COMBINED FINAL and SECOND ANNUAL REPORT – GR426

EL 30498, EL 30499, EL 30500 & EL 30808

Lake Duggan Project

Geotech Minerals Pty Ltd

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Project Operator: Geotech Minerals Pty Limited
Author/s: Todd Hoffman (Senior Geoscientist)
Relevant Mapsheet: Fergusson River, Katherine & Larrimah
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Introduction

This is the Final and Second Annual Report for Grouped Tenement GR426 (GR426) which comprises of EL 30498, EL 30499, EL 30500 and EL 30808 (Figure 1) and was granted to Geotech Minerals Pty Ltd at various dates in 2015. This group of tenements is referred to as the Lake Duggan Project. This report covers from the reporting period from the 13th May 2015 to the 12th May 2017.

These four exploration licenses within the Lake Duggan Project area cover the northwestern faulted boundary of the Palaeoproterozoic McArthur (Birrindudu) Basin approximately 35 km south to southwest of Katherine (Figure 1). This area of the McArthur Basin has had very limited mineral exploration in the past and no minerals wells have been drilled within the exploration license areas to date. The most recent exploration in the region has been by petroleum exploration companies, with 2d seismic, full-tensor gravity gradiometry data and a stratigraphic well being drilled in EL 30498.

No on ground exploration activities were carried out during the reporting year. However, a regional review of the open file data, including magnetics, gravity and seismic and well data has been undertaken to help evaluate the base and precious metal and rare mineralization potential across the exploration area. The Manbulloo-S1 well core was logged and assayed to evaluate the mineralization potential along the faulted boundary of the greater McArthur Basin.
Figure 1: Grouped tenements GR426 location with the 1:250,000 surface geology.
Background

This is the Second Annual and Final Report for GR426 covering the period ending the 23 March 2017. No on ground exploration activities were carried out during the reporting year. However, a regional review of the open file magnetics, gravity and seismic data has been undertaken to help evaluate the base and precious metal and rare earth mineralization potential within the exploration area. The Manbulloo-S1 well core was also assayed.

Location and Access

GR426 is located 35 km south of Katherine and 17 km southwest of Mataranka and can be accessed via the Stuart or Victoria highways (Figure 1) and within the project area along tracks and dirt roads. The landscape is dominated by low-lying savanna with the predominant land use being broad acre cattle grazing. The relatively flat lying topography within the project area should allow for vehicle access during the dry season (typically late May to late October).

Tenure

The exploration licenses within GR426 were granted to Geotech Minerals Pty Ltd for a period of six years and cover a combined 936 sub-blocks (3102 km²) (Table 1).

Table 1. Summary of EL’s in GR426

<table>
<thead>
<tr>
<th>Tenement</th>
<th>Granted Date</th>
<th>Sub-Blocks</th>
<th>Area (km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EL 30498</td>
<td>13th May 2015</td>
<td>250</td>
<td>829</td>
</tr>
<tr>
<td>EL 30499</td>
<td>13th May 2015</td>
<td>250</td>
<td>829</td>
</tr>
<tr>
<td>EL 30500</td>
<td>1st June 2015</td>
<td>250</td>
<td>826</td>
</tr>
<tr>
<td>EL 30808</td>
<td>21st December 2015</td>
<td>186</td>
<td>617</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>936</td>
<td>3102</td>
</tr>
</tbody>
</table>

Aboriginal Sacred Sites

No archaeological surveys have been carried out during the second year reporting period.

Geology

Regional Geology

GR426 is located within the western region of the Palaeoproterozoic greater McArthur Basin (Figure 2) west of the Daly Waters Arch. The surface geology across the project area consists of Cambrian and Cretaceous age sedimentary rocks from the Daly and Carpentaria basins (Figure 1). Below these Phanerozoic basins, the Palaeoproterozoic greater McArthur and Mesoproterozoic Roper basins have been interpreted along the southern half of the project area. The greater McArthur Basin sequence intersected in nearby wells consists of dolomite and siltstone and shale. The units are the target formations for mineralization along with organic rich shales within the Roper Basin.
Previous Exploration

Mining history

No mining has been conducted within the Lake Duggan Project area (‘Project area’).

