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MADEN TETKİK ve ARAMA ENSTİTÜSÜ
Mineral Research and Exploration Institute of Turkey

TURKEY
Mineral Exploration and Training Report
AID Loan No 277-H-081

Final Report

A.I.D.
Reference Center
Room 1656 NS

Maden Tetkik ve Arama Enstitüsü
ANKARA, TURKEY

MINERAL EXPLORATION AND TRAINING PROJECT

A.I.D. LOAN NO. 277-H-081

Final Report

M.T.A. Institute

ANKARA-TURKEY

I. INSTRUCTION

This final report summarises the progress made by the Mineral Research and Exploration Institute of Turkey (M.T.A.) in cooperation with the United States Geological Survey (U.S.G.S.) on the "Mineral Exploration and Training Project" during the period of January 1, 1968 to December 31, 1971.

The formal starting date of the A.I.D. project was March 1968, but activities had been in progress since November 1967.

The general objectives of the project were :

1. To assist the technical operations of M.T.A.
2. To explore promising mineral areas ; to achieve maximum training for M.T.A. ; and to deliniate new areas for commercial exploitation.
3. To provide M.T.A. with field and laboratory equipment to achieve the above goals.

Taking into consideration the above objectives, the project was divided into four main sub-projects, which were interconnected and usually overlapping each other, as follows :

./2

a) Exploration and beneficiation studies in both field and laboratories.

b) Procurement of the needed equipment for the project.

c) Training of M.T.A. personnel.

d) Publication of the results of the work.

The progress made on each sub-project are shown in each quarterly report.

The U.S.G.S. personnel assigned to the project were as follows :

Name	Position Title	Starting Date	Ending Date
John P. Albers	Chief of the Party (Senior Geologist)	9. 5. 1968	5. 5.1971
Patrick J. Barosh	Geologist	5. 7. 1968	8.21.1970
Herbert S. Jacobson	"	7.16. 1968	5. 1.1970
Richard D. Krushensky	"	3. 5. 1968	5. 5.1970
Gerhard W. Leo	"	4.20. 1968	8.14.1970
William L. Fieldhouse	Drilling specialist	3. 9. 1968	5. 9.1970
Jacob E. Gair	Geologist	3. 4. 1969	7. 8.1969
Wallace R. Griffiths	"	5.31. 1969	9.30.1969
Leonard G. Schultz	X-Ray difraction Specialist	9.22. 1969	11.23.1969
Jean W. Pressler	Ore Beneficiation Specialist	1. 1. 1970	7. 1.1971
A.E. Weissenborn	Geologist	6. 4. 1970	7.11.1970
P.W. Richards	Party Chief	6.30. 1970	10. 8.1971

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3

Name	Position Title	Starting Date	Ending Date
H.J. Rose	Chemist	9. 6. 1970	10. 1.1970
A.W. Holz	Physicist	11.14. 1970	12.31.1970
M.J. Walthall	Cameraman	6. 1. 1971	9. 8.1971
R.E. James	Cartographer	8.11. 1971	9.21.1971
H.D. Sawyer	Pressman	8.11. 1971	9.21.1971

2. Exploration and Beneficiation Studies :

Valuable work had been done during the project time.

Ferrous and Base metal surveys some geological mapping with a different scale around the ore deposits and Aeromagnetic Surveys and Mineral investigations were succesfully made in different parts of the country.

The winter months were spent preparing reports on the field investigation.

The kinds and places of the work were explained in detail in the quarterly reports.

3. Acquirement of the needed Equipment :

The needed equipment may be categorized in five main groups as follows :

I. Drilling Equipment (Diamond Drilling Equipment and two Crawler Tractors).

II. Laboratory Equipment (Technological and Analytical).

.4

4

III. Geophysical Equipment

IV. Map Printing Equipment

V. Engineering Equipment and Chemicals.

The U.S.G.S. experts employed within the frame work of the project have helped M.T.A. in the assessment of the equipment needed, and also in the preparation of the technical specifications for each group of items.

3.1. Drilling Equipment :

This equipment consists of mainly Diamond Drilling equipment and crawler Tractor and spare parts. The Sprague and Henwood Company was the succesfull bidder for diamond drilling equipment.

Benefits gained from the diamond drilling equipment and crawler Tractors in M.T.A. may be stated as follows :

a) Drilling capacity doubled.

b) About fifty - percent of the needed equipment between 1969 - 1972 was obtained from this credit.

c) The Wire-line drilling system was applied on a broad scale.

d) Drilling techniques were improved among our drillers with the help of A.I.D. specialists.

