



# MASTRADE INTERNATIONAL CAPITALS LTD

## Analysis of Gold Deposits in Namibia



# 1. INTRODUCTION

## 1.1. General Overview

Historical to recent extensive exploration and mineral investigation resulted in a large amount of data in the form of reports submitted by various exploration companies. These mineral exploration reports on activities carried out on various projects across the entire country are held and are available in the library in digital and hard copy format at the Geological Survey of Namibia. This document will review all available data sets relating to EPL 7075 and will provide a comprehensive summary of the regional and local geology, reported and known mineral occurrences within and around EPL 7075. The document will further assess the prospectivity of the area in order to generate information, targets and further recommendations on the way forward.

## 1.2. Licence Tenure

The Exclusive Prospecting Licence (EPL) 7075 is registered under the company Décor House Namibia CC as the owner. The license is granted for Base and Rare Metals (copper, lead, zinc, tin, cobalt, nickel etc.), Precious Metals (Gold, Silver etc.), Industrial Minerals (Lithium, phosphate, Fluorite, gypsum, graphite, etc.) and Dimension Stones (granite & marbles). The project covers a vast area of about 19 887.76 hectares. The Exclusive Prospecting License for which the applicant has been granted the mineral rights is valid for a period of three years from 15 June 2018 to 14 June 2021.



# 2. CLIMATE AND INFRASTRUCTURE

## 2.1. Climate

The area experiences arid to semi-arid climatic condition with an average rainfall, most of which occurs during summer, that lies between 300 and 500 mm annually, with maximum average temperatures varying between 30 and 34 oC, and minimum winter temperatures between 3 and 6 oC. The area can be described as semi-desert with occasional thunderstorm experienced during summer rainfall months of December to April. Natural vegetation consists mostly of thorn bush savanna, with camelthorn savanna in the east and forest savanna in the extreme northeastern corner (National Atlas of Namibia, 2002). The average sunshine hours per day, ranging between 9 – 10 hours, which results in an annual average temperature 18 - 19 oC. The high temperature condition causes a high average annual evaporation rate ranging between 3100 – 3400 mm per annum.

*Table 1: Summary table of the climate for the project area (from, Mandelson et al, 2003)*

Average annual rainfall (mm/a)	300 - 500
Variation in annual rainfall (%)	90 - 100
Average rate of evaporation (mm/a)	3100 - 3400
Water deficit (mm/a)	3500 - 4500
Average hours of sunshine per day	9 - 10
Average annual temperature ( °C)	30 - 34

## 2.2. Infrastructure

The property is situated in central northern part of Namibia, approximately 30 kilometres north of Otjiwarongo and about 25 Km southwest of B2Gold Mine. The railway line is well developed and runs parallel to the main road between Otjiwarongo and Otavi. Knowledge on the availability of water to maintain exploration activities on the properties is currently unknown, however underground water is obtainable by drilling. Fuel and equipment is easily available at the town of Otjiwarongo.