Exploration History

Very limited previous exploration has been conducted across the Project area. Normandy Exploration Ltd held two exploration licenses over part of the Project area during the mid-1990’s. They drilled one exploration well, VDD-1 (Figure 1) to the east of the project area looking for lead, zinc, copper and silver in the Palaeo-Mesoproterozoic McArthur and Roper basins. However the hole was terminated in a Proterozoic dolerite sill directly below the Cambrian unconformity and did not test the McArthur/Roper basin sedimentary sequence.

Fodina Minerals and Omega Oil NL joint venture had exploration licenses to the south east along the Daly Waters Arch during the mid-1990’s. The joint venture sampled the Sever-1 well which highlighted greater than 3% zinc in the middle Velkerri Formation directly above and below the Derim Derim Sill (Figure 3).
Figure 3: Elevated zinc concentration in the middle Velkerri Formation above and below the Derim Derim dolomite sill (Frances DJ, 1995).
Exploration Rationale

Exploration Completed Year 1

The Year 1 work programme included building a regional geological and geophysical database which was integrated into a geospatial package for evaluation. This included downloading open file potential field geophysical data, 2D seismic data, mineral holes and petroleum wells and geological maps. An evaluation of open file mineral exploration reports was also undertaken.

A preliminary regional interpretation of the open file geological/geophysical data was conducted and used to develop a working geological model to guide the future exploration programme.

Geological Model

Based on the work conducted during the first year work programme, a working geological model has been developed for potential mineralization in the project area. Two conceptual mineralization targets have been identified so far. These include base and precious metal and/or rare earth mineralization within the McArthur Basin associated with the major basin bounding fault trend identified on the potential field geophysical data and the seismic data (Figure 4). The second potential mineralization target would be base metals in organic rich shales in the middle Velkerri Formation associated with the Derim Derim dolorite sill, as seen in Sever-1 (Figure 3). The Derim Derim Sill can be mapped on the magnetics and seismic data and may allow for targeted exploration in the in middle Velkerri in the southeastern portion of the Lake Duggan Project area (Figure 4).
Figure 4: Conceptual models for potential mineralization along McArthur Basin bounding fault zone and within the middle Velkerri Formation.

Figure 5: Interpretation of partial seismic section PB13-09 showing the location of the Manbulloo-S1 well and the major basin bounding fault and unconformities.
Exploration - Year 2

The Manbulloo-S1 well become open file during the second year work programme. Handheld XRF data collected across the Reward Dolomite and Barney Creek Formation core highlighted a barite unit in the Reward Dolomite with elevated Au (extremely high), S, Pb and Cu, and pyritic shales with slightly elevated Pb, Cu and TOC in the Barney Creek Formation (Figure 6). The core from this well was viewed, sampled and assayed to evaluate the McArthur Basin stratigraphy adjacent to the basin bounding fault for Au and sedex style mineralisation. In addition, the open file potential field magnetic and gravity data was processed, interpreted to help identify any potential future drilling targets.

Figure 6: Geochemical profile through the Reward Dolomite and BCF (portable XRF).
Review and Sampling of the Core

23.53 m of core from the Manbulloo-S1 well representing the downhole interval from 532.26 m to 555.79 m was reviewed and sampled and assayed. This interval represents part of the stratigraphic section interpreted as part of the Reward Dolomite or its lateral equivalent (Figure 6). The detailed description of this core is provided in Table 2 and core photos are shown in Figures 7 - 9.

