

# MINCOR ZINC PTY LTD

# **GEORGINA BASIN PROJECT**

# EL 25089, EL 25091-92, 25094, 25143, 26933

# Final Surrender Report 2012

# FOR THE PERIOD 7 September 2006 to 20 August 2012

Distribution: DPI-FM Mincor Resources NL JOGMEC

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#### **1. SUMMARY**

The Georgina Basin Project tenements are located approximately 225 kilometres northeast of the Northern Territory township of Alice Springs (350-400km by road), with the main access via the Stuart and Plenty Highways. The boundaries of the leases are located within the 1:250,000 scale Huckitta (SF 5311) and Tobermory (SF 5312) map sheets.

Work of a technical nature, over the period 2006-2012, on the final surrendered ground comprised a regional helicopter assisted gravity survey (all digital data already lodged with NTGS), regional (ionic leach) soil sampling traverses and selected stream sediment geochemistry. Geological ground-truthing was carried out in areas of soil geochemistry anomalism; however no detailed geological mapping has been conducted on the surrendered ground. A Dipole-Dipole Induced Polarisation test survey was carried out over the Putta Putta detailed soil grid.

Exploration activities (detailed in 2007, 2008, 2009, 2010 and 2011 Annual Reports) were as follows:

- **2007** CSA Prospectivity Report NTGS Core Library Inspection Development of Exploration Strategy
- 2008 Regional Stream Sediment Sampling Regional Heliborne Gravity Survey CSIRO Gravity based Structural Analysis and Intrepretation
  - 2009 Review of Stream Sediment Results Gravity (worming) Analysis Basin Edge Structural Interpretation Soil Sampling traverses across Key Structures
- 2010
   Partial Relinquishments of tenements
   Detailed Grid Soil Sampling; Tomahawk and Putta Putta Targets
   IP Survey
  - **2011** Analysis of detailed soils Heritage Clearance of 5 potential drill sites
  - 2012 Diamond Drilling (GBDH001-003) Core Logging, sampling, XRF and Petrography HyLogger (NTGS) Surrender (July-August 2012) and Final Reporting (October 2012)

Follow-up drilling activities scheduled to commence earlier in the 2010-11 reporting period were postponed until later in the 2011 field season due firstly, to heavy summer rains that severely restricted access to the area, and secondly by restricted drill rig availability. The combination of the above unforseen factors resulted just two (2) of five (5) planned drillholes being collared, both within the retained portions of EL25091 (Lucy Creek).

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#### 2. INTRODUCTION

The finally surrendered portions of tenements EL 25089, EL25091-92, EL25093-94, EL25143 and EL26933 comprised part of the greater Georgina Basin Project (see Table 1, and Figure 1 below). The main access to the project is via the Plenty Highway. The boundaries of the licences are located within the 1:250,000 scale Huckitta (SF 5311) and Tobermory (SF 5312) map sheets.

Exploration activities within the finally surrendered portions of the project area were intermittently conducted over the period 2007-2011, and were in part curtailed by Native Title issues; the location of stream sediment and soil samples were on occasion modified, and some large areas placed in exploration moratorium for cultural reasons (particularly on EL25093). Two drill holes were completed from 1-17 October 2011, with follow-up geological logging and sampling (for petrographic analysis) carried out in November 2011, and XRF measurement of core in March 2012. Drill core was then sent to Darwin to be scanned by NTGS as part of their HyLogger Program.

#### 3. TENEMENTS

Table 1 below summarises the tenement holding of the entire Georgina Basin Project; technical work on surrendered ground for EL26933 (75%) and EL25093 (100%) have previously been reported on and lodged with the NTGS in September 2011 and October 2011 respectively. This report summarises work carried out on finally surrendered ground for the remaining tenements EL25089, El25091-92, El25094 and EL25143.

The project tenements were granted between 7<sup>th</sup> September 2006 and 2<sup>nd</sup> October 2006, and originally covered an area of some 3,878 km<sup>2</sup>. Subsequent tenement relinquishments in 2010 and 2011 reduced the land holdings down to 489 graticular blocks or 1565 km<sup>2</sup> (yellow plus red areas in Table 1 below).

