ROPER PROJECT

EL's 23047, 23048 & 23111

SECOND GROUP ANNUAL REPORT

FOR PERIOD

02-12-2003 to 01-12-2004

Submitted to: NT Dept of Business, Industry & Resource Development

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1. Summary

Exploration Licences 23047, 23048 and 23111 were granted to Exploration & Resource Development Pty Ltd (ERD) on the 2nd December 2002. ERD Pty Ltd, a Darwin based resource sector company, is the designated Project Manager. The three tenements cover approximately 1,747 sq km and abut and complement an existing large tenure holding (EL's 22478-480; 4,464 sq km) to form a collective and contiguous Roper Project Area. Group reporting status was approved by the Department of Business, Industry & Resource Development (DBIRD).

The Project Area overlies Roper Group stratigraphy in the Bauhinia Shelf tectonic element of the western McArthur Basin and envelopes extensively mapped eroded ilmenite-bearing source rocks with considerable potential for large tonnage 'insitu', eluvial, colluvial and downstream detrital heavy mineral (HM) accumulations.

Titaniferous dolerite sills intrude Adelaidean Roper Group sediments at a number of exposed stratigraphic horizons. The dolerites have been subject to prolonged weathering and erosion during the Tertiary and Recent epochs through to modern day wet season cycles.

Year 1 exploration activities incorporated office studies and helicopter supported field reconnaissance, 875 metres of shallow auger drilling (EL's 23048 & 23111), eight shallow test pit excavations with collection of pit wall channel samples (EL 23048).

Second year activities included detailed analysis of laboratory results and inferred resource estimations in EL 23048 and rigorous tenement holding rationalisation with subsequent 50% EL reductions for all three EL's.

EL 23047

No field work was undertaken on the tenement during tenure year 2. Comprehensive geological and data reviews resulted in a 50% rationalisation of tenure from an original 119 sub-blocks to 59 retained sub-blocks.

EL 23048

Laboratory results for the seven shallow trench wall channel samples from dolerite regolith soils in the extreme southern EL returned very promising heavy mineral contents averaging 8.09%HM of which 99% was ilmenite. A preliminary inferred resource for the 5.9 sq km mapped soils was estimated to comprise approximately 8.4Mt grading 8% ilmenite for 670,000 tonnes of contained ilmenite.

The eighth pit, excavated and sampled one kilometre south of the Roper Highway on the Numul Numul Station access road to provide a preliminary test of a small red regolith soil outlier amidst extensive black soil reported a low tenor 1.6%HM (1% ilmenite) result.

A regional airborne survey covering the southern EL portions was flown to provide rectified aerial photography, ortho-images, contours and a Digital Terrain Model to enhance remote mapping capabilities of additional regolithic soils. Final products are awaited.

Following a review of all data from EL 23048, a 50% relinquishment (190 sub-blocks) of non-prospective ground was made at end of tenure year 2.

EL 23111

No ground intrusive activities were conducted in the EL during the year. Civil engineering studies including scoping work on possible sites for tailings disposal and optimisation of the proposed ring dam in the western EL is continuing.

ERD personnel accompanied the survey crew for the proposed Port Keats to Nhulumbuy gas pipeline which traverses through EL 23111.

Following a review of all data from EL 23111, a 50% relinquishment (29 sub-blocks) of non-prospective ground was made at end of tenure year 2.

1.1 Environment

No ground intrusive activities were conducted on EL'23047, 23048 and 23111 during tenure year 3.

2. Conclusions and Recommendations

Following overall Roper Project data reviews, a large scale tenement rationalisation was undertaken resulting in significant reduction in tenure holding including 50% relinquishment of EL's 23047, 23048 and 23111.

Extremely favourable results were received from test pit channel samples collected from dolerite regolith soils in southern EL 23048. The samples yielded an average of 8% ilmenite from surface to one metre depth over an area in excess of 5 sq km.

