



# Mining Opportunities in Oman

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Public Authority for Mining

# Outlines

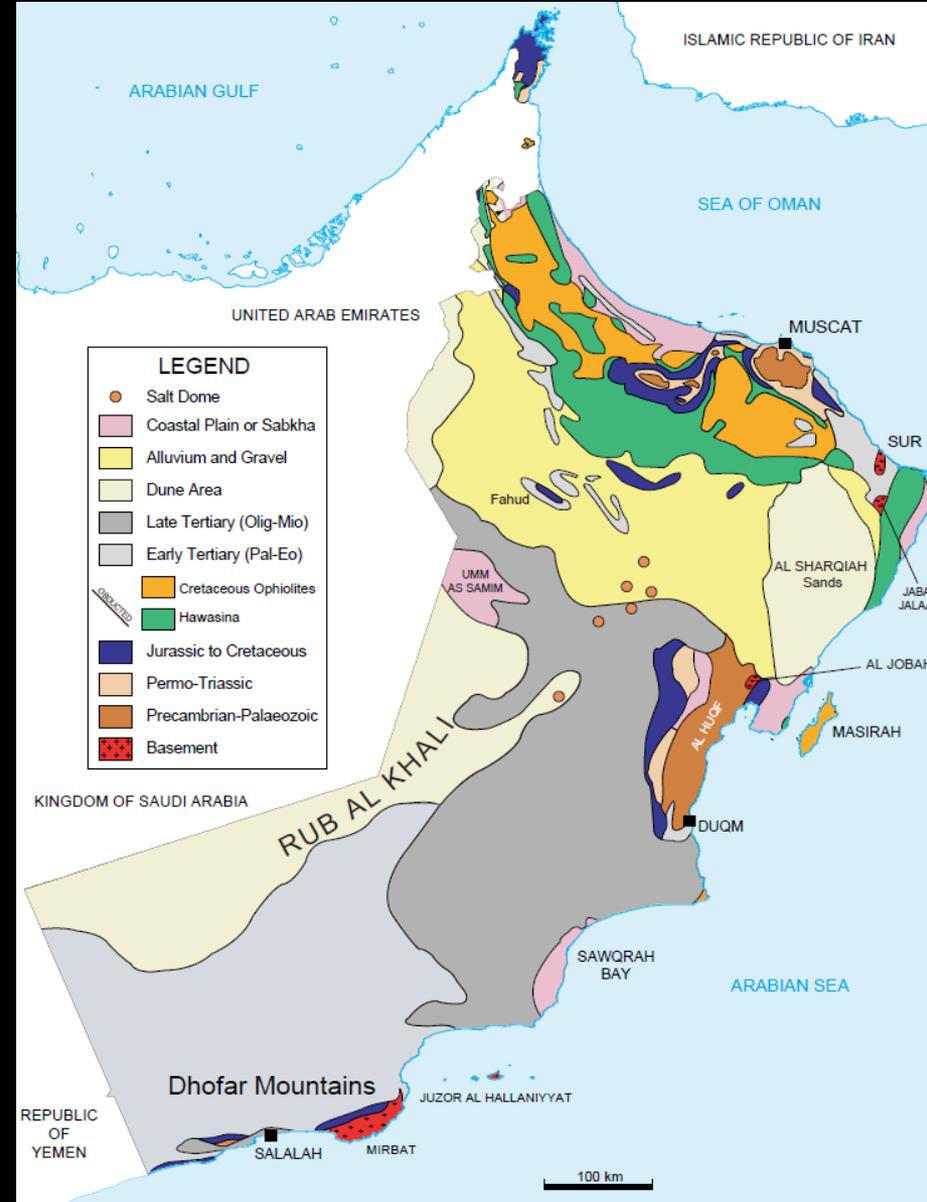
- Geology of Oman
- Mining History in Oman
- Presence of Minerals in Oman
- Mining Investment Opportunities
- Plans & Investment Attractions



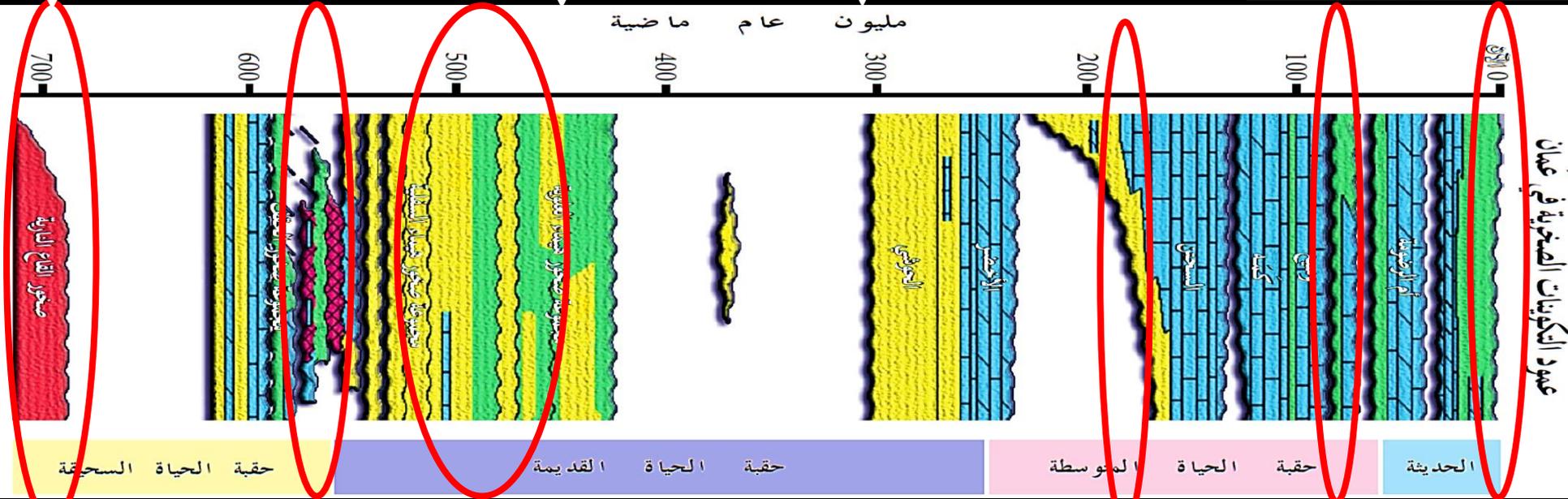
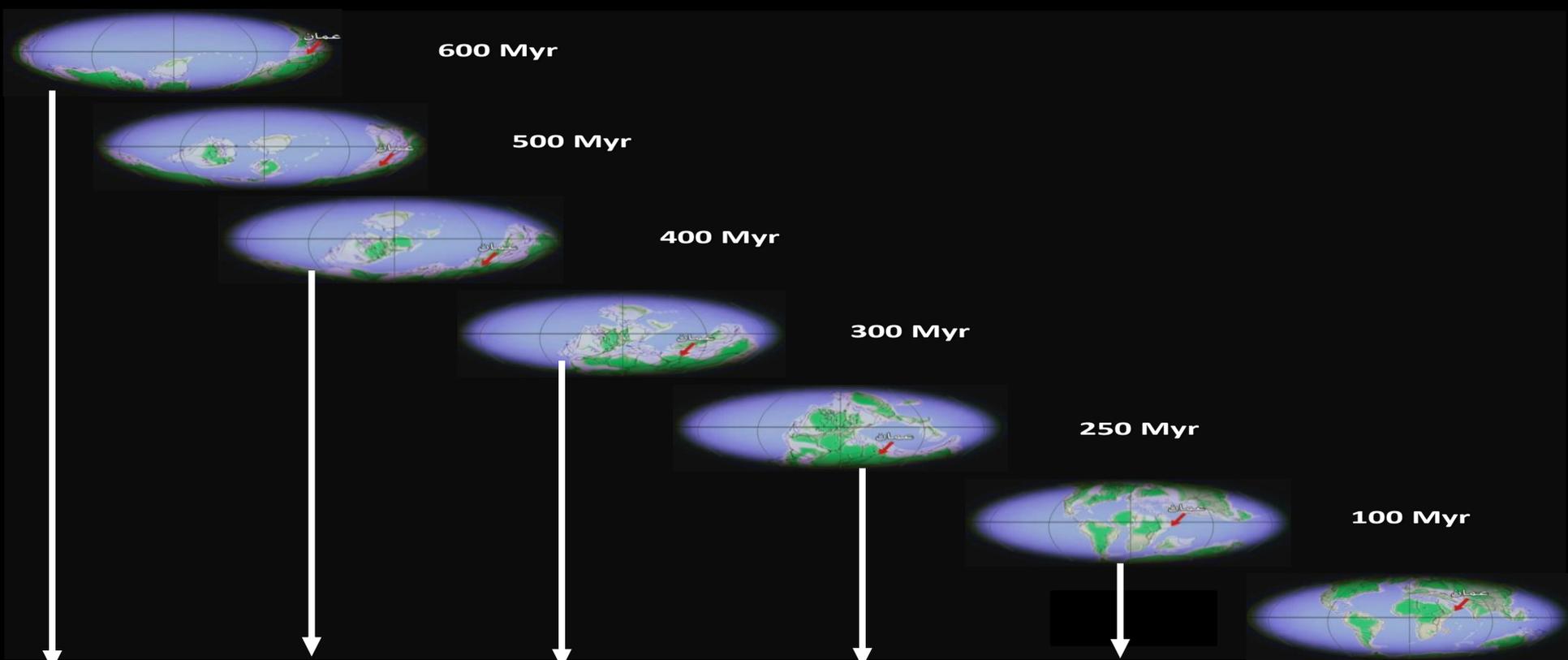
# Oman's Various Landscapes and Surface Geology



