



**Republic of the Sudan
Ministry Of Minerals
Geological Research Authority of the
Sudan**

**Uranium in Sudan
MUSB OSMAN EBRAHIM
Hesham Aldeen Alkhar**



Republic of the Sudan

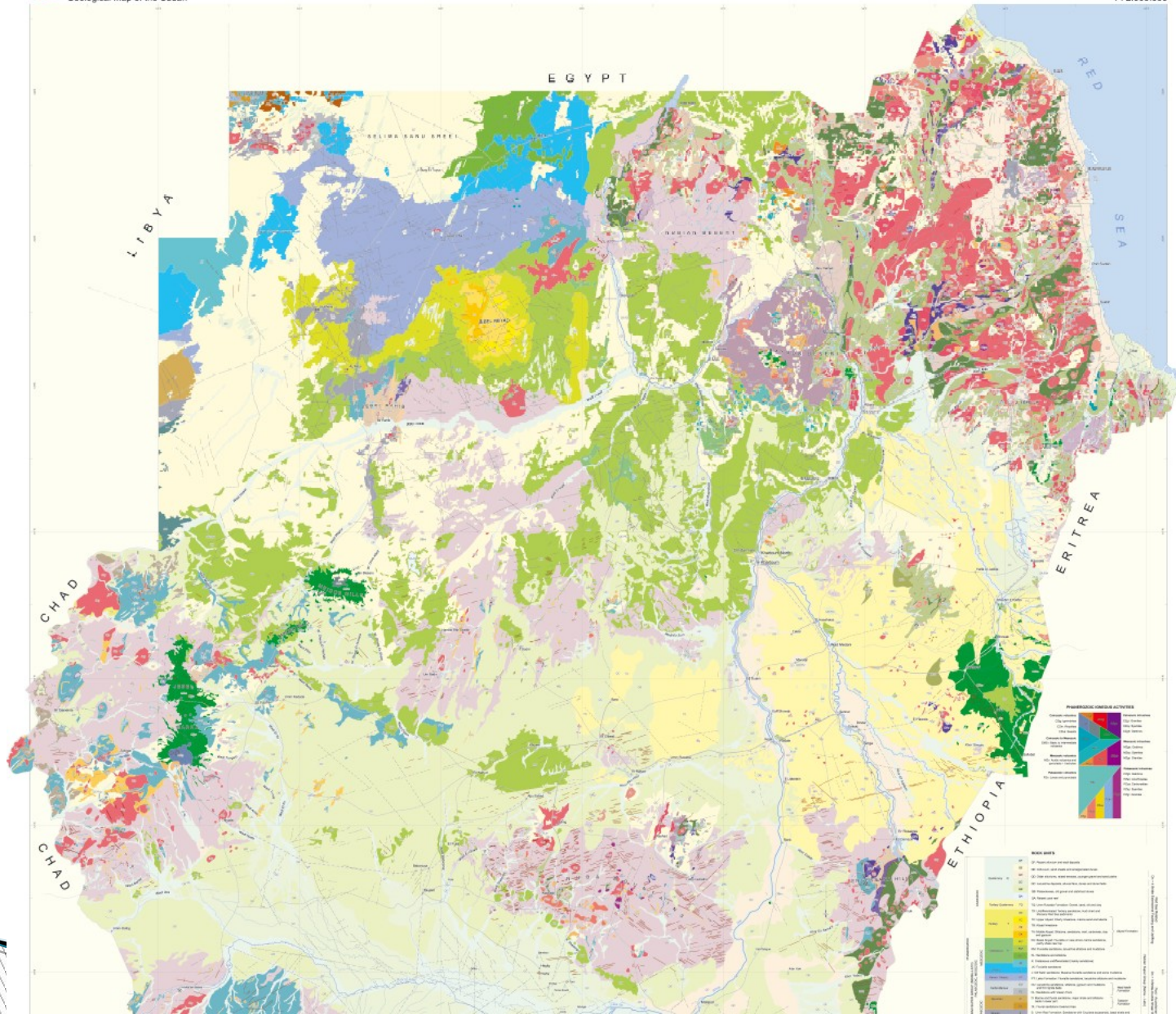
Location

Situated in northern Africa, Republic of Sudan shares its borders with Egypt to the north, the Red Sea to the northeast, Eritrea and Ethiopia to the east, South Sudan to the south, the Central African Republic to the southwest, Chad to the west, and Libya to the northwest



