

PROJECT A-78-60

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PROGRESS REPORT

JANUARY TO JULY 1982

ZEEHAN

EXPLORATION LICENCE 4/78

TASMANIA

P.A. JONES

JULY 1982

REPORT 309

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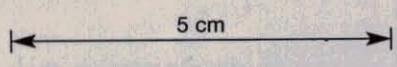
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# Project Location

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## SUMMARY

Exploration Licence 4/78 was granted to Amoco Minerals Australia Company for a period of six months from June 14, 1978 with further renewals of 12 months subject to Mines Department approval. Amoco negotiated a joint venture with Electrolytic Zinc to farm-in to Mining Lease 60M/77 located within EL 4/78 which embraces the southern portion of the Austral prospect. The tenement embraces potential shale or carbonate hosted basemetal prospects.

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.

Grids were extended in preparation for further ground magnetic and soil geochemical surveys designed to close off previously defined anomalies.

Rockchip sampling of the North Austral prospect outlined ironstones and mineralized sandstone from the Montagu workings assaying up to 11.6% lead, 16.0% zinc and 100 g/t silver. These results lie coincident with high tenor soil geochemical response and anomalous IP, magnetic, and PEM responses delineated previously. A program of road side sampling was commenced in the area between the Rose Valley and Myrtle Extended grids returning encouraging results with values up to 0.36% lead and 0.45% zinc.

An ongoing program of diamond drill core grinding to quickly scan previously unassayed core continued during the period with a three meter sample from ZT-81A-5 assaying 1.15% lead.

Geoex was contracted to conduct downhole Sirotem surveys on holes drilled on both the Austral and Oceana prospects. Hole ZT-81A-7 at Austral shows a weak off-hole response. Subsequent Sirotem surface surveys outlined a strong vertical conductor, located approximately 25 meters east of the drill collar. Hole ZT-80-9 on the Oceana prospect shows two significant in-hole conductors and a possible broad off-hole conductor coincident with mineralized and projected intercepts. This hole had been surveyed previously using downhole PEM with poor results.

Downhole density and gamma logging surveys were implemented by Mitre Geophysics on the same holes logged by Geoex. The density logging system, designed to help define the surface gravity readings showed little definition in densities. The available data does however show little or no variation consistent with the observed surface gravity anomaly. Downhole gamma logging aided the geological interpretation of units which were otherwise masked by facies changes.

Detailed drillcore density readings were taken from hole ZT-81A-5, the results showing no variation from the observed surface response of 0.75 milligals.

Magnetic susceptibility tests conducted on Oceana drillcore showed the siderite gauge to be weakly magnetic. Detailed ground magnetic surveys were commenced on both the Oceana and Austral prospects with ironstones on both showing clear but weak near surface anomalies.

Two Winkie holes, totalling 42 meters were drilled testing geochemical targets. ZT-W1, drilled on the Austral prospect, south of ZT-81A-7 intersected four meters of 1.6% lead, 0.8% zinc, 118 g/t silver and was abandoned in a mineralized zone due to caving ground conditions. ZT-W2 drilled on the Oceana prospect, was also abandoned above the target due to caving ground after encountering 11 meters grading 10.2% lead, 3.3% zinc and 22 g/t silver.

The Zeehan property has excellent potential for hosting both open pitable and underground silver-lead-zinc deposits grading greater than 10% combined lead-zinc.

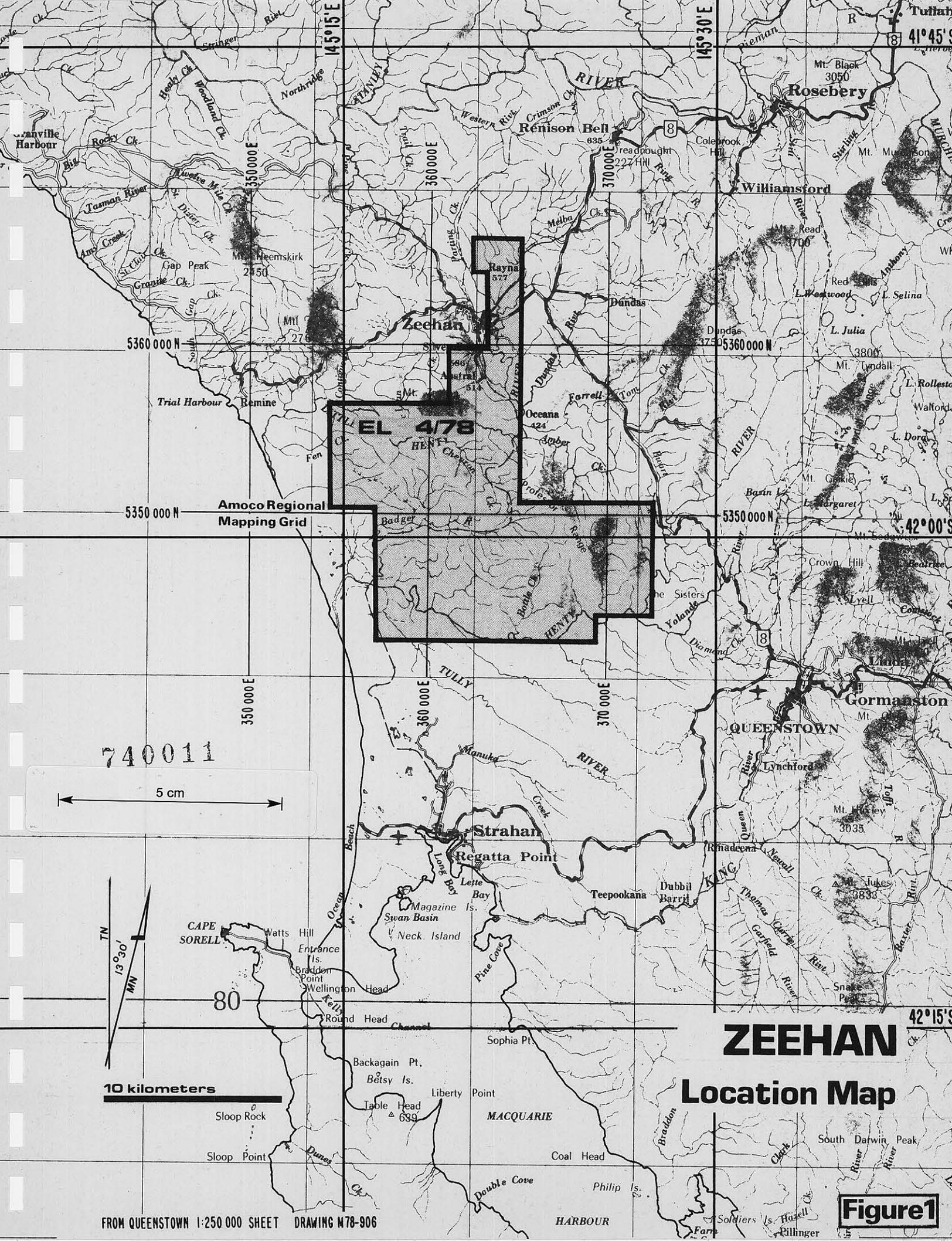
Geochemical and magnetic surveys will be conducted on the prospects from Myrtle to Rose Valley and also on Pyramid.

Further core density testing is to be carried out on specific portions of core, in particular from hole ZT-81A-7. EM responses will be further investigated using a dipole receiver type transient EM (TEM) system and the Myrtle and Pyramid grids will be geologically mapped.

#### LOCATION AND ACCESS

Exploration Licence 4/78 (EL 4/78) is located immediately south of the town of Zeehan which has a population of approximately 5,000. (Figure 1). 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 tracks are located along the dolomites which form topographic lows.

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



FROM QUEENSTOWN 1:250 000 SHEET DRAWING M78-906

**Figure 1**

#### DESCRIPTION OF THE PROPERTY AND OWNERSHIP

Exploration Licence 4/78 has an area of approximately 208 square kilometers, and was granted to Amoco Minerals for the period of six months from June 14, 1978. The tenement was renewed for twelve months to January 14, 1983.

Amoco negotiated a joint venture with Electrolytic Zinc Company to farm-in to the Mining Licence 60M/77 embracing the southern portion of the Austral prospect. The lease is designed to cover the slag dumps from the old Zeehan smelters.

Amoco applied for and was granted a three hectare mining lease; 34M/81, encompassing the Oceana mine environs (Enclosure 1).

Four other mining leases are within the tenement. Two leases granted to J.N.R. Enraght-Moony (38M/77 and 39M/77) are designed

to embrace slag dumps from the Oonah Tin Mine. Two small leases held by Tasmanian Mineral Developments were forfeited late in 1981 due to non compliance with the Mining Act. These leases, covering the mine environs at the Queensberry deposit, were reissued for a twelve month period, subject to Mines Department approval, to the Malcolm Bendall Mining Syndicate at the Wardens Court.

## HISTORY AND PREVIOUS EXPLORATION

A detailed description of the mining history and exploration carried out within EL 4/78 has been summarized in two previous progress reports:-

'Progress Report for the period June 1979 to June 1980' (Amoco Report 179) and 'Progress Report for the period June 1980 to June 1981' (Amoco Report 249).

## REGIONAL GEOLOGY

The basement complex is comprised of Precambrian schists, quartzites, siltstones, shales, spillitic or keratophyric lavas and pyroclastics which form a stable craton to the northwest of the tenement. The Lower Cambrian units such as the Crimson Creek Formation, are predominantly shallow water sediments, including argillites, grits, and tuffaceous arenites. Cambrian sedimentation appears confined to fault bounded blocks or graben structures.

The Ordovician to Devonian strata of the Zeehan Basin occur within a series of synclinal structures with northwest axial trends. The quartzose and hematitic Owen Conglomerate at Mt. Zeehan was deposited within a graben structure in the Lower Ordovician period and is transgressively overlain by micaceous siltstones, tubicolular sandstones, grits and minor sandstones and

shales. It is the time equivalent of the Moina Sandstone which was deposited in the Zeehan Basin. The Moina Sandstone is overlain disconformably by the Ordovician Gordon Limestone. The disconformity is marked by a white conglomerate followed by an interbedded sequence of siltstones, dolomites and minor sandstone and limestones. The Gordon Limestone is comprised of interbedded limestones and dolomites with numerous breccia horizons and zones of clastic sedimentation including fossiliferous sandstones, siltstones and shales. Siluro-Devonian sediments within the basin are fossiliferous marine, coarse grained and cross bedded quartzose sandstones, siltstones, minor quartzites and dolomitic to pyritic shales and siltstones.

The western portion of the tenement has been blanketed by Permian glacials, lacustrine sediments and Jurassic dolerite flows.

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 northwest folding and faulting. East and northwest trending fault systems are considered to have been contemporaneous. North-northeast striking faults are thought to have developed in post Permian times and are not common within the tenement area.

A geologic map of the tenement and surrounding area was included in a previous progress report for the period July 1978 to July 1979. (Amoco Report 151, Enclosure 1)

#### WORK CONDUCTED BY AMOCO

Gridding, drill core geophysical property testing, downhole geophysical, ground magnetic and geochemical surveys have been conducted during the period January to June 1982. Two shallow Winkie diamond holes totalling 42 meters were drilled to test geochemical targets on the Austral and Oceana prospects (Prospect locations shown on Enclosure 2).

All computer contouring of geochemical and geophysical surveys was conducted by CEANET of Sydney.

#### Gridding

A total of 3.3 line kilometers of extension gridding was completed on both the Nubeena (1.5 kilometer) and Myrtle (1.8 kilometer) prospects in preparation for further ground magnetic and soil geochemical surveys designed to close off previously defined anomalies.

### Analytical Techniques

Rockchip, core and fillet samples were dried, crushed and pulverised and despatched to Comlabs Pty Ltd in Adelaide for analysis for copper, lead, zinc and silver. Analysis for basemetals was by AAS after hydrochloric acid digestion.

Rockchip samples were analysed for an additional twelve elements; tin, tungsten, arsenic, antimony by XRF and gold, nickel, cobalt, bismuth, molybdenum, vanadium, cadmium and manganese by AAS. Drill core samples were analysed for basemetals plus manganese and barium and in one case for the additional two elements, gold and uranium. Check assays on every twentieth sample were carried out by Amdel in Adelaide.

### Rockchip Geochemistry

#### North Austral:

A total of 51 composite rockchip samples have been taken from outcropping ironstones, sandstones, quartzites and dump material (locations are shown on Enclosure 3 with rock types and assay results summarized in Table 1).

Dump material assayed up to 33% lead, to 25% zinc and to 3200 g/t silver, with one sample (66623) assaying 1.5% copper and 1.3% antimony. Sample 66291 contains high nickel (3.3%) and cobalt (0.38%) and is possibly derived from the mineral nicolite which was observed by Twelvetries and Ward in 1910 from within a shallow shaft south of Austral Creek.

Outcropping mangano sideritic ironstones vary greatly in tenor from weakly anomalous to very anomalous. Assays range up to 3.2% lead, 1.75% zinc, 20 g/t silver with one exceptional sample of lead-zinc mineralized sandstone found outcropping within an ironstone zone, (2800N - 2900N:1625E) assaying up to 11.6% lead, 16.0% zinc and 100 g/t silver. This highly anomalous result lies along strike to the north of the Montagu Mine coinciding with a

TABLE 1 - NORTH AUSTRAL ROCKCHIP DETAILS

No	Sample	Coords	Rock Type	Cu	Pb	Zn	Ag	Sn	Au	Sb	Ni	Co	Mn	Bi	Cd	Mo	V	As	W
1	36298	3125N:1745E	Ferrug brecc (dmp)	28	1450	4000	3	20	<0.05	<4	20	10	6.9%	<4	14	<4	20	50	<10
2	36299	3145N:1750E	Ferrug sh (dmp)	70	3400	5000	4	<4	<0.05	<4	22	6	6.6%	<4	20	<4	10	20	<10
3	36300	3080N:1770E	Ironstone pisol (o/c)	4	170	810	1	4	<0.05	<4	6	38	1.41%	<4	<1	<4	10	15	20
4	36248	2912N:1685E	Ferrug sh (dmp)	70	260	450	1	6	<0.05	50	8	10	2900	<4	<1	<4	60	60	10
5	36249	2855N:1630E	Ironstone (o/c)	4	840%	1650	2	26	<0.05	<4	20	6	3.80%	<4	<1	<4	10	<10	<10
6	36250	2855N:1625E	Pb/Zn in Sst (o/c)	590	11.6%	16.0%	100	180	<0.05	180	6	10	3.50%	<4	1100	<4	<10	<10	<10
7	37501	2840N:1625E	Ironstone (o/c)	6	1650	1950	2	30	<0.05	<4	10	8	8.90%	<4	3	<4	<10	20	<10
8	37502	2802N:1630E	Breccia Ore (dmp)	510	16.5%	11.2%	240	85	<0.05	470	14	10	6.0%	<4	450	<4	<10	<10	<10
9	37503	2780N:1630E	Brec ore, sid (dmp)	580	18.4%	5.0%	260	50	<0.05	630	10	14	4.70%	<4	240	<4	<10	<10	<10
10	37504	3075N:1620E	Zn/Pb mass sid (dmp)	290	3.25%	25%	105	150	<0.05	420	18	12	6.9%	<4	1450	<4	<10	<10	<10
11	37505	3050N:1557E	Mass sid mnr Pb/Zn	360	145	24	2	<4	<0.05	12	145	24	<4	10	70	<1	<10	44	310
12	37506	3057N:1560E	Ironstone (o/c)	90	8500	8200	18	200	<0.05	55	36	30	4.50%	<4	24	<4	30	50	<10
13	37507	3030N:1595E	Mass sid, Pb/Zn (dmp)	800	28.0%	3.6%	420	145	0.054	1100	12	6	5.00%	<4	185	<4	<10	<10	<10
14	37508	3015N:1620E	Ironston (o/c)	44	9400	1.5%	18	26	<0.05	36	10	6	8.50%	<4	40	<4	<10	<10	<10
15	66287	3070N:1670E	Ironstone (o/c)	10	940	1400	1	20	<0.05	12	16	6	9.10%	<4	2	<4	<10	55	<10
16	66288	3080N:1675E	Ironstone (o/c)	8	800	4100	1	24	<0.05	<4	18	10	5.00%	<4	9	<4	10	40	10
17	66289	3250N:1640E	Sid & mnr Pb/Zn (dmp)	370	3.9%	1.7%	150	110	<0.05	240	60	22	7.70%	<4	55	<4	<10	4700	20
18	66290	3275N:1650E	Mass sid, Pb/Zn (dmp)	480	14.0%	3.3%	240	140	<0.05	720	60	24	5.90%	<4	120	<4	<10	7550	15
19	66291	3200N:1580E	Con. ironst, bl sid	22	370	370	11	<4	<0.05	6650	3.30%	3800	3.40%	<4	<1	<4	90	4.9%	20
20	66292	2340N:1350E	Sid/lim, Pb/Zn (dmp)	320	33.0%	4.9%	250	30	<0.05	380	125	26	6.30%	4	260	<4	10	250	<10
21	66601	3050N:1700E	Sid with Pb/Zn (dmp)	500	6.25%	7.2%	220	36	<0.05	690	16	<4	10.5%	<4	350	8	<10	20	<10
22	66602	3115N:1425E	Ironstone + sid (o/c)	28	2800	9600	5	20	<0.05	46	44	16	3.15%	<4	12	<4	<10	80	10
23	66603	3070N:1400E	Ironstone/sid (dmp)	450	11.2%	4600	190	200	<0.05	900	16	4	8.00%	<4	19	<4	<10	780	<10
24	66604	3020N:1410E	Sid Pb/Zn (dmp)	550	10.9%	1.4%	220	90	<0.05	930	16	<4	9.60%	<4	70	<4	<10	130	10
25	66605	3050N:1385E	Ironstone (o/c)	80	3.2%	1.75%	20	65	<0.05	130	55	12	2.55%	<4	23	<4	<10	125	25
26	66606	2910N:1310E	Ironst/sid (dmp)	300	7400	3.4%	36	135	<0.05	85	32	8	9.70%	<4	300	<4	<10	110	10
27	66607	2950N:1540E	Ironst/sid (dmp)	70	1.9%	1.95%	24	32	<0.05	75	55	8	11.5%	<4	90	<4	<10	6	<10
28	66608	2925N:1500E	Ironstone (dmp)	44	1300	3900	6	18	<0.05	34	12	8	1.85%	<4	14	4	120	60	<10
29	66609	2780N:1160E	Ironst/sid (dmp)	200	7.0%	2.5%	180	100	<0.05	280	32	4	9.10%	<4	125	<4	<10	1450	10
30	66610	2805N:1265E	Sid + Pb/Zn (dmp)	250	4.45%	4.8%	66	175	<0.05	120	16	<4	11.5%	<4	195	<4	<10	170	10
31	66611	2785N:1240E	Sid + Pb/Zn (dmp)	1000	19.5%	1.30%	760	40	<0.05	1150	48	8	9.20%	<4	65	<4	<10	170	10
32	66612	2610N:1210E	Sideritic Brecc (dmp)	700	7.95%	3.0%	240	60	<0.05	650	44	16	3.30%	<4	155	6	20	130	10
33	66613	2730N:1500E	Sideritic Pb/Zn (dmp)	150	5.55%	6700	80	16	<0.05	135	36	8	14.0%	<4	22	<4	<10	20	<10
34	66614	2705N:1500E	Ironstone (dmp)	8	230	135	<1	<4	<0.05	10	<4	8	980	<4	<1	<4	40	22	10
35	66615	2700N:1565E	Sideritic silt (dmp)	16	6000	3400	4	48	<0.05	12	16	<4	13.5%	<4	10	8	10	95	<10
36	66616	2625N:1570E	Quartzite (o/c)	4	85	28	<1	<4	<0.05	6	12	<4	320	<4	<1	4	<10	<2	<10
37	66617	2600N:1480E	Ironstone (dmp)	10	430	120	<1	<4	<0.05	10	<4	12	2500	<4	<1	<4	50	55	<10
38	66618	2575N:1460E	Ironstone (dmp)	14	200	120	<1	<4	<0.05	10	<4	4	5000	<4	<1	<4	80	20	<10
39	66619	2515N:1520E	Sideritic Ironst(dp)	3000	16.4%	3800	850	<4	<0.05	2500	48	16	12.0%	<4	18	8	<10	55	<10
40	66620	2495N:1500E	Tuff/Ironst (dmp)	60	1350	4000	5	16	<0.05	180	44	16	5.60%	<4	13	6	80	20	10
41	66621	2460N:1405E	Sideritic Siltst(dmp)	350	6.10%	7.7%	78	120	<0.05	240	85	28	12.5%	<4	290	<4	10	24	<10
42	66622	2440N:1370E	Sid/limonite (dmp)	140	2.05%	8400	28	20	<0.05	160	32	8	11.0%	<4	34	<4	<10	18	<10
43	66623	2440N:1425E	Sid/limonite (dmp)	1.50%	22.4%	2.1%	3200	<4	<0.05	1.30%	36	12	5.80%	<4	125	8	20	140	10
44	66624	2410N:1560E	Quartz/Ironst (o/c)	12	240	85	2	4	<0.05	28	4	<4	420	<4	<1	6	40	24	<10
45	66625	2370N:1470E	Sideritic Siltst(dmp)	300	10.7%	1.20%	155	70	<0.05	410	28	8	10.5%	<4	55	<4	<10	240	10
46	66626	2325N:1425E	Sid/limonite (dmp)	42	13.0%	8500	75	<4	<0.05	115	60	28	12.5%	<4	30	4	<10	40	15
47	66627	2280N:1450E	Ironstone (dmp)	28	350	210	<1	<4	<0.05	4	<4	<4	1650	<4	<1	6	70	26	10
48	66628	2260N:1535E	Sideritic Siltst(dmp)	500	8.00%	5.3%	100	36	<0.05	420	48	16	11.0%	<4	240	10	20	30	<10
49	66629	2215N:1480E	Grey Siltst Pb/Zn(dp)	1100	27.0%	2.7%	470	30	<0.05	790	60	12	4.70%	<4	125	10	30	40	<10
50	66630	2265N:1380E	Ironstone (dmp)	22	320	105	1	4	<0.05	12	<4	<4	690	<4	<1	6	60	26	10
51	66631	2120N:1510E	Ironstone (float)	80	8000	8500	1	<4	<0.05	24	40	16	1.65%	<4	<1	10	<10	170	15