# 3. REGIONAL AND LOCAL GEOLOGY

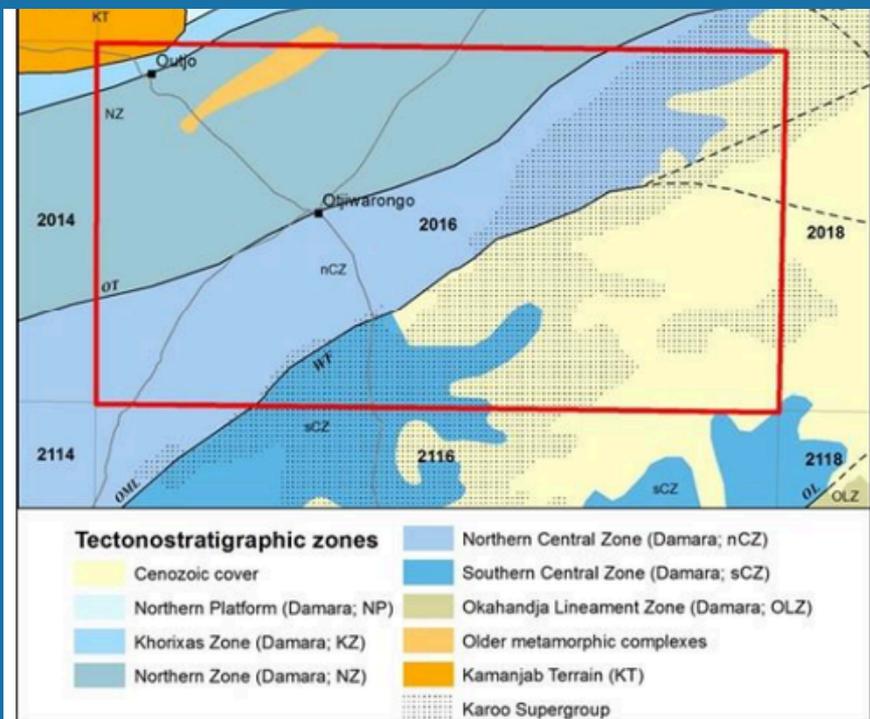
## 3.1. Regional geology

Regionally the oldest rocks in the area belong to the Palaeoproterozoic Huab Metamorphic Complex, which outcrops in the northwestern part of the area (Figure 3). They comprise a variety of gneisses, as well as metasedimentary and intrusive rocks, which are overlain by metasedimentary rocks of the Neoproterozoic Damara Orogen. The latter dominate the northwestern half of the area, although much of the terrain is covered by recent unconsolidated deposits.

The area lies within the intracontinental or main branch of the Damara Orogen, which, based on stratigraphy, structure and metamorphic grade, has been subdivided into a number of distinct zones (Miller, 1983; Hoffmann, 1987). In the map area these are mainly the Northern Zone (NZ) and the northern Central Zone (nCZ), which are separated by the Otjohorong Thrust; another distinct structural feature, the Waterberg Fault, separates the northern from the southern Central Zone. The Northern Margin (or Khorixas) Zone (NMZ), which occurs in the north-western most corner of the map sheet, forms the transition between the Otavi Platform to the north and the Northern Zone; here, stratigraphic relationships and correlations are controversial, and several solutions have been proposed (Miller, 2008).

In the NZ the siliciclastics of the basal Nosib Group are overlain by carbonates, schists, and locally coarser clastic material of the Swakop Group; the coeval carbonates of the Otavi Group occur in the NMZ northwest of Outjo. Two glacial horizons, i.e. the Chuos and Ghaub diamictites, subdivide the Swakop and Otavi Groups into subgroups, providing distinct lithological and geochronological markers, but outcrops of these units within the map area are poor. The highest stratigraphic unit of the Damara Supergroup is formed by the siliciclastic Mulden Group, which represents a molasses facies restricted to the northern part of the orogen. Deposition of the Damara sediments was followed by a variety of late Proterozoic to Ordovician intrusive bodies emplaced during or after the deformational and metamorphic events that led to the formation of the orogen.

Sedimentary rocks of the Carboniferous to Jurassic Karoo Supergroup occur in the southeastern part of the area, largely under cover of the Cenozoic Kalahari Group. While the Waterberg Plateau is formed by the Triassic Omingonde Formation and the Jurassic Etjo Formation, the older units of the super-group are only known from drill holes. A number of Cretaceous anorogenic complexes belonging to the Damaraland Intrusive Suite form significant landmarks, the most prominent being the Paresis and Kalkfeld Complexes in composition they range from carbonatitic to alkaline and granitic. Also of Cretaceous to Jurassic age are the dolerite and porphyry dykes in the northwestern part of the map area, while the Cenozoic is represented by conglomerates of the Miocene Bertram Formation (Namib Group) in the northwest, by the Weissrand Formation of the Kalahari Group in the southeast, as well as by recent superficial sediments covering extensive flat-lying areas and filling ephemeral river valleys.



## 3.2. Local geology

The area under study generally consists of medium to high grade rocks of the Huab (Grootfontein) Metamorphic complex. These rock units of the complex were originally of sedimentary origin and have undergone polyphase metamorphism and deformation processes and subsequently have been intruded by the range of gabbroic rock in order of decreasing ages (Kartun, 1979).

