



WATER RESOURCES AUTHORITY

OPEN TENDER

TENDER NO: WRA/T/006/2020-2021

TENDER NAME:

DRILLING AND RELATED DATA COLLECTION EXPLORATORY/PRODUCTION
BOREHOLES AT NJUMBI HIGH SCHOOL MURANG'A COUNTY AND
DRILLING AND RELATED DATA COLLECTION EXPLORATORY/PRODUCTION
BOREHOLES AT NUU BOYS SECONDARY SCHOOL KITUI COUNTY

ISSUE DATE: 1ST DECEMBER, 2020

CLOSING DATE: 8TH DECEMBER, 2020 AT 11.00AM

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SECTION I
LETTER OF INVITATION FOR TENDERS

Date: 1st December, 2020

Tender reference No. **WRA/T/006/2020-2021**

Tender Name: Drilling and Related Data Collection
Exploratory/Production Boreholes at Njumbi High School Murang'a
County and Drilling and Related Data Collection
Exploratory/Production Boreholes at Nuu Boys Secondary School Kitui
County

- 1.1 The Water Resources Authority invites sealed tenders for the Drilling and Related Data Collection Exploratory/Production Boreholes at Njumbi High School Murang'a County and Drilling and Related Data Collection Exploratory/Production Boreholes at Nuu Boys Secondary School Kitui County
- 12 The interested candidates may obtain further information and inspect tender documents at NHIF Building, Wing B, 10th Floor, Supply Chain Office during normal working hours.
- 1.2 A complete set (hard copy) of tender documents may be obtained by interested candidates upon payment of a non-refundable fees of Kshs. 1,000 in Bankers Cheque payable to WRA, alternatively the documents may be downloaded free of charge from www.wra.go.ke/tenders or www.tenders.go.ke. Bidders who download the tender document from the websites shall be required to email their detailed contact information to procurement@wra.go.ke for future communication.
- 1.3 Prices quoted should be net inclusive of all taxes, must be in Kenya shillings and shall remain valid for (120) days from the closing date of tender.
- 1.4 Provision of **Bid Security of Kshs. 200,000 (Kenya Shillings Two Hundred Thousand)** from Bank/Insurance Company approved by PPRA (Attach original letter with stamp) and shall be valid for one hundred and fifty (150) days as follows;
- 15 Completed bid documents in **duplicate** should be submitted in plain sealed envelopes and clearly marked as; **WRA/T/006/2020-2021 Drilling and Related Data Collection Exploratory/Production Boreholes at Njumbi High School Murang'a County and Drilling and Related Data Collection Exploratory/Production Boreholes at Nuu Boys Secondary School Kitui County**

The original and all copies of the bid document shall be clearly marked **"ORIGINAL"** and **"COPY"** and shall be placed into an envelope and sealed. The

envelope shall bear the submission address and tender number and be clearly marked, “**DO NOT OPEN BEFORE 8th December, 2020 AT 11.00AM**” and addressed to:

**The Chief Executive Officer
Water Resources Authority,
NHIF Building Wing B 10th Floor,
Ragati Rd, off Ngong Rd Nairobi
P. O. Box 45250-00100
Nairobi**

- 1.6 Water Resources Authority (WRA) **reserves the right** to accept or reject any offer giving reasons thereof and does not bind itself to accept the lowest or any tender.

Bidders who do not adhere to the submission instruction shall be declared non responsive. Any canvassing or giving of false information will lead to automatic disqualification.

- 1.7 Tenders will be opened immediately thereafter in the presence of the candidates or their representatives who choose to attend at **the boardroom 10th floor wing B, NHIF building.**

**Chief Executive Officer
Water Resources Authority**

SECTION II INSTRUCTIONS TO TENDERERS

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INSTRUCTIONS TO TENDERERS.

1. General

Water Resources Authority as defined in the Appendix to Conditions of Contract invites tenders for Drilling and Related Data Collection Exploratory/Production Boreholes at Njumbi High School Murang'a County and Drilling and Related Data Collection Exploratory/Production Boreholes at Nuu Boys Secondary School Kitui County

- 11 The successful Tenderer will be expected to complete the Works by the Intended Completion Date specified in the said Appendix.
- 12 Tenderers shall include the following statutory/mandatory information and documents with their tenders:-
 - a) Registration and possession of a valid License certificate as a practicing borehole drilling contractor from the Ministry of Water & Sanitation and Irrigation in the year 2020.
 - b) Copy of certificates of Business registration/Incorporation
 - c) Copy of Valid Business Trading License Permit from County Government
 - d) Copy of Current CR12 form/ BN whichever is applicable
 - e) Valid Tax compliance certificate
 - f) Valid Certificate of registration with National Construction Authority (NCA) in the Water Works Category in the year 2020
 - g) **Original Tender/ Bid security of Kshs 200,000**(Kenya Shillings Two Hundred Thousand) in form of Insurance Bond/Bank Guarantee from financial institution recognized by PPRA valid for 150 days.
 - h) Submission of Two bid documents (clearly marked 'Original' and 'Copy') in a perfect bound (No spiral binding) and correctly serialized / paginated and initialized by binder/ rubber stamped.
 - i) Correctly duly filled and signed Form of Tender in WRA's Tender Document Template)
 - j) Duly filled and signed Confidential Business Questionnaire **(certified by Commissioner of Oath as true information given)**
 - k) Must fill, sign and stamp anti-corruption declaration form available in the tender document **(certified by Commissioner of Oath as true information given)**
- 13 The Tenderer shall bear all costs associated with the preparation and submission of his tender, and Water Resources Authority will in no case be responsible or liable for those costs.
- 14 The Tenderer, at the Tenderer's own responsibility and risk, is encouraged to visit and examine the Site of the Works and its

surroundings, and obtain all information that may be necessary for preparing the tender and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the Tenderer's own expense.

- 15 The WRA employees, committee members, board members and their relative (spouse and children) are not eligible to participate in the tender.
- 16 The WRA shall allow the tenderer to review the tender document free of charge before purchase.

2. Tender Documents

- 21 The complete set of tender documents comprises the documents listed here below and any addenda issued in accordance with clause 2.4 here below:-
 - a. Form of Invitation for Tender
 - b. Instructions to Tenderers
 - c. Form of Tender
 - d. General Conditions of Contract and Special Conditions of Contract
 - e. Specifications
 - f. Bill of Quantities
 - g. Drawings
 - h. Declaration FORM
- 22 The Tenderer shall examine all instructions, forms and specifications in the tender documents. Failure to furnish all information required by the tender documents may result in rejection of his tender.
- 23 A prospective Tenderer making inquiries of the tendering documents may notify Water Resources Authority in writing or by email through the address indicated in the letter of invitation to tender (clause 1.4). Water Resources Authority will respond to any request for clarification received earlier than three [3] days prior to the deadline for submission of tenders. Copies of Water Resources Authority's response will be forwarded to all persons issued with tendering documents, including a description of the inquiry, but without identifying its source.
- 24 Before the deadline for submission of tenders, Water Resources Authority may modify the tendering documents by issuing addenda. Any addendum thus issued shall be part of the tendering documents and shall be communicated in writing or by email to all Tenderers. Prospective Tenderers shall acknowledge receipt of each addendum in writing to Water Resources Authority.
- 25 To give prospective Tenderers reasonable time in which to take an

addendum into account in preparing their tenders, Water Resources Authority may extend, as necessary, the deadline for submission of tenders in accordance with clause 4.2 here below.

3. Preparation of Tenders

- 3.1 All documents relating to the tender and any correspondence shall be in English Language.
- 3.2 The tender submitted by the Tenderer shall comprise the following:-
 - (a) The Tender;
 - (b) Tender Security;
 - (c) Priced Bill of Quantities/Schedule of Rates for lump-sum Contracts
 - (d) Any other materials required to be completed and submitted by Tenderers.
- 3.3 The Tenderer shall fill in rates and prices for all items of the Works described in the Bill of Quantities/Schedule of Rates. Items for which no rate or price is entered by the Tenderer will not be paid for when executed and shall be deemed covered by the other rates and prices in the Bill of Quantities/Schedule of Rates. All duties, taxes and other levies payable by the Contractor under the Contract, as of 30 days prior to the deadline for submission of tenders, shall be included in the tender price submitted by the Tenderer.
- 3.4 The rates and prices quoted by the Tenderer shall not be subject to any adjustment during the performance of the Contract.
- 3.5 The unit rates and prices shall be in Kenya Shillings.
- 3.6 Tenders shall remain valid for a period of one hundred and twenty (120) days from the date of submission. However, in exceptional circumstances, Water Resources Authority may request that the Tenderers extend the period of validity for a specified additional period. The request and the Tenderers' responses shall be made in writing.
- 3.7 The Tenderer shall prepare one original of the documents comprising the tender documents as described in these Instructions to Tenderers.
- 3.8 The original shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign on behalf of the Tenderer. All pages of the tender where alterations or additions have been made shall be initialed by the person or persons signing the tender.
- 3.9 Clarification of tenders shall be requested by the tenderer to be received by the procuring entity not later than 3 days prior to the

deadline for submission of tenders.

- 3.10 WRA shall reply to any clarifications sought by the tenderer within 1 day of receiving the request to enable the tenderer to make timely submission of its tender.

4. Submission of Tenders

- 4.1 The tender duly filled and sealed in an envelope shall; -
- (a) be addressed to Water Resources Authority at the address provided in the invitation to tender;
 - [b] bear the name and identification number of the Contract as defined in the invitation to tender; and
 - [c] provide a warning not to open before the specified time and date for tender opening.
- 4.2 Tenders shall be delivered to Water Resources Authority at the address specified above not later than the time and date specified in the invitation to tender.
- 4.3 The tenderer shall not submit any alternative offers unless they are specifically required in the tender documents.
- 4.4 Tenderers may bid for one or more lots.
- 4.5 Any tender received after the deadline for opening tenders will be returned to the tenderer un-opened.
- 4.6 Water Resources Authority may extend the deadline for submission of tenders by issuing an amendment in accordance with sub-clause 2.5 in which case all rights and obligations of Water Resources Authority and the Tenderers previously subject to the original deadline will then be subject to the new deadline.

5. Tender Opening and Evaluation

- 5.1 The tenders will be opened in the presence of the Tenderers' representatives who choose to attend at the time and in the place specified in the invitation to tender.
- 5.2 The Tenderers' names, the total amount of each tender, the presence of requisite tender surety and such other details as may be considered appropriate, will be announced at the opening by Water Resources Authority. Minutes of the tender opening, including the information disclosed to those present will also be prepared by Water

- Resources Authority.
- 53 Information relating to the examination, clarification, evaluation and comparison of tenders and recommendations for the award of the Contract shall not be disclosed to Tenderers or any other persons not officially concerned with such process until the award to the successful Tenderer has been announced. Any effort by a Tenderer to influence Water Resources Authority's officials, processing of tenders or award decisions may result in the rejection of his tender.
- 54 The tender sum as submitted and read out during the tender opening shall be absolute and final and shall not be the subject of correction.
- 55 The tender evaluation committee shall evaluate the tender within 30 days of the validity period from the date of opening the tender.
- 56 Contract price variations shall not be allowed for contracts not exceeding one year (12 months)
- 57 Where Contract Price variation is allowed, the quantity variation of works shall not exceed 20% of the original Contract Price.
- 58 Price variation requests shall be processed by the procuring entity within 30 days of receiving the request.
- 5.9 Preference where allowed in the evaluation of tenders shall not exceed 15%
- 5.10 To assist in the examination, evaluation, and comparison of tenders, Water Resources Authority at his discretion, may request [in writing] any Tenderer for clarification of the tender, including breakdowns of unit rates. The request for clarification and the response shall be in writing or email but no change in the tender price or substance of the tender shall be sought, offered or permitted.
- 5.11 The Tenderer shall not influence Water Resources Authority on any matter relating to his tender from the time of the tender opening to the time the Contract is awarded. Any effort by the Tenderer to influence Water Resources Authority or his employees in his decision on tender evaluation, tender comparison or Contract award may result in the rejection of the tender.

6. Award of Contract

- 61 The award of the Contract will be made to the Tenderer who has offered the lowest evaluated tender price as outlined in the evaluation criteria.
- 62 Notwithstanding the provisions of clause 6.1 above, Water Resources

Authority reserves the right to accept or reject any tender and to cancel the tendering process and reject all tenders at any time prior to the award of Contract without thereby incurring any liability to the affected Tenderer or Tenderers or any obligation to inform the affected Tenderer or Tenderers of the grounds for the action.

