

***A review of Unicef's borehole drilling
programme from 1995 - 2000***

**Contract # SSA/ZAMA/2000/1522- 0
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Table of Contents

EXECUTIVE SUMMARY	3
1. PURPOSE	5
2 ACTIVITIES	6
3 OUTPUTS	6
4 FINDINGS AND RECOMMENDATIONS	6
4.1 ADMINISTRATIVE ISSUES:	6
4.2 REVIEW OF RECORDS AND DOCUMENTATION:	6
4.3 CONTRACT DOCUMENTS:	7
4.4 RECOMMENDATIONS: - ADMINISTRATION AND CONTRACT DOCUMENTATION:	7
4.5 FORM OF CONTRACT:	7
4.6 NO WATER, NO PAY CLAUSE:	8
4.7 RECOMMENDATION: FORM OF CONTRACT	9
4.8 PAYMENT TERMS AND CONDITIONS:	9
4.9 RECOMMENDATION: PAYMENT TERMS	9
4.10 ADVANCE FACILITY:	9
4.11 RECOMMENDATION: ADVANCE	10
4.12 MOBILISATION COST FOR DRY BOREHOLES:	11
4.13 THREE SITES AT EACH LOCATION - ONE PAYMENT:	11
4.14 RECOMMENDATION: MOBILISATION COSTS	11
4.15 VAT AND DUTY ISSUES:	11
4.16 RECOMMENDATION: VAT AND DUTY ISSUES:	12
4.17 TENDERING PROCEDURES:	12
4.18 TENDERING IN LOTS:	12
4.19 RECOMMENDATION: TENDERING	13
5 CONCLUSIONS	13
6 ANNEXES	13

Executive Summary

In December 2000 Unicef Zambia commissioned a short research consultancy to review the borehole drilling programme between 1995 and 2000 in order to inform about the effectiveness of the programme and to provide recommendations for improving the contract document.

Since 1995 borehole drilling (for WASHE as well as School Sanitation and Education programmes) has been subcontracted out to private drilling contractors using a competitive bidding process. This was done in an effort to reduce the high costs of drilling (previously in the region of 5,000 US Dollars for an average 60m deep fully cased and screened hole) in order to address Donor fears about the cost effectiveness of such programmes.

Data was gathered from drilling companies that have had contracts with Unicef in the past as well as from Unicef's own records. A database (in Excel) was created to record pertinent data both for successful boreholes as well as dry or abandoned ones. This was needed in order to make a value judgement about the efficacy of the contract document with respect to the non-payment of dry holes as well as other analyses such as the trend in the average cost per borehole and cost/m for the thirteen districts covered. In addition to the collection of specific data relating to boreholes, additional information concerning views on the contract document was gathered through structured interviews with several contractors.

The report will focus on the main issues that have arisen during the course of the consultancy and will present the consultants recommendations based on the analysis of the data. Recommendations will be presented at the end of each area covered.

The main areas covered were:

- Review of the historical data on boreholes drilled in East and Southern provinces from 1995 to the present and to determine average cost information.
- Collect and analyse data on lost or unsuccessful (dry) boreholes and to determine the cost to the contractors and to estimate the failure rates for each district.
- Review the changes to the terms and conditions of the contract and to suggest improvements.
- Present the findings and recommendations to invited drilling contractors and discuss.

Summary of findings.

Over the period of review Unicef, through the support of its donors, has invested some 3.5 Million US Dollars in the provision of approximately 1200 drilled wells, complete with handpumps providing improved access to potable water to approximately 300,000 people. It is seen as a very successful programme, with many schools, clinics and villages now having greatly improved water supplies. This has been achieved through the a partnership approach which included the contracting out of drilling services, working through the District and village WASHE committees and with the support of local NGOs. It should be noted that although traditionally a formal relationship the contracting of services to local drilling contractors has been seen by Unicef as very much on a partnership basis. The reason for this is clear; if communities capacities are developed, along with local NGOs and Government counterparts the expectation is that in the future each District could manage drilling contracts without the need for Unicef to be involved directly.

Success rates (successful vs dry or abandoned boreholes) have steadily increased over the period as contractors have improved their techniques. The average success rate for drilling (in all 13 Districts covered) is 85% but this varies from District to District and has improved over time as the drilling contractors both improved their siting and their quality of drilling. In some Districts the success rate is close to 100% whilst in others it is lower, due primarily to difficult geological conditions.

