THE EGYPTIAN MINERAL RESOURCES AUTHORITY

(The Egyptian Geological Survey (EGS))

Its services and consultation skills

By

Dr.Hassan Bekheite

Head of Sector of Geological Survey

2012

THE EGYPTIAN MINERAL RESOURCES AUTHORITY (EMRA)

(The Egyptian Geological Survey (EGS))

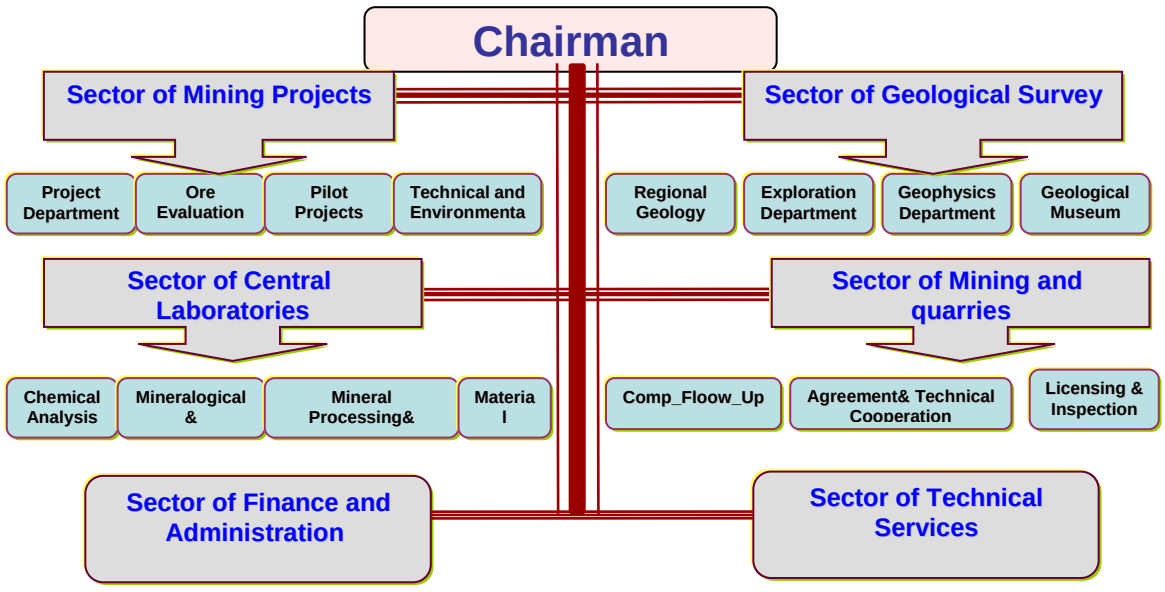
Its services and consultation skills

The Egyptian Geological Survey (EGS) was established in the year 1896 as The tasks and duties of the EGS are similar to those of most geological surveys worldwide, and include mapping, grass-roots mineral exploration, geohazard and geoenvironmental studies, hydro geological studies and services to the community. The EGS maintains support teams of geophysicists, remote sensors, GIS and database specialists, as well as laboratory and publication arms, that will allow it to provide a full range of earth-science information about the Stat

Under the terms of its establishment, the EGS will be able to provide, on a contract basis, a number of its services and consultation skills to the public and private sectors.

EGS also has the flexibility to operate abroad and can form partnerships with private companies or with other earth science agencies.

Organization Chart



Mission and Vision

Mission

Using trained professionals, advise the government and the community on earth sciences. Utilize advanced technology to acquire and interpret geoscience information, and develop sustainable mineral and water resources. Protect the environment and monitor geohazards to secure a better life for our people.

Vision

The Egyptian Geological Survey is a valued earth science organization serving our community and customers to create a healthy environment. Using technology and rewards that enhance our ability to achieve our goals, we provide a better quality of life to our nation.

Mapping and surveys

Services in geologic mapping, topographic surveying and remote sensing are provided by the following departments:

Geologic survey

Geophysical survey

Surveying support

Remote sensing

EGS programs in Geologic Survey

Geologic surveying is the primary activity of national geologic survey organizations in most of the world's countries. Geological maps provide strategic information on resources, ground conditions and natural hazards that is geared to a broad constituency of direct users and indirect beneficiaries in government, industry and the public.

EGS geologic survey programs continue to build on this base of existing mapping completed by its predecessor organizations. Work is concentrating on gaps in the existing map coverage, or on selective revision of existing maps in response to new information, new scientific understanding or changing user requirements.
A typical geologic survey in EGS follows a series of steps:

1. Acquiring, interpreting and databasing existing geologic data

2. Interpreting aerial photographs and multi-spectral satellite imagery.

3. Geological mapping in the field, including verifying airphoto and satellite imagery interpretations, measuring and sampling rock exposures for lithologic, sedimentologic, and biostratigraphic data, and reconnaissance level mapping of resources and geohazards

4. Interpreting field work data and analyzing samples

5. Compiling digital geologic maps using GIS technology

6. Publishing of geologic maps and accompanying reports.

Services to the community

The EGS Geologic Survey department can provide mapping services to external customers at a range of scales ranging from regional reconnaissance to local site-specific investigations. Various thematic outputs can be produced on request in the form of maps, GIS data and accompanying reports. Typical products are:

Regional scale maps

1:500,000, 1:1,000,000, 1:2,000,000 scales
Lithofacies maps
Structural and tectonic maps
Geographic maps

Medium scale maps

1:50,000, 1:100,000 and: 250,000 scales
Structural and tectonic maps
Geomorphologic maps
Surficial deposits
Metamorphic and alteration maps
Urban geology maps
Mineral belt *maps*

Site specific scale maps

1:10,000, 1:5,000, 1:2,000
Mineral prospect sites
Engineering project sites
Maps for micro-seismic risk assessments
Structural maps for mineral prospects
Jointing maps for ornamental stone quarries

Geochemical Survey

EGS has a strategic plan for regional geochemical surveys in Egypt. These investigations will provide essential natural baseline data on chemical-element distribution and anomalies to underpin future mineral exploration, geochemical exploration, and geologic mapping by EGS, and to assess and monitor numbers of elements related to the maintenance of a healthy environment. Results will be databased and published as a contribution to the Geochemical Atlas of Egypt.

