

# ***Roper River Iron Ore Pty Limited***

## **Exploration Licence 29776**

### **First and Final Report**

**For the Period**

**07-08-2013 to 31-07-2014**

By

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GDA94 - Zone 53

Target Commodities: Iron ore, Ilmenite,

1:250,000 Urapunga

1:100,000 Moroak

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## **1.0 SUMMARY**

This report covers activities on EL 29776 which was granted on 07<sup>th</sup> August 2013 for a period of six years to Roper River Iron Ore Pty Limited (A.C.N. 149 861 665).

The exploration licence is located approximately 90km east by east north east of Mataranka in the Roper River region of the Northern Territory. Roper River Iron Ore Pty Limited (RRIO) is the designated Project Manager with Australian Ilmenite Resources Pty Limited (AIR) controlling RRIO and providing exploration initiatives as well as tenement management.

The EL lies in the Urapunga Fault Zone within the Bauhinia Shelf of the Proterozoic McArthur Basin. The area is underlain by sedimentary rocks of the Maiwok Subgroup of the Mesoproterozoic Roper Group. The Kyalla Formation in the area has been extensively intruded by sills of the Derim Derim Dolerite.

The exploration target has been iron ore from the Sherwin Formation and ilmenite associated with the weathering and erosion of dolerite sills within the Mesoproterozoic Roper Group. The area has previously been explored for iron ore, base metals and diamonds. The tenement lies outside and to the north west of the known Roper River Iron Field but still a part of the Maiwok Subgroup of the Roper Group and the dissected Gulf Fall physiographic division. The tenement is only partially accessible by road/station tracks with the Roper River flowing south and east of the tenement and the south east trending Flying Fox Creek to the east of the tenement.

The geology is dominated by sandstone of the Sherwin and Moroak Formations throughout with minor pisolitic and oolitic ironstones within as previously documented by Ferenzi (DME, 2001)

Exploration activities undertaken on the EL have included a full data search, database compilation of all known mineral occurrences, and a full geological assessment conducted by helicopter in the dry season of 2014 including mapping and surface sampling. The results of this work indicate that the area only has the current potential for sub-economic heavy mineral (ilmenite) deposits with no Sherwin Ironstone outcrops found. A resource estimate completed in 2003 defined an Indicated Mineral Resource of 39Mt at 4.1% heavy mineral content at the nearby Buka South prospect west of the EL29776.

## **2.0 INTRODUCTION**

### **2.1 Background**

This tenement area was previously part of the Roper Heavy Mineral (HM) Project area associated with dolerite sills of the Roper River region. The area was originally applied to target potential outcroppings of Sherwin Iron Formation and in situ and in some instances remobilised heavy minerals shedding from eroding dolerite sills which had been intruded into the Mesoproterozoic Roper Group.

This report covers activities on EL 29776 which was granted on 07<sup>th</sup> August 2013 for a period of six years to Roper River Iron Ore Pty Limited. As part of a presentation to Senior members of the Department of Mines and Energy in May 2014 Ian Johnstone as General Manager explained that the priority this year was to exploration and the need to understand the organisations Tenement holdings with a view to

reduce those holdings after a full geological assessment. Mr. Warrick Rafferty was appointed as Senior Geologist to complete this exercise.

## **2.2 Location and Access**

The exploration licence is located about 80km eastnortheast of Mataranka in the Roper River region of the Northern Territory. EL 29776 is located south of the unsealed Central Arnhem Road and north of the Roper Highway which provides dry weather access to the tenement, (Figure 1). Further internal access within the EL is provided by unsealed station tracks. There are sealed airstrips at Ngukurr to the east and Minyerri to the south providing all weather access to the tenement to support helicopter flying operations.