The remaining portions of the three EL's contain or have good potential for heavy mineral deposits. They are recommended to be included in the encompassing project marketing campaign to attract investment and joint venture opportunities.

3. Introduction

Exploration Licences 23047, 23048 and 23111 cover an area of approximately 1,747km^2 on the Urapunga 1:250000 mapsheet SD 53-10 and largely flank and infill ERD's large existing tenement holding (EL's 22478, 22479 & 22480). 50% statutory relinquishments were effected at end of year 2.

Statutory tenement details are tabled below:

EL Number	Holder	Grant Date	Expiry Date	Area (sqkm)
23047	ERD Pty Ltd	02-12-2002	01-12-2008	367.4
23048	ERD Pty Ltd	02-12-2002	01-12-2008	1,194
23111	ERD Pty Ltd	02-12-2002	01-12-2008	185.9

The tenements principally target insitu and remobilised heavy minerals shedding from numerously exposed and variably eroded dolerite sills intruding into Proterozoic Roper Group.

The tenements, collectively forming part of the Roper Project, are centred approximately 120 kilometres east of the township of Mataranka and are accessed from the north and south by the unsealed Central Arnhem and sealed Roper Highways respectively (Figure 1). A gazetted station-maintained road is central to the Project Area linking the two highways. All EL's are interspersed with station tracks leading to the main arterial roads. Due to the monsoonal nature of the area the station tracks are well graded every year but are virtually impassable at the height of the monsoon.

The Project Area lies principally within the physiographic province of the Gulf Fall, a dissected terrane from which almost all of the old Tertiary land surfaces have been eroded. Topography is characterised by broad alluvial valleys between low rubbly hills and prominent strike ridges of resistant Roper Group strata, locally still capped by remnant Tertiary laterite. Large components of the new EL's cover the flat-floored valleys which form part of the vast Roper River floodplain and its associated tributaries (Wilton, Maiwok, Jalboi, Flying Fox, Mainoru) and are largely developed on incompetent shales, fine-grained sediments, volcanics and carbonate rocks. The target dolerite sills are prominent in their deep red soil colour and rounded boulder outcrops. Quite a few of the rivers and creeks are perennial or contain large year round billabongs.

The principal vegetation regime is open Eucalyptus woodland ranging from sparsely wooded open grassland alluvial and blacksoil plains to densely vegetated lancewood on high ground and steeply sloping areas. The major watercourses are lined with paperbarks and larger Eucalypts. Spinifex grows predominantly on the sandy soils close to outcrop.

This report outlines exploration activities conducted during tenure year 2 for EL's 23047, 23048 and 23111.

4. Regional Geology

The Project lies in the central-western shelf (Bauhinia Shelf) of the McArthur Basin. The basin can be viewed as several northerly trending rifts separated by northwest-trending faults and transverse ridges and was subject to repeated cycles of clastic and marine carbonate sedimentation interspersed with volcanic extrusion and sill emplacement (*Tawallah, McArthur and Nathan Groups*) in response to reactivation of older basement structures.

A later, more passive series of sedimentation cycles in response to western basin subsidence occurred with the deposition of suites of blanket quartz sandstones, micaceous siltstones, black shales and glauconitic sandstones (*Roper Group*). Ironstones are prominent on a local stratigraphic level (Roper and Hodgson Iron Deposits). 'A variety of marginal, shallow and deeper marine shelf environments reflect alternating basin-wide sea level rises and falls. Tholeiitic dolerite and gabbro sills were emplaced throughout the Roper group soon after deposition ceased and before regional deformation.' (NTGS).

4.1 Project Geology

The Roper Heavy Minerals Project is confined to the Roper Group specifically targeting the ilmenite-bearing dolerite sill horizons and their erosional transport trails. The strata are generally flat lying to undulating although secondary folding and reactivation of older faults result in steepening of dips and stratigraphic dislocation in places (WNW trending Urapunga Tectonic Ridge in the central area and N-S trending Strangeways Fault in the southwest).