The survey procedure for each 1:250,000-scale quadrangle area involves extensive sampling of wadi sediments, which are then processed by sieving, mineral concentration, and concentrate splitting. One split is chemically analyzed for several elements; the other is archived for future studies. Results are entered into the EGS Integrated Geoscience Database, and plotted in a variety of formats showing sample locations, element

distributions, element contours, geochemical anomalies, and correlation maps. Final reports, covering each quadrangle area will provide interpretations of the data, listing anomalies, highlighting areas for exploration follow-up, and delineating areas of environmental concern.

Geophysical surveys provide essential data in support of the surveying, exploration and environmental projects carried out by EGS. Geophysical techniques have broad utility because they measure a variety of physical phenomena or properties. These include gravity (density), magnetism (susceptibility and remanence), electric-current flow and electromagnetic wave propagation (resistivity), seismic waves (elastic wave velocity), heat flow, and radioactivity. Passive methods such as gravity and magnetic surveys measure existing potential fields, whereas active techniques such as seismic or electromagnetic methods measure the response of the Earth to controlled sources of energy.
EGS uses geophysics for a wide range of applications at various scales of investigation. In exploration geophysics, the main objective is to map structures that are of potential economic importance, such as those that control the location of ore deposits and petroleum reservoirs or to define the character of an aquifer. In geologic mapping, geophysics is commonly used to differentiate rock types and characterize their contacts. In the fields of geohazards and the environment, geophysics is used to measure features such as the magnitude and location of earthquakes and earthquake epicenters, and the levels of naturally occurring radiation

During the past seven decades, geophysical methods have contributed significantly to geologic mapping and exploration for hydrocarbons, minerals and aquifers in Egypt, and aided the discovery of several ore deposits of economic significance in Egypt..

Airborne surveys controlled by GPS navigational systems allow many geophysical methods to be applied over wide areas with consistent, high-quality resolution, and are a cost-effective way of obtaining effective coverage for both regional mapping and detailed studies. While there may be some loss of resolution compared to ground-based methods, this is usually more than compensated by the uniformity of coverage and data quality.

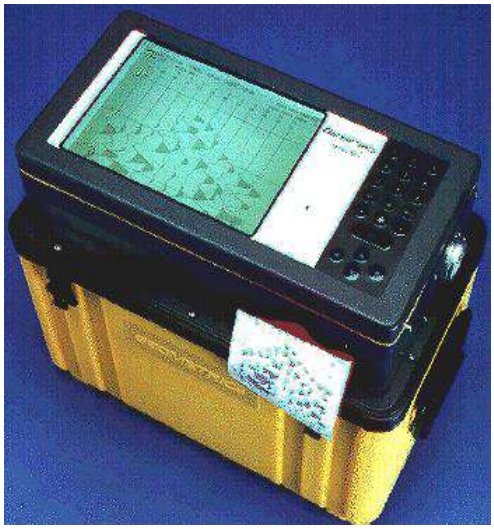
Airborne data employed by EGS include magnetic, radiometric and electromagnetic surveys, and these lay a foundation for detailed follow-up ground-based measurements if required.

Available geophysical Services: -

Disablement of Geophysics sharing. EGS in geophysical fustigations in both surface and subsurface exploration, in situ and laboratory.
For mentioned fields (mineral, groundwater, geophysical mapping, numerous Geoenuiron mental applications studies, geotechuieol studies and geoarchiologycal studies.
Doing These jobs using up-to-date Instruments and software for Data Acquisition, processing and Interpretation of these Instruments as an Example are ground Magnetic prospecting Sinter enigma proteome entoleter with precession of 1 not (panatela) – gamine for mapping Total intensitymasne earth magnetic field & vertical magnetic grodieiend nt/m ground gratuity prospecting :-

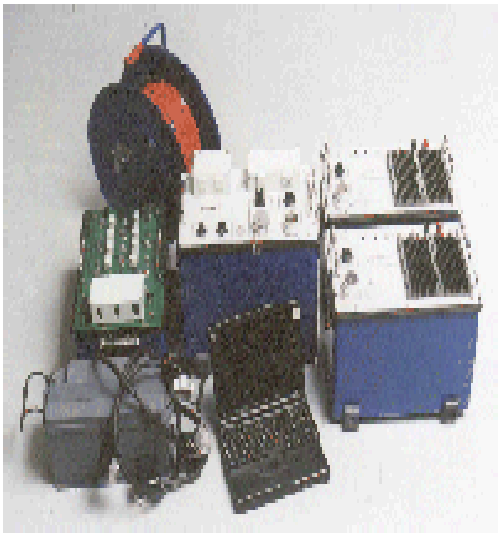
Centrex (G3 & (Gs gravimeters with accuracy of 0.1 mg al for gravity mapping of gravitational Cougar map of earth.

- VLF (very low frequency) EM mapping for locations of conductive Zone bodies of economic minerals and ores IGS2 VLF -4 Scoured.
- EM militia frequency IGS -2 EM – 2 Scene Genotype.
- Resistively and IP (Induced polarization) time & frequency. domain Respite: ohms never domain of yuck formations IRIS Instrument E lyric-T multi channel Tomography.



- Ground penetrating radar (GPR) using SIR 10 – A with different antennas frequency including (100, 300, 500, 100 MH2).

- Shallow Seismic exploration for shallow geophysical and geotechnical exploration using Messes OYO corporation Dash instruments with 24, 48 channels bespoke.



