

ARAB REPUBLIC OF EGYPT  
NATIONAL ORGANIZATION FOR POTABLE WATER  
AND SANITARY DRAINAGE

**PROVINCIAL CITIES DEVELOPMENT PROJECT  
WATER AND WASTEWATER IMPROVEMENTS**

UNITED STATES OF AMERICA  
AGENCY FOR INTERNATIONAL DEVELOPMENT  
USAID/EGYPT

USAID GRANT NO. 263-0161.3

CONSTRUCTION MANAGER:

**MONTGOMERY-HARZA**

**JMM** James M. Montgomery  
Consulting Engineers Inc

**HARZA** ENGINEERING COMPANY



IN ASSOCIATION WITH:

ECTO/WARDANI ASSOCIATED CONSULTANTS

PD-ABE-171

MONTHLY REPORT NO. 31

December, 1990

MONTGOMERY-HARZA

United States Agency for  
International Development  
Cairo Center Bldg. Ninth Floor  
106 Kasr El Aini Street  
Cairo, Egypt

Ref. No. MH-AID-313

January 20, 1991

Attention: Mr. John W. Airhart  
Project Officer

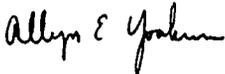
Subject: Provincial Cities Development Project  
Water and Wastewater Improvements  
USAID Project No. 263--0161.03  
C/M MONTHLY REPORT NO. 31  
DECEMBER, 1990

Gentlemen:

Attached is the Construction Manager's Monthly Report No. 31 for the month of December, 1990.

If you have any comments or questions, please do not hesitate to call us.

Very truly yours,



Allyn E. Yoakum  
Project Manager

Distribution:

USAID-----10  
NOPWASD---5  
L\*A WTC---5  
JMM-Pasadena  
Harza-Chicago  
Project Manager  
Contracts Engineer  
Project Engineer  
Claims Specialist  
WMA  
Beni Suef Site (2)  
Fayoum Site (2)  
Minia Site (2)  
File 3.1.6 - Out (w/o encl.)  
File 8.1.6

TRANSMR.AID

## TABLE OF CONTENTS

	<u>Page No.</u>
PREFACE TO MONTHLY REPORT	2
EXECUTIVE SUMMARY	6
PROJECT ACTIVITIES	7
Construction Management Activities	7
Contractor Activities	10
DESIGN STATUS	12
CONSTRUCTION PROGRESS	15
Beni Suef	15
Fayoum	17
Minia	19
PROJECT COSTS	20
PROJECT SCHEDULE	21
STAFF MOVEMENTS	21
Construction Manager	22
Contractor	22
ANNEXES:	
A - Contract Amendments and Change Orders	
B - Bar Graph Schedules	
C - Graph Of Monetary Earnings Schedules	
D - Contractor's Commercial Invoice Listing	
E - Arrival and Departure Dates For Key Personnel	
F - Materials On Site	
G - List Of Equipment	
H - Progress Photographs	

## PROVINCIAL CITIES DEVELOPMENT PROJECT

### PREFACE TO MONTHLY REPORT

The Provincial Cities Development Project Water and Wastewater Improvements Program is the culmination of a major project begun in 1982, under a USAID grant, for the Egyptian Cities of Fayoum, Beni Suef and Minia. These three cities situated in the Nile Valley to the southwest of Cairo are approximately equal in size and have a combined population near 1,000,000.

Previous phases of the Provincial Cities Development Project focused on such improvements as laying sewer laterals, installing distribution mains, upgrading drainage facilities, and refurbishing existing water and wastewater treatment plants and pumping stations.

The current Water and Wastewater Improvement Program is being implemented by the Egyptian Government's National Organization for Potable Water and Sanitary Drainage (NOPWASD).

On May 30, 1988, NOPWASD awarded a contract to L\*A Water Treatment Corporation (L\*A WTC) of City of Industry, California, for design and construction of major facilities to increase available water supplies, and for upgrading operation and maintenance capabilities of the beneficiary cities.

USAID retained a joint venture of the U.S. firms of James M. Montgomery, Consulting Engineers, Inc. (JMM) of Pasadena, California, and Harza Engineering Company (Harza), of Chicago, Illinois, under a direct USAID Contract to provide Construction Management Services for the current phase of work. Montgomery-Harza's responsibilities include, among other things, review of designs, monitoring of construction, certification of payments, and general contract administration.

Similar improvement programs are being performed simultaneously in the three cities. The work in each case consists of the following major elements:

Water Treatment Plant	300 L/S (6.85 MGD)
Treated Water Reservoir	8,000 to 12,000 m <sup>3</sup> (2.11 to 3.17 MG)
Elevated Steel Tanks	Three one-million gallon (3,785 m <sup>3</sup> ) units each city
Raw Water Intake and Pumping Stations	330 L/S (5,230 GPM)
Wastewater Pump Stations	5 in Beni Suef, 6 in Fayoum, and 6 in Minia

PREFACE TO MONTHLY REPORT (Cont.)

Water Transmission Main Extensions 2,500 to 3,000 M (8,200 to 10,800 FT.)

In addition, the project includes the following elements for upgrading or rehabilitating existing facilities and institutional capabilities:

- Sewer System Rehabilitation
- Watermain Leak Detection
- Sewer Infiltration/Inflow Studies and Sewerage System Evaluation Studies
- Watermain Cleaning and Lining
- Operation and Maintenance of Completed Facilities and Existing Wastewater Treatment Plants by L\*A WTC for a Two-Year Period
- Training in Leak Detection, Water Main Cleaning and Lining, and General Operation and Maintenance
- Inventory Control System

L\*A WTC has awarded a subcontract to Stanley Consultants International, of Muscatine, Iowa. Stanley's duties include contractor quality control services at the construction site, prepare O & M Manuals, and provide an inventory control system. In addition, other subcontracts have been awarded, as follows:

U.S.A.

Pittsburgh-Des Moines Steel Corp. (PDM): Design and Erection of Elevated Steel Water Tanks and Foundations

Raymond International: Watermain Cleaning and Lining

Pacific Sewer Maintenance Corporation (PSMC): Sewer System I/I and SSES

Heath Consultants: Watermain Leak Detection

A.R.E.

Badran and Associates: Design of Civil, Mechanical and Electrical Works and Buildings

Dr. Abouleid: Evaluation of Subsurface Soil Conditions and Conceptual Design of Foundations

Dr. Abdel Warith: Design of Water Transmission Line Extensions and Design of Wastewater Pumping Stations

Dr. Hisham Hafez: Geotechnical Consultant Specialist

**PREFACE TO MONTHLY REPORT (Cont.)**

Ardeman-Ace Company: Field Geotechnical Investigations and Laboratory Work

Orascom Construction Company: Construction of Civil Works and Buildings

Orascom Construction Company: Painting Elevated Tanks

Kolaly Construction Company: Construction of Electrical and Mechanical Works and Rehabilitation of Wastewater Pumping Stations

The Design/Build Contract is funded for the amount of US\$ 53,066,009 by USAID with a contribution of LE 13,000,000 by the Egyptian government. An additional contribution of LE 2,000,000 for the payment of social security has been funded by the Egyptian government. The start date for the contract has been established as July 3, 1988. Construction completion date per the contract is March 3, 1991. This includes the Startup Function and a four month period of Initial Operation. Final contract completion date is March 3, 1993. This includes a twenty-four month period of Continued Operational Assistance. The contract also includes a concurrent, post startup, twelve month maintenance period. The USAID Letter of Commitment (L/C) in the amount of USD 52,446,359 extends only up to the Project Assistance Completion Date (PACD) of August 31, 1991. The difference between the L/C and the USD contract amount represents payments for Continued Operational Assistance after the PACD.

Description of Contract Bid Item Tasks:

<u>Task No.</u>			<u>Description of Work Under Tasks</u>
<u>Beni Suef</u>	<u>Fayoum</u>	<u>Minia</u>	
A1	A2	A3	New Water Treatment Plants
A4	A5	A6	New Treated Water Reservoirs & High Service Pump Stations
A7	A8	A9	Three new Elevated Storage Tanks in each city
A10	A11	A12	Raw Water Intake and Pump Station Renovations in Beni Suef and New Facilities in Fayoum and Minia
A13	A14	A15	Rehabilitation of 16 Wastewater Pump Stations
A16	A17	A18	Six Months of Training in Waterline Cleaning and Unit Price Lining.

**PREFACE TO MONTHLY REPORT (Cont.)**

A19	A20	A21	Water Transmission Line Extensions
A22	A23	A24	Sewer System Rehabilitations
B1	B2	B3	Waterline Leak Detection Surveys and Reports
B4	B5	B6	Sewer Infiltration Surveys
B7	B8	B9	Sewer System Evaluation Surveys
C1	C2	C3	Operational Assistance for Wastewater Collection and Treatment Facilities

**EXECUTIVE SUMMARY**

Design activity continues, with nearly all drawings required for current construction activity reaching the preliminary or final works level, including the sludge lagoons. An exception is the Minia raw water intake jetty design which is undergoing review at the 90% level. The Beni Suef raw water intake mechanical design has not yet been submitted pending preparation of a change order to resolve the sedimentation problem. The Fayoum raw water canal intake mechanical design has not yet been approved due to the Ministry of Irrigation request for additional design details. New civil drawings relating to sanitary and site works continue to be submitted by the Contractor at the 90% level, but since the Construction Manager has not received a master index of all drawings, it is hard to determine how many drawings are left.

The FAS procurement and freight activity based on the value of certified invoices recently approved by the Construction Manager has increased substantially for the last two months over the previous four months. FAS and freight invoices with a total value of US\$ 1,345,647 were certified this month.

Construction activity on the new water treatment plants continues to make progress, but is still without the benefit of an approved schedule to determine when this work will be complete. All nine elevated water storage tanks are erected, and only painting and mechanical remains. No construction activity has started on the water transmission line extensions or on the rehabilitation of wastewater pump stations. Design/construction invoices certified during the month totaled LE 420,882 and US\$ 409,534, which represents a small decrease from last month.

Construction progress based on invoices indicates that Beni Suef is 63% complete, Fayoum is 62% complete, and Minia is 56% complete. The overall Project is 71% complete based on US\$ invoices. FAS is 80% complete and construction/design is 66% complete based on US\$ invoices.

Project schedule slippage at the end of December, as noted in Annex B, was computed to be 7 months. This value is misleadingly low, as it is only a reflection of construction activity, rather than a reflection of the actual schedule. The report section on Project Schedule indicates LE invoices are 11 months behind schedule and US\$ invoices are 16 months behind schedule. It is therefore estimated the Project, based on invoices, is approximately 14 months behind schedule.

The Contractor submitted a request for time extension on November 19, 1990 which is undergoing evaluation by the Construction Manager. Costs associated with the time extension were not submitted at this time, but are expected to follow at a later date.

## PROJECT ACTIVITIES

### Construction Management Activities

The Construction Management principal office staff concentrated on resolving design issues and design reviews, technical correspondence, review of quality control issues, processing of invoices, resolution of contract change orders, schedule reviews, and attending Project and other technical and administrative meetings.

The Construction Management home office staff assisted the principal office staff by providing design drawing reviews for the structural and electrical discipline. The home office staff also assisted in processing Contract change orders by providing reviews and comments.

Major review and action items addressed this month are as follows:

o Review Commercial Invoices and Certify for Payment:

Invoice	Status	Amount	Date
65	Certified	LE 277,031	01/05/91
65A	Certified	LE 22,610.61	01/05/91
66	Certified	\$ 374,955.86	01/06/91
67	Certified	\$ 293,943	01/08/91
68	Certified	\$ 332,383	01/08/91
69	Certified	\$ 457,876	01/08/91

o Review Contractor Quality Control Submittals:

1. Reviewed the submitted weekly CQC report summaries from the CQC Manager.
2. Distributed final Arabic version CQC manual for Electrical, Mechanical, Site Works and Watertightness Testing of Structures.
3. Reviewed various documentation packages for FAS equipment and approved shipping to Egypt.
4. Reviewed requests for the use of specific materials for incorporation in the works.

o Design Reviews and Comments:

1. Mechanical and Electrical:
  - a. Final Works Mechanical Drawings for Tasks A1, A4 - Beni Suef. Review completed and drawings stamped "No

Exception Taken" and distributed.

b. Final Works Mechanical Calculations for Tasks A1, A4 - Beni Suef. Review completed and calculations stamped "No Exception Taken" and distributed.

c. Final Works Electrical Drawings for Tasks A1, A4, A10 - Beni Suef. Review completed and drawings stamped "No Exception Taken" and distributed.

d. Final Works Electrical Calculations for Tasks A1, A4, A10 - Beni Suef. Review completed and calculations stamped "No Exception Taken" and distributed.

e. NWS Final Works Electrical Drawings for Tasks A2, A5, A11 - Fayoum. Review completed and drawings stamped "No Exception Taken" and distributed.

f. Preliminary Works Mechanical and Electrical Drawings for Tasks A13, A14, A15 - Wastewater Pump Station Rehabilitation. With the exception of Pump Station No. 5 drawings for Task A15 in Minia which was not included, the review was completed and drawings stamped "No Exception Taken". Pump Station No. 5 in Minia is the subject of a change order for mechanical piping.