Variable Landscape



Different Rocks



عمود التكوينات الصخرية في عمان

إيران

حوض التيثيس الرسوبي

عمان

جزر بركانية مرجانية

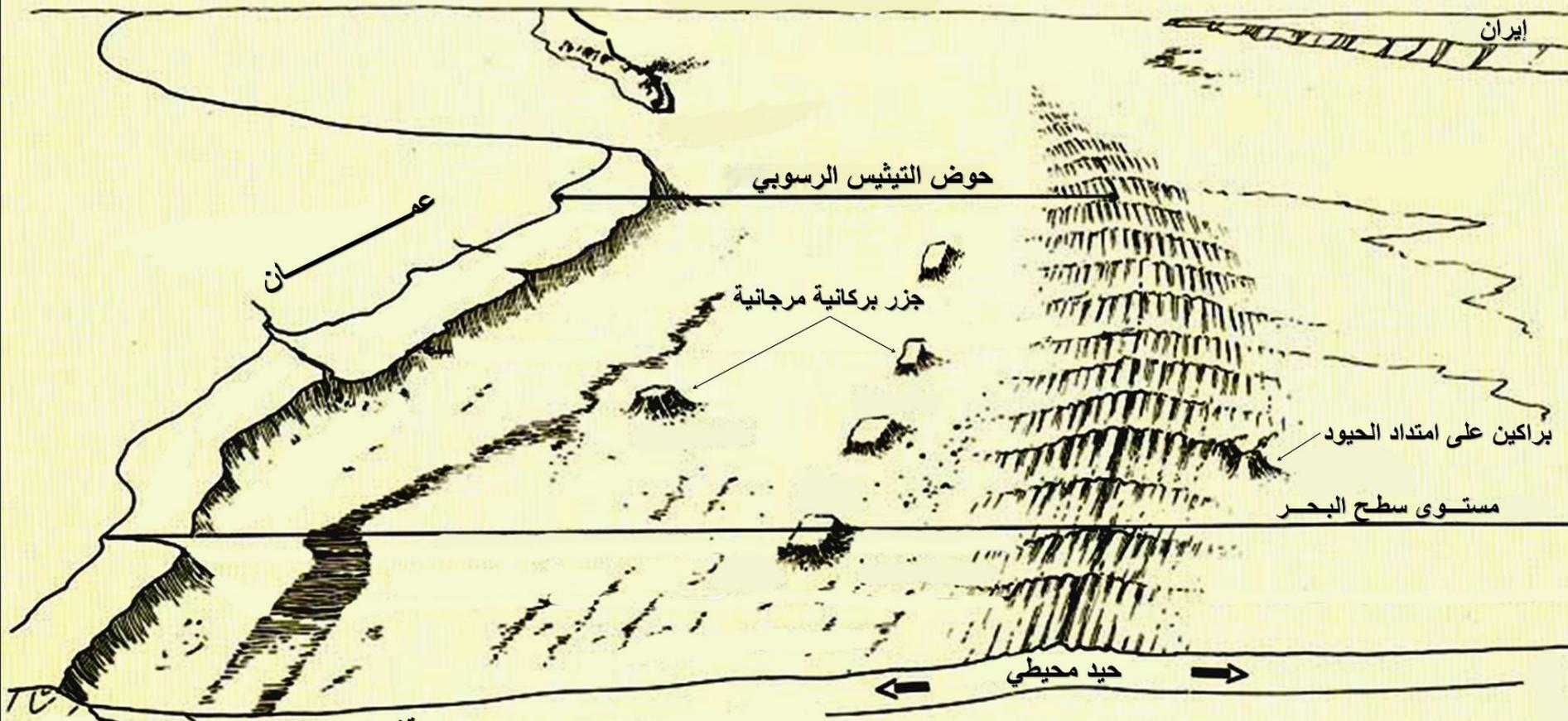
براكين على امتداد الحيوود

مستوى سطح البحر

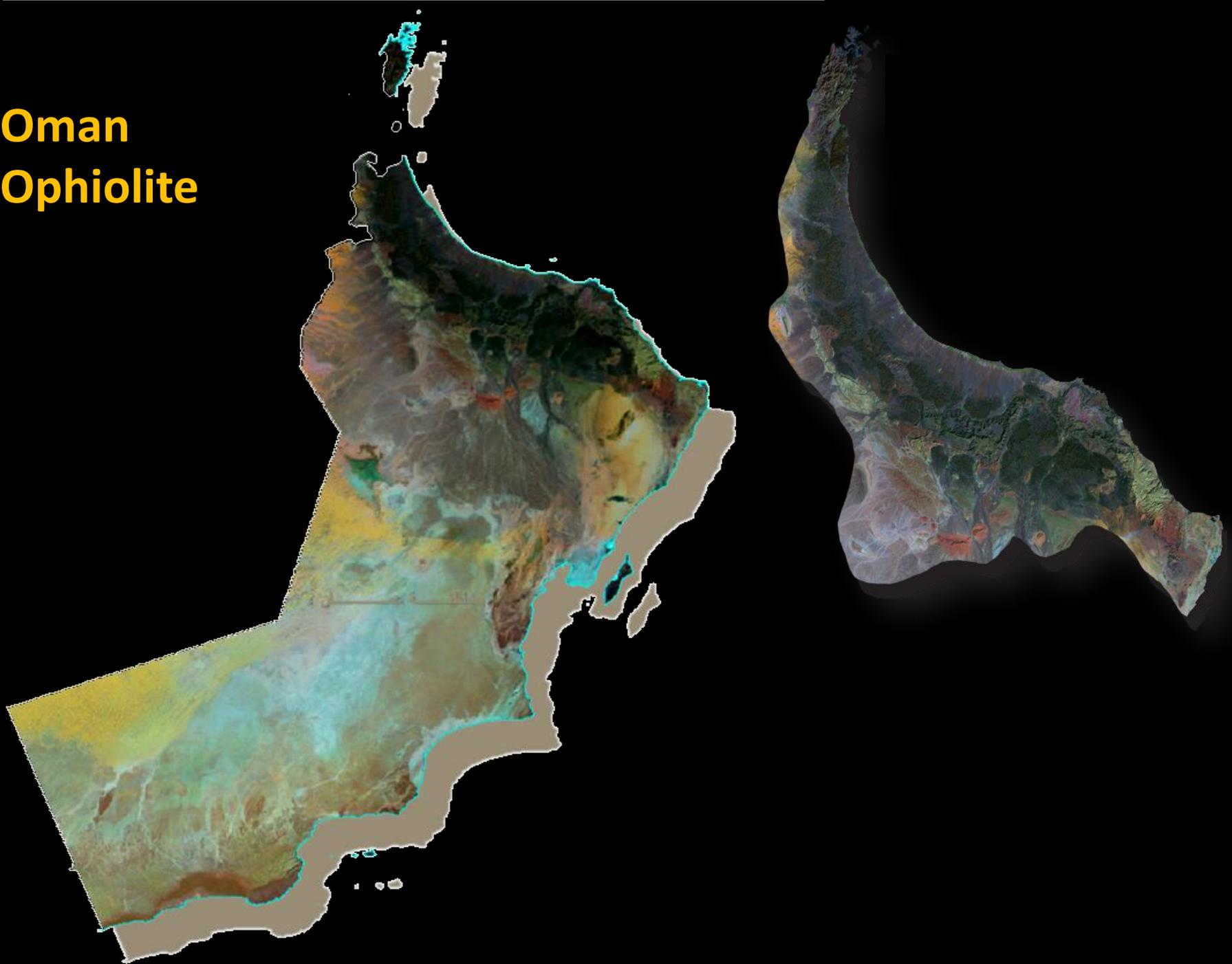
حيد محيطي

قشرة محيطية

قشرة قارية



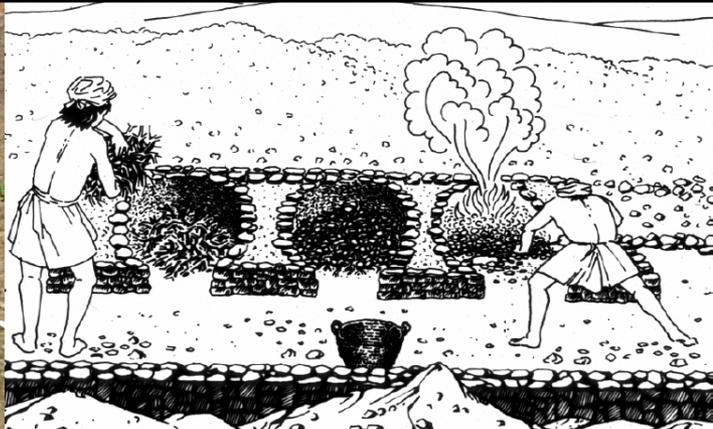
**Oman**  
**Ophiolite**



## Mining History in Oman

- Ancient Omani's understood their mineral resources and its usages and benefits in their daily lives.
- The Sultanate considered one of the earliest countries which started mining. Oman (Majan, the old name) exported minerals particularly copper to **Mesopotamia** since more than 2000 years BC.
- Archeologists acknowledged that on the **Mesopotamia (Iraq)** ancient writings (Mulokha) is southern east of Oman.

