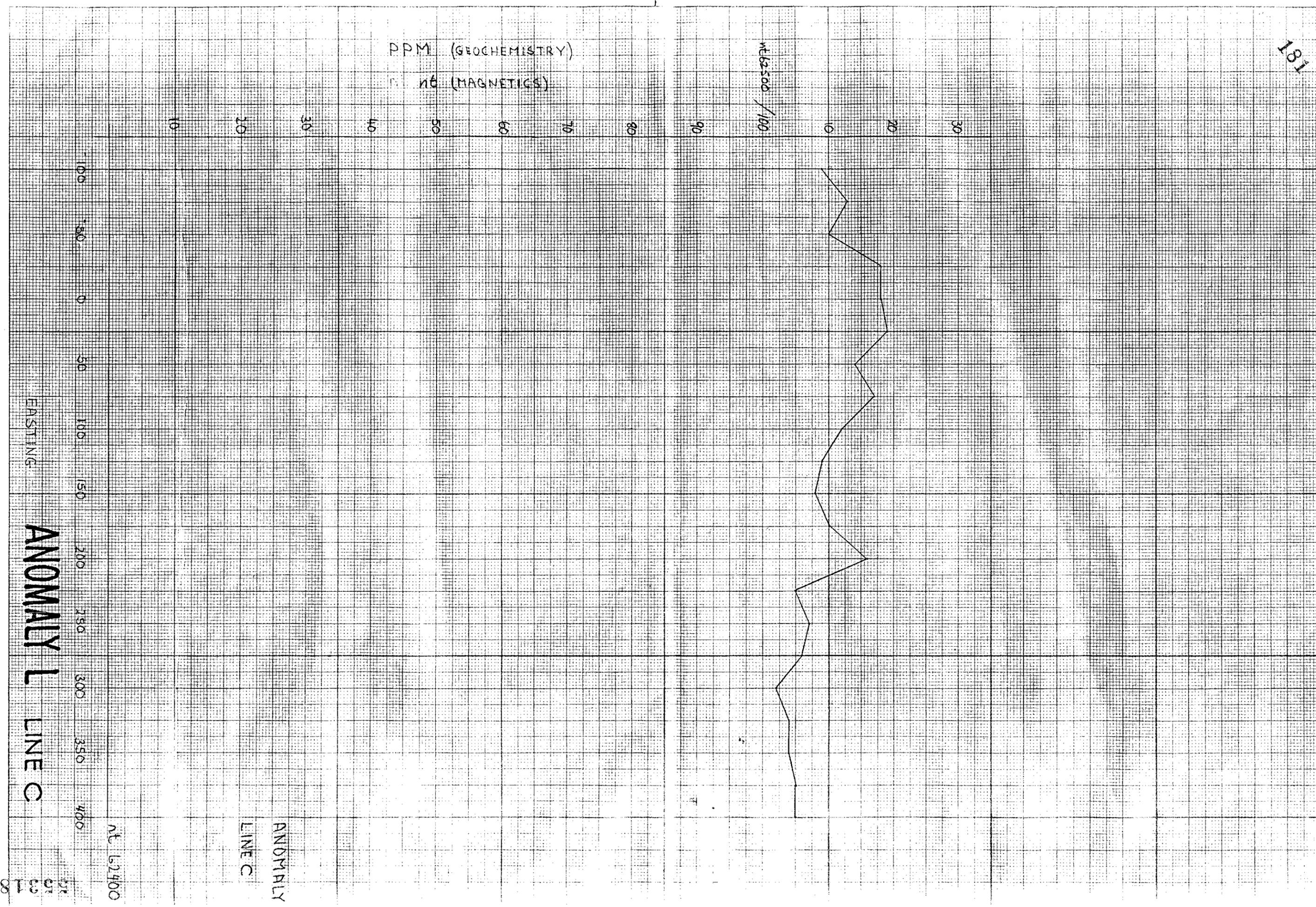
EASTING

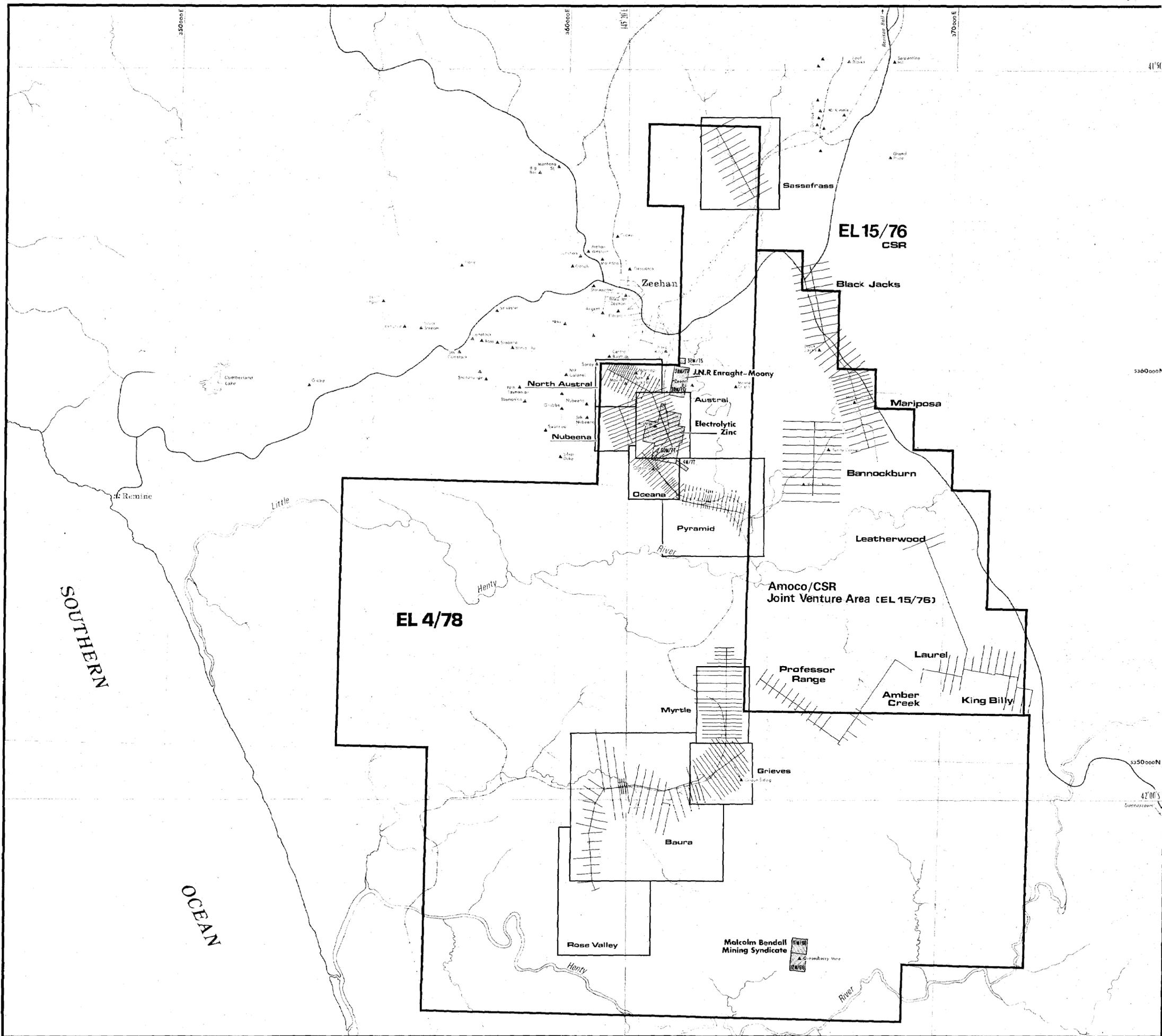
ANOMALY L
LINE C

NT 62400

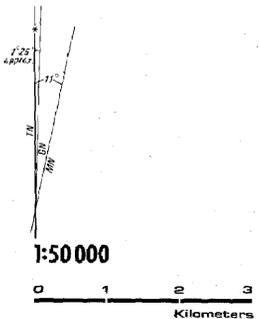
ANOMALY
LINE C

01
02
03
04





Location



Compiled from enlargement of Zeehan 1:63360 scale and Strahan 1:50000 scale geologic maps. Transverse Mercator Projection



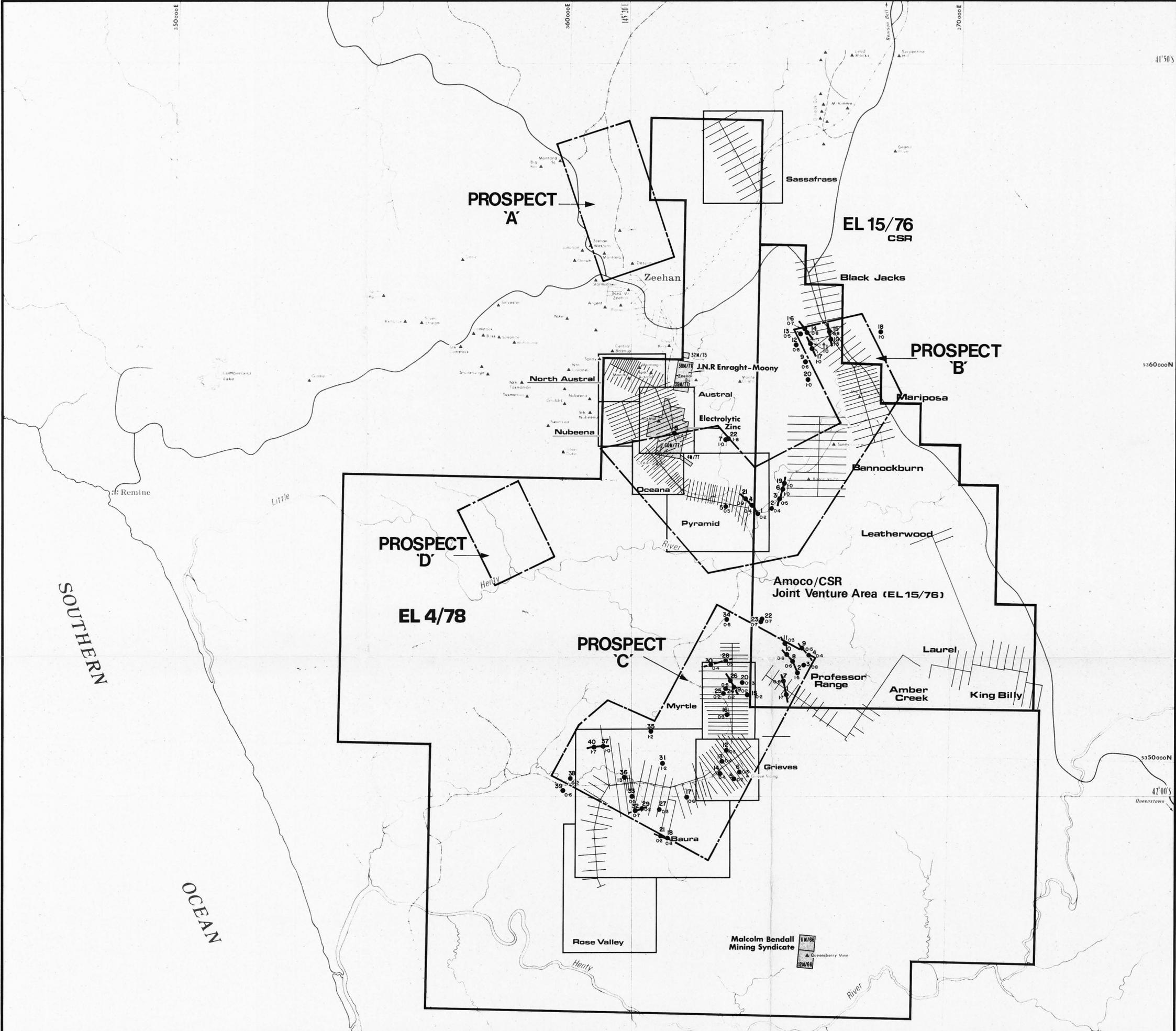
Amoco Minerals Australia Company

553152
5 cm

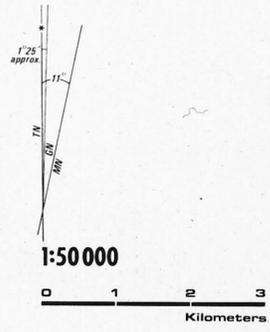
6339

Project	ZEEHAN	Nº	A-78-60
Project Partner	Zeehan EL 4/78 & Amoco/CSR JV		
PROSPECT LOCATION			
Map Ref. ANG	K-55-5	Latitude	42° 00' S
		Longitude	145° 20' E
Surveyed	Date	Scale	1:50000
Drawn T.G.D.S.	Date	March 1983	

REF: MITRE GEOPHYSICS REPORT Nº AM/W683/02



Location



LEGEND

- Survey boundary
- 15 0.8 Anomaly code number
Anomaly location and Conductor axis
in phase/out of phase ratio

NOTES

Original maps show anomalies outside of survey boundaries.
Survey by Scintrex in 1971 for Tenneco
System used: HEM-701

553183



Amoco Minerals Australia Company

6340

Project	ZEEHAN	Nº A-78-60
Project Partner	Tenneco's Helicopter E.M. Survey COVERAGE & ANOMALIES	
Map Ref. ANG	K-55-5	Latitude 42° 00' S Longitude 145° 20' E
Surveyed	Date	Scale 1:50000
Drawn T.G.D.S.	Date March 1983	Drawing Nº

Compiled from enlargement of Zeehan 1:63360 scale
and Strahan 1:50000 scale geologic maps.
Transverse Mercator Projection

REF: MITRE GEOPHYSICS
REPORT Nº AM/MG83/02

EL 15/76
Amoco/CSR Joint Venture

6341



Limit of Amoco/CSR Joint Venture Area



1:2500



Basemap compiled from field mapping and airphoto enlargement
Discrepancies exist

Notes

- Gravity contours, interval 0.1mg
 - Chargeability contours
 - Magnetic Coverage
- Gravity and magnetic surveys by BMR
(Loh, record 1950/24).
IP survey by CGG for McIntyre Mines
(Omnes, 1971).



