EXPLORATION LICENCE 38/97
ABERFOYLE HILL
NE TASMANIA

ANNUAL REPORT ON EXPLORATION
APRIL 2001 TO MARCH 2002

For

Mineral Holdings Australia Pty Ltd
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ABSTRACT

This report describes the work carried out during year four on EL 38/97 at Aberfoyle Hill on the evaluation of tin-bearing placers as part of the Ringarooma Alluvial Project of Mineral Holdings Pty Ltd.

As part of a larger program on the Great Northern Plains, four pits were dug by excavator in the old workings of the Aberfoyle alluvial tin mine and three bulk samples of basal, gravel wash in the 1-2 cu m range were extracted and processed through a mobile treatment plant.

The resulting concentrates and screen products were hand picked and assayed for heavy minerals and sapphires and the results calculated back to give grades in the alluvial wash.

The two successful pits ABE 3 and 4, at Aberfoyle Central and East respectively, have SnO_2 grades in the range 100-130, TiO_2 24-29, ZrO_2 9-11 and sapphire up to 3.3 g/LCM. Tantalum and niobium pentoxides are in the range 0.35-0.55g/LCM with the Nb/Ta ratio being about 2 or 3 to 1.

No resource figures of wash have been measured at Aberfoyle due to lack of drilling but some potential exists for reasonable volumes in association with the surrounding alluvial mines such as Taylors, MacGregors and Beltz as well as the Wanex area.

The clays in the deposit at Aberfoyle Hill have combined rare earth values up to about 200ppm but fall well short of the concentrations required for commercial extraction by one or two orders of magnitude.

EL 38/97 - Aberfoyle Hill - Annual Report

1.0 Introduction

EL 38/97 was granted to Mineral Holdings Australia Pty Ltd on 6th March 1998 for a maximum of 5 years to 6th March 2003 over an area of 4sq km at Aberfoyle Hill, near Gladstone, NE Tasmania to search for bentonite clay. The EL is adjacent and to the south of RLs 8715 and 8723 held by the same company covering the Fosters Marshes alluvial tin resources (Plan 1).

The first target was bentonite clay suitable as a pelletising agent for Savage River iron ore and a wide range of other industrial uses.

The main targets now are the tin placers exposed in the old alluvial tin workings as a component part of the larger project being run by Mineral Holdings to evaluate the alluvial potential of the Ringarooma Basin both onshore and offshore.

2.0 Previous Exploration

Exploration during the tenure of this licence by Mineral Holdings is described in the three previous annual reports to 1999, 2000 and 2001(Duncan & Rhodes) on EL 38/97.

Initial exploration led to the discovery of a clay deposit averaging 6m thick under a sandy overburden 1-2m thick on the western side of the Ringarooma River, adjacent to the old Dry Gut alluvial tin workings.

The deposit has an inferred in situ resource of 2.8 million tonnes of mixed clays. This contains a resource of 200-400,000 cu m of smectite-type clay. Industrial tests on the clay indicate the lower adsorption and swelling properties of beidellites or nontronites rather than higher swelling montmorillonites. Potential applications for the clay are still being considered but its use as a pelletising agent appears out of the question.

In the third year of the licence, the focus of investigation was shifted to the evaluation of the sapphire content of the tin-bearing alluvials on the Great Northern Plains as part of a wider study of sapphire distribution both onshore and offshore throughout NE Tasmania as part of the Ringarooma Alluvial Project of Mineral Holdings Australia Pty Ltd (Plan 1). As the alluvials in the Retention Licences are too deep for sampling by any means other than drilling, it was decided to test the more accessible, adjacent alluvials exposed in the old working faces at MacGregors, Aberfoyle, Dry Gut, Taylors, Wanex and Delta alluvial tin mines. The first three fall within EL 38/97 and the last three within SEL 22/99.

The samples of wash were hand dug, sieved, handpicked and assayed to record their values of tin, sapphire and gold. Aberfoyle Central (four samples) gave the best values of 1800g/BCM tin and 110g/BCM sapphire in one sample at the Boomerang face and 140g/BCM tin and 1.6g/BCM sapphire in one sample at the northern Sea Shell face. Aberfoyle East (two samples) gave 252g/BCM tin in one sample and 5.5g/BCM sapphire in the other. Dry Gut and Delta showed some interest with 430g/BCM tin and minor sapphire at 0.54g/BCM in a composite of three samples in

the former and best value of 1028g/BCM tin and 8.8g/BCM sapphire of 3 samples in the latter.

3.0 Current Exploration

Exploration for the reporting year consisted of bulk sampling of alluvial deposits for heavy minerals and sapphires and an analytical survey of rare earth contents in the Aberfoyle Hill clay deposit.

