

DESA

TANZANIA - PROGRESS REPORTS BY S.N. SAHA, GEOPHYSICIST, OPAS EXPERT

10 JAN 1973 - 16 JAN 1975

[2 MAPS]

UNCLASSIFIED

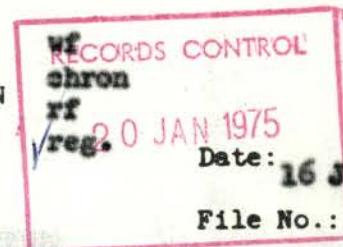
VP/WG MAR 2015

PLEASE RETAIN  
ORIGINAL ORDER

UN ARCHIVES

SERIES	<u>S-1906</u>
BOX	<u>82</u>
FILE	<u>6</u>
ACC.	<u>TE 432/21</u>

OFFICE OF TECHNICAL CO-OPERATION



Date: 16 January 1975

File No.:

TE 432/21 TANZA(15)

I. Experts' Reports: Referral to Substantive Offices

To: the Substantive Office: Mr. John Carman

Through: \_\_\_\_\_ (Area Section Chief)

From: Raymond R. Knowles, Programme Management Officer  
Physical Resources Section, Africa Branch, OTC

Subject: Request for Comments

Please find attached the following Progress Report No. 1111 1 July - 31 December 1974  
Outline of Final Report\* / letter / memorandum:  
~~XX~~

Name of expert: S.N. Saha

Field: Mineral Exploration

Country: Tanzania

Date: 1 July - 31 December 1974

I should appreciate your action on the attachment as indicated below, before

30 January 1975  
(date)

II. Experts Reports: Action by the Substantive Office

From the Substantive Office: \_\_\_\_\_

1. \_\_\_\_\_ A memorandum giving substantive comments on the above is attached (3 copies) for transmittal to the field as appropriate.
2. \_\_\_\_\_ A letter addressed to the expert is attached for clearance and return (2 copies included for the Area Section)
3. Indicate disposal of comments from the Regional Secretariat:
  - \_\_\_\_\_ a. Endorsed for transmittal to the expert
  - \_\_\_\_\_ b. Consolidated with Headquarters comments
4. Indicate whether the expert fulfilled the requirements with respect to:
  - \_\_\_\_\_ a. Carrying out responsibilities outlined in his job description
  - \_\_\_\_\_ b. Training counterparts
  - \_\_\_\_\_ c. Other (indicate) .....

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

\* A different form is used for comments on Final Report.



	UNITED NATIONS DEVELOPMENT PROGRAMME				FORM A SUMMARY
	PROJECT PROGRESS REPORT	PROJECT NUMBER URT/69/019	AGENCY UNOTC	REPORTING PERIOD 1 July 1974 "to" 31 December 1974	

COUNTRY AND PROJECT TITLE: <b>Tanzania Mineral Exploration</b>			DURATION 19 March 1971 to 18 March 1975		UNDP BUDGET (\$US) US\$ 116,316 (1972-75)
DATE PROJECT APPROVED <b>31/10/72</b>	START OF FIELD WORK		COMPLETION OF FIELD WORK		TRIPARTITE REVIEW? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
	SCHEDULED 19 March 1971	ACTUAL 19 March 1971	ORIGINAL EST. 18 March 1975	CURRENT EST. 18 March 1975	DATE:

### Summary of Project Implementation

#### Project Activities

During the period the activities mainly comprised of field work in the Imweru gold prospect area using Resistivity method, and in the Kapalagulu Nickel Copper prospect area, using Electromagnetic, Magnetic, I.P., geochemical and geological methods and drilling operations. During this period a report on the geophysical work at Imweru prospect was also submitted.

#### Major Problems

Every detail of the survey, including topographic surveys, geological mapping, core logging had to be carried out by the writer as there were no qualified surveyor, or geologist attached to him. Training imparted to new recruits of geophysical methods retarded the progress of work slightly.

The I.P. instrument was not working for most of the field period as two fuses in the the rectifier circuit blew off. The fuses were ordered by air mail and was only available after the party returned from the field. They were not available locally.

Several mandays were lost due to inefficient system of payment of salaries and wages to the staff and labourers of the field camp. Responsible officers had to physically bring money from Dodoma, and the administrative set up to get the cash and send to the field camp was too time consuming and entailed loss of several mandays.

The progress of drilling left much to be desired even though a new drilling machine was added to the already existing one.

#### Major Achievements

The major achievement has been the successful culmination ~~although~~ of the ground geophysical and geochemical surveys covering the whole area of the ~~basic~~ Kapalagulu basic complex, after three field seasons work during the years 1972, 1973, and 1974. However, some area could only be covered on a reconnaissance basis. The results were interesting and the final report, which is now being written, would form a comprehensive study of the project.

The Imweru gold prospect area survey was completed over the quarter of the area programmed but the submitted report carried some interesting anomalies which need be followed up by drilling.

#### Overall status and assessment of the project

The present status of the project requires the compilation of the three years data and the writing up of the report on the Kapalagulu Complex survey. All these require the timely availability of the finally drawn maps from the drawing office, results of the geochemical analysis of the samples and drill cores, and timely completion of the three test drill holes recommended. Efforts are being made however to complete the report within the project period.

Another small magnetic survey in Handeni area has been proposed in January 75, but its successful completion and reporting within the period is doubtful.

S.N. Saha, 3 January 1975

FORM SUBMITTED (CHECK)

A ☒ B ☒ C ☒ D ☒ E-1 ☒ E-2 ☒ F ☐ G ☒ H ☒ I-1 ☐ I-2 ☐



PROJECT PROGRESS  
REPORTPROJECT NUMBER  
URT/69/019AGENCY  
UNOTCREPORTING PERIOD  
July to 31 Dec '74GENERAL  
ACCOUNTGeneral Account of Project Implementation

During the period project activities mainly comprised the field work carried out in (a) Imweru Gold prospect area and (b) Kapalagulu Nickel Copper prospect area. A completed report with a map was also submitted ~~over~~ on the former investigation.

(a) Geophysical Investigations in the Imweru Gold prospect area.

The Imweru gold prospect area has several exposed and buried quartz veins of thickness varying from 1 to 8 ft, generally within the medium of lateritic soil or weathered metavolcanics. These quartz veins sometimes contained economic concentration of gold, but their locations or extensions were mostly obscured by overburden. The good resistivity contrast between the lateritic soil and the quartz veins enabled the application of resistivity survey to delineate the location and extension of the subsurface veins. Schlumberger in line spread of electrodes was used to carry out the survey.

The results of the survey did indicate buried quartz veins through resistivity highs but sometimes ~~the anomalies~~ could not differentiate ~~the~~ between those caused by quartz veins and those through the differential weathering of the linearly disposed EW trending metavolcanics. Some linear anomalies were suggested to be drilled for possible existence of buried gold bearing quartz veins.

The resistivity survey was very useful in delineating some interesting zones which required follow up test drilling, and trenching. If the veins are intersected and they contain economic quantity of gold, the survey will have ~~good~~ significant investment potential.

The work in the area was stopped in July by the State Mining Corporation, although only about a fourth of the area programmed had been covered by the survey.

A report on the investigation has been submitted.

(b) Kapalagulu Nickel Copper Prospect - Geophysical, Geochemical, and Geological and Drilling investigations

Since 1972 and integrated geological, geophysical, geochemical surveys and drilling were carried out to cover the entire area of mineralisation of the large basic complex at Kapalagulu.

This year, the party reached there on 26 August and continued field work upto <sup>h</sup>24 November, when heavy rain started. The work comprised mainly:

- i) Geophysical: I.P., Magnetic, Electromagnetic surveys.
- ii) Geochemical: Collection of soil and botanical samples from the area and core samples from the drill holes and their immediate analysis in the mobile geochemical laboratory brought to the field.
- iii) Geological: Study of the principal rock types and major structures and their relationship with the geophysical and geochemical anomalies.
- iv) Drilling: Test drill holes sunk at three locations. Logging and chemical analysis of the cores.

.... page 2





PROJECT PROGRESS

PROJECT NUMBER

AGENCY

REPORTING PERIOD

GENERAL  
ACCOUNT

REPORT

URT/69/019

UNOTC

1 July 1974 to  
31 December 1974General Account of Project Implementation

(continued from page 1 )

Page 2

Two areas were covered this year. The south eastern extension of the complex was covered in detail and the far eastern part which is completely covered by soil, on a reconnaissance basis. This far eastern part was earlier covered by the Western Rift Exploration company in 1961 and by the Russian Geological Mission in 1973, by reconnaissance geochemistry and drilling.

The survey showed several significant and interesting anomalous zones and delineated the areas of mineralisation within the complex. Examination of the results are in progress.

Major Problems

The I.P. instrument was out of order for most part of the field season as its rectifier circuit fuse was blown off. Some areas of interest could not therefore be surveyed. The fuses were ordered from Canada as they are not available locally. The drilling operation was very slow in spite of the addition of a second machine which was brought there in <sup>October</sup> ~~August~~ 1974. From August 1973 to end of November 1974 only about 1000 ft. length of the hole ~~was~~ <sup>was not</sup> drilled. There had been a number of mandays lost in coping with the administrative defect of making cash available to the party for disbursement to labourers and staff. This loss is quite appreciable considering the field work of only 3 months. Finally, training of the staff, which kept on changing every year, put a lot of strain on the writer to keep up the progress of work.

Except the administrative and instrumental problems, all problems had been reported previously. The instrument has since been repaired and the administrative problem has been reported and is likely to be rectified in future.

Progress of the Project as a whole

Generally the progress of the project is satisfactory. A complete report on the Imweru survey has been submitted. Presence of a mobile laboratory in the field increased the efficiency of the geochemical survey at Kapalagulu manifold. This field season culminates in the successful coverage ( although on a reconnaissance basis at one area) of the whole mineralised area of the Kapalagulu basic complex. A comprehensive report on the whole mineralised belt indicating mineral possibilities and their locations may be possible at this stage.

In order to fulfill the immediate and long range objectives of the project which ends on 18 March 1975, the following pending work need be completed:

- i) Availability of the core samples of all the three test holes in the area. Only one hole so far has been completed.
- ii) Availability of the geochemical analysis results of the soil, cores, and botanical samples, of the remaining samples of Kapalagulu.
- iii) Availability of the final drawn maps of the Kapalagulu area for the seasons 1973 and 1974. Those of 1974 are being compiled and processed now. These are to be completed by the drawing office.

Work Programme for the immediate future

The writer finishes his contract on 18 March 1975 and does not contemplate taking up any field investigation during the rest of the period. However, the Commissioner desires a short magnetic survey in the Kiberashi area of Handeni district, to locate on ground a highly magnetic area detected by the compass of the planes flying across the area. If the survey is taken up, the writer considers it difficult to complete the report on the three year survey at Kapalagulu within the project period.





## UNITED NATIONS DEVELOPMENT PROGRAMME

PROJECT PROGRESS  
REPORT

PROJECT NUMBER

URT/69/019

AGENCY

UNOTC

REPORTING PERIOD

1 July 1974 to  
31 December 1974

FORM C

PROJECT  
ACTIVITIES

ACTIVITY NO.	PROJECT ACTIVITY	ACTIVITY STARTED		ACTIVITY COMPLETED		MAJOR POSITIVE/NEGATIVE FACTORS AFFECTING RESULTS OF ACTIVITIES AND IMPLEMENTATION
		SCHED.	ACTUAL (EST.)	SCHED.	ACTUAL (EST.)	
	Geophysical Exploration for Minerals in Tanzania.	March '71	March '71	March '75	March or April 1975	Retardation of progress is due to slowness of drilling and lack of adequate counterpart personnel.





## UNITED NATIONS DEVELOPMENT PROGRAMME

FORM D

PROJECT PROGRESS  
REPORT

PROJECT NUMBER

URT/69/019

AGENCY

UNOTC

REPORTING PERIOD

1 July 1974 to  
31 December 1974PROJECT  
INPUTS

## UNDP/AGENCY INPUTS

	DURING PERIOD		CUMULATIVE	
	PLANNED	ACTUAL	PLANNED	ACTUAL
EXPERTS (Man-months)	6	6	3 yrs. 9 months	3yr. 9 mo.
SUBCONTRACTS (\$US 000)	Nil	Nil	Nil	Nil
EQUIPMENT REC'D (\$US 000)	Nil	Nil	\$ 32,400.00	30,670.00 <del>\$ 22,000</del>
FELLOWSHIPS (Man-months)	Nil	Nil	Nil	Nil

## GOVERNMENT INPUTS

COUNTERPART STAFF (Man-months)	6	6	90	41
SUPPORT STAFF (Man-months)	6	6	45	27
EQUIPMENT REC'D (\$US 000)		\$ 1100	17,750 (App)	10,200 (Appro)
BUILDINGS, LAND (\$US 000)				
CASH SUPPORT (\$US 000)	Not known			
OTHER _____ (Specify)				

## REMARKS:

The government purchased the following equipment: during the whole project period.

Refraction Seismic instrument

D.C. Resistivity Meter,

Augur sets..2

Pauline precision altimeter

Intensity Polarity meter.

Demi Gun, Electromagnetic Unit ( Expected to arrive any day)

These equipment were purchased to supplement those purchased by the UN.





## UNITED NATIONS DEVELOPMENT PROGRAMME

PROJECT PROGRESS  
REPORT

PROJECT NUMBER

URT/69/019

AGENCY

UNOTC

REPORTING PERIOD  
1 July 1974 to  
31 December 1974

FORM E-1

AGENCY  
PERSONNEL

POST NO.	POST DESCRIPTION	NAME OF INCUMBENT (AND NATIONALITY)	ARRIVED (MO/YR)		DEPARTED (MO/YR)	
			SCHED.	ACTUAL (EST.)	SCHED.	ACTUAL (EST.)
1	Geophysicist OPAS	S.N. Saha, INDIA	19/3/71	19/3/71	18/3/75	-

REMARKS: Every effort will be made to finish the project within the scheduled date. However the finalisation of the technical report on Kapalagulu is very much dependant on the completion of the drafting of the maps and drilling results. These are not in the hands of the writer. Another small investigation has been proposed in January. If taken up, it will be difficult to finish the report and carry out the field investigation within the contract period. A small period of extension of contract may then be necessary.



## UNITED NATIONS DEVELOPMENT PROGRAMME

FORM E-2

PROJECT PROGRESS  
REPORT

PROJECT NUMBER

URT/69/019

AGENCY

UNOTC

REPORTING PERIOD

1 July 1974 to  
31 December 1974GOVERNMENT  
PERSONNEL

POST NO.	POST DESCRIPTION	NAME OF INCUMBENT	FULL/ PART TIME	ASSUMED DUTY (MO/YR)	
				SCHED.	ACTUAL (EST.)
1	Geophysicist	M.M. Pondaga	Full	Jan '73	May '73
2	Field Assistant	B. Mitti	Full	Jan '74	April '74
3.	Geologist	None			

## REMARKS:

No geologist was attached to the writer since September 1973. ~~The geologist was attached to the writer since September 1973.~~





## UNITED NATIONS DEVELOPMENT PROGRAMME

PROJECT PROGRESS  
REPORT

PROJECT NUMBER

URT/69/019

AGENCY

UNOTC

REPORTING PERIOD

1 July 1974 to  
31 December 1974

FORM G.

EQUIPMENT

EQUIPMENT	DELIVERY (MO/YR)		REMARKS
	SCHED.	ACTUAL (EST.)	
N117			



PROJECT PROGRESS  
REPORTPROJECT NUMBER  
URT/69/019AGENCY  
UNOTCREPORTING PERIOD  
1 July 1974 to  
31 December 1974

REPORTS

TITLE OF REPORT, PAPER, ETC.

REMARKS

Report on Electrical Resistivity survey for  
gold bearing quartz veins in the Imweru area  
Biharamulo district, Tanzania.

By  
S.N. Saha & M.M. Pondaga  
September 1974

It is a technical report for the work  
carried out for the State Mining Corporation  
and was scheduled within the work plan.  
The report was written in English. Draft  
report completed and submitted with a map  
to the Commissioner.

Distribution proposed:  
State Mining Corporation,  
UNDP, Dar Es Salaam,  
UNOTC, New York,  
Commissioner, Geology & Mines Division,  
Principal Secy, Ministry of Commerce and  
Industries,  
Authors.



RECEIVED IN RECORDS CONTROL

10 OCT 1974

ACTION TO:

1. *MR. WATTS*

2. *Mr. Kuopiles*

3. *11/11/74*

☒ PUT AWAY

☒ BRING FORWARD

ON

DAY MONTH YR.

TO: Telephone: 27411-5



UNITED NATIONS  
DEVELOPMENT PROGRAMME

DAR ES SALAAM. TANZANIA

MATASALAMAT MANSION  
Zanaki Street

RECEIVED

11 OCT 1974

Cable: UNDEVPRO, DAR ES SALAAM

POST OFFICE BOX 9182

Reference

URT/69/019

PR/SECTION FOR AFRICA/OTC

Telex 41284

Telephone: 27411-5

OFFICIAL CORRESPONDENCE

MUST BE RETURNED TO  
RECORDS CONTROL, ROOM 2074

4 October 1974

CONTROL NO.

*TE 432/21 TANZA(15)*

*10-175*

Dear Mr. Watts,

URT/69/019 - Mineral Exploration

....

Enclosed please find three copies of the quarterly progress report  
(July to September 1974) submitted to us by Dr. S.N. Saha for forwarding  
to you.

Yours sincerely,

Willem H. Binnendijk  
Resident Representative a.i.

Mr. K. Watts,  
Deputy Director,  
Africa Branch  
Office of Technical Co-operation,  
United Nations,  
NEW YORK.

*cc. Mr. Brand*  
*WF*  
*11/10/74*



OFFICE OF TECHNICAL CO-OPERATION

wf  
chron  
rf  
reg

I. Experts' Reports: Referral to Substantive Offices

Date: 11 October 1974

To: the Substantive Office: \_\_\_\_\_

File No.:

Through: \_\_\_\_\_ (Area Section Chief)

TE 432/21 TANZA(15)

From: Raymond R. Knowles, Programme Management Officer  
Physical Resources Section, Africa Branch, OTC

Subject: Request for Comments

Please find attached the following <sup>Quarterly</sup> Progress Report No. July to September 1974  
Outline of Final Report\*, letter / memorandum:

Name of expert: S. N. Saha

Field: Mineral exploration

Country: Tanzania

Date: 1 July - 30 September 1974

I should appreciate your action on the attachment as indicated below, before

25 October 1974  
(date)

II. Experts Reports: Action by the Substantive Office

From the Substantive Office: \_\_\_\_\_

1. \_\_\_\_\_ A memorandum giving substantive comments on the above is attached (3 copies) for transmittal to the field as appropriate.
2. \_\_\_\_\_ A letter addressed to the expert is attached for clearance and return (2 copies included for the Area Section)
3. Indicate disposal of comments from the Regional Secretariat:
  - \_\_\_\_\_ a. Endorsed for transmittal to the expert
  - \_\_\_\_\_ b. Consolidated with Headquarters comments
4. Indicate whether the expert fulfilled the requirements with respect to:
  - \_\_\_\_\_ a. Carrying out responsibilities outlined in his job description
  - \_\_\_\_\_ b. Training counterparts
  - \_\_\_\_\_ c. Other (indicate) .....