2. Architectural and Civil:

a. Preliminary Works Architectural Drawings for Tasks A1, A4 - Beni Suef. Review completed and drawings stamped "No Exception Taken".

b. Preliminary Works Structural Drawings for Sludge Lagoons Task A1 - Beni Suef. Review completed and drawings stamped "No Exception Taken".

c. Preliminary Works Architectural Drawings for Tasks A2, A5, A11 - Fayoum. Review completed and drawings stamped "No Exception Taken".

d. Preliminary Works Site Development Drawings for Task A3 - Minia. Review completed and drawings stamped "No Exception Taken".

e. Preliminary Works Architectural and Civil Drawings for Tasks A13, A14, A15 - Wastewater Pump Station Rehabilitation. With the exception of Pump Station No. 5 drawings for Task A15 in Minia which were not included, the review was completed and drawings stamped "No Exception Taken". Pump Station No. 5 in Fayoum was included, but is also the subject of a change order for roof slab replacement.

f. 90% Site External Works Civil Drawings for Task A3 - Minia. Review was completed and the Contractor requested to submit Preliminary Works Drawings after having considered the Construction Manager's comments.

o Meetings During the Month on Technical Matters:

1. A Project meeting was held in the Construction Manager's Fayoum site office on December 4, 1990.
2. A Project meeting was held in the Construction Manager's Minia site office on December 18, 1990.
3. Meetings were held with USAID on December 2, 4, 9, 11, 16, 19, 23 and 30 to discuss invoices, change orders and other technical matters.
4. Meetings were held with NOPWASD on December 9, 16, 23 and 30 to discuss invoices, change orders and other technical matters.
5. A special meeting was held at the Contractor's principal office in Fayoum on December 25, 1990 to discuss the use of non-conformance reports and their resolution.

o Schedule:

The Contractor submitted an updated schedule for Fayoum on December 4, 1990 and for Minia on December 16, 1990. An updated schedule for Beni Suef is expected shortly. These schedules are currently under review by the Construction Manager.

o Water Distribution System Study:

The Construction Manager completed their study of the water distribution system and preparation of change orders. The draft potential change orders for surge protection and for pressure reducing valve stations have been forwarded to USAID and NOPWASD for evaluation and approval prior to issuing to the Contractor. The Construction Manager is preparing an engineer's estimate.

o Sewer System Infiltration Reports:

Revised chapters of the report for Beni Suef were resubmitted by the Contractor on December 11, 1990 and for Minia on December 15, 1990, and are being reviewed in the C/M Home Office. The Contractor was authorized by the Construction Manager to mobilize for the Phase 2 Sanitary Sewer Evaluation Survey in Minia last month.

o Operations and Maintenance Manuals:

The 50% Level 1 and 2 O&M manuals were " Egyptianized " in Egypt by Stanley Consultants with a four member team from the USA. These 50% manuals have been reviewed by the Construction Manager and approved with comments.  
Change Orders and Potential Change Orders:

Change Orders 14, 15 and 18 were executed by the Employer. Change Orders 9 and 19 were cancelled. Two new potential change orders for water system surge protection and pressure control were initiated.

Potential Change Order 22, the Contractor's Alternate Compensable Delay Claim, is being analyzed by the Construction Manager and their subcontractor Wilson Management Associates of New York.

### Contractor Activities

Design submittals from the Contractor continued throughout December. Submittals and related correspondence are as follows:

1. Mechanical and Electrical:
  - a. Final Works Mechanical Drawings for Tasks A1, A4 - Beni Suef. Provided response to the Construction Manager's review comments.
  - b. Final Works Mechanical Calculations for Tasks A1, A4 - Beni Suef. Provided response to the Construction Manager's review comments.
  - c. Final Works Electrical Drawings for Tasks A1, A4, A10 - Beni Suef. Provided response to the Construction Manager's review comments.
  - d. Final Works Electrical Calculations for Tasks A1, A4, A10 - Beni Suef. Provided response to the Construction Manager's review comments.
  - e. NWS Final Works Electrical Drawings for Tasks A2, A5, A11 - Fayoum. Provided drawings for stamping and distribution.
  - f. Preliminary Works Mechanical and Electrical Drawings for Tasks A13, A14, A15 - Wastewater Pump Station Rehabilitation. Comments were incorporated and submitted for review by the Construction Manager. Pump Station No. 5 drawings for Task A15 in Minia were not included due to pending change order.

2. Architectural and Civil:

a. Preliminary Works Architectural Drawings for Tasks A1, A4 - Beni Suef. Provided response to the Construction Manager's review comments.

b. Preliminary Works Structural Drawings for Sludge Lagoons Task A1 - Beni Suef. Provided response to the Construction Manager's review comments.

c. Preliminary Works Architectural Drawings for Tasks A2, A5, A11 - Fayoum. Provided response to the Construction Manager's review comments.

d. Preliminary Works Site Development Drawings for Task A3 - Minia. Provided response to the Construction Manager's review comments.

e. Preliminary Works Architectural and Civil Drawings for Tasks A13, A14, A15 - Wastewater Pump Station Rehabilitation. Provided response to the Construction Manager's review comments. Pump Station No. 5 drawings for Task A15 in Minia were not included due to pending change order.

f. 90% Site External Works Civil Drawings for Task A3 - Minia. Drawings were prepared and submitted to the Construction Manager for review.

Sewer System Infiltration Reports:

Revised chapters of the reports for Fayoum and Beni Suef were resubmitted for review by the Construction Manager. The revised chapters of the report for Minia have been previously resubmitted and accepted by the Construction Manager.

Construction Summary:

Beni Suef:

Work is continuing on the Beni Suef water treatment plant treated water reservoir, flocculator/wastewater tanks, sedimentation basins, rapid gravity filter, administration building, chemical building, chlorine building, generator station, sludge lagoons, and guard house. Overall, the water treatment plant is approximately 62% complete. The treated water reservoir is approximately 89% complete. The entire construction work in Beni Suef is estimated to be 63% complete.

Fayoum:

Work is continuing on the Fayoum water treatment plant

treated water reservoir, raw water pump station, flocculator/wastewater tanks, sedimentation basins, rapid gravity filter, administration building, chemical building, chlorine building, generator station, and sludge lagoons. Overall, the water treatment plant is approximately 50% complete. The treated water reservoir is approximately 82% complete and construction of the raw water pump station is 73% complete. Painting of the elevated water storage tanks continues to proceed. The entire construction work in Fayoum is estimated to be 62% complete.

#### Minia:

Work is continuing on the Minia water treatment plant treated water reservoir, raw water pump station, flocculator/wastewater tanks, sedimentation basins, rapid gravity filter, administration building, chemical building, chlorine building, generator station, work shop, sludge lagoons, and guard house. Overall, the water treatment plant construction work is approximately 50% complete. The treated water reservoir work is approximately 83 % complete. The raw water pump station is approximately 68% complete. Painting of Water Tank No. 1 continues to proceed. Installation of electrical supply by the Power Company at Water Tanks No. 1 and 2 is ongoing. Overall work in Minia is estimated to be 56% complete.

### DESIGN STATUS

The status of the designs from the Contractor, the design reviews by the Construction Manager, and corrections or changes required are as follows:

#### o Mechanical and Electrical:

##### a. Tasks A1, A4, A10 - Beni Suef

Final Works Mechanical and Electrical Drawings for the Water Work tasks have been reviewed and stamped "No Exceptions Taken".

An exception is the raw water pump station Mechanical Drawings which have been reviewed and stamped "No Exceptions Taken" at the Preliminary Works level. Another exception is the raw water river intake mechanical design details which are still unresolved due to a potential change order.

##### b. Tasks A2, A5, A11 - Fayoum

Final Works Mechanical and Electrical Drawings for the Water Work tasks have been reviewed and stamped "No Exceptions Taken".

An exception is the raw water canal intake mechanical design details which are still unresolved due to the lack of Ministry of Irrigation approval for construction.

c. Tasks A3, A6, A12 - Minia

Final Works Mechanical and Electrical Drawings for the Water Work tasks have been reviewed and stamped "No Exceptions Taken".

d. Tasks A7, A8, A9 - All Cities:

Final Works Mechanical and Electrical Drawings for the Elevated Water Storage Tanks have been reviewed and stamped "No Exceptions Taken".

e. Tasks A13, A14, A15 - All Cities:

Preliminary Works Mechanical and Electrical Drawings for the Wastewater Pump Station Rehabilitation have been reviewed and stamped "No Exceptions Taken". An exception is Pump Station No. 5 at Minia which is the subject of a change order.

f. Tasks A19, A20, A21 - All Cities:

Preliminary Works Drawings for the Water Transmission Line Extensions have been reviewed and stamped "No Exceptions Taken".

Architectural and Civil:

a. Tasks A1, A4, A10 - Beni Suef

Preliminary Works Architectural and Civil Drawings have been reviewed and stamped "No Exceptions Taken"

90% Sanitary and Site Works Drawings have been reviewed and Preliminary Works Drawings are now being prepared.

b. Tasks A2, A5, A11 - Fayoum

Preliminary Works Architectural and Civil Drawings have been reviewed and stamped "No Exceptions Taken".

90% Sanitary and Site Works Drawings have been reviewed and Preliminary Works Drawings are now being prepared.

c. Tasks A3, A6, A12 - Minia

Preliminary Works Site Development Drawings have been reviewed and stamped "No Exceptions Taken".

Preliminary Works Architectural and Civil Drawings have been

reviewed and stamped "No Exceptions Taken".

90% Sanitary and Site Works Drawings have been reviewed and Preliminary Works Drawings are now being prepared.

90% Site External Works Drawings have been reviewed and Preliminary Works Drawings are now being prepared.

e. Tasks A13, A14, A15 - All Cities:

Preliminary Works Architectural and Civil Drawings for the Wastewater Pump Station Rehabilitation have been reviewed and stamped "No Exceptions Taken". An exception is Pump Station No. 5 at Minia which is the subject of a change order.

Structural:

a. Tasks A1, A4, A10 - Beni Suef

Preliminary Works Structural Drawings and Calculations for the Water Work tasks have been reviewed and stamped "No Exceptions Taken".

b. Tasks A2, A5, A11 - Fayoum

Preliminary Works Structural Drawings and Calculations for the Water Work tasks have been reviewed and stamped "No Exceptions Taken". An exception is the raw water canal intake structure, which is anticipated to be submitted soon at the 90% level.

c. Tasks A3, A6, A12 - Minia

Preliminary Works Structural Drawings and Calculations for the Water Work tasks have been reviewed and stamped "No Exceptions Taken". An exception is the raw water river intake jetty structure, which has been submitted and is being reviewed at the 90% level.

d. Tasks A7, A8, A9 - All Cities:

Final Works Structural Drawings for the Elevated Water Storage Tanks have been reviewed and stamped "No Exceptions Taken".

e. Tasks A13, A14, A15 - All Cities:

Preliminary Works Structural Drawings for the Wastewater Pump Station Rehabilitation have been reviewed and stamped "No Exceptions Taken".

## CONSTRUCTION PROGRESS

### Beni Suef

Construction work in Beni Suef is estimated to be 63% complete based on invoiced values. The following is a brief synopsis of the work status for each Task:

Task A1: Work continues on the sedimentation basin and the flocculator/wastewater tanks. The wastewater tank is undergoing watertightness test. This work is approximately 90% complete.

Work continues on the walls, water channels, columns and weirs of the rapid gravity filter. The concrete work is approximately 72% complete.

Work continues on the chemical building. All concrete work on the structure is now complete. Installation of electrical conduit is continuing. This structure is approximately 52% complete.

Work continues on the administration building. Structural concrete is complete. Interior masonry surfaces and external masonry brick construction is ongoing. This structure is approximately 39% complete.

Work continues on the generator building and fuel storage tank facility. Backfilling and compaction of the structure is ongoing. This structure is approximately 73% complete.

Work has begun on the chlorine building with excavation to grade elevation completed. Concrete work on isolated footings is ongoing. This structure is approximately 24% complete.

Construction of the sludge lagoons continues. All footings and piers are complete. Division wall, ramp walls and ramp deck construction is continuing. This structure is approximately 85% complete.

Work has begun on the guard house with excavation works completed.

Task A1 construction is estimated to be 62% complete.

Task A4: Work continues on the treated water reservoir. Asphalt and brick protection of the external surface is complete. Backfilling and compaction around the reservoir is ongoing. Concrete work for beams, columns and roof slab is complete. Formwork and rebar erection

for parapet walls is ongoing.

Task A4 construction is estimated to be 89% complete.

Task A7: Installation of the rough-in electrical work at all three elevated water storage tanks is complete.

Remedial work on the paint at the interior wet surfaces has commenced.

Task A7 construction is estimated to be 94% complete.

Task A16: No on-site work performed by the Contractor this month.

Task A19: No on-site work performed by the Contractor this month.

Task A22: No on-site work performed by the Contractor this month.

T. B4,B7: No on-site work performed by the Contractor this month.

Other:

o Contractor Quality Control:

CQC tests of concrete aggregates and cube strengths continued throughout the month. All tests met the contract specifications. Activities included checking of rebar, checking formwork dimensions and alignments, casting concrete cubes, performing slump tests, performing sieve analyses of aggregates and density tests on compacted backfill.

o Non-Conformance Reports (NCRs):

There were two outstanding NCRs at the end of the month.

