



RESEARCH INSTITUTE FOR WATER RESOURCES
WATER RESEARCH CENTER
MINISTRY OF PUBLIC WORKS AND
WATER RESOURCES DEVELOPMENT

NORTH SINAI GROUNDWATER RESOURCES STUDY
IN
THE ARAB REPUBLIC OF EGYPT

HYDROGEOLOGICAL MAPS

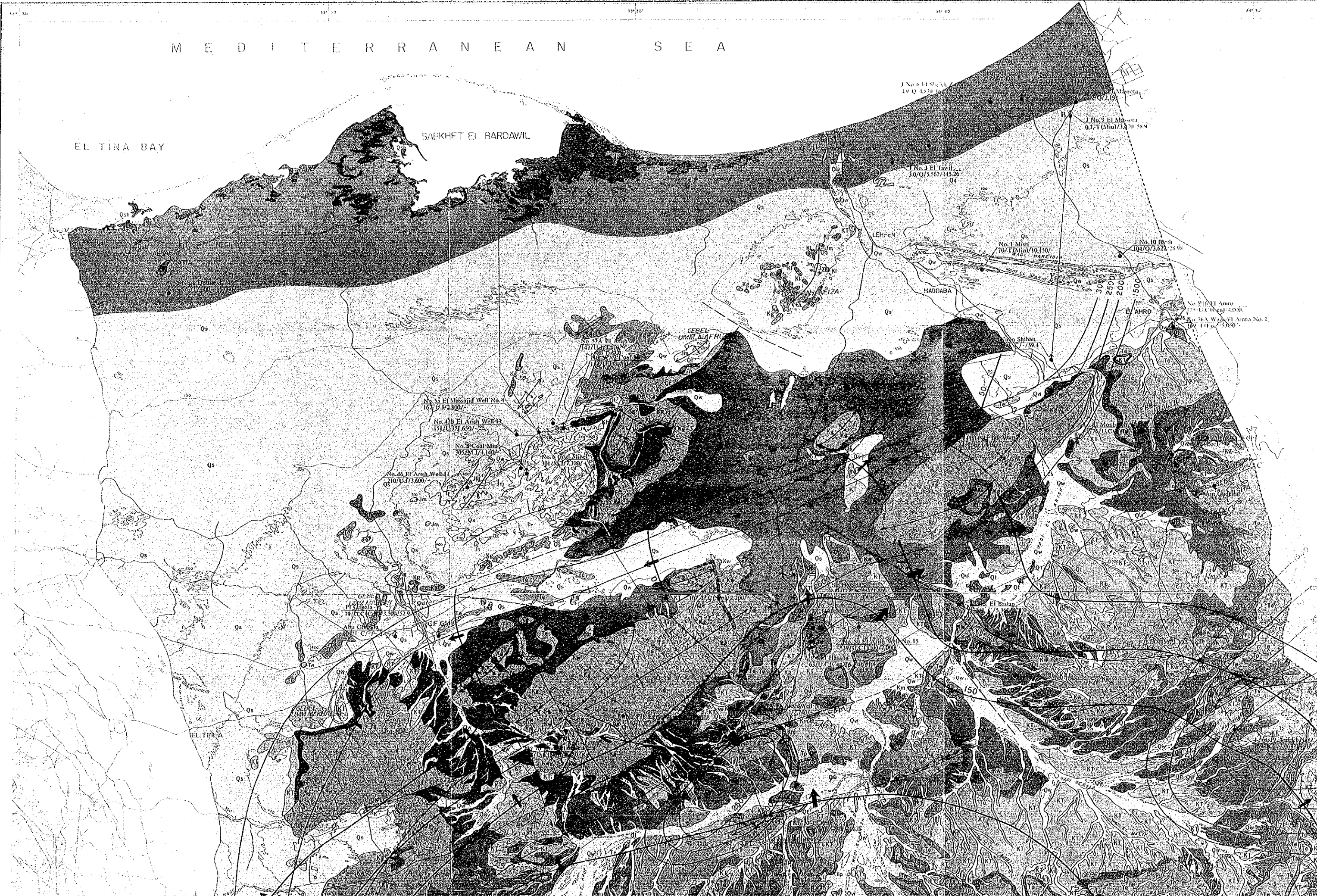
1. HYDROGEOLOGICAL MAP
(SCALE 1/250,000)
2. HYDROGEOLOGICAL CROSS SECTION
(SCALE H = 1/250,000, V = 1/25,000)
3. GROUNDWATER RESOURCES EVALUATION MAP
(SCALE 1/500,000)
4. SUMMARY OF HYDROGEOLOGY AND EVALUATION OF
GROUNDWATER RESOURCES