6

- Geo Radiometric exploration using GAD – m multichannel fray spectrometry field and lab exploration geophysical properties.
- Well Logging and well evaluation using an up to data well loss station of Hose are Rusticity, natural gamma ray, density, sonic, etc.) earth quacks seismology seeks for earth quack Ha2ards.
- In Side exact location using Aztec GPS siskin Physical, mope tics of rock evaluation of Magnetic Susccbtibitity using kappa meter Instrument rock density, moisture contend, porosity, resistivity.
- Geophysical Instrument its calibration so an example for geophysical data processing & tuber petition include goof for geophysical data mapping and processing, seizer (seismic Refraction process. & enter First pix (seismic Refraction software)Remix seismic sees vision Inner.& mapping system seizure reflection Seismic Data price. soft Radon (GPR) Resist IP(Rims.) Rees 2D Innu (Rises)

Surveying Support Services

The EGS Surveying Department plays a vital role in support of EGS field-based project work, in geologic mapping, mineral exploration, hydrogeology, marine geology, geophysics, and engineering geology, and wherever else field surveying services are required. The department also offers surveying services to clients in other government agencies and the private sector.

In addition to traditional survey equipment such as theodolites and leveling instruments, the department is comprehensively equipped with an array of up-to-date electronic surveying, total-station, digital level, GPS and GNSS equipment, including:

. Trimble R8 GNSS.
2. Leica SR530 GPS.
3. Leica TC1100 total station.
4. Topcon GTS-211D total station.
5. Topcon GTS-2 total station.
6. Leica NA2002 digital level.

The engineers in the department using the professional software including Autodesk Civil 3D, LisCAD, Geomatics Office, Ski-Pro and Surfer to correct, process data and producing survey maps with different shapes and scales

The following services are offered:

1. Topographic survey.
2. Leveling network implementation.
3. Calculations of land area and volumes of study zones.
4. Establishing ground control points.
5. Using GPS to correct coordinates of satellite images.
6. Production of survey maps, contour maps, and 3-dimensional terrain models.

Mineral exploration

The minerals sector of the Egypt's economy is an area of major significance and great promise, one that must be enhanced and expanded. Consequently, the Egyptian Geological Survey places considerable emphasis on its mineral exploration programs, using highly trained staff and modern techniques to explore for metallic and non-metallic (industrial) minerals, and drawing on the support and technical skill of a range of in-house analytical laboratory facilities.

The primary goals of our mineral exploration programs are to explore and evaluate particular prospects or mineral belts and secure greater national self-sufficiency in resources. EGS also conducts pre-feasibility and feasibility studies of known deposits, whether the target commodity is a precious, strategic, or base metal, or a non-metallic resource. We also provide advisory and consultancy services for potential investors to evaluate the quality and quantity of resources at specific prospects.

Technical and resource information on mineral prospects is gathered using a variety of investigative techniques including geochemical and mineralogical sampling, drilling, trenching and geophysics. All new exploration data is entered into the EGS Mineral Occurrences Database, which is also being populated with historic data collected by EGS predecessor organizations

EGS Programs in Metallic Minerals

Survey and exploration by the EGS Metallic Minerals department is guided by a long-term Regional Reconnaissance program that identifies potential exploration targets based on documentary records, known ancient mining, and regional geological, geophysical and geochemical survey data. Targets are then followed up by more detailed surveys of individual prospects to determine potential resource value and attract potential investors. Analysis of ore samples is carried out by the EGS Chemical and Petrology Laborites.

EGS Programs in Industrial Minerals

Our industrial minerals team consists of experienced exploration geologists and engages in both EGS and community-funded projects throughout Egypt Exploration is supported by EGS drilling and field support teams and by the EGS Chemical and Industrial Mineral Applications laboratories.

Priorities for the EGS strategic program of exploration projects are formulated in response to statistics on national and regional mineral extraction, usage and anticipated needs, and in consultation with forums of key investors.

All new project data is added to the EGS Mineral Occurrences Database. Outputs are delivered as reports, maps and GIS. These products and databases are the source information for our advice and consultancy services, described below.

Services to the Community

The EGS Industrial Minerals Department offers an advisory and consulting service to investors by providing information on the location and availability of industrial minerals within Egypt, and by carrying out contracted exploration and evaluation projects. Three levels of service are offered:

1. Information and advice on known prospects based on existing information. The product consists of a short report, packaged with available published or open file reports, maps and data.

2. Field visits, carried out by experienced EGS staff, to demonstrate prospects on the ground to potential investors and carry out additional sampling as directed.

3. Resource evaluation projects to survey individual prospects, determine quality and quantity, and provide feasibility assessments for future mining operations. These projects are usually carried out in partnership with the EGS Mining Development Department.

Mining Development

The objective of the EGS Mining Development program is to increase the contribution made by the Egyptian mining sector to the growth and

diversification of the national economy, reduce reliance on imported raw materials, and encourage safe and environmentally sensitive development of mining operations in Egypt. We do this by:

Carrying out pre-feasibility studies of mineral resource locations using extensive drilling campaigns and ore processing tests in the laboratory and on-site

Advising on investment opportunities and market requirements for specific mineral commodities

Consulting on all aspects of exploitation methods and infrastructure, including mine waste management, environmental impacts and after-use options

Testing ores to refine processing methods and investigate new raw materials for industrial processes

Compiling and publishing national mining statistics for Egypt including information on mine locations and reserves, and on source, consumption and demand for each commodity.

Information Technology

The Information Revolution provides ever-growing opportunities to develop new tools and methodologies for geoscience surveys and research, new ways of handling, sharing and visualizing our data, and new ways of delivering knowledge and services to a global audience. In EGS, Information Technology underpins the management and publication of all our data and information, and is enhancing and diversifying the capability of all our geoscience programs, support services and administrative functions. In

support of our geoscience programs, the main objectives of the Information Technology program are to:-
Compile, document and update geologic databases for mineral localities and drilling sites, and to archive sampling and analytical data for rock, soil and hydrogeologic investigations.

Establish a comprehensive digital database of geologic survey, exploration and applied geology data, and design and compile Geographic Information Systems for data analysis and delivery to customers.