Amoco Minerals Australia Company

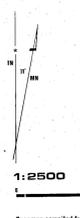
553184

Project	GORDON RIVER N ^o A-80-82		
Project Partner	CSR		
Dundas JV	Mariposa		
Gravity Contours, Chargeability Contours and Magnetic Coverage			
Map Ref. ANG	K-55-S	Latitude	39° 55' S
		Longitude	145° 25' E
Surveyed	Date	Scale	1:2500
Drawn	T.G.D.S.	Date	April 1983
		Drawing N ^o	

REF: MTR GEOPHYSICS REPORT N^o AM/M83/02

TO ACCOMPANY APPENDIX A REPORT 358

Figure

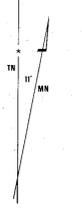
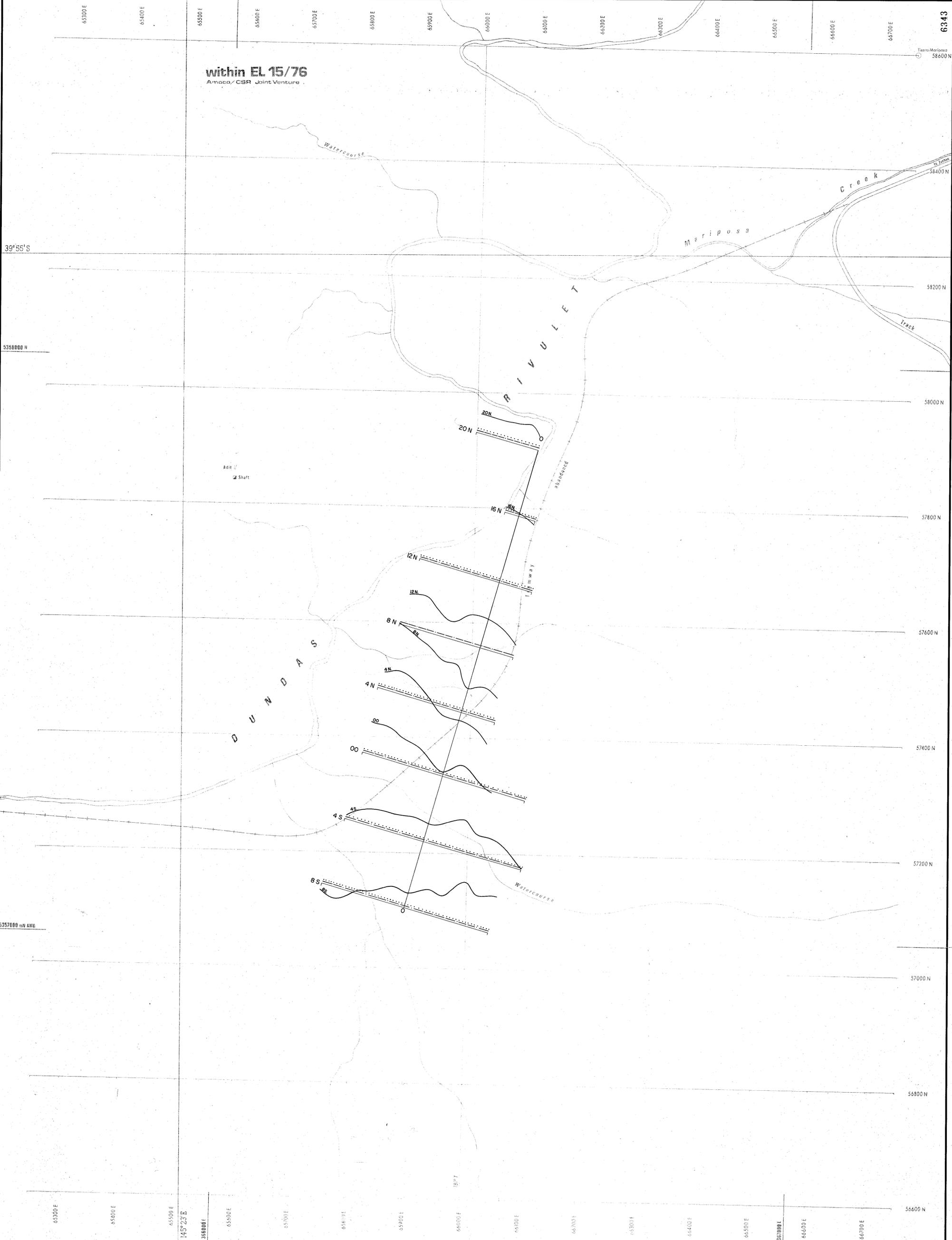


Notes:
 Turon survey by Sciencas (1972) for Tenasco (report Ten-003)
 SP survey by Tenasco, 1972
 Gravity survey by SRI/Key, 1972.
 -120 SP Contours
 --- Gravity Coverage
 --- Turon Coverage
 ● Turon Conductor with axis

Amoco Minerals Australia Company 553185

Project	GORDON RIVER N° A-80-B2		
Project Partner	CSR		
	Dundas JV	Black Jacks	
SELF POTENTIAL CONTOURS AND OTHER INDICATIONS			
Map Ref. ANG	K-55-5	Latitude	39°55'S
		Longitude	145°25'E
Surveyed		Date	April, '83
Drawn	T.G.D.S.	Date	April, '83
		Drawing N°	

within EL 15/76
Amoco/CSR Joint Venture



- Notes:
- Surveys by Rio Tinto: see Bonwell (1959).
 - Gravity Profiles
 - Magnetic Coverage
 - Electromagnetic Coverage



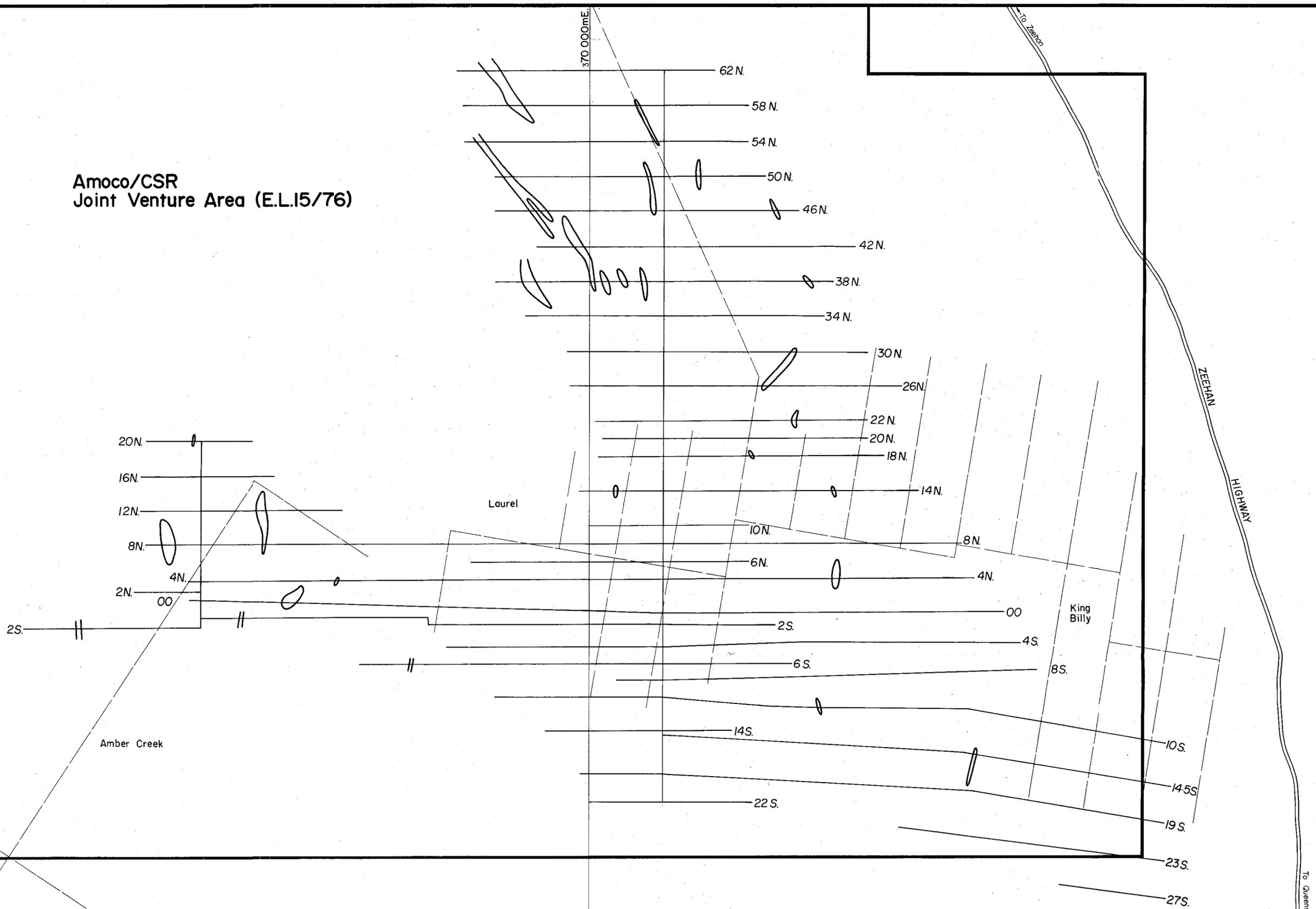
Amoco Minerals Australia Company

553186

Project	GORDON RIVER N° A-80-82		
Project Partner	CSR		
Dundas JV	Bannockburn		
GRAVITY PROFILES AND OTHER COVERAGE			
Map Ref. ANG	K-55-5	Latitude	39° 55' S
		Longitude	145° 25' E
Surveyed	Date	Scale	1:2500
Drawn	T.G.D.S.	Date	March 1983
		Drawing N°	

REF: VITRE GEOPHYSICS REPORT N° M983/02

Amoco/CSR
Joint Venture Area (E.L.15/76)



NOTES:
 Anomaly $\geq 20^\circ$ Dip Angle
 VLF survey by Geophoto in 1972
 for Texins Development.