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

\* A different form is used for comments on Final Report.

QUARTERLY PROGRESS REPORT FOR THE PERIOD JULY TO SEPTEMBER 1974

By  
S.N. Saha  
Geophysicist UN/OPAS

September 1974

Mineral Resources Division,  
Dodoma,  
Tanzania.



# QUARTERLY PROGRESS REPORT FOR THE PERIOD JULY TO SEPTEMBER 1974

By  
S.N. Saha, Geophysicist UN/OPAS  
TANZANIA

## Summary

During the period, the writer carried out Resistivity survey in the Imweru gold prospect area. He visited the drilling operation at Kapalagulu during July. In August, he closed the Imweru camp and established the camp at Kapalagulu to carry out geophysical operations on the south eastern part of the complex. Geophysical and geochemical observations are being carried out at present. While at headquarters, the writer prepared several geochemical and geophysical maps of Kapalagulu and Imweru areas and submitted a report on the survey at Imweru.

## Field Investigations

### 1) Imweru gold prospect

The resistivity survey for locating buried quartz veins in the Imweru area was carried out up to 8 July 1974. The work was unilaterally stopped by the State Mining Corporation thereafter. The camp was however closed on 22 August after the return of the writer.

11 linearly disposed, E-W trending, high resistivity anomalies were interpreted over the surveyed area. The anomalies are caused by three possible geological conditions e.g. i) buried quartz veins, ii) unweathered or less weathered metavolcanics standing out as resistive zones within lateritic soil or, iii) dolerite or similar basic dykes. Drilling over a few anomaly zones has been recommended to verify the exact geological identity of these anomalous bodies.

A report, together with a geophysical map, of the area covered, is being submitted. Since the area covered, comprise  $\frac{1}{4}$  th of the area programmed to be surveyed, further geophysical work at a future date is recommended.

### 2) Kapalagulu drilling operation

The writer inspected the drilling operation at Kapalagulu from 11 to 15 July and then again on 7 September. The second drill hole DDH2, which was started in April 1974, was complete up to 89 ft. in July and 173 ft. in September. The drilling machine



was out of order when the writer visited it in September. The writer logged the drill cores up to 172 ft. at approximate intervals of 5 feet, and arranged to get them chemically assayed for Cu, Ni, and Co contents. Twenty Nine core samples have so far been analysed. The geophysical and geochemical anomalous zones are expected to be reached in this hole at depths beyond 200 to 250 ft, and therefore not much importance could be attached to the value of the analyses. The values do not show any promising results so far, and the highest of 0.1% of nickel have been recorded.

The writer strongly recommended the commission of a second drilling machine in the area to complete the third drill hole before the start of the rainy season in November. A second machine is expected to be sent there-hopefully to start work by the middle of October.

The necessity of using a Tropyary, or some other device, to record the inclination of the hole at various depths, was stressed time and again by the writer. So far no action was taken to procure the device for the drilling outfit. Correlation of geophysical and geochemical data with the drill cores, on the assumption of geometrically assumed path of the hole, may lead to erroneous interpretation.

### 3) Kapalagulu Geophysical-Geochemical survey.

A party consisting of the writer, one geophysicist, one field assistant, one laboratory technician, and others, proceeded to Kapalagulu on 8 August along with a mobile geochemical laboratory. Field work started on 27 August. A new base line was laid from station 200S of the old base line, towards east, and parallel cross lines at intervals of 500 ft. were laid along it. Observations were made 3500 ft towards north and 2500 ft. towards south of this new base line. Electromagnetic, magnetic observations and geochemical soil sampling, were carried out over these cross lines. The mobile laboratory provided immediate analysis of the soil samples and the <sup>core</sup> samples, for Cu, Ni, and Co contents.

I.P. observations were made on line 125S to correlate the anomalous geophysical and geochemical results on line 132S, on a parallel line. The work was only half completed and had to be stopped due to some sudden trouble with the transmitter.



The writer intends to look after it when he returns to Kapalagulu from Dodoma.

### Movement

The writer was at Imweru camp from 1 to 8 July 1974. From 9 to 17 July he was away to Kapalagulu to inspect the drilling operation. He was back in Dodoma on 17th. He left Dodoma on 8 August and reached Imweru on 16. He left Imweru camp on 22nd and reached Bolimba camp at Kapalagulu, on 26th. He returned to Dodoma on 13 September to make emergency movement of his residence due to the capital movement programme. He was at Dodoma till the end of September.

### Instruments

The following instruments and equipment were received-being purchased from the government fund. A magnetic polarity intensity meter, two Paoline precision altimeters, and two sets of hand augurs. A high powered EM gun, called Demigun, has been purchased by the division and is expected to be delivered shortly. This will be of immense help in carrying out the EM surveys more effectively. A few testing and research equipment may also be available through other government funds.

### Personnel

Mr. M.M. Pondaga was on leave almost the whole of the month of July. The writer tried to get the leave postponed but the regulations obliged him to go on leave, thus partly affecting the work at Imweru. Mr. B. Mitti, field assistant, joined the Imweru camp in April and was attached to the writer since. At Kapalagulu, apart from Mr. Pondaga and Mr. Mitti, a geochemical capacity was introduced through the inclusion of Mr. S.K. Mukhopadhyay, chemist, and Mr. D.S. Kayombo, Laboratory Technician. Mr. Omari Kaku and his party carried out drilling operation in the area. Mr. Kaku is now in Dodoma to arrange to take the other drilling rig to Kapalagulu. No action appears to have been taken by the government to request the UNDP for the services of a volunteer technician, to help provide maintenance, repair, and field operation of the instruments.

### Reports

The following report has been prepared with map, and submitted:  
1) Report on Electrical Resistivity survey for gold bearing quartz veins in the Imweru area of Biharamulo district, Tanzania, By S.N. Saha and M.M. Pondaga. Maps for the draft report on Kapalagulu are under preparation.



### Miscellaneous

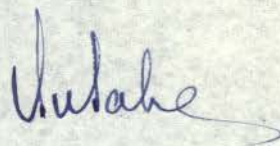
With the increase in the number of instruments, it is vitally necessary to store them in dust free rooms and check them from time to time. Previously, instruments were kept in the general stores where dust spoiled most of them, making contacts defective. Thus, it again emphasizes the necessity for a dust free store and the requirement of a technician to maintain the instruments. The writer repeats this request again to ensure proper maintenance, servicing and storage of the many expensive instruments bought by the department and the United Nations.

The writer was requested by the UN mineral survey project at Malawi to carry out some surveys over some of their E.M. anomalies, with the gravimeter of this project. The matter, referred by the UN to this government, is under consideration.

The writer was brought from the field at Kapalagulu through urgent police message to make arrangements to move his residence to another house in order to make room for some senior members of the government - in connection with the movement of capital to Dodoma. There has been some changes and delay due to this mass movement programme, and the writer was obliged to stay at Dodoma till he moves ~~till he moves~~ his residence and gets settled in the new house.

### Future work

It is proposed that the EM, magnetic, and geochemical surveys in the Kapalagulu area be continued in the routine manner on the south eastern part of the basic complex. I.P. work will be carried out over selected lines. Test drill holes will be made on the three proposed sites, and depending on the results, further drilling on other anomaly zones will be recommended.



S.N. SAHA

30/9/74



ENCLOSURE ATTACHED



UNITED NATIONS  
DEVELOPMENT PROGRAMME

RECEIVED

14 AUG 1974

PR/SECTION FOR AFRICA/013

DAR ES SALAAM, TANZANIA

MATASALAMAT MANSION  
Zanaki Street

Reference URT/69/019

RECEIVED IN RECORDS CONTROL

13 AUG 1974

ACTION TO:

1 Mr. Watts  
2 Mr. Kuo  
3

☒ PUT AWAY

INITIALS

☐ BRING FORWARD

ON

DAY MONTH YR.

TO:

Cable: UNDEVPRO, DAR ES SALAAM

POST OFFICE BOX 9182

Telex 41284 Telephone: 27411-5

7 August 1974

Dear Mr. Watts,

Mineral Exploration (URT/69/019)  
Semi-Annual Progress Report

TE 432/21 TANZA (15)

.... In accordance with the UNDP reporting system please find  
.... enclosed two copies of the progress report on the above project prepared by  
.... the expert for your consideration. The report covers the period from 1  
January to 30 June 1974. I am also enclosing three copies of the quarterly  
report (April/June 1974) on the same project for your consideration.

.... The successful completion of this project depends very  
much on the presence of the expert. In this connection, I also attach a copy  
of a letter from the Ministry of Finance in which the Government officially  
requests the extension of Dr. Saha's contract, at least until 19 March 1975.  
I trust you will make every effort to obtain a further release of Dr. Saha  
from the Government of India.

Any comments you might have on the report would be most  
welcome.

Yours sincerely,

Willem H. Binnendijk  
Resident Representative, a.i.


Mr. K. Watts,  
Deputy Director,  
Africa Branch,  
Office of Technical Co-operation,  
United Nations,  
New York

OFFICIAL CORRESPONDENCE  
MUST BE RETURNED TO  
RECORDS CONTROL, ROOM 2074

CONTROL NO.

c.c. Mr. M. Doo Kingue,  
Assistant Administrator and Regional  
Director for Africa,  
UNDP,  
New York



UNITED NATIONS DEVELOPMENT PROGRAMME						FORM A SUMMARY	
	PROJECT PROGRESS REPORT	PROJECT NUMBER URT/69/019	AGENCY United Nations	REPORTING PERIOD 1 January 1974 to 30 June 1974			
COUNTRY AND PROJECT TITLE: Tanzania , Mineral Exploration				DURATION 19 March 1971 to 18 March 1975		UNDP BUDGET (\$US) 116,316 US\$	
DATE PROJECT APPROVED		START OF FIELD WORK		COMPLETION OF FIELD WORK		TRIPARTITE REVIEW? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	
29 July 1972		SCHEDULED 19 March 1971	ACTUAL 19 March 1971	ORIGINAL EST. 18 March 1975	CURRENT EST.	Govt. 24/7/74 DATE:	
Summary of Project Implementation							
<u>(a) Project activities</u>							
<p>During the period Resistivity survey was carried out in the Imweru area of Biharamulo district to explore buried gold bearing quartz veins. Drilling operation at the Kapalagulu basic complex over geophysical and geochemical anomalies is being continued and is being supervised by the writer.</p>							
<u>(b) Major Problems</u>							
<p>The major problem is the slowness of drilling operation which is attributed to the inefficient system and the old age of the drilling machine. The result of the geophysical and geochemical anomalies cannot be well assessed unless the three test holes suggested are complete within the project period, and the samples are analysed.</p>							
<u>(c) Project achievements</u>							
<p>The geophysical and geochemical survey at Kapalagulu was successful in outlining a zone rich in Ni and Cu mineralisation, which is being tested by preliminary drilling. Of the three drill holes proposed, only the first hole is now complete (491 ft.). In this, a length of nearly 100 ft. containing 0.1 to 0.6 per cent of copper and nickel, both, have been found. The second hole is now being drilled. The results of these three holes if found promising, will pave the way for further drilling for feasibility studies and also some detailed geophysical and geochemical work in adjacent areas.</p> <p>At Imweru, the D.C. resistivity method applied was found to be highly successful in outlining buried quartz veins which are known to be goldbearing. 5 veins or reefs have been discovered which could not be seen at the surface. Drilling and deep trenching to collect samples are recommended and assays of gold content in the samples are envisaged. If found economic, possibility of mining them at not too distant future, is bright.</p>							
<u>(d) Overall Status and Assessment of the Project</u>							
<p>Work of the project is going on satisfactorily except for the drilling, on which the writer has no control. <del>about</del> The last 1/3 area of the Kapalagulu basic complex is still to be covered by the geophysical and geochemical observations. These results, together with the old ones, will bring out a complete picture of the basic complex and its mineralised zones. Drilling can then be suggested in various areas of such mineralisation. It is proposed to carry out the geophysical-geochemical survey in this field season (August to November 1974). The successful completion of the project however depends very much on the presence of the writer upto the end of the project in this country. Efforts are being made to obtain release from the government of India the home country of the writer, upto the end of this project. Unless the result of this effort is known soon it is difficult for him to plan the work. At present he is released by government of India upto the end of September 1974.</p>							
NAME OF PROJECT MANAGER/EXPERT AND DATE				FORMS SUBMITTED (CHECK)			
Sudhirendra Nath Saha, 23 July 1974				<div style="display: flex; justify-content: space-around;"> <div>A <input checked="" type="checkbox"/></div> <div>B <input checked="" type="checkbox"/></div> <div>C <input checked="" type="checkbox"/></div> <div>D <input checked="" type="checkbox"/></div> <div>E-1 <input checked="" type="checkbox"/></div> <div>E-2 <input checked="" type="checkbox"/></div> <div>F <input type="checkbox"/></div> <div>G <input checked="" type="checkbox"/></div> <div>H <input checked="" type="checkbox"/></div> <div>I-1 <input type="checkbox"/></div> <div>I-2 <input type="checkbox"/></div> </div>			





## UNITED NATIONS DEVELOPMENT PROGRAMME

PROJECT PROGRESS  
REPORT

PROJECT NUMBER

URT/69/019

AGENCY

United  
Nations

REPORTING PERIOD

1 January 1974  
to 30 June 1974

FORM B

GENERAL  
ACCOUNTGeneral Account of Project ImplementationAccount of the project activities

During the period two major projects were carried out. i) Exploration ~~for~~ gold bearing buried quartz veins in Imweru area, Biharamulo District and ii) Drilling operation at the Ni-Cu prospect at Kapalagulu area of Kigoma district.

i) This work was taken up by the Mineral Resources Division for the State Mining corporation of Tanzania. The object was to identify and locate quartz veins buried under the mantle of earth. These quartz veins were generally known to be gold bearing. D.C. Resistivity survey is being carried out in the area since April 1974 and so far 5 major quartz reefs have been discovered and outlined on the surface. Drilling and deep trenching have been recommended to intersect these reefs and the rocks are to be assayed for gold content.

In one of the known and exposed reef in the area the average <sup>gold</sup> concentration showed more than 20 grams per ton ~~of gold~~. It is most probable that the other discovered reefs should show similar results. The Williamson Diamond Mines Ltd have started mining operations in an area 20 miles south of this prospect - in the Buck Reef area. It is most likely that if the assay results are good, the State Mining Corporation will hand over the Imweru area as well to the Company.

In view of the good results obtained it has been decided to continue the geophysical work in the area.

ii) The drilling operation in the <sup>A</sup>apalagulu basic complex for Ni and Cu is unfortunately very slow. It was started from August 1973 and so far only about 550 ft. of core drilling has been completed. General inefficiency is the main cause. The drilling machine is also about 25 to 30 years old and breaks down often. A new drill machine or better, drilling carried out by a contractor is the only solution to the problem. At present 3 or 4 holes covering a total length of about 3600 ft. are essential to determine the economic mineral possibilities of the areas ~~delimited~~ outlined by geophysical and geochemical anomalies. Only one hole so far has been completed. In this hole a 100 ft. length showed about 0.1 to 0.6 per cent of both copper and nickel. The hole was completed at 491 ft. Better results are expected in the second and the third holes.

Government has very little fund or equipment to change the status of drilling. However, effort is being made to improve the situation by borrowing drill machines and men from other department.


The government has also requested UNDP to revise the present project to include a fellowship for two years for postgraduate studies in Geophysics by a Tanzanian national undergoing training with the project.

Progress of the Project as a whole

The immediate objective of the project - geophysical operations - has been more than adequately fulfilled. Apart from the above, several operations not within the work plan were carried out and reported. They are: 1) Geochemical and Geological surveys in the Bukoba region over the Ultrabasic rocks, 2) Geochemical and Magnetic studies in Ngara and Biharamulo districts for ultrabasic rocks, 3) Terms of reference for an airborne geophysical survey in the West Lake, <sup>M</sup>ara and Mwanza regions.

The long term objective of exploration - investment potential- is also also partly fulfilled. The Imweru gold prospect - after test drilling and gold assay of the reefs discovered - if favourable, may be a good mining venture. The <sup>A</sup>apalagulu



	UNITED NATIONS DEVELOPMENT PROGRAMME			FORM B GENERAL ACCOUNT
	PROJECT PROGRESS REPORT	PROJECT NUMBER URT/69/019	AGENCY United Nations	

Page 2

General Account of Project Implementation

continued from previous page:

prospect, if shows economic concentration of Copper and Nickel, may be further drilled for mining feasibility studies.

### Work Programme

The present work programme includes further geophysical work at <sup>K</sup>apalagulu to finish the last 1/3 part of the complex through surface observations. Geochemical and geological surveys as well are envisaged.. Continuance of test drilling as at present - perhaps with some improvement. Finally, The work at Imweru gold prospect may be continued after the <sup>K</sup>apalgulu survey is over.

It appears that the ~~new~~ new Mineral Exploration in Western Tanzania, <sup>a</sup>UN project starting in July 1974, envisages the service of the present OPAS geophysicist in their programme.





## UNITED NATIONS DEVELOPMENT PROGRAMME

FORM C

PROJECT PROGRESS  
REPORT

PROJECT NUMBER

URT/69/019

AGENCY

United  
Nations

REPORTING PERIOD

1 January 1974  
to 30 June 1974PROJECT  
ACTIVITIES

ACTIVITY NO.	PROJECT ACTIVITY	ACTIVITY STARTED		ACTIVITY COMPLETED		MAJOR POSITIVE/NEGATIVE FACTORS AFFECTING RESULTS OF ACTIVITIES AND IMPLEMENTATION
		SCHED.	ACTUAL (EST.)	SCHED.	ACTUAL (EST.)	
A	Carrying out geophysical field studies on locations selected by the Commissioner of the Mineral Resources Division, using varied instrumentation as may be indicated by the physical parameters of the areas studied.	March 71	March 71	March 75	(Sept 74)	Government of India released Mr. Saha only upto 30 September 1974. The activities may not be completed by Sept. 1974 as the project taken on hand will remain unfinished. A further request from the govt. of Tanzania to release him upto end of March 1975 has been sent to the Govt. of India through the United Nations Training of the counter part personnel to take over from Mr. Saha with all the instruments is also incomplete.