Process satellite images and Thematic Mapper digital data for use by our survey, exploration and applied geology programs

Develop new systems and databases for primary digital recording of data by fieldworkers

Integrated Geoscience Database

Development and population of the EGS Integrated Geoscience Database is a major strategic project in EGS with the objective of digitally capturing, preserving and indexing the work of our predecessor organizations, and merging this with new, digital geoscience data collected by current EGS programs. The resulting database will serve future clients and programs of EGS with comprehensive and inter-operable digital geoscience data that can be visualized and delivered in a wide variety of user-specified formats and themes, and can be browsed and supplied to the community via electronic delivery
The Integrated Geoscience Database project has two main components:

Database development and management

Development and management of the Integrated Geoscience Database is emphasizing inter-operability of datasets to ensure wide application and exchange of information between the EGS and other organizations with similar interests, especially in management of groundwater, natural hazards, and mineral resources. Data structures are compatible with a variety of

proprietary output software including GIS, statistical and borehole logging packages.

The database is managed using Microsoft SQL Server and built around a single relational data model with 12 interlinked domains and over 450 individual data tables. The domains reflect key applications of EGS information such as mineral occurrences, groundwater, and natural hazards, as well as survey activities such as mapping, drilling, geophysics, and chemical analyses. The principal domains are:

Geological Map Database
Geological Observations Database
Geophysical Survey Database
Geochemical Survey Databse
Water Resources Database
Seismology Database
Borehole and Drilling Database
Bibliographic Database
Mining Database

Geographic Information Systems

The EGS GIS department is responsible for digital capture and attribution of all maps produced by EGS survey and exploration programs. The department is well equipped with workstations running the latest ESRI ArcGIS 8 software. All new EGS printed maps are now produced by digital methods.

In addition to providing GIS data capture and digital map production services for current EGS projects, the department is also carrying out a number of strategic digitization and development projects.

Development of an integrated GIS data model and database
Digitization of existing geological and topographic maps
Digital maps of Saudi Arabian administrative regions

Development of an integrated GIS data model and database

This project is developing an integrated, relational data model and database for future management and delivery of GIS data by EGS. The data model

will standardize the basic attribution and symbolization of point, line and area features on EGS maps to ensure seamlessness of GIS data coverage for the entire Kingdom. Links will be created to other attributes tables that describe a wide range of geological, environmental and resource properties. The GIS database will be incorporated into the EGS Integrated Geoscience Database to unify all EGS geoscience data and information within a single data management system.

Digitization of existing geological and topographic maps

This ongoing project has the objective of systematically digitizing and attributing all existing printed geological and topographic map coverage of Egypt, with the aim of building an integrated and seamless national databank of digital mapping. Current work is concentrating on the 1:250,000 scale geological and topographic maps, and is being prioritized to ensure that digital map and GIS coverage of the more densely populated and resource-rich parts of Egypt is completed during the early stages of the project

Remote Sensing

Spectral imagery data covering the thermal-infrared, infrared, visible, ultraviolet, radar, and gamma -ray wavelengths, obtained by sensors mounted in aircraft or satellites, provide a unique perspective and information about the composition and structure of rocks and other materials exposed at the earth's surface. Remote sensing imagery is especially valuable as a geologic survey tool in sparsely populated arid areas, and its interpretation is therefore an indispensable step in all EGS geologic mapping, mineral reconnaissance and geohazard assessment projects.

Support for EGS programs

The Remote Sensing section offers services and training to EGS staff in the enhancement and interpretation of satellite data, and provides a range of hard-copy and digital products both for EGS internal project use and for external clients. Imagery is processed, enhanced and delivered using ERDAS 8.4 software.

Services to the community

EGS supplies remote sensing imagery mosaics to a wide client base in the government, industry, defense and education sectors.

Satellite imagery/maps can be delivered in a variety of paper sizes (A0, A1, A3, A4 or user defined) and types. Coated or glossy paper is more suited for posters and displays, whereas light coated paper is recommended for desk interpretation and fieldwork.

The Unit also offers training workshops for Earth Sciences students. The workshops familiarize trainees with the latest remote sensing technologies and provide practical exercises to demonstrate applications.

Publications and outreach

The EGS Publications department publishes the results of EGS programs, ensuring that these outputs are peer reviewed and edited to the highest scientific standards. It also manages the EGS library and maintains stocks of EGS maps, reports and books for external sale. Our main activities are:

Providing the technical and editorial support, including arrangement of peer review, to produce high quality geoscientific maps and reports in-house

Preparing educational and promotional material for publication and for conferences, exhibitions and seminars

Producing printed aerial photographs and topographic maps on stable and robust media for use by EGS fieldworkers

Managing the EGS Central Library and Reference Archive, which holds the most complete catalogue of published and open file reports, maps and manuscripts produced by the predecessor organizations of EGS.
EGS Central Library and Archive
The Egyptian Geological Survey maintains a scientific, technical and professional Earth-Science library at the EGS Cairo office. It is one of the

largest of its kind in Egypt and is an important source of published and on-line Earth-science information for EGS staff and visitors, the Government and private sectors, mining companies, Universities, and Research Centers. It also houses archives of original field notes, manuscripts, and analytic data for EGS and earlier exploration and geologic projects.

The library contains a wide range of data and documents and a varied collection of geologic books and journals. The available materials are:
Books
Technical and Open-File Reports
Geological, Geophysical, and Topographic Maps
Professional and Research Papers
Special Publications
Booklets, Pamphlets, and Brochures
Major international geoscientific journals
On-line bibliographic databases.

Maps

The Egyptian Geological Survey and its predecessor organizations have produced hundreds of geologic maps, at various scales, over the preceding 4 decades. Most of these map products are for sale as hard-copy documents. A limited number of the newest map products can be obtained in digital formats.