high tenor soil geochemical response and anomalous IP, magnetic and PEM responses delineated previously. The prospective Gordon Limestone sequence at this point is overlain to a depth of approximately 150 meters by Crotty Quartzite.

#### Road Side Sampling

A program of roadside sampling was undertaken in conjunction with a major road works program conducted by the Public Works Department, making the best use of fresh exposures of bedrock. The prospects covered include Baura, Grieves and the southern portion of Myrtle Extended (Figures 2 and 3, Table 2). A number of samples proved moderately anomalous with results of up to 0.36% lead and 0.43% zinc. The roadworks parallel the stratigraphy to a certain extent resulting in only partial sampling of the prospective area. Further bedrock sampling of the area will commence later in the year using the bombardier-Jackro auger combination.

#### Diamond Drillcore Sampling

Two zones from 27-32 meters and 35-39 meters in hole ZT-81A-6 of very pyritic white quartz conglomerates were split and despatched for assay. Results for copper, lead/zinc and silver were weakly anomalous, however both uranium and gold values were either extremely low or below the limit of detection.

An ongoing program of diamond drill core filleting to quickly scan previously unassayed material from Austral continued during the period with some three meter zones assaying up to :-

ZT-81A-5	1.15% lead	within a sideritic breccia (very poor recovery zone)
	0.45% zinc	
ZT-81A-7	0.16% lead	
	0.21% zinc	

Filleting of holes ZT-81A-5 and 7 is now complete  
Holes ZT-81A-8, 9 and 10 have yet to be filleted.

# Baura Area ROADSIDE SAMPLE LOCATIONS

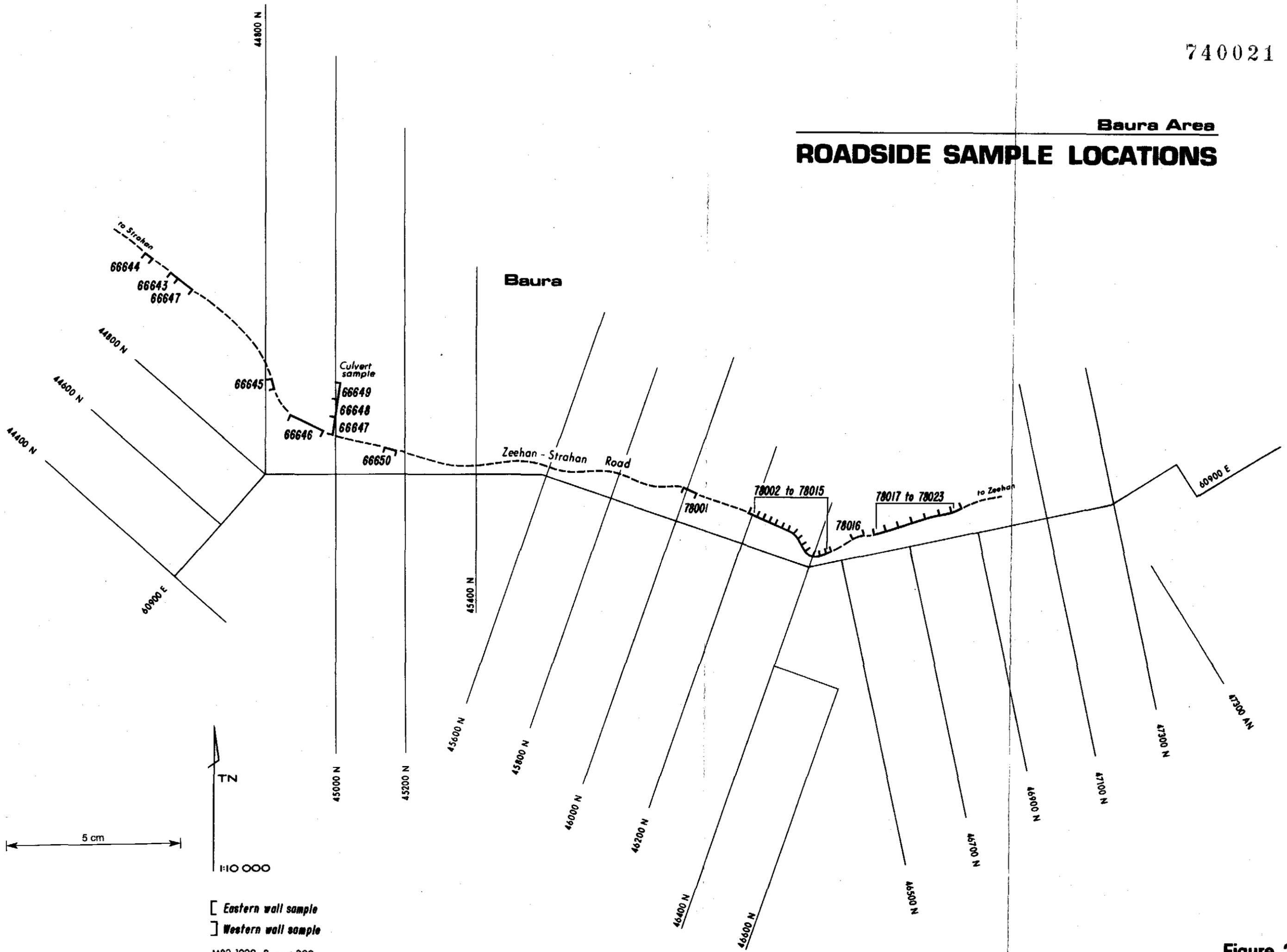
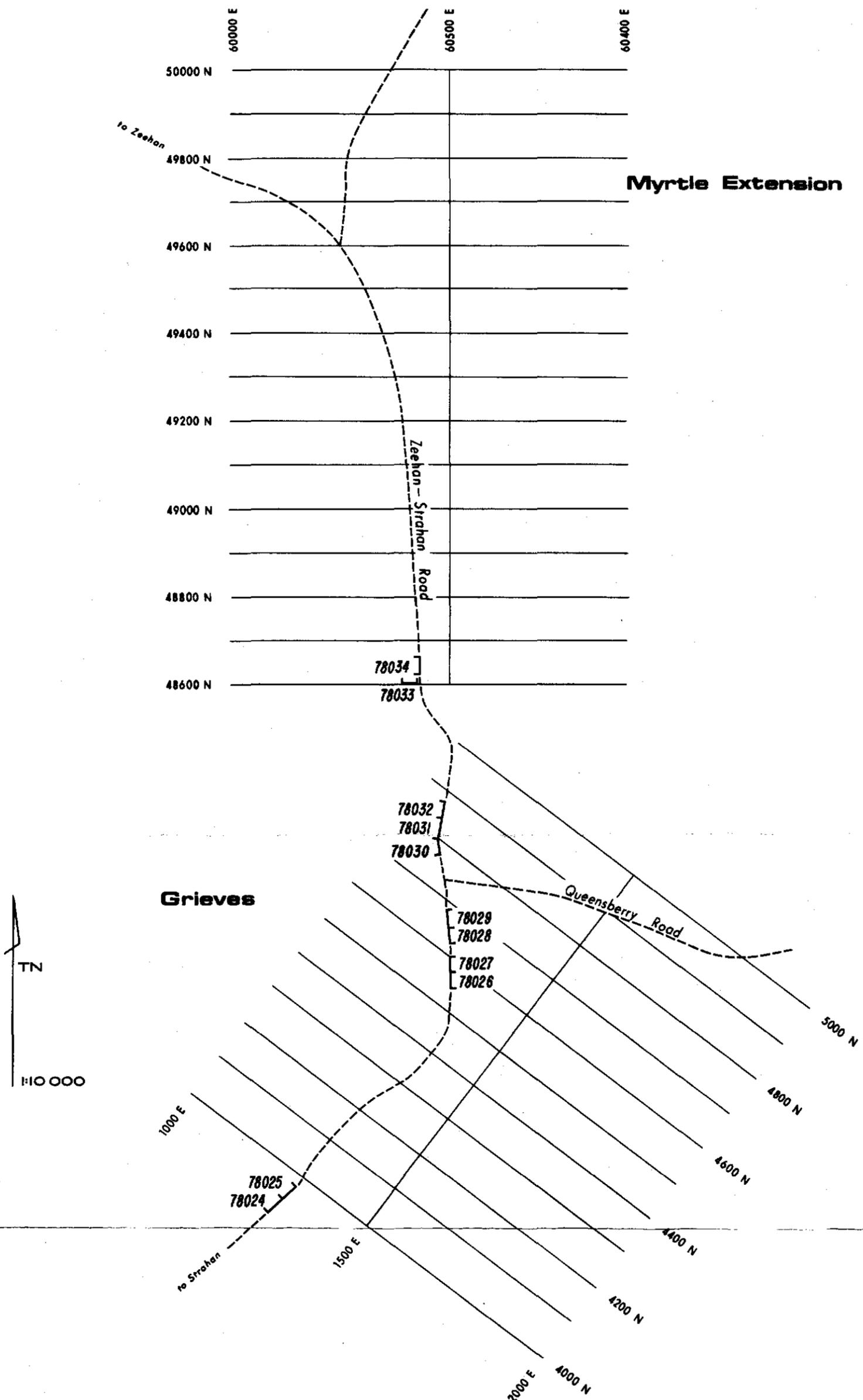


Figure 2



[ Eastern wall sample  
 ] Western wall sample

Myrtle Ext. /Grieves Area  
**ROADSIDE SAMPLE LOCATIONS**

TABLE 2

## ROADSIDE SAMPLING - BAURA AREA

Nu	Sample	Coords	Rock Type	Cu	Pb	Zn	Ag	Sn	W	Ba	Mn
1/1	66642	250m sth	Brown-black clay	10	200	105	<1	330	10	150	48
1/2	66643	44800N:60525E	Grey/blue Qtzite (o/c)	2	85	8	<1	<4	<10	200	24
2	66644	390m sth	Qtzite weather to								
		44800N:60525E	clay	14	36	16	<1	46	10	360	12
3	66645	44830N:60650E	Creamy brown clay	<2	22	10	<1	18	<10	350	8
4	66646	44900N:60750E	Peaty black clay	12	90	100	<1	6	<10	240	8
5/1	66647	45000N:60780-730	Black clay	22	46	75	<1	10	<10	250	12
5/2	66648	45000N:60730-680	Mottled clay	14	300	180	<1	12	<10	120	8
5/3	66649	45000N:60680-60630	Black mottled clay	16	470	155	<1	4	<10	70	12
6	66650	45150N:60825	Black clay	14	26	26	<1	10	10	300	12
7	78001	46000N:60800E	Cream black clay	2	130	24	<1	10	<10	310	8
8/1	78002	46190N:60810E	Dolomite	400	3600	4100	<1	6	<10	300	12
8/2	78003	46210N:60810E	Ferrug clay/dolomite	75	2950	760	<1	6	10	260	20
8/3	78004	46230N:60810E	Ferrug clay/dolomite	105	300	3400	<1	6	10	280	12
8/4	78005	46250N:60810E	Ferrug clay/dolomite	46	155	1150	<1	8	10	310	46
8/5	78006	46270N:60810E	Ferrug clay/dolomite	48	125	440	<1	6	<10	240	20
8/6	78007	46290N:60810E	Ferrug clay/dolomite	46	75	180	<1	6	10	270	8
8/7	78008	46310N:60810E	Ferrug clay/dolomite	28	50	220	<1	4	<10	330	16
8/8	78009	46330N:60810E	Ferrug clay/dolomite	60	75	14	<1	6	<10	330	8
8/9	78010	46350N:60820E	Ferrug clay/dolomite	24	110	30	<1	<4	<10	380	4
8/0	78011	46370N:60860E	Dolomite	70	1800	4250	<1	6	<10	250	12
8/11	78012	46390N:60860E	Ferrug clay/dolomite	20	690	1500	<1	4	10	220	12
8/12	78013	46410N:60870E	Ferrug clay/dolomite	46	250	190	<1	6	10	280	28
8/13	78014	46430N:60880E	Mottled clay	8	170	16	<1	8	<10	230	8
8/14	78015	46450N:60880E	Black dolomite clay	18	320	10	<1	8	<10	220	12
9	78016	46560N:60850E	Creamy clay	10	330	110	<1	4	<10	560	8
10/1	78017	46600N:60850E	Grey clay	70	500	32	<1	4	<10	350	8
10/2	78018	46640N:60850E	Dolomite grey clay	210	1950	30	<1	6	<10	330	8
10/3	78019	46680N:60845E	Mottled dolomite clay	28	130	40	<1	6	<10	320	8
10/4	78020	46720N:60830E	Mottled dolomite clay	8	115	1600	<1	8	<10	230	8
10/5	78021	46760N:60830E	Grey brown clay	18	560	155	<1	4	10	410	12
10/6	78022	46800N:60830E	Brown black clay	65	3400	790	<1	6	<10	340	12
10/7	78023	46840N:60825	Dolomite ferrug clay	200	1600	100	<1	6	<10	240	8

## MYRTLE EXTENSION - GRIEVES AREA

11/1	78024*	3000N:1300E	Dolomite siltstone	8	16	8	<1	4	10	280	12
11/2	78025*	3040N:1300E	Clay siltstone	10	50	16	<1	8	10	280	12
12/1	78026	4550N:1310E	Grey black clay	16	50	80	<1	8	<10	190	8
12/2	78027	4570N:1280E	Brown black clay	12	26	65	<1	4	<10	280	8
12/3	78028	4620N:1250E	Brown black clay	14	38	50	<1	8	10	175	16
13/4	78029	4660N:1240E	Brown black clay	14	28	50	<1	8	<10	150	16
13/1	78030	4780N:1120E	Dolomitic grey clay	28	280	950	<1	6	<10	250	16
13/2	78031	4810N:1090E	Grey black clay	16	230	355	<1	6	<10	500	12
13/3	78032	4840N:1070E	Ferrug brown clay	14	75	260	<1	6	<10	490	8
14	78033	48600N:60425E	Dolomite (o/c)	26	155	135	<1	6	<10	360	8
15	78034	48620N:60425E	Brown yellow clay	10	75	16	<1	8	<10	250	8

\* Map Sample Book

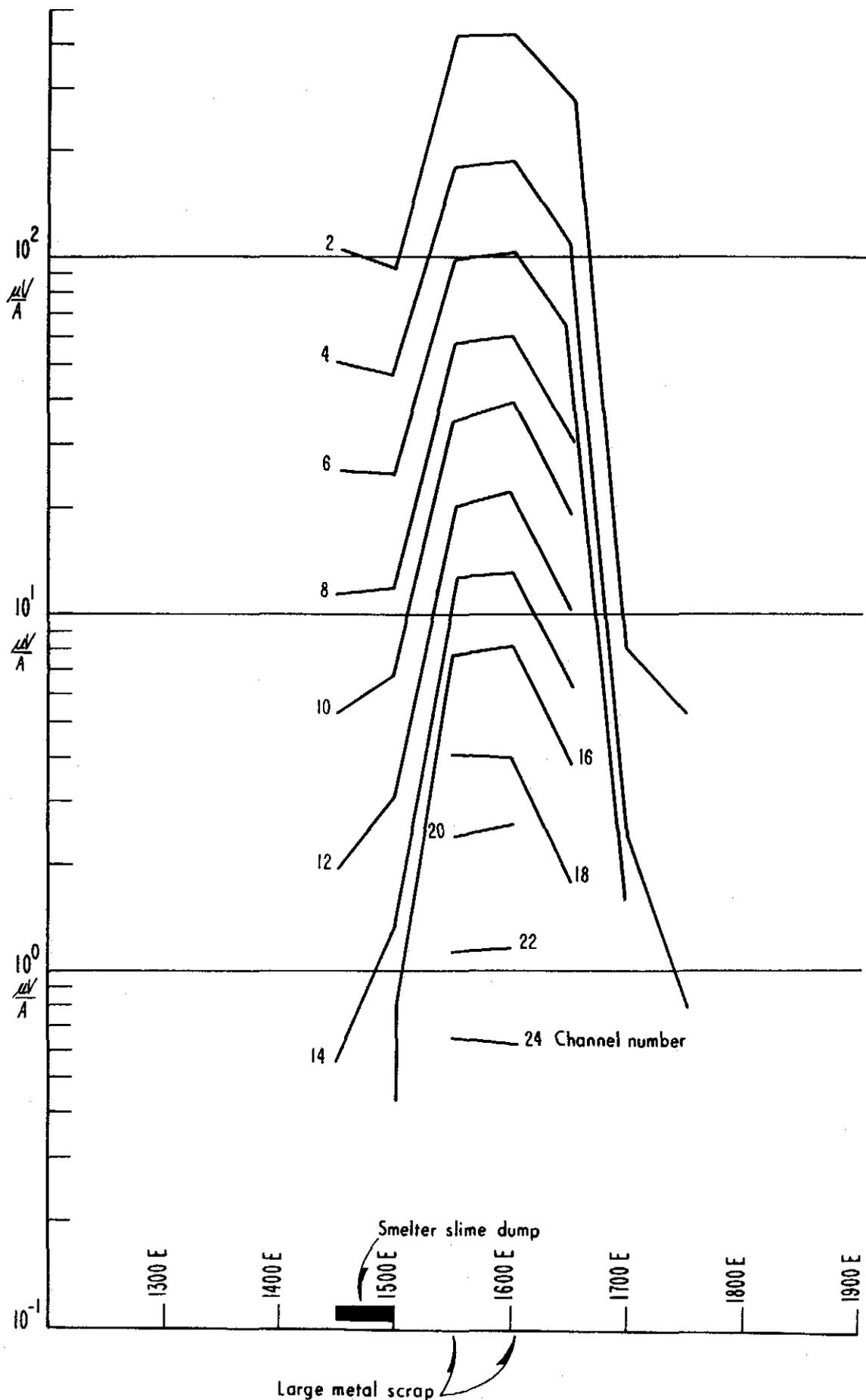
## Geophysics

Geophysical surveys and data interpretation included downhole and surface Sirotem surveys by Geoex, downhole density and gamma logging by Mitre Geophysics and ground magnetic, core density, magnetic surveys and data interpretation by Amoco. An airborne magnetic survey was to have been conducted in conjunction with a Tasmanian Mines Department survey, however, this is now planned for later in the year.