1. Concrete strength of chemical building columns.
2. Dewatering cessation at wastewater tank.

o Contractor/subcontractor man-days on site this month:

Supervisory and Overhead	870
Skilled and Unskilled Workers	<u>7,668</u>
Total . . . . .	8,538

o Visitors:

There were 43 visitors to the Beni Suef site office this month.

o Materials and Equipment:

A summary of the materials and equipment on site are shown in Appendices F and G respectively.

**Training:**

City of Beni Suef and NOPWASD engineers were on-the-job trained in inspection procedures and reporting of construction activities.

**Fayoum**

Construction work in Fayoum is estimated to be 62 % complete based on invoiced values. The following is a brief synopsis of the work status for each Task:

Task A2: Work continues on the flocculator/wastewater tanks, sedimentation basins, rapid gravity filter, and the administration, chemical, generator and chlorine buildings. Work recommenced on the sludge lagoons. Concrete placement during the month totaled 522 cubic meters.

Task A2 construction is estimated to be 50% complete.

Task A5: Work continues on the treated water reservoir and high level pump station. Concrete placement during the month totaled 32 cubic meters. Watertightness testing of the treated water reservoir has commenced.

Task A5 construction is estimated to be 82% complete.

Task A8: Remedial work on the paint at Tank No. 2 is ongoing. Painting of Tank No. 3 is complete and dry film thickness testing is ongoing. Cleaning of Tank No. 1 in preparation for painting has commenced.

Task A8 construction is estimated to be 95% complete.

Task A11: Work continues on the the raw water pump station. Concrete placement during the month totaled 15 cubic meters of concrete in columns and beams.

Task A11 construction is estimated to be 73% complete.

Task A14: No on-site work performed by the Contractor this month.

Task A17: No on-site work performed by the Contractor this month.

Task A20: No on-site work performed by the Contractor this month.

Task A23: No on-site work performed by the Contractor this month.

T. B5,B8: No on-site work performed by the Contractor this month.

Other:

o Contractor Quality Control:

CQC tests of concrete aggregates and 'cube strengths continued throughout the month. All tests met the contract specifications. Activities included checking of rebar, checking formwork dimensions and alignments, casting concrete cubes, performing slump tests, performing sieve analyses of aggregates and density tests on compacted backfill, taking cement samples for laboratory tests.

o Non-Conformance Reports (NCRs):

There were five outstanding NCRs at the end of the month.

1. Unformed surface finish at the treated water reservoir.
2. Unsafe excavation for fuel tank.
3. Extensive honeycombing of the soffit of the flocculation chamber floor slab.
4. Unformed surface finish at the raw water pump station.
5. Misaligned columns in administration building.

o Contractor/subcontractor man-days on site this month:

Supervisory and Overhead	1,582
Skilled and Unskilled Workers	<u>8,652</u>
Total . . . . .	10,234

o Visitors:

There were 46 visitors to the Fayoum Site Office this month.

o Materials and Equipment:

A summary of the materials and equipment on site are shown in Appendices F and G, respectively.

o Training:

City of Fayoum and NOPWASD engineers were on-the-job trained in inspection procedures and reporting of construction activities.

## Minia

Construction work in Minia is estimated to be 56% complete based on invoiced values. The following is a brief synopsis of the work status for each Task:

Task A3: Work continues on the flocculator/wastewater tanks, sedimentation basin, rapid gravity filter, and the chemical, chlorine, administration, and generator buildings, sludge lagoons, workshop, fuel oil storage facility, and guard house. Work has commenced on the site external works.

Task A3 construction is estimated to be 50% complete.

Task A6: Work continues on the treated water reservoir and high level pump station. Concrete placement has been completed. Reservoir water leak testing is ongoing.

Task A6 construction is estimated to be 99% complete.

Task A9: Installation of power supply by the Power Company has begun at all three elevated water storage tanks. Painting of Tank No. 2 is complete and is ongoing at Tank No. 1.

Task A9 construction is estimated to be 99% complete.

Task A12: Work continues on the raw water pump station. Concrete placement is complete. Backfilling and compaction is ongoing.

Task A12 construction is estimated to be 99% complete.

Task A15: No on-site work performed by the Contractor this month.

Task A18: No on-site work performed by the Contractor this month.

Task A21: No on-site work performed by the Contractor this month.

Task A24: No on-site work performed by the Contractor this month.

T. B6, B9: No on-site work performed by the Contractor this month.

### o Contractor Quality Control:

CQC tests of concrete aggregates and cube strengths continued throughout the month. 283 concrete cube tests were made this month. All tests met the contract specifications. Activities included checking of rebar, checking formwork dimensions and alignments, casting concrete cubes, performing slump tests, performing sieve analyses of aggregates and density tests on compacted backfill, and taking cement samples for laboratory tests.

Soil compaction tests under and around the various structures met the specifications.

o Non-Conformance Reports (NCRs):

There were two outstanding NCRs at the end of the month.

1. Erosion of backfill at the sedimentation basin.
2. Baffle wall alignment at the flocculation basin.

o Contractor/subcontractor man-days on site this month:

Supervisory and Overhead	1,552
Skilled and Unskilled Workers	<u>7,394</u>
Total . . . . .	8,946

o Visitors:

There were 52 visitors to the Minia Site Office this month.

o Materials and Equipment:

A summary of the materials and equipment on site are shown in Appendices F and G, respectively.

o Training:

City of Minia and NOPWASD engineers were on-the-job trained in inspection procedures and reporting of construction activities.

PROJECT COSTS

Annex D provides a complete listing of all Commercial Invoices to date for the Project. The following is a summary of the status of the work according to expenditures:

Total Earned w/C.O.	\$35,775,006	LE 8,941,414
Total Certified Payments:	\$33,063,311	LE 8,864,015

Status Summary based on invoices:

	<u>Percent Complete</u>		<u>Percent of Scheduled</u>			
			<u>08/88 Sch.</u>		<u>01/90 Sch.</u>	
	US\$	LE	US\$	LE	US\$	LE
Project	71	69	71	69	84	80
FAS	80	-				
Const./Design	66	69				

## PROJECT SCHEDULE

The bar-graph schedule submitted with the technical bid shows construction completion and four months continued operation in 32 months and is still the only schedule that fits the original Contract completion time. A revised schedule update showing progress through September 25, 1989 was submitted on October 2, 1989. This update was approved by the Construction Manager with many exceptions. The Contractor has submitted subsequent updates.

The Contractor has submitted schedule updates for Fayoum and Minia this month and an updated schedule for Beni Suef is anticipated shortly. The Fayoum and Minia schedule updates are currently under review by the Construction Manager.

As a result the Project is now operating without a working schedule, and undoubtedly, the cash-flow schedule submitted in January, 1990 is also inappropriate.

A comparison of the original progress invoice schedule against actual progress invoices indicates slippage in the work schedule of approximately 14 months. See Annex C.

911 days out of the total 854 scheduled construction days have elapsed. This is 107% of the Contract Time while 71% of the US\$ work has been invoiced.

A study of Annex B - Bar Graph Schedule, which is based on the technical bid, reveals that the Contractor is 27.2% behind schedule. Since the elapsed contract time at the end of August is 26 months, that schedule indicates approximately seven months lost time. The difference between the bar-chart and the US\$ cash-flow indicator may represent FAS invoices that have been earned but not yet invoiced.

The graphs included in Annex C plot the schedule of slippage from November, 1988.

## STAFF MOVEMENTS

The following is a summary of arrivals and departures by key employees of both the Construction Manager and the Contractor during the month. A summary listing of all known arrivals and departures from the date the Contract was signed through this report period is shown in Annex E.

**Construction Manager**

Mr. T. G. Carson, File Specialist, departed Egypt on December 12, 1990.

Mr. R. Swart, Chief Counsel, departed Egypt on December 11, 1990

Mr. H. De Guia, Resident Engineer, departed Egypt on December 21, 1990.

Mr. N. Corcoran, Project Engineer, departed Egypt on December 21, 1990.

**Contractor**

Mr. J. Groves, Site Manager Fayoum transferred to Beni Suef as Site Manager on December 1, 1990.

Mr. M. Taute, Site Manager Beni Suef transferred to Minia as Site Manager on December 1, 1990.

Mr. S. Smallwood, Construction Manager, departed the project on December 19, 1990.

Mr. J. Dalrymple, Site Manager Minia, departed the project on December 31, 1990.

## ANNEX A

## CONTRACT AMENDMENTS (CA) AND CHANGE ORDERS (CO)

Contract Amendments

<u>No.</u>	<u>Description</u>	<u>Status</u>
CA1	Total Value of Contract	Executed
CA2	Revise No. of Invoices	Executed
CA3	Provisional Sum	Executed
CA4	Additional Contract Time	Review/LA

Change Orders and Potential Change Orders

<u>CO</u>	<u>PCO</u>	<u>Description</u>	<u>Status</u>
CO1	1	Delete Reference To "Lining" In Art. III-9	Executed
CO2	2	Change Elevated Tank Exterior Paint System From Vinyl to Alkyd	Executed
CO3	3	Revise Total Dynamic Head (TDH) For The Treated Water Pumps	Executed
CO4	4	Suspend Work On Water Line Leak Detection (B1, B2, B3)	Executed
CO5	5	Revise Scope Task A17 In Fayoum	Executed
	6	Resolution Of US Professional Engineer In Egypt	Rejected
CO7	7	Revise Spec. To Permit Local Reinforcing Steel Procurement	Executed
CO8	8	Contractor's Manual, Add Change Order Procedures	Executed
CO6	9	Resolve Whether A US PE Is Required To Sign That All Design Drawings Are In Accordance With The Contract	Review/LA
CO11	10	Re-allocate Pay Items (A16, A17, A18) On The Commercial Bid	Executed
	11	A16, A17, and A18 - Revise Scope Of Work	
	12	A1 - Site Acquisition (Police Camp)	Review/LA
CO18	13	Temperature Reinforcing Steel In Elevated Tank Foundation Concrete	Executed
	14	Extra Geotechnical Work On Elevated Tank Sites In Minia	
	15	Relocate Elevated Tank No. 3 in Fayoum	Review/MH
	16	Design Charges for Alternative Proposals	
	17	Revise Number of Construction Photos	Cancelled
	18	Define 50% Effort For Draft O&M Manuals	
	19	Extend Raw Water Intake In Minia	
	20	Redesign Raw Water Intake in Fayoum	
	21	Revise CPM Schedule As Required by USAID	
CO17	22	Contract Time Resulting from Accumulated Delays	Review/LA

## ANNEX A (Sheet 2 of 3)

<u>CO</u>	<u>PCO</u>	<u>Description</u>	<u>Status</u>
CO19	23	Delete the Requirement For Air Entrainment In Concrete	Cancelled
CO9	24	Revise Wastewater Sump Pumps From 12 l/s To 1.2 l/s	Cancelled
CO14	25	Increase Wastewater Pump Station Wetwell Ventilation	Executed
CO21	26	Site Office Telephone In Minia	Executed
CO17	27	Increased Scope, Sewer System Evaluation Studies, Delays	Review/LA
	28	Revise Quantity And Alignment Of Water Transmission Main Extensions	
CO10	29	Revise Spec. On Underground Fuel Tanks	Executed
	30	Construction Power At the Water Plant Sites	
	31	Revise Scope Of Work on Waterline Leak Detection	
CO12	32	Automatic Inlet Flow Control Valve	Suspended
CO15	33	Tasks A1, A2, A3 - Chlorine Leak Detectors	Draft/NO
	34	LE Withholding On Subsidised Rebar	
	35	Force Majeure - Capsized Barge	
	36	Tasks A7, A8, A9 - USAID Signs	Cancelled
CO16	37	A1, Relocation Of Admin/Chemical Building	Final/NO
	38	A2, Domestic Waste Disposal, Admin Building	
CO13	39	Additional Vehicle For C/M Staff	Executed
	40	Establish Contract Interest Clause	Rejected
	41	Additional Concrete Specification	Cancelled
CO20	42	All-Raw Water Pump House, Increased Depth	Review/LA
	43	Interest For Late US\$ Invoice Payments	
	44	Interest For Late LE Invoice Payments	
	45	Relocate Raw Water Intake For Beni Suef	Review/NO
	46	Additional Sulphate Resistant Cement	Review/MH
	47	A6-Treated Water Reservoir, Flotation	
	48	A1,A2,A3 - Additional Alarms And Annunciators	Review/LA
	49	-Inactive-	
CO22	50	Additional O & M Requirements	Review/LA
	51	A1,A2,A3, Filter Backwash Recycle System	Review/MH
	52	A15, Minia Wastewater Pump Station No. 5	Review/LA
	53	Water System Surge Protection	Review/NO
	54	Water System Pressure Reduction/Sustaining	Review/NO

## LEGEND

Change Orders and Contract Amendments are first prepared by the Construction Manager and issued for review and "Approval in Principle" by the Contractor, USAID and NOPWASD. These are designated "Draft". When approval in principle has been reached, the document is revised as necessary and issued by the Construction Manager for "Acceptance" by the Contractor and

ANNEX A (Sheet 3 of 3)

LEGEND (Cont.)

"Approval" by NOPWASD. These are designated "Final". Changes that are finally executed are designated "Executed".