3.1 Bulk Sampling of Alluvials

Based on the survey of the old alluvial faces exposed in the old workings and the above results, an excavator program was designed to extract basal gravels and concentrate the heavy minerals and the sapphires in a mobile plant.

Four pits (ABE 1-4) were dug in the Aberfoyle workings, seven (TAY 1-7) in Taylors workings and four (WAX 1-4) in the Wanex area. The results from the Aberfoyle pits are reported here as they fall within EL 39/97. The others fall within SEL 22/99 and will be reported in the September annual report for that licence (Plan 2).

Three pits were dug in the Aberfoyle Central area or the Sea Shell Face. ABE 1 (MR 579,570mE; 5,469,250mN) was on a small rise above the workings and ABE 2(MR 579,480mE; 5,469,240mN) and 3 (MR 579,380mE; 5,469,220mN) were on the work faces. One pit (ABE 4) was dug on Aberfoyle East on the work face at MR 579,900mE; 5,469,200mN. No pits were dug on the Boomerang Face due to poor access for the large excavator. The size of the bulk samples ranged from 1.5-1.8 LCM (loose cubic metres).

The excavator was a 35 tonne CAT 350 with a 1.8cu m capacity bucket and the mobile test unit was a 2 cu m/hour Max-I-Weld plant equipped with a trommel and jig. Following extraction, the bulk samples of wash were trucked to a central stockpile site at MacGregors for processing (MR 580,350mE; 5,469,870mN) using water from an old alluvial mine pond. The details of the plant circuit and the processing of the products derived from it have been described in the report (Kinnane, 2001) on the bulk sampling at the Monarch tin mine which was part of this same program and are not repeated here. Basically, any sapphires were hand picked from the +3mm material on the jig screen and the jig underflow was collected from the sluice and riffles. The heavy mineral concentrates were divided into three by passing through a single disc magnetic separator giving a non magnetic fraction (assayed for Sn, ZrO_2, TiO_2, Ta and Nb), a magnetic 1 fraction (assayed for TiO_2) and a magnetic 2 fraction (rare earth to storage). Sapphire/corundum was hand picked from the concentrates.

3.2 Analytical Survey of Clays

Following reports from an industry source that rare earths adsorbed on clays could be a potential exploration target as there was some production from these in China, it was decided to do a preliminary scan of rare earth contents in the Aberfoyle Hill clay deposit outlined by Mineral Holdings in previous exploration on this licence.

Four samples of clay from the deposit were selected as follows- three montmorillonites derived from Jurassic dolerite and one kaolinite from Mathinna metasediment. One sample of clay derived from a granitic terrain at Monarch was also included for comparison.

Details of the samples are-

Montmorillonites- Aberfoyle Hill

Sample 027 Hole 5 Interval 4.25- 5.0 m grey yellow plastic clay
AMG 578,030mE; 5,469,930mN

Sample 038 Hole 6 Interval 3-4m grey white plastic clay
AMG 578,150mE; 5,469,900mN

Sample 050 Hole 7 Interval 3-4m tan brown plastic clay
AMG 578,250mE; 5,469,810mN

Kaolinite- Aberfoyle Hill

Sample 068 Hole 9 Interval 3-4m orange brown clay
AMG 578,450mE; 5,469,670m N

Clay- Monarch

Sample M108 PIT No 8 Interval 3.4-4.6m grey to red, mottled plastic clay
AMG 575,800mE; 5,465,040mE

4.0 Results

The results from the exploration activities are presented below.

4.1 Heavy Minerals in Alluvials

The alluvial lithologies and sampling details are given in the accompanying graphical logs (Table 1) and show up to 2.6m of gravel and cobble wash sitting on a granite basement in one case with an intervening sandy clay layer (A122). The cover to the wash is up to 2.8m of sandy clay or sand. In ABE 1, no gravel wash was found and so no sample was taken. Despite the wash being on a granite basement, few granite clasts were found and the cobbles (up to 25cm across) were mainly quartzites in grey, brown or black; buff coloured, cleaved sandstones and white quartz with, only occasionally, cemented grits. Jig screen logs, contained in the Appendix, show 80% metasediment and 20% quartz pebbles with only 1% irregular fragments of granite.

The assays of metals in the various fractions derived from the bulk samples are given in Table 2 and calculated to grades in the wash as expressed in grams per LCM. The analytical results from Amdel are contained in the Appendix. The grades are compared below in g/LCM-

ABE 2	16.95 SnO2	11.19 TiO2	2.61 ZrO2	0.13 Sapphire	Central
ABE 3	127.0 SnO2	28.53 TiO2	9.52 ZrO2	0.11 Sapphire	Central
ABE 4	107.46 SnO2	24.60 TiO2	11.32 ZrO2	3.28 Sapphire	East

Tantalum and niobium were also determined and when expressed as the oxides and added together reached 0.1, 0.54 and 0.37 g/LCM in ABE 2, 3 and 4 respectively with the ratio of Nb to Ta about 2 to 1 or greater (1.8-2.9).