## UNITED NATIONS DEVELOPMENT PROGRAMME

FORM D

PROJECT PROGRESS  
REPORT

PROJECT NUMBER

URT/69/019

AGENCY

United  
NationsREPORTING PERIOD  
1 January 1974  
to 30 June 1974PROJECT  
INPUTS

## UNDP/AGENCY INPUTS

	DURING PERIOD		CUMULATIVE	
	PLANNED	ACTUAL	PLANNED	ACTUAL
EXPERTS (Man-months)	6 months	6 months	39 <del>42 months</del>	39 <del>42 months</del>
SUBCONTRACTS (\$US 000)	Nil		Nil	
EQUIPMENT REC'D (\$US 000)	Nil	Nil	32,400 US\$	32,400 US\$
FELLOWSHIPS (Man-months)	Nil	Nil	Nil	Nil

## GOVERNMENT INPUTS

COUNTERPART STAFF (Man-months)	<del>6</del> 12	<del>6</del> 12	78 <del>59 months</del>	50 <del>29 months</del>
SUPPORT STAFF (Man-months)	3	3	39	29
EQUIPMENT REC'D (\$US 000)	Nil	Nil	12000 US\$	12000 US\$
BUILDINGS, LAND (\$US 000)				
CASH SUPPORT (\$US 000)				
OTHER _____ (Specify)				

REMARKS: No Secretarial assistance envisaged in the plan was made available.





## UNITED NATIONS DEVELOPMENT PROGRAMME

PROJECT PROGRESS  
REPORTPROJECT NUMBER  
URT/69/019AGENCY  
United  
NationsREPORTING PERIOD  
1 January 1974  
to 30 June 1974

FORM E-1

AGENCY  
PERSONNEL

POST NO.	POST DESCRIPTION	NAME OF INCUMBENT (AND NATIONALITY)	ARRIVED (MO/YR)		DEPARTED (MO/YR)	
			SCHED.	ACTUAL (EST.)	SCHED.	ACTUAL (EST.)
12-01	Geophysicist OPAS	Sushirendra Nath Saha India	March 71	March 71	March 75	(Sept 74)

## REMARKS:

Government of India released Mr. Saha through to September 1974. Govt. of Tanzania has again requested through UN, the government of India, to reconsider Mr. Saha's release upto March 1975 to complete the project.





## UNITED NATIONS DEVELOPMENT PROGRAMME

FORM E-2

PROJECT PROGRESS  
REPORT

PROJECT NUMBER

URT/69/019

AGENCY

United  
Nations

REPORTING PERIOD

1 January 1974  
to  
30 June 1974GOVERNMENT  
PERSONNEL

POST NO.	POST DESCRIPTION	NAME OF INCUMBENT	FULL/ PART TIME	ASSUMED DUTY (MO/YR)	
				SCHED.	ACTUAL (EST.)
10	Geologist/Geophysicist (One)	a) B.A. Mcharo (left on January 1973)	F	March '71	Oct '71
		b) M.M. Pondaga	F	Jan '73	May '73
	Geologist (One)	a) A.P. Shah (Left on January 1973)	P	March '71	Sept '71
		b) M.J. Budhani (Left on September 1973)	P	Jan '73	May '73
	Field Assistant (One)	a) W. Iyombe (Left on January 1973)	F	March '71	June '71
		b) M. Ngondiya (Left on December 1973)	F	Jan '73	June '73
		c) B. Mitti	F	Dec 73	April 74

## REMARKS:

Counterpart Geophysicist, B.A. Mcharo and Field Assistant, W. Iyombe are abroad for higher studies in Geophysics. Mr. Mcharo is on a UN scholarship outside the project. Counterpart geophysicist, geologist and Field assistants were attached to ~~the~~ Agency personnel from time to time and they were taken away during the recess period i.e. January to June every year. At present Only Mr. Pondaga and Mr. Mitti are attached to the project. The project has been requested to be revised to provide for a two year scholarship in applied geophysics for Mr. M.M. Pondaga, to study abroad.





## UNITED NATIONS DEVELOPMENT PROGRAMME

FORM G.

PROJECT PROGRESS  
REPORTPROJECT NUMBER  
URT/69/019AGENCY  
United  
NationsREPORTING PERIOD  
1 January 1974  
to 30 June 1974

EQUIPMENT

EQUIPMENT	DELIVERY (MO/YR)		REMARKS
	SCHED.	ACTUAL (EST.)	
1) Induced Polarisation Unit	Feb '73	June '73	
2) Gravimeter	April '73	June '73	
3) Gamma Ray Spectrometer	March '73	June '73	
4) Flux Gate Magnetometer	March '73	June '73	
5) Charts and diagrams for interpretation of IP and Resistivity results	March '73	June '73	
6) Landrover	Feb '73	May '73	
7) Office and Field equipment (3M copier, Typewriter, Generator, Avometer, Battery Charger, Calculating Machine electrical, Calculating Machine manual.)	Dec '71	Jan '72	





## UNITED NATIONS DEVELOPMENT PROGRAMME

FORM H

PROJECT PROGRESS  
REPORT

PROJECT NUMBER

URT/69/019

AGENCY

United  
Nations

REPORTING PERIOD

1 January 1974  
to 30 June 1974

REPORTS

TITLE OF REPORT, PAPER, ETC.

REMARKS

1) Report on the preliminary Geological and Geochemical study of the Ultrabasic rocks in QDS 17,29, and 30, Bukoba region, Tanzania. By S.N.Saha and A. Brants.

It is a technical report written in English and is submitted as a final version. Distributed to Government, Res.Rep. UNDP Tanzania, and UNOTC, New York. Not Scheduled in work plan.

2) Report on experimental Geochemical and Magnetic ~~study~~ studies of some of the areas in QDS 29, adjacent to Burundi, to locate hidden ultrabasic rocks. By S.N. Saha

Technical ~~Draft~~ report under preparation. Written in English. To be distributed To Government, UNDP Tanzania, and UNOTC New York. Not Scheduled in work plan.

3) Terms of reference on the proposed Airborne Geophysical Survey in the West Lake, Mara and Mwanza regions, Tanzania. By S.N. Saha

Draft Technical report written in English submitted to the government only. Not Scheduled in the work plan. Also copied to Mr. Stig Regnell, Chief Engineer, SIDA Tanzania.

4) Note on the proposed Lake Natron Soda Ash Project - Comments on the Japanese consultants' report on April 1974 entitled " Report on Natural Soda Development Project in Lake Natron, Tanzania!" By S.N. Saha

Technical report in English submitted to the government only as a final version.



PROGRESS REPORT FOR THE PERIOD APRIL TO JUNE 1974

By

S.N. Saha

GEOPHYSICIST UN/OPAS

Mineral Resources Division,  
P.O. Box 903,  
Dodoma,  
Tanzania.



QUARTERLY REPORT FOR THE PERIOD APRIL TO JUNE 1974

By

S.N. Saha,

GEOPHYSICIST UN/OPAS

SUMMARY

During the period D.C. resistivity survey with Schlumberger configuration was carried out in the Imweru area of Biharamulo district. Initially, tests were carried out in the area with several different configurations, leading to Schlumberger method, with spread as NN:AB: 25: 325 ft. as the best suited one with maximum resolving power. This system was then adopted for covering the whole area to locate resistive buried quartz veins containing gold. So far 5 resistive veins, presumably quartz veins, have been discovered by the method and the method is claimed to be highly successful. One of the veins has been found to extend nearly 1,500 ft.

The writer was in Dodoma from 13 to 20 April and again between 26 May to 28 June 1974, for consultations and writing reports.

The drilling operation at Kapalagulu suffered a setback due to some technical trouble with the boring of the hole, and the DDH 2 was restarted on early June 1974.

FIELD INVESTIGATIONS

1. IMWERU GOLD EXPLORATION:

The Imweru area is situated at the border of Biharamulo and Geita districts and is about 9 miles north of Katoro - a border village along the main road from Geita to Biharamulo. The quartz veins along with the granites have traversed the Nyanzian metavolcanics. The quartz veins generally traversing in the E.W. direction often have economic gold content. The area in question is mainly covered with laterite and lateritic soil which are mainly the remnants of weathered Nyanzian metavolcanics. The E.W. trending quartz veins generally 1 to 8 ft. in thickness seem to be buried within this soil cover at depths ranging from surface to about 30 ft. The area to be covered by geophysical investigation to locate



these hidden quartz veins is located at approximately Lat.  $2^{\circ} 54'S.$ , and Long.  $31^{\circ} 50'E.$ , and comprise a rectangular area of 4,000 ft. by 7,500 ft. An Indian made DC resistivity meter and 8 battery packs of 90 volts each, were used for the survey.

The geophysical investigation in this area was mainly aimed at locating these quartz veins or reefs and outlining them on the surface. The higher resistivity of quartz compared to the lateritic soil provided the necessary resistivity contrast. Over a known quartz vein containing economic gold concentration, test D.C. resistivity survey was carried out over several parallel lines across the vein. The following systems of measurements were tested.

- (1) Wenner System: ..... (i) In line array at 50 and 100 ft. separation. (ii) Transverse array (parallel to vein) at 50 and 100 ft. separation.
- (2) Two Electrode System: ... In line array. Movable current and potential electrodes 50 ft. apart along the traverse and the second current and potential electrodes being kept fixed at an infinite distance.
- (3) Three Electrode System: ..In line array. One current and two potential electrodes 50 ft. apart moving along the line and the second current electrode is fixed at infinite distance.
- (4) Schlumberger System:..... In line array. Current and potential electrodes along the line with values of MN and AB varying. MN separation was tested from 12.5 ft. to 50ft.

All the measurements showed some indications of the presence of the known quartz vein, but their resolving power enabling one to identify it from the geological noise level was not satisfactory. The thinness of the vein and its fingering structure made it all



the more difficult. Of all the above systems, system (2) and (4) proved to be better. The best resolving power was however shown by system (4) i.e. Schlumberger system, with the electrode spread MN:AB: 25:325 ft. This spread was therefore adopted for regular survey in the area and measurements were thereafter carried out on 100 ft. spaced NS lines at station intervals of 25 ft. A sample of the results obtained is shown in the enclosed diagram.

The results in the diagram indicate the outline of the known quartz vein marked as No. 1 running between lines 8E. to 11.5E around station 12S. It also discovered a new buried resistive vein marked No. 2 - presumably another quartz vein - around station <sup>195</sup> ~~12S~~ on lines between 8E to 13E. The veins are marked as dashed lines.

Subsequent data revealed at least 4 other resistive veins ranging from a length of 400 to 1,500 ft. The vein No. 2 has been traced upto a distance of 1,500 ft. in the EW direction.

The exact geological identity of these resistive veins, in all probability, is quartz - particularly when one sees their trend (EW) and their pattern along several lines. However one should not discount the possibility of doleritic dykes. Drilling or deep trenching are therefore immediately recommended over these areas for the exact geological identity and assay of gold content in the quartz veins.

Due to the excellent results obtained it was decided to continue the survey for the whole area, and the survey is now being continued. The work is being carried out for the State Mining Corporation.

## 2. KAPALAGULU DRILLING INVESTIGATIONS

The drilling at Kapalagulu over geophysical and geochemical anomalies had a setback during April and May due to some technical trouble. Almost no drilling was achieved at the Drill hole DDH 2 location. The driller returned from leave by the 1st week of June and drilling was restarted by shifting the location laterally by about a foot. The writer regrets to attribute it to the general inefficiency of the system and the old age of the machine. The footage drilled upto the end of June 1974 (From August 1973) is



around 550 ft.

The assay of the drill cores from DDH1 from 300 to 491 ft. did not show any encouraging value of Cu and Ni. About 0.1% of Ni was the highest value obtained along this length. The results so far confirmed that in DDH1 there is a band between 160 to 260 ft. along the hole, which have general values of 0.1 to 0.6% of both Copper and Nickel. This also confirmed the dip of the mineralised zone towards  $240^{\circ}$ .

#### MOVEMENT

The writer was at Dodoma between 13 to 20 April 1974 and then between 26 May to 28 June 1974 for consultations, preparation of maps and writing his reports. He was at Dar es Salaam between 28 May to 1st June and then from 16 to 22 June 1974 for medical examination and consultations respectively.

#### MISCELLANEOUS

Request has been made by the Ministry to revise the present project URT/69/019 to include the provision of training a Tanzanian geophysicist through a foreign scholarship. If agreed upon, it will be necessary to send the present incumbent, Mr. M.N. Pondaga for a two year postgraduate course in Applied geophysics abroad, preferably this year.

#### FUTURE PLAN

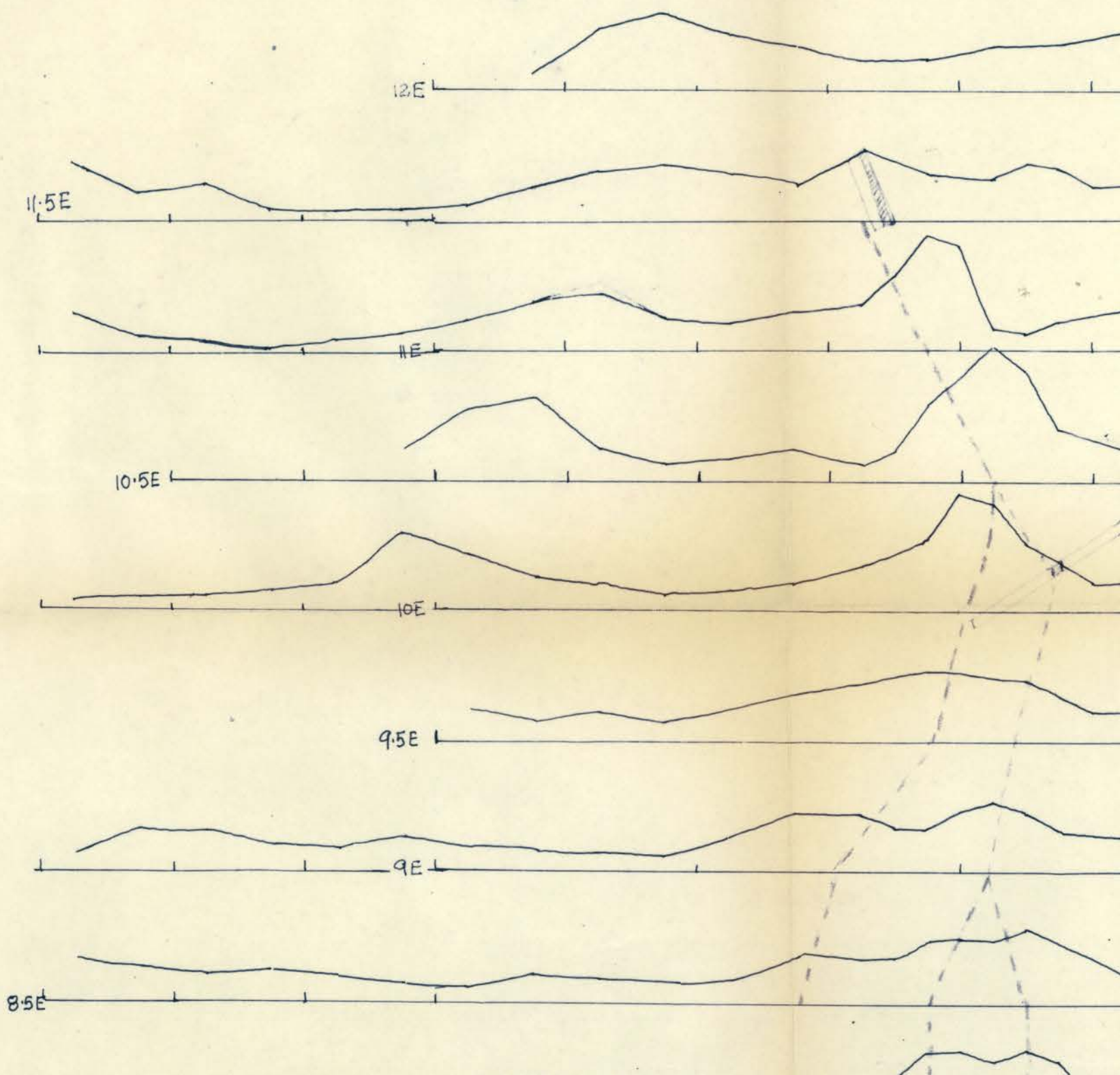
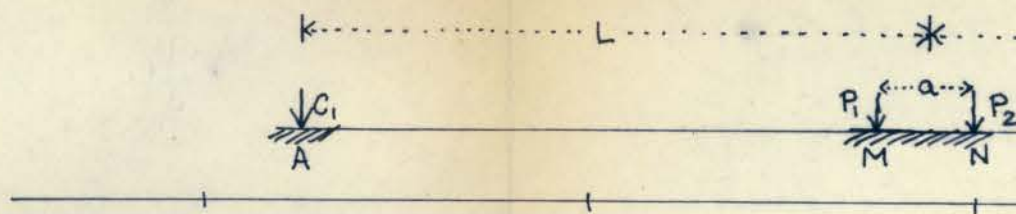
The writer intends to visit Kapalagulu by the middle of July to inspect the drilling operations and get the core samples logged and analysed, from DDH 2. It is proposed to take a geophysical geochemical party to Kapalagulu in August to complete the rest of the unsurveyed area of the basic complex. A third hole at Station - 6, line <sup>1325</sup> (DDH 3) has been suggested after the completion of DDH 2. The resistivity work at Imweru will be resumed after the Kapalagulu survey is over by November, 1974.

Encl: one diagram.

  
(S.N. Saha)

19 July 1974

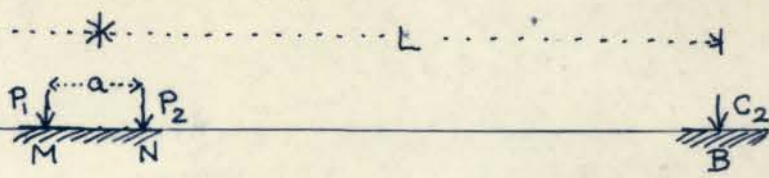






# IMWERU GOLD RESISTIVITY PROFILES

BY  
S. N. SAH  
M. M. PONDAG  
&  
B. MITTI  
MAY 1974.