The "GM map series" (Geologic Map Series) at 1:250,000 scale is the premier geologic map series of the EGS. This is an ongoing series of color printed maps, with accompanying explanatory notes, that will eventually cover the entire Egypt. The maps are 1 degree by 1.5 degree quadrangles, and conform to the 1:250,000-scale topographic map boundaries of the State..
In many cases, particularly in coverages of the GM-map products are compilations built on field mapping programs carried out at 1:100,000 scale. Many of the 1:100,000-scale maps are available for purchase although, as base datasets, these maps are part of reports of varying size and complexity and are individually priced.
In addition to the geologic maps available at 1:250,000 and 1:100,000 scales, EGS also has available a number of country-wide maps, shield-wide

maps (at 1:1 million scale), and a range of specialized maps covering geology, aeromagnetic coverages, industrial minerals, etc.

- Topographic coverages are available at different scales, from 1:50,000 scale to 1:500,000 scale.
-
- GEOLOGIC MAPS AT 1:100,000 SCALE
- INDUSTRIAL MINERAL RESOURCE MAPS OF URBAN AREAS
- GEOLOGIC & GEOGRAPHIC QUADRANGLE MAPS AT 1:250,000 SCALE
- HYDROGEOLOGIC MAP, 1:250,000 SCALE
- AEROMAGNETIC MAPS AT 1:250,000 SCALE
- AEROMAGNETIC MAP COMPILATION AT 1:1,000,000 SCALE
- GEOLOGIC & GEOGRAPHIC MAPS, 1:500,000-SCALE
- LANDSAT-IMAGE MAPS AT 1:500,000 SCALE
- TOTAL-INTENSITY AEROMAGNETIC MAPS, 1:500,000 SCALE
- ARABIAN PENINSULA MAPS
- OTHER COLOR-PRINTED SMALL-SCALE MAPS
- RECONNAISSANCE GEOLOGIC MAPS
- MINERAL LOCALITY MAPS OF THE ARABIAN SHIELD

Reports

The Egyptian Geological Survey (EGS) has produced several types of technical reports, which can be accessed through the following links:

- OPEN FILE REPORT
- TECHNICAL REPORT

Training

EGS has an extensive range of training programs with emphasis on developing the geoscientific, information technology, managerial and English-language skills of its staff. Training comprises a combination of specific job-related courses, seminars and lectures, and participation in local and international conferences. EGS trainees also participate extensively in externally-provided courses on a part-time or time-release basis, and in

geoscientific courses and seminars provided by staff from our partner organizations and other collaborators.

Laboratories and logistics

EGS maintains laboratory and logistical facilities to support its own survey and exploration programs and as services to external customers in the government, research and industry sectors.

EGS laboratories prepare and analyse rock, mineral, soil and water samples for a variety of downstream geoscientific, engineering and industrial applications. All our laboratories carry appropriate accreditation, and samples and analyses are prepared according to the applicable industry and research standards. Our laboratories are:

Chemical Laboratory
Water and Environment Laboratory
Petrology Laboratory
Industrial Applications Laboratory
Engineering Geology Laboratory

Chemical Laboratory

The EGS Chemical Laboratory carries out chemical analyses to provide baseline knowledge of the geochemistry of the rocks, soils and sediments of Saudi Arabia and its adjacent offshore territories. The analyses have applications for geologic mapping, metallic mineral exploration and the identification of sources and pathways for natural and man-made contamination of the environment.

The laboratory has the capability to carry out a diverse range of chemical analyses of soil, sediment and rock in support of all SGS geoscience operations and for external clients. The Laboratory is fully equipped with state of the art analytical tools including new X-Ray Diffraction (XRD) and Inductively Coupled Plasma Mass Spectrometry (ICP-MS)

Water and Environment Laboratory

Chemical and bacteriological analysis of water samples is essential to support EGS research and survey activities in hazardous wastes, mineral exploration, geochemistry, marine surveys, hydrogeology and water quality. Our analytical services aim to increase basic knowledge about water resource quality in Egypt, permit the identification and evaluation of newly discovered water resources and new wells, and provide diagnostic and reference data for the monitoring of water supplies.

Petrology-Mineralogy Laboratory

The EGS Petrology-Mineralogy Lab provides ongoing support services and research facilities to our internal clients (EGS geoscientists) and external clients (government and the private sector, community services and individual institutions) in various fields of petrologic lab services.

The laboratory provides services in the preparation of rocks, minerals, and ores as thin sections, polished thin sections, polished sections and polished slabs. It also provides cutting, grinding and staining facilities for the making of rock slabs and thin sections, mineral concentrations and separation, grain-size analyses, microscopic studies and X-ray diffraction analyses.

These support services and research facilities are organized into five distinct units; the functions of each are briefly given below:

Follow-up unit: The main function of this unit is to receive samples, and record all in-coming and out-going jobs. It distributes requests & samples to concerned units. It receives samples after the completion of jobs from different units, and delivers samples to clients and has established a database of all studied samples. It also maintains the lab store inventory

Sample-preparation unit: This unit provides facilities for cutting, grinding,

thin sectioning, staining, and polishing thin sections and slabs, by using sawing machines, grinding machines, thin-sectioning Logitech machines, and a variety of polishing machines.

The unit delivers finished samples including cut slabs, thin sections, polished sections, stained sections and slabs. The sample preparation unit also produces and delivers rocks that have been cut and polished in aesthetic designs .

Industrial Applications Laboratory

EGS has abundant and sustainable resources of a variety of industrial mineral commodities. They are used as raw materials for producing ceramics, glass, paint, cement, construction materials, abrasives and many other commercial products, including less obvious applications such as paper, plastics, rubber, cosmetics, animal feed and horticulture. Industrial minerals require processing and refinement before they can be used in commercial manufacturing.

The Egypt manufacturing industry has shown significant growth during the last decade and it is predicted that the demand for high-grade raw materials will continue to increase. Presently, a large number of Saudi manufacturers rely on imported raw materials, but would turn to locally produced high-grade raw material if the consistency, quality and long-term supply is guaranteed at competitive prices.