GEOLOGICAL MAP OF THE SUDAN

1 : 2,000,000



Geology Of Sudan comprises

1 – Basement complex (Archaean–Upper Proterozoic)

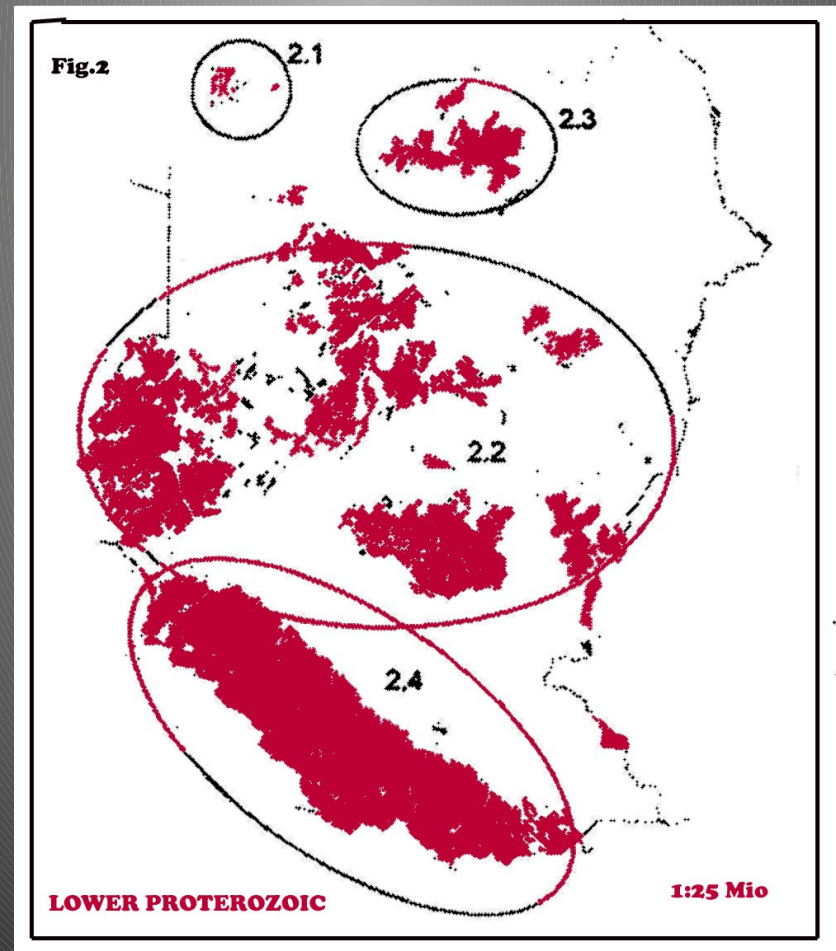
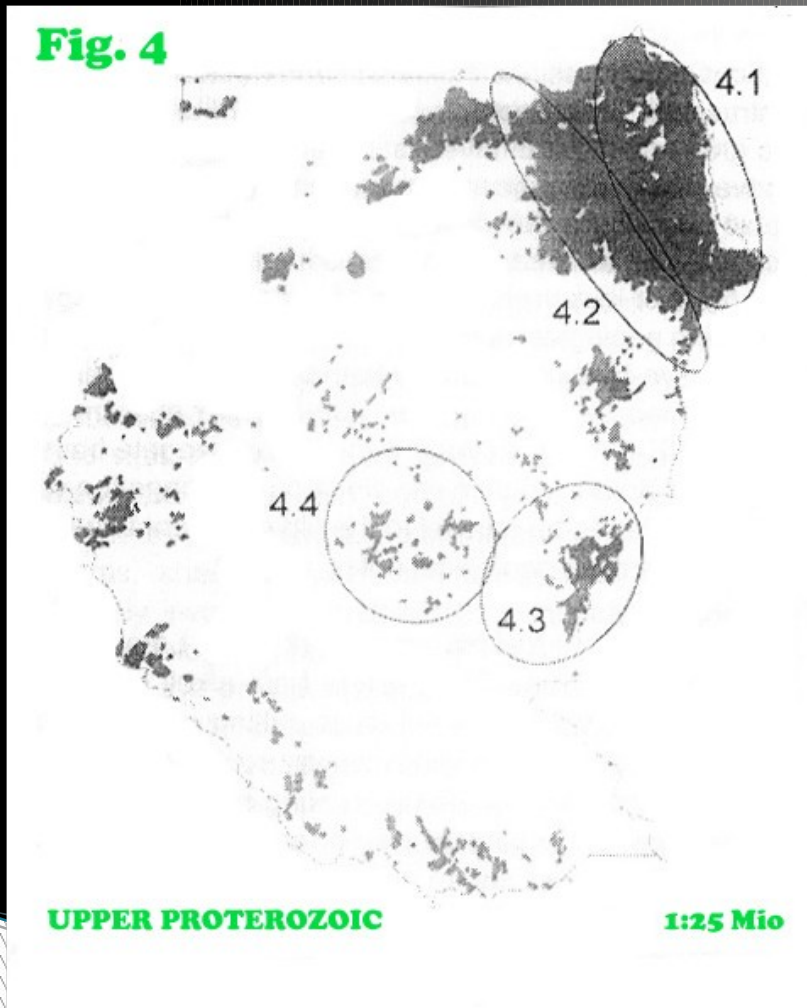
2 – An-orogenic high level alkaline igneous activity