The average cost of drilling a 60m deep borehole equipped with 100mm diameter uPVC casing and screen has greatly reduced from what was considered an unacceptably high figure of close to 6,000 US Dollars in the early 1990's to a more acceptable 2,800 US Dollars today. The cost per beneficiary of approximately 12 US Dollars for the provision of a handpump water supply is half the global figure for provision of potable water in rural areas. This reduced cost has had the effect of encouraging donors to return to funding this activity as well as allowing Unicef to programme a significantly larger number of units with the result of greater numbers of people being served. Indeed the Japanese Government's recent announcement of its intention to fund rural water supply and sanitation with a grant of 4.4M US Dollars, to include the provision of boreholes in six districts, is evidence of this.

Although the number of boreholes drilled on an annual basis has dropped from a peak of approximately 300 in 1996 (perhaps the height of the 90's drought mitigation measures) to as few as 75 in 2000 there is good reason to suggest that the provision of borehole water sources is a cost effective approach, and that funding for such will continue. It is therefore clear that the approach taken by Unicef to reduce the cost of drilling to an acceptable level, using competitive bidding and with some innovative approaches to contract formulation is one that has had many benefits for the organisation and its beneficiaries. It should also be noted that Unicef has played an important role in terms of capacity building within the Zambian water well drilling arena. Various companies have benefited directly from the experience and technical support of the WASHE programme manager, Mr Sham Mathur, and have voiced their appreciation of his inputs over the years.

Assuming that the donor community will be encouraged by the figures presented in this report, the likelihood of continued and possibly improved funding for borehole drilling is high. This should be welcome news for the people of rural Zambia and the local drilling contractors alike.

1. Purpose

The purpose of this consultancy is defined by the following Terms of Reference.

1.1 Terms of Reference:

- 1.1.1 Review historical data from 1995 to present on boreholes drilled in each of the (ten) districts where Unicef has funded drilling and make an estimate of the cost of drilling per borehole and per metre for each district and for each contractor.
- 1.1.2 Collect and analyse data on Lost or Unsuccessful (dry) boreholes and estimate the cost that this represents to the drilling companies. Take into account the conditions of contract. This will require visits to FORADEx (Lusaka), DESONS (Chipata) and CORATOM (Choma) to collect any data that these companies have in their records.
- 1.1.3 Collect and analyse data on the failure rate for each district by Ward, Constituency and or Geological formation, if data is available for this. If little data exists estimate by District only.
- 1.1.4 Assess the incentives that have been offered to drilling companies and determine estimates of the actual costs of drilling to contractors and how the incentives may or may not offset or mitigate the costs of dry holes.
- 1.1.5 Review the development of the drilling contract Terms of Reference and Specifications and make recommendations on changes (or otherwise) to the current contract to widen the bidding to companies that are currently concerned about the cost of Unicef contracts and therefore excluding themselves from the market. This shall include a review of all clauses, but especially the “No water – No pay” policy, as well as payment arrangements currently in force.
- 1.1.6 Collect, compare and contrast drilling cost data from neighbouring countries (if possible) and comment with respect to current costs in Zambia. If appropriate, make suitable recommendations for inclusion into contract terms and conditions.
- 1.1.7 Present the findings and recommendations first to Unicef /GRZ and then in a workshop with invited drilling contractors.

2 The approach of the consultant:

2.2 Data collection:

In order to obtain data on the costs for drilling it was first necessary to prepare a suitable database that could be used to provide suitable reports. Attempts have been made by Unicef in the past to record this and other WASHE data using MS Excel and some of these earlier databases were reviewed and used as a source of information. Unfortunately it appeared that there was little information on lost or dry boreholes and much of the other data appeared to be unreliable. Given the number of boreholes drilled (approximately 1300) during the period it was considered useful to create a new database, utilising some of the information currently available and supplementing this from contractors own records.

2.3 Review of Contract Documents:

A review of the contract document as it has developed since 1995 was carried out. The reasons for the changes that have been incorporated over the years will be explained and comments made about the appropriateness (or otherwise) of these changes.

Recommendations will be made for changes to the present contract documents based on the findings, as well as some of the concerns that drilling companies have with the document.

