

# BLOCK-8 - EXPLORATION WORK PROGRAM

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## 1. INTRODUCTION:

Block-8 is situated in the Northern part of Semail Ophiolite Belt and it covers main tenements of volcanogenic massive sulphide. VMS deposits are major sources of copper, zinc, and lead and contain significant quantities of Au, Ag, Se, and Cd, as well as minor amounts of other metals such as Co and Ni. As a group VMS deposits consist of massive accumulation of sulphide minerals (more than 60% of sulphide minerals) that occur in lens-like or tubular bodies parallel to the volcanic stratigraphy or bedding. They are usually underlain by a footwall stockwork of vein and stringer sulphide mineralization and hydrothermal alteration. They occur on the sea floor or fossil sea floor in ancient rocks and may occur in any sedimentary or volcanic rock type, but the predominant hosts are intermediate to mafic volcanic rocks or fine-grained, clay rich sediments. Block- 8 has an area covering approximately 498 sq km. Preliminary geological studies and prospectivity study in the tenement area was made by Kenex Pty Ltd. According to the findings made by the contracting company, Block-8 is an attractive economic target for exploration of Volcanogenic Massive Sulphide (VMS) Copper-Gold Mineralization. The potential of this Block for copper and gold deposits is similar to the deposits being developed at Shinas, Hatta, Iasail, Aarja, Ghuzayn, Hay-As-Safil and Rakah.

The coordinates and Location of the study area is given in below table.

Point	UTM Easting (E)	UTM Northing (N)
1.	540572	2593953
2.	553449	2613010
3.	572043	2609078
4.	560486	2584828



## **2. GEOLOGY:**

The morphology, ore types, mineralogy, and geochemistry of the deposits are similar to the deposits of Cyprus. The geological domain in and around the vicinity of the concession area is dominated by the rocks of samail ophiolite with tertiary-quarterly sediments cover, at places. The samail ophiolite is a fragment of oceanic lithosphere originating from the ocean floor of the Neo-Tethys during middle to late cretaceous. The stratigraphic sequence observed in ophiolite corresponds to the lithosphere forming processes at mid-oceanic ridges. The extrusive basaltic lavas are thinner but have great metallogenic importance. This sequence is formed by the products of submarine volcanic eruptions related to sea-floor spreading. They are overlain locally by manganiferous radiolarian sediments that mark the end of the oceanic accretion of the samail basin. The extrusive rocks of the samail ophiolite represent the best metallotects known in Oman for base and precious metals. Copper occurrences exist throughout the samail ophiolite. The associated mineralization most commonly resulted from hydrothermal processes, mainly at the end of the submarine volcanic cycle or during the period of quiescence. This mineralization is generally assigned to the Massive Sulphide Type and related to MORB (Mid-Ocean-Ridge Basalt). Although, occurrences of fracture-filling or vein sulphides may be encountered throughout the samail ophiolite, but the interesting mineralization is much

localized. More than 400 mineralized occurrences have been recorded in the Oman Mountains, although at present, a large number of these are considered as being of little economic interest. It is possible that later work may reveal new interesting targets. The Oman sulphide deposits usually have low gold grade like most sulphide deposits associated with submarine tholeiitic basalts.

Geological fieldwork carried out in and around Block-8 reveals that atleast 38 sq km of this area is prospective for VMS copper- gold mineralization

On the basis of the geological observations and assessment made by a walk around inspection, it may be inferred that the volcanogenic massive sulphide deposits occur in the concession area which needs to be examined in detail.

### **3. THE EXPLORATION PROGRAM:**

On the basis of the geological assessment made during the traverses in the tenement area and review of literature, the exploration program on prospecting the copper deposits is split up in two phases of activities.

- Phase-I: The preliminary study
- Phase-II: The detailed study

The result from phase-I would lead to conclude and justify the need to undertake the detailed study.

#### **Phase-I: The preliminary study: 3 months**

The activities for the preliminary study will include the following:

1. Study of the geological literature and review of the pre-existing data.
2. Field work and walk around inspection
3. Sampling of superficial anomalies
4. Trenching
5. Geological logging of the out crops and trenches.
6. Chemical analysis
7. Data interpretation

8. Compilation of the Preliminary report.

### **Phase-II: The detailed survey: 10 to 15 months**

The results of the preliminary study would define the quantity and scope of the detailed study. The activities for this phase would include the following:

1. Topographical survey and Mapping
2. Geological mapping
3. Preparation of the geological sections
4. Geophysical Study
5. Drilling and core logging
6. Data modelling
7. Core cutting analysis
8. Ore Reserve Estimation.

### **Phase-I: -**

#### **STUDY AND REVIEW OF LITERATURE AND PRE-EXISTING DATA:**

It includes study of area literature, topographical maps, satellite image, and any other information relevant to this area of interests.