(Paleozoic–Lower Cenozoic

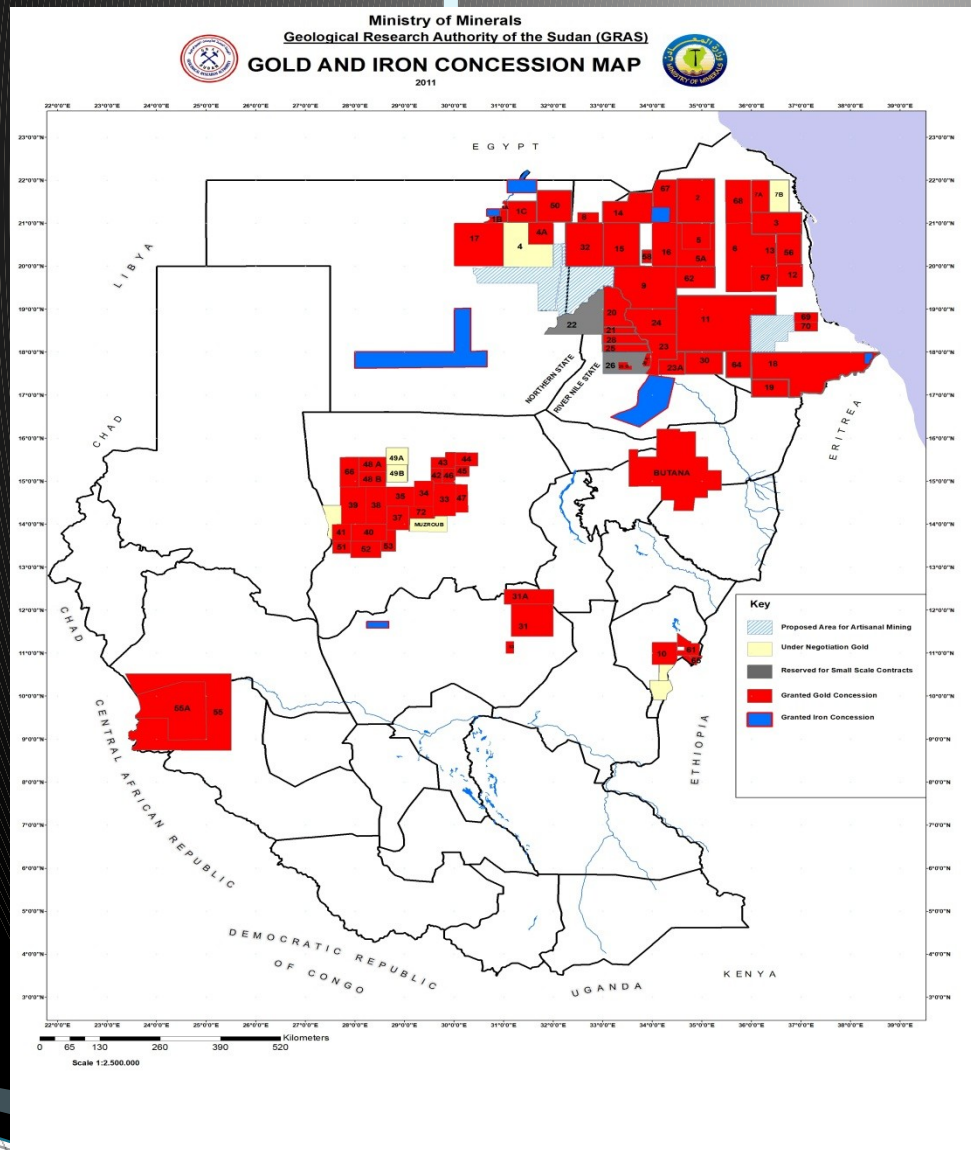
3 – Extensive Phanerozoic sedimentary strata (Early Paleozoic – Recent).