Geoex was contracted to implement a downhole Sirotem survey on seven holes drilled on the Austral prospect during 1981 as well as two holes drilled on the Oceana prospect late in 1980. All holes were cased to bottom with 40 millimeter internal diameter PVC plastic to prevent caving. The PVC in ZT-81A-6 appears to have been crushed at a depth of 45 meters, within a fault zone, and downhole surveys were abandoned.

The program was designed to screen both the Austral and Oceana prospects for possible adjacent massive sulfide occurrences. Hole ZT-81A-7 on the Austral prospect, drilled to intersect a gravity response of 0.75 milligal at approximately 150 meters depth, showed a weak off-hole response within the zone 0-100 meters (Appendix 1). Surface Sirotem was used to more accurately locate the anomaly (Figure 4). This survey succeeded in defining a highly conductive, (decay constant - 8 milliseconds) vertically dipping body lying 75 meters to the east of the slime dump and approximately 25 meters east of the drill collar near the contact between the Gordon Limestone and the overlying Crotty Quartzite Formation.

Four further loop set ups of 200 x 200 meters were implemented to define the conductor and locate its axis more precisely. Due to the high level of noise it was not possible to relocate the response observed from the original survey. However, a moderate tenor off-hole anomaly with the transmitter loop positioned well



AUSTRAL  
Surface Sirottem **Line 750 N**

Figure 4

to the west of the previous anomalous zone, is observed at approximately 250 meters and has an interpreted distance from the hole of 40 - 50 meters.

Due to noise and lack of consistency with the previous loop configuration the validity of this anomaly is in doubt. It is thought that a small dipole receiver type TEM System (either Geonics TEM 37 or SiroteM roving receiver) should be used to elucidate the source of the anomaly.

Holes ZT-80-7 and 9 on the Oceana prospect were also surveyed with downhole SiroteM with hole ZT-80-9 showing two significant in-hole conductors and a possible broad off-hole conductor coincident with mineralized and projected intercepts (Appendix 2). This hole had been surveyed previously using downhole PEM with poor results. Downhole density readings indicate a dense mass in a section of no core recovery over seven meters from 175 - 182 meters coincident with the deepest TEM response. One meter grading 10% lead and one meter grading 44% lead were intersected above and below this zone. Hole ZT-80-7 showed a weak TEM response coincident with a two meter sulfide intercept composed predominantly of sphalerite and galena with a siderite gauge. The intercept is considered to be poorly conducting due to the non interlocking of veinlets and disseminations.

Downhole density and gamma logging surveys, by Mitre Geophysics, were also implemented on the Austral and Oceana prospects using a SIE T 450 E logger (Appendices 3 and 4). The program was designed to help define the source of the large gravity response drilled during the latter part of 1981 and to aid geological interpretation of lithologies using the gamma logging data. The density logging system was shown to be very sensitive to low density readings as it was designed primarily for coal exploration, but showed little definition in densities from approximately 2.8 gm/cc upwards. Quantitative analysis of the gravity response due to the observed density variations was not

possible due to lack of accurate calibration for the density logger. The available data, however, shows no broad scale consistent density variations which could explain the presence of the observed surface gravity.

Downhole gamma logging aided the geological understanding of the prospects and most holes within the Austral prospect could be located stratigraphically even though lithologically the units look quite dissimilar due to facies changes. A borehole gamma correlation section with marker horizons highlighted using the gamma logs of holes drilled from north to south on the Austral prospect is included (Appendix 5).

Subsequent to the limited number of drill core density measurements undertaken late in 1981, some 67 samples of core from ZT-81A-5 were tested for density variations. Densities varied from 2.65 gm/cc to 2.98 gm/cc (Table 3), the high value obtained from sideritic material is not consistent with the observed 0.75 milligal gravity response as the sideritic zones were generally very narrow. The average densities for the carbonate lithologies varied little from a mean of 2.72 gm/cc with the more dolomitic material being slightly higher and averaging 2.77 gm/cc. Quartzose carbonates and laminar carbonates had the lowest densities of 2.69 gm/cc and 2.65 gm/cc.

Computer modelling using a prism model indicates the anomaly can not be due to a dense mass below the drillholes. It is now felt that the observed gravity anomaly is due to a combination of a very broad lithological unit completely surrounding the drillholes and density variations in the near surface overburden.

Magnetic susceptibility tests were carried out on core from the Oceana prospect (Table 4), on holes ZT-79-2 and ZT-80-4, with low tenor magnetic responses occurring wherever siderite was observed. Limestones, dolomites and massive lead-zinc sulfides showed no magnetic response.

TABLE 3 + AUSTRAL DRILLHOLE ZT+81A+5 + DOWNHOLE DENSITY MEASUREMENTS

Depth	Rock Type	Density gm/cc
14.10	Dolomite	2.71
20.80	Slump breccia + dolomite matrix	2.65
27.00	Slump breccia	2.75
33.60	Slumped calcutite, calcite veined	2.68
39.00	Slumpy calcutite + dolomite	2.72
42.80	Slumpy calcutite + dolomite	2.73
46.10	Laminar limestone	2.52
51.25	Slump breccia + dolomite matrix	2.76
55.20	Interbedded dolomite + calcutite (60:40)	2.72
59.00	Argillaceous dolomite	2.76
66.60	Slump breccia	2.73
70.35	Dolomite + argillaceous	2.74
72.30	Fossil breccia + dolomite matrix	2.76
79.00	Shelly calcutite	2.72
85.80	Calcutite	2.68
94.20	Fossil breccia + dolomite matrix	2.71
95.20	Slumpy limestone + dolomite (85:15)	2.70
103.00	Slumpy calcutite + dolomite (80:20)	2.75
110.20	Slumpy calcutite + dolomite (70:30)	2.72
116.00	Bedded calcutite	2.71
123.80	Laminar calcutite/dolomite (80:20)	2.71
129.10	Calcutite + dolomite (70:30)	2.74
138.30	Calcutite	2.72
143.00	Calcutite + microcrystalline	2.74
149.80	Foliated calcutite - dolomite (70:30)	2.75
154.95	Calcarenite	2.71
156.05	Argillaceous foliated calcutite	2.73
160.50	Dolomite + calcutite (60:40)	2.74
170.00	Dolomitized calcarenite	2.75
172.50	Calcutite	2.72
178.20	Siderite calcite breccia	3.11
182.75	Argillaceous dolomite	2.73
188.40	Calcutite	2.70
193.30	Pelletal dolomite + calcutite (60:40)	2.75
200.00	Calcutite	2.73
203.90	Laminar calcutite	2.68
207.50	Weathered dolomite + argillaceous	2.33
214.30	Dolomite + breccia, minor siderite	2.96
227.35	Calcutite	2.72
232.00	Calcareous quartz arenite	2.66
239.20	Calcutite + dolomite (75:25)	2.71
243.10	Dolomite + argillaceous	2.70
244.95	Calcareous quartz arenite	2.65
250.90	Shelly calcarenite	2.72
251.30	Quartzose calcutite	2.73
251.60	Calcutite	2.72
251.65	Dolomite	2.80
259.00	Foliated calcutite	2.74
265.35	Foliated calcutite	2.72
269.65	Slumpy calcutite - minor dolomite	2.72
276.70	Dolomite + calcutite breccia + minor calcite	2.73
279.40	Graded bedded quartzose siderite + dolomite rock, trace galena	3.33
284.00	Calcutite + dolomite (40:60)	2.78
289.00	Dolomite, minor calcutite	2.78
294.10	Dolomite + calcutite	2.72
300.60	Interbedded calcutite - dolomite	2.76
305.00	Calcite vein + massive	2.73
306.20	Calcite + siderite massive vein	2.79
310.60	Calcutite	2.71
316.65	Laminar calcutite	2.69
318.00	Calcite siderite breccia	2.92
325.00	Quartzose calcutite	2.70
326.00	Massive calcite/siderite vein	2.75
330.00	Calcutite	2.71
333.00	Calcutite + calcite veined	2.70
337.00	Calcutite	2.71
340.00	Interbedded calcutite + dolomite	2.72

## AVERAGE DENSITY + ZT+80A+5 LITHOLOGIES

	gm/cc
Calcutite	2.72
Dolomite * one low value of 2.33	2.73 (2.77)
Calcarenite	2.72
Slump breccia	2.72
Fossil breccia	2.74
Interbedded calcutite + dolomite	2.74
Slumped calcutite + dolomite	2.72
Laminar calcutite	2.65
Quartzose limestones	2.69
Massive calcite	2.73
Siderite + calcite breccia's * one low value of 2.75	2.98 (3.01)

TABLE 4

Magnetic Susceptibility Readings (Oceana cove) x 10<sup>-3</sup> cgs units

	Depth Meters	Rock Type	Reading	
ZT-80-4	254	Interbedded dolomite limestone	0.0	
	250	Sideritic mineralization	0.2	
	253	" "	0.2	
	255	" "	0.1	
	257	" "	0.2	
	260	Interbedded dolomite limestone	0.0	
	265	" "	0.0	
	270	" "	0.0	
	299	Sideritic mineralization	0.2	
	302	" "	0.2	
	305	Lead zinc mineralization	0.1	
	306.5	" "	0.1	
	ZT-79-2	77.6	Claystone	0.0
		85	" "	0.0
96		" "	0.0	
100		Dolomite	0.0	
103.5		Feruginous claystone	0.0	
106		Lead zinc mineralization	0.0	
111.5		" "	0.0	
114.2		" "	0.0	
116		" "	0.0	
119.8		Ferruginous claystone	0.0	
130.5		Sideritic mineralization	0.1	
173.5		Siderite veined dolomite	0.1	
188		Sideritic breccia	0.1	
198		Siderite veined brecciated limestone	0.2	
204.5		" " "	0.1	
208.3		Sideritic mineralization	0.1	
212	" "	0.1		
216	" "	0.2		
220	Sideritic Limestone	0.2		
229	Pyritic dolomite - no siderite	0.2		
234	Sideritic limestone - minor Pb/Zn	0.2		



Geoex conducting downhole Sirotem survey.



Drilling Winkie hole ZT-W1 at Austral.

Detailed ground magnetic surveys using two Geometrics G856 magnetometers were implemented on the results of the core testing program, as lead-zinc mineralization is frequently associated with a siderite gangue. Modelling suggested that near surface siderite and ironstones could be delineated

As the survey was able to discriminate and define this anomaly a detailed survey was undertaken on the Austral prospect from 400N to 1400N (Enclosures 4 and 5). A zone of weak anomalism was defined from 1200N to 1400N at 1275E coincident with a pisolitic textured goethitic ironstone. The large negative response of approximately 2000 gammas lies coincident with the slag dumps from the old Zeehan Smelter and influences most of the prospective part of the grid. Minor one-point anomalies appear to be culture related as evidenced by numerous occurrences of scrap iron on the grid.

Results from the Oceana survey clearly outline the weakly anomalous response coincident with the mangano-ironstone zone north of the main shaft from 3575N to 3725N (Enclosures 6 and 7). The ironstone is derived from the weathering of a sideritic lead-zinc body near surface.

General ground magnetic surveys using a Geometrics G816 magnetometer were conducted over the North Austral and Nubeena prospects located within the Cambrian Crimson Creek Formation. (Enclosure 8). The survey at Nubeena is incomplete but results recorded to date have outlined a strong anomaly and the grid has since been extended to enable the anomaly to be detailed. No anomalies were observed on the North Austral prospect.

#### Winkie Diamond Drilling

Two holes totalling 42 meters were drilled on the Austral and Oceana prospects using a Winkie drill. The holes were drilled with conventional (BX) rods. Drillhole locations are shown on

Enclosures 9 and 10 and drill logs are included as Appendices 6 and 7.

- ZT-W1 Austral (Joint venture area)
  - Location : 630N:1555E
  - Declination : 45°
  - Azimuth : 249°T
  - Total Depth : 28 meters (abandoned)
  - Results : 19-23 = 4m of 1.6% Pb + 0.8% Zn + 118g/t Ag

Hole W1 was sited to test a ferruginous breccia zone averaging 0.82% lead and 31.8 g/t silver on the lower Austral prospect. The four meters of low grade lead/zinc mineralization encountered from 19 - 23 meters appears to be the southern extent of mineralization encountered previously in ZT-81A-7 (50.2-52.2 =2m of 1.4% Pb + 0.2% Zn + 43g/t Ag). The silver content of the Winkie intercept is however, significantly higher. The hole was abandoned at 28 meters with no core being obtained from 23-28 meters due to caving. Only part of the target zone appears to have been tested as mineralized core lies directly above the zone of no recovery.

- ZT-W2 Oceana
  - Location : 3600N:1415E
  - Declination : 45°
  - Azimuth : 228°T (Grid west)
  - Total Depth : 15 meters (abandoned)
  - Results : 3-14 = 11m of 10.2% Pb + 3.3% Zn + 21.5g/t Ag  
incl. 6m of 16.2% Pb + 3.0% Zn + 31.7g/t Ag

ZT-W2 was designed to intersect (at approximately 25 meters downhole) the near surface mineralization encountered in ZT-80-9  
 4- 9 = 5m of 7.3% Pb + 1.9% Zn + 16.8g/t Ag  
 and 18-20 = 2m of 3.6% Pb + 10.2% Zn + 27.0g/t Ag

to ascertain its true width. The hole was abandoned at 15 meters

due to caving and broken ground from 14-15 meters. Highly encouraging grades of lead/zinc mineralization were encountered from 3 - 14 meters with the grades appearing to improve with depth. The hole was abandoned some 10 meters above the projected target horizon, however the grades encountered may increase the width of the mineralized zone considerably. It also appears that hole ZT-80-5 failed to intersect the target zone due to low angle faulting, stepping the mineralized zone westwards as reported by R. Jack, Tasmanian Mines Department geologist in 1960 after a visit subsequent to the mines closure.

Drilling details to date and significant mineralization of Austral and Oceana are summarized (Tables 5 and 6).

