



Rio Tinto Exploration Pty. Limited

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A member of the Rio Tinto Group

**Second Annual Report
for the Period Ending 22 September 2004,
EL1638 Port Keats 1, EL1639 Port Keats 2,
EL1640 Keats, EL1641 Port Keats,
EL1923 Keats 2, EL3403 Barwolla,
EL3404 Fitzmaurice, EL3406 Keyling,
EL6516 Tom Turners Creek,
EL6517 Cui-eci Creek, EL6551 Greenwood,
EL22218 Fitzmaurice 4,
Yambarra Project,
Northern Territory.**

Exploration Report No. 27166

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WAp45817	Tenement Location Plan	1:500 000
WAp46190	Yambarra Project 2003/2004 Work Programme	1:150 000

1 SUMMARY

Exploration Licence (EL) 1638 Port Keats 1, EL1639 Port Keats 2, EL1640 Keats, EL1641 Port Keats, EL1923 Keats 2, EL3403 Barwolla, EL3404 Fitzmaurice, EL3406 Keyling, EL6516 Tom Turners Creek, EL6517 Cui-eci Creek, EL6551 Greenwood and EL22218 Fitzmaurice 4 were applied for by Ashton Mining Limited and Ashton Operations Australia Limited (“Ashton”) in the late 1970’s and early 1980’s. The tenements are centered approximately 200 km south west of Darwin on the Daly River / Port Keats Aboriginal Land Trust and consequently are processed under the Aboriginal Land Rights Act 1975 (ALRA).

The project area covers parts of the Palaeoproterozoic Pine Creek Orogen, the Mesoproterozoic Victoria – Birrinduddu Basin and the Palaeozoic Bonaparte Basin.

Exploration completed during the current reporting period was directed at locating a diamondiferous kimberlite / lamproite and has comprised:

- Scanning Electron Microprobe Analysis of 9485 indicator mineral grains from 167 samples.
- Trace Element Analysis of 103 indicator mineral grains from 18 samples.
- Interpretation of indicator mineral chemistry.
- Collection of 38 helicopter supported gravel and loam samples.

Results to date have not identified a primary kimberlite / lamproite source for diamonds. Interpretation of indicator mineral chemistry is ongoing and will continue in the next reporting period.

2 CONCLUSIONS AND RECOMMENDATIONS

A modest number of samples were collected from diamond positive catchments based on the first round of sampling. This sampling reported further isolated diamonds and small numbers of indicator minerals with dominantly crustal source chemistry.

The diamond positive samples concentrate near the Cretaceous – Proterozoic unconformity and may have derived from non kimberlite-lamproite sources. The absence of compelling kimberlitic indicators from these samples coupled with the fine diamond size support this conclusion.

The major element chemistry of large numbers of chromite grains were classified and analysed. No significant clusters of mantle source chemistry are indicated.

Trace element analysis of chromite has not returned any convincing signatures of mantle derivation. The trace score classification ranges from 0 to 10 with 10 indicating diamond inclusion field chemistry. From the Yambarra data, no grains reported higher than 7 and no sample had multiple grains greater than 5. In general, a trace score of more than 5 is indicative of a mantle source. Further interpretation is in progress.

Future work will concentrate on further in-fill sampling, mineral chemistry interpretation, geophysical surveys and possibly target drilling.

3 INTRODUCTION

The tenements were applied for by Ashton Mining Limited and Ashton Operations Australia Limited (“Ashton”) in the late 1970’s and early 1980’s. The tenements form a contiguous block centered approximately 200 km south west of Darwin on the Daly River / Port Keats Aboriginal Land Trust and consequently are processed under the Aboriginal Land Rights Act 1975 (ALRA).

The tenements were granted to Ashton on 23rd September 2003. Ashton was acquired by Rio Tinto Exploration Pty Limited (RTE) in late 2000. Tenement details are included in Table 1 below. The tenements are located on Plan WAp45817.

All exploration was completed in accordance with a DBIRD lodged and approved Mine Management Plan (Smith et al 2003).