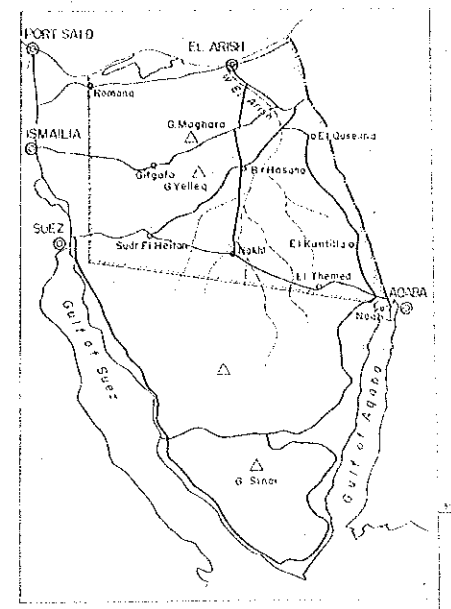
JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)

M E D I T E R R A N E A N S E A

EL TINA BAY

SABKHET EL BARDAWIL





LEGEND

Interglacial Aquifers

1 Highly Productive Aquifers

Quaternary	Pleistocene		Sand Dune Deposits	Quartz sand, calcareous in part, contains low TDS water in coastal area.
Tertiary			Undivided Miocene Deposits	Shale, sand and limestone, its TDS ranges from 3,000 to 10,000 ppm, assume to supply groundwater to Oosternary.
Mesozoic	Lower Cretaceous		Malha Formation	Sandstone and shale, contain a huge amount of groundwater, its TDS is assumed to be less than 2,000 ppm in general, but high TDS encounters in some part.

2 Locally Productive Aquifers

Quaternary	Holocene		Sand Dune Deposits	Quartz sand calcareous in part, contains groundwater, TDS ranges from 2,000 to 5,000 ppm.
	Pleistocene		Wadi Deposits	Sand and gravels, dug wells sometimes exist in this beds.
Jurassic			Upper Jurassic Formations	Limestone hard, cracked and jointed form aquifers of TDS ranging from 1,650 to 3,600 ppm in Maghara area.
			Sefa Formation and older formations	Sandstone intercalated with shale and limestone, assumed to contain groundwater.
Triassic			Undivided Triassic Rocks	

Fissured Aquifers, including Karst Aquifer

1 Highly Productive Aquifers

Tertiary	Eocene		Egna Formation	Hard limestone, shaly in part, cracked and jointed, cavernous, may contain a huge amount of groundwater.
Mesozoic	Upper Cretaceous		Wata Formation	Limestone with clay, contain favourable low TDS (1,100 ppm) groundwater at Shora and TDS is assumed to be high in other area.
			Galata Formation	Limestone and dolomite with shale and sandstone, cracked and jointed, contain groundwater of which TDS is ranging from 1,650 to 5,600 ppm.