TABLE 5 - AUSTRAL PROSPECT - SUMMARY OF DIAMOND &amp; WINKIE DRILLING

HOLE	CO-ORD	BEARING	DECLIN	DEPTH (M)	COORDINATES AZIMUTH DEFLECTION (at terminal depth)	RESULTS (* including)
ZT-79A-1	1800N 1225E	270°G	+50°	163	Unknown (acid)	76+82=6m @ 1.06% Pb + 1.66% Zn + 1.6g/t Ag 130+143=13m @ 2.61% Pb + 0.62% Zn + 13.8g/t Ag
ZT-80A-2	1850N 1300E	270°	+60°	331	1850N 1135E	40-46=6m @ 0.69% Pb + 1.62% Zn + 5.8g/t Ag 284+299=15m @ 0.80% Pb + 0.86% Zn + 4.8g/t Ag *284+290=6m @ 1.44% Pb + 0.65% Zn + 5.1g/t Ag and 294-299=5m @ 0.29% Pb + 1.40% Zn + 3.8g/t Ag
ZT-80A-3	1610N 1300E	270°	-65°	373.50	1535N 1097E	294-296=2m @ 0.42% Pb + 2.05% Zn + 15.5g/t Ag 341-355=14m @ 0.86% Pb + 0.23% Zn + 4.4g/t Ag *347+351=4m @ 2.25% Pb + 0.28% Zn + 9.0g/t Ag
ZT-81A-4	1300N 1530E	270°G	-50°	259		No significant mineralization
ZT-81A-5	897.5N 1373E	270°G	+50°	340		201-202=1m @ 0.63% Pb + 1.15% Zn + 5.0g/t Ag 278-281=3m @ 0.57% Pb + 0.59% Zn + 2.3g/t Ag
ZT-81A-6	1695N 1050E	090°G	-55°	194.2		42+43=1m @ 0.63% Pb + 5.00% Zn + 18.0g/t Ag 74+77=3m @ 9.50% Pb + 6.60% Zn + 71.3g/t Ag 153+167=14m @ 2.54% Pb + 0.35% Zn + 40.4g/t Ag 181+183=2m @ 4.20% Pb + 0.18% Zn + 40.0g/t Ag
ZT-81A-7	750N 1535E	250°G	-50°	254		50.2+52.2=2m @ 1.40% Pb + 0.16% Zn + 42.5g/t Ag 122+125=3m @ 4.34% Pb + 0.29% Zn + 17.0g/t Ag *124+125=1m @ 10.60% Pb + 0.27% Zn + 42.0g/t Ag *244+245.8=1.8m @ 0.06% Pb + 1.89% Zn + 1.0g/t Ag
ZT-81A-8	1030.5N 1340E	270°G	+45°	150		12+13=1m @ 3.30% Pb + 5.30% Zn + 23.0g/t Ag
ZT-81A-9	555N 1500E	242°G	-45°	149.5		No significant mineralization
ZT-81A-10	550N 1598E	255°	+45°	100		52+58=6m @ 1.79% Pb + 0.58% Zn + 14.8g/t Ag *52-55=3m @ 2.57% Pb + 0.67% Zn + 20.0g/t Ag
ZT-W1	630N 1555E	249°	-45°	28 (abandoned)		19+23=4m @ 1.60% Pb + 0.80% Zn + 118.0g/t Ag

TABLE 6 - OCEANA PROSPECT + SUMMARY OF DIAMOND AND WINKIE DRILLING

HOLE	CO-ORD	BEARING	DECLIN	DEPTH (m)	COORDINATES AZIMUTH DEFLECTION (at terminal depth)	RESULTS (* including)
ZT-79-2	3700N 1500E	270°G	-60°	235.90	Unknown (acid)	65-218=153m @ 5.10% Pb + 3.50% Zn + 41.7g/t Ag * 65-96= 31m @ 0.66% Pb + 3.28% Zn + 1.0g/t Ag 96+122= 26m @ 22.26% Pb +11.69% Zn + 203.4g/t Ag *103+118= 15m @ 33.29% Pb +19.22% Zn + 336.7g/t Ag 122+204= 82m @ 0.68% Pb + 1.01% Zn + 3.0g/t Ag *204-218= 14m @ 8.37% Pb + 2.95% Zn + 56.7g/t Ag
ZT+80+3	3200N 1515E	270°G	-60°	399.70	3075N 1335E	237+238= 1m @ 8.25% Pb + 0.39% Zn + 73.6g/t Ag
ZT+80-4	3420N 1490E	270°G	-66°	360.30	3370N 1350E	247+258= 11m @ 12.00% Pb + 4.0% Zn + 89g/t Ag *250+258= 8m @ 15.00% Pb + 5.40% Zn + 113g/t Ag 302+307= 5m @ 22.30% Pb + 1.99% Zn + 323g/t Ag *304-307= 3m @ 36.0% Pb + 3.2% Zn + 530g/t Ag
ZT-80-5	3600N 1590E	270°G	-65°	475.30	3530N 1350E	No visible mineralization
ZT-80+6	3650N 1350E	90°G	-60°	330		69+72= 3m @ 1.52% Pb + 0.28% Zn + 13.3g/t Ag 112+117= 5m @ 1.76% Pb + 1.20% Zn + 6.6g/t Ag 126+134= 8m @ 1.22% Pb + 0.24% Zn + 5.5g/t Ag 212+220= 8m @ 0.45% Pb + 1.39% Zn + 1.0g/t Ag
ZT+80+7	3420N 1250E	037°G	-50°	250		167+169= 2m @ 12.0% Pb + 11.0% Zn + 70g/t Ag
ZT+80+8	3700N 1575E	270°G	-55°	228		160+167= 7m @ 0.6% Pb + 3.12% Zn + 13.7g/t Ag *165-167= 2m @ 1.7% Pb + 7.7% Zn + 29.0g/t Ag
ZT-80+9	3600N 1400E	06°G	-50°	200.20		1+24= 23m @ 2.82% Pb + 2.12% Zn + 9.9g/t Ag * 4-9= 5m @ 7.30% Pb + 1.88% Zn + 16.8g/t Ag 120+186= 66m @ 2.45% Pb + 0.82% Zn + 12.5g/t Ag *148+162= 14m @ 3.25% Pb + 0.4% Zn + 8.7g/t Ag 172+186= 14m @ 5.80% Pb + 1.28% Zn + 21.7g/t Ag *182-186= 4m @ 12.95% Pb + 3.09% Zn + 76.0g/t Ag
ZT+W2	3600N 1415E	228°	+45°	15(abandoned)		3+14= 11m @ 10.20% Pb + 3.30% Zn + 21.5g/t Ag * 6m @ 16.20% Pb + 3.0% Zn + 31.7g/t Ag

740035

#### EXPLORATION POTENTIAL

The Zeehan property has excellent potential for hosting both open pitable and underground silver lead-zinc deposits grading greater than 10% combined lead-zinc.

Drilling to date on the Oceana prospect has shown basemetal sulfide accumulations of +10% lead-zinc from 3-11 meters in width at an open pitable depth. Winkie diamond hole 2 drilled perpendicular to the start of hole ZT-80-9, reinforces the tenor and widths of near surface mineralization north of the head frame as did costean E, excavated in 1980 in which 33 meters assayed 5.7% lead + 1.4% zinc + 35g/t silver, to a depth of 1-3 meters.

Similar deposits may also be located in the surrounding portion of the tenement at such prospects as Austral, North Austral, Myrtle and Pyramid. These all require diamond drilling to realize their potential.

#### PROPOSED PROGRAM

Bedrock geochemical surveys, using bombardier mounted Jackro 200 and 350 auger rigs, will be conducted on the Baura and Rose Valley grids to detail a 1.0 milligal gravity response with dimensions 400 by 400 meters. Further surveys using the Jackro combinations will be conducted on the Pyramid, Myrtle Extended and Grieve grids. Hand auger sampling will be carried out on the remainder of the Nubeena grid and on the recently extended portion of the Myrtle prospect endeavoring to close off the high geochemistry zone observed from lines 50200N to 50600N.

An airborne magnetic survey will be conducted late in 1982 with flight lines spaced at 250 meter intervals between those flown during the Tasmanian Mines Department survey early in the year. Extension ground magnetic surveys using a Geometrics G856 magnetometer will be conducted on the Nubeena grid closing off a

2000 gamma response observed from the initial survey. Detailed ground magnetic surveys will be implemented on the Baura, Rose Valley, Grieves, Myrtle Extended, Myrtle and Pyramid grids to quickly scan the prospects for near surface siderite rich lead-zinc occurrences.

Further core density testing will be carried out on specific portions of core, in particular from hole ZT-81A-7. Electromagnetic anomalies outlined on both the Austral and Oceana prospects will be further investigated using a dipole receiver type transient EM (TEM) system.

The Myrtle and Pyramid grids will be geologically mapped. Additions and reinterpretations to the geology of Austral, Oceana, Nubeena and North Austral prospects will be made incorporating diamond drillhole information from the 1981 program and from the Winkie program, the downhole geophysical data and any magnetometer data.

Costeaning will be carried out where necessary to aid the geological interpretation and elucidate the extent and type of mineralization observed at or near the surface on all the grids.

SIGNED: *P.A. Jones* For .....

P.A. JONES

## AMOCO MINERALS AUSTRALIA COMPANY

EXPENDITURE FOR THE PERIOD JANUARY 1, 1982 TO JUNE 30, 1982

EXPLORATION LICENCE NO. 4/78

Salaries and Wages	11,549.24
Supplies	2,578.67
Supplies - Maps	-
Cookery	840.28
Field Office Rent	169.00
Field Supplies	153.90
Freight	2,455.61
Travel	305.05
Communications	109.45
Consultants	2,028.00
Contractors	1,203.50
Drilling	381.99
Assays	1,524.33
Legal Fees	858.60
Equipment Rental	792.66
Equipment Operation & Maintenance	633.13
Property Payments	251.04
Outside Services	1,538.83
	<hr/>
	27,373.28
Overhead	11,125.37
	<hr/>
	38,498.65
	<hr/>


T. J. CONQUEST,  
ACCOUNTANT.

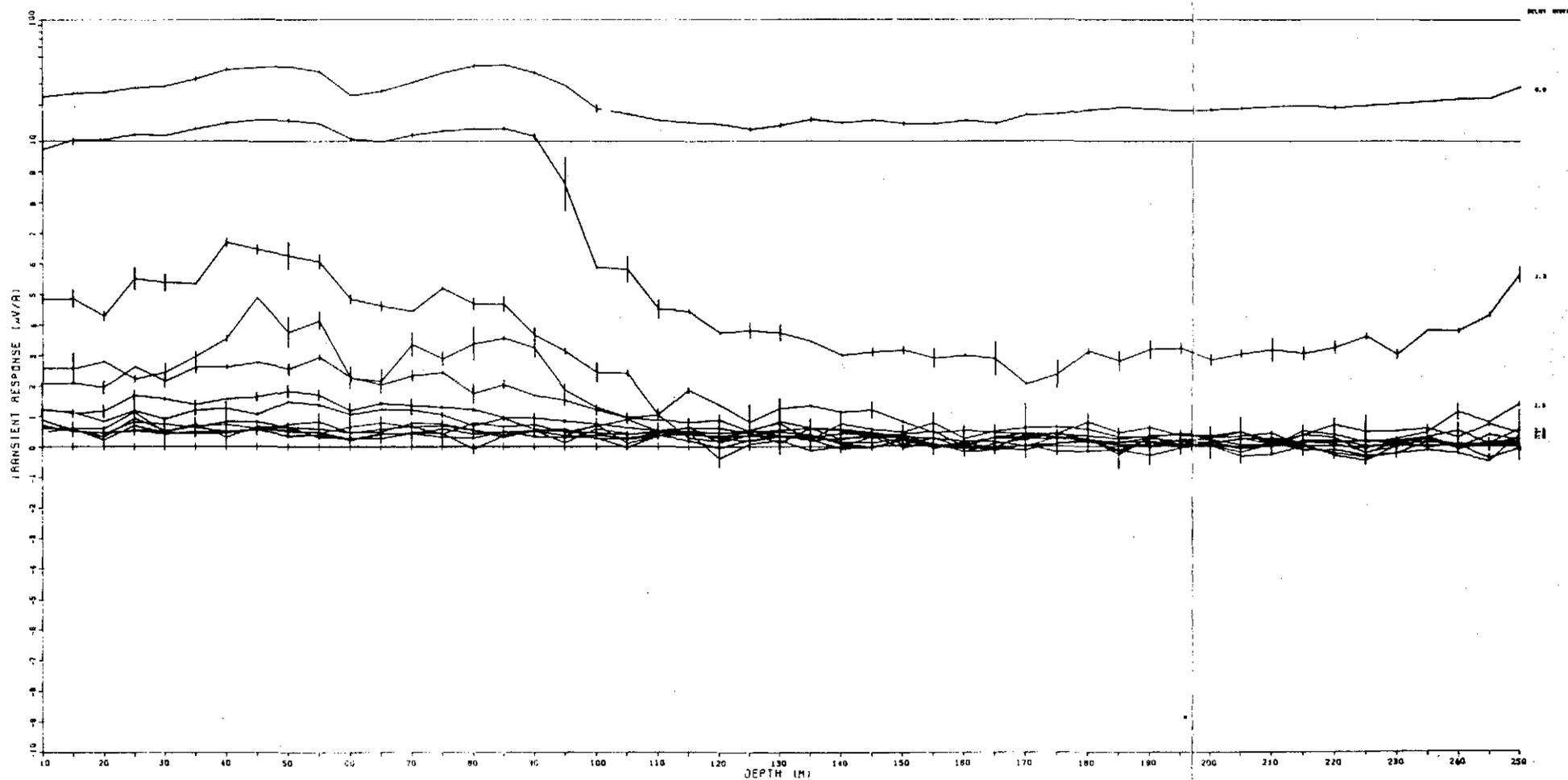
of M.	A.O.	C.G.	E.O.	D.S.M.E.
				Registrar
Received	4 AUG 1982			E & IL
Answered				
DEPT. OF MINES				
REF. No. 5997/82				

## DISTRIBUTION

- o Denver
- Mines Department
- o Sydney
- o Field
- o Spare
- o Trade

APPENDIX 1

AUSTRAL - DOWNHOLE SIROTEM PROFILES - by GEOEX

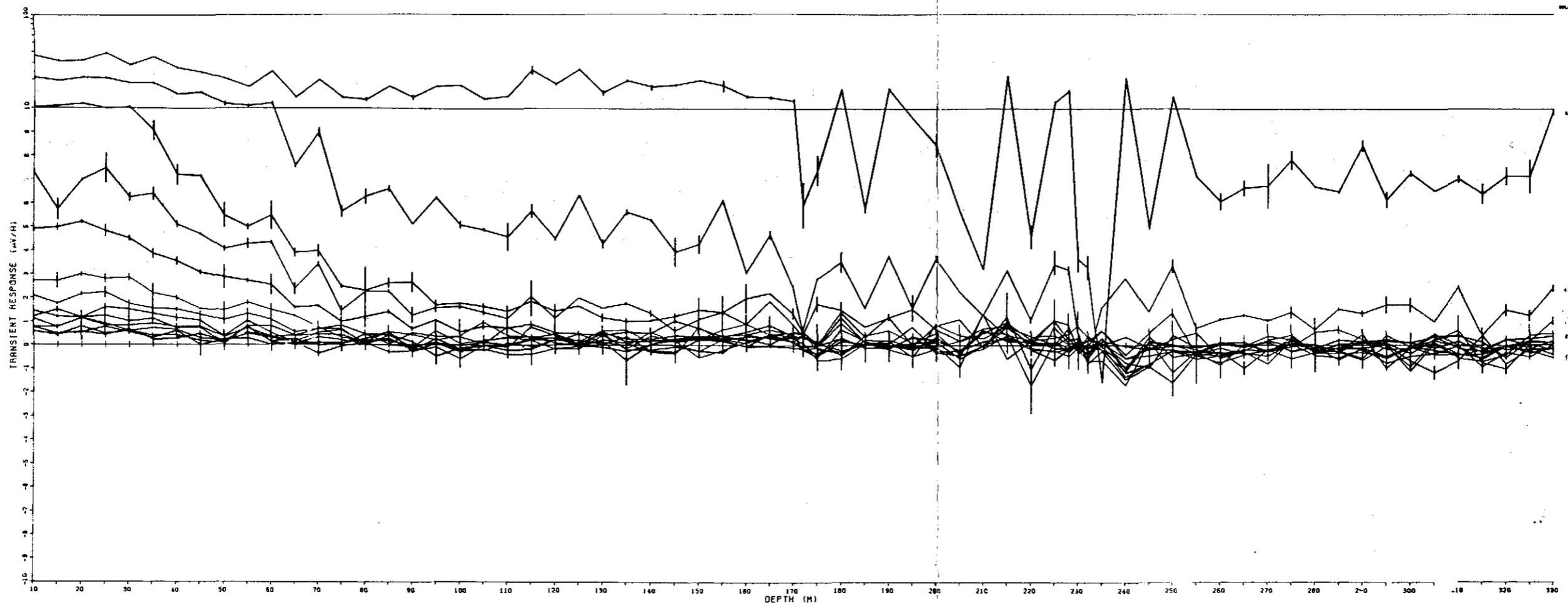


INSTRUMENT: SIR07EN  
 CONFIGURATION: 200M SQUARE TRANSMITTER LOOP,  
 DRILL HOLE SURVEY  
 READING INTERVAL: 5M  
 AMOCO MINERALS AUSTRALIA COMPANY  
 TRANSIENT E.M. PROFILE  
 00H ZT-81A-4, PROSPECT AUSTRAL

SCALE:  
 DATE: 3/4/82  
 MAP: ZEEHAN, TAS.

GEDEX  
 PTY LTD

ZT-81A-4  
 Austral...

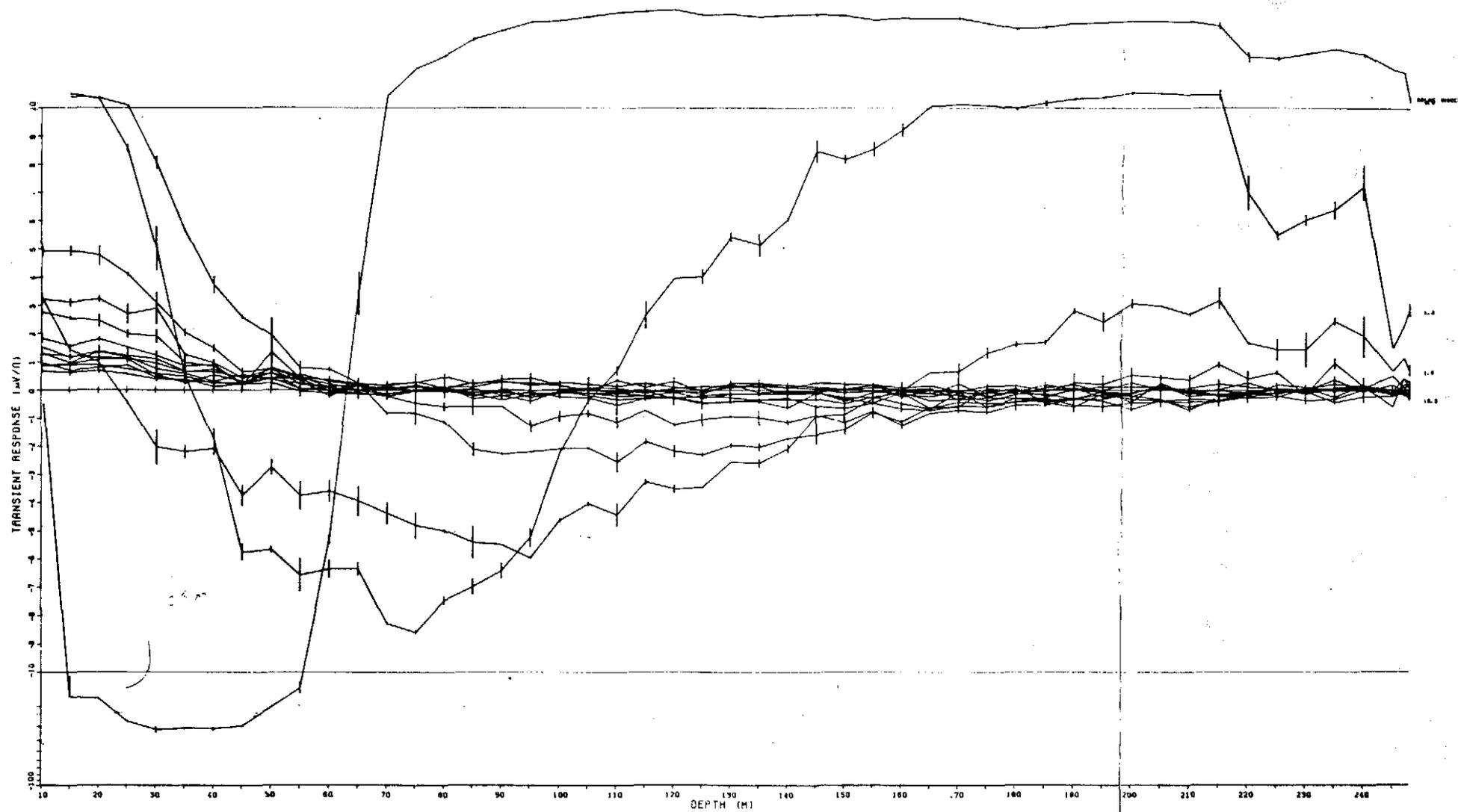


INSTRUMENT : SIARTEN  
CONFIGURATION : 200M SQUARE TRANSMITTER LOOP.  
DRILL HOLE SJAVET  
READING INTERVAL 5M  
AMOCO MINERALS AUSTRALIA COMPANY  
TRANSIENT E.M. PROFILE  
00H ZT-81A-5, PROSPECT AUSTRAL

SCALE :  
DATE : 4/4/82  
MAP : ZEENAN, TAS.