The following legend can be used to determine the status of each document at the end of a given month:

1. Issued for "Approval-in Principle" and with the Contractor, NOPWASD, USAID: Draft/LA, Draft/NO, Draft/AI.
2. Issued for final "Acceptance" and with the Contractor (Final/LA), or "Approval" and with NOPWASD (Final/NO).
3. "Rejected", the Contractor's request for a Change Order has been rejected.

## ANNEX B

## BAR GRAPH SCHEDULES

The following schedules present "planned progress" and actual progress to the extent known to the Construction Manager. Some items of each Task may be unknown, such as the status of drawings that have not been submitted; accordingly, the graphs can only be considered as indicators of the status of the work which in combination with other indicators, such as invoices and reports of construction work, reasonably reflect the status of the work.

Planned work shown herein was obtained from the Contractor's Technical Bid, 1987, for Tasks A1 to A6, A10 to A15. The schedule shown for A19 to A21 was taken from the Contractor's Schedule submitted in August, 1988. The planned work shown for Tasks A7 to A9 was developed from information furnished in the Technical Bid but was not directly copied for these schedules.

## SUMMARY

Task No.	Percent Behind Schedule	Weight by \$ Value	Weighted % Slippage
A1,A2,A3	25	20.2	5.05
A4,A5,A6	18	5.2	0.94
A7,A8,A9	19	13.9	2.64
A10,A11,A12	22	2.1	0.46
A13,A14,A15	75	2.7	2.02
A19,A20,A21	72	2.0	1.44
TOTALS		46.1	12.55

Average weighted percent behind schedule:  $12.15/46.1 = 27.22\%$

Total Contract time at the end of this period of 26 months multiplied by the average % behind schedule reveals an indicated slippage from the bid schedule of 7.08 months as shown below:

$26$  (Contract Months) X  $0.2722$  (Ave. wt. % behind) =  $7.08$  months.

PCDP DESIGN / CONSTRUCTION SCHEDULE

ITEM	ITEM WORK	PROGRESS PLANNED	1988					1989					1990					1991				1 Yr.	1 Yr.															
			J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	-	M	A	M	A									
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	-	-	-	1
1	ARRANGEMENT DWGS. 40% CLIENTS REVIEW	100/100	[Planned Progress]												[Actual Progress]																							
2	DETAIL DWGS. (90%) CLIENTS REVIEW	100/100	[Planned Progress]												[Actual Progress]																							
3	WORKS DRAWINGS CLIENTS REVIEW	90/100	[Planned Progress]												[Actual Progress]																							
4	MAJOR EQUIPMENT DATA CLIENTS REVIEW	95/100	[Planned Progress]												[Actual Progress]																							
5	PROCUREMENT	85/100	[Planned Progress]												[Actual Progress]																							
6	DELIVERIES TO SITE	80/100	[Planned Progress]												[Actual Progress]																							
7	MOBILIZATION (SITE)	100/100	[Planned Progress]												[Actual Progress]																							
8	CIVIL CONSTRUCTION	65/100	[Planned Progress]												[Actual Progress]																							
9	M. & E. INSTALLATION	0/100	[Planned Progress]												[Actual Progress]																							
10	INITIAL OPERATION	0/50	[Planned Progress]												[Actual Progress]																							
11	MAINTENANCE	0/0	[Planned Progress]												[Actual Progress]																							
12	CONTINUED OPERATION	0/0	[Planned Progress]												[Actual Progress]																							
TOTALS		715/950	[Planned Progress]												[Actual Progress]																							
% OF PLANNED		75%	[Planned Progress]												[Actual Progress]																							

21

Planned Progress Actual Progress	Average Progress • Behind Schedule 25% • Ahead Of Schedule	Tasks A1, A2, A3 WATER TREATMENT PLANTS		MONTGOMERY - HARZA		
				DATE	CHECKED BY	APPROVED BY
				Jan. 1,		
				1991		

PCDP DESIGN / CONSTRUCTION SCHEDULE

ITEM	ITEM WORK	PROGRESS PLANNED	1988					1989					1990					1991				1 Yr.	1 Yr.															
			J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	-	M	A	M	A									
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	-	-	-	1
1	ARRANGEMENT DWGS. 40%	100/100	[Planned Progress]																																			
	CLIENTS REVIEW		[Actual Progress]																																			
2	DETAIL DWGS. (90%)	100/100	[Planned Progress]																																			
	CLIENTS REVIEW		[Actual Progress]																																			
3	WORKS DRAWINGS	98/100	[Planned Progress]																																			
	CLIENTS REVIEW		[Actual Progress]																																			
4	MAJOR EQUIPMENT DATA	100/100	[Planned Progress]																																			
	CLIENTS REVIEW		[Actual Progress]																																			
5	PROCUREMENT	98/100	[Planned Progress]																																			
6	DELIVERIES TO SITE	98/100	[Planned Progress]																																			
7	MOBILIZATION (SITE)	100/100	[Planned Progress]																																			
8	CIVIL CONSTRUCTION	85/100	[Planned Progress]																																			
9	M. & E. INSTALLATION	0/100	[Planned Progress]																																			
10	INITIAL OPERATION	0/50	[Planned Progress]																																			
11	MAINTENANCE	0/0	[Planned Progress]																																			
12	CONTINUED OPERATION	0/0	[Planned Progress]																																			
TOTALS		779/850	[Planned Progress]																																			
% OF PLANNED		92%	[Planned Progress]																																			

28

Planned Progress Actual Progress	Average Progress ● Behind Schedule 18% ● Ahead Of Schedule	Tasks A4, A5, A6		MONTGOMERY - HARZA	
		GROUND STORAGE RESERVOIR & HIGH SVC. P.S.		DATE	CHECKED BY
				Jan. 1,	
				1991	

# PCDP DESIGN / CONSTRUCTION SCHEDULE

ITEM	ITEM WORK	PROGRESS PLANNED	1988												1989												1990																																				
			J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S																						
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	PURCHASE ORDER	100/100	[Gantt bar: 100% complete]																																																												
2	FABRICATE	100/100	[Gantt bar: 100% complete]																																																												
3	SHIP TO SITE	100/100	[Gantt bar: 100% complete]																																																												
4	ERECTION DWGS. 90 % CLIENTS REVIEW	100/100	[Gantt bar: 90% complete]																																																												
5	FOUNDATION DWGS. 90 % CLIENTS REVIEW	100/100	[Gantt bar: 90% complete]																																																												
6	FOUNDATION CONST.	100/100	[Gantt bar: 100% complete]																																																												
7	TANK ERECTION	99/100	[Gantt bar: 99% complete]																																																												
8	TANK PAINTING	50/100	[Gantt bar: 50% complete]																																																												
9	MECH. & ELECTRICAL	60/100	[Gantt bar: 60% complete]																																																												
10	CHLORINATION & TEST	0/100	[Gantt bar: 0% complete]																																																												
TCTALS		809/1000	[Gantt bar: 80.9% complete]																																																												
% OF PLANNED		81%	[Gantt bar: 81% complete]																																																												

19

<p> Planned Progress</p> <p> Actual Progress</p>	<p>Average Progress</p> <ul style="list-style-type: none"> <li>● Behind Schedule 10%</li> <li>● Ahead Of Schedule</li> </ul>	<p>Tasks A7, A8, A9</p> <h2 style="margin: 0;">ELEVATED STORAGE TANKS</h2> <p style="font-size: small; margin-top: 5px;">NOTE: EST. SCHEDULE DERIVED FROM TECH. SUBMITTAL &amp; FAYOUM CPM REV. 0</p>	<p><b>MONTGOMERY - HARZA</b></p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <tr> <td style="width: 20%;">DATE</td> <td style="width: 20%;">CHECKED BY</td> <td style="width: 20%;">APPROVED BY</td> <td style="width: 40%;"></td> </tr> <tr> <td>Jan. 1, 1991</td> <td></td> <td></td> <td></td> </tr> </table>	DATE	CHECKED BY	APPROVED BY		Jan. 1, 1991			
DATE	CHECKED BY	APPROVED BY									
Jan. 1, 1991											

**PCDP DESIGN / CONSTRUCTION SCHEDULE**

ITEM	ITEM WORK	PROGRESS PLANNED	1988				1989				1990				1991				1 Yr.	1 Yr.																		
			J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	-	M	A	M	A									
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	-	-	-	1
1	ARRANGEMENT DWGS. 40%	100/100	[Gantt bars showing progress]																																			
	CLIENTS REVIEW		[Gantt bars showing progress]																																			
2	DETAIL DWGS. (90%)	95/100	[Gantt bars showing progress]																																			
	CLIENTS REVIEW		[Gantt bars showing progress]																																			
3	WORKS DRAWINGS	90/100	[Gantt bars showing progress]																																			
	CLIENTS REVIEW		[Gantt bars showing progress]																																			
4	MAJOR EQUIPMENT DATA	100/100	[Gantt bars showing progress]																																			
	CLIENTS REVIEW		[Gantt bars showing progress]																																			
5	PROCUREMENT	95/100	[Gantt bars showing progress]																																			
6	DELIVERIES TO SITE	90/100	[Gantt bars showing progress]																																			
7	MOBILIZATION (SITE)	100/100	[Gantt bars showing progress]																																			
8	CIVIL CONSTRUCTION	50/100	[Gantt bars showing progress]																																			
9	M. & E. INSTALLATION	20/100	[Gantt bars showing progress]																																			
10	INITIAL OPERATION	0/50	[Gantt bars showing progress]																																			
11	MAINTENANCE	0/0	[Gantt bars showing progress]																																			
12	CONTINUED OPERATION	0/0	[Gantt bars showing progress]																																			
TOTALS		740/950																																				
% OF PLANNED		78%																																				

30

Planned Progress Actual Progress	<b>Average Progress</b> ● Behind Schedule    22% ● Ahead Of Schedule	<b>Tasks A10, A11, A12</b> <b>RAW WATER INTAKE &amp; P.S.</b>			<b>MONTGOMERY - HARZA</b>			
		DATE	CHECKED BY	APPROVED BY				
		Jan. 1, 1991						

**PCDP DESIGN / CONSTRUCTION SCHEDULE**

ITEM	ITEM WORK	PROGRESS % PLANNED	1988				1989				1990				1991				1 Yr.	1 Yr.																		
			J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	-	-	-	1	12	13	24							
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	-	-	-	1
	STATION SURVEY	100/100	[Gantt bar: 100% complete]																																			
1	ARRANGEMENT DWGS. 40%	100/100	[Gantt bar: 100% complete]																																			
	CLIENTS REVIEW		[Gantt bar: 100% complete]																																			
2	DETAIL DWGS. (90%)		[Gantt bar: 90% complete]																																			
	CLIENTS REVIEW		[Gantt bar: 90% complete]																																			
3	WORKS DRAWINGS	0/100	[Gantt bar: 0% complete]																																			
	CLIENTS REVIEW		[Gantt bar: 0% complete]																																			
4	MAJOR EQUIPMENT DATA	50/100	[Gantt bar: 50% complete]																																			
	CLIENTS REVIEW		[Gantt bar: 50% complete]																																			
5	PROCUREMENT	35/100	[Gantt bar: 35% complete]																																			
6	DELIVERIES TO SITE	20/100	[Gantt bar: 20% complete]																																			
7	MOBILIZATION (SITE)	0/100	[Gantt bar: 0% complete]																																			
8	CIVIL CONSTRUCTION	0/100	[Gantt bar: 0% complete]																																			
9	M. & E. INSTALLATION	0/100	[Gantt bar: 0% complete]																																			
10	INITIAL OPERATION	0/100	[Gantt bar: 0% complete]																																			
11	MAINTENANCE	0/100	[Gantt bar: 0% complete]																																			
12	CONTINUED OPERATION	0/0	[Gantt bar: 0% complete]																																			
TOTALS		305/1200																																				
% OF PLANNED		25%																																				

31

Planned Progress Actual Progress	<b>Average Progress</b> ● Behind Schedule 75% ● Ahead Of Schedule	<b>Tasks A13, A14, A15</b> <b>WASTEWATER P.S. UPGRADING</b>				<b>MONTGOMERY - HARZA</b>			
		DATE	CHECKED BY	APPROVED BY		DATE	CHECKED BY	APPROVED BY	
		Jan. 1, 1991							