# Ancient Copper Mines



# Presence of Minerals in Oman

## Metallic Minerals

- Copper
- Gold
- Chromite
- Manganese
- Laterite
- Lead & Zinc

## Non- Metallic minerals

- Marble
- Limestone
- Dolomite
- Gypsum
- Quartz and Silica
- Clay

### Mineral Commodities with HIGH POTENTIAL

#### Aggregates & Construction Materials

Cement

Chromite, mined underground

Clays, Common

Copper

Dolomite

Magnesium

Guano

Gypsum & Anhydrite

Laterite

Limestone

Manganese

Marble, non metamorphic

Ornamental Stones

Quartz & Silica

Salt & Potash

Wollastonite

### Mineral Commodities with MEDIUM POTENTIAL

Attapulgit

Barite & Fluorspar

Basalt

Chromite, mined by open pit

Feldspar

Gemstones

Geothermal Potential

Gold & Silver

Kaolin

Kimberlites / Diamonds

Mineral Pigments

Olivine & Dunite

### Mineral Commodities with LOW POTENTIAL

Asbestos

Bentonite\*

Carbonatites & Rare Earth\*

Celestite\*

Platinum Metals

Coal

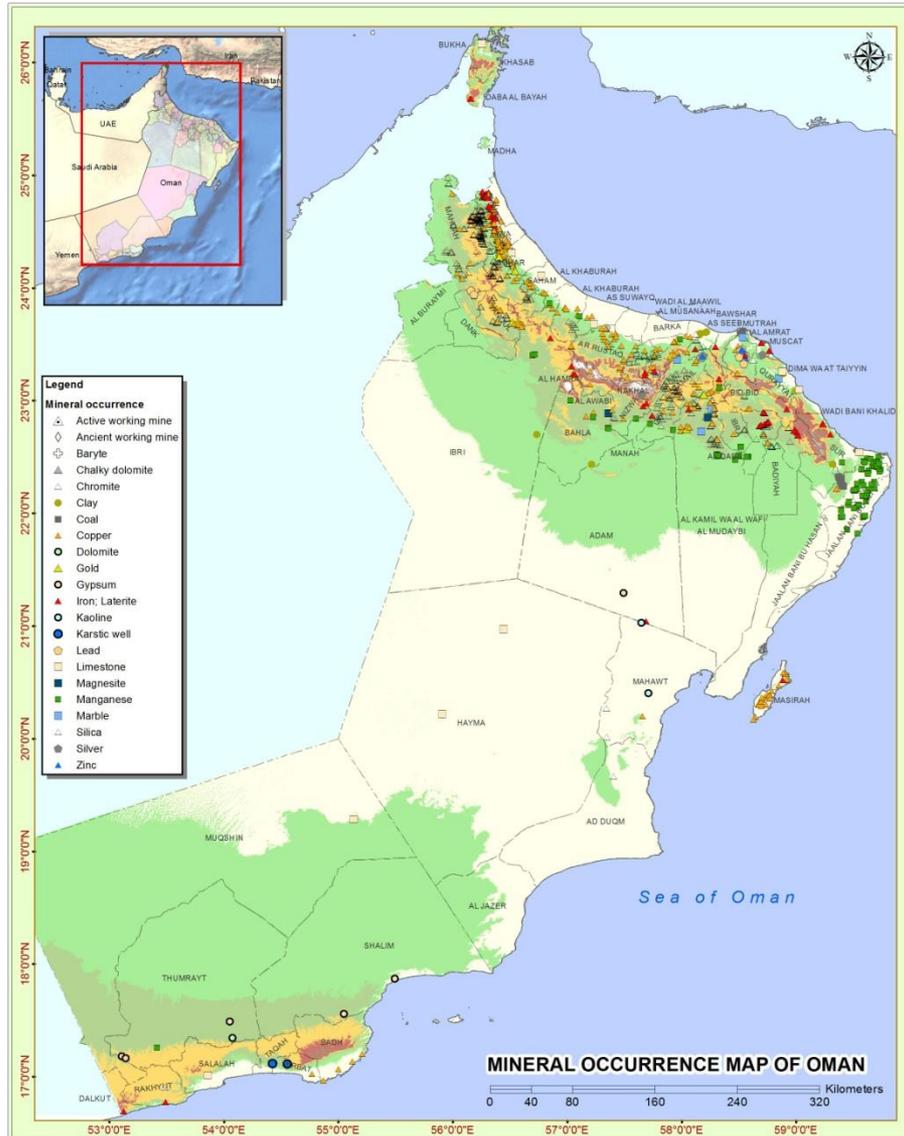
Magnesite

Lead & Zinc\*

Phosphate

Uranium

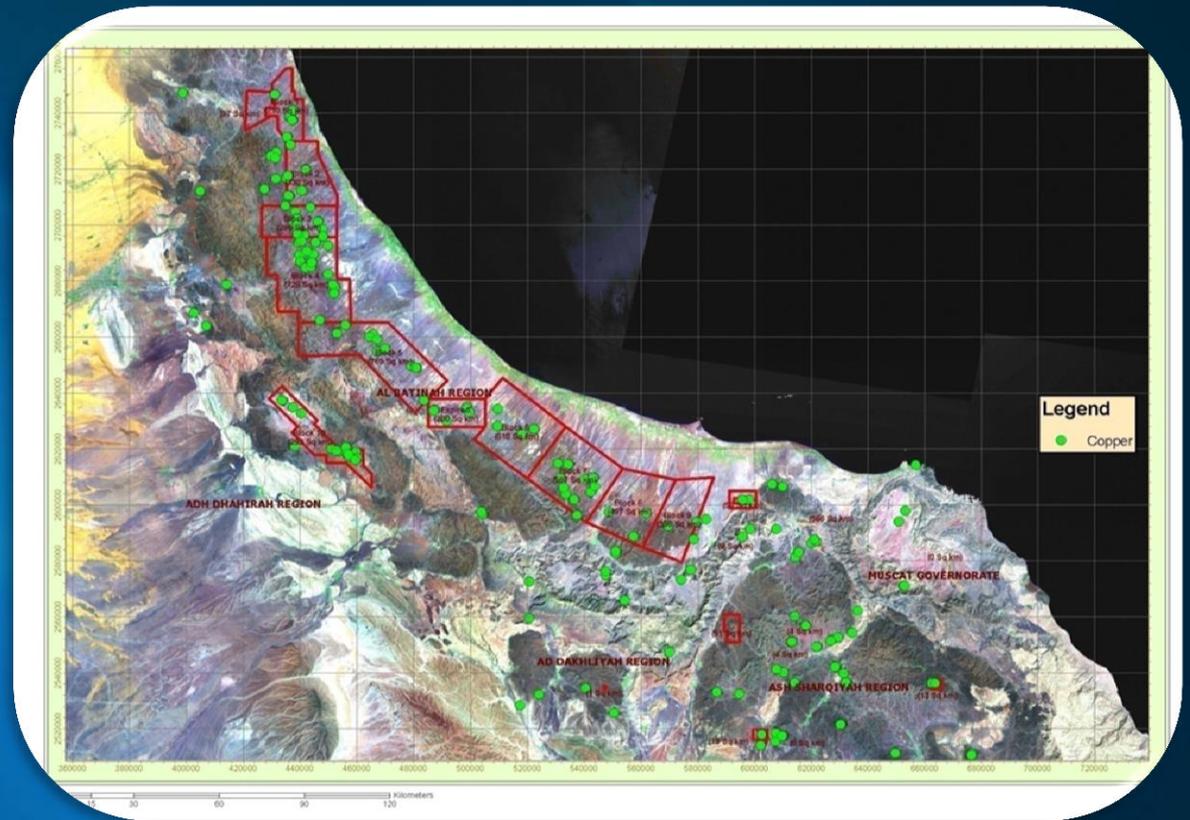
**\* But : Discoveries of larger  
deposits are possible !**

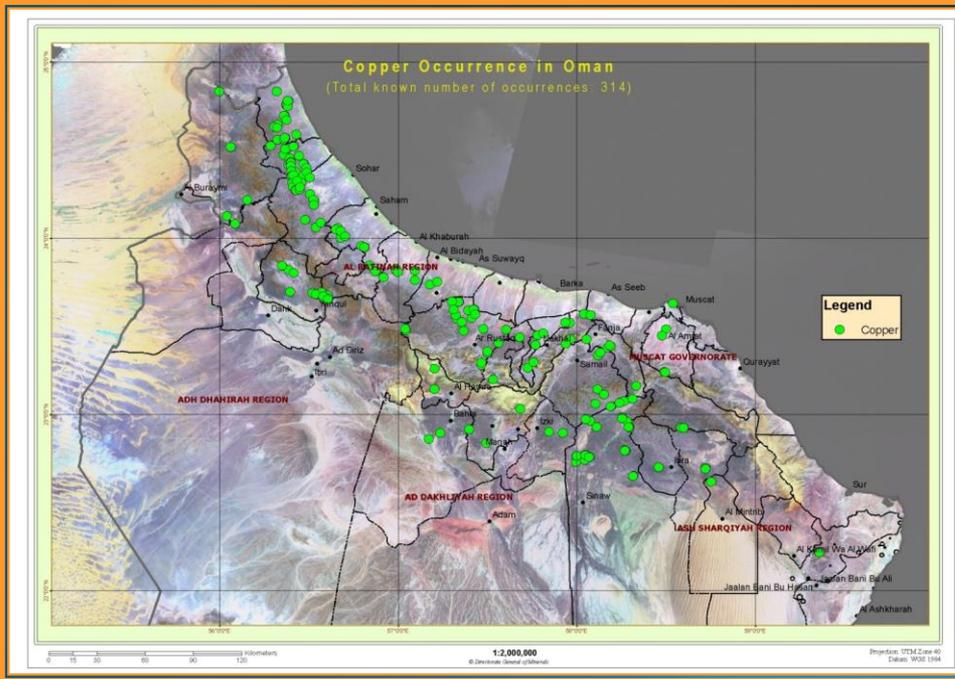


Mining  
investments  
opportunities

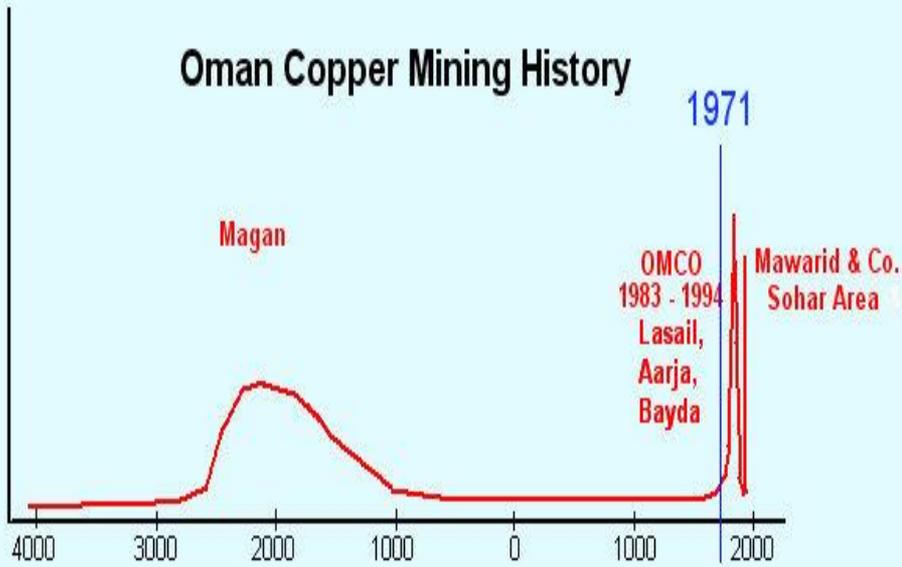
# COPPER

- Copper mainly occur in upper ophiolite suite (volcanic sequence) in north Oman.
- The estimated exploration resource of copper is around 50 millions tons with grade between 1-1,5 .