Licence	Name	Grant	Final	Blocks		Commitment	Expenditure
			Surrender	2011	2012	2011-12	2011-12
EL25089	Arapunya	7/09/2006	20/08/2012	124	0	\$75,000	\$85,192
EL25091	Lucy Creek	2/10/2006	20/08/2012	161	0	\$320,000	\$368,952
EL25092	Mt Teitkens	2/10/2006	20/08/2012	74	0	\$50,000	\$4,778
EL25093	Mt Ultim	2/10/2006	5/10/2011	0	0	\$0	\$0
EL25094	Tarlton Hill	2/10/2006	20/08/2012	103	0	\$50,000	\$6,739
EL25143	Huckitta	2/10/2006	20/08/2012	2	0	\$5,000	\$1,181
EL26933	Dulcie Range	27/07/2009	26/07/2012	25	0	\$10,000	\$964
TOTAL				489	0	\$510,000	\$467,806

#### Table 1: Georgina Basin Project Tenement Schedule and Expenditure.

Aggregate Project expenditure for the final reporting period 2011-12 was \$467,806 against a minimum commitment of \$510,000.

Aggregate Project expenditure (unaudited) for the period from grant on7 September 2006 to final surrender on 20 August 2012 was \$2,639,169. Some minimal expenditure on reporting and administration will accrue to the project during the September-October period.



Figure 1: Georgina Tenement Plan – unshaded areas surrendered after October 2011.

#### 4. REGIONAL GEOLOGY

The Georgina Basin is a broad, northwest-southeast trending, intracratonic depression which is about 1000km long and 500km wide, underlying an area of some 325,000km<sup>2</sup> of the Northern Territory and Queensland. Approximately 60 percent of the basin area (195,000km<sup>2</sup>) lies within the Northern Territory borders (*Figure 2*).

The basin contains prospective Cambrian and Ordovician marine carbonate and clastic sediments and Devonian continental sediments, Neoproterozoic (Vendian) clastics are also considered prospective in places. Sediments were deposited in a series of subtidal to supratidal environments over part of an extensive epicontinental shelf. The Palaeozoic sediments progressively thicken in a SSE direction, rarely exceeding 400 metres in the northern half of the basin and becoming significantly thicker in the southeast (Toko Syncline). The sedimentary sequence of the basin proper appears to have been neither metamorphosed nor intruded by igneous rocks.

The present outline of the Georgina Basin is an erosional remnant of a much larger, early Palaeozoic sedimentary province that once covered much of north central Australia.



Figure 2: The Centralian Superbasin and the component basins.

The basin was once contiguous with the Amadeus Basin to the south, but is now separated from it by the Archaean Arunta Block. It is not known at present if, or to what extent the Georgina Basin is connected to the Wiso Basin to the west and the Daly Basin to the northwest. The northwest and southwest extremities of the basin are concealed beneath Mesozoic and Cainozoic sediments which mask the actual limits of the basin in these localities. The Davenport Range and the Tennant Creek Block, both comprising deformed Early Proterozoic sediments, provide at least partial separation of the three sedimentary basins. The basin is fully confined by Archaean to Late Proterozoic metamorphic and igneous rocks. In addition to the structural elements described above, the Georgina Basin is bounded by the Mt Isa Block to the east, while to the north the basin extends as a thin veneer which overlies the Antrim Plateau Volcanics and the potentially prospective Proterozoic McArthur Basin.

The basin has been deformed by minor to moderate folding and faulting, especially in the south and east, with folding, faulting and some overthrusting along the southern margin. Most of the structural deformation occurred during the Late Devonian to Early Carboniferous Alice Springs Orogeny. Work by Pacific Oil and Gas has shown that mainly flat lying, Ordovician sediments can conceal and disguise earlier Palaeozoic structuring. North of latitude 21°S, the Georgina Basin sequence is gently undulating, with no pronounced folding recognised other than the Lake Nash Anticline which is interpreted to be a supratenuous fold. In the north, faults are recognised only along the basin margin.

The most prominent structural elements in the basin are the Dulcie and Toko Synclines, both of which are asymmetric folds with steep dips on their SW flanks; the "GMI" linear which has been identified from gravity and magnetics and is believed to be a basement feature; and the "Jinka Feature", another gravity-magnetic linear, the surface expression of which occurs in the Lucy Creek-Mt Playford Ooratippra Fault Zones.

