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Minerals, Petroleum, and Groundwater
Assessment Project
c/o Egyptian Geological Survey and
Mining Authority
3 Salah Salem Street, Abbassiya
Cairo, Egypt

TO: Project Officer, S. Arif

FROM: Project Coordinator, D. T. Snow

SUBJECT: Bimonthly Report for period September 23- November 23, 1983

rè Contract NEB-0150-S-00-3035-00, ID2

The attached bimonthly report is submitted herewith.

David T. Snow

Egyptian Geological Survey and Mining Authority

Task I: Regional Mapping:

Work has been delayed during this reporting period because of delays in editing. The editor of the Wadi Kuffa and Ras Banas sheets is preparing for retirement, and of the Wadi Qena metallogenic map, preparing for the season's field work. Placing map progress at lower priorities is necessary, but it has detrimental effects on cartographic progress and morale. The participants promise to rectify the impediments shortly.

It has been said that the drafting work for Annal No. 13 will have to be done by contract, as will the type-setting. The cartography section is not committed to such drafting work, and the existing compugraphic machine is incapable of the text preparation.

Bendix, Grand Junction has initiated orders for work of the photographic supplies requisitioned.

Task II: Geophysical and Geochemical Studies:

A problem developed with the radiometric survey, now resolved by committee action. The contract stipulates 500 ft maximum altitude, impossible in many rugged areas of the Red Sea Hills. Radiometric accuracy is known to be poor above 1000 ft, and 9% of the hill areas cannot be covered safely at lesser altitudes. It has been decided that areas not satisfying the 1000 ft criterion will be left as holes in the survey, for which no charge will be made, whereas the stacked profiles will be continuous, permitting interpretation in those areas, if needed. The surveys in Area II are proceeding a schedule, and some trial output for areas IA, IB has been received, pending completion of those areas by March, 1984. Drafting of specifications for geophysical equipment has been completed.

Task III: Economic Viability and Estimation of Potential Resources:

Potash exploration planning and preparations are being made. The first drill site, subject of many discussions with GPC because our initial target lay coincident with their oil production area at Ras El Behar NE, has been moved about half-way between Ras El Behar and Gemsa, to another shallow occurence predicted from a geophysical log. The materials and technology for making saturated-

brine heavy mud to prevent core erosion and water pressure problems has also taken time and money. Start-up will be in December.

Gypsum exploration holes have been laid out at Gemsa Peninsula, 6 holes to 50 m along 2 profiles, designed to prove the existence of gypsum with shallow anhydrite overburden. The drill rig is in place, and start-up will be in December.

Work parties at four gold mines have begun: at Umm Rus and Atud, detailed surface mapping and underground drift and shaft rehabilitation and mapping have been started, at least on the first levels. At Dongash and Talaat Gadalla, surface mapping, geochemical sampling and vein sampling are being conducted by two other parties.

In the area of mineral contracts, the AGRICO (sulfur) agreement has been initialed for all terms except the price of natural gas GPC will charge. Though still confidential, the terms of the joint-venture agreement are said to represent many departures from prior requirements, and that we can use the contract as a favorable model with future investors.

The concession-type agreement under negotiation with Minex (gold) has reached a stage of a proposed letter of intent. Robertson Research Co. is doing a technical evaluation of the deposit for Minex. During the past two months, a committee of senior EGSMA and EGPC geologists and the writer have been meeting weekly to draft a model concession agreement, based on the production-sharing scheme so successful in the oil business, revised to provide better profit incentives and quicker payback of investment. In my opinion, further changes are necessary, or it will fail to result in agreement with Western mining companies. The writer has also had many conferences with former Director Mahmoud Zaatout to find mutually agreeable concession terms.

A computer program for commodity data storage and access has been outlined, and a few data sources located through libraries and the Commercial Section, U.S. Embassy. It will be programmed during January, to be ready for receipt of hardware at EGSMA.

Correspondence with Dravo Engineering Co. (U.S.) produced a visit by Mr. Chris Bonwit, their Europe-Africa exploration representative from Italy. They are interested in gold, bentonite, coal and lime. After they receive our mineral summary and we develop some reports for their study, they promise to return.

Bendix' membership in the American Chamber of Commerce led to contact with an Egyptian-American, Mr. Adel Anber , who is promoting Allied Chemical Co. (U.S.) to produce hydrated aluminous sulfate for water purification. I suggested they use anhydrite to make sulfuric acid instead of importing sulfur from Iraq, and to explore for bauxite rather than use Kalabsha or Abu Dharag kaolin. These matters are under study. Anber also represents Higgins Brick Co., who wishes to make 100 million bricks per year at various localities. We are investigating analysis of clay deposits for them.