## **2.3 Climate**

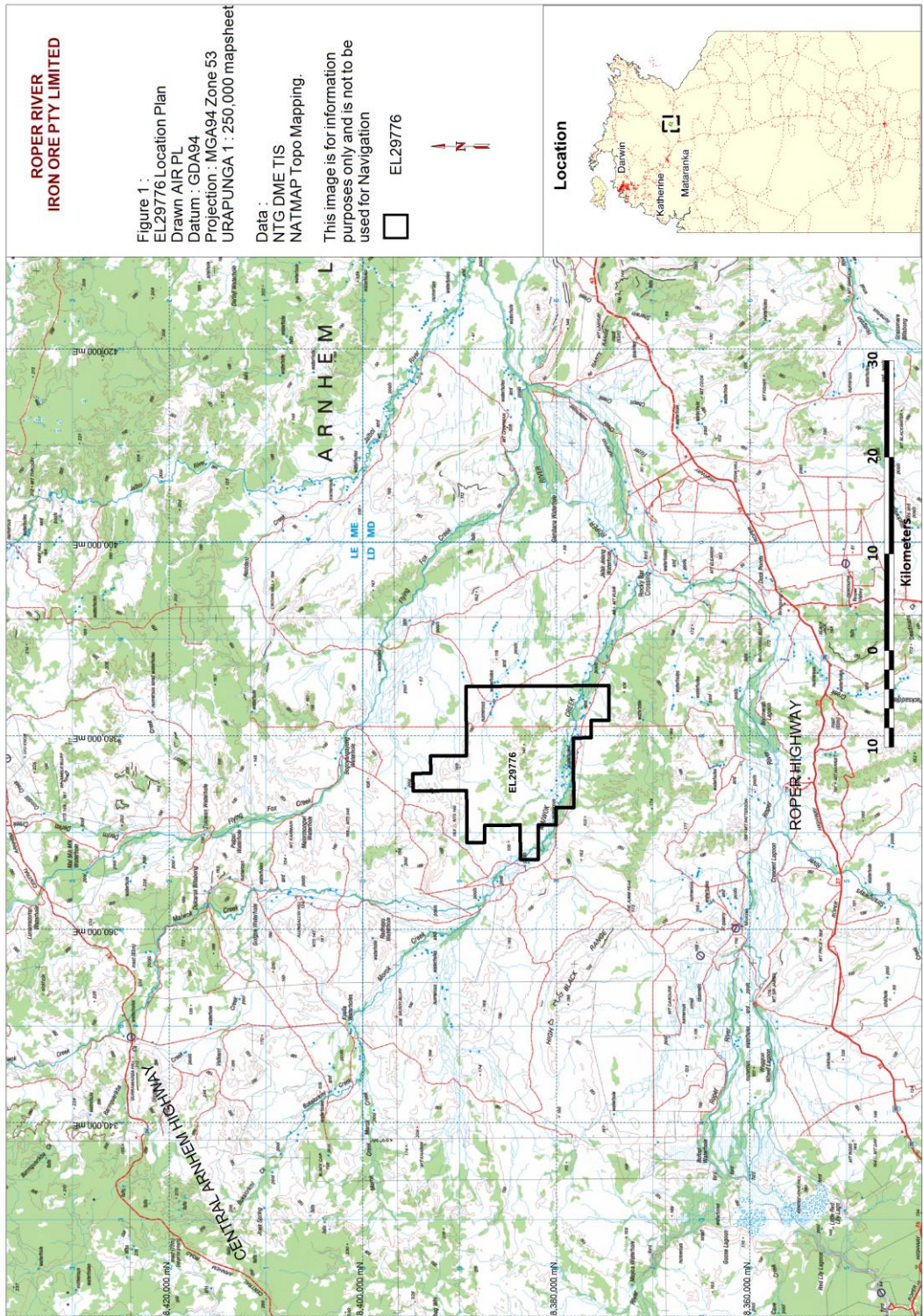
The project area has a humid monsoonal climate, with mild dry winters and hot humid summers often with heavy monsoonal rains associated with tropical cyclones. The average annual rainfall is 700 millimetres with most falls between November and April. The wet season renders portions of the area inaccessible for exploration activities.

## **2.4 Topography and Vegetation**

The EL is within the Gulf Fall physiographic province where dissected Proterozoic sediments have produced an undulating topography of low hills and rubble covered ridges with broad areas of alluvial and colluvial plains associated with the Roper River and its tributaries.