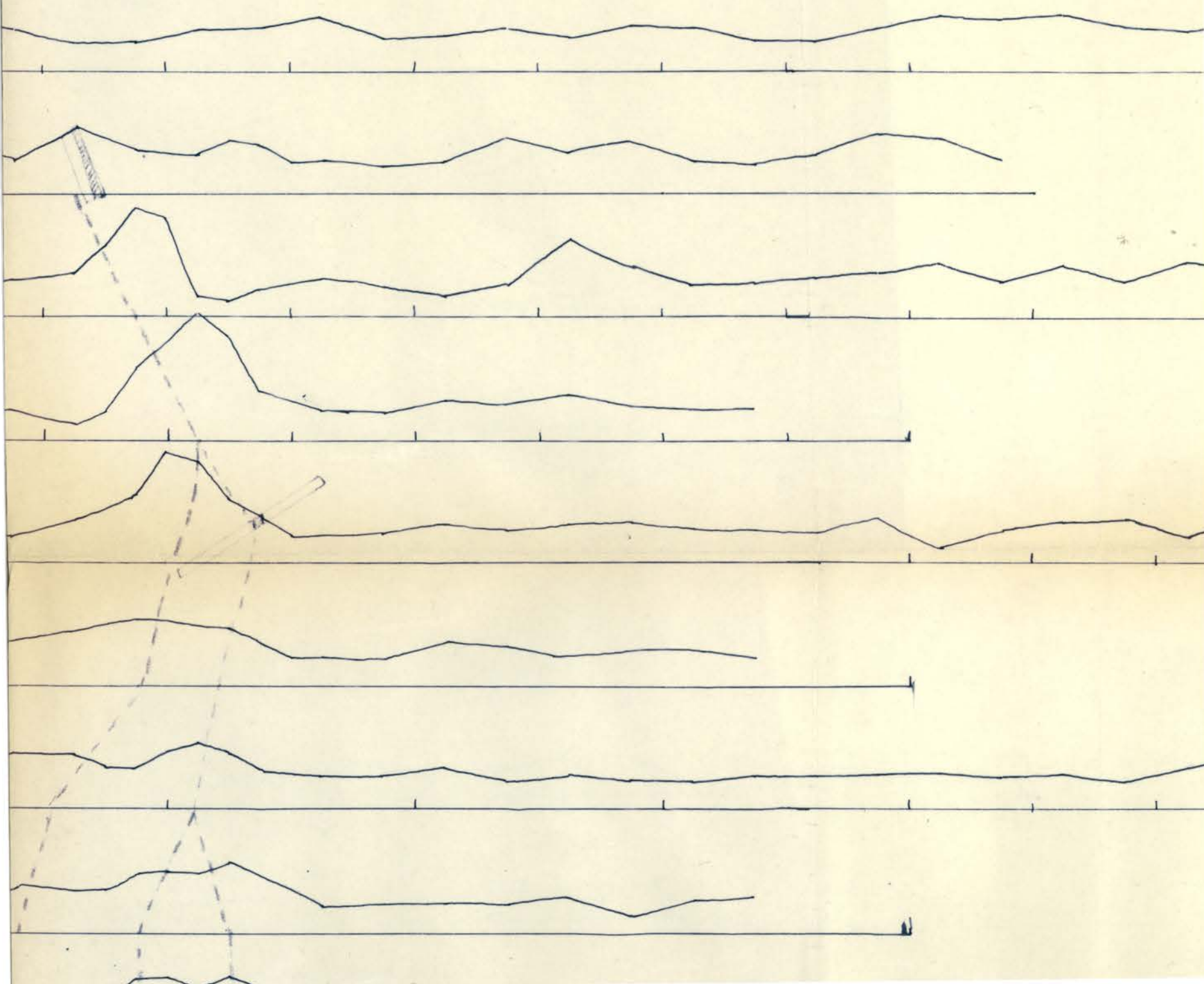
$$\frac{2L}{a} = 13$$

$$L = 162.5 \text{ ft.}$$

$$a = 25 \text{ ft.}$$

MAGNETIC

NORTH



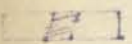



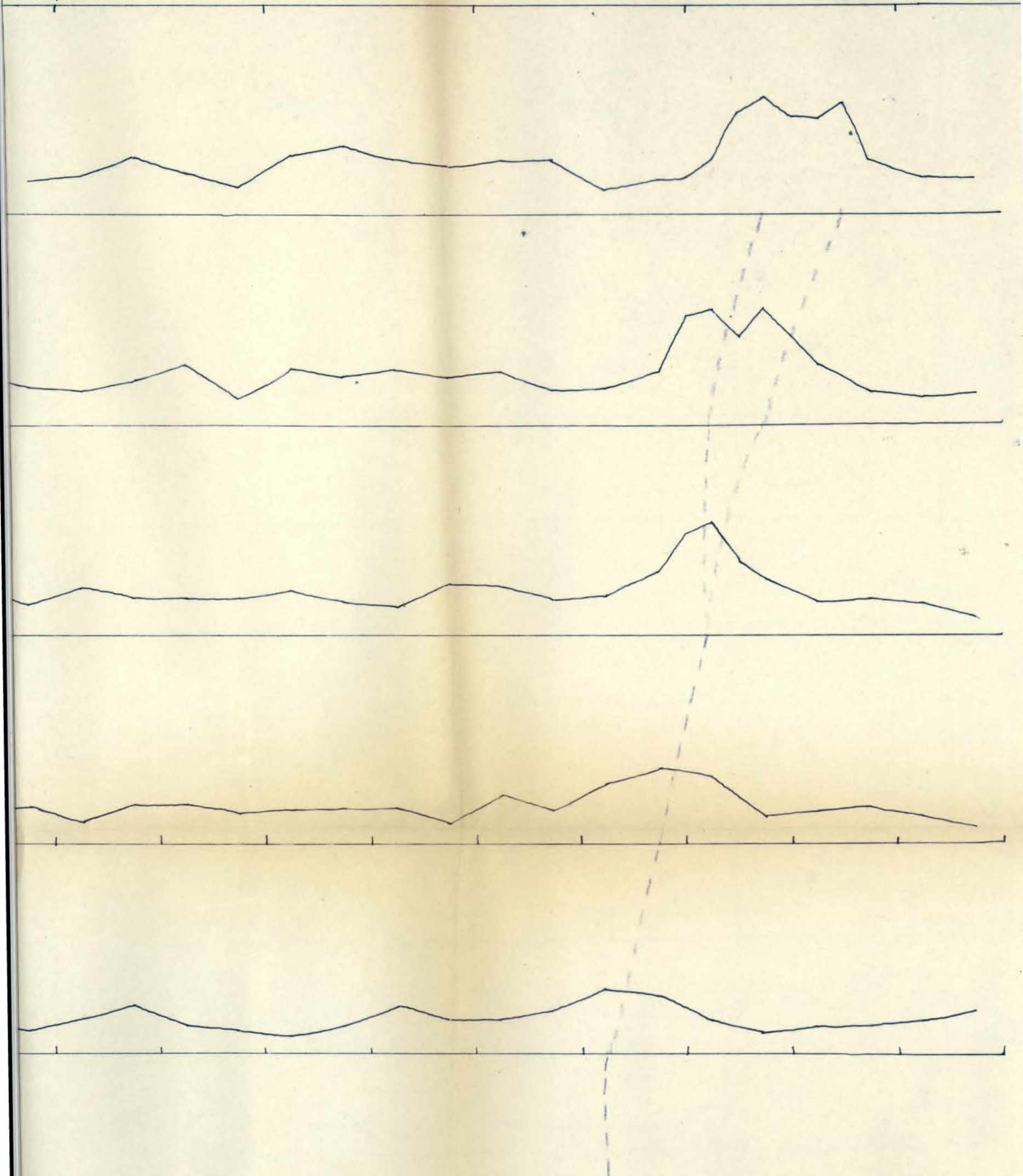
# GOLD PROSPECT FILES (SCHLUMBERGER CONFIGURATION)

BY  
N. SAHA  
PONDAGA  
&  
S. MITTI  
1974.

SCALE

0 50 100 150 200 FT.

 .... PIT WITH EXPOSED QUARTZ VEIN  
 .... INTERPRETED OUTLINE OF BURIED QUARTZ VEIN



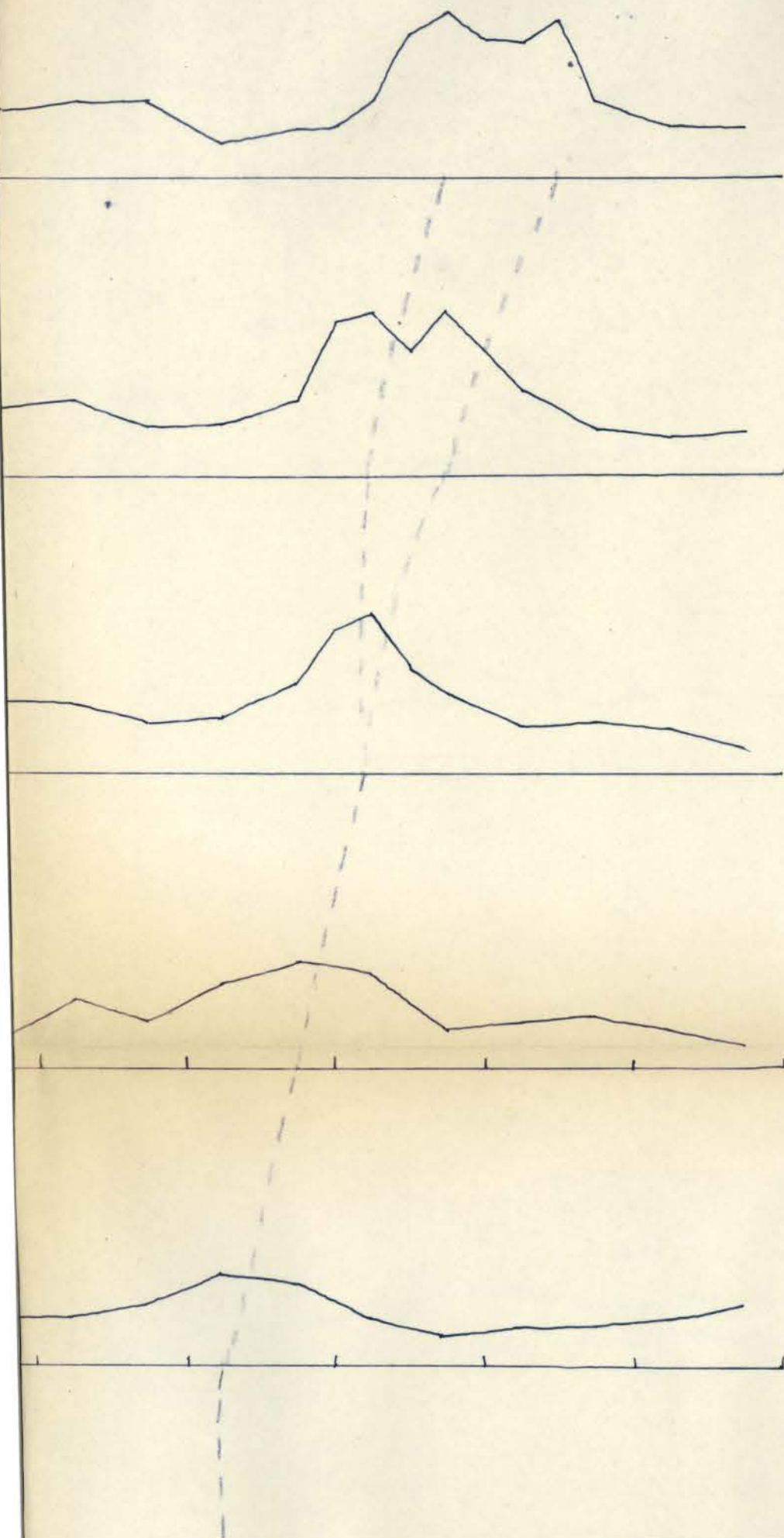


(URATION)

SCALE

100 150 200 FT.

..... PIT WITH EXPOSED QUARTZ VEIN  
--- INTERPRETED OUTLINE OF BURIED QUARTZ VEINS



100 OHM-FT.

0-13E

100 OHM FEET

0-12E

100 OHM-FT.

0-11E

100 OHM-FT.

APPARENT  
RESISTIVITY  
0-10E

100 OHM-FT.

0-9E

100 OHM-FT.



100 OHM-FT.

0-13E

100 OHM FEET

0-12E

100 OHM-FT.

0-11E

100 OHM-FT.

APPARENT  
RESISTIVITY  
0-10E

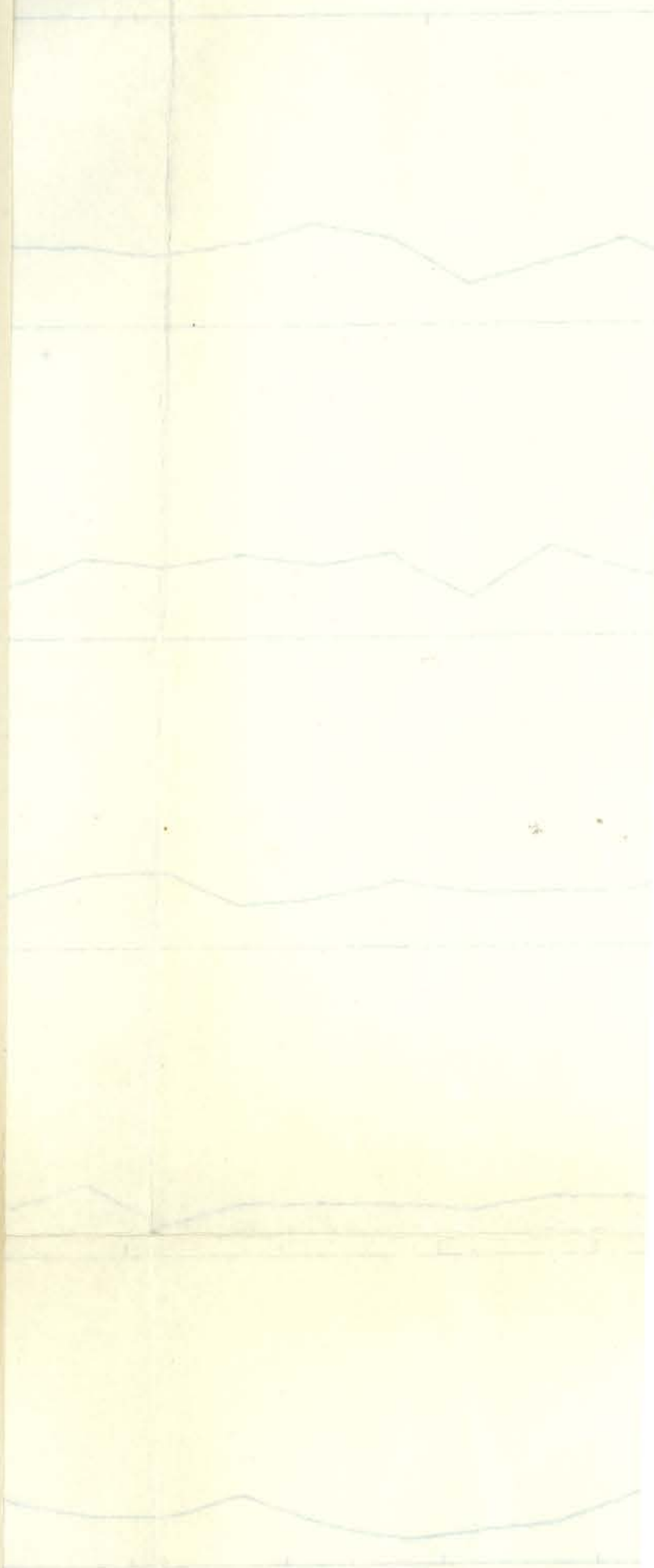
100 OHM-FT.

0-9E

100 OHM-FT.

PROSPECT  
SCHUMBERGER CORRELATION

0 50 100





GEOLOGY AND MINES DIVISION  
TANZANIA

RECEIVED

10 MAY 1974

PR/SECTION FOR AFRICA/OTC

RECEIVED IN RECORDS CONTROL

9 MAY 1974

ACTION TO:

1. MR. WATTS

2. Mr. Knowles 10/5/74

3. PUT AWAY

INITIALS *gt*

☐ BRING ON

DAY

TO:

QUARTERLY REPORT FOR THE PERIOD JANUARY TO MARCH, 1974

by

TE 432/21 TANZA (15)

S.N. SAHA, Geophysicist UN/OPAS

OFFICIAL CORRESPONDENCE

MUST BE RETURNED TO  
RECORDS CONTROL, ROOM 2074

CONTROL NO.  
5/121

Geology and Mines Division,  
P.O. Box 903,  
DODOMA, Tanzania



# QUARTERLY REPORT FOR THE PERIOD JANUARY TO MARCH, 1974

By

S.N. SAHA, Geophysicist UN/OPAS

## SUMMARY

During the period, processing of the geophysical and geochemical data collected at Kapalagulu was in progress. The report on the geological - geochemical study of the basic rocks in the West Lake Region was completed and submitted. A report stating the terms of reference of an aerial geophysical survey in the West Lake, Mara and Mwanza regions was submitted. A short magnetic and geochemical survey along road sections in the Ngara district of West Lake Region was completed. The magnetic survey was carried out to assess the suitability of the method in locating subsurface gabbroic and doleritic rocks of the Karagwe Ankolean system. The writer visited the drilling operation at Kapalagulu, and the gold prospects at Imweru, Biharamulo district, and Sekenke at Kiomboi district. The writer assessed the suitability of a geophysical survey in the gold prospects to locate and outline the gold bearing subsurface quartz veins. Finally, the writer proceeded with his party to Imweru to carry out a Resistivity survey.

