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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-176

**SEMI-ANNUAL REPORT NO. 2**  
**JUNE 1990 - NOVEMBER 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-359

March 16, 1990

Attention: Mr. John W. Airhart  
Project Officer

Subject: Provincial Cities Development Project  
Water and Wastewater Improvements  
USAID Project No. 263-0161.03  
C/M SEMI-ANNUAL REPORT NO. 2  
JUNE 1990 - NOVEMBER 1990

Gentlemen:

Enclosed is the Construction Manager's Semi-Annual Report No. 2  
for the period of June 1990 through November, 1990.

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

Very truly yours,

Allyn E. Yoakum  
Project Manager

AY/if

Distribution:

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**SECTION 1**  
**PROJECT OVERVIEW**

## SECTION 1

### PROVINCIAL CITIES DEVELOPMENT PROJECT WATER AND WASTEWATER IMPROVEMENTS SEMI-ANNUAL REPORT NO. 2 June 1990 - November 1990

#### PROJECT OVERVIEW

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> ) tanks 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
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

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.
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

**SECTION 2**  
**EXECUTIVE SUMMARY**

## SECTION 2

### PROVINCIAL CITIES DEVELOPMENT PROJECT WATER AND WASTEWATER IMPROVEMENTS SEMI-ANNUAL REPORT NO. 2 June 1990 - November 1990

#### EXECUTIVE SUMMARY

##### Introduction

This Semi-Annual Report does not report all the activities in any detail, but instead concentrates more on the progress during the semi-annual reporting period, the problem areas, project schedule and costs, and training. For detailed information, please refer to monthly reports which have been produced to inform the concerned parties of all Project events and activities, both technical and administrative, and to list these events as a record for future use.

##### Construction Progress

Construction progress based on invoices indicates an overall completion of 64%. Beni Suef is 62% complete followed closely by Fayoum at 61%, whereas Minia is only 54% complete. The Construction Manager stresses that these values are based on certified invoice values. The Contractor has never submitted an acceptable progress schedule on which to base a more accurate estimate. The monthly updated progress schedules that have been submitted since last May reflect a completion date approximately eight months beyond the Contract time for completion. The C/M has responded to each of these schedule updates with an in-depth evaluation pointing out the errors and discrepancies which will only lead to further delays, and stressing the Contractor must prepare a meaningful schedule to properly manage the work.

Because of this problem, and the need to present a more accurate picture of the Project status, the C/M is now developing an alternate method to determine percentage of construction completion based on a standardized field estimate conducted at all three cities. By this method, it is estimated that the overall construction completion will actually be 5 or 6 percentage points lower, resulting in an overall completion closer to 58%. This number will be refined in subsequent progress reports.

Off shore procurement of material and equipment which form part of the construction activities continued during the reporting period, however, because of delay in submitting invoices for payment, the FAS invoices show 75% completion to date. The Construction Manager estimates the materials and equipment shipped and already on site in Egypt are actually at the 85% level. The Contractor has been asked at progress meetings to confirm these values and we are awaiting his response.

The overall project completion based on invoices (construction and FAS combined) is estimated to be 67%. 880 days out of the total 854 scheduled construction days have elapsed. This is 103% of the Contract time against a reported 67% project completion.

#### **Progress Payment**

US\$ 37,030,025 and LE 11,120,532 have been certified for payment to the Contractor. Amounts paid were US\$ 31,604,152 and LE 8,564,373. The difference represents the 10% retention money and repayment by the Contractor for US\$ Mobilization and LE Advance Payments.

The original contract amount was US\$ 53,066,009 and LE 13,000,000.

#### **Project Schedule**

Project schedule slippage at the end of November was computed to be approximately 7 months. This method of computation is based on actual construction activity using a weighted average, and results in a misleadingly low time period as the project approaches the Contract completion date. Based on LE and US\$ invoices, the Project is approximately 12 months behind schedule. As mentioned above, the Construction Manager is developing an alternate method to determine Project slippage. Future progress reports will indicate this more meaningful value and the weighted average method will be abandoned.

