

2014 Group Technical Report GR-148/13 (EL10182, EL24524, EL27249)

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Brief Description:	Annual Group Technical Report (GR-148/13) for activities by GEMCO on Exploration Licences EL10182, EL24524 and EL27249 for the reporting period.

EXECUTIVE SUMMARY

East Arnhem Land is Aboriginal-owned land, as granted under the *Aboriginal Land Rights (NT) Act 1976 (ALRA)*. The Groote Eylandt Mining Company Pty Ltd (GEMCO) has its obligations defined in various lease documents. During the reporting period, GEMCO focused on EL24524 where 39 Aircore holes were drilled for 1,803m. A total of 461 samples were collected for analysis. In addition, GEMCO drilled two stratigraphic diamond holes for 86.4m from which 10 biostratigraphic samples were collected. All results have been analysed and have been incorporated into a preliminary model.

Titleholder	Groote Eylandt Mining Company Pty Ltd (GEMCO)
Operator (if different from above)	
Tenement Manager/Agent	Manganese Australia
Titles/Tenements	EL10182, EL24524, EL27249
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1.0 Introduction

The Exploration Licences (EL) 10182 and 24524 were applied for respectively by the Groote Eylandt Mining Company Pty Ltd (GEMCO) on 2 September 1998; and BHP Billiton Minerals Pty Ltd (BHPB) on 17 December 2004. These applications are located within Aboriginal Freehold Land and consequently were lodged under the Aboriginal Land Rights (NT) Act 1976 (ALRA). Although the original applications covered much larger areas, the Northern Land Council (NLC) gave consent only to only parts of the applications. As a result, three new ELs were established to cover the non-contiguous consent areas and ten new EL applications to cover the non-contiguous non-consent areas.

Five ELs, viz 10182, 24524, 27216, 27217 and 27249, which together are referred to as the 'East Arnhem Land Project' were granted. Combined technical reporting on these ELs was also granted on 23 February 2010. Since this time, EL27216 and 27217 have been fully surrendered.

Rio Tinto Exploration Pty Ltd (RTX) has a joint venture agreement with GEMCO on EL10182 and EL27249 that gives them the right to explore for bauxite. BHPB also has a joint venture agreement with RTX to explore for manganese on EL4171 that adjoins EL24524.

GEMCO took over the operation of this project from BHP Billiton Minerals Exploration (MinEx) in January 2012.

The location of the leases are shown in Figure 1.