ZT-81A-5  
Austral.

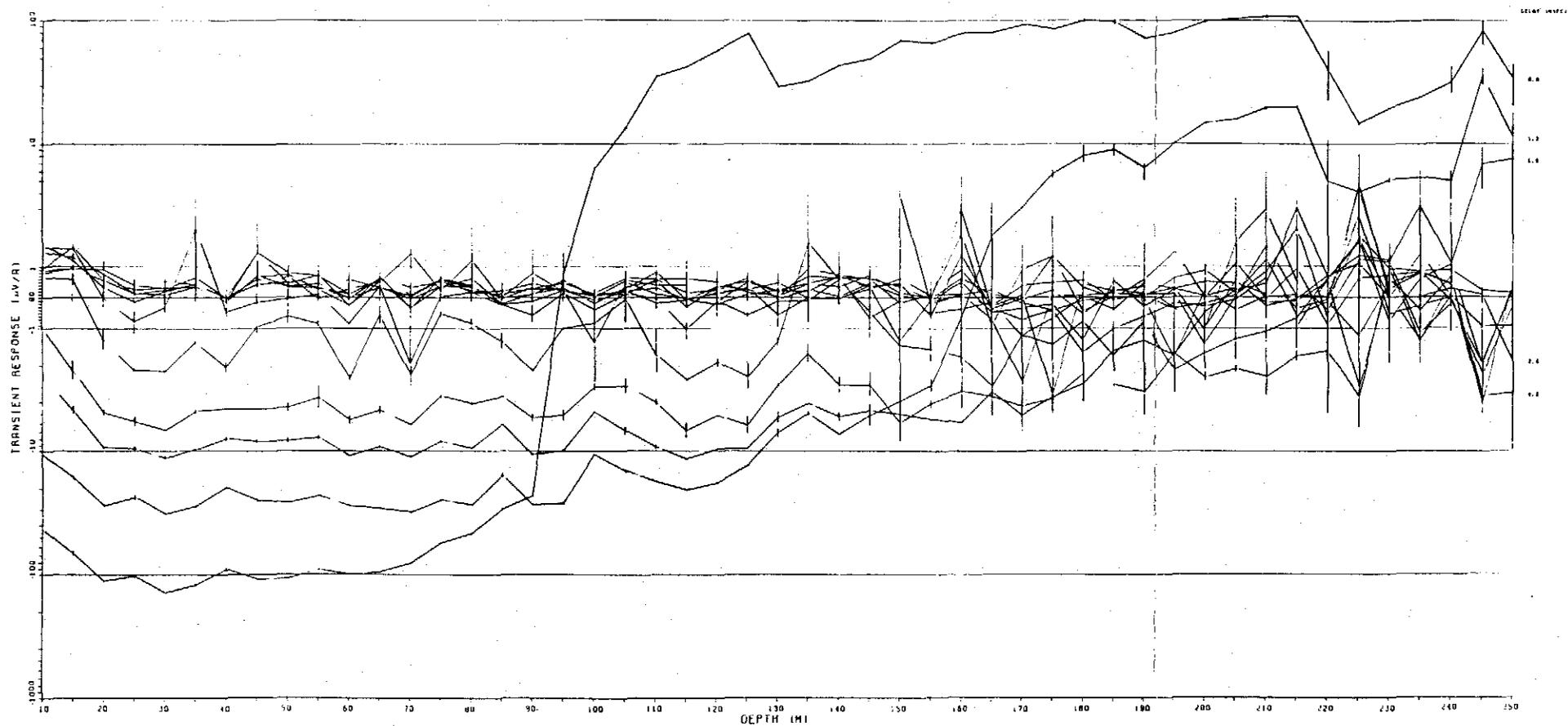


INSTRUMENT SIADEN  
 CONFIGURATION 200M SQUARE TRANSMITTER LOOP,  
 DRILL HOLE SURVEY  
 READING INTERVAL 5M  
 AMOCO MINERALS AUSTRALIA COMPANY  
 TRANSIENT E.M. PROFILE  
 COH ZT-81A-7, PROSPECT AUSTRAL

SCALE:  
 DATE: 7/4/82  
 WOP: ZEEHAN, TNS.

GEDEX  
 PTY LTD

ZT-81A-7  
 Austral.



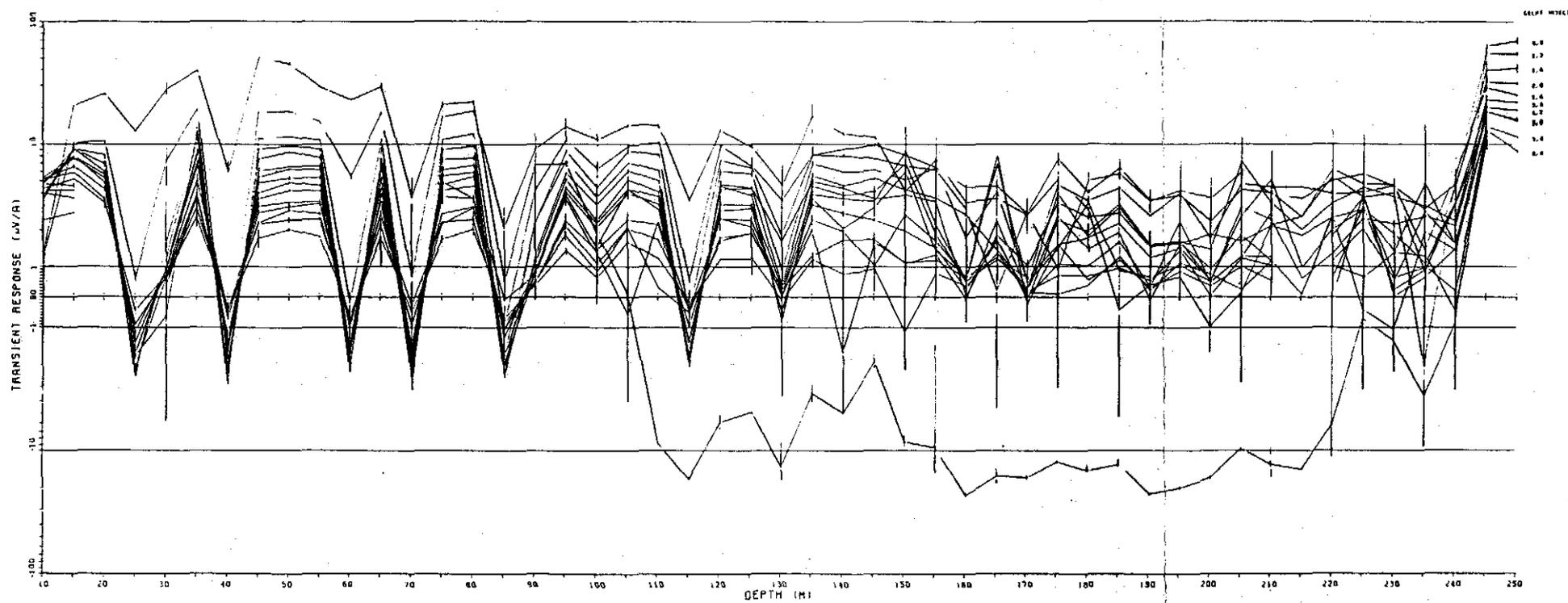
INSTRUMENT : SIRDEN  
 CONFIGURATION : 200M SQUARE TRANSMITTER LOOP,  
 DRILL HOLE SURVEY  
 READING INTERVAL 5M

SCALE :  
 DATE : 5-8/5/82  
 MAP : ZEEHAN, TAS.

AMOCO MINERALS AUSTRALIA CO.  
 TRANSIENT E. M. PROFILE  
 OOH-ZT-BIA-7 (LOOP 1), PROSPECT AUSTRAL

GEUEX  
 / PTY LTD

740046

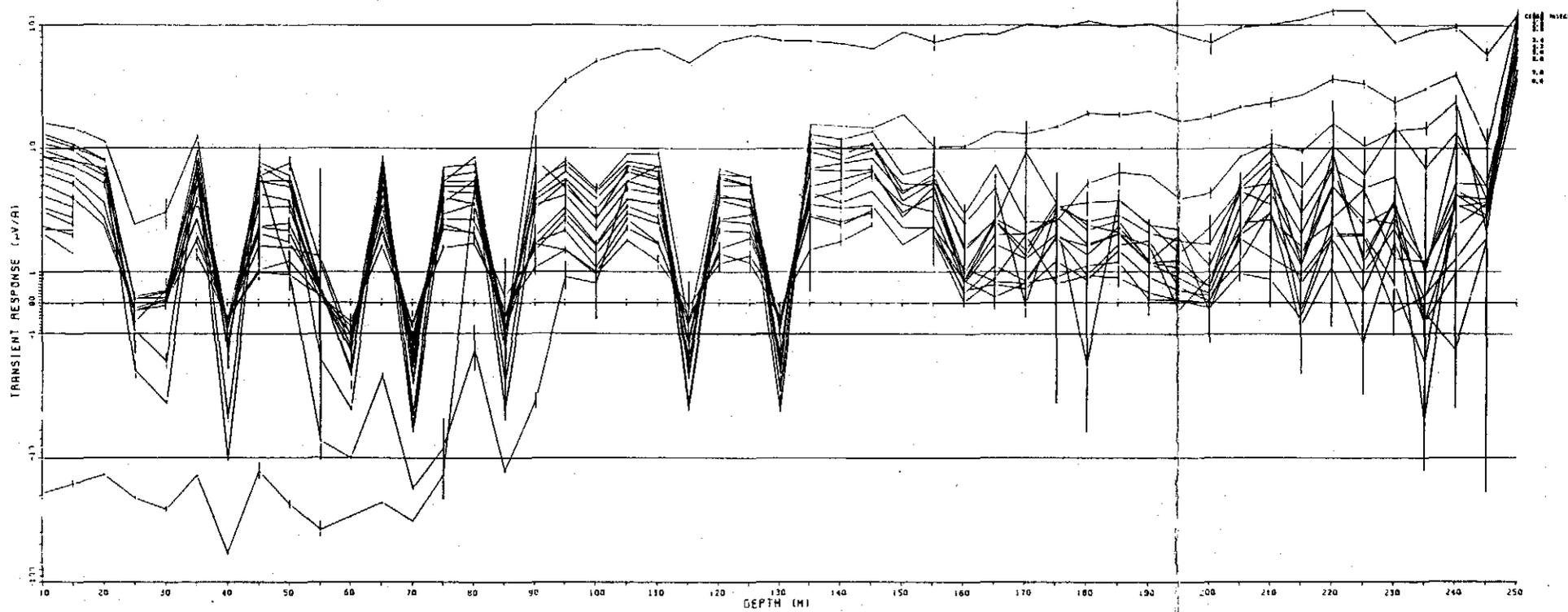


INSTRUMENT : SECTIA  
 CONFIGURATION : 200A SQUARE TRANSMITTER LOOP,  
 DRILL HOLE SURVEY  
 READING INTERVAL 5M  
 AMCO MINERALS AUSTRALIA CO.  
 TRANSIENT E.M. PROFILE  
 GDH-ZT-81A-7 (LOOP 2), PROSPECT AUSTRAL

SCALE:  
 DATE : 5-6/5/82  
 MAP : ZEEHAN, TAS.

SEDEX  
 PTY LTD

740047

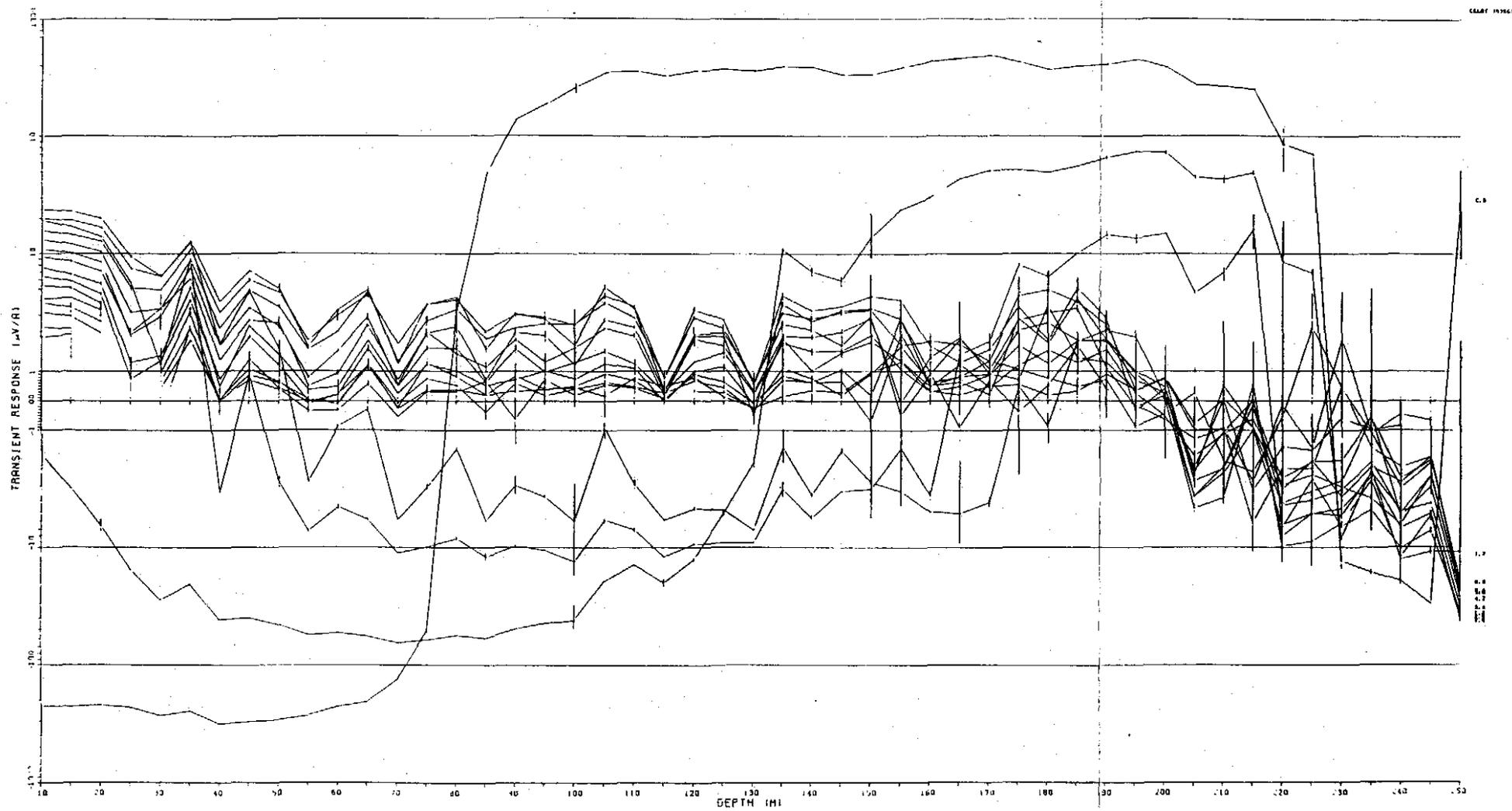


INSTRUMENT : SIROTEK  
 CONFIGURATION : 200M SQUARE TRANSMITTER LOOP,  
 DRILL HOLE SURVEY  
 READING INTERVAL 5M  
 GEMCO MINERALS AUSTRALIA CO.  
 TRANSIENT E.M. PROFILE  
 GDH-ZT-81A-7 (LOOP 31), PROSPECT AUSTRAL

SCALE :  
 DATE : 5-6/5/82  
 MAP : ZEEHAN, TAS.

GENEX  
 PTY LTD

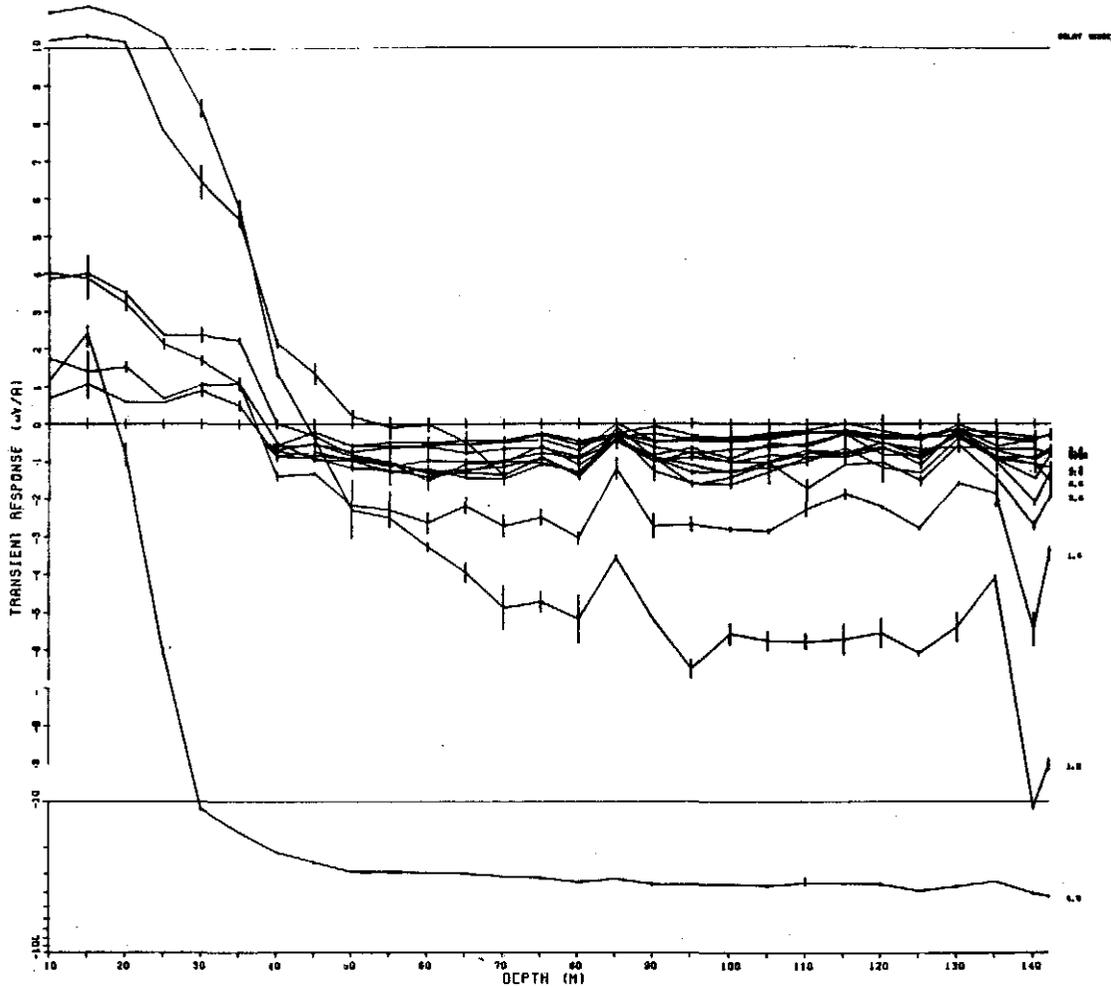
740048



INSTRUMENT : SIACOM  
 CONFIGURATION : 200M SQUARE TRANSMITTER LOOP  
 DRILL HOLE SURVEY  
 READING INTERVAL 5M  
 PH 1.1 MINERAL AUSTRALIA CO.  
 TRANSIENT E.M. PROFILE  
 DDH-ZT-81A-7 (LOOP 4), PROSPECT AUSTRAL

SCALE :  
 DATE : 5-6/5/82  
 MAP : ZEEHAN, TAS.