- 63 The Tenderer whose tender has been accepted will be notified of the award prior to expiration of the tender validity period in writing or email. This notification (hereinafter and in all Contract documents called the "Letter of Acceptance") will state the sum [hereinafter and in all Contract documents called the "Contract Price" which Water Resources Authority will pay the Contractor in consideration of the execution, completion, and maintenance of the Works by the Contractor as prescribed by the Contract. The contract shall be formed on the parties signing the contract. At the same time the other tenderers shall be informed that their tenders have not been successful.
- 64 Within fourteen (14) days of receipt of the Form of contract agreement/notification for contract award from Water Resources Authority, the successful tenderer shall sign the form and return it to Water Resources Authority together with the required Performance Security as stipulated in the Special Conditions of Contract.
- 6.5 The Contract Agreement will incorporate all agreements between Water Resources Authority and the successful Tenderer and they shall have it signed by the parties within 30 days from the date of notification of contract award unless there is an administrative review request.
- 66 The Water Resources Authority may at any time terminate procurement proceedings before contract award and shall not be liable to any person for the termination.
- 67 Water Resources Authority shall give prompt notice of the termination to the tenderers and on request give its reasons for termination within 14 days of receiving the request from any tenderer.

7. Corrupt and fraudulent practices

- 7.1 Water Resources Authority requires that the tenderer observes the highest standard of ethics during the procurement process and execution of the contract. A tenderer shall sign a declaration that he has not and will not be involved in corrupt and fraudulent practices.
- 72 Water Resources Authority will reject a tender if it determines that the tenderer recommended for award has engaged in corrupt and fraudulent practices in competing for the contract in question.

73 Further a tenderer who is found to have indulged in corrupt and fraudulent practices risks being debarred from participating in public procurement in Kenya.

SECTION III CONDITIONS OF CONTRACT

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SECTION III - CONDITIONS OF CONTRACT:-GENERAL CONDITIONS

1. Definitions

1.1 In this Contract, except where context otherwise requires, the following terms shall be interpreted as indicated;

“Bills of Quantities” means the priced and completed Bill of Quantities forming part of the tender [where applicable].

“Schedule of Rates” means the priced Schedule of Rates forming part of the tender [where applicable].

“The Completion Date” means the date of completion of the Works as certified by Water Resources Authority’s Representative.

“The Contract” means the agreement entered into by Water Resources Authority and the Contractor as recorded in the Agreement Form and signed by the parties.

“The Contractor” refers to the person or corporate body whose tender to carry out the Works has been accepted by Water Resources Authority.

“The Contractor’s Tender” is the completed tendering document submitted by the Contractor to Water Resources Authority.

“The Contract Price” is the price stated in the Letter of Acceptance.

“Days” are calendar days; **“Months”** are calendar months.

“A Defect” is any part of the Works not completed in accordance with the Contract.

“The Defects Liability Certificate” is the certificate issued by WRA Representative upon correction of defects by the Contractor.

“The Defects Liability Period” is the period named in the Appendix to Conditions of Contract and calculated from the Completion Date.

“Drawings” include calculations and other information provided or approved by Water Resources Authority’s Representative for the execution of the Contract.

“Employer” is the Water Resources Authority

“Equipment” is the Contractor’s machinery and vehicles brought temporarily to the Site for the execution of the Works.

“Site” means the place or places where the permanent Works are to be carried out including workshops where the same is being prepared.

“Materials” are all supplies, including consumables, used by the Contractor for incorporation in the Works.

“Employer’s Representative” is the person appointed by Water Resources Authority and notified to the Contractor for the purpose of supervision of the Works.

“Specification” means the Specification of the Works included in the Contract.

“Start Date” is the date when the Contractor shall commence execution of the Works.

“A Subcontractor” is a person or corporate body who has a Contract with the Contractor to carry out a part of the Work in the Contract, which includes Work on the Site.

“Temporary works” are works designed, constructed, installed, and removed by the Contractor which are needed for construction or installation of the Works.

“A Variation” is an instruction given by Water Resources Authority’s Representative which varies the Works.

“The Works” are what the Contract requires the Contractor to construct, install, and turnover to Water Resources Authority.

2. Contract Documents

2.1 The following documents shall constitute the Contract documents and shall be interpreted in the following order of priority;

- (1) Agreement,
- (2) Letter of Acceptance,
- (3) Contractor’s Tender,
- (4) Conditions of Contract,

- (5) Specifications,
- (6) Drawings,
- (7) Bills of Quantities or Schedule of Rates

3. Employer's Representative's Decisions

- 3.1 Except where otherwise specifically stated, Water Resources Authority's Representative will decide contractual matters between Water Resources Authority and the Contractor in the role representing Water Resources Authority.

4. Works, Language and Law of Contract

- 4.1 The Contractor shall construct and install the Works in accordance with the Contract documents. The Works may commence on the Start Date and shall be carried out in accordance with the Program submitted by the Contractor, as updated with the approval of Water Resources Authority's Representative, and complete them by the Intended Completion Date.
- 4.2 The ruling language of the Contract shall be English language and the law governing the Contract shall be the law of the Republic of Kenya.

5. Safety, Temporary works and Discoveries

- 5.1 The Contractor shall be responsible for design of temporary works and shall obtain approval of third parties to the design of the temporary works where required.
- 5.2 The Contractor shall be responsible for the safety of all activities on the Site.
- 5.3 Anything of historical or other interest or significant value unexpectedly discovered on the Site shall be the property of Water Resources Authority. The Contractor shall notify Water Resources Authority's Representative of such discoveries and carry out Water Resources Authority's Representative's instructions for dealing with them.

6. Work Program and Sub-contracting

- 6.1 Within seven days after Site possession date, the Contractor shall submit to Water Resources Authority's Representative for approval a program showing the general methods, arrangements, order and timing for all the activities in the Works.

62 The Contractor may sub-contract the Works (but only to a maximum of 25 percent of the Contract Price) with the approval of Water Resources Authority's Representative. However, he shall not assign the Contract without the approval of Water Resources Authority in writing. Sub-contracting shall not alter the Contractor's obligations.

7. The site

71 Water Resources Authority shall give possession of all parts of the Site to the Contractor.

72 The Contractor shall allow Water Resources Authority's Representative and any other person authorized by Water Resources Authority's Representative, access to the Site and to any place where work in connection with the Contract is being carried out or is intended to be carried out.

8. Instructions

81 The Contractor shall carry out all instructions of Water Resources Authority's Representative which are in accordance with the Contract.

9 Extension of Completion Date

91 Water Resources Authority shall extend the Completion Date if an occurrence arises which makes it impossible for completion to be achieved by the Intended Completion Date. Water Resources Authority shall decide whether and by how much to extend the Completion Date.

92 For the purposes of this clause, the following occurrences shall be valid for consideration;

Delay by:-

(a) force majeure, or

(b) reason of any exceptionally adverse weather conditions, or

(c) reason of civil commotion, strike or lockout affecting any of the trades employed upon the Works or any of the trades engaged in the preparation, manufacture or transportation of any of the goods or materials required for the Works, or

- (d) reason of Water Resources Authority's Representative's instructions issued under these Conditions, or
- (e) reason of the contractor not having received in due time necessary instructions, drawings, details or levels from Water Resources Authority's Representative for which he specifically applied in writing on a date which having regard to the date for Completion stated in the appendix to these Conditions or to any extension of time then fixed under this clause was neither unreasonably distant from nor unreasonably close to the date on which it was necessary for him to receive the same, or
- (f) delay on the part of artists, tradesmen or others engaged by Water Resources Authority in executing work not forming part of this Contract, or
- (g) reason of delay by statutory or other services providers or similar bodies engaged directly by Water Resources Authority, or
- (h) reason of opening up for inspection of any Work covered up or of the testing or any of the Work, materials or goods in accordance with these conditions unless the inspection or test showed that the Work, materials or goods were not in accordance with this Contract, or
- (i) reason of delay in appointing a replacement Employer's Representative, or
- (j) reason of delay caused by the late supply of goods or materials or in executing Work for which Water Resources Authority or his agents are contractually obliged to supply or to execute as the case may be, or
- (k) delay in receiving possession of or access to the Site.

10 Management Meetings

- 10.1 A Contract management meeting shall be held regularly and attended by Water Resources Authority's Representative and the Contractor. Its business shall be to review the plans for the remaining Work. Water Resources Authority's Representative shall record the business of management meetings and provide copies of the record to those attending the meeting and Water Resources Authority. The responsibility of the parties for actions to be taken shall be decided by Water Resources Authority's Representative either at the management

meeting or after the management meeting and stated in writing to all who attend the meeting.

102 Communication between parties shall be effective only when in writing.

11 Defects

11.1 Water Resources Authority's Representative shall inspect the Contractor's work and notify the Contractor of any defects that are found. Such inspection shall not affect the Contractor's responsibilities. Water Resources Authority's Representative may instruct the Contractor to search for a defect and to uncover and test any Work that Water Resources Authority's Representative considers may have a defect. Should the defect be found, the cost of uncovering and making good shall be borne by the Contractor. However, if there is no defect found, the cost of uncovering and making good shall be treated as a variation and added to the Contract Price.

11.2 Water Resources Authority's Representative shall give notice to the Contractor of any defects before the end of the Defects Liability Period, which begins at Completion, and is defined in the Appendix to Conditions of Contract.

11.3 Every time notice of a defect is given, the Contractor shall correct the notified defect within the length of time specified by Water Resources Authority's Representative's notice. If the Contractor has not corrected a defect within the time specified in Water Resources Authority's Representative's notice, Water Resources Authority's Representative will assess the cost of having the defect corrected by other parties and such cost shall be treated as a variation and be deducted from the Contract Price.

12 Bills of Quantities/Schedule of Rates

12.1 The Bills of Quantities/Schedule of Rates shall contain items for the construction, installation, testing and commissioning of the Work to be done by the Contractor. The Contractor will be paid for the quantity of the Work done at the rates in the Bills of Quantities/Schedule of Rates for each item. Items against which no rate is entered by the Tenderer will not be paid for when executed and shall be deemed covered by the rates for other items in the Bills of Quantities/Schedule of Rates.

12.2 Where Bills of Quantities do not form part of the Contract, the Contract Price shall be a lump sum (which shall be deemed to have been based on the rates in the Schedule of Rates forming part of the tender) and shall be subject to re-measurement after each stage.

13 Variations

13.1 The Contractor shall provide Water Resources Authority's Representative with a quotation for carrying out the variations when requested to do so. Water

Resources Authority's Representative shall assess the quotation and shall obtain the necessary authority from Water Resources Authority before the variation is ordered.

- 13.2 If the Work in the variation corresponds with an item description in the Bill of Quantities/Schedule of Rates, the rate in the Bill of Quantities/Schedule of Rates shall be used to calculate the value of the variation. If the nature of the Work in the variation does not correspond with items in the Bill of Quantities/Schedule of Rates, the quotation by the Contractor shall be in the form of new rates for the relevant items of Work.
- 13.3 If the Contractor's quotation is unreasonable, Water Resources Authority's Representative may order the variation and make a change to the Contract Price, which shall be based on Water Resources Authority's Representative's own forecast of the effects of the variation on the Contractor's costs.

14 Payment Certificates and Final Account

- 14.1 The Contractor shall be paid based on executed works/services against the Bill of Quantities (BoQ).

N/B: This will have to be supported by a supervision report by Water Resources Authority contract supervisor.

10% of contract amount shall be retained for the defects liability and paid after 90 days

- 14.2 Upon deciding that Works included in a particular stage are complete, the Contractor shall submit to Water Resources Authority's Representative his application for payment. Water Resources Authority's Representative shall check, adjust if necessary and certify the amount to be paid to the Contractor within 21 days of receipt of the Contractor's application. Water Resources Authority shall pay the Contractor the amounts so certified within 30 days of the date of issue of each Interim Certificate.
- 14.3 The Contractor shall supply Water Resources Authority's Representative with a detailed final account of the total amount that the Contractor considers payable under the Contract before the end of the Defects Liability Period. Water Resources Authority's Representative shall issue a Defect Liability Certificate and certify any final payment that is due to the Contractor within 30 days of receiving the Contractor's account if it is correct and complete. If it is not, Water Resources Authority's Representative shall issue within 21 days a schedule that states the scope of the corrections or additions that are necessary. If the final account is still unsatisfactory after it has been resubmitted, Water Resources Authority's Representative shall decide on the amount payable to the Contractor and issue a Final Payment Certificate. Water Resources Authority shall pay the Contractor the amount so certified within 60 days of the issue of the Final Payment Certificate.

14.4 If the period laid down for payment to the Contractor upon each of Water Resources Authority's Representative's Certificate by Water Resources Authority has been exceeded, the Contractor shall be entitled to claim simple interest calculated pro-rata on the basis of the number of days delayed at the Central Bank of Kenya's average base lending rate prevailing on the first day the payment becomes overdue. The Contractor will be required to notify Water Resources Authority within 15 days of receipt of delayed payments of his intentions to claim interest.