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e) Road construction and some trenches were made easily by means of the crawler tructors.

f) Some technical people had experienced in drilling industries in the U.S. under project training programs.

Pictures : (1, 2, 3, 4)

3.2. Laboratory Equipment

3.2.1. Technological Laboratory Equipment :

A, rather, newly established and much needed section, Technological Laboratories of M.T.A., to a large extent, had been equipped under A.I.D. Loan. The section, performing various evaluation tests and technical feasibility studies, consists of three divisions : Ceramics, Ore Dressing, and Metallurgy.

The Ceramics division carries out evaluation tests of industrial mineral samples from various parts of the Country. And, under the loan, it has been equipped with various ball mills, grinders, sieve analysis sets, balances, drying ovens, an electric furnace, a cut-off machine, mixers, special testing equipments, and various accessories.

./6

The Ore Dressing division tests the ore samples from various parts of the country for beneficiation and concentration purposes. With the loan, various equipment for crushing, grinding, agitation, homogenizing, sieve analysis, flotation, magnetic separation, reagent and ore feeding, pumping, hydrosizing, heavy media separation, drying, and others had been procured for the division.

The metallurgy division performs various hydro and pyrometallurgical tests and studies toward process evaluation and determination, under the loan, had been equipped with various mixers, extraction units, a pressure reactor unit, a drying oven, and various types of furnaces : tube, box, crucible, conveyer, split tube, and rotary.

In procurement, priority had been given to urgently needed items, such as a line of magnetic separators for the beneficiation of low grade iron ores. Still, some of the badly needed items are left unprocured due to the exhaustion of the available funds. Difficulties has been experienced due to the shipment damages, missing or none functioning accessories : but, all in all, the equipment procured have been most helpfull to, and are quite vital for the functioning of the Technological Laboratories.

(Picture : 6, 7, 8, 9, 10)

./7

3.2.2. Analytical Laboratory Equipment :

We may classify those items in two groups.

a) The first group consists of the equipment which can analyse samples directly such as :
atomic absorption Spectrophotometer, optic Emission Spectrograph, X-ray Fluorescence Spectrometer, and Fluorometer.
After the Analytical laboratory was equipped with these items the number of the sample analyses increased in a short time, and additional elements can be analysed by means of these equipment.

b) The second group of the equipment are the preparation stage of the samples to be analysed, such as :

Magnetic separator, ovens, drying box, automatic morter grinder, prevation balances and other laboratory equipment. The samples can be prepared quickly in a better way to be analysed.

./8

3.3. Geophysical Equipment :

In order to detect hidden deposits of iron and sulphide minerals, airborn magnetometers and EM - AFMAG equipment were obtained under A.I.D. Loan 277-H-052.

The equipment was utilized in airborne and surface exploration of various parts of Turkey, covering an area of approximately 75.000 sq. km. in a short time, producing positive results.

As a result of the exploration work, iron reserves in Sivas - Malatya, Bolu and Eskişehir regions were increased and the work is still going on. The exploration work has also resulted in discovering of virgin mineralization in Hasangelebi area.

(Picture : II)

3.4. Map Printing Equipment

The great progress and advantages had been made by Map Printing equipment which were obtained under A.I.D. Loan. These advantages are mainly :

a) Printing of the geologic map of 1 : 50.000 series.

b) The new photographic equipment and new press are operating in excellent order.

./9

c) Cartographers were trained to prepare 1 : 2.500.000 scaled National Atlas and 1 : 50.000 series.

d) The Printing of higher quality and more economical scientific publication of M.T.A. in a short space of time was achieved.

(Pictures : 12, 13, 14, 15, 16, 17, 18)

3.5. Engineering Equipment and Chemicals :

These were small value Procurement items. Such as : Electric batteries and chemical reagents, all were received and used.

3.6. Progress Measurement :

Progress made and the equipment recieved is shown on chart II, progress schedule.

A Financial Plan and Cash Flow chart is also attached (See chart III), which shows the amount of dollars committed for each item.

4. Training of M.T.A. Personnel :

M.T.A. personnel had been trained by U.S.G.S. experts in the areas of drilling, photo geology, geological mapping

10

and so on. Some of M.T.A. personnel were sent to the U.S. to be trained and to get experience in drilling, and in the study and evaluation of base and heavy metals deposits ; and also, in the use of operation and maintenance of Atomic Abcorbtion Spectrophotometer, X-ray Spectrographs and emission spectrographs being procured as a part of the Analytical Laboratory Equipment under the loan funds. They were also instructed on the interpretation and evaluation of related results and information.

