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EL 3339

MCDOUALL PEAK STATION

FINAL REPORT AT LICENCE EXPIRY/SURRENDER FOR THE PERIOD 20/5/2004 TO 19/5/2009

Submitted by
Flinders Mines Ltd
2009

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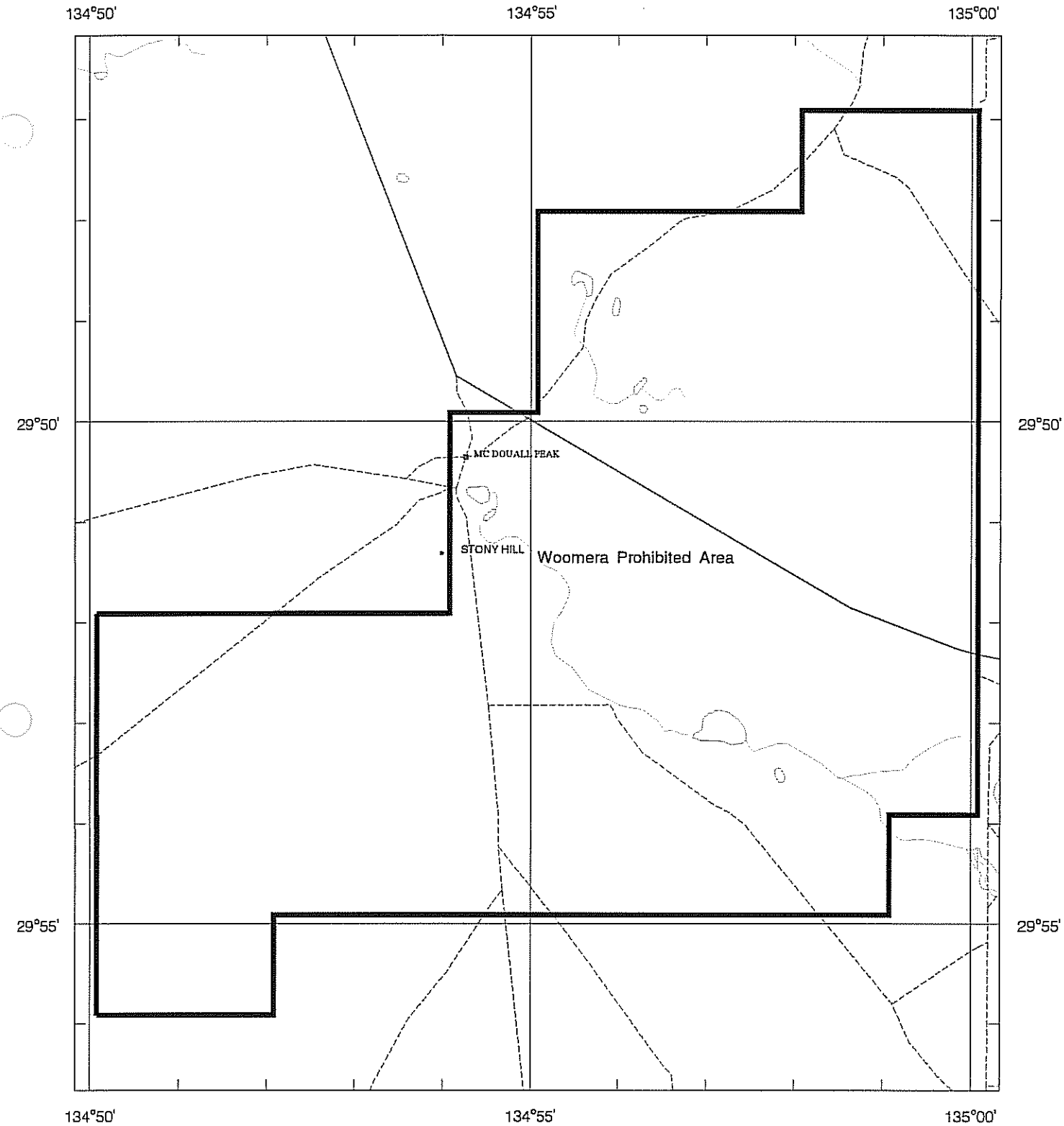
Government of South Australia
Primary Industries and Resources SA