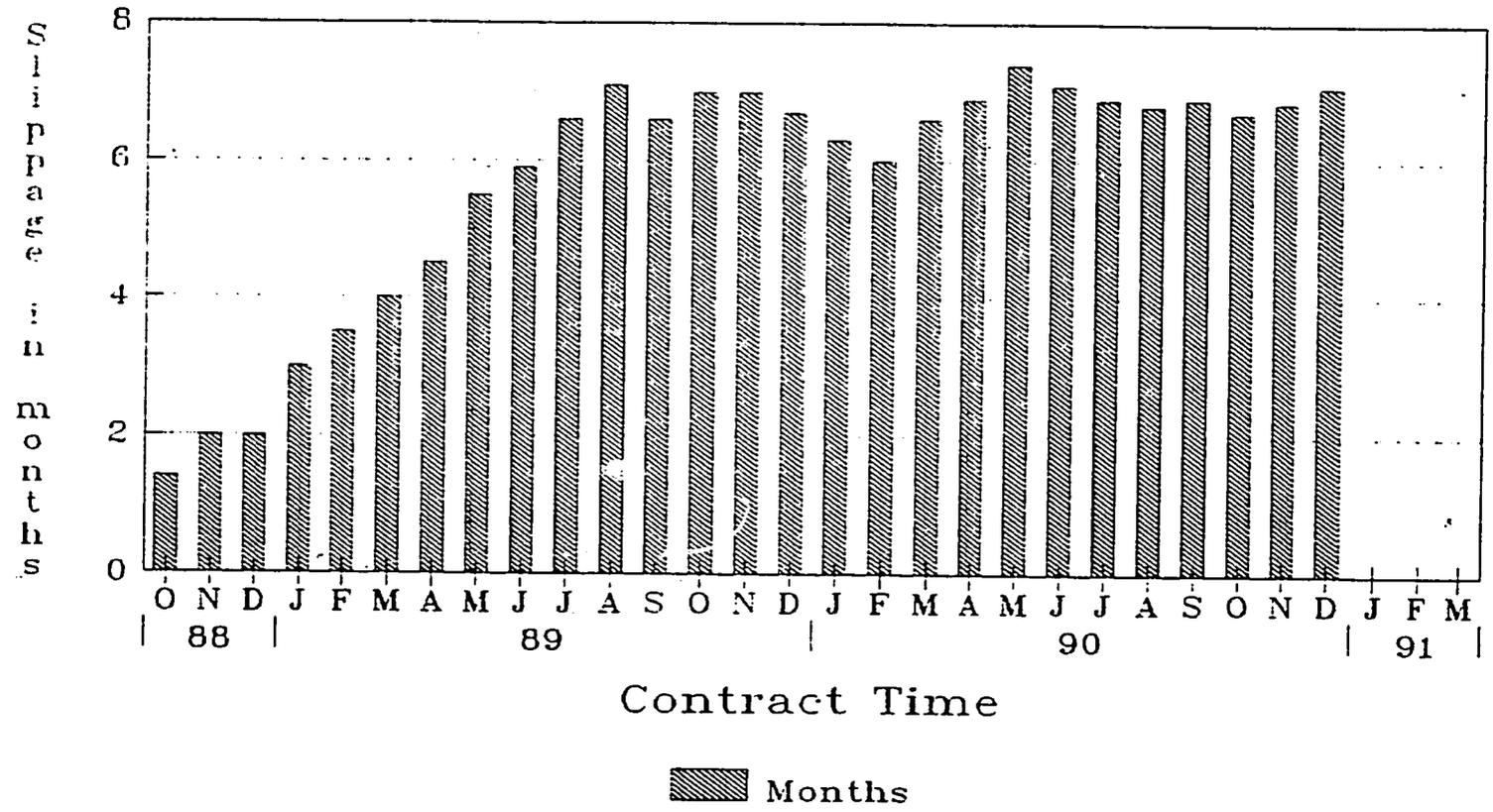
PCDP DESIGN / CONSTRUCTION SCHEDULE

ITEM	ITEM WORK	PROGRESS % PLANNED	1988					1989					1990					1991					1 Yr.	1 Yr.														
			J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	A	M	A	1	12	13	24						
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	-	-	-	1
1	DETAIL DWGS. (90%) CLIENTS REVIEW	100/100	[Gantt chart showing progress for Item 1]																																			
2	WORKS DRAWINGS	90/100	[Gantt chart showing progress for Item 2]																																			
3	PROCUREMENT	35/100	[Gantt chart showing progress for Item 3]																																			
4	DELIVERIES TO SITE	0/100	[Gantt chart showing progress for Item 4]																																			
5	MOBILIZATION (SITE)	0/100	[Gantt chart showing progress for Item 5]																																			
6	CIVIL CONSTRUCTION	0/100	[Gantt chart showing progress for Item 6]																																			
7	PROGRESS TESTING	0/100	[Gantt chart showing progress for Item 7]																																			
8	ACCEPTANCE	0/100	[Gantt chart showing progress for Item 8]																																			
TOTALS		225/800																																				
% OF PLANNED		28%																																				

32

 Planned Progress  Actual Progress	Average Progress ● Behind Schedule 72% ● Ahead Of Schedule	Tasks A19, A20, A21 <b>WATER LINE EXTENSIONS</b>		MONTGOMERY - HARZA		
			DATE Jan. 1, 1991	CHECKED BY	APPROVED BY	

# SCHEDULE SLIPPAGE VS. CONTRACT TIME



Note: Slippage relative to Aug. 88 sch.

## ANNEX C

## GRAPH OF MONETARY EARNINGS SCHEDULES

(1) U.S. DOLLAR EARNINGS SCHEDULE FIGURE 1

(2) EGYPTIAN POUND (LE) EARNINGS SCHEDULE FIGURE 2

The Cash-Flow Schedule submitted on August 30, 1988 totaled US \$50,055,809 and LE 10,400,000, which when added to the US \$3,010,200 Mobilization Advance and LE 2,600,000 Downpayment, totaled the Contract Price. Those cumulative values were plotted on Figure 1 and Figure 2 to compare with the total of actual payments made, exclusive of the Mobilization and Downpayment.

The Cash-Flow Schedule submitted on January 10, 1990 included the Mobilization and Downpayment. That schedule totaled the Contract Price. Therefore, in order to provide a meaningful comparison with the August 30, 1988 schedule, each month's accumulative value was reduced by the Mobilization and Downpayment and plotted against time on Figures 1 and 2.

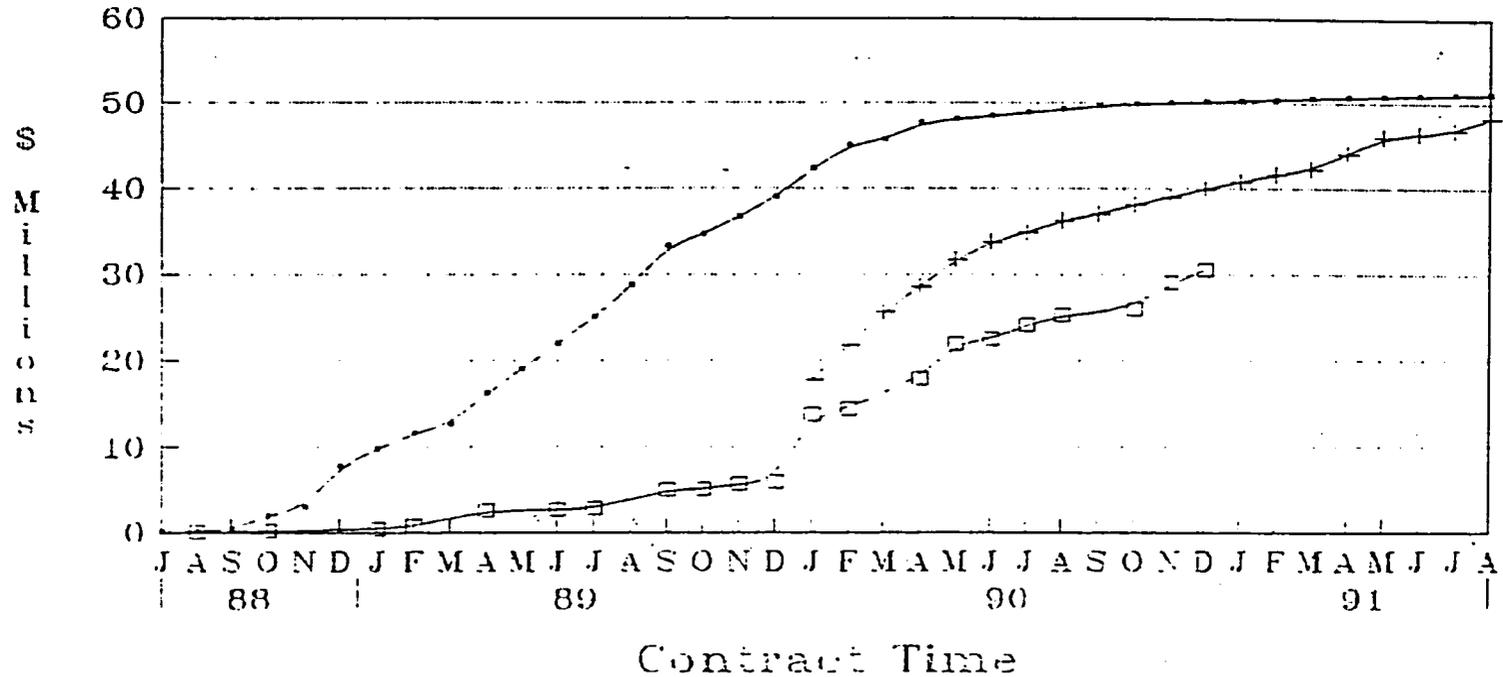
Neither of the two schedules reflected contractual deductions such as retainage and repayment of the Mobilization that impact on the actual value of each invoice, and in that respect, should not be termed "Cash-Flow Schedules".

For clarity the following deductions are typically made from the three types of invoices listed below:

<u>Type of Invoice</u>	<u>Percent of Retainage</u>	<u>Percent of Repayment</u>
FAS	10	10
Freight	0	0
US\$ Construction	10	0
LE Construction	10	20
Operation & Maintenance	0	0

In view of the foregoing, the accumulated amounts earned listed in Annex D are decreased by the repayment value for comparison on Figures 1 and 2.

