MINERALOGICAL AND GEOCHEMICAL STUDIES OF THE PRIMARY ORE AT EL ATSHAN, EASTERN DESERT, EGYPT, U.A.R.

By

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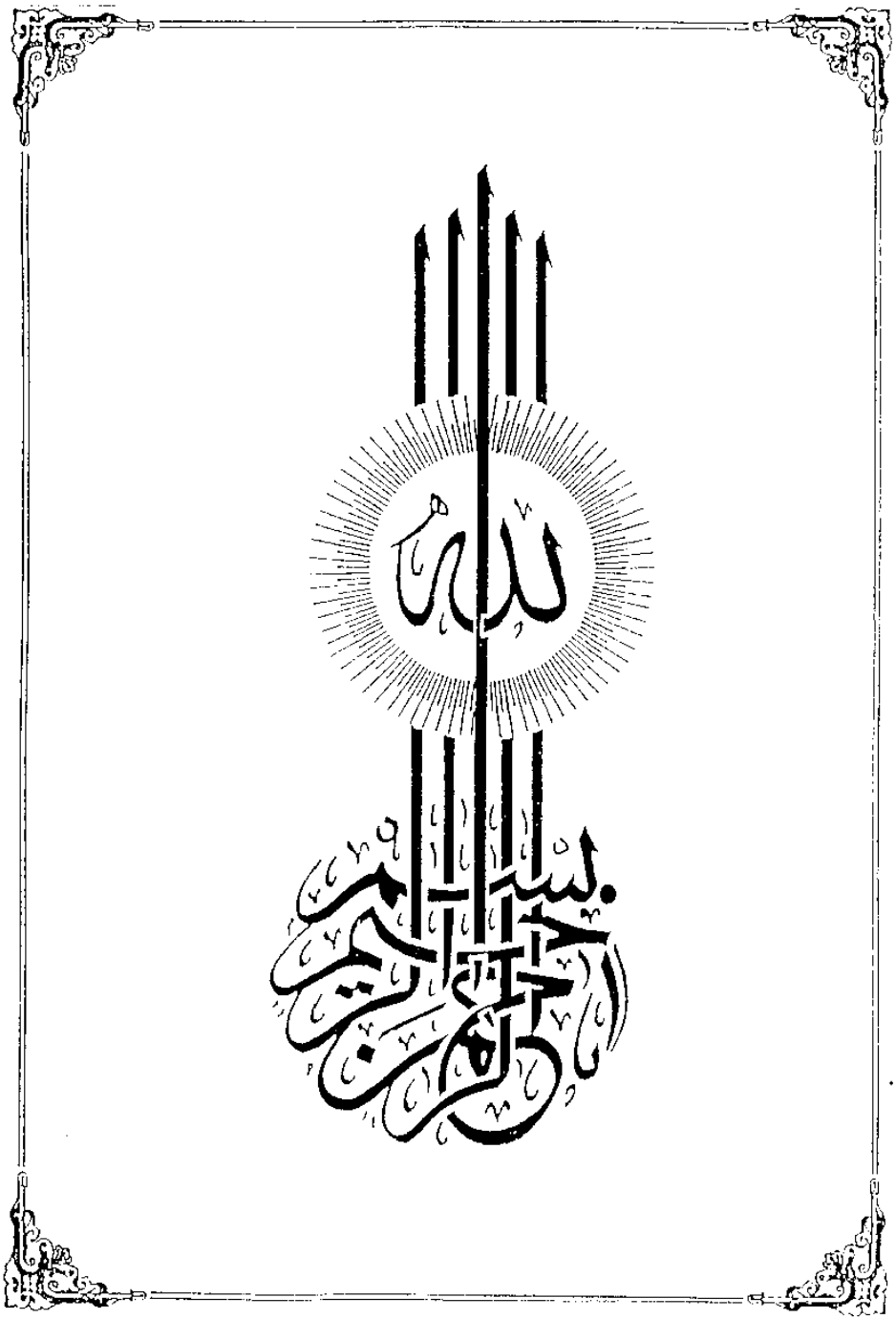

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CHAPTER I

INTRODUCTION

I- General Statement:

The uranium mineralization at El Atshan mine is located at about 50 Km to the SW of Qusseir town on the Red Sea coast, between Wadi El Dabbah and Wadi Kareim, central Eastern Desert, the coordinates are 34° 7' 30" N and 25° 50' 30" E (Fig. 1).

The geologic framework of the area is outlined in the work of the Atomic Energy Prospection field-groups for radioactive minerals, in 1962-1963, field season.

A drilling program of 35 boreholes conducted by the same Department in the year, 1963-1964, resulted in a detailed study of the surface geology as well as the subsurface. The primary ore of El Atshan and its physical and chemical properties were studied by El Hazek (1968), the secondary uranium mineralization in the area was earlier studied by Assaf (1966).

The drilling program was followed by exploratory mining work (1966) in order to follow the mineralizations in depth.