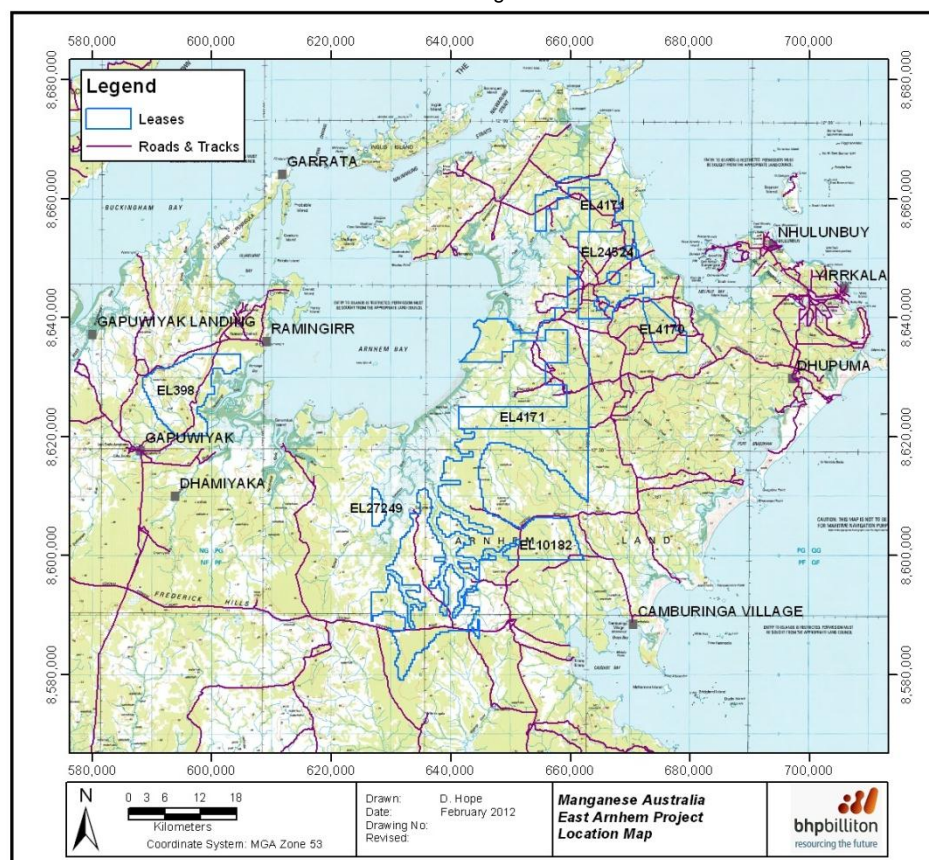


Figure 1 – Location

2.0 Tenure

2.1 Land Status

Aboriginal Freehold Land – Northern Land Council (NLC).

2.2 Tenements Involved

Table 1 below lists the details of the tenement covered by the group technical report

EL No	Holder	Application Date	Grant Date	Expiry Date	No of Blocks	Area (km ²)
EL10182	GEMCO	2-Sep-1998	20-Apr-2009	19-Apr-2015	222	517.84
EL27249	GEMCO	2-Sep-1998	20-Apr-2009	19-Apr-2015	6	10.89
EL24524	BHPB	17-Dec-2004	20-Apr-2009	19-Apr-2015	48	141.70

Table 1 - Tenement details

3.0 Previous exploration

3.1 Historic

Previous exploration over this area is described in Report 13 of the Northern Territory Geological Survey (Ferenczi, 2001).

In the mid 1960's, BHPB (then BHP Ltd) explored parts of the eastern Arnhem Land area for sedimentary-diagenetic Mn after the discovery of the Groote Eylandt deposit. A variety of exploration campaigns were completed by BHPB in the 1960's, including helicopter reconnaissance work, regional mapping, pitting and regional drilling at some prospects (e.g. Caledon Bay, Peter John River, Lake Evella).

The Peter John River prospect extends over an area of about 10 sq km straddling EL24524 (BHPB 100%) and EL4171 (RTX). In 1965, a total of 33 exploration pits were dug. Subsequently 11 holes were drilled to various depths to test the Mn potential. However no significant Mn mineralisation was found at this prospect and was not pursued further.

The Caledon Bay prospect is located on the south-east, but outside of EL10182. Scattered outcrops of Mn laterite and sandy lump Mn were recognised in 1963 over a significant area. Initial samples returned up to 49.4% Mn. In 1964, a significant campaign was carried out to evaluate this prospect. A total of 13 pits were sunk, which revealed a Mn-horizon up to 2m thick at various depths from the surface. The mineralisation is hosted in Cretaceous-aged Mullaman Beds lying unconformably on Pre-Cambrian granites. A follow up drilling programme was undertaken in 1966 and several widely spaced percussion holes were drilled. Although sandy Mn was intersected in many holes, the mineralisation was considered uneconomic.

3.2 Recent work

3.2.1 Drilling

Between July and September 2009, BHPB completed a drilling program in EL24524 and some reconnaissance traversing on EL10182. The programme in EL24524 involved the drilling of 27 shallow Reverse Circulation (RC) holes and establishment of access tracks (~ 27 km) to reach the drill sites. The drilling concluded in August 2009 and all the drill sites and access tracks were rehabilitated in the following month prior to closure of the field camp and withdrawal from the project site.

A second drilling program was completed by BHPB between July and November 2010 with work focused on EL10182. Although drillholes were planned on both EL27249 and EL398, concerns were raised by the Traditional Owners (TOs) during the heritage survey. Consequently, the proposed drilling on these leases was not conducted.

During 2010 field season, a total of 58 drill sites and approximately 73 km of access tracks were cleared on EL10182 in preparation for the drilling program. However, drilling at only 12 sites were completed in 2010 due to a series of major rig breakdowns and the early onset of the wet season. The 12 completed drill sites were rehabilitated however, the remainder of the drill pads and all the access tracks were left open with only the entrances blocked off from the Central Arnhem Road.

The drilling indicated the presence of thin and discontinuous intervals of elevated Mn values (mainly in sandy horizons) in only four holes within EL10182. The best interval contained 21.5% Mn over 1.0m starting from 12.5 metres in EARC207.

