E.L. 1850 WOMBUNGI

NORTHERN TERRITORY

FINAL REPORT

OPEN FILE

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MINERAL DEPOSITS LIMITED

ON BEHALF OF BAROID AUSTRALIA PTY. LTD.

SUMMARY:

Exploration programmes for base metals, diamonds and barite were carried out over Exploration Licence 1850 during the period of tenure. In addition, samples were analysed for uranium and six samples were tested for gold, arsenic, antimony and mercury.

Mineral Deposits Limited carried out the base metals and barite exploration and Ashton Mining Limited the diamond exploration, on behalf of the Licence holder, Baroid Australia Pty. Ltd.

The results returned from the various programmes were generally negative and it has been concluded that E.L. 1850 does not contain significant base metals, barite or gold mineralization and there is no evidence of kimberlitic rocks.

The recommendation to relinquish the Licence was implemented, effective from 11th January, 1982.

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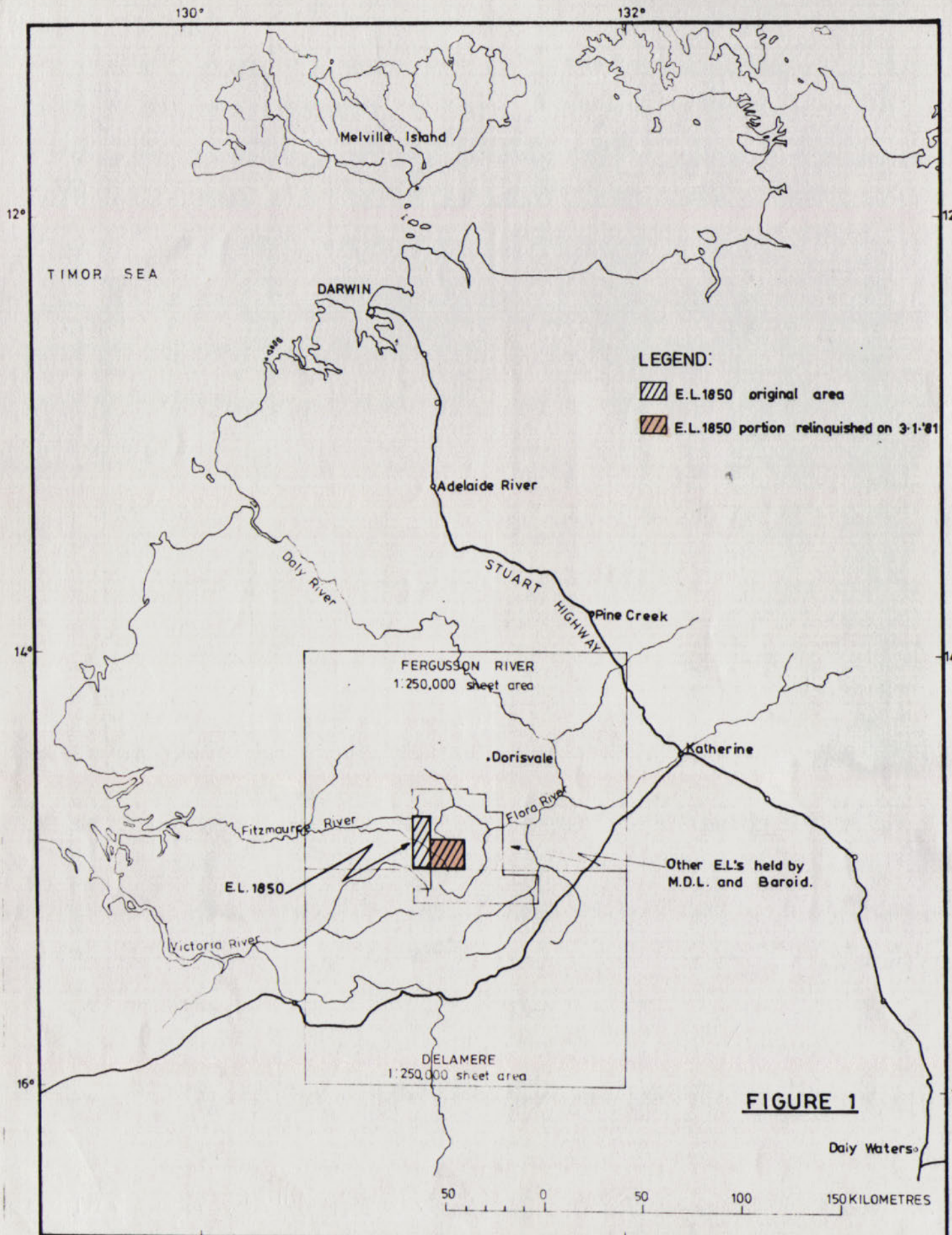

FIGURE 1

MINERAL DEPOSITS LTD.—SOUTHPORT, QUEENSLAND

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E.L. 1850 WOMBUNGI N.T.

