



**Kidman Barrow Creek Pty Ltd**

**Exploration Licence 23186**

16<sup>th</sup> Annual Technical Report

For Period ending

14<sup>th</sup> July 2017

Map 1:250,000	SF53-06
Map 1:100,000	5755, 5754
Datum/Zone	GDA94, Zone 53
Report reference:	EL23186_20170803_Report.pdf
Target Commodity:	Copper, Gold and Base Metals
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Date of report 4 August 2017

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## TABLE OF CONTENTS

<b>1. Introduction .....</b>	<b>5</b>
<b>2. Location, Tenure &amp; Title .....</b>	<b>5</b>
<b>3. Geology.....</b>	<b>6</b>
<b>4. Exploration .....</b>	<b>8</b>
<b>4.1. Previous Exploration .....</b>	<b>8</b>
<b>4.2. CLC Clearance Certificate .....</b>	<b>9</b>
<b>4.3. Exploration 2016-2017 .....</b>	<b>9</b>
<b>4.4. Exploration 2017-2017 .....</b>	<b>11</b>
<b>5. Conclusion and Summary.....</b>	<b>12</b>
<b>6. References .....</b>	<b>12</b>

Figure 1: NT location Map for EL23186 .....	5
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Figure 2: Location and tenement boundaries for EL 23186 with local geology 250k.....	6
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Figure 3: Composite cross section incorporating drilling, surface observations and interpolation through the HOB prospect..	8
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Figure 4: Landform mapping undertaken during 2015-16 reporting period over Home of Bullion work area.....	10
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Figure 5: Home of Bullion Project area with proposed drill zones (pink polygons) and access tracks (yellow dashes). The location of permanent and portable infrastructure (core farm, drillers camp and laydown) erected during 2013 are also shown.....	11
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## 1. INTRODUCTION

This annual report documents activities undertaken on exploration licence (EL) 23186 for the period 15<sup>th</sup> July 2016 to 14<sup>th</sup> July 2017.

Kidman Barrow Creek Pty Ltd, a wholly owned subsidiary of Kidman Resources Ltd, purchased the EL23186 from previous owners, Imperial Granite Pty Ltd, Goldstake Explorations Inc. and Robert Cleaver. The EL transfer was granted by the Northern Territory Department of Resources on the 10th May 2012.

The EL is composed of two historical prospects known as The Home of Bullion Prospect and Prospect D. The primary objective of the exploration is Gold and Base metals with the aim of delivering a JORC compliant inferred resource.

## 2. LOCATION, TENURE & TITLE

EL 23186 is located about 27 km ENE of Barrow Creek, a roadside stop on the Stuart Highway 282 km north of Alice Springs. The Alice Springs to Darwin railway passes 10 km east of the Home of Bullion prospect (Figure 1).

The tenement is within the Neutral Junction pastoral property (PPL 969, Portion 3375). Access to the Home of Bullion prospect is via the road to Neutral Junction Station and the Tara aboriginal community and then tracks utilised by the Neutral Junction Pastoral owners. Access to the Prospect D prospect is from a tourist track off the Stuart Highway and by rarely used pastoral tracks. Flooding in 2010/11 destroyed many of the lesser tracks and access to both prospects had been greatly hindered. However with ownership, rehabilitation, grading and repair of these tracks has occurred and access to all areas of the Home of Bullion Prospect is now possible.

EL 23186 was originally granted on the 15 July 2002 and is in its 16<sup>th</sup> year of tenure for the next reporting period. EL 23186 is comprised of 43 graticule blocks covering 137.47 sq. km.