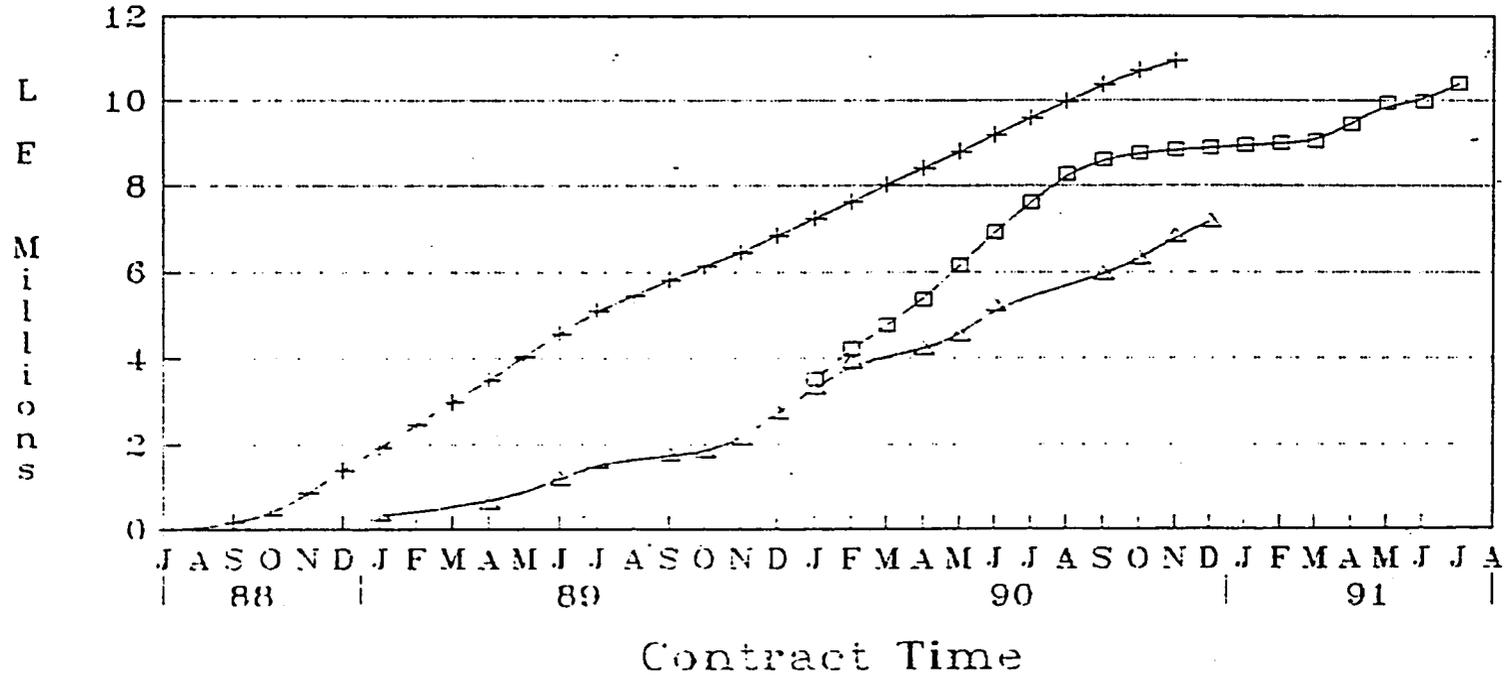
# US \$ CASH FLOW VS. TIME



—•— US \$ CASH FLOW 88      -+ - US \$ CASH FLOW 90      —□— ACTUAL C F CUM

Slippage:  
 Aug 88 sch 16 mts, Jan 90 sch 7.5 mts

# L.E. CASH FLOW VS. TIME



— CASH FLOW AUG.88      —□— CASH FLOW JAN.90      —△— ACTUAL CASH FLOW

Slippage:  
 Aug 88 sch 11 mts, Jan 90 sch 5.5 mts

## ANNEX D

## CONTRACTOR'S COMMERCIAL INVOICE LISTING

Invoice No.	Date Submitted	Date Certified	Amount Certified for Payment	
			US\$	LE
1	06/30/88	07/05/88	3,010,200	-
2	06/30/88	07/05/88	-	2,600,000
3	08/22/88	09/06/88	15,607	-
4A	10/16/88	10/22/88	188,805	-
5	12/12/88	01/11/89	233,985	-
6	01/24/89	02/06/89	231,780	-
7	01/24/89	02/06/89	-	401,807
8	02/19/89	02/22/89	125,697	-
9	03/15/89	04/13/89	2,268,342 (1)	-
10	04/23/89	06/01/89	30,572	-
11	04/25/89	04/17/89	-	343,783
12A	06/20/89	07/11/89	210,391	-
13A	06/20/89	07/11/89	-	705,663
14A	07/31/89	08/07/89	-	497,596
15A	09/03/89	09/19/89	-	117,282
16A	09/09/89	09/19/89	296,989	-
17	09/09/89	09/19/89	2,260,972 (1)	-
18	09/09/89	09/19/89	17,300 (1)	-
19	09/09/89	09/19/89	20,055 (1)	-
20A	10/26/89	11/05/89	355,457 (1)	-
21A	09/26/89	10/01/89	18,600 (1)	-
22	09/17/89	09/19/89	-	101,189
23	09/26/89	10/01/89	90,886	-
24	10/29/89	11/01/89	-	103,502
25	11/01/89	-	882,604 (2)	-
25	Returned	11/02/89	(882,604) (2)	-
26B	11/28/89	12/04/89	79,104 (3)	-
		Disputed Amount	(20,182)	-
		Inadvertently deducted	(80.90)	-
27	11/07/89	11/11/89	237,940 (1)	-
28	11/07/89	11/13/89	148,923 (1)	-
29A	11/14/89	11/16/89	-	369,202
30A	11/20/89	12/10/89	292,901 (3)	-
		Disputed Amount	(48,404)	-
(Note: The disputed amount was reduced to \$18,257 by Inv. 33A which removed \$25,307 from the amount previously claimed.)				
31	12/20/89	01/02/90	322,546 (1)	-
32	12/21/89	01/02/89	-	747,725
33A	01/04/90	01/11/90	849,958	-
		Disputed Amount	(4,298)	-
34	01/15/90	01/22/90	-	714,048
35	01/21/90	01/22/90	777,618	-

## ANNEX D (Cont.)

Monthly Invoice No.	Date Submitted	Date Certified	Amount Certified for Payment	
			US\$	LE
36	01/24/90	01/28/90	7,431,555 (1)	-
37	02/06/90	02/10/90	-	275,938
38	02/06/90	02/10/90	773,858	-
39	02/15/90	02/17/90	-	499,954
40A	04/01/90	04/05/90	1,151,544	-
41A	04/01/90	04/05/90	2,316,520 (1)	-
42	04/17/90	04/28/90	-	363,518
43	04/21/90	04/28/90	655,539	-
44	05/07/90	05/10/90	2,260,639 (1)	-
45	05/14/90	05/16/90	-	387,219
46	05/14/90	05/16/90	686,823 (4)	-
47	05/19/90	05/20/90	880,983 (1)	-
48	05/19/90	05/22/90	1,053,115 (1)	-
49	06/04/90	06/06/90	-	425,246
50	06/07/90	06/09/90	537,398	-
51	06/27/90	06/28/90	-	439,634
52	07/01/90	07/01/90	1,301,554	-
53	07/01/90	07/01/90	708,495 (1)	-
54	08/25/90	08/27/90	-	Returned
55	08/25/90	08/26/90	325,216	-
56	08/25/90	08/26/90	1,134,431 (1)	-
54A	09/15/90	09/17/90	-	414,564
57	09/19/90	09/22/90	-	503,154
58	09/27/90	10/03/90	496,174	-
59	10/30/90	10/31/90	-	454,380
60	10/31/90	10/31/90	284,303	-
61	12/02/90	12/06/90	-	655,128
62	12/02/90	12/06/90	693,841	-
63	11/24/90	12/01/90	1,812,415 (1)	-
64	11/24/90	12/01/90	509,661 (1)	-
65	12/20/90	01/05/90	-	395,759
65A	12/20/90	01/05/91	-	25,123
66	12/20/90	01/06/91	409,534	-
67	12/20/90	01/08/91	366,364 (1)	-
68	12/22/90	01/08/91	411,833 (1)	-
69	12/22/90	01/08/91	567,450 (1)	-

TOTAL AMOUNT CERTIFIED FOR PAYMENT	\$38,785,206	LE 11,541,414
Less Change Order Payments	(16,899)	(25,123)
US\$ Mob. and LE Advance	<u>(3,010,200)</u>	<u>(2,600,000)</u>
Total Amount of Orig. Cont. Earned *	35,758,107	8,916,291

Less Repayments	(2,331,609)	(1,783,258)
Less Retainage	(3,390,286)	(894,141)
Plus Change Order Payments	16,899	25,123
US\$ Mob. and LE Advance	<u>3,010,200</u>	<u>2,600,000</u>
Total Amount Paid	\$33,063,311	LE 8,864,015

## ANNEX D (Cont.)

\* This will total the original Contract Amount of US\$ 53,066,009 and LE 13,000,000 when the work is complete.

Comparison With Cash Flow Schedules

Scheduled Payments through December 1990 should be compared to the total amount paid plus retainage less change order payments and \$ and LE advances.

(a) Total Amount Paid to Date *	\$ 33,426,498	LE 7,133,033
(b) Schedule Dated Aug. 1988	\$ 47,281,859	LE10,400,000
(c) Schedule Dated Jan. 1990	\$ 39,931,205	LE 8,892,824

\* The amount shown is the total amount of the original contract earned less the amount repaid against the dollar mobilization advance and LE downpayment.

The overall value of the work completed to date is 71% of the value scheduled according to the August, 1988 cash-flow schedule and 84% of the January, 1990 cash-flow schedule for US\$. For LE, they are 69% and 80%, respectively.

Invoices paid under the Articles on FAS payments total \$25,103,596 and represent \$23,316,092 for materials and \$1,787,504 for freight. This represents 80% and 80% of the total \$29,222,963 and \$2,235,252 price for FAS and freight, respectively.

Un-marked dollar entries are for design, on-site construction and O & M. Those payments total \$10,654,511. The total price quoted for design and construction was \$16,096,209. The payments to date represent 66% of the total US \$ price for that work.

The earned LE 8,916,291 represents 69% of the total progress LE payment for design and construction. The total price was LE 13,000,000.

<u>Summary:</u>	<u>US\$</u>	<u>LE</u>
Percent Overall Project Complete	71%	69%
Percent FAS Complete	80%	-
Percent On-site Construction and Design Complete	66%	69%

ANNEX D (Cont.)

Notes:

- (1) Represents FAS and freight payments for materials and equipment.
- (2) Invoice No. 25 was returned for contractual reasons, and was effectively reduced to \$240,000 by CO 11.
- (3) The inadvertent deduction in Invoice No. 26B of \$72.81 under C.O. No. 4 was paid in Invoice No. 40A.
- (4) The previously disputed \$40,920 for Task A16, A17, A18 was certified in full in Invoice 46.

## ANNEX E

## ARRIVAL AND DEPARTURE DATES FOR KEY PERSONNEL

## Construction Manager Staff Movements:

<u>Name</u>	<u>Position</u>	<u>Date of Arrival</u>	<u>Date of Departure</u>
Expatriate Staff:			
C. A. Moffitt	Project Manager	12/12/87	12/23/87
		01/27/88	09/23/88
		10/05/88	09/08/89
		09/08/89	09/29/89
		10/22/89	01/08/90
S. M. Moffitt	Office Coordinator	02/06/88	09/23/88
		10/05/88	08/06/89
		10/22/89	01/08/90
E. W. Hurley	Resident Engineer, Minia	06/27/88	06/03/89
		06/24/89	06/30/90
		07/28/90	----
T. E. Kent	Chief Office Engineer	07/14/88	08/19/88
		08/26/88	07/08/89
		07/15/89	12/20/89
		12/30/89	04/13/90
		04/26/90	07/13/90
		08/17/90	09/27/90
D. Wetstein	Water Treatment Specialist	07/06/88	07/15/88
		12/09/88	12/17/88
R. Wong	Geotechnical Specialist	10/14/88	10/27/88
		01/21/89	02/14/89
B. Anthony	Vice President, Harza	10/25/88	10/27/89
		09/15/89	09/25/89
		03/11/90	03/15/90
D. Zion	Resident Engineer, Fayoum	11/01/88	03/07/90
		03/31/90	----
R. Gordon	Computer Specialist	02/04/89	03/23/89

## ANNEX E (Sheet 2 of 10)

<u>Name</u>	<u>Position</u>	<u>Date of Arrival</u>	<u>Date of Departure</u>
H. DeGuia	Resident	02/06/89	01/05/90
	Engineer, Beni	02/05/90	04/12/90
	Suef	04/30/90	12/21/90
T. Heinsoo	Vice President, JMM	05/23/89	05/29/89
		09/18/89	09/26/89
		11/13/89	11/22/89
R. Holgrem	President, JMM	05/25/89	05/29/89
R. Angeli	Training Specialist	06/04/89	08/04/89
T. Rust	I/I Specialist	07/21/89	09/08/89
D. Bird	Vice President, JMM	07/28/89	09/14/89
		10/05/89	10/26/89
		01/24/90	01/29/90
		05/05/90	05/11/90
		10/01/90	10/10/90
J. Barstad	Scheduling Specialist	11/12/90	11/23/90
		10/07/89	10/20/89
		01/15/90	01/20/90
		05/17/90	06/01/90
H. A. Dare	Contract Specialist	11/15/90	11/20/90
		09/09/89	10/31/89
		01/13/90	02/05/90
		03/20/90	04/19/90
		06/21/90	07/25/90
J. Kuiken	Hydraulic Specialist	08/15/90	08/31/90
		12/09/89	12/16/89
D. Scheel	Office Engineer	11/30/89	04/12/90
		04/28/90	10/12/90
		10/21/90	11/22/90
J. H. Creager	Acting Project Manager	11/30/89	01/27/90
		02/15/90	03/24/90
A. E. Yoakum	Project Manager	03/05/90	----
R. Prior	Water Systems Specialist	03/31/90	05/13/90
		08/25/90	10/28/90

## ANNEX E (Sheet 3 of 10)

<u>Name</u>	<u>Position</u>	<u>Date of Arrival</u>	<u>Date of Departure</u>
C. D. Smith	Temp Office Engr	07/14/90	08/20/90
D. N. Corcoran	Project Engr.	09/22/90	12/21/90
D. Swart	Chief Counsel	11/12/90	12/11/90
T.G. Carson	File Specialist	11/16/90	12/12/90
D. Leishman	Contracts Engr.	11/15/90	----
Wilson Management Associates			
D. Holman	Claims Analyst	11/12/90	04/22/90
Local Staff:			
M. A. Rahman	Asst. RE, Beni Suef	06/01/88	----
G. El Sawi	Asst. RE, Fayoum	06/01/88	----
G. M. Bakhit	Office Asst.	06/01/88	----
H. Hafez	Short-Term Geotech.	10/15/88	03/16/89
V. Wahba	Const. Inspector	07/01/89	----
Contractor' Staff Movements:			
Expatriate Staff:			
M. J. Burns	Former Project Manager	06/19/88	06/24/88
		07/17/88	07/21/88
		08/11/88	08/15/88
		08/24/88	10/07/88
L. Brimson	Design Engineer	06/19/88	06/24/88
		09/02/88	09/23/88
		11/06/88	11/15/88
		01/22/89	01/27/89
		04/29/89	05/01/89
G. Anstiss	Design Engineer	07/17/88	07/21/88
		11/06/88	11/15/88
		05/08/89	05/19/89

## ANNEX E (Sheet 4 of 10)

<u>Name</u>	<u>Position</u>	<u>Date of Arrival</u>	<u>Date of Departure</u>
D. Honstain	Site Mgr, Minia; Asst Proj Mgr	07/17/88	11/17/88
		11/17/88	01/19/90
		02/18/90	04/06/90
E. Anderson	Site Mgr, Fayoum	08/09/88	11/30/88
W. Parsons	Site Mgr, Beni Suef	08/09/88	12/31/88
P. Giacoletti	Chief of Project; Vice President, Operations (eff 09/90)	11/06/88	11/11/88
		04/27/89	05/03/89
		06/05/89	06/09/89
		07/23/89	07/31/89
		02/04/90	02/08/90
		03/22/90	03/27/90
		05/06/90	05/11/90
		06/23/90	06/29/90
		08/25/90	08/31/90
11/03/90	11/08/90		
R. Cox	Administrator	11/06/88	11/18/88
P. Burrows	Material Procurement	11/05/88	11/18/88
		03/05/90	03/15/90
R. Rose	Project Manager, Project Director (eff 07/01/90)	12/30/88	10/06/89
		10/20/89	04/23/90
		04/27/90	05/20/90
		06/03/90	09/30/90
R. Lacey	Site Mgr, Minia	12/30/88	10/26/89
		11/24/89	04/21/90
		04/29/90	05/28/90
J. Groves	Site Mgr, Fayoum	12/30/88	11/17/89
		12/04/89	06/30/90
		07/06/90	12/01/90
	Site Mgr, Beni Suef	12/01/90	---
J. Robinson	Site Mgr, Beni Suef Sub contract Admin.	12/30/88	12/22/89
		02/08/90	10/16/90
		10/16/90	12/07/90

