

Molawi  
expenses

NTT/PP/SWA

- ① TA contract may be  
    (a) local or foreign
- ② Design fee page
- ③ TA team fee (see 3014)
- ④ 1/16
- ⑤ 1/16 reimbursement  
    low price film
- ⑥ Cost page 15

MAURITANIA: RURAL ROADS PROJECT, 682-0214

- ⑦ Why advance to UN (20)
- ⑧

\*\* EVALUATION \*\*

USAID/Mauritania  
April, 1984

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## I. INTRODUCTION

### A. THE EVALUATION

The purpose of this evaluation is (a) to judge the efficiency of project implementation; (b) to determine if and how implementation can be improved; (c) to determine what progress can be expected with available funds; and (d) to determine what additional funding is required to complete the project.

The evaluation methodology included a review of relevant project documentation; visits to the project sites; meetings with interested parties; preparation of a draft report; additional analysis and field work to address issues raised by project committee in response to the draft; and preparation of the final report.

The costing information available for the preparation of this evaluation in March 1984 was less accurate than might be desired. Construction has started too recently to develop an adequate sense of routine costs. Similarly, some of the judgements we have made have been based on preliminary plans and reports which are only now being finalized. Despite these constraints we chose to proceed with the evaluation. The urgent need for additional funding and development of revised long-term plans dictated this decision.

The Project Evaluation Committee is composed of the following people:

George Thompson, ENG, Chairperson  
Barry MacDonald, PDE (Alternate - Campbell McClusky)  
Vicki MacDonald, OPI  
Jannine Baranyanka, SMO (Alternate - Paul Lacerte)  
Wayne Butler, CONT  
Richard Goldman, A/DDIR

## B. PROJECT BACKGROUND

A PID for a Trail and Track Project Improvement (682-0214) in the Guidimaka was approved on December 15, 1978. The PP design was scheduled for March 1980. The PID called for the upgrading of approximately 300 km of existing tracks and trails over a five-year period to conform to the minimum standard (45 km/h reference speed) for all weather use. In October and November 1979, USAID was approached by UNSO to consider joint financing of a road from M'Bout to Selibaby. AID was to finance heavy road equipment of U.S. origin (e.g. Mack trucks, CAT bulldozers, etc.); UNSO would fund design activities, technical assistance and local costs. Arrangements were made by correspondence among the USAID Director, the Director of UNSO (New York), the Director of Infrastructure and the Minister of Equipment and Transport. USAID had significant difficulties putting together the PP design team. In September 1980, UNSO announced it was ready to go ahead with a Project Agreement to construct the first phase of the road for U.S. \$4,300,000. Since AID was still in the design stage, UNSO began construction with possibilities of future collaboration left open.

This separate UNSO project consisted of 70 km of road beginning in M'Bout and heading south toward Selibaby. The original design was for 50 km. This was increased to seventy with no parallel increase in funding. Seventy kilometers of road were finally built with the available funding. Eventually an AID project was approved which was designed to connect the UN road to the river basin at Gouraye and Kaedi. At Kaedi, it would also connect with a road which provides a very important link within the river basin and to the capital, Nouakchott.

The history of this project explains many of the circumstances that surround the implementation plan and the fact that AID finds itself with a cost increase of considerable proportions. The design assumed that the UNSO model would work -- it did not, 30,000 dollars per km proved to be too low in the difficult terrain in Gorgol. The design assumed that the UN equipment mix was correct and that the equipment inherited from the first phase UN effort would, after one year, be well maintained and ready to go. The equipment was in poor shape, not ready for use and the mix was not appropriate. The project assumed that the UN road would be complete -- a finished product. Last year rains washed out large portions of the road and showed that the design of the drainage structures was inadequate. It will cost approximately one million dollars to put the UN segment of the road into acceptable condition. The design suggested that continuation of the modified force account procedure of construction was a good one.

Based upon the experience of UNSO/OPE that the modified force account could be much cheaper than an A + E contract; using an A + E contractor for the number of kilometers under consideration was out of the question. As it turns out, the UN had considerable problems with its contractor: The final miles of the road were constructed without an engineer on site, and the project suffered as a result.

The AID team has made many adjustments to the basic design of the project to overcome the original erroneous assumptions of both the AID and the UN designs. As a result additional funding will be necessary if the project is to provide the outputs it originally anticipated.

### C. SUMMARY FINDINGS

#### 1. Inputs

##### a) AID

(i) Technical Assistance: Technical Assistance has been provided but personnel problems have left the project without a permanent Chief of Party (COP). (This situation is now being rectified - May, 1984). The per-month cost, implementation timetable, and number of personnel required as set forth in the PP were all underestimated.

(ii) Commodities to carry out earthwork and drainage operations: The lead time required for commodity procurement was greater than anticipated. The quantity and value of required commodities were underestimated due to the poor condition and unacceptable mix of equipment inherited by the project. Procurement is now proceeding in an efficient fashion.

(iii) Training: On-the-job-training of mechanics, operators, foremen and some local Public Work (PW) personnel has been minimal due to the lack of commodities for use in training and the lack of an organized training program. Too few mid-level PW personnel are receiving training.

(iv) Operating costs: Operating costs for a road brigade have been provided. However, grant funds have not been matched by a GIRM contribution as originally proposed. The delayed availability of PL480 funds to cover local costs, has necessitated the use of grant funds for his purpose.

b. Other Donors (UNSO/OPE):

(i) Equipment to carry out earthwork and drainage: The equipment which had been purchased by UNSO/OPE and used for the first 70 km of construction was donated to the USAID Project as expected. Unexpectedly many spare parts and extensive repair work were required to return the equipment to working condition.

c. GIRM:

(i) Salaries for counterparts and Public Works personnel:

The GIRM was unable to meet this requirement for its project personnel. Some of those it could not finance were detached from the Ministry and hired by the project.

(ii) Availability of garage/workshop facilities: The GIRM made available a PW sub-station. This facility has proven inadequate for the Project's needs. A heavy equipment workshop is being constructed in M'Bout.

(iii) Equipment: The GIRM has provided seven important pieces of heavy equipment (approximate value U.S. \$1,8 million). This contribution was not foreseen in either the PP or the Pro-Ag.

2. Outputs

(a) Road Construction: As of February 29, 1984, 70 km of clearing and grubbing, 20 km of fill, 12 km of base and two km of final course had been completed.

(b) Road maintenance: Efforts to improve existing maintenance facilities have only just begun. The limited contacts which currently exist between the TA team and PW sub-divisions should produce some improvements in GIRM maintenance capacity. Increased contact, an operational repair shop at M'Bout and increased road building and maintenance operations should result in a more marked improvement.

(c) Road Brigade: This has been established, but few senior level PW personnel are involved.

(d) Trained Personnel: Thus far, only limited junior level on-the-job training is underway.

### 3. Conclusions

(a) The design based upon the UNSO model for rural road construction is unsuitable to project conditions. The project cannot achieve its planned outputs, purpose, or goal without major operational/construction modifications to benefit from the experience of the UNSO model, which has shown that: (i) Estimates of drainage requirements (both structures and embankments) were much too low; (ii) estimates of spare parts requirements, optimistically based upon what was assumed to be low mileage used equipment, were far too low; and (iii) Estimates of the time required to execute project tasks were too short (as a result of the poor equipment mix and unrealistic optimism concerning weather and lead times). A minimum of nine additional months are needed for completion of all road segments as originally planned. Project construction costs were underestimated. Unanticipated factors have contributed to upward revisions of costs. Approximately U.S.\$ 5.9 million in additional AID support for T.A., commodities and operating costs are urgently needed to complete the proposed construction.

Road construction, though behind schedule, is proceeding well. A revised timetable could be maintained if implementation planning, field organization, and overall coordination of all parties concerned are improved.

Improvement to and construction of the road segments identified in the project are an essential prerequisite for agricultural development in the area.

### 4. Modifications Extant

In responses to the inadequacies in the original project design the following changes were made in design standard and implementation procedures:

(a) The Road Design Standard was changed as follows: Platform width from 5.5.m to 7m.; platform depth from 30 cm. to 30 cm above flood waters; alignment curves to 80 km/hr. design speed.

Drainage: Structures were redesigned to accommodate low maintenance and local flash flood conditions.

(b) The Brigade equipment mix was changed to include scrapers. Spare parts were acquired to restore inherited equipment to working conditions.

(c) Construction of a repair shop for heavy equipment was begun at M'Bout.

(d) Twenty-five million UM local cost financing was added for equipment repair, workshop construction and other local costs.

(e) Nouakchott based administrative assistant and SMO personnel were added to the project staff.

## 5. Options

There are three basic options to be considered:

- A. Continue until current project funds are exhausted;
- B. Provide additional funds to build some segments of the road;

or

C. Provide sufficient funds to build the originally proposed road from Kaedi to Gouraye. If Option A is followed, project activities will end approximately January 1985. At this time the project will have completed construction of the road bed from M'Bout to Selibaby. In addition to the construction there will be an equipment park of well maintained heavy equipment, vehicles and machinery, culverts, and the infrastructure needed (camps, maintenance equipment, etc.) to continue road construction.

Under Option B there are two possible ways to proceed. In either case it is assumed that sound engineering will apply i.e., all construction will include adequate drainage and road specifications as currently approved by AID:

(i) Complete the road segment from M'Bout to Selibaby. Additional cost: U.S. \$.8 million;

(ii) Complete the road segments from M'Bout to Kaedi and M'bout to Selibaby. Additional cost: U.S. \$4.5 million

Financing options, discussed below in detail, include a mix of reobligated and PL 480, Section 206 generated funds.

Option C would complete the road as originally specified in the PP, that is, Kaedi-M'Bout-Selibaby-Gouraye. It would also involve rehabilitation of the UNSO road, M'Bout km 70. Additional Cost US \$5.9 million.

Financing would require a supplement of US dollar funds to cover foreign exchange expenditures and a mixture of PL480 Section 206 funds and deobligated funds for local costs.

## 6. Recommendations

(a) That additional funding be provided to permit completion of the Kaedi to Gouraye road as described in the Project Paper and Project Grant Agreement. Completion of this project conforms to USAID development strategy and geographical focus. Future project development activities are planned for the Basin and the project road will be essential to support communications and transportation in the Basin area.

(b) The first 70 km, built under the supervision of a UNSO contract team, must be brought up to a minimum standard for all weather gravel roads.

(c) That project planning, organizational, and management adjustments, conforming with the detailed recommendations of this evaluation be incorporated into the project.

## II. DETAILED RECOMMENDATIONS

### A. Prime Contractor/Morrison-Mairle (M&M)

That the prime contractor, M&M:

1. Provide amenities consisting (at a minimum) of approved visits to Senegal;

2. Adhere to Mauritanian labor conventions;

3. Prepare (a) a comprehensive equipment maintenance plan, including accurate jacket files, maintenance files, and consumption files for each piece of equipment, by June 1 1984; and (b) appropriately updated summary charts of such files to be included in each monthly report;

4. Establish by June 1, 1984 (a) systematic ordering/receiving and inventory procedures, including systems for flagging ordering requirements and following-up orders, and (b) appropriately updated summary charts for tracking parts and fuel supplies.

5. Formulate network planning, by June 1, 1984, on which to base work schedules and on-the-job time, motion and production calculations. This should be done in coordination with Public Works;

6. Systematize monitoring of performance of all personnel;

7. Inventory and otherwise protect equipment, tools and supplies;

8. Provide guidance, assistance, and supervisory checks for all approved recommendations to assure full implementation;

9. Revise the Project Work Plan and Schedule PWP&S according to 83 STATE 206726 (including training);and

10. Consider possible improvements to the Selibaby Wadi crossing.

B. GIRM/Ministry of Equipment and Transport, Directorate of Public Work

That the Directorate of Public Work of the Ministry of Equipment and Transport:

1. Assist the Contractor in the identification of interested personnel to work on the project including the short-term assignment of selected GIRM personnel to cooperate with the project;

2. Evaluate the feasibility of village maintenance contracts; this evaluation could be conducted in association with the project-funded socio-economic evaluation;

3. Promote increased contact with, coordination of, and assistance from the project to Public Works sub-divisions for Kaedi and Selibaby in developing an innovative maintenance plan of action for incorporation into the Fourth Highway Project; and

4. Promote action in the region and coordination with this project by the World Bank supported Fourth Highway Maintenance Project.

C. Procurement

1. General

That the procurement of two or three new Mack Dump Trucks available in Nouakchott and compatible with existing trucks be considered.

2. Supply Management Office, SMO/USAID

(a) That Project procurement actions be based on concurrence of all relevant parties i.e. SMO, Contractor(s), Project Director (PWA), Project Officer (USAID/OPI/ENGR), and Program Officer (USAID/PROG).

(b) That SMO continue, to issue periodic summary procurement charts that should show estimated arrival date of all project procurement actions still in process.

(c) That procurement receiving reports of all equipment procured by the project be routinely prepared by the prime contractor ;

3. United Nations Sahelian Office/Office of Project Execution (UNSO/OPE):

(a) That UNSO/OPE issue periodic summary charts showing estimated arrival dates in M'Bout.

#### D. Financial

1. That an account be set up in Dakar for small purchases to be managed by the UN Representative. Estimated amount: US\$4,000 advance;

2. That the Project Financial Implementation Plan, now revised, be updated quarterly; and

3. That additional funding be authorized for the project.

#### E. USAID Project Monitoring/Management

1. That a management information system be put into effect;

2. That an equipment specialist install equipment requisition monitoring systems;

3. That the Project Financial Implementation Plan and Project Network Plan be updated quarterly;

4. That coverage of appropriate benefits for field personnel under the contract be assured, and that every effort be made to alleviate the tension that has developed between USAID and the M&M TA Team.

#### F. M'Bout to KM 70

That while seeking reimbursement by the United Nations and pending the availability of funds, AID under the auspices of the project should replace drainage structures, raise the road, and eliminate curves as recommended by the contractor (M&M) and the USAID Engineer.

