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# **MMG EXPLORATION PTY LTD**

### ACN 119 136 659

### **FINAL REPORT FOR EL31294**

Reporting Period 06/01/2017 - 30/05/2019

**Project Title Holder: MMG Exploration Pty Ltd** 

**Project Operator: MMG Exploration Pty Ltd** 

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### 1. ABSTRACT

Between 3 March 2016 and 2 July 2018, MMG was granted 22 exploration tenements in the McArthur Basin, including EL31294. This tenement along with the other granted tenements, formed the South Batten project. The primary exploration target for MMG is zinc-lead deposits in black shales of the McArthur Group. Initial field reconnaissance was conducted in 2016 and 2017 to assess access into areas for proposed drilling and program logistics. Exploration activities consisted mainly of desktop studies and field reconnaissance exercises in the Tanumbirini, Letterbox and Glyde River areas.

In 2018 an external consultant was engaged to develop a detailed structural history and solid geology interpretation of the Glyde area using regional-scale geophysical datasets and camp-scale surveys (Falcon GD and GeoTEM).

In 2018 the learnings to date were used to design a major field campaign in 2018 including ground geophysics (IP) at Tanumbirini and a proposed heli-rig drilling program at Glyde River. Unfortunately ground disturbing exploration activities in the South Batten Group Reporting area experienced significant delays due to long wait times on obtaining AAPA cultural heritage clearance surveys and a Mine Management Plan. In 2018 helicopter supported field reconnaissance and surface sampling was undertaken on the South Batten Group Reporting tenements, there was no ground disturbing works (drilling or IP surveys).

For the current reporting period, a total of AUD \$10,855 was spent on the South Batten tenement EL31294.

### 2. COPYRIGHT STATEMENT

This document and its content are the copyright of MMG Australia Limited (MMG). The document has been written by Kate Lester for submission to the Northern Territory Department of Primary Industry and Resources as part of the tenement reporting requirements as per Regulation 86 of the Minerals Titles Act.

Any information included in the report that originates from historical reports or other sources is listed in the References section at the end of the document. This report may be released to open file as per Regulation 125(3) (a).

### 3. BACKGROUND

### 3.1 Introduction

This final report is for Exploration Licence EL31294 which is held 100% by MMG Exploration Pty Ltd (MMG).

### 3.2 Location, Access and Physiography

Tenement EL31294 is located approximately 760 km southeast of Darwin and approximately 370 km northeast of Tennant Creek in the 'Gulf Country' of the Northern Territory, Australia. The township of Borroloola and the roadhouse at Cape Crawford (Heartbreak Hotel) serve as the main points of service for freight, fuel and food while the McArthur River Mine airport is used to fly in and out of the exploration area.

Access to the project area is via the Carpentaria Highway to and from Darwin to the west and Borroloola to the east and via the Tablelands Highway for access from Mt Isa to the south-east. Station tracks in the Mallapunyah, McArthur, and Broadmere stations can be used to access many of our exploration areas but track quality is variable based on their frequency of use by pastoralists. Access deteriorates significantly on unsealed roads and creek crossings need to be negotiated. Each wet season results in substantial damage to most creek crossings which need to be re-established.

Lease	Status	Grant Date	Reporting Period
EL31294	Granted	06/01/2017	06/01/2017 to 30/05/2019

 Table 1. EL31294 Tenement grant date and reporting period.

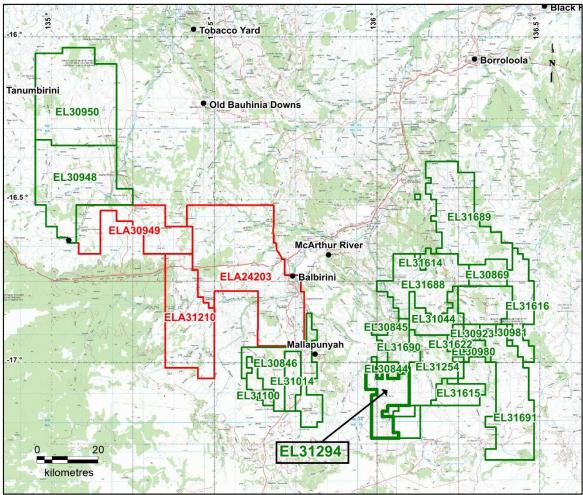


Figure 1. South Batten exploration tenement EL31294 on background 1:250k topography map.

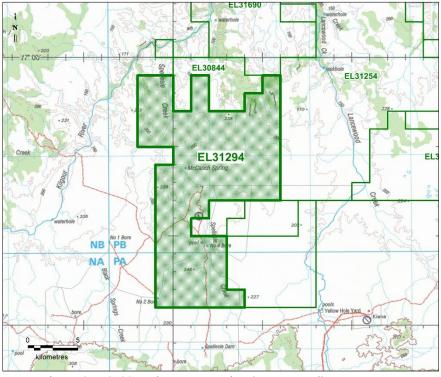


Figure 2. EL31294 - close up map showing surrounding tenements.

### 3.3 Native Title

The South Batten tenements are subject to several determined Native Title Claims. Native Title exists in all claim areas (Table 2, Figure 3).

Tribunal ID	Related NTDA	FC No	Name	Determination Date	Determination Type
DC2000/027		NTD6031/2000	McArthur River	02/02/2001	Accepted for registration
DC2001/068		NTD6068/2001	Kiana West	31/12/2001	Accepted for registration

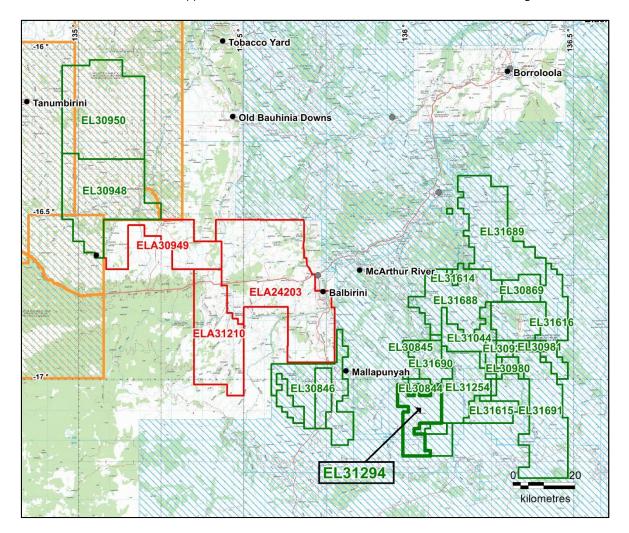


 Table 2.
 Native title applicable within the South Batten tenement EL31294 (see also Figure 3).

