



ANNUAL REPORT

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FOR

Mineral Lease ML24511

Lethbridge West, Tiwi Islands, Northern Territory

For period 5/12/2018 to 4/12/2019

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Commodity: Mineral Sand

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Operator (if different from above)	MZI Resources Ltd
Tenement Manager/Agent	Austwide Mining Title Management Pty Ltd
Titles/Tenements	ML24511
Mine/Project Name	Lethbridge Bay West
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1.0 SUMMARY

This annual report covers ML24511 located on the north east coast of Melville Island, part of the Tiwi Islands, in the Northern Territory (see Figure 1 & Figure 2). The area is prospective for zircon and rutile-rich mineral sands however suitable mining areas must be outside of environmentally sensitive beach, mangrove and river zones. The tenement was purchased by MZI Resources (previously Matilda Zircon) from Stirling Zircon Pty Ltd who obtained the tenement from the Administrator of Matilda Minerals in July 2009.

The first tenement owner Matilda Minerals Ltd (“Matilda”) was admitted to the Australian Stock Exchange on 15 September 2004. Matilda’s objective was to explore and mine small to medium sized heavy mineral deposits which are rich in zircon and rutile, have low clay content, little or no overburden, a small environmental footprint and require low capital expenditure to develop. The potential deposits on the Tiwi Islands met these criteria.

The tenement was awarded on the 5th December 2005. Based on a minable reserve of 190,250 tonnes at 7.5% heavy mineral concentrate containing approximately 52% zircon, 34% rutile and minor leucoxene and ilmenite heavy minerals the project was expected to have a mine life of approximately 6 months. Mining and processing operations commenced at the ML 24511 “Lethbridge Bay West” in July 2010 and were completed in October 2010. Total production by MZI was 11,094 tonnes of concentrate from 118,329 tonnes processed. The economic mineralisation within ML 24511 has been mined with only mineralisation within environmental buffers remaining.

During the reporting period no mineral sand mining or exploration was completed. Focus was rehabilitation with rehabilitation monitoring and completion of a revised Mine Closure Plan.

2.0 INTRODUCTION

MZI Resources purchased the Tiwi Island tenements and assets from Stirling Zircon Pty Limited who had purchased the tenements from the receiver manager of Matilda Minerals in June 2009 following Matilda Minerals being placed into administration in late September 2008. The collapse of the wharf at Garden Point prevented Matilda Minerals from shipping out a large tonnage of concentrate and therefore the company could not meet its financial obligations and had little choice except to appoint an administrator to the company.

The islands are wholly within the Tiwi Island Aboriginal Land Trust administered by the Tiwi Land Council (“TLC”). Matilda signed an agreement with the TLC on 19 December 2003 which set conditions for the exploration and mining development activity.



Figure 1: Location of ML24511 Lethbridge West Tenement Area

3.0 PHYSIOGRAPHY

The climate of the Tiwi Islands is tropical monsoonal, with warm dry winters and hot wet summers. The annual average rainfall is 1200mm – 1400mm in the eastern part of Melville Island to 1800mm – 2000mm in the north-west of Melville Island and north of Bathurst Island. The majority of the rain falls between December and April under the influence of the northwest monsoons. Temperatures range from a mean of 35°C to 21°C in summer, and 26°C to 18°C in winter.

The topography of the islands is characterised by relatively low relief, dominated by partially dissected plateau rising to 100m above sea level, interspersed with broad valleys, riverine lagoons and estuarine tidal flats. The coastline varies from more exposed low cliffs and beaches to large estuaries and extensive tidal flats.

The vegetation is consistent with a tropical savannah regime, dominated by dense eucalypt and acacia woodland in the hinterland and more prominent coastal fringe, while melaleuca (paperbark) forests predominate along the watercourses. Mangroves proliferate around tidal flats, while casuarina trees and pandanus palms fringe the coastline.

The EL is located on a flat lying sand plains dissected by very minor seasonal billabongs and one metre rounded dunes in some inlets vegetated with melaleuca.