Table 1: Tenement Details

Tenement No.	Tenement Name	Ownership	Application Date	Grant Date	No. Blocks Applied	No Blocks Granted	No Blocks Current
EL3403	Barwolla	Ashton Mining Limited	28/09/1981	23/09/2002	23	23	23
EL6517	Cui-eci Creek	Ashton Mining Limited	22/02/1989	23/09/2002	194	194	194
EL3404	Fitzmaurice	Ashton Mining Limited	28/09/1981	23/09/2002	118	118	118
EL6551	Greenwood	Ashton Mining Limited	23/03/89	23/09/2002	365	365	365
EL1640	Keats	AO (Australia) Pty Limited	02/06/1977	23/09/2002	389	389	389
EL1923	Keats 2	AO (Australia) Pty Limited	08/09/1978	23/09/2002	414	414	414
EL3406	Keyling	Ashton Mining Limited	28/09/1981	23/09/2002	214	214	214
EL1641	Port Keats	AO (Australia) Pty Limited	02/06/1977	23/09/2002	394	394	394
EL1638	Port Keats 1	AO (Australia) Pty Limited	02/06/1977	23/09/2002	358	358	358
EL1639	Port Keats 2	AO (Australia) Pty Limited	02/06/1977	23/09/2002	390	390	390
EL6516	Tom Turners Creek	Ashton Mining Limited	22/02/1989	23/09/2002	97	97	97
EL22218	Fitzmaurice 4	Ashton Mining Limited	28/9/1981	23/09/2002	51	51	51

4 GEOMORPHOLOGY

The geomorphology of the project area may be divided into five divisions: Lateritised mesa surfaces; Uplands; Escarpments and dissected hills; Elluvial lowlands and Flood plains. (Edgoose, C J et al 1989).

The Lateritised mesa surface has developed on a thin sheet of Cretaceous sedimentary rocks. This sheet was once very extensive but is now reduced to isolated plateau and outlying remnant mesas. A thicker soil profile (than on other units) developed on this surface supports a tall, dense eucalypt forest.

The Mesa escarpments, Uplands and dissected hills form the ground between the mesa surfaces and lowlands. The escarpments form the flanks of mesa and usually consist of a small scarp topping a steep, talus-strewn slope. The dissected hills are formed on Early - Middle

Proterozoic igneous, sedimentary and metamorphic rocks. The soils developed are dominantly skeletal and support sparse open woodland and hardy grasses.

The alluvial lowlands form over sedimentary, granitic and metamorphic rocks which are largely concealed by alluvium. The lowlands are characterised by open woodland and perennial grasses.

The floodplains are extensively developed in the western half of the project area. The plains remain wet well into the dry season and are vegetated by swamp grasses and stands of Melaleuca. Extensive mud and salt tidal flat are also present, adjacent to the Fitzmaurice River and the Joseph Bonaparte Gulf.

5 GEOLOGY

The geological description below is dominantly taken from Edgoose et al 1989.

The project area covers parts of three geological regions within the Northern Territory. These are; the Palaeoproterozoic Pine Creek Orogen, the Mesoproterozoic Victoria – Birrinduddu Basin and the Palaeozoic Bonaparte Basin.

The oldest rocks in the project area are the Early Proterozoic Hermit Creek Metamorphics. This unit consists of pelitic schist and gneiss, phyllite, quartz-mica schist, sillimanite-andalusite-muscovite schist, andalusite-cordierite hornfels and quartzite. The Finniss River Group also of Early Proterozoic age is inferred to overlie the Hermit Creek Metamorphics although the exact nature of their relationship is unclear. Within the project area, the Finniss River Group is dominated by the extremely thick, monotonous quartz arenites of the Chilling Sandstone and Burrell Creek Formation. The Henschke Breccia, a massive breccia conglomerate is interpreted to be approximately synchronous with these units.