5. Publication of the Results :

Reports were published as the investigation of each area was completed. Such as :

1. Iron resources of Turkey. by : Dr. J.P. Albers, R.Özdoğan, Ussal Çapan.

2. Geology and mineral deposits of the Hakimhan - Hasançelebi iron district, Turkey. by : H.S.Jacobson, Z.Kendiroğlu, C.Özdemir, R.Boğaz.

3. Geology of Area A, Çatak Iron deposits, Eğrigöz Mountains, Kütahya Province, by : P.J. Barosh.

4. A target area for base-metal exploration in the Kuluncak region, Malatya Province, Turkey, by : G.H.Leo.

./11

5. Interim Results of Geological Investigations in the vicinity of the Ergani - Maden Massif Copper Deposits near Maden Elâzığ. by : A.E. Weissenborn, Ömer Öner.

6. Conclusions :

As can be seen from chart II, procurement of most of the items are recieved. However, there were some delayed and cancelled equipment mainly due to :

i) At the start of the project M.T.A. was not adequatly familiard with the requirements and the formalities of A.I.D., some time was last because of this.

ii) Delays occured in obtaining the necessary A.I.D. approvals and Letter of commitments.

iii) Unexpected situations have arisen.

It can be said that, however, M.T.A. and U.S.G.S. cooperation was fully sufficient, and all of the phases of the project were achieved.

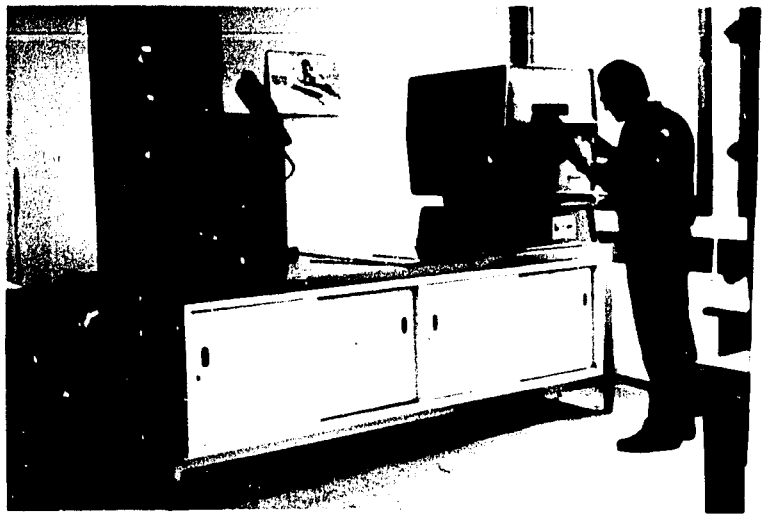
MY/ms.

Picture 1 : Preparation of a drilling machine (Sprague and Henwood 40 - CL)

P. 2 : Drilling machine working in Hasançelebi Iron Mine area, and a view from the road which was constructed by the crawler tructors.

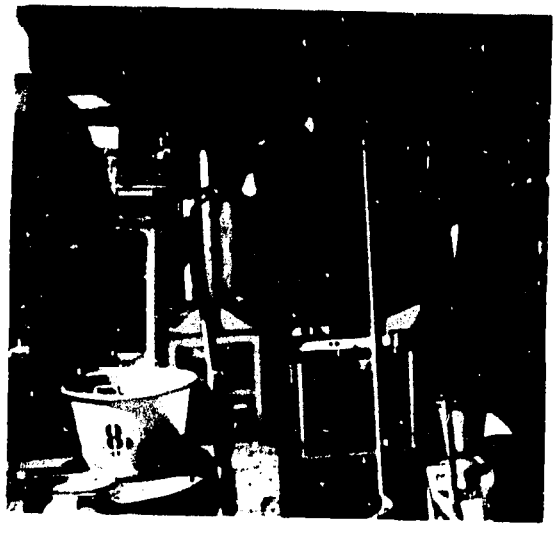
P. 3 : Inclined drill hole in Karakuz Iron deposit (Sprague and Henwood 40 CL).

P. 4 : An M.T.A. Engineer is training at Sprague and Henwood Co. in U.S.A.



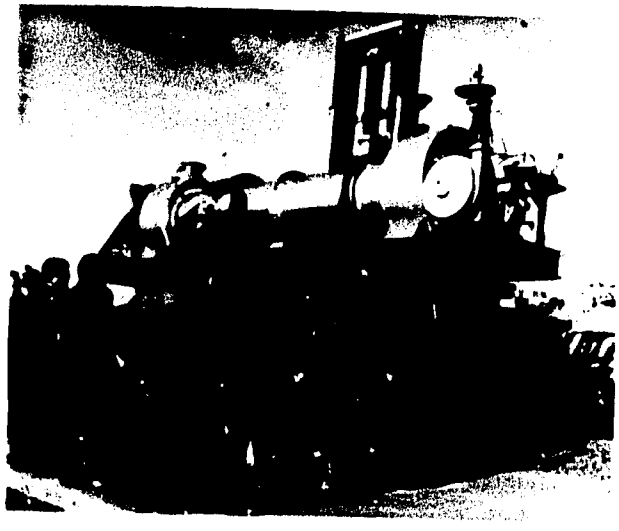
P. 5 : High temperature Box Furnaces.