4 – Cenozoic basaltic volcanism

Basement Rock in sudan



Concession map of sudan



Minerals in Sudan

Minerals potentiality:

Sudan is among the largest countries in Africa and characterized with diversified geological units and structure that host great and variable numbers of minerals wealth

Gold

The area between the Nile and the Red sea south Kordofan, and south Darfur

Silver

Red sea hills

Iron

Iron is found at many locations at the Red Sea Hills

Chromite

Chromate is found in many localities in the Sudan; Ingessana, Nuba Mountains, Red Sea Hill, and Qala En Nahal.

Manganese

The Red Sea Hills, and Bayuda Desert. sands, and black sands red sea costal.

Copper

in the Ariab Region and in Hofrat En Nahas

Zinc

Zinc is concentrated at Abu Samar area, Tagoteb in the Red Sea Hills, Um Takatik at NE–Nuba Mountains

Lead

Lead is known at Kutum in north Darfur

Limestone and Marbles:

Bayuda (west Atbra, and Berber), Red sea hills and costal plane.

Gypsum

north Portsudan.

Black sands

Red Sea Coastal It contains magnetite, ilmenite, rutile, and zircon etc.

Agricultural minerals:

Phosphate and Potassium oxide.

Other minerals

kaoline, talc, phosphate, magnesite, feldspars, fluorspar, kyanite, truna, bentonite, wollastonite, barite, white

Minig sector Gold Mining Example ARIAB MINING COMPANY

**the mine in belt between hadel
awateib area and Portsudan area
about 280 km from Portsudan**





Explosive



Explosive



:Mining Open Cast Mining Hadal Awateib

Depleted Secondary Gossan Deposits



Ochre (Oxidation-Hydration zone)