SCHEDULE A



SCALE 1 : 100 000

METRES 2000 0 2 4 6 8 10 KILOMETRES

APPLICATION LODGED IN : DATUM AGD66

GDA GEOCENTRIC DATUM OF AUSTRALIA

APPLICANT : **TASMAN RESOURCES NL**

FILE REF : **62/04** TYPE : **MINERAL ONLY** AREA : **163** km² (approx.)

1:250000 MAPSHEETS : **COOBER PEDY BILLA KALINA**

LOCALITY : **MCDOUALL PEAK AREA - Approximately 100 km SSE of Coober Pedy**

DATE GRANTED : **20-May-2005** DATE EXPIRED : **19-May-2006** EL NO : **3339**

CENTRAL GAWLER PROJECT

Final Technical Report

For the period

20 May 2005 to 19 May 2009

FOR

EXPLORATION LICENCE

EL 3339 (McDouall Peak)

Author : **L Cole**
Date : **December 2009**
Report No : **FDL_0941**

Distribution:
Tasman Resources Limited (1 Digital Copy)
Flinders Mines Limited (1 Copy, 1 Digital Copy)

***Key words**: Diamond exploration, Gawler Craton, Mulgathing Complex, Algebuckina Sandstone, kimberlite, kimberlitic indicator minerals, kimberlite dykes and kimberlite pipes.*

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Drillhole petrophysics	EL3306~3712_2008_A_geophysics\Petrophysics\EL3341~3344\ EL3341~3344_2008_magsusc.xls
Loam samples	FDL_0941_HM_Loams.xls
Loam sample observation sheets	FDL_0941_HM_Loams_Obs.pdf
Drillhole header file	FDL_0941_DH_Header.xls
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Summary

The following report outlines the exploration for diamonds undertaken by Flinders Mines Ltd (FMS) as part of the Tasman JV agreement for EL 3339 with Tasman Resources Limited during the period 20 May 2005 to 19 May 2009.

Work completed during the reporting period was part of a regional program and comprised:

- Assessment of open file airborne magnetic survey data
- Selection and flying of key target area using detailed airborne magnetic survey
- Ground inspections and loam sampling of magnetic anomaly
- Drill testing magnetic target
- Sampling of drillhole for diamond indicator minerals (DIM)

Flinders Diamonds innovative exploration strategy commenced with a re-assessment of open file airborne magnetic data in an attempt to identify subtle magnetic signatures associated with possible kimberlites. The data was reprocessed to remove noise and to enhance subtle magnetic features. The results were used to identify a number of key exploration areas.

In April 2008, 'Postage stamp' helimag surveys (each 1 – 2 km^2 in area) were flown over prospective magnetic anomalies picked from regional data. Anomalies with affinities to kimberlite pipe targets were selected.

Targets were ground checked and heavy mineral samples where relevant, were collected for DIM identification. One loam sample was collected on EL 3339, and was negative for DIMs.

One target on EL 3339 was selected to be drilled. The drilling program utilised a KD 150, aircore/RAB capable rig. Drilling of the target took place on 06 March 2009. The first hole (vertical) was terminated at 21 m when the RAB rods became bogged from loose flowing sands. These rods were recovered later by the drilling company. The second hole was drilled approximately 2 m from the first. This aircore hole was terminated at 19 m depth, to prevent bogging of rods due to more loose flowing sands.

Basement was not reached due to the fluvial sands creating drilling difficulty. Basal sands from the second hole were sampled for DIMs. A positive result was received from this sample. Indicator minerals recovered comprised only chrome spinel (x 4) and picroilmenites (x 2). Minerals were highly weathered/altered, but microprobe work has confirmed a likely kimberlitic origin. The DIMs were recovered from mature river sand, thus the source of the DIMs is likely to be some distance, outside the EL. There is also the possibility of glacial origin of indicators on the Gawler Craton. Thus, without insufficient numbers and grain size distribution, a proximal primary source is unlikely.

