# 2012

# Annual Report GR263 EL 26054, EL 26055 Period: 5/09/2011 to 4/09/2012 Barkly Region, Northern Territory

Fertoz Ltd

40 Balgowlah St Wakerley QLD 4154

# **Barkly Project**

1:100 000 Mapsheets: 6058 Dalmore, 6158 Wonarah, 6258 Ranken 1:250 000 Mapsheets: SE5315 Alroy, SE5316 Ranken, SF5303 Frew River, SF5304 Avon Downs

Commodity: Phosphate

L Szonyi PhD B.E. (Chem.) Fertoz Ltd November 2012



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## Abstract

EL 26054 and EL 26055 form part of the Barkly Project which consists of ten granted exploration licences covering an area of 4,714 km<sup>2</sup> in the Wonarah area of the Northern Territory (Figure 2). The area is considered to be prospective for phosphate mineralisation and is adjacent to Minemaker's discovery of phosphate at Wonarah.

Early in 2012 the Mine Management Plan was approved and a bond of \$34,000 lodged with the Government. The plan was later withdrawn due to a change of Operator. Terra Search were then engaged to review the proposed drill programme. They conducted an advanced desktop study including a review of open file geophysical datasets (i.e. radiometrics, magnetics), review of GIS data (historic phosphate occurrences) with the aim of identifying prospective stratigraphy and structural elements that may be favourable for accumulation of phosphate.

Six areas were identified prospective for phosphate, of which three are considered high priority to drill in 2013.

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## 1. LOCATION

The licences EL 26054 and EL 26055 are located 290km east of Tennant Creek along the Barkly Highway. They are located within the 1:250K Mapsheets SE5315 Alroy, SE5316 Rankin, SF5303 Frew River, SF5304 Avon Downs and the 1:100K Mapsheets 6058 Dalmore, 6158 Wonarah and 6258 Ranken. The tenements are located between 19° 31'S to 19° 59'S and 135° 54'E to 136° 39'E.

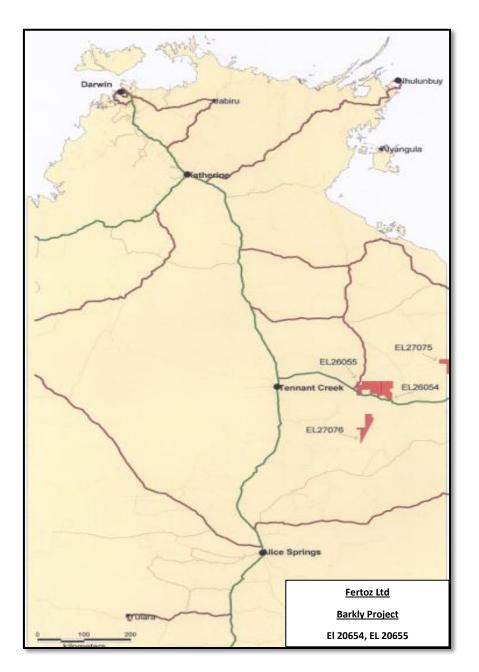


Figure 1. Location Map

# 2. <u>TITLE HISTORY</u>

#### Mineral Tenure

Exploration Licences 26054 and 26055 were granted to FSL World Holdings on 5<sup>th</sup> of September 2008 for a period of 6 years, expiring on 4<sup>th</sup> September 2014.

Fertoz Pty Ltd purchased the licences in late October 2010.

The exploration licences consisted of a total of 825 graticular blocks (2,644 km<sup>2</sup>) made up as follows EL 26054, 1,054 km<sup>2</sup> and EL26055, 1,590 km<sup>2</sup>.

EL 26054 and EL 26055 form part of the Barkly Project which consists of ten granted exploration licences (also EL 27075, EL27076, EL 29193 – EL 29198) covering an area of 1,476 graticular blocks (4,713.5 km<sup>2</sup>). It will reduce to 773 graticular blocks (2,481 km<sup>2</sup>) after relinquishment of EL 27075 and reductions to EL 26054 and EL 26055.

This technical report is the Fourth Annual Report and covers activities in the period 3/09/2011 to 2/09/2012, being the fourth year of tenure. A mandatory 50% reduction in area is due at the end of the fourth year.

#### Real Property

The licences are located within PPL 914 "West Ranken Station" which is owned by the North Australian Pastoral Company Pty Ltd, (c/ Alexandria Station, Barkly Tableland District, NT) and PPL988 "Dalmore Downs Station" which is owned by the Baldy Bay Pty Ltd as trustee for the Long Yard Trust, (PMB 15 Halls Creek, WA).