### III. CURRENT STATUS OF IMPLEMENTATION

Despite some short-comings, the Rural Roads Improvement Project of the Government of the Islamic Republic of Mauritania has been well staffed (1) with Mauritians and U.S. contract personnel in the field; (2) with experienced spare parts and procurement personnel in Nouakchott; and (3) with able Government and donor engineers in relevant representative roles. Other than the funding and scheduling problems inherited primarily from the design and M'Bout to Km 70 construction phases, all project elements are now in place and functioning as planned. Adjustments for drainage considerations, equipment mix, inventory requirements, and repair facilities have been made. Pending availability of additional funding, all project targets as planned may be achieved by late spring of 1966.

## A. Progress to date

1. Road construction: One hundred eighty eight (188) kilometers of road have been repaired. The first 20 kilometers of new road have been laid on an alignment that has been cleared and grubbed well past Selibaby. A drainage plan for the first stretch of road is completed.

2. Equipment: Most equipment is on-line again (with some important exceptions). Two scrapers have been added to the equipment mix. The base camp at Km 77 is equipped to handle all repairs and maintenance. The repair facility in M'Bout is under construction.

3. Management: A draft Project Work Plan and Schedule is complete and revisions are in progress.

4. Projected Construction Rate: The project is expected to reach full force in April 1984. Full force is defined as having all new equipment at the site, the shop at M'Bout in operation and management and planning system in place or being developed. Assuming funding can be obtained, the key to realizing the above scenario is putting in place Management, Organizational, and Planning systems which will improve operation and maintenance of equipment and performance of work force. Such improved systems are required for all project elements as described below. Once full force status is attained it is believed the proposed road could be completed in 23 months.

## B. Equipment Status:

The addition of new and used equipment from the U.S. and from the GIRM Direction of Public Works has given the project a truly powerful high production mix. The cost analysis (Addendum 1) estimates that up to 15 km/month through easier terrain can be sustained. A current weakness is the short supply of water trucks. While the existing trucks were adequate for use with dump trucks they cannot maintain the pace set by newly acquired scrapers. The two potential solutions of purchasing more trucks or digging more wells are too costly to consider at this time. As a result, we are currently relying on dry compaction and compaction by traffic. The sampling and analysis of the performance of these compaction methods will be done soon. So far, these methods, similar to ones used in the U.S. on low volume roads seem adequate.

The number of dump trucks could also be productively increased by two or three to keep up with the scrapers. If this measure is not taken the scrapers will have to be used on longer, less economic runs with the corresponding negative impact on timely completion of the final courses. The efficient use of this equipment demands rigorous planning of both construction and equipment maintenance. Detailed network type planning, on-the-job production computations "a la CAT manual" and continuous adjustments, are called for.

Equipment management procedures in this project have the potential to serve as a model for future African roads projects. The typical procedure for equipment procurement and maintenance in such projects has involved the procurement of new equipment. By project's end, the equipment is in disrepair and spareparts stocks are depleted. Local Public Works (PW) crews are expected to use the remains for road maintenance activities.

In sharp contrast to this norm our project has concentrated on procurement of excess property and restoration of used equipment. The equipment inherited from the first 70 km of construction had been pushed to its limits by efforts to complete the road on schedule. Public and private engineers in any developed country would have considered it ready for salvage. However, at a fraction of the cost of new equipment it has been returned to top condition. Proper maintenance and repair will preserve it throughout the life of the project. Such restoration activities have demonstrated to the PW subdivisions methods for taking full advantage of existing materials. The procurement of excess property will reinforce the lesson that proper equipment repair and maintenance makes construction possible at much reduced costs.

This project, if modified and fully funded as proposed, will bequeath mechanics, tools and spareparts, as well as comprehensive systems for procurement and maintenance. This will provide local PW sub-divisions with a real road maintenance capability despite the minimal availability of operating funds.

### C. Status of Contract Team

#### 1. Work Site

The worksite at M'Bout and Km 77 are 500 kms from the source of any real amenities. Until recently work was frustrated by a lack of parts and materials. Early on the contractor personnel became convinced that they were being subjected to sub-normal work conditions. Despite their own diligent efforts to maintain high work standards, low morale and persistently difficult field conditions have taken an inevitable toll on their overall performance. AID/W/SER/CM ruled against a contract amendment designed to improve morale by upgrading benefits for the Technical Assistance Field Team. They did, however approve of efforts to boost morale, as long as they fall within the scope of the existing contract.

## 2. Organization and Planning

The evaluation team found the contractor's organization and planning to be weak. Examples include:

- a. Lax adherence to Mauritania Labor conventions;
- b. Non-existence of jacket files, maintenance files, consumption files, and comprehensive maintenance work plans on each piece of equipment;
- c. Lack of systematic ordering procedures including summary charts, elimination of duplication, stock/inventory systems, systematic preparation of receiving reports, etc. for spare parts and fuel supplies;
- d. Lack of adequate planning documentation upon which to base work and ordering systems;
- e. Inadequate personnel filing system and system for supervision and guidance which in conjunction with jacket files can yield a system for awarding good work and taking corrective action on bad work or abuse;
- f. Lack of cohesive leadership by Chief of Party (COP) and of team work as result of ad hoc/crises management style.

Central office guidance to the COP with respect to the above, was consistently lacking. Nevertheless, it is important to note that the high quality of the contract team and laudable efforts by several Mauritians allowed the project to progress despite the flaws in management systems. Crises were well handled (though not without some scars), equipment was repaired, earth moved and construction begun. In response to the evaluations findings, all weaknesses are currently being addressed.

While the organizational and planning base required for efficient field operations cannot be developed overnight, notable progress has already been made.

## 3. Reports

The quality of M&M reports has varied significantly. The Project Work Plan and Schedule, (PWP&S) though very well done as far as it went, did not go far enough. AID/Washington guidance, (STATE 83 206726 Addendum) dated 23 July 1983, gives numerous comments which should have been incorporated into PWP&S. Mr. Larson of M&M was informed of these comments during his visits to Mauritania in July 1983 and in January 1984. To date, no revised PWP&S has been received. USAID has been assured that revisions are in process.

Monthly reports have improved somewhat in quality over the course of the project. However, they continue to be based upon the limited planning efforts of the preliminary PWP&S. M&M Central Office guidance was again inadequate. Now these reports are vastly improved and will be of great use to all concerned.

The hydraulic report was an excellent report and the basis for much of our redesign work. Unavoidably, it was done without the benefit of a center line profile. This makes its quality and depth all the more impressive.

#### 4. Training

Structured on-the-job training has been provided for operators and mechanics and is being continued through daily instructive supervision. Training, thus far, has concentrated on operational maintenance and repair actions. It is strongly recommended that organizational requirements be included as part of the curriculum. This is particularly important to counter the exposure of all personnel (inventory/lubricant and fuel, mechanics, operators) to the poor field organization procedures, which have existed in the past and are only now being rectified. The M&M team is encouraged to actively pursue any additional training opportunities which arise during the course of the project. One possibility is providing maintenance training to the personnel of the Public Work Subdivisions. Additional training opportunities may present themselves as the project progresses. The M&M team should actively pursue any opportunities which arise (e.g. maintenance training of sub-division personnel).

#### 5. Construction Contract

Attitude has been an important disruptive factor in this project. In November the M&M team perceived themselves as a construction contractor with the requisite need to fight for every possible concession from the client USAID. Similarly USAID gave as little as possible to the contractor. While such tactics are a normal part of a construction contract, this is a development project in addition to being a contract and the ensuing conflict is in no one's best interest. A more collaborative approach is preferable. The project would benefit by being viewed as a joint venture by M&M, USAID, UNSO/OPE and the Department of Public Works.

#### 6. Implementation Alternatives

We are optimistic that the contractor will solve all management, planning and organizational problems. However we consider it prudent to present alternative methods of implementation, in order to be prepared for any eventuality.

By June 1984, the contractor is expected to:

- a. Complete and assure USAID approval of a comprehensive Equipment Maintenance Plan;
- b. Revise and receive USAID and AID/W approval of the project Work Plan and Schedule; and
- c. Complete a one year detailed Procurement Plan.

If these actions have not been taken, then the following alternatives should be considered:

Alternative A. PSC direct AID project management:

PSC's should be sought by USAID, AFR/TR/ENGR, and REDSO/ENGR to fill the positions of the TA team. USAID would contract directly with them for required work. Some studies (e.g. drainage) would have to be completed by short-term consultants.

Alternative B. An Alternative Firm would be substituted for the present contractor as quickly as possible.

D. Status Of Public Works Contributions

1. GENERAL:

The Directorate of Public Works has been very supportive. An excellent rapport has been developed in terms of holding meetings, obtaining exonerations and processing implementation letters. The minimum tasks to allow the project to exist are accomplished with little difficulty. In addition some very valuable equipment was obtained from PW and the project has been able to borrow other items when necessary. Outside of these activities project implementation proceeds with no regular interaction with the Directorate.

2. Personnel

Some of the detached PW personnel working on the project have proven to be very capable. The work superintendent, for example, would be able to run a heavy equipment maintenance operation if he received literacy and administrative training. In general, PW/Nouakchott personnel have demonstrated little interest in working for the project, or benefitting from project training opportunities. More determined efforts should be made to evoke such interest. In particular, it would be useful to encourage a technical administrator to go to M'Bout both to assist in the project activities and to learn about planning and organization of construction sites. Similarly another topographer would provide useful assistance and benefit from exposure to the project.

Who  
to  
do?  
  
No  
  
Yes

The most serious constraint to encouraging PW employees to take part in project activities, is the inability of the GIRM to pay indemnities. Previous agreements with the GIRM prevent USAID from taking over this part of the payment to GIRM personnel. Consequently PW staff are reticent to take field positions. This problem has been partially resolved by detaching PW employees from the Ministry and hiring them by the project. However, most of the PW employees who chose this option were "contractual" workers, as opposed to "fonctionnaires". It is this higher grade of personnel that we now need. It is possible that there are different obstacles blocking this class of worker from joining the project. All such obstacles must be identified and overcome if the project is to accomplish its anticipated training goals.

### 3. Funds

Public Works funds have not been available. As discussed above even personnel originally on the GIRM payroll have not received salaries from the GIRM. An important in-kind contribution of equipment by PW has constituted a significant saving of project funds.

### 4. Maintenance

As anyone who has worked on road projects in the Sahel can attest you must never assume that the road you build will be routinely maintained. Even now, in this project it is uncertain whether there will be maintenance funds.

Several actions may be taken at this time to increase the chances of road maintenance after construction is completed. While there is no guaranteed source of maintenance funds available for this road in the foreseeable future, there is some chance that the new World Bank Fourth Highway Maintenance Project will be active in this region. Currently neither PW sub-division has a plan of action for the future use of funds should they become available. We, therefore, conclude, that an essential first step must be the preparation of a comprehensive maintenance plan.

It also important that contact between the TA team and local PW sub-divisions be broadened. This would be beneficial to both groups. The TA team has much expertise to share. The local PW sub-divisions (in contrast to the Nouakchott central) are highly motivated to deal with maintenance problems. After all, they bear the brunt of the criticism from local people. They also have excellent hands-on knowledge of the problems in their own regions.

Unfortunately contact to date has been limited to some maintenance work and borrowing of PW tools and equipment. Closer collaboration could be used to develop work plans and devise imaginative maintenance schemes (eg. using commercial trucks to pull road drags).

In keeping with this latter idea, the PW could follow-up on the Project Paper suggestion that maintenance activities be developed in conjunction with the local population. For instance, at the peak work times which follow rains day-laborers could be hired at the going rate. The specific modalities for the contracting of labor and raising maintenance funds need to be worked out with the various communities located along the road. PW staff might visit some villages to begin to learn 'if an arrangement is possible. Even if this approach proves untenable, the investigative efforts would have a positive side effect by getting PW personnel into the field.

*Y has worked in Kenya*

Local currency funds (PL480, Section 206) could be used to finance post project maintenance activities on the Kaedi-Gouraye road. This option needs to be evaluated by GIRM and USAID.

### 5. Work Request

Additional work done by the project at the request of the GIRM includes the maintenance and repair of the M'Bout to Km 70 stretch, the maintenance and repair of the Kaedi-M'Bout road and the lengthening of the runway at the Selibaby Airport. The first two actions are part of the project as stated in the ProAg. They also benefited the project by making transportation in the area easier. The runway improvements only took three days and may provide some positive, (though minor) benefits for the project. All three activities promoted good will, which is an important prerequisite for continued collaboration. We do not recommend that reimbursement be sought from the GIRM for M'Bout-Kaedi or Airport work. However the UN will be asked to share (at minimum) in the cost of repair (not maintenance) of the section of road which it built.

*showed 18 include the 1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th 11th 12th 13th 14th 15th 16th 17th 18th 19th 20th 21st 22nd 23rd 24th 25th 26th 27th 28th 29th 30th 31st 32nd 33rd 34th 35th 36th 37th 38th 39th 40th 41st 42nd 43rd 44th 45th 46th 47th 48th 49th 50th 51st 52nd 53rd 54th 55th 56th 57th 58th 59th 60th 61st 62nd 63rd 64th 65th 66th 67th 68th 69th 70th 71st 72nd 73rd 74th 75th 76th 77th 78th 79th 80th 81st 82nd 83rd 84th 85th 86th 87th 88th 89th 90th 91st 92nd 93rd 94th 95th 96th 97th 98th 99th 100th*

The Governor of Selibaby has requested we build a new bridge. This activity is too extensive for us to consider. We do recommend that a study be done to determine what improvements in existing combination bridge/ford are feasible.

*included in the project*

### 6. Ferry Landing at Gouraye

A positive example of local cooperative effort and a significant contribution to our project activities was the completion of a ferry landing at Gouraye. The PW sub-division provided funds and personnel; the local rural works entity provided heavy equipment and the local Governmental Administration coordinated the work.

It is believed that the crossing from Gouraye to Bakel will increase the benefits from the project roads significantly. While the stability of the landing is still in question, it could be easily upgraded. It is important to note the high priority the regional administration must have attached to the ferry crossing to dedicate scarce resources to its construction.