These SnO2 values of the wash in bulk are generally lower than the values found in hand samples last year which were in the 200-360g/LCM range as are the sapphire values which were in the 1.6 to 5.9g/LCM range.

Comparison with the bulk testing on the Monarch tin deposit carried out as part of the same program shows that the Aberfoyle values are less in all categories than those of the basal wash at Monarch in g/LCM-

MONARCH	70.9-1417.0 SnO2	4.2-90.0 TiO2	1.4-48.3 ZrO2
	433 av	av 41	av 16

4.2 Rare Earths in Clays

Results of the rare earth analyses carried out by Amdel on the clay samples are given in the appendix and summarised in Table 3.

The rare earths determined were the light earths (listed in order of increasing atomic number and with average crustal abundance quoted in ppm from Koch, 1987) - lanthanum (La 18), cerium (Ce 46), praseodymium (Pr 5.5), neodymium (Nd 24), samarium (Sm 6.5) and europium (Eu 0.5) and the heavy earths- gadolinium (Gd 6.4), terbium (Tb 0.9), dysprosium (Dy 5.0), holmium (Ho 1.2), erbium (Er 4.0), thulium (Tm 0.4), ytterbium (Yb 2.7) and lutetium (Lu 0.8).

Generally, the rare earths in the clays as shown in Table 3 are more likely to be below than above their average crustal levels except for sample 038, a montmorillonite where values are up to a factor of 2 above the average level. The most common rare earths in the samples are cerium, neodymium and lanthanum. Collectively, the rare earths range from 53 to 205ppm in the samples, well below the 2000ppm -2% required for commercial deposits of this nature.

5.0 Conclusions

5.1 A limited bulk-testing program of 4 pits in the Aberfoyle workings using an excavator and mobile jig plant has shown that, in two of these pits, basal alluvial wash of reasonable grade can be accessed in the former work faces. As well as arriving at the tin grade, the processing has allowed estimation of the accessory minerals – ilmenite/rutile, zircon, gold and sapphire.

5.2 The two successful pits ABE 3 and 4, at Aberfoyle Central and East respectively, have SnO_2 grades in the range 100-130, TiO_2 24-29, ZrO_2 9-11 and sapphire up to 3.3 g/LCM. Tantalum and niobium pentoxides are in the range 0.35-0.55g/LCM with the Nb/Ta ratio being about 2 or 3 to 1.

5.3 These bulk values are generally lower than those of the 20kg hand samples collected and analysed the previous year. This may reflect the dilution of wash by overburden due to the imprecision of the large 35 tonne excavator as was proposed for the Monarch test results.

5.4 The bulk values are also lower than the Great Northern Plain resource values as deduced from the drilling, the latter having an average grade of about 200g/cu m SnO_2. The lower accessory mineral grades may be due to excessive ragging of the jig bed by steel nut-punchings on the mobile plant which was optimised for cassiterite recovery causing loss of the lighter minerals zircon, rutile and ilmenite as well as sapphire.

5.5 No resource figures of wash have been measured at Aberfoyle due to lack of drilling but some potential exists for reasonable volumes in association with the surrounding alluvial mines such as Taylors, MacGregors and Beltz as well as the Wanex area. Shallow ground still exists at the Sea Shell face and Aberfoyle East and deeper ground at the Boomerang face.

5.6 The clays in the deposit at Aberfoyle Hill have combined rare earth values up to about 200ppm but fall well short of the concentrations required for commercial extraction by one or two orders of magnitude.

6.0 Future Exploration

As part of the continuing assessment of alluvial resources on the Great Northern Plains, further bulk sampling will be carried out to build up a picture of the volumes of alluvial wash remaining in the old workings at Aberfoyle along with the assaying of heavy mineral and sapphire grades.

7.0 Environment

Only existing tracks were used for access. As the main access track to the MacGregors area was becoming overgrown particularly in the northern section, marginal vegetation was trimmed using a grader.

Following the extraction of the wash samples, the pits were backfilled immediately with the excavator, the ground compacted and recontoured with the topsoil replaced where present. Where the topsoil was absent or skeletal in this previously mined area, the disturbed pit area was covered with vegetation slash to reduce the visible effect and to promote natural reseeding.

At the plant site, all stockpiles were processed through the mobile plant. At the end of the program, the oversize gravel and the tailings were smoothed by hand tools. The slimes introduced into the old mining pond by return circulation were left to settle by natural flocculation.