1. Introduction

This report outlines exploration for diamonds during the period 20 May 2005 to 19 May 2009. Exploration undertaken by FMS during the reporting period comprised re-processing and assessment of open file airborne magnetic survey data, selection of prospective target areas, 1 small scale helicopter helimag survey, site visit to target identified by helimagnetic 'postage stamp' survey. A loam sample was taken over the targets to test for the presence of DIM on the surface of the cover sequence above crystalline basement.

The target was drill tested in March 2009. The drillhole was testing an individual magnetic anomaly interpreted to be kimberlite. Basement was not intersected and the hole was terminated due to loose flowing sands. This particular target was ranked as low so no further work was warranted. A heavy mineral sample was taken in fluvial sands at the end of hole to test for diamond indicator minerals.

The work completed on EL 3339 was part of a regional program of Flinders Mines Central Gawler Project.

2. Tenure

2.1 Tenure Details

EL 3339 was granted to Tasman Resources on 20 May 2005 and surrendered on 19 May 2009.

EL No.	EL Name	Grant	Expiry	Registered Holder	Area Sq km
EL3339	McDouall Peak	20/05/05	19/05/09	Tasman Resources Ltd	69

Table 1: Tenement Details

3. Location and Access

The tenements are located approximately 680 km NW of Adelaide and some 70 km south of Coober Pedy in the northwest pastoral district of South Australia, as shown in Figure 1.

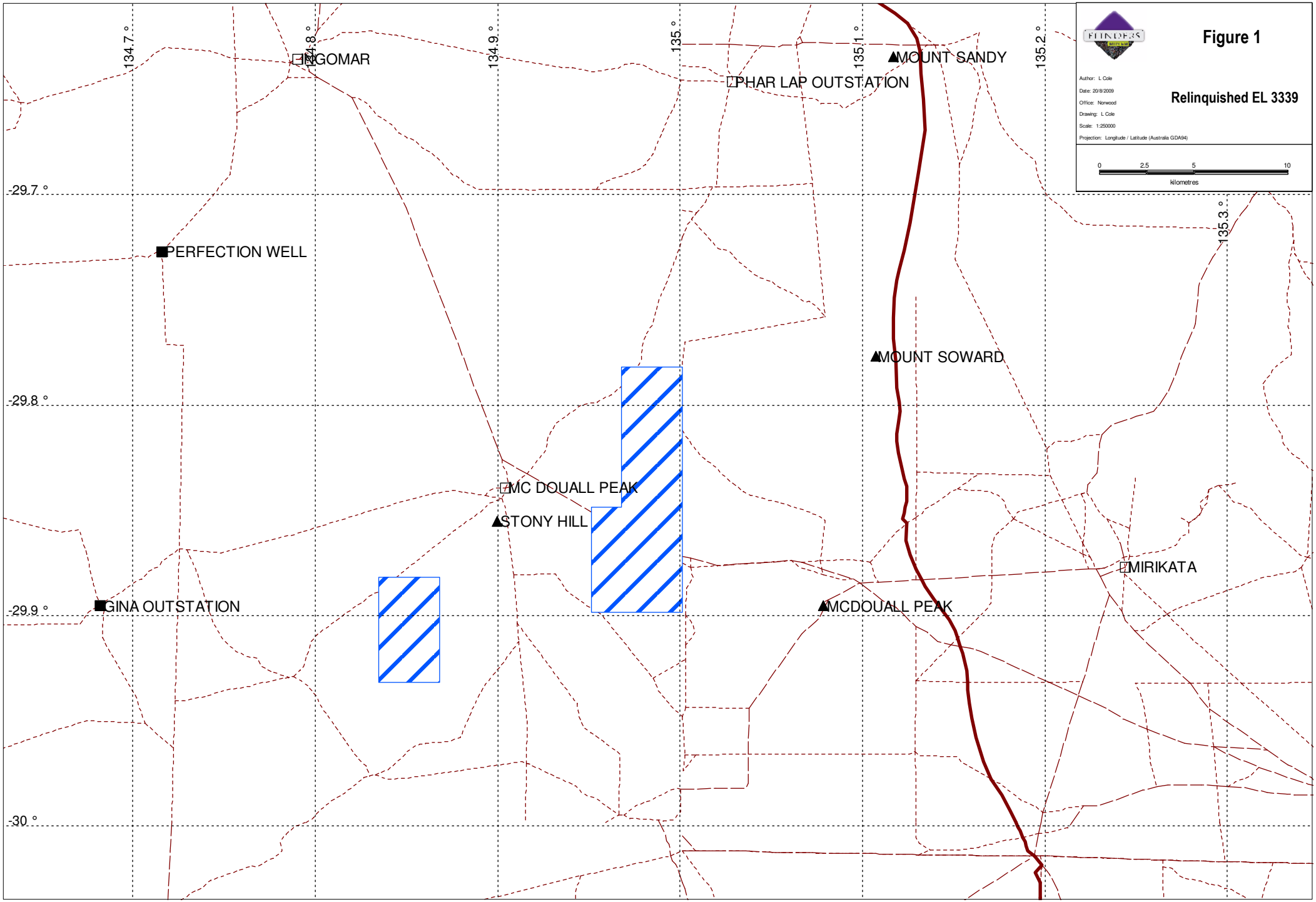
This tenement is accessed from the Stuart Highway via a network of unsealed roads and station tracks. Short off-road access to target sites is possible in most areas. Low impact tracks were pushed in for access for the drilling programs. A backhoe was used for tracks and latter rehabilitation.