## F. STATUS OF PROCUREMENT

### 1. SMO

The biggest problem with procurement is the lack of a detailed procurement plan. The preparation of this document is the responsibility of the contractor (see contractor status). Though the off-shore procurement by surface has often required a six month lead time, the operation as a whole has been as well managed as any this author has seen in West Africa. The office has been unusually creative in its efforts to expedite the procurement of goods and commodity related services within the sometimes rigid limitations of AID Regulations. In addition to the office's adroitness in the field of procurement, its chief's previous experience as mechanic and operator has permitted him to offer much valuable advice on equipment operation and maintenance.

A critical component of the procurement process is a relationship of mutual respect and good communication between the field and the procurement office in Nouakchott. In the past some procurement actions have been taken without the necessary consultations and the tone of some communications have been unduly harsh. For example deletions made by suppliers on requisitions without consulting the TA team have caused much consternation in the field. While some deletions are unavoidable they should always be cleared by the TA team. Constructive criticism and information sharing are essential to the efficient operation of the project.

The customs exonerations obtained by SMO are done with amazing efficiency.

Receiving reports must be requested in a timely manner by Project Management so that SMO can maintain up-to-date records.

It is recommended that the very valuable Summary Charts of Off-shore Procurement should always include Estimated Arrival Dates. This should be done even early in the process, when it is known that they will have to be revised several times. Despite potential future changes the initial estimate remains useful for planning purposes.

Procurement and local fund management by UNSO/OPE has provided indispensable support to the project. The existing system of local procurement in Nouakchott will soon be enhanced by a system for Dakar, which will greatly increase the variety of locally available spares.

Preparation of a summary chart similar to SMO's is a necessary addition. This would keep all concerned up-to-date and avoid having things "slip through the cracks."

Unfortunately the attitude problems affecting M&M/USAID relations have also affected the UNDP/OPE field director, who had the misfortune until recently of being the only radio contact with the field crew. It is hoped that future problems will be both communicated and responded to in a constructive fashion.

#### F. FINANCIAL STATUS

##### 1. Financial Situation (see Addendum 1 for Summary as of 1984)

The cost per kilometer is currently estimated at US\$56,535 as opposed to the PP calculation of US\$31,143. The change in cost may be attributed to a number of factors including delays in implementation due to damage and subsequent repairs to M'Bout-km 70, increased equipment and spares procurement to improve machine mix and return it to working condition and increased use of technical assistance over PP estimates. It is believed by Project staff that the UNSO model cost/km figure was simply too low to provide an adequate road for the region. What might be saved during construction would most certainly be lost in maintenance costs. Last year's average rainfall caused sufficient damage to show clearly the long-run cost ineffectiveness of this approach. Furthermore M'Bout-Km70 was a less difficult terrain than the other segments, which certainly cannot be constructed at the same cost. Finally, the completion of a high quality hydrological study has provided us with a much more accurate picture of the required drainage structures. It would be foolhardy to ignore these findings and not follow through with the recommended improvements in road specification. For those who are concerned with the sharp increase in cost/km it is useful to compare these figures with that for the Aleg-Boghe road, which cost \$100,000/km. While this road was admittedly of higher than necessary standards, it could in no way be classed as a high standard road. Additionally, it did not require the complexity of drainage work demanded by the Kaedi-Gouraye construction.

Cost estimates for this project are based on a cost/month, with all equipment on line, of approximately US\$262,000/month. Of this, US\$111,000/month is fixed salary costs, US\$4,625/day. Consequently each day on which work cannot be done, and each additional day of implementation costs the project a minimum of US\$4,625.

The critical conclusion coming from the cost analysis is the urgent need for additional funding. We have known for sometime that the PP cost estimates were too low. However, the magnitude of the discrepancy and the rate of funds disbursement have been much greater than anticipated. At the present rate of expenditure virtually all dollar funds will be subobligated by June of this year. This will leave no funds for contingencies. Any imprecision in current cost calculations will not be able to be covered.

If additional PL480 funds are used to reimburse dollar funds and vital drainage structures are not procured (requiring adjustments in the project implementation plan), basic commodity procurement could continue until December with the existing funds. The Project could then continue with local currency, possibly reaching Gouraye by June 1985. This assumes that all cost estimates are adequate and nothing unexpected occurs during implementation. Given the inadequacies of our costing data, a five percent contingency should be considered the minimum acceptable. The USAID engineer believes the figures might vary by as much as 15 percent in either direction.

To complete the road as planned in the PP and to bring the UN road up to minimum road standards will require an addition of US\$5,927,000 to the already available US\$6,509,000. These calculations of the project's costs include neither the GIRM's contribution of heavy equipment (valued at US\$1,800,000) nor the administrative contribution of the UN (value US\$200,000). Within the additional funds requirements it is important to consider the different needs for foreign exchange (FX) and local currency (LC). The LC costs are US\$3,387,000 and could be made available through PL480 funds, if such can be provided in a timely fashion. The remaining US\$2,540,000 must be provided in foreign exchange.

While the timely availability of PL480 funds is possible, past experience suggests it is improbable. An alternative is to use dollar funds deobligated from other projects; or a combination of the two sources. We recommend that all available PL480 funds for this year be applied to the Project to allow time for preparation of the PP supplement and amendment of the Grant Agreement. This would add US\$762,000 to the local currency funds already approved, slightly reducing the total need for additional funds to US\$5,115,000.

## 2. Financial Management

The financial management of the project has been relatively problem free. Some improvements are being made in the already certified accounting system for local purchases. There has been an ongoing problem involving the method of payment for purchases of critical items in Dakar. (These purchases are considered local). It has been proposed that a UN Bank account be opened in Dakar by advancing US\$4,000. The advance is to be reimbursed upon receipt of payment for project commodities. We recommend that this account be opened ASAP.

## G. STATUS USAID PROJECT MONITORING/MANAGEMENT

### 1. Project Management Information System

The Project Monitoring and Management done by the USAID Project Manager has been more than adequate. We propose that a simple management information system would be a useful addition to the existing system. It would avoid having things fall through the cracks or delayed by crises. Such a system should be set up for the Project Manager himself, the Equipment Specialist, and the Administrative Assistant.

### 2. Equipment Specialist

The Equipment Specialist has been a key contributor to the progress of the project as a whole. His continual hard work has kept the project moving. Plans he has prepared for equipment and requisition monitoring system should be put in place ASAP.

## H. M'BOUT TO KM 70 ROAD

The first seventy kilometers of road from M'Bout toward Selibaby funded by UNSO were constructed by approximately the same workforce as the current project, but with a different TA team and a different philosophy of road construction. No systemized design was done. Instead ridge lines were followed as closely as possible for alignment. Curves are often small radius. Fords were built with no effort to estimate hydraulic characteristics of crossing. As a consequence the road is at times flooded by unchanneled waters. Severe damage occurred during several floods last year, leaving the road impassable at the Gafar crossing for over 60 days.

Several of the fords must be replaced by larger, higher structures be they fords, combo ford/culverts or other. The surfacing material used for much of the road is also inadequate.

If this first road segment is not brought up to the minimum standards required by the local environment it will not be worth continuing our road. The cost of these improvements is approximately U.S.\$ 1,000,000 . Records of the exact costs of repairs should be kept and presented to the UN for possible future reimbursement.

#### IV. SIGNIFICANT CHANGES FROM PROJECT PAPER EXPECTATIONS

##### A. Introduction

The fundamental assumption in the PP logical framework was that "Standards selected for improvements of rural roads meet technical, social and economic requirements of the region". The extensive damage suffered by the first segment of the road showed indisputably that the design specifications were not adequate. Our new understanding of the conditions combined with other unexpected changes in inputs (eg. GIRM's contribution) required revisions not only in the technical specifications of the construction but also in the implementation and financial plans. These revisions are now presented to demonstrate the gradual divergence of the existing project from the situation anticipated in the PP.

##### B. Technical Revisions

The Project Paper technical analysis, above average as far as it went, did not include a center-line profile nor a drainage study. Instead hydrological considerations were based on the experience and judgement of the design engineer. The extensive damage caused last year by average rainfall revealed the inadequacy of the estimates for the design water level, and hence fill and structure specifications. The error in judgement (which was repeated by engineers from the UN, M&M, USAID Mauritania and the M&M hydrological engineer prior to his study) is understandable in light of the completed hydrology and unusual drainage problems. For example a 566 square kilometers drainage basin with a flood flow of 1,105 meters per second and an average flood duration of 12-20 days was discovered. The magnitude of this flooding was unlikely to be predicted, as the main channel is only about five meters deep and 15 meters wide. Flooding had been so general that high water signs were not clearly evident nor was the flood plain easily distinguishable from surrounding terrain. Revised technical specifications, designed to be responsive to current awareness of these drainage problems, include increased embankments, increased provisions for drainage, and a more appropriate mix of heavy equipment.

### C. Implementation Plan Revisions

The implementation plan was altered to include:

1. Increased maintenance and procurement activities associated with the restoration of the UN equipment;
2. Reevaluation of the design standards; and
3. Repair work on the damaged road segments, essential to secure access to the Project Sites.

Each of these activities contributed to delays in new road construction. The length of the procurement process had been in general underestimated, particularly for certain makes of equipment (e.g. almost one year for IH major components). Combined with the increased number of procurement actions demanded by the poor condition and inappropriate mix of inherited equipment, this led to significant delays.

The time spent repairing M'Bout to Km 70 diverted resources from their originally scheduled activities. This occupied road crews over a five-month period as flash flooding repeatedly rendered certain wadi crossings impassable.

New road construction was further delayed as drainage structures were reevaluated and plans revised. Revisions required acquisition and repair of additional GIRM equipment to manage newly determined embankment fill quantities. Culvert procurement was also delayed pending reconsideration of the specifications required.

### D. Financial Revisions

The most important financial revision is the increased cost/km estimate. The UNSO road was built for U.S \$ 31,143/km. Clearly the savings made by adhering to this standard, have been undone by the high cost of maintaining the segment.

Our revision of the technical specification, greater use of technical assistance (including the important addition of an Equipment Specialist to our team and the use of shorter term TA) and our need for more sophisticated equipment mix to carry out the work have all contributed to an upward revision in costs to U.S. \$56,535/km.

### E. Changes in GIRM Contributions

During the course of the project there have been significant changes in the contribution made by the GIRM, both in terms of commodities and participation.

The value of the GIRM's equipment contribution was increased substantially by the addition of two graders, three scrapers and two bulldozers.

In Ministry of Equipment and Transport was unable to maintain the salaries and indemnities of the personnel it had assigned to the project field activities.

The GIRM's ability to maintain the completed segments of the road remains uncertain. The GIRM's fourth Highway Project, supported by the IBRD offers the best prospects for future maintenance.

As a result of these combined revisions the Project now faces a serious shortage of funds. It has become necessary to make a critical decision as to how to proceed. Should the project be terminated when current funds are exhausted? If additional funds are provided should the original plans for a Kaedi-Gouraye road be completed, or are there shorter sections that would be useful and more economical, Section V presents the options, their costs, advantages and disadvantages.

#### V. OPTIONS FOR FUTURE IMPLEMENTATION

Cost estimates in this section were based on the method used in the Project Work Plan and Schedule and the most up-to-date cost information available. Uncertain drainage requirements and production rates limit these estimates to a 15 percent accuracy level. Below we will analyze each of the possible options for future implementation.

Option A is to terminate the project with existing funds. This will allow the project to complete construction of the road bed from M'Bout-Selibaby (approximately 22 percent of the originally planned construction). In addition to the construction there will be an equipment park of well maintained heavy equipment, vehicles machinery, culverts and the infrastructure needed (camps, maintenance equipments, etc.) to continue road construction.

Option B is to construct one or a combination of segments of the road, without completing the entire road from Kaedi to Gouraye. Possibilities and their respective costs are:

(1) M'Bout - Selibaby. Additional cost \$.8 million

(2) M'Bout - Selibaby - Gouraye. Additional cost \$ 2.8 million. If no additional dollars are made available, this option could proceed with an additional equivalent of US \$2,000,000 in PL480 generated funds. This would assume no imprecision in cost estimates and no offshore procurement of spares after December 1984.

(3) M'Bout - Kaedi; M'Bout - Selibaby. Additional cost \$ 4.5 million.

Each of these sub-options has its own set of advantages and disadvantages.

(1) M'Bout to Selibaby:

Advantages.

- a. Limited cost increase; and
- b. No additional project supplement.

Disadvantages.

a. Would not satisfy any of original project outputs or purpose;

b. Despite the Grant Agreement standard clause that GIRM will cover cost overruns, termination of the project at Selibaby will give the GIRM the impression that USAID has not fulfilled its commitment. Renegotiation of the Grant Agreement would be onerous at best;

c. The work completed would be almost useless----a road in the middle of nowhere;

d. There would not be sufficient time to refurbish equipment for subsequent GIRM use; and

e. Again, due to the time constraints, training would be very limited.

(2) M'Bout - Selibaby - Gouraye

Advantages.

a. If Gouraye is reached an economically viable road link will have been established, i.e., project outputs and purpose will have been partially addressed;

b. Possibility of US dollar Grant cost increase; and

c. Limited additional project supplement work.

Disadvantages.

a. Timing of generation and delivery of PL 480 funds is uncertain;

b. Would not satisfy all project outputs;

c. US would leave impression of defaulting on its commitment;

d. Equipment would be left in unusable condition; and

e. Training would be very limited. Some negative lessons might be learned as equipment is abused in attempt to complete the job on time.

### 3. Kaedi - M'Bout - Selibaby

#### Advantages.

a. Selibaby would be linked with Kaedi;

b. Most outputs and part of Project Purpose would be met;

c. Roads would be of high standards;

d. Equipment will be left in good working condition; and

e. Training will have accomplished much of its purpose.

#### Disadvantages.

a. Does not satisfy all outputs nor entire purpose;

b. USAID would leave impression of defaulting on commitments;

c. Richest rainfall area of all Mauritanian would be left isolated;

d. Economic benefits from ferry at Gouraye would not be realized; and

e. Expenses would almost equal these of option C (our preference).