Figure 3. Native Title Determinations with respect to the South Batten Tenement EL31294.

#### 3.4 Landowners

Pastoral and Crown Perpetual Leases overlapping with the granted exploration licenses are listed in Table 3 and Figure 3.

LOCATION NAME	PARCEL	PROPERTY NAME	OWNER CATEGORY	TENURE REFERENCE DESCRIPTION	TENURE REFERENCE NUMBER
NT Portion	4319	McArthur River	Private	Perpetual Pastoral Lease	1051
NT Portion	1164	Kiana	Private	Perpetual Pastoral Lease	1065

**Table 3.** Pastoral and Crown Perpetual Leases that overlap with the South Batten exploration tenement EL31294 (see also Figure 4).

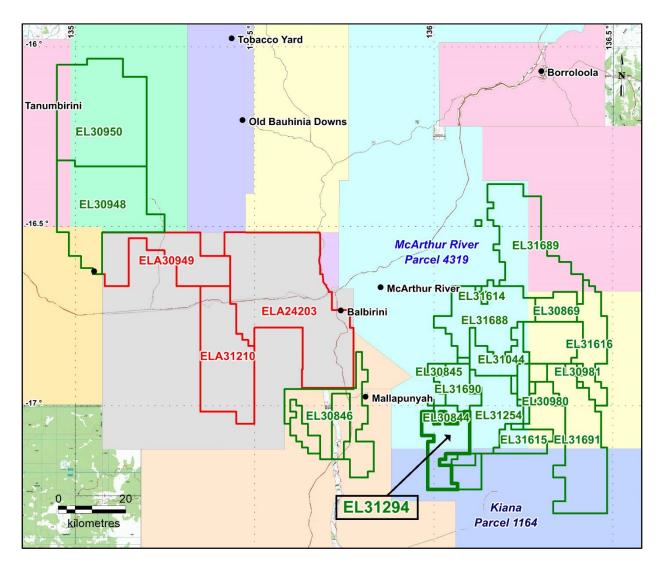


Figure 4. Cadastre layer overlapping with South Batten exploration tenement EL31294.

### 3.5 Regional Geology and Prospectivity

The McArthur Basin is a large sedimentary basin with an exposed area of about 180,000 km<sup>2</sup>. Most of it lies within the north-eastern Northern Territory, and it extends over the border into Queensland. Thick marine and non-marine sedimentary rocks were deposited from the late Palaeoproterozoic to the early Mesoproterozoic (1800–1430 Ma). The central tenements of the South Batten project area lie within the Batten Fault Zone (BFZ) where sediments of the Tawallah, McArthur and Roper Groups rest unconformably on the Scrutton Volcanics, and are partially concealed by Cretaceous and Tertiary sediments. The western tenements of the project area (Tanumbirini) are outside the Batten Fault Zone and overlap an area that seems to lack any McArthur Group rocks separating the underlying Tawallah Group from the overlying Nathan and Roper groups. This area is transected by the major northwest trending Mallapunyah Fault. The eastern tenements (Glyde River) lie mostly on the Cambrian-aged Bukalara Sandstone which covers the Palaeo-/Mesoproterozoic sequences.

The McArthur Basin is a prime target area for SEDEX type economic sulfide deposits. This type of deposit holds 50% of the world's zinc and lead reserves, and makes up around 25% of world zinc and lead production. In particular the McArthur Basin hosts the world-class McArthur River (HYC) zinc-lead-silver deposits in close proximity to the northerly trending Emu Fault Zone along the eastern margin of the South Batten project area.

The Batten Fault Zone setting may also be considered prospective for red-beds and Mississippi Valley-type (MVT) styles of base metal mineralisation. The Mallapunyah Fm/Masterton Fm contact may host red-beds style mineralisation within the Masterton Sandstone. Within the McArthur Basin stratigraphic sequence, siltstone and dolostone lithologies may have provided hosts for replacement lead-zinc mineralisation analogous to the MVT deposition style.

Diamonds have been the target of previous exploration in the South Batten project area. Multiple macrodiamonds, micro-diamonds and kimberlitic indicator minerals have been recovered from alluvial samples taken from creeks surrounding a remnant Cretaceous plateau within surrounding McArthur Group sediments.

### 3.6 Exploration Rationale

The exploration targets for MMG are lead-zinc HYC-style or Century replacement deposits in carbonaceous shales and carbonates of the McArthur Group.

### 4. HISTORICAL EXPLORATION

### 4.1 Tanumbirini

In the early 1970s Kratos Uranium/Pechiney Australia explored for uranium in the Tanumbirini area. Several drillholes were drilled into the Lower Roper Group, however the position of these drillholes cannot be determined with confidence and these holes were not assayed for zinc (CR1972-0087). During the late 1970s Australian Electrolytic conducted mapping and limited surface sampling programs over the area of interest. Although float containing anomalous zinc was sampled this was considered an incomplete test of potential and WMC conducted reconnaissance ground geophysics (100 m dipole IP and 200 m loop TEM) in 1981. Anomalous responses from this program were tested by twelve target oriented percussion holes in 1981 (Table 4). WMC also conducted surface sampling during this period. It was found that the IP anomalous responses were associated with disseminated, stringer and minor laminated pyrite in green and black dolomitic siltstones, algal dolomites and cherts. In general base metal results for both the drilling and surface sampling programs were disappointing and WMC chose to relinquish tenements in the area (CR1982-0090).

CRA explored for diamonds between 1984 and 1985 and flew a low-level aeromagnetic and radiometric survey over the area to identify possible kimberlitic diatremes. Anomalies were followed up with loam sampling however results weren't encouraging (CR19850178). General Electricity began exploring for

uranium in the area in 1987. Aeromagnetic and radiometric surveys were flown and followed up by field investigations and surface sampling. Despite initially encouraging radioactivity there was no evidence that economic concentrations of uranium existed (CR1987-0174).