15. Insurance

15.1 The Contractor shall be responsible for and shall take out appropriate cover against, among other risks, personal injury; loss of or damage to the Works, materials and plant; and loss of or damage to property.

16. Liquidated Damages

16.1 The Contractor shall pay liquidated damages to Water Resources Authority at the rate 0.001 per cent of the Contract price per day for each day that the actual Completion Date is later than the Intended Completion Date except in the case of any of the occurrences listed under clause 9.2. Water Resources Authority may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not affect the Contractor's liabilities.

17. Completion and Taking Over

17.1 Upon deciding that the Work is complete the Contractor shall request Water Resources Authority's Representative to issue a Certificate of Completion of the Works, upon deciding that the Work is completed.

Water Resources Authority shall take over the Site and the Works within seven days of Water Resources Authority's Representative issuing a Certificate of Completion.

18. Termination

18.1 Water Resources Authority or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract. These fundamental breaches of Contract shall include, but shall not be limited to, the following;

- a). the Contractor stops Work for 30 days continuously without reasonable cause or authority from Water Resources Authority's Representative;
- b). the Contractor is declared bankrupt or goes into liquidation other than for a reconstruction or amalgamation;

c). a payment certified by Water Resources Authority's Representative is not paid by Water Resources Authority to the Contractor within 30 days after the expiry of the payment periods stated in sub clauses 14.2 and 14.3 hereinabove.

d). Water Resources Authority's Representative gives notice that failure to correct a particular defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time.

18.2 If the Contract is terminated, the Contractor shall stop Work immediately, and leave the Site as soon as reasonably possible. Water Resources Authority's Representative shall immediately thereafter arrange for a meeting for the purpose of taking record of the Works executed and materials, goods, equipment and temporary buildings on Site.

19. Payment upon Termination

19.1 Water Resources Authority may employ and pay other persons to carry out and complete the Works and to rectify any defects and may enter upon the Works and use all materials on Site, plant, equipment and temporary works.

19.2 The Contractor shall, during the execution or after the completion of the Works under this clause, remove from the Site as and when required within such reasonable time as Water Resources Authority's Representative may in writing specify, any temporary buildings, plant, machinery, appliances, goods or materials belonging to him, and in default thereof, Water Resources Authority may (without being responsible for any loss or damage) remove and sell any such property of the Contractor, holding the proceeds less all costs incurred to the credit of the Contractor.

19.3 Until after completion of the Works under this clause, Water Resources Authority shall not be bound by any other provision of this Contract to make any payment to the Contractor, but upon such completion as aforesaid and the verification within a reasonable time of the accounts therefor Water Resources Authority's Representative shall certify the amount of expenses properly incurred by Water Resources Authority and, if such amount added to the money paid to the Contractor before such determination exceeds the total amount which would have been payable on due completion in accordance with this Contract, the difference shall be a debt payable to Water Resources Authority by the Contractor; and if the said amount added to the said money be less than the said total amount, the difference shall be a debt payable by Water Resources Authority to the Contractor.

20. Corrupt Gifts and Payments of Commission

20.1 The Contractor shall not;

(a) Offer or give or agree to give to any person in the service of Water Resources

Authority any gifts or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of this or any other contract with Water Resources Authority or for showing or forbearing to show favour or disfavour to any person in relation to this or any other contract with Water Resources Authority.

- (b) Any breach of this Condition by the Contractor or by anyone employed by him or acting on his behalf (whether with or without the knowledge of the Contractor) shall be an offence under the Laws of Kenya.

21. Settlement of Disputes

- 21.1 Any dispute arising out of the Contract which cannot be amicably settled between the parties shall be referred by either party to the arbitration and final decision of a person to be agreed between the parties. Failing agreement to concur in the appointment of an Arbitrator, the Arbitrator shall be appointed by the chairman of the Chartered Institute of Arbitrators, Kenya branch, on the request of the applying party.

APPENDIX TO INSTRUCTIONS TO TENDERERS

Instru	Particulars of Appendix to instructions to tenderers
2.1 A	<p>The Water Resources Authority invites sealed tenders for WRA/T/006/2020-2021</p> <p>Drilling and Related Data Collection Exploratory/Production Boreholes at Njumbi High School Murang'a County and Drilling and Related Data Collection Exploratory/Production Boreholes at Nuu Boys Secondary School Kitui County</p>
2.2	<p>Bidders who download the tender document from the Government Portal-www.tenders.go.ke shall be required to email their detailed contact information to procurement@wra.go.ke or future communication.</p>
2.12.1	<p>Particulars of Tender Security; Kshs. 200,000 (Kenya Shillings Two Hundred Thousand) valid for 150 days</p>
2.12.	<p>Form of Tender Security. The Tender Security shall be in the form of Bank Guarantee from a reputable bank or a Guarantee from an Insurance Company approved by the Public Procurement Regulatory Authority (PPRA).</p>
2.13	<p>Validity of Tenders: Tenders shall remain valid for 120 days after date of Tender Opening</p>
2.16.1	<p>Deadline for submission of Tenders: 8th December, 2020 at 11.00am</p>
2.16.	<p>Bulky tenders that will not fit in the tender box shall be delivered to the Procurement department and will be signed for, the officer receiving indicating date and time delivered.</p>
2.18.1	<p>Opening of Tenders: 8th December, 2020 at 11.00am</p>
11.0	<p>The Defects Liability Period is 90 days.</p>
	<p>The amount of performance security is 10% to be accepted in a form of bank guarantee, in its original form</p>
14.1	<p>The Contractor shall be paid based on executed works/services against the Bill of Quantities (BoQ).</p> <p><i>N/B: This will have to be supported by a supervision report by a Water Resources Authority's contract supervisor.</i></p> <p>10% of contract amount shall be retained for the defects liability and paid after 90 days</p>

TECHNICAL SPECIFICATIONS

**TECHNICAL SPECIFICATIONS AND FORM BILLS OF QUANTITIES FOR PROPOSED
ONE (1 NO.) EXPLORATORY BOREHOLE ATNJUMBI HIGH SCHOOL
MURANG'A COUNTY**

1. GENERAL

Introduction

This Technical Specification describes in outlines the specification for one borehole proposed to be drilled in Njumbi High School Centre area in Murang'a County (see table 1).

Objective of works

The objective of these works is to construct one (1) exploratory/production boreholes at a completed and cased diameter of not less than 208 mm (8") to a depth not exceeding 350 m as specified in the bill of quantities and in this technical specification. Boreholes will be tested according to the Water Resources Management Rules, 2007, and may subsequently be put into service as water supply boreholes by the respective County government.

Authorizations will be provided AT the respective Water Resources Authority (WRA) Office (Murang'a Sub Region Office).

Supervision of works

WRA shall have the right to appoint its own supervisor or inspector to monitor the conduct of the works, should it so wish, at its own cost. The Drilling contractor shall have a hydrogeologist as part of the contractor team. The hydrogeologist should be a water resources professional with a valid license in 2020 (Hydrogeologist) with the Ministry of Water, Sanitation and Irrigation. He will also demonstrate professional qualifications including degree certificate in Geology,

WRA will inspect plant and personnel proposed by any Contractor for deployment for the works prior to the award of contract. Rig capable of mud drilling is recommended due to the geology of the area.

Location of the works

Borehole will be drilled in sites selected as follows in Murang'a County

SITE NAME	LOCATION	FORMATION	GEOGRAPHICAL COORDINATES	COUNTY
Njumbi High School	Nyakianga Area Njumbi Division Mathioya Sub-County	Volcanic	Longitude 36.952155; Latitude: -0.64146 Elevation: 1861 amsl	Murang'a

Contractors should note that access to sites is on rural access roads that are in variable condition; however, we foresee no specific problems facing mobilisation under normal conditions with plant in normal working condition.

The Client shall make available a working area of not less than 30 x 30 m prior to drilling plant arriving on site.

Description of the Contractor/ works

The driller of the works should fulfill statutory registrations as a contractor of similar works. The firm should have a valid license for the year 2020 from the Ministry of Water, Sanitation and Irrigation and National Construction Authority and all such condition as will be set out by the Authority towards this work.

The Contractor shall mobilise both drilling and test plant and all related equipment to ensure their availability to undertake the works. The process shall be as follows: -

Borehole construction

- 1) Mobilise to the site and set up drilling plant at the first drill site.
- 2) Drill a borehole to a depth of 350 m at a diameter of not less than 203 mm (8”), unless directed by the Supervising Hydrogeologist to complete drilling at a shallower depth.
- 3) Collect samples at every 2 metres and lay them out as per the Code of practice for the construction of a borehole (section 4.2)
- 4) Examine and record in the relevant forms the collected samples description as per the Code of practice for the supervision of construction and test pumping of boreholes (sections 4 and the referred forms)
- 5) Provided significant groundwater is encountered, supply and install 152 mm (6”) steel casing and screen, gravel pack and inert backfill. If a shallow saline or brackish aquifer is encountered, this may be sealed off with grout if so instructed by the supervising hydrogeologist.
- 6) Develop the completed borehole.
- 7) Disinfect the completed borehole.
- 8) Carry out electrical(resistivity) and gamma logging. These should be conducted before installation of casing against the raw borehole wall.
- 9) Construct the borehole headworks.
- 10) Carry out down the hole filming using a Borehole Camera.

Borehole pumping test

- 11) Mobilise test pumping plant to the site and set up at the borehole to be tested (as instructed by the Supervising hydrogeologist).
- 12) Install test pumping plant and conduct pumping and recovery tests in the first borehole to be tested.
- 13) Sample and have the pumped water analysed for chemical and bacteriological parameters from the borehole.
- 14) Remove test pumping plant.
- 15) Install well cap that is tamper proof till the works are commissioned.

This outline programme should not be considered immutable: in the event that boreholes are either dry or produce water of insufficient quantity or unacceptable salinity, it is likely that boreholes will not be subjected to testing.

Programme of works

The Contractor shall provide the Supervising hydrogeologist with a detailed Programme of Works within seven days of site handover to be drilled and the order in which they will be drilled. This Programme shall be mutually agreed. It shall include both a logistic and a communication plan. These shall *in total* thereafter be deemed the Agreed Programme. The Contractor shall adhere

strictly to the Agreed Programme unless otherwise authorised by the Supervising hydrogeologist in writing or by other mutually approved method.

This shall exclude Acts of God, Force *Majeure* and other unavoidable events, but shall not exclude delays arising from mechanical plant breakdown, labour disputes or failure to ensure that water is available on site for drilling. Acts of God explicitly exclude normal rains. Unauthorised departure from the Agreed Programme may incur liquidated damages.

Bills of quantity

The Items and Rates given by the Contractor are deemed the Bills of Quantity that shall apply to these works.

Payments will be made according to the actual depth drilled, materials installed and works, and tests undertaken, except where errors are the responsibility of the Contractor.

Site access and permits

The Client will obtain all necessary permits and authorisations. Copies of all documentation required by the Water Resources Management Rules, 2007 will be handed over to the Contractor as will the EIA Licence (if relevant).

Provision of equipment, materials and labour

The Contractor shall provide all equipment, transport, materials consumables and labour necessary for the satisfactory completion of the Works in compliance with this Specification. Direct rotary plant shall be deployed, capable of drilling a borehole to a depth of 350 m at a diameter of not less than 254 mm (10") in basalts, volcano clastic sediments, old land surfaces and weathered and fresh Basement rock.

Bidders **must** be able to deploy both air (down-the-hole hammer) and fluid flush drilling equipment for these works. The most appropriate method will be left to the drilling contractor to decide, after consultation with the Supervising hydrogeologist.

When bidding, Contractors shall provide full specifications of all plant to be deployed for these Works, including all downhole drilling and fishing tools (including a Schedule of bits, stabilisers, subs, crossovers etc). The Supervising hydrogeologist will inspect plant and materials prior to mobilisation and may reject plant or material that in his view is sub-standard or inappropriate.

The bidder will also provide full specifications of the electrical logger and borehole Camera. The electrical logger and borehole camera should be appropriate to log or film to a maximum depth of 400m.

Bidders shall present method statements in their Proposal describing in detail the proposed approach to these works, in which respect his attention is drawn to the need to describe their proposed approach to the following: –

1. Logistic train available to support the works; this shall include all haulage plant and the specification of all drilling, development, testing and associated plant; and the Schedule of bits, stabilisers subs, crossovers etc proposed for

- deployment to site;
2. Proposed borehole drilling approach, including measures to overcome setbacks that may be encountered during drilling (including but not limited to collapse of geological material);
 3. Proposed approach to reaming (if proposed), including measures to overcome setbacks that may be encountered during reaming (if applicable);
 4. Proposed approach to the completion of the drilled borehole as a production borehole, including specifications of casing, screen and gravel pack; proposed casing attachment method (e.g. butt-welding or ring-welding, etc);
 5. Proposed development methodology or methodologies.
 6. Confirmation of intention to comply with Kenya Code of Practice for the Test Pumping of Boreholes in respect of all pumping and recovery tests; or by providing a detailed description of the proposed approach to conducting constant discharge and recovery tests;

Personnel on site

The Contractor shall provide summary details of the experience of key personnel to be deployed for these Works, in the form of short *curricula vita* for each of the principal drill team members, in particular the Hydrogeologist and drilling Supervisor. He should confirm availability three more Drillers.