Option C: Complete road as originally specified in the project paper with the improved engineering standards. The additional cost for this option would be \$5.9 million, based on a specific design standard for the road and drainage structures.

#### Advantages.

a. All outputs and entire Purpose of Project can be satisfied;

b. USAID will have honored its commitment (plus some);

c. Relationship with the Ministry of Equipment and Transport would be strengthened;

d. The roads would be of a standard which would serve as a model for future use;.

e. The equipment will be in good working condition giving the GIRM and other donors an example of what can be accomplished with older equipment. The cost analysis of this equipment management system will be available for-future reference; and

f. Project training activities would be completed, leaving a core of qualified personnel capable of performing a significant portion of the necessary maintenance activities.

Disadvantages.

a. The cost increase is very large; and

b. Much additional project supplement work will be required to prepare the PP supplement, authorization, Grant Agreement Amendment, etc.

FINANCIAL IMPLEMENTATION SUMMARY (000'S DOLLARS)

	<u>Proj. No. 0214 - Budget</u>			<u>PL 480 (March 1, 1984)</u>		<u>Grant as of May 9, 1984</u>		<u>Completion of Road as Originally Planned</u>		
	<u>PL 480</u>	<u>Grant</u>	<u>Total</u>	<u>Earmarkings</u>	<u>Accrued Expenditures</u>	<u>Earmarkings</u>	<u>Accrued Expenditures</u>	<u>PL 480 Equiv.</u>	<u>Grant Funds</u>	<u>Total</u>
Tech. Assistance	0	\$1,561	\$535	0	0	\$1,431	\$557	0	\$636	\$636
Commodities	0	2,626	2,626	0	0	1,707	646	0	1,379	1,379
POL	0	85	85	0	0	106	39	0	0	0
Local Costs	\$1,699	433	2,132	\$1,699	\$667	433	431	\$762	1,791	2,553
Socio. Econ. Eva.	0	60	60	0	0	0	0	0	0	0
Contingencies	0	45	45	0	0	12	7	0	80	80
Imprecision	0	0	0	0	0	0	0	0	1,279	1,279
<u>Totals</u>	<u>\$1,699</u>	<u>\$4,810</u>	<u>\$6,509</u>	<u>\$1,699</u>	<u>\$667</u>	<u>\$3,789</u>	<u>\$1,680</u>	<u>\$762</u>	<u>\$5,165</u>	<u>\$5,927</u>

# MATERIALS, LOCAL ROADS IMPROVEMENT PROJECT #682-0214

## COST ANALYSIS

### SUMMARY FINANCIAL IMPLEMENTATION PLAN

PROJECT UNITS	BUDGET FIK 0214-S	ACCUALS & POS. in \$ 2/27/84	MONTHLY ACCUALS 4 1/2 Sub-obj	LUMP SUM Requirements	Estimated Accruals as of 5/31/84	OPTION 2					OPTION 3		
						DITTO 8/31/84	DITTO 11/30/84	DITTO 2/28/85	DITTO 5/31/85	DITTO 2/28/86	Minimum Requirements TO GOVERNMENT + U.S. FEDERAL (2 months delay)	Change in BUDGET FOR TOTAL PROJECT	Reserve FUND FOR TOTAL PROJECT
TECHNICAL ASSISTANCE	15,000	53,000	60,000	8,000	77,000	95,000	116,000	138,000	158,000	212,000	105,000	53,000	210,000
MAIL EQUI SPECIALIST	134,000	140,000	60,000	30,000	640,000	830,000	1,020,000	1,210,000	1,390,000	1,930,000	1,370,000	584,000	1,930,000
COMMODITIES	262,600	211,700	37,000	1,000,000	247,700	3,334,000	2,450,000	2,511,000	3,672,000	4,655,000	2,157,000	1,379,000	4,005,000
DRAINAGE RIGHTS EQMT/SPACE/TOOLS		650,000	0	8,811,000	720,000	1,531,000	721,000	1,531,000	1,531,000	1,531,000	936,000	-	-
		1,467,000	37,000	11,900	167,700	1,808,000	1,790,000	2,030,000	2,141,000	2,474,000	1,757,000	-	-
TOL	85,000	37,000	0	48,000	256,000	35,000	35,000	35,000	35,000	35,000	35,000	-	35,000
<b>TOTAL COST</b>	<b>2,172,000</b>	<b>810,000</b>	<b>115,000</b>	<b>1,107,000</b>	<b>1,827,000</b>	<b>22,770,000</b>	<b>27,160,000</b>	<b>31,320,000</b>	<b>35,050,000</b>	<b>46,950,000</b>	<b>34,780,000</b>	<b>2,553,000</b>	<b>46,250,000</b>
Personnel (incl. Equip)	520,000	303,000	43,000	3,000	1,350,000	567,000	693,000	722,000	951,000	1,338,000	951,000	-	-
Local Travel	18,000	5,000	1,000		8,000	16,000	15,000	17,000	24,000	27,000	20,000	-	-
Vehicle Maint	32,000	22,000	4,000		34,000	46,000	50,000	70,000	82,000	118,000	52,000	-	-
POL	327,000	1,140,000	45,000		319,000	4,447,000	5,290,000	7,740,000	8,590,000	12,640,000	6,770,000	-	-
Mach & Eqmt	589,000	1,630,000	5,000	411,000	598,000	672,000	646,000	670,000	674,000	766,000	694,000	-	-
Bldg & Struct	29,000	24,000	1,000	0	23,000	30,000	33,000	36,000	35,000	48,000	32,000	-	-
Mat'l & Suppl (Admin)	20,000	50,000	10,000	0	70,000	11,000	14,000	12,000	20,000	29,000	20,000	-	-
Mat'l & Suppl (Tech)	128,000	300,000	1,000	529,000	128,000	2,310,000	3,290,000	4,020,000	4,450,000	5,830,000	4,000,000	-	-
Freight	14,000	9,000	250	0	1,000	11,000	12,000	13,000	14,000	17,000	14,000	-	-
Workshop	147,000	63,000	N/A	99,000	147,000	147,000	147,000	147,000	147,000	147,000	147,000	-	-
Well Constr.	80,000	0	N/A	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	-	-
Contingencies	21,000	0	7,000	0	21,000	42,000	63,000	84,000	105,000	168,000	105,000	-	-
Spares & Supplies (D.A.S.)	75,000	20,000	4,000	0	114,000	26,000	38,000	50,000	62,000	91,000	62,000	-	-
<b>DETO ECON EVALUATION</b>	<b>4,000</b>	<b>0</b>	<b>0</b>	<b>60,000</b>	<b>70,000</b>	<b>30,000</b>	<b>30,000</b>	<b>30,000</b>	<b>30,000</b>	<b>60,000</b>	<b>30,000</b>	<b>0</b>	<b>30,000</b>
<b>CONTINGENT (Total)</b>	<b>47,000</b>	<b>50,000</b>	<b>5,000</b>	<b>0</b>	<b>76,000</b>	<b>35,000</b>	<b>50,000</b>	<b>55,000</b>	<b>50,000</b>	<b>122,000</b>	<b>80,000</b>	<b>70,000</b>	<b>122,000</b>
<b>PRECISION</b>	<b>0</b>	<b>0</b>	<b>37,000</b>	<b>381,000</b>	<b>346,000</b>	<b>534,000</b>	<b>707,000</b>	<b>935,000</b>	<b>970,000</b>	<b>1,279,000</b>	<b>348,000</b>	<b>1,279,000</b>	<b>1,279,000</b>
<b>TOTAL</b>	<b>2,229,000</b>	<b>786,000</b>	<b>212,000</b>	<b>1,340,000</b>	<b>2,193,000</b>	<b>23,310,000</b>	<b>28,110,000</b>	<b>32,697,000</b>	<b>36,360,000</b>	<b>48,279,000</b>	<b>35,110,000</b>	<b>2,723,000</b>	<b>47,973,000</b>

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TAGS:

SUBJECT: MAURITANIA RURAL ROADS PROJECT 682-0214  
PROJECT WORK PLAN AND SCHEDULE

REF: STATE 189782

1. A REVIEW OF SUBJECT PROJECT WORK PLAN AND SCHEDULE  
WFP/S, RESULTED IN THE FOLLOWING COMMENTS:

--A. THE ORIGINAL CONCEPT FOR THE WFP/S WAS TO PROVIDE  
AN OVERALL PLAN FOR EXECUTION OF THE PROJECT. HOPEFULLY  
IT WOULD SHOW HOW THE DIFFERENT ELEMENTS INTERFACED, THE  
DEPENDENT FACTORS INCLUDING UNKNOWN, I.E.G. LOCATIONS OF  
SURFACE MATERIAL, AVAILABILITY OF WATER, ETC.; LEVEL OF  
WORK FORCE; WHEN MAJOR ORDERS FOR SUPPLIES AND MATERIALS  
WOULD BE MADE AND WHEN THEY WOULD BE ON THE JOB. THE  
WFP/S WOULD BE SUBJECT TO UPDATING (DEPENDING ON CHANGED  
CIRCUMSTANCES OR CONDITIONS) BUT WOULD BE THE BASIC PLAN  
INCORPORATING ALL THE KNOWN FACTORS WHICH WOULD EFFECT  
THE EXECUTION AND PROGRESS OF THE PROJECT.

--B. PRELIMINARY CONSTRUCTION WORK SCHEDULE

----(1) TABLE 1 PROVIDES A BAR CHART SHOWING ESTIMATED  
DURATION AND TIMES OF MAJOR CONSTRUCTION ACTIVITIES.  
HOWEVER IT DOES NOT SHOW THE INTERRELATION OF EVENTS AND  
ACTIVITIES.

----(2) THE NARRATIVE GIVES SOME OF THE ASSUMPTIONS  
THAT WERE USED IN DEVELOPING TABLE 1, HOWEVER NEITHER  
THE TABLE NOR NARRATIVE REFLECT THE IMPACT OF THE  
UNCERTAINTIES. I.E.G. SOURCE OF MATERIALS AND WATER.

----(3) THE ESTIMATED LOCAL EXPENDITURES IN GUINIAS IS  
GIVEN ON PAGE 24. IT DOES NOT BREAK IT DOWN INTO  
MAINTENANCE, CONSTRUCTION, TRAINING OR SUPPORT COSTS.

----(4) THE ESTIMATED OFFSHORE EXPENDITURES IN DOLLARS  
IS GIVEN ON PAGE 27. AGAIN IT WOULD BE HELPFUL IF THE  
EXPENDITURES WERE BROKE DOWN INTO COMPONENTS, OILS,  
PARTS AND LUBRICANTS.

	ACT	1
DIR		
DD		
PDE		
MGT		
OGD		
FA		
SNO		
CO		
PER		
TRV		
DUE DATE 7/31		
ANSWER		

----(1) A VERBAL OUTLINE OF THE TRAINING PLAN IS GIVEN ON PAGE 12 AND 13. THE PROPOSED WORK SCHEDULE INDICATES COST. INDICATION SHOULD BE WHEN THE DECISION ON FORMAL CLASSROOM TRAINING WILL BE MADE IN ORDER TO SCHEDULE TDY ASSISTANCE AND TRAINING AIDS.

----(2) IT WOULD ALSO BE HELPFUL TO HAVE THE ESTIMATED COST OF THE TRAINING - BOTH FOR LOCAL COSTS (STUDENT SALARIES), CONTRACT COSTS (TRAINERS) AND TRAINING AIDS.

----(3) ALSO SEE CONTRACT PARA E1.21E PART 11 TRAINING PLAN.

--D. DESIGN AND INSPECTION SCHEDULE

----(1) AGAIN IT WOULD BE HELPFUL TO HAVE THE COST OF THESE FUNCTIONS ESTIMATED.

----(2) WHAT TESTS WILL BE MADE? E.G. COMPACTION, RESINITY, WATER CONTENT, INVERT ELEVATIONS OF STRUCTURES CHECKED, ROADWAY WIDTH, ETC.

----(3) NOTWITHSTANDING PARAGRAPH 6 PAGE 4 OF PRELIMINARY REPORT SEE CONTRACT PARAGRAPHS E1.21 D2 AND PARAGRAPHS E1.22C REGARDING DRAINAGE STRUCTURES.

--E. IT WOULD BE HELPFUL IF THE EXPENDITURES ALSO WERE EXPRESSED IN GRAPHIC FORM BY MONTH AND TOTAL PROJECT (S CURVE).

2. SUGGEST THE PROJECT BE BROKEN DOWN BY MAJOR TASKS AND THE SUB ACTIVITIES THAT COMPRISE THE MAJOR TASK. THEN THE MAJOR TASK BE GIVEN A PERCENTAGE WEIGHT OF THE TOTAL PROJECT AND THE SUB ACTIVITIES BE GIVEN A PERCENTAGE WEIGHT OF THE MAJOR TASK. THE PERCENTAGES MAY BE WEIGHTED IN EITHER PHYSICAL OR MONETARY TERMS. THESE FIGURES SHOULD BE GIVEN COLUMNAR FORM. THE PROPOSED CONSTRUCTION SCHEDULE AND WORK SCHEDULE CAN BE PRESENTED ON THE RIGHT HAND SIDE OF THE SHEET IN BAR CHART FORM AND THE 'S' CURVE OVERLAID ON THE SAME GRAPH. WITH THIS TYPE OF PWP/S THE SCHEDULE AND WORK PLAN CAN BE REVISED AS EXPERIENCE DICTATES.