In 1990 Helix Resources explored the area corresponding to present-day EL30949 for diamonds, base metals and precious metals. Stream sample heavy metal separates came back with zinc results up to 1400 ppm but were disappointing for diamonds and precious metals. Helix did not consider the ground prospective and relinquished the tenements in 1991 (CR1991-0368). In 1990, Aberfoyle acquired an EL overlapping much of the Tanumbirini dome and conducted a gravel sampling program for diamond exploration with limited success (CR1990-0123). Ashton Mining also explored for diamonds in the area from 1993-1996. During the term of their licence a data review and two gravel/loam sampling programs were conducted, the licence was relinquished in 1996 (CR1996-0742).

Astro Mining acquired tenements in the area for diamond exploration in 2004 but work was limited to a desktop review (CR2005-0525). Legend International Holdings continued with diamond exploration in 2007 and conducted field reconnaissance and rock chip sampling. Results were not encouraging and the tenements were surrendered in 2008 (CR2008-0919).

Table 4. Historical drilling in the Tanumbirini area.

Hole ID	EOH (m)	Target	EOH lithology	EOH Formation	Highest Zn assay (ppm)
PD6-450	81	IP	Black fissile dolomitic siltstones, interbedded black and grey algal chert bands. Thinly interbedded bleached pink quartz arenite with trace feldspar. Stringers, very fine grained disseminated pyrite from 23 m to 64 m.	Pms (Masterton Sandstone)	140 ppm from 2 – 4m
PD6-700	81	IP	Red-brown arenites and minor interbedded siltstone, trace feldspar. Hole did not reach target depth.	Pms (Masterton Sandstone)???	80 ppm from 34 – 36m
PD6-2500	17	Ironstone anomaly (Zn)	Fine to medium grained poorly cemented sand.	Cover (Cretaceous)	200 ppm from 5 – 6m
PD6-2600	96	IP/ Ironstone anomaly (Zn)	Green dolomitic siltstones and dolomites, pyritic stringers and joint infilling (trace only).	Pm (Amelia Dolomite)???	180 ppm from 6 – 8m
PD12-900	25	Ironstone anomaly (Zn)	Moist fissile clay with trace ferruginous mottling.	Cover (Cretaceous)	300 ppm from 23 – 24m
PD12-1100	15	Ironstone anomaly (Zn)	Tan to green montmorillonitic clay.	Cover (Cretaceous)	410 ppm from 9 – 10m
PD12-1300	30	Ironstone anomaly (Zn)	Montmorillonitic clay and chlorite after chloritised/altered volcanic.	Cover (Cretaceous)	400 ppm from 13 – 14m
PD12-1500	20	Ironstone anomaly (Zn)	Montmorillonitic clays. Cover (Crea		600 ppm from 0 – 1m
PD19-400	141	IP	Green thinly bedded dolomitic siltstone, shale and dolomite, trace muscovite and trace disseminated pyrite from 83 m to 141 m.	Unknown	250 ppm from 0 – 2m
PD26-750	161	IP	Green and dark grey-green fissile dolomitic siltstone, some algal laminations, trace pyrite and siderite from 120 m to 161m.	Unknown	350 ppm from 124 – 126m
PD28-900	71	IP	Green, micaceous, silty dolomitic shale and dolomite with trace disseminated pyrite and pyrite stringers.	Prr (Crawford Formation-Roper Group)	150 ppm from 40 – 42m
PD29-450	175	IP	Green and dark green fissile dolomitic shale, laminated to thinly bedded, slightly carbonaceous, some wispy algal laminae, trace disseminated pyrite and pyrite stringers.		120 ppm from 70 – 72m

In summary, only 12 drillholes have been drilled in the Tanumbirini area, five of which terminated in Cretaceous cover. These holes were only assayed for Cu, Fe, Mn, Pb, Zn and As. No diamond holes have been drilled in the area. It is therefore poorly understood, stratigraphically unconstrained and insufficiently tested.

The overwhelming majority of historical surface sampling in the area of interest has been for diamond exploration and has not been assayed. WMC conducted surface ironstone sampling in the 1980s that was assayed for Cu, Fe, Mn, Pb, Zn and As, however no information about the analytical method is provided and the majority of sample locations are uncertain (CR1982-0090). High Zn usually coincided with high Mn and Fe suggesting scavenging effects. WMC discriminated subtle anomalies above background that were followed up with infill surface sampling and drillholes (Table 4). Geochemical anomalies were resolved by sparse pyritic laminae and stringers in dolomitic siltstones.

### 4.2 Glyde River

Amoco began exploring in the Glyde River prospect area in 1978. Exploration consisted of surface geological mapping, air photo geological interpretation, geochemistry, airborne input EM surveys, aeromagnetic surveys, gravity surveys and induced polarisation surveys (CR1981-0028). A series of 11 diamond drillholes were drilled by Kennecott Exploration and Amoco Minerals between 1979 and 1982. The drilling was targeted based on the availability of water, the ease of access by helicopter, the EM anomalies and the gravity anomalies (CR1980-0064). The structure and stratigraphy of the Glyde River basin was found to be very similar to the HYC-hosting sun-basin. The drilling is summarized in Table 5.