In the southern portion of the basin, Late Proterozoic-Early Cambrian sediments are now regarded as basal units; elsewhere in the basin, Middle Cambrian rocks are regarded as basal units.



Figure 3: The geology of the Georgina Project area

#### 5. EXPLORATION ACTIVITIES

### Stream Sediment Sampling

A total in excess of 350 sample sites were selected for regional stream sediment sampling in 2008, with some 327 sites actually sampled (figure 4 below) in a modified program subsequent to imposed Heritage restrictions. Samples were collected at 5cm within active drainages, and sieved to -80# to +200#. The samples were then sent for multi-element analysis by ICPMS using a 4 acid digest.

ASCII data have been provided in the past years as many separate data files, but are amalgamated in Appendix 1 of this final report. Data files are report on a tenement basis.



Figure 4: Stream Sediment Sampling Areas, Zn analyses

### **Gravity Survey**

A total of 392 stations were measured in a helicopter assisted regional gravity survey during 2008. Figure 5 below shows the MCR gravity data merged with NTGS regional data, and Figure 6 summarises the Structural Interpretation and subsequent modelled drill targets (CSIRO).

Digital data, Interpretation and logistics reports (CSIRO and Bob Murphy) have been previously provided to NTGS.



Figure 5: Merged Gravity Image, Mincor and NTGS data



Figure 6: Potential Drill Targets Generated from Gravity Interpretation work

# Soil Sampling

A total of 4500 soil sample sites were planned, which generated five (5) separate anomalous areas for possible detailed soil sampling; an additional 4000 samples were to be collected in two detailed survey areas (Tomahawk and Putta Putta) as shown in figure 7 below. Due to Heritage restrictions, ultimately only 7986 soil samples (-200µm from 25cm depth) were completed and analysed by the lonic Leach method.

No significant anomalism related to MVT style Base Metal sulphide mineralisation was encountered.

ASCII data have been provided in the past years as many separate data files, but are amalgamated in Appendix 1 of this final report. Data files are report on a tenement basis.



Figure 7: Structural Interpretation and areas selected for detailed soils (white squares)

## Induced Polarisation Survey

A total of 23.1 line km (100m spaced stations) and 1.5km (50m spaced stations) of Dipole-Dipole IP lines was surveyed over 18.5 days in October 2010 (figs 8a, 8b below). The survey was conducted along four (4) EW traverses (500m spaced lines) across the Putta Putta Fault, and was designed to test the applicability of the IP method for target generation in the limestone dominated geological environment.



Figure 8a, 8b: Zones of Interest on GeoCover Image (top), and Chargeability Model Sections.

A number of zones of interest were defined by the IP survey, with these likely to be associated with structures (Putta Putta Fault) and black pyritic shales within the predominantly limestone sequence.

A full documentation, processing and Interpretation Report was provided to NTGS as Appendix 2 in the 2010 Annual Report.

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### **Diamond Drilling**

A total of three (3) stratigraphic diamond drillholes (figure 9) were drilled at Georgina, with two of these (GBD001 and GBD003) completed to their target depth of 600m (Table 2); drilling was conducted between the 1-17 October, for a total of 1345.28 metres. Analysis of core was obtained by portable XRF (InnovX) in April 2012, and data provided to the NTGS.

The drill holes intersected a generally fine grained siliclastic sequence of greenish to grey laminated calcareous siltstone and shale (calcilutites) with lesser buff-grey calcareous sandstones (calcirudites), and vughy dolomitic (evaporitic) limestones of the Arrinthrunga and Chabalowe Formations; evidence in GBD001 indicates that the Arrinthrunga and Chabalowe Formations interfinger. The significant thickness of finely laminated calcareous siltstone and grey-black carbonaceous shale (with minor limestone) intersected at the base of GBD003 is interpreted as belonging to the Arthur Creek Formation.