### 3.2.1. Undifferentiated Damara Sequence

The basement of the area is known to be the Huab (Grootfontein) Metamorphic Complex and is overlain by rocks of the Neoproterozoic undifferentiated Damara Sequence, which comprises metasedimentary and subordinate metavolcanic rocks deposited between 900 and 700 Ma (Miller, 1983). However, subsequent to deposition the rocks enjoyed very intense deformation and metamorphism events, which vary according to geological events. By regional geology the basal which is mainly quartzitic Nosib Group is followed by the interbedded carbonate rocks and schists of the Swakop Group, the predominant limestones and dolostones of the Otavi Group and the molasse facies rocks of the uppermost Mulden Group (Becker, 2005).

### 3.2.2. Karibib formation

The formation consists of a thick succession of bluish-grey, bedded to flaggy limestones with lensoid, mass-flow conglomerates containing granite pebbles near the base. The limestones are overlain locally by massive dolomites. Around the EPL's area there are Antifoams, believed to be that of the Okanguari and the Karibib formation consists largely of bedded, bluish-grey dolomitic limestone with minor white marble, meta-pelites and dolomite. The area is known for its carbonate rock that bears accessory scapolite, tremolite and pyrite. Part, if not all, of the Karibib Formation in this area is detrital to turbiditic in origin as is indicated by graded bedding, ripple marks, cross-bedding and channel structures (Miller, 2008).

The northwestern part of the prospective area is known to comprise mostly of the light bedded marble, locally intercalated with arenaceous marble, followed by dark dolomitic limestone and arenaceous limestone, arenaceous limestone with interbedded schist and impure quartzite and arenaceous marble and dolomitic limestone with pebble interbeds. 10 There are traces of pure to impure, massive to thin-bedded or oolitic marble, with subordinate calc-silicate and schist bands. It is assumed that the prospective area consist of dolostone/limestone-dominant (Miller, 2008).

### 3.2.3. Kuiseb formations

The prospective area comprises of quartz albite-chlorite-muscovite schists with accessory biotite. Regionally the geological units shows traces of marly metapelite with thin, subordinate layers of fine-grained metagreywacke, which weathers more readily than the metagreywackes. However in some area stains of graded, coarser-grained metagreywackes, locally with thin, but laterally persistent white orthoquartzite layers are observed in the EPL surroundings. Thick schistose metagreywacke and metapelite overlie the above rocks and contain a narrow 350 km-long zone of interbedded oceanic greenstones which are Matchless Member. The Kuiseb formation consist of predominantly rock types, quartzites, schists, limestones, dolomites and marbles, is quite variable as far as its lithology is concerned (Ministry of mines and energy, 1993).

According to Miller (2008) the presence of Damaran Granitic gneiss on the northeastern part of the farm contains sporadic copper-lead-bismuth gold mineralisation in lenticular quartz pods that occur in fault zones striking east and dipping steeply to the north. Several smaller traces of copper oxides, some with gold mineralisation, are known to exist at various localities on the farm within the Karibib Formation marbles. Copper-gold skarn mineralisation was sampled by Petzel around 1995 on Okorusu 499, 25km south of Otavi and is north of the prospective area. The rock samples collected was found to contain 108 ppb, 471 ppb and 7845 ppb gold.

### 3.2.4. Swakop Group

The Swakop Group is known for its Chuos Formation with its massive poorly- sorted and highly foliated diamictite, which consists of amphibole schist, granite, gneiss, quartzite and vein quartz pebbles in a dark-grey to greenish-grey calc-silicate matrix and the total thickness of the Swakop Group in the Northern Zone is  $\pm 15$  km respectively. Swakop Group made up the remainder of the undifferentiated Damara Sequences and it's made up of the rocks such as metapelite, metagreywackes, limestones and minor metapelite. The area shows trace of some dolomites massive calcitic, marbles, yellowish- brown impure marble, minor calc-silicate, diamictite, granites and some quartz veins in some area (Badenhorst, 1987).