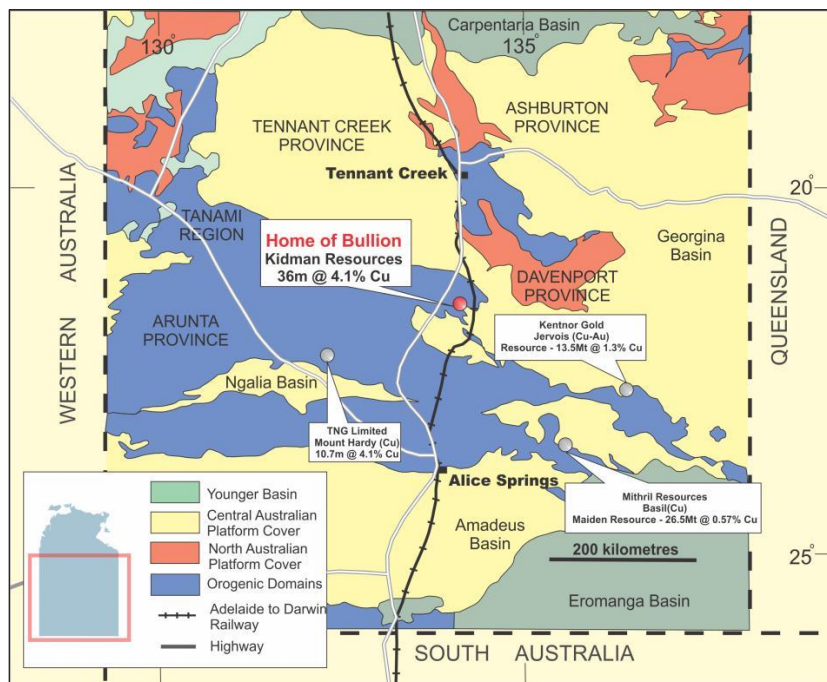


FIGURE 1: NT LOCATION MAP FOR EL23186

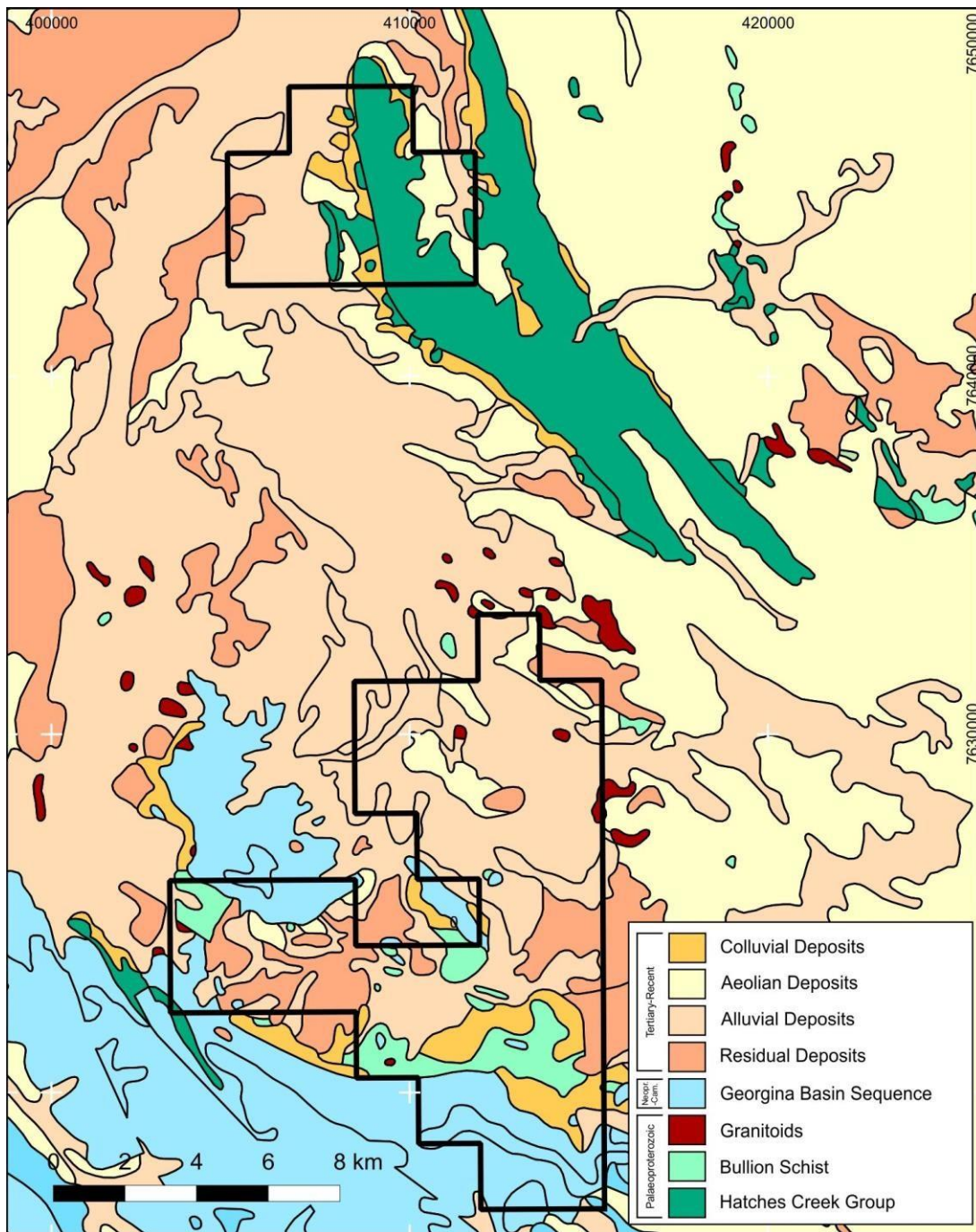


FIGURE 2: LOCATION AND TENEMENT BOUNDARIES FOR EL 23186 WITH LOCAL GEOLOGY 250K

### 3. GEOLOGY

The oldest exposed basement in central Australia comprises metamorphic and igneous rocks of the Arunta Inlier (Haines et al., 1991). Rocks of the Arunta Inlier are interpreted as at least partly correlative with sedimentary and volcanic sequences of the adjacent Tennant Creek and Granites – Tanami inliers. Barrow Creek lies on the SW margin of the Late Proterozoic to Palaeozoic Georgina Basin. Block faulting during the Tertiary has produced a number of small non-marine basins in central Australia. Also preserved are relics of a Tertiary silicified land surface. A thin Quaternary veneer of soil, sand and gravel covers most of the lowland area in the region.

The Arunta Inlier (Early – Middle Proterozoic) is characterised by metamorphosed sedimentary and igneous rocks of low to medium pressure facies. Deformation and regional metamorphism of upper

greenschist facies took place between 1810 – 1750 Ma (Black, 1981). Shaw and Stewart (1975) established three broad stratigraphic subdivisions based on facies assemblages and lithological correlations. From oldest to youngest, these subdivisions are named Division 1, 2, and 3. Using this model defined by Shaw and Stewart (1975), the orthogneiss east of Osborne Range, the calc-silicate rocks west of Crawford Range and the Bullion Schist would be included in Division 2, and the Ledan Schist in Division 3 of the Arunta Inlier.

Uncomfortably overlying these rocks are the Hatches Creek Group sediments and volcanics. Blake et al. (1987) formally subdivided the Group into the Ooradidgee, Wauchope and Hanlon Subgroups, comprising a total of 20 Formations and two Members. The Hatches Creek Group is a folded sequence of shallow-water sediments with interbedded volcanic units which reach thicknesses of at least 10,000 metres.

The sediments include ridge-forming quartzites, felspathic, lithic and minor conglomeratic arenites and friable arenite, siltstone, shale and carbonate. The Ooradidgee Subgroup consists mainly of fluvial sediments and sub-aerial volcanics which partly interfinger. The Wauchope Subgroup is characterised by large volumes of volcanics and sediments probably both marine and fluvial in origin. The Hanlon Subgroup may be entirely marine and lacking volcanics (Blake et al., 1987). Following deposition, the Hatches Creek Group was folded about NW trending axes and metamorphosed to upper greenschist facies. Later intrusion of both the Arunta basement and the Hatches Creek Group by granitoids took place around 1660 Ma (Blake et al., 1987). A long erosional period followed with subsequent weathering during the Tertiary to produce silcrete and ferricrete horizons. A thin veneer of Quaternary sands and soils overlays this area.