The tenement is located on the 1:250,000 Map Sheet: SH53-06 (Coober Pedy).

4. Topography

Most of the area consists of gently undulating plains. The plains are covered by a dense surface lag of silcrete and quartzite gibbers formed during the breakdown and gradual recession of the Tertiary land surface. These plains are treeless and characterised by a gilgai micro relief of low mounds and hollows covered by sparse low vegetation.

Unconsolidated, but essentially vegetation-fixed, longitudinal sand dunes are prominent in the northern and central areas. Individual dunes, trending northeast/southwest, may be up to 15m high and 20km long, separated by interdunal corridors containing numerous clay pans.


134.7 °
134.8 °
134.9 °
135 °
135.1 °
135.2 °
135.3 °
-29.7 °
-29.8 °
-29.9 °
-30 °
NGOMAR
PHAR LAP OUTSTATION
MOUNT SANDY
PERFECTION WELL
MOUNT SOWARD
MC DOUALL PEAK
STONY HILL
MIRIKATA
GINA OUTSTATION
MCDOUALL PEAK
Figure 1
Relinquished EL 3339
Author: L Cole
Date: 20/8/2009
Office: Norwood
Drawing: L Cole
Scale: 1:250000
Projection: Longitude / Latitude (Australia GDA94)
0
2.5
5
10
kilometres

5. Geology

EL 3339 is located over the central Gawler Craton. The crystalline basement comprises Archaean rocks of the Mulgathing Complex, and later intrusions of Palaeoproterozoic – Mesoproterozoic in age. The Mulgathing Complex (and Sleaford Complex to the south) has been dated as 2.5 – 2.4 Ga (Belousova et al 2006). The Kararan Orogeny was a widespread thermal and magmatic event that has been dated at c. 1.6 Ga. This event includes the Gawler Range Volcanics, and comprised felsic to mafic/ultramafic intrusions and felsic – intermediate volcanics (Meyers and Cooper 2004).

Potential for diamonds from original mantle roots may be limited to source rocks (kimberlite or lamproite) of 1.6 Ga or older, due to the destabilisation of diamonds within the lithospheric mantle brought about by the Kararan thermal event. However Meyers and Cooper (2004) argue that the geological setting of the central Gawler Craton has a similar cratonic and tectonic history to the Siberian kimberlite diamond deposits. Economic diamond bearing kimberlites postdate Proterozoic and Palaeozoic thermo tectonic events. Thus it is likely that some of the deep mantle roots have survived these events, to be later sampled by kimberlite activity.