The Contractor submitted a request for time extension on November 19, 1990 which will be evaluated by the Construction Manager. Costs associated with the time extension were not submitted. The Construction Manager informed the Contractor that cost damages were also required before an analysis could be completed and a response presented. The Contractor objected to having both time and cost tied together, but will apparently prepare the cost damages in December and submit them to the C/M.

#### **Problem Areas**

Numerous problems resulting in delays to the Project have and are continuing to occur. An in-depth discussion of many of these problems is presented in Section 6 of this Report.

**SECTION 3**  
**PROJECT ACTIVITIES**

### SECTION 3

PROVINCIAL CITIES DEVELOPMENT PROJECT  
WATER AND WASTEWATER IMPROVEMENTS  
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#### PROJECT ACTIVITIES

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, mechanical, and electrical work remains. Design activity continues, with all drawings except the raw water intake structures reaching the preliminary or final works level.

Whereas actual construction has been progressing well during this reporting period, the procurement activity appears to be at a low level based on invoices. The Contractor has been receiving shipments of materials during this period, but they were not reflected by appropriate FAS invoice amounts submitted to the C/M for certification. The Contractor informed the C/M last month that there was considerable FAS material for which purchase orders have been issued and that much of it has actually been shipped, but for which documentation has not yet been prepared for invoicing. Indications, however, are that the Contractor has begun invoicing for this material.

#### 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, by providing review of the Sewer System Infiltration Study, and performing a Water Distribution System Study in the three cities. The home office staff also assisted in processing Contract change orders by providing reviews and comments. It also provided At-Source Warehouse Inspection of Project equipment.

Major review and action items addressed this Report period are as follows:

#### o Review Commercial Invoices and Certify for Payment:

A total of 17 invoices were reviewed and certified for payment. The amounts certified for payment were US\$ 7,803,488 and LE 2,892,106. Retention money and

repayment of advance payments have been withheld in accordance with the Contract terms.

o Review Contractor Quality Control Submittals:

1. Reviewed the submitted weekly CQC report summaries from the CQC Manager.
2. Reviewed final CQC Manuals in Arabic of: Materials and Construction for Waterline Extensions; Procedures for Inspecting Electrical and Mechanical Equipment Installation and Site Works; Procedures for Testing Watertightness of Water Retaining Structures; and Procedures for Use In Coating Elevated Water Steel Tanks.
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:

Reviewed and provided comments, where appropriate, of the following:

1. Mechanical and Electrical:

- a. Final Works Mechanical NWS Drawings for Tasks A2, A5, A11 - Fayoum.
- b. Preliminary Works Mechanical Drawings and Calculations for Tasks A11, A12 - Fayoum and Minia Raw Water Pump Stations.
- c. Final Works Electrical Drawings and Calculations for Tasks A2, A3, A5, A6, A11, A12 - Fayoum and Minia.
- d. Final Works Mechanical Drawings and Calculations for Tasks A3, A6, A12 - Minia.
- e. Preliminary Works Electrical Drawings and Calculations for Tasks A1, A2, A4, A5, A10, A11 - Beni Suef and Fayoum.
- f. 90% Mechanical and Electrical Design Drawings for Tasks A13, A14, A15 - Beni Suef, Fayoum, and Minia Wastewater Pump Station Rehabilitations.
- g. Preliminary Works Mechanical and Civil Drawings for Tasks A19, A20, A21 - Beni Suef, Fayoum, and Minia Water Transmission Line Extensions.