3. THE PRELIMINARY PWP/S REPORT IS A BEGINNING AND THE NEXT EDITION OF THE REPORT SHOULD INCORPORATE THE ABOVE COMMENTS. THE PWP/S REPORT SHOULD INDICATE WHEN COMMODITIES, SUPPLIES AND EQUIPMENT ARE SCHEDULED TO BE ORDERED AND WHEN ARRIVAL ON THE PROJECT IS EXPECTED. SHULTZ

TRANSLATION

Islamic Republic of Mauritania  
Rural Roads Improvement Project  
No. 682-0214  
s/c USAID  
P.O. 222  
Nouakchott (RIM)

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Technical and Financial Implementation  
Program Document

Transfer Authorization No. 682-XXX-000-

**GENERAL:**

The purpose of this program document is to specify the conditions under which the local currency (Ouguiya) proceeds from the sales of U.S. PL 480 Program Section 206 food aid provided through Commission for Food Security (CSA) are used for the Rural Roads Improvement sub-project of the 206 program.

A bank account has been opened in the name of the project (AID No. 682-0214). This account is managed by the UNSO/OPE Coordinator who shares joint responsibility with USAID Project Officer for all local Project expenses.

This account can be, upon request, examined and audited by official representatives of the Government of the Islamic Republic of Mauritania and the Government of the United States of America.

The USAID Controller verifies the state of the account at the end of each quarter, at a minimum; external financial reports relative to expended funds (by budget category or sub-section) are furnished each quarter by the Office of the UNSO/OPE Coordinator.

These funds will be deposited by the CSA to the account to be used in the budget categories as specified in the Technical and Financial Implementation Program Document (PETF).

Nevertheless, we must note that while waiting for the funds to be deposited by the CSA, it has been necessary to make payment on an exceptional and provisional basis from this account using dollar funds (normally reserved for exterior purchases). These payments are for local expenses which should have been made exclusively using these U.S. food aid sales proceeds. The dollar funds account, temporarily used to allow work to progress, must be reimbursed to the level of this expenditure.\* This must be accomplished by withdrawing a corresponding amount of funds from the Rural Roads Project local currency account to reimburse U.S. dollar account, when adequate deposits have been made.

\*If no further dollar funds are forthcoming and upon written agreement of

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During the time this reimbursement is being accomplished, there is a total flexibility between FETF budget subdivisions. For example, a given FETF budget subdivision for POL may be \$100,000. However, there may already be dollars spent for POL to satisfy this need but inadequate sale proceeds yet made available to reimburse the dollar and keep the project going. In such a case, the \$100,000 will be used to advance funds to other line items until the additional sales proceeds become available. The subdivisions in the sub-project budget for sale proceeds will not be exceeded or reduced by more than 15% which is an allowable flexibility among subdivisions.

The overall budget categories, or subdivisions, in the Rural Roads Improvement Project (682-0214) are itemized as follows:

## 1. PERSONNEL - SALARIES AND RELATED COSTS INCLUDING:

- a. Specialized personnel hired by the project;
- b. Unskilled laborers employed at the work site;
- c. The administrative assistant to the USAID Engineer;
- d. Selected local-hire procurement and warehouse personnel essential to the movement of commodities to the Project, from the USAID Procurement Office;
- e. Other personnel as may be mutually agreed upon by the Mauritanian Government and USAID to keep the Project on course.

## 2. LOCAL TRAVEL AND PER DIEMS INCLUDING:

- a. Purchase of airline tickets from Nouakchott to the worksite whenever necessary, or to Dakar to conclude urgent commodity purchases;
- b. Purchase of places on local ground transportation; and
- c. Other jointly agreed upon travel costs not covered by other funds.

## 3. VEHICLES - MAINTENANCE AND REPAIRS INCLUDING:

- a. Procurement of spare parts; and
- b. Costs for all local services and work necessary for the maintenance of the Project's light vehicles.

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## 4. PETROLEUM PRODUCTS (POL) INCLUDING:

- a. Various fuels (Gasoline, Diesel);
- b. Oils (motor, hydraulic, brake, etc.);
- c. Lubricants;
- d. Miscellaneous (radiator coolants, motor treatments, penetration oils, etc.);and
- e. In-country transportation of fuels.

## 5. MACHINES AND EQUIPMENT - MAINTENANCE, REPAIRS AND PURCHASES INCLUDING:

- a. Overhaul of engines on equipment provided to the project by the GIRM: three (3) scrapers, two (2) graders, two (2) bulldozers;
- b. Spare parts for the above (CAT);
- c. Various spare parts for other heavy equipment;
- d. Three new "MACK" Dump Trucks available at Nouakchott and similar to those of the project (if agreed to be necessary by the GIRM and USAID); and
- e. Two new small pick-up trucks available at Nouakchott.

## 6. CONSTRUCTION AND STRUCTURES - MAINTENANCE, REPAIRS AND MINOR WORK IN PROGRESS INCLUDING:

The purchase of (1) materials for construction or repairs, including minor maintenance of housing units at camps, and (2) supplies required by the construction contracts.

## 7. OFFICE SUPPLIES AND FURNISHINGS - ADMINISTRATION

## 8. TECHNICAL MATERIALS AND SUPPLIES INCLUDING:

- a. Equipment and technical materials for matters of topography, design, laboratories, etc.; and
- b. Materials for project drainage structures, particularly cement, reinforcing bar, wood for forms, gabions, culverts, etc.

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9. FREIGHT INCLUDING:

Freight charges for transportation of materials and commodities excepting fuels (see 5 above).

10. CONSTRUCTION CONTRACT FOR A REPAIR GARAGE IN M'BOUT

11. CONSTRUCTION OF SHALLOW OR DEEP WELLS INCLUDING:

The cost of shallow, hand-dug or deep well construction (a function of local hydro-geological conditions) and equipment required for that construction sufficient only to meet the water.

12. CONTINGENCIES

13. IMPRECISION

BUDGET FOR TRANSFER AUTHORIZATION NO. 687-XXX-000.

The budget for this specific transfer is provided in Attachment A.

Details of this budget may be examined at the Office of the Engineer, USAID.

Coûts locaux administrés par UNISO  
 Projet No. 682-0214  
 Amélioration des Routes Rurales  
 Autorisation de Transfer No.  
 682-XXX-000- 3616

Pièce Joint (A)

Budget Semestriel  
 (en milliers d'Ouguiyas)

<u>O b j e t</u>	<u>Besoins Immediats</u>	<u>Besoins Mensuels</u>	<u>Besoins pour le Semestre</u>	<u>Budget Total PEFT</u>	<u>Budget Provisoire Global du Projet dans son ensemb.</u>
Personnel - Salaires et Coûts s'y rapportant	15.150 UM	2.150 UM	28.050 UM	28.050 UM	66,250 UM
Déplacements locaux	250	50	550	250	1.450
Véhicule: entretien et réparations	1.100	200	2.300	1.100	5.900
Produits Pétroliers	5.950	2.250	19.450	15.412	63.200
Machines et équipement entretien, réparations et achat	(-1850)	400 +20,550 (forfaitaire)	21.100	21.100	38.300
Construction et structures entretien réparations et petite construction	1.200	50	1.500	1.500	2.400
Matériels et fournitures bureau et administration	250	50	550	550	1.460
Matériels et fournitures techniques	1.500	50 +7.950 (Forfaitaire)	9.750	6.600	29.150
Fret	450	17	552	450	850
Construction d'un Atelier	0	N/A	0	0	7.350
Construction d'un puit ou forage	0	N/A	0	0	4.000
Imprévus	0	350	2.100	0	8.400
Imprecisions	0	1.050	6.300	0	25.600
TOTAUX (Milliers d'Ouguiyas)	24.000 UM	6.617 UM +28.500 UM(Forfaitaire)	92.202 UM	75.012 UM	254.300 UM
TOTAUX (Milliers de dollars)	\$480	\$132.0 +570 (Forfaitaire)	\$1844	\$1,500	\$5,086.0

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Coûts locaux administrés par UNSO  
 Projet No. 682-0214  
 Amélioration des Routes Rurales  
 Autorisation du Transfer No.  
 682-XXX-000-2515 Amendement No. 1

Budget Semestriel  
 (en milliers d'Ouguiyas)

<u>O b j e t</u>	<u>Besoins Immédiats</u>	<u>Besoins Mensuels</u>	<u>Besoins pour le Semestre</u>	<u>Budget Total PEFT</u>	<u>Budget Provisoire Global du Projet dans son ensemble</u>
Personnel - Salaires et Coûts s'y rapportant	15.150 UM	2.150 UM	28.050 UM	0 UM	66.250 UM
Déplacements locaux	250	50	550	0	1.450
Véhicule: entretien et réparations	1.100	200	2.300	0	5.900
Produits pétroliers	9.200	2.250	22.700	3.250	63.200
Machines et équipement entretien, réparations et achat	8.150	400 +20.550(forfaitaire)	31.100	10.000	38.300
Construction et structures entretien réparations et petite construction	1.200	50	1.500	0	2.400
Matériels et fournitures bureau et administration	250	50	550	0	1.460
Matériels et fournitures techniques	1.500	50 +7.950(forfaitaire)	9750	0	29.150
Fret	450	17	552	0	850
Construction d'un Atelier	4.700	2.650(forfaitaire)	7.350	7.350	7.350
Construction d'un puit ou forage	0	4.000(forfaitaire)	4.000	4.000	4.000
Imprévus	0	350	2.100	0	8.400
Imprecisions	0	1.050	6.300	0	25.600
<b>TOTAUX (Milliers d'Ouguiyas)</b>	<b>41.950 UM</b>	<b>6.617 UM</b>	<b>16802 UM</b>	<b>24.600 UM</b>	<b>254.300 UM</b>
<b>TOTAUX (Milliers de dollars)</b>	<b>\$839</b>	<b>+35.150 UM(forfaitaire)</b> \$132 \$703(forfaitaire)	<b>\$2336</b>	<b>\$492</b>	<b>\$5.086</b>

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UNCLASSIFIED

NOUAKCHOTT 21712

VZCZCMT \*  
PP RUEEC  
IE RUFHC #1712/31 129 \*\*  
ZNR UUUUU ZZH  
P 171056Z APR 84  
FM AMEMBASSY NOUAKCHOTT

CLASS: UNCLASSIFIED  
CHRG: AID 4/11/84  
APPR: AID/DIR:DMILLER  
DFTD: ENGR:GTHOMPSON  
CLPAR: SA/DIR:REGOLDMAN  
DISTR: AID-5 AMP DCM  
ECON CERON

~~UNCLAS SECTION 21 OF \* NOUAKCHOTT 21712~~

AIDAG-

FOR: AFR/SWA, AFR/PD/SWAP, AFR/TR/ENGR

E.O. 12356: N/A

SUBJECT: MAURITANIA RURAL ROADS PROJECT (682-3214) PP  
SUPPLEMENT

REF: (A) STATE Z21114, (F) NOUAKCHOTT 00445, (C)  
NOUAKCHOTT 1341 (D) NOUAKCHOTT 2711, (E) 23 NOUAKCHOTT  
22297

1. SUMMARY: THIS CABLE SUMMARIZES THE MAJOR FEATURES OF THE RECENT IN-FOCUS RURAL ROADS PROJECT EVALUATION AND SETS OUT STRATEGY FOR THE PREPARATION OF THE PP SUPPLEMENT REQUIRED FOR THE ACHIEVEMENT OF ORIGINALLY ANTICIPATED PROJECT OUTPUTS. REFTELS (C,D) ON PERSONNEL HAVE BEEN SENT CONCERNING THE ISSUE OF THERE BEING NO DE ENGINEER OR MISSION PROJECT MANAGER AT POST AND THE ISSUE CONCERNING THE LACK OF A CONTRACTOR COP. IN ESSENCE, USAID'S INTERNAL EVALUATION CONFIRMED THE FOLLOWING MAJOR POINTS:

A) THE UNESCO LOW COST ROAD BUILDING MODEL HAS NOT WORKED IN THE PROJECT AREA.

B) THERE WERE GOOD HISTORICAL REASONS FOR THE FACT THAT A NUMBER OF IMPORTANT ASSUMPTIONS ON WHICH THE DESIGN OF THIS PROJECT WAS BASED PROVED INCORRECT.

C) CORRECTIVE ACTIONS TAKEN TO DATE VIS-A-VIS CONSTRUCTION DESIGN, EQUIPMENT MIX, ETC. WERE APPROPRIATE.

D) THESE ACTIONS ALMOST DOUBLE THE COST OF THE ORIGINAL PROJECT.

E) THE CONTRACTOR AND THE MISSION HAVE DONE AN EXCELLENT JOB IN ADAPTING TO UNFORESEEN CONDITIONS AND IMPLEMENTATION IS NOW PROCEEDING WELL.

F) THE KARDI-M'BOU-S'ELIABY-GONPAYE ROAD IS A PREREQUISITE TO REAL DEVELOPMENT IN MAURITANIA'S MAJOR AGRICULTURAL REGION - THE SENEGAL RIVER BASIN.

G) THE PROJECT AS ORIGINALLY DEFINED SHOULD BE COMPLETED AND THE REQUIRED FUNDS OF \$5.9 MILLION ADDED.

USAID REQUESTS AID/W REVIEW OF EVALUATION AND PROPOSED TECHNICAL AND FINANCIAL SUPPLEMENTS TO PP CONTAINED IN THE EVALUATION. MISSION REQUESTS AID/W GUIDANCE ON PROCEDURES

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REQUIRED TO SUPPLEMENT PP AND AMEND AUTHORIZATION WITH THE  
 OBJECTIVE OF OBLIGATING ADDITIONAL FUNDS PRIOR TO  
 SEPTEMBER 1984 IF THE PROJECT IMPLEMENTATION SCHEDULE IS  
 TO BE MAINTAINED. END SUMMARY.

2. THE HISTORY OF THIS PROJECT EXPLAINS MANY OF THE  
 CIRCUMSTANCES THAT SURROUND ITS CURRENT IMPLEMENTATION  
 PLAN AND THE FACT THAT PROJECT FACES A COST INCREASE LARGE  
 IN PROPORTIONS IF NOT IN ABSOLUTE MAGNITUDE.

