MINISTRY OF ENERGY AND WATER RESOURCES AND DEVELOPMENT

PRIMARY WATER SUPPLY UNIT

MONTHLY REPORT NO. 14 - JUNE 1984

1. SUMMARY

1.1 Work continued in the Romsley (Mutanda 1) and Nyamazura resettlement schemes.

1.2 Imelda Richardson, PWSU Field Hydrogeologist, returned to the UK for medical treatment on June 9th.

1.3 Work was started on planning the PWSU drilling programme in the Devuli resettlement scheme.

1.4 Arrangements were made for the Hydrological Branch of MEWRD to undertake the exploratory drilling programme in the Rusitu proposed resettlement scheme, with staff and material support from the PWSU.

1.5 Arising out of discussions with MLRRD, a draft proposal was prepared by the PWSU on behalf of MEWRD recommending that consideration be given to establishing a seond mobile pump maintenance and repair unit to supplement the team already working in resettlement schemes.

1.6 A water resources survey was carried out in the Mpudzi II proposed resettlement scheme.

2. STAFF

2.1 One additional driver and 2 general hands/geophysical assistants were recruited during the month. The appointment in March of a former mining overseer as drill superintendent designate had not proved a success , and his employment was terminated on June 15th. The total permanent PWSU complement is now as follows:-

3	counterpart hydrogeologists
5	senior drill foremen
1	foreman mason
1	pumpfitter
1	welder
1	dug well foreman
6	drivers
1	storeman
1	camp guard
3	senior hands
17	general hands
40	

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2.2 Recommendations were made to MEWRD that one of the Senior Drill Foreman be promoted to overseer foreman, and a general hand, who was being trained as rig second man, be promoted to Drill Operator.

2.3 An average of 15 casual labourers, from Romsley and Nyamazura schemes, were employed throughout the month.

2.4 Imelda Richardson, CDA Field Hydrogeologist with the PWSU, returned to the UK for medical treatment on June 9th. It is not known how long it will be before she can return, but her absence will be a considerable handicap to the effectiveness of the drilling operation. Mr. Davies, who is on a short term attachment to the PWSU with the brief to carry out water resources surveys in proposed schemes and is not therefore strictly 'spare', has since June 26th been acting as a Field Hydrogeologist in Miss Richardson's place.

3. PLANT, EQUIPMENT AND MATERIALS

3.1 One of the 3 original Land Rover pickups suffered a stripped cog in the overdrive unit and has been in CMED since June 6th. Overdrive spares are not stocked in Zimbabwe, and a replacement will have to be machined locally.

3.2 Phillips Electrical demonstrated their portable VHF radio equipment, which performed effectively from a mobile set over a distance of 58 kilometres to a base station, and they have been asked to quote for the local supply of similar equipment according to the requirement of 5 mobile sets (one for each drilling rig) and one base station.

3.3 The original Rediffusion long-range HF sets have been dispatched from the UK after having been tested and repaired by the manufacturers. A replacement set of whip aerials is being supplied. It is proposed that one set will be installed with a dipole aerial in the base camp on site, a second will be located in the MEWRD offices in Harare, and the two others will be vehicle-mounted with the whip aerials.

3.4 The 5½" hammer plus 6" bits, which were ordered last month from Ingersoll-Rand Zimbabwe, have not arrived, and work at some sites has had to be delayed as a result.

3.5 The ten 6" alloy percussion bits for the Dando rigs were ordered in March, and it is hoped they will arrive next month. Rapid blunting of the existing bits continues to be a problem.

4. DRILLING PROGRESS DURING JUNE

4.1 Drilling continued in both the Romsley (Mutanda 1) and the Nyamazura resettlement schemes. The schemes are centred approximately 50 kilometres apart, and the plan had been to complete Romsley before starting work in Nyamazura, but in practice the situation could not be achieved where all five rigs became free within a few days; the outstanding boreholes to be drilled in Romsley were at difficult sites with a high chance of failure necessitating re-drilling, but not requiring all the machines simulatenously. Drilling has by contrast proved relatively straightforward in Nyamazura and progress has been good, so that it now appears likely that Nyamazura will actually be completed before Romsley.