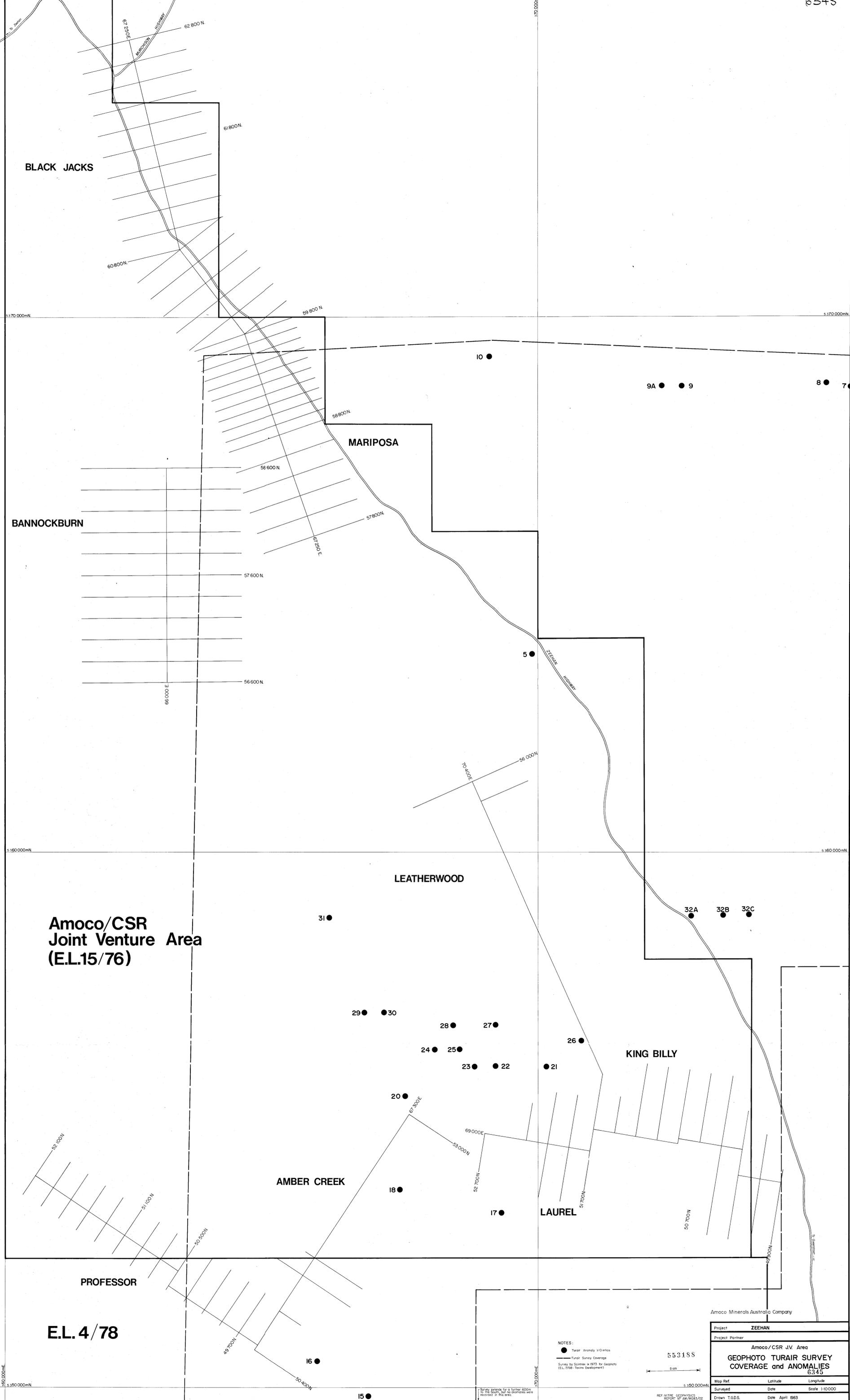
5 cm

553187

REF: MITRE GEOPHYSICS
 REPORT N° AM/M683/02

Amoco Minerals Australia Company

Project	ZEEHAN	
Project Partner		
Amber Creek Area GEOPHOTO VLF SURVEY 6344		
Map Ref	Latitude	Longitude
Surveyed	Date	Scale 1:10,000
Drawn T.G.D.S.	Date April 1983	



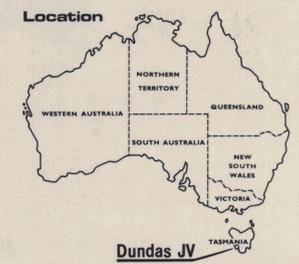
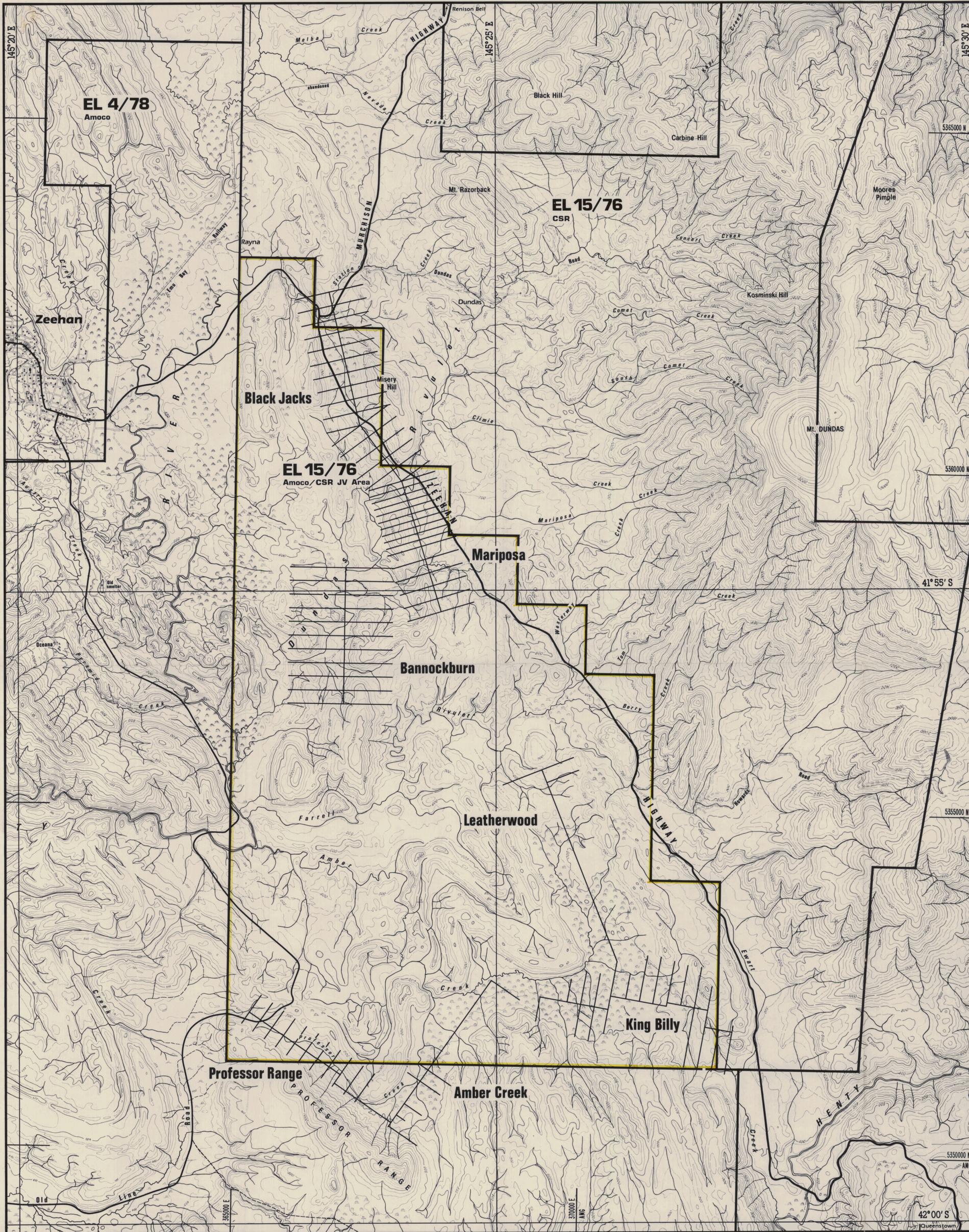
**Amoco/CSR
Joint Venture Area
(E.L.15/76)**

E.L. 4/78

NOTES:
 ● Turair Anomaly 310-mph
 — Turair Survey Coverage
 Survey by Scintrex in 1973 for Geophoto
 (E.L. 7/68 - Texnis Development)

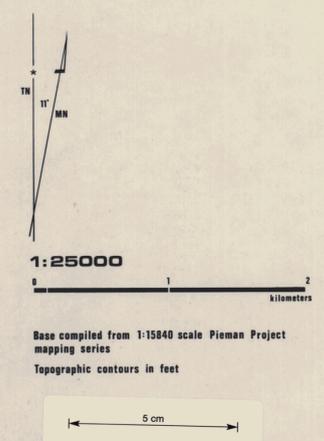
553188
 5 cm
 5350 000mN

Project		ZEEHAN	
Project Partner		Amoco/CSR JV. Area	
GEOPHOTO TURAIR SURVEY COVERAGE and ANOMALIES 6345			
Map Ref	Latitude	Longitude	
Surveyed	Date	Scale	1:10000
Drawn	T.G.D.S.	Date	April 1983



Notes

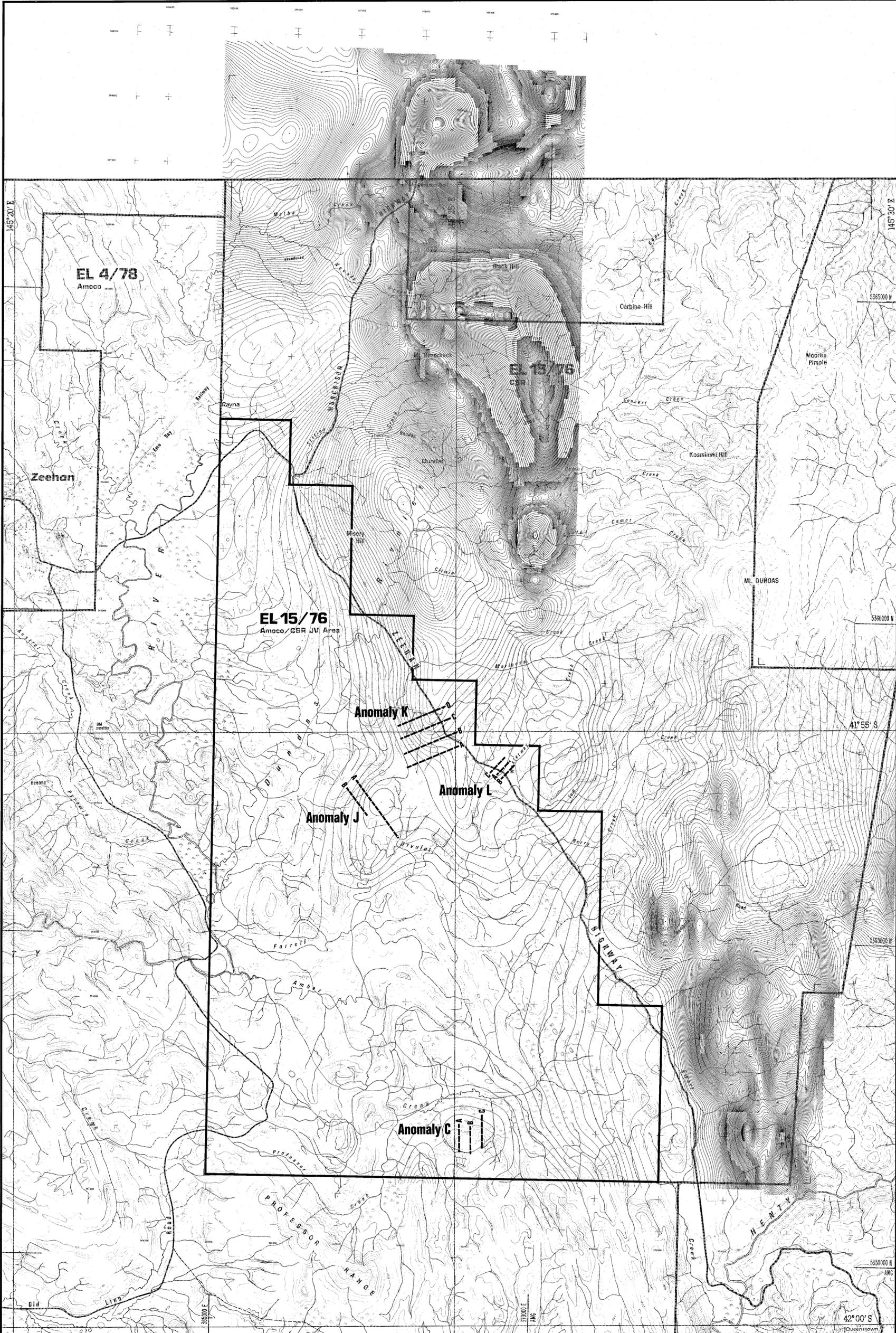
Grid positions approximate only



Amoco Minerals Australia Company 553189

Project	GORDON RIVER N° A-80-82		
Project Partner	CSR		
Dundas JV		Part EL 15/76	
JOINT VENTURE AREA AND PROSPECT LOCATION			
Map Ref. ANG	K-55-5	Latitude	42°00'S Longitude 145°30'E
Surveyed	Amoco	Date	1983 Scale 1:25000
Drawn	R.S.-K., S.F.	Date	June 1983 Drawing N° M83-2069

Report 358

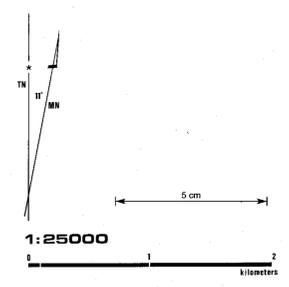


Notes

The data presented in this report are the result of reconnaissance ground magnetic and soil geochemistry traverses over aeromagnetic anomalies delineated from the West Coast Aeromagnetic Survey (see Figure 3, Report 358).