During the reporting period, the writer went on three short (2 or 3 day) field trips. At Abu Zenema, Sept. 24-25, the Sinai Manganese Co. properties were examined, including an operating kaolin mine, Saba Salama, a dormant glass sand mine, Khabuba, dormant gypsum mines and manganese mines and the processing and transporting facilities. It is proving important to know about all such resources and alternates, to be able to advise visiting company representatives.

In one visit to Ras Gharib, Oct. 5-8, a GPC brick plant was visited. It utilizes waste gas and clay body from a nearby sabkha. From the time of my first visit (July) to the present, they have become an exporting producer, a demonstration of the importance of access to cheap shipping for all the coastal commodities. I am attempting to find data on this clay for Higgins Co. Whereas Ras Gharib is not suited to serve the Cairo market, bricks can be made so cheaply there that overseas markets like Jedda or Elat are conceivable.

Task IV: Upgrading the Analytical Laboratories:

Debate continues over the framing of specifications for an X-Ray diffractometer and fluorescence apparatus. A request for proposals will be issued by AID in the near future, together with the DTA request.

Task V: Geologic Museum:

Awaiting the museum's new quarters, and training.

Task VI: Mineral Commodity Program:

The Mineral Commodity Summary of exportable mineral resources (Oct. 23, 1983) has been prepared and distributed to a few companies requesting it. It is envisioned that this will be updated every six months, as new data become available.

Accumulation of mineral export/import data has begun. The CAPMAS printout is signally useless. Magazines are more to the point. A long list of mineral publications has been selected for study by BFEC at U.S. libraries, to categorize them as: 1) publications needed on a subscription basis in Egypt (if not already held in Cairo), 2) publications containing occasional market data that need to be scrutinized occasionally by the contractor, and 3) publications that would be desireable targets for publishing news briefs from Egypt. A COBOL programmer has been engaged to write my program for data filing.

In addition to comments on concession agreements under Task III, it should be noted that EGSMA will have a week's free service of an expert on mineral agreements from the U.N. Mineral Program, New York, made available through the kind offer of Dr. Harkins on the occassion of a recent interview at Cairo.

Task VII: Publication and Documents Center:

We have so far failed to generate an enthusiastic response to the need for centralized publication access for investors, though we know of several companies planning to come soon in search of data. An index to topographic mapping cannot be located, as it is a military secret, so far, Proposals to microfilm internal reports are seemingly unacceptable at this time. A proposal for implementing the Scientific Documents Center will be presented for consideration, once some additional cost figures are obtained.

During the period, one of the two editor-trainees has been enrolled in English at AUC, while the other has been out for surgery. Furthermore, the senior EGSMA editor threatens to leave. Thus a strengthening of numbers is in order if this unit is to survive Editor Stout.

The promised compillation of internal reports has not been produced yet.

Desert Research Institute

Task I: Groundwater Exploration:

Before any field work could commence, DRI was asked by EGSMA to help in establishing water supplies for a) Dier St.Paul, and b) Wadi Dakhl glass sand area, both in their second-year Zaafarana area. The two directors and the writer met once in the field to determine a plan, but DRI required time to work on the hydrogeology. EGSMA moved in a field camp and drill rig, expecting a quick recommendation. To attempt to resolve this the writer and Dr. Misak of DRI visited the Monastery site with Mr. A. M. Kamel of EGSMA, during which it was confirmed that detailed geologic work must precede drilling, since chances of failure are great, even with good preparations. EGSMA may have to proceed to drill with only vague locations or move its camp. Contract money is at stake.

With its field vehicles recently delivered, DRI is preparing to get its field parties to Marsa Alam for a shortened field season. Many of the EGSMA parties as well as DRI have delayed departure for lack of preparations, mainly due to budgetary problems. With work in full swing by mid-December, objectives can still be reached this season, and in some cases, work will proceed into the hot season.

DRI has hired 15 new graduates and many of these are also to be sent into the field. Arrangements have been made for logistical support, including drill-rigs, from EGSMA at Marsa Alam.

Task II: Data Organization and Analysis:

No progress was planned during this period of preparation for field work. However, receipt of computers for DRI and EGSMA should be speeded by combining our acquisitions with the GIT bid, expected in January.

Remote Sensing Center

Task I: Data Organization and Analysis:

No progress has been made in this area.

Task II: Production of Atlas:

Contract negotiations have been conducted between ERIM and Bendix, with RSC and AID contributing. Dr. Robert Rogers was in Cairo to formulate details Oct. 16-20, including the curriculum and schedule for training remote sensing instructors and technicians at ERIM, the selection of test sites in the SE desert, and to lay out specifications for the Landsat scenes. It became apparent that vast areas of the W.D. lack even minimum (degree intersections) control points for computer adjustment of the scenes. About 1000 new ground controls would be desireable, but even if it required physically occupying as many as 50 sites with a satellite positioning system, the cost would be a large, unanticipated element to the program. Other sources of control, such as GPC's East Uweinat Project, and military airphoto projects are being investigated for availability.