2 Locally Productive Aquifers

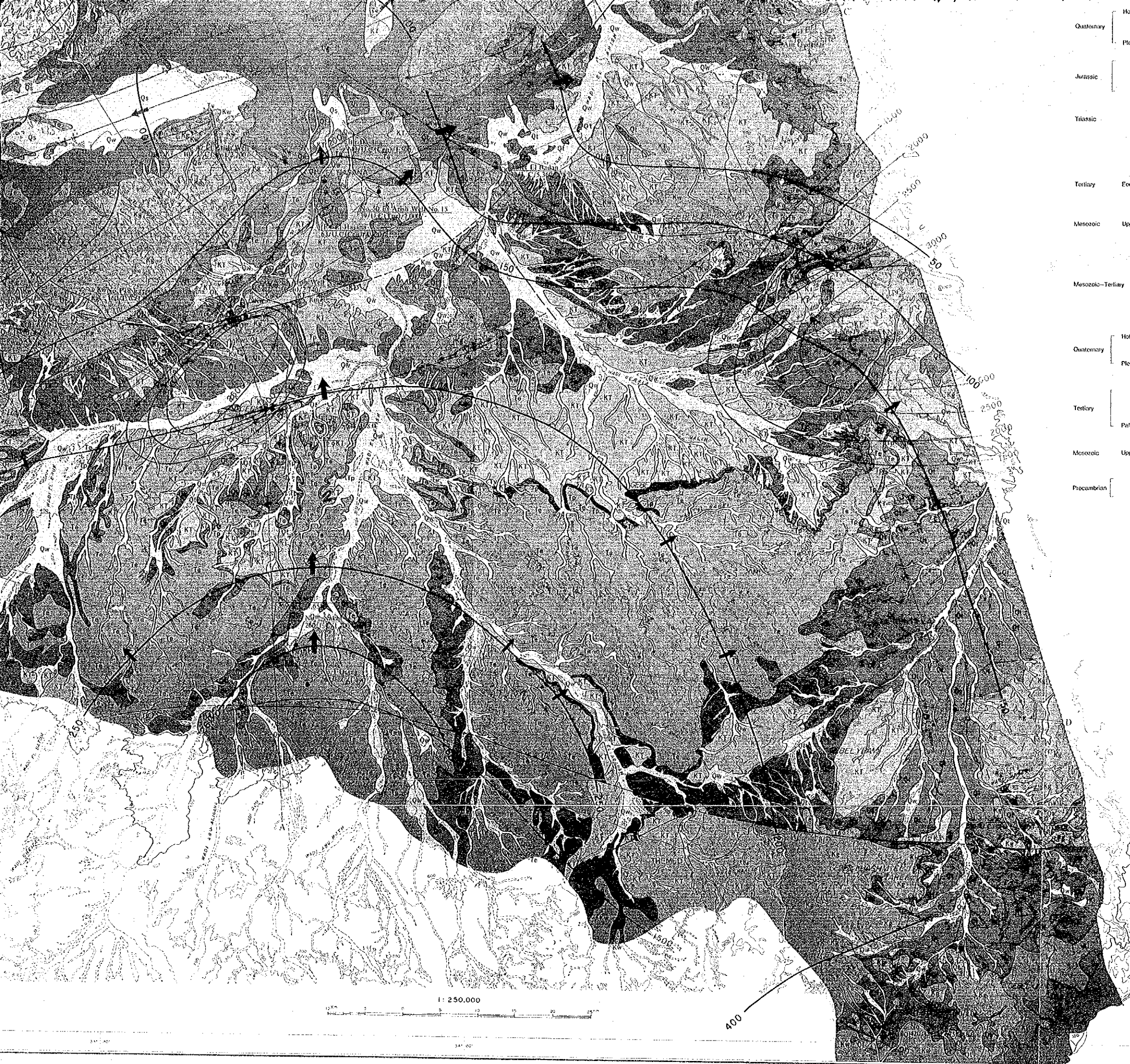
Mesozoic-Tertiary			Sudi Formation (Cenozoic-Danian)	Chalk, marly in part, may contain groundwater of high TDS but it would be low at certain areas along large Wadi channels.
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Strata with essentially no groundwater resources