The Arunta Province records a Paleoproterozoic-Paleozoic tectonic history characterised by regional folding and movement on large-scale shear zones that were active during deposition of the Bullion Schist. The Bullion Schist has been intruded by the Barrow Creek Granite and dolerite leading to its correlation with the Lander Package elsewhere in the Arunta Inlier (Haines et al., 1991) and the Ooradidgee Group in the Davenport Province to the North (Claoue-Long et al., 2008a). Detrital zircon populations and magmatic relationships suggest a ca. 1840-1820Ma depositional timeframe. Regionally the ca. 1820-1800Ma Hatches Creek Group (e.g. Gwynne Sandstone and Strzeleckie Volcanics) is stratigraphically distinct from underlying Bullion Schist and preserves kilometre-scale, NE-inclined folds.

The Home of Bullion (HOB) prospect occurs within metamorphosed, generally thin-bedded pelitic-dominated sediments of the ca. 1840-1820Ma Bullion Schist. This area is located within the SE-facing hinge zone of a WNW-trending ~2x10 kilometre anticlinal F1 structure. This structure's magnetic signature is enhanced by buried magnetic granite, likely sourced from a nearby highly magnetic pluton north of the prospect and possibly involved in the mineralisation.

The first deformation affecting the Bullion Schist in the HOB prospect is correlated with the ca. 1810-1800Ma Stafford Event and characterised by tight to isoclinal, NNE-inclined F1 folds that have strongly attenuated shear-zone style limbs. D1 folds and shears mineralisation that is localised adjacent to a biotite- or chlorite schist that presumably had a mafic protolith. This inferred mafic protolith is altered in the mineralisation zone, but can be structurally correlated with a single, fold-repeated amphibolite sill that outcrops across the mapped area. The northern and southern lenses can be correlated with each other through a major, map-scale fold which exhibits thickened high-grade zones in F1 (western north lens), F3 (western south lens) and F4 (eastern north lens) fold hinge positions. A major F1 hinge zone is interpreted to the SE of known mineralisation and remains untested.

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Three subsequent deformations rework the F1 structures and retrogress the rocks to sericite and chlorite schists. D2 is associated with a post-Stafford Event deformation, probably the ca. 1740- 1690 Ma Strangways Orogeny that folds overlying ca. 1820-1800 Ma Hatches Creek Group rocks. At HOB this event is characterised by the development of an intense foliation that overprints F1 structures but does not appear to be associated with folding. Partitioned shear zone movements appear localised within and between the north and south lenses and NW-trending F3 and NE trending F4 folds can be linked to separate shearing events, probably associated with ca. 400-300 Ma the Alice Springs Orogeny (Stewart 2013).

Massive sulphide mineralisation is stratbound and hosted in the lower amphibolite facies Bullion Schist. The mineralisation is spatially related to a mafic protolith now found as retrogressed chlorite and biotite schist; however the mineralisation may also be related to several less altered metagabbro bodies intruding near the deposit. The primary coarse-grained mineralisation is associated with magnetite and consists of pyrite, chalcopyrite, sphalerite, bornite, galena and minor chalcocite (McGloin et al 2017).