A) THE DESIGN ASSUMED THAT THE UNSO DESIGN WOULD WORK. IT  
 DID NOT. THE UNSO/OPE MODEL FOR RURAL ROAD CONSTRUCTION,  
 WHICH HAS BEEN APPLIED IN OTHER COUNTRIES WITH MIXED  
 RESULTS, HAS PROVEN INAPPROPRIATE HERE. IT PROVED  
 INADEQUATE EVEN FOR THE LESS DIFFICULT TERRAIN OVER WHICH  
 UNSO/OPE DESIGNED AND MANAGED THE CONSTRUCTION OF THE  
 FIRST 73 KM FROM M'BOU TO TOWARD SELIBABY. NEITHER DESIGN  
 NOR CONSTRUCTION ON THIS SEGMENT IS OF SUFFICIENT QUALITY.  
 AID'S DESIGN, IN TURN, ASSUMED THAT THE UN EQUIPMENT MIX  
 WAS CORRECT AND THAT THE EQUIPMENT INHERITED FROM THE  
 FIRST PHASE UN EFFORT WOULD, AFTER ONE YEAR, BE WELL  
 MAINTAINED AND READY TO GO. THE EQUIPMENT WAS IN POOR  
 SHAPE, NOT READY FOR USE, AND THE MIX WAS NOT APPROPRIATE.  
 OUR ASSUMPTIONS WERE WRONG, OUR CONFIDENCE MISPLACED.  
 DOLLARS 38,223 PER KM PROVED TO BE TOO LOW IN THE  
 DIFFICULT TERRAIN OF GORGOL.

B) THE PROJECT ASSUMED THAT THE UN ROAD WOULD BE COMPLETE  
 -- A FINISHED PRODUCT. LAST YEAR'S RAINS WASHED OUT LARGE  
 PORTIONS OF THE ROAD AND SHOWED THAT THE DESIGN OF THE  
 DRAINAGE STRUCTURES ON THE UN ROAD WAS NOT ADEQUATE. IT  
 WILL COST APPROXIMATELY ONE MILLION DOLLARS TO BRING THE  
 UN SEGMENT OF THE ROAD UP TO A MINIMUM STANDARD FOR ALL-  
 WEATHER GRAVEL ROADS.

C) THE DESIGN SUGGESTED THAT CONTINUATION OF THE UNSO  
 MODIFIED FORCE ACCOUNT PROCEDURE OF CONSTRUCTION WAS A  
 GOOD ONE. THIS ASSUMPTION INFLUENCED OUR PROGRAMMING THE  
 ROAD PROJECT AT THE ALTOGETHER TOO-LOW FIGURE OF SIX  
 MILLION DOLLARS. THIS AMOUNT WAS ULTIMATELY AUTHORIZED  
 WHICH THEN RULED OUT ANY POSSIBILITY OF USING A  
 CONSTRUCTION CONTRACTOR. IT TURNED OUT THAT THE UN HAD  
 CONSIDERABLE PROBLEMS WITH ITS CONTRACTOR. THE FINAL  
 KILOMETERS OF THE ROAD WERE CONSTRUCTED WITHOUT AN  
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ENGINEER ON SITE AND THEIR PROJECT (C-173) SUFFERED AS A RESULT.

1) THE AID TEAM HAS MADE MANY ADJUSTMENTS TO THE BASIC DESIGN OF THE PROJECT TO OVERCOME THE ERRONEOUS ASSUMPTIONS MADE IN THE DESIGN OF BOTH THE UN AND THE AID PROJECTS. THESE CORRECTIONS WERE NECESSARY IF WE WERE TO AVOID THE DISASTER OF A MAJOR "UNDER-DESIGN". BUT THE REMEDY HAS A COST, A COST WE MUST ABSORB SINCE IMPROVEMENT TO AND CONSTRUCTION OF EACH OF THE ROAD SEGMENTS IDENTIFIED IN THE PROJECT ARE AN ESSENTIAL PREREQUISITE FOR AGRICULTURAL DEVELOPMENT IN THE AREA.

11. P

3. AS OF NOW, THE PROJECT CANNOT ACHIEVE THE OUTPUTS, PURPOSE, OR GOAL WITHOUT MAJOR OPERATIONAL/CONSTRUCTION MODIFICATIONS TO BENEFIT FROM THE EXPERIENCE WITH THE UNSO MODEL WHICH SHOWS THAT:

A) ESTIMATES OF DRAINAGE REQUIREMENTS (BOTH STRUCTURES AND EMBANKMENTS) WERE MUCH TOO LOW;

B) ESTIMATES OF SPARE PARTS REQUIREMENTS, OPTIMISTICALLY BASED UPON WHAT WAS ASSUMED TO BE LOW MILEAGE USED EQUIPMENT, WERE FAR TOO LOW; AND

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C) ESTIMATES OF THE TIME REQUIRED TO EXECUTE PROJECT TASKS WERE TOO SHORT (AS A RESULT OF THE POOR EQUIPMENT MIX AND UNREALISTIC OPTIMISM CONCERNING WEATHER AND LEAD TIMES. AN ADDITIONAL NINE MONTHS IS NOW ESTIMATED FOR COMPLETION OF ALL ROAD SEGMENTS AS PLANNED). APPROXIMATELY U.S. DOLS 8.9 MILLION IN ADDITIONAL AID SUPPORT IS NOW ESTIMATED TO BE NEEDED FOR COMPLETION OF THE PROPOSED CONSTRUCTION. THE ADDITIONAL FUNDING WILL ALLOW THE COMPLETION OF THE THREE ROAD SEGMENTS AS PER THE PROJECT PAPER AND OUR PROJECT AGREEMENT WITH GIRM. IT WILL ALSO FINANCE THE REHABILITATION OF THE UNSO CONSTRUCTED SEGMENT (M'ECUT - 173). THUS THE ROAD PROJECT WILL CONSIST OF THE CONSTRUCTION OF AN ALL WEATHER GRAVEL ROAD BUILT TO PROPER ENGINEERING STANDARDS FOR THE LOCAL CONDITIONS. COMPONENTS OF THE KAEDI TO GOURAYE ROAD PROJECT ARE :

-----	0M
KAEDI TO M'ECUT-----	115
M'ECUT TO 173-----	79
173 TO SELIBABY-----	45
SELIBABY TO GOURAYE-----	45

11. P

-----279

THE DOLS 8.9 MILLION IS BROKEN DOWN AS FX DOLS 2.9 MILLION AND LC 3.8 MILLION. THE PACE SHOULD BE CHANGED FROM 12/88 TO 3/89 TO ACCOMMODATE CHANGES IN THE CONSTRUCTION SCHEDULE.

4. CURRENT PROJECT STATUS AND MAJOR ACTIONS TAKEN TO IMPROVE PROJECT IMPLEMENTATION ARE LISTED BELOW:

----A. BRIGADE EQUIPMENT MIX CHANGED AND EQUIPMENT ADDED. THE MAJOR CHANGE WAS THE ADDITION OF SCRAPERS WHICH WERE NOT PART OF THE UNSO BRIGADE.

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-----B. EQUIPMENT REPAIR SHOP BUILT AT M'ECOUT TO FACILITATE ON-SITE REPAIR AND FOR FUTURE ROAD MAINTENANCE ACTIVITIES. GIRM CONTRIBUTED 25 MILLION UM (FROM FY 81, PL 422, SECTION 206 COUNTERPART FUNDS) FOR WORKSHOP AND OTHER UNANTICIPATED LOCAL COST REQUIREMENTS.

-----C. ROAD DESIGN STANDARDS CHANGED:

----- WIDTE, FROM 5.5 M TO 7.0 M.

----- DEPTE, FROM 30 CM TO 30 CM ABOVE FLOODING.

----- DRAINAGE, DESIGNED TO ACCOMMODATE LOW MAINTENANCE AND LOCAL FLASH FLOOD CONDITIONS.

----- FYI. ALIGNMENT, HORIZONTAL AND VERTICLE CURVES MAINTAINED AT ORIGINAL SPECIFICATIONS FOR DESIGN SPEED OF 80 KPH.

PE P-----D. MINIMUM MAINTENANCE CARRIED OUT ON KADEI TO M'ECOUT TO K 72 PORTION OF ROAD (198 KM) TO PROVIDE NECESSARY ACCESS TO CONSTRUCTION SITE.

-----E. CONSTRUCTION OF ROAD BEGUN AND MOVING AT THE RATE OF 10 KM PER MONTH; 20 KM OF ROAD BUILT.

-----F. HYDROLOGY STUDY AND DRAINAGE WORKS DESIGNED FOR K 72 TO SELIBABY SEGMENT.

-----G. ALIGNMENT CLEARED FROM K 72 TO GOURAYE.

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-----H. OFF-SHORE AND LOCAL SUPPORT AND PROCUREMENT SYSTEMS ESTABLISHED AND WORKING.

UC C. THERE ARE A NUMBER OF OPTIONS FROM WHICH AID CAN BE CHOSEN WITH RESPECT TO THE FUTURE IMPLEMENTATION OF THIS PROJECT.

A. TERMINATE PROJECT WITH PRESENT FUNDS. AT THAT TIME THE PROJECT WILL HAVE COMPLETED CONSTRUCTION OF THE ROAD FROM M'ECUT TO SELIBABY, OR ABOUT 22% OF THE ORIGINALLY PLANNED CONSTRUCTION. IN ADDITION TO THE CONSTRUCTION THERE WILL BE AN EQUIPMENT PARK OF WELL MAINTAINED HEAVY EQUIPMENT, VEHICLES, MACHINERY, CULVERTS AND THE INFRASTRUCTURE NEEDED (CAMPS, MAINTENANCE EQUIPMENT, ETC.) TO CONTINUE ROAD CONSTRUCTION.

B. CONSTRUCTING VARIOUS SEGMENTS OF THE ROAD WITHOUT COMPLETING THE WHOLE ROAD FROM KAEDI TO GOURAYE. EACH OF THESE OPTIONS HAS AN ASSOCIATED COST AS PRESENTED BELOW. SEGMENTS AND COSTS OF OTHER COMPONENTS:

-----M'ECUT TO SELIBABY. ADDITIONAL COST DOLS .8 MILLION.

-----M'ECUT, SELIBABY, GOURAYE. ADDITIONAL COST DOLS 2.8 MILLION.

LU D. -----M'ECUT TO KAEDI; M'ECUT TO SELIBABY. ADDITIONAL COST DOLS 4.5 MILLION.

. COMPLETING THE ROAD AS ORIGINALLY SPECIFIED IN THE PROJECT PAPER WITH THE IMPROVED ENGINEERING - DOLS 5.9 MILLION. USAID'S COST ANALYSIS IS BASED ON A SPECIFIC DESIGN STANDARD FOR THE ROAD AND DRAINAGE STRUCTURES. IT COLLIGES THE RECOMMENDATIONS OF THE CONTRACTOR AND OF THE AID/W ENGINEER WHO HAS BEEN ON TDY IN MAURITANIA FOR THE PAST FIVE MONTHS. IT IS CONSIDERED THE MINIMUM ACCEPTABLE FOR THE PREVAILING CONDITIONS.

UU E. USAID STRONGLY FAVORS COMPLETING THE PROJECT AS ORIGINALLY PROPOSED FROM KAEDI TO GOURAYE. THIS IS CONSISTENT WITH THE ORIGINAL PLAN AND WITH OUR EXISTING AGREEMENT WITH THE GIRM. THE OBJECTIVES ARE COMPLETION OF 279 KM OF ROAD AND THE PROVISION OF INFRASTRUCTURE NEEDED FOR AGRICULTURAL DEVELOPMENT. COMPLETION OF THIS PROJECT CONFORMS TO THE USAID DEVELOPMENT STRATEGY AND GEOGRAPHICAL FOCUS. FUTURE PROJECT DEVELOPMENT ACTIVITIES WILL BE IN THE BASIN AND THE PROJECT ROAD IS ESSENTIAL FOR GOOD COMMUNICATIONS.

ACCORDINGLY WE RECOMMEND THAT THE PROJECT SHOULD BE AMENDED AS NECESSARY TO PERMIT COMPLETION OF CONSTRUCTION ON THE ROAD SEGMENTS AS SET FORTH IN THE PROJECT PAPER AND THE PROJECT GRANT AGREEMENT, AS MODIFIED, TO INCLUDE REMEDIAL WORKS ON THE M'ECUT TO KAEDI SEGMENT.

USAID RECOMMENDS REJECTION OF OPTIONS OTHER THAN COMPLETION OF THE ROAD FOR BOTH DEVELOPMENTAL AND POLITICAL REASONS WHILE RECOGNIZING THAT AID DOES NOT HAVE A LEGAL OBLIGATION TO CONTINUE ONCE FUNDS OBLIGATED ARE EXHAUSTED. A PREREQUISITE TO DEVELOPMENT OF THE REGION IS GOOD COMMUNICATIONS. COMPLETION OF THE ROAD FROM M'ECUT TO SELIBABY LEAVES GOURAYE ISOLATED AND LEAVES THE KAEDI-M'ECUT SECTION IN POOR SHAPE. COMPLETING ONLY THE KAEDI TO

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LIBRARY PORTION STILL LEAVES GOURAYE ISOLATED. PROVIDING ACCESS TO GOURAYE HAS BEEN AN OBJECTIVE OF THE PROJECT AS GOURAYE IS ON THE RIVER AND THE GOVERNMENT AND OTHER CONCNS (IFAD, IERE) ARE PLANNING IRRIGATED AGRICULTURAL PROJECTS IN THAT SECTOR. POLITICALLY, IT WOULD BE QUITE UNSATISFACTORY TO HAVE MADE A "COMMITTMENT" TO BUILD AN IMPORTANT ROAD IN THE RIVER BASIN AND THEN NOT TO COMPLETE IT.