LOCATION MAP SHOWING ORIGINAL AND REDUCED AREA

DARWIN / FERGUSSON RIVER AREA

1. INTRODUCTION

Exploration Licence 1850 Wombungi (Longitude 131°E, latitude 14°45'S) is located 150 Km in a direct line south-west of Pine Creek which is situated on the Stuart Highway 248 Km south of Darwin (figure 1). The licence was held in the name of Baroid Australia Pty. Ltd. and was granted on 4th January, 1979, for a period of two years, over an area of 198 square miles.

In accordance with the requirements of the licence, fifty percent reduction of the licence area was effected by 3rd January, 1981. Approval was received on 13th July, 1981 from the Department of Mines and Energy, Darwin, for the renewal of the licence over the 50% retention area.

Very little previous investigation has been carried out in this area. Frances Creek Iron Mining Company (FIMCO) located Pb/Zn stream anomalies within A.P.2603 which covered the area just east of the top end of E.L. 1850 (Harrison, 1971).

The exploration objectives of the recently terminated programme over E.L. 1850, were to locate base-metals, uranium, barite or gold mineralization and to detect diamonds or diamond indicator minerals.

The base metals programme was carried out by Mineral Deposits Limited as part of an integrated project over a group of contiguous E.L's in the headwaters of the Flora River (see figure 1). Ashton Mining Limited conducted the diamond exploration programme as part of a regional exploration coverage over a large joint venture area west of the Daly River Basin.

The bulk of the exploration activity was carried out in the 1980 and 1981 dry seasons.

2. FIELD INVESTIGATIONS

2.1 Geology

The oldest rocks represented in the area are those of the Bullita Group of Adelaidean or Carpentarian Age. This sequence consists of a sequence of dolomite, siltstones, limestones and minor sandstones.

The Skull Creek formation has a very limited outcrop to the south of the Wombungi Outstation and is transgressed by the Palm Creek drainage. The unit consists mainly of dolomite and dolomitic limestone, together with associated chert, interbedded with dolomitic siltstone. Stromatolites are present in the dolomitic limestone.

The Bynoe Formation overlies the Skull Creek Formation and outcrops over a large area of the region. This unit is largely characterised by a distinctive purple and green siltstone. Friable and blocky dolomitic siltstone containing minor dolomite is also present.

The Bynoe Formation is, in general conformably overlain by the Banyan Formation. The Formation outcrops in the Flora River and Hayward Creek drainage valleys. It consists of a basal calcareous sandstone dolomite sequence, a middle thick dolomite sequence, and an upper siltstone shale sequence. The middle dolomite sequence is well exposed and contains

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pink and grey, flaggy to massive, oolitic and stromatolitic dolomite. Chert beds occur both within and above the middle sequence.

Overlying the Bullita Group are the two lowermost members of the Auvergne Group. The Stubb Formation has limited outcrop south of the Wombungi Fault and is a siltstone and shale unit. Normally the base of the Auvergne Group is represented by the Jasper Gorge Sandstone which is a quartz sandstone of massive form, well jointed and forms a distinctive rugged, plateau-gorge relief pattern.

The next youngest unit represented is the basalt volcanic outcrops which are considered to be part of the Antrim Plateau Volcanics. These volcanics unconformably overlie the older Proterozoic rocks.

The other unit represented unconformably overlies all older units and the Lower Cretaceous Mullaman Beds. This unit consists of freshwater and marine sediments and in places has been extensively lateritised. This can form a tough silicified cap rock on the mesas and plateaux.

Cainozoic Age laterite and ferruginous rubble cover a large area in the centre of E.L. 1850.

This geological description has been compiled from the mapping of the Bureau of Mineral Resources (Pontifex and Mendum, 1972) combined with confirmatory traversing by Mineral Deposits Limited field geologists.

2.2 Stream Sediment Geochemistry - Methods

Using aerial photographs and 1:100,000 topographic sheets for location purposes, a stream sediment survey was carried out using a Bell 47 helicopter for access. This program involved the taking of 25 samples which were analysed for Cu, Pb, Zn, U, Ba and Ni. In addition, six of these samples were analysed for Au and five for As, Sb and Hg.

The samples were taken from the fine fractions of the stream sediments in the Hayward Creek and Palm Creek drainage systems. The flat relief around Wombungi Station prevents the development of definite water courses, so no samples were collected in the Flora River headwaters within E.L. 1850.