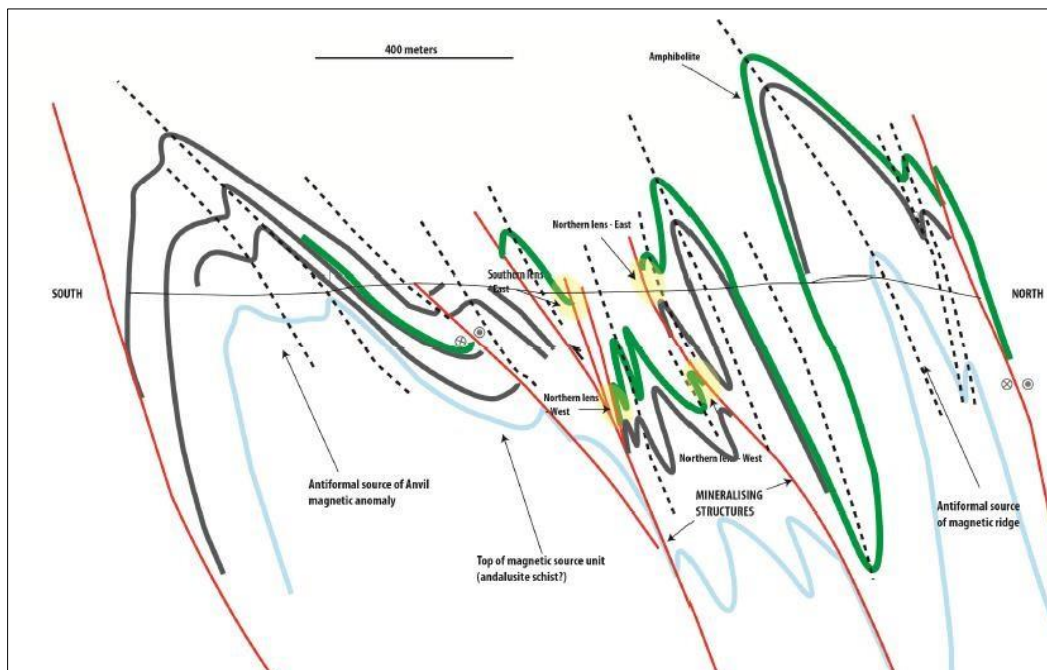


FIGURE 3: COMPOSITE CROSS SECTION INCORPORATING DRILLING, SURFACE OBSERVATIONS AND INTERPOLATION THROUGH THE HOB PROSPECT

## 4. EXPLORATION

### 4.1. PREVIOUS EXPLORATION

Several exploration companies have been active in the area of the Home Of Bullion Project area. Most of the work was targeted at extracting Copper oxide ore from the two mineralised areas. Historical explorer summaries are listed as;

**Ward (1925):** The earliest available record on the Home of Bullion prospect is by the South Australian Government Geologist (Ward, 1925) who examined the workings in July and September 1925.

**Madigan (1934):** The earliest detailed records of the mine geology, exploratory underground mine development, ore reserves and mineral potential of the Home of Bullion copper deposits are given by Madigan (1934). Commissioned by Central Australian Silver, Lead & Copper Mining Company NL, he undertook a property examination on 21-24 August 1934.

**Blanchard (1936):** Blanchard (1936) inspected the property for the Mt Isa Mines Limited (owned by American Smelting and Refining Company). He provides interesting details on transportation, water supply and costs at that time, as well as valuable information on the general geology, exploratory underground development and mineral potential.

**Hossfeld (1937):** The next currently available record of the general geology, aerial photography, mine geology, underground workings, mineral potential, water supply and ore treatment of the Home of Bullion copper deposits is given by Hossfeld (1937), as part of the investigations carried out by the Geophysical Survey of Northern Australia.

**Sullivan (1950):** After a gap of 13 years the next available reports on the Home of Bullion mine were those by Sullivan, Brittingham and Thomson in 1950. Sullivan briefly summarised the main features of the general geology, mine geology, mine workings and mineral potential of the Home of Bullion copper deposits.

**Thomson (1950):** Thomson (1950) undertook an eight day field examination, magnetometer survey and sampling assessment for Zinc Corporation Limited in May 1950. He summarised the main features of the general geology, mine geology, workings and production, mining operation and mineral potential of the Home of Bullion copper deposits.

**Brittingham (1950):** In a preliminary metallurgical report on flotation of the Home of Bullion mineralisation, Brittingham (1950) provides some interesting facts on previous exploratory underground mine development as well as on two completed diamond drill holes.

**Bell (1953, 1954):** The Bureau of Mineral Resources' Resident Geologist at Alice Springs (Bell, 1953) undertook an assessment of Home of Bullion mine.

**Australian Geophysical (1965b):** In 1965 a private company (Australian Geophysical Pty. Ltd.) undertook geophysical surveys (mainly induced polarisation) and soil sampling by shallow drilling over the Home of Bullion mine.

**Drown (1992):** Aberfoyle Resources Limited examined the abandoned Home of Bullion in 1992 to assess the regional potential of EL 6910 which surrounded the MLC's covering the old mine workings.