P. 6 : Pressure Autoclave.



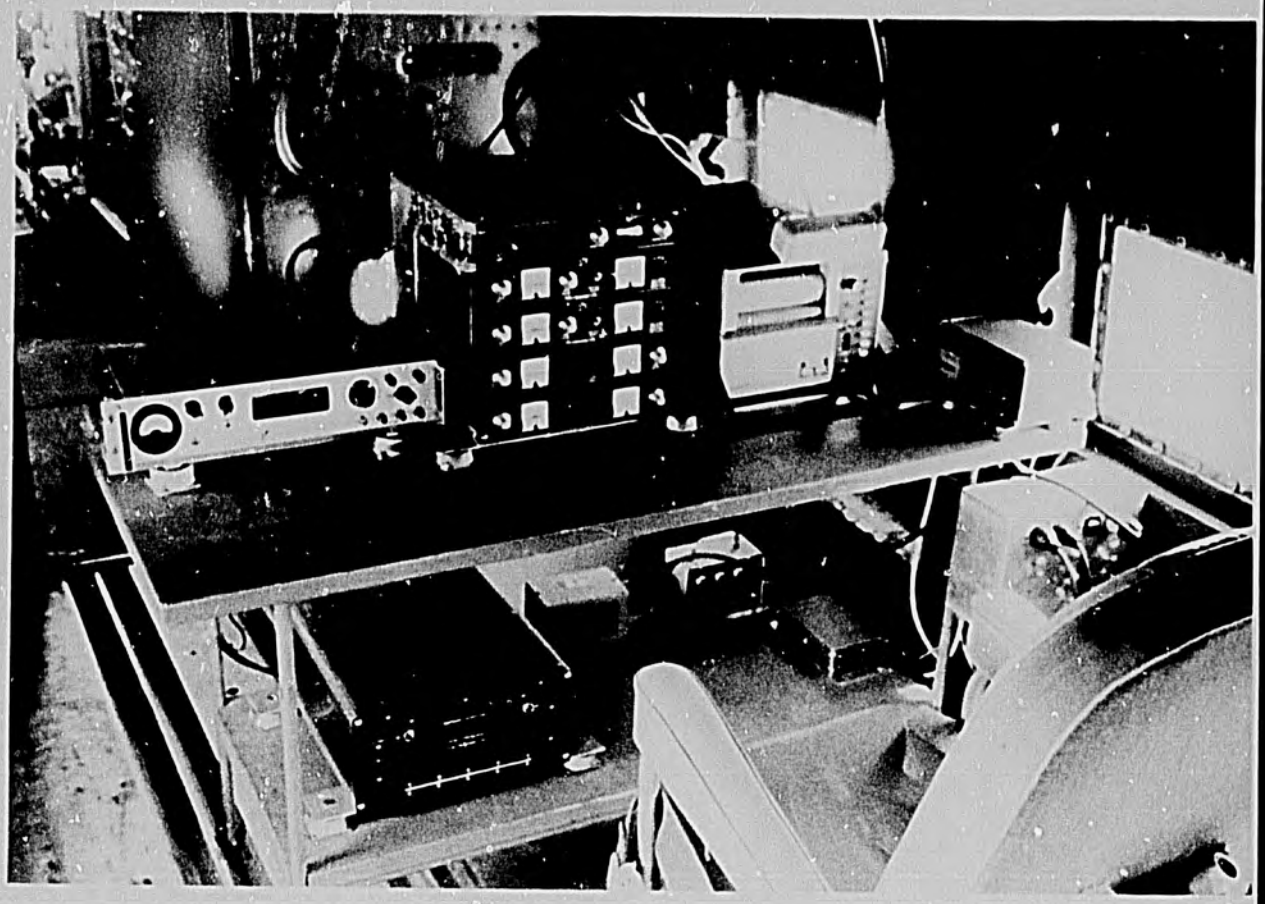
P. 7 : Drum Magnetic Separator in Operation.