The Algebuckina Sandstone unconformably overlies the Archaean basement. The Algebuckina is of late Jurassic to early Cretaceous in age. Average thickness of the Algebuckina is approximately 20 m in the local area. The sandstone is of fluvial origin, with deposition from braided river systems in a flat topographic environment (Rogers and Zang 2006). Younger sedimentation in the area includes the tertiary Garford Palaeochannel, and Quaternary aeolian sediments.

6. Previous Exploration

Diamond exploration commenced in the area in the mid 1980's. Kimberlitic indicator mineral anomalies were discovered over the Gawler Craton. However, these were later deemed to represent a secondary source of DIM grains. Younger sediments such as the Algebuckina were proved to be shedding these indicator minerals. The lack of developed drainage systems and no suitable natural concentration of indicator grains have also impeded exploration efforts. Since the realisation of false anomalies created by direct DIM sampling, no detailed aeromagnetic surveys have been used in targeting kimberlites directly (Meyers and Cooper 2004).

Previous exploration in the area has mainly been focused on gold and base metals. Calcrete sampling and drilling of calcrete anomalies has located some gold mineralisation (Knaak and Parker 1997). However no economic Au has been found to date apart from Challenger mine, some 100 km to the south west.

7. Recent Exploration

7.1 Geophysics

The strategy adopted for the diamond search on the Gawler Craton involved re-assessing open file airborne magnetic data in an attempt to identify anomalies or specific anomalous areas with magnetic signatures that may be associated with kimberlite occurrences. Once the key locations were identified detailed helicopter based magnetic surveys were flown to select suitable drill targets.

Details of the processing and analysis of the open file survey data are provided in digital appendices attached. A summary of the helimag surveys are also provided in the attached digital appendices. Digital data sets (located, grids, images etc) of the re-processed open file data and the 2008 helicopter based airborne magnetic surveys are included. Figure 2 displays location boundary of the sole postage stamp helimagnetic survey on EL 3339.

7.2 Target Testing

7.2.1 Target Verification and Loam Sampling

Each magnetic anomaly identified from the helimag postage stamp surveys were inspected on the ground. Any cultural or obvious explanations for mag anomalies were sought. In areas where suitable cover sequences were found, heavy mineral samples were collected for the identification of DIMs.

The loam samples were approximately 10 litres of material; sieved at -1.6 mm. Samples were sent for processing and observation at Diatech Heavy Mineral Services in Perth. The samples were taken from transported cover above crystalline basement. The purpose of the samples were to detect DIM grains which would may have been derived from a secondary (transported) source in the local area, or may have been brought to the surface by bioturbation.

All samples returned a negative result. The hypothesis that DIM can be present on transported cover by bioturbation on the Gawler Craton has yet to be sufficiently tested. Heavy mineral data including locations and observation sheets are supplied in digital form only.