:Mining Open Cast Mining Hassai South



● Uppermost Part of Sulphides and
Bottom of Secondary Gossan Part

:Mining

Transportation of Secondary Ore



Uppermost Part of Sulphides and
Bottom of Secondary Gossan Part

Hassai South

:Ore Dressing

,Crushing -1

Grinding (Milling) -2



Agglomeration -3

:Ore Dressing

Stackerring and leveling of the heap for cyanide leaching



:Ore Dressing

Stackerring and leveling of the heap for cyanide leaching



:Ore Dressing

Heaping of the ore for cyanide leaching



Second floor heap



First floor heap



Cyanide leaching (Dripping) above the slope



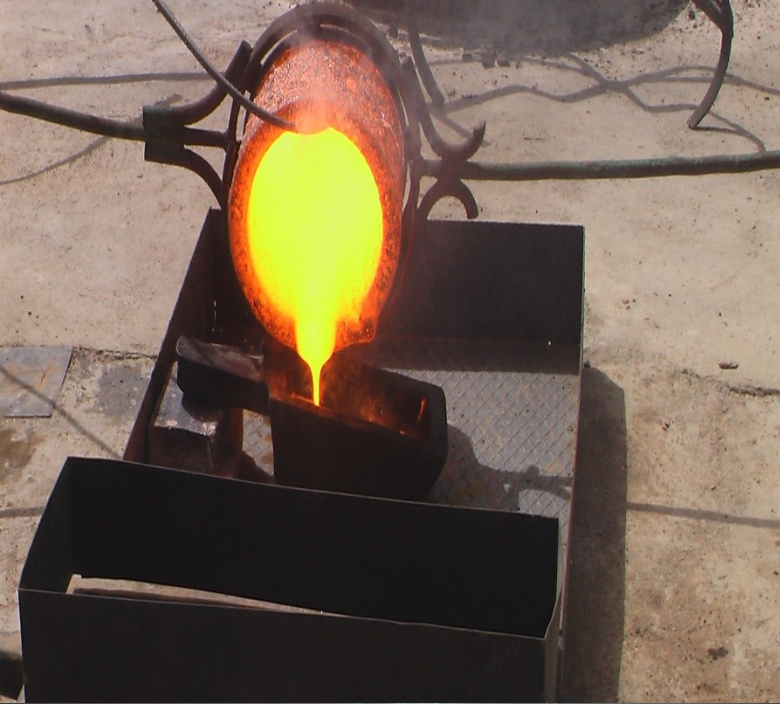




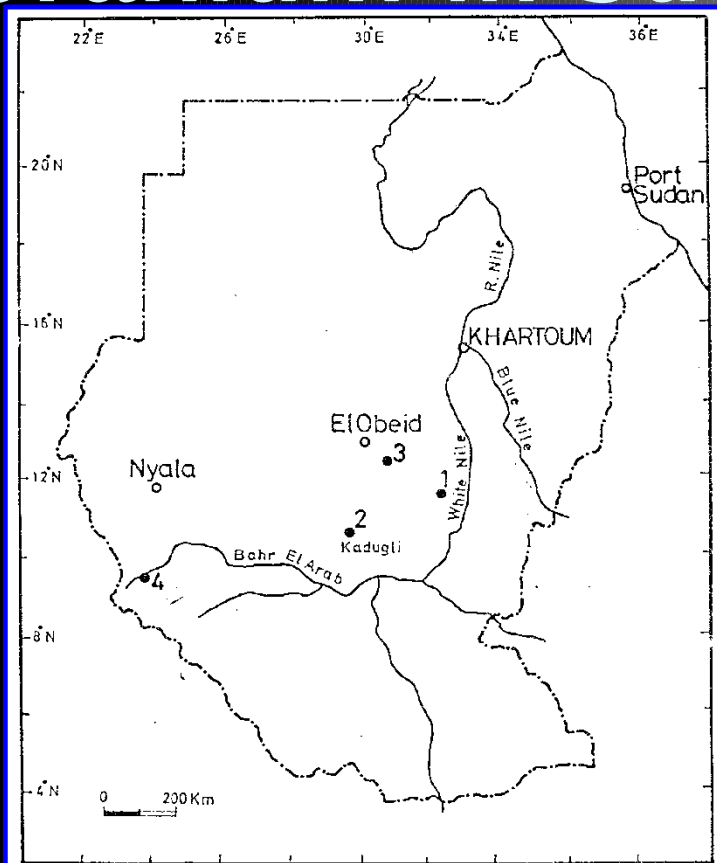




المرحلة النهائية للإنتاج



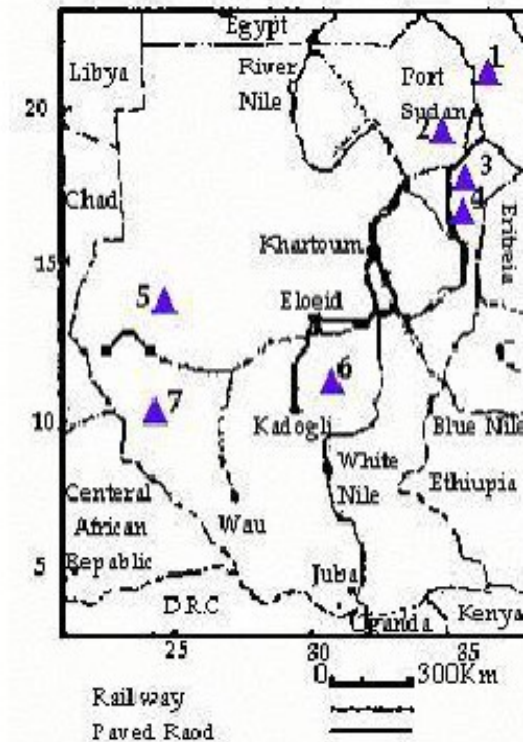
Uranium in Sudan



- 1 Uro-Kurun - Abu Gubeiha
- 2 Miri - Kadugli
- 3 J. Dumbeir - El Semeih
- 4 Hofrat En Nahas