P. 8 : Flotation test cell in Operation.

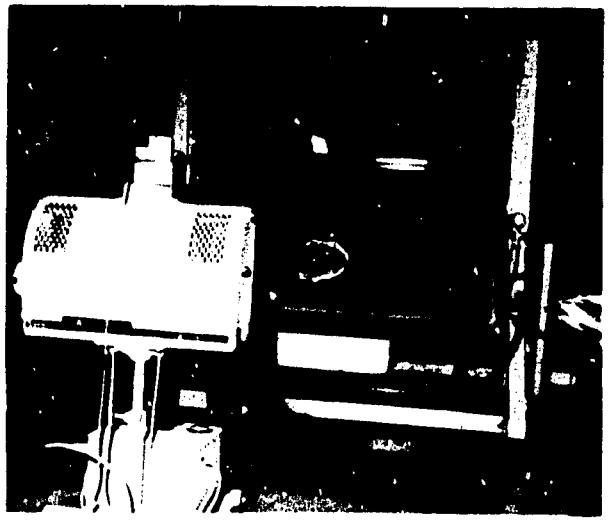


P. 9 : Rotary kiln erection.

P. 10 : Rotary kiln erected.



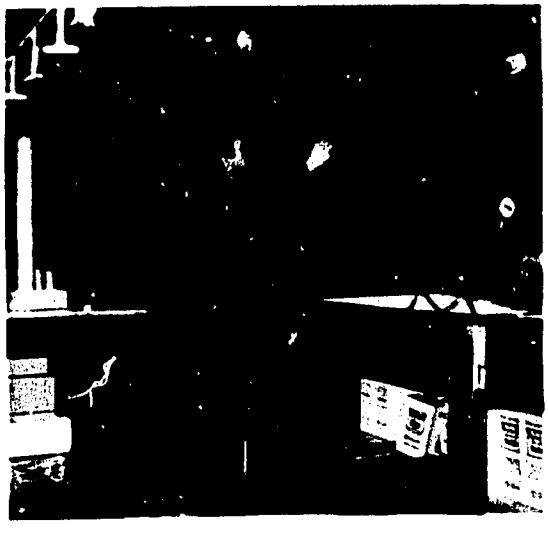
P. 11 : The photograph shows the magnetometer and EM - AFMAG equipment installed on a prospecting aeroplane.



P. 12 : Contact Frame in operation (Nu-Arc).

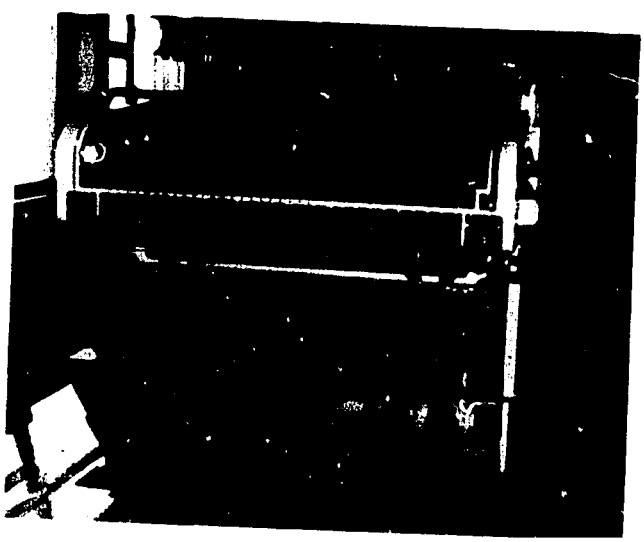
P. 13 : The adjustment of Diaphram (Robertson).