- h. Final Works Mechanical Drawings for Task A5, A6 - Fayoum and Minia High Service Pump Stations.
2. Architectural and Civil:
- a. 90% Sanitary Works Design Drawings for Tasks A1, A2 - Beni Suef and Fayoum.
  - b. 90% Site Development Design Drawings for Tasks A1, A2, A4, A5, A10, A11 - Beni Suef and Fayoum.
  - c. Preliminary Works Architectural Drawings for Tasks A3, A6, A12 - Minia.
  - d. Preliminary Works Drawings and Calculations for Task A1 - Beni Suef Sludge Lagoons.
  - e. Preliminary Works Sanitary Drawings for Task A3 - Minia.
  - f. Preliminary Works Drawings for the Generator Stations - Beni Suef and Minia.
  - g. 90% Drawings and Calculations for the Generator Station and Sludge Lagoons - Beni Suef.
  - h. Preliminary Works Drawings for the Generator Station and Sludge Lagoons - Fayoum.
  - i. Preliminary Works Drawings for Tasks A1, A2, A3 - Beni Suef, Fayoum, and Minia Guard Houses.
  - j. Preliminary Works Drawings for Tasks A13, A14, A15 - Beni Suef, Fayoum, and Minia Wastewater Pump Station Rehabilitations.
  - k. Preliminary Works Structural Drawings for Task A2- Fayoum Gravity Filter Building and Generator Building.
  - l. Preliminary Works Structural Drawings for Task A11 - Fayoum Raw Water Pump Station.
  - m. Preliminary Works Structural Drawings for Task A1 - Beni Suef Gravity Filter Building.
  - n. Preliminary Works Structural Drawings for Task A3 - Minia Sludge Lagoons and Workshop.
  - o. Preliminary Works Structural Drawings and Specifications for Tasks A19, A20, A21 - Beni Suef, Fayoum, and Minia Water Transmission Line Extensions.

p. Preliminary Works Structural Drawings for Tasks A1, A2, A3 - Beni Suef, Fayoum, and Minia Cast-In-Place Flocculator Baffles.

q. Structural Drawings for the Beni Suef, Fayoum and Minia Chlorine and Chemical Plants, the Fayoum and Minia Gravity Filters, and the Fayoum Sedimentation Basins.

r. Structural Drawings for the Beni Suef, Fayoum, and Minia Administration Buildings.

s. Structural Drawings for the Minia Guard House and Workshop.

t. Structural changes from pre-cast to cast-in-place flocculator basin baffles.

o Meetings During the Month on Technical Matters:

Project meetings at the Beni Suef construction site on: June 24, August 21, October 9, and November 20, 1990.

Project meetings at the Fayoum construction site on: September 3 and October 23, 1990.

Project meetings at the Minia construction site on: June 5, July 31, September 18, and November 6, 1990.

Periodic meetings with USAID and NOPWASD on Sunday to discuss invoices, potential change orders, and other technical matters.

Periodic meetings with the Contractor each Saturday (except June 2, 16, July 7, 14, 1990) to discuss potential change orders, change orders in process, and other pertinent matters.

Special meetings with NOPWASD and USAID were held on; 1) August 21 to review the staffing requirements for the new plants, 2) on August 21 with the City of Beni Suef to resolve issues relative to costs for relocating structures at the new water treatment plant, 2) with USAID at the Cairo Center office to resolve subcontracts issue, 3) on November 1 at the request of NOPWASD with NOPWASD, USAID, and the Contractor to discuss concrete strength at the Beni Suef construction site.

Special meetings with the Contractor were held on; 1) September 5 to discuss cement shortage and painting problems with elevated water tanks, 2) October 1 to discuss the subsidized rebar problem wherein deductions were taken from the Contractor's invoices by NOPWASD, 3) October 4 to discuss rebar subsidy, tank painting, concrete problems at Beni Suef, and the raw water intake at Fayoum, 2) October 17 and 27 to discuss the 50% draft O&M manuals.

- o **Schedule:**

The Contractor submitted an updated schedule effective July 25, 1990 in late August but immediately withdrew the schedule. A revised schedule for Fayoum is expected in early December with Beni Suef and Minia to follow.
- o **Water Distribution System Study:**

Draft potential change orders for surge protection and pressure reducing/pressure sustaining valve stations have been forwarded to USAID and NOPWASD for evaluation and approval to issue to the Contractor.
- o **Sewer System Infiltration Reports:**

The revised reports for Fayoum and Beni-Suef have not yet been submitted by the Contractor. They were authorized by the Construction Manager to mobilize for the Phase 2 Sanitary Sewer Evaluation Survey in Minia in October.
- o **Change Orders and Potential Change Orders:**

The Contractor presented his Alternate Compensable Delay Claim (PCO 22) on November 19, 1990. The Construction Manager subcontracted with Wilson Management Associates of New York to assist in the evaluation of this claim. The Construction Manager formed a Montgomery-Harza team to evaluate and provide a response to USAID and NOPWASD.