8.0 Expenditure

Expenditure on exploration in the licence area for the twelve months to March 2002 was $21,415 bringing the total for the life of the licence to $55,690.

REFERENCES

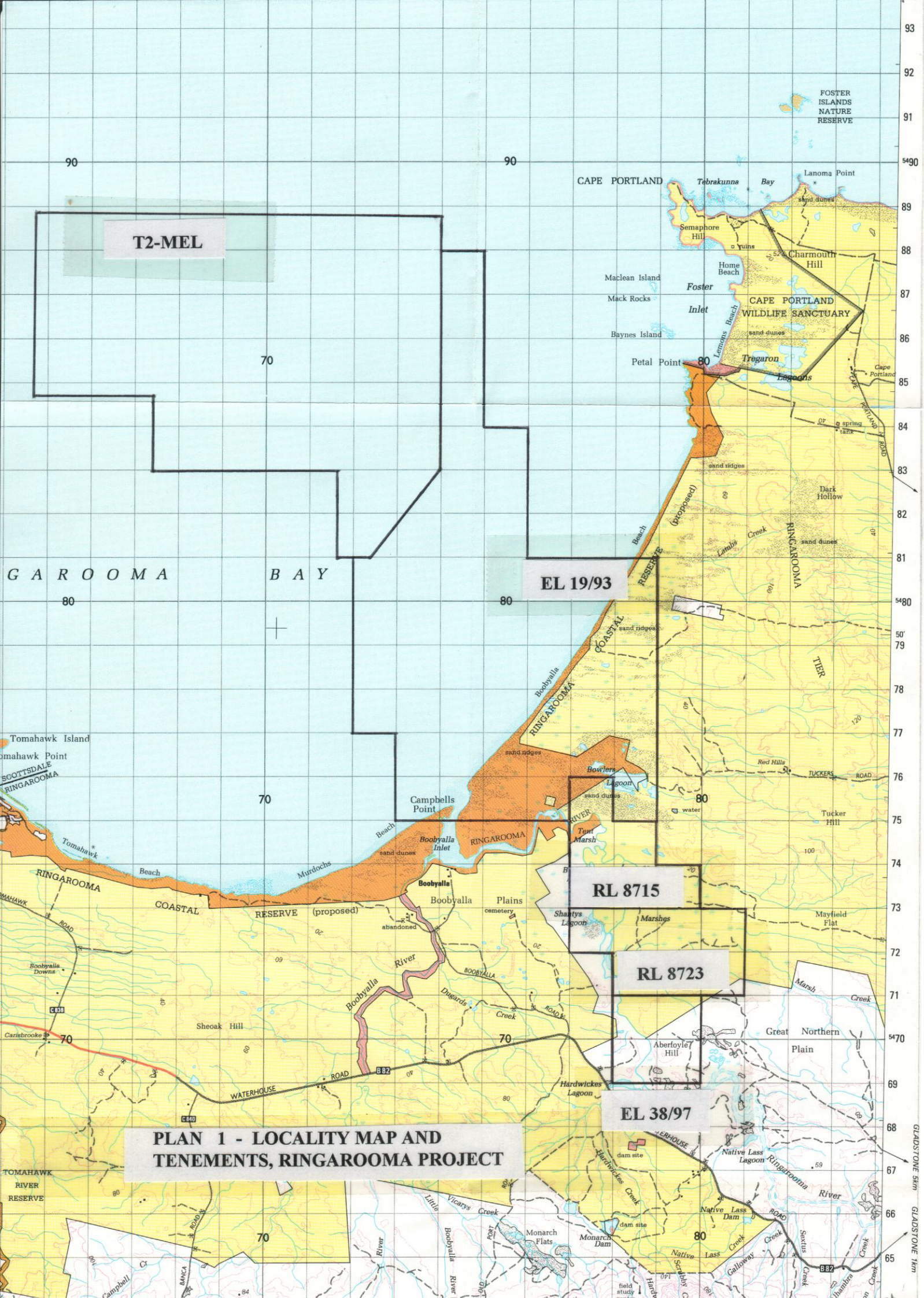
Duncan, D. McP. and Rhodes, L.J. EL 38/97- Aberfoyle Hill. Annual Reports on Exploration to March 1999, 2000 and 2001.

Kinnane, N. R. 2001. The Monarch Project, Mt Cameron, Gladstone District, North East Tasmania. Geological Assessment and Ore Resource Statement. Niugini Resources Pty Ltd.