## FIELD INVESTIGATIONS:

### (1) Kapalagulu Ni-Cu prospect:

Drilling operation is now in progress in the Kapalagulu prospect at the three proposed sites recommended by the writer. The writer visited the drilling party on 16 and 17 January, 1974. At the time of his visit the first proposed drill hole at Stn. 7.5 line 80S, was drilled upto 309 ft. Pyrrhotite and Pyrite mineralisation was found throughout the length, but a richer zone of sulphide (4 to 5 % visual) was particularly noticeable between 170 to 260 ft. along the length of the hole. Some Chalcopyrite and Bornite specks were visible among the sulphides. The rock type was generally picrite and serpentinite. Samples of the core (about 3 to 4 inches length of the split core) were collected approximately at every 10 ft. interval and sent for analysis of Ni, Cu and Co contents, in the Dodoma laboratory. A spectroscopic analysis was initially carried out to decide on the abundance of various elements. The core samples with higher values were then chemically assayed. The results showed that in the cores there were copper and nickel and their general higher values were 0.1 to 0.7 % of Cu and 0.1 to 0.6 % of Ni. The soil samples over the area showed values of the order of 2250 ppm of Ni and 500 ppm of Cu respectively. The obvious inference is that the nickel may have gone into the soil, being more altered. A log showing the spectroscopic and the assay values of Cu and Ni and the total sulphide content of the core samples along the hole is attached herewith.



During first week of March, the hole was completed (500 ft.) and the rest of the core samples were brought to Dodoma. Visually sulphides are present in these cores (beyond 300 ft.) but much less abundant. The cores are to be given for analysis for Ni and Cu contents, as before, at about every 10 ft. interval. The second hole at station 12 on line 90S in the azimuth  $240^{\circ}$  and inclination of  $45^{\circ}$  has been started. Assay at closer interval will be taken up if the results are encouraging.

The direction of the dip of the sulphide body as interpreted by geophysical observations was confirmed as far as the first hole is concerned. Better results are expected in the second hole where the soil values were Ni 2500 ppm and Cu 3500 ppm and the I.P. effect was found to be nearly 12 %.

(2) Magnetic Survey in Ngara District:

During last October's survey in the West Lake region no geophysical observations were taken to recognise the basic intrusives, if they are buried. During March, 1974, the writer along with Mr. Pondaga, carried out an experimental magnetic survey over some road sections crossing the anticlinal and synclinal folds of the K-A system in the Ngara district. Initial observations with a magnetometer over known gabbroic and doleritic exposures within the folds showed typical fluctuating character of the magnetic field. Several observations at 1 to 2 Km interval were taken over road sections crossing the Mwiruzi river basin, known to be an anticline, covered with lateritic soil. The results indicated generally smooth non-anomalous values except at a few places where short distance fluctuations were prominent. It is interpreted notwithstanding other possibilities, that these areas are most likely underlain by basic intrusive rocks. Soil samples collected on these areas on the lateritic soil did not indicate any anomalous Ni, Cu, or Co values. It is therefore recommended that some detailed magnetic observations may be made over such covered areas to locate subsurface ultrabasic rocks and then further investigations through drilling and assay of the cores, for Ni and Cu, could be carried out according to the planned UN project.

(3) Resistivity Survey for goldbearing buried quartz veins:

The writer paid a short visit to two gold prospects, one at Imweru, Biharamulo district and the other at Sekenke, in Kiomboi district. The Imweru gold occurs as hydrothermal deposit within the quartz veins which traverses the granites. The area is mostly covered by lateritic soil or duricrust and the quartz veins of 1 to 8 feet in thickness seem to be buried within this cover at depths, from surface to about 30 ft. It seemed possible that a resistivity contrast between the soil cover and the quartz veins should exist and a resistivity survey may be able to



delineate and outline the subsurface quartz veins. This will help in carrying out further drilling and trenching in the area on the basis of the outline. It was therefore recommended that a geophysical party carry out systematic resistivity survey in the area after initially assessing the resistivity contrast and the type of anomaly obtainable.

The gold occurrence at Sekenke is both hydrothermal as well as alluvial, and occurs in numerous quartz veins traversing the country rock of greenstone schist, diorite and quartzite. The river terraces show alluvial deposits. The area had been mined by several miners in the past. Since the country rock is very near to the surface, and the quartz veins are sometimes too thin or small, the possibility of obtaining a good resistivity contrast appeared remote and therefore geophysical work in the area was not recommended.

#### REPORTS:

During the period a report on the geological - geochemical study of the basic intrusive rocks in the Ngara, Biharamulo, and Karagwe districts, was submitted. The report on the magnetic survey in the same area is under preparation.

At the request of the Commissioner, Geology and Mines Division, the writer prepared a report stating the terms of reference for an aerial geophysical survey to be carried out in the West Lake, Mara and Mwanza regions. Airborne Electromagnetic Magnetic and Gamma Ray Spectrometric surveys are expected to be carried out with the financial aid from the Swedish International Development Authority. The writer recommended West Lake region as the first priority and suggested further surveys in two more areas if funds are available. These are the southwestern border districts of Tanzania following the Western rift zone from Kigoma to Lake Nyasa, and the Gregory rift zone north of Dodoma with related faults, upto the border of Kenya. The writer had a detailed discussion with Mr. Stig Regnell, Chief Engineer of SIDA, and had impressed upon him the importance of these surveys in respect of mineral geothermal power and groundwater interests.

#### PERSONNEL:

Mr. M.M. Pondaga, is the only counterpart geophysicist attached to the writer.

Mr. M. Budhani, geologist, had been away on leave from the field since September, 1973 and had not rejoined him.

During his discussion with Mr. Robertson, UN Technical Adviser, in September, 1973, the writer had strongly recommended Mr. Pondaga to take up a course in applied geophysics, as he has the required physics and mathematics background upto B.Sc. level. Some provision was therefore promised for a scholarship in geophysics under the proposed mineral survey project in western Tanzania. The proposed project is expected to start in January, 1975, with a pre project study from July, 1974. The



writer strongly recommends that some provision be made in the pre-project to grant a scholarship to Mr. Pondaga so that he can start from September, 1974 in a university at Canada, United States or India.

The proposal for the engagement of a Volunteer Electronic Technician had been submitted in May, 1973, but it appears to have got stuck somewhere on the way before being presented to the UNDP, Tanzania.

#### MOVEMENT:

The writer was away at Kapalagulu between 11 to 20 January, 1974. On February 15 he attended a meeting at the UNDP office at Dar es Salaam, and had a discussion with the Principal Secretary, Water Development, regarding the proposed aerial geophysical survey in the West Lake region. From 2 to 8 March he was away on an inspection visit to Imweru and Sekenke gold prospects and carried out an experimental magnetic survey in Ngara district. On 27 March he left Dodoma with his party to carry out a resistivity survey in the Imweru Gold prospect area, for the State Mining Corporation.

#### MISCELLANEOUS:

The writer is somewhat dissatisfied at the slow implementation of the proposals made by him, to organise and establish a well equipped and maintained geophysical section within the division.

The Volunteer Electronic Technician proposed in May last year has not yet been requested from the UNDP by the government. This technician has an important role to play. Instruments worth nearly 250,000 shillings, both purchased by UN as well as by the government, need be constantly serviced to get the maximum service from them. He will also help the writer in the fieldwork and maintenance of the equipment in the field. A dust free and well ventilated stores for the equipment was proposed two years back without much action so far. The office accommodation and associated facilities are not adequate to set up a section. The problem of accommodation has become more acute at the moment, with the declaration of Dodoma as the future capital of Tanzania, and consequent movement of several ministries to Dodoma.

#### FUTURE WORK:

The writer intends to study the cores of the three drill holes proposed at Kapalagulu and get them analysed for copper and nickel contents. It is hoped that by June, 1974, all the three holes will be completed and some analysis of the core samples will be available. If the results show promise of economic concentration of Ni and Cu over a broad area, some more drilling will be recommended. Further Geophysical survey will then be carried out to cover the unexplored south eastern part of the complex and some detailed observations will be taken over some selected areas to the north.



In the meantime, the writer intends to continue the resistivity survey in the Imweru area - provided the preliminary observations justify its continuance.



(S.N. Saha)

Geophysicist UN/OPAS

17th April, 1974

Encl: one diagram

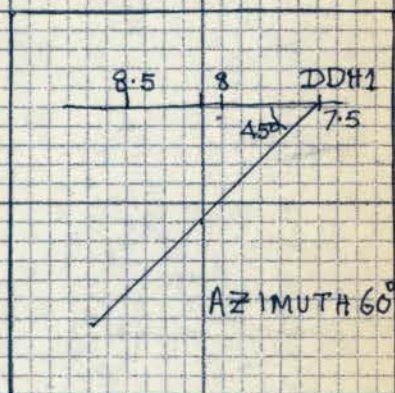


# KAPALAGULU CU-NI PROSPECT

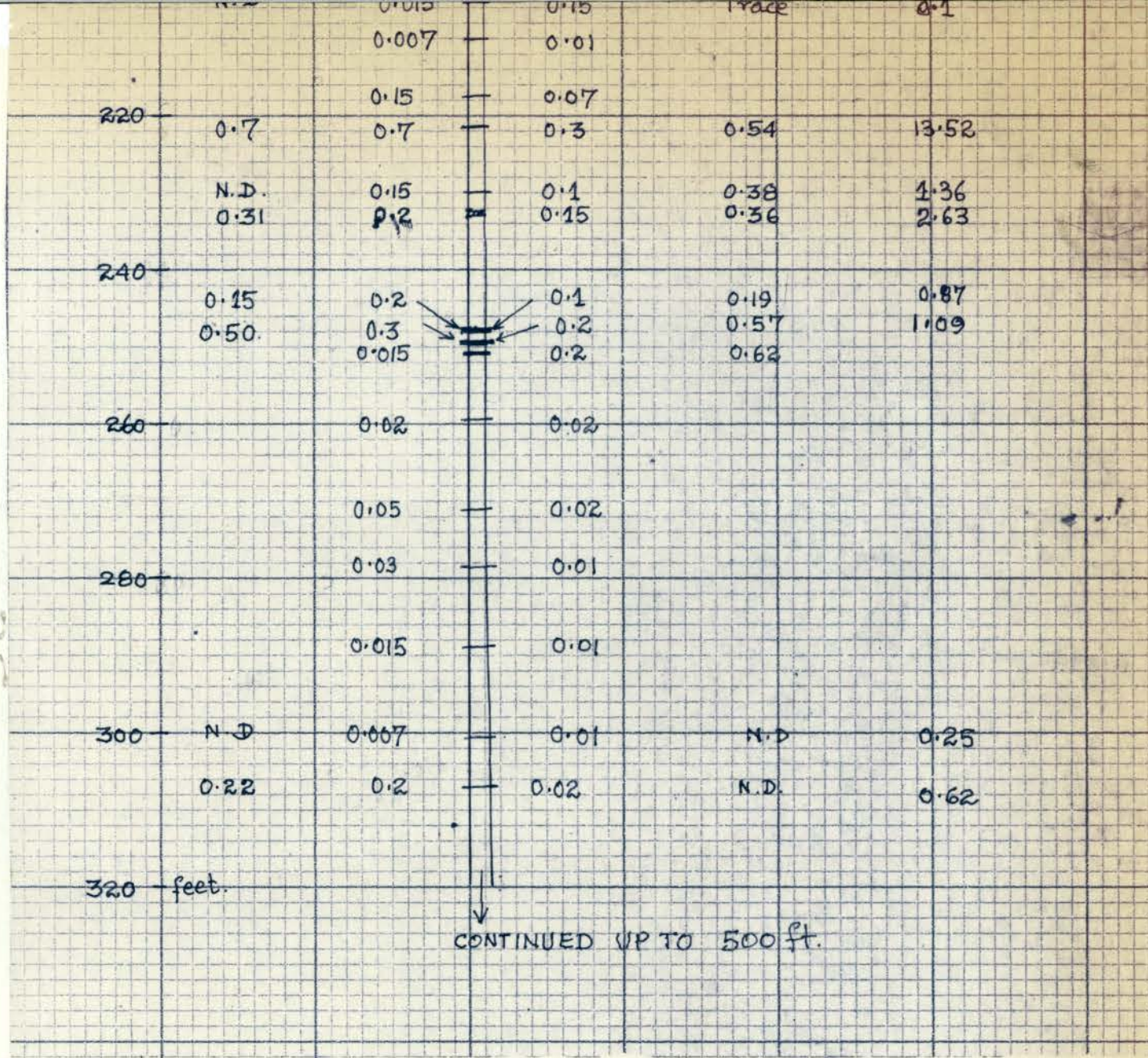
BORE HOLE LOG

LOCATION STN. 7.5 LINE 80S

DEPTH 0	COPPER % ASSAY	DDH1 SPECT.	NICKEL % SPECT.	NICKEL % ASSAY	SULPHIDE %
20					
40					
60	N.D.	0.015	0.1	TRACE	0.06
80		0.007	0.01		
100		0.05	0.05		
120					
140					
160	N.D.	0.15	0.1	0.26	5.26
180	0.45	0.015 1.00	0.03 0.2	0.49	2.72
200	0.17	0.5	0.07	N.D.	0.57
		0.15	0.07		
	N.D.	0.015	0.15		









SECTION FOR AFRICA

16 JAN 1974

RECORDS CONTROL

JAN 17 1974

H. Al. Fatail / Miss Kirof  
16/1/74

TE 438/21  
TANZAC(15)

PROGRESS REPORT FOR THE QUARTER ~~OCTOBER~~ TO DECEMBER 1973

By

S. N. Saha ,  
Geophysicist UN/OPAS

Mineral Resources Division,  
P.O.Box 903,  
Dodoma,  
Tanzania.



## PROGRESS REPORT FOR THE QUARTER OCTOBER TO DECEMBER 1973

By

S.N. Saha , Geophysicist UN/OPAS  
Mineral Resources Division, Dodoma,  
Tanzania.

### General

During the three month period, the writer completed his field investigations at the Kapalagulu Basic Complex on 4 November 1973 and returned to headquarter on the 10th. Between 9 to 23 October the writer, together with Mr. A. Brants of the State Mining Corporation, completed a preliminary geological and geochemical investigations of the basic igneous rocks of the Bukoba region in connection with a proposed UN mineral survey in the area. Drilling is being continued over the recommended boreholes in the Kapalagulu area.

The writer was on leave from 16 to 30 November 1973 and was away to India for a short visit. At headquarters, for the rest of the period, the writer was busy in writing reports and preparing the basemaps of the Kapalagulu survey area.

### Filed Investigations

At the Kapalagulu Complex area, I.P., S.P., E.M., Resistivity, and Magnetic Surveys were carried out on line 132S along which some old bore holes are known to have been sunk in 1951. The results of the old boreholes were encouraging and hence some geophysical data were collected and some soil samples were taken over the line. The present geophysical data showed a well mineralised ~~body~~ sulphide body which appeared to be dipping westwards. There is excellent corroboration of the E.M., S.P., and I.P. data at the anomalous point. The I.P. values showed larger I.P. effects (F.E. 17%) at greater depths, and seem to be dipping westwards. The mineralised body seems to be located at the region of contact between the picrite and the granite. The results of the soil samples analysis over the line are not yet available. According to the results obtained, the old boreholes were slightly out of this anomalous zone and therefore, a deep vertical hole at station -4 on line 132S, was recommended to intersect the anomaly. The I.P. anomaly suggests higher concentration of sulphide mineralisation at the place.

In addition routine Electromagnetic, Magnetic measurements and soil sampling were carried out to cover the complex between lines 110S to 185S, and a little eastwards.

During the period of 9 to 23 October 1973, the writer together with Mr. A. Brants of the State Mining Corporation, carried out Geological and Geochemical studies



of the gabbroic or doleritic rocks exposed in the Ngara, Biharamulo, and Karagwe districts. Rocks and soil samples in these areas were collected and their geological settings were studied. The samples have now been submitted to the Dodoma Laboratory for analysis of their Ni, Cu and Co contents, and the exact identification of the rock types. 38 Soil and 24 rock samples have been collected from 19 localities. The results are being processed in the form of a report as a preproject study of a proposed UN mineral survey project.

at Kapalagulu.

The writer cited ~~three~~ locations for drill holes. They are at:

- i) Station 7.5, line 80S, azimuth  $60^{\circ}$ , inclination  $45^{\circ}$ ,
- ii) Station 12, line 90S, azimuth  $240^{\circ}$ , inclination  $45^{\circ}$ ,
- & iii) Station -4, line 132S, ~~azimuth~~ vertical.

The holes are expected to be around 600 to 800 ft. in length.

#### Movement

~~Movement~~ The camp was closed on 4 November 1973 and the party returned to headquarter on 10th. The writer was away from the camp from 9 to 23 October to carry out the survey in the Bukoba region. On arriving at headquarter, he left Tanzania for India, on leave, from 16 to 30 November 1973, to attend to some urgent family matters. Mr. W. Mahanga, Acting ~~Principal Geological Survey officer~~ <sup>Senior Geologist</sup>, visited the Kapalagulu Camp on 20 October during the writer's absence.

#### Miscellaneous

At headquarter, the base maps of the E.M., Magnetic, and soil sample surveys are being prepared. The analysed data of the soil samples are not yet available. The report on the survey in the Bukoba region is nearing completion.

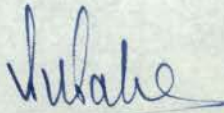
The drilling at Kapalagulu is reported to have completed only 265 feet of the first hole so far. The progress seems to be slow and all the ~~three~~ holes need be completed to make a proper assessment of the mineralisation.

#### Future work

The drilling at Kapalagulu should continue on the three bore holes suggested. Future work at that place should be dependant on the results of the drilling.

#### Statistics of Field Measurements

Methods Used	No. of Stations covered	Approx. line feet covered.
I.P.	<del>2000</del>	6,600
E.M.	300	40,000
Magnetic	440	22,000
S.P.	100	7,100
Resistivity	45	2,200
Soil Sampling	1176	116,000
Survey work	—	208,000

  
 ( S.N. Saha )  
 4 January 1974



OFFICE OF TECHNICAL SERVICES

I. Experts' Reports: Referral to Substantive Offices

Date: 23 Oct. 1973

To: the Substantive Office: Mr. H. Brand, Chief  
Geology & Mining Section

File No.: TE 432/21  
TANZA(15)

Through: (Area Section Chief)

From: Yuri Polnikov, Deputy Chief  
PRS/AB/OTC

Subject: Request for Comments

Please find attached the following Progress Report No. July - Sept. 1973  
Outline of Final Report\*/ letter / memorandum:

Name of expert: S.N. Saha

Field: Geophysicist

Country: Tanzania

Date:

I should appreciate your action on the attachment as indicated below, before

1 Nov. 1973

(date)

II. Experts' Reports: Action by the Substantive Office

From the Substantive Office: RTD

1.        A memorandum giving substantive comments on the above is attached (3 copies) for transmittal to the field as appropriate.
2.        A letter addressed to the expert is attached for clearance and return (2 copies included for the Area Section)
3. Indicate disposal of comments from the Regional Secretariat:
  - a. Endorsed for transmittal to the expert
  - b. Consolidated with Headquarters comments
4. Indicate whether the expert fulfilled the requirements with respect to:
  - X a. Carrying out responsibilities outlined in his job description
  - X b. Training counterparts
  - c. Other (indicate) .....