#### **Contractor Activities**

- o Design submittals from the Contractor continued throughout the Report period. Submittals and related correspondence were as presented in the Construction Manager's Construction Management Activities - Design Review.
- o **Operations and Maintenance Manuals:**

The 50% draft level O&M manuals were " Egyptianized " in Egypt by Stanley Consultants with a four member team from the USA. The 50% O&M manuals were submitted to the Construction Manager.
- o **Sewer System Infiltration Reports:**

The report for Minia has been resubmitted, reviewed and accepted by the Construction Manager. The reports for Beni Suef and Fayoum are being prepared.

o Construction Summary:

Beni Suef:

Work is continuing on the Beni Suef water treatment plant flocculator/wastewater tanks, sedimentation basins, rapid gravity filter, administration building, chemical building, chlorine building generator station, and sludge lagoons. Overall, the water treatment plant concrete work is approximately 57% complete. The treated water reservoir concrete work is approximately 86% complete. Erection of all three elevated storage water tanks is complete, and electrical rough-in work has been completed. The entire construction work in Beni Suef is estimated to be 62% complete.

Fayoum:

Work is continuing on the Fayoum water treatment plant flocculator/wastewater tanks, sedimentation basins, rapid gravity filter, administration building, chemical building and chlorine building. Overall, the water treatment plant concrete work is approximately 48% complete. The treated water reservoir concrete work is approximately 82% complete and construction of the raw water pump station is 71% complete. Erection of all three elevated water storage tanks is complete. Painting of the elevated water storage tanks is proceeding. The entire construction work in Fayoum is estimated to be 61% complete.

Minia:

Work is continuing on the Minia water treatment plant flocculator/wastewater tanks, sedimentation basins, rapid gravity filter building, chlorine building, chemical building, administration building, generator station, work shop, sludge lagoons and guard house. Work is continuing on the fuel oil storage facilities. Overall, the water treatment plant construction work is approximately 47% complete. The treated water reservoir concrete work is approximately 99 % complete. The raw water pump station concrete work is approximately 97% complete. Erection of all three elevated water storage tanks is complete, with overall work approximately 97% complete. Painting of Tank No.1 is in progress with Tank No.2 completed. Installation of electrical supply by the Power Company at Tank No.1 has commenced. Overall work in Minia is estimated to be 54% complete.

o Contractor Quality Control:

CQC tests of concrete aggregates and cube strengths continued throughout this report period. All tests met the contract specifications, with the exception that 50 tons of cement was tested in August and found unfit for any purpose on the Project. 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.

**SECTION 4**  
**PROJECT COSTS**

**SECTION 4**

**PROVINCIAL CITIES DEVELOPMENT PROJECT  
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**PROJECT COSTS**

Annex C provides a complete listing of all commercial invoices to date for the Project. The following is a summary of the status of invoices certified for payment during the Report period:

	<u>US\$</u>	<u>LE</u>
	37,030,025	11,120,532
Less:		
Change Order Payments	(8,065)	
US\$ Mobe. & LE Advance	<u>(3,010,200)</u>	<u>(2,600,000)</u>
<b>Total Amount of Original Contract Earned</b>	<b>34,011,760</b>	<b>8,520,532</b>
Less:		
Repayments	(2,200,887)	(1,704,106)
Retainage	(3,224,986)	(852,053)
Plus:		
Change Order Payments	8,065	
US\$ Mobe. & LE Advance	<u>(3,010,200)</u>	<u>(2,600,000)</u>
<b>Total Amount Paid</b>	<b>\$ 31,604,152</b>	<b>LE 8,564,373</b>
<b>Amounts Certified for Payment During Report Period</b>	<b>\$ 7,803,488</b>	<b>LE 2,892,106</b>

**SECTION 5**  
**PROJECT SCHEDULE**

**PROVINCIAL CITIES DEVELOPMENT PROJECT  
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**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 updated May 25, 1990 schedule shows completion of the water plant "period of initial operation" by August 27, 1991 (Fayoum); however, the water transmission lines will not be complete until October 27, 1991 (Minia). The rehabilitation of the wastewater pump stations is scheduled to be complete by October 26, 1991 (all Cities) and the sewer system rehabilitation by November 16, 1991. The schedule updates have shown overall slippage of about five months, from July 1991 to November 1991. This slippage has not been directly explained; however, the Contractor submitted details for a change order and requested additional time to November 16, 1991.