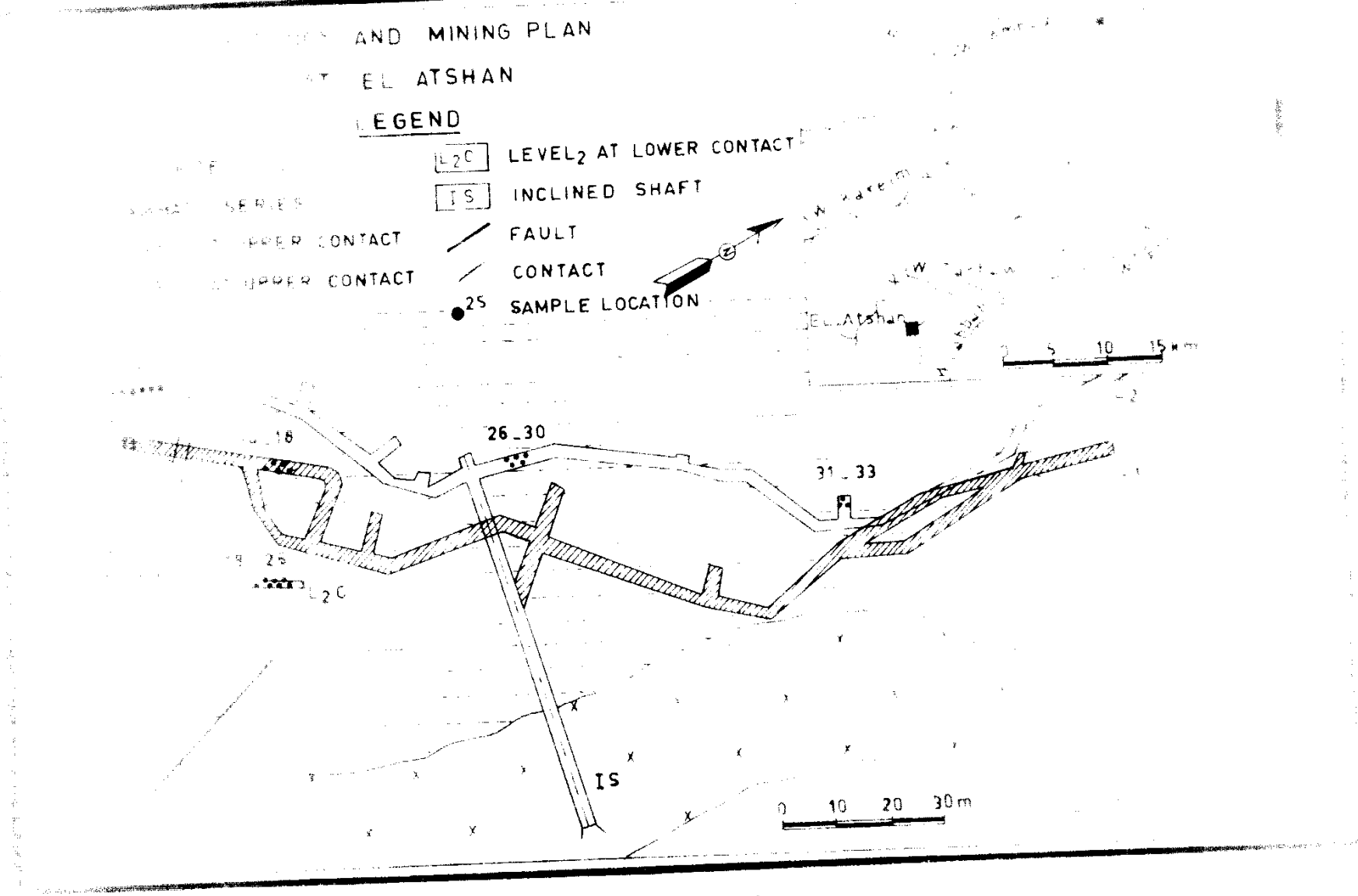

FIG.(1).

The study of the mineralogy and geochemistry of both uranium and sulphide primary mineralization is given in Chapter III. The mineralogy and geochemistry of the oxidized zone; secondary uranium minerals and sulphide oxidation products as well as the gangue minerals and the host rock are given in Chapter IV. The chemical composition and major and trace element distributions are dealt with in Chapter V. This is attempted to answer some questions about the origin and condition of formation of the ore.

II- Geologic Setting:

The geology of this region has been investigated by Nedimovic, Hussein and Obrenovic (1962), Obrenovic, Assaf, El Kassas and El Amin (1966), Assaf (1966) and El Kassas (1969). The regional geology of the area under investigation is summarized in the following paragraphs:

The central part of the Eastern Desert is composed of folded and metamorphosed complex which is bordered on the east by Cretaceous and younger sediments and on the west by the Nubian Sandstone and Upper Cretaceous formations.

The different rock units in the area were correlated with the main structural stages of El Shazly (1964),

classification of the Precambrian and magmatically affiliated rocks. In the area they are stated as follows:

A) Metasediments (Geosynclinal Sediments):

This is considered to be the oldest in the basement complex, and consists mainly of two types, metamudstones and schists. The metamudstones are represented by fine-grained greyish-green colored rocks and are generally siliceous, ferruginous or calcareous. Intercalations of foliated metamudstones are also present. The schists include both chloritic and quartz-sericitic types. The geosynclinal sediments are metamorphosed in the range of low to moderate grades (green schist-amphibolite facies).

B) Metavolcanics (Main Geosynclinal Volcanics):

These are extruded over and sometimes intruding the meta sediments. The metavolcanics include mostly doleritic basalts and andesites which occur as sills, sheets or lenses. They are generally fine-to moderate-grained rocks and ranging in color from dark green to greyish-green or dark grey. The metavolcanics are followed by diorites and the Dokhan volcanics.