Drillhole ID	Depth (m)	Company	Summary
GR1 (aka GRNT-79-1)	0 – 359	Amoco	Drilled down to W-fold Member; high Zn at 300-330 m
GR2 (aka GRNT-79-2)	0 – 239	Amoco	Abandoned hole in mid-Barney Creek
GR3 (aka GRNT-79-3)	0 - 509	Amoco	Drilled down to Coxco dolomite; high Zn at 285 – 315 m
GR4 (aka GRNT-79-4)	0 – 275	Amoco	Drilled down to Coxco dolomite; high Zn at 145 – 151 m
GR5 (aka GRNT-79-5)	0 – 492	Amoco	Drilled to top of ore-equivalent horizon; high zinc from 491- eoh
GR5 (aka GRNT-79-5)	492 – 528	Kennecott	Intersected 20.7 m of pyritic shales and siltstone before grading into the tuffaceous dolomitic W-fold shale
GR6 (aka GRNT-79-6)	0 – 194	Amoco	Not in the Glyde River prospect but at Mountain Home
GR7 (aka GRNT-79-7)	0 - 635	Amoco	Drilled to lower Barney Creek but could not drill any deeper with the rig
GR7 (aka GRNT-79-8)	635 – 917	Kennecott	32.8 m of bituminous pyritic siltstone with 10-30% pyrite and minor
			sphalerite correlating to HYC ore horizon then 197 m of bituminous
			pyritic dolomitic siltstone and tuffaceous siltstone with minor sphalerite;
			max 800 ppm Zn in 3m sample
GR8 (aka GRNT-79-9)	0 – 613	Kennecott	10.2 m of Bukalara sandstone followed by 549.8 m of dolomitic siltstone;
			elevated lead up to 0.44% Pb between 340 – 365 m; 39.5 m of weakly
			pyritic dolomitic siltstone with trace sphalerite (max 760 ppm Zn) and into W-fold at 601.5 m
GR9 (aka GRNT-79-9)	0 – 534	Kennecott	42.5 m of Bukalara sandstone followed by 413.7 m of dolomitic
			bituminous Barney Creek Fm; pyritic siltstone 456.2 – 501.7 m containing
			8% Py and trace sphalerite; W-fold is absent as Coxco Member is in
			contact with pyritic shale; gas flows (74% methane) were more evident in
			this hole than any other in the area.
GR10	0 - 704	Shell	Drilled through Bukalara sandstone, Upper Barney Creek Fm, HYC pyritic
			shale member and terminated in W-fold member; max 460 ppm Zn
GR11	0 - 470	Shell	Drilled through Bukalara sandstone, Upper Barney Creek Fm, HYC pyritic
			shale member and terminated in W-fold member; max 590 ppm Zn

Table 5. Brief summary of Glyde River drilling sourced from CR1981-0028, CR1980-0064 and CR1983-0048.

More recently Armour Energy completed an airborne FALCON<sup>™</sup> gravity gradiometry survey in the region that partially overlaps a small proportion of the South Batten tenements in the Glyde River region. This FALCON data is publicly available and has been used by MMG to assist with the interpreting the local geology (see Section 5).

### 4.3 Letterbox

In the Letterbox prospect area, the most important historical working is the Kilgour Copper mine which is estimated to have produced about 1600 t of copper ore from 1913 – 1955. The ore consists of malachite, chalcocite and azurite and is hosted by shallow-water nodular microbial dolostone of the Amelia Dolomite. Mineralisation occurs as a copper-haematite gossan in brecciated joint fissures up to 4 m wide and as patchy disseminated low-grade mineralisation throughout the host-rock (Kruse *et al.* 2010). Ashton Mining explored much of this ground for diamonds in the 1990s. A summary of exploration activities during this period is included below (CR1999-0187):

- BHP Minerals contracted Geoterrex in 1993 to fly a GEOTEM survey over historical tenement EL7642 to assist in their base metal exploration. Ashton Mining field checked many anomalies but no further work was recommended.
- Three ground based EM-34 survey were carried out over two years but did not lead to any discoveries. Black soil deposits of variable conductivity were thought to adversely affect the results and limit their effectiveness.
- A helimag survey was flown by Geoinstruments. Loam samples were collected based on anomalies from this survey.
- Vegetation sampling was undertaken in 1997 to follow-up on a chromite-positive loam sample. Ninety samples of an unknown species of tall grass were collected over a 300 m x 300 m grid.
- Rotary Air Blast drilling of 11 shallow holes 16 35 metres deep targeted gravity and vegetation anomalies exploring for diamonds but were unsuccessful.

### 5. MMG WORK COMPLETED 01/03/2016 - 31/12/2016

MMG carried out ground traverses, rock chip sampling, stream sediment sampling and track and terrain reconnaissance during the 2016 field season.

### 5.1.1 Tanumbirini Reconnaissance and Stream Sediment Survey

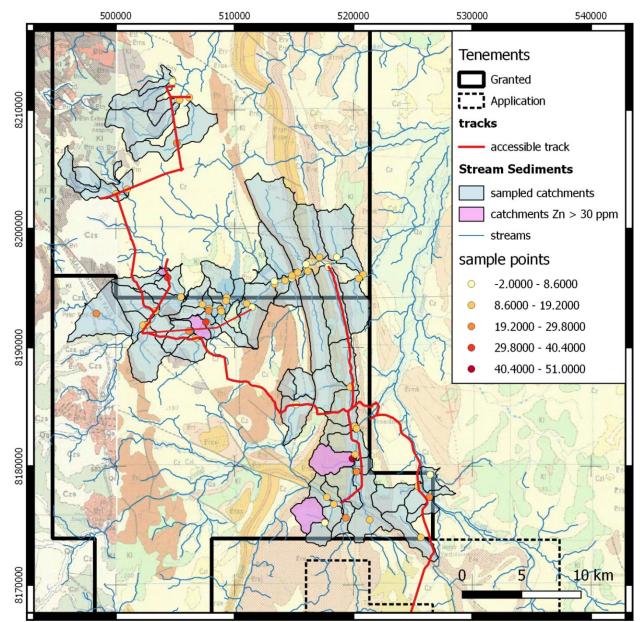
The Tanumbirini area is comprised of the two western contiguous granted exploration licences (EL30948 & EL30950). It was accessed in July 2016 to gain an understanding of the terrain and road access, to meet with the station managers at Broadmere Station and to follow-up on historical stream sediment samples and to assess the local geology.

The Tanumbirini stream catchments were digitally generated based on a digital elevation model and a stream sediment points were designed to test easily accessible catchments draining the major recessive plain in the centre of the broad anticline and along the NW-striking Mallapunyah Fault (Figure 5). Several samples were also designed to duplicate anomalous historical streams samples (CR1991-0368).

In total, 61 stream sediment samples were collected. Assay results were mostly very low for Zn with the highest zinc assay returning 51 ppm and only 4 samples containing greater than 30 ppm Zn. Highly 'anomalous' historical stream sample assays were not replicated because the historical samples were processed to be concentrated in heavy mineral whereas ours were only sieved. These heavy mineral historical samples were not minerals elevated in metals of interest whereas our samples were not mineralogically biased.