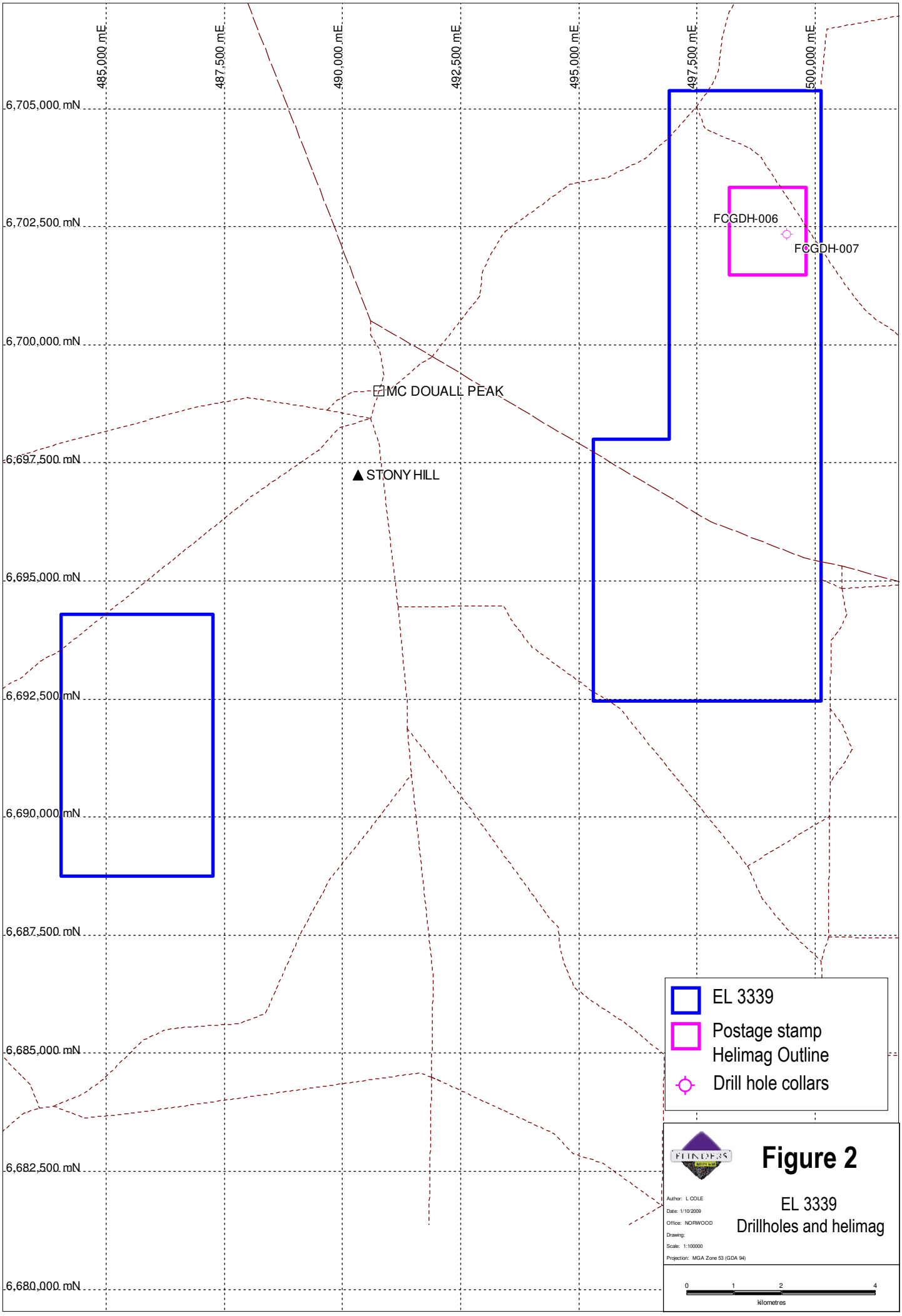
Related Data Files:

FDL_0941_HM_Loams.xls	Heavy mineral loam sample data
FDL_0941_HM_Loams_Obs.pdf	Heavy mineral observation laboratory sheets

7.2.2 Drilling

Drill testing of the EL 3339 target took place in March 2009. A KD 150 rig RAB/Aircore rig was utilised. McLeod Drilling were contracted for this program. A total of 2 holes were drilled for 40 m. Basement was not intersected with both holes being terminated prematurely due to deterioration of hole stability, cause by loose flowing sands.

The magnetic anomaly was not further tested due to the poor rating of the anomaly and the cost involved in effectively testing the anomaly into basement. One explanation for the


485,000 mE
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6,692,500 mN
6,690,000 mN
6,687,500 mN
6,685,000 mN
6,682,500 mN
6,680,000 mN
FCGDH-006
FCGDH-007
MC DOUALL PEAK
STONY HILL
EL 3339
Postage stamp Helimag Outline
Drill hole collars
Figure 2
EL 3339
Drillholes and helimag
Author: L COLE
Date: 1/10/2009
Office: NORWOOD
Drawing:
Scale: 1:100000
Projection: MGA Zone 53 (GDA 94)
0
1
2
4
kilometres

anomaly is that it is caused by maghemite concentration in undercover palaeo-drainage, which was intersected during drilling.