The holes failed to intersect any significant alteration within the target Arthur Creek Formation, with only minor pyritic zones (eg: 371.5m and 447m in GBD001); however some zones of interest were noted. The upper part of the Chabalowe Formation in GBD001 is typically vuggy with some coarse dolomite and calcite crystals infilling the vugs; this may represent late stage hydrothermal alteration. Silicification of limestone is noted between 210-286m in GBD001 (Arrinthrunga?) and 326-396 in GBD003 (Chabalowe or Arrinthrunga). Bleaching is pronounced between 150-165m in GBD001 (Chabalowe).

Hole #	Name	Start	End	Depth	Az	Dip	Comment
GBD001	Putta Putta	1/10	7/10	600.76	<b>0</b> <sup>0</sup>	<b>90</b> <sup>0</sup>	
GBD002	Tomahawk1	7/10	10/10	143.7	<b>0</b> <sup>0</sup>	90 <sup>0</sup>	Abandoned
GBD003	Tomahawk2	13/10	19/10	600.82	<b>0</b> <sup>0</sup>	<b>90</b> <sup>0</sup>	Redrill of GBD002
TOTAL				1345.28			

#### Table 2: Georgina Basin Project Drilling Summary.

A brief discussion of lithologies encountered in the drill holes is presented below, with more detailed lithological descriptions provided in drill logs (previously lodged with NTGS); drillhole locations are shown on the structural plan (figure 9) below:

#### GBD001

This stratigraphic drill hole was collared just west of a NS splay off the Putta Putta Fault and in an area of moderately anomalous (ionic leach) Zn in soils.

The hole was originally inferred to have drilled through a 57m thickness of the basal Hagen Member of the Chabalowe Formation before passing into a thick laminated grey to black (calcareous) siltstone-shale sequence of Arthur Creek Formation from 290.5m to 600.76m (EOH). On review of the core it was concluded that this section was more likely to be Arrinthrunga Formation interfingering with the Chabalowe Formation. Lithologies observed were predominantly silicified (partly evaporitic) dolomitised nodular limestone between 234-290.5m; this is unlikely to be Hagen Member which is defined as an arkosic conglomerate developed on Proterozoic granite or crystalline basement.

The hole was completed in thinly laminated black carbonaceous shale of the Arthur Creek Formation, and was possibly within 100m or so of the targeted "Hot Shale"-Thorntonia Limestone contact.



Figure 9: Drillhole Location Map.

### GBD002

The hole was abandoned (due to extreme broken ground conditions) at 143.7m in fine grained laminated quartz siltstone, possibly of the Chabalowe Formation. The hole was subsequently redrilled as GBD003 (see below).

#### GBD003

Collared 10m SW of GBD002, this drill hole was also targeted to intersect an upthrown block where the Arthur Creek Formation (basal "Hot Shale") - Thorntonia Limestone contact was expected to occur relatively close to the surface; the hole is sited close to the intersection of two faults; a possibly fertile NE structure (Putta Putta Fault) and a NNW fault which trends towards the Boxhole Pbprospect. Moderately anomalous (ionic leach) Zn values were returned from soils in the vicinity of the drill collar.

The hole is interpreted to have been collared in Arrinthrunga Formation before passing into Chabalowe Formation at around 128m; however due to the adoption of mud-roller drilling techniques to 133.62m there was very poor sample recovery in this section of the hole.

The cored portion of the hole appears to have predominantly stayed in laminated dolomitic siltstones of the Chabalowe Formation, although noticeable silicification (326-396m) and also lesser stromatolitic limestone (261.5-268.5m) suggest that there is interfingering with the Arrinthrunga Formation, as seen in GBD001.

The hole was completed at 600.82m in dolomitic limestone of the Chabalowe Formation and the target Arthur Creek Formation was not reached.

### **Petrography**

Table 3 below summarises the ten (10) samples collected by JOGMEC for petrographic analysis in Japan; reporting on this study has been submitted separately to the NTGS in September 2012, and a copy of the report included as Appendix 3.