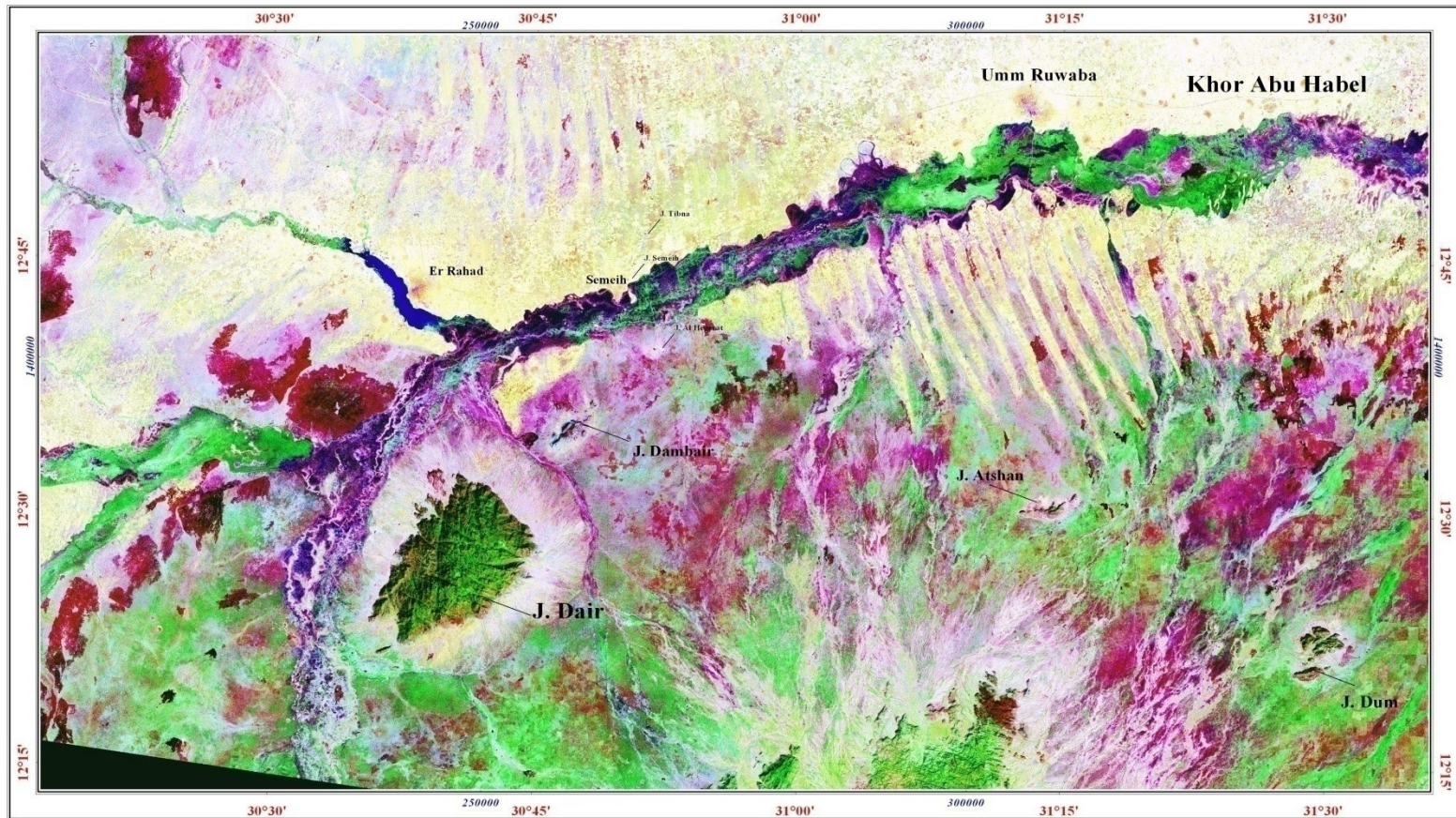
تواجد اليورانيوم في السودان

Location Map

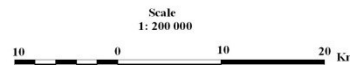


- 1- Red Sea Hot Brines.
- 2- Ariab Area.
- 3- Abu Samar.
- 4- Tagoteb
- 5- Kutum.
- 6- Northeastern Nuba Mountains.
- 7- Hofrat en Nahas