Vegetation consists of open savannah Eucalyptus woodland with local stands of lancewood on higher ground. The creek beds and water holes of the tributaries of the Moroak and Flying Fox Creeks extend through the area and are associated with paperbark and larger Eucalyptus trees. Dense thickets of lancewood occur in higher ground particularly on the steep slopes adjacent to Cretaceous mesas and sandstone plateaus.

Figure 1: Tenement Location Plan



## 3.0 TENURE

### 3.1 EL29776

EL29776 was granted on 07 August 2013 to Roper River Iron Ore Pty Limited for a period of six years. After the first years exploration program it was decided to surrender the entire EL.

Table 1. Titles Information System EL29776

#### Layer Exploration Licence – Granted

##### Item Information

1 of 1

<b>Tenure Type</b>	Exploration Licence
<b>Number</b>	29776
<b>Date Effective</b>	7/08/2013
<b>Status</b>	grant
<b>Area</b>	60 SBKS (199.4 sqkm)
<b>Grant Date</b>	7/08/2013
<b>Expiry Date</b>	6/08/2019
<b>Renewal Application Date</b>	
<b>Renewal Grant Date</b>	

##### Holders Information

Name	Percent	Type
AUSTRALIAN ILMENITE RESOURCES PTY LIMITED*		Contact
ROPER RIVER IRON ORE PTY LTD	100.00%	Current Holder

##### Transactional History Information

Transaction Type	Effective Date	Expiry Date	Period	Area (km2)
Application	13/11/2012		6	199.4
Native Title	15/11/2012	18/06/2013		
Landholder Notification	20/11/2012			
Advertisements	13/02/2013			
Advertisements	13/02/2013			
Offer Of Grant	05/07/2013	07/08/2013	6	199.4
Grant	07/08/2013	06/08/2019	6	199.4

### 3.2 Land Tenure

The current tenement is located on PPL1067 (Moroak Station) and PPL1179 (Flying Fox Station), Figure 2.