Elements which are considered of particular importance are years of drill team experience in deep borehole construction in volcanic, basement and alluvial/sedimentary formations both in the County and elsewhere in Kenya as well as relevant professional qualifications. Demonstrated experience in the logistic support of remote sites is also clearly advantageous.

Diligent performance

The Contractor shall at all times perform the Works diligently and in accordance with sound professional practice. The Contractor shall not proceed from one stage of works to another without the express permission of the Supervising Hydrogeologist bearing in mind the nature of an exploratory exercise.

Decisions regarding discontinuing any element or part of any element of these works, or abandonment of these works, shall be discussed jointly between the Contractor and the Supervising Hydrogeologist before any further actions are authorized by the Supervising Hydrogeologist. The Supervising Hydrogeologist's decision shall be final and shall be given in writing.

The Supervising Hydrogeologist will require a written submission justifying any steps taken or works conducted by the Contractor made without the Supervising Hydrogeologist's approval. An unsatisfactory explanation shall lead to non-payment for works undertaken without prior agreement and may be taken into consideration for inclusion as liquidated damages.

Lost bore

If the Contractor is unable to finish drilling or has to abandon a well due to the loss of tools or any other accident or contingency that is his responsibility, the borehole will

be deemed a Lost Bore. This includes his equipment not able to drill through any formation, it is deemed that if offered this work the plant is capable of drilling through any formation. The Contractor shall remove all casing or drill pipe already placed in the hole where this is possible and plug it to surface at his own expense. All material remaining in and removed from the hole will remain the property of the Contractor. In such a case the Client shall not pay for any of the work carried out and will authorise in advance the drilling of a new hole at a site near the abandoned one, after consultation with the Water Resources Authority.

In the event that a successfully-drilled borehole is deemed by the Supervising Hydrogeologist to be dry or is of unacceptable salinity and should be abandoned, the Contractor shall be paid for all works associated with its drilling and abandonment and the designation Lost Bore shall not apply.

2. TECHNICAL SPECIFICATION, EXPLORATION/PRODUCTION BOREHOLES

Only One (1) borehole shall be constructed. The precise sites on which the boreholes will be constructed will be shown to the Contractor by the Client or the Client's representative; the Contractor shall not commence setup or drilling at an unapproved site; should he do so, all costs shall be deemed his own. All necessary permits and authorisations will have been issued and will be made available to the Contractor prior to mobilisation.

Mobilisation, demobilisation and site restitution – drilling plant

Description

The Contractor shall mobilise his drilling plant to the drill site in accordance with the Agreed Programme. Mobilisation is deemed to include the erection, dismantling, preparation of the drill site area and its restitution after the completion of all works; and erection and removal of a temporary camp at the site indicated by the Client should this be required.

On completion of works, the site shall be cleaned, and surplus material removed to the satisfaction of the Supervising Hydrogeologist. Site re-instatement includes the removal off-site of all hydrocarbons changed, spilled, leaked or otherwise released, all packaging and cotton waste.

The Contractor shall make his own arrangements for the collection and transport of water for drilling and camp purposes.

Rates

The Contractor shall provide: –

- A lump sum price for mobilisation and demobilisation of drilling plant, site re-instatement, and camp, including setting up, commencing at the site.
- A lump sum price for the borehole for water provision and haulage

Drilling

Description

Boreholes shall be drilled at a diameter of not less than 203mm (8”) to allow the safe installation of 152 mm (6”) production casing and screen, to a depth not greater than 350m. The Contractor shall provide plant capable of drilling to a depth of 350m at a diameter of 20mm (8”).

The Contractor shall be responsible for the drilling method or methods selected, and neither the Client nor the Supervising Hydrogeologist shall be held responsible should the method or methods adopted fail in the objective of drilling to a depth of at least 350 m. It is imperative for the contractor to be familiar with site drilling and geological conditions beforehand.

With rotary methods the Contractor shall not use excessive pulldown on the bit. Should the borehole be skewed as a result of excessive pulldown, and the borehole not fit for purpose in consequence, the hole shall be deemed a Lost Bore. The Contractor is required to deploy a stabiliser/drill collar of appropriate diameter when drilling; the following table presents acceptable ranges for stabilisers/drill collars for different borehole diameters: –

Drilling diameter, inches	Recommended stabiliser diameter (range), inches
6½”	4¾” – 5”
8½”	6½” – 6¾”
9½”	6” – 7¼”
11”	8¼” – 9½”

A) drilling with air/foam

Foam used for hammer drilling and additives used for fluid rotary flush drilling must be suited to environmental applications. The Contractor shall be responsible for ensuring that the additives deployed are suitable for such conditions and shall furnish the specification of all proposed additives with his proposal.

B) drilling with fluid flush

Fluid additives of bentonitic type will not be acceptable for use in these works: if fluid rotary flush methods are to be adopted, either cellulose-based reconstituted powder or artificial liquid anionic polymeric additives will be used for viscosity enhancement. The Contractor will state the type and manufacturer of additive(s) to be used and will describe the means by which the additive(s) will be mixed. The judicious application of bentonite and cellulose or similar material will be acceptable as a means of preventing loss of circulation in those parts of the borehole located above the aquifer zone, though their use must be authorised in advance by the Supervising Hydrogeologist.

Rates

The Contractor shall provide unit prices for the following: –

A: drilling with air/foam

- Drilling at a diameter to accommodate surface casing (per metre) (provisionally 12m);
- Drilling at 203mm (8”) from the depth to which surface casing has been installed to 100mbgl (per metre), provisional total 88 m;
- Drilling at 203 mm (8”) from 100 to 350 (per metre)

B: drilling with fluid flush

- Drilling at a diameter to accommodate surface casing (per metre) (provisionally 12m);
- Drilling at 203mm (8”) from the depth to which surface casing has been installed to 100mbgl (per metre), provisional total 88m.
- Drilling at 203 mm (8”) from 100 to 350mbgl (per metre),

Supply and installation of temporary / surface casing

Description

Boreholes may require temporary casing to protect the wellhead from cavitation while drilling at greater depths. The Contractor should allow for not less than three (3) metres of temporary casing per borehole, though the Supervising Hydrogeologist may require surface casing to be installed to depths greater than this, and the Contractor must ensure that sufficient temporary casing is deployed to site to allow installation to greater depths. Casing used as surface casing shall be new mild steel of a specification suited to water well applications for installation to depths not exceeding 5 m depth; the specification shall be given in the Contractor’s Proposal.

Rates

The Contractor shall provide unit prices for the following: –

- Supply/install and or remove temporary / surface casing (per metre; rate only);

The provisional total for temporary / surface casing is 12 metres.

Sample collection and storage, and record keeping

Description

Geological samples of dry weight 500 g shall be collected at 2 m intervals and at prominent lithological boundaries. These are to be sun- or oven-dried, packed in polythene bags or bottles of appropriate size, and clearly marked with tie-on labels indicating date of collection, depth interval and borehole name and number. These will be analysed on site by the Supervising Hydrogeologist.

The Contractor shall record the depth of any zone of lost circulation for which no sample was taken.

A log of the rate of penetration, in minutes per metre drilled, shall be kept. The depth of any voids, or of particularly rapid penetration, or significant changes in rig noise indicating changes in geological conditions, shall also be noted.

Water levels shall be measured and recorded at the start and end of every shift, after significant breaks in activity (such as meal breaks), and during periods of plant downtime (as appropriate), and as required by the Water Act 2016 (Fourth Schedule). Water levels shall be measured using a sounding and/or lighting dipper approved in advance by the Supervising Hydrogeologist. One (1) fully functional dipper, complete with spares batteries, bulbs or buzzers (as appropriate), shall be deployed with the drilling rig throughout drilling operations. The Supervising Hydrogeologist will check

that the dipper meets the required standard.

Rates

The Contractor shall provide a unit rate for the collection, drying and packaging of samples, which shall include the collection of water level data during the drilling process.

There shall be a provisional maximum of 175 samples generated during the drilling programme, assuming that the full metreage is drilled. The number of water level measurements that shall be collected cannot be anticipated.

Geophysical Logging

3. The successful bidder will conduct electrical downhole geophysical logging of all boreholes, for all parts of each borehole that are saturated. It is acknowledged that this may require more than a single pass in any one borehole.

4. The electric log will be collected at 1 metre intervals, with the following data required by the logging process: -

- i. Self-potential (in all cases SP shall be measured during the first instrument run, down the borehole)
- ii. Temperature (again, measured during the first run)
- iii. Fluid resistivity (again, measured during the first run)
- iv. Short-normal resistivity
- v. Long-normal resistivity
- vi. Lateralog (resistivity)

5. Bidders shall provide: –

- a) A unit measurement rate for running logs, multiple pass. Thus for a 250 m-deep borehole, the net run will cover 250 measurement sets (each comprising one each for the six parameters listed at 2. above). The maximum possible total number of logging points will be 350M in the borehole; however, as measurements cannot be made in unsaturated sections of boreholes, the actual total will be less than this.

The contractor shall carry out the required operations by personnel skilled both in conducting the

measurements and the interpretation of the results. The operation shall be as follows

- a. Electric logging shall be conducted in uncased boreholes upon completion of the drilling of the pilot holes (before reaming).
- b. Gamma logging
- c. The drilled hole shall be cleaned by circulation of drilling fluid and its depth measured.
- d. The electrode cables shall be lowered into the borehole while at the same time measuring the depth.
- e. The logs shall be taken from the bottom of the borehole upwards while the cable is taut over its entire length.

Upon completion of all operations the contractor shall provide the Supervising Hydrogeologist with the electric logs comprised of SP curve and R curve, together with their interpretation. Should the Supervising Hydrogeologist refuse to accept the results of the logging because of technical faults then the contractor shall repeat the measurement until satisfactory results are obtained.

The logging data should be presented in a good practice format.

Abandonment if dry

Description

If the borehole is deemed “dry” by the Supervising Hydrogeologist (which may simply indicate that insufficient water has been encountered to justify completion as a production borehole, or that saline water has been encountered), he shall instruct that all surface casing be removed from the borehole, and that the borehole be backfilled with drill cuttings to 2 m bgl. From 2 m bgl to ground level a 1: 2 OPC: sand grout plug will be installed (for specification see S. 2.9.1). Set into the top of this plug shall be a mild steel plate, on which the WRMA Authorisation number shall be inscribed or written in weld-metal.

Rates

The Contractor shall be paid for all works associated with drilling and making safe an abandoned borehole. The Contractor shall provide unit prices for the following: –

- Backfilling with drill cuttings (per linear metre: rate only);
- Grouting from 2 m bgl to ground level and provision of a steel plate with borehole identification number to be set into grout (lump sum; rate only).

Supply and installation of permanent casing and screen

Casing and screen specification

Casing shall be new 152 mm (6”) internal diameter mild steel of a specification suited to water well applications in boreholes of up to 400m depth.

Screens shall comprise mild steel 152mm (6”) diameter screen with plasma-cut slots of size 1.0 mm in width, with an open area of not less than 6%. Slots cut with an oxy-acetylene gas torch will not be acceptable. The Contractor will provide open area and column strength information in his Proposal.

Casing and screen installation

Before installation of casing and screen the hole shall be shown clear to design depth and diameter; if not clear the hole shall be flushed to remove any backfilled material present.

Where casing and screen are to be welded the appropriate welding electrodes shall be used. Welding shall proceed only when the casing or screen length is demonstrated to be vertical. Care shall be taken to ensure that all oxide coating is removed between welding passes, and to avoid any burn-through or deposition of weld on the inside of the casing or screen.

The base of the casing string shall probably be blinded. The decision as to whether it is left open or sealed will be finalised during the borehole design stage by the Supervising Hydrogeologist. Blinding may comprise either a pointed or a flat closure,

at the discretion of the Contractor and with the approval of the Supervising Hydrogeologist. The closure shall entirely seal the casing string and shall be constructed of mild steel. The Supervising Hydrogeologist will consider alternative means by which casing bottom blinding may be achieved, including running a steel slug packer into the casing string after installation to design depth; or by running a grout into the base of the borehole. Should the Contractor propose alternatives, he shall describe the method in appropriate detail in his Proposal.

The top of the casing string at completion of construction shall terminate not less than 0.35 m above original ground level.

Rates

The Contractor shall provide unit prices for the following: –

- Supply/install mild steel plain casing (per metre);
- Supply/install mild steel screen (per metre).