The absence of Cambrian flood basalts and only remnant outliers of Cretaceous sandstones, both of which are extensive to the south, west and north of the Project, suggest a significant exposure to uplift and erosion within the area permitting exposure of the underlying Proterozoic sediments and dolerite sills. Extensive deposits of Quaternary to Recent sediments comprising alluvium, colluvium, unconsolidated gravel and sand overlain by mud-rich soils are mapped in the project area and reflect material derived from prolonged weathering and erosion during the Tertiary. EL's 23046-23048 and 23111 contain significant areas of these recent valley fill / floodplain deposits which are associated with the Roper, Maiwok, Mainoru and Jalboi Rivers and their tributaries.

Sills of the Derim Derim Dolerite were emplaced at various stratigraphic horizons (Table 1) from a primary magma source at depth. Extensive lateritised outcrops, subcrops and regolithic soils of the dolerite have been mapped over approximately 1,300km^2. The dolerite outcrops as low-relief medium to coarse grained, variably altered and weathered ('onion-skin' weathering) rounded boulders. Composition is dominated by plagioclase (40%), clinopyroxene (40%), amphibole (7%), opaques (ilmenite & magnetite 5%) and clay (7%). The associated regolith soils are deep red-purple-brown, clay-rich and contain abundant liberated ilmenite and locally with accessory titanomagnetite, magnetite and haematite grains. In some areas these dolerite

sills have only been recently exhumed (higher elevations) and in other instances, larger areas of dolerite sills have been exposed for a longer geological time resulting in pisolitic laterite formation and attendant erosion (lower elevations). These latter areas are considered to have the best potential for higher insitu ilmenite grades in both eluvial and alluvial terrain.

Diamond drillhole intercepts of the dolerite sills show a thickness in the order of 60-70 metres with upper and basal fine-grained chilled margins of 6-10m. Thin section work commissioned by Pacific Oil & Gas in the late 1980's showed the rock to be representative of a small, high-level intrusion of doleritic basic rocks. Ilmenite and magnetite are observed to be primary constituents of the dolerite. A chemical analysis (Cochrane & Edwards, 1960) of fresh dolerite within the Moroak Formation (Prk) near the Sherwin Iron Deposits reported 1.52% TiO_2. (Figure 2 displays the dolerite distribution plan together with the granted tenements).

Table 1 - Roper Group Stratigraphy

Stratigraphy ***(youngest to oldest)***	**Symbol**	**Lithology**	**Comments**
Chambers River Formation	Prc	Siltstone, mudstone, fine sandstone	Dolerite sill
Bukalorkmi Sandstone	Prl	Quartz sandstone	Dolerite sill
Kyalla Formation	Pry	Siltstone, mudstone, fine sandstone	Dolerite sill
Moroak Formation	Prk	Quartz sandstone	Dolerite sill
Sherwin Member	Prkz	Sand-silt-mudstone & ironstone	Iron ore horizon
Velkerri Formation	Prv	Mudstone, siltstone (organic in part)	Dolerite sill
Bessie Sandstone	Pre	Quartz sandstone	Dolerite sill
Corcoran Formation	Pro	Siltstone lower; with sandstone upper	Dolerite sill
Munyi Member	Prom	Ferruginous sandstone & siltstone	Dolerite sill
Hodgson Sandstone	Prh	Quartz sandstone	Dolerite sill
Jalboi Formation	Prj	Fine sandstone, siltstone	Dolerite sill
Arnold Sandstone	Prx	Quartz sandstone	
Crawford Formation	Prr	Fine sandstone, siltstone	Dolerite sill
Mainoru Formation	Pru	Undifferentiated	Dolerite sill
Showell Member	Prus	Calcareous mudstone, limestone	Dolerite sill
Wooden Duck Member	Pruw	Mudstone-siltstone-sandstone	
Mountain Valley Limestone	Prut	Mudstone, limestone	
Nullawun Member	Prun	Mudstone	
Limmen Sandstone	Pri	Quartz sandstone	
Mantungula Formation	Prn	Mudstone, fine sandstone, dolostone	
Phelp Sandstone	Prp	Quartz sandstone	

5.0 Previous Exploration

Previous exploration is summarised in the first annual report submitted to DBIRD in March 2004.