PROJECT NUMBER 8075 - SURVEYED FEBRUARY 1982

Reconnaissance ground magnetic and soil geochemistry traverses over aeromagnetic anomalies delineated from the West Coast Aeromagnetic Survey (see Figure 3, Report 358)

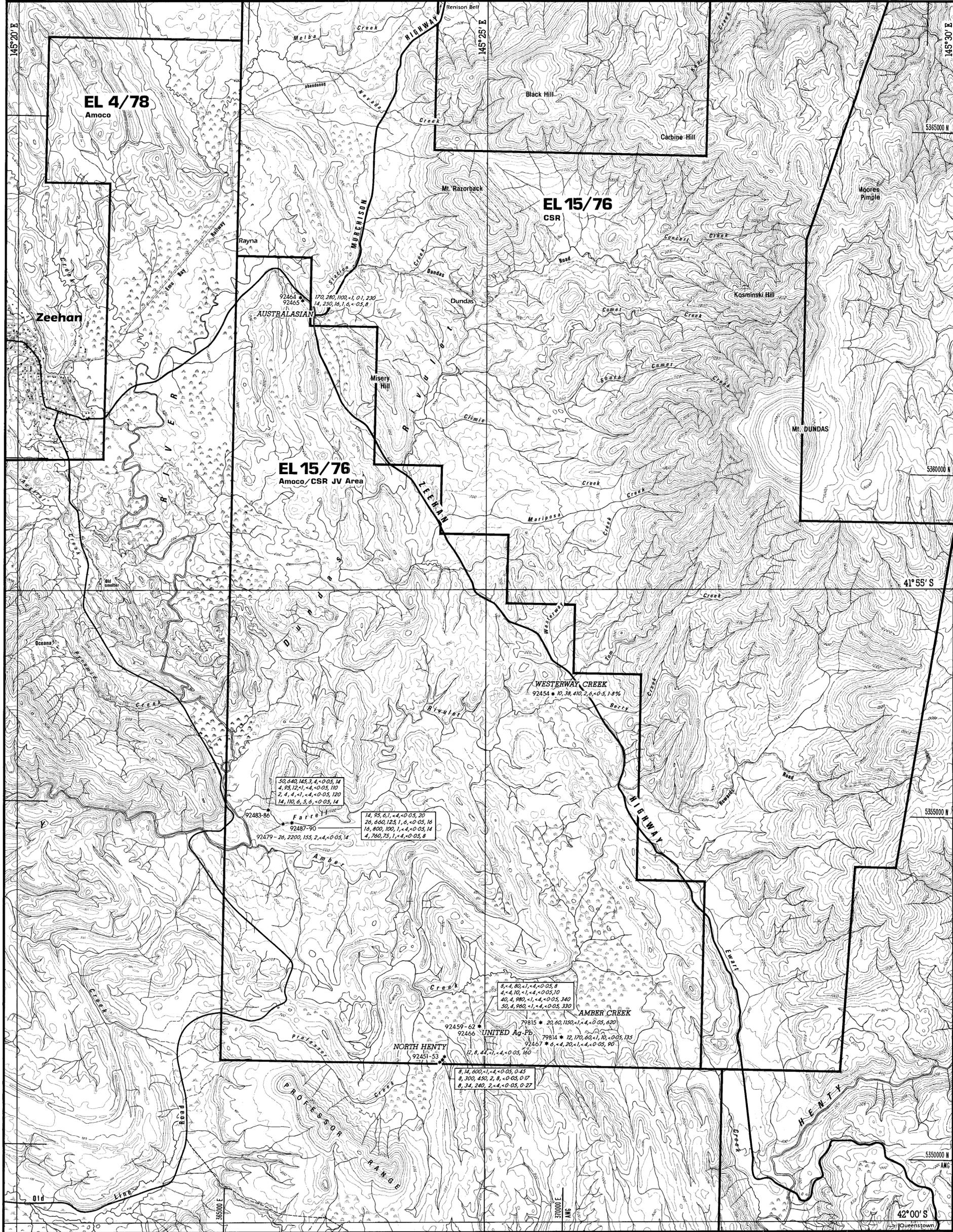


Base compiled from 1:15840 scale Pieman Project mapping series
Topographic contours in feet



Amoco Minerals Australia Company 553190

Project	GORDON RIVER N° A-80-82		
Project Partner	CSR		
Dundas JV			
AEROMAGNETICS (EX CSR)			
Map Ref. ANG	K-55-5	Latitude	42°00'S Longitude 145°30'E
Surveyed	Geox / CSR	Date	1982 Scale 1:25000
Drawn	Geox, R.S-K, S.F.	Date	June 1983 Drawing N°M83-2060
Report 358			



Notes

Rockchip sample location and number * 92469
Order of results - Cu, Pb, Zn, Ag, Sn, Au, Mn

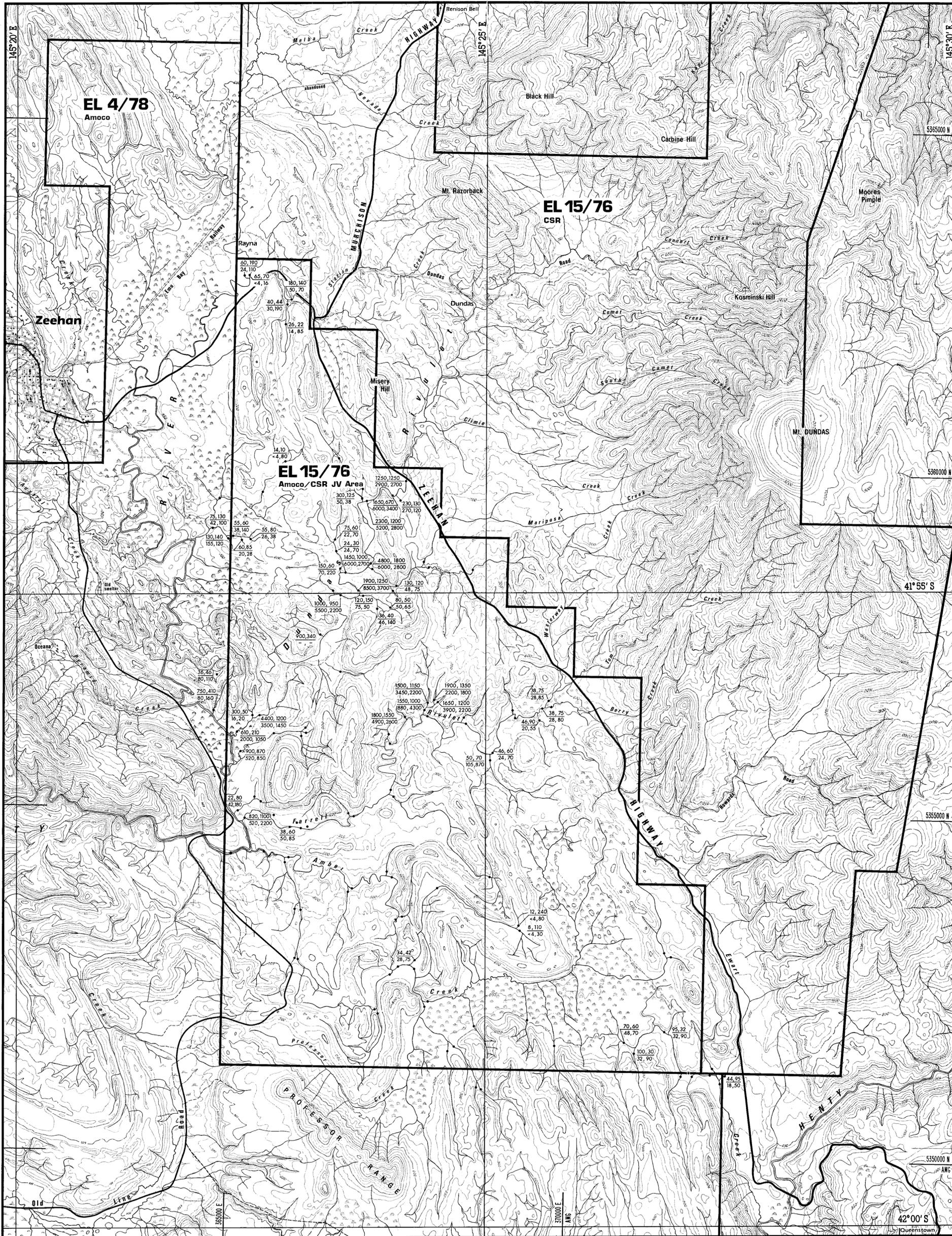


Base compiled from 1:15840 scale Pieman Project mapping series
Topographic contours in feet



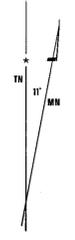
Amoco Minerals Australia Company 553191

Project	GORDON RIVER N° A-80-82		
Project Partner	CSR		
Dundas JV			
REGIONAL ROCKCHIP GEOCHEMISTRY 6348			
Map Ref. ANG	K-55-5	Latitude	42°00'S Longitude 145°30'E
Surveyed	Amoco	Date	1983 Scale 1:25000
Drawn	Geoffing, R.S.-K., S.F.	Date	June 1983 Drawing N° M83-2068
Report	358		



Notes

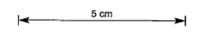
Top results denoted from stream sediment sampling
 Bottom results from panned concentrate
 Order of results - lead, zinc
 Only values considered anomalous shown -
 ie. 70 and greater for lead, 70 and greater for zinc
 All other results appended to this report
 Values in ppm