The Hermit Creek Metamorphics and Finniss River Group were intruded successively by the Early Proterozoic Muarra-Kamangee Granodiorite (weakly foliated, xenolithic, medium to coarse grained biotite tonalite, granodiorite and minor anamellite) and Peppimenarti Granite (fine aplitic to coarse grained pegmatitic phases of adamellite and granite).

The Middle Proterozoic Fitzmaurice Group unconformably overlies the Early Proterozoic basement. This Group consists of a thick sequence (in excess of 6000 m) of unmetamorphosed

quartz rich sediments. The formations comprising the group are the basal Moyle River Formation (dominantly quartzarenite with lesser conglomerate, stromatolitic dolomite, dolomite and siltstone), the Goobaieri Formation (siltstone and quartzarenite) and the Lalngang Formation (quartzarenite). These units are intruded by Middle Proterozoic intrusives of both basic (Murrenja Dolerite) and acid (Ti-Tree Granophyre) composition. The Murrenja Dolerite consists of altered gabbro and dolerite and the Ti-Tree Granophyre of significantly and variably altered adamellite.

Permian sediments of the Bonaparte Basin are present in the east of the project area. These sediments consist of quartzarenite, subarkose and mudstone with minor conglomerate and coal.

Cretaceous rocks form an extensive unit within the project area. Friable, clayey, commonly ferruginous and mottled arenite is the dominant rock type.

Cainozoic sediments and Quaternary alluvium cover much of the bedrock.

The dominant structural features of the area are the extensive, regional transcurrent faults that are the northerly continuations of the major faults, which define the Middle Proterozoic Fitzmaurice Mobile Zone and the Early Proterozoic Halls Creek Mobile Zone.

6 GEOPHYSICS

The project area is covered by two regional scale aeromagnetic surveys. The western half was flown east west at 500 m line spacing (100 m elevation) in 1994 by AGSO (Medusa Banks, Port Keats, Survey). The eastern half was flown north south in 1984 by the NTGS (Litchfield South Survey) also at 500 m line spacing (100 m elevation).

Data has been acquired and reviewed. Selected magnetic anomalies possibly indicative of intrusive bodies are identified on the attached plan.

7 EXPLORATION COMPLETED DURING REPORTING PERIOD

Exploration completed during the reporting year included:

- Scanning Electron Microprobe Analysis of 9485 indicator mineral grains from 167 samples.
- Trace Element Analysis of 103 indicator mineral grains from 18 samples.
- Collection of 38 helicopter supported gravel and loam samples.
- Interpretation of indicator mineral chemistry and diamond results.

7.1 Stream Sampling

A total of 38 gravel and loam sediment samples were collected as follow up of diamond positive samples collected in the original sampling phase. No camp was established and the sampling was completed by helicopter from a base at Nauiyu. The samples concentrated over the Cretaceous plateau area in the central-eastern portion of the sampled area.

The gravel samples consisted of approximately 30 kg of minus 1mm gravel collected from trap sites. Sample site quality was assessed by the geologist collecting the sample and ranged from very good (bedrock bar or pothole) to very poor (no satisfactory trap). Sample site descriptions and locations are included as Appendix 1. Samples are located on Plan WAp46190.

Gravel samples were processed to 0.125 mm at RTE's Belmont laboratory and observed for kimberlitic indicators to 0.2 mm and diamonds to 0.125 mm. Available results are included as Appendix 2.

Recovered diamonds were examined and described to assist in determination of population and potential source. Two macro and 10 micro diamonds were recovered from the initial sampling programme. An additional 4 micros were recovered from the follow up phase. (Note, the distinction between macro and micro diamond is made at 0.4 mm in any dimension). Insufficient diamonds were recovered to enable any conclusions to be drawn. Descriptions are included as Appendix 6.

7.2 Mineral Chemistry

Kimberlitic indicator minerals (chromite, picroilmenite, pyrope garnet etc) are selected by mineral observers from a samples heavy mineral concentrate. Selected grains are then mounted on a slide and probed using an in house scanning electron microscope. This selection is designed to represent the population of the grains in the sample and may be a large or small proportion of the grains identified. Typically this probing is completed using a 25-30 second count time. Probe data from the first and second rounds of sampling are included in Appendix 3.