P. 14 : Wipe Roller in operation (Pot Dewin).



P. 15 : Film control in Developping room (Leadel).

P. 16 : The measurement of Dia Tones in Densitometer (Macbeth).



P. 17 : A view from the Harris offset machine.

P. 18 : An other view from the Harris offset Machine.

Best Available Document

Item No.	M.T.As Ref.No.	PROJECT ITEMS	Approved by A. I. D.	L/COM. Issued	Purchase Order
I		DRILLING EQUIPMENT			
I a	DE-101 A	Diamond Drilling Equipment 2 Truck mounted 1420 Drills 2 Skid mounted 1420 Drills 3 Truck mounted [illegible] Drills [illegible] Skid mounted [illegible] Drills 6 P[illegible] 5[illegible] [illegible], 35 GPM. 25 Pumps [illegible], 2[illegible] GPM. [illegible] [illegible] Equipment [illegible]	Jan.7/6[illegible]	Jan.3[illegible]/69	[illegible].20/69
I b	DE-101 B1	2 Crawler [illegible]	[illegible] 3/69	Jul 31/[illegible]	Sept 10/69
2					
2 a	LE-102	Technological Lab.Equipment 23 Items (Denver [illegible].Co.) 10 Items (Arthur [illegible].Thomas Co.) 4 Items (Morse Bros. [illegible].Co.) 15 Items (Cenco Inst. [illegible]) 27 Items (Fisher I,Co.) 2 Items (Fisher II,Co. 2 Items (Eriez [illegible].Co.) 1 Item (Bench Scale [illegible].Co.) 1 Item (Harper Elect.Furnace Co.)	Feb. 1[illegible]/[illegible]	Apr. 1[illegible]/69	June 12/69 June [illegible]/69 June [illegible]/69 June 13/69 June 12/69 June 12/69 June 11/69 June 1[illegible]/69 June 13/69
2 a	LE-102	Technological Lab.Equipment Baroid Division Scor-Tip Enterprise			
2 a	LE-102	Technological Lab.Equipment 4 Boxes(Solo basic International) 3 Boxes(Bico Inc.) 3 Cases(Eriez) 1 Box(Harry W.Dietert Co.) 4 Boxes(A.D.Alpine) 1 Box(Ultraviolet products) 2 Boxes(Solo basic Int.) 2 pkgs(Master carr)			March 15/71 Apr. 26/71 May 26/71 Apr. 7/71 Apr 9/71 ? May 24/71 May 3/71
2 a	LE-102	Technological Lab. Equipment 4 Boxes (Joy manifacturing Co.) 1 Box (Von Water Rdgers Co.) 1 Crate (Bartlett-Snow)			June/25/71 Mar /19/71 Dec/ 1/71
[illegible]	[illegible]	Analytical Lab.Equipment 2 Atomic Absorbtion	Apr. 2[illegible]/6[illegible]	June 10/69	July 4/69

[illegible]NT SCHEDULE PROGRESS REPORT NO. [illegible]

Best Available Document

	During the Period Covered by this Report			To [illegible]			
	Equipment Shipped	Value Shipped U.S.$	Date Shipped	Equipment Already Delivered	Value Delivered	Estimated Date of Delivery	Date of Delivery
9				[illegible] the Equipment	[illegible].435.[illegible]		[illegible] J[illegible] 28/[illegible] to [illegible] 5
[illegible]	2 Crawler Tractors [illegible]	[illegible] 73.[illegible]	[illegible]				[illegible] 1[illegible]
[illegible]					(Fo[illegible] Vess[illegible] 1[illegible] [illegible] [illegible] [illegible].00 [illegible].00 [illegible] 3.0[illegible] 3.[illegible] [illegible] 22.5[illegible]		[illegible]arch 1[illegible] [illegible]pt. 29/[illegible] Dec. [illegible] Feb. [illegible]7/70 [illegible] [illegible]rch.1[illegible]/70 Sept. [illegible]/6[illegible] Nov. 1[illegible]/6[illegible]
	1 Box Pressure Gauge	[illegible]75 10 75.00	Feb. 26/71 Marc[illegible] 1/71	1 Box			March 12/71 March 5/71
	1 Case	400.00	Feb.1[illegible]/71	1 Case			March 4/71
'1	Tech.Lab.Eq.	11.265.20		4 Boxes	11.265.20		May 1[illegible]/71
'1	Tech.Equip.	1545.56		3 Boxes	1.5[illegible].56		Apr.26/71
	Magnetic Sep.	1[illegible].055.00		3 Cases	18.055.00		June19/71
	Tech.Equip.	41[illegible].63		1 Box	414.63		May 1/71
	Tech.Equip.	3.977.00		4 Boxes	3.977.00		May 20/71
	Tech.Equip.	111.18		1 Box	111.18		May 20/71
	Tech.Equip.	3.189.50		2 Boxes	3.189.50		June 7/71
	Tech.Equip.	1.71[illegible]		2 [illegible]	1.71[illegible]		Apr. 20/71
	Tech.Lab.Eq.	16.116.[illegible]0		4 Boxes	16.116.00		Sept./14/71
	Tech.Lab.Eq.	3.350.[illegible]0		1 Box	3.350.00		Sept./14/71
	Tech.Lab.Eq.	26.561.87		1 Crate	26 .561.87		Dec./29/71