Supply and installation of gravel pack

Gravel pack specification

The Contractor shall supply and install filter pack/formation stabiliser. Material shall be 2-4 mm diameter, clean well-rounded siliceous gravel with no more than 5% non-siliceous material. The Contractor shall provide in his Proposal a particle size distribution curve from a reputable laboratory describing the gravel pack he proposes to install, as well as the bulk density of the pack material expressed as kg per m³.

The pack shall be inspected by the Supervising Hydrogeologist on site, and if it is excessively dirty, he will require that it be washed to his satisfaction, before approving its installation into the borehole annular space; the costs associated with such washing on site shall be met by the Contractor, and the time spent doing so will be accounted as down-time.

Gravel pack installation

Installation of gravel pack/formation stabiliser may use water washdown or reverse circulation methods. In the latter case a pump set or airlift string shall be installed in the borehole so as to encourage material settlement. 65% chlorine granular calcium hypochlorite will be introduced into the annular space along with the pack material at a nominal concentration of 500 grammes per cubic metre of pack. This will break down any residual additive(s) (if used) and will disinfect the wellbore.

The filter pack shall terminate not less than 10 m above the uppermost screen when stabilised, or as otherwise directed by the Supervising Hydrogeologist. The contractor shall describe how he proposes to measure the level of gravel pack.

Rates

The Contractor shall provide a unit volume price for the supply and installation of gravel pack, inclusive of washdown or reverse circulation, and granular calcium hypochlorite.

Installation of backfill

Description

Backfill material shall comprise fine or clayey drill cuttings and shall be installed from

the top of the filter pack to 3 m bgl or as otherwise directed by the Supervising Hydrogeologist. The installation method must ensure that no bridging occurs within the annular space. The Contractor shall measure the depth to the top of the backfill and provide the means by which this level shall be measured.

Rates

The Contractor shall provide a unit linear metre price for the installation of inert backfill. Bidders must bear in mind that the installation of backfill is a simple manual job. If the linear meter rate for manual backfilling exceeds that offered for day rate (manpower), then the latter rate may be used on a *pro-rata* basis should the Supervising Hydrogeologist consider the cost saving to be significant.

Grout

Description

In the event that a saline aquifer is encountered at any depth, the Supervising Hydrogeologist shall instruct the Contractor to install a cement grout that shall effectively and permanently seal the aquifer from the casing string and vertical percolation.

In any event the Contractor shall install a cement grout as a sanitary seal at the wellhead, which shall be installed from 3 m bgl to ground level.

Grout specification and installation

Grout shall comprise a cement/fine siliceous sand mixture in the ratio 1: 2, mixed with just enough water that it can be poured (it should have a slurry weight not less than 1.6 kg/l), which shall be installed from the top of the inert backfill to ground level or as otherwise directed by the Supervising Hydrogeologist. The installation method must ensure that no bridging occurs within the annular space. The Contractor shall measure the distance to the top of the grout from time to time and provide the means by which this level shall be measured. The installation method and the means of measurement will be described in the Proposal.

Rates

No provisional total for grout is provided, since downhole grouting needs are not known at this draft Specification stage. Less than 200 litres of grout will be required for sanitary seal grouting, however. The Contractor shall provide:

- A unit price for the supply and installation of grout to specification (per cubic metre);
- An hour rate for waiting on grout.

Development

Boreholes shall be comprehensively developed in accordance with modern borehole construction practices. This Specification includes the possibility that chemical development will be required. The Contractor will include equipment and chemicals for chemical development, though there is no certainty that chemical development will be required.

Physical development

Physical development may adopt any of the commonly used methods, including but not necessarily restricted to, the following: –

- Surging with a surge block;
- High-velocity water jetting;
- Airlift rawhiding;
- Airlift rawhiding with eductor pipe.

Rawhiding using air, either with or without eductor pipes, is considered the optimum development method. The use of an eductor pipe effectively focuses the development energy to specific parts of the screen, allowing development in detail. Fines are flushed to the surface by airlift pumping. The Contractor shall provide a method statement describing the proposed methodology, including compressor characteristics and airline and eductor pipe diameters (if proposed).

The Contractor shall describe in detail the methodology proposed for undertaking the development method of their choice, and the plant available for doing so.

Not less than 3 and not more than 8 hours of physical development will be required. Development will be considered complete only when less than 5 ppm of suspended solids remain in the water, provided that pumping test data do not indicate further development taking place during the borehole pumping test.

Chemical development

If clays are encountered and their removal is required, the Supervising Hydrogeologist will instruct the Contractor to commence development using chemical methods.

If required, chemical development will use an approved polyphosphate as a disaggregant that shall break down clays, silts, or other fine material adjacent to the wellbore. Consideration shall be given to the geological log when dosing; where clays are abundant the over-application of polyphosphate can lead to sloughing of geological material and may damage the borehole.

The decision as to whether chemical development shall be adopted, and at what dosage rates, shall be made by the Supervising Hydrogeologist on the basis of observations made during drilling and sample logging.

Rates

The Contractor shall provide unit prices for the following: –

- Physical development (per hour) – this explicitly refers to development time, and excludes the time taken for installation/removal of development tools which shall be costed into the development rate;
- Chemical development (each chemical development exercise; rate only), inclusive of installation/removal of development tools.

Provisionally, there shall not be more than 40 hours of physical development. Bidders should allow for not less than five (5) chemical development cycles.

Borehole Testing

Introduction

The boreholes shall be tested in accordance with modern practices. Borehole testing

shall be conducted according to British Standard BS 6316 (1992) (Code of Practice for Test Pumping of Water Wells), or the draft Kenya Code of Practice for the Test Pumping of Boreholes or an acceptable equivalent. The following elements shall be required:–

- a) A pre-test.
- b) A 10-hour step-drawdown test.
- c) A constant discharge test for 24 hours.
- d) A recovery test.

The step-drawdown and constant discharge tests shall be timed so as to begin in the morning, in order that the frequent early test time measurements are made during daylight hours.

Installation, plant and methodology

Pumping plant and dipping tube shall be installed in the borehole. The Supervising Hydrogeologist shall specify anticipated discharge and pump intake depth.

a. Pumping plant

Pumps used for testing may be electric submersible, surface-mounted turbine, or reciprocating pumps. Intake depth shall not be less than 300 metres below ground level. Any pump used in tests shall have a fully functioning non-return valve either in the pump itself or in the rising main immediately above the top of the pump.

Discharges shall be in the range 3 to 30 m³/hr at dynamic heads of at least 300 metres and the Contractor shall have at his disposal pumps and appropriate power generation plant covering this discharge and head range. Bidders shall provide the specification (manufacturer, designation and performance curves) for the pumps they propose to deploy for these works as a part of their Proposal.

Rising main pipe shall be of a material suitable for installation depths to a minimum of 300 metres. The water pumped from the borehole shall be discharged to waste at a distance not less than 10 metres from the wellhead or as otherwise approved by the Supervising Hydrogeologist, and in such a manner that it does not flow back towards the borehole.

A generator or other prime mover shall be provided for powering the pump; the power source shall be able to provide motive power without stopping for any reason, for a continuous period of not less than 30 hours. Weatherproofing for the prime mover and the wellhead area, such that rain will not prevent tests from being undertaken, shall also be provided.

Any failure to adequately weatherproof prime moving plant or any mechanical failure leading to the abandonment of tests will be at the Contractor's cost, as abandoned tests will not be paid for. Furthermore, the Client shall hold back from payment any costs incurred by himself in respect of additional site time costs incurred by the Supervising Hydrogeologist for this reason.

(i) Discharge measurement and control

Discharge measurement shall be by an approved accurate method, such as an orifice plate, calibrated flow meter, V-notch weir or using a volumetric method.

If volumetric methods are proposed, the Contractor will ensure that the container to be used has been calibrated and set absolutely horizontally; each discharge measurement shall be calculated from the average of not less than three time measurements, or as otherwise approved by the Supervising Hydrogeologist. The base on which the calibrated container is supported during measurement shall be horizontal, and the Contractor will be required to demonstrate this to the Supervising Hydrogeologist's satisfaction at any time before and during tests.

Discharge shall vary by not more than 15% across the constant discharge test, except when otherwise approved by the Supervising Hydrogeologist. If unapproved variation occurs the test shall be repeated. No payment shall be made for a failed test.

A flow control device (a globe or gate valve) and a pressure gauge will be supplied for flow control.

(ii) *Water level measurement*

Water level measurement shall be by electric sounding and/or lighting dipper and shall be made in a dipper tube installed alongside the test pump rising main and secured to it. The Supervising Hydrogeologist will check the dipper for stretch and any other inaccuracies prior to accepting its use; the dipper must be marked such that measurements may be read off the tape to the nearest centimetre without recourse to rulers or other measuring devices. Reproducibility of measurement shall be ± 2.0 cm or better. Water level measurement using a pressurised airline and pump shall not be acceptable on the grounds of poor precision.

The Contractor will deploy two (2) fully functional dippers for the testing works, which will be inspected prior to approving mobilisation. Any tests that are terminated due to faulty dippers will be at the Contractors cost, and any delays may also be included as grounds for liquidated damages. Delays that lead to standing time on site by the Supervising Hydrogeologist will also be at the Contractor's cost.

(iii) *Time measurement*

All times shall be recorded by means of a stopwatch or similar approved timepiece; mobile phone stopwatches will not be approved as timepieces. The Contractor shall ensure that spare batteries, etc. for all equipment are available on site prior to commencing tests.

b. Pre-test

The pre-test will check all equipment and shall not exceed three (3) hours.

c. Step-drawdown test

Each successful borehole will be subjected to a 5-step, 10-hour long step-drawdown test which will commence early in the day following the installation and testing of test plant.

d. Constant discharge test

The constant discharge tests shall last not less than twenty-four (24) hours, unless otherwise approved by the Supervising Hydrogeologist; they will commence early in the day following the step-drawdown test. The borehole shall be pumped at the highest discharge it is deemed capable of, or the maximum discharge the pump is capable of. The constant discharge test shall not start until water level has returned to

true static water level, unless otherwise approved by the Supervising Hydrogeologist. Water samples will be collected towards the end of the constant discharge test for subsequent analyses by an approved laboratory (§ 2.12 below).

e. Recovery test and removal of plant

Recovery tests shall continue for not longer than twelve hours (12) hours, unless otherwise directed by the Supervising Hydrogeologist.

Only after the completion of recovery data collection may pumping and ancillary plant be removed from the borehole, though aboveground components may be dismantled during the recovery phase provided this in no way affects the collection of water level data or affects water level recovery.

Rates

The Contractor shall provide unit prices for the following: –

- A lump sum price for mobilisation and demobilisation of testing plant and camp to the first work site at which testing will commence, to include setting up;
- A unit price per kilometre, for moves of test plant between sites in the County;
- A lump sum price each for setup within the County, to a maximum of one (1) such moves;
- A unit rate for conducting discharge tests (per hour) (covering the pre-test, step-test and constant discharge test), which shall include installation of pumping plant;
- A rate for conducting the recovery test (per hour), which shall include removal of pumping plant at the conclusion of testing.

There shall be a provisional maximum of 24 hours of drawdown test (including pre-tests, step- drawdown tests and constant discharge tests); and a provisional maximum of 24 hours of recovery test.

Water sampling and analysis

Analysis specification

In the closing hour of each constant discharge test water samples shall be collected for chemical and bacteriological analysis by Water Resources Authority Central Water Testing laboratory, or field measurement (in the case of electrical conductivity and temperature).

Chemical analysis shall include direct measurement of the following parameters: –

- Field electrical conductivity (corrected to 25oC); a suitable instrument must be deployed along with the drilling and pumping test crew
- Field water temperature; a thermistor or an alcohol-in-glass thermometer must be deployed along with the drilling and pumping test crew (mercury-in-glass thermometers will not be acceptable)
- Field pH
- Field alkalinity (both carbonate and bicarbonate)

- Hardness (carbonate and non-carbonate)
- Sodium
- Potassium
- Calcium
- Magnesium
- Iron (all species)
- Manganese
- Bicarbonate
- Carbonate
- Chloride
- Sulphate
- Fluoride
- Nitrate
- Nitrite
- Total Dissolved Solids
- Total Suspended Solids

The Supervising Hydrogeologist shall check the completeness of analyses by calculating the charge balance. If this shows an error greater than $\pm 10\%$, the test shall be repeated at the Contractor's cost. The Contractor shall provide the name and address of the laboratory or laboratories that shall undertake the analyses and confirm that all of the above parameters can be determined by the laboratory or laboratories.

Bacteriological analysis shall test for total plate count at 37°C, total coliforms and *E. coli*, in accordance with KS 05-459: Part 1: 1996 (Table 4, *i* to *iii*). Analysis for bacteriological parameters must commence within 6 hours of the collection of the sample, in accordance with the Kenya Standard. The Contractor shall describe how bacteriological samples will be transported to the selected laboratory in compliance with the Kenya Standard.