#### Other Stakeholders

Other stakeholders in the licence area consist of the Wunara peoples who are the identified traditional owners of this area. They are located to the south of EL 26054 and EL 26055 on a large freehold landholding.

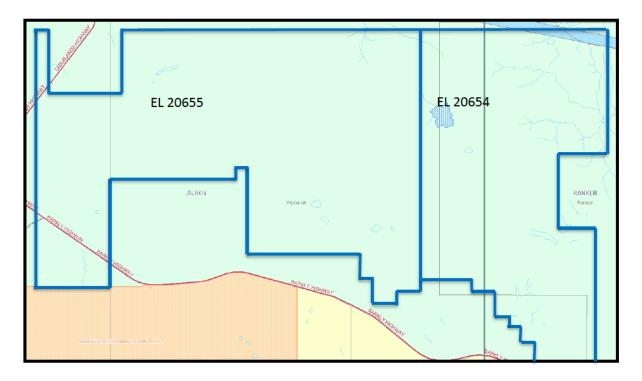


Figure 2. Real Property Tenure

## 3. <u>PHYSIOGRAPHY</u>

#### i. Geomorphology

The landform is generally flat, open grassland with only a few scattered trees and shrubs in the northern part of the licence. There is very little out crop in the area. Occasionally there are patches of loose, wind polished cobbles but mostly the area is desiccated black soil.

#### ii. Biogeography

The typical physiography is very open woodland typical of the Barkly Tableland but fire management has allowed mid level populations of acacia species to become established in areas that were historically open eucalypt woodlands.

#### iii. Hydrology

The absence of hills in the area indicates that rainfall runoff during the wet season is via broad sheet wash and shallowly incised creeks. There is no permanent surface water in the exploration area.

## 4. <u>ACCESS</u>

EL 26054 and EL 26055 are located adjacent and to the north of the sealed Barkly Highway, the main road access from the Northern Territory to the east coast of Australia. Rail access is north-south along the Darwin to Adelaide railway, located some 280km to the west near Tennant Creek, or to the east coast via the Mt Isa to Townsville railway which is located approximately 400km to the east at Mt Isa, Queensland.

The licences are located 290km east of Tennant Creek along the Barkly Highway, the closest roadhouse/accommodation/fuel depot is the Barkly Homestead, a substantial roadhouse located some 65km to the west of EL 26055.

Access throughout the licence is via station fences and access roads, usually connecting bores. As the licence covers portions of 2 adjacent stations the infrastructure is generally not connected between the 2 properties.

Fourth Annual Report

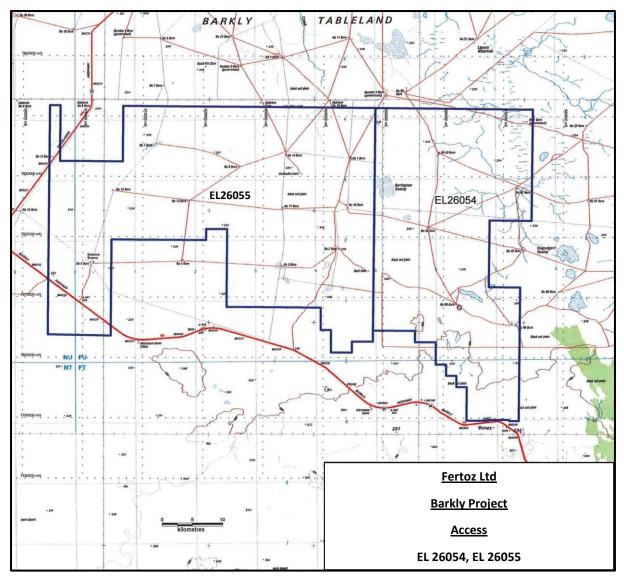


Figure 3. Access

## 5. <u>GEOLOGICAL SETTING</u>

The geology of the area consists of flatlying Cambrian limestones and cherts overlying Proterozoic Volcanics on the Wonarah Basement high.

## i. Regional Geology

The South Nicholson Group is the oldest exposed unit in the region and constitutes the regional basement for the Georgina Basin. It is correlated with the Roper Group of the MacArthur Basin.

Rawlins, et al subdivided this group into the Wild Cow and overlying Accident subgroups. The Accident subgroup consists of the Mittiebah Sandstone and can be either conformable or disconformable with the Wild Cow Subgroup and has an uncertain but probably lateral relationship with the Constance Sandstone and is possibly conformably overlain by the Mullera Formation, these latter two units are also constituents of the Accident Subgroup.

On the Alexandria-Wonarah basement high the basement is represented by the Helen springs Volcanics, an extrusive volcanic of basaltic affinity. In this location, the absence of the Thorntonia Limestone and overlying Arthur Creek Formation has the basal unit of the Wonarah Formation, (which contains the phosphorite) resting directly on the volcanic basement, (Helen Springs Volcanics).