UH #7. USAID IS PREPARED TO REOBLIGATE PLANNED DEOBLIGATIONS OF UP TO DOLS 5.2 MILLION FOR THIS PROJECT UNDER DECE-REOBLIGATORY AUTHORITY. (THESE DEOBLIGATIONS WILL COME FROM PROJECTS THAT WERE TERMINATED LAST YEAR WHEN USAID FINANCED ACTIVITIES IN RURAL DEVELOPMENT STOPPED.) BASED UPON THE REVISED FINANCIAL IMPLEMENTATION PLAN AND CASH FLOW ANALYSIS FOR PL 422 SECTION 226 GENERATED LOCAL CURRENCY, WE ALSO RECOMMEND THE USE OF THE AVAILABLE GENERATIONS OF DOLS 722, 233 FROM PL 422 SECTION 226 IN-COUNTRY FOOD SALES PROCEEDS FOR LOCAL COST REQUIREMENTS. AVAILABILITY OF THESE ADDITIONAL FOOD SALES PROCEEDS REQUIRES APPROVAL FROM THOSE RESPONSIBLE FOR THE SECTION 226 PROGRAM (GIRM AND AID/W). WE ARE PREPARED TO SEEK THEIR CONCURRENCE IN OUR PROPOSED PROGRAM. THUS, NO NEW FY1984 DA FUNDS AUTHORIZATION WOULD BE NEEDED TO COMPLETE THE PROJECT AS PROPOSED.

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8. DISCUSSIONS HAVE BEEN HELD WITH REPRESENTATIVES OF THE UNIP, UNSC AND OPE CONCERNING THE C-170 PORTION OF THE ROAD AND THE REHABILITATION NEEDED. DURING THE WEEK OF 9 APRIL AN UNSC/OPE TEAM VISITED USAID AND THE PROJECT SITE. UNSC AGREES THAT REMEDIAL WORK IS REQUIRED BUT STATES THAT FUNDS ARE NOT AVAILABLE. WHILE USAID RECOGNIZES THAT WE ARE NOT RESPONSIBLE FOR THE C-170 PORTION OF THE ROAD, IT IS UNFORTUNATELY LOCATED IN THE MIDDLE OF THE ROAD WE ARE FINANCING AND NEEDS TO BE REHABILITATED. UNSC HAS BEEN REQUESTING DDCNR FINANCING FOR A SECOND PHASE OF ITS RURAL ROADS ACTIVITIES IN MAURITANIA FOR MORE THAN ONE YEAR. WERE THEY TO GET FUNDS THE C-170 ROAD WOULD BE A HIGH PRIORITY USE OF THESE FUNDS. UNSC HAS NOT BEEN SUCCESSFUL IN FINDING DONORS FOR THE MAURITANIAN PROGRAM AND WE DOUBT THEY WILL COME UP WITH THE FUNDS REQUIRED IN A TIMELY MANNER.

9. FYI UNSC IS BEGINNING ROAD MAINTENANCE ACTIVITIES IN THE SAHEL. FUNDS COULD CONCEIVABLY BE MADE AVAILABLE FOR MAINTENANCE ACTIVITIES ON THE KAEI-TOURAYE ROAD WHEN CONSTRUCTION IS COMPLETED. A DAFAR BASED, UNSC FINANCED, ENGINEER WILL BE POSTED SHORTLY. THIS ENGINEER'S WORK WILL INCLUDE DEVELOPMENT OF A MAINTENANCE PROGRAM FOR THE KAEI TO GOURAYE ROAD. END FYI.

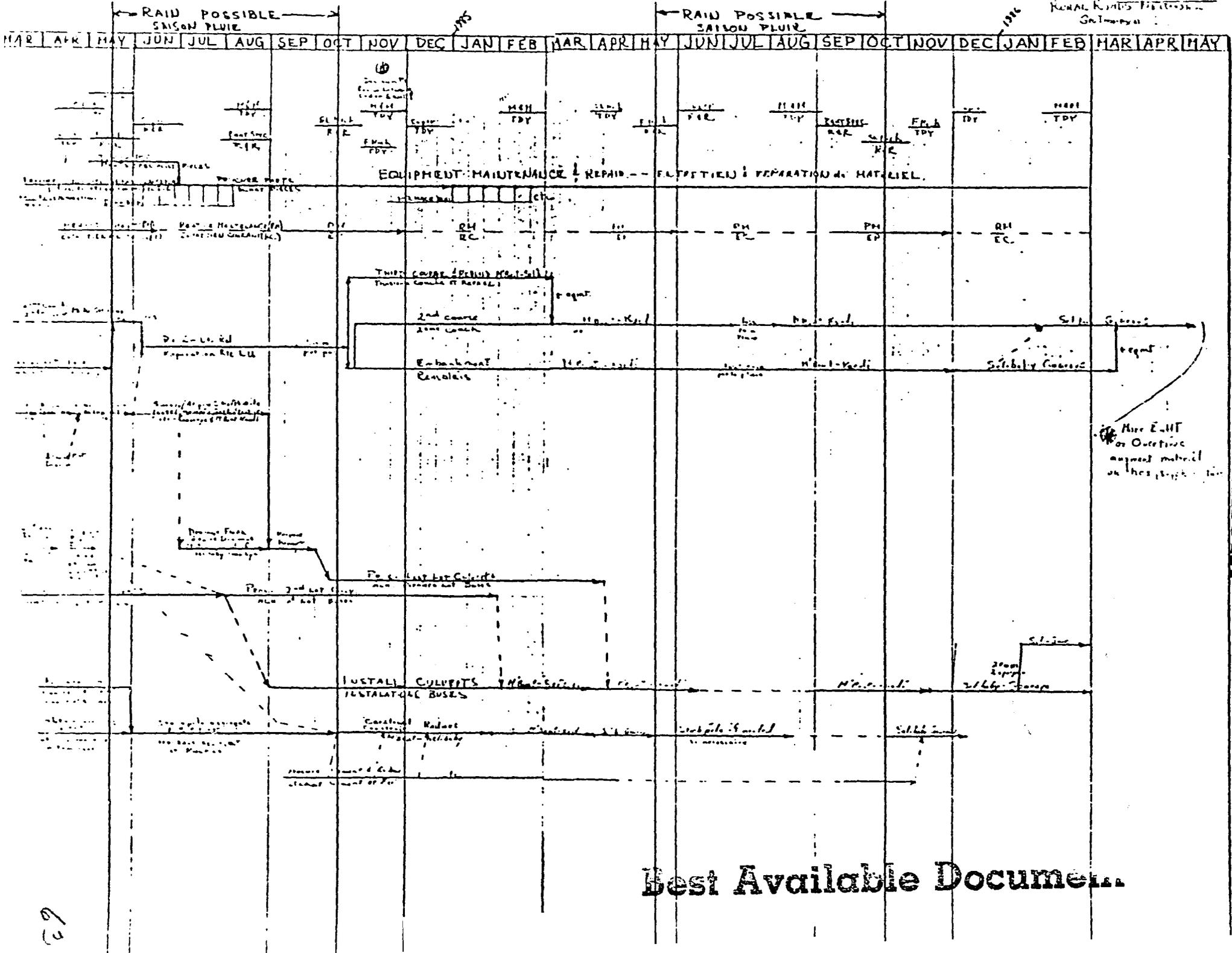
10. ENGINEER THOMPSON AND THE USAID EVALUATION WILL ARRIVE IN AID/W DURING THE FOURTH WEEK OF APRIL. REQUEST PROJECT COMMITTEE BE CONVENED UPON THOMPSON'S ARRIVAL TO CONSIDER PROPOSED CHANGES IN TECHNICAL PLAN AND FINANCING PROPOSAL. USAID RECOMMENDS THAT PP SUPPLEMENT AND AUTHORIZATION BE COMPLETED IN AID/W WITH THOMPSON'S PARTICIPATION. ALTERNATIVELY, WITH AD HOC DELEGATION FROM THE AA/AFR AND TTY ASSISTANCE FROM AFR/PD/SWAP (SIMMONS) THE MISSION COULD PREPARE PP SUPPLEMENT AND AMEND AUTHORIZATION IN THE FIELD. PLEASE ADVISE.

REC:

F:

#1718

NNNN



Best Available Document

MAINTENANCE RAILROADS - INTERCOMMISSION

Best Available Document

COST ANALYSIS

ADENDUM 2

I Technical Assistance:

A. M&M Contract Assume \$60,000/month  
Accrual

Lump sum \$30,000 added for  
additional TDY &  
basically cause it's there.

until

Mar 1 1986

± 15% imprecision gives up to 3.6 months more  
Note: independent of but similar to Exons ± 4 note

B. Geo Poulin Amend for 1 yr of  
Project \$8,000/month accrual  
will cover everything  
Assume no raise, but should  
cover small one.

II COMMODITIES:

Off shore  
A. Drainage requirements (culvert & Gabions) were  
based upon Drainage Study assume

PK 70 - Sélibaby requirements = ~~PK 70~~ Sélibaby

- Gouage = M. Rout-Kaedi

For Culverts:  $463,000 \times 3 = \$1,389,000$

For Gabion amount was  $3 \times 95,000 = 64$   
 $= \$285,000$  reduced to half before...

Gabion use not anticipated as yet. RIP RAP and/or mortared RIP RAP to substitute.

\$142000 budgeted for Gabions could be used for <sup>addit</sup> culverts if required. ~~the~~ Note: Kauri requirements estimated very low maybe too low. But many structures in place are useable w/ modifications. Time will tell.

B. Spare Parts: Total Parts estimated at ~~3000~~ Value of Eqpt x 20%/yr ÷ 12 m/yr = <sup>Value</sup> Parts/month = 3000000 x .2 x 1/12 = 50,000<sup>00</sup> of this 15,000 was programmed

for local costs procurement.

∴ \$35,000 per month was programmed for off-shore parts procurement.

Note: Though it could be assumed that parts need not be procured the last several months... The maintenance objective of this project and the possibility of future road building with this equipment require that spares be in stock at the E.O.P. ~~Amount~~

For misc. tools & supplies & equipment

\$1000/month each was allowed.

Lump sum requirement of \$19,000 was estimated for additional refurbishing during this time.

4/7

season. Already ~~approx~~ approx \$500 000  
has been spent of spare off shore

III For P.O.L. offshore. This line  
item will be melted into  
the commodity line item  
after remaining funds are used.  
Almost all P.O.L. products are  
now purchased locally ~~and~~  
under the next line item.

#### IV Local Costs

A Personnel: \$43,000 per month  
used which is about 20% higher  
than existing payroll to allow  
for additional operators and  
concrete and culvert workers  
plus short-term personnel  
required from time to time.

- B. Local Travel: \$1,000 per month used
- C. Vehicle Maintenance & Repair: \$4,000 per month used  
part of \$15,000 local spare budget

D. POI's - Computed from past experience based upon estimated fuel consumption of 70-80,000 l/month + factors for oils, lubricants etc + transport included here as transporters sometimes can get fuel when no one else can = \$45,000/month

E.  $75,000 \times \frac{22 \text{ UN/l}}{50} + \frac{4 \text{ UN/l}}{50} \text{ trans} = \$39,000$   
 Oil & lubs  $15\% = \$5,850$   
 Use \$45,000

F. Machine & Equip: Includes Repair of CAT Equipment, CAT spare

other spares & other equip  
(6000/month) 0/month

Total monthly cost: \$8000/mo

≠ another part of \$15000/mo

Lump Sum Amounts Total Spares  
of Other Items: \$411,000

Plus 163,000 already spent.

F. Bldg & Structure: \$1000/mo used  
based on past exp

G. Mat'l & Supply Off/Admin \$1000 used  
DITTO

4. Mat'l & Supply <sup>(Tech)</sup>: Generally 1000/mo  
DITTO

Plus Cement & Rebar computed  
based on Rodier Design by  
Thompson and extrapolation  
as w/ culverts L.S. \$529,000

I. Freight \$300/month based on experience

J. Construction - LS contract \$147000

K. Well Construction: Bid for a given <sup>depth</sup> well w/ pump etc. \$80,000

L. Contingencies 5% of new costs

M. DAKAR based on exper \$400/month

V Socio Econ Old est accepted

VI Contingencies other than local 5% ~~of~~ of new costs

VII Imprecision +/- 5% as estimated based upon limited data.

# NETWORK PLANNING COMPUTATIONS

## 1. EMBANKMENT CONSTRUCTION

Average 5 km/month/scrapper/1/2 dozer

Begin Km 20 w/ 2 scrapers & one dozer  
Feb 25

$$\frac{26 \text{ km}}{2 \times 5 \text{ km/month}} = 2.6 \text{ months}$$

~~May~~ May 15 arrive Selibaby

## 2. Second Course → Selibaby -

Begin km 12 April 5 w 1 Dozer

Assume 3 Dumps Average

3 Dumps

10 km/month w 1 Dozer OT + between piles

1 Scrapper

1 scrapper & 1/2 Dozer

still 5 km/month lower level

→ 15 km/month

by 15 May = 1.3 months

$$15 \times 1.3 = \underline{19.5 \text{ km}}$$

Remaining  $46 - 12 - 19.5 = 14.5 \text{ km}$

Adding 2 more scrapers & Doyer  
 $10 \text{ km/month} + 15 \text{ km/month} = 25 \text{ km/month}$

$$= \frac{14.5 \text{ km}}{25 \text{ km/month}} = \underline{.58 \text{ mon}}$$

3. Anticipated for Courage Embank

longer haul 15% less production

$$.5 \text{ km/scrape} \times .85 = 4.25 \text{ km/scrap}$$

$$\times 3 \text{ scrap} = 12.75 \text{ km/month}$$

$$\frac{45 \text{ km}}{12.75} = 3.53 \text{ mon}$$

Assume 20 rainy days 3 day lost  
 per rain day = 60 lost days

$$\text{go to } 5.5 \text{ months} = \frac{12}{5.5} = 2.18$$

4. Option (\*) VN upgrade  
from 70 → Garfa  
then M' Bout to Garfa

70 km small x section  
3 Dozers 2 D7 + D6  
3 scrapers 5 km/mon/scrap = 15 km/mon  
2 Dumps 5 km/mon ave

2 for stockpiling Aggregate

2 being revised

= 20 km per month (also some  
km no work  
needed  
but longer haul  
an area to work)