The Industrial Applications Laboratory conducts research on Egyptian raw materials and waste products to investigate their potential for upgrade and refinement for industrial use, and thereby encourage inward investment by Egyptian industries and creation of new employment opportunities. The laboratory is currently leading two research projects, commissioned by the EGS Geological Studies program

Engineering Geology Laboratory

Several departments in the EGS, including Geohazards and Engineering Geology, Environmental Geology, Industrial Minerals and Hydrogeology, require a comprehensive range of materials testing facilities in support of their project objectives. To meet these needs, the EGS Engineering Geology Laboratory carries out rock and soil sample preparations, and laboratory and in-situ tests for rock physical properties, rock mechanical properties, soil physical properties, soil mechanical properties, and aggregate and concrete properties.

The laboratory also provides these services on request to external clients in the academic, government and industry sectors.

Drilling services

Drilling is commonly essential to provide information on the subsurface to supplement and confirm geologic observations and interpretations made at the Earth's surface. EGS Drilling Services are routinely used for support of SGS programs in Mineral Exploration, Mining Development, Hydrogeology and Environmental Geology, and are also available for contract work, with or without crew, for clients in the community.

The EGS Drilling Section routinely undertakes diamond drilling down to depths of about 400 meters and reverse-circulation, percussion and auger drilling to shallower depths. The section provides drill rigs, crews, drill bits and other necessary equipment, maintenance facilities, and transportation and placement of the rigs. Other services offered include trenching, earth moving for temporary airstrips and access roads, and preparation of drilling platforms

Field transportation and logistics

Geologic and exploration activities commonly take place in remote areas far removed from cities or towns, and require purpose-built, temporary accommodation and facilities. The EGS Field Services section establishes, maintains, and demobilizes field camps of various sizes, appropriate for the number of technical and support personnel engaged in the projects serviced. This covers the erection of tents, bathrooms and other temporary structures; the transportation and installation of cabins, kitchens, and dining facilities; provision of electric power using transported generators; hook-up of a water supply; and provision of manpower such as camp boss, cooks, and cleaning staff. The section also operates helicopters, and a small fleet of SkyVan transportation aircraft is currently being re-commissioned for future field transportation, supply and aerial survey use.

The Field Services section also provides bulldozers and excavators for trenching and other types of shallow excavation for site investigation and mineral exploration projects to obtain fresh or bulk samples.

These services are also offered to external clients on request

Studies and Research

The Objective of the Studies and Research Department

The main objective of the Studies and Research Department is to assist and help in increasing the contribution made by the Saudi mining sector to the growth and diversification of the national economy, reduce reliance on imported raw materials, and encourage environmentally safe development of mining operations in Egypt.
We achieve this objective by:

1. Carrying out conceptual and preliminary studies for the promising mineral deposits, which include:

- Processing chemical analysis data obtained from drilling sample.
- Conduct bench-scale beneficiation tests.
- Calculate resources and reserves using geostatistical methods.
- Prepare mining plans and methods.

- Perform market studies.
- Perform economic studies.

2. Advising on investment opportunities and market requirements for specific mineral commodities.

3. consulting on all aspects of exploitation methods and infrastructure, including mine waste management, environmental impacts and after-use options.

4. Compiling and publishing national mining statistics for Egypt, including information on mine locations and reserves, and on source, consumption and demand for each commodity.

Work Programs of the Studies and Research Department

Currently the department focuses on mining, pre-feasibility studies, ore processing, testing, and application of geostatistical analyses to mining and mineral resource assessments.
contrast to conventional statistics, geostatistical analyses data with regard to its spatial structure and correlations, it offers geologists and mining engineers a wide range of tools for mining data analyses, estimation and simulations of deposits. EGS applies geostatistics at all stages in its mining development projects, from initial feasibility studies to production control. Coherent geostatistical models provide solutions for the formulation of grade tonnage relationships, the determination of cut-off grades, sampling pattern optimization, selectivity studies and the evaluation of the support effect on ore reserves.

Ongoing activities include the publication of a Yearbook on Mineral Statistics of Egypt, and the issue of Monthly Mining News, which includes the latest industry news, prices, and events. EGS has also established the Mining Development Club, an industry forum for exchange of knowledge

and expertise on investment opportunities, markets and solutions to mining industry problems

EGS logistical facilities provide the essential support for fieldworking teams our survey, exploration and engineering programmes.

BID PROCEDURES

In accordance to the announced Bid Terms and Conditions, interested Mining Companies which have sound Technical and Financial capabilities invited to bid for exploration and Exploitation of Sulfur Ore Deposit in Dekla area, East El Arish , North Sinai in two sealed envelopes.
These two envelopes will be submitted and hand delivered separately at the same time and marked;

Envelope -1 (Technical)
Envelope -2 (Commercial)

Both envelopes (1) & (2) should be entitled
2010 INTERNATIONAL SULFUR BID ROUND No. 1
“ CONFIDENTIAL ”
and addressed to:
Mr. geologist / Chairman of the Board (Confedential)
Egyptian Mineral Resources Authority (EMRA)
Address: *3 Salah Salem St., Abbasiya, Cairo – Egypt*

Offers has to be submitted no later than September 30, 2010 . during working hours from 8 am till 3 pm.

Technical Offers should include the following:
1- Company name and its scope of interest and all other documents necessary to proof the legal status, shareholders and their nationalities.
2 - Previous experience in the field of mining exploration and exploitation, and its relevant activities for the company worldwide. (Mining projects - the quantity of mineral production - the amount of the reserve - the latest know how applied)
3 - Annual report of the company

4 - Corporate Structure - The legal entity
5 - Statute of the company - and the commercial register
6 - The financial situation and the financial statements include the profit or loss for the last three years
7 – Unconditioned letter of guarantee as a deposit for the amount of (US$ 50000) fifty thousand US dollars, or payable check by the same value for the benefit of the Egyptian Mineral Resources Authority (EMRA)
8 - A photocopy of the purchase receipt of the Bid Round Terms & Conditions
9 - A photocopy of the purchase receipt of the information package
10 - Copy of the Bid Round Terms approved and signed by the authorized person indicates company commitment to all its content and notarized by the company.

The Commercial Offers should include

1 - Exploration Program for sulfur ore
2 - Exploitation plan for sulfur ore and the start date of production
3 - Minimum expenditures to implement the Exploration and exploitation plan.
4 – Company Commitment to all competitive elements of the bid terms & conditions mentioned and according to the model of commercial offer prepared by EMRA.