GENEX  
 PTY LTD

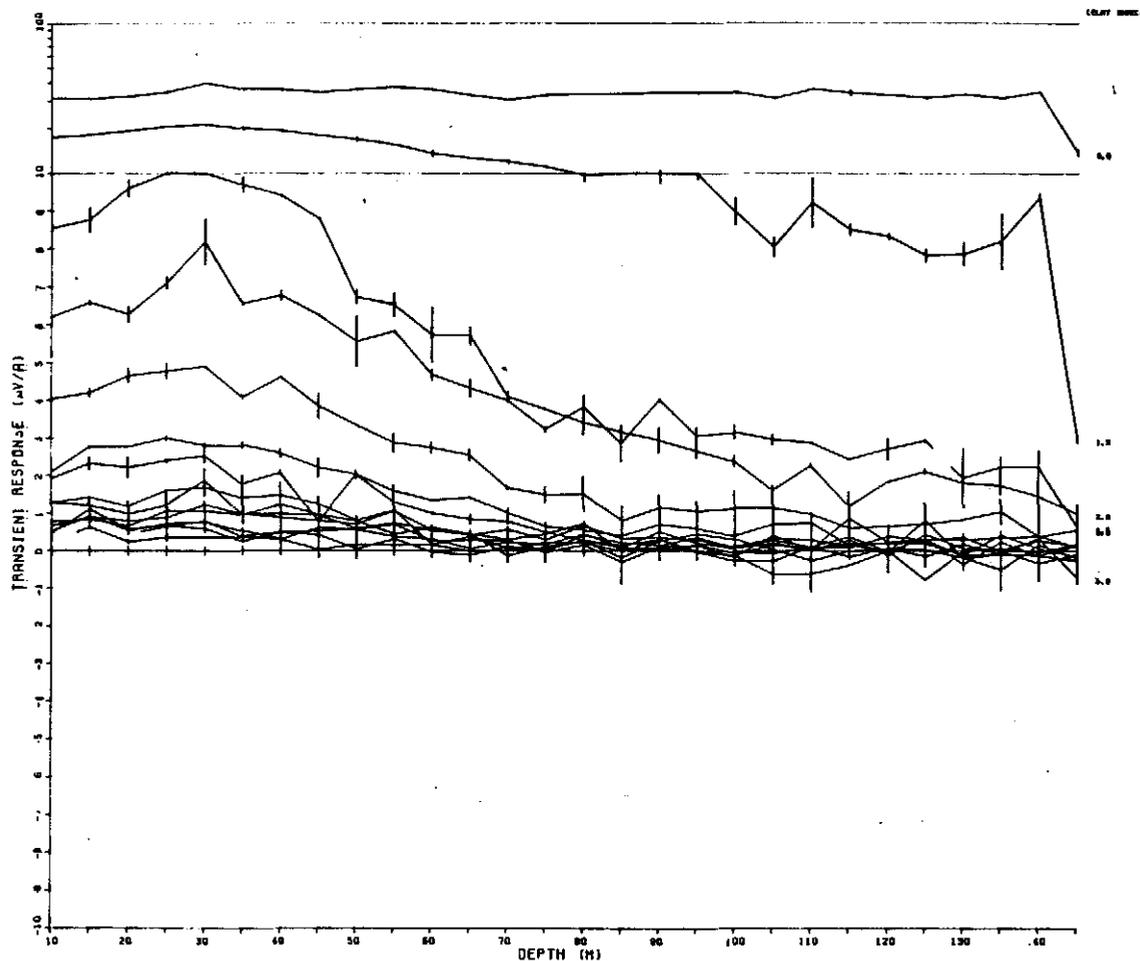


INSTRUMENT : SIAD 700  
 CONFIGURATION : 200M SQUARE TRANSMITTER LOOP,  
 DRILL HOLE SURVEY  
 READING INTERVAL : 5M

AMOCO MINERALS AUSTRALIA COMPANY  
 TRANSIENT E.M. PROFILE  
 DDH Z7-81A-9, PROSPECT AUSTRAL

SCALE : .....  
 DATE : 6/4/82  
 MAP : ZEPHAN, TAS.

GEOEX  
 PTY LTD

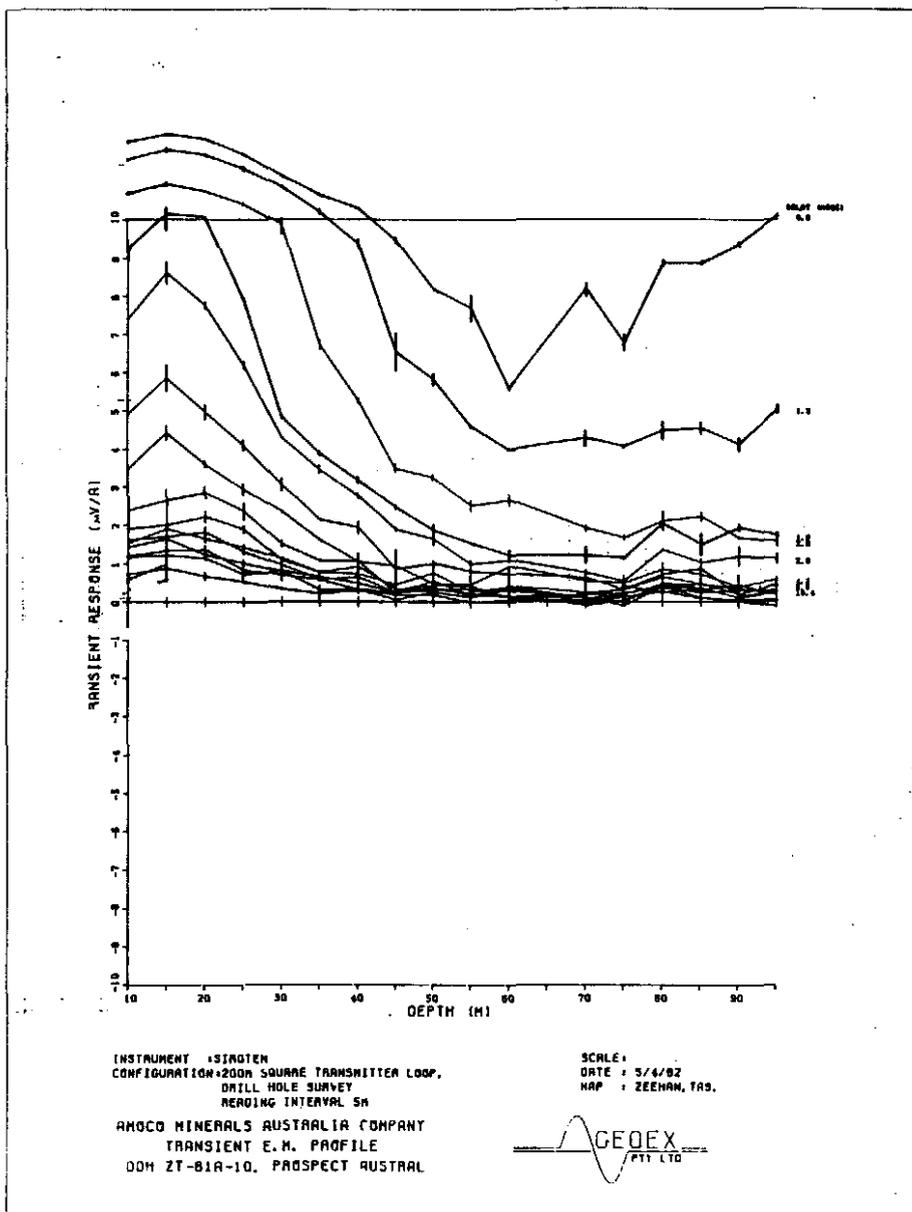


INSTRUMENT : SIAPATEN  
 CONFIGURATION : 200M SQUARE TRANSMITTER LOOP,  
 DRILL HOLE SURVEY  
 READING INTERVAL 5M

SCALE :  
 DATE : 4. 4/82  
 MAP : ZEEHAN, TAS.

ORICO MINERALS AUSTRALIA COMPANY  
 TRANSIENT E.M. PROFILE  
 CON ZT-81A-0, PROSPECT AUSTADL

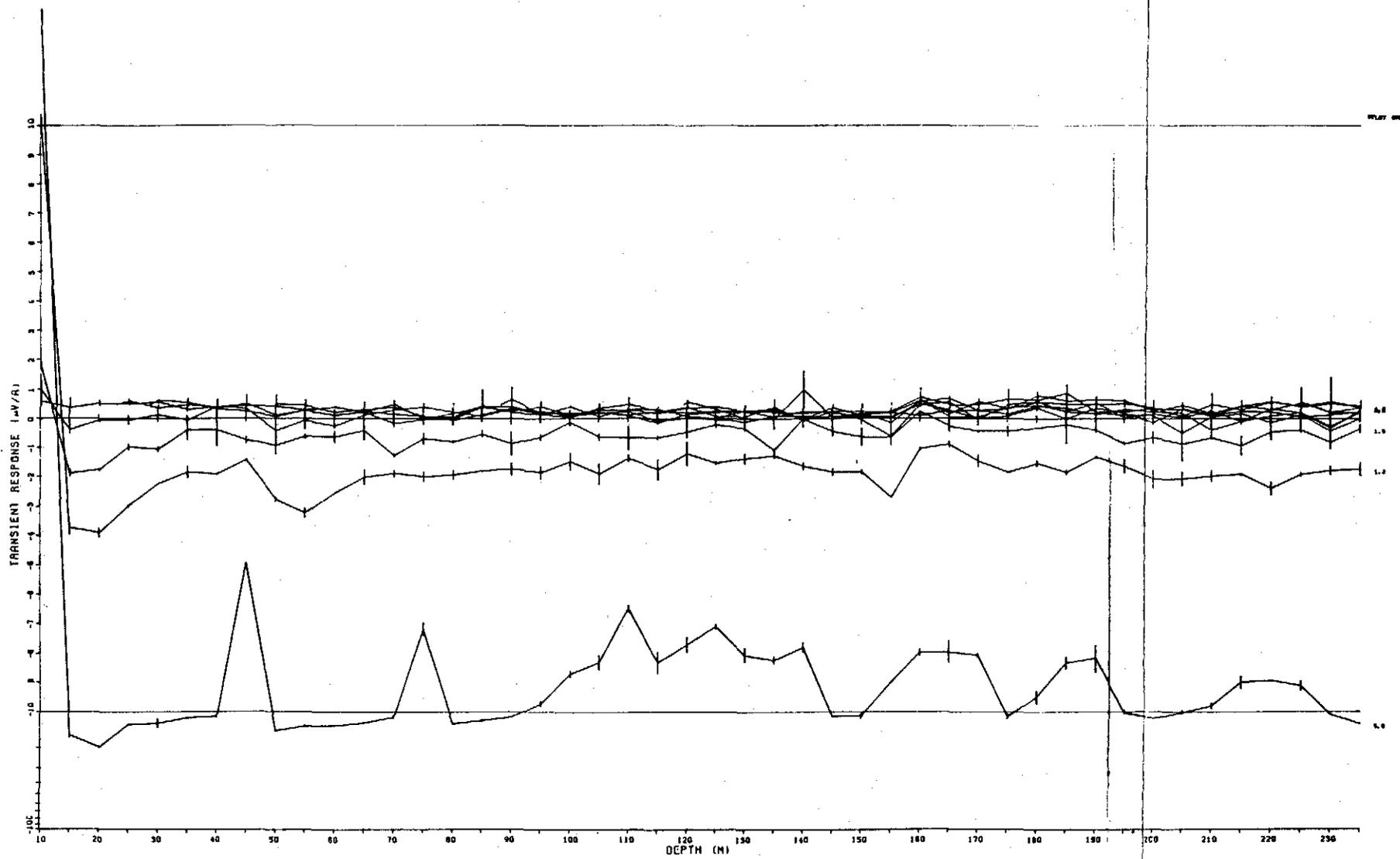




APPENDIX 2

OCEANA - DOWNHOLE SIROTEM PROFILES - by GEOEX

740053



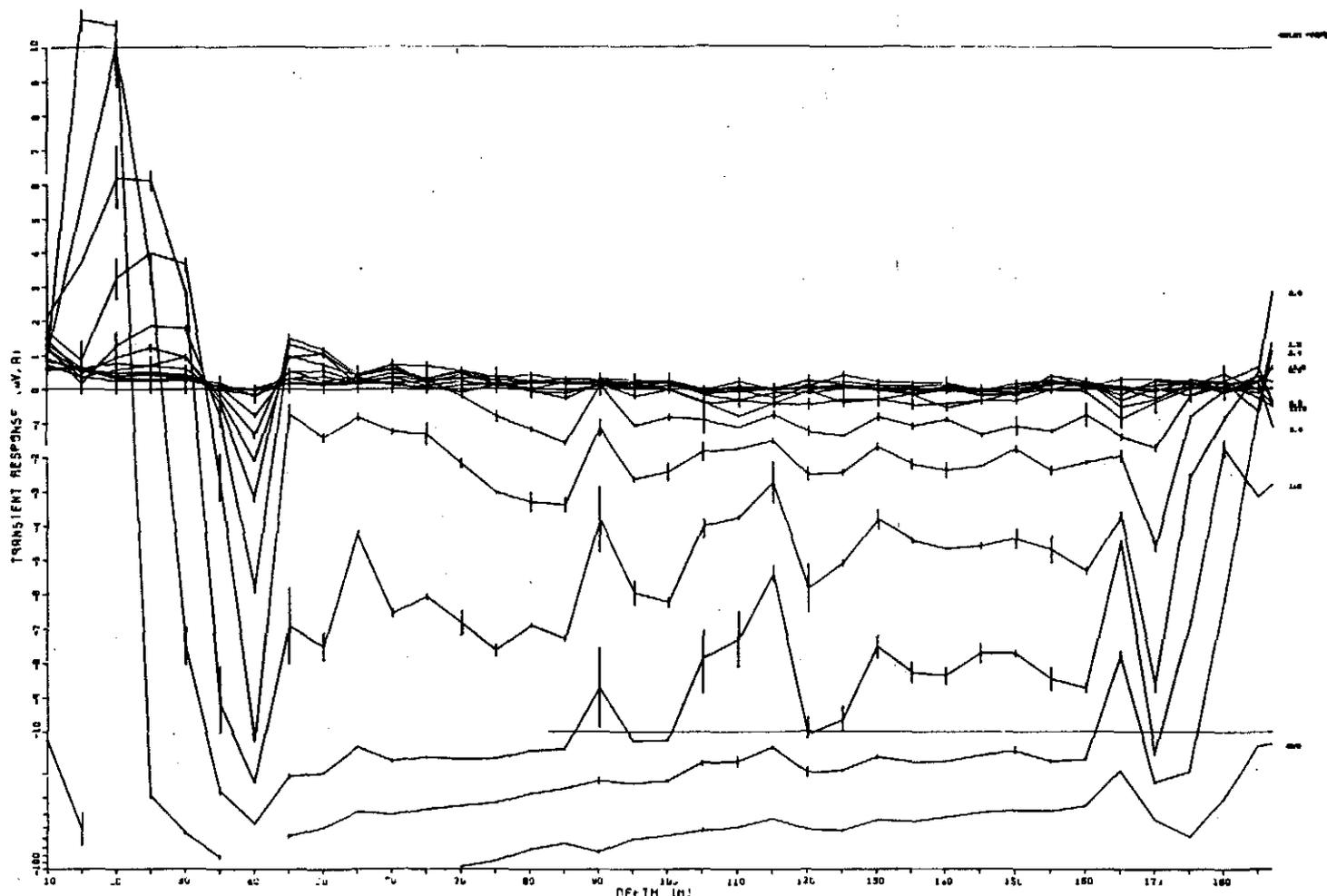
INSTRUMENT : SIADTEM  
 CONFIGURATION : 200M SQUARE TRANSMITTER LOOP,  
 DRILL HOLE SURVEY  
 READING INTERVAL : 5M

AMOCO MINERALS AUSTRALIA COMPANY  
 TRANSIENT E.M. PROFILE  
 DDH ZI-80-7, PROSPECT OCEANA

SCALE :  
 DATE : 7/2/82  
 MAP : ZEEHAN, TRS.

GEDEX  
 PTY LTD

ZI-80-7  
 Oceana



INSTRUMENT: STADIA  
 CONFIGURATION: OGN SOURCE TRANSMITTED LOOP  
 DRILL HOLE: 50MPT  
 READING: 1 TERRAL SA  
 AMOCO MINERALS AUSTRALIA COMPANY  
 TRANSIENT E.M. PROFILE  
 OGN ZT-80-9, WOSPET OCEAN

SCALE:  
 DATE: 8/2/80  
 MAP: ZEEHAN, TAS.