1:25000

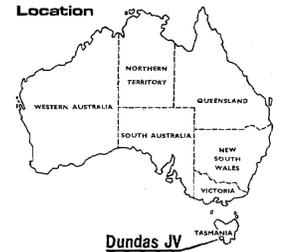
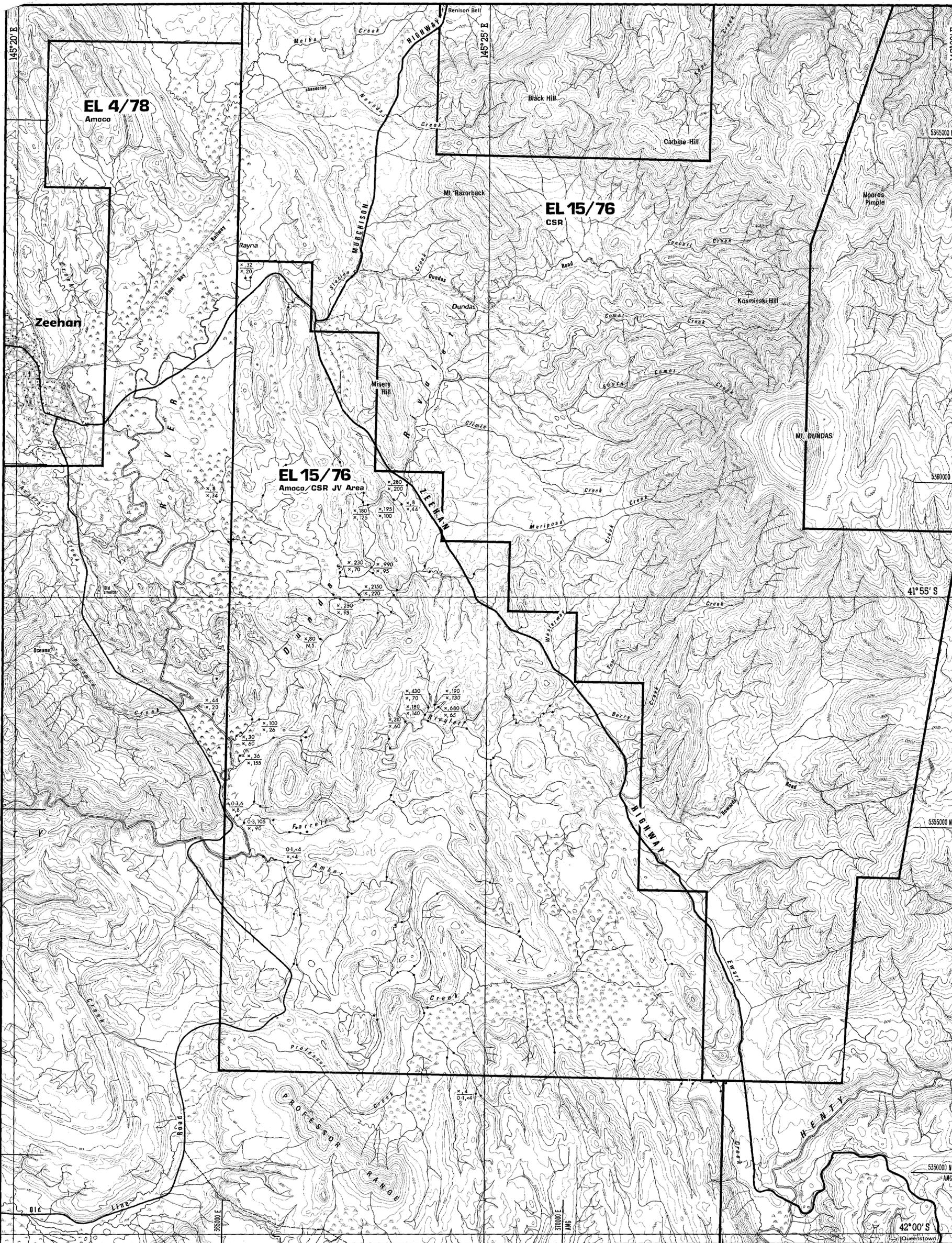


Base compiled from 1:15840 scale Pieman Project mapping series
 Topographic contours in feet



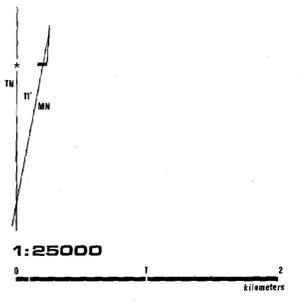
Amoco Minerals Australia Company 553100

Project	GORDON RIVER N° A-80-82	
Project Partner	CSR	
Dundas JV		
STREAM SEDIMENT GEOCHEMISTRY		6350
LEAD, ZINC		
Map Ref.	ANG K-55-S	Latitude 42°00'S Longitude 145°30'E
Surveyed	Amoco	Date 1983 Scale 1:25000
Drawn	Geodfng, R.S-K, S.E.	Date June 1983 Drawing N°M83-2064
Report 358		



Notes

Top results denoted from stream sediment sampling
 Bottom results from panned concentrate
 Order of results - gold, tin
 Only values considered anomalous shown -
 - 0.05 and greater for gold, 30 and greater for tin
 All other results appended to this report
 Values in ppm

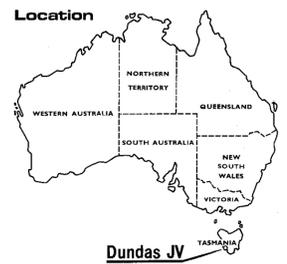
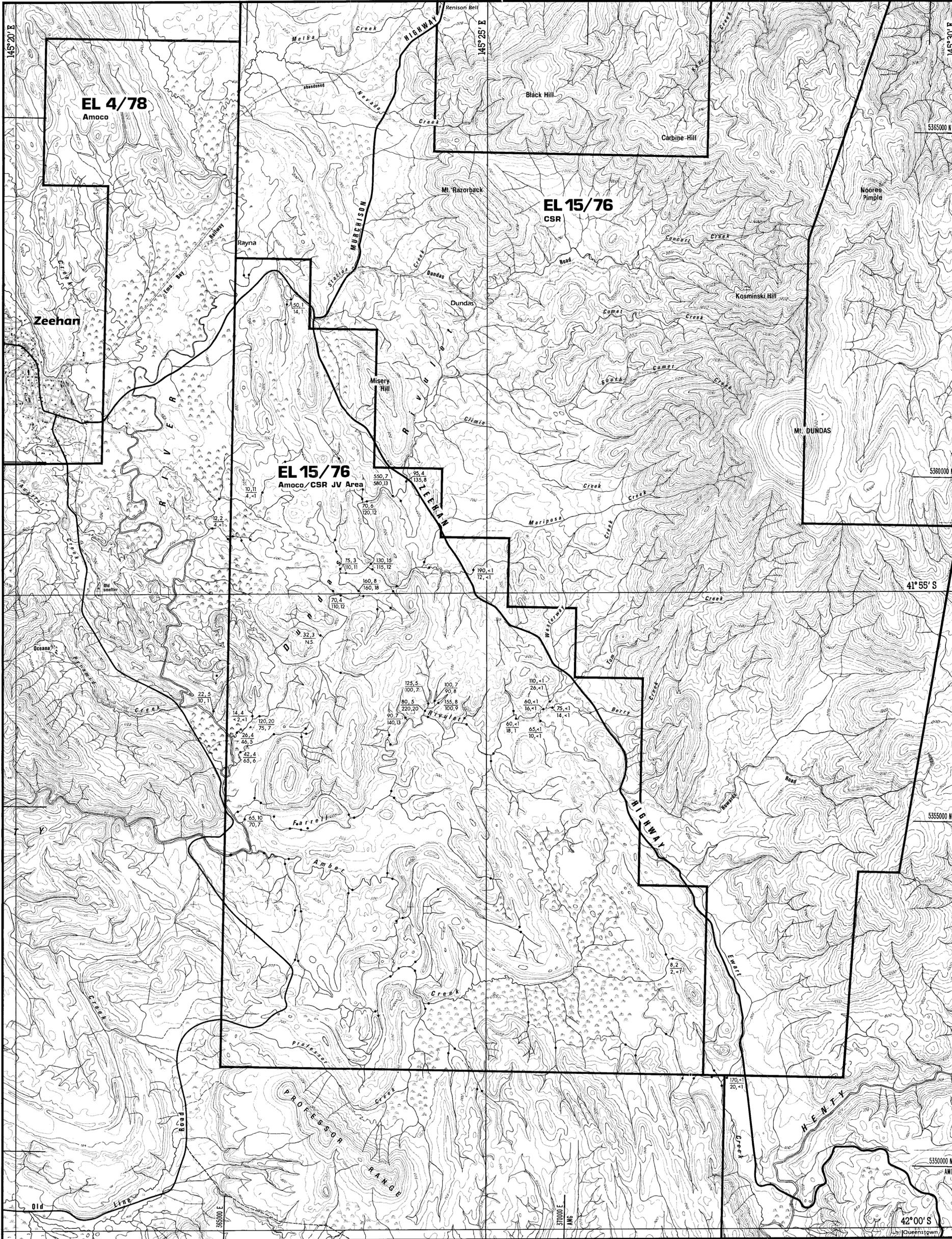


Base compiled from 1:15840 scale Pieman Project mapping series
 Topographic contours in feet
 5 cm



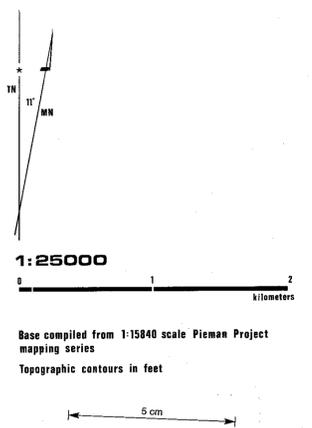
Amoco Minerals Australia Company 553194

Project	GORDON RIVER N ^o A-80-82		
Project Partner	CSR		
Dundas JV			
STREAM SEDIMENT GEOCHEMISTRY			
GOLD, TIN 6351			
Map Ref. ANG	K-55-5	Latitude	42°00' S Longitude 145°30' E
Surveyed	Amoco	Date	1983 Scale 1:25000
Drawn	Geodrig, R. S.-K., S. F.	Date	June 1983 Drawing N ^o M83-2065
Report	358		



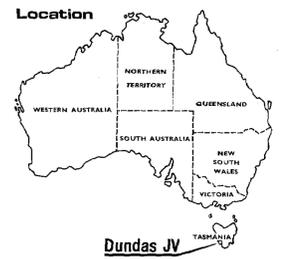
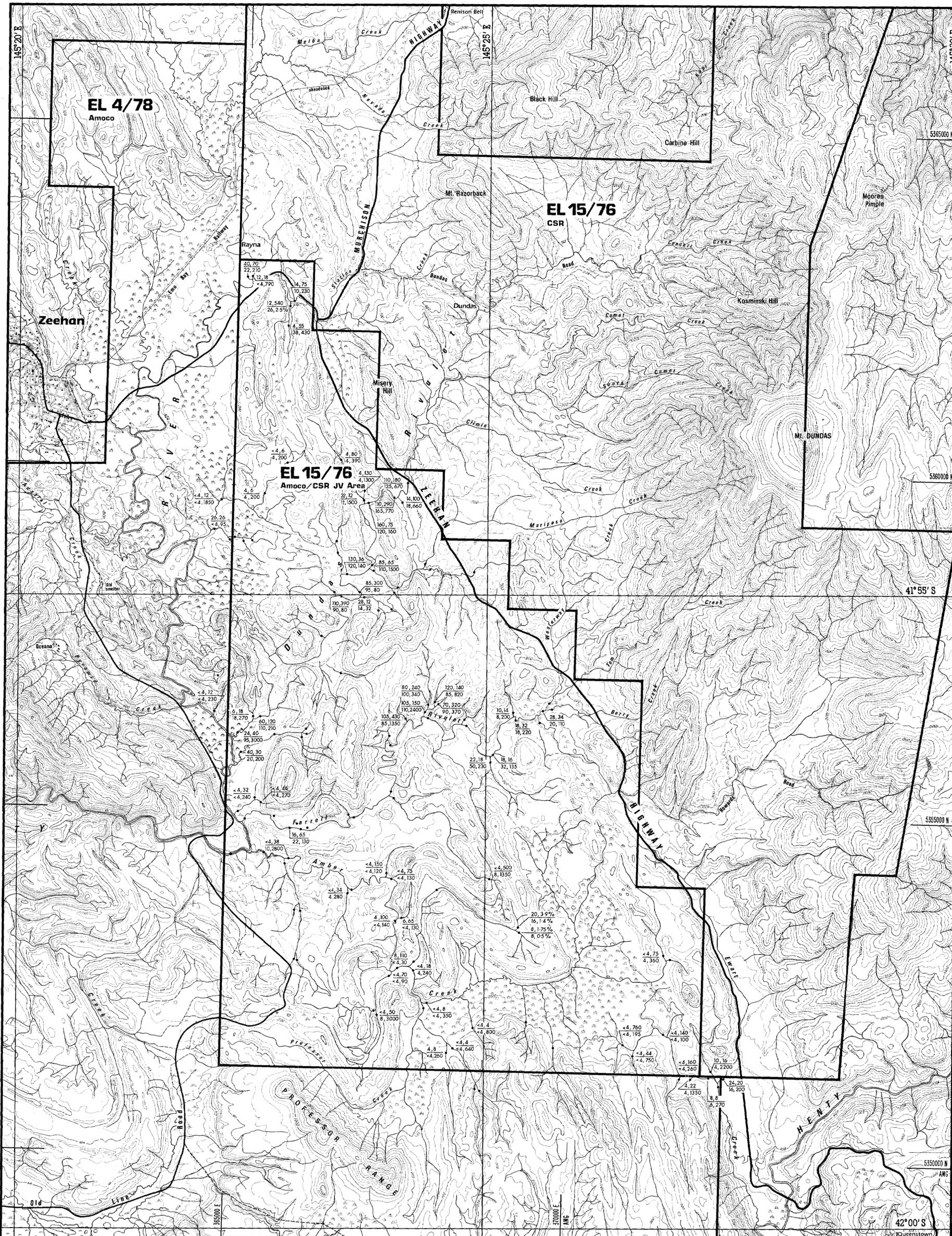
Notes