To the west into the Barkly sub-basin the Wonarah Formation laterally correlates with the Anthony Lagoon Beds. From the basement high to the west the Gum Ridge Formation may correlate with the basal Wonarah Formation. The Wonarah Formation is overlain by the Camooweal Dolostone as it dives below the surface in the Undilla sub-basin.

Arrinthrunga Formation (Eua) 975 m	Dolostone, limestone; minor quartz sandstone, siltstone, shale	Peritidal, restricted shallow subtidal marine	Conformable on €md, €ma	Stromatolites, thrombolites, nodular evaporites, gypsum crystals, fenestrae	
Camooweal Dolostone (€md) 167+ m, ?300 m	Dolostone; minor marl and quartz sandstone; basal intraclast, ooid and oncoid dolostone and quartz sandstone	Basal high-energy peritidal to shallow subtidal barrier, passing upward into restricted to epeiric back- barrier	Conformable on Emk, Emw, Currant Bush Limestone	Spheroidal chert concretions, cross-beds, flat-pebble conglomerate, planar to crinkly or wavy microbial lamination, stromatolites	
<b>Ranken Limestone</b> (Emk) 74+ m	Bioclast, bioclast-ooid and bioclast-intraclast rudstone, bioclast wackc/floatstone; minor calcimudstone	Marine ramp seaward of high-energy shallow subtidal barrier	Conformable on Cmw	Red-brown silicification, abundant fossils	
Wonarah Formation (Emw) 191+ m	Silty dolostone, calci/ dolomudstone and siliciclastic mudstone interbeds, micaceous siltstone; minor intraclast and bioclast wacke- to grainstone; basal carbonaceous marly laminite	Subtidal marine	Disconformable on Emt; unconformable on Elh, Es	Planar to wavy siliciclastic laminations, siliceous chert concretions, phosphorite, evaporites, disseminated pyrite, fossils; minor detrital glauconite and biogenic phosclasts	
Arthur Creek Formation (Ema) 457 m	Upper: dolostone, limestone; lower: foetid pyritic- carbonaceous black shale, laminated dolostone	Upper: open to restricted subtidal marine; lower: deeper anoxic marine	Disconformable on Cmt; unconformable on Ps	Nodular evaporite, shredded to brecciated texture, fossils, disseminated pyrite	
Thorntonia Limestone (€mt) 121 m	Dolosparstone; minor bioclast and oncoid dolosparstone and intraclast dolowackestone to dolograinstone; basal dolomitic quartz sandstone and conglomerate	Subtidal marine	Unconformable on Es	Pervasive recrystallisation, carbonate concretions, nodular evaporite, silicified interbeds, disseminated pyrite, hydrocarbons	
Helen Springs Volcanics (€lh) 34 m	Basalt, trachyte, microdolerite; minor dolerite; basal pebbly mudstone, sandstone and conglomerate	Extrusive volcanic	Unconformable on Ps	Alteration, amygdales	
CALYMMIAN		•			
Mittiebah Sandstone (Psi) 2200+ m	Quartzose to sublithic sandstone; minor siltstone and conglomerate	Marine	Disconformable on Crow Formation	Medium to thick bedding, quartz granules and pebbles, ripples, mudclasts, crossbeds	

Table 1. Lithostratigraphy of the southern Georgina Basin

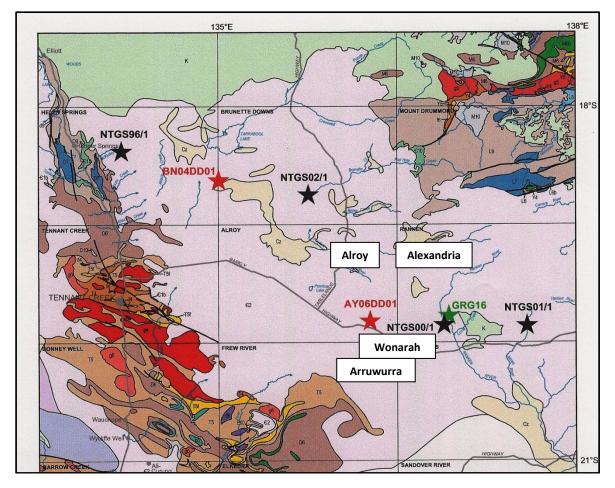


Figure 4. Regional Geology

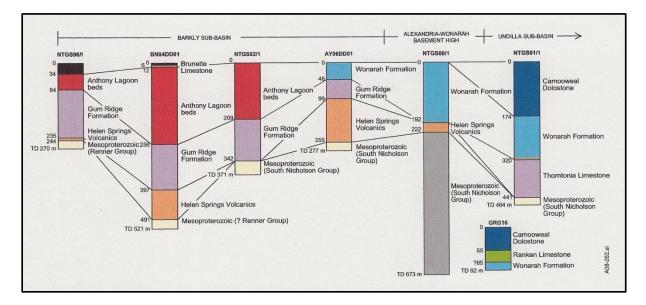


Figure 5. Regional Stratigraphy (Kruse PD and Radke BM)

i. Licence Geology

The geology of EL 26054 and EL 26055 consist of the sediments of the South Georgina Basin that are overlain by Cainozoic soils derived from the underlying geology.