Sample preparation in the field consisted of sieving to -10#. The samples were freighted to the Mineral Deposits Limited laboratory, Southport, for further preparation and analysis. The procedure employed was as follows:-

Samples were sieved to -20# and this fraction was pulverized to -80#. A 0.5 gm split was digested in perchloric acid ($HClO_4$) for one hour at 180°C and determined for Cu, Pb, Zn and Ni.

The analyses for U, Ba, As, Sb and Hg were carried out by Australian Laboratory Services in Brisbane using X-ray fluorescence techniques. The same laboratory tested the six samples for Au using their 120C method, *viz*, 30 gm of the -80# fraction was subjected to HF attack, aqua regia digestion, solvent extraction, and carbon rod determination by A.A.S.

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2.3 Diamond Exploration - Methods

Regional gravel sampling is regarded as the most effective exploration technique for the location of kimberlites in this region as there is a reasonably well developed drainage pattern, and the degree of relief and outcrop conditions provide suitable heavy mineral trap sites. Sample sites were pre-determined and plotted on 1:100,000 scale maps so that sample sites tested drainages at approximate intervals of six kilometres.

Helicopter transport provided access to the 22 selected trap sites where approximately 40 Kgm of gravel were gathered, sieved and the minus 4mm fraction collected for laboratory examination, this fraction generally weighing 25-30 Kgm. The sample sites are plotted on figure 2.

The 22 samples were processed at the Ashton Mining Limited laboratory at Perth where they were concentrated by Wilfley Table and heavy liquid (tetrabromoethane, S.G. 2.96) separation techniques. The concentrates were then screened into various size fractions, further concentrated, where required, by magnetic and electrostatic separation techniques, and a comprehensive grain by grain examination carried out on the minus 1.0mm plus 0.425mm fractions.

The following fractions of each sample were studied.

- 1.00mm	+	0.8mm,	denoted	+	0.8
- 0.8mm	+	0.5mm,	denoted	+	0.5
- 0.5mm	+	0.425mm,	denoted	+	0.425.

3. EXPLORATION RESULTS

All phases of the exploration activity over this E.L. returned negative results.

Air photo interpretation of the area failed to provide any interesting targets worthy of ground traversing. (Mineral Deposits Limited, 1981).

Nevertheless, ground traversing over the Wombungi Fault line was undertaken particularly with the aim of locating barite mineralization. None was found.

Reconnaissance stream sediment sampling was carried out and background values only were returned. (Cook, 1981).

The diamond exploration programme thoroughly sampled the entire E.L., and likewise, no positive results were obtained.

The sample sites and results for both stream geochemistry and diamond programmes are plotted on figure 2.

4. CONCLUSIONS AND RECOMMENDATIONS

Geological reconnaissance of the exploration licence area confirmed that a major portion of the surface geology was unprospective for carbonate hosted base-metals mineralization.

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The absence of the Banyan Formation in the Palm Creek and Hayward Creek systems probably explains the low analysis results for the stream samples.

The diamond programme returned negative results from all samples, indicating that kimberlitic rocks are probably not present in the area.

The recommendation, based on these discouraging results, to relinquish the Exploration Licence 1850, was implemented on 3rd January, 1982 and became effective on 11th January, 1982.

5. EXPENDITURE

Expenditure debited against this project when it covered the original 198 square mile area was $42,464. Over the reduced area of 96 square miles, $1,847 was spent.