Top results denoted from stream sediment sampling
 Bottom results from panned concentrate
 Order of results - copper, silver
 Only values considered anomalous shown -
 ie. 50 and greater for Cu, 2 and greater for Ag
 All other results appended to this report
 Values in ppm



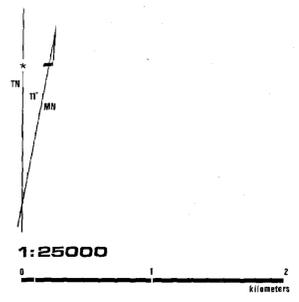
Amoco Minerals Australia Company 553195

Project	GORDON RIVER N° A-80-82		
Project Partner	CSR		
Dundas JV	6352		
STREAM SEDIMENT GEOCHEMISTRY			
COPPER, SILVER			
Map Ref. ANG	K-55-5	Latitude	42°00'S Longitude 145°30'E
Surveyed	Amoco	Date	1983 Scale 1:25000
Drawn	Geoffing, R. S.-K., S. F.	Date	June 1983 Drawing N° M83-2066
Report	358		

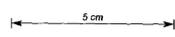


Notes

Top results denoted from stream sediment sampling
 Bottom results from panned concentrate
 Order of results - nickel, chromium
 Only values considered anomalous shown -
 ie. 25 and greater for Ni, 50(ss) 200(pp) and greater for Cr
 All other results appended to this report
 Values in ppm



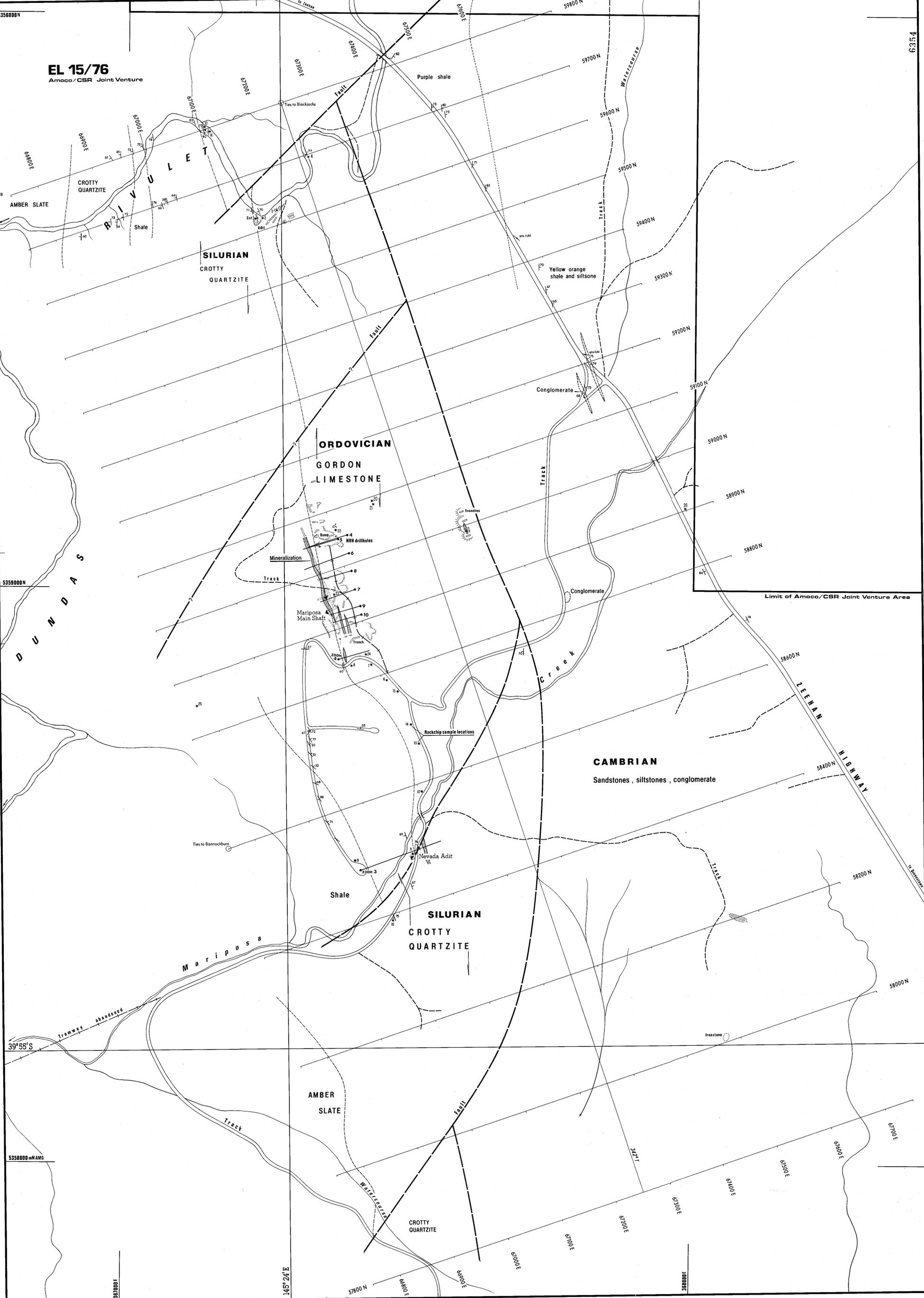
Map compiled from 1:5840 scale Pieman Project mapping series
 Topographic contours in feet



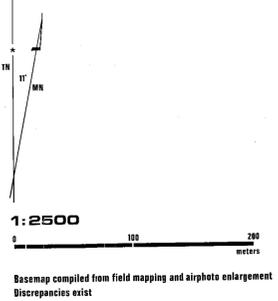
553196
 Amoco Minerals Australia Company

Project	GORDON RIVER N° A-80-82		
Project Partner	CSR		
Dundas JV	6353		
STREAM SEDIMENT GEOCHEMISTRY			
NICKEL, CHROMIUM			
Map Ref. ANG	K-55-5	Latitude	42°00'S Longitude 145°30'E
Surveyed	Amoco	Date	1983 Scale 1:25000
Drawn	Geodftng, R.S.-K., S.E.	Date	June 1983 Drawing N° M83-2067
Report	358		

EL 15/76
Amoco/CSR Joint Venture



Limit of Amoco/CSR Joint Venture Area



Notes

Rockchip sample location and number
See Table 3 of Report 358 for rockchip results

2550 m = 1646 ft
1:1 = 1:1



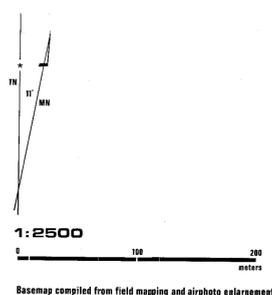
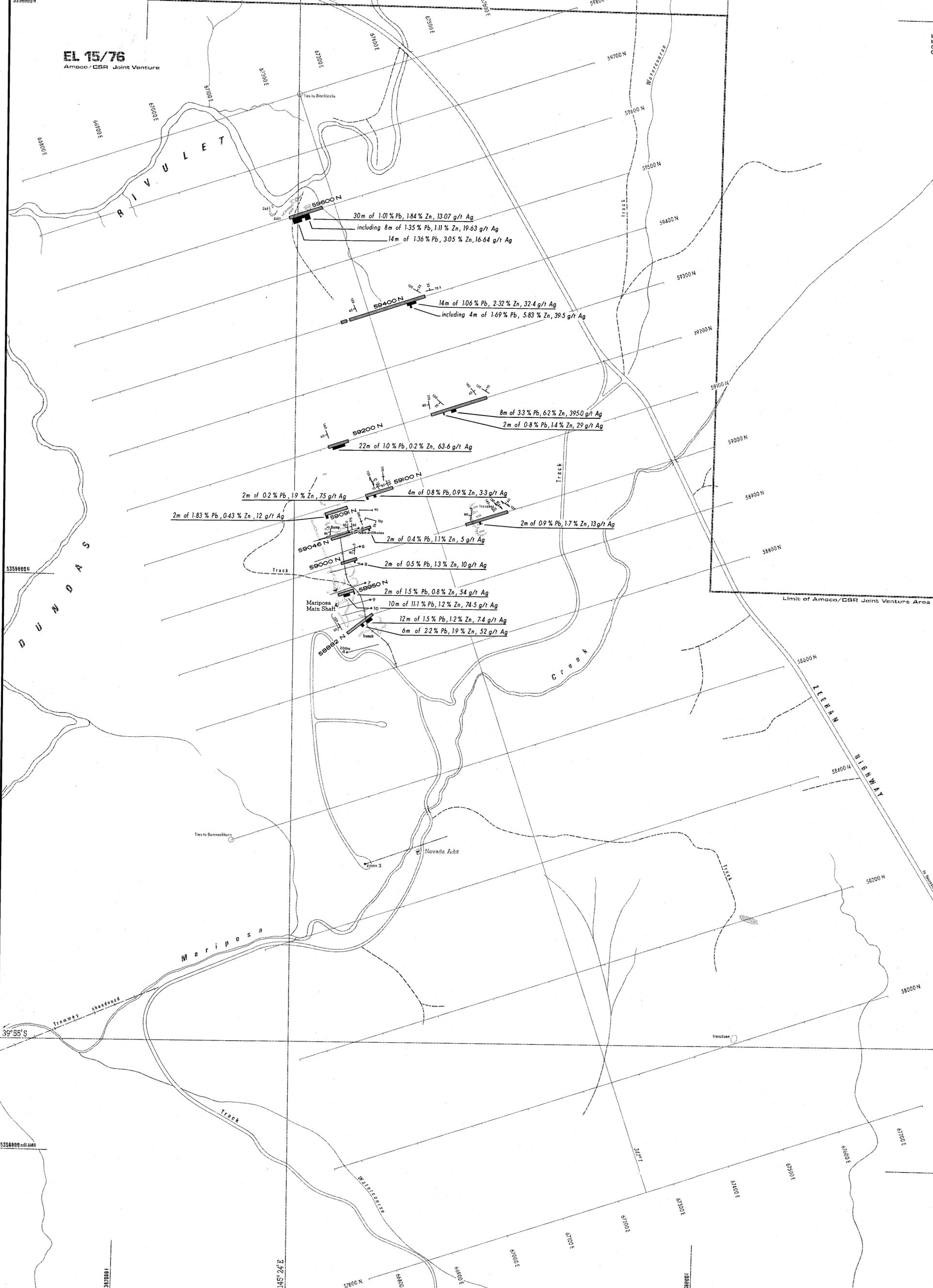
553197
Amoco Minerals Australia Company

Project	GORDON RIVER N° A-80-82		
Project Partner	CSR		
	Dundas JV	Mariposa	
PRELIMINARY GEOLOGY			
Map Ref. ANG	K-55-5	Latitude	39° 55' S Longitude 145° 25' E
Surveyed	P.J. I.S.	Date	1982 Scale 1:2500
Drawn	R.S.K., S.E.	Date	December 1982 Drawing N° M83-1952
Report 358			