7.2.2.1 Rehabilitation

Rehabilitation was preformed by the landholder, Mr Wayne Rankin of McDouall Peak. Rehabilitation of the entire project is documented in the Central Gawler Project – 2009 Rehabilitation Report, FDL_0970.

Related Data Files:

FDL_0941_DH_Header.xls	Drillhole details and collar locations
FDL_0941_HM_DH_Lithology.xls	Drillhole logs

7.2.3 Heavy Mineral Sampling

A heavy mineral sample was collected from the second drill hole (FCGDH007). The sample was taken from the interval 16 – 19 m (EOH). The drill chips were not screened. Mature, unconsolidated, moderately Fe rich, fluvial sands were sampled. The head weight of the sample was 9.66 kg.

7.2.3.1 Indicator Mineral Results and Geochemistry

All heavy mineral samples were processed and observed at Diatech Heavy Mineral Services, Perth WA. The samples were processed with a standard micro DMS plant and magnetic separation. Observed size fraction was +0.3 mm. Potential DIMs and other interesting minerals were picked and sent for microprobe analysis.

The sample returned a positive result of DIMs. Four Cr spinels (chromites) and two Mg ilmenites (picroilmenites) were recovered. Probe geochemistry of these grains suggests they are derived from kimberlite or affiliated rock types. The chromites are typically low TiO_2 and high Cr_2O_3 and MgO. The ilmenites are high MgO and moderately low Cr_2O_3 and very low MnO (refer to FDL_0941_DH_Probe_data.xls).

Chromites, along with chrome diopside, are the DIMs most prone to mechanical breakdown, and are often only found 5 -10 km from source. The picroilmenite grains recovered have been described as moderately fresh and the chromites are highly weathered (refer to FMS_0941_HMS_obs.pdf). In terms of chemical stability, chromite and picroilmenite are the most stable. Therefore any other DIM may have been destroyed during the weathering process. These suggest that the primary source of the grains is not proximal; however it may >10 km, but unlikely to be on the EL. Alternatively these grains may have undergone glacial transport and have been reworked back into a later system.

Related Data Files:

FDL_0941_DH_HMS.xls	Drillhole Heavy mineral sample Data
FDL_0941_DH_HMS_obs.pdf	Drillhole HMS observation laboratory sheets
FDL_0941_DH_Probe_data.xls	Indicator mineral probe data/geochemistry

8. Conclusions

Drilling of high resolution helimagnetic targets on the Gawler Craton was undertaken by FMS in the 2008-09. Drilling was targeting Jurassic kimberlite, extruding through crystalline basement, and beneath the Jurassic Algebuckina Sandstone. No kimberlite was intersected. Basal sands and gravels were taken from appropriate drill holes for heavy mineral samples.

Diamond indicator minerals were recovered from a drill hole heavy mineral sample on EL 3339. Chromites and picroilmenites were the sole DIMs recovered (four and two respectively). Size distributions were +0.3 mm with an occasional +0.4 mm grain. All chromite grains were highly weathered and identified kimberlitic only on microprobe results. The picroilmenite grains are described as moderately fresh. These grains were recovered from mature fluvial sands, which in turn were likely sourced by the Algebuckina or equivalent fluvial sands. A proximal source is unlikely.

9. References

Belousova, E.A., Reid, A.J., Schwarz, M.P., Griffin, W.L. and Fairclough, M.C. 2006 Crustal Evolution of the Gawler Craton, South Australia *South Australia Department of Primary Industries, Report Book 2006/6.*

Knaak, M. and Parker, A.J. 1997 Wildingi, Exploration License 2124. Annual Technical Report *South Australia Department of Primary Industries Open File Envelope No. 9159.*

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Rogers, P.A. and Zang, W. 2006 Guide to the sedimentary cover of the central Gawler Craton, South Australia. *South Australia Department of Primary Industries, Report Book 2006/0001*