The Contractor shall provide the name and address of the laboratory that shall undertake the analysis and confirm that all of the above parameters can be determined by that laboratory.

Rates

The Contractor shall provide unit prices for the following: –

- Full chemical analysis (each)
- Bacterial analysis (each).

There shall be a provisional maximum of five (5) sets of chemical and bacteriological analyses.

Borehole headworks

Headworks specification

The ground surface at the wellhead shall be excavated to a depth of one metre, and be one metre square, to allow a concrete plinth to be cast. The 1 x 1 x 1 m pit will be filled with concrete, to be finished just proud of ground surface and shaped at surface with appropriate formwork. Concrete shall be 1:2:4 OPC: siliceous sand: half-inch

ballast: **volcanic sand will not be approved for use in mixing concrete.** The concrete must be cast with two 0.8 m lengths of 12 mm reinforcing bar welded horizontally to the 152 mm (6") casing 0.7 m below ground level.

Rates

The Contractor shall provide a price for the following: –
- Headworks complete (each).

There shall be a provisional maximum of one (1) headworks.

Borehole cap

Borehole cap specification

After removal of test plant, the Contractor shall supply and install a borehole cap. This shall be fashioned such that its internal diameter is marginally greater than the external diameter of the 152mm (6") permanent casing, so that when it is in position it completely seals the borehole from the accidental or deliberate introduction of foreign material. The vertical sides of the cap should not exceed 75 mm in length. This cap will be tack-welded into place, with three single passes of mild steel weld not less than 50 mm long bonding the bottom lip of the cap to the permanent casing. The three lengths of weld will be located at 120o intervals around the cap.

Rates

The Contractor shall provide a price for the following: –
- Supply and install borehole cap complete (each).

There shall be a provisional maximum of three (3) borehole caps.

Records and reporting

Description

The following records shall be submitted to the Supervising Hydrogeologist within fourteen days of completion of the works at each borehole bound in one report except for the down the hole camera film.

- Borehole number/name and schematic diagram of borehole in section
- Pumping test times, discharge and water level data
- Results of chemical and bacteriological analyses
- Originals of signed daily reports as per the codes of practice for construction of boreholes and codes of practice for the supervision of construction and pumping test of boreholes, These will be provided by WRA
- Drilling penetration log
- Geological log
- Form WRMA 009A Borehole Completion Record in draft (the preparation and submission of a

WRMA 009A is a legal obligation under the Water Act 2016). It should be duly filled in by the Supervising hydrogeologist and Driller

- The resistivity logging and **the interpretation report**

- The Gamma logging data and **interpretation report**
- 1 DVD/flash disk of the borehole camera film of the borehole

It is acknowledged that some chemical analysis laboratories may be unable to present analytical results within the fourteen day period stipulated above. Delays caused by a laboratory shall not be considered grounds to invoke liquidated damages.

Rates

The Contractor shall provide a price for the following: –

- Record set complete (each).

There shall be a provisional maximum of three copies of borehole completion record sets of reports described above, which shall include for dry or abandoned boreholes.

Borehole Camera Video Log

Upon completion of pump testing, the Contractor shall Video Log the well in color on DVD not more than seven (7) days following final pumping. The Video Log shall be provided to the WRA in a DVD/flash disk copy

TECHNICAL SPECIFICATIONS

**TECHNICAL SPECIFICATIONS AND FORM BILLS OF QUANTITIES FOR PROPOSED
ONE (1 No.) EXPLORATORY BOREHOLE AT NUU BOYS SECONDARY
SCHOOL KITUI COUNTY**

6. GENERAL

Introduction

This Technical Specification describes in outlines the specification for one borehole proposed to be drilled in Nuu Secondary School in Kitui County (see table 1).

Objective of works

The objective of these works is to construct one (1) exploratory/production boreholes at a completed and cased diameter of not less than 208 mm (8”) to a depth not exceeding 300 m as specified in the bill of quantities and in this technical specification. Boreholes will be tested according to the Water Resources Management Rules, 2007, and may subsequently be put into service as water supply boreholes by the respective County government.

Authorizations will be provided AT the respective Water Resources Authority (WRA) Office (Kitui Sub Region Office).

Supervision of works

The WRA shall have the right to appoint its own supervisor or inspector to monitor the conduct of the works, should it so wish, at its own cost. The Drilling contractor shall have a hydrogeologist as part of the contractor team. The hydrogeologist should be a water resource professional with a valid license in 2020 (Hydrogeologist) with the Ministry of Water & Sanitation and Irrigation. He will also demonstrate professional qualifications including degree certificate in Geology,

WRA will inspect plant and personnel proposed by any Contractor for deployment for the works prior to the award of contract. Multipurpose Rig capable of mud drilling is recommended.

Location of the works

Boreholes will be drilled in sites selected as follows in Wajir County

SITE NAME	LOCATION	FORMATION	GEOGRAPHICAL COORDINATES	COUNTY
NUU Secondary School	Nuu Town	Basement system	Easting: 0428980, Northing: 9882119, Elevation: 633m	Kitui

Contractors should note that access to sites is on rural access roads that are in variable condition; however, we foresee no specific problems facing mobilisation under normal conditions with plant in normal working condition.

The Client shall make available a working area of not less than 30 x 30 m prior to drilling plant arriving on site.

Description of the Contractor/ works

The driller of the works should fulfill statutory registrations as a contractor of similar works. The firm should have a valid license for the year 2020 from the Ministry of Water, Sanitation and Irrigation and National Construction Authority and all such condition as will be set out by the Authority towards this work.

The Contractor shall mobilize both drilling and test plant and all related equipment to ensure their availability to undertake the works. The process shall be as follows: -

Borehole construction

- 1) Mobilize to the site and set up drilling plant at the first drill site.
- 2) Drill a borehole to a depth of 300 m at a diameter of not less than 203 mm (8”), unless directed by the Supervising Hydrogeologist to complete drilling at a shallower depth.
- 3) Collect samples at every 2 meters and lay them out as per the Code of practice for the construction of a borehole (section 4.2)
- 4) Examine and record in the relevant forms the collected samples description as per the Code of practice for the supervision of construction and test pumping of boreholes (sections 4 and the referred forms)
- 5) Provided significant groundwater is encountered, supply and install 152 mm (6”) steel casing and screen, gravel pack and inert backfill. If a shallow saline or brackish aquifer is encountered, this may be sealed off with grout if so instructed by the supervising hydrogeologist.
- 6) Develop the completed borehole.
- 7) Disinfect the completed borehole.
- 8) Carry out electrical (resistivity) and gamma logging. These should be conducted before installation of casing against the raw borehole wall.
- 9) Construct the borehole headwork.
- 10) Carry out down the hole filming using a Borehole Camera.

Borehole pumping test

- 11) Mobilize test pumping plant to the site and set up at the borehole to be tested (as instructed by the Supervising hydrogeologist).
- 12) Install test pumping plant and conduct pumping and recovery tests in the first borehole to be tested.
- 13) Sample and have the pumped water analyzed for chemical and bacteriological parameters from the borehole.
- 14) Remove test pumping plant.
- 15) Install well cap that is tamper proof till the works are commissioned.

This outline programme should not be considered immutable: in the event that boreholes are either dry or produce water of insufficient quantity or unacceptable salinity, it is likely that boreholes will not be subjected to testing.

Programme of works

The Contractor shall provide the Supervising hydrogeologist with a detailed Programme of Works within seven days of site handover to be drilled and the order in which they will be drilled. This Programme shall be mutually agreed. It shall include both a logistic and a communication plan. These shall *in total* thereafter be deemed the Agreed Programme. The Contractor shall adhere strictly to the Agreed

Programme unless otherwise authorised by the Supervising hydrogeologist in writing or by other mutually approved method.

This shall exclude Acts of God, Force *Majeure* and other unavoidable events, but shall not exclude delays arising from mechanical plant breakdown, labour disputes or failure to ensure that water is available on site for drilling. Acts of God explicitly exclude normal rains. Unauthorised departure from the Agreed Programme may incur liquidated damages.

Bills of quantity

The Items and Rates given by the Contractor are deemed the Bills of Quantity that shall apply to these works.

Payments will be made according to the actual depth drilled, materials installed and works, and tests undertaken, except where errors are the responsibility of the Contractor.

Site access and permits

The Client will obtain all necessary permits and authorisations. Copies of all documentation required by the Water Resources Management Rules, 2007 will be handed over to the Contractor as will the EIA Licence (if relevant).

Provision of equipment, materials and labour

The Contractor shall provide all equipment, transport, materials consumables and labour necessary for the satisfactory completion of the Works in compliance with this Specification. Direct rotary plant shall be deployed, capable of drilling a borehole to a depth of 300 m at a diameter of not less than 203 mm (8”) in basalts, volcano clastic sediments, old land surfaces and weathered and fresh Basement rock.

Bidders **must** be able to deploy both air (down-the-hole hammer) and fluid flush drilling equipment for these works. The most appropriate method will be left to the drilling contractor to decide, after consultation with the Supervising hydrogeologist.

When bidding, Contractors shall provide full specifications of all plant to be deployed for these works, including all downhole drilling and fishing tools (including a Schedule of bits, stabilisers, subs, crossovers etc). The Supervising hydrogeologist will inspect plant and materials prior to mobilisation and may reject plant or material that in his view is sub-standard or inappropriate.

The bidder will also provide full specifications of the electrical logger and borehole Camera. The electrical logger and borehole camera should be appropriate to log or film to a maximum depth of 350m.

Bidders shall present method statements in their Proposal describing in detail the proposed approach to these works, in which respect his attention is drawn to the need to describe their proposed approach to the following: –

1. Logistic train available to support the works; this shall include all haulage plant

- and the specification of all drilling, development, testing and associated plant; and the Schedule of bits, stabilizers subs, crossovers etc. proposed for deployment to site;
2. Proposed borehole drilling approach, including measures to overcome setbacks that may be encountered during drilling (including but not limited to collapse of geological material);
 3. Proposed approach to reaming (if proposed), including measures to overcome setbacks that may be encountered during reaming (if applicable);
 4. Proposed approach to the completion of the drilled borehole as a production borehole, including specifications of casing, screen and gravel pack; proposed casing attachment method (e.g. butt-welding or ring-welding, etc);
 5. Proposed development methodology or methodologies.
 6. Confirmation of intention to comply with Kenya Code of Practice for the Test Pumping of Boreholes in respect of all pumping and recovery tests; or by providing a detailed description of the proposed approach to conducting constant discharge and recovery tests;

Personnel on site

The Contractor shall provide summary details of the experience of key personnel to be deployed for these Works, in the form of short *curricula vita* for each of the principal drill team members, in particular the hydrogeologist and drilling Supervisor. He should confirm availability three more drillers.

Elements which are considered of particular importance are years of drill team experience in deep borehole construction in volcanic, basement and alluvial/sedimentary formations both in the County and elsewhere in Kenya as well as relevant professional qualifications. Demonstrated experience in the logistic support of remote sites is also clearly advantageous.

Diligent performance

The Contractor shall at all times perform the Works diligently and in accordance with sound professional practice. The Contractor shall not proceed from one stage of works to another without the express permission of the Supervising Hydrogeologist bearing in mind the nature of an exploratory exercise.

Decisions regarding discontinuing any element or part of any element of these works, or abandonment of these works, shall be discussed jointly between the Contractor and the Supervising Hydrogeologist before any further actions are authorised by the Supervising Hydrogeologist. The Supervising Hydrogeologist's decision shall be final and shall be given in writing.

The Supervising Hydrogeologist will require a written submission justifying any steps taken or works conducted by the Contractor made without the Supervising Hydrogeologist's approval. An unsatisfactory explanation shall lead to non-payment for works undertaken without prior agreement and may be taken into consideration for inclusion as liquidated damages.

Lost bore

If the Contractor is unable to finish drilling or has to abandon a well due to the loss of tools or any other accident or contingency that is his responsibility, the borehole will be deemed a Lost Bore. This includes his equipment not able to drill through any formation, it is deemed that if offered this work the plant is capable of drilling through any formation. The Contractor shall remove all casing or drill pipe already placed in the hole where this is possible and plug it to surface at his own expense. All material remaining in and removed from the hole will remain the property of the Contractor. In such a case the Client shall not pay for any of the work carried out and will authorise in advance the drilling of a new hole at a site near the abandoned one, after consultation with the Water Resources Authority.

In the event that a successfully-drilled borehole is deemed by the Supervising Hydrogeologist to be dry or is of unacceptable salinity and should be abandoned, the Contractor shall be paid for all works associated with its drilling and abandonment and the designation Lost Bore shall not apply.