The licence area covers the Alexandria-Wonarah Basement High, which separates the Undilla Subbasin which extends to the east into Queensland from the Barkly Sub-basin to the west. The presence of this basement high is extremely important as it represents a basin edge where the prospective Wonarah Formation outcrops. Structural highs are important during phospho-genesis as they possibly represent a shelf environment within a Cambrian sea; It is believed cold phosphate rich waters up-welled against the basin margin and hence deposited on this shelf surface. The proximity to the sealed Barkly Highway also adds to the prospectivity of the licence area.

The licences are located between NTGS Hole No AY06DD01 and NTGS00/1 and these holes provide an excellent stratigraphic section through the underlying geology.

This work indicates that the Cainozoic soils are 3-4m thick and overly the prospective Wonarah Formation in the licence area. The Wonarah deposit has been defined by previous explorers drilling to the southern boundary of ELs 26054 and 26055 and so provides immediate targets to the north of this drilling.

In the licence area the Wonarah Formation overlies the Gum Ridge Formation which overlies the Helen Springs Volcanics. The Gum Ridge Formation pinches out between the above mentioned drill holes and by drill hole No NTGS00/1 the Wonarah Formation overlies the Helen Springs Volcanics.

The Wonarah Formation outcrops directly to the south of the licence area and dives under the soil in the licence area. The depth of the horizon will be determined once a drilling program is undertaken.

The licences EL 26054 and EL 26055 are located at the eastern edge of the Georgina Basin and examination of figure 8 shows that deposits in general occur on the eastern and north-eastern margins in the component sub-basins of the Georgina Basin.

To the north of ELs 260054 and 26055, two phosphate deposits, Alroy (14Mt @  $20\%P_2O_5$ ) and Alexandria (15Mt @  $10\%P_2O_5$ ) in EL 25600, owned by Phosphate Australia, occur and to the south of the licence, Wonarah and Arruwurra (1258Mt @  $12\%P_2O_5$ ), SELs 26451, 26452 and ML27244, owned by Minemakers Ltd occurs.

Also to the north a gypsum deposit, 6 mile waterhole, (1Mm<sup>3</sup> of gypsum, MCCs 205-208 and MCCs 983-990), owned by Northern Cement occurs.

This would indicate that a shallow marine environment prevailed in the Cambrian that was conducive to the formation of both types of deposit. This was mainly due to glacial/interglacial periods where eustatic sea level change would dictate precipitation of phosphate rich substrates. These glacial periods brought about a reduction in sea level change making these intra-continental seas shallower and encouraging the settling of phosphate rich substances out of solution. With this in mind a secondary target will be gypsum deposits of the type located at 6 mile waterhole.

The early Cambrian extrusion of continental basalt and associated volcanic rocks of the Helen Springs Volcanics along an existing or newly forming Alexandria-Wonarah Basement High generated the oldest Georgina-Basin related rocks. In an initial regional marine transgression followed cessation of volcanism. A second marine transgression overtopped the high and deposited an extensive blanket of carbonate and siliciclastic sediments across the Undilla sub-basin during the remainder of the middle Cambrian. Phosphatic sediments were deposited on the basement high during the initial transgression, ((Kruse & Radke).