2 Activities

- 2.1 The period of the consultancy was 40 working days from 18th December 2000 - 17th February 2001. Approximately 8 days were needed in the field (4 days of travel and 4 of visits to drilling companies). The remainder was spent carrying out data entry and analyses and in the preparation of this report.
- 2.2 Data collection and structured interviews were carried out with one Lusaka based drilling company and two other companies based in Chipata and Choma respectively. All these companies have had contracts for borehole drilling over the whole of the period of review. Some informal data was collected from one other company that has been invited to bid in the past but was not successful in securing a contract. Some attempts were made to locate and solicit information from drilling companies based in the region with a view to establishing some comparative data, but this was not successful.
- 2.3 The interviews with the various drilling companies were for the purpose of ascertaining the main concerns with the contract document and the impediments to bidding. It provided an opportunity to further gauge the opinions and understanding of companies that would like, but currently do not feel able, to bid.

3 Outputs

- 3.1 A near complete record of all boreholes drilled in thirteen districts over the period of review which includes dry holes, holes drilled in wells, at schools, clinics and in villages which can easily be used for analysis and the preparation of reports has been prepared. Excel was chosen for its flexibility of use and the ease of creating the type of reports required.
- 3.2 In addition to this a separate record of all contracts issued over the period was also created, in order to both cross-refer and to produce overall cost data analyses.

4 Findings and Recommendations

4.1 Administrative issues:

- 4.1.1 Although technically outside of the ToR it was necessary to spend time reviewing the processes and documents that are used by Unicef in the management of drilling projects and activities. This revealed certain issues pertaining to administration that perhaps should be looked into with a view to making improvements.

4.2 Review of records and documentation:

- 4.2.1 In order to gather data for the database exercise it was necessary to trawl through the numerous folders and files that are kept in the WASHE section of Unicef as well as review a variety of previously created Excel spreadsheet databases. In the process it became apparent that there is little in the way of order to the records, files and folders that are kept in the WASHE section, nor for that matter in the WASHE shared drive. For example, apart from the name of the contractor on the spine of the folder, little evidence of order was noted inside with records from many years appearing in a variety of chronological orders! More importantly perhaps there are frequently no references on the documents. Supplier's invoices and drilling reports are often only

identified by the village or school name and District. No contract reference is included and sometimes even dates are omitted.

- 4.2.2 The 'soft' or 'virtual' filing of documents on the WASHE section computers also leaves much to be desired from the point of view of easy access and retrieval. Many files are cryptically named, and without adequate descriptive information in their "Properties". This resulted in time-consuming review; the seemingly relevant document requiring to be opened before its contents could be revealed.

4.3 Contract documents:

- 4.3.1 There appear to be some gaps in the filing of contract documents. During the initial phase of data collection it became apparent that there are some shortcomings in the filing system both in WASHE and HR. For instance, in order to locate copies of all the relevant drilling contracts it was necessary to check through the records held in HR. However, this exercise identified a number of gaps in the records between the two departments and it appears there are incomplete records in both locations. Following discussions with WASHE staff it is clear that there are systems and procedures that are used to monitor each drilling project and that records are reviewed to ensure that correct payments are made. It should therefore be possible to improve and streamline document filing for effective access, retrieval and archiving.

4.4 Recommendations: - Administration and Contract documentation:

- 4.4.1 In order to be able to better administer individual drilling contracts it is recommended that each contract document be uniquely numbered and contain all necessary references to internal Unicef documents such as SSA documents and Donor references. It is understood that for each contract there may be more than one funding source (and therefore SSA document) but it is nevertheless useful for cross-reference and monitoring. Documentation pertaining to each contract e.g. the contract Agreement, Conditions and Specifications, list of borehole names and locations from the D-WASHE, Contractors invoices, borehole completion reports, payment vouchers, etc. should be kept together in order to facilitate the timely analysis of payments and disbursement of funds. Equally each contract may be quickly audited if all relevant documents are located in a single file.
- 4.4.2 Contractors invoices should carry both the contract reference number (if contracts are not numbered then the description of the works) and perhaps the relevant SSA reference.
- 4.4.3 It is understood that the D-WASHE can only provide the list of locations to the contractor after the contract has been signed, but this should not prevent the contractor from choosing the correct number of boreholes to assign to the SSA and submitting this information to Unicef. In the case of multiple SSAs the contractor should simply choose the relevant number of borehole to assign. The D-WASHE will routinely be supplying Unicef with a copy of the list of boreholes for each district in which a contract is running. This practice would reduce the risk of possible duplications for payment occurring.