## ANNEX E (Sheet 5 of 10)

<u>Name</u>	<u>Position</u>	<u>Date of Arrival</u>	<u>Date of Departure</u>
M. Harper	Cost Engineer	07/15/88	09/28/89
		10/12/89	11/30/89
		12/05/89	06/29/90
		07/23/90	----
R. Crosby	Materials Manager	07/17/89	05/31/90
C. Haggard	Scheduling Engineer	07/23/89	11/09/89
		11/19/89	01/26/90
		02/12/90	04/20/90
		04/29/90	06/26/90
		07/28/90	09/23/90
R. Franks	Contracts Manager	07/23/89	07/31/89
		08/26/89	09/08/89
		09/20/89	12/03/89
		12/08/89	01/15/90
		01/29/90	02/12/90
		02/17/90	04/23/90
		04/27/90	05/31/90
06/13/90	08/26/90		
T. Patel	PE Design Engineer	07/23/89	06/23/90
A. Anstadt	Chief of Project	07/23/89	07/31/89
		08/26/89	09/08/89
		09/20/89	12/15/89
		12/29/89	06/30/90
T. Mak	Field Project Engineer	02/01/90	04/20/90
		04/29/90	06/28/90
		07/06/90	----
H. Archer	Vice President	03/21/90	03/27/90
		08/25/90	08/31/90
Y. Cariou	President	03/22/90	03/27/90
		05/06/90	05/11/90
		08/25/90	08/31/90
Dr. T. Jackson	Chairman, Portals	03/22/90	03/27/90
M. Hoffman	Chief Executive, Thames Water	05/07/90	05/11/90

## ANNEX E (Sheet 6 of 10)

<u>Name</u>	<u>Position</u>	<u>Date of Arrival</u>	<u>Date of Departure</u>
G. Gillingham	Mechanical Supervisor	03/05/90 06/24/90	03/15/90 ----
L. S. Brown	Cost Supervisor	06/19/90	----
B. McCullough	Materials Manager	06/20/90	08/06/90
S. Smallwood	Const. Manager	07/14/90	12/19/90
H. Bondoc	Electrical Supervisor	07/14/90	----
M. Fannin	Materials Manager	08/17/90 12/12/90	11/20/90 ---
J. Dalrymple	Site Manager Minia	06/07/90	12/31/90
C. Strande	Project Director	09/06/90 11/17/90 12/30/90	11/07/90 12/21/90 ---
S. Besseghini	Contracts Admin.	09/12/90 11/17/90 12/30/90	11/04/90 12/21/90 ---
B. Campbell	Schedule Mgr.	09/15/90	----
M. (Rusty) Taute	Site Mgr. Beni Suef Site Mgr. Minia	10/12/90 12/01/90	12/01/90 ----
M. Rowe	Mgr. Dir. PWT	11/03/90	11/08/90
G. Alexander	President L*AWTC	11/03/90	11/08/90
J. Moran	Site Mgr. Fayoum	12/01/90	----

Notes: M. J. Burns, former Project Manager, permanently left the Project on 10/07/88. He was replaced by R. H. Rose on December 30, 1988.

E. Anderson, Site Manager for Fayoum, W. Parsons, Site Manager for Beni Suef, and R. Lacy, Site Manager for Minia (replacing D. Honstain) permanently left the sites on 11/30/88, 12/31/88, and 05/28/90, respectively.

## ANNEX E (Sheet 7 of 10)

<u>Name</u>	<u>Position</u>	<u>Date of Arrival</u>	<u>Date of Departure</u>
-------------	-----------------	------------------------	--------------------------

D. Honstain, former Minia Site Manager, was promoted to Assistant Project Manager in December, 1988. Mr. Honstain permanently left the Project on 04/06/90.

P. Giacoletti was promoted to V. P. Operations and A. Anstadt assumed the position of Chief of Project in September, 1989.

R. Crosby, Materials Manager, permanently left the Project on 05/31/90. He was replaced by B. McCullough.

T. Patel was employed to supervise the structural designs produced in the office of Engineer Badran and to complete the design certificates required by IFB Part III, Article 8.4.9 for structural designs in Egypt. Mr. Patel departed from Egypt on 06/23/90.

A. Anstadt, Chief of Project, was terminated on 06/30/90. Project Director duties were assumed by R. H. Rose.

**Subcontractors:****Heath Consultants:**

W. Germann	Leak Detection Specialist	09/23/88	11/15/88
E. Sullivan	Leak Detection Specialist	09/23/90	11/15/88

**Stanley Consultants International:**

G. Thomopolus	President	02/13/89	02/17/89
J. Hollatz	Project Manager	02/13/89 11/06/89 02/15/90 10/06/90 11/25/90	02/17/89 11/17/89 03/01/90 10/14/90 12/02/90
R. Schulte	CQC Supervisor	03/16/89 05/18/90	04/18/90 08/22/90

## ANNEX E (Sheet 8 of 10)

<u>Name</u>	<u>Position</u>	<u>Date of Arrival</u>	<u>Date of Departure</u>
R. Binger	CQC Manager	03/22/89 01/02/90 07/10/90	12/12/89 06/30/90 ----
R. Gonzalez	CQC Supervisor	03/28/89 07/30/90	06/29/90 ----
H. Slott	CQC Supervisor	03/28/89 01/26/90 06/13/90	12/23/89 06/06/90 ----
R. Stanley	Pres, Stanley Consultants	12/12/89	12/23/89
E. R. Slattery	O&M Specialist	02/15/90 06/23/90 10/13/90	03/30/90 06/30/90 11/09/90
J. L. Hansen	O&M Specialist	02/15/90	03/05/90
L. Titus	Project Manager	07/30/90 10/06/90	08/03/90 10/14/90
D. Jones	CQC Supervisor	08/11/90	---
J. Marlowe	Env. Eng.	10/13/90	11/09/90
B.E. Roth	Civil Eng.	10/13/90	11/09/90
S. Teraberry	Tech. Illust.	10/13/90	11/09/90
Pacific Sewer Maintenance Corporation:			
M. Gayman	Project Manager	02/22/89 05/19/89	03/17/89 08/11/89
S. Guyman	Civil Engineer	05/19/89	08/11/89
R. Finnerty	Project Director	05/27/89	06/12/89
Graham Hawley	Engineer	05/27/89 08/11/89 01/26/90	08/01/89 08/01/89 02/02/90
Garry Hawley	Engineer	05/27/89	08/01/89

## ANNEX E (9 of 10)

<u>Name</u>	<u>Position</u>	<u>Date of Arrival</u>	<u>Date of Departure</u>
Tom Brown	Engineer	06/15/89	08/04/89
Tim Brown	Engineer	06/15/89	08/04/89
R. Correll	Sewer System Surveyor	07/07/89	10/29/89
J. Correll	Sewer System Surveyor	07/07/89	10/29/89
L. Becker	Sewer System Surveyor	09/09/89	10/29/89

## Raymond International:

T. Brian	Engineer	02/12/89	02/15/89
E. Olson	Coordinator	04/01/89	11/15/89
R. Pitson	Supervisor	04/01/89	09/06/89
J. Tobin	Project Manager	04/05/89	09/14/89
B. Goodley	Supervisor	04/15/89	10/31/89
J. Fairbanks	Supervisor	04/15/89	10/31/89
K. Bender	Lining Operator	05/15/89	05/21/89
T. Cummings	Lining Operator	05/10/89	10/31/89
E. Deihl	Lining Foreman	05/10/89	07/22/89
D. McLynn	Operations Manager	06/20/89 08/01/89	06/22/89 08/11/89
B. Preston	Lining Foreman	07/25/89	10/06/89
M. Ventolo	Project Manager	08/23/89 09/05/89	08/28/89 09/08/89
W. M. Mclean	Temp Proj Mgr	09/23/89	10/06/89
G. Hammond	Supervisor	09/25/89	10/31/89

## ANNEX E (Sheet 10 of 10)

<u>Name</u>	<u>Position</u>	<u>Date of Arrival</u>	<u>Date of Departure</u>
Pittsburg Des Moines:			
M. Siebert	Project Director	08/26/89	08/30/89
		03/03/90	03/10/90
		05/16/90	05/23/90
		09/22/90	10/01/90
G. Charrbanaue	Construction Manager	08/26/89	08/30/89
		10/12/89	11/27/90
B. Hahn	Site Foreman	11/11/89	01/19/90
T. Smoot	Site Foreman	10/12/89	09/21/90
J. Reynolds	CQC Welding Specialist	12/28/89	08/07/90
		08/11/90	09/04/90
		09/20/90	11/06/90
D. McCoy	Site Foreman	12/28/89	06/03/90
J. Newmiester	Construction Manager	03/03/90	03/10/90
B. Campbell	Tnemic Rep.	09/22/90	10/01/90

## ANNEX F

## MATERIALS ON SITE

## BENI SUEF:

		BALANCE	DELIVERED	TOTAL	CONSUMED	BALANCE
<u>MATERIALS UNIT</u>		<u>11/30/90</u>	<u>IN DEC.</u>	<u>ON HAND</u>	<u>IN DEC.</u>	<u>12/31/90</u>
Cement	ton	455	520	975	280	695
Rebar	ton	400	---	400	45	355
Waterstop	m	60	40	100	100	---
Sand	cu m	150	350	500	350	150
Gravel	cu m	300	350	650	430	220

## FAYOUM:

MATERIALS UNIT

Cement-I	ton	270	-30	240	130	110
Cement-V	ton	88	665	753	110	643
Rebar	ton	443	3	446	69	377
Waterstop	m	894	---	894	150	744
Sand	cu m	68	298	366	268	98
Gravel	cu m	823	548	1371	452	919

## MINIA:

MATERIALS UNIT

Cement	ton	477	-193	284	242	42
Rebar	ton	125	18	143	38	105
Waterstop	m	756	---	756	98	658
Sand	cu m	1086	215	1301	300	1001
Gravel	cu m	1917	188	2105	600	1505

## PROJECT:

MATERIALS UNIT

Cement	ton	1290	962	2252	762	1490
Rebar	ton	968	21	989	152	837
Waterstop	m	1710	40	1750	348	1402
Sand	cu m	1304	863	2167	918	1249
Gravel	cu m	3040	1086	4126	1482	2644

## ANNEX G

## LIST OF EQUIPMENT

The following construction equipment was on the Beni Suef site at the end of the month:

Concrete Batch Plant-30m3	(1)	Electric Transformer	(1)
Concrete Dumper-1/2 m3	(1)	Concrete Mixer-1/2M3	(2)
Front End Loader	(1)	Concr Truck Mixer-5 m3	(2)
Rebar Bender, Electric	(1)	Concr Vibrator-4.3 HP	(1)
Concr Vibrator, Electric	(1)	Air Compressor	(1)
Pick-Up Truck	(2)	Dewatering Pumps	(5)
Tractor-50 HP	(1)	Submersible Pumps	(2)
Fuel Tanks-3.5 m3	(1)	Rebar Cutter	(1)
Concrete Pump-Mobile	(1)	Welding Machine-500 A	(1)
Plate Compactor	(2)	Dump Truck	(3)
Portable Generator-300KVA	(1)	Brick saw cutter	(1)

The following equipment was on the Fayoum site at the end of the month:

Concrete Batch Plant-30m3	(1)	Concr Truck Mixer-5 m3	(2)
Front End Loader	(1)	Welder, Lincoln 400 A	(1)
Generator 100 KVA	(1)	Dumper-3/4 m3	(1)
Sta. Conc. Pump	(1)	Concrete Pump 55 m3/hr	(1)
Air Compressors	(2)	Dewatering Pump 20 l/s	(4)
Mixer 1/2 m3	(2)	Dewatering Pump 80 l/s	(1)
Truck Crane-22T	(1)	Rebar Bender/cutter	(1)
Conc. Vibrators	(5)		