Model of commercial offer

- Company Name ----------
- Name of the authorized person to sign ----------

Elements of competition

1- Royalty (non-recoverable) (------%) not less than 4%

2 – Exploration Period (------ years) up to five years and is divided into three phases providing that the first exploration phase will not exceed 12 months, the second and third phases will be 24 months each, which starts from the end of the previous phase.

3 - The minimum technical exploration program at each phase

4 - The minimum financial expenditure obligations for each phase

(--------- $ US dollars for 1st phase)
(--------- $ US dollars for 2nd phase)

(--------- $ US dollars for 3rd phase)

5- Contractor shall relinquish at least 50 % of the original concession area by the end of the 2nd exploration phase and before entering into the 3rd and last exploration phase, and by the end of all exploration phases the contractor shall relinquish the remaining area of the concession except the area or areas which converted to exploitation lease or leases.

6 - Technical Program for existing ore evaluation and its Exploitation and production plan.

7 - All costs and expenses shall be recovered out and deducted from (50% of annual production after deducting the royalty during the initial five years of production and then starting from the sixth year of production all costs and expenses including carry forward expenses (if any) recovered within and against (-----%) (Competitive) of the production after the deduction of royalty.

8 – In case if the value of the cost recovery exceeds the total of expenses and expenditures including (carry forward) during any financial year (Excess), the Excess goes to the production sharing percentages.

9 - Production Sharing: The remaining production after deduction of royalty and the cost recovery shall be divided between **EMRA** and the contractor as follows (----%) to **EMRA** (----%) to the **contractor** during the first five years of commercial production date, (provided that EMRA share is not less than 50 %)

Starting of the sixth year of commercial production EMRA share is not less than 65%.

10 – Bonuses: (all bonuses are none recoverable except the bonus for training & performance improvement for EMRA) shall be recovered, Bonuses will be paid to EMRA by the contractor as follows:

A – **Signature Bonus** (competitive): not less than 5 million US dollars and due upon the issuing the Law and before the signing of the Government on the concession agreement.

B – **An Exploitation Lease Bonus** (competitive): and not less than 5 million US dollars and due upon the approval of the government on exploitation Lease.

C - **Assignment Bonus**: equal to 10% from the value of the deal and due upon The approval of the government on assignment, except the assignment to
Contractor Affiliated company.

D – **Bonus for Extension of Exploitation Lease** (competitive): due upon the approval of the Extension Lease and it will be equal to (-----%) of the original remaining and the added reserves.

E – **Bonus for Training & Performance Improvement of EMRA**: due during first 15 days of each financial year it is not less than (US$ 100.000) hundred thousand US dollars annually during the Exploration period and (US$ 200,000) Two hundreds thousand US dollars annually from the starting date of the exploitation lease until this time and during the exploitation period including its extension if any.

General Terms & conditions for bidding

Mining companies have invited to submit their qualifying offers indicating their financial technical capabilities for exploring and exploiting the sulfur ore deposit North Sinai, under production-sharing scheme, and in accordance to the Model of Agreement prepared by EMRA, which considered as integral part of these terms & conditions of this Bid Round.

1- Type of contract:
Production sharing and issued by law published in the Official Gazette authorize the minister of petroleum to sign the contract on behalf of the Government.

2 - Parties to the Contract:

Government, (EMRA) and Contractor
the government shall grant the right to Egyptian Public Authority for Mineral Resources (EMRA) and the contractor to explore and exploit sulfur ore deposit in the area and contractor shall responsible to incur and pay all costs, expenses and expenditures required for exploring and exploiting such deposit .these costs, expenses and expenditures shall be recovered only from commercial production and in accordance to the percentage allocated for cost recovery.

3 - Contractor:
Shall be a single company or a group of companies have financial and technical expertise, in case contractor consist of more than one company Each company shall jointly and severally liable for the performance of obligations of the contractor under the concision agreement.
Each company shall decide and inform EMRA for the person who represent it.

4 – Contract Period:

4. A - Exploration Period: shall not exceed five years, divided into three phases. The first phase shall not exceed 12 months with a commitment of carry out and conduct new exploration studies and activities related to add additional reserve to sulfur deposit which has already discovered in the area.

4. B – Exploitation Period: shall be twenty years from signing the exploitation lease and it may be extended to additional ten years upon approval of EMRA and Government, providing that, contractor has no right to apply for exploitation lease contract unless and until submit to EMRA detailed Technical studies to confirm or not additional reserves to the already discovered.

5 - Income tax:

Contractor shall be subject to the law and regulation s of the Egyptian income tax relating to submit the tax report and provide such records and reports for review from the authorized governmental employee. EMRA shall pay on behalf of the contractor the income tax from its share of production.

6 - Management of Operations

Exploration Advisory Committee shall consist of equal representative of contractor and EMRA to review and approve the working program budget submitted by the contractor during exploration phases. After the approval of the exploitation lease, contractor and EMRA shall meet and agreed upon running operation model either to form a steering committee from both sides with the right for EMRA to add more members, or to establish a Joint Venture Company to work on behalf of the two sides named and approved by minister of petroleum.

7 - Preferences to the local product

Preferences shall be given to the local service and material and products which equivalent in quality, provided however the difference in price not exceeds 10 %

8 - Environmental pollution and rehabilitation

The Contractor shall be responsible for the restoration and rehabilitation of the

production area or any other area used. Contractor grants that the operations and equipment used compatible with the universal standards to avoid any impact on the environment in general and production site in particular, in accordance with the Environmental Law No. 4 of 1994 and its executive regulations.

9 - Applicable law and arbitration

Egyptian law is applied in the provisions of the agreement and the way the arbitration governed by the rules of arbitration in the Cairo Regional Centre for International Commercial Arbitration.