4.5 Form of Contract:

- 4.5.1 Over the period of review the standard form of contract has undergone several revisions. In general the current form is considered to be an acceptable document although there are some changes that should be made in order to remove ambiguities.

4.6 No water, no pay clause:

- 4.6.1 It is felt by all contractors that the "no water, no payment" clause is fundamentally unfair to the contractor, particularly when coupled with the additional requirement of the contractor having to site the boreholes.
- 4.6.2 Review of the borehole drilling data over the period 1995 - 2000 indicates that from a total of approximately 1300 holes drilled nearly 180 dry boreholes have been dry. If the average figure for the cost of drilling a dry hole is used to calculate the total cost, the value arrived at is approximately 275,000 US Dollars. This represents approximately 8% of the sum of gross contract values over the period. This probably represents the actual cost to the drilling contractors since the unit figure is based on 65% of the calculated actual.
- 4.6.3 Even if payment were to be made for dry holes it is unlikely to change the status quo with respect to encouraging the Contractors to site effectively because there is a far greater premium on drilling successful holes and each contractor will be siting with that in mind.
- 4.6.4 Traditionally, (by that I mean for drilling contracts) borehole siting is done by a highly qualified and experienced third party and thus, if the hole is unsuccessful for hydro-geological reasons (and not due to poor construction methods) the client has the opportunity for redress and compensation in the case of dry or lost holes with the party responsible for siting, assuming that a separate contract is in place with the agency responsible for siting. To load the drilling contractor with both the responsibility for siting and with the condition for non-payment of dry holes is considered by the consultant to be an unreasonable burden on the contractor. The contractors interviewed all stated that they were unhappy with the clause in the contract but were forced to accept it, due to there currently being few opportunities in the sector. Unicef may be considered to be taking advantage of the current economic climate in order to maximize the cost-benefit of its borehole drilling programme. This is probably understandable from Unicef's point of view as it is in a buyers market and is mandated to get the best value for money from all its service agreements.
- 4.6.5 However, it should be born in mind that other aspects of the contract, such as the opportunity for the Contractor to supply casing and screens at a profit, (perhaps by as much as 50%) and the opportunity for procurement of drill bits Duty and VAT exempt, should reasonably compensate for the risk (and cost) of dry holes.
- 4.6.6 There is little doubt that paying even part of the cost of dry holes would increase the cost of drilling to Unicef as the average success rate for all districts over the period of review is 85%. For a 20 borehole contract the additional cost of 3 dry holes would amount to an additional 7% or approximately 4,500 USD on a 66,000 USD contract. This figure is slightly more than the average cost of a successful borehole.
- 4.6.7 If the contract were to include part payment for dry holes perhaps the most important impact of this change would be to increase the number of companies willing to bid for Unicef contracts and thus, potentially at least, the increased competition might actually result in lower price bids being offered (possibly thereby offsetting the increased overall cost). The cost to Unicef may therefore increase only slightly (see Annex 6 for spreadsheet analysis).
- 4.6.8 It is interesting to note that there is little doubt (from interview data collected) that the drilling companies feel that the "no water, no pay" clause has forced them to improve both their siting and drilling. All cited that they had learned to drill more effectively and successfully following the introduction of the clause in 1995/6.

4.7 Recommendation: Form of Contract

- 4.7.1 Given the relatively small increase in cost and the potential to actually recover part of this from the expected increased competition (with possibly reduced rates), if the clause is changed, it is probably worth considering.

4.8 Payment terms and conditions:

- 4.8.1 All contractors interviewed were content with the payment arrangements (excluding the no water, no pay clause) in terms of timing, value of payments (%age) and timeliness of disbursements. However they were unanimous over the issue of payments being made in Kwacha at the UN rate at the time of payment.
- 4.8.2 In the past payments have been made both in US Dollars and in Kwacha. Currently payments are being made in US Dollars since the recent fluctuations of the Kwacha against the Dollar have been cause for concern.

4.9 Recommendation: Payment terms

- 4.9.1 It is recommended that this practice be maintained until such time as there is stability in the Kwacha. However, it is not known how the Bank of Zambia and the Government would view this measure, particularly in light of some of the recent press statements.