**Table 2. Manbulloo-S1 Reward Dolomite core description.**

<table>
<thead>
<tr>
<th>Interval</th>
<th>Description</th>
<th>Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>532.26</td>
<td>533.57</td>
<td>Medium pinkish-brown to pale orange-red, hard Dolostone. Common sporadic discontinuous contorted micro lamina (soft sediment deformation). Argillaceous and interbedded with medium grey shale bands.</td>
</tr>
<tr>
<td>533.57</td>
<td>534.45</td>
<td>Mostly massive calcite spar with brecciated clasts of mottled brownish red dolostone (Figure 2-6a). Common disseminated pyrite along fracture planes</td>
</tr>
<tr>
<td>534.45</td>
<td>535.57</td>
<td>Reddish maroon dolostone, hard and laminated to micro laminated. The interval contains abundant microfractures (mm-scale) with calcite infill, of similar appearance to the calcite spar beds (Figure 2-6b).</td>
</tr>
<tr>
<td>535.57</td>
<td>536.65</td>
<td>Massive crystalline calcite spar band, clear to semi-translucent, bright rose-pink mineral fluorescence.</td>
</tr>
<tr>
<td>536.65</td>
<td>540.93</td>
<td>A 4.28m interval of stratiform barite (visually close to pure barium sulphate), massive well developed crystalline texture (Figure 2-7a) with systematic hinge fractures and occasional vugs developed around the upper and lower contacts. The surfaces of fractures and vugs are sparsely lined with sulphide (predominantly pyrite)(Figure 2-6c). No evidence of organic matter (a major impurity in bedded barite deposits). No evidence of laminated quartz horizons in the form of silica or chert beds; or preservation of fossil evidence (that may suggest macrofossils endemic to fluid vent sites on the seafloor during barite deposition). The contact with the underlying calcite spar is sharp with evidence for coarse cavity fill (Figure 2-7b). Based on a simple classification of barite types (after Koski and Hein, 2004; refer also to Table 2-3), the massive nature, textural habit and chemical composition favour a hydrothermal origin.</td>
</tr>
<tr>
<td>540.93</td>
<td>542.01</td>
<td>Massive calcite spar with well-developed coarse crystalline texture and internal translucency (Figure 2-7c). Coarse bladed crystalline structure evident in vugs (Figure 2-7c)</td>
</tr>
<tr>
<td>542.01</td>
<td>542.33</td>
<td>Argillaceous (impure) calcite band, increasingly vuggy and porous along the basal contact with a dolostone unit. Disseminated pyrite (± chalcopyrite) bands are present throughout the interval and along the contact with the overlying calcite (Figure 2-7c). A petrographic sample taken though one of these bands.</td>
</tr>
<tr>
<td>542.33</td>
<td>543.85</td>
<td>Mottled grey-pink dolostone. Well-developed micro-fractures annealed with calcite.</td>
</tr>
</tbody>
</table>
### Table 2. Continued.