4.0 TENURE

This report covers the following Title:

Table 1 Tenement Details

Tenement number	Date granted	Tenure Location	Area (hectares)	Commitment	Expenditure
ML24511	5/12/2005	Melville Island (north)	909.4	n/a	\$Nil

5.0 GEOLOGY AND GEOMORPHOLOGY

5.1 Geology

The oldest rocks exposed on Bathurst and Melville Islands are represented by the Upper Cretaceous Moonkina Member. This formation consists of fine to very fine sub-labile sandstone, along with interbedded claystone, grey carbonaceous mudstone and siltstone, of shallow marine to deltaic derivation. The Moonkina Member is exposed at the base of coastal cliffs, particularly along the southern coastline of Bathurst and Melville Islands, and in lower lying portions of the hinterland (Hughes, 1977).

The Moonkina Member is unconformably overlain by the Tertiary Van Diemen Sandstone, which dominates the geology of the Tiwi Islands. This formation comprises a friable, white to yellow, medium to coarse-grained quartzose sandstone with subordinate intercalations of grey carbonaceous mudstone and siltstone of fluvial to paralic derivation. The Van Diemen Sandstone broadly dips very gently to the north, becoming thicker in the process, with the unit exposed over a 60m vertical interval at Cape Van Diemen at the extreme north-western tip of Melville Island (Hughes, 1977).

Both the Moonkina Member and Van Diemen Sandstone are unconformably overlain by unconsolidated Quaternary fluvial, paralic, deltaic and littoral deposits. The most economically significant of these are the Pleistocene age littoral quartzose sands associated with the paleo-shoreline. Holocene (recent) littoral deposits have accumulated along the present coastline, variously abutting or transgressing the Cretaceous, Tertiary and Pleistocene deposits (J.L. Baxter & Coxhell, 2009).

5.2 Geomorphology

The Van Diemen Sandstone dominates the geomorphology of both Bathurst and Melville Island, forming low partially dissected and lateritised plateau, which are frequently capped by ferruginous to bauxitic pisolitic laterite accumulations. Low red cliffs, nick points and platforms of Van Diemen Sandstone are developed along or adjacent to the more exposed portions of the coastline (Hughes, 1977).

In many instances the Tertiary sea cliffs are preserved from further erosion by accumulations of Pleistocene and/or Holocene littoral deposits. The Pleistocene sands are distinguishable from their Holocene counterparts by a mild orange, pink or red discoloration, and are invariably developed as one or more low amplitude, but strike persistent strandlines, with a wavelength characteristically in tens, rather than hundreds, of metres (J.L. Baxter & Coxhell, 2009).

The Holocene deposits generally appear to be cleaner and marginally finer grained than their Pleistocene equivalents, incorporating a more significant proportion of coquina and coralline debris. Along the north coast of the islands the present day beaches appear to have accumulated as strandlines directly against the Tertiary escarpment or as a composite strand plain successively comprising both the Holocene and Pleistocene deposits. Holocene dune deposits transgress the older strandlines on several beaches that are more exposed to the prevailing north-westerly monsoonal winds (J.L. Baxter & Coxhell, 2009).

Heavy mineral ("HM") sand accumulations are present within both the Pleistocene and Holocene strands. The immediate provenance of the HM is the Van Diemen Sandstone itself, which contains thin laminae of HM identical in composition to the mineral sands. The Pleistocene and Holocene deposits have therefore been subjected to two cycles of erosion and deposition, being originally derived from the Lower Proterozoic igneous and metamorphic complexes of the Pine Creek Geosyncline on the mainland to the south.

Heavy mineral accumulations, be they Pleistocene or Holocene, appear to be best developed immediately adjacent to the Tertiary Van Diemen Sandstone escarpment, with successive strandlines being considerably and progressively more depleted in HM away from the scarp. This preferential accumulation of HM immediately adjacent to the Van Diemen Sandstone headland or scarp can be readily witnessed in the present day environment near Cape Fourcroy, located at the extreme south-western tip of Bathurst Island. Here, although limited in extent, HM species represent the only sand on a wave-cut platform at the base of an extensive cliff of Van Diemen Sandstone.

Recent dating of the underlying coquina at the Lethbridge deposit on Melville Island has recorded a carbon date of 2000 years old.

6.0 PREVIOUS EXPLORATION BY MATILDA MINERALS

The following tables summarise exploration carried out by Matilda Minerals on the Tiwi Islands Exploration Licences in 2004-2008.

