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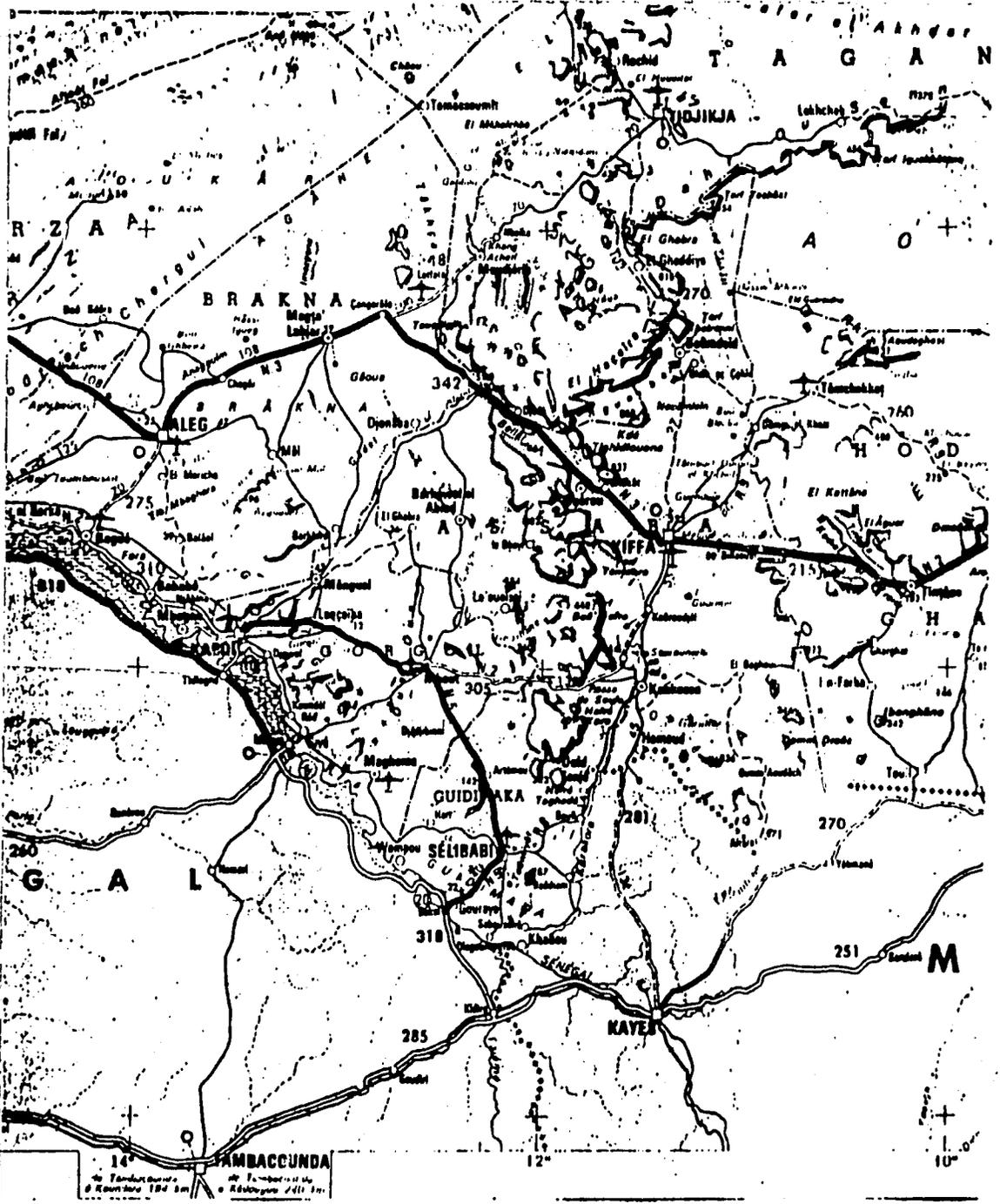
M A U R I T A N I A R U R A L R O A D S

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CONTRACT NO. AFR-0214-C-00-3045-00

CONSULTANT: Morrison-Maierle, Inc.