24

	LE-103 D	**Analytical Lab.Equipment** a. 41 Items,Analytical Lab. Equipment(Ovens,crushers balances,furnaces,rinders, mortars,sieves etc.) b. 3 Items,Spectrochemical Instruments(2 Flame photometers, 1 Spectrophotometer, 2 calorimeters) c. 8 Items,Petrographic Lab. Equipment		Aug. 27/69	Sept.29/69
	LE-104	**Analytical Lab.Equipment** 2 Boxes(Denver Equip.Co.) 2 Boxes(Jarrel Ash Division) (Ultra Carbon Corp.) 1 Box (Jarrel Ash Division) 1 Box (Mathosan Scientific)			
c	LE-103	**Analytical Lab.Equipment** 1 Box (Perkin Elmer Corp.) (Spex Industries Inc.) (Spex Industries Inc.) (Eastmen Kodak Co.)			
2 d	LE-105	**Analytical Lab. Equipment** 1 Box (Fisher Scientific) 2 Sylinders(Air products and chemicals) 3 Cases(Fisher Scientific Co.) 6 Boxes(Jarrel Ash) 4 Boxes(Kodak. USA) 5 Boxes(Fisher)			Mar/22/7 Mar 29/7 Mar 3/71 May 18/7 Mar 3/31 Mar.12/7
3	GP-105	**Geophysical Equipment** 2 Nuclear Precession Magnetometers 1 Seismic Refraction Recording System 6 Portable Gravimeters, 3 High Power I.P. 3 Low Power I.P. 1 CTN (AMF International)	Apr. 26/69	June 10/69	July 4/6
3	GP-105	**Geophysical Equipment** (Sancint Corp.) (Textronix Incorp.) (Transworld Trade Co.) (Triplett Electrical Intrument Co.			

ases	N.Y.FOB 1.388.91	Feb. 27/70				
ty 3) oxes	7.006.49					Aug. 25/71
ty 1)	1.633.61	Nov.11/70	1 Box	1.633.61		Nov. 17/71
ty 2)	395.85	Dec.9/7	1 Box	395.85		Dec. 10/70
ride	5.884.80	Oct.30/70				Nov. 5/70
trode crucibl						
ox	549.05	Dec.23/70	1 Box			Dec. 23/70
	1.190.75	Jul.23/70	1 Box	1.190.75		Aug. 5/70
ox(Lamps)	752.85	Dec. 11/70	1 Box			Jan. 8/71
x Press)	252.40	Feb. 10/71	1 CTN			Feb.19/71
TN(Stan- t Samp.)	3.224.30	Jan. 21/71	1 CTN			Jan. 3/71
ns	170.65	March 3/71	Filter			March 3/71
Box(Stan- s Samples)	450.00		1 Box	450.00		May 5/1971
Cylinders	299.00		2 Cylinders	299.00		Apr. 13/71
ases) Cases	1200.00		3 Cases	1200.00		Apr. 5/71
Boxes	6698.18		6 Boxes	7.772.71		June 7/71
Boxes	394.25		2 Boxes	524.39		Mar. 4/71
Boxes(Che- icals)	605.92		3 Boxes	605.92		Apr.10/71
					May/70	May
				7.178.35 C-F		August 19/69
				61.177.00 C-F		Jan. 6/70
				102.982.00		Jan. 20/70
1 CTN	200.94	July 16/70				July. 16/70
Box	382.24					Feb. 5/71
Box	873.55	Jan 29/71				Jan. 29/71
Box	2.716.05	Feb. 5/71				Feb. 9/71
Box	501.00	Feb. 12/71				Feb. 22/71
						March 10/71

24

26

		(Kemas Instruments Co.) (Hewlett Packard) (Gearhart Owen) [illegible] ?			
3	GP-105	Geophysical Equipment 3 Boxes (Barringer Instrument Inc 7 Boxes (Houston Instruments) 1 Box (Motorola Inc.)			April 2/71 Mar 22/71 Apr. 30/71
3	GP-105	Geophysical Equipment 1 Box (General Radio Co,			Dec. [illegible]/71
4	PE-104	Map Printing Equipment 1 Box (G.S.A) 6 Boxes (G.S.A. 7 Boxes(G.S.A.) 1 Box " 1 Box " 1 Box " 3 Boxes " 1 Box " 1 Box " 1 CRTS " 1 CRT " 1 Box " 6 Boxes " 1 CTN " 1 CTN " 1 Box "			May 15/70 Oct. 1/70 Nov. 6/70 Nov. 17/70 Jan. 2/71 Jan. 2/71 Mar. 5/71 Feb. 15/71 Feb. 19/71 Mar. 26/71 Apr. 20/71 June 17/71 June 17/71 Apr. 8/71 Aug. 25/71 Dec. 14/71
5		Engineering Equipment and Chemicals Chemical Reagents Class Ware 60 Compasses 30 Stereoscopes 30 Altimeters Electric Batteries		June 10/69	Sept. 1[illegible]

