EBONY IRON PTY LTD
FINAL REPORT
EXPLORATION LICENCE 27026

REPORTING PERIOD
3 September 2009 – 20 November 2013

1:100 000 Mapsheets
5865 Tanumbirini, 5864 October, 5964 OT Downs

1:250 000 Mapsheets
SE5302 Tanumbirini, SE5303 Bauhinia Downs

Commodity
Iron Ore
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Abstract:

EL 27026 was applied for and granted to FSL World Holdings Pty Ltd. EL 27026 was transferred to Fertoz Pty Ltd in January 2011. The area was considered to be prospective for phosphate and iron ore mineralisation. Fertoz Pty Ltd engaged Terra Search Pty Ltd to undertake a review, to identify the areas likely to be prospective for Iron Ore, with the intention of relinquishing the non-prospective regions at the end of the third year. Terra Search recommended further investigation of 19 subblocks at Tanumbirini because of a magnetic anomaly. They however concluded that the depth of Cretaceous sediments makes the chances of developing an economic phosphate or iron ore deposit unlikely on the remainder of the tenement. Fertoz then sold the tenement to Ebony Iron Pty Ltd with the transfer registered in August 2013. Ebony Iron did not commence any works on this Exploration Licence due to the change of focus of their parent UK based company, Strategic Minerals NL and the raising of funds. Exploration Licence 27026 ceased on 20 November 2013.

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1. LOCATION

EL 27026 is located 130km to the east of the Stuart Highway, along the Carpentaria Highway, some 580km to the south of Darwin. It is located within the 1:250K Mapsheets SE5302 Tanumbirini and SE5303 Bauhinia Downs, and the 1:100K Mapsheets 5864 October, 5964 OT Downs and 5865 Tanumbirini. The tenement is located between 16o 10’S to 16o 46’S and 134o 30’E to 135o 05’E.

![Location Map of EL 27026](image)

Figure 1. EL 27026 Location Map
2. **TITLE HISTORY**

**Mineral Tenure**

Exploration Licence 27026 was granted to FSL World Holdings on 3rd of September 2009 for a period of 6 years, expiring on 2nd September 2015. The area applied for covered an area of 497 graticular blocks and is located on the eastern extents of the Carpentaria Basin. This Licence area is located within the Tanumbirini and Bauhinia Downs 1:250 000 Mapsheets.

Fertoz Ltd purchased the licence in late October 2010. The transfer was registered with the Department of Mines and Energy on 11 January 2011. Fertoz then sold the iron ore rights to Ebony Iron Pty Ltd in 2011 and reached an agreement to transfer the tenement and the responsibility for ongoing exploration in January 2012 to Ebony Iron Pty Ltd. This transfer was registered with the Department of Mines and Energy on 26 August 2013. At the third anniversary of the Licence (September 2012) Fertoz voluntarily reduced the area to 19 graticular blocks on the recommendation from Terra Search that the relinquished area was non-prospective for iron ore. Since the transfer to Ebony Iron no work has been undertaken with the title ceasing on the 20 November 2013.

**Real Property**

The licence is located within PPL 1059 “Beetaloo Station” which is owned by Yarabala Pty Ltd (Beetaloo Station, Elliott NT 0862), PPL 1046 “Broadmere Station” which is owned by the Carwoola Pastoral Co Pty Ltd (Suite 4 38 Macquarie St, Sydney NSW 2000) and PPL 1060 “Tanumbirini Station” which is owned by Baldy Bay Pty Ltd (PMB 15 Halls Creek, WA 6670).

**Other Stakeholders**

Other stakeholders in the licence area consist of the Alawa peoples who own Cox River Station to the north, and the Wampaya peoples who own Anthony Lagoon Station to the south.
Figure 2. Real Property Tenure
3. PHYSIOGRAPHY

i. Geomorphology

The outcrop geology of EL 27026 consists of Cretaceous sediments of the Carpentaria Basin which are overlain by Cainozoic black clay rich soils. The Cretaceous sediments consist of mudstones and shales. The area to the north of the Tanumbirini Homestead, (which is located on the Cretaceous cover overlooking the eroded cover to the north), consists of rolling plains and hills that contain the eroded remnants of the Cretaceous claystones to varying degrees through which the Proterozoic sandstones, siltstones and limestones are occasionally exposed.

ii. Biogeography

The vegetation of the licence area varies between open treeless black soil plains to heavily wooded lancewood and bulwaddy forests.