*Mr Saha continues to function very effectively in his post. Mr Robertson reports very favourably on Mr Saha's activities. We are quite impressed with the economic potential of the Kapulagulu prospect.*

Signed: F.A. Seward

F.A. Seward, Technical Adv.

Date: 30 Oct 73

\* A different form is used for comments on Final Report.

cleared: Edward Kallian, Officer-in-Charge  
Geology and Mining Section, RTD

3,000 - June 1973



23 OCT 1973  
SECTION FOR AFRICA, P.R.  
Mr. Polnikov 23/X/73

PROGRESS REPORT FOR THE QUARTER JULY TO SEPTEMBER 1973

By

S.N. Saha,  
Geophysicist UN/OPAS

( With Four Plates)

Mineral Resources Division,  
Dodoma,  
Tanzania.



## PROGRESS REPORT FOR THE QUARTER **JULY** TO SEPTEMBER 1973

By  
S.N. Saha,  
Geophysicist UN/OPAS  
Tanzania.

(with ~~three plates~~) Four Plates)

### General

During the period most of the activities of the writer were in the field at the Kapalagulu Basic Complex in the Kungwe Bay area of Lake Tanganyika. The writer left Dodoma on 2 July 1973 for the camp and throughout the period supervised the Geophysical, Geochemical and Geological work at the Complex south of Mugambazi river. Mr. A. Brants from the State Mining Corporation visited the area and surveyed the geology between 21 August to 10 September 1973. Drilling was recommended in a few geochemical and geophysical anomaly zones and Mr. O. Kaku, Drilling Foreman arrived at the camp on 12 September 1973 to start the drilling. Drilling could not be started as yet -as the equipment have not yet arrived from its last destination and some avoidable delay. During 21 to 26 September the writer was at Dar Es Salaam for consultations with the UN Technical adviser, Mr. D.P. Robertson and the Commissioner. He spent 27 and 28 at Dodoma and reached camp at Mpanda on 30th.

### Field investigations

The roads and the bridges to the main camp at Mugambazi being complete, the camp was shifted there on 5 July and work was started from 11 July 1973. The Survey lines of 1972 were partly resurveyed south of Mugambazi river to check some points. The layout of the survey lines with respect to the geology is shown in the plate 1. Actually the survey lines are straight but the geological map is slightly in error. Some geochemical and geophysical results obtained during 1972 were resampled and repeated. Measurements were made from 45S southwards along the cross lines 500 ft. apart, upto line 185S, to cover the basal layer of the ultrabasic complex. Electromagnetic (Turam), Magnetic, and soil sampling operations were mainly carried out over these cross lines. Intense and detailed observations by E.M., Magnetic, Resistivity, S.P. and Induced polarisation methods, together with geochemical sampling and geology were carried out over a small area between lines 80S to 95S, to check the correlations of the various anomalies obtained on these lines and pinpoint drill hole locations.

### Results

The results obtained so far through last years and this year's work, indicated strong, linearly disposed geochemical anomalies in the soil, of the order of upto 2500ppm of Cu and Ni, throughout a length of about 4 miles along the approximate position of the basal layer of the complex. So far the results indicate that the Soil Nickel and Copper highs follow the basal bronzite-picrite zone consistently from Line 101N to 95S. The Electromagnetic anomalies followed closely these highs particularly in the southern part of Mugambazi river. Data, south of line 95S are not yet available for interpretation.

The results over a small area covered by 4 parallel cross lines, 500ft. apart, from 80S to 95S are shown in the three enclosed plates. These indicate samples of the anomalies obtained over the area. The Plate 2 shows the plan of the lines and the geochemical contours and the location of the EM conductors. The Plates 3 and 4, cross sections of lines 80S and 90S with the geochemical, geophysical and geological data.



Both the plan and the cross sections show the excellent correlations of the geochemical and geophysical anomalies and the geology, and indicate areas of sulphide mineralisation containing Ni and copper concentration. The mineralisation is mainly situated within the picrite zone adjacent to the granite. The main indications are:

#### I.P.:-

Plates 3 and 4 show the I.P. cross sections along lines 80S and 90S respectively. The cross sections delineate a zone of coincident low apparent resistivity, high metal conduction factor and percent frequency effect, correlating extremely well with the soil Cu and Ni highs. The Percentage Frequency Effect was found to be as much as 12%, indicating possible high percentage of metallic mineral dissemination. The order and magnitude of the soil Copper and Nickel ~~values~~ anomalies appear to vary sympathetically with that of the Metal conduction factors and Percentage frequency effects. This probably suggests a close relationship of <sup>disseminated</sup> sulphide mineralisation with the Ni and Cu contents.

It may also be noted that whereas the I.P. apparent resistivity data indicate a dip towards east, of its low values, on line 90S, it shows a westerly or subvertical dip on line 80S. The I.P. anomalies appear to be prominent around stations 9 to 12.

#### E.M.(Turam):-

The E.M. conductors seem to coincide well with the soil Ni and Cu highs both in the plan (plate 2) and in the cross sections. The anomalies are around Stn 9 to 10 on line 80S and between Stns. 6 to 10 on line 90S. This suggests that there are several bands of metallic sulphides associated with the disseminated mineralisation.

#### S.P.:-

The S.P. anomalies indicated zones of possible banded or massive sulphides quite well through peak negative potentials of moderate nature. The anomalies are quite apparent at Station 10 on line 80S and 90S but they do not seem to be continuous on adjacent lines. This probably indicates pinching out of the bands and disseminations in between. The S.P. anomalies are coincident with the E.M. and Geochemical anomalies.

#### Resistivity (D.C.) :-

D.C. resistivity observations with transverse spread were made over line 80S. The results indicate a clear zone of low resistivity at the station 9-10 at the E.M. and I.P. anomaly points. This also indicates the faint westerly dip of the conductor.

#### Magnetic :-

The vertical magnetic intensity on both the sections appear to be non indicative, due to the presence of magnetite within the rock. The fluctuating character of the magnetic anomalies demarcates the picrite zone from the granites, where, the readings are relatively stable. The strong, high frequency magnetic anomalies are caused by magnetite or dolerite bands or dykes.

#### Geochemistry:-

The soil samples analysed colorimetrically for trace Ni and Cu contents showed a clear zone of high values and are coincident with the geophysical anomalies and situated mainly in the picrite zone adjacent to the granite. The maximum value of Ni is 2250ppm and that of copper, 3500ppm. The threshold values are respectively 200 and 110 ppm. The three peaks of Cu values on line 90S is well corroborated with a number of E.M. conductors between stations 6 and 10. The single peak at Station 9.8 is also well correlated with the E.M. anomalies, <sup>on line 80S.</sup>

#### Geology :-

The geology as shown in plate 1 is assumed correct as far as the



the rock types are concerned. The basal picrite layer (Bronzite Picrite) seems to bear the maximum mineralisation and have been supported by the geophysical and geochemical anomalies. The structure however, has been differently interpreted by Mr. A. Brants of the State Mining Corporation. He postulated an anticlinal fold of Bukoban age, the core of which forms the basic complex. This is overlain by <sup>post Bukoban</sup> granite, quartzite and shales of the Bukoban age in succession. The geology shown on line 80S shows the structure with the change in the direction of the dips on either side of the creek around station 8.

In fact the I.P. and Resistivity data on both the lines seem to indicate that the conducting horizon (mineralised) has a dip westwards on line 80S and eastwards on line 90S. This is only possible if mineralisation along both the limbs of an anticline is postulated.

#### Drilling:-

Drilling has been proposed at Station 7.5 on line 80S in the azimuth  $N60^{\circ}E$  at an angle of  $45^{\circ}$  below the horizontal to intersect the westward dipping anomalous conductor at Station 10. Another drill hole is being considered around Stn. 12 on line 90S in the direction  $N240^{\circ}E$  and  $45^{\circ}$  inclination to intersect the eastward dipping conductors between stations 6 to 10. The depth to the top of the conductors was difficult to interpret as the E.M. anomalies appear to have been caused by two or more parallel bands of sulphide. However, the thickness of the overburden is known to be around 60 to 80 ft. or less. The assay values of the core samples for Ni and Cu content will determine the economic prospect of the deposit.

#### Future work

If the assay values of the drill cores proves economic, further geophysical and geochemical surveys should be carried out to delineate zones of richer concentration. I.P., E.M. and Geo-chemical soil sampling should be main methods used. The combination of the three methods would ~~exactly~~ single out areas of i) higher disseminated sulphide concentration, ii) possible banded or massive sulphide bodies, and iii) areas of higher concentration of Ni and Cu in the soil. Judicious selection of an area where the combination is positive should determine the best area of exploitation. If the assay values are not economic, the area need not be surveyed further.

#### Results of past and present drilling

The whole length of the complex was drilled in the past in 1951-53 by the International Nickel Company at approximately half mile interval on the basis of geological information only. The results indicated both disseminated and banded pyrrhotite with Ni and Cu. The average percentage of Ni and Cu was found to be 0.27% and 0.13% respectively mainly on the disseminated zone. Wherever massive bands were encountered, percentage as high as 2 to 3% of Ni and Cu were found. In most places however, in the light of the present day data- drilling was carried out either in the wrong direction or at wrong places. Therefore, their result cannot be considered as representative.

Recently, during the past three months, the Russian Geological Mission, drilled three vertical holes in the far eastern side of the complex NE of the Kamatandala Settlement (see Plate 1). The location of the holes were based on high soil geochemical values (Cu = 5000ppm and Ni = 1500ppm) obtained in that area by Western Rift Company in 1960. Even though the assay results are not yet known the following findings are recorded through verbal communication.



The first 20 metres is the oxidised zone composed of Malachite and oxidised sulphide (pyrrhotite) containing nearly 1.5% of Cu and similar amount of Ni. These were also found in the trench samples.

Around a depth of 50 metres, a 10-15 metres thick horizontal mineralised zone was encountered, which contained a visual estimate of about 1 to 1.5% of Chalcopyrite within a sulphide content of about 5%, mainly pyrrhotite. The Ni could not be estimated visually.

Around the depth of 100 metres, a second 10 metres thick sulphide rich zone was encountered. Cores are yet to be analysed.

Some patches of sulphide were found disseminated around the depth of 70 metres. The zones are horizontal and the mineralised crystals are isometric.

### Movement

The writer left Dodoma for the field on 2 July 1973. He returned to Dodoma on 7 August for consultations. The writer returned to the field on 17th August after arranging a drilling operation at the complex. Mr. Omari Kaku, Drilling Foreman arrived on 12 September at the camp. The equipment however is yet to arrive. The writer left camp on 18 September again for Dar Es Salaam to confer with the Commissioner, Mr. D.P. Robertson, and Mr. Kimambo, general Manager of the State Mining Corporation, on the issue of drafting a proposed UN mineral survey project for exploration of Copper and Nickel. The writer stayed at Dodoma on 27 and 28, and after necessary arrangements, left for camp on 29 September 1973. He was on leave on 10 August 1973.

Mr. A. Brants, Geologist, from the State Mining Corporation arrived at Kapalagulu camp on 21 August and stayed till 10 September to carry out reconnaissance and detailed geological study of the area. He left on 10 September.

Mr. M.J. Budhani, Counterpart Geologist, injured his eye during field work and left camp on 9 August 1973 and returned on 21 August after treatment. As he was not well even afterwards, he again left the camp on 10 September, and is on leave on medical ground since.

Mr. M.M. Pondaga, Counterpart Geologist, remained in the field throughout the period. Mr. M. Ngondiya left for Dodoma on 6 August and returned on 16 August. He assisted the writer to bring the gravimeter and arrange other equipment.

### Instruments

The gravimeter was brought from Dodoma on 16/8/73 and is expected to be tried in the Kapalagulu area for possible indication. The I.P. instrument was field tested and was found in order. A few lines have been successfully surveyed by the instrument.

### Health

The health of the personnel in the camp were generally good except for the general weakness among the labourers due to malnutrition & ~~and malaria and heat exhaustion~~. Mr. M.J. Budhani suffered an eye injury due to broken glass and was away from the camp for a long time. Lack of salt in the body caused several cases of hallucination among the workers.

### Miscellaneous

The subject matter of discussion at Dar Es Salaam during September with Mr. Robertson, the Commissioner, and the General Manager, State Mining Corporation, was mainly the drafting of a proposed UN Mineral Survey project for Nickel and Copper near the border of Burundi, and a pre-project study for its feasibility and size.



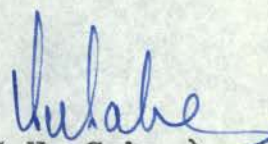
It is proposed that the writer and Mr. A. Brants of the State Mining Corporation would collect soil and rock samples from specified ultrabasic rocks in the proposed project area and get them analysed for their Ni and Cu contents. The geological environment of these rocks are also expected to be studied. This work is expected to be carried out in October.

Since the geological situation of the Ultrabasics found in Burundi, containing high percentage of Nickel, is similar to that in Kapalagulu, and part of the western part of Tanzania, it is most probable that the result at Kapalagulu Complex will have a direct bearing on finding Ni and Cu in the proposed UN Project area in Tanzania, adjoining Burundi. The geological situation in Burundi is continued along the north western border of Tanzania in the rocks of Karagwe-Ankolean and Bukoban system.

### Statistics

During July to September the following work was completed in the Field.

<del>No. of</del> Resistivity obsns - - -	34	"	2,000	line feet.
No. of E.M. observations.....	2000	covering	99,000	line feet.
No. of Magnetic Observations.....	3277	"	155,000	" "
No. of S.P. Observations.....	431	"	21000	" "
No. of I.P. observations.....	144	"	12,000	" "
Stations sampled for soil .....	642	"	36,000	" "
Levelling .....			11,600	" "
Line Cutting.....			157,000	" "
Road making.....			3 miles	
No. of square miles surveyed.....			2.62	Sq. miles.
Total man months utilised.....			10	

  
 ( S.N. Saha )  
 7 October 1973

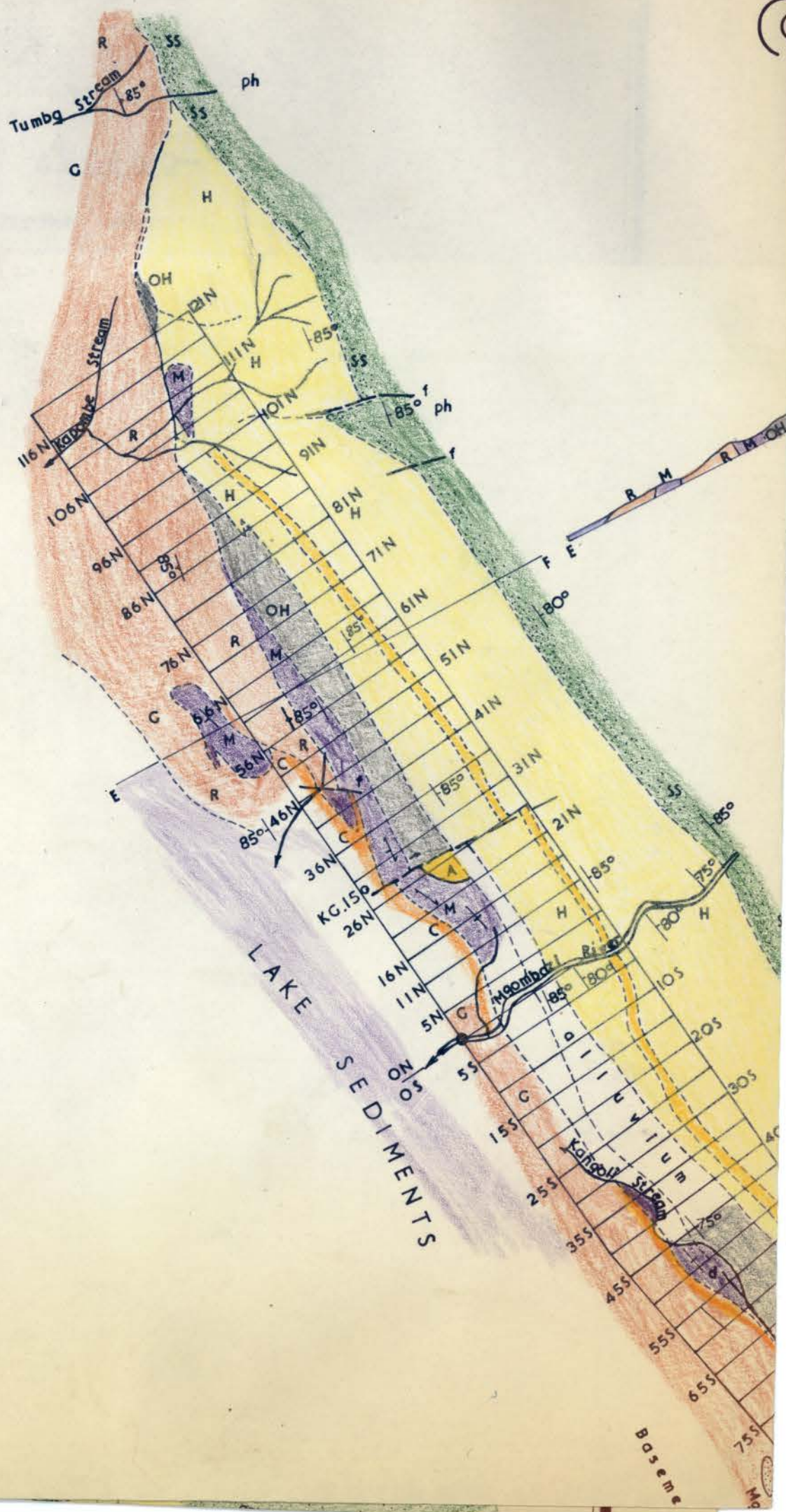
The following plates are included:

- Plate 1 ... Geophysical Survey Layout on Kapalagulu Basic Complex.
- Plate 2..... Comparison of Soil Nickel and Copper Anomalies with E.M. Conductors (Plan).
- Plate 3..... Geophysical, Geochemical and Geological Cross Sections Along Line 80S, Kapalagulu Basic Complex, Lake Tanganyika Area, Tanzania.
- Plate 4..... Geophysical, Geochemical and Geological Cross Sections Along Line 90S, Kapalagulu Basic Complex, Lake Tanganyika Area, Tanzania.