#### **FIELD WORK**

Fieldwork will include taking a series of field traverses on foot along the main wadies, tributaries, fault planes and across the strike direction etc in the given area. Lithological and structural studies like physical characters of rocks, their dips, strikes, folds, joints, faults and foliated planes, if any shall be made. Special attention will be given to study the outcrops bearing signature of copper mineralization. Geological sections at various locations shall be prepared. Each section shall be studied with regard to ore homogeneity, bed thickness and presence of intercalated layers of other rocks so as to define ore grade and estimate the visual reserves.

#### **SAMPLING**

Representative samples of the ore and the host rocks shall be collected from different locations. Changes in the lithological characteristics of the parent strata shall be noted. The location of the sample site shall be marked. A profile of sample locations shall be prepared. Samples shall be preserved and transported to Muscat for laboratory analyses.

#### CHEMICAL ANALYSIS:

The selected samples of Copper ore and the relevant rocks shall be subjected to chemical analysis through a recognized laboratory in Muscat. The chemical tests will be to see the percentage of copper. The results of the chemical analysis will be evaluated by identifying the elements which could have an impact on the characteristics of copper ore for its industrial use.

#### COMPILATION OF PRELIMINARY REPORT:

The data collected from the activities of the different stages cited above shall be used to prepare a geological report with due recommendations. The report shall highlight the probable reserve size and its grade, and also define the scope of work for phase-II.

#### PHASE-II:

##### TOPOGRAPHIC SURVEY AND MAPPING

A topographical survey of areas of interest in the concession area will be conducted by a qualified and experienced team. A denser network of observation points will be noted so as to record sharper topographical definitions.

##### GEOLOGICAL MAPPING

It will entail a comprehensive geological survey to produce a detailed geological map of areas of interest in the concession area. The map will exhibit different mappable litho-units with their distinguished contacts with each other. Surface outcrop with their distinct rock types will be marked on the map. Also, structural features shall be marked on the map in order to interpret the probable subsurface extension of the rocks bearing copper deposit. With the help of large scale geological map, cross-sections will be developed to calculate the minable reserves.

## GEOPHYSICAL STUDY

Landsat imagery and aeromagnetic data will be used to its best to target area and then ground geophysics and geological reconnaissance mapping and geochemistry will be deployed to define the drill targets. Copper deposits respond well to TEM (Time-Domain electromagnetic), IP (Induced polarization) and magnetics, in cover situations down to atleast 150m. Geophysical expressions will be a reliable indication of the areal extents of massive sulphide mineralization and resource potential. Therefore regional exploration will focus on areas of higher IP chargeability.

## DRILLING AND CORE LOGGING

It is envisaged to drill boreholes or as an alternate, excavation of few pits at the selected spots close to or on the exposed ore body and in and around prospective zones as indicated by IP surveys. The choice to prefer any of the two options would depend on the results of the preliminary study. The drilling method employed will be rotary drilling using water as fluid with conventional diamond core drilling rig and RC drill testing (Reverse circulation). Core samples will be described and preserved for each meter of drilled depth. Borehole logs and reports will be prepared for each borehole.

Alternatively, pits will be excavated in an appropriate numbers as required using rock breaking machines. The pit dimension will be of the order of 1x1x3(m). The ore samples will be collected with change in depth. A profile of ore quality will be developed. Drilling and pit data will be used to construct cross-sections for different parts of the concession area in order to estimate the available reserves.

## ANALYSIS OF CORE CUTTINGS

The ore samples collected from drilling of boreholes or excavation of pits will be chemically analysed. The basis and the procedure will be the same as adopted in a standard modern laboratory. The chemical tests will be to analyze the percentage of copper and other related elements.

The presence of tracer elements in the ore that may have an impact will be ascertained. The ore quality will be confirmed in conjunction with the earlier analyses results.

ORE RESERVE ESTIMATION:

Upon completion of the drilling program, the results will be fully examined and cross-sections extended as appropriate to define the resource. Based on the topographical survey and geological cross sections, the resource reserves will be calculated. Results and all related supporting documents will be compiled in a report that will conclude the reserves available in metric ton.

**4. BUDGET:**

**A summary Budget is provided in the following table**

<b>Wages and Salary</b>	<b>Wages/month</b>	<b>Wages for 3 months</b>
Geologist x 1	1,500	4500
Asst- Geologist x 1	800	2400
Asst - Field workers x 2	700	2100
<b>Total</b>	<b>2,600</b>	<b>9,000</b>
<b>Prospecting &amp; Exploration expenditure For Phase I</b>		
Study of literature and pre-existing data		
Fieldwork / survey		
Sampling		1000
Chemical analysis		
Data interpretation & Compilation of Report		
		750
	<b>TOTAL</b>	<b>1,750</b>
	<b>GRAND TOTAL</b>	<b>11,750</b>