iii. Hydrology

The long term average rainfall is around 850 mm and is summer dominant which significantly influences the total hydrological system. The difference between seasons is pronounced, with high rainfall up to 600 mm/month in the wet season, and negligible rainfall in the dry season. Canopy interception significantly reduces the amount of effective rainfall because of the native vegetation cover in the catchment. Evaporation exceeds rainfall the majority of the year. Due to elevated evaporation and high temperature in the tropics, at least 600 mm of annual rainfall is required to generate potential recharge. As the dry season progresses, surface runoff depletes, and groundwater becomes the main component of stream flow. This is due to the groundwater and spring discharge from the highly permeable Tindall Limestone and tufa aquifers.
4. ACCESS

Access to the general area from Darwin is via the Stuart Highway southwards to the Hi-Way Inn, (some 10km to the east of Daly Waters), thence approx 130km to the east along the Carpentaria Highway which traverses the licence. The Tanumbirini homestead is located near the central part of the licence and the OT homestead is located to the east of the licence. As with all cattle stations, roads, tracks and fencelines generally reach their highest density in these areas (near homesteads) and so make traversing the licence areas relatively easy. In the case of EL 27026 the Carpentaria Highway also traverses the licence and so gives an excellent starting point for field operations. The OT Downs homestead and station is run as an outstation of Beetaloo Station and is only occupied for part of the year, (during mustering operations).

Figure 3. EL 27026 Access
5. **Geological Setting**

The youngest rocks in the licence area are the sandstones, mudstones and limestones of the Carpentaria Basin. This basin has an age of between 205 and 65Ma. It unconformably overlies the sedimentary rocks of the MacArthur and Georgina Basins.

i. **Regional Geology**

In the licence area the Cretaceous shales and mudstones form an opaque cover which effectively masks the underlying basinal contact between the Carpentaria, and probably the Georgina, and McArthur basins. The outcropping Roper Group is underlain by the Tawallah Group which in turn is underlain by the Nathan Group to the west of the EL. These Mesoproterozoic groups mark the western extent of the McArthur Basin. For our search for phosphorite we need to be concentrating on the Cambrian Top Springs limestone which probably represents the equivalent of the Tindal limestone in the Daly Basin and Wonarah Formation in the Georgina Basin.

![Figure 4. Regional Geology](image)
Figure 5. Stratigraphy

- Top Springs Limestone
- Antrim Plateau Volcanics
- Bukalara Sandstone
- Hayfield Mudstone
- Jamison Sandstone
- Kyalla Formation
- Moroak Sandstone
- Velkerri Formation
- Bessie Creek Sandstone
- Corcoran Formation
- Abner Sandstone
- 1100–1280 Ma dolerite
- Crawford Formation
- Mainoru Formation
- Limmen Sandstone
ii. Licence Geology

The outcrop geology of EL 27026 consists of Cretaceous sediments of the Carpentaria Basin which are overlain by Tertiary laterite soils. In the areas to the north of the escarpments as shown on the map below the Cretaceous claystones are eroded away to varying degrees exposing the underlying Proterozoic rocks. These consist of sandstones, siltstones and limestones, generally having varying dips indicating an angular unconformity at the base of the Cretaceous.

Crossing the northeast corner of the licence is a northwest plunging syncline that contains Roper Group sediments and this site adjacent to the western side of the Tanumbirini Dome a large scale antiform to the east of the licence area.

Figure 6. Licence Geology
6. EXPLORATION AND MINING HISTORY

Exploration

In the early 1980s Western Mining explored the area of outcropping Proterozoic geology to the east of the licence area for stratiform copper and fault-associated stratiform lead-zinc deposits, (the Mallapunyah Fault play). They mainly concentrated on the Tanumbirini Dome, a southeast plunging antiform located in the eastern edge of EL 27026 and to the northeast of this licence. They used geological, geochemical and geophysical exploration techniques with negative results. From this date the exploration has been aimed towards diamonds as part of each of the major diamond explorers have continued their search across the Australian landscape.

CRA Exploration were the first of the diamond explorers in the area in 1984, there efforts led to the discovery of 1 microdiamond in the licence area. Follow up of this result by loam sampling produced generally negative results. This sample has tantalised subsequent explorers and the source has not been located as yet. Other diamond explorers in the area have been Aberfoyle Exploration as part of the ADE Joint Venture with Ashton Mining. Helix Resources on their own, and Ashton Mining for the ADE JV from 1993 to 1996.

Late stage explorers were Astro Diamonds (Legend International) and De Beers. It seems that De Beers had 2 strategies, one was to lead the pack as Stockdale in the 1980s and 90s, and the second was to come along as de Beers in the 2000s and re-evaluate everyone else’s work.
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Table1. Historical Exploration Reports
Figure 7. Historical Exploration Licences
7. EXPLORATION RATIONALE

It has been demonstrated that phosphorite deposits are usually to be found in restricted basin margins and may exhibit a subtle radiometric signature associated with the replacement of Ca in the phosphate lattice by Uranium. Palaeogeographic basin margins, or basin shorelines in the Cambrian represent the primary targets. These will be masked by the Cretaceous sediments of the Carpentaria Basin so aeromagnetics will be used to define the basin margin, which is our exploration “fairway”. The picture below shows that this exploration licence is still in the area seen as being prospective for phosphate exploration by the geologists of the Northern Territory Geological Survey.