**Goldstake Exploration Inc. (2001-2012):** Goldstake undertook an initial diamond drilling programme in June-August 2006. It comprised 15 drill holes totalling 1,406m on both the northern and southern groups of lodes. Seven of the drill holes failed to intersect the targeted lodes so, in September 2006, Goldstake engaged Roy Cox & Associates to carry out a detailed examination of the prospect and of the drilling results to ascertain the reasons for this situation. The main reasons were due to the absence of a detailed topographic survey, a detailed geology map and an accurate 3-D correlation of the surface geology with underground workings and diamond drill holes.

#### **4.2. CLC CLEARANCE CERTIFICATE**

A CLC Sacred Site Clearance Certificate (2012-067) was approved on the 16<sup>th</sup> July 2012.

This allowed Kidman Resources access to the prospects so the proposed exploration for 2012-2013 could begin. A CLC Sacred Site Clearance Certificate (2013-016) was also granted for work in 2013-2014.

#### **4.3. EXPLORATION 2015-2016**

##### **4.3.1. Surface landform/regolith Mapping**

Kidman Resources undertook surface landform mapping around the Home of Bullion deposit. The work was done to form a more complete understanding of the geology around the Home of Bullion mine. Environmental monitoring was also undertaken to ensure that all rehabilitation that had been completed in previous reporting periods was still regenerating adequately. Several field trips were also undertaken to give orientation to new members of the geology team.

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Further review of geological targets was also undertaken as the renewal of the tenement was due at the end of the reporting period so areas considered not to be of material importance were relinquished and the drill targets refined to ensure the targets drilled will have most impact on any future resource upgrade. Kidman Resources also made core available to the Geological Survey's Matthew McGloin in which geochronology/geochemistry/ collection of thin sections and S isotope work was undertaken.