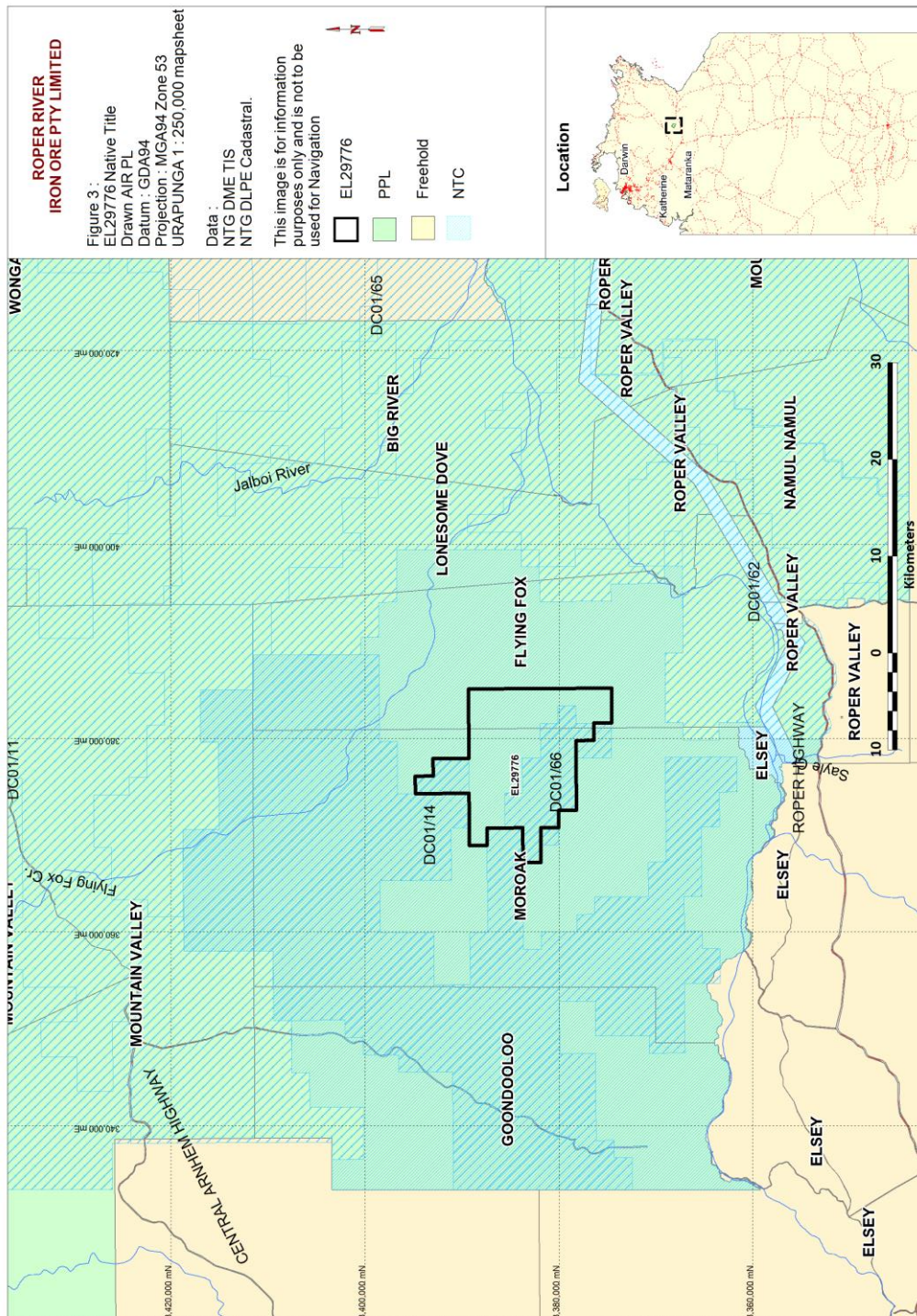


### 3.3 Native Title





Figure 3: Land Claims



### 3.4 Heritage Aboriginal Sacred Sites

There are no known heritage or aboriginal sacred sites within the tenement.