Quaternary	Holocene		Sabiha Deposits	Swampy lagoonal deposits, mainly sodium chloride salt without groundwater.
	Pleistocene		Gravel Deposits	Gravel, sand and silt without groundwater.
			Terrace Deposits	Gravels of chert and limestone without groundwater.
Tertiary			Undivided Pliocene Deposits	Thick clay, appears in oil Exploratory wells, without groundwater.
			Dyke and Sheet	Basalt, dolerite dike and sheet without groundwater.
	Paleocene		Esna Formation (Laudanian-Ypresian)	Shale with marl bands of aquiclude.
Mesozoic	Upper Cretaceous		Matulla Formation (Coniacian-Santonian)	Marl with phosphate without groundwater.
Precambrian			Extrusive Rocks	Alkali rhyolite, without groundwater.
			Plutonic and Metamorphic Rocks	Granite and gneiss, without groundwater in Nakh area.

200 Contour of Water Level (Lower Cretaceous)





Quaternary	Holocene	Qs	Sand Dune Deposits	Quartz sand calcareous in part, contains groundwater, TDS ranges from 2,000 to 5,000 ppm.
	Pleistocene	Qw	Wadi Deposits	Sand and gravels. Dug wells sometimes exist in this beds
Jurassic	Jm	Upper Jurassic Formations	Limestone hard, cracked and jointed form aquifers of TDS ranging from 1,650 to 5,600 ppm in Maghara area.	
	Jk	Safa Formation and older formations	Sandstone intercalated with shale and limestone, assumed to contain groundwater.	
Triassic	Tt	Undivided Triassic Rocks		
Fissured Aquifers, including Karst Aquifer				
1 Highly Productive Aquifers				
Tertiary	Eocene	Egma	Egma Formation	Hard limestone, shaly in part, cracked and jointed, cavernous, may contain a huge amount of groundwater.
	Mesozoic	Upper Cretaceous	Wata	Wata Formation
Galala			Galala Formation	Limestone and dolomite with shale and sandstone, cracked and jointed, contain groundwater of which TDS is ranging from 1,800 to 5,600 ppm.
2 Locally Productive Aquifers				
Mesozoic-Tertiary		Kti	Sadi Formation (Campanian-Danian)	Chalk, mostly in part, may contain groundwater of high TDS but it would be low at certain areas along large Wadi channels.
Strata with essentially no groundwater resources				
Quaternary	Holocene	Qst	Sabkha Deposits	Swampy lagoonal deposits, mainly sodium chloride salt without groundwater
	Pleistocene	Qg	Gravel Deposits	Gravel, sand and silt without groundwater.
		Qtd	Terrace Deposits	Gravels of chert and limestone without groundwater.
Tertiary	Paleocene	Utd	Undivided Pliocene Deposits	Thick clay, appears in oil Exploratory wells, without groundwater.
		Ds	Dyke and Sheet	Basalt, dolerite dike and sheet without groundwater.
Mesozoic	Upper Cretaceous	Esna	Esna Formation (Landanian-Ypresian)	Shale with marl bands of aquiclude.
		Mahuta	Mahuta Formation (Cretaceous-Santonian)	Marl with phosphate without groundwater.
Precambrian		Er	Extrusive Rocks	Alkali rhyolite, without groundwater.
		Pr	Plutonic and Metamorphic Rocks	Granite and gneiss, without groundwater in Naqib area.

- Contour of Water Level (Lower Cretaceous)
- Water Flow Direction
- Well Name
Water Level (m ASL)/Age of Aquifer/TDS(ppm)/Specific Capacity(m³/day)
- Contour of Total Dissolved Solid (TDS)

GENERAL LEGEND		GEOGRAPHICAL SYMBOLS	
	Geological Boundary, Established		Urban Area
	Normal Fault with Visible Dip		Asphaltic Roads and Desert Tracks
	Actual Fault		Water Springs
	Inferred Fault		Wadi
	Concealed Fault		Contour Line in Meters
	Strike and Dip of Sedimentary Beds		Airport
	Anticlinal Axis, Showing Direction of Plunge		
	Synclinal Axis		
	Geological Cross-Section		

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HYDROGEOLOGICAL MAP
1/250,000

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