Hole #	Sample Type	mFrom	mTo	Comment
GBD001	NQ ¼ Core	121.95	122.15	Vughy fenestral limestone
GBD001	NQ ¼ Core	152.15	152.20	Chert fragment in bleached dolomitic limestone
GBD003	NQ ¼ Core	225.90	226.00	Granular (fenestral?) limestone
GBD003	NQ ¼ Core	253.30	253.40	Ooidal (oolitic) limestone
GBD003	NQ ¼ Core	264.65	264.75	Microbial (stromatolitic) limestone
GBD003	NQ ¼ Core	282.40	282.50	Vughy stylolitic limestone
GBD003	NQ ¼ Core	411.55	411.75	Laminated calcareous siltstone (calcilutite)
GBD003	NQ ¼ Core	414.00	414.12	Anhydrite fragments in calcilutite
GBD003	NQ ¼ Core	437.72	437.80	Ooidal (oolitic) limestone
GBD003	NQ ¼ Core	454.10	454.20	Hematitic (jarositic) laminated calcareous siltstone

Table 3: Georgina Basin Project, Petrography Drill Sample Summary.

# XRF Analysis of Drill Core

XRF analysis of drill core was carried out in April 2012 prior to the NTGS shipping the ore to Darwin for HyLogger analysis. The XRF data has been provided to NTGS, however key indicator elements, Zn-Pb, Fe, S, Mg and Ca have been plotted against broad lithologies in Surpac downhole plots; this information is presented as figure 10 below, and as full scale pdf files in Appendix 3.



Figure 10: Drillhole Zn-Pb, Fe, S, Mg Ca XRF Lithoplots.

### NTGS HyLogger Study of Drill Core

The NTGS have undertaken to acquire spectral (HyLogger) data from collaborative core on a priority basis. Mincor has received a "draft" Preliminary Review of data collected from GBD003.

A comparison of the Hylogger data and the XRF data collected by Mincor has confirmed a good correlation in respect of zones of dolomitisation; these zones (high Ca-Mg on XRF) occur from 150-250m, 280-395m and 450-475m. The lowermost zone of weak dolomitisation also characterised by elevated Fe (1.5-4.0% from XRF data) with minor visible pyrite-marcasite in the core. The upper more intensely dolomitised zones have intermittent moderately elevated Fe (generally 1.0-2.0% XRF) and alternating low-Fe zones (<1.0% XRF). The HyLogger data defines a low goethite zone (NTGS) from 346-394m, however this correlates with a slightly elevated Fe zone (1.0-2.2% XRF) from 365-385m.

There is only moderate correlation between visually logged lithologies and HyLogger data, which in part reflects the difficulty in recognition of dolomitisation where there is a silicification overprint.

#### 6. CONCLUSIONS

Due to various cultural issues, parts of the surrendered ground have been somewhat difficult to explore (particularly EL25093 and the general Dulcie Range area). The exploration activities that have been carried out (gravity, IP and surface geochemical sampling), failed to detect any significant geochemical anomalies which could likely be associated with a base metal deposit.

Although the two completed drillholes (GBD001, GBD003) were essentially stratigraphic in nature, analysis of the drill core, and follow-up inspections of the core at the NTGS Core Library in Alice Springs (XRF and Petrography) has been disappointing, and have revealed no significant sulphide mineralisation. Depths to the target Arthur Creek Formation basal "Hot Shale" horizon (as seen in Baldwin 1) are in excess of the 600m drilling depths attained.

GBD001 may have been terminated within 100m of the target depth, but intersected only minor sulphides (pyrite) between 350-475m within carbonaceous black shales. Minor bleaching within Chabalowe Formation siliciclastics was noted between 150-165m, but this may be supergene.

GBD003 also did not reach the target Arthur Creek Formation, and contained no visible coarse sulphides. Pink-orange (possibly hydrothermal) dolomite crystals lining cavities in Chabalowe Formation dolomitic limestone are noted between 200-201m and 286-287. Moderate silicification occurs in mixed siliciclastics and dolomitic limestone between 320-390m also in Chabalowe Formation. Minor hematite veins and patches occur at 453m (with possible jarosite) and also between 525-530m in possible Upper Arthur Creek Formation.

There is a general lack of key alteration indicators (veining, brecciation, strong hydrothermal dolomitisation) and also generally low background Zn-Pb values from XRF analysis.

Mincor Zinc Pty Ltd and JOGMEC have therefore decided to surrender the ground.

Appendix 1:

Analytical Data Files (ASCII)

Appendix 2:

JOGMEC Petrography Report (PDF)

# Appendix 3:

Geological Sections, XRF Results (PDF)

GBD001, GBD003