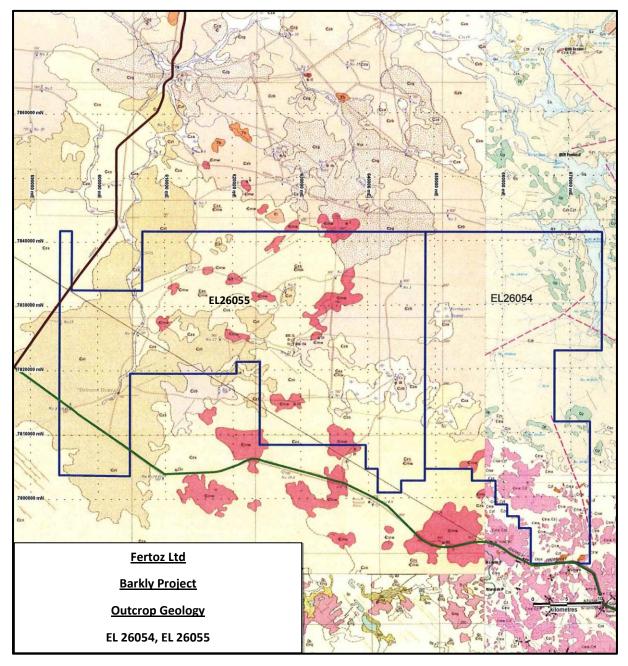


Figure 6. Outcrop Geology

# 6. EXPLORATION AND MINING HISTORY

Historical exploration in this area has been sparse. In recent years this area, as with large parts of the Northern Territory has had renewed exploration interest for bulk commodities due to the construction of the Darwin to Adelaide railway. The rail link with its ability to go both north and south has made a number of these deposits viable, including Wonarah Phosphate, Bootu Creek Manganese, Francis Creek Iron Ore and Nolans Bore Rare Earths.

The Wonarah Phosphate deposit was found By IMC Development Corporation in the late 1960s. The deposit was identified by regional mapping, geophysics and open hole drilling, which located ore grade phosphorite between 12 and 50m depth in 1967. This drilling program consisted of 294 no-cored holes, totalling 11,660m. Howard (1989) characterised the deposit as two successive phosphorite beds comprising phosphatic mudstone, silty mudstone and grainstone (of reworked mudstone clasts). Six partially cored holes were drilled in 1968 by BMR to elucidate the stratigraphic context of the deposits.

CRA flew a low level (80m) aeromagnetic survey over the area in 1983-84 aimed at defining the volcanic basement to the Wonarah phosphorite, this survey highlighted the potential of the then identified deposit. CRA terminated exploration activities due to low world phosphate prices and a lack of local infrastructure.

A RioTinto - AKD Limited joint venture explored for large tonnage phosphorite in the Wonarah area between 1999 and 2003, employing photo interpretation, geological mapping, rock chip sampling ground gravity surveys and also drilled 136 holes. An ore-grade (>15% P2O5) 'phosphorite horizon' was delineated almost directly overlying the Helen Springs Volcanics. Rio Tinto withdrew from the joint venture in late 2002, following a negative internal economic evaluation.

Cored drillholes NTGS00/1 and NTGS01/1 were included in a larger phosphate survey centred around the exposed Tennant Creek Region.

Stratigraphic drillholes were also drilled by the NTGS on both sides of EL 26054 and indicated that the Wonarah Formation outcrops in the licence area.

Minemakers Ltd acquired title to the Wonarah deposit in 2006.

Licence No	Tenure Period	Open File	Company
		<b>Company Reports</b>	
AP 1802	14/08/67 – 13/08/68	CR1968-0030	IMC Development
AP 2161	12/12/68 - ?	CR1968-0032	IMC Development
		CR1969-0022	IMC Development
		CR1970-0036	IMC Development
		CR1970-0038	IMC Development
		CR1970-0040	IMC Development
EL 1084	6/05/76 – 5/05/82	No reports	?
EL 22168	4/08/00 - 27/09/07	CR2003-0389	AKD Limited
EL 22979	18/09/02 - 21/07/03	CR2004-0044	De Beers Aust. Exploration
EL 22981	18/09/02 - 21/07/03	CR2004-0044	De Beers Aust. Exploration

#### EL 26054, EL26055

Table 2. Historical Exploration Reports

<u>Mining</u>

Table 3. Historical Mines and Prospects

Mine/Prospect	Modat	Mineral		
Name	Site Id	Field	Commodity	Orebody Type

There are no Department of Resources recorded historical mines or prospects within the licence area.

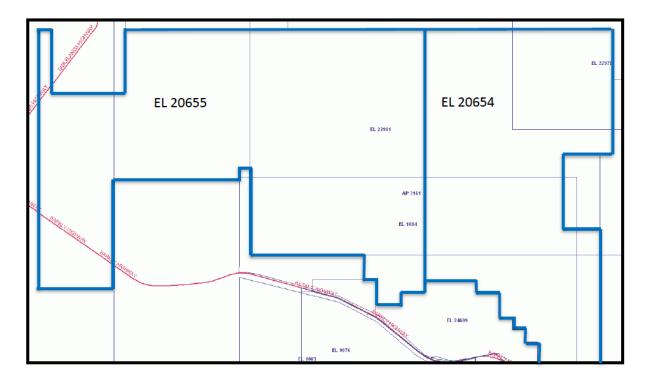


Figure 7. Historical Exploration Licences

## 7. <u>EXPLORATION RATIONALE</u>

Exploration models target organic-rich carbonate rocks on depositional basin margins and areas of onlap onto basement highs where upwelling and favourable palaeogeography would have bought cold phosphate-rich waters onto the shelf. These shallow eustatically low seas brought about a rise in Ph and a concentration of organics onto a shelf environment; facies that indicate such a progression shall be the key focus of the future search. Francolite formation takes place close to the sediment-water interface during times of low overall sedimentation and is intimately connected with the dynamics of diagenetic redox fronts, (Dunster, Kruse et al 2007).