Data within Appendix 3 identifies grains as follows:

C= chromite
G = garnet
I = ilmenite
M = magnetite
O = olivine
P = pyroxene
R = rutile
S = spinel
T = tourmaline
X = unknown

The large numbers of chromite grains returned from some of the Yambarra samples precluded single grain analysis. For some samples (from both programmes) an alternative “mass scanning” approach was adopted. Using this methodology, every identified chromite grain in the sample is probed for approximately 2 seconds. 2033 chromite grains from 29 samples were probed in this fashion. This data is included in Appendix 4. While it is recognised that the data from the mass scanning approach are not as accurate as the single grain probing, the identified populations are very similar and valid conclusions can be drawn.

The SEM provides major element chemical data only. Indicator minerals from kimberlite / lamproite sources have characteristic but not unique major element chemical signatures. Trace elements provide a much greater degree of discrimination between possible source rocks. One hundred and three chromite grains from 18 samples were sent to ANU for trace element determination. These data are included as Appendix 5. A report from ANU describing this work is included as Appendix 7. Note that this report refers to more samples and grains than listed in Appendix 5. This additional data is not from the Yambarra programme.

8 ENVIRONMENT

All exploration was completed in accordance with a DBIRD lodged and approved Mine Management Plan. (Smith et al 2003). This was included in the previous statutory report and is not attached

The follow up sampling was completed from existing infrastructure at the Naiuyu community on the Daly River. All of the field-based exploration completed by RTE was helicopter-assisted and non-surface disturbing. No additional rehabilitation is required.

9 EXPLORATION EXPENDITURE

The exploration expenditure attributed to the project by RTE for the first year of exploration is detailed on Table 3 (next page).

10 PROPOSED EXPLORATION

Review of the sampling and mineral chemistry results is on-going. Minor in-fill sampling is envisaged. Further follow up on the Cretaceous plateau area would consist of airborne geophysical surveying (HEM and magnetic) and target drilling.

A notional budget for the project area is listed as follows:

Table 2: Proposed Expenditure

Description	Amount \$
Gravel and loam sampling	50000
Sample processing	50000
Geophysical surveys	50000
Drilling	50000
Total	200000

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Second Annual Report for the Period Ending 22 September 2004, EL1638 Port Keats 1, EL1639 Port Keats 2, EL1640 Keats, EL1641 Port Keats, EL192 3Keats 2, EL3403 Barwolla, EL3404 Fitzmaurice, EL3406 Keyling, EL6516 Tom Turners Creek, EL6517 Cui-eci Creek, EL6551 Greenwood, EL22218 Fitzmaurice 4, Yambarra Project, Northern Territory.
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Table 3: Exploration Expenditure

Element Summary Group	EL1638	EL1639	EL1640	EL1641	EL1923	EL3403	EL3404	EL3406	EL6516	EL6517	EL6551	EL22218
Computing Services	919.40	2,390.42		2,390.42			459.70			1,287.15	1,103.27	643.59
Cont Exploration- Ext	2,544.12	7,883.84		6,614.70			1,272.07			4,530.90	3,052.94	2,750.02
Field & Transport	4,024.05	10,462.51		10,462.51			2,012.02			5,633.64	4,828.81	2,816.79
Gen Office Supp & Comm	61.13	77.32		77.32			14.88			41.64	35.68	20.82
Indirect Costs	2,977.20	6,965.91	1,075.39	7,594.45	1,183.68	96.34	1,313.32	563.80	624.75	4,254.09	3,525.51	1,492.91
Laboratory Analysis	6,011.70	19,009.76		49,630.19		552.45	12,820.15	150.00	4,317.80	18,750.97	12,422.54	3,597.48
Payroll & Benefits	8,109.63	21,084.92		21,084.92			4,054.78			11,353.43	9,731.50	5,676.72
Rent & Property	542.75	1,411.13		1,411.13			271.38			759.84	651.3	379.91
Sundry Prof & Other	61.23	159.20		159.20			30.63			85.73	73.46	42.87
Tenement Payments	2,614.88	-3,861.32	7,170.00	-3,801.32	7,890.00	510.00	117.42	3,790.00	1,990.00	-2,399.17	1,917.85	-2,119.60
Travel & Accomodation	1,634.36	4,249.33		4,249.33			817.17			2,288.09	1,985.33	1,144.06
Grand Total	29,500.45	69,833.02	8245.39	99,872.85	9,073.68	1,158.79	23,183.52	4,503.80	6,932.55	46,586.31	39,328.19	16,445.57