7. TECHNICAL SPECIFICATION, EXPLORATION/PRODUCTION BOREHOLES

Only One (1) borehole shall be constructed. The precise sites on which the boreholes will be constructed will be shown to the Contractor by the Client or the Client's representative; the Contractor shall not commence setup or drilling at an unapproved site; should he do so, all costs shall be deemed his own. All necessary permits and authorisations will have been issued and will be made available to the Contractor prior to mobilisation.

Mobilisation, demobilisation and site restitution – drilling plant

Description

The Contractor shall mobilise his drilling plant to the drill site in accordance with the Agreed Programme. Mobilisation is deemed to include the erection, dismantling, preparation of the drill site area and its restitution after the completion of all works; and erection and removal of a temporary camp at the site indicated by the Client should this be required.

On completion of works, the site shall be cleaned, and surplus material removed to the satisfaction of the Supervising Hydrogeologist. Site re-instatement includes the removal off-site of all hydrocarbons changed, spilled, leaked or otherwise released, all packaging and cotton waste.

The Contractor shall make his own arrangements for the collection and transport of water for drilling and camp purposes.

Rates

The Contractor shall provide: –

- A lump sum price for mobilisation and demobilisation of drilling plant, site re-instatement, and camp, including setting up, commencing at the site.
- A lump sum price for the borehole for water provision and haulage

Drilling

Description

Boreholes shall be drilled at a diameter of not less than 203mm (8") to allow the safe installation of 152 mm (6") production casing and screen, to a depth not greater than 350m. The Contractor shall provide plant capable of drilling to a depth of 350m at a diameter of 203mm (8").

The Contractor shall be responsible for the drilling method or methods selected, and neither the Client nor the Supervising Hydrogeologist shall be held responsible should the method or methods adopted fail in the objective of drilling to a depth of at least 350 m.

With rotary methods the Contractor shall not use excessive pulldown on the bit. Should the borehole be skewed as a result of excessive pulldown, and the borehole not fit for purpose in consequence, the hole shall be deemed a Lost Bore. The Contractor is required to deploy a stabiliser/drill collar of appropriate diameter when drilling; the following table presents acceptable ranges for stabilisers/drill collars for different borehole diameters: –

Drilling diameter, inches	Recommended stabiliser diameter (range), inches
6½"	4¾" – 5"
8½"	6½" – 6¾"
9½"	6" – 7¼"
11"	8¼" – 9½"

A) drilling with air/foam

Foam used for hammer drilling and additives used for fluid rotary flush drilling must be suited to environmental applications. The Contractor shall be responsible for ensuring that the additives deployed are suitable for such conditions and shall furnish the specification of all proposed additives with his proposal.

B) drilling with fluid flush

Fluid additives of bentonitic type will not be acceptable for use in these works: if fluid rotary flush methods are to be adopted, either cellulose-based reconstituted powder or artificial liquid anionic polymeric additives will be used for viscosity enhancement. The Contractor will state the type and manufacturer of additive(s) to be used and will describe the means by which the additive(s) will be mixed. The judicious application of bentonite and cellulose or similar material will be acceptable as a means of preventing loss of circulation in those parts of the borehole located above the aquifer zone, though their use must be authorised in advance by the Supervising Hydrogeologist.

Rates

The Contractor shall provide unit prices for the following: –

A: drilling with air/foam

- Drilling at a diameter to accommodate surface casing (per metre) (provisionally 12m);
- Drilling at 203mm (8") from the depth to which surface casing has been installed to

100mbgl (per metre), provisional total 88 m;
- Drilling at 203 mm (8") from 100 to 300 bgl(per metre)

B: drilling with fluid flush

- Drilling at a diameter to accommodate surface casing (per metre) (provisionally 12m);
- Drilling at 203mm (8") from the depth to which surface casing has been installed to 100mbgl (per metre), provisional total 88m.
- Drilling at 203 mm (8") from 100 to 300mbgl (per metre)

Supply and installation of temporary / surface casing

Description

Boreholes may require temporary casing to protect the wellhead from cavitation while drilling at greater depths. The Contractor should allow for not less than three (3) metres of temporary casing per borehole, though the Supervising Hydrogeologist may require surface casing to be installed to depths greater than this, and the Contractor must ensure that sufficient temporary casing is deployed to site to allow installation to greater depths. Casing used as surface casing shall be new mild steel of a specification suited to water well applications for installation to depths not exceeding 5 m depth; the specification shall be given in the Contractor's Proposal.

Rates

The Contractor shall provide unit prices for the following: –

- Supply/install and or remove temporary / surface casing (per metre; rate only);

The provisional total for temporary / surface casing is 12 metres.

Sample collection and storage, and record keeping

Description

Geological samples of dry weight 500 g shall be collected at 2 m intervals and at prominent lithological boundaries. These are to be sun- or oven-dried, packed in polythene bags or bottles of appropriate size, and clearly marked with tie-on labels indicating date of collection, depth interval and borehole name and number. These will be analysed on site by the Supervising Hydrogeologist.

The Contractor shall record the depth of any zone of lost circulation for which no sample was taken. A log of the rate of penetration, in minutes per metre drilled, shall be kept. The depth of any voids, or of particularly rapid penetration, or significant changes in rig noise indicating changes in geological conditions, shall also be noted.

Water levels shall be measured and recorded at the start and end of every shift, after significant breaks in activity (such as meal breaks), and during periods of plant downtime (as appropriate), and as required by the Water Act 2016 (Fourth Schedule). Water levels shall be measured using a sounding and/or lighting dipper approved in advance by the Supervising Hydrogeologist. One (1) fully functional dipper, complete

with spares batteries, bulbs or buzzers (as appropriate), shall be deployed with the drilling rig throughout drilling operations. The Supervising Hydrogeologist will check that the dipper meets the required standard.

Rates

The Contractor shall provide a unit rate for the collection, drying and packaging of samples, which shall include the collection of water level data during the drilling process.

There shall be a provisional maximum of 150 samples generated during the drilling programme, assuming that the full metreage is drilled. The number of water level measurements that shall be collected cannot be anticipated.

Geophysical Logging

8. The successful bidder will conduct electrical downhole geophysical logging of all boreholes, for all parts of each borehole that are saturated. It is acknowledged that this may require more than a single pass in any one borehole.

9. The electric log will be collected at 1 metre intervals, with the following data required by the logging process: -

- vii. Self-potential (in all cases SP shall be measured during the first instrument run, down the borehole)
- viii. Temperature (again, measured during the first run)
- ix. Fluid resistivity (again, measured during the first run)
- x. Short-normal resistivity
- xi. Long-normal resistivity
- xii. Lateralog (resistivity)

10. Bidders shall provide: –

- b) A unit measurement rate for running logs, multiple pass. Thus for a 250 m-deep borehole, the net run will cover 250 measurement sets (each comprising one each for the six parameters listed at 2. above). The maximum possible total number of logging points will be 300m in the borehole; however, as measurements cannot be made in unsaturated sections of boreholes, the actual total will be less than this.

The contractor shall carry out the required operations by personnel skilled both in conducting the measurements and the interpretation of the results. The operation shall be as follows

- f. Electric logging shall be conducted in uncased boreholes upon completion of the drilling of the pilot holes (before reaming).
- g. Gamma logging
- h. The drilled hole shall be cleaned by circulation of drilling fluid and its depth measured.
- i. The electrode cables shall be lowered into the borehole while at the same time measuring the depth.
- j. The logs shall be taken from the bottom of the borehole upwards while the cable is taut over its entire length.

Upon completion of all operations the contractor shall provide the Supervising Hydrogeologist with the electric logs comprised of SP curve and R curve, together with their interpretation. Should the Supervising Hydrogeologist refuse to accept the results of the logging because of technical faults then the contractor shall repeat the measurement until satisfactory results are obtained.

The logging data should be presented in a good practice format.

Abandonment if dry

Description

If the borehole is deemed “dry” by the Supervising Hydrogeologist (which may simply indicate that insufficient water has been encountered to justify completion as a production borehole, or that saline water has been encountered), he shall instruct that all surface casing be removed from the borehole, and that the borehole be backfilled with drill cuttings to 2 m bgl. From 2 m bgl to ground level a 1: 2 OPC: sand grout plug will be installed.

Rates

The Contractor shall be paid for all works associated with drilling and making safe an abandoned borehole. The Contractor shall provide unit prices for the following: –

- Backfilling with drill cuttings (per linear meter: rate only);
- Grouting from 2 m bgl to ground level and provision of a steel plate with borehole identification number to be set into grout (lump sum; rate only).

Supply and installation of permanent casing and screen

Casing and screen specification

Casing shall be new 152 mm (6”) internal diameter mild steel of a specification suited to water well applications in boreholes of up to 350m depth.

Screens shall comprise mild steel 152mm (6”) diameter screen with plasma-cut slots of size 1.0 mm in width, with an open area of not less than 6%. Slots cut with an oxy-acetylene gas torch will not be acceptable. The Contractor will provide open area and column strength information in his Proposal.

Casing and screen installation

Before installation of casing and screen the hole shall be shown clear to design depth and diameter; if not clear the hole shall be flushed to remove any backfilled material present.

Where casing and screen are to be welded the appropriate welding electrodes shall be used. Welding shall proceed only when the casing or screen length is demonstrated to be vertical. Care shall be taken to ensure that all oxide coating is removed between welding passes, and to avoid any burn-through or deposition of weld on the inside of the casing or screen.

The base of the casing string shall probably be blinded. The decision as to whether it is left open or sealed will be finalised during the borehole design stage by the Supervising Hydrogeologist. Blinding may comprise either a pointed or a flat closure, at the discretion of the Contractor and with the approval of the Supervising Hydrogeologist. The closure shall entirely seal the casing string and shall be constructed of mild steel. The Supervising Hydrogeologist will consider alternative means by which casing bottom blinding may be achieved, including running a steel slug packer into the casing string after installation to design depth; or by running a grout into the base of the borehole. Should the Contractor propose alternatives, he shall describe the method in appropriate detail in his Proposal.

The top of the casing string at completion of construction shall terminate not less than 0.35 m above original ground level.

Rates

The Contractor shall provide unit prices for the following: –

- Supply/install mild steel plain casing (per metre);
- Supply/install mild steel screen (per metre).

Supply and installation of gravel pack

Gravel pack specification

The Contractor shall supply and install filter pack/formation stabiliser. Material shall be 2-4 mm diameter, clean well-rounded siliceous gravel with no more than 5% non-siliceous material. The Contractor shall provide in his Proposal a particle size distribution curve from a reputable laboratory describing the gravel pack he proposes to install, as well as the bulk density of the pack material expressed as kg per m³.

The pack shall be inspected by the Supervising Hydrogeologist on site, and if it is excessively dirty, he will require that it be washed to his satisfaction, before approving its installation into the borehole annular space; the costs associated with such washing on site shall be met by the Contractor, and the time spent doing so will be accounted as down-time.

Gravel pack installation

Installation of gravel pack/formation stabiliser may use water washdown or reverse circulation methods. In the latter case a pump set or airlift string shall be installed in the borehole so as to encourage material settlement. 65% chlorine granular calcium hypochlorite will be introduced into the annular space along with the pack material at a nominal concentration of 500 grammes per cubic metre of pack. This will break down any residual additive(s) (if used) and will disinfect the wellbore.

The filter pack shall terminate not less than 10 m above the uppermost screen when stabilised, or as otherwise directed by the Supervising Hydrogeologist. The contractor shall describe how he proposes to measure the level of gravel pack.

Rates

The Contractor shall provide a unit volume price for the supply and installation of gravel pack, inclusive of wash down or reverse circulation, and granular calcium hypochlorite.

Installation of backfill**Description**

Backfill material shall comprise fine or clayey drill cuttings and shall be installed from the top of the filter pack to 3 m bgl or as otherwise directed by the Supervising Hydrogeologist. The installation method must ensure that no bridging occurs within the annular space. The Contractor shall measure the depth to the top of the backfill and provide the means by which this level shall be measured.

Rates

The Contractor shall provide a unit linear metre price for the installation of inert backfill. Bidders must bear in mind that the installation of backfill is a simple manual job. If the linear meter rate for manual backfilling exceeds that offered for day rate (manpower), then the latter rate may be used on a *pro-rata* basis should the Supervising Hydrogeologist consider the cost saving to be significant.

Grout**Description**

In the event that a saline aquifer is encountered at any depth, the Supervising Hydrogeologist shall instruct the Contractor to install a cement grout that shall effectively and permanently seal the aquifer from the casing string and vertical percolation.

In any event the Contractor shall install a cement grout as a sanitary seal at the wellhead, which shall be installed from 3 m bgl to ground level.

Grout specification and installation

Grout shall comprise a cement/fine siliceous sand mixture in the ratio 1: 2, mixed with just enough water that it can be poured (it should have a slurry weight not less than 1.6 kg/l), which shall be installed from the top of the inert backfill to ground level or as otherwise directed by the Supervising Hydrogeologist. The installation method must ensure that no bridging occurs within the annular space. The Contractor shall measure the distance to the top of the grout from time to time and provide the means by which this level shall be measured. The installation method and the means of measurement will be described in the proposal.