Uranium with fluorite at J.Dumbeir violate fluorite



IHS Fused image of NE Nuba Mountains, Sudan.
Subscene of Landsat ETM+7 (Path/Row : 174/51),
Bands 7, 4 & 1 as R G & B with Panchromatic band 8
Acqu. date: 27,11,1999



Projection: UTM-Zone 36
Spheroid: WGS84

Image processing by Sami El Khidir (May 2004)
Remote Sensing Group-Prof. List
FU Berlin



Francis8288 www.delcampe.net

Amber mountain



Uranium in Nuba Mountain

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URANIUM ABUNDANCE IN SOME SUDANESE PHOSPHATE ORES

Abdelmajid A. Adam¹ and Mohamed Ahmed H. Eltayeb
2010

Abstract

uranium abundance and total phosphorus content measured as P₂O₅%. For this purpose, 30 samples of two types of phosphate ore from Eastern Nuba Mountains, in Sudan namely, Kurun and Uro areas were examined. In addition, the relationship between uranium and major, and trace elements were obtained, also, the natural radioactivity of the phosphate samples was measured, in order to characterize and differentiate between the two types of phosphate ores.. The uranium abundance in Uro phosphate with 20.3% P₂O₅ is five time higher than in Kurun phosphate with 26.7% P₂O₅. The average of uranium content was found to be 56.6 and 310 mg/kg for Kurun and Uro phosphate ore, respectively

. The main elements in Kurun and Uro phosphate ore are silicon, aluminum, and phosphorus, while the most abundant trace elements in these two ores are titanium, strontium and barium. Pearson correlation coefficient revealed that uranium in Kurun phosphate shows strong positive correlation with P_2O_5 , and its distribution is essentially controlled by the variations of P_2O_5 concentration, whereas uranium in Uro phosphate shows strong positive correlation with strontium, and its distribution is controlled by the variations of Sr concentration. Uranium behaves in different ways in Kurun phosphate and in Uro phosphate. Uro phosphate shows higher concentrations of all the estimated radionuclides than Kurun phosphate. According to the obtained results, it can be concluded that Uro phosphate is considered as secondary uranium source, and is more suitable for uranium recovery, because it has high uranium abundance and low $P_2O_5\%$ than Kurun phosphate.