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# PLAN DU PROJET

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1. PROJECT DESCRIPTION

The specific objective of this Project is to provide road construction and for rehabilitation of some 205 Km of track between Kaedi - M'Bout - Selibabi - Gouraye to all weather standards to make the Guidimaka/Gorgol area more accessible to commercial and social service.

2. PROJECT DATA

2.1 Road Location and Length:

Kaedi - M'Bout	(110 Km)
M'Bout - Km 70	(completed by UNDP)
Km 70 - Selibabi	(49 Km)
Selibabi - Gouraye	(46 Km)

2.2 Road Design Criteria:

2 lane 80 km/hr all weather earth road  
5.5 meters in width (7.0 meters)  
60 cm road section (45 cm base x 15 cm surface)

2.3 Construction Period and Cost

24 month period beginning May 1983  
and ending May 1985.  
US\$ 6,000,000.

\*Base course 7.90 meters wide - changed inslope to give 7.0 meter finish grade - Two scrapers (3.5 meters each) passing need 7.0 meters

3. PROJECT PROBLEMS

Major problems in February were primarily equipment related and consequently had some adverse effects on monthly production. Listed below are the 3 major problems which caused some reduction in February's work output.

3.1 Production was halted for 3 days (Feb. 12-14) due to a low fuel supply and unavailability in Nouakchott. The problem was solved with subsequent fuel deliveries.

3.2 Bulldozer No. 6000-1 was removed from production when it developed a severe hydraulic leak in the control panel. Spares were ordered to be air shipped, but further inspection of the unit indicated severe problems in the dozer's undercarrage. Once spares arrive, the dozer will be put on a very limited production schedule until

the undercarriage parts are received. At the present time, the project is at a loss for a dozer to perform stockpiling operations for granular surfacing material. As of February 23, the Dump Trucks had to be taken from production since all existing stockpiles are depleted. USAID is presently trying to rent a dozer for the project's use until the first D7F dozer is repaired and delivered to the project by Mauriequip. Until a second dozer is on site, very little work will be accomplished by the trucks since the trucking operation required a dozer on a full time basis to build the necessary stockpiles for surfacing material.

- 3.3 Champion grader No. 2 was dispatched to Selibabi on February 25 to work with the survey crew performing a trace of the roadway. Along with the grader, one IH-530 loader was also sent to Selibabi to clear the new alignment. Loss of both of these units from the production crew will have a compound effect (along with the loss of the TD-20E) on surfacing operations.

A partial solution to the problem seems to be on the way, that is the delivery of the Caterpillar 120 C motor grader. The delivery of the grader is dependent on the ability to rent a low boy trailer since the project's trailer is broken down in Nouakchott with "U" bolts problems.

#### 4. OVERALL PROGRESS

A number of positive events which contributed to the project occurred in February. They were as follows:

- 4.1 The arrival of the 2 Caterpillar 621B scrapers has had a dramatic effect on increasing production rates. The scrapers have been very reliable to date with only 3 recorded break downs (hydraulic hoses).
- 4.2 Two new Jeep Cherokees were delivered to the project site on February 13 which greatly increased the team members' mobility.
- 4.3 On February 13, a new Radio System was installed, making regular communications possible with USAID Nouakchott. The existing UNDP Radio was moved to the Camp at Km 77 which then provided inter-camp communication and another link with Nouakchott. The improved communication system will greatly reduce unnecessary travel between camps and will have a positive effect on overall project communication.

Presently (as of February 20) the M'Bout Camp is without a Radio due to a power surge from the Camp generator. The Radio is expected to be repaired in Dakar by the first week in March and reinstated with a voltage protection device to eliminate future problems.

4.4 During the week of February 13 - 20, Mr. George Poulin assisted the team in preparing a 12 month supply order for off-shore purchases in the following categories.