Table 2 – Summary of Exploration Activity 2004-2008

Exploration activity - 2004	Comments
Data compilation	Compilation of all previous exploration
Aerial photography and Digital Terrain Mapping	Stereo air photo coverage of the coastal plains at \pm 1:15000 scale DGPS surveying; production of orthophotos for Andranangoo Creek West and Lethbridge Bay West
Ground magnetic mapping	Andranangoo Creek West and Lethbridge Bay West
Helicopter-supported reconnaissance	Reconnaissance sampling – 153 EL 24330, EL24332, EL24333 and others
Air core drilling	Andranangoo Creek West – 171 holes - 669m Lethbridge Bay West – 172 holes - 895m
Modal analyses	Andranangoo Creek West – 7 Lethbridge Bay West – 5
Bulk sampling and metallurgical test work	1 x 1000kg ACW 1 x 1000kg LBW

Exploration activity – 2005	Comments
Ground magnetic mapping	Puwanapi; Wangati North; Wangati South, Atauini Point; Murrow Point, Deception Point; Brace Point; Kili Impini
Air core drilling 2787 holes – 9134.9 metres	Andranangoo Creek West - 1916 holes; 5827m Lethbridge Bay West - 98 holes; 313m Andranangoo Creek East - 248 holes; 723.5m Radford Point - 28 holes; 66.4m Lethbridge Bay South - 139 holes; 447m Cache Point – 30 holes; 90m Puwanapi – 310 holes; 1596m Wangati North – 18 holes; 72m
Reconnaissance sampling	584 auger holes; 243 sampling using a spade
Auguring (shell)	145 holes – 266.8 metres
Modal analyses of heavy mineral concentrates	Total = 27 Andranangoo Creek West – 18 Andranangoo Creek East – 4 Radford Point – 1 Goose Creek West – 1 Robinson Inlet East – 2 Lethbridge Bay South – 1
Costeaming	Andranangoo Creek West - 6 costeams
Bulk sampling and metallurgical test work	Andranangoo Creek West - BSA C-4 & BSA C-6

Ore Reserve/Resource estimation	Andranangoo Creek West and Lethbridge Bay West; Puwanapi
Surveying	Drill hole pick-up

Exploration activity – 2006 -2008			Comments	
Prospect	Date	Number of holes	Sample # start	Sample # end
Andranangoo Creek East	June	28	13316	13343
Goose Creek East	May	1	13070	13070
Lethbridge Bay South	April	47	13000 13047	13024 13068
Lethbridge Bay South	June	164	13374	13537
Lethbridge Bay South	July	25	13639	13663
Lethbridge Bay South	July	99	14005	14103
Lethbridge Bay South	August	80 40	14104 17019	14183 17058
Robinson East	July	46	13593	13638
Totals		530		

Prospect	Date	Number of holes	Sample # start	Sample # end
Wangati North	July	228 21	13664 13912	13891 13932
Atauini Point (Wangeroo)	July	64	13933	13996
Wangati South	July	20	13892	13911
One Tree Point	July	8	13997	14004
One Tree Point	Oct	19	17990	18008
Totals		360		

Note: not all Wangati North and Wangati South samples were analysed.

Prospect	Date	No. of holes	Sample # start	Sample # end
One Tree Point (Bathurst South)	Feb 2007	81	18283	18363
Totals		81		

All digital data has been previously provided to the department by Matilda Minerals. Reports presented by S. Milner (2007) contain details of exploration for many areas prior to 2007.

7.0 EXPLORATION

No geological activity was conducted on the tenement. The activity has been related to rehabilitation included weed spraying at Andranangoo, closure plan review and submission. The mine closure plan submitted to the DPIR in October 2018 has been accepted and application for Certificate of Closure actioned.

8.0 DISCUSSION & RECOMMENDATIONS

ML24511, along with the remaining MZI Tiwi Island tenements are subject to purchase by Tiwi Resources Pty Ltd, the commercial arm of the Tiwi Land Council.

It is unknown at the time of preparation of this report whether Tiwi Island Resources Pty Ltd intends to conduct any exploration or mining activity within ML24511.

9.0 REFERENCES

- Baxter, J. L., & Coxhell, S. (2009). *Tiwi Island Review Resource Report* [Report]. Matilda Zircon Ltd.
- Hughes, R. J. (1977). *The geology and mineral occurrences of Bathurst Island, Cobourg Peninsula Northern Territory*. Canberra: AGPS.
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