6. REFERENCES

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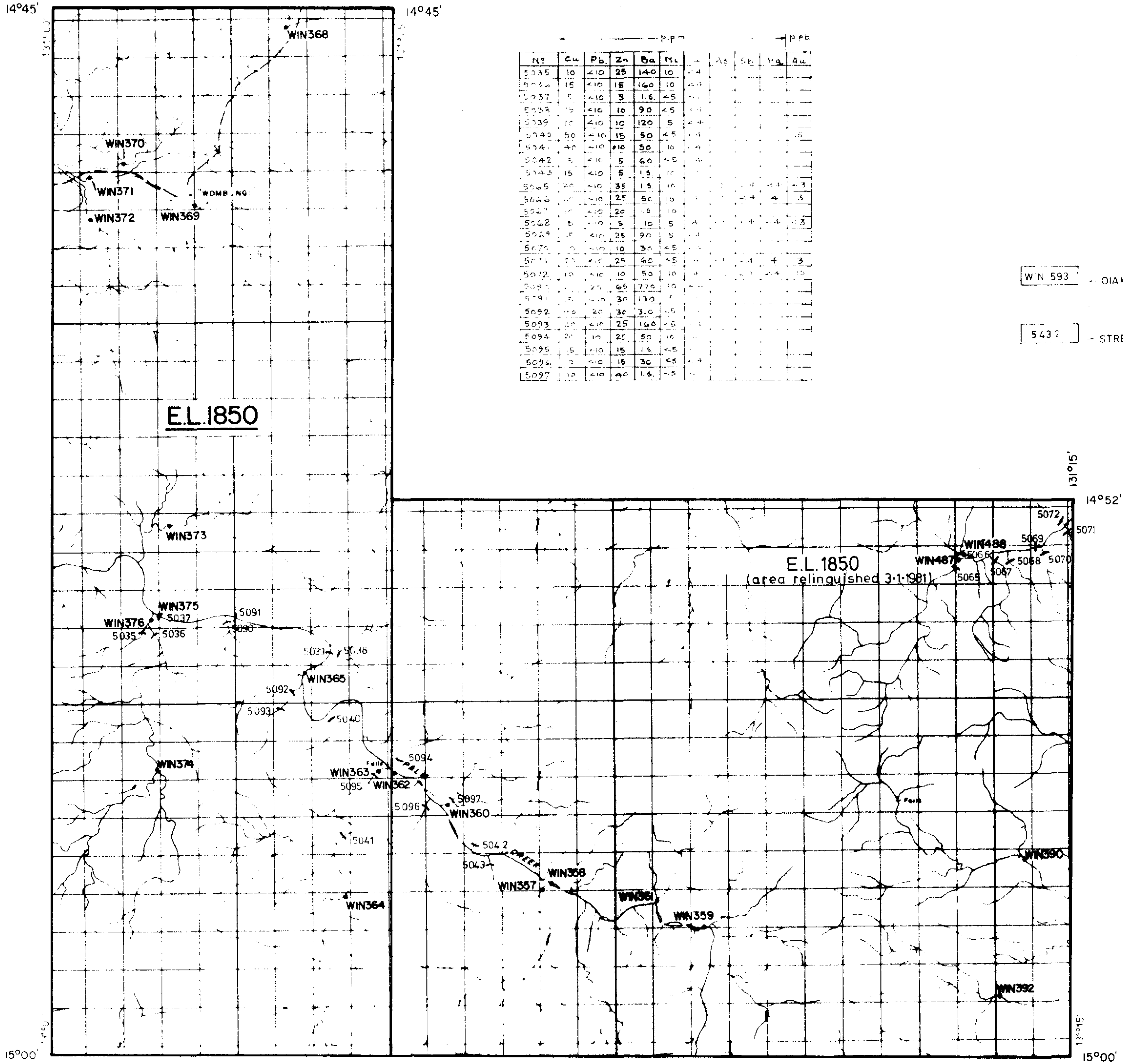
Nº	Cu	Pb.	Zn	Ba	Ni		As	Sb	Hg	Au
	p.p.m									ppb
5035	10	<10	25	140	10	<4				
5036	15	<10	15	160	10	<4				
5037	5	<10	5	1.6.	<5	[illegible]				
5038	15	<10	10	90	<5	<4				
5039	10	<10	10	120	5	<4				
5040	50	<10	15	50	<5	<4				[illegible]
5041	40	<10	<10	50	10	<4				
5042	5	<10	5	60	<5	<4				
5043	15	<10	5	1.5.	10					
5065	20	<10	35	1.5.	10		[illegible]	<4	<4	<3
5066	[illegible]	<10	25	50	10	<4	[illegible]	<4	4	3
5067	[illegible]	<10	20	[illegible]	10					
5068	5	<10	5	10	5	4	[illegible]	<4	<4	<3
5069	15	<10	25	90	5	<4				
5070	[illegible]	<10	10	30	<5	<4				
5071	20	<10	25	60	<5	<4	[illegible]	<4	4	3
5072	10	<10	10	50	10	<4	[illegible]	<4	<4	10
5090	[illegible]	25	65	770	10	<4				
5091	15	<10	30	130	5					
5092	<10	20	30	310	<5					
5093	20	<10	25	160	<5	<4				
5094	20	10	25	50	10	[illegible]				
5095	15	<10	15	1.5.	<5					
5096	5	<10	15	30	<5	<4				
5097	10	<10	40	1.6.	<5	[illegible]				



WIN 593 – DIAMOND EXPLORATION REGIONAL GRAVEL SAMPLE LOCATION AND NUMBER.

5432 – STREAM SEDIMENT SAMPLE LOCATION AND NUMBER.

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FIGURE 2

0 1 2 3 4 5 km

Scale: 1,000,000

MINERAL DEPOSITS LIMITED

REGIONAL GRAVEL SAMPLING

E.L.1850 WOMBUNGI N.T.

SAMPLE LOCATIONS

No. A3-2163 Date: 3.7.1981