#### **Field observations**

In parallel to the stream sediment sampling program, field observations and informal outcrop descriptions were taken. A key finding of these traverses was that the vast majority of the mapped Balbirini Dolomite (Pnz) south of Lansen Creek is a very mature, medium bedded, weakly cross bedded to massive quartz sandstone with only a single siltstone outcrop identified. It is possible however that much of the cover to the north of the exposed Balbirini Dolomite hides more recessive and finer grained Balbirini Dolomite units.



**Figure 5.** Tanumbirini stream sample area showing stream sediment sample points, area of sampled catchments and tracks confirmed to be accessible by light vehicle.

#### 5.1.2 Letterbox and Glyde River

The Letterbox and Glyde River areas are two groupings of exploration licences located to the south of the Carpentaria Highway. Field work in these two areas consisted of three rock chip samples near Top Spring Creek (NE of the Letterbox tenement group), track reconnaissance and taking informal field observations along these tracks. Two rock chip samples were taken in the basal Barney Creek Formation near the Teena Dolostone contact while the other was stratigraphically higher. No anomalous metal concentrations were returned and the exposed unit was not considered to be of the desired prospective deep-water facies.

### 5.1.3 Historical Drillhole Review

Seven public drillholes in or in proximity the South Batten exploration licences were samples at the NTGS core library in Winnellie, NT: LV09-001, GSD3, GRNT-79-1 (aka GR1), GRNT-79-4 (aka GR4), GRNT-79-7 (aka GR7), GR-10 and GR11. Most of these drillholes were historically assayed for limited number of elements. The purpose of the re-sampling was to obtain a larger suite of elements that we could compare between holes to help target our future drilling. This data is not included with this report as it is submitted separately as part of the normal NTGS core sampling protocol.

Of the six sampled holes, GR-10 was also re-logged and stratigraphically re-interpreted to also contain Caranbirini Member and Reward Dolomite within what was historically interpreted as 'Upper Barney Creek Fm'. The re-assignment of the stratigraphy is based on a marked coarsening of the sedimentary sequence between 70 – 230 m that includes at least 6 fining-upward sequences of coarse and medium sand-rich layers grading to siltstone. This has been re-logged as Reward Dolomite while the unit above it, which has a deepwater facies of fissile shale at its base, has been assigned to the deep-water Caranbirini Member. The re-logging is as follows:

Depth (m)	Stratigraphy			
0 - 12	Bukalara Sandstone			
12 - 70	Caranbirini Member (Pmnc)			
70 - 230	Reward Dolomite (Pmx)			
230 - 646.2	Barney Creek Fm (Pmq)			
646.2 - 704	W-fold Member (PmqW)			

### 6. MMG WORK COMPLETED 01/01/2017 - 31/12/2017

In early 2017 a major data review of the South Batten Project was completed focused on several target prospects within the Tanumbirini, Letterbox and Glyde River areas. The purpose of this review was to identify areas for potential drilling in 2017. Of these Tanumbirini, Letterbox and the Glyde River regions warranted further work.

In 2017 the planned MMG exploration program for the South Batten Project experienced significant landowner and aboriginal heritage survey delays that negatively impacted on the amount of field work completed during this reporting period.

### 6.1 Tanumbirini Field Program

Following on from 2016 desktop reviews and field reconnaissance field further targeting exercises were employed to determine the best possible collar location for drilling the Tanumbirini prospect and to identify relevant further work that could be carried out to refine our understanding of the local geology. The main source of historical data was report CR1982-0090 from WMC which consists of soil lines and coincident IP lines collected in 1981.

Soil lines are reported in map form in report CR1982-0090. The soil sample map has been georeferenced in GIS and soil assays colour-coded graphically based on Zn assays Figure 6. Anomalism was identified at locations along the Mallapunyah Fault and within a black soil plain. In particular, three lines located 1 km apart in the black soil plan have a consistent Zn anomaly (see **Error! Reference source not found.**).

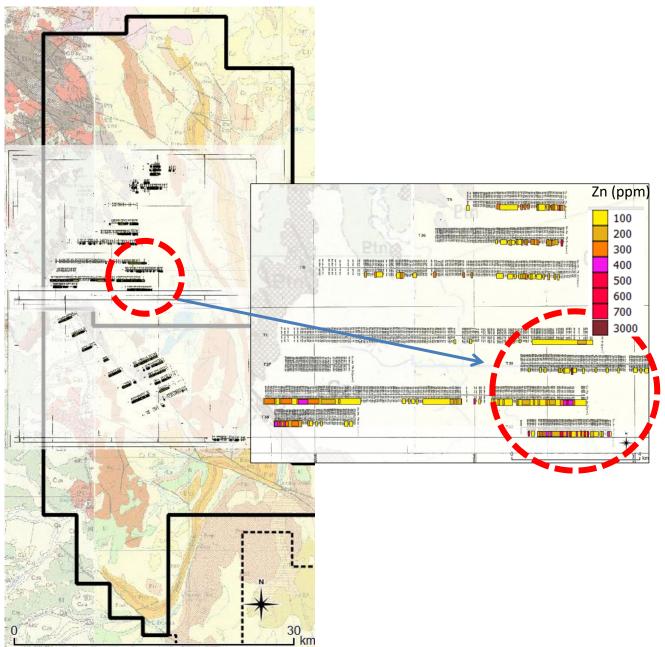
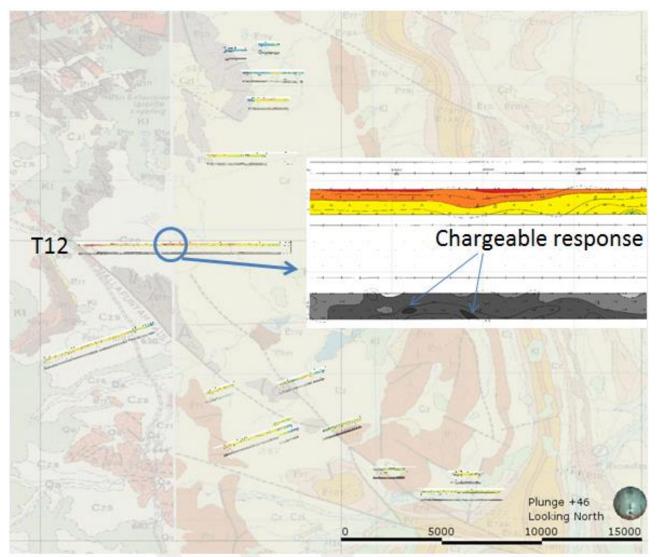


Figure 6. Tanumbirini soil sampling program from 1982 georeferenced over NTGS Geology 250k.