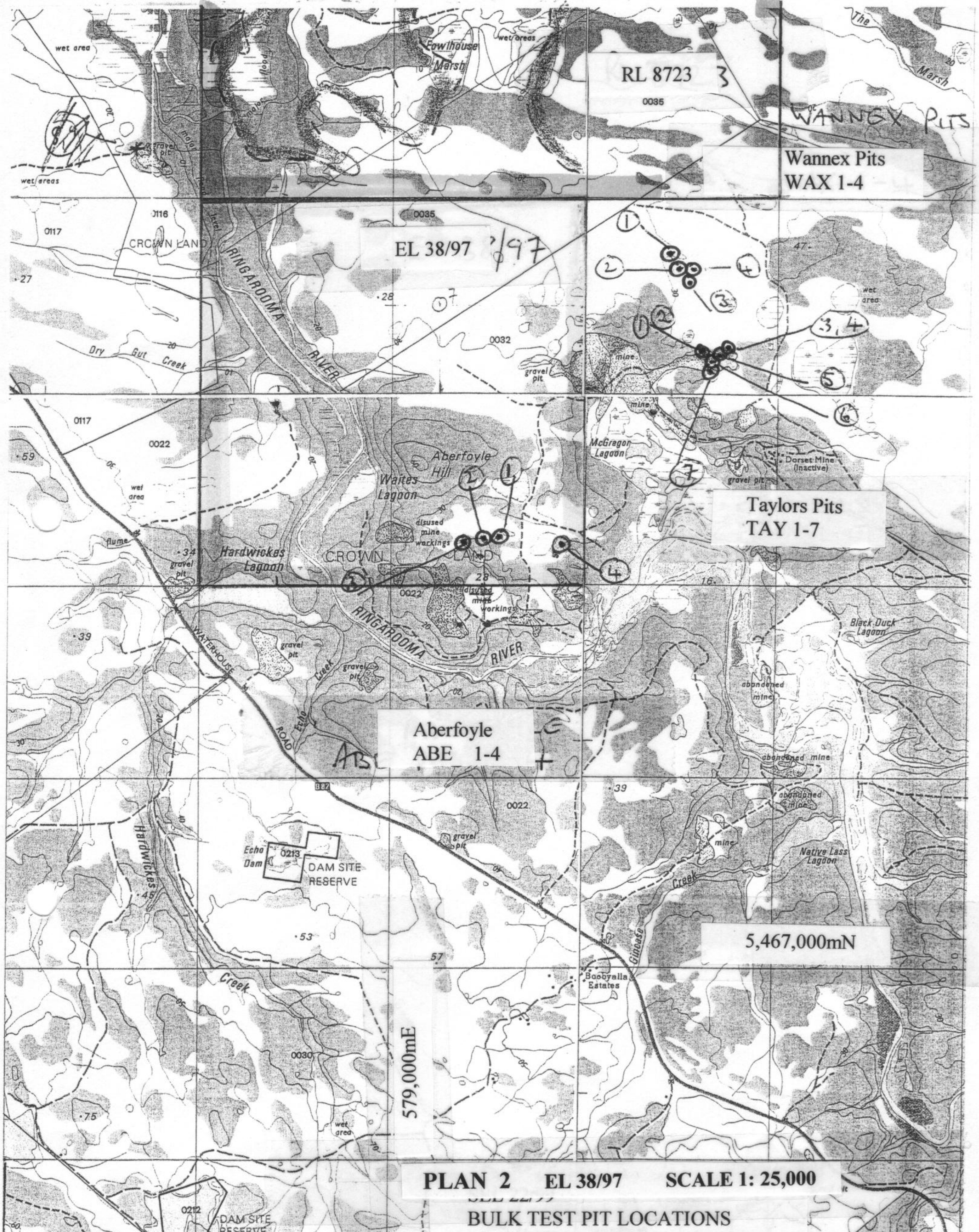
Koch, D.F.A. 1987. Rare Earth Extraction and Separation. Materials Australasia. Vol 19. No 4, May 1987, pp12- 15.

KEY WORDS

Aberfoyle, MacGregors, Alluvial Deposits, Cassiterite, Rutile, Ilmenite, Zircon, Monazite, Gold, Sapphire, Clay, Rare Earths