The southern portion of the Georgina Basin contains several loci prospective for phosphorite deposition. Historical exploration work indicates that there are prospective targets within the Fertoz licences to the north of the Wonarah deposit.

Generally speaking the two exploration licences owned by Fertoz are highly prospective for phosphate development, being located between 3 phosphate deposits in a geological and structural environment that is conducive to phosphorite development.

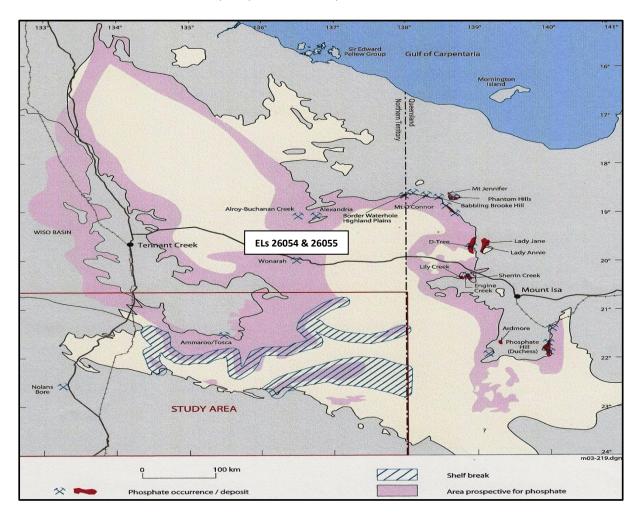


Figure 8. Georgina Basin phosphate prospectivity (Dunster JN, Kruse PD, et al.)

## 8. EXPLORATION INDEX MAP

No exploration index map has been constructed for EL 26054 or EL 26055.

## 9. <u>GEOLOGICAL ACTIVITIES</u>

#### **Office Studies**

Fertoz Ltd commissioned Terra Search to conduct an advanced desktop study including a review of open file geophysical datasets (i.e. radiometrics, magnetics), review of GIS data (historic phosphate occurrences) with the aim of identifying prospective stratigraphy and structural elements that may be favourable for accumulation of phosphate.

There were four aspects to Terra Search's work program .

- Review of water bore data and chemical analysis on relevant drill chips.
- Incorporate historical exploration drill holes, water bore geological and chemical data into a review of stratigraphy within the Wonarah Group of tenements and production of lithostratigraphic cross-sections over the area, particularly identifying phosphatic horizons.
- Assessment and reprocessing and reimaging of geophysical data sets over Barkly project area, particularly aeromagnetics, radiometrics and gravity. Determining whether phosphatic enriched areas can be recognized by a unique or combination of unique geophysical signatures.
- Generation of drill targets using the new data sets. Design of drill program to expedite chances of intersecting phosphate mineralisation in Fertoz's first program of drilling.

#### Water Bore Assessment

Cuttings from thirty one (31) water bores ,located within or adjacent to the Barkly tenements. The location of the waterbores in the Barkly licences are shown in Figure 9 below.

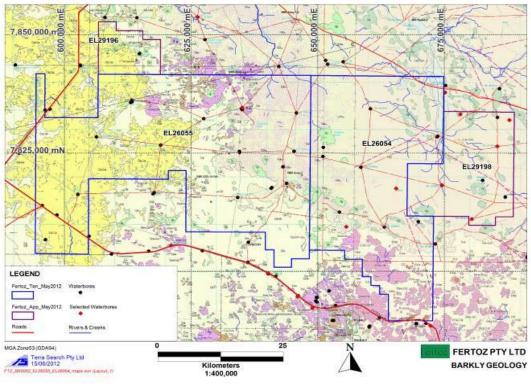


Figure 9. Waterbore locations Barkly Project

The drill chips were geologically assessed and XRF assayed by Terra Search for Fertoz . Phosphate highlights appear below.