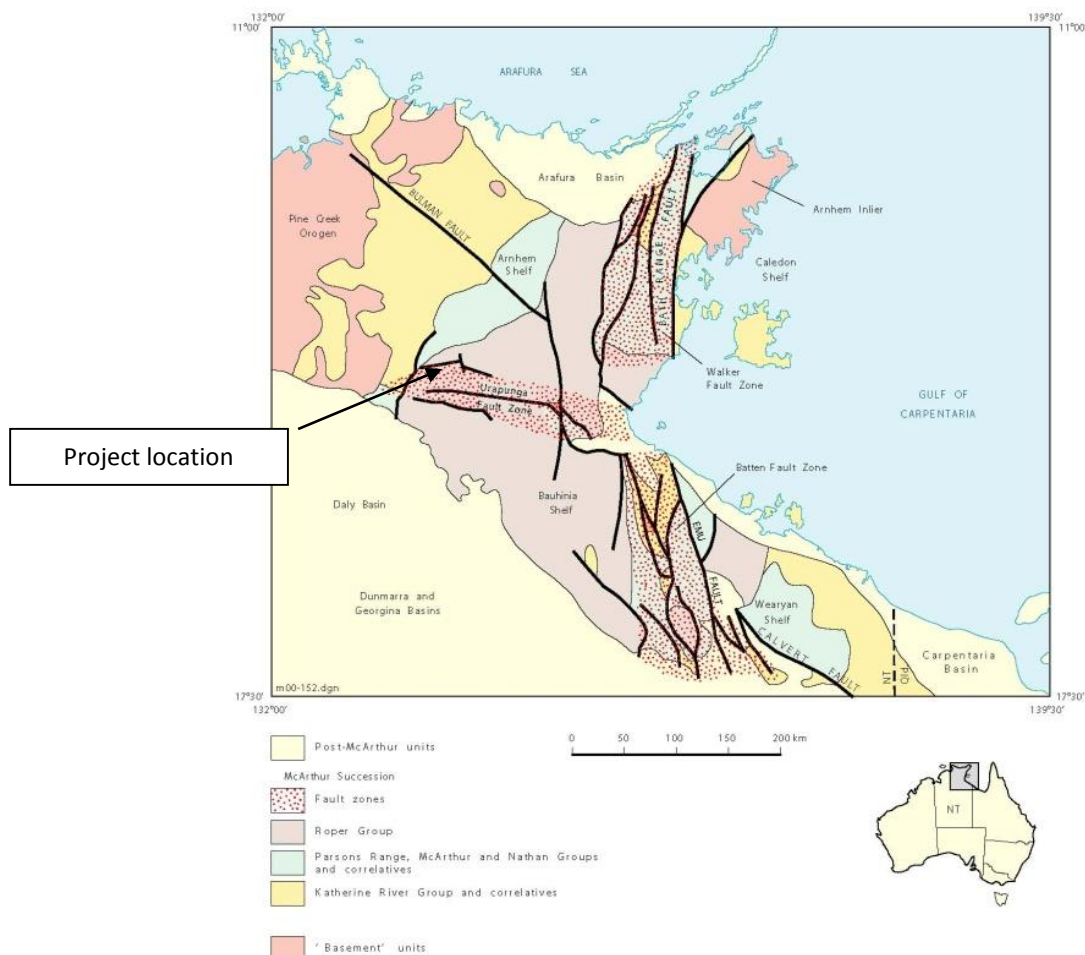
## 4.0 GEOLOGY

### 4.1 Regional Geology

The Project lies in the Urupunga Fault Zone within the Bauhinia Shelf of the Proterozoic McArthur Basin, (Figure 4). The basin consists of 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 in response to reactivation of older basement structures.

A later, more passive series of sedimentary cycles in response to western basin subsidence occurred with the deposition of suites of blanket quartz sandstones, micaceous siltstones, black shales and glauconitic sandstones of the Roper Group. Ironstones are prominent on a local stratigraphic level within this succession. Tholeiitic dolerite and gabbro sills were emplaced throughout the Roper Group soon after deposition ceased and before regional deformation.

*Figure 4: Regional Geological Setting*



## 4.1 Local Geology

The area is underlain by sedimentary rocks of the Maiwok Subgroup of the Mesoproterozoic Roper Group, (Figure 5). The oldest rocks cropping out in the area are sandstones of the Moroak Formation. These are overlain by siltstones, mudstones and minor sandstones of the Kyalla Formation. Some low escarpments of the Bukalorkmi Sandstone which overlies the Kyalla Formation occur in the area, and these are the youngest Proterozoic rocks present.

The strata are generally flat lying although faulting has resulted in steepening of dips and stratigraphic dislocation in places.