PLAN 1 - LOCALITY MAP AND TENEMENTS, RINGAROOMA PROJECT



PLAN 2 EL 38/97 SCALE 1: 25,000

BULK TEST PIT LOCATIONS
MacGREGORS, near GLADSTONE

MINERAL HOLDINGS AUSTRALIA PTY., LIMITED

ALLUVIAL LITHOLOGIC AND SAMPLING LOG

PROJECT: Aberfoyle East | **GEOLOGY:** D. Duncan | **DATE:** 4th June 2001

PIT NO	INTERSECTION FROM m	TO m	INT m	LITHOLOGY	LITHOLOGIC LOG	SAMPLE NUMBER	SAMPLE INTERVAL m	SAMPLE VOLUME LCM	SAMPLE DESCRIPTION
ABE PIT NO 1	0	2.0	2.0		Iron stained clayey sand with 0.4 m of occasional pebbles of quartz and quartzite clasts to 20 cm. on top	Not Sampled			
	2.0	6.1	4.1		Buff to grey sandy wash to basement				
	6.1			+	Granite basement				
ABE PIT NO 2	0	2.8	2.8		Brown to buff sandy clay in old work face "Sea Shell Face"	A122	2.8 to 4.0	1.80	Grey - brown wash, rounded clasts of 10 cm of pebbles of grey, brown, or black quartzite, also cleaved, buff coloured sandstones, clayey matrix
	2.8	4.0	1.2		Coarse alluvial wash				
	4.0	5.0	1.0		Sandy clay				
	5.0			+	Granite basement				
ABE PIT NO 3	0	2.3	2.3		Buff coloured sand, occasional gravel layer 0.5 m thick in old "Sea Shell Face"	A124	2.3 to 4.0	1.80	Dark grey wash with cobbles and clasts to 25 cm of grey quartzite, white quartz, black chert, and cemented grits in gritty groundmass
	2.3	4.0	1.7		Coarse gravel, cobble wash				
	4.0			+	Granite basement				
ABE PIT NO 4	0	2.6	2.6		Yellow grey wash in old work face.	A125	0 to 2.6	1.50	Yellow grey cemented wash; rounded quartzite and quartz cobbles to 25 cm in a high clay matrix.
	2.6			+	Granite basement				

TABLE 1

PROJECT: ABERFOYLE PROJECT **TENEMENT:** GREAT NORTHERN PLAIN **DATE:** 14th June 2001

SAMPLE		INTERVAL			VOL	CONC	CASSITERITE			ZIRCON			TITANIUM			GOLD		SAPPHIRE		TANTALUM			NIOBIUM		
MHAP/L *AMDEL*		FROM m	TO m	INT m	LCM	WT grams	% Sn	70% SnO_2 grams	70% SnO_2 g/LCM	% ZrO_2	ZrO_2 grams	67.2% ZrO_2 g/LCM	%TiO_2	TiO_2 grams	53% TiO_2 g/LCM	gm	g/LCM	Weight grams	Grade g/LCM	%Ta	Ta_2O_5 gm	Ta_2O_6 g/LCM	%Nb	Nb_2O_5 gm	Nb_2O_6 g/LCM
ABE 1	NS																								
ABE 2	122	2.8	4.0	1.2	1.8													0.24	0.13						
	Non M					908	2.32	29.964	16.647	0.51	4.63	2.57	0.43	3.90												
Check Non M							*2.15*			*0.50*			*0.67*							*0.0037*	*0.0333*		*0.01*	*0.091*	
	Mag 1					136.2							6.62	9.02	11.19										
Check Mag 1							*0.28*	*0.54*		*0.05*	*0.07*		*8.34*							*0.0098*	*0.0133*		*0.0286*	*0.039*	
	Mag 2					2.1																			
GRADES									**16.95**			**2.61**			**11.19**				**0.13**			**0.03**			**0.07**
ABE 3	124	2.3	4.0	1.7	1.8													0.19	0.11						
	Non M					2156	7.37	226.02	125.56	0.79	17.032	9.46	0.37	7.98												
Check Non M							*6.5*			*0.72*			*0.33*							*0.0098*	*0.2106*		*0.0286*	*0.617*	
	Mag 1					145.2							16.6	24.103	28.53										
Check Mag 1							*1.24*	*2.56*		*0.07*	*0.10*		*2.67*							*0.0244*	*0.0355*		*0.0716*	*0.1039*	
	Mag 2					5.4																			
GRADES									**127.0**			**9.52**			**28.53**				**0.11**			**0.14**			**0.40**
(Dish)	A123	2.3	4.0	1.7	0.006	86.2	10.0	12.24	**2040.1**																
ABE 4	125	0.0	2.6	2.6	1.5													4.92	3.28						
	Non M					1938	5.78	159.33	106.22	0.87	16.861	11.24	0.18	3.49												
Check Non M							*4.57*			*0.86*			*0.20*							*0.0085*	*0.1656*		*0.0143*	*0.2773*	
	Mag 1					868.6							2.43	21.107	24.60										
Check Mag 1							*0.15*	*1.85*		*0.01*	*0.12*		*2.67*							*0.0037*	*0.0318*		*0.01*	*0.087*	
	Mag 2					5.4																			
GRADES									**107.46**			**11.319**			**24.60**				**3.28**			**0.13**			**0.24**
(Dish)	A125	0.0	2.6	2.6	0.006	109.7	1.9	2.96	**493.3**																