[illegible]	[illegible].15 [illegible].83 9.868.00	Jan. 13/71 March 5/71 Mar. 24/71				March 2/71 March 11/71 March 24/71
.Equ. ders [illegible]	33.926.[illegible] 2.[illegible]50.3[illegible] 757.[illegible]		3 Boxes 7 Boxes	33.[illegible]26.75 2.[illegible]45.13 757.[illegible]3		[illegible]. 2/71 Mar. 25/71 [illegible] 6/71
	[illegible]			3[illegible].5		Dec/21/71
[illegible]x(Con- [illegible])	73[illegible].27		1 Box	738.27	May/70	Aug. 30/70
[illegible]xes [illegible])	5.[illegible]26.72		6 Boxes	[illegible]5.926.72		Sept. 23/70
[illegible] [illegible])	15.36[illegible].45		7 Boxes	15.364.45		Oct. 30/70
[illegible]x(air [illegible]ressor)	30[illegible].5		1 Box	304.95		Nov. 17/70
[illegible]x(Sin[illegible] [illegible])			1Box	1[illegible]00.[illegible]		Jan. 26/71
[illegible]ox(Photo [illegible]ipm.)	2[illegible].62		1 Box	225.62		Jan. 26/71
[illegible]es([illegible]p [illegible])	5.1[illegible]1.51		3 Boxes	5.191.[illegible]1		Feb. 23/71
[illegible](Light [illegible])	[illegible]		1 Box	3[illegible].95		Feb.1[illegible]/71
[illegible] [illegible]ins)	[illegible]1.5[illegible]		1 Box	[illegible]1.5[illegible]		Feb.19/71
[illegible]RTS(Pho- [illegible]pparat[illegible]	4058.65		1 CRTS	[illegible]058.65		Mar.19/71
[illegible]RT(Li[illegible]t [illegible] T[illegible]s)	60.09		1 CRT	[illegible]6[illegible].09		[illegible] 18/71
Box(offset [illegible]nkets)	[illegible]2[illegible].53		1 Box	[illegible]2[illegible].53		June 17/71
Boxes [illegible]ns [illegible]d paper)	3.737.[illegible]		5 Boxes	3.737.8[illegible]		Jul[illegible] 2/71
CTN(offset [illegible]k)	1968.52		1 CTN	19[illegible]8.52		July 27/71
CT[illegible](Prin- [illegible] ink)	2 2[illegible].72		1 CTN	2.[illegible]2[illegible].72		Aug. 15/71
Box(Tech. [illegible]hin.parts)	257.[illegible]		1 Box	257.80		Mar. 14/71
Boxes	2[illegible]	N.[illegible]OB Jan. 1/70.			[illegible]r./70	
CTN	C and [illegible] 241.[illegible]	Feb. 70				March 16/70

28

PROGRESS SCHEDULE

CHART : II

FINAL REPORT

Item No.	M.T.A. Ref. No.	PROJECT ITEMS	Weighted % Of Project	Item % Complete	Project % Complete
		TOTAL	100	99.5	99.5
1		DRILLING EQUIPMENT			
1 a	DE-101 A	DIAMOND DRILLING EQUIPMENT	62,0	100	62,0
1 b	DE-101 B1	2 CRAWLER TRACTORS	5,0	100	5,0
2		LABORATORY EQUIPMENT			
2 a	LE-102	TECHNOLOGICAL LAB.EQUIPMENT	3,0	95	2,9
2 b	LE-103	ANALYTICAL LAB. EQUIPMENT (Part I)	7,0	100	7,0
2 b[x]	LE-103 D	ANALYTICAL LAB. EQUIPMENT (Part II)	4,5	93,0	4,2
3	GP-105	GEOPHYSICAL EQUIPMENT	11,5	100	11,5
4	PE-104	MAP PRINTING EQUIPMENT	6,5	100	6,5
5		ENGINEERING EQUIPMENT AND CHEMICALS	0,5	100	0,5

ITEMS which are canceled

No	Company	Item	[illegible]
SA/DLF-69-68	General Electric Co.	Analytical lab.Equip.	$ 9.137.96
SA/DLF-69-57	Felker Manifacturing Co.	Tech.Lab.Equip.	$ 199.42
SA/DLF-69-35	Perkin Elmer Co.	Analytical Lab.Equip	$ 1.264.00

FINAL REPORT

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TERENT	Gross Tonnage Total Long Tons	U.S.Vessels Long Tons	U.S.Vessels % Total	Freight Cost U.S.Dollars Equ. Total	Freight Cost U.S.Dollars Equ. Paid With Loan Funs
Total - Shipment	516.65	454.43	88.92	77.210.65	67.453.88