The contract with Wimvex, Inc. has been completed, for purchase of the MDAS hardware and software.

Task III: Remote Sensing Workshops:

The content of the workshops has been changed, by request of Mr. A. Ayoub, to include not two sequel courses, but one, conducted twice, on the basis of anticipated demand If this proves erroneous, a sequel course will have to be organized solely by RSC efforts. The content of the third workshop, to be taught by a TDY expert, has been changed from photogeology to include all remote-sensing geologic techniques pertinent to minerals and groundwater exploration. The RSC personnel are scheduled for departure to ERIM during January.

Task IV: Aerial Photography:

No progress made in this reporting period.

Egyptian General Petroleum Corporation

a. Aeromagnetic Study in the Eastern Desert:

Flights continued out of Aswan to cover Area II with the low-sensitivity aeromagnetometer and radiometer. A few trial products from Area IA, IB have been seen, with expectations that all deliverables will be received for those areas by end of March, 1984. At that time, basement interpretive work can begin.

b. Seismic Study in the Eastern Desert:
h. Stratigraphic Study (Drilling) in the Eastern Desert:

No progress,both are sequel to a.

c. Establishment of Leismic Data Storage System and Data Library:

No decision made as yet.

d. Source Rock/Oil Migration in the Western Desert:
e. Sedimentary/Petrographic Study of the Western Desert and the Gulf of Suez:

Dr. Hantar prefers to wait on these Western Desert studies because of the skilled-supervisor problems. P.C. has devoted a few days to the Robertson Research report, but has not concluded appropriate steps in a program in these areas.

f. Estimation of Existing and Potential Oil and Gas Resources in the Gulf of Suez:

Numerous proposals from competent companies have been received for Gulf of Suez petroleum and gas resources evaluations. It has not been learned whether the oil companies agree to sponsor it or not.

g. R&D and Feasibility Study of Tertiary Enhanced Oil Recovery:

The concept of the proposed feasibility study of enhanced oil recovery has to be re-evaluated. From the head of IPR Co., P.C. got the reaction that such a canvass of about 50 GPC reservoirs or abondoned reservoirs could be done within our (undisclosed) budget and that it has tremendous potential because essentially no EOR work has been done on these or any other Egyptian fields except El Morgan and the Nullipore at Ras Gharib, currently being gas-stimulated. From the opposite bias, GPC's reservoir engineer, Hamdi Dewick, said that a canvass has already been done by them, and that only the viscous-oil fields Ras Bakr and Kareem are potentially good for EOR. Further, he feels that our budget hardly suffices to evaluate one field. Because the truth may lie between these extreme views, P.C. feels he must

do an independant assessment of the state of knowledge. He is reviewing reservoir engineering texts preparatory to study of the GPC reports. One thing is apparent: the magnitude of expenditures in this area usually exceeds a $million for a full-blown simulation of just one reservoir enhancement project. The actual stimulation might cost 10 times that amount. Extra production of $100 million worth of oil is a possible result, whose likelihood will require expert advice.

Project Coordinator Activities: included three short field trips. First, 3 days, Cairo-Abu Zeneima-Cairo to visit mines and facilities of the Sinai Manganese Co., including the active kaolin mine, Saba Salama, the inactive glass sand deposit at Kabuba, the dormant manganese mines at Umm Bogma and the complementary facilities including ropeway, railway, storage and ferro-manganese smelter, then the inactive gypsum mines at Ras Malaab. Knowledge of these resources is vital to the work of EGSMA in exploring , developing and marketing other deposits, as has become evident in meetings with potential investors' representatives.

Two short trips, of 2 to 4 days each, were made to the Ras Gharib region. One was in company with the Directors of the Geological Survey and the Desert Research Institute, to plan exploration drill holes for water-supplies in that area. Also, the writer met Project Officer Sherif Arif for an inspection of the GPC Training Center and other facilities, notably the water purification plant, a brick plant and gas-turbine power plant. A subsequent revisit with Dr. Misak of DRI was made to re-examine the Dier St. Paul area for water-supply planning.

In Cairo, many visits to GPC were made to confer with their training people about procurement of equipment for the Ras Gharib Training Center. Ultimately, they dropped all requests in favor of a comprehensive Drill-Stand Simulator, expecting it to require essentially the entire $175,000 budgeted.

During the reporting period, the writer spent a major portion of his time on matters concerning the content and form of future contracts that EGSMA expects to negotiate with investors.