TABLE 2

REO CLAY ANALYSES

ELEMENT	ELEMENT NAME	ATOMIC WEIGHT	SAMPLE NUMBER	SAMPLE NUMBER	SAMPLE NUMBER	SAMPLE NUMBER	SAMPLE NUMBER
			027	038	050	068	M108
			ANALYSIS ppm	ANALYSIS ppm	ANALYSIS ppm	ANALYSIS ppm	ANALYSIS ppm
Ce	Cerium	140.12	22.00	89.00	29.50	62.00	91.00
Dy	Dysprosium	162.50	2.20	7.00	6.00	2.90	4.00
Er	Erbium	167.26	1.25	3.30	3.60	1.50	2.00
Eu	Europium	151.96	0.64	2.50	1.20	0.95	0.47
Gd	Gadolinium	157.25	1.65	6.50	3.80	2.90	4.40
Ho	Holmium	164.93	0.43	1.25	1.25	0.49	0.68
La	Lanthanum	138.91	7.50	25.00	7.00	17.50	24.50
Lu	Lutetium	174.97	0.22	0.44	0.64	0.26	0.37
Nd	Neodymium	144.24	10.50	44.50	15.00	25.50	38.00
Pr	Praseodymium	140.91	2.60	10.50	3.50	6.50	10.00
Sm	Samarium	150.35	2.30	10.00	4.40	5.00	8.50
Tb	Terbium	158.92	0.29	1.10	0.78	0.44	0.71
Tm	Thulium	168.93	0.20	0.50	0.65	0.25	0.40
Yb	Ytterbium	173.04	1.40	3.40	4.50	1.70	2.60
TOTAL			**53.18**	**204.99**	**81.82**	**127.89**	**187.63**
Ta			1.0	1.0	<0.5	1.0	7.5

TABLE 3

APPENDIX

LOGS OF THE JIG SCREEN OVERSIZE (+ 3mm)

A 122 2.8- 4.0m

20% white and glassy quartz; pebbles down to granule size
80% pebbles of metasediment; white, pale grey, dark grey and black

A124 2.3-4.0m

As above

A125 0-2.6m

As above + 1% irregularly shaped, granite fragments

ANALYTICAL RESULTS FROM LABORATORIES

APPENDIX

LOGS OF THE JIG SCREEN OVERSIZE (+ 3mm)

A 122 2.8- 4.0m

20% white and glassy quartz; pebbles down to granule size
80% pebbles of metasediment; white, pale grey, dark grey and black

A124 2.3-4.0m

As above

A125 0-2.6m

As above + 1% irregularly shaped, granite fragments

ANALYTICAL RESULTS FROM LABORATORIES

AMINYA LABORATORIES BURNIE

RESULTS SHEET

PRELIMINARY RESULTS

TO **MINERAL HOLDINGS AUSTRALIA P/L**

AMINYA JOB NUMBER	7.9.1 4352
CLIENT REFERENCE	4352
DATE SUBMITTED	7/31/01
BY	L.J. RHODES
NUMBER SUBMITTED	10

SAMPLE NUMBER UNITS		Sn %	TiO2 %	ZrO2 %
A122	NON MAGNETICS	2.32	0.43	0.51
A124	NON MAGNETICS	7.37	0.37	0.79
A125	NON MAGNETICS	5.78	0.18	0.87
A122	MAGNETICS	XXXX	6.62	XXXX
A124	MAGNETICS	XXXX	16.6	XXXX
A125	MAGNETICS	XXXX	2.43	XXXX
M103	MAGNETICS	XXXX	46.1	XXXX
M 108	MAGNETICS	XXXX	30.9	XXXX
M 109	MAGNETICS	XXXX	34.5	XXXX
M 110	MAGNETICS	XXXX	41.4	XXXX
METHOD		AMBN 1	XRF	XRF

REPORT PREPARED BY
DATE

amdel

Job: 1AD2568
O/N:

rinal

ANALYTICAL REPORT

SAMPLE	Ta	Nb	Sn	Zr
T114	50	115	4.28%	3200
T115	35	84	3.44%	2300
T116	<10	10	4400	1300
T117	175	310	18.6%	2000
T118	85	150	6.74%	3500
T119	I.S.	I.S.	I.S.	I.S.
T120	<10	14	3550	5100
T121	10	31	1.13%	1150
T114 MAG	65	160	4300	420
T115 MAG	90	230	6050	600
T116 MAG	I.S.	I.S.	I.S.	I.S.
T117 MAG	240	430	4.18%	470
T118 MAG	220	370	1.47%	400
T119 MAG	100	360	3650	600
T120 MAG	60	280	850	340
T121 MAG	85	210	4250	1350
A103 MAG	I.S.	I.S.	I.S.	I.S.
A108 MAG	390	1050	4350	1500
A109 MAG	470	1050	1550	750
A110 MAG	250	1050	4550	1300
A122 MAG	75	210	2800	420
A124 MAG	230	500	1.24%	490
A125 MAG	25	66	1450	100
A122 NON MAG	30	68	2.15%	3650
A124 NON MAG	75	155	6.50%	5350
A125 NON MAG	65	135	4.57%	6400
UNITS	ppm	ppm	ppm	ppm
DET.LIM	10	2	4	4
SCHEME	XRF1	XRF1	XRF1	XRF1
UPPER SCHEME			XRF2	

amdel

Analytical Chemistry

Final
Job Number:1AD2602C
O/N :

ANALYTICAL REPORT

Element	Unit	027	038	050	068		
Ce	ppm	22.0	89	29.5	62	IC3R	0.5 DL
Dy	ppm	2.2	7.0	6.0	2.9	IC3R	0.02 DL
Er	ppm	1.25	3.3	3.6	1.50	IC3R	0.05 DL
Eu	ppm	0.64	2.5	1.20	0.95	IC3R	0.02 DL
Gd	ppm	1.65	6.5	3.8	2.9	IC3R	0.05 DL
Ho	ppm	0.43	1.25	1.25	0.49	IC3R	0.02 DL
La	ppm	7.5	25.0	7.0	17.5	IC3R	0.5 DL
Lu	ppm	0.22	0.44	0.64	0.26	IC3R	0.02 DL
Nd	ppm	10.5	44.5	15.0	25.5	IC3R	0.02 DL
Pr	ppm	2.6	10.5	3.5	6.5	IC3R	0.05 DL
Sm	ppm	2.3	10.0	4.4	5.0	IC3R	0.02 DL
Tb	ppm	0.29	1.10	0.78	0.44	IC3R	0.02 DL
Tm	ppm	0.20	0.50	0.65	0.25	IC3R	0.05 DL
Yb	ppm	1.40	3.4	4.5	1.70	IC3R	0.05 DL
Ta	ppm	1.0	1.0	<0.5	1.0	IC3M	0.5 DL

Analytical Chemistry

Final
Job Number:1AD2593B
O/N :

ANALYTICAL REPORT

Element	Unit	M108 CLAY		
Ce	ppm	91	IC3R	0.5 DL
Dy	ppm	4.0	IC3R	0.02 DL
Er	ppm	2.00	IC3R	0.05 DL
Eu	ppm	0.47	IC3R	0.02 DL
Gd	ppm	4.4	IC3R	0.05 DL
Ho	ppm	0.68	IC3R	0.02 DL
La	ppm	24.5	IC3R	0.5 DL
Lu	ppm	0.37	IC3R	0.02 DL
Nd	ppm	38.0	IC3R	0.02 DL
Pr	ppm	10.0	IC3R	0.05 DL
Sm	ppm	8.5	IC3R	0.02 DL
Tb	ppm	0.71	IC3R	0.02 DL
Tm	ppm	0.40	IC3R	0.05 DL
Yb	ppm	2.6	IC3R	0.05 DL
Ta	ppm	7.5	IC3M	0.5 DL

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Analytical Chemistry

Final
Job Number:1AD2734
O/N :

ANALYTICAL REPORT

Element	Unit	M108	038		
Ce	ppm	8.0	21.0	WAT3M	0.03 DL
Dy	ppm	0.25	2.3	WAT3M	0.01 DL
Er	ppm	0.10	1.15	WAT3M	0.03 DL
Eu	ppm	0.08	0.65	WAT3M	0.01 DL
Gd	ppm	0.40	2.6	WAT3M	0.03 DL
Ho	ppm	0.05	0.45	WAT3M	0.01 DL
La	ppm	2.7	10.5	WAT3M	0.03 DL
Lu	ppm	0.01	0.12	WAT3M	0.01 DL
Nd	ppm	2.7	11.0	WAT3M	0.01 DL
Pr	ppm	0.70	2.7	WAT3M	0.03 DL
Sm	ppm	0.44	2.3	WAT3M	0.01 DL
Tb	ppm	0.05	0.38	WAT3M	0.01 DL
Tm	ppm	<0.03	0.15	WAT3M	0.03 DL
Yb	ppm	0.05	0.70	WAT3M	0.03 DL
Ta	ppm	<0.25	<0.25	WAT3M	0.25 DL

for
Alan Ciplys
Manager, Organalytical Central Region