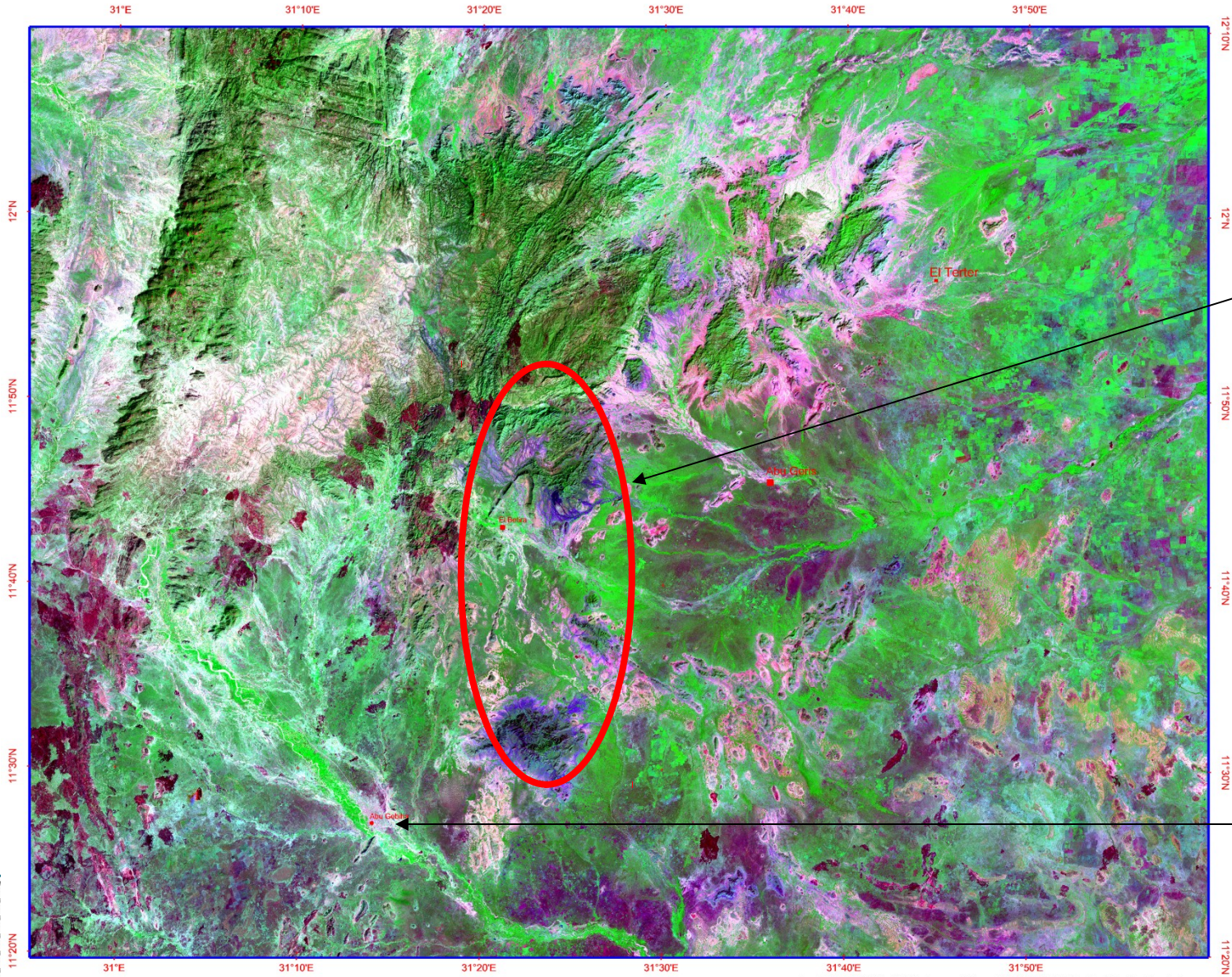
URANIUM ABUNDANCE IN SOME SUDANESE PHOSPHATE ORES

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Table 2. Uranium content and P₂O₅% for phosphate ore samples from Kurun and Uro areas.

Phosphate ore type					
Kurun phosphate			Uro phosphate		
Sample No.	Uranium content (mg/kg)	P ₂ O ₅ %	Sample No.	Uranium content (mg/kg)	P ₂ O ₅ %
1KPO	53.000	25.411	1UPO	100.500	22.633
2KPO	70.300	35.233	2UPO	129.200	16.700
3KPO	27.700	23.500	3UPO	94.300	18.000
4KPO	65.600	33.400	4UPO	1050.000	16.900
5KPO	86.200	20.122	5UPO	245.000	20.341
6KPO	38.500	21.000	6UPO	137.100	17.500
7KPO	33.000	29.500	7UPO	175.100	25.036
8KPO	109.600	40.473	8UPO	556.200	20.800
9KPO	41.400	25.200	9UPO	219.000	24.263
10KPO	21.700	20.000	10UPO	164.700	19.300
11KPO	19.200	18.300	11UPO	800.600	23.622
12KPO	95.100	24.451	12UPO	322.000	21.542
13KPO	61.000	29.500	13UPO	204.400	23.400
14KPO	50.100	26.300	14UPO	113.000	17.966
15KPO	77.000	28.112	15UPO	338.900	16.500

KPO: Kurun phosphate ore samle



**Radiation
Area
In Korne
and Oro**

**Eastern
Nuba
mountain
To abu
jebiha
area**

0 1 2 3 4 5 6 7 8 9 10
km

Landsat ETM+ (p173r52,p174r52) color composite image (7,4,1) in RGB of Northeastern Nuba Mountains, Sudan.
Digitally processed by Esam A. Ahmed, remote sensing dept., El Neelain Univ, October 2004.

Conclusion

***Sudan have different geological environment occur many type of mineral**

***uranium in Sudan occur in different type.**

***UNFC is best system and we need suerly ..**

THANK YOU FOR ATTENTION