Note the following brief description of the changes in anticipated completion has remained unchanged since the June Report:

Task	Sch. Date 12/25/89	Sch. Date 05/25/90	Approximate Slippage-Mo.s
A1,2,3	04/91	08/91	4
A4,5,6	08/90	12/90	4
A7,8,9	12/90	03/91	3
A10,11,12	12/90	08/91	8
A13,14,15	04/91	10/91*	6
A19,20,21	01/91	09/91*	8
A22,23,24	07/91	11/91*	4

\* Scheduled Completion Dates after the PACD.

The May 25, 1990 update anticipates work beyond the Project Assistance Completion Date (PACD) of August 31, 1991, and eight months following the original schedule completion.

An updated schedule was submitted effective July 25 but was immediately withdrawn by the Contractor for revisions. On August 29, 1990, the Contractor informed the Construction Manager that the lack of progress on their request for a time extension had

impacted adversely on the progress of work and that they would reassess the schedule accordingly and resubmit in 30 to 45 days.

As a result of the foregoing, the Project has been operating without a working schedule since August, 1990.

A comparison of the original progress invoice schedule against actual progress invoices indicates slippage in the work schedule of approximately 12 months. (See Annex B).

**SECTION 6**  
**PROBLEM AREAS**

**PROVINCIAL CITIES DEVELOPMENT PROJECT  
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**PROBLEM AREAS**

**Lack of Acceptable Schedule**

There has never been an acceptable schedule from the very beginning of the Project. The very first schedule submitted in 1988 was not acceptable, and the subsequent schedule updates have followed a similar pattern. Each time that a schedule is updated and submitted for review, the Construction Manager has transmitted extensive comments to the Contractor explaining the inconsistencies obvious in each update. There appears to be no well defined logical critical path on the schedules, as they keep changing from one schedule update to another. This has been pointed out to the Contractor during the reviews.

**Raw Water Intakes**

The reported problem of approval of the Minia raw water intake by the Ministry of Irrigation (MOI) has apparently been resolved. The Contractor has questioned the validity of the approval transmitted by NOPWASD early this year. It appears the Contractor has finally accepted that the MOI has no objection to the construction of the jetty at this city. The 90% structural design for the raw water intake jetty at Minia has not yet been submitted, and is therefore being left by the Contractor to the end of the plant construction period for completion. The submittal dates of all drawing reviews are tabulated and monitored by the C/M to ensure that responsibility for ensuing delays that may result from this lack of planning is properly established.

The Fayoum intake structure is still under design by the Contractor. Discussions have taken place between the Construction Manager and the Contractor, and drawings showing the intended location of the intake have been submitted for review.

The Beni Suef raw water intake design is on hold until the decision is made regarding extension of the existing jetty further into the Nile River. The Contractor has determined that the jetty may be structurally deficient and is performing a study to determine the extent of the problem. The C/M is awaiting the results of this report and then make a recommendation to NOPWASD and USAID for their concurrence regarding the best alternative to complete the system.

**Rebar Price Subsidy**

The problem of rebar subsidy is still unresolved. Two meetings with the NOPWASD officials and the Contractor have been held to determine what alternatives are acceptable to resolve this

problem. It has been determined that the best alternative is for the Contractor to pay NOPWASD aside from the Contract for the amount being held. In this manner, the Contractor can collect the full amount due in their commercial invoices, and the Contract is not affected by this problem. The Contractor will now have to decide if this is acceptable.

#### **Disposal of Filter Backwash Wastewater**

The disposal of wastewater from the new water treatment plants is constrained by Egyptian Law 48 governing pollution of surface waters. Study of the ultimate filter backwash wastewater will be done by the Construction Manager in early January, 1991. Regarding disposal of sludge lagoon decant, it appears that with proper operation and by using the decant for irrigation of green areas, the problem can be minimized. Plant sludge disposal continues to be a problem. Due to lack of available lagoon surface area for sludge to dry out naturally, sludge lagoons may be overloaded and "emergency" flow of unacceptable turbid water into the canal or river may occur. The purpose of the study will be to find ways to mitigate the impact of disposal of the spent filter water into the adjacent waterways.