Assume 15 Rain days (farther north)  
only  
12 days lost per rain day  
(less time due to more granular  
quality of mat)

$$\frac{0 \text{ km}}{0 \text{ km/month}} = \frac{3.5 \text{ month} + 1. \text{ month}}{1 \text{ month}}$$

$$= 4.5 \text{ months} \quad \text{Oct 15 } 20 \pm$$

5. M-Bout - Kaedi

EMBANKMENT

Given short hauls anticipated even with deep fills assume

15 km/month w 3 scrapers

$$\frac{118 \text{ km}}{15 \text{ km/month}} = 7.9 \text{ months}$$

Say 2 scrape =  $7.5 \times 1.5 = 11.25$

6. → Gouraye Embankment <sup>lost to rain 45 days</sup>  
w/ 2 scrapers

$$3.5 \times 1.5 = 5.25 + (2 \text{ rain}) = 7.25$$

w 3 scrap after rain 3.5 month

Km 70 → ~~Delibaby~~ repair

7. ~~Second~~ Course 3 dumps 1 scraper  
2 dozer

say 20 km per month

Check w/ Jerry

longest hauls?  
thinnest course?  
no experience.

$$\frac{46 \text{ km}}{20} = 2.3 \text{ months}$$

+ 2 months reconstruct

$$= \underline{\underline{4.5 \text{ months}}}$$

8. - H. Bout: Kaedi Second Course

$$\text{say } 7 \text{ km/month} \times 4.5 \text{ months} = 31.5 \text{ km}$$

$$118 - 31.5 = 86.5$$

w/ 5 Dumps & scraper on 3 dozers

$$\text{say } 22 \text{ km/month} = \text{for } 86.5 \text{ km}$$

$$= 3.93 \text{ mon } \quad 1 \text{ month lost to rain}$$

9. M Bout Kaedi Third Course lose scrap after 3.5 mon

$$\text{say } 22 \text{ km/month} \times 3.5 \text{ mon} = 77 \text{ km}$$

$$1 \text{ month } 17 \text{ km more then add dump } \frac{118 - 77 - 17}{20} = 1.2 \text{ mo Total } 5.7 \text{ mo } \quad 75$$

10 Ali-Houaye 2nd Course & 3rd  
6 Dumps

20 km / mon for 1.6 mon = 32 km

$45.2 - 32 = 35 \text{ km/mon}$  for  $\frac{58 \text{ km}}{1.7 \text{ month}}$   
 $= 1.8 \text{ months}$

total 3.1 too long need dumps

11 Rastiers used approx  $4.4 \text{ m}^3/\text{hr}$   
need skip loader  
Dump  $\times 8 \text{ hr/day}$

$\times 2.6 \text{ day/mon} = 9.15 \text{ m}^3/\text{mon}$   
M'Bout Aclibaly =  $\frac{3000 \text{ m}^3}{9.15} = 3.27 \text{ mon}$

Kaedi M'Bout =  $\frac{2000 \text{ m}^3}{9.15} = 2.19 \text{ mon}$   
= M'Bout Bouraye +

Add one month! at c.c. 76

12 For Culverts assume 1 <sup>(single or multi)</sup> per day per team <sup>7/7</sup>

M. Bout to Helibaby 135 days ÷ 5.2 mon  
+ 1.5 mon for VN

assume 5 mon est. Helibaby - Bou.  
of M. Bout - Bou.

Probably the 3 scraper option on Embankment would be preferable to complete embankment before structures but in any case more detailed analysis and better production figures are required to determine if additional equipment is required or if overtime or rentals might be the answer.

← RAIN POSSIBLE SAISON PLUIE →

MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | AP

ETA USAID  
RIGR

COP ETA  
orientation

SMOck  
TDY

F Hch  
R&R

TDY or PSC  
PARTS SPECIALIST PIECES

PREPARE COMPREHENSIVE MAINTENANCE PLAN

PLAN ENTRETIEN COMPREHENSIF  
BACK ENGINE ROOMS & TANKS DUMP DUMP

PROCURE PARTS

EQUIP SPEC  
R&R

ROUTINE MAINTENANCE (RM)  
ENTRETIEN COURANT (EC)

PERIODIC MAINT (PM)  
ENTRETIEN PERIODIQUE (EP)

SL Mech  
R&R

Decision Pt  
Revise Material  
Order EQMT?

M&M  
TDY

F Hch  
TDY

Super  
TDY

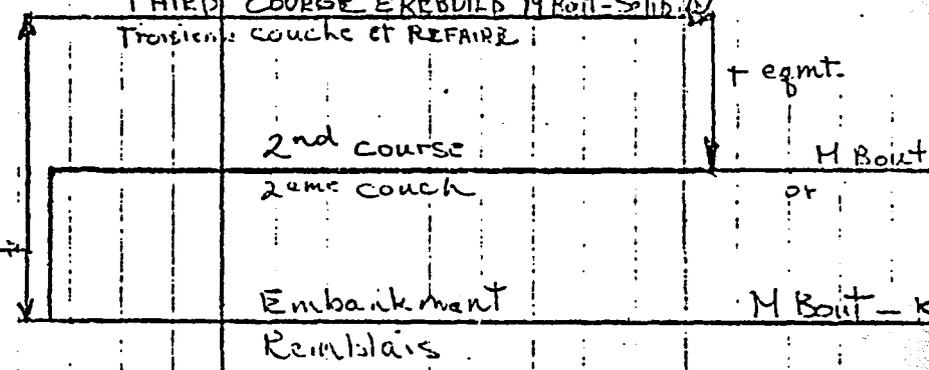
EQUIPMENT MAINTENANCE & REPAIR

1-2 MACH DUMP etc

RM  
EC

THIRD COURSE REBUILD M'Roit-Selibaby  
Troisième couche et REFAIRE

2eme couche  
2nd Course PK 70-Selibaby  
+ 2 scrapers



Repair UN Rd  
Reparation Rte UN

loss rain  
perte pluie

Embankment PK 70  
Remblais Selibaby

As built UN RATION  
As built UN RATION

Survey/Align/CHG/Profile  
Séle-Gouraye & M'Roit Karedi

Remind Plot  
Dessin

1986

← RAIN POSSIBLE  
 SAISON PLUIE →

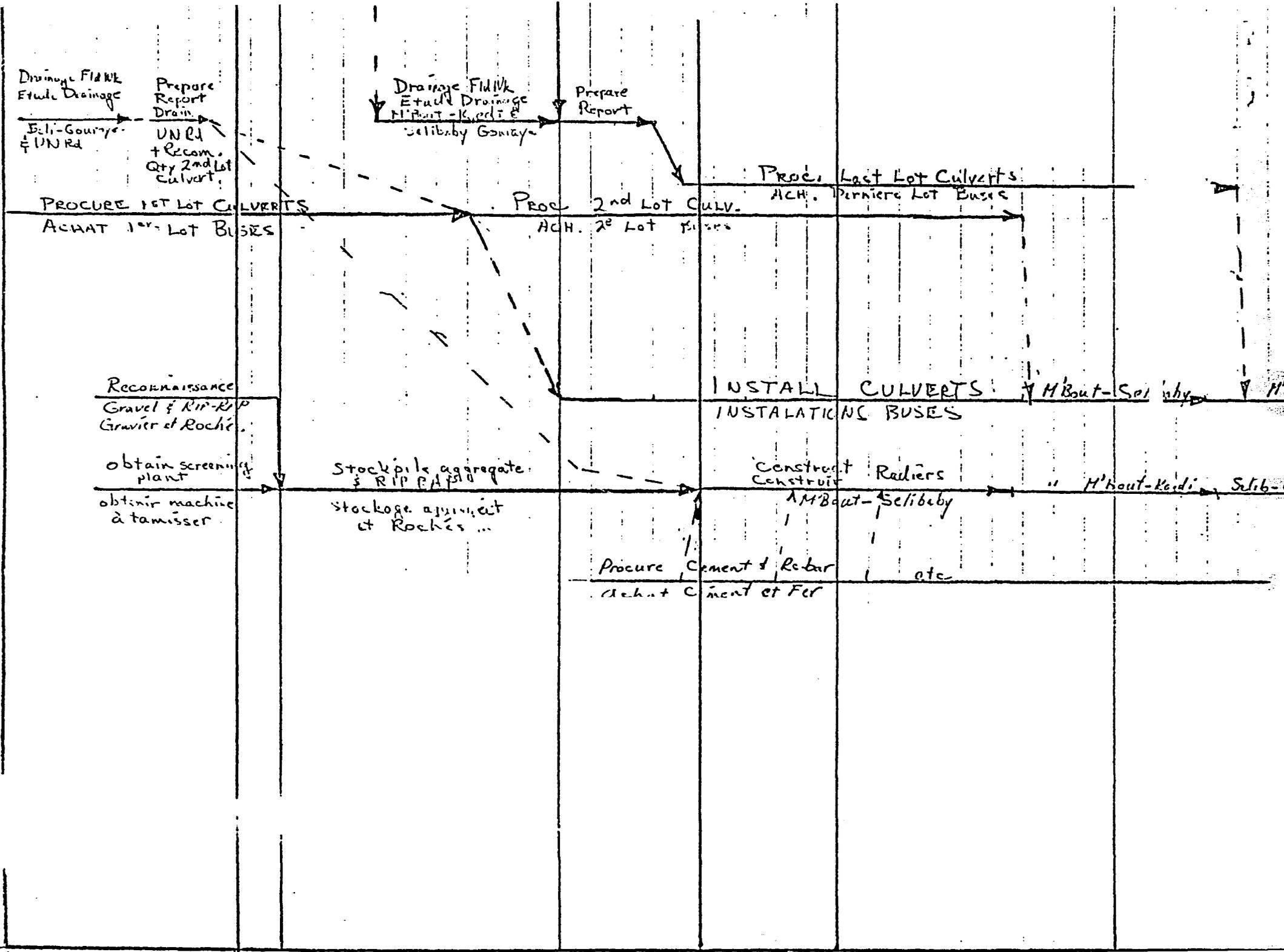
MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY

	Super R/R	M&M TDY	Joint Spec R/R	Sh Patch R/R	F Patch TDY	Super TDY	M&M TDY					
High R/R												
ENTRETIEN & REPARATION de MATERIEL												

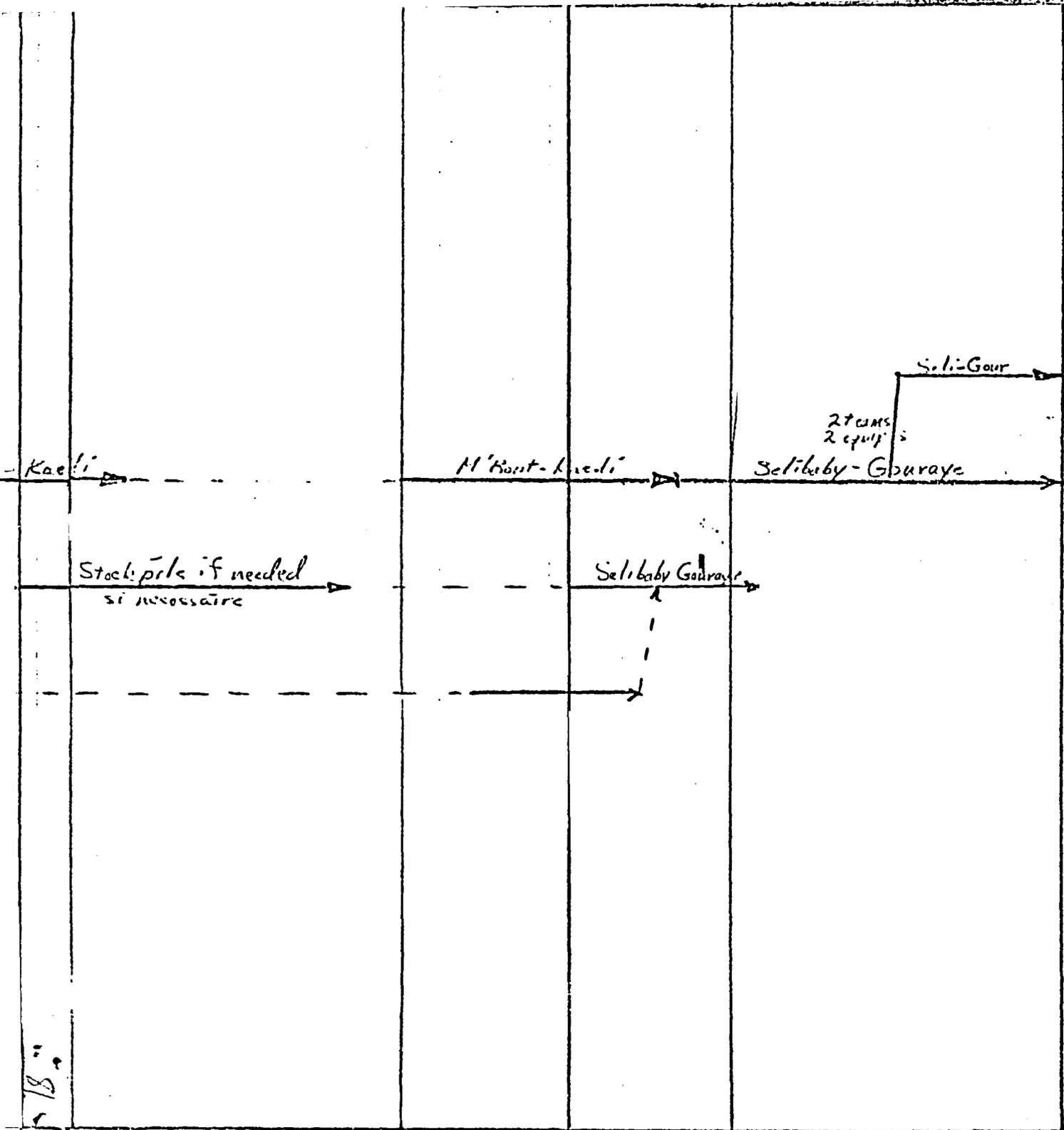



More EQMT  
 or Overtime  
 augment materiel  
 ou hrs supplémentaires

bb



MAURITANIA RURAL ROADS -- NETWORK PLAN



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