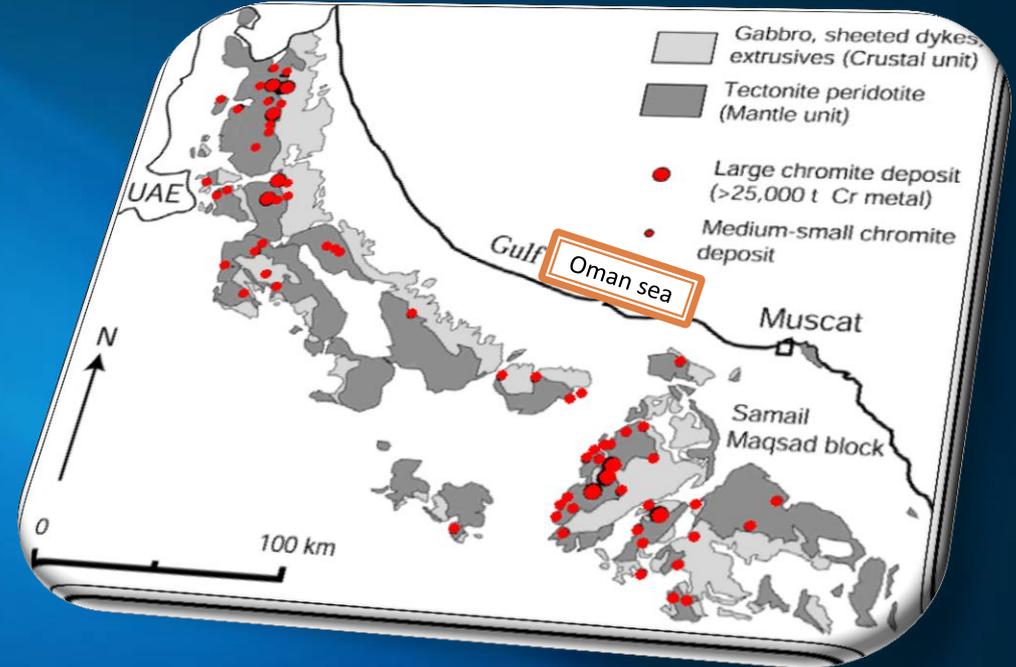


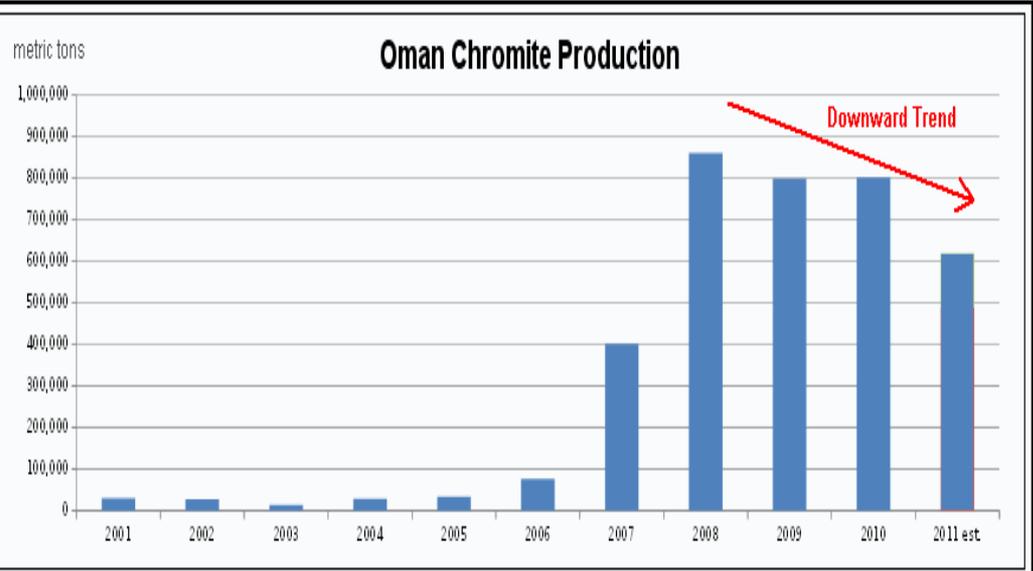
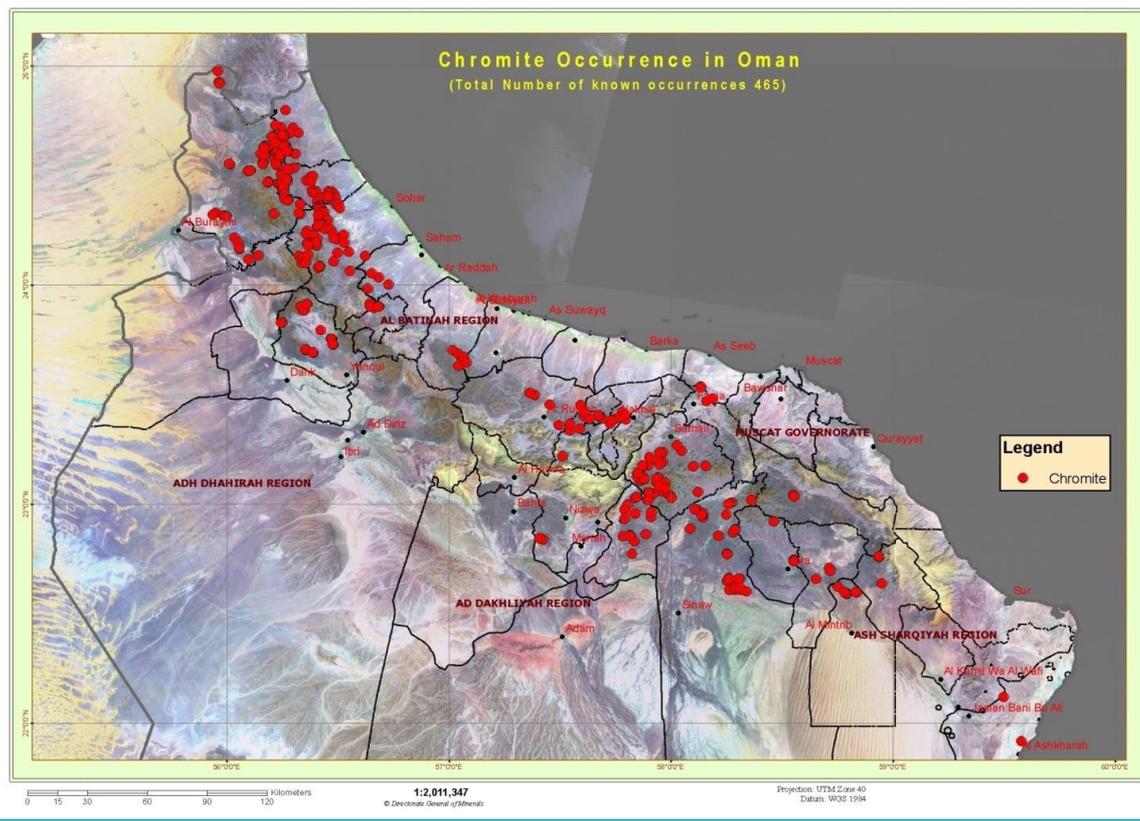
## Oman Copper Mining History



# Chromite

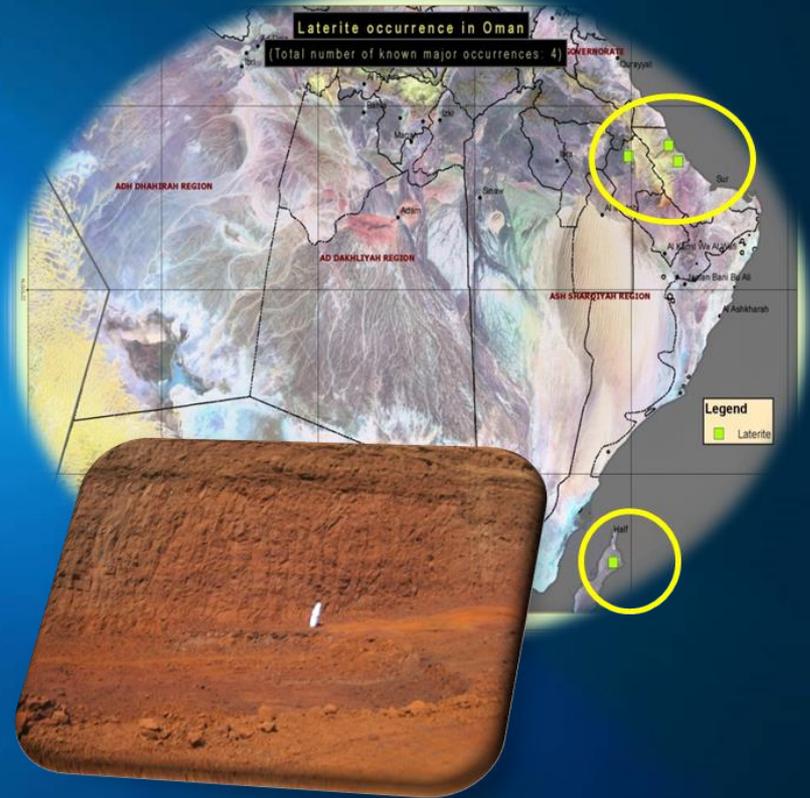
- Occurs in the lower part of the Ophiolite sequence (Dunite and Harzburgite).
- Extended in the northern part of Oman.
- Chromite grade ranges between (20-40%).