Due to a shift in exploration focus by BHP Billiton, MinEx did not conduct any exploration on the East Arnhem Project during the 2011 dry season.

During the 2012 drill season (August to December), the remainder of the planned holes on EL10182 were completed. Additionally 60km of track was re-established in order to access and drill the remaining 46 holes. A further four diamond core (DC) holes were drilled in order to enable the construction of a stratigraphic model of the area.

Three Diamond drillholes were also drilled on EL24524, again to establish stratigraphic control in the area. The holes were planned along the existing Mata Mata Road requiring only drill pad construction.

3.2.2 Biostratigraphic age dating

Twenty biostratigraphic samples were submitted for foraminifera and dinoflagellates/spores-pollens analysis.

Based on the foraminifera content, most of the samples were placed within the Eomarrsonella Crespinae Zone and assigned a mid to late Albian age. The foraminifera are considered as part of the Ammobaculites Association which occurs in variably brackish / estuarine water as part of enclosed seaways.

The palynological analysis identified only fifteen samples with only fair preservation of palynomorphs and low to moderate yields. These were all placed within the Endoceratium ludbrookie dinocyst Zone and assigned a Late Albian age. The productive samples are interpreted to have been deposited in a shallow-marine, near-shore setting.

3.2.3 Mineralogical studies

Six samples with visible Mn mineralisation were also collected for mineralogical studies. Four represent the selected chips gathered from the drill samples and two were selected from an outcrop. The mineralogical studies were conducted by X-ray diffraction and microscopic examination of polished thin sections. Only one sample representing the drill interval 31-31.5m in EARC203 was found to contain some pisolitic Mn-oxide (cryptomelane and pyrolusite)

4.0 Exploration activities

4.1 Drilling

During the 2013 field season, GEMCO returned to the Peter John River target after biostratigraphic and stratigraphic studies found that Manganese genesis in the area was likely different in origin. Renewed focus on an alternate exploration model resulted in additional holes being drilled in the Peter John River target area (EL24524). A total of 39 Aircore holes for 1803m was drilled from which 461 samples were collected for analysis. Samples were submitted for either 'whole rock geochemistry' (WR) or 'Heavy Liquid Separation' (HLS) at SG's of 3 and 3.3 gm³. The HLS sample protocol was designed to remove free silica from samples before chemical analysis. Results indicated that a deep chemical weathering profile where Fe Oxides are prevalent affects most of the target horizon. Some grades at very low yields are preserved in areas of deeper cover. An additional two diamond holes were drilled to support the stratigraphic model. Figure 2 shows the location of holes and manganese results at the 3.3 gm³ separation.