4.10 Advance facility:

- 4.10.1 Over the period of review the relationship between Unicef WASHE and the contractors engaged to carry out drilling for handpump programmes has been seen very much as a partnership rather than a traditional Client - Contractor approach. This is important as it provides insight into the particular nuances and provisions that make up the contract document used.
- 4.10.2 In the early part of the programme a workshop was held by Unicef to which drilling contractors were invited to attend to learn about Unicef's programming approaches, some of the problems associated with contracting out services in what is perhaps an unusual operating environment and to provide a forum for discussion and exchange of views. This "capacity building" approach was considered to be valuable by all parties and one that some contractors have suggested perhaps should be taken further. In addition the head of the WASHE section was willing and able to impart valuable experience and knowledge to the drilling contractors in an attempt to improve their performance, recognising that it was in all stakeholders interests to do so.
- 4.10.3 The modifications to the standard form of contract used by Unicef globally were made to suit the needs of the programme and to take into account the particular circumstances of the time. Subsequent changes have come about in response to various factors and events. In any case, given the partnership approach that Unicef were taking, certain elements of the contract have been considered to be more important than others.
- 4.10.4 It is considered standard practice in Zambia to pay an advance prior to the start of any contracted works over a certain value. (The historical reason for this is probably the small size of the economy, difficult exchange controls and subsequent problems with cash-flow and procurement.) The value of the advance will depend on various factors such as the size and nature of the works, the total value of the works and the period of execution.
- 4.10.5 In the case of Unicef's borehole drilling programme it appears, from the analysis of the contract data, that an advance of 20 -25% has been the norm. What is surprising

to the author is the fact that, on occasions, this has been paid to various contractors without the requirement of a performance bond or Bank Guarantee.

- 4.10.6 Whilst it is understood that the reason for this may have been to encourage smaller contractors to bid for work, it being difficult for them perhaps to persuade their bankers to provide guarantees (and it being costly for the documentation), it is nonetheless considered a serious liability on the part of the Client if this provision is not ensured. Following two unfortunate incidents of contractors not being able to perform, having received advances, and subsequent difficulties in Unicef being able to recover their money, the approach seems to have been to remove the provision of an advance, rather than to provide an advance against a guarantee. This is felt by many contractors to be the wrong approach as it penalises those genuine businesses, which are able to cover the requirement of raising a guarantee, from benefiting from the advance facility.
- 4.10.7 The contractors interviewed all lamented the removal of the facility from the contract and explained that it was very hard for them to implement contracts under these conditions (particularly in the current poor economic climate). They all stated that they would be willing to provide a bank guarantee against an advance if it were required.
- 4.10.8 It needs to be said here that the advance facility is considered very important to the contractor since he has to procure PVC casings and screens for the project which, not being available locally, have to be procured usually in one lot (using foreign currency paid up-front to the supplier as credit to Zambian companies is limited,) in order to meet the contract conditions. Thus by removing the advance facility, Unicef is effectively asking the contractor to pre-finance the project, at least to some extent - something even the larger companies are finding difficult due to the generally poor macro-economic environment within Zambia today.
- 4.10.9 As an alternative to the provision of an advance, Unicef could procure casing and screen to be made available to contractors on a free-issue basis based on the requirements of the contract. This was done in the past and in many respects is the preferred option because it can be done in bulk, with savings being made in unit costs from the supplier as well as for bulk transport. Casing and screen is not considered to be a particularly "high risk" product from the point of view of theft and therefore could be held in stock by Unicef and provided to contractors on a free-issue basis based on the requirements of the contract. Any remaining casings and screens not utilised on a contract can be recovered from the contractor since good records are kept of the amounts used. It is understood that the reason for allowing the contractor to supply casing and screen was to a certain extent a capacity building exercise, and one that removed a logistical problem from Unicef and that it provided the Contractor with an opportunity for covering (in part) the cost of drilling dry holes.

4.11 Recommendation: Advance

- 4.11.1 It is recommended that the advance facility is reinstated but with the proviso that a Bank guarantee or an Insurance bond is presented on receipt. This will serve to protect the Client from possible loss incurred by a contractor not performing the contractual obligations satisfactorily.
- 4.11.2 Purchase of casing and screen by Unicef is not recommended for primarily logistical reasons but also because this function could be covered by a reputable local supplier. There are companies in Lusaka quite able to procure uPVC casing of the correct specifications and by allowing them this opportunity Unicef are encouraging local business and building capacity in the local supply marketplace. This is also good for other organisations that are now receiving the support of the international donor community for the provision of improved water supplies in rural areas.