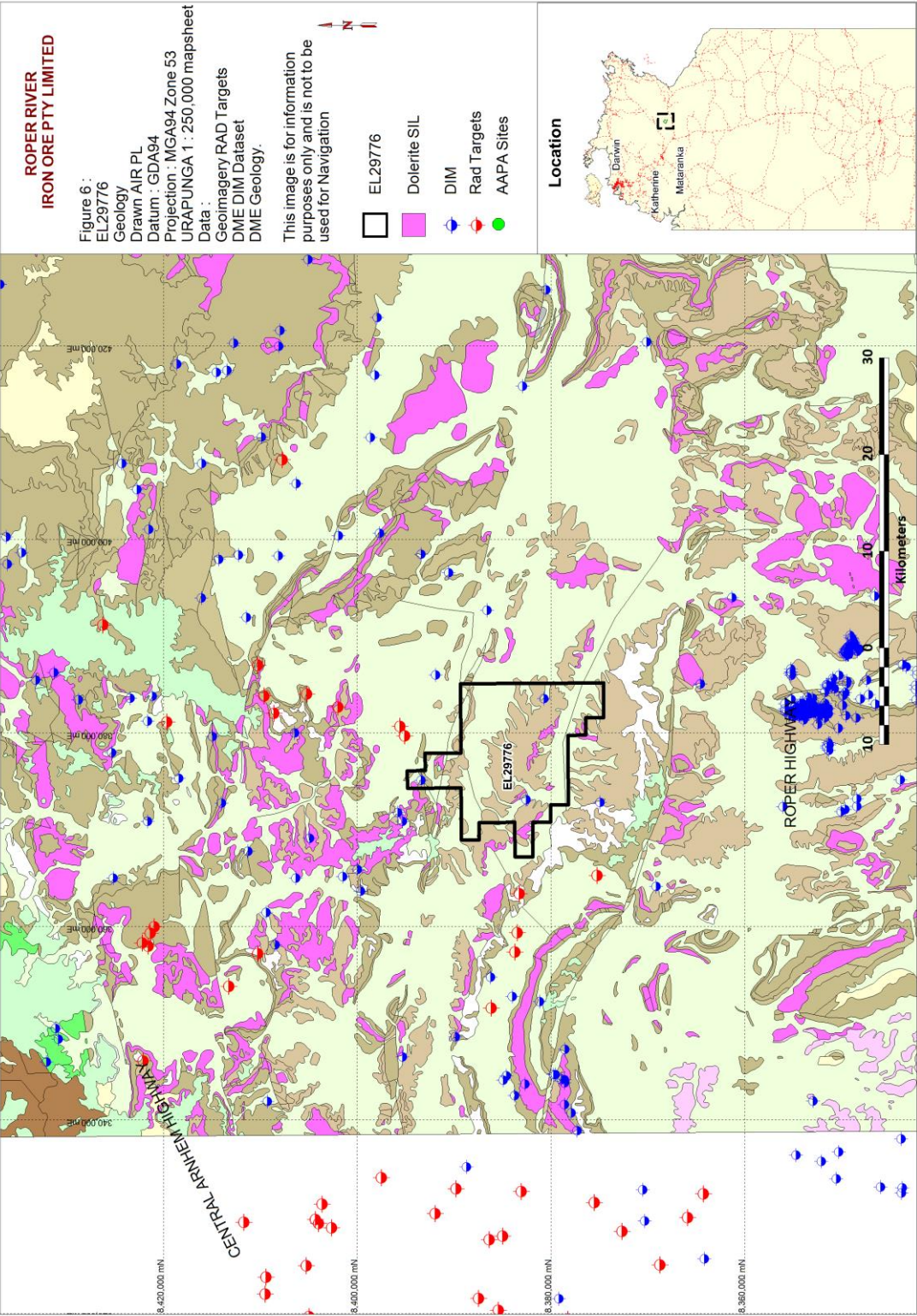
The absence of Cambrian flood basalts (Antrim Plateau Volcanics) and only remnant outliers of Cretaceous sandstone suggest that significant uplift and erosion has occurred within the area permitting exposure of the underlying Proterozoic sediments and dolerite sills. Extensive deposits of Quaternary 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. EL29776 contains significant areas of these recent valley fill / floodplain deposits which are associated with the Moroak Creek and its tributaries.

The Kyalla Formation in the area has been extensively intruded by sills of the Derim Derim Dolerite, which may be up to 100 thick. The dolerite outcrops as low-relief hills strewn with rounded boulders. The dolerites are fine to coarse-grained and composed of plagioclase (40%), clinopyroxene (40%), amphibole (7%), opaques (ilmenite & magnetite 5%) and clay (7%).

The dolerite is generally deeply weathered and forms soils which are deep red-brown in colour, clay-rich and contains abundant liberated ilmenite, titanomagnetite, magnetite and haematite grains. The heavy mineral deposits present in the residual soils and in associated colluvial and alluvial concentrations form the primary exploration target in the area. In areas of higher elevation the dolerite sills have only been recently exposed, and soil development and erosion are limited. In lower lying areas the dolerite has been exposed for a longer geological time resulting in pisolitic laterite formation and attendant erosion. These latter areas are considered to have the best potential for higher in-situ ilmenite grades in both colluvial and alluvial terrain.