In recognition that the former model contract for concession agreements is inadequate for todays needs, there has been an urgent move to modify it,

and numerous senior geologists, petroleum engineers and lawyers have been engaged in the revision work. I worked informally for five two-hour periods with former Director Zaatout, composing an outline of terms, first for joint-venture agreements, settling on specifics resembling the forthcoming AGRICO agreement , and second, for concession agreements. An ad-hoc committee formed by Dr. Issawi to revise the latter was chaired by Dr. Ibrahim Radwan of EGPC, and seconded by Dr. Mahmoud Amin. I was honored to serve on this committee, which conducted most of its affairs in Arabic, but I was given opportunity to participate on some important debates. After 5 sessions of 3-4 hours, some held at night, a "final" draft was approved. I have started to prepare a minority report taking some exceptions to the model agreement.

Though this work is beyond the expected MPGAP scope, it is clearly vital to the success of the program, as it will influence whether or not investors favor working in Egypt.

Another area of some effort during the period was in relation to the ERIM-Bendix contract for training and updating RSC staff and equipment. Dr. Robert Rogers visit Oct. 17-20 and conferences with Mr. Ayoub and Dr. Lepley were formative to the plans.

Several discussions were held during the period with Dr. M. M. El Shazley of DRI, and with his assistants Drs. Ismael El Ramley and Rafaat Misak, concerning plans for field efforts. The target areas were prioritized, with help from Dr. Bihai Issawi, and plans for the three field seasons 1983-1986 were laid. Commodity acquisitions were discussed with DRI staff, including Dr. Sammi Soliman rè geophysical tools needed, with Dr. Himeda rè geochemical tools, and with Dr. El Shazley rè hydrological equipment. Invitations for proposals have not been formulated yet, while awaiting completion of the EGSMA IFB.

P.C. attended two sessions of the Conference on Basement Tectonics, Oct. 26-27, mainly to hear papers on the Paleozoic rocks of Egypt.

Several interviews have been conducted for gathering of data on mineral markets, including Mr. Hatem O. El Dali and Eric R. Weaver of the Commercial Section, U.S. Embassy, Ahmed El Kanawati of Sinai Manganese Co.

In company with Dr. Lepley, P.C. has checked meeting facilities at two hotels.

Representatives of companies interested in investments in Egypt's resources have been interviewed and assisted. These include: Mr. Chris Bonwit of Dravo Engineers, and Mr. Adel Anber, representing Allied Chemical Co. and Higgins Brick Co. These parties will return for subsequent work on deposits of gold, bentonite, kaolin, anhydrite and brick clay-bodies.

Contractor Performance: Bendix's Project Director has been impaired during this reporting period by lack of office space, precluding the hiring of any secretarial or administrative help. Without telephones or telex, only emergency operations for logistical aspects of the training program have been handled adequately. Few other contract commitments have been met. Reports have been absent or delayed. The Resident Editor has been effective at recuiting two young Egyptian editor trainees, and with one senior geologist, an editorial staff is being trained. Procedures and nomenclature are being standardized, and the production of Annal No. 13 is well underway. EGSMA expresses pleasure at Mr. Stout's performance.

Plans for the Next Two Months: The Resident Director, L. Lepley, plans to be on leave during most of December. This period coincides with a lull in the training program, only one scheduled departure to U.S. being planned until January. There will be an inevitable slow-down of activity, but Editor Stout is prepared to complete all arrangements for distribution of the first Newsletter.

Commodities procurement, oft-delayed due to lack of skills in specifications definition, is being pursued by Ms. Nadia Henein of AID, with expectations of getting the EGSMA IFB dispatched to Washington for issuance. DRI wishes are being processed, many items for direct purchase, vice bid.

I plan to stimulate exploration for bauxite in Egypt by including two field trips to likely areas for discovery, and to encourage EGSMA to mount a reconnaissance program this year. There is an immediate need for the bauxite, to satisfy a potential investor's need for material better than kaolin for manufacture of hydrous aluminum sulfate. On the same field trip, to Sinai and E.D., I will look to the work of parties studying copper and gold occurrences, and seek non-metallic deposits not presently in our exploration inventory.

The progress of DRI work in the Marsa Alam area will also be monitored.

Project Coordinator is scheduled for a brief visit to Jedda, Saudi Arabia, a likely market place for several minerals, including gypsum.

Plans for the petroleum sector include studies of the state of secondary oil recovery in Gulf of Suez fields, with the objective of planning some AID-assisted work in this potentially remunerative area.

The drill-stand simulator will be advertised soon.

On-going work of Dr. Issawi's ad-hoc committee to rewrite the model concession contract for mineral resource developments will demand much of P.C.'s time. Though not within the original Project scope, it is considered to be of highest priority to help steer the form of contracts to attract investors.

The process of selection of TDY experts by EGSMA, Contractor and AID will demand increasing attention in the next period, since some of the experts are scheduled for Spring, 1984, and many trainees from Egypt are also to be dovetailed into the experts' schedules.