Hole	Location	From	То	Interval	Geological	Phosphorous	$P_2O_5$
ID		Depth (m)	Depth (m)	(m)	Unit	ppm	%
RN003125	Alroy	24.4	27.4	3	Chert	16082	3.7
RN029369	Alroy	54	57	3	Chert	12059	2.8
RN020569	Wonarah	33	36	3	Siltstone	11890	2.7
RN020675	Wonarah	54	60	6	Limestone	23567	5.4 <sup>1</sup>
RN020998	Wonarah	30	45	15	Siltstone/Limestone /Chert	24528	5.6 <sup>1</sup>
RN020998	Wonarah	54	60	6	Siltstone/Limestone /Chert	16222	3.7 <sup>1</sup>
RN021245	Wonarah	18	21	3	Clay	22830	5.2
RN021245	Wonarah	24	33	9	Clay	17787	4.1 <sup>1</sup>
RN026500	Wonarah	48	51	3	Limestone	12355	2.8
RN033253	Wonarah	57	60	3	Limestone	15381	3.5

Stratigraphically phosphorite is associated with siltstone, rather than carbonate units.

Terra Search has reviewed all previous assay results in the Wonarah GroupTenements and highlighted any holes which returned >5%  $P_2O_5$ . A large area of 35km x 20km is highlighted in the central part of Fertoz Wonarah tenements, together with zones in the southern section adjacent to the higher grade results from previous phosphatic exploration in the Wonarah area south of Fertoz's ground.

The key conclusions are that the phosphatic horizons have a spatial association to basement highs which include the basalt. Whereas, phosphatic zone (1% to 10%  $P_2O_5$ ) can occur in carbonate and siliclastic units, high grade phosphate (phosphorite >10%  $P_2O_5$ ) is restricted to fine grained siltstone/mudstone units where siliclastic or carbonate sedimentation does not swamp and dilute the build up of organics.

The integration of the magnetic patterns, gravity features and phosphate values with the known downhole geology supports models where phosphorite zones are draped over and flank volcanic basalt highs.

Terra Search have applied this model to the regional data sets and used the Wonarah Deposit as a type area to identify the following prospective signatures :

- High phosphate in historical drilling
- Lithology siltstone dominant rather than carbonate dominant
- Magnetically active area indicative of basaltic floor to sequence or on flank of basalt high
- In detail either thin magnetic ridges or mottled magnetics
- Saddle in gravity or flank of gravity low.

• Gravity low correlating with basement ridge.

The resultant interpretation highlights three high priority areas of six target areas (Figure 10), which represent significant targets for phosphate mineralisation within the Fertoz Wonarah Group tenements. The largest area is in the order of 20 km x 35km and occurs in the eastern side of EL26055. Other highly ranked priority areas are in the order of 5km x 5km.

An 85 hole RC drilling program with an average notional depth of 50m is proposed to test the priority phosphate. However, several of the holes are expected to be deeper than this as a first pass in order to obtain important stratigraphic information to pin down the phosphatic target zones and prospective stratigraphy. Total meterage is in the order of 5000m.

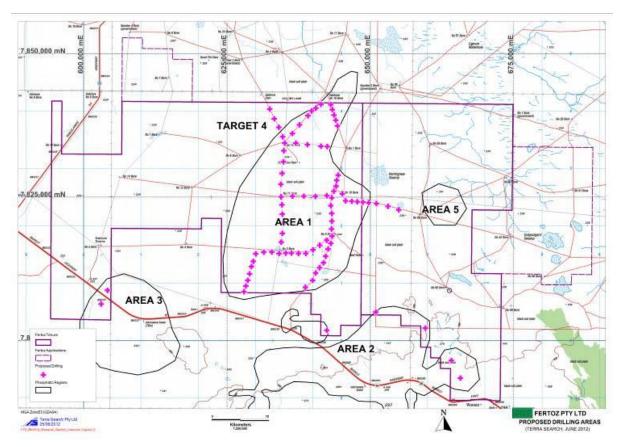


Figure 10. Priority areas and proposed drillholes Barkly Project

Field Studies

No field work was done during the year.

## 10. <u>REMOTE SENSING</u>

There were no remote sensing surveys done during the year. Included below is an image taken from the DoR Strike dataset, LANDSAT 7.

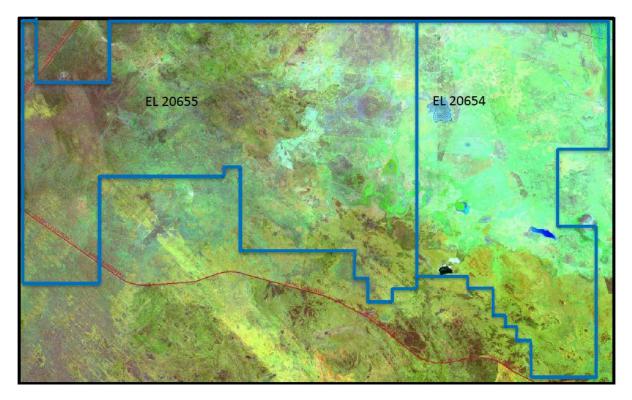


Figure 11. Landsat 741 Photography

## 11. <u>GEOPHYSICAL ACTIVITIES</u>

Terra Search has carried out a geophysical assessment of the Wonarah Group tenements in particular utilizing the available high quality NTGS data sets (aeromagnetics, radiometrics, gravity).