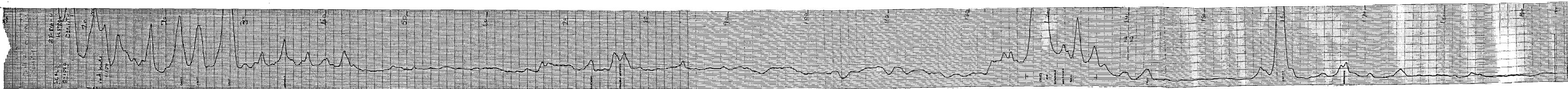


APPENDIX 3

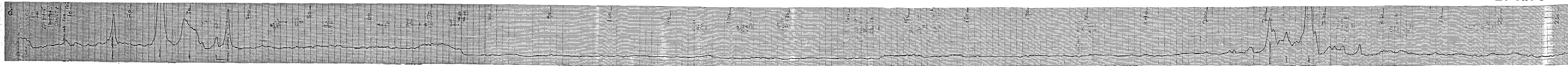
AUSTRAL - DOWNHOLE DENSITY AND GAMMA LOGS

ZT-81A-4

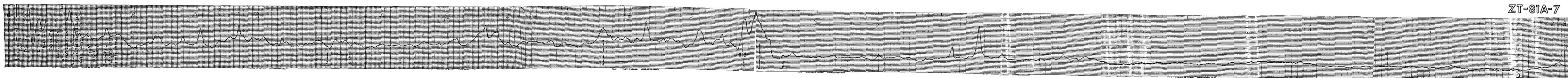
740056



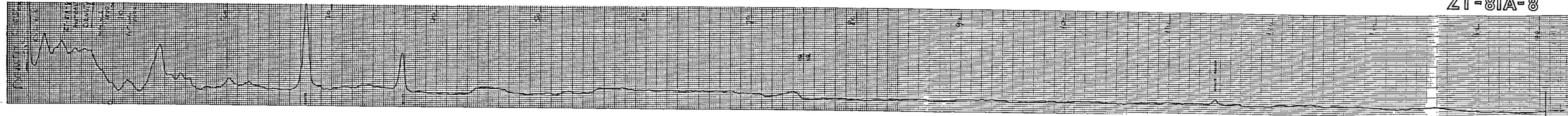
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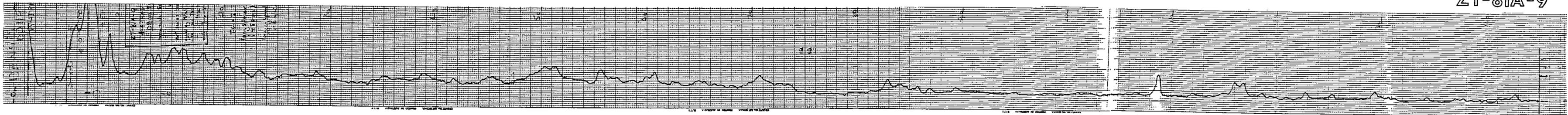
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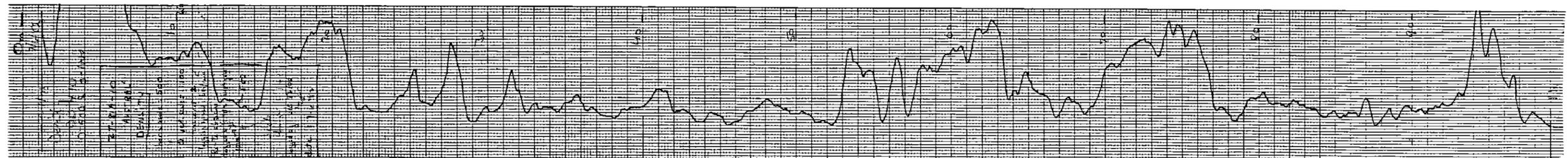
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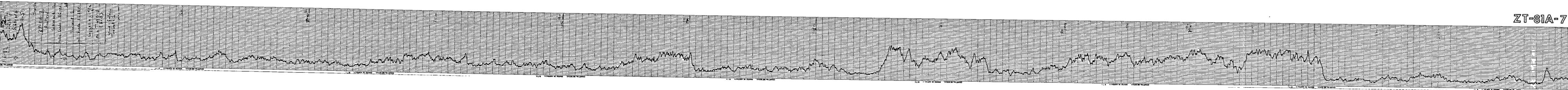
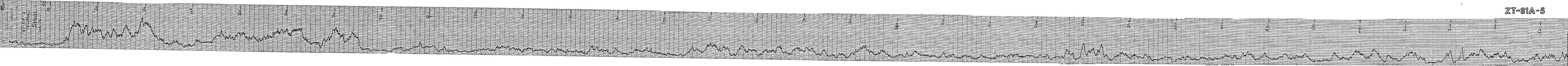
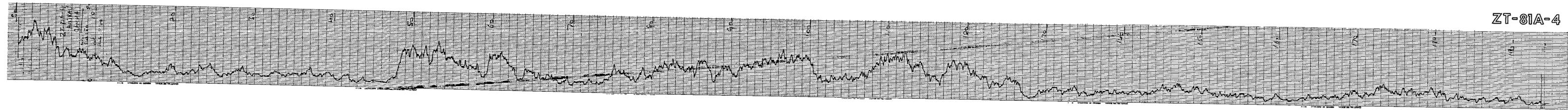
ZT-81A-9



ZT-81A-10



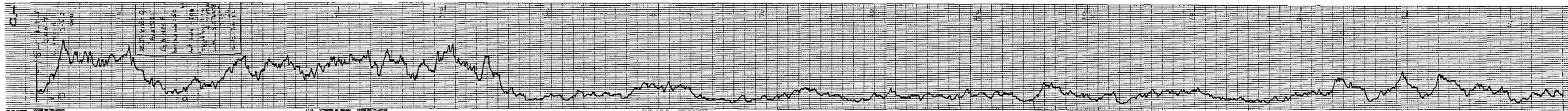
AUSTRAL  
DOWNHOLE DENSITY SURVEY



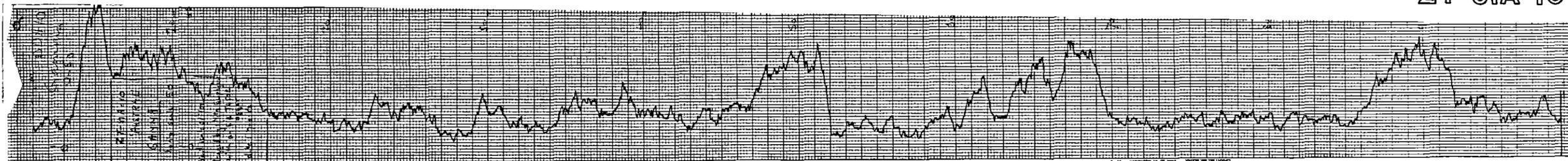
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ZT-81A-9



ZT-81A-10

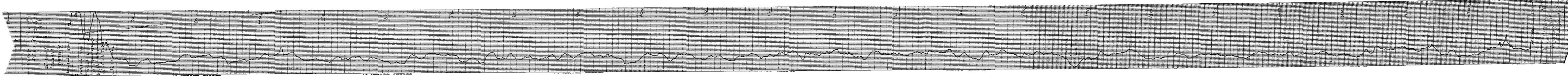


AUSTRAL  
DOWNHOLE GAMMA SURVEY

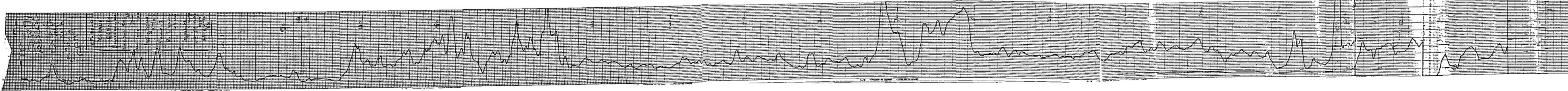
APPENDIX 4

OCEANA - DOWNHOLE DENSITY AND GAMMA LOGS

ZT-80-7

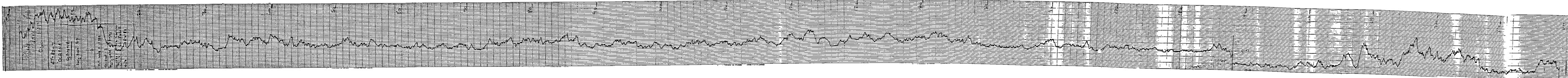


ZT-80-9

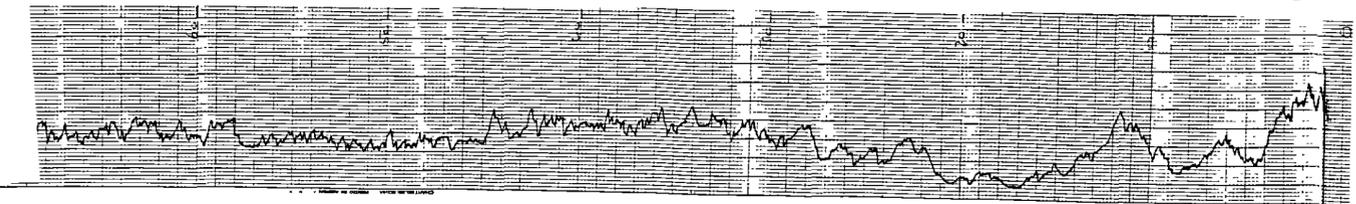
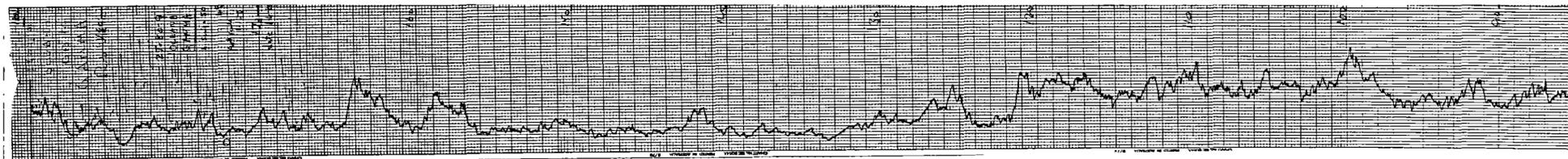


OCEANA  
DOWNHOLE DENSITY SURVEY

ZT-80-7



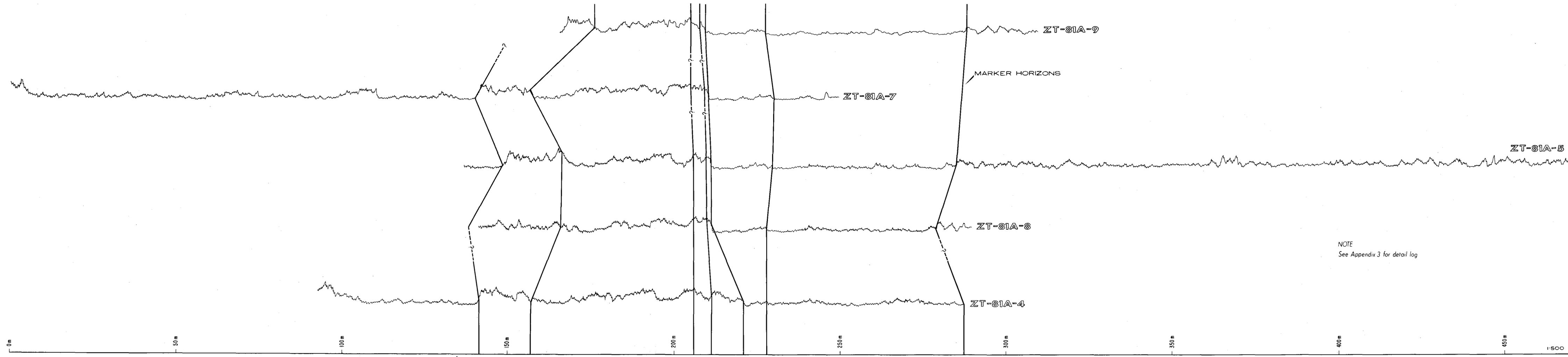
ZT-80-9



OCEANA  
DOWNHOLE GAMMA SURVEY

APPENDIX 5

AUSTRAL - BOREHOLE GAMMA CORRELATIONS



## APPENDIX 6

AUSTRAL - WINKIE HOLE LOG - ZT-W1



PROJECT ZEEHAN - TAS		MPA7860C	ELEVATION	COMMENCED	CORE DATA SUMMARY								
PROSPECT AUSTRAL EZ/JV AREA			DIP COLLAR 45° GW	COMPLETED	Depth	Dip	Bearing	Depth	Dip	Bearing	Depth	Dip	Bearing
CO-ORDINATES 630		N 1555 E	CORE SIZE BX, AX	TOTAL LENGTH 28m.									
BEARING 270°		G 238° M 249° T	LOGGED BY PHILIP JONES	WINKIE JKS. Amoco.									
METERAGE		DESCRIPTION	MINERALIZATION	SAMPLE NO	METERAGE			ASSAYS					
From	To				From	To	Length	Cu	Pb	Zn	Ag	Sn	
0	3	Fluvioglacial Gravels.											
3	19	LIMESTONE, weathered, fossiliferous grey calcarenites and calcutites, weakly calcite veined, weakly pyritic, occasionally cavernous.											
19	23	BRECCIA, mineralized (galena/sphalerite) siderite and calcite cemented, highly angular dolomitic Breccia.	1-3% combined galena/sphalerite. Trace pyrite.	66978	19	20	1	165	1.4%	8000	93	<4	
				66979	20	21	1	300	1.45%	5500	195	<4	
				66980	21	22	1	140	1.85%	6500	75	<4	
				66981	22	23	1	190	1.60%	100%	109	<4	
23	28	NO CORE RECOVERY in badly broken and caving ground. HOLE ABANDONED. 28 metres.											

740066

APPENDIX 7

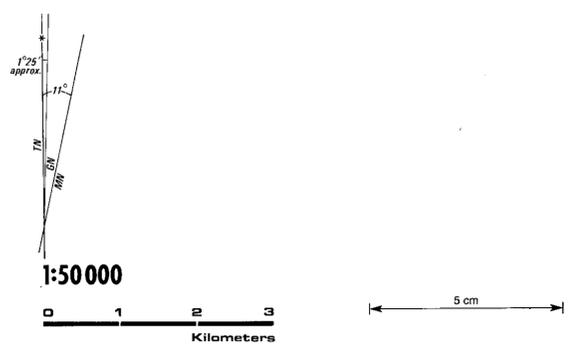
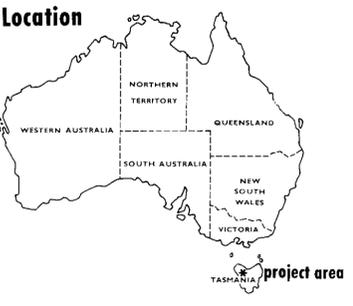
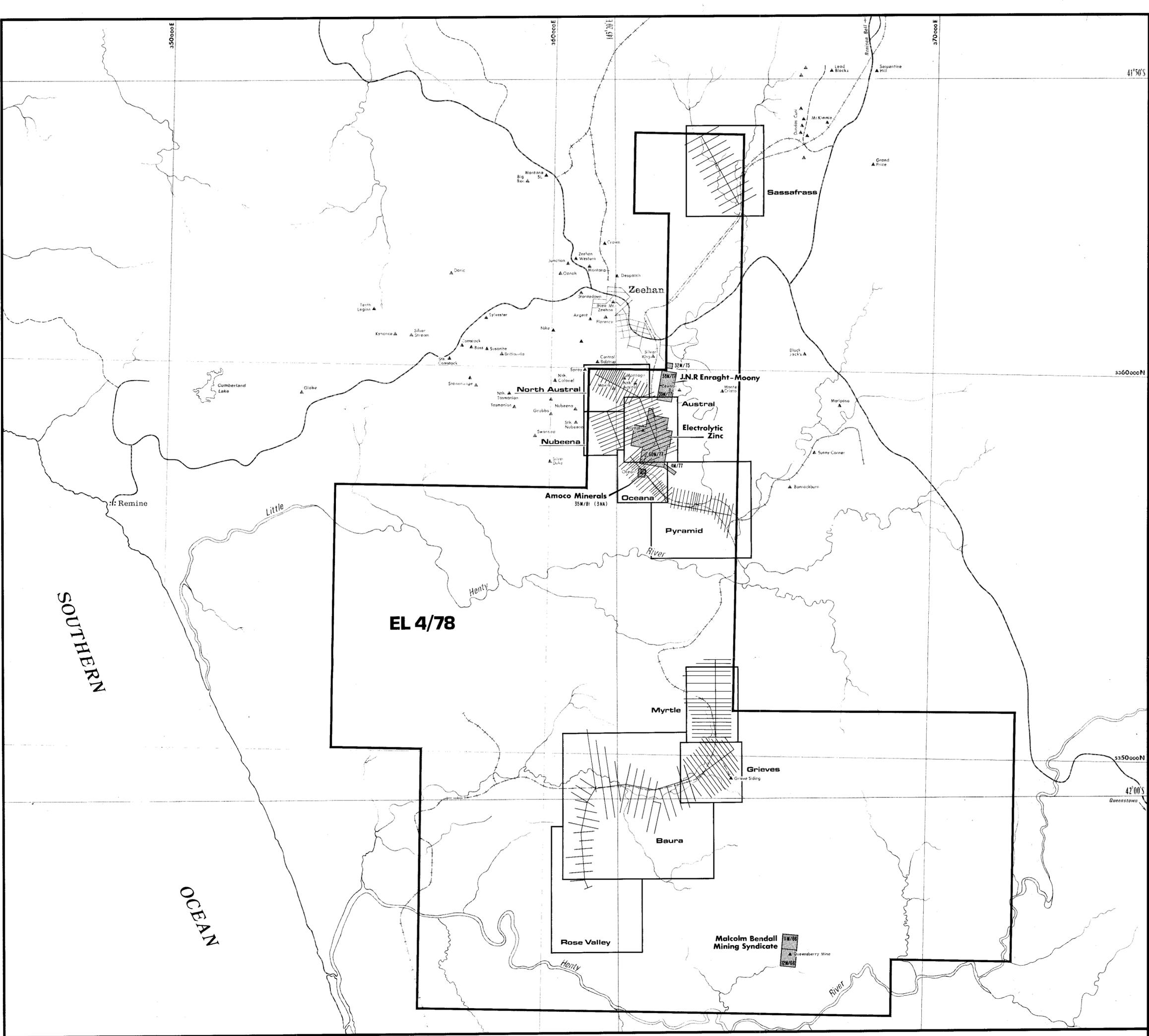
OCEANA - WINKIE HOLE LOG - ZT-W2



PROJECT ZEEHAN - TAS		NO A7860B		ELEVATION		COMMENCED		BORE HOLE SURVEY								
PROSPECT OCEANA				DIP COLLAR 45° GW		COMPLETED		Depth	Dip	Bearing	Depth	Dip	Bearing	Depth	Dip	Bearing
CO-ORDINATES 3600		N 1415 E		CORE SIZE BX		TOTAL LENGTH 15m.										
BEARING 270		G 217 M 228 T		LOGGED BY PHILIP JONES		WINKLE JKS Amoco.										
METERAGE		DESCRIPTION	MINERALIZATION	SAMPLE NO	METERAGE			ASSAYS								
From	To				From	To	Length	Cu	Pb	Zn	Ag	Sn	Mn	Ba		
0	3	Fluvioglacial Gravels														
3	5	CLAYSTONE; laminar and massive silty grey clays.		78389	3	5	2	44	3.00%	4.58%	10	6	40	470		
5	6	CLAYSTONE; mottled (brecciated?) grey to brown silty clays.		78390	5	6	1	40	1.70%	4.61%	12	12	60	330		
6	8	DOLOMITE; Coarsely laminar, mottled brown to black, minor pyrite and sphalerite.	Minor pyrite and sphalerite (2%)	78391	6	8	2	28	3.90%	2.41%	7	4	20	320		
8	11	MINERALIZED CLAYSTONE; mottled black, brown and orange silty clays. Fine grained galena present ~ 10%, very fine grained pink to light brown sphalerite ~ 5%.	Galena ~ 10% Sphalerite ~ 5%	78392	8	10	2	95	34.7%	2.58%	50	22	7800	55		
11	12	DOLOMITE; weathered, calcite cemented, grey white and brecciated.		78393	10	12	2	60	8.10%	2.10%	32	16	1.90%	280		
12	14	DOLOMITE; siderite veined, mineralized (galena/sphalerite) grey green unghy and porous, clay filled dolomite.	Minor galena / sphalerite ~ 3% combined.	78394	12	14	2	50	5.70%	4.50%	13	20	6.3%	110		
14	15	NO CORE RECOVERY. in badly broken and caving ground; possible fault zone.  HOLE ABANDONED AT 15 metres.														