- a) Filters
- b) Tires
- c) Oil
- d) Batteries

Existing stocks were inventoried and items in which critical shortages presently exist were identified.

4.5 On February 18, the alignment survey for the road section from Selibabi to Gouraye commenced. The arrival of the new Jeeps allowed the Toyota Land Cruiser to be dispatched as a survey vehicle. Prior to the arrival of the Jeeps, Mack Dump No. 6 was used as a survey Truck. Mack Dump No. 6 is now available for roadwork.

4.6 A bulk storage tank for gasoline was installed at the M'Bout camp, thereby eliminating the requirement for gasoline to be transported by barrels and eliminating waste due to barrel leakage.

4.7 The Rexnor roller which had been inoperative from the project's inception was repaired and put into operation.

4.8 On February 3rd an Open House was conducted at the M'Bout Camp with approximately 600 local residents attending.

#### 5. ROAD CONSTRUCTION PROGRESS

Road construction (Earth work) as of February 25, 1984 has been completed to station 16 + 902 Km for a total of 7436 meters this month.

The Scraper crew moved approximately 35,976 M<sup>3</sup> (12M<sup>3</sup>/Load of Earth and second course (Granular material) while the trucks hauled 8360 M<sup>3</sup> (8M<sup>3</sup>/Load) of granular material.

The calculated average cross section depth for the typical section (7.90 meter base width 7.00 meter top width) is approximately 0.65 meters. The increased average thickness is due primarily to the depth of fill required near the village of Tassota to prevent high water from overtopping the grade.

6. SCRAPER PRODUCTION

The production statistics gathered during the month of February should provide a basis for determination of realistic production (earthwork) goals.

Data for this report was gathered between the period of January 29, 1984 thru February 25, 1984. During this period the scrapers operated for approximately 20.5 working days out of a possible 23.5 working days (3 days were lost due to a fuel shortage). Down time due to equipment failure and maintenance averaged 5.7% of the total time available for work. A summary of loads hauled, hours worked and equipment availability is shown on Table I below.

TABLE I  
SCRAPER UTILIZATION  
January 29 - February 25

<u>EQUIPMENT NUMBER</u>	<u>LOADS HAULED</u>	<u>HOURS WORKED</u>	<u>AVAILABILITY %</u>	<u>DOWN TIME %</u>
0214-S1	1553	151	97.7	2.3% minor repairs and maintenance. 12.9% - lack of fuel
0214-S2	1445	139	91.0	9.0% minor repairs and maintenance. 12.9% lack of fuel.
0214-S3	Not available at this time. Engine under repair in Nouakchott.			

During the same period the scrapers constructed roadway embankment from Km 9.466 to Km 16.902 for a total of 7436 meters of completed roadway base. In addition to construction of roadway base, the scrapers applied the second course of granular material over at least 60% of the 7436 meters constructed.

Though fill depths vary widely depending on terrain and the high water level, the following calculations should represent a reasonable average as to what might be expected in production rates for the remaining 26 Km of the alignment to Selibabi.

AVVERAGE NUMBER LOADS REQUIRED TO CONSTRUCT 1 KM OF BASE.

$$\frac{2,998 \text{ Loads}}{7.437 \text{ Km}} = 403 \text{ Loads/Km}$$

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AVERAGE NUMBER OF LOADS PER SCRAPER DAY

$$\frac{2998 \text{ Loads}}{41 \text{ scraper days}} = 73 \text{ Loads/Scraper day}$$

(2 @ 20.5 days each)

NUMBER OF SCRAPER DAYS REQUIRED TO CONSTRUCT 1.0 KM OF ROADWAY BASE

$$\frac{403 \text{ Loads/Km}}{73 \text{ Loads/Scraper-Day}} = \frac{5.5 \text{ Scraper days}}{\text{KM}}$$

To construct the remaining 26.0 Km of roadway should require the following amount of scraper days at the present rate of efficiency (94%).

$$\frac{26.0 \text{ Km} \times 5.5 \text{ scraper days/Km}}{.94} = 152 \text{ scraper days}$$

Assuming the two scrapers continue operating at the same rate of efficiency, it should take approximately 76 working days to reach Selibabi.