# GEOPHYSICAL SURVEY

By: S

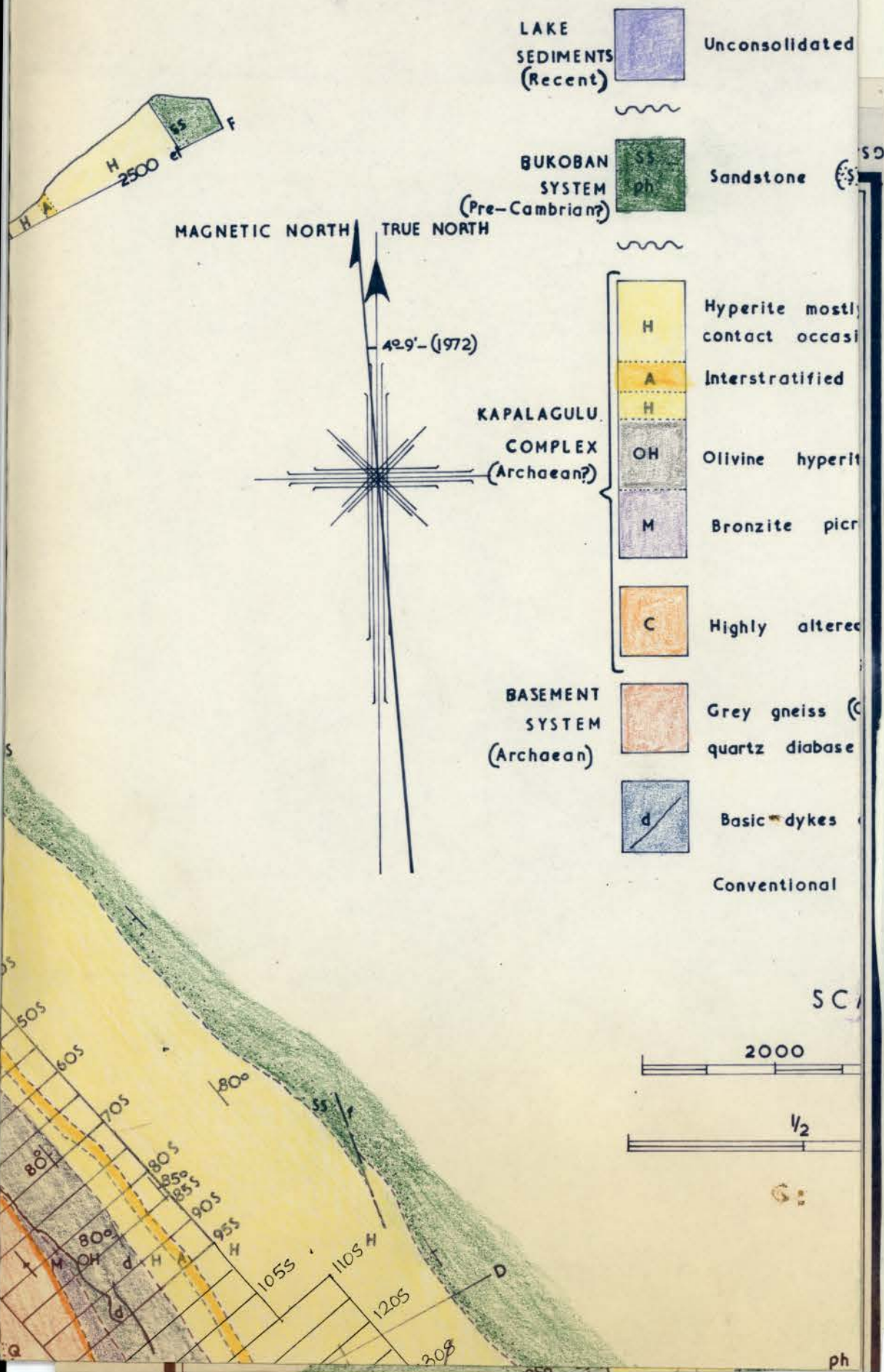




# LAYOUT ON KAPALAGULU BA

N.Saha, B.A.Mcharo & A.P. Shah

Geology by Collin Van Zyl





# SIC COMPLEX.

PLATE 1

## —LEGEND—

clay-rich sediments.

and phyllite (ph)

, also norite and gabbro Near upper  
onal quartz gabbro and granodiorite: (H)

band of anorthosite (A) towards base of Zone

Main Zone

e predominant.....Intermediate Zone

te and similar ultramafic rocks.....Basal Zone

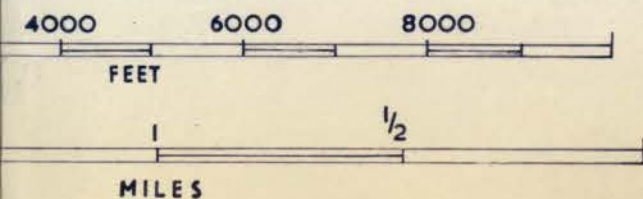
rocks, mostly gabbroid.....Lower Contact Zone

, red gneiss (R), trondhjemite (T), quartzite (Q),  
(D), amphibolite (Am) and ironstone (I),

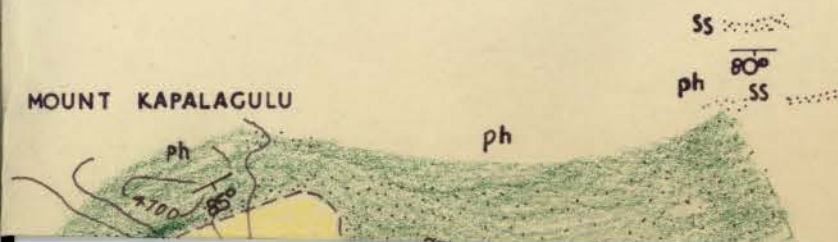
and sills intruding Kapalagulu Complex.

signs used for streams, dips, strikes, faults etc.

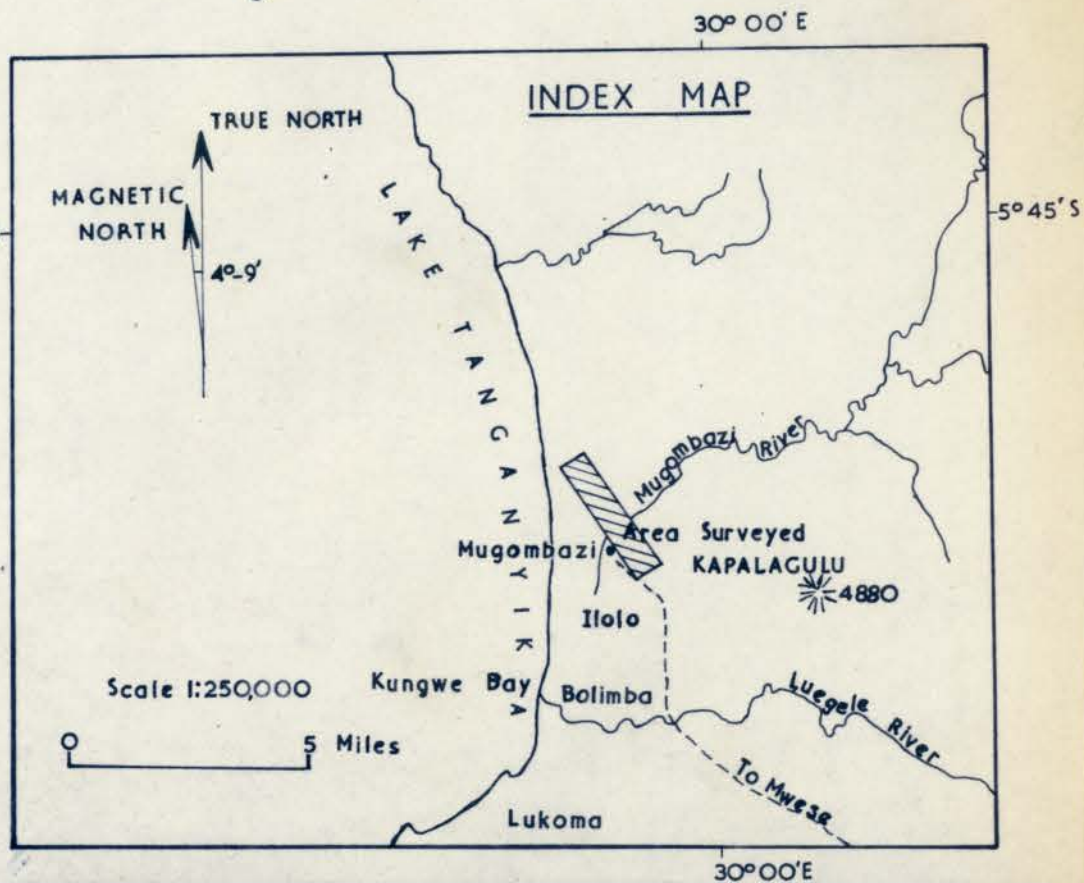
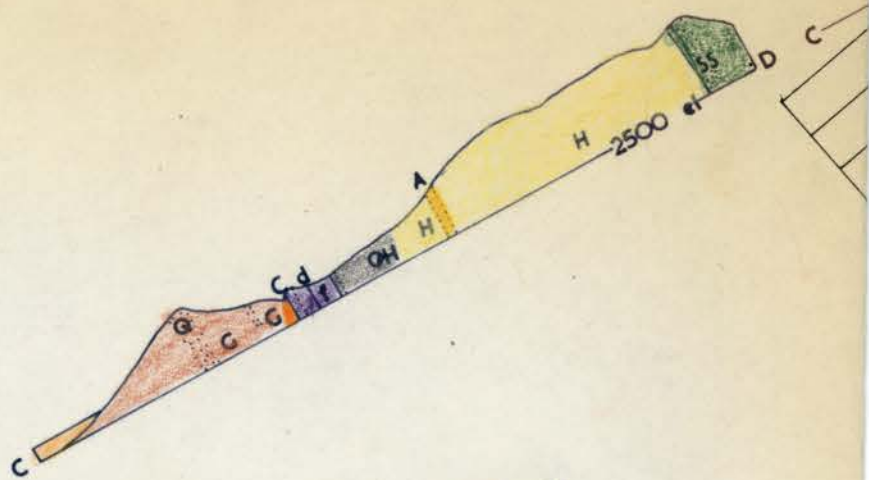
SCALE 1:25,000