#### **Design Drawings**

The design drawings are still not complete, to include but not limited to the raw water intakes as noted above. The only design which is currently on hold is the Beni Suef raw water intake system.

The Contractor continues to submit drawings for C/M review which should have been part of packages submitted at an earlier period in the Project. The C/M also continues to receive sets of drawings for review that have gaps in the numbering system, leading us to believe there are missing drawings from the set. This reflects poor planning on the part of the Contractor, resulting in not only construction delays but also shortages of materials that have to be procured from the USA. The C/M has attempted to clarify this issue of piecemeal design submittal by asking the Contractor for a Master Drawing List, but this has not been submitted to date. The C/M does not know at this time what drawings are left to be submitted until this list is obtained from the Contractor.

#### **Procurement**

Based on invoices, the quantity of materials being shipped from the USA is too low for the time period and percentage of construction completion. This indicates there will be a delay due to material shortages well beyond the current Project completion date. The C/M has written letters to the Contractor on a periodic basis, corresponding to their submittal of updated project schedules, requesting that procurement schedules which meet the IFB requirements be submitted for review and comment. This activity has not been complied with by the Contractor to date.

**SECTION 7**  
**TRAINING**

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**TRAINING**

Training of the Construction Management local Egyptian staff continued throughout the Report period. This included the assistant resident engineers at all three of the Project cities, the senior design engineer in the principal office, as well as NOPWASD engineers. Experience was gained in construction management quality assurance duties, design review duties, estimating, invoice processing and various other aspects of the Project.

The training during this period was entirely on-the-job, at both the construction sites and in the principal office. It is estimated that a total of 7,000 person-hours have been spent in on-the-job (OJT) training during the Report period.

**ANNEXES**

- A - CONTRACT AMMENDMENTS AND CHANGE ORDERS**
- B - GRAPHS OF MONETARY EARNING SCHEDULES**
- C - COMMERCIAL INVOICE LISTING**

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ANNEX A

CONTRACT AMENDMENTS AND CHANGE ORDERS

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	Final/NO
	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	

ANNEX A (2 of 3)

<u>CO</u>	<u>PCO</u>	<u>Description</u>	<u>Status</u>
CO17	22	Contract Time Resulting from Accumulated Delays	Review/LA
CO19	23	Delete the Requirement For Air Entrainment In Concrete	Review/LA
CO9	24	Revise Wastewater Sump Pumps From 12 l/s To 1.2 l/s	Draft/NO
CO14	25	Increase Wastewater Pump Station Wetwell Ventilation	Draft/NO
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 Majoure - 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	
	46	Additional Sulphate Resistant Cement	
	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	
	52	A15, Minia Wastewater Pump Station No. 5	

## ANNEX A (3 of 3)

### METHOD OF PROCESSING

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

### LEGEND

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.

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**ANNEX B**

**GRAPHS OF MONETARY EARNING SCHEDULES**

- (1) U.S. DOLLAR (US\$) 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 Down Payment, 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 US\$ Mobilization and LE Down Payment.

The Cash-Flow Schedule submitted on January 10, 1990 included the US\$ Mobilization and LE Down Payment. 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 US\$ Mobilization and LE Down Payment and plotted against time on Figure 1 and Figure 2.