REFERENCES

- Curtis R A, 2003 Cui-eci Creek, EL3404 Fitzmaurice, EL 6551 Greenwood, EL1640 Keats, EL1923 Keats 2, EL3406 Keyling, EL1641 Port Keats, EL1638 Port Keats 1, EL1639 Port Keats 2, EL6516 Tom Turners Creek, SD5211 Port Keats, SD5212 Fergusson River, SD5207 Cape Scott, Northern Territory. RTE Report Number25615.
- Curtis R A, 2003 First Annual Report for the Period Ending 22 September 2003,EL's 1638 Port Keats 1, EL1639 Port Keats 2, EL1640 Keats, EL1641 Port Keats, EL1923 Keats 2, EL3403 Barwolla, EL3404 Fitzmaurice, EL3406 Keyling, EL6516 Tom Turners Creek, EL6517 Cui-eci Creek, EL6551 Greenwood, EL22218 Fitzmaurice 4, Yambarra Project,Northern Territory. Exploration Report No. 26197
- Edgoose, C J et al, 1989 1 : 100 000 Geological Map Series Explanatory Notes. **MOYLE 4969** Northern Territory Geological Survey
- Smith, S.L & Williams, P R Mine Management Plan Yambarra, EL3403 Barwolla, EL6517 Report on 1971 Drilling Programme on Coal Licence 173, Bonaparte Gulf Basin, NT. CR 1973-0082.

LOCALITY

Port Keats	SD 5211	1:250 000
Fergusson River	SD 5212	1:250 000
Cape Scott	SD 5207	1:250 000

DESCRIPTOR

Second Annual Report for the Period Ending 22 October 2003, EL 1638 Port Keats 1, EL1639 Port Keats 2, EL1640 Keats, EL1641 Port Keats, EL1923 Keats 2, EL3403 Barwolla, EL3404 Fitzmaurice, EL3406 Keyling, EL6516 Tom Turners Creek, EL6517 Cui-eci Creek, EL6551 Greenwood, EL22218 Fitzmaurice 4. Yambarra Project, Northern Territory. located within the Daly River / Port Keats Aboriginal Land Trust, Northern Territory, Australia. Diamond exploration activities consisted of first pass and follow up gravel and loam sampling.

KEYWORDS

Port Keats, Fergusson River, Cape Scott gravel sample, -80 # stream sediment sample, rock chip sample, Chromite, Cretaceous, Diamond, Garnet, Indicator mineral, Kimberlite, Loam sample, Proterozoic,

APPENDIX 1

Gravel and Loam Sample Locations

Yam_Gp_2004_A_Sample_Locations.txt

APPENDIX 2

Indicator Mineral Results Summary

Yam_Gp_2004_A_Indicator_Summary.txt

APPENDIX 3

Indicator Mineral Chemistry – Single Grain Analysis

Yam_Gp_2004_A_SEM_SGA.txt

APPENDIX 4

Indicator Mineral Chemistry – Mass Analysis

Yam_Gp_2004_A_SEM_Mass.txt

APPENDIX 5

Indicator Mineral Chemistry – Trace Element Analysis

Yam_GP_2004_A_Trace_element_data.txt

APPENDIX 6

Diamond Descriptions

Yam_Gp_2004_A_Diamonds.txt

APPENDIX 7

Trace Element Analysis Report

Trace Element Report.pdf