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... summarised in the following table:

OPERATION	MTANDA	NYAGUNDI	ROMSLEY	NYAMAZURA	TOTAL END MAY	TOTAL END JUNE
CLEANOUTS						
(a) completed	22	3	2	0	27	27
(b) abandoned	2	1	1	0	3	4
(c) underway	0	0	0	0	1	0
(d) remaining	0	0	0	4	4	4
NEW HOLES						
(a) completed	9	0	10	0	16	19
(b) abandoned	2	0	13	2	14	17
(c) underway	0	0	4	6	7	10
(d) remaining	0	0	1	2		
TOTAL	35	4	31	14	68	77

The net progress achieved during June, in round terms, was as follows:-

1 cement abandoned (hole solidly blocked)
3 new boreholes completed
3 new holes started
3 new holes abandoned

The wellhead construction and pump installation team completed 5 installations; a number of pump repairs and wellhead improvements (non-PWSU holes) was also carried out.

4.3 The table above reveals the high proportion of holes which have been abandoned, most of them in Romsley. The overall success rate, assuming that all holes currently being drilled prove productive, is only slightly better than 63% and in view of the importance widely attached to this figure in siting and drilling operations in Zimbabwe some background to the PWSU statistic which is significantly below the average, is perhaps warranted.

i) Firstly, the hydrogeological conditions in the part of the Romsley scheme where the majority 'duds' were drilled are not favourable. Water levels are deep, often below the depth which can effectively be investigated with the electrical and electromagnetic geophysical techniques available. In some cases also levels are below the practical operating limit of a handpump. In areas where the weathered overburden is unsaturated, the only available aquifer is the fractured bedrock; often the degree of fracturing is limited and yields thus inadequate to support long term abstraction even at the rate required for a handpump. The location using geological and geophysical techniques of fracturing below a substantial cover of unsaturated overburden is difficult. The positive side of these setbacks is that a great deal of attention has been focused on the problem and some progress has been made towards a better understanding of the occurrence and distribution of groundwater in such marginal areas which will be of assistance in future work. The need for an experienced Field Hydrogeologist is clear, and the absence of Imelda Richardson will be a considerable handicap, particularly in view of the imminent move to Devuli which is likely to be more difficult than Romsley hydrogeologically.

ii) The second factor contributing to the high incidence of 'dud' boreholes lies on the role of the Hands-England air-hammer rig. Drilling a borehole to, say, 50 metres with one of the Dando percussion rigs could take 3 weeks or more; if the hole is dry this time has been wasted. The Hands-England could drill the some hole in 2 days. Consequently, at several sites which were known to be marginal prospects, and which would not have been drilled at all if only percussion rigs had been available, it was considered worthwhile to drill with the Hands-England. While a few such holes proved successful, others were not; the latter contribute to the tally of 'duds' but such duds should really be viewed in the context of there being an existing village requiring a water supply at what is known at the time of drilling to be a poor site.

4.4 Jeffrey Davies, ODA Hydrogeologist, spent one week in the Devuli resettlement scheme beginning the reconnaissance study which will be completed before the PWSU drilling unit moves to the scheme.

4.5 A water resources appraisal was carried out in the proposed Mpudzi II scheme, and a report will be submitted to Agritex. The water prospects in the scheme are good.

4.6 Peter Devillez, Project Engineer, spent 2 days in Victoria Province following up the recommendations he had made on an earlier visit regarding repair and re-installation of Bush Pumps on MEWRD boreholes in the Province. The response to the recommendations from the Provincial Water Engineers' staff has been very good and considerable progress has been achieved in rectifying defective installations. This work is to continue.

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4.7 Discussions were held with MLRRD to consider the problem of the large number of broken hand pumps in resettlement schemes, and MLRRD asked for a proposal from MEWRD as to how the situation may be remedied. A draft document was prepared recommending the establishment of a second specialist pump repair unit to supplement the MLRRD team already engaged on this work, and MLRRD are investigating the possibility of obtaining funding for the unit from CDA. It was felt that the unit should be established within MEWRD as an attachment to the PWSU, although its operation will be financed from the resettlement programme budget.

4.8 David Whitaker, PWSU Team Leader, visited Concession at the request of the Mazoe Rural District Council to advise on the siting of a septic tank which was thought, rightly, to be close to a borehole used for drinking water supplies.

4.9 Peter Devillez attended a meeting of the Pumping Technical Committee of the Institution of Agricultural Engineers in Harare.

4.10 After investigating several other options, including employment of a private drilling contractor, arrangements were made for the Hydrological Branch of MEWRD to carry out the exploratory drilling programme in the Rusitu resettlement scheme.

The Hydrolocial Branch have a lightweight air hammer rig which is suitable for the job, although the machine has no hammer bits and a 4½" hammer and bits from the PWSU Hands.- England rig will have to be used.

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