4.12 Mobilisation cost for dry boreholes:

- 4.12.1 Unicef currently does not pay the mobilisation cost for a location that turns out to be dry. Again this is viewed as unfair since the drilling contractor will have incurred expenses both in the initial survey for siting and, having chosen those sites which he feels will result in satisfactory boreholes, will mobilise his equipment to site with the full intention of completing a successful hole.
- 4.12.2 Siting is not an exact science and whilst many contractors have good local knowledge they are not hydro-geologists and generally do not have either the equipment or training to interpret the data produced by such. Even if they did it is always possible for dry holes to be drilled as interpretation of the geophysical data is difficult. No responsibility is carried by a third party for siting which results in a dry hole; the Contractor carries all the risk. Third parties will not site boreholes unless they are paid for the work and none are likely to accept "no water, no pay" as a payment condition. In the cases where contractors have sub-contracted the siting to a competent third party the results have been variable and so most are now adopting traditional divining techniques as their preferred method for siting. If they do get it wrong, they can at least claim the \$200 lump sum for siting.

4.13 Three sites at each location - one payment:

- 4.13.1 The requirement of the Contractor to attempt either or both of the two remaining sites at any location is also felt to be disadvantageous as the Contractor is not permitted the option of making an informed choice and moving to a different location in the hope of getting a better result. In this respect the author feels this clause needs to be revised in order to allow the Contractor to make that choice. It is accepted that this may be disappointing for the community but unless there is some incentive it is unlikely that the contractors will agree to continue drilling additional holes that carry what could be considered a high risk of failure, unless they were compensated for the loss.

4.14 Recommendation: Mobilisation costs

- 4.14.1 It is recommended that the clause (See Contract Annex II, 3.0) be amended to allow for payment for mobilisation to each site regardless of whether it is drilled dry or not.
- 4.14.2 In addition the clause requiring drilling of all three sites at a location be amended to provide some choice to the Contractor if he feels the risk of failure is very high.

4.15 VAT and Duty issues:

- 4.15.1 It is apparent from the results of the interviews that the provision for the VAT and Duty free import of drill bits is not considered to be particularly advantageous. In one case the contractor had never taken advantage of the provision. In another, the contractor stated that they had made use of it on one occasion only. It is likely that this "incentive" would be considered more valuable if the contracts were of a greater size.
- 4.15.2 However the issue of VAT-free fuel is considered to be of great advantage if it is available. Although Unicef may issue a VAT exemption certificate to the fuel retailer it is very often the case that the retailer will insist that the VAT is paid by the contractor as the Zambia Revenue Authority is very slow to refund VAT paid by the retailer. Thus the contractor ends up having to find a supplier that will honour the conditions of the Certificate and supply the fuel. In one case fuel for use in Districts in Eastern Province was procured in Lusaka. (It should be mentioned that the base price was lower in any case.) It should be noted that the VAT exemption provides a cash flow

benefit, not a cost benefit to the contractor as they are not able to pass on the VAT liability to the Client.

- 4.15.3 Several contractors stated that they had waited in excess of two years to receive a refund from ZRA, with the consequent loss of value of that payment as a result of inflation amounting in some cases to a considerable percentage of their profits. Of course it should be possible for the contractor to have this "credit" used to offset any VAT payments due but ZRA appear to be unhelpful on these matters, preferring the payments to be made when due and to ignore the credit option.

4.16 Recommendation: VAT and Duty issues:

- 4.16.1 In general the provision of VAT exemption certificates to Contractors is of benefit and should be continued. Contractors are, or should be, able to source their fuel from a suitable supplier to gain advantage from this provision.
- 4.16.2 It is clear that few contractors realise that Unicef are able to offer Duty exemption on items such as fuel, since none have taken up the issue. If this facility is available the contract should be amended to make it very clear that this is a benefit available to the Contractor.

4.17 Tendering procedures:

- 4.17.1 During the course of the interview process it has become apparent that there could be some improvements made to the tendering procedures. On some occasions in the past some tenders have been issued quite late in the season with the result that the contractor has found himself struggling with mobilisation from site to site in the rains. Whilst all contractors accept responsibility for this, they can incur additional expenses if they had not anticipated operating during the rains. In one case a contractor's rig was stranded by a washed out bridge, there being no other route out from the site and was required to wait for ten days whilst the bridge was repaired sufficiently to allow the plant to move out. Standing time is not budgeted for in the UNICEF contract and whilst some provision will of course be made by the contractor for this in his rates, it may be that it is minimal in order to remain competitive. It is accepted that the availability of funds may not always allow for this.