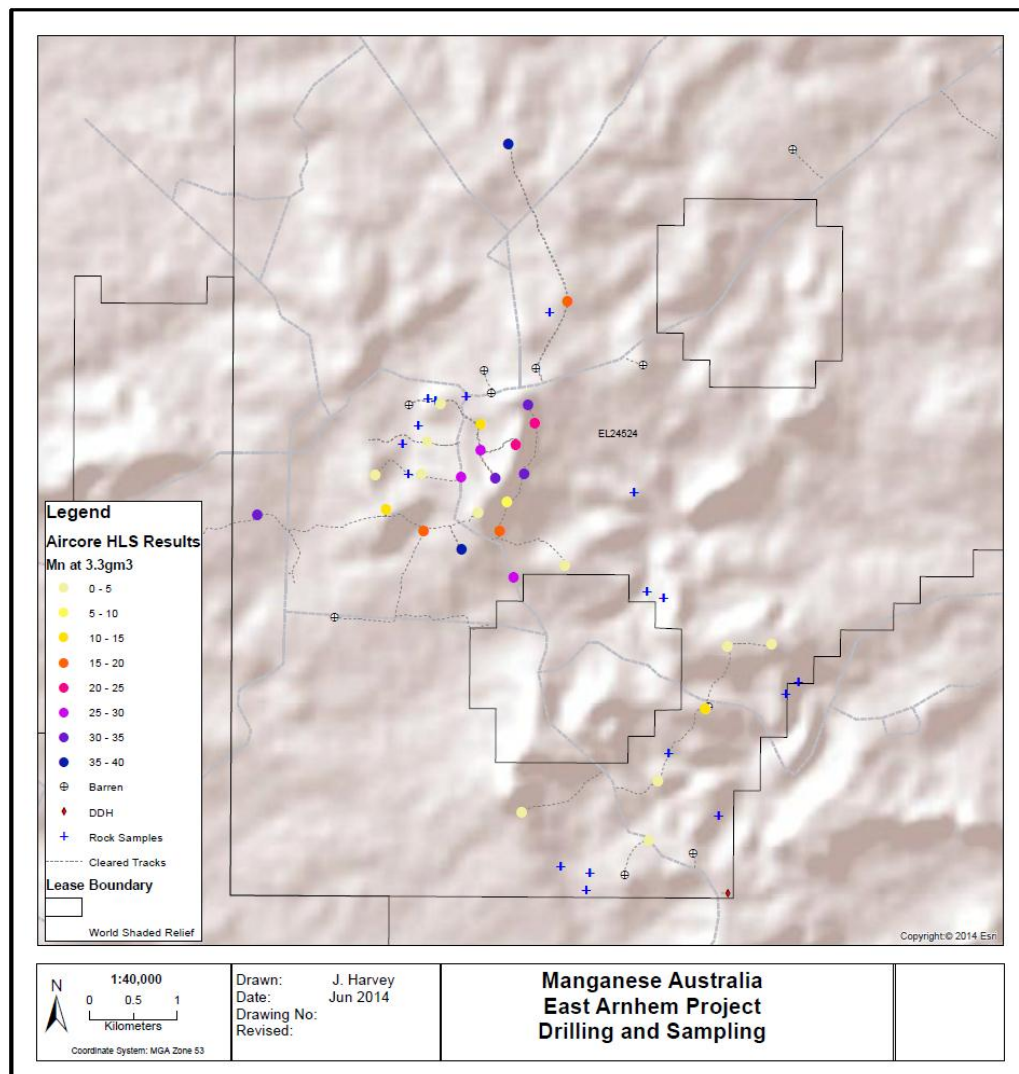


Figure 2 – HLS Drilling Results and Hand Sample Locations

One hole was planned on EL27249 however due to the remote location of the hole; access would only have been possible by clearing 10km of track. This hole was therefore deferred until more information is available in the area.

No further on-ground work was conducted on EL10182, however analysis of available data continued as part of the development of a regional exploration model.

Drilling results are included in Appendix A.

EL24524		
	Holes	Metres
AC	39	1803
Diamond	2	86.4

Table 2 - Drilling details

In preparation for the field season GEMCO undertook construction of a remote field camp and provision of medical services to support field program.

4.2 Mapping and Sampling

GEMCO continued extensive field mapping targeting outcropping units of interest. 20 hand specimens were collected for mineralogical and HLS analysis. Petrographic results showed the presence of Mn oxide mineralogy (pyrolusite and cryptomelane) identified in additional samples, however an abundance of Fe oxide mineralogy (goethite and limonite) indicated the large extent of tropical weathering in the area. As with the drill samples, HLS samples were crushed to 20um and separated at densities of 3 and 3.3 gm³. Manganese grades were generally low however a small amount of samples returned grades of >30% Mn at higher SG cutoffs. Sampling results are included in Appendix A.

4.3 Biostratigraphy

As part of the basin analysis work GEMCO continued with biostratigraphic sampling. A total of 10 samples were collected however all samples were deemed to be too oxidised to preserve any biostratigraphic information.

5.0 Future work program

Lack of access to ground in the region has resulted in GEMCO decreasing its planned activity substantially in the area for the upcoming field season. All remaining planned holes in the area will be deferred until it makes economic sense to mobilise equipment to conduct the works. Planned activity for the next 12-18 months will involve:

- Rehabilitation of all remaining disturbance in EL24524
- Continuing geological field mapping and sampling in all leases
- Continued analysis of results
- Compilation of an updated geological model
- Development of an exploration prospectivity model for the region.

6.0 Conclusions and recommendations

GEMCO's long term plan for exploration in the area is currently hampered by access to land currently under application and in moratorium. Once drilling re-commences in the area, further work may be carried out on EL27249, however the high costs of mobilisation of equipment does not warrant the drilling of residual holes in the area. Low level activities will continue until further ground is available.