NOTE:

The preceding calculations have not taken into account the positive effect of the addition of the third scraper to the fleet nor has any allowance been made for breakdowns requiring off-shore parts purchases.

7. TRUCK PRODUCTION

Total truck production for the month of February was 1045 loads. The load count for the month was appreciatively lower than the January load count of 2207 loads for the following reasons.

- 7.1 Haul distances were increased because trucks were diverted to surfacing operations using select granular material.
- 7.2 Insufficient material stockpiles due to the loss of one TD-20E dozer with hydraulic and undercarrage problems.
- 7.3 Low fuel level which stopped production for approximately 3 days.

Truck Activity distribution, status and production quantities are shown in Table II.

TABLE II

DUMP TRUCK UTILIZATION

<u>TRUCK NUMBER</u>	<u>PRODUCTION TIME &amp; (LOADS) % - Loads</u>	<u>TRANSPORT PERSONNEL, MAT'L %</u>	<u>TIME NO FUEL %</u>	<u>TIME NO STOCKPILE %</u>	<u>TOTAL AVAILABILITY %</u>	<u>DOWN TIME REPAIR &amp; MAINT. %</u>
6004-1	Down at Km 77 Tandem axel seals				0	100
6004-3	Down at M'Bout Engine overhaul reqeud partially cannibalized in order to maintain remaining units in operation condition.				0	100
6004-4	58% 476 Loads	11%	7%	7%	83%	17%
6004-5	54% 464 Loads	9%	7%	7%	77%	23%
6004-6	38% 105 Loads	26% (topographers)	7%	7%	78%	22%
6004-7	0%	79% (transport supplies from Nouakchott)	-	-	79%	21%

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## 8. SCHEDULED PROGRESS FOR NEXT MONTH

### 8.1 Drainage Study

Mr. Brad Peterson (M-M Hydrologist) is scheduled to arrive in Mauritania on March 6th to begin the drainage study for the Selibabi - Gouraye road section.

### 8.2 Alignment Survey

The alignment survey from Selibabi to Gouraye should be completed by the end of March.

### 8.3 Warehouse

Warehouse activities will continue in the following areas.

- a) Updating and expansion at the cardex system to include all off shore pending procurements and existing stock.
- b) Physical inventory of existing stock.
- c) Shelving and storing improvements in containers.

### 8.4 Training

At present, there are three main areas in which training is progressing at a satisfactory rate; 1) Preventive Maintenance 2) Warehouse 3) Welding.

Mechanic training which is dependent on material supplies (spare parts) and facilities is progressing at a slower rate than desired. Mechanics are being presently trained on an unscheduled basis coping with daily breakdowns and "patching" the equipment with what existing supplies and facilities exist. From a practical stand point, this type of training has merit. The mechanics are learning alternate techniques for repairs in cases where some or all of the required spare parts are lacking.

The mechanic training program will progress to a more formal schedule as the facilities and spare parts become available.

### 8.5 Road Construction

Considering the current equipment problem (the loss of the TD-20E Bulldozer) and the uncertainty of a replacement machine the only road work which can be realistically planned is base course construction. Provided break downs are kept to a minimum, a production goal of 10 Km of roadway base should be possible.

Second and third course production will be minimal unless a second dozer is acquired to perform the material stockpiling operation.