# Laterite(Iron oxide)

- Deposits mainly in wadi Naam Al Qabil and Ibra .
- Resulting from Chemical weathering of ophiolitic rocks: gabbros, serpentinites, peridotites.
- Iron content often  $> 50 \%$ .
- Nickel content and reserves may be substantial and economic, but need more study.
- Further potential for : Aluminium, Cobalt.



# Limestone , Marble & Dolomite

## Limestone :

- Deposit mainly in Salalah , Dunk, Sur, Quriayat & Duqum.
- Huge Reserves.
- $\text{CaCO}_3$  up to 99%.

## Marble:

- Deposit mainly in Ibri , Nizwa, Bahala, Manah & Alqbil.
- White , Beige & Pink colors.

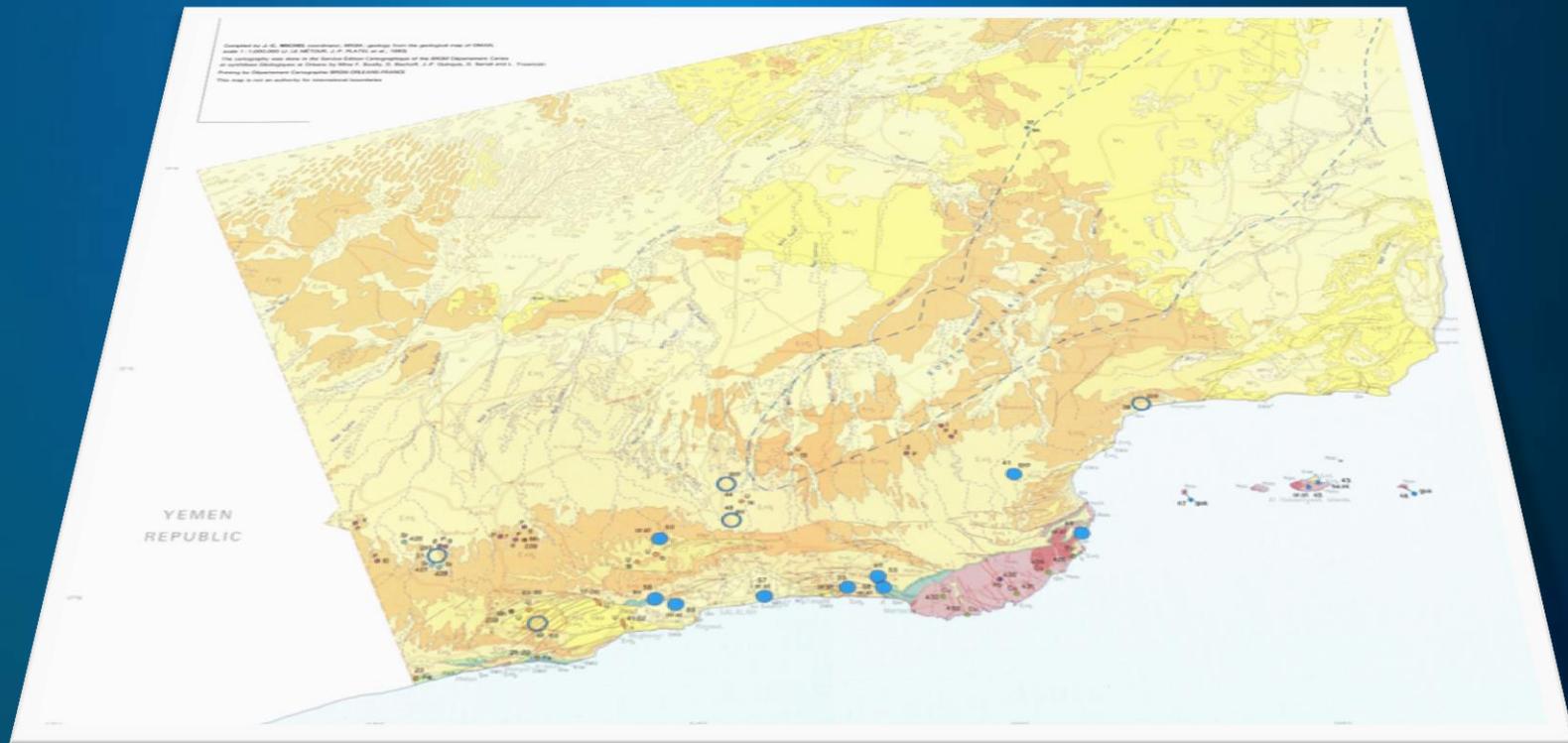
## Dolomite:

- Deposit mainly in Quriayat, Muscat & Duqum. .
- Huge Reserves.
- MgO up to 21%



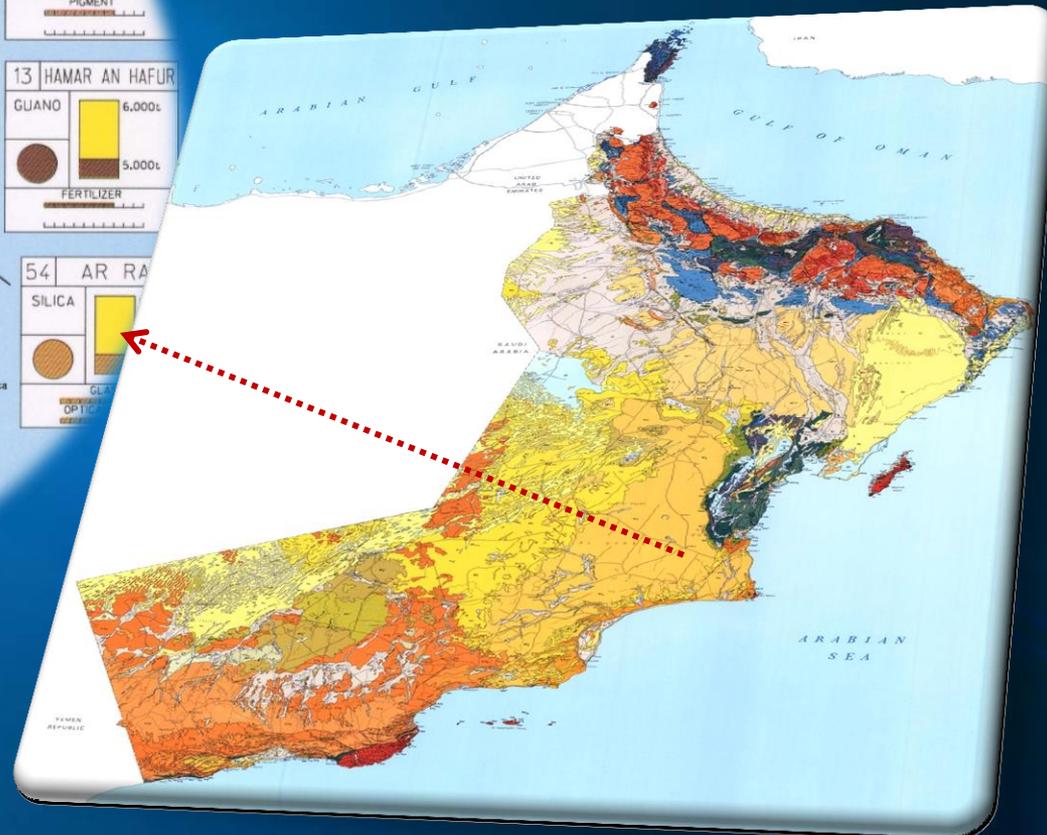
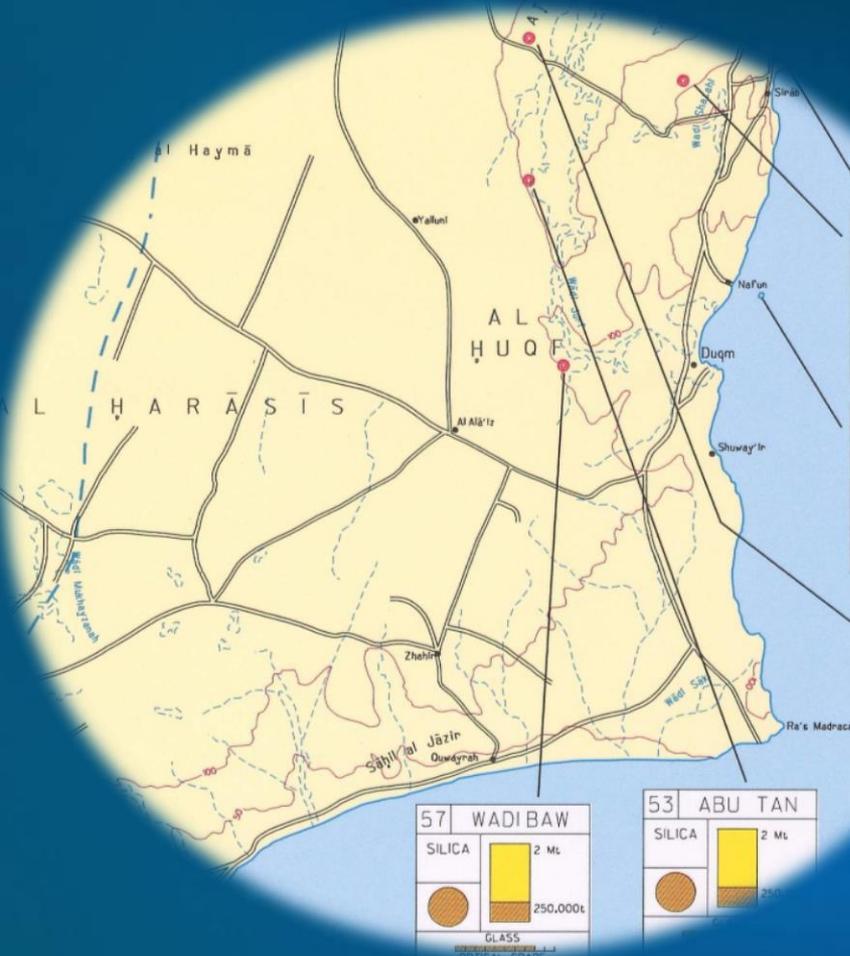
# Gypsum