A review of thirteen historical IP lines located on a subset of the historical soil lines was completed. The results of the survey were interpreted by MMG to show domains of high/low resistivity and chargeability (see Figure 6). As the data has not been reprocessed by MMG the significance of the amplitude of the responses is not known. However, heterogeneities and anomalism can be used as an exploration guide. Many of the IP lines targeted the Mallapunyah Fault whilst only one IP line crosses the recessive plain of interest containing the surface geochemistry anomalism. This IP line is the longest in the survey and shows some evidence for a chargeable stratabound unit (Figure 6).



**Figure 7.** Oblique view looking down and to the north of registered IP cross-sections (conductivity in colour, chargeability in greyscale underneath) against NTGS 250k Geology.

### 6.2 Letterbox and Glyde River

Field reconnaissance activities were carried out at both the Letterbox and Glyde River areas in early 2017.

### Letterbox - Dillingham's Bore

Two transects of reconnaissance field checking/mapping were completed over interpreted Balbirini and Barney Creek Formation sediments. Debris flow conglomerates were identified that suggest the Mallapunyah Fault was an active growth fault at that time of Barney Creek deposition and increases prospectivity of this area.

#### Letterbox - Six Mile Yard

Barney-Lynott Cycle sediments were mapped and the covered black soil plain target area was inspected.

#### **Glyde** River

The rough terrain and limited access tracks means that any field reconnaissance and drilling activities need to be helicopter supported.

In March 2017 a helicopter-supported field reconnaissance exercise was completed involving the field checking of several potential drill sites. These drill sites were field checked for suitability in terms of the terrain (drill pad location) and potential nearby water sources. Of 12 potential drill sites visited a total of 4 high and 3 low priority holes were selected for drilling totalling ~5000-6000m. Subsequently, the process of engaging potential heli-rig and helicopter suppliers for the Glyde River drilling program commenced.

These drill sites were assessed against the publicly available FALCON gravity gradiometry data that partially covers some of the Glyde River region (Figure 8). This survey was flown at 400m line spacing and with an older system, however, it is still a significant upgrade on the regional gravity of the region.

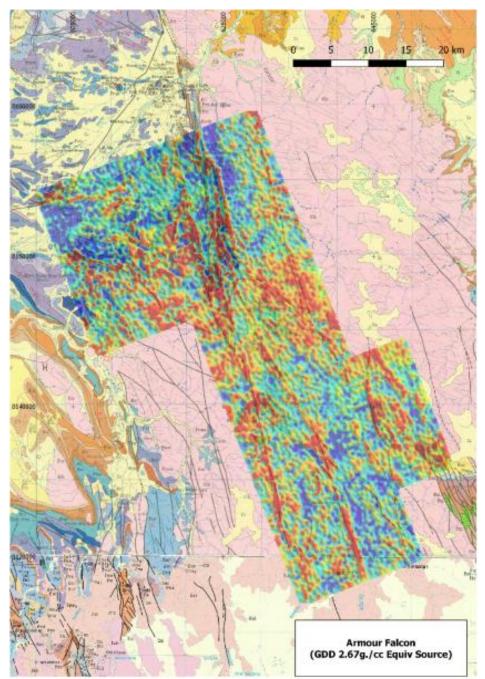


Figure 8. Historical (Armour Energy) FALCON GDD data image that partially covers some of the Glyde River tenements.

#### 6.3 Historical Drillhole Review

In early 2017 a comparison between historical assays from Glyde River drillcore and new assays by MMG at the same depths in the same holes found Zn assays are higher in the modern analyses. GR-10 in particular has Zn concentrations as much as 10-30 times higher in new analyses. Other holes (GRNT-79-1, GRNT-79-4, GRNT-79-7, GRNT-79-9 and GR-11) returned Zn only 2-3 times higher. All our modern GR-10 samples were re-assayed again using both 4-acid and Aqua Regia digest to test if the digest was the cause of the discrepancy but it was not found to be the case. It was eventually concluded that the recent MMG re-sampling was affected by oxidised zinc galvanisation of the old rusting core trays resulting in higher zinc assay results.

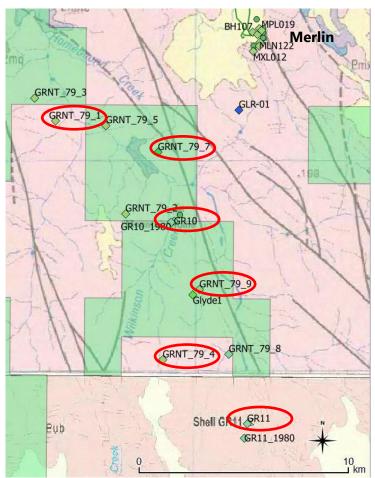


Figure 9. Historical Glyde River Region drill holes reviewed and re-sampled by MMG in 2016/17.

#### 6.4 Program Suspension - Landowner and AAPA Delays

As part of the early 2017 technical investigations and field reconnaissance programs several applications for AAPA cultural heritage clearance surveys were submitted to and receipted by the AAPA on 3<sup>rd</sup> April, 2017. These included applications at Tanumbirini, Letterbox and Glyde River covering potential ground geophysics, surface sampling and/or drilling target areas scheduled for completion in 2017.

These surveys were subsequently scheduled for field surveys in late June 2017, however, due to very strong objections from Mallapunyah Station pastoralists (Letterbox Prospect area) these heritage surveys were delayed another >2 months. This was due to the fact that the AAPA were obligated to lodge official Notices of Entry with a minimum of 2 months notification. Approaches were made to the Mallapunyah Pastoralists to try and alleviate and resolve their concerns, however, the decision was made to suspend all cultural heritage survey and exploration activities on Mallapunyah Station until such time as a resolution is reached. This

suspension is still in effect mainly out of respect for the passing away of one of the Mallapunyah Pastoralists involved.