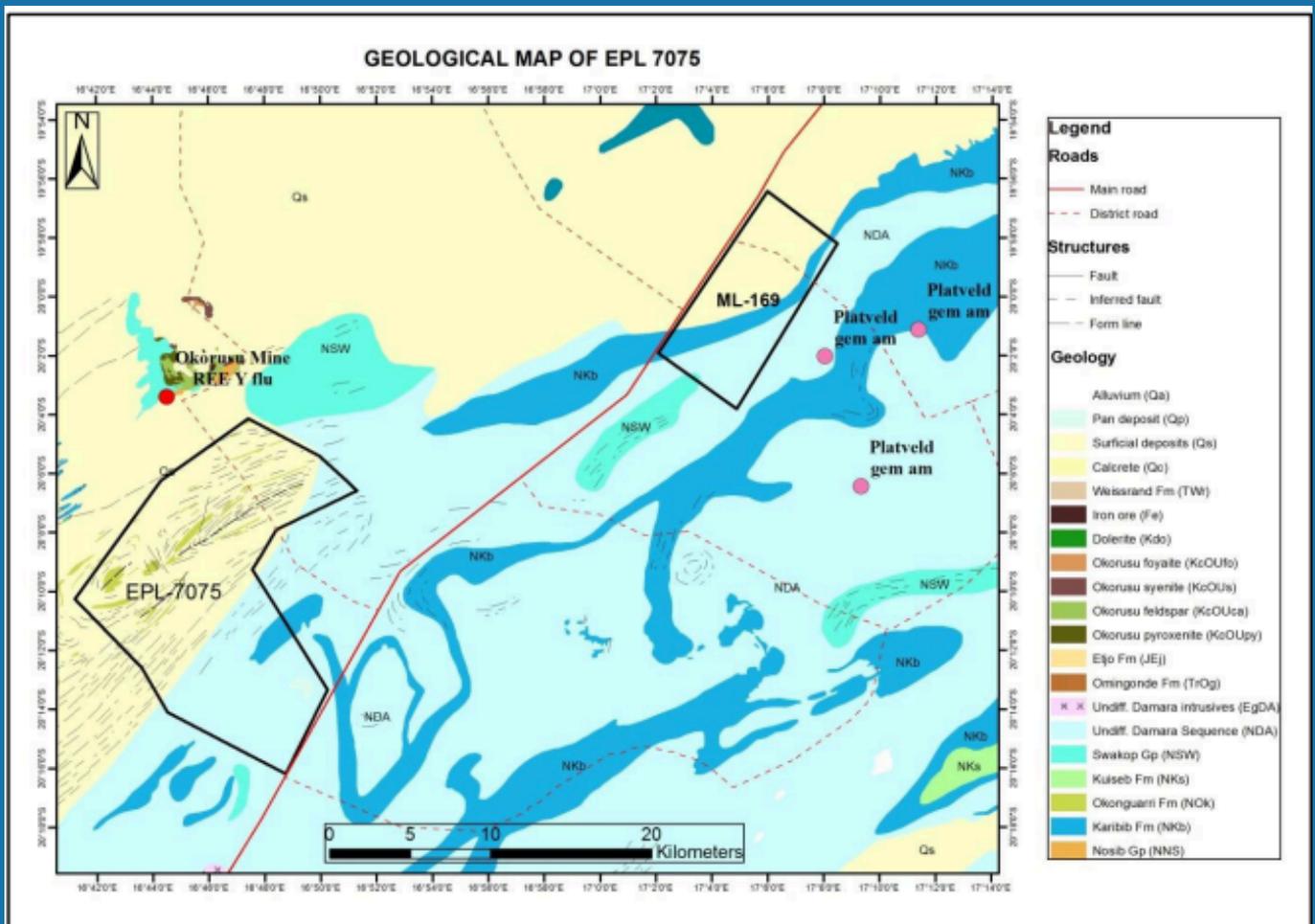


Figure 4: Geological map of EPL 7075.

### **3.2.5. Undifferentiated surficial deposit**

The undifferentiated surficial deposits consist of the soil predominantly black, clayey but modified in part by red-brown sand soil of the colluvial origins. However, most of area is covered with layer of calcrete of varying thickness (depth). The calcrete cover has an impact on the previous mapping since it covers the outcrops. The Calcrete/sand cover necessitates the somewhat different exploration approach (Badenhorst, 1987). The first phase of the geological work will required aerial photo interpretation to identify surface expression of the underlying geology. In calcrete area the pH value are in the rage of 8.0-9.0 and simple cations of metal copper, zinc, lead turned to be insoluble but zinc can be mobile.