No.	Deposit Location	Reserve	Gypsum%
1	Shuwaymiyah	900Mt-1Bill t	Up to 98%
2	Thumrait	200-400Mt	>85%
3	Suddah	100-400Mt	>85%
4	Thakabayt	1-50Mt	>85%
5	Ghaba	0.5-2Mt	>85%
6	Buraymi	30,000-50,000t	>97%



# Silica

Estimated Reserves	SiO <sub>2</sub> %
35 Mt	>98%



# Number of mining licenses

## Mining Licenses

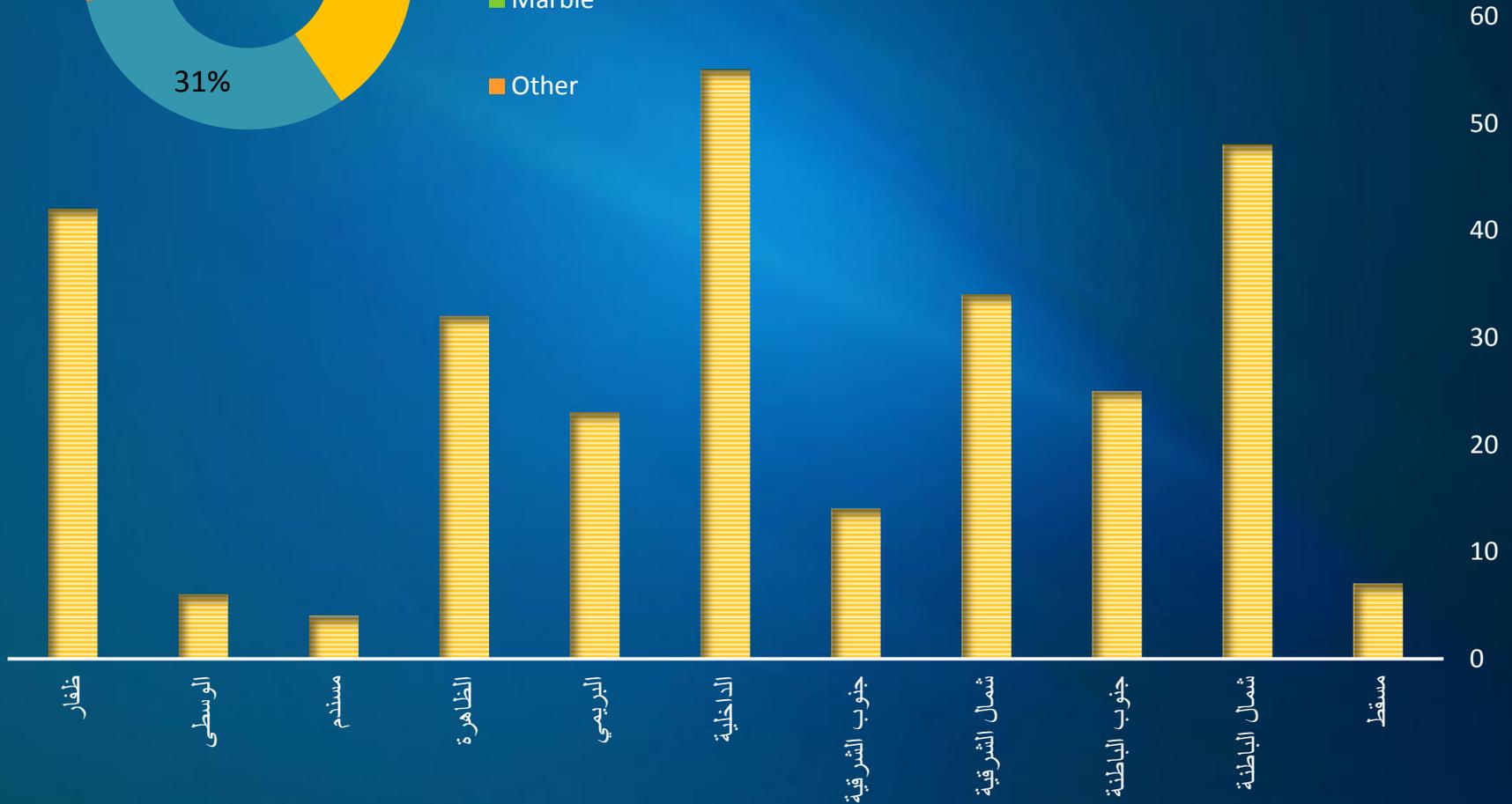
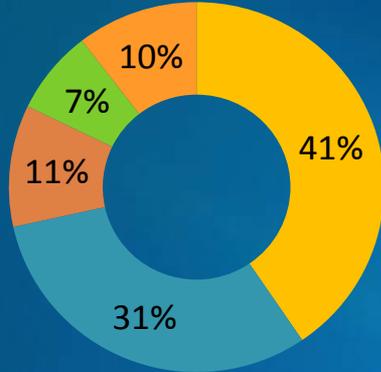
Filling Materials

Construction Materials

Chromite

Marble

Other



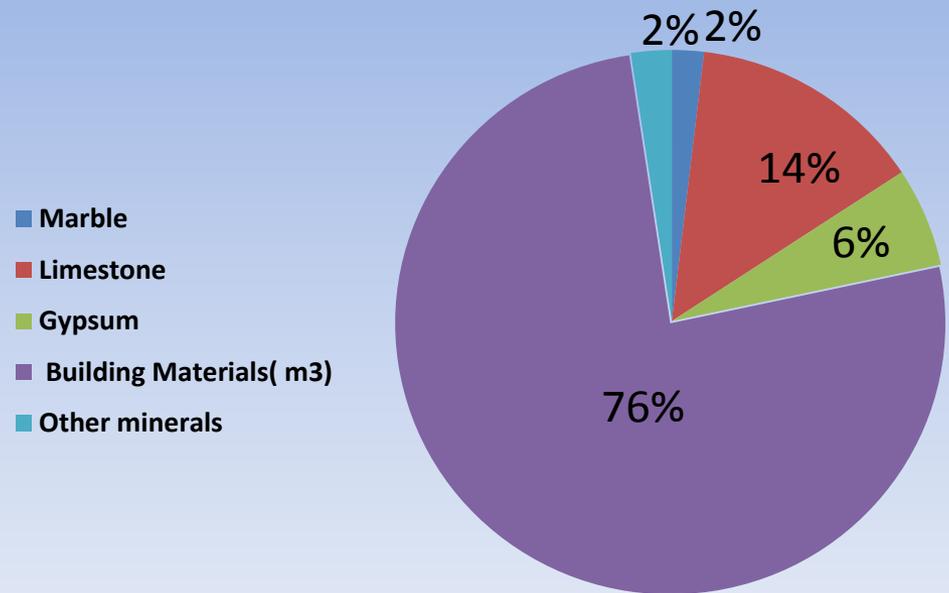
# Total Mineral Production 2008 - 2015



Minerals	Production of 2015	
	Value	Production
	OR	Mt
Marble	20,164,567.460	1,629,342.000
Limestone	13,588,284.810	12,156,031.000
Gypsum	8,997,967.619	6,049,413.000
Salt	439,705.000	12,563.000
Chromite	15,390,240.440	442,658.000
Laterite	2,160,639.000	720,213.000
Building materials(3M)	60,517,516.310	70,035,681.800
clay	1,649,374.000	286,298.000
Silica sand	141,680.000	56,672.000
quartzite	1,405,600.000	351,400.000
Gold	0.000	0.000
Silver	0.000	0.000
Copper	11,327,201.903	41,226.000
Sandstone	0.000	0.000
Kaolinite	508,500.000	169,500.000
Manganese	127,801.000	7,390.000
Silica	17,941.500	8,485.000
<b>Total</b>	<b>136,437,019.042</b>	<b>91,966,872.800</b>

## Production of Minerals 2015.

Production of Minerals 2015



Production of Minerals for the first quarter of 2016.