MOUNT KAPALAGULU

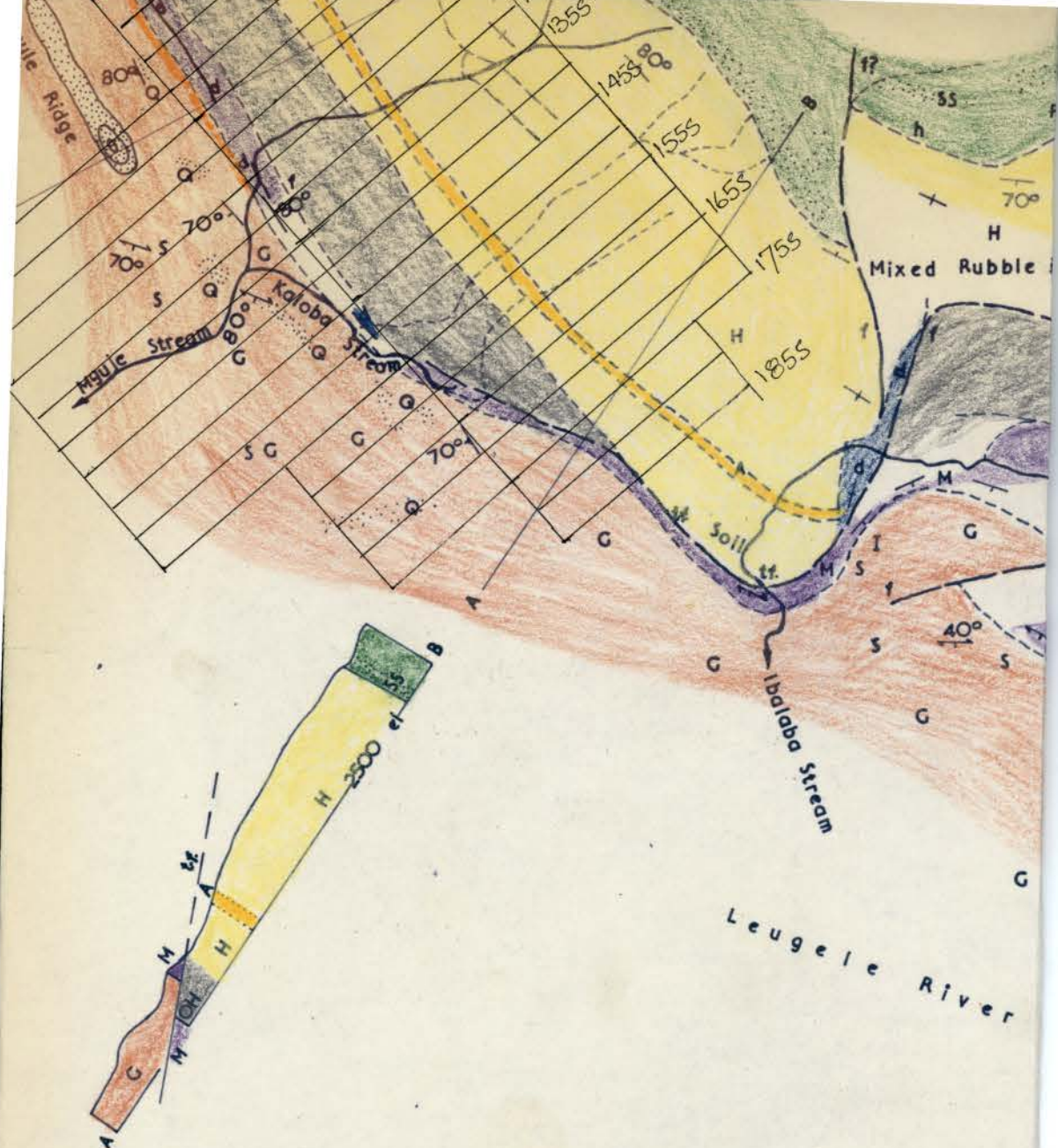




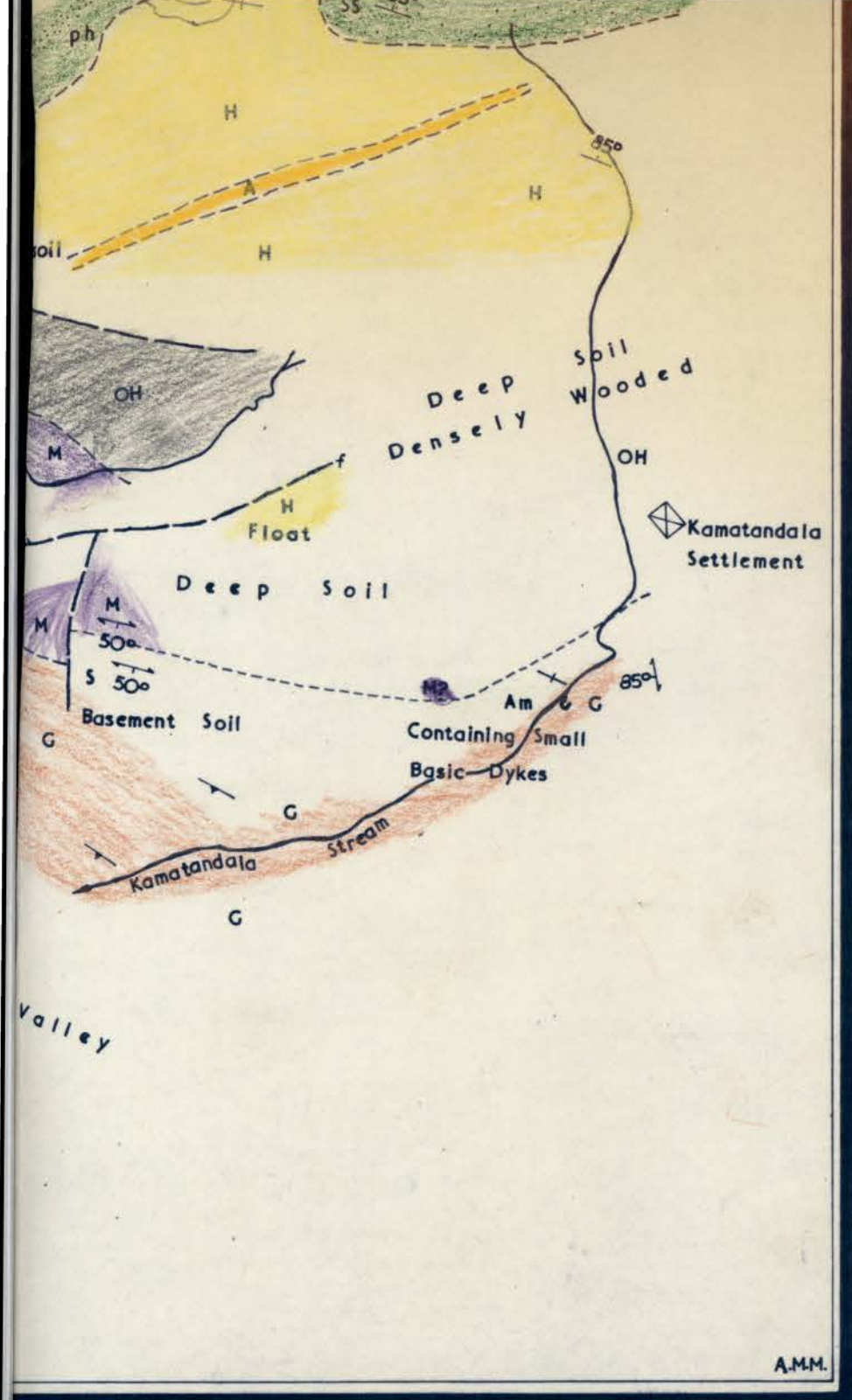


GS. 2279









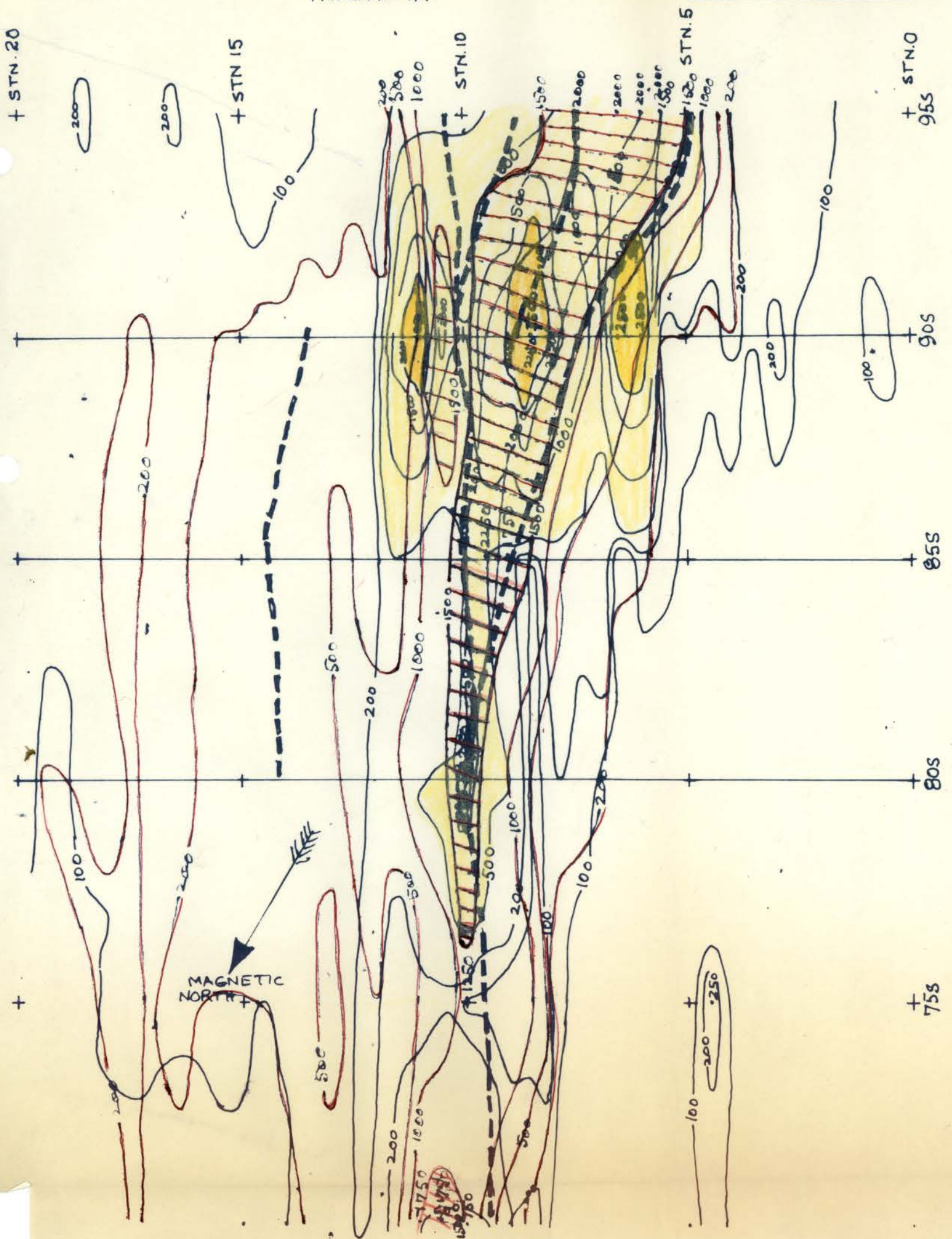
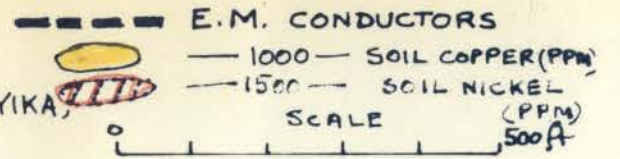
Mineral Resources Division Dodoma, 1972.



COMPARISON OF SOIL NICKEL & COPPER ANOMALIES WITH E.M. CONDUCTORS  
(PLAN)

BY S. N. SAHA

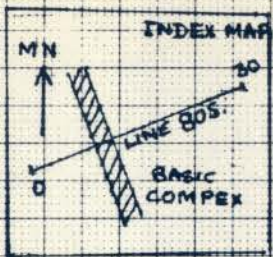
KAPALAGULU BASIC COMPLEX, LAKE TANGANYIKA,  
TANZANIA.





GEOPHYSICAL, GEOCHEMICAL & GEOLOGICAL  
KAPALAGULU BASIC COMPLEX  
LAKE TANGANYIKA AREA, T

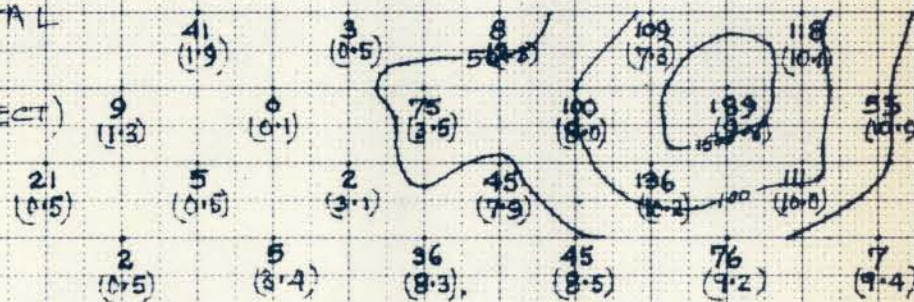
BY  
S. N. SAHA  
SEPT. 1973



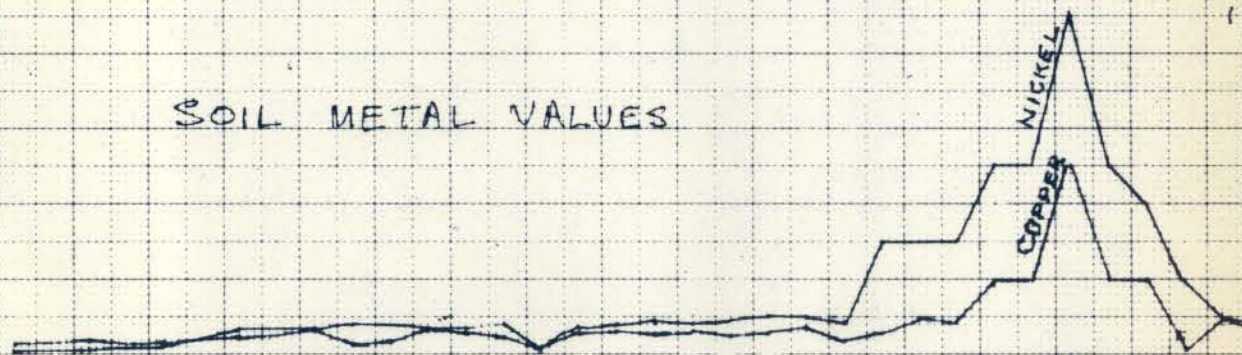
APPARENT RESISTIVITY



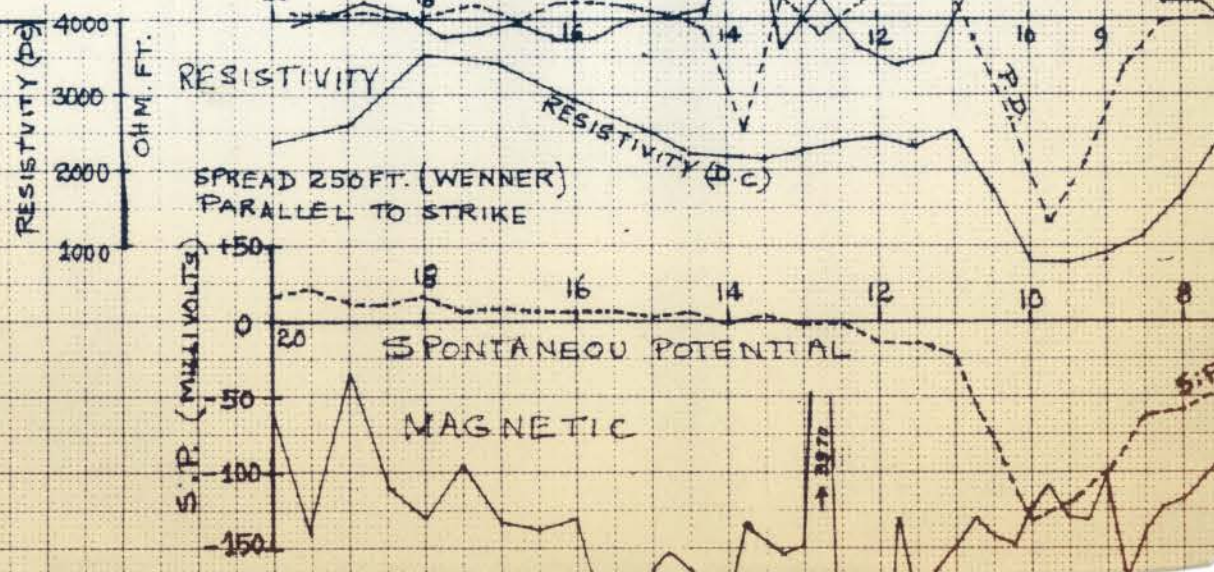
I.P  
APPARENT METAL  
FACTOR  
(FREQUENCY EFFECT)



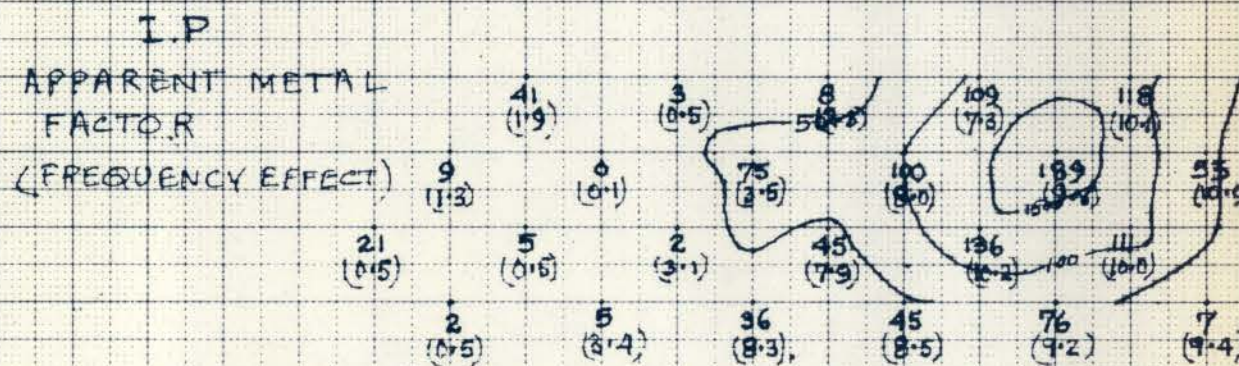
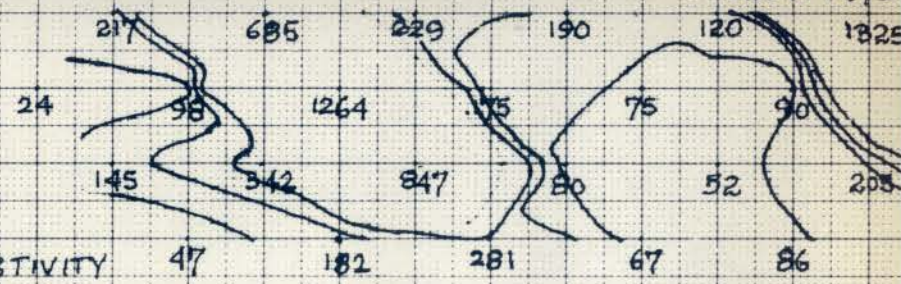
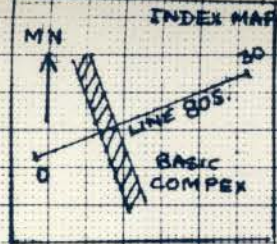
SOIL METAL VALUES



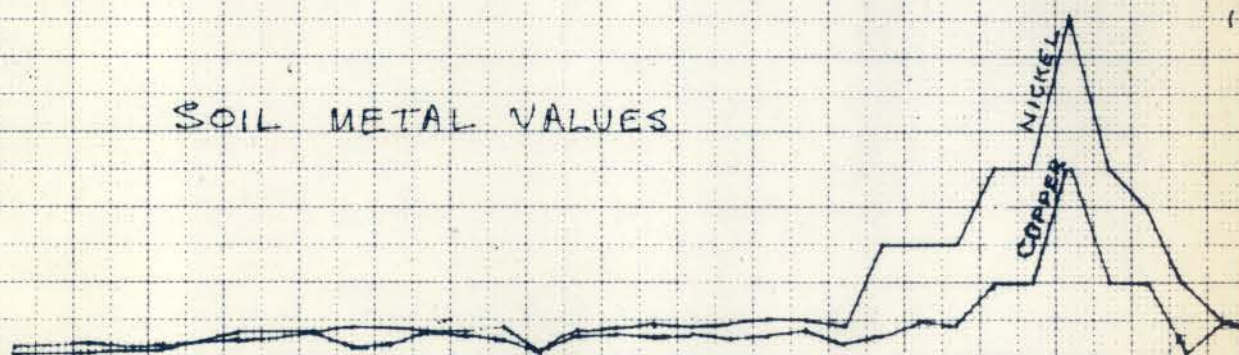
ELECTROMAGNETIC



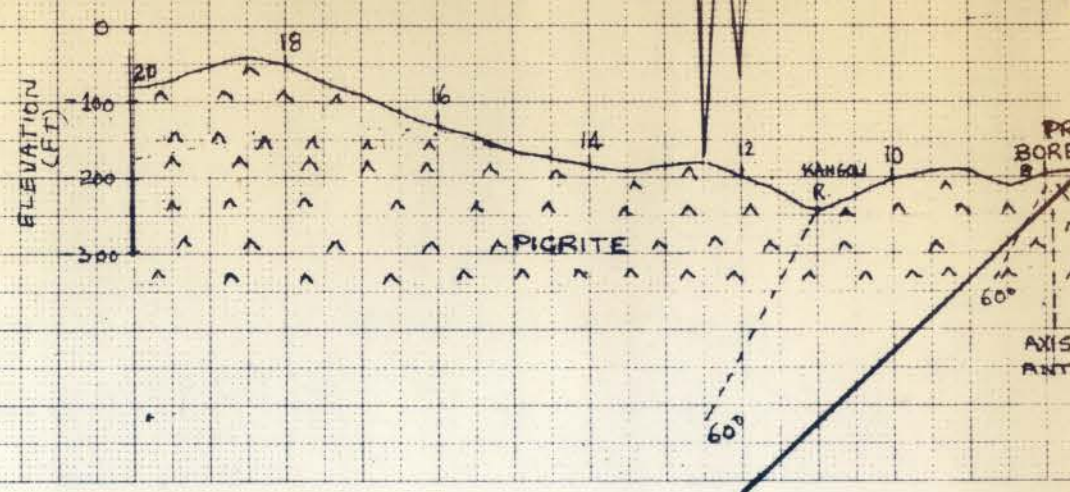
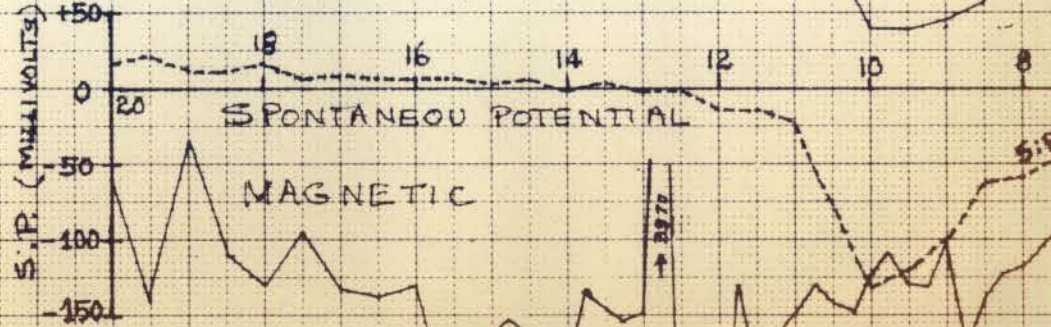
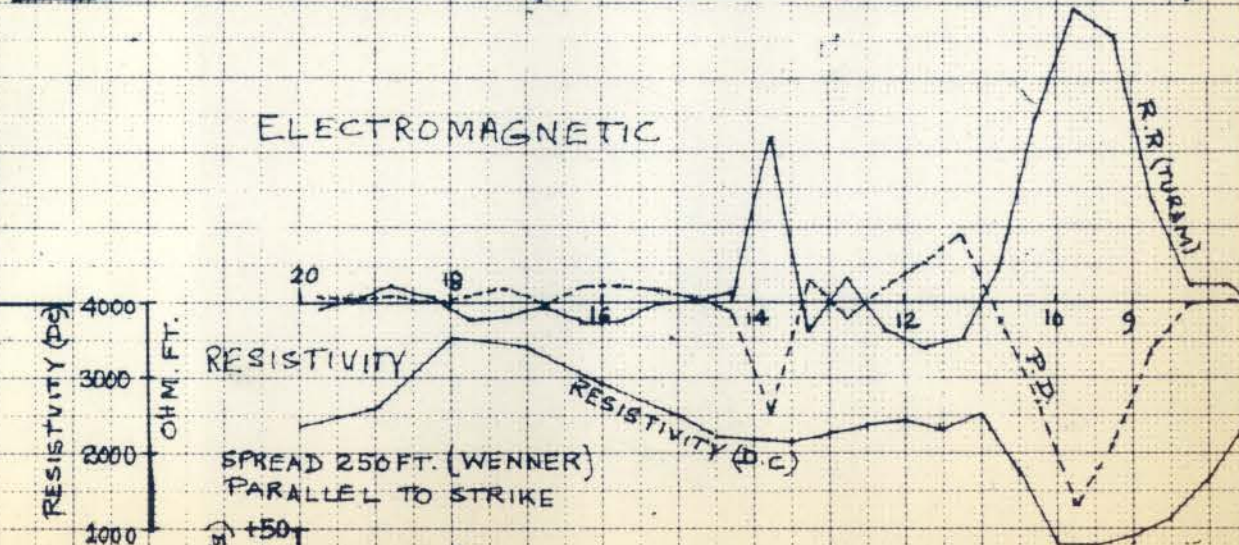




### SOIL METAL VALUES



### ELECTROMAGNETIC





L CROSS SECTIONS ALONG LINE BOS,  
LEX,  
ANZANIA