4.18 Tendering in Lots:

- 4.18.1 Review of the contract documentation reveals that in the past large tenders were broken down into Lots based on districts. This is obviously beneficial to Unicef as it reduces the administrative burden to a certain extent and it provides for a more even spread of contracts between the contractors. However each contractor was given a separate contract and so no administrative benefit in terms of contract management seem to have been derived.
- 4.18.2 Opportunities for contracts have reduced considerably over the last few years (see Contracts Database report in Annex 3) and this has put additional pressures on all drilling companies. The high competition is advantageous for Unicef but only as long as those companies who have been content to bid continue to do so. Some may feel that it is better to have their plant idle rather than risk embarking on small contracts that at best could run at break-even or even at a loss.
- 4.18.3 If the handpump programme is to be continued and opportunities arise for larger contracts (in excess of say 50 boreholes), it might be considered more beneficial to issue one contract and agree on approved sub-contractors, if it is felt that the main contractor is unable to complete the works in the stipulated time.
- 4.18.4 Given the long experience with a small number of local drilling contractors and the wealth of data now available for analysis Unicef may, as a viable alternative to open

tendering, consider using the "preferred supplier" approach. This may be considered to be cost-effective, relatively flexible and easy to manage and it removes the need for repeated tender issues.

- 4.18.5 Perhaps one disadvantage of this approach is the impact that it may have on the drilling Contractor community and the fact that, to some extent, it goes against the partnership approach developed over the last six years.

4.19 Recommendation: Tendering

- 4.19.1 It is recommended that future contracts be tendered in good time in order to facilitate timely completion.
- 4.19.2 Tenders should be of sufficient size as to provide some benefit in terms of covering the cost of dry boreholes. A minimum of 50 boreholes per contract is recommended.

5 Conclusions

- 5.1 Whilst this report reflects the rather technical requirements of the Terms of Reference it is worth mentioning some factors which have had a bearing on the development of the programme over the period, and help to explain some of the decisions and developments that have occurred. One of the main objectives of the WASHE programme has been capacity building in the Districts (Ref.: Unicef Country Programme 1997-2001) and this, to a large extent, has been achieved. Although not explicit in the document it is clear that developing the capacity of local drilling contractors from both a technical point of view as well as their understanding of what Unicef and the Government is trying to achieve with respect to improved water supplies in the Districts is advantageous. There has therefore been a gradual transfer of responsibilities from Unicef to the District authorities in an attempt to maximise the impact of the community-based approach, and this has included empowering V-WASHEs to monitor the performance of the drilling contractors working in their area. Issues such as site selection and installation of handpumps has clearly been part of the responsibility of the communities.
- 5.2 In terms of Administration and documentation there are several areas that need to be looked at in terms of making some improvements to the present arrangements. These are:
- 5.2.1 Administration and contract management: The systems and procedures for monitoring and filing contract information should be reviewed and improved to allow for easier access and retrieval.
- 5.2.2 Contract documents: Some changes need to be made to the current form of contract to a) better serve and protect the interests of Unicef and b) to encourage opening up of the competition as currently there appear to be only a few companies bidding competitively.
- 5.2.3 Approach to procurement of drilling services: Unicef may consider that it is appropriate to change the procurement methodology in light of their experience with borehole drilling contractors in Zambia. There is perhaps an argument for moving away from competitive bidding towards preferred supplier arrangements, providing there is no conflict with Unicef's standard procurement rules.

6 Annexes

- Annex 1 Sample of the borehole database. (N.B. A complete printout runs to about 70 pages) Note that it is located on WASHE shared drive.
- Annex 2 Report from above database showing average costs (borehole and rate/m) by district, driller and year. (N.B. 1995 to 1997 figures are skewed as casing and screen were supplied by Unicef and therefore the actual costs of drilling were higher than shown.)

- Annex 3 Contract database.
- Annex 4 Report of boreholes contracted by District, driller and year.
- Annex 5 Dry borehole records. (N.B. This is part of the total record.)
- Annex 6 Dry borehole cost analysis.
- Annex 7 Summary of cost/m for dry boreholes by District, driller and year.
- Annex 8 Draft revised Contract document.

Note that the various spreadsheets from which these documents are derived are available on the WASHE shared drive.