335600N

EL 15/76
Amoco/CSR Joint Venture

63355



Legend

- Dip, bedding
- Foliation
- Joint planes
- Costean

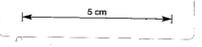
Note

See Appendix 2 of Report 358 for detailed costean plans



Amoco Minerals Australia Company

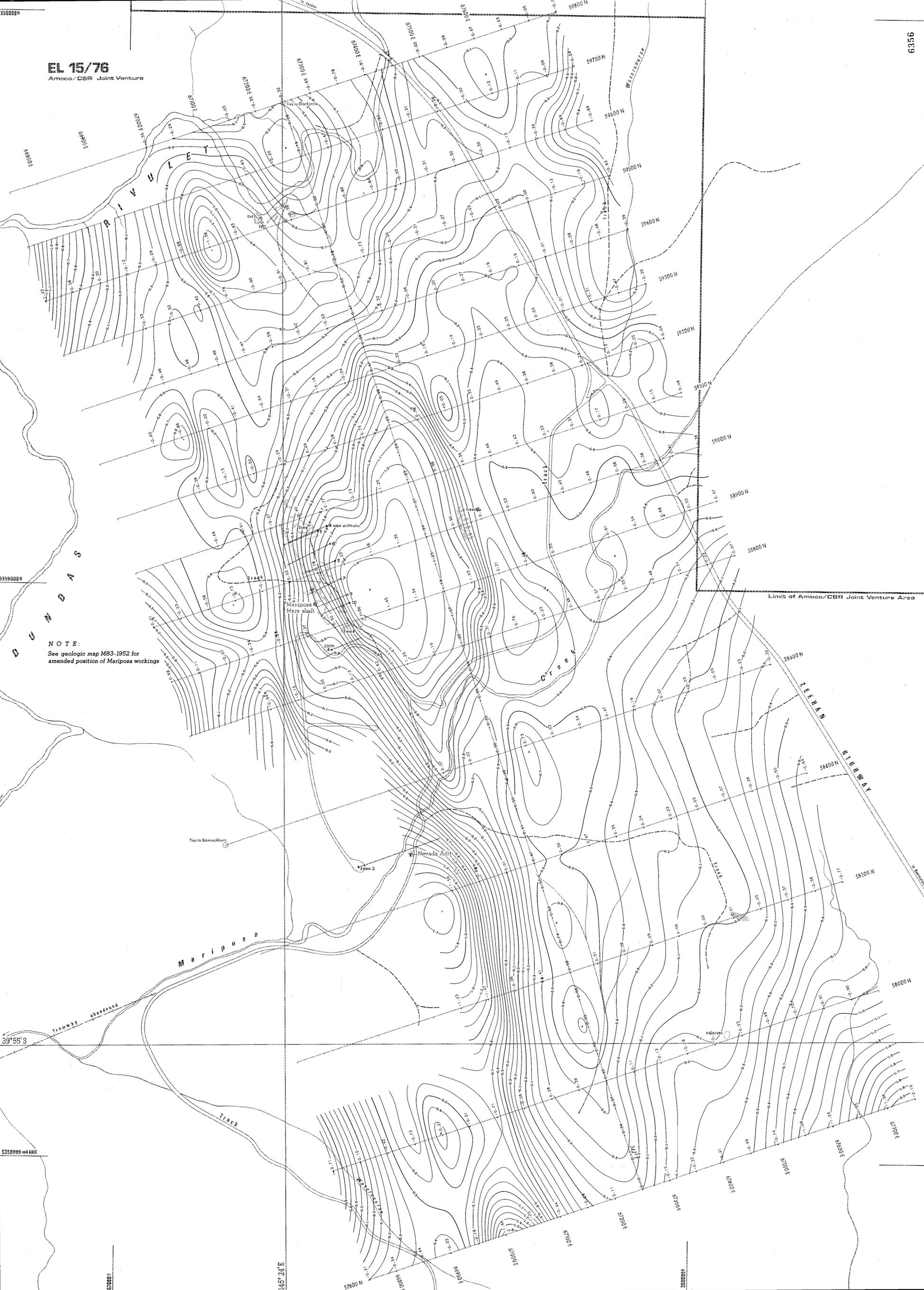
553198



Project	GORDON RIVER N° A-80-82	
Project Partner	CSR	
Dundas JV	Mariposa	
COSTEANS		
LOCATION AND MINERALIZATION		
Map Ref. ANG	K-55-5	Latitude 39° 55' S Longitude 145° 25' E
Surveyed	G.K., J.S. Date 1983	Scale 1:2500
Drawn	R. S-K., S.F. Date 1983	Drawing N°M83-2059
Report 358		

EL 15/76
Amoco / CSR Joint Venture

6556



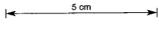
NOTE:
See geologic map M83-1952 for amended position of Mariposa workings

Limit of Amoco/CSR Joint Venture Area

39°55'S

5358000 mNAG

553199



Contour Intervals

Values in milligals

1.0	10
0.6	6
0.2	2
-0.2	-2
-0.6	-6
-1.0	-10

Notes

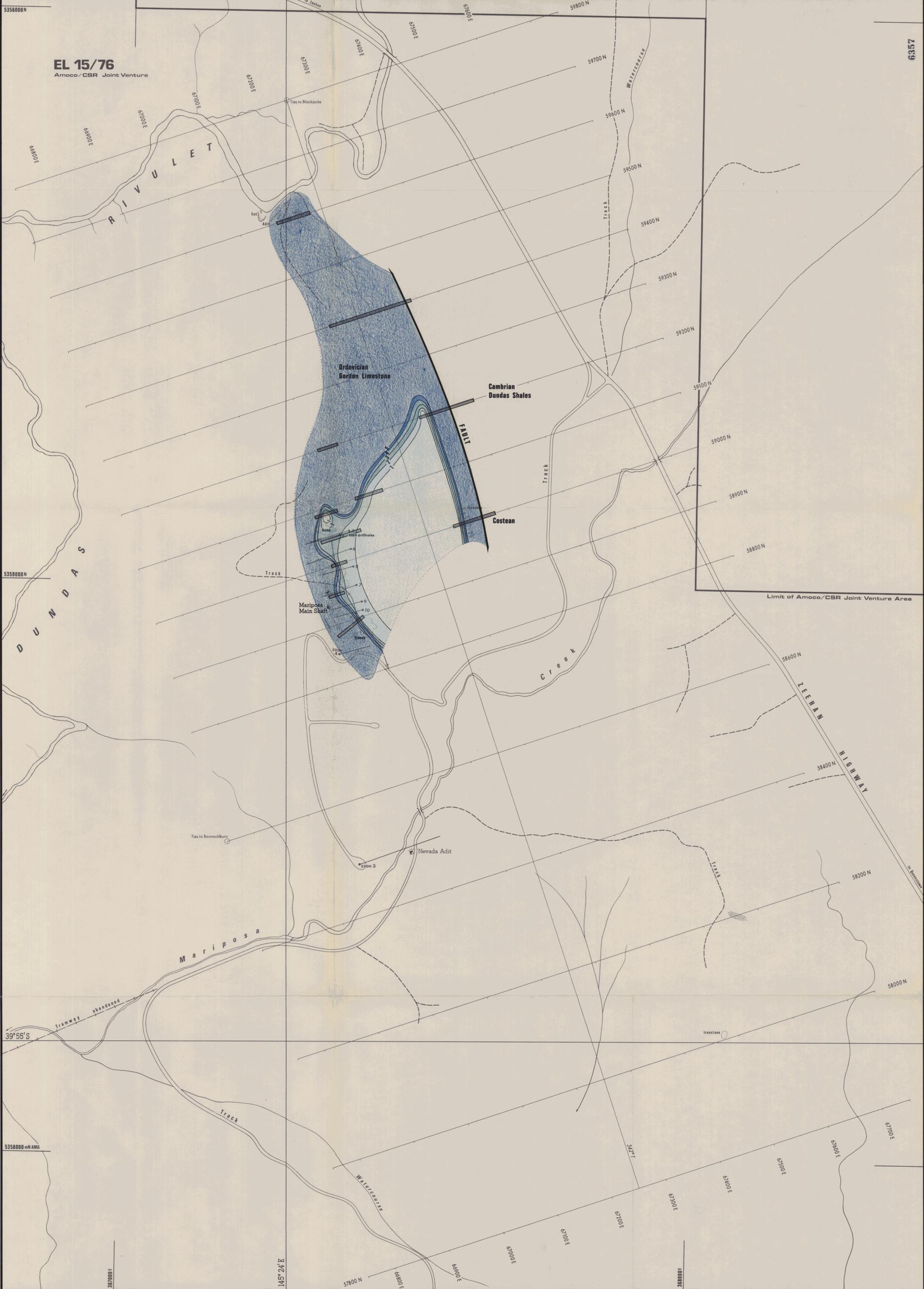
Computer graphics by CEA, North Sydney
Gravity survey by Peter Mewkill
Correction density 2.67 gm/cc



Amoco Minerals Australia Company

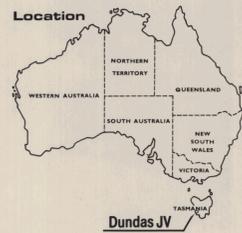
Project	GORDON RIVER N° A-80-82				
Project Partner	CSR				
Dundas JV		Mariposa			
RESIDUAL GRAVITY					
Map Ref. ANG	K-55-5	Latitude	39° 55' S	Longitude	145° 25' E
Surveyed	P.J. J.S.	Date	1982	Scale	1:2500
Drawn	R.S.K., S.E.	Date	December 1982	Drawing No	M83-1959

Report 358

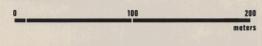


EL 15/76
Amoco/CSR Joint Venture

Limit of Amoco/CSR Joint Venture Area



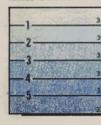
1:2500



Basemap compiled from field mapping and airphoto enlargement
Discrepancies exist

Contour Intervals

Values in meters



Amoco Minerals Australia Company



Project	GORDON RIVER N° A-80-82		
Project Partner	CSR		
Dundas JV	Mariposa		
ISOPLETH MAP		DEPTH TO FRESH LIMESTONE	
Map Ref. ANG	K-55-5	Latitude 39° 55' S	Longitude 145° 25' E
Surveyed	P.J.G.K.	Date 1983	Scale 1:2500
Drawn	R.S.K., S.F.	Date June 1983	Drawing N° M83-2061
Report 358			