Minerals	First quarter of 2016	
	Value	Production
	OR	Mt
<b>Marble</b>	<b>4,015,369.161</b>	<b>332,663.000</b>
<b>Limestone</b>	<b>2,975,113.882</b>	<b>1,947,171.000</b>
<b>Gypsum</b>	<b>1,988,853.500</b>	<b>1,347,406.000</b>
<b>Salt</b>	<b>109,655.000</b>	<b>3,133.000</b>
<b>Chromite</b>	<b>475,221.050</b>	<b>23,255.000</b>
<b>Laterite</b>	<b>377,289.000</b>	<b>125,763.000</b>
<b>(3M)Building Materials</b>	<b>11,616,055.573</b>	<b>13,637,417.200</b>
<b>Clay</b>	<b>639,460.000</b>	<b>120,470.000</b>
<b>Silica Sand</b>	<b>30,215.000</b>	<b>12,086.000</b>
<b>Quartzite</b>	<b>369,568.000</b>	<b>92,392.000</b>
<b>Gold</b>	<b>0.000</b>	<b>0.000</b>
<b>Silver</b>	<b>0.000</b>	<b>0.000</b>
<b>Copper</b>	<b>0.000</b>	<b>0.000</b>
<b>Sandstone</b>	<b>0.000</b>	<b>0.000</b>
<b>Kaolinite</b>	<b>60,900.000</b>	<b>20,300.000</b>
<b>Manganese</b>	<b>0.000</b>	<b>0.000</b>
<b>Silica</b>	<b>7,000.000</b>	<b>3,500.000</b>
<b>Total</b>	<b>22,664,700.166</b>	<b>17,665,556.200</b>

# Do we have the investment's ingredients ?

✓ Geological settings

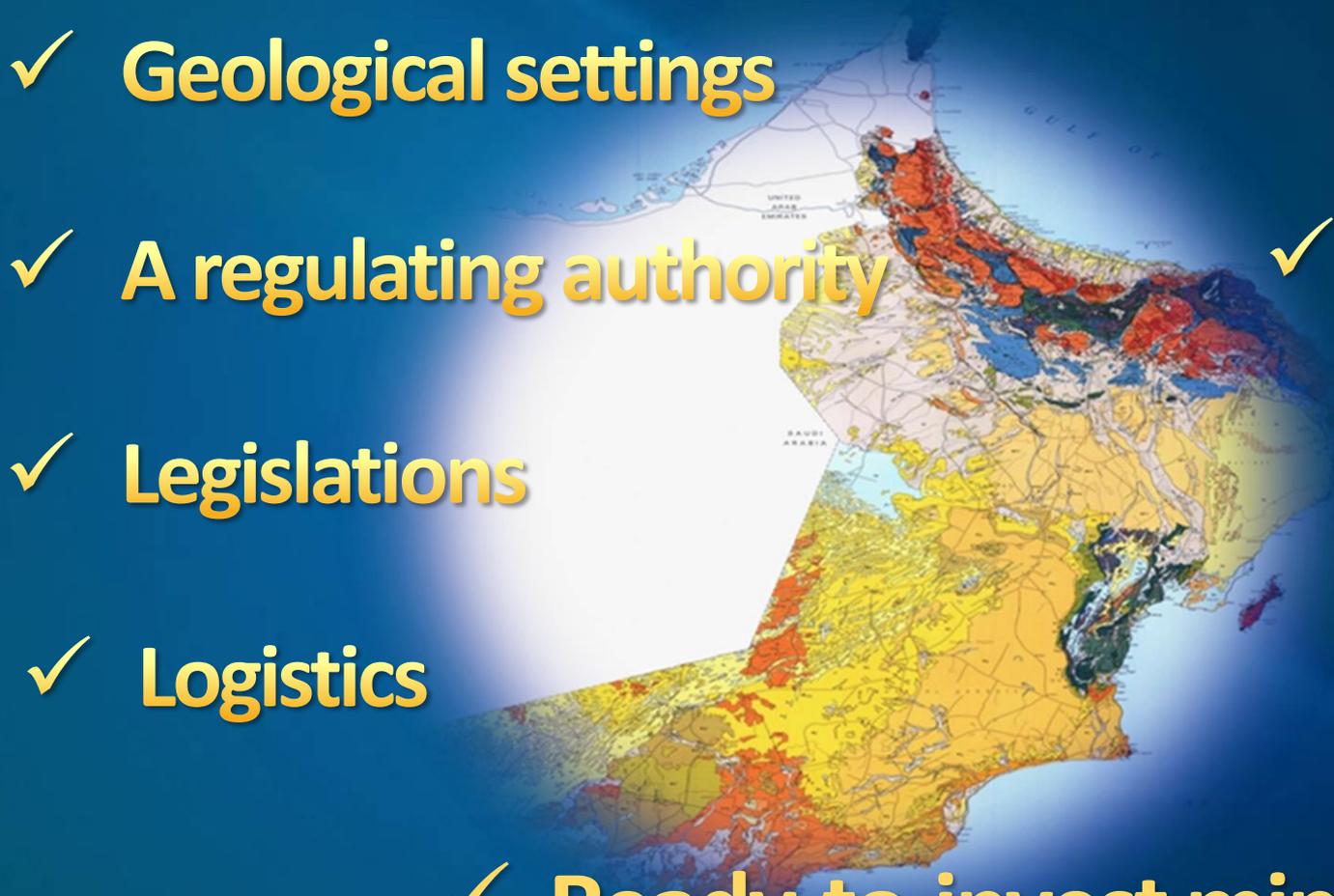
✓ A regulating authority

✓ Legislations

✓ Logistics

✓ Ready-to-invest mining blocks

✓ Country's Location

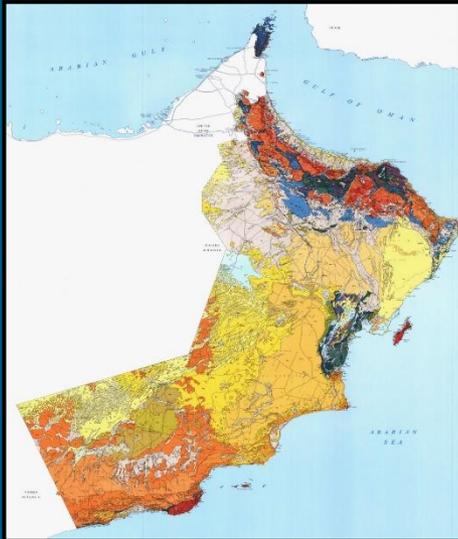


# Studies and reports of minerals

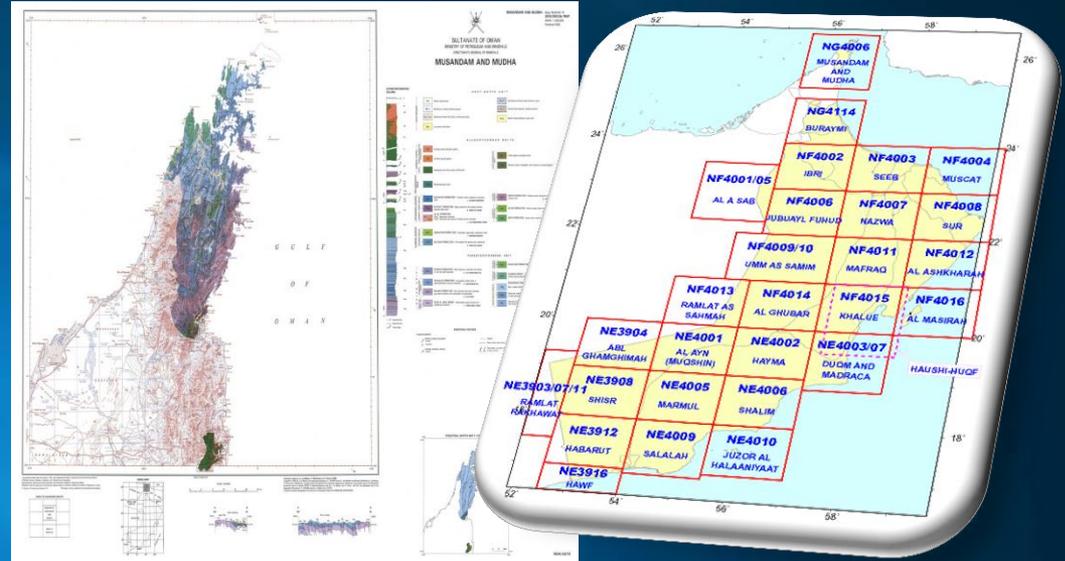
ITEM NO.	ITEM NAME	Year	PRICE / RIALS
1	Minerals Of Oman	1987	10/000
2	Ophiolite and Metamorphic Rocks of the - A petrography Atlas	1990	15/000
3	Geology of Dhofar	1995	20/000
4	Industrial Rocks and Minerals Deposits in the Sultanate of	1995	50/000
5	Chert Hosted Manganese Deposits in the Wahrah Formation, Al , Sultanate of	1995	10/000
6	Geology of Easternmost Al Wahrah Formation (Part 1 & Part 11)	1995	10/000each book
7	Information on Mining Blocks of the Northern part of	1995	50/000
8	Geology and Mineral Wealth of the Sultanate of	1995	50/000
9	Industrial Rocks & Minrals of : Development Possibilities	2004	10/000