740068





**AMOCO** 740070  
 Amoco Minerals Australia Company

Project	ZEEHAN	Nº A-78-60
Project Partner	82-1800.	
Zeehan EL 4/78		
<b>PROSPECT LOCATION</b>		
Map Ref.	ANG K-55-5	Latitude 42°00'S Longitude 145°20'E
Surveyed	Date	Scale 1:50000
Drawn	S.F., R. Smyth-King	Date August 1981 Drawing Nº M80-1476
Report 309		

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

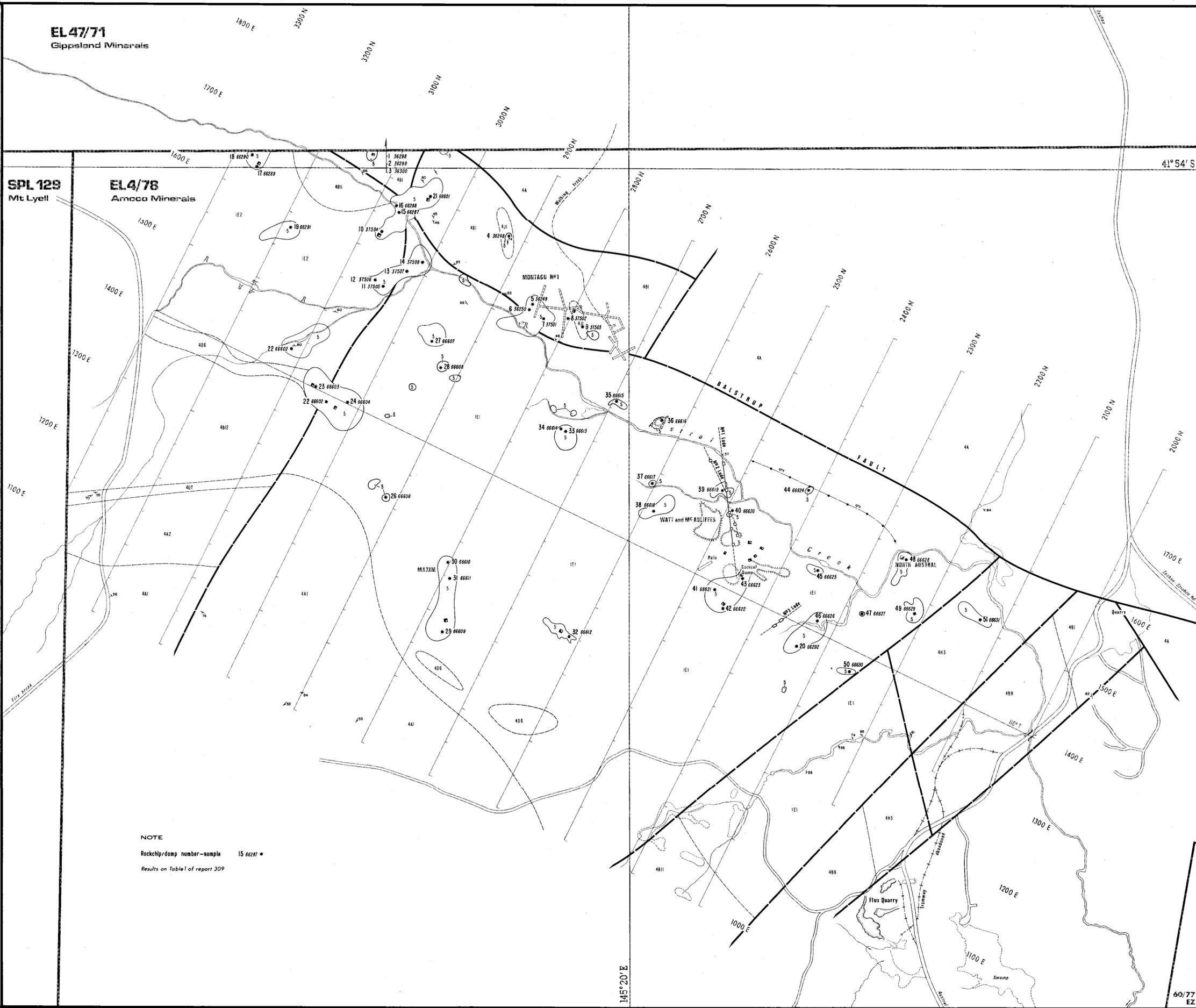
**Legend**

QUATERNARY	Alluvium etc	GR	
TERTIARY	Basalt	2C	2
DEVONIAN	Florence Quartzite	4A	28
	Undifferentiated quartzites, sandstones, siltstones		
SILURIAN	Amber Slate	4D1	68
	Siltstone interbedded with shales		
	Crotty Quartzite		
	Undiff. sandstones, siltstones and grits	4B1	6
	Sandstone, massive	4B2	8
	Sandstone, cross bedded	4B3	9
	Sandstone, tubular	4B4	44
	Sandstone, white, friable	4B5	6
	Siltstone	4D2	57
	Conglomerate	411	6
	Grits	4J1	6
ORDOVICIAN	Gordon Limestone		
	Sandstone	4B6	63
	Sandstone, fossiliferous	4B7	63
	Sandstone breccia	4B8	63
	Siltstone	4D3	63
	Shale	4E1	63
	Claystone	4F	63
	Limestone	4G1	33
	Limestone, fossil breccia	4G2	46
	Limestone, slumped	4G3	41
	Dolomite, black	4H1	35
	Dolomite breccia	4H2	35
	Dolomite, silicified	4H3	35
	Conglomerate	412	68
	Ironstone	5	14
	Mineralization	51	12
	Moina Formation		
	Sandstone, tubular	4B9	10
	Sandstone	4B10	64
	Undifferentiated	4D4	64
	Siltstone, tubular	4D5	64
	Dolomite	4H4	64
	Conglomerate	413	64
	Grit	4J2	64
	Ironstone	5	14
	Mt. Zeehan Conglomerate		
	Conglomerate	414	38
CAMBRIAN	Crimson Creek Formation		
	Undifferentiated	1E1	20
	Tuff, volcano lith-arenite	1E 2	20
	Sandstone-tuff	4B 11	20
	Shale	4E 2	20
	Ironstone	5	14
	Siltstone	4D6	20
PRECAMBRIAN	Donah Quartzite		
	Undifferentiated	4A1	60
	Micaceous quartzite	4A2	60
	Sandstone, brown	4B12	60
	Siltstone	4D7	60

**EL47/71**  
Gippsland Minerals

**SPL 129**  
Mt Lyell

**EL4/78**  
Amoco Minerals



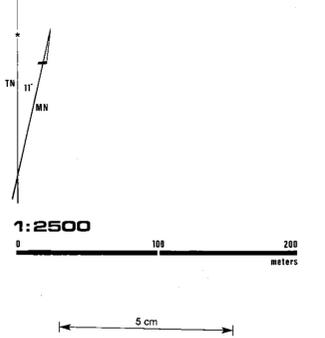
**NOTE**  
Rockchip/dump number-sample 15 66287 \*  
Results on Table of report 309

**Location**



**Symbols**

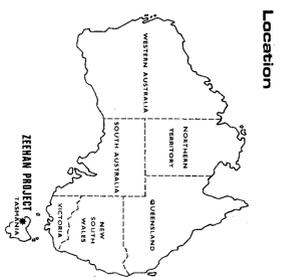
- Geologic contact, position accurate
- Geologic contact, position approximate
- Fault, position accurate
- Fault, position approximate
- Fault, inferred
- Unconformity
- Facies change
- Shear zone
- Zone of intense cleavage
- Brecciation
- Overturned bedding
- Measured dip and strike
- Plunging anticline (minor)
- Quartz vein
- Outcropping Pb/Zn mineralization
- Shaft/prospecting pit
- Adit
- Underground workings
- Costean
- Cutting or quarry
- Dump
- Amoco rock chip location
- Amoco costean
- Amoco drillhole



740071  
Amoco Minerals Australia Company

Project	ZEEHAN	Nº A-78-60B
Project Partner	North Austral	
<b>FACTUAL GEOLOGY</b> SHOWING ROCKCHIP AND DUMP SAMPLE LOCATIONS		
Map Ref. ANG	K-55-5	Latitude 41°55'S Longitude 145°20'E
Surveyed	P. Jones	Date 1981 Scale 1:2500
Drawn	R. SK	Date 1981 Drawing Nº M81-1727

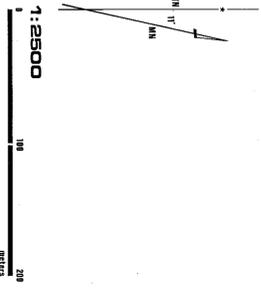
within EL 4/78



Location

Notes

Computer graphics by GEA North Sydney



Amoco Minerals Australia Company

74072

82-1/800

Project	ZEEHAN	№ A-78-60B
Project Partner		
Austral		
GROUND MAGNETICS		
VALUES		
Map Ref. ANG	K-55-S	Latitude 41°55'S Longitude 145° 20' E
Surveyed	Date	Scale 1:2500
Drawn	S. Fowler	Date 1982 Drawing No. 82-1/802-1977
Report 309		

within EL 4/78

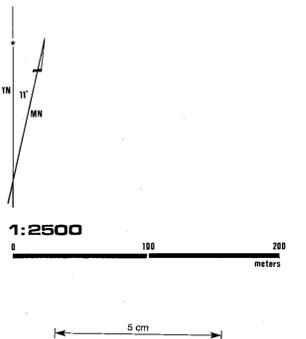
39M/77  
J.N.R. Enraght-Moony

Location



Notes

Computer graphics by CEA, North Sydney  
Contour interval 5 gammas



740073

Amoco Minerals Australia Company

82-1800

Project	ZEEHAN	Nº A-78-60B
Project Partner	Austral	
<b>GROUND MAGNETICS CONTOURS</b>		
Map Ref.	ANG K-55-5	Latitude 41°55'S Longitude 145°20'E
Surveyed	Date	Scale 1:2500
Drawn	S. Fowler	Date 1982 Drawing Nº M82-1926
Report 309		

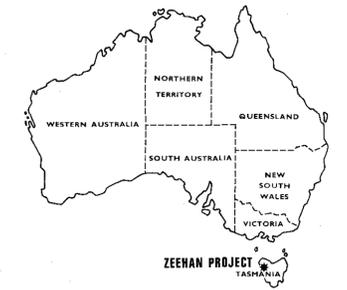
within EL4/78

60M/77  
Electrolytic Zinc

4191/M  
Clark (Amoco option)

4W/77  
EZ

Location

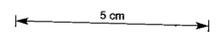
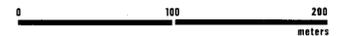


Notes

Computer graphics by CEA, North Sydney



1:2500



Amoco Minerals Australia Company

740074

82-1800

Project	ZEEHAN	Nº	A-78-60B
Project Partner	Oceana		
<b>GROUND MAGNETICS VALUES</b>			
Map Ref. ANG	K-55-5	Latitude	41°55' S Longitude 145° 20' E
Surveyed	Date	Scale	1:2500
Drawn	R. SK	Date	1982 Drawing Nº M82-924

Report 309

within EL4/78

60M/77  
Electrolytic Zinc

4191/M  
Clerk (Amoco option)

4W/77  
EZ

Location



Notes

Computer graphics by CEA, North Sydney  
Contour interval 5 gammas



1:2500



Amoco Minerals Australia Company  
82-1800

740075

Project **ZEEHAN** N° **A-78-60B**

Project Partner

**Oceana**  
**GROUND MAGNETICS**  
**CONTOURS**

Map Ref. ANG K-55-5 Latitude 41°55'S Longitude 145°20'E

Surveyed Date Scale 1:2500

Drawn R. SK Date Drawing N°

Report 309

EL47/71  
Gippsland Minerals

SPL 129  
Mt Lyell

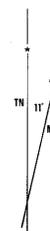
EL4/78  
Amoco Minerals

Location



Notes

Computer graphics by CEI, North Sydney  
Contour interval 10gammas



1:2500

0 100 200 meters

5 cm



Amoco Minerals Australia Company 740076

82-1800

Project	ZEEHAN	Nº A-78-60B
Project Partner		
<b>North Austral</b>		
<b>GROUND MAGNETICS</b>		
<b>VALUES, CONTOURS</b>		
Map Ref. ANG	K-55-5	Latitude 41°55'S Longitude 145°20'E
Surveyed	P. Jones	Date 1981 Scale 1:2500
Drawn	R. SK	Date 1982 Drawing Nº M82-1928
Report 309		

60/77  
EZ

within EL 4/78

39M/77  
J.N.R. Enraght-Moony

60M/77  
Electrolytic Zinc (Amoco JV)

Location



**Legend**

QUATERNARY	Alluvium etc	GR	2
TERTIARY	Basalt	2C	2
DEVONIAN	Florence Quartzite	AA	28
	Undifferentiated quartzites, sandstones, siltstones		
SILURIAN	Amber Slate	AD1	88
	Siltstone interbedded with shales		
	Crotty Quartzite		
	Undiff. sandstones, siltstones and grits	4B1	6
	Sandstone, massive	4B2	6
	Sandstone, cross bedded	4B3	8
	Sandstone, tubular	4B4	44
	Sandstone, white, friable	4B5	6
	Siltstone	4D2	57
	Conglomerate	4I1	6
	Grits	4J1	6
ORDOVICIAN	Gordon Limestone		
	Sandstone	4B6	43
	Sandstone, fossiliferous	4B7	83
	Sandstone breccia	4B8	63
	Siltstone	4D3	63
	Shale	4E1	63
	Claystone	4F	63
	Limestone	4G1	33
	Limestone, fossil breccia	4G2	46
	Limestone, slumped	4G3	41
	Dolomite, black	4H1	35
	Dolomite breccia	4H2	35
	Dolomite, silicified	4H3	35
	Conglomerate	4I2	66
	Ironstone	5	14
	Mineralization	51	12
	Moira Formation		
	Sandstone, tubular	4B9	10
	Sandstone	4B10	64
	Undifferentiated	4D4	64
	Siltstone, tubular	4D5	64
	Dolomite	4H4	64
	Conglomerate	4I3	64
	Grit	4J2	64
	Ironstone	5	14
	Mt. Zeehan Conglomerate		
	Conglomerate	4I4	38
CAMBRIAN	Crimson Creek Formation		
	Undifferentiated	1E1	20
	Tuff, volcano lith-arenite	1E 2	20
	Sandstone-tuff	4B 11	20
	Shale	4E 2	20
	Ironstone	5	14
	Siltstone	4D6	20
PRECAMBRIAN	Donah Quartzite		
	Undifferentiated	4A1	60
	Micaceous quartzite	4A2	60
	Sandstone, brown	4B12	60
	Siltstone	4D7	60

**Symbols**

Geologic contact, position accurate	
Geologic contact, position approximate	
Fault, position accurate	
Fault, position approximate	
Fault, inferred	
Unconformity	
Facies change	
Shear zone	
Zone of intense cleavage	
Brecciation	
Overturned bedding	
Measured dip and strike	
Plunging anticline (minor)	
Quartz vein	
Outcropping Pb/Zn mineralization	
Shaft/prospecting pit	
Adit	
Underground workings	
Costean	
Cutting or quarry	
Dump	
Amoco rock chip location	
Amoco costean	
Amoco drillhole	

41°55'S



1:2500



Amoco Minerals Australia Company

140077

92-1800

Project ZEEHAN N° A-78-60B

Project Partner

**Austral**  
**FACTUAL**  
**GEOLOGY** showing rockchip locations

Map Ref. ANG K-55-5 Latitude 41°55'S Longitude 145°20'E

Surveyed P. Jones Date 1981 Scale 1:2500

Drawn S. Fowler Date 1981 Drawing N° M81-1725

Report 309

1292

Enclosure 9

08/8-2/8

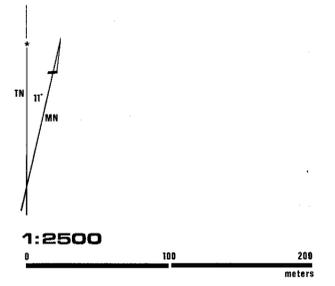
**Legend**

QUATERNARY	Alluvium etc	GR	
TERTIARY	Basalt	2C	2
DEVONIAN	Florence Quartzite	4A	25
	Undifferentiated quartzites, sandstones, siltstones		
SILURIAN	Amber Slate	4D1	88
	Siltstone interbedded with shales		
	Crotty Quartzite		
	Undiff. sandstones, siltstones and grits	4B1	8
	Sandstone, massive	4B2	8
	Sandstone, cross bedded	4B3	9
	Sandstone, tubular	4B4	44
	Sandstone, white, friable	4B5	8
	Siltstone	4D2	57
	Conglomerate	4I1	6
	Grits	4J1	6
ORDOVICIAN	Gordon Limestone		
	Sandstone	4B6	83
	Sandstone, fossiliferous	4B7	83
	Sandstone breccia	4B8	83
	Siltstone	4D3	83
	Shale	4E1	83
	Claystone	4F	83
	Limestone	4G1	33
	Limestone, fossil breccia	4G2	46
	Limestone, slumped	4G3	41
	Dolomite, black	4H1	35
	Dolomite breccia	4H2	35
	Dolomite, silicified	4H3	35
	Conglomerate	4I2	89
	Ironstone	5	14
	Mineralization	51	12
	Moina Formation		
	Sandstone, tubular	4B9	10
	Sandstone	4B10	64
	Undifferentiated	4D4	64
	Siltstone, tubular	4D5	64
	Dolomite	4H4	64
	Conglomerate	4I3	64
	Grit	4J2	64
	Ironstone	5	14
	Mt. Zeehan Conglomerate		
	Conglomerate	4I4	51
CAMBRIAN	Crimson Creek Formation		
	Undifferentiated	1E1	20
	Tuff, volcano lith-arenite	1E 2	20
	Sandstone-tuff	4B 11	20
	Shale	4E 2	20
	Ironstone	5	14
	Siltstone	4D6	20
PRECAMBRIAN	Oonah Quartzite		
	Undifferentiated	4A1	80
	Micaceous quartzite	4A2	80
	Sandstone, brown	4B12	80
	Siltstone	4D7	80



**Symbols**

Geologic contact, position accurate	
Geologic contact, position approximate	
Fault, position accurate	
Fault, position approximate	
Fault, inferred	
Unconformity	
Facies change	
Shear zone	
Zone of intense cleavage	
Brecciation	
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Measured dip and strike	
Plunging anticline (minor)	
Quartz vein	
Outcropping Pb/Zn mineralization	
Shaft/prospecting pit	
Adit	
Underground workings	
Costean	
Cutting or quarry	
Dump	
Amoco rock chip location	
Amoco costean	
Amoco drillhole	



**AMOCO**  
Amoco Minerals Australia Company  
82-1800.

Project	ZEEHAN	Nº A-78-60B
Project Partner	Oceana	
<b>FACTUAL GEOLOGY</b>		
Map Ref. ANG	K-55-S	Latitude 41°55'S Longitude 145°20'E
Surveyed	P. Jones	Date 1981 Scale 1:2500
Drawn	R. SK	Date 1981 Drawing Nº M81-1705

Report 309

740078