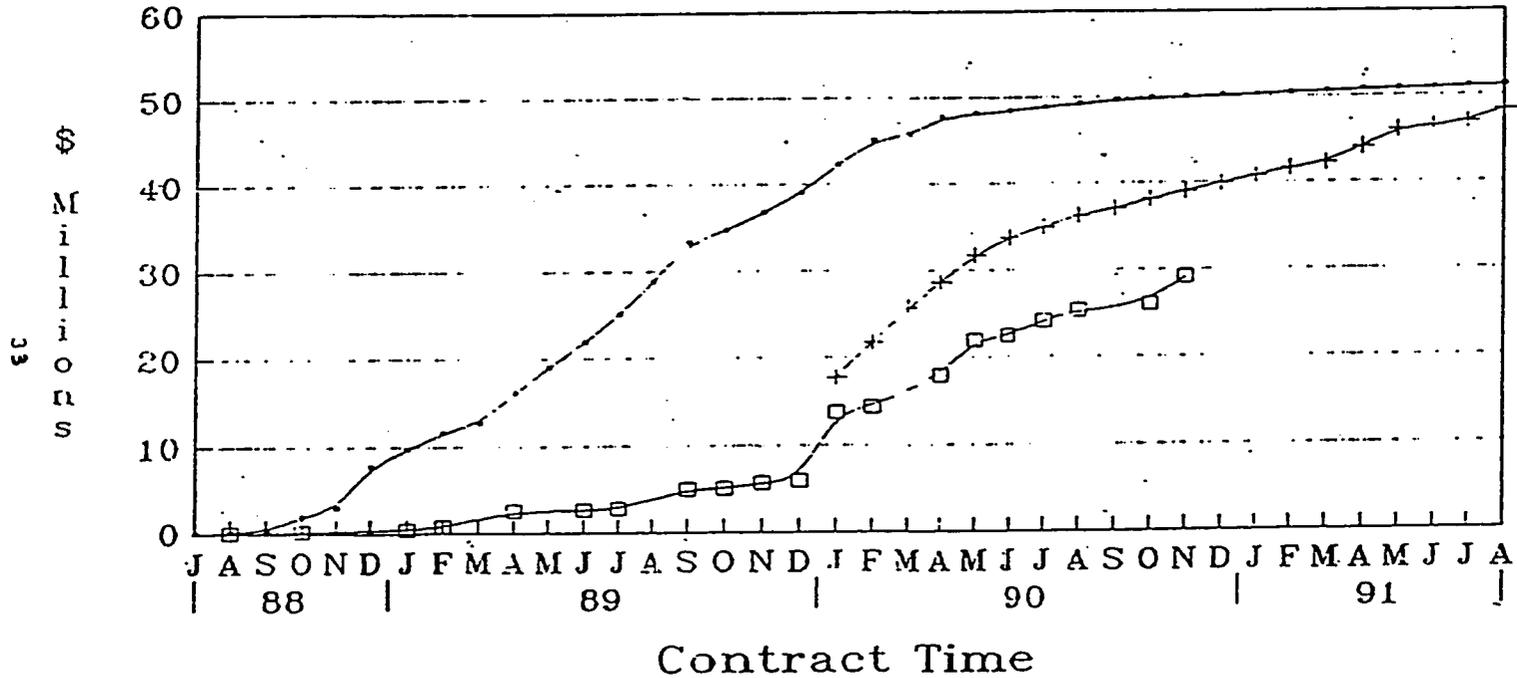
Neither of the two schedules reflect contractual deductions such as retainage and repayment of the Mobilization that impact the actual value of each invoice, and in that respect, should not be termed "Cash-Flow Schedules".