EL 15/76
Amoco/CSR Joint Venture

Amoco/CSR
Australian
workings

Limit of Amoco/CSR Joint Venture Area

Misery Hill

DUNDAS RIVULET

148°23'E

38000 E

148°24'E

553201



Amoco Minerals Australia Company

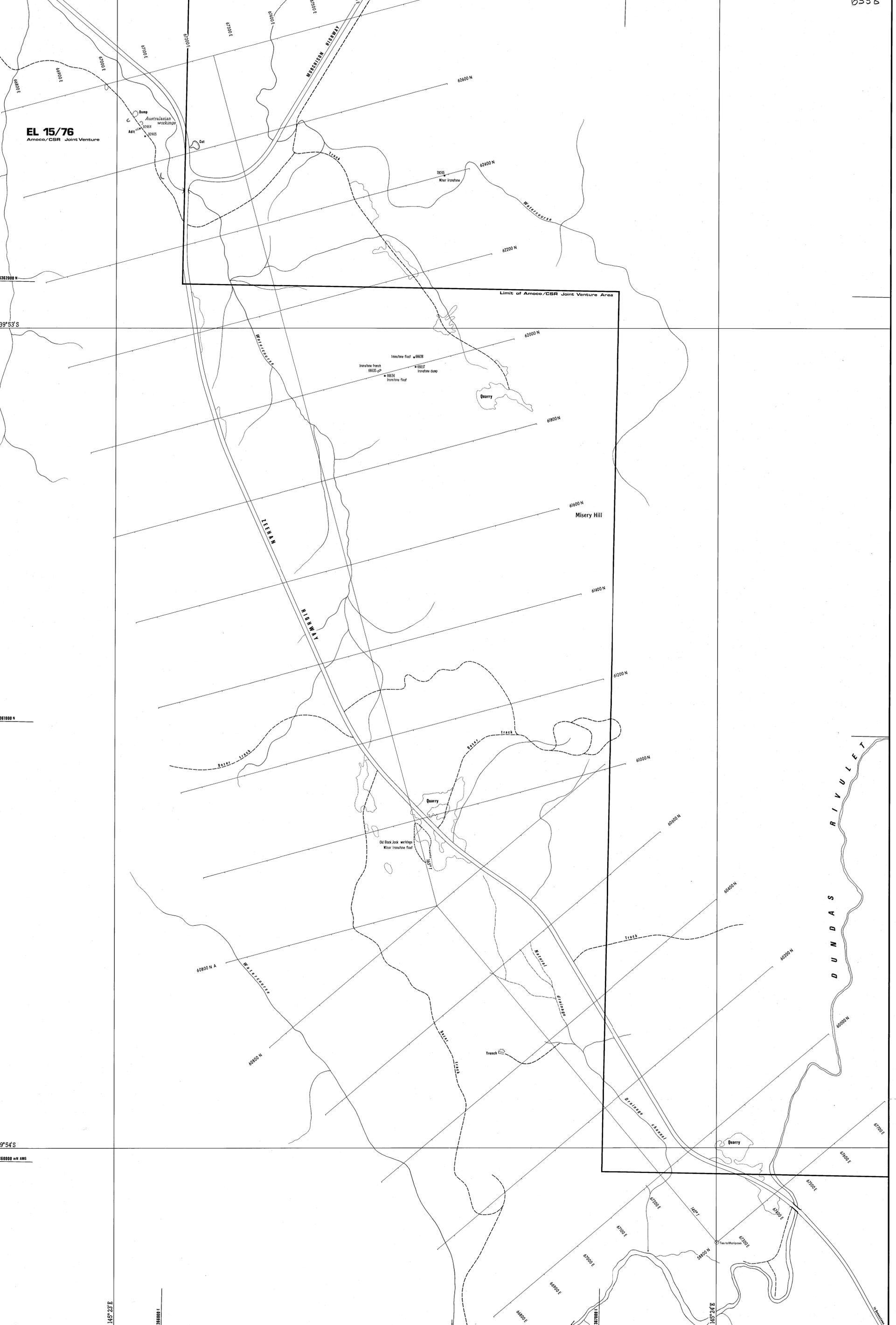
6358

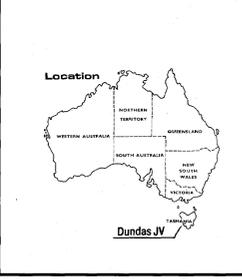
Project	GORDON RIVER	Nº A-80-82
Project Partner	CSR	
Dundas JV		Black Jacks
ROCKCHIP GEOCHEMISTRY		
SAMPLE LOCATION		
Map Ref. ANG	K-55-S	Latitude 39° 55' S Longitude 148° 23' E
Surveyed	P. J. J. S.	Date 1982 Scale 1:2500
Drawn	R. S. K., S. F.	Date December 1982 Drawing Nº M83-1949
Report	358	



1:2500
0 100 200 meters
Basesmap compiled from field mapping and airphoto enlargement
Discrepancies exist

Notes
Rockchip sample location and number = 6858
See Table Z of report 358 for results





Notes

See Appendix 1 of Report 358 for detailed costean plans

1:2500

Reshape compiled from field mapping and alpha enlargement. Discrepancies exist.

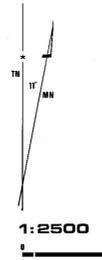
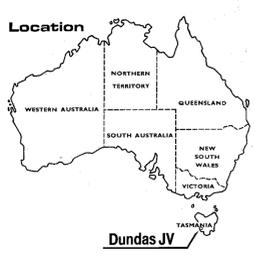
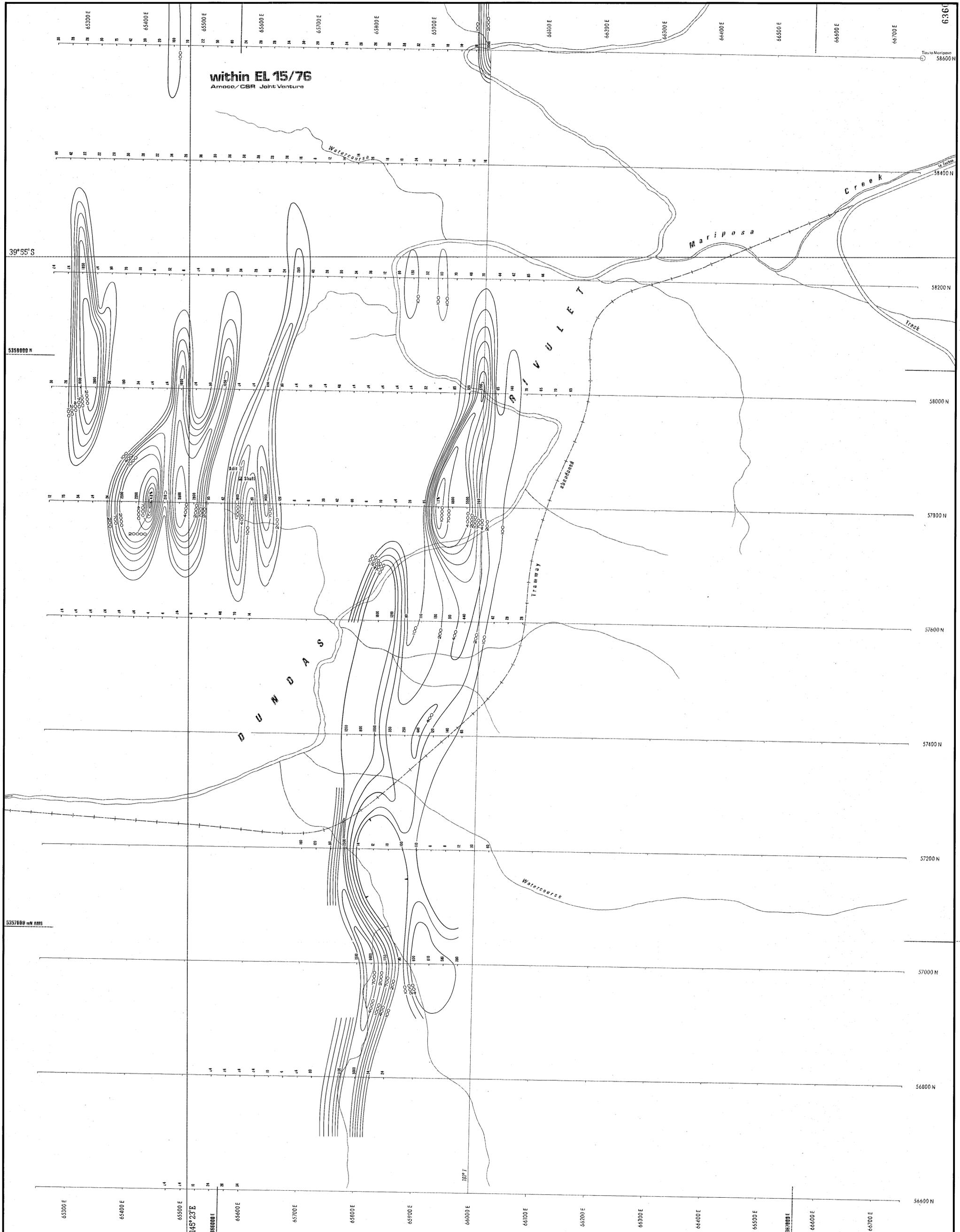
553202

AMOCO

Amoco Minerals Australia Company

6359

Project	GORDON RIVER	Nº A-80-82
Project Partner	CSR	
Dundas JV	Black Jacks	
COSTEANS		
LOCATION AND MINERALIZATION		
Map Ref	ANG	K-55-S
Latitude	39° 55' S	
Longitude	145° 22' E	
Surveyed	R.J.G.K.	Date 1983
Scale	1:2500	
Drawn	R.S.K., S.E.	Date December 1983
Report	Drawing Nº M83-2058	
Report	358	



Contour Intervals

Values in ppm

200	34
700	34
2000	33
7000	33



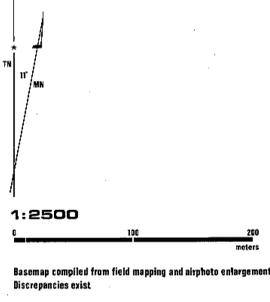
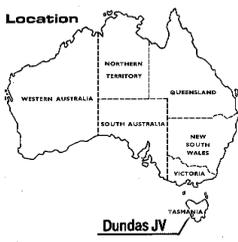
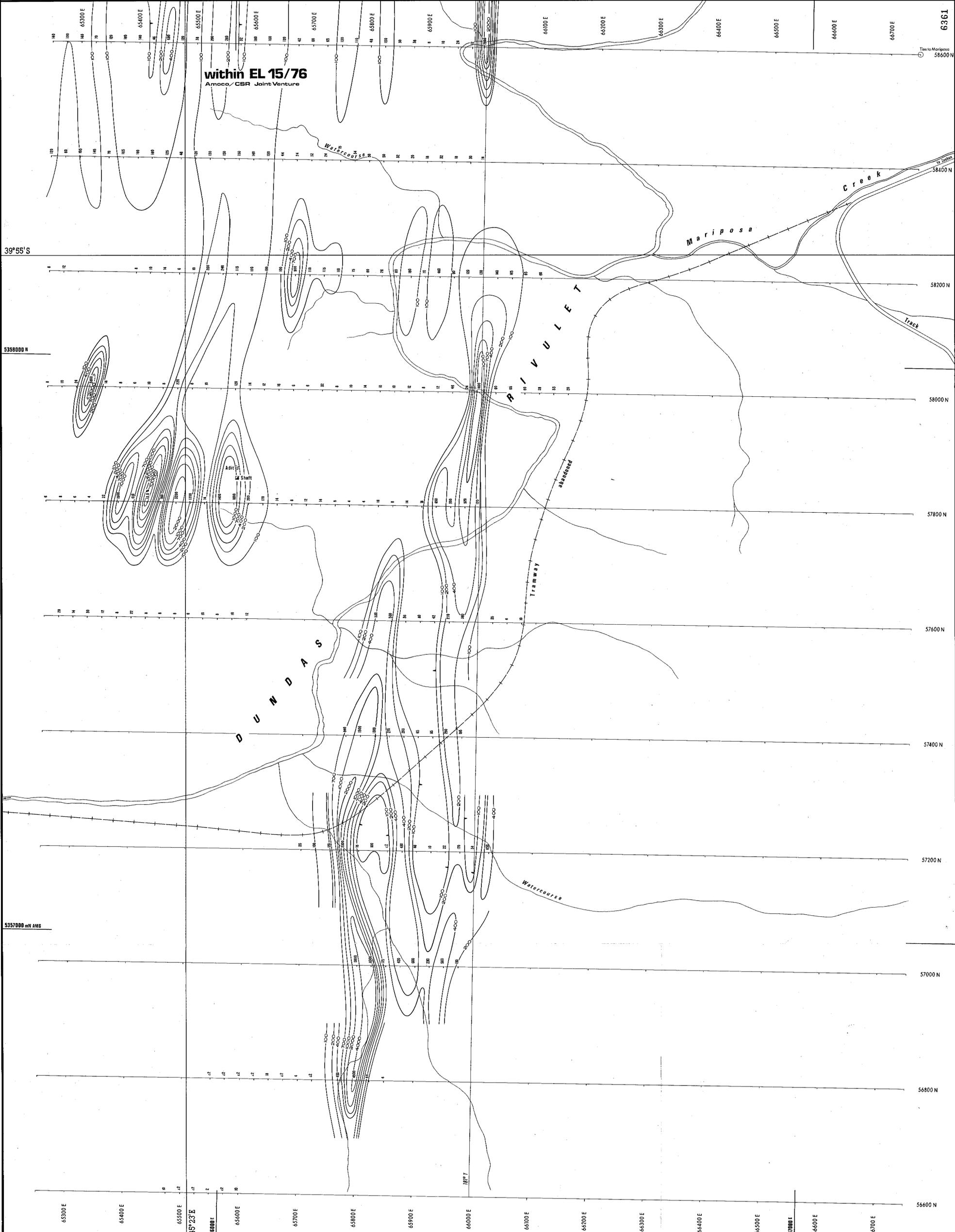
Amoco Minerals Australia Company

Project	GORDON RIVER	Nº A-80-82
Project Partner	CSR	
Dundas JV	Bannockburn	
BEDROCK GEOCHEMISTRY		
LEAD		
Map Ref. ANG	K-55-5	Latitude 39° 55' S Longitude 145° 25' E
Surveyed	P.J., J.S.	Date 1982 Scale 1:2500
Drawn	R.S.-K., S.E.	Date December 1982 Drawing Nº M83-1962

Report 358

553203





Contour Intervals

Values in ppm

200	41
700	42
2000	43
7000	45



Amoco Minerals Australia Company

553204



Project	GORDON RIVER N° A-80-B2		
Project Partner	CSB		
Dundas JV	Bannockburn		
BEDROCK GEOCHEMISTRY			
ZINC			
Map Ref. ANG	K-55-5	Latitude	39° 55' S
		Longitude	145° 23' E
Surveyed	P.J., J.S.	Date	1982
		Scale	1:2500
Drawn	R.S.-K., S.F.	Date	December 1982
		Drawing No	M83-1963
Report	358		