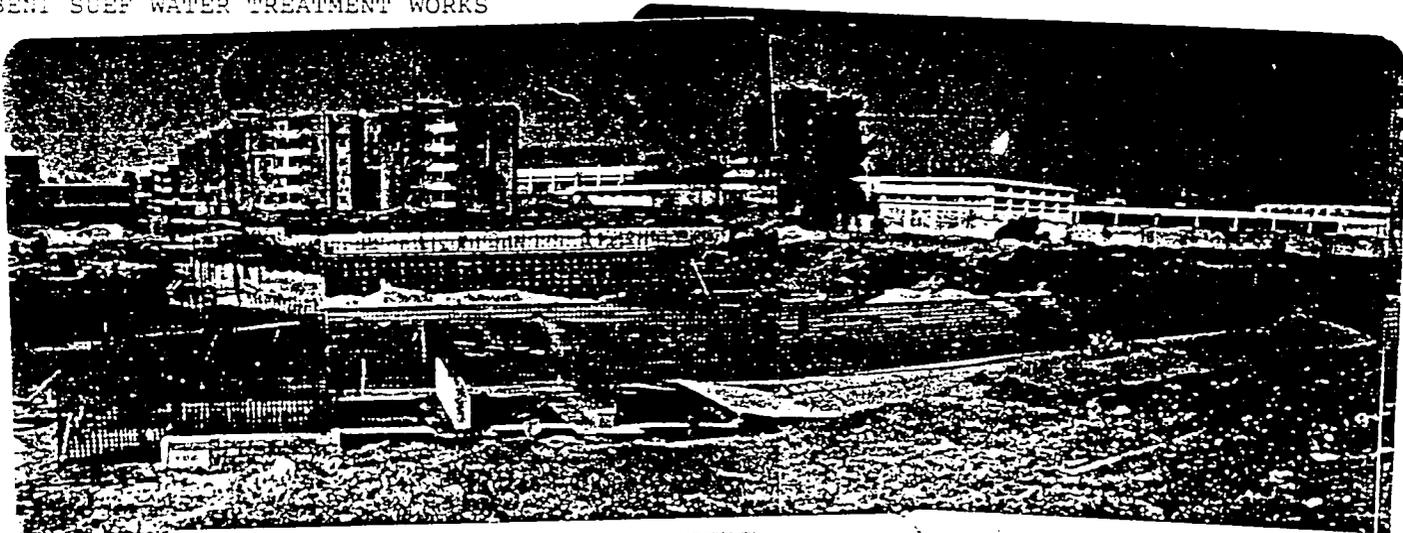
The following construction equipment was on the Minia site at the end of the month:

Concrete Batch Plant-30m3	(1)	Concr Truck Mixer-6 m3	(2)
Air Compressor	(4)	Front End Loader	(1)
Rebar Bender, Electric	(1)	Generator 100 KVA	(1)
Generator 250 KVA	(1)	Rebar Cutter	(1)
Submersible Pump-20 HP	(8)	Set Concrete Vibrators	(5)
Disc Metal Cutter	(1)	Sump Pump 4-inch	(1)
Mixer 1/2 m3	(1)	Manual Crane 3-ton	(1)
Sump Pump 3-inch	(2)	Threading Machine	(1)
Roller compactor	(1)	Concrete pump	(1)
Dumper	(1)	Drill Press	(1)
Generator 300KVA	(1)		

**ANNEX H**

**PROGRESS PHOTOGRAPHS**

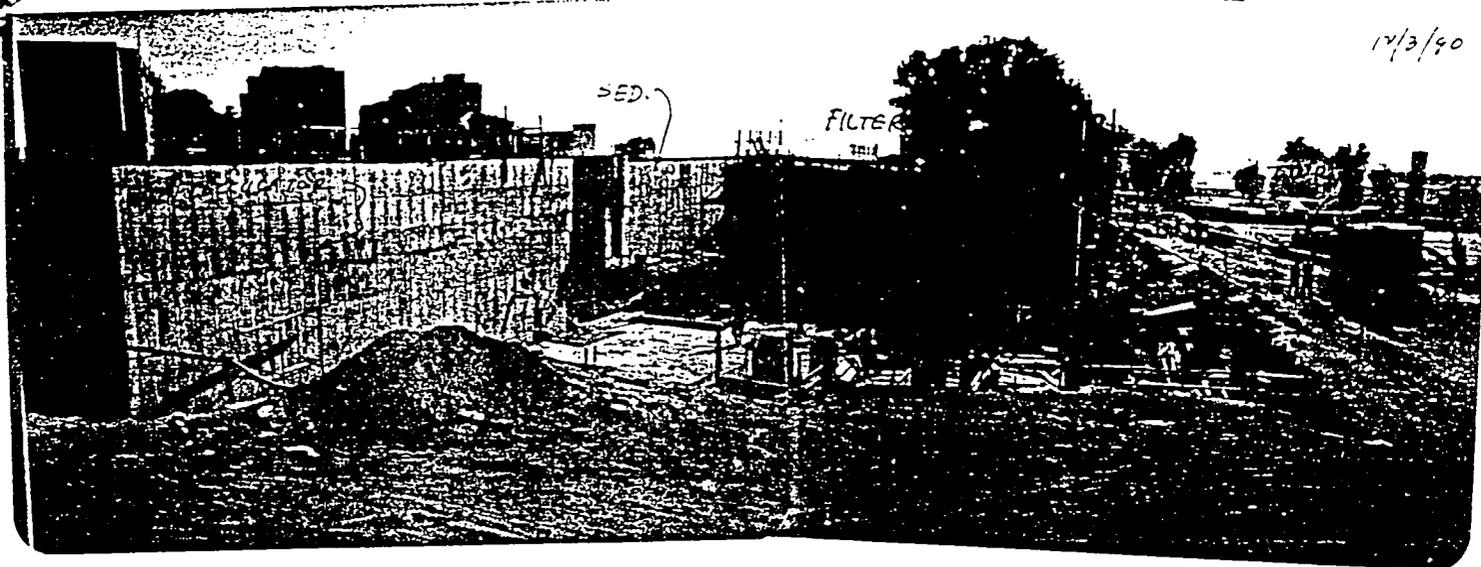
BENI SUEF WATER TREATMENT WORKS



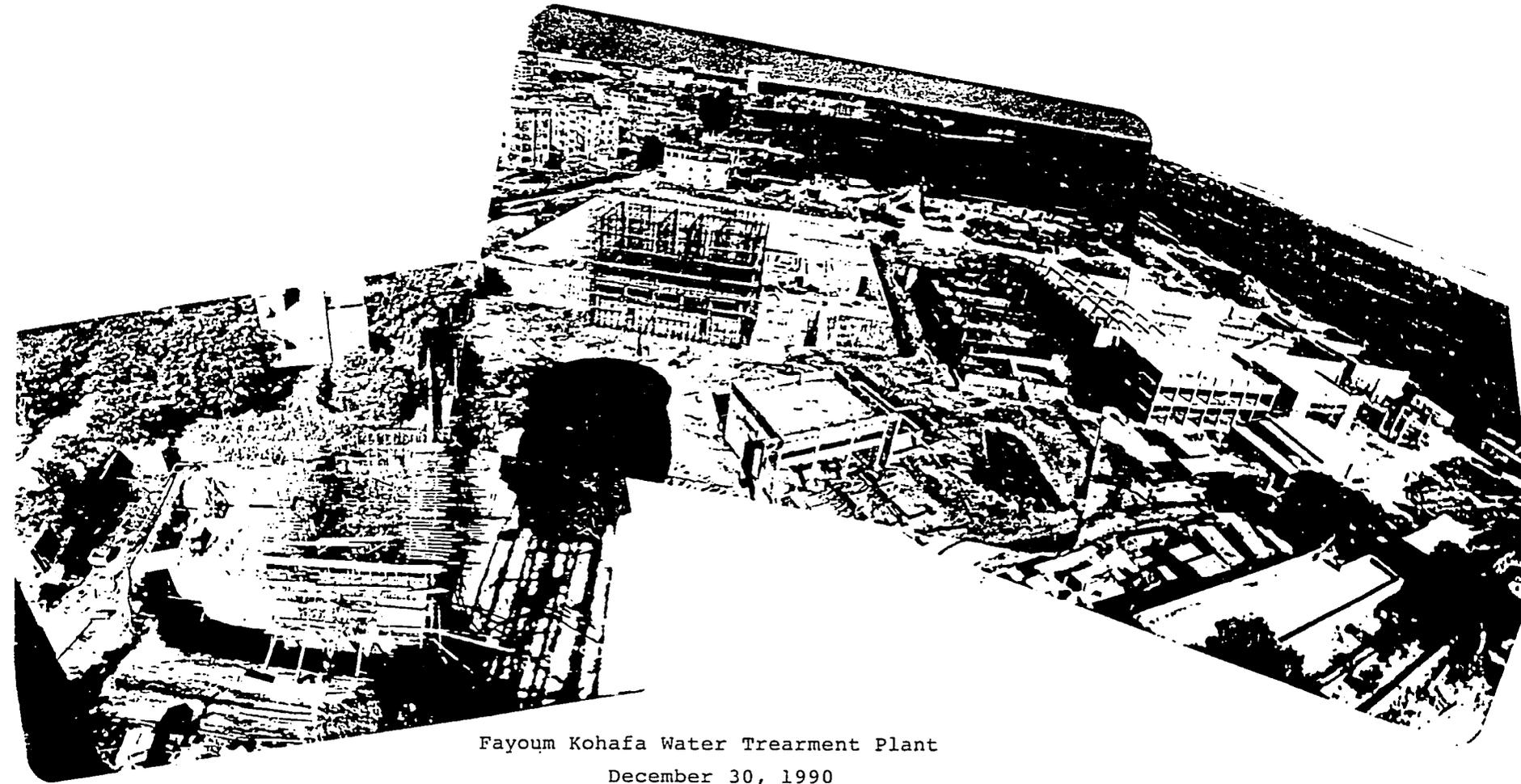
SLUDGE  
LAGOONS

12/3/90

WATER  
WORKS  
STRUCTURES

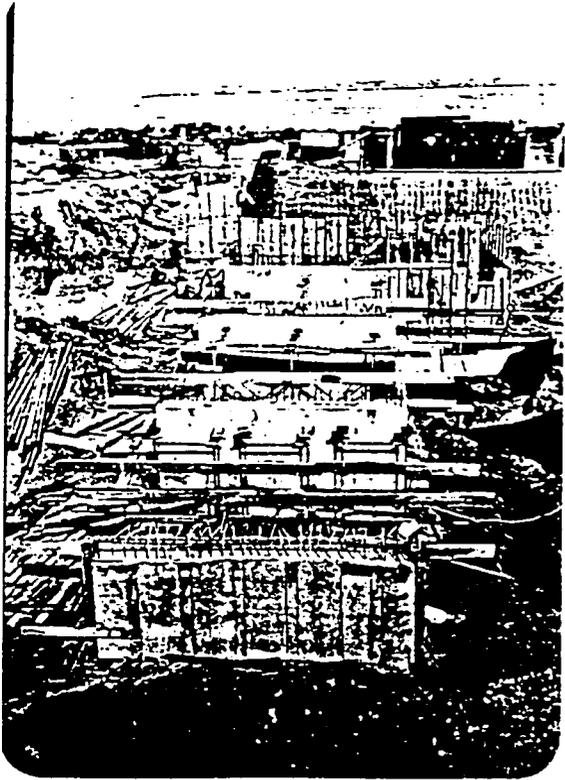


1/5

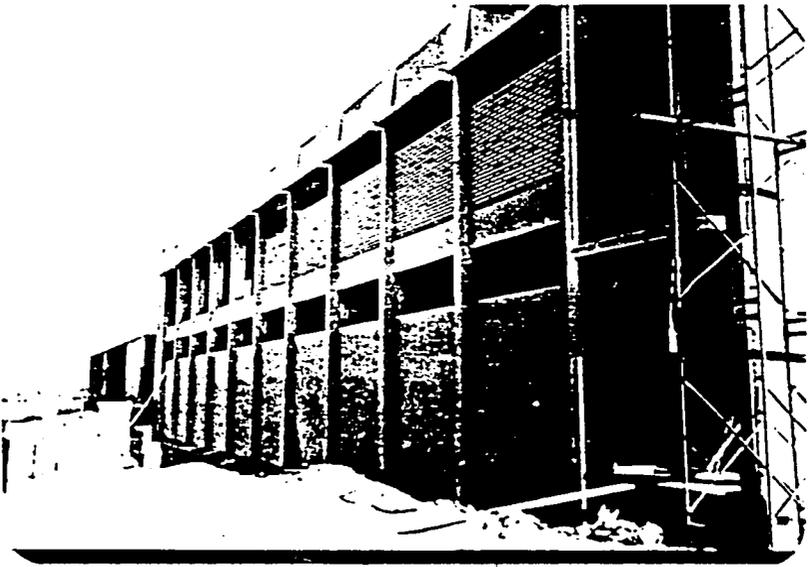


Fayoum Kohafa Water Treatment Plant

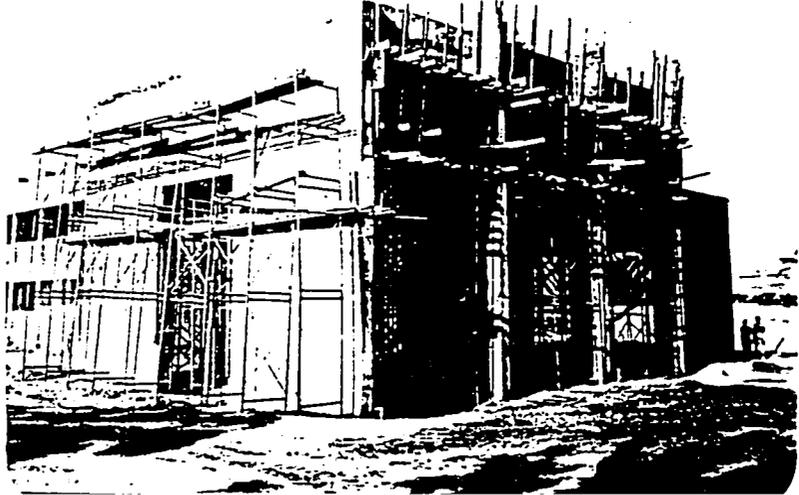
December 30, 1990



SLUDGE LAGOON



FILTER BUILDING



WORKSHOP

56