Bid Bond

Amount of **(US $** 50.000) fifty thousand US Dollars shall be submitted to EMRA in the qualification envelopes through unconditioned **L o G.** issued by a bank approved by the Central Bank of Egypt, Or, by payable cheque for the benefit of EMRA and it will be valid for a period until the completion of the final evaluation of the financial offers, and shall return to the unsuccessful bidders within 15 days from the date of finalizing the evaluation.

Successful Bidder has to increase the bid Bond to 500,000 $ US within 15 days by unconditioned **L o G** issued by a local bank approved by the Central Bank of Egypt. or by payable cheque for the benefit of EMRA and it will be valid for at least 6 months.

EMRA shall liquidate such **L o G** or cheque in case bidder fails to submit the required documents and payments necessary for signing the concision agreement during the time specified by EMRA

10 – Expenses and Funds

The Contractor shall be responsible to make all available funds necessary for the operations in the area, these funds can be recovered only in case of contractor achieves commercial production from the area from the specified percentage under the concession agreement

11- Additional Studies

Upon a request from the bidder and pay the required fees (such fees is none recoverable), EMRA shall provide the bidders with all available documents covering various topics in order to enable the bidder to;

. Submit his offer and;

. Achieve his obligations under the lease contract later on.

The bidder, on the other side, should carry out his own necessary additional studies, researches and studies in order to check, rectify, modify, confirm any current design parameters concerning geology, reserves, mining, beneficiation, '" etc.

The aim of such additional studies is to allow the bidder to figure out the actual situation of the offered area, to enable him to offer the best possible Exploration and Production plans, and to successfully achieve these plans later on.

Such additional studies shall be carried out in two stages;

The first stage (before submitting the offer), where all bidders are invited to carry out their site visits to the area to review and checkout themselves the actual situation of every detail to run the necessary preliminary studies required to prepare their offers upon the bidder's own responsibility.

The second stage (after the effective date of the contract), where the winner shall be deemed liable to run any additional detailed studies which enable him to securely and successfully activities

12- Visit to the Area

EMRA shall arrange visit/s to the Diqla area per request for the interested bidders at the bidders cost, and it will be none recoverable.

The Bidder prior to making any Bid calculation and as part of the preparation of it's Bid, can have a visit and an inspection of the Site(s), made all enquiries and collecte all information documentary or otherwise, as considered necessary by the Bidder for the proper and accurate preparation of it's bid.

13- Assignments before signing the agreement:

Neither Contractor nor Contractor member-(s) may assign to a firm or corporation, in whole or in part, any of its rights, privileges and duties till the issuance of the law under the contract.

14- No Deviation from Bid

A Declaration Sheet indicating that there is no deviation from Bid Documents is to be furnished. Bidders may further note that this declaration is a prerequisite for EMRA to consider their bids. Bids submitted without “no deviation declaration” will be rejected.

15- No Revision of Rates

Any revision of rates / prices what so ever after the time and date mentioned in bid documents for submission of completed quotations shall not be entertained unless called for specifically by EMRA.
NO document presented by the bidder after the closing date and time of the bid will be entertained or taken into account by EMRA, unless otherwise requested by EMRA.
The submitted offers must remain valid for 12 MONTHS after the Bid Closing Date. Offers will not be permitted to be withdrawn during this period.

16- EMRA's Rights

- EMRA has the right to reject or disqualify any or all offers without given reasons.
- Any offers related to other agreements either expired or current or future for the same area or another area will be disregarded.
- Any offers includes areas outside the announced one will be rejected.
- EMRA has present All information and data related to this bid round in good shape and with no legal responsibility.
- EMRA shall have the right to liquidate the Bid Pond without taking any legal procedures in case of any of the following:

1- Contractor withdrew before EMRA announce for the outcome of the Bid Round
2- Contractor can't increase Bid Bond and provided EMRA 500,000 $ US.

Bidders has no right to withdrew the initial bid bond before the final financial evaluation is completed.

- The announced terms & conditions of such bid round for exploitation and exploration of sulfur ore in the subject area, and in case of any other ores or minerals where discovered other than the sulfur in the area, and could be of economical value, these ores will be belong to the government represented by EMRA, contractor should refer to EMRA to discuss and agreed upon ways to exploit such ore or ores with the right terms & condition accepted from the tow parties and not conflict with the exploitation of sulfur ore.

17- EMRA`S Contact

All communications, requests, and inquiries by a Bidder must be directed in writing to EMRA, and all communications, requests, and inquiries By EMRA will be directed to the Bidders.

18- Company's Contact

The Bidder shall designate his correspondence address, and the name of his authorized contact person. All correspondence and notifications sent to the Bidder by hand delivery by registered mail, or by courier mail at said address will be deemed to have been duly delivered and received by the Bidder. The Bidder will advise EMRA, in writing, of any change in his representative's address; failing which any notification made to his declared address will be deemed to have been received by him.

19- Official Language

The official language of all correspondence and notifications between the Bidder and EMRA shall be the English language and/or Arabic language. Supporting documents and printed literature submitted by the Bidder as part of its Bid may be in another language shall be accompanied by an English or Arabic language translation.

20- Authentication

Quotations, erased and over written, will be summarily rejected unless corrections are authenticated with the bidder's signature.
All pages of the submitted offer of part-1 “Qualification” , Part-2 “Commercial” along with enclosures consisting should be signed with name &. designation and have company's seal. This is a must.

21- Confidentiality and Communications

On receiving the Bid documents, Bidders should have signed the confidentiality statement, stating that information made available to Bidders during the Bid process will be kept confidential. The statement also states that, unless other arrangements agreed in writing, all communications during the Bid process should be channeled directly between the Bidders (or their respective Agent) and EMRA.

Contact

Egypt

MINISTRY OF PETROLUM

THE EGYPTIAN MINERAL RESOURCES AUTHORITY
(The Egyptian geological Survey)

3 Salah Salem Rd. Abbassiya,Cairo, Egypt (11517)

Cable Address: GEOSURVEY/

Tel.: 202/26852914. 202/ 24829935

Fax: 202/ 24820128- 202/26832252

Hassan_b@egsma.gov.eg