A comprehensive summary of all past exploration is published in the 2nd edition of 1:250 000 Geological Map Series Explanatory Notes for the Roper Region Urapunga and Roper River Special.

6. Exploration Activities

Second year activities included detailed analysis of laboratory results and inferred resource estimations in EL 23048 and rigorous tenement holding rationalisation with subsequent 50% EL reductions for all three EL's.

6.1 EL 23047

No field work was undertaken on the tenement during tenure year 2. Comprehensive geological and data reviews resulted in a 50% rationalisation of tenure from an original 119 sub-blocks to 59 retained sub-blocks.

6.2 EL 23048

No ground intrusive activities were conducted on the tenement during year 2.

Laboratory results for the seven channel samples from shallow (1m D) backhoe pits (03TR152-03TR158) excavated during year 1 immediately adjacent to N-S and E-W station fence lines approximately 2km east of the old Roper Valley Homestead were received. The regolithic soils reported extremely encouraging heavy mineral contents, averaging 8.09%HM with a 99% dominance of ilmenite (8% average) in the HM assemblage. Ilmenite ranged 4.5% to 14.1% over one metre depths with an average slimes component of 65.4% (range 15%-84%).

The seven samples provide an excellent preliminary indication of heavy mineral content of mapped dolerite regolith soils over an immediate area of 5.87km^2 within the southern tenement confines. An inferred ore resource exercise was undertaken using the following parameters:

- Assume 80% of mapped dolerite comprises mineralised regolith soils (4.7km^2);
- Assume bulk density of 1.78t/bcm (average from Roper project deposits);
- Assume one metre average depth of mineralised soils.

The preliminary inferred resource can be calculated as approximately:
8.36Mt grading 8% ilmenite for 669,000t ilmenite.

An eighth pit, excavated and sampled one kilometre south of the Roper Highway on the Numul Numul Station access road to provide a preliminary

test of a small red regolith soil outlier amidst extensive black soil reported a low tenor 1.6%HM (1% ilmenite) result. Laboratory results are tabulated in Appendix 1.

A recent larger regional airborne survey including coverage of the mineralised southern EL portions was commissioned to Fugro to provide 4m contour resolution topographic data and aerial photography to aid in remote mapping of regolith soil targets. Cross Surveys of Nhulumbuy provided the Ground Control Points for this aerial survey.

The survey provided ERD with the following products:

Hard copy registered, rectified and mosaiced aerial photography;
Digital copy registered and rectified aerial photography;
Orthoimages, contours and Digital Terrain Model.

Final data is awaited at time of writing.

6.3 EL 23111

No ground intrusive activities were conducted in the EL during the year. Civil engineering studies including scoping work on possible sites for tailings disposal and optimisation of the proposed ring dam in the western portion of the EL is continuing.

ERD personnel accompanied the survey crew for the proposed Port Keats to Nhulumbuy gas pipeline which traverses through EL 23111.

Following a review of all data from EL 23111, a 50% relinquishment (29 sub-blocks) of non-prospective ground was made at end of tenure year 2.

6.0 Rehabilitation

No ground intrusive activities requiring rehabilitation were carried out on the three EL's during tenure year 2.

7. References

Abbott ST, Sweet IP, Plumb KA, Young DN, Cutovinos A, Ferenzi PA, Brakel A & Pietsch BA, 2001. Roper Region: Urapunga and Roper River Special, Northern Territory (Second Edition), 1:250 000 Geological Map Series Explanatory Notes, SD 53-10 & SD 53-11. Northern Territory Geological Survey.

Roiko HJ, 2004. Roper Project EL's 23046, 23047, 23048 & 23111 Group Annual Report for Period 02-12-2002 to 01-12-2003 (unpublished).

List of Figures

List of Appendices