Figure 5: Local Geology



## **5.0 PREVIOUS EXPLORATION**

### **5.1 Mining History**

There has been no mining carried out in the region.

### **5.2 Exploration by Previous Companies**

The project area has attracted companies in exploration campaigns for iron ore, base metals, diamonds and uranium.

Evaluation of the oolitic ironstones of the Sherwin Formation by BHP in the 1950's identified potential for large tonnage (>400Mt) low to moderate grade (30%-60% Fe) iron deposits largely to the east and southeast of the Project Area. Recently further exploration has been undertaken by Sherwin Iron Ltd.

Exploration of the area for uranium was undertaken by Kratos Uranium NL in the early 1970's with little success.

Normandy/Poseidon explored the area for base metals (Pb, Zn and Cu) culminating in the discovery of a number of small low grade deposits of sandstone-hosted base metals (disseminated galena in Roper Group arenites at Galena Cliffs and Wongalara Prospects).

Intensive diamond exploration occurred in the 1980's with large scale stream sediment sampling, loam sampling, airborne magnetic surveys and drilling programs conducted by Stockdale Prospecting and Ashton Mining. While a few kimberlitic indicator minerals including micro and macro diamonds were reported, most could not be traced to a source with the exception of two thin (<2m) steeply dipping kimberlitic dykes (Packsaddle and Blackjack 1) located by Stockdale south of the Project area.

CRA Exploration undertook a reconnaissance evaluation of the heavy mineral content of the extensive dolerite sill (and lateritic soil) horizons. Eight hand-held auger holes were completed to test the upper soil profile at scattered localities. A best assay of 1.0m grading 3.0% ilmenite was reported and the tenements were subsequently surrendered in 1996.

Exploration & Resource Development Pty Limited (ERD) undertook comprehensive HM sampling and testwork throughout the area from 2001 to 2003 with no major ore bodies reported in the regolithic confines of this EL.

A comprehensive summary of all past exploration can be found in the Explanatory Notes for the Roper Region: Urapunga and Roper River Special Sheet (Abbott, S.T., et al. 2001).

## **6.0 EXPLORATION COMPLETED BY AIR**

### **6.1 YEAR 1**

1. Year 1 activities included:
2. DME database research on all previous exploration initiatives within the area




3. Desktop mapping and compiling of all previous information sets including lithologies and transfer of any BHP data on hematitic iron oxides into a compiled dataset on the EL.
4. Aerial and satellite imagery obtained, rectified and assessed for outcropping of Sherwin Ironstone formations.
5. Helicopter based mapping and non-intrusive sampling of HM-bearing sills with no visible ironstones present in the north of the EL.

Three samples were taken of potentially ilmenite-bearing dolerite sills, (Figure 6). Manual sampling as sweeps using ERD's methodology was conducted, tested for ilmenite vs titanomagnetite and then washed and investigated to assess potential. No significant HM was found.

*Table 2. Sampling*

Sample ID	Type	Wt (gm)	GDA53E	GDA53N	Elevation (m)	Geology	Comments
REC14018	surface sweep	2979	369799	8383055	79	blders subo/c dolerite, common sst,zst flt	minor Fe pisolites, oolites
REC14019	surface sweep	3081	375188	8380433	65	minor zst flt, patchy zst gravel	common Fe oolites
REC14020	surface sweep	3234	379777	8380549	70	common sst, zst gravel and flt	minor Fe pisolites