# 4. ECONOMIC GEOLOGY

## 4.1. Overview

EPL 7075 area is underlain by Neoproterozoic Damara Sequence, which comprises metasedimentary and subordinate meta-volcanic rocks. There are several mineral occurrences associated with these meta-sedimentary and intrusive and igneous rocks, which includes variety of base metals (e.g. copper, gold, lead, zinc, tungsten, Tin, molybdenum, uranium and nickel), rare earth elements, industrial minerals (fluorite, graphite) and semiprecious stones. There are major known commodities occurrences around the EPL area of Fluorite, gold, silver, copper, lead, Zinc and semi-precious stone of amethysts. The most significant known deposits in the area are Okurusu Fluorite deposit about 5 Km northwest of the EPL and the newly discovered Otjikoto Gold deposits being mined by B2Gold Namibia about 25 Km northeast of EPL. The Otjikoto deposit is hosted by deep water turbiditic metasediment, and similar geology is found into EPL.

## 4.2. Prospectivity nearby EPL 7075

Okorusu fluorite deposit about 5 Km northwest of EPL 7075 is one of the most successful fluorspar mines in the world. The fluorite is closely associated with the Okorusu Alkaline Complex; the fluorite replacement bodies are confined mainly to the southern portion of the complex, which is demarcated by the Okorusu Mountain, consisting of metasediments of the Swakop Group. Fluorite occurs as disseminated grains in a feldspar-limonite-calcite rock, as vein and fillings along prominent fissures, as irregular stockworks in crush-breccia and as massive replacement bodies in medium-grained limestone.

Otjikoto deposit (about 25 Km northeast of the EPL) is estimated to contain a probable reserve of 29.4 million tonnes at a grade of 1.42 g/t gold containing 1.34 million ounces of gold at a stripping ratio of 5.59:1. A newly discovered Wolfshag zone consists of a series of en-echelon stacked, shallow easterly dipping and south-southeast plunging mineralized shoots hosted within albitite + calcite + clay altered meta-sediments and marble lenses.

The Wolfshag zone has an inferred resource of 6.8 Mt @ 3.2 g/t (703,000 ounces gold) and is expected to increase the production and/or life of the Otjikoto mine.



Figure 5: B2Gold site

Table 2: B2Gold Resource from website

Zone	Tonnes	Grade g/t Au	Ounces Au	Kg Au
<b>Indicated Resources – Open Pit</b>				
Otjikoto	28,680,000	1.43	1,321,000	41,100
Wolfshag	930,000	2.81	84,000	2,600
<b>Subtotal – Indicated Open Pit</b>	<b>29,610,000</b>	<b>1.48</b>	<b>1,405,000</b>	<b>43,700</b>
<b>Indicated Resources – Stockpiles</b>				
Run-of-Mine Stockpile	590,000	1.35	25,000	800
Low Grade Stockpile	250,000	0.52	4,000	100
<b>Subtotal – Indicated Stockpiles</b>	<b>840,000</b>	<b>1.10</b>	<b>30,000</b>	<b>900</b>
<b>Total Indicated Resources</b>	<b>30,460,000</b>	<b>1.47</b>	<b>1,435,000</b>	<b>44,600</b>

# 5. CONCLUSION AND RECOMMENDATIONS

The Okurusu Mine about 5 km from EPL and Otjikoto Mine which is about 25 Km northeast of the EPL is suggestive that this licence have potential to host a variety of mineral deposits, mainly Fluorite, Gold and Copper. Most mineralization in the area shows a strong structural control, spatial as associated with veins and faults and therefore a deep understanding of the structural evolution of the EPL area is important. Fluorite, Gold and Copper exploration should be given a priority.

## **Recommendations**

### **Geophysical data acquisition and Interpretation;**

Acquire geophysical data set from the Geological Survey of Namibia (GSN) and carryout an integrated Geological and Geophysical data interpretation to delineate exploration targets.

### **Ground Truthing Exploration;**

Reconnaissance and field based mapping is recommended to map out all geological units at local scale since the area was only mapped on regional scale by the (GSN) at a scale of 1: 250 000.

## **Soil/Rock chips/Trench sampling;**

Soil & Rock chips sampling should be carried on the delineated exploration targets and all existing trenches that were dug by previous exploration work should be sampled for analysis. Drilling on potential targets.

## **6. REFERENCES**

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