Figure 8. Georgina Basin phosphate prospectivity (Dunster JN, Kruse PD, et al.)
Iron – Iron exploration would be carried out in those areas of Proterozoic outcrop seeking outcrops of the Sherwin Iron Formation. A subtle magnetic signature may be the geophysical signature if there is one and this may help to see through the outcropping cretaceous sediments. The licence may be considered to be prospective for the discovery of iron deposits as it is located approximately 13km along strike from the 75km long Roper Iron field.

The potential prospectivity for iron ore prompted Fertoz to sell the iron ore rights of to Ebony Iron Pty Ltd in 2011. Fertoz then reached agreement to transfer the tenements and the responsibility for ongoing exploration to Ebony Iron in January 2012.

8. **EXPLORATION INDEX MAP**

No exploration index map has been constructed for EL27026.

9. **GEOLOGICAL ACTIVITIES**

**Office Studies**

Terra Search have reviewed the data sets available for EL27026 and the surrounding area on the basis of aeromagnetics, airborne radiometrics, Google Earth satellite imagery, geology, gravity and water bore drill results.

EL 27026 is largely underlain by very subdued low relief aeromagnetics indicating thick Cretaceous and Cambrian cover over low magnetic Proterozoic basement. There is however a single point magnetic low at Tanumbirini which may be a aermag survey artefact or could be a strong magnetic low similar to a pipe like body. This area is of interest and needs further investigation. Subblocks surrounding the promontory of high magnetic basement in the central west of the tenement probably correspond to magnetic flows surrounding Proterozoic basement highs. This is potentially an environment for phosphate accumulation in a similar fashion to the Wonarah deposit in the Barkly area. There may be a possibility of Roper Group being present under cover towards the south east section of EL 27026. However economic potential would appear low as the depth to basement appears in the order of 100m on the basis of waterbore data. Any accumulation of bulk commodities such as phosphate or iron are almost certainly too deep to be economic. Given this lack of encouragement, most of EL27026 is recommended for relinquishment by Terra Search.

**Field Studies**

No field work was done on Exploration Licence 27026.
10. REMOTE SENSING

There were no remote sensing surveys done during the year. Included below is an image taken from the Department of Mines and Energy Strike dataset, Landsat 741.

Figure 9. Landsat Photography
11. GEOPHYSICAL ACTIVITIES

There were no geophysical activities conducted on EL 27026.

Radiometrics
There have been no radiometric surveys conducted.
Included below is an image taken from the Department of Mines and Energy Strike dataset, Ternary Radiometrics.

Figure 10. Radiometrics
Magnetics

There were no Magnetic surveys done. Included below is an image taken from the Department of Mines and Energy Strike dataset, Magnetics TMI.

![Magnetics Map](image)

Figure 11. Magnetics
12. **SURFACE GEOCHEMISTRY**

No soil and rock chip sampling programme has been carried out on EL27026.

13. **DRILLING**

No drilling was undertaken on Exploration Licence 27026.

14. **GEOTECHNICAL STUDIES**

Geotechnical studies conducted consisted of a literature survey and data collection study covering the whole of the Roper Project area.

15. **RESOURCE AND RESERVE ESTIMATION**

There were no resource or reserve estimations done.

16. **CONCLUSIONS AND RECOMMENDATIONS**

The exploration work done to date has not successfully explored EL 27026 for the presence of phosphate mineralisation. The tenement appears to be more prospective for iron ore than phosphate due to their proximity to the Sherwin Iron deposits. Terra Search concluded that any phosphate or iron deposits would be too deep to be economic, therefore it was agreed that Exploration Licence 27026 cease.

17. **REFERENCES**

**Open File Company Reports**


Western Mining Corporation, (1982), Terminal Report for Adjoining ELs, EL 2715 - Lanson Creek, EL 3123 – Crooked Creek and EL 3243 – Tanumbirini Creek, Western McArthur Basin, western Mining Corporation unpublished company report, CR1982-0232.


**Published Reports**


Khan M, Ferenczi PA, *et al*, (2007), Phosphate testing of waterbores and diamond drillcore in the Georgina, Wiso and Daly Basins, Northern Territory, Northern Territory Geological Survey


**Company Reports**

Jettner WA, (2010), Annual