## Radiometrics

Radiometrics only records variation in radioactive elements from surface material. It is an effective technique for mapping out the various surface cover. However, the previous work at Wonarah, shows there is very little exposed phosphatic rock. The three radioactive components uranium, thorium, potassium are mapping out their contents in the surface rocks. In the case of the Wonarah Group of tenements, there is some uranium anomalism related to outcrop of the siltstone which occurs above the phosphate, potassium is dominant in the east where more clay may be evident. The north west streaking results from the prevailing wind direction which tends to mask the radiometric features of the underlying geology.

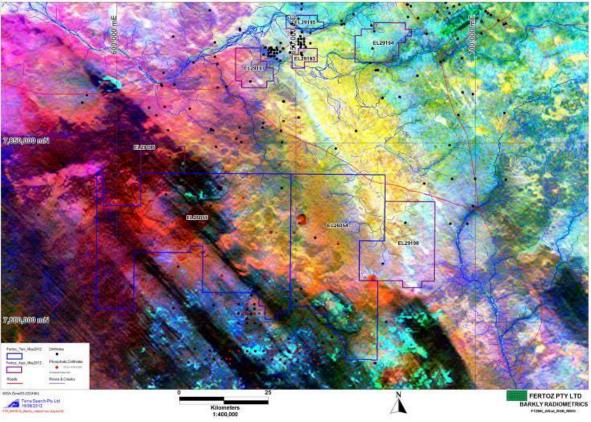


Figure 12. Radiometrics

#### **Magnetics**

The key features of the magnetics in the Wonarah area are interpreted to be mostly related to the geological configuration of the basement, below the phosphate bearing Georgina Basin sediments. Nevertheless, the basement geology appears to have had a dominant influence on the phosphate occurrences. The strong ridge like magnetic linears which dominate the western and southern areas of the Wonarah Group tenements are interpreted as indicative of a basement where the Georgina Basin sediments are floored by flood basalt of the Lower Cambrian Helen Springs Volcanics and equivalents.

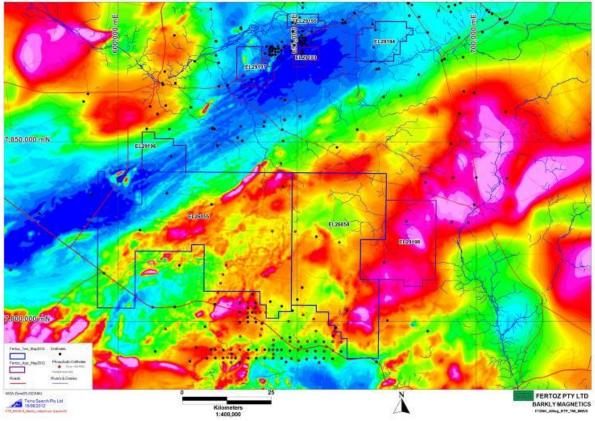


Figure 13 Magnetic data Reduced to Pole (RTP)

## 12. SURFACE GEOCHEMISTRY

As the rock units of interest were not exposed on the licences, no rock chip or soil samples were taken during site visits in 2011.

## 13. DRILLING

No drilling was undertaken in 2012. A Mine Management Plan was approved in February 2012 and a bond of \$34,000 was lodged with the Department of Resources. The plan was later withdrawn with the change of operator to Fertoz. It is in the process of being revised with drilling planned for 2013.

## 14. <u>GEOTECHNICAL STUDIES</u>

Geotechnical studies conducted during the year consisted of an advanced desktop study including a review of open file geophysical datasets (i.e. radiometrics, magnetics), review of GIS data (historic phosphate occurrences) with the aim of identifying prospective stratigraphy and structural elements that may be favourable for accumulation of phosphate.

## 15. <u>RESOURCE AND RESERVE ESTIMATION</u>

There were no resource or reserve estimations done during the year.

## 16. <u>CONCLUSIONS AND RECOMMENDATIONS</u>

The exploration work done to date has not successfully explored EL 26054 and EL 26055 for the presence of phosphate mineralisation. What limited work that has been done has proved that the transported soils effectively are geochemically blanketing the underlying rocks.

The only effective way to examine the underlying strata is by drilling using Reverse Circulation methods. A detailed study has identified six areas prospective for phosphate, of which three are considered high priority.

## 17. <u>REFERENCES</u>

#### **Open File Company Reports**

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