RURAL ROADS IMPROVEMENT PROJECT 682-0214  
 FINANCIAL STATEMENT AS OF 29 FEBRUARY 1984

	<u>PRO-AG</u>	<u>OBLIGATION</u>	<u>EXPENDITURES</u>	<u>UNLIQUIDATED</u>	<u>PIPELINE</u>
I. Technical Assistance	1,461,000.00	1,431,680.00	433,712.00	997,968.00	29,320.00
II. Commodities	1,076,000.00	1,024,966.00	382,131.65	642,835.04	1,051,033.31
III. POL	85,000.00	48,100.00	39,016.29	9,083.71	36,900.00
IV. Local Personnel/Travel	923,000.00	566,534.66	306,799.00	259,735.66	356,465.34
V. Evaluation	60,000.00	.00	.00	.00	60,000.00
VI. Contingencies	205,000.00	7,023.77	4,956.22	2,067.55	197,976.23
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T O T A L	4,810,000.00	3,078,305.12	1,166,615.16	1,911,689.96	1,731,694.88
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9. BRIGADE PERSONNEL STAFFING

1 Superintendent  
1 Labor Foreman  
7 Surveyors  
1 Office Accountant  
8 Mechanics  
3 Mechanic Helpers  
1 Warehouse man  
7 Greasers and Tiremen  
2 Checkers  
2 Welders  
2 Plumber  
13 Drivers  
10 Guards  
1 Rebarman  
4 Electricians (2 Auto and 2 Building)  
1 Mason  
16 Laborers  
3 Carpenters  
11 Operators and Helpers  
2 Cooks  
3 Housekeepers

10. CONSULTANT'S PERSONNEL STAFFING

David A. Paulson (Acting)  
Chief of Party

Gerard Garneau  
Superintendent

John Nicholson  
Field Mechanic (77 Km Camp)

Marian Iwankowski  
Shop Mechanic (M'Bout Camp)

11. SUMMARY OF PAYMENT CERTIFICATES

Force Account Payroll

A total of 98 personnel were employed during the month of February 1984.

Total Net Payrol - 1,298,997 UM

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MAJOR PLANT AND EQUIPMENT

EQUIPMENT NUMBER	DESCRIPTION	S T A T U S	AVAILABILITY %
6000-1	TD-20E Bulldozer	Down - hydraulic leaks Requires undercarrage replacement	46%
6000-2	TD-20E Bulldozer	Operational	100%
6001-1	Champion 710 Grader	Operational	95%
6001-2	Champion 710 Grader	Operational (survey crew)	95%
6002-1	IH-530 Loader	Operational	100%
6002-2	IH-530 Loader	Operational (survey crew)	77%
6003	IH-260 A Backhoe	Down at Nouakchott for engine rebuild	0
6004-1	Mack Dump	Down - Tandem seals	0
6004-3	Mack Dump	Down - required engine overhaul partially cannibalized	0
6004-4	Mack Dump	Operational	83%
6004-5	Mack Dump	Operational	77%
6004-6	Mack Dump	Operational	78%
6004-7	Mack Dump	Operational	79%
6005-1	Mack Water Truck	Operational	100%
6005-2	Mack Water Truck	Operational	5%
6005-3	Mack Water Truck	Operational	100%
6007	Mack Boom Truck	Down - Transmission (air shift)	0
6008	Mack Lube Truck	Operational	100%
6009	Mobile Workshop	Operational-Gen. set in poor condition	100%
6012	Rexnor Roller	Operational -(Repaired in Feb.)	35%
6013	Dynapac Roller	Down - transmission charge pump	0
6006	Mack Fuel Truck	Operational	100%
6028	Mack Tractor/ Lowboy Trailer	Tractor Operation/Lowboy down Broken "U" Bolts	100/70%