The AAPA Authority Certificate covering part of the Glyde River area was eventually received on the 2<sup>nd</sup> November 2017 (C2017/103), however, this did not leave enough time to complete the proposed heli-rig drilling program before the start of the wet season.

The Tanumbirini AAPA heritage surveys were also postponed in 2017 due to timing and cost concerns.

## 7. MMG WORK COMPLETED 01/01/2018 - 31/12/2018

### 7.1 Tanumbirini – mapping and surface sampling

In early August 2018 MMG returned to Tanumbirini to meet with station managers, conduct basic field mapping and undertake a small rock chip surface sampling program.

A total of 5 rock chip samples were taken from fine grained lithologies of the Balbirini Formation of the Nathan Group and submitted for assay by ALS Townsville (MEMS-41). The highest Zn assay was 55 ppm in sample R222610 (Figure 10). Full assay results are included as Appendix 2. QAQC results are included as Appendix 3.

The lack of anomalism in these samples is not discouraging as the target at Tanumbirni is not the Nathan Group but rather the McArthur Group which is interpreted to occur below the black soil plain between the outcropping Nathan Group and the outcropping Tawallah Group in the northwest of the tenement area.

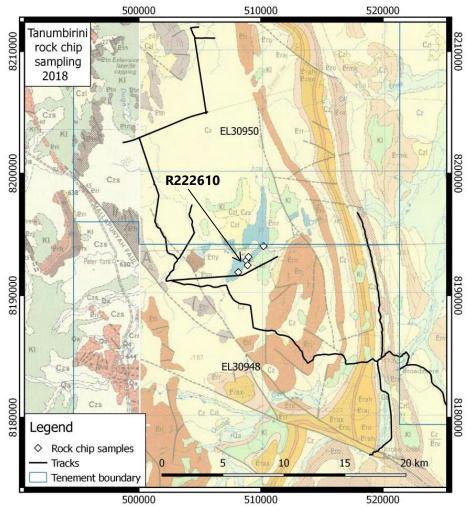


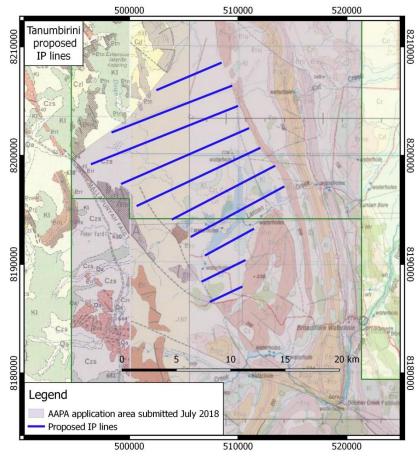
Figure 10. 2018 Tanumbirni rock chip samples shown over NTGS 250K geology. Highest Zn assay was 55 ppm in R222610.

### 7.2 Proposed Tanumbirini IP program

Based on the results of a successful pilot IP program at MMG's North Batten project area a series of IP lines (Figure 11) were planned at Tanumbirini to test for chargeable pyritic shales of the McArthur Group beneath the recessive black soil plan area.

The proposed work area was ground checked to assess the logistical difficulty of conducting an IP program. In general the recessive plain was sparsely vegetated and flat and it was determined that only minimal earthworks and clearing would be required for the survey.

Based on the promising results at North Batten and anticipated ease of conducting the survey an AAPA application over the area was submitted in July 2018 (Figure 11). At the time of writing this application had still not been approved by the AAPA. For a discussion of project delays in 2018 due to permitting please see section 7.5 of this report.



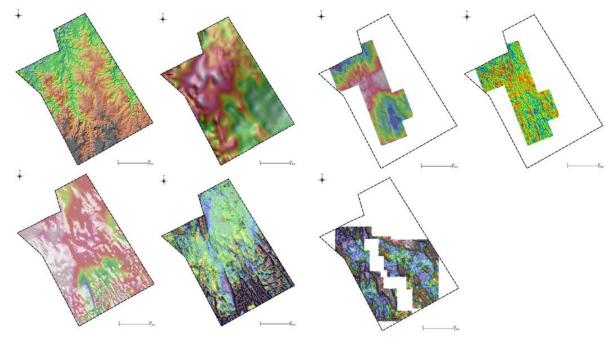
**Figure 11.** Proposed IP lines at Tanumbirini shown on NTGS 250K geology. AAPA clearance area submitted for assessment in July 2018 shown.

### 7.3 Glyde River consultant potential field interpretation

In 2018 MMG engaged an external consultant (Geokincern) to complete a potential field interpretation of the Glyde area. The fundamental exploration strategy in the wider Glyde AOI is delineation of magnetic low compartments and systematic drill-testing to determine the presence of a shale sub-basin and assess shale fertility using geochemical and facies determinants. To augment our existing understanding of the area Geokincern was commissioned to develop a detailed structural history and solid geology interpretation of the using regional-scale geophysical datasets and camp-scale surveys (Falcon GD and GeoTEM).

The resulting report provided a detailed interpretation of the structural history of the area allowing for the targeting of prospective structural positions. The major structures following the north-northwest structural grain represent the structural analogues for the Emu fault in the HYC mineral camp. These are all therefore high priority areas for drill testing where flexures will have provided the right structural setting for sub-basin development.

Based on the products of this report eighteen diamond holes of varying priority were designed in early 2018 to test the most prospective structural positions in the Glyde (subject to field checking and heli-drilling logistics).



**Figure 12.** Datasets employed by Geokincern in their interpretation of the Glyde AOI: clockwise from upper left, SRTM elevation model; colourdraped regional gravity (1VD); colourdraped Falcon Gravity-Gradiometry (equiv 2.67); colourdraped Falcon Gravity- Gradiometry (Gravity Gradient); colourdraped early channel GeoTEM; colourdraped statewide aeromagnetics (1VD); colourdraped statewide aeromagnetics (RTP).