# Geological maps of different of scales

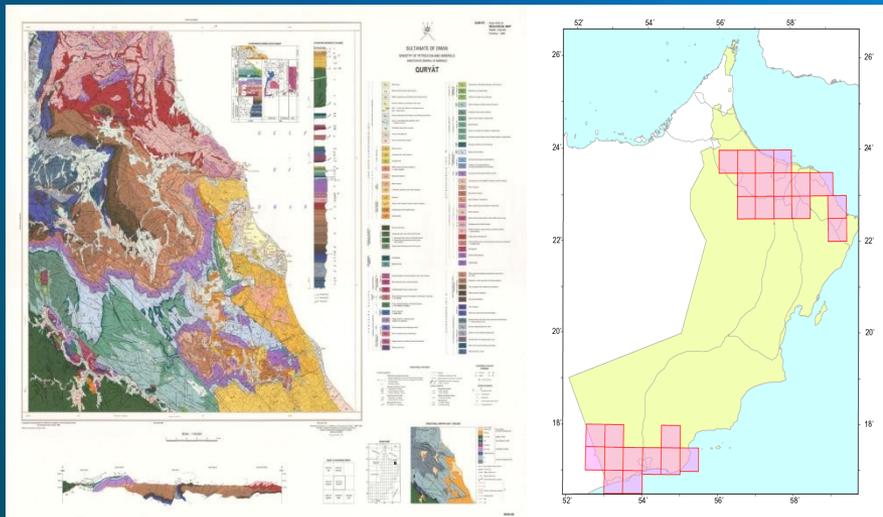
Geological map of 1:1000,000



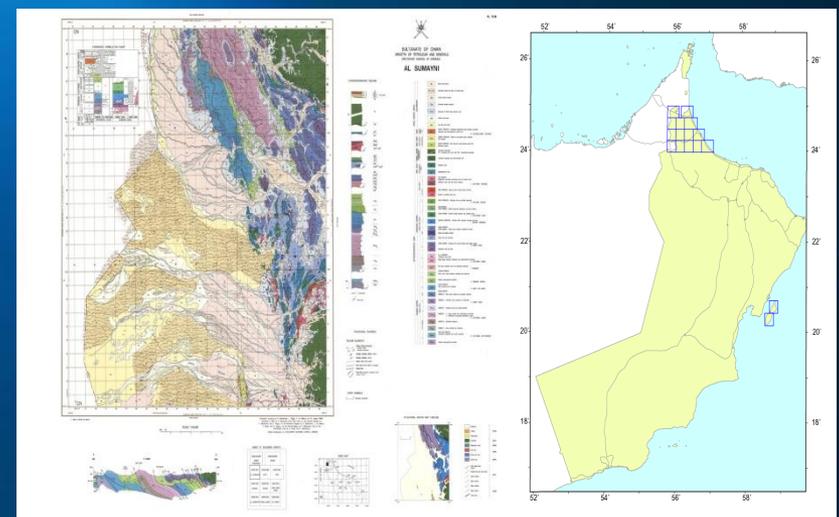
Geological map of 1:250,000



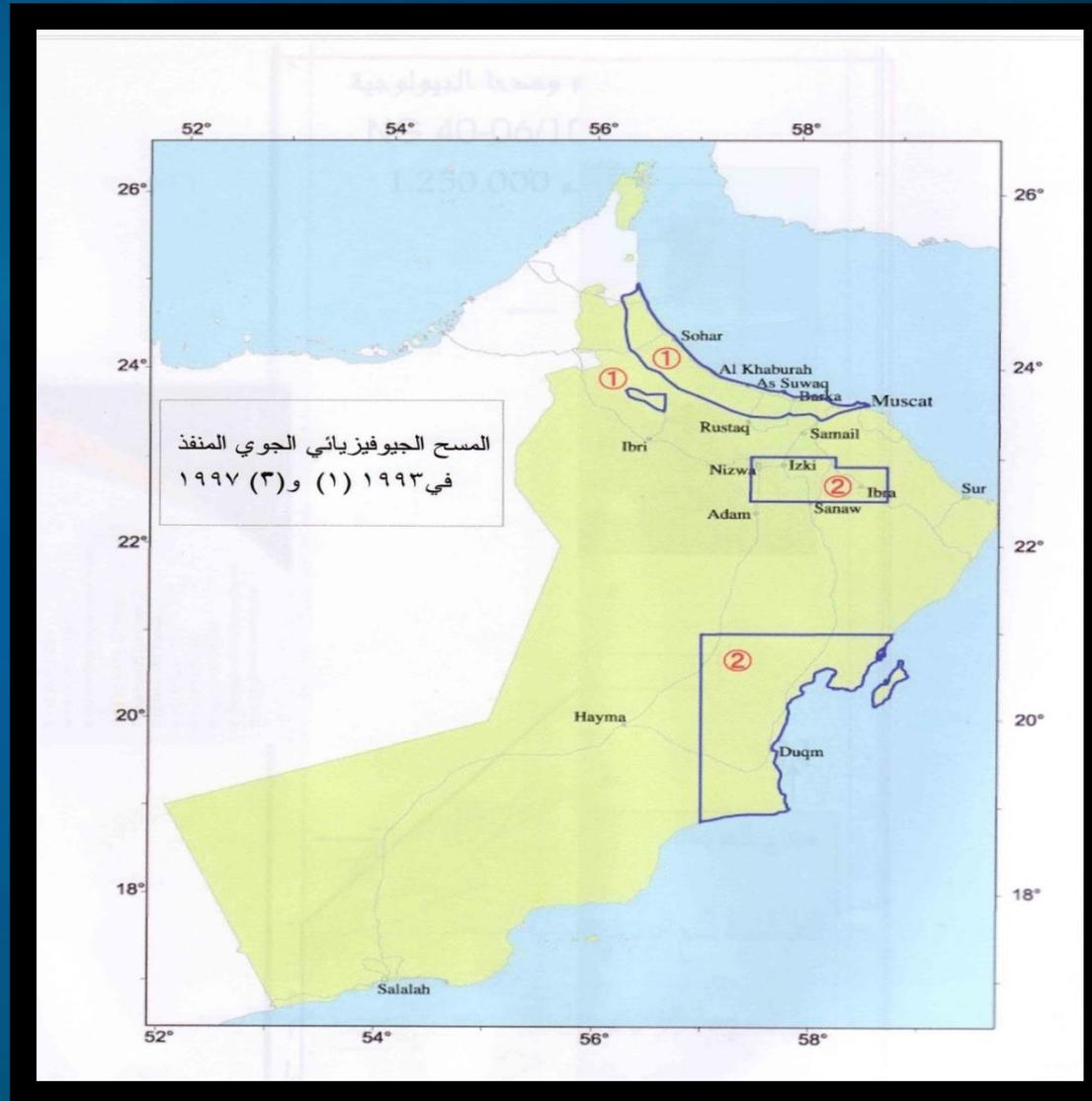
Geological map of 1:100,000

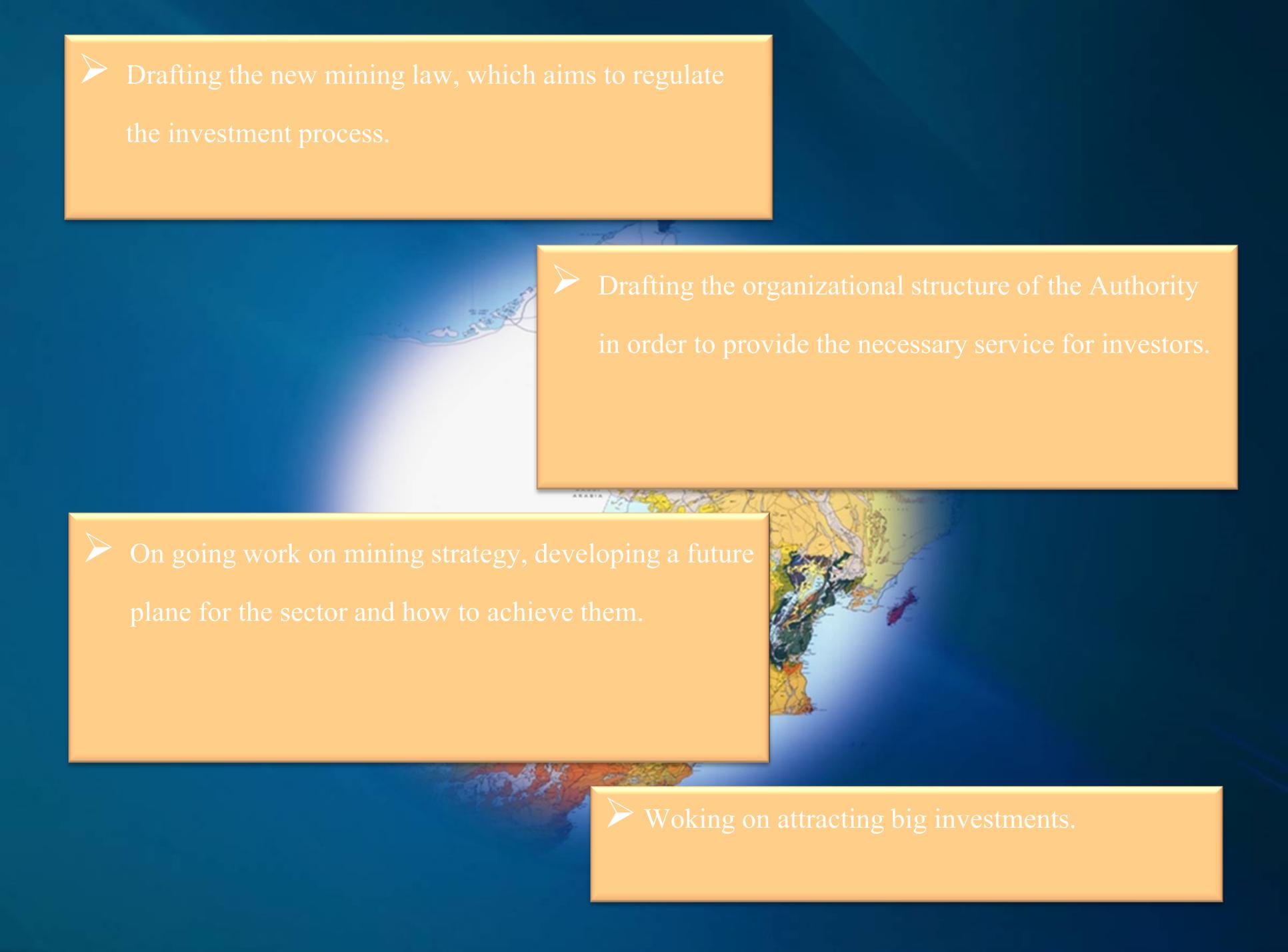


Geological map of 1:50,000



# Airborne Geophysics Survey





➤ Drafting the new mining law, which aims to regulate the investment process.

➤ Drafting the organizational structure of the Authority in order to provide the necessary service for investors.

➤ On going work on mining strategy, developing a future plane for the sector and how to achieve them.

➤ Working on attracting big investments.

## ■ Mining Law

A new mining law has been drafted by PAM & under the process for endorsement

- Clear and transparent.
- Increase the period of the mining licenses.
- Identify mining blocks.
- Facilitate the procedures for obtaining mining approvals (One-stop-shop).
- Acceptance of the application depends on the added value.
- Contribute to community development.
- Strengthen the mining database.
- More detailed description about licenses.
- Clearer penalties and fines.

# Mining Strategy



## ▪ Mining blocks

- Identify Mining Blocks for the most prospective minerals to be offered for investment.
- Obtain non-objection from other concerned governmental agencies.
- Offer mining blocks to investors through competition bidding.

*Thank You*