## Major Plant and Equipment (Cont'd)

EQUIPMENT NUMBER	DESCRIPTION	S T A T U S	AVAILABILITY %
6024-2	Toyota Land Cruiser	Operational (survey crew)	95%
6024-4	Toyota Pick-up	Operational (grade foreman)	90%
6025	Peugeot 404	Down - front suspension	20%
6017	Generator - Hewitt 20 KVA	Down - required engine overhaul	0
0214-G1	26KW Onan Generator set	Operational Camp 77	100%
0214-G2	15KW Lister gen. set (single phase)	Operational - used as workshop generator at Camp 77 (days only)	100%
0214-G3	60KW Onan	Down - Nouakchott	0
0214-G4	18KW Sodiack	M'Bout Camp Generator	99%
0214-SG1-6	(6) Honda 3.5KW standby gen. sets	Operational - emergency power source	100%
0214-S1	CAT 621B Scraper	Operational	97.7%
0214-S2	CAT 621B Scraper	Operational	91.0%
0214-S3	CAT 621B Scraper	Down - awaiting engine and other repairs (Maurequip)	0
0214-MU	Mercedes Unimog	Operational	100%
0214-10	Jeep Wagoneer	Operational (M'Bout)	100%
0214-11	Jeep Cherokee	Operational (Km-77)	100%
0214-12	Jeep Cherokee	Operational (Nouakchott-USAID)	100%
0214-14	Miller Welder	Operational	100%
6015-1	Water Pump	Operational - no hoses	0
6015-2	Water Pump	Down - engine	0
0621-1	Dynapac Plate Comp	Down - engine	0
6021-2	Dynapac Plate Comp	Down - engine	0

The following salvage units will be deleted from the monthly equipment list since the cost of repair would exceed new value.

1. Hewitt 50KW Generator  
Equipment No. 6016
2. Concrete Mixer  
Equipment No. 6019  
S.N. E 180445
3. Mack Dump Truck  
Equipment No. 6004-2  
S.N. R685ST 83217
4. Toyota Pick-up  
Equipment No. 6024-3  
S.N. BJ 45000988
5. Toyota Pick-up  
Equipment No. 6024-5  
S.N. BJ 45000961
6. Toyota Land Cruiser  
Equipment No. 6024-1  
S.N. BJ60-002810

LUBRICANT INVENTORY

February 25, 1984

T Y P E	CAMP LOCATION		TOTAL ON HAND	TOTAL RECEIVED THIS MONTH	TOTAL USED THIS MONTH
	ON HAND M'BOU	ON HAND KM 77			
40 W ENGINE OILS (BBL)	35.75	3	38.75	-	3
10 W HYDRAULIC (BBL)	1	3	4	5	1
DEXTRON II (BBL)	3	5.5	8.5	-	0.5
DEXTRON II (5 GAL PAIL)	24	-	24	-	0
DEXTRON II (CASE - 23 QT CANS)	10	-	10	-	0
W 40 MULTI - GR (CASE 24 QT CANS)	0	5	5	-	0
M.P.E.P. GEAR LUBE (5 GAL PAIL)	36	0	36	-	0
MULTI - DUTI - 2 (35 - PAIL)	34	2	36	-	0
ANTI - FREEZE (BBL)	1	0.5	1.5	-	1.5
140 W GEAR OIL (BBL)	2	1	3	-	3
90 W GEAR OIL (BBL)	1	-	1	-	0
GREASE	7	0.5	7.5	-	0.5
10 W 40 MULTI - GR (CASE 24 QT CANS)	10	2	12	-	8

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FEBRUARY 15, 1984

FUEL OIL INVENTORY

DIESEL - FUEL ON HAND

	<u>CAMP</u>	<u>GENERATOR TANK</u>	<u>STORAGE TANKS</u>	<u>FUEL TRUCK</u>	<u>T O T A L</u>
1.	M'Bout	1,415	7,625	-	9,040
2.	KM 77	4,000	3,460	7,400	14,860
					<u>23,900</u>

D E L I V E R I E S

<u>D A T E</u>	<u>AMOUNT</u>
February 14, 1984	12,000 L
February 15, 1984	30,000 L
February 21, 1984	12,000 L
February 23, 1984	8,000 L
	<u>62,000 L</u>

U S A G E

On hand January 29, 1984	24,380 L
Plus February Deliveries	62,000 L
Minus on Hand	23,900 L
	<u>62,480 L</u>

FUEL USED THIS MONTH

62,480 L

GASOLINE USAGE

On Hand January 29, 1984	400 L
February Deliveries	5,000 L
On Hand February 25, 1984	4,250 L
	<u>1,150 L</u>

TOTAL USED

1,150 L