*Table 3. Sampling Sites*

SAMPLE REC14018	SAMPLE REC14019	SAMPLE REC14020
		

## 6.2 Conclusions and Recommendations

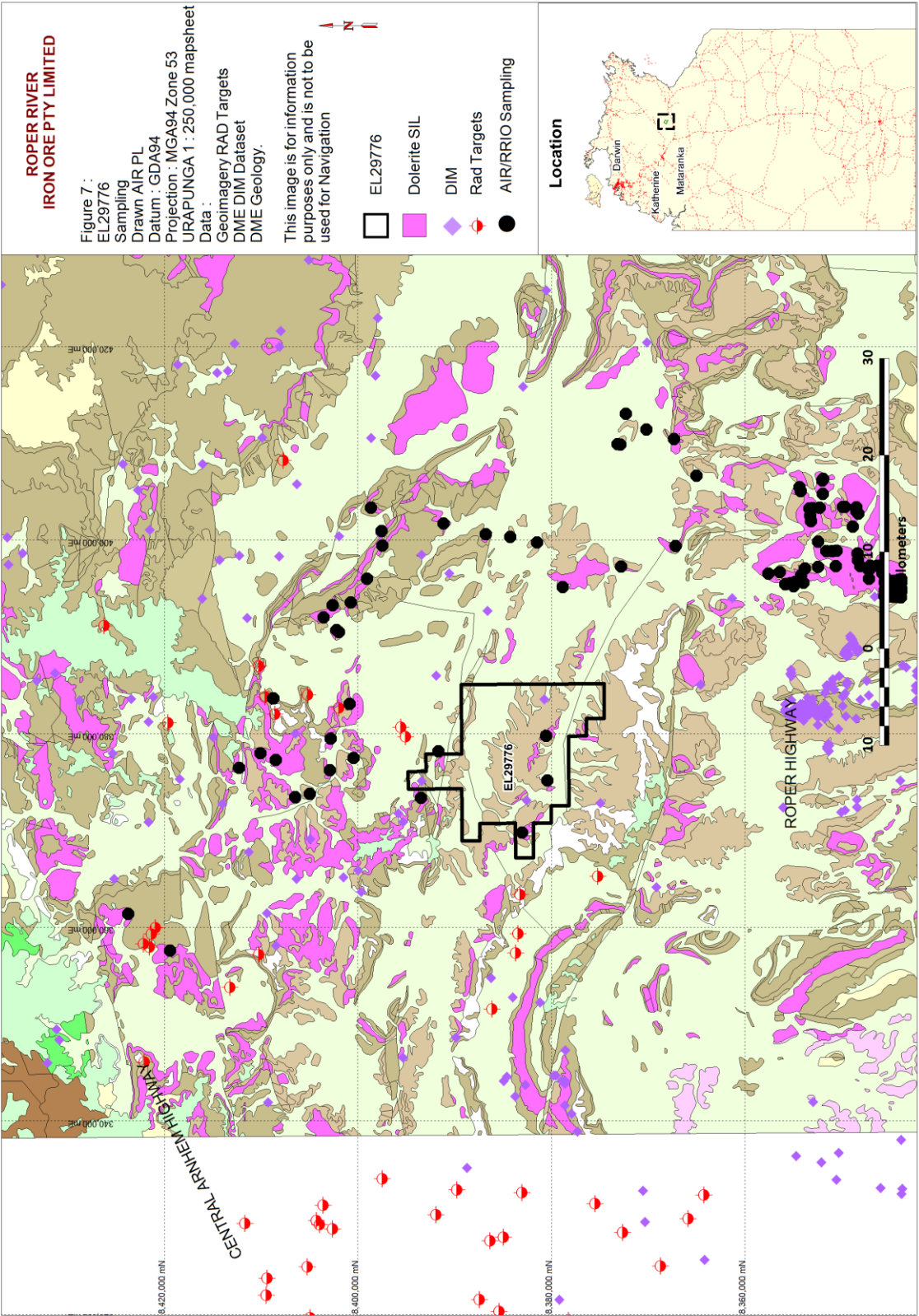
A three day helicopter survey including sampling when combined with the office based research suggests that there is no Sherwin Ironstone outcropping nor any HM bearing ore bodies suitable for Roper River Iron Ore Pty Limited to further investigate and this EL should be surrendered back to the Department of Mines and Energy.

## 6.3 Rehabilitation

There was no need for any rehabilitation. Non-intrusive sampling only.



Figure 6: Exploration Sampling





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