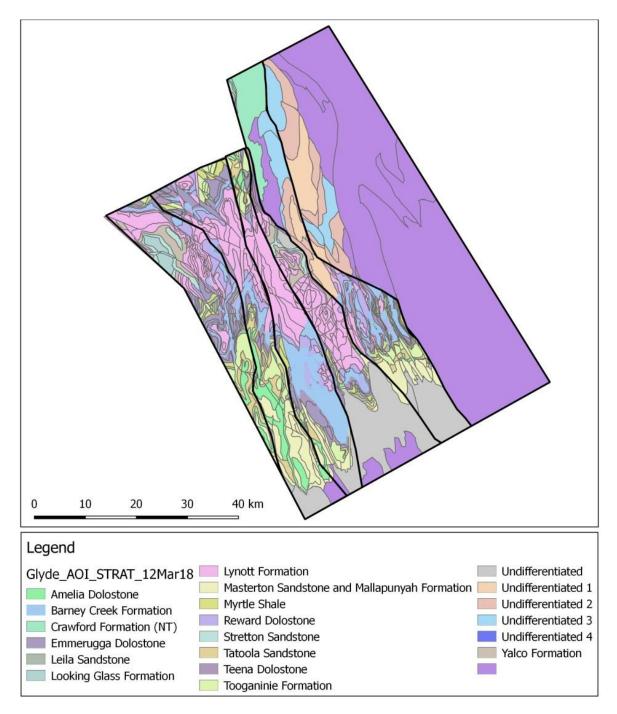


Figure 13. Solid geology interpretation from Geokincern.

#### 7.4 Glyde River helicopter reconnaissance

In April 2018 a helicopter-supported field reconnaissance exercise was completed involving the field checking of 18 potential drill sites in the Glyde River area. Sites were checked for suitability in terms of the terrain (drill pad location) and potential nearby water sources. The Palaeozoic Bukalara sandstone covers prospective McArthur sediments and weathers to create deeply incised gorges and fractures which are prohibitive for road development.

The planned drillholes were investigated from the air and in some cases on the ground. Two of the holes were found to be located where an access track could be established while the remaining holes would require helicopter support to complete the drilling. Of the 18 holes, six were found to be impossible or logistically very challenging due to the lack of nearby natural water sources and/or particularly challenging terrain. The remaining 10 holes were ranked by geological priority and up to 6 were slated for drilling in 2018 (governed by budgetary constraints and timing forecasts).

MMG engaged a drilling contractor with an available helicopter rig and obtained all requisite internal safety sign off. The planned heli-drilling program did not go ahead in 2018 due to permitting delays and subsequent misalignment of budgeting, scheduling and program resourcing. See section 7.5 for further discussion.

### 7.5 Program suspension – AAPA and MMP delays

MMG's major planned programs on South Batten in 2018 were delayed and ultimately suspended due to permitting delays and ensuing forecasting and scheduling issues.

#### Tanumbirini – Proposed Tanumbirini IP program

An application was made to the AAPA in July 2018 to clear the proposed work area for the Tanumbirini IP program. As of 21<sup>st</sup> January 2019 the status of this application is still pending with advice that the certificate is expected in first quarter 2019.

#### Glyde River – Planned helicopter supported drilling

AAPA applications for the Glyde area were submitted in late 2017 and early 2018 with the final certificates received in October/November 2018. Some areas were approved by the AAPA for ground disturbing works earlier in 2018 but due to the significant cost associated with helicopter supported drilling the decision was made to wait for all approvals to come through before mobilising a helicopter and heli-rig. The South Batten Mine Management Plan (MMP) and Project Authorisation were submitted 8<sup>th</sup> May 2018 in anticipation of receiving AAPA certificates and completing the helicopter supported drilling in 2018. The initial DPIR review was received on 26<sup>th</sup> June 2018 recommending that a threatened fauna/flora review be undertaken. Coffey was engaged by MMG to complete the review, no issues were identified. Approval of the MMP ended up being contingent on provision of the AAPA certificates and the MMP was resubmitted in November 2018 and approved in December 2018 with plans to complete the helicopter supported drilling in 2019.

#### Letterbox

All work for the Letterbox prospect area is currently suspended as it is contingent on an agreement being reached with the Mallapunyah Pastoral Station. This suspension is still in effect mainly out of respect for the passing away of one of the Mallapunyah Pastoralists involved and higher priority work being planned on other areas of the South Batten tenements as well as other MMG project areas in the NT (North Batten).

### 8. MMG WORK COMPLETED 01/01/2019 - 30/05/2019 - Nil Activity

No exploration was undertaken from 01/01/2019 – 30/05/2019. At the end of 2018 and early 2019 MMG evaluated their exploration strategy in the Northern Territory.

### 9. RELINQUISHMENT RATIONALE

At the end of 2018, MMG evaluated their exploration strategy. As a result, in early 2019 MMG decided it would not continue with its greenfields exploration programs. Therefore, a decision was made to relinquish some of their exploration tenements, including tenement EL31294.

### 10. **EXPENDITURE**

For this final reporting period, a total of AUD \$10,855 was spent on the tenement EL31294. Detailed expenditure has been submitted in the attached expenditure reports. A summary of expenditure by tenement is shown in Table 6.

 Table 6. Expenditure summary per tenement

Tenement	Expenditure Expenditure Reporting Per	
EL31294	\$10,855	01/01/2019 to 30/05/2019
Total	\$10,855	

### 11. REFERENCES

Kruse PD, Maier RC, Khan M and Dunster JN, 2010. *Walhallow-Brunette Downs-Alroy-Frew River, Northern Territory.* 1:250 000 geological map series explanatory notes, SE 53-07, SE 53-11, SE 53-15, SF 53-03. Northern Territory Geological Survey, Darwin.

Company reports:

Report number	Company
CR1972-0087	Kratos Exploration
CR1980-0064	Amoco Minerals
CR1981-0028	Amoco Minerals; Kennecott Exploration
CR1982-0090	Western Mining
CR1983-0048	Amoco Minerals
CR19850178	CRA Exploration
CR1987-0174	General Electricity
CR1990-0123	Aberfoyle Exploration
CR1991-0368	Helix Resources
CR1996-0742	Ashton Mining
CR1999-0187	Ashton Mining
CR2005-0525	Astro Diamond Mines
CR2008-0919	Legend International Holdings