<table>
<thead>
<tr>
<th>Interval</th>
<th>Description</th>
<th>Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>543.85</td>
<td>Brecciated basal mottled grey-pink dolostone contiguous with the overlying unit. Well-developed micro-fractures annealed with calcite and minor specular hematite overprint. Strong siliceous alteration.</td>
<td>MBS1-012</td>
</tr>
<tr>
<td>544.17</td>
<td>Hydraulic brecciated basal mottled grey-pink dolostone contiguous with the overlying unit. Well-developed micro-fractures annealed with calcite and abundant specular hematite overprint. Strong silicic alteration.</td>
<td>MBS1-013</td>
</tr>
<tr>
<td>544.81</td>
<td>Massive calcite spar with well-developed coarse crystalline texture and internal translucency. Pyrite (± chalcopyrite) sparsely disseminated throughout the interval.</td>
<td>MBS1-014</td>
</tr>
<tr>
<td>454.30</td>
<td>Thin 24cm band of more impure calcite, weakly argillaceous with poor translucency and well developed vugs with sulphide coatings (Figure 2-6e). Disseminated pyrite developed along the upper and lower contacts and specular hematite (?) weakly disseminated throughout (Figure 2-6).</td>
<td>MBS1-015</td>
</tr>
<tr>
<td>545.54</td>
<td>Clast supported breccia of dolostone fragments with a matrix of argillaceous sediment and calcite. Possibly represents a more altered version of the unit below or could be a finer grained graded upper portion of the unit below.</td>
<td>MBS1-016</td>
</tr>
<tr>
<td>546.77</td>
<td>Sedimentary breccia interval. Predominantly matrix supported with angular to subangular clasts of dolostone and shale (from mm to 15cm in diameter)(Figure 2-8c). Carbonate matrix?? Rare carbonate veins and microfracture, more prominent toward the base of the interval. Abundant specular hematite (+manganese) alteration (some clasts appear to have been completely replaced.</td>
<td>MBS1-017 - 019</td>
</tr>
<tr>
<td>549.13</td>
<td>Finely laminated (~1mm microlaminae) reddish brown-pink dolostone. Minor micro-fractures annealed with calcite infill.</td>
<td>MBS1-020-021</td>
</tr>
<tr>
<td>550.95</td>
<td>Matrix supported polymictic breccia. Clasts up to 10 cm dominated by light grey to medium grey shales and dolostone supported in a calcareous argillaceous matrix (Figure 2-8b). Intensely hematite (± manganese) altered with hematite occurring as fine fracture fill, disseminations and in some cases complete replacement of breccia clasts (Figure 2-8a). Carbonate replacement (± quartz) possibly after gypsum crystals is also evident in the lower part of the interval (Figure 2-8d)</td>
<td>MBS1-022-027</td>
</tr>
</tbody>
</table>
Figure 7: Photos of elements of core.
Figure 8: Photos of elements of core.
Figure 9: Photos of elements of core.
27 samples across a 23.53 m interval from the Reward Dolomite (equivalent) in the Manbulloo-S1 core was assayed. The assay included the evaluation of 93 elements and minerals, specially evaluating the presence of base, precious metals and rare earths. No metal or rare earth anomalies were identified in the assay (Appendix 1). The extremely elevated Au values observed in the handheld XRF in the Barite unit at 537 – 541 m is interpreted as a false positive anomaly associated with the handheld device. The laboratory XRF results had no Au associated with this zone.

Updated Exploration Model

The Barney Creek Formation was not assayed, but the lack of thick sequences of pyritic shale with elevated TOC in the Manbulloo-S1 well indicates the limited potential for McArthur Basin style sedex mineralization at this location. Deeper water sub-basins would need to be identified along the Mallapunyah Fault Zone to host these McArthur style deposits. Figure 10 shows the updated structural interpretation of potential field geophysics and Figure 11 the updated simplified exploration model for sedex style mineralization in the Barney Creek Formation along the Mallapunyah Fault zone. This sedex style exploration model for the Barney Creek Formation is considered to be high risk in this area. The Barney Creek Formation is truncated by the Base Cambrian Unconformity to the west of the Manbulloo-S1 well, and to the east, the Barney Creek Formation becomes very deep, limiting the area sub-basin could be identified and exploited.
Figure 10: Structural interpretation over high resolution gravity data, highlighting the Mallapunyah Fault zone where it is inferred to truncate the Barney Creek Formation base. A narrow zone presents as a suitable structural target around the Manbulloo-S1.
Figure 11: Simplified exploration model highlights zones along the Mallapunyah Fault that could contain sub-basins with thick sequences of organic rich shales in the Barney Creek Formation.

Conclusions and Recommendations

Based on Geotech Minerals’ detailed integration and interpretation of the available gravity, magnetic, seismic, surface geology and Manbulloo-S1 well core, and assay results, the base and precious metal potential along the Mallapunyah Fault trend in this area is considered to be low to moderately low and high risk. Based on the lack of prospectivity, Geotech Minerals Pty Ltd determined that the GR426 grouped tenements do not warrant further exploration and the grouped tenements were surrendered accordingly.

References


Appendix 1: Assay Results, Manbulloo-S1