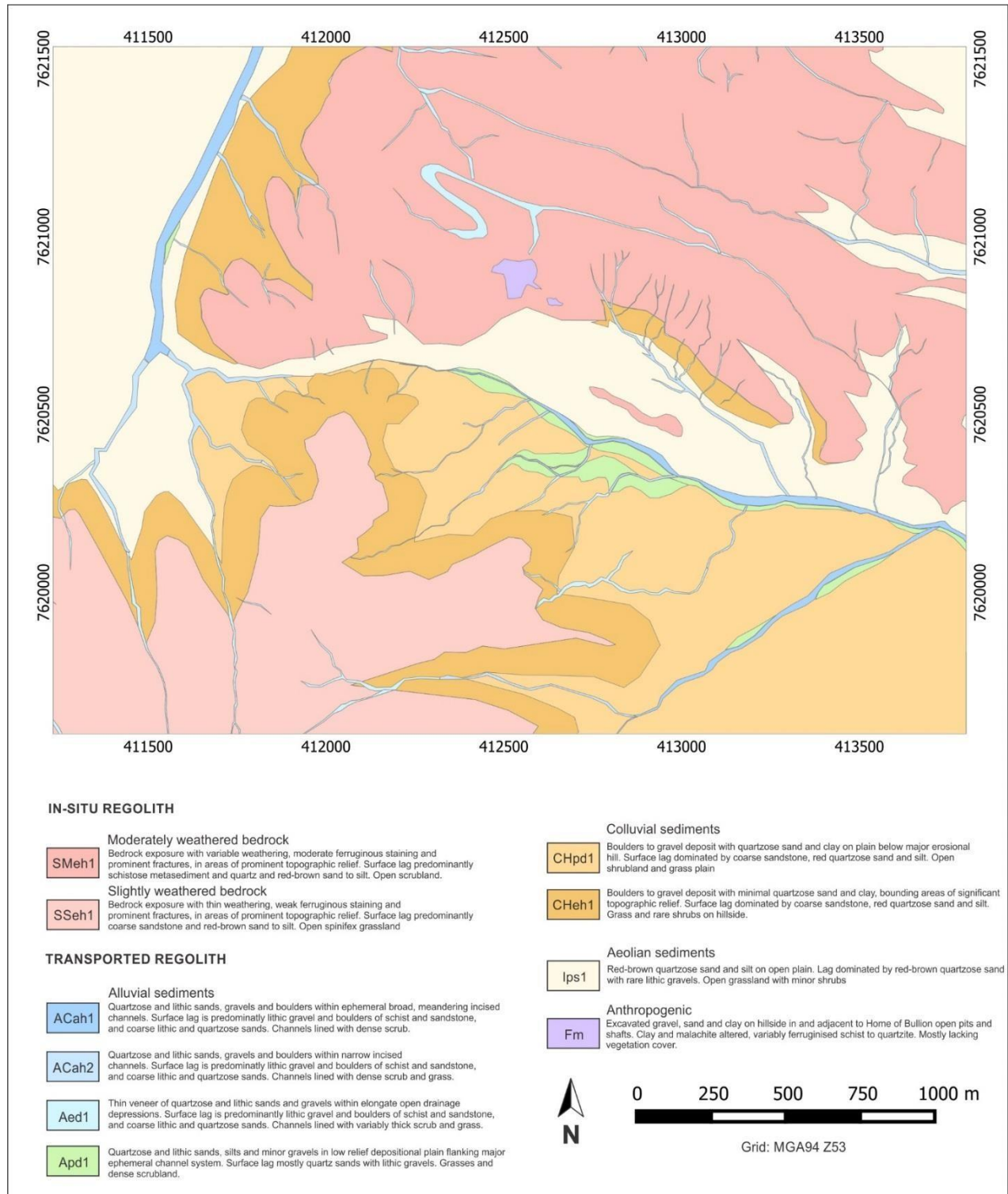


FIGURE 4: LANDFORM MAPPING UNDERTAKEN DURING 2016-16 REPORTING PERIOD OVER HOME OF BULLION WORK AREA

#### 4.4. EXPLORATION 2016-2017

No on-ground exploration was performed during the year during the reporting period.

#### 4.5 PROPOSED EXPLORATION 2016-2017

##### 4.5.1 Drilling

The next stage of drilling is aimed at increasing the contained Mineral Resource of the Home of Bullion deposit, and further defining the strike extent of the lodes.

##### Home of Bullion

The areas proposed for an RC drill program will be confined to the polygons and tracks shown in Figure 5. The actual drill positions will be dependent on results generated from the Resource Estimation and a recent structural interpretation. Where possible existing tracks will be utilised avoiding local waterways and steep slopes to minimise disturbance to the environment. Once the proposed drill hole locations are confirmed, collar coordinates will be supplied in an amendment to the Department of Mines and Energy.

##### Phase 7 (2016-2017)

This phase of drilling will consist of a total of 5 RC drill holes for 1000m. The program will involve exploration drilling on the Southern Lodes and initial testing of new structural targets located along strike from the Southern Lode.