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 & Maint.	0	0

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

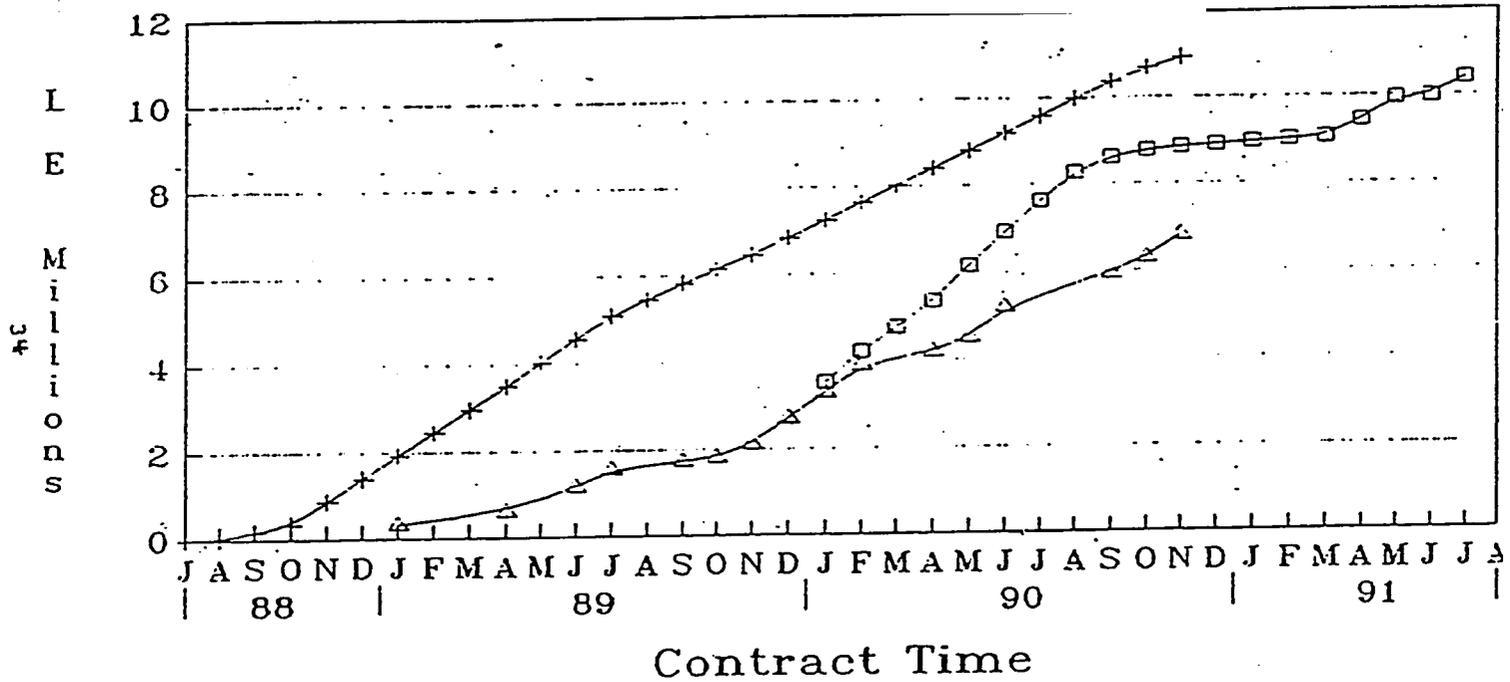
# US \$ CASH FLOW VS.TIME



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

Slippage:  
 Aug 88 sch.    mts, Jan 90 sch.    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 mts

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**ANNEX C**

**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

**ANNEX C (2 of 4)**

Invoice No.	Date Submitted	Date Certified	Amount Certified for Payment	
			US\$	LE
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	-
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	-	-
<b>Returned</b>				
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)	-
<b>TOTAL AMOUNT CERTIFIED FOR PAYMENT</b>			<b>\$37,030,025</b>	<b>LE 11,120,532</b>

**ANNEX C (3 of 4)**

Total Amount Certified For Payment	\$37,030,025	LE 11,120,532
Less Change Order Payments	(8,065)	-
US\$ Mob. and LE Advance	<u>(3,010,200)</u>	<u>(2,600,000)</u>
<b>Total Amount of Orig. Cont. Earned *</b>	<b>34,011,760</b>	<b>8,520,532</b>
Less Repayments	(2,200,887)	
(1,704,106) Less Retainage	(3,224,986)	(852,053)
Plus Change Order Payments	8,065	-
US\$ Mob. and LE Advance	<u>3,010,200</u>	<u>2,600,000</u>
<b>Total Amount Paid</b>	<b>\$31,604,152</b>	<b>LE 8,564,373</b>

\* 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 October, 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 *	\$ 31,810,873	LE 6,816,426
(b) Schedule Dated Aug. 1988	\$ 47,138,859	LE10,400,000
(c) Schedule Dated Jan. 1990	\$ 39,015,344	LE 8,842,326

\* 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 67% of the value scheduled according to the August, 1988 cash-flow schedule and 82% of the January, 1990 cash-flow schedule for US\$. For LE, they are 66% and 77%, respectively.

Invoices paid under the Articles on FAS payments total \$23,757,949 and represent \$22,008,866 for materials and \$1,749,083 for freight. This represents 75% and 78% 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 \$10,253,811. The total price quoted for design and construction was \$16,096,209. The payments to date represent 64% of the total US \$ price for that work.

ANNEX C (4 of 4)

The earned LE 8,520,532 represents 66% 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	67%	66%
Percent FAS Complete	75%	-
Percent On-site Construction and Design Complete	64%	66%

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 C.O. 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.