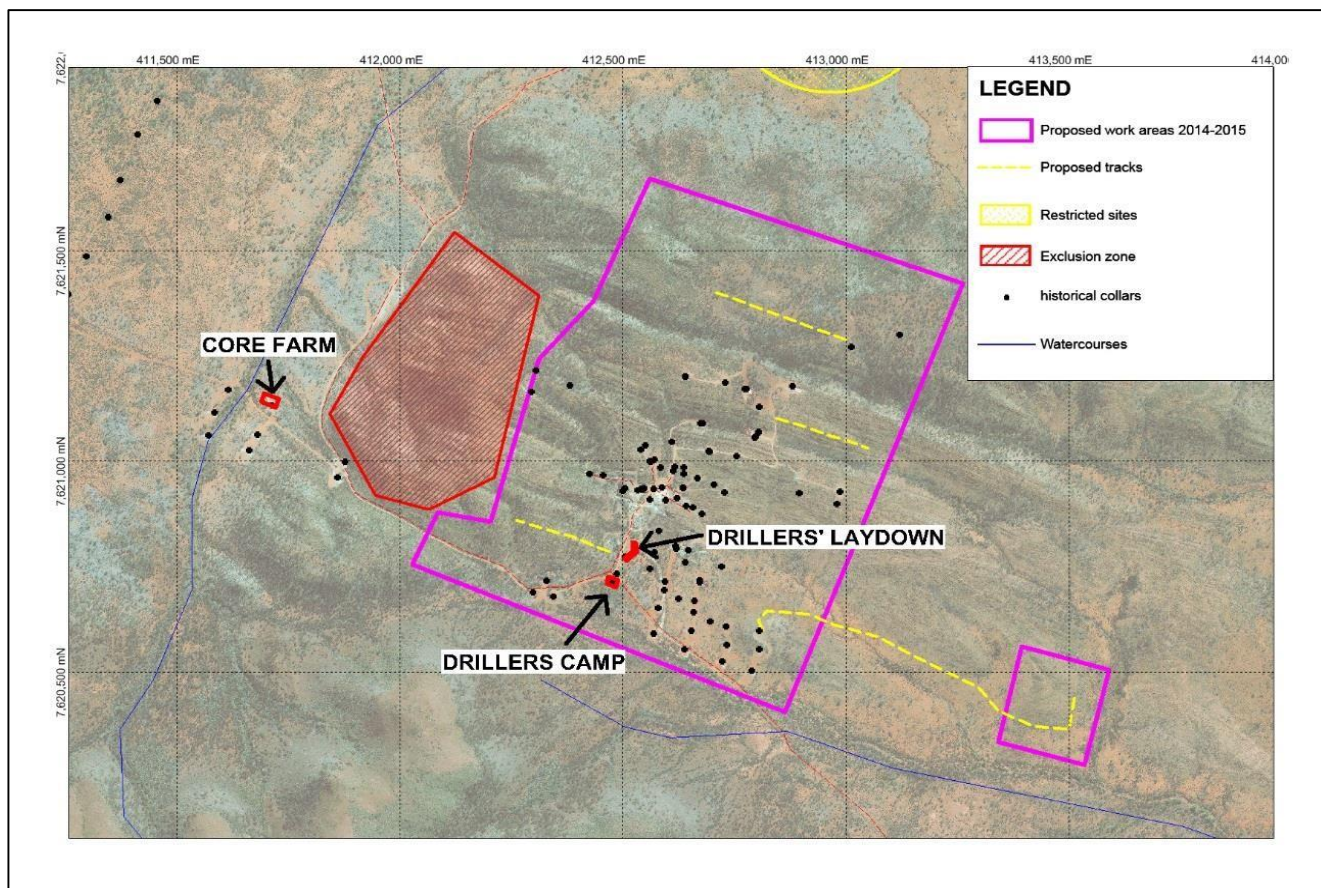


FIGURE 5: HOME OF BULLION PROJECT AREA WITH PROPOSED DRILL ZONES (PINK POLYGONS) AND ACCESS TRACKS (YELLOW DASHES). THE LOCATION OF PERMANENT AND PORTABLE INFRASTRUCTURE (CORE FARM, DRILLERS CAMP AND LAYDOWN) ERECTED DURING 2013 DRILLING PROGRAM ARE ALSO SHOWN.

## 5. CONCLUSION AND SUMMARY

Home of Bullion is strategically located near to significant infrastructure. The Stuart Highway and gas pipeline passes immediately west of the project and the Darwin – Adelaide railway line also passes approximately 10km to the East of the project.

Kidman Resources Ltd acquired 100% of the Home of Bullion project in April 2012. The exploration license covers approximately 137.5 square kilometres and within this area there are several more regional projects that could provide resource extensions to the Home of Bullion high grade ore body.

The maiden Mineral Resource estimate for Home of Bullion delivered during the 2015 -2016 reporting period and demonstrates the current tenor of mineralisation at the prospect, with significant potential for additions both along strike and at depth. Extensions of the known mineralized lenses remain open particularly as the structural complexity of the project is understood and the ore forming processes are established.

An RC drill programme is planned for the next reporting period which should add to the maiden Mineral Resource and test the strike extent of mineralisation at the Home of Bullion prospect.

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