Rates

No provisional total for grout is provided, since downhole grouting needs are not known at this draft Specification stage. Less than 200 litres of grout will be required for sanitary seal grouting, however. The Contractor shall provide:

- A unit price for the supply and installation of grout to specification (per cubic metre);
- An hour rate for waiting on grout.

Development

Boreholes shall be comprehensively developed in accordance with modern borehole construction practices. This Specification includes the possibility that chemical development will be required. The Contractor will include equipment and chemicals for chemical development, though there is no certainty that chemical development will be required.

Physical development

Physical development may adopt any of the commonly used methods, including but not necessarily restricted to, the following: –

- Surging with a surge block;
- High-velocity water jetting;
- Airlift rawhiding;
- Airlift rawhiding with eductor pipe.

Rawhiding using air, either with or without eductor pipes, is considered the optimum development method. The use of an eductor pipe effectively focuses the development energy to specific parts of the screen, allowing development in detail. Fines are flushed to the surface by airlift pumping. The Contractor shall provide a method statement describing the proposed methodology, including compressor characteristics and airline and eductor pipe diameters (if proposed).

The Contractor shall describe in detail the methodology proposed for undertaking the development method of their choice, and the plant available for doing so.

Not less than 3 and not more than 8 hours of physical development will be required. Development will be considered complete only when less than 5 ppm of suspended solids remain in the water, provided that pumping test data do not indicate further development taking place during the borehole pumping test.

Chemical development

If clays are encountered and their removal is required, the Supervising Hydrogeologist will instruct the Contractor to commence development using chemical methods.

If required, chemical development will use an approved polyphosphate as a disaggregant that shall break down clays, silts, or other fine material adjacent to the wellbore. Consideration shall be given to the geological log when dosing; where clays are abundant the over-application of polyphosphate can lead to sloughing of geological material and may damage the borehole.

The decision as to whether chemical development shall be adopted, and at what dosage rates, shall be made by the Supervising Hydrogeologist on the basis of observations made during drilling and sample logging.

Rates

The Contractor shall provide unit prices for the following: –

- Physical development (per hour) – this explicitly refers to development time, and excludes the time taken for installation/removal of development tools which shall be costed into the development rate;
- Chemical development (each chemical development exercise; rate only), inclusive of installation/removal of development tools.

Provisionally, there shall not be more than 40 hours of physical development. Bidders should allow for not less than five (5) chemical development cycles.

Borehole Testing

Introduction

The boreholes shall be tested in accordance with modern practices. Borehole testing shall be conducted

to Code of Practice for Test Pumping of Water Wells, or an acceptable equivalent.

The following elements shall be required:–

- a) A pre-test.
- b) A 10-hour step-drawdown test.
- c) A constant discharge test for 24 hours.
- d) A recovery test.

The step-drawdown and constant discharge tests shall be timed so as to begin in the morning, in order that the frequent early test time measurements are made during daylight hours.

Installation, plant and methodology

Pumping plant and dipping tube shall be installed in the borehole. The Supervising Hydrogeologist shall specify anticipated discharge and pump intake depth.

a. Pumping plant

Pumps used for testing may be electric submersible, surface-mounted turbine, or reciprocating pumps. Intake depth shall not be less than 300 metres below ground level. Any pump used in tests shall have a fully functioning non-return valve either in the pump itself or in the rising main immediately above the top of the pump.

Discharges shall be in the range 3 to 30 m³/hr at dynamic heads of at least 300 metres and the Contractor shall have at his disposal pumps and appropriate power generation plant covering this discharge and head range. Bidders shall provide the specification (manufacturer, designation and performance curves) for the pumps they propose to deploy for these works as a part of their Proposal.

Rising main pipe shall be of a material suitable for installation depths to a minimum of 300 metres. The water pumped from the borehole shall be discharged to waste at a distance not less than 10 metres from the wellhead or as otherwise approved by the Supervising Hydrogeologist, and in such a manner that it does not flow back towards the borehole.

A generator or other prime mover shall be provided for powering the pump; the power source shall be able to provide motive power without stopping for any reason,

for a continuous period of not less than 30 hours. Weatherproofing for the prime mover and the wellhead area, such that rain will not prevent tests from being undertaken, shall also be provided.

Any failure to adequately weatherproof prime moving plant or any mechanical failure leading to the abandonment of tests will be at the Contractor's cost, as abandoned tests will not be paid for. Furthermore, the Client shall hold back from payment any costs incurred by himself in respect of additional site time costs incurred by the Supervising Hydrogeologist for this reason.

(i) Discharge measurement and control

Discharge measurement shall be by an approved accurate method, such as an orifice plate, calibrated flow meter, V-notch weir or using a volumetric method.

If volumetric methods are proposed, the Contractor will ensure that the container to be used has been calibrated and set absolutely horizontally; each discharge measurement shall be calculated from the average of not less than three time measurements, or as otherwise approved by the Supervising Hydrogeologist. The base on which the calibrated container is supported during measurement shall be horizontal, and the Contractor will be required to demonstrate this to the Supervising Hydrogeologist's satisfaction at any time before and during tests.

Discharge shall vary by not more than 15% across the constant discharge test, except when otherwise approved by the Supervising Hydrogeologist. If unapproved variation occurs the test shall be repeated. No payment shall be made for a failed test.

A flow control device (a globe or gate valve) and a pressure gauge will be supplied for flow control.

(ii) Water level measurement

Water level measurement shall be by electric sounding and/or lighting dipper and shall be made in a dipper tube installed alongside the test pump rising main and secured to it. The Supervising Hydrogeologist will check the dipper for stretch and any other inaccuracies prior to accepting its use; the dipper must be marked such that measurements may be read off the tape to the nearest centimetre without recourse to rulers or other measuring devices. Reproducibility of measurement shall be ± 2.0 cm or better. Water level measurement using a pressurized airline and pump shall not be acceptable on the grounds of poor precision.

The Contractor will deploy two (2) fully functional dippers for the testing works, which will be inspected prior to approving mobilisation. Any tests that are terminated due to faulty dippers will be at the Contractor's cost, and any delays may also be included as grounds for liquidated damages. Delays that lead to standing time on site by the Supervising Hydrogeologist will also be at the Contractor's cost.

(iii) Time measurement

All times shall be recorded by means of a stopwatch or similar approved timepiece;

mobile phone stopwatches will not be approved as timepieces. The Contractor shall ensure that spare batteries, etc. for all equipment are available on site prior to commencing tests.

b. Pre-test

The pre-test will check all equipment and shall not exceed three (3) hours.

c. Step-drawdown test

Each successful borehole will be subjected to a 5-step, 10-hour long step-drawdown test which will commence early in the day following the installation and testing of test plant.

d. Constant discharge test

The constant discharge tests shall last not less than twenty-four (24) hours, unless otherwise approved by the Supervising Hydrogeologist; they will commence early in the day following the step-drawdown test. The borehole shall be pumped at the highest discharge it is deemed capable of, or the maximum discharge the pump is capable of. The constant discharge test shall not start until water level has returned to true static water level, unless otherwise approved by the Supervising Hydrogeologist. Water samples will be collected towards the end of the constant discharge test for subsequent analyses by a WRA laboratory

e. Recovery test and removal of plant

Recovery tests shall continue for not longer than twelve hours (12) hours, unless otherwise directed by the Supervising Hydrogeologist.

Only after the completion of recovery data collection may pumping and ancillary plant be removed from the borehole, though aboveground components may be dismantled during the recovery phase provided this in no way affects the collection of water level data or affects water level recovery.

Rates

The Contractor shall provide unit prices for the following: –

- A lump sum price for mobilisation and demobilisation of testing plant and camp to the first work site at which testing will commence, to include setting up;
- A unit price per kilometre, for moves of test plant between sites in the County;
- A lump sum price each for setup within the County, to a maximum of one (1) such moves;
- A unit rate for conducting discharge tests (per hour) (covering the pre-test, step-test and constant discharge test), which shall include installation of pumping plant;
- A rate for conducting the recovery test (per hour), which shall include removal of pumping plant at the conclusion of testing.

There shall be a provisional maximum of 24 hours of drawdown test (including pre-tests, step-drawdown tests and constant discharge tests); and a provisional maximum of 24 hours of recovery test.

Water sampling and analysis

Analysis specification

In the closing hour of each constant discharge test water samples shall be collected for chemical and bacteriological analysis by Water Resources Authority Central Water Testing laboratory, or field measurement (in the case of electrical conductivity and temperature).

Chemical analysis shall include direct measurement of the following parameters: –

- Field electrical conductivity (corrected to 25°C); a suitable instrument must be deployed along with the drilling and pumping test crew
- Field water temperature; a thermistor or an alcohol-in-glass thermometer must be deployed along with the drilling and pumping test crew (mercury-in-glass thermometers will not be acceptable)
- Field pH
- Field alkalinity (both carbonate and bicarbonate)
- Hardness (carbonate and non-carbonate)
- Sodium
- Potassium
- Calcium
- Magnesium
- Iron (all species)
- Manganese
- Bicarbonate
- Carbonate
- Chloride
- Sulphate
- Fluoride
- Nitrate
- Nitrite
- Total Dissolved Solids
- Total Suspended Solids

The Supervising Hydrogeologist shall check the completeness of analyses by calculating the charge balance. If this shows an error greater than $\pm 10\%$, the test shall be repeated at the Contractor's cost. The Contractor shall provide the name and address of the laboratory or laboratories that shall undertake the analyses and confirm that all of the above parameters can be determined by the laboratory or laboratories.

Bacteriological analysis shall test for total plate count at 37°C, total coliforms and *E. coli*, in accordance. Analysis for bacteriological parameters must commence within 6 hours of the collection of the sample, in accordance with the Kenya Standard. The Contractor shall describe how bacteriological samples will be transported to the selected laboratory in compliance with the Kenya Standard.

The Contractor shall provide the name and address of the laboratory that shall undertake the analysis and confirm that all of the above parameters can be

determined by that laboratory.

Rates

The Contractor shall provide unit prices for the following: –

- Full chemical analysis (each)
- Bacterial analysis (each).

There shall be a provisional maximum of five (5) sets of chemical and bacteriological analyses.

Borehole headworks

Headworks specification

The ground surface at the wellhead shall be excavated to a depth of one metre, and be one metre square, to allow a concrete plinth to be cast. The 1 x 1 x 1 m pit will be filled with concrete, to be finished just proud of ground surface and shaped at surface with appropriate formwork. Concrete shall be 1:2:4 OPC: siliceous sand: half-inch ballast: **volcanic sand will not be approved for use in mixing concrete.** The concrete must be cast with two 0.8 m lengths of 12 mm reinforcing bar welded horizontally to the 152 mm (6”) casing 0.7 m below ground level.

Rates

The Contractor shall provide a price for the following: –

- Headworks complete (each).

There shall be a provisional maximum of one (1) headworks.

Borehole cap

Borehole cap specification

After removal of test plant, the Contractor shall supply and install a borehole cap. This shall be fashioned such that its internal diameter is marginally greater than the external diameter of the 152mm (6”) permanent casing, so that when it is in position it completely seals the borehole from the accidental or deliberate introduction of foreign material. The vertical sides of the cap should not exceed 75 mm in length. This cap will be tack-welded into place, with three single passes of mild steel weld not less than 50 mm long bonding the bottom lip of the cap to the permanent casing. The three lengths of weld will be located at 120o intervals around the cap.

Rates

The Contractor shall provide a price for the following: –

- Supply and install borehole cap complete (each).

There shall be a provisional maximum of three (3) borehole caps.

Records and reporting

Description

The following records shall be submitted to the Supervising Hydrogeologist within

fourteen days of completion of the works at each borehole bound in one report except for the down the hole camera film.

- Borehole number/name and schematic diagram of borehole in section
- Pumping test times, discharge and water level data
- Results of chemical and bacteriological analyses
- Originals of signed daily reports as per the codes of practice for construction of boreholes and codes of practice for the supervision of construction and pumping test of boreholes, These will be provided by WRA
- Drilling penetration log
- Geological log
- Form WRMA 009A Borehole Completion Record in draft (the preparation and submission of a

WRMA 009A is a legal obligation under the Water Act 2016). It should be duly filled in by the Supervising hydrogeologist and Driller

- The resistivity logging and **the interpretation report**
- The Gamma logging data and **interpretation report**
- 1 CD/flash disk of the borehole camera film of the borehole

It is acknowledged that some chemical analysis laboratories may be unable to present analytical results within the fourteen day period stipulated above. Delays caused by a laboratory shall not be considered grounds to invoke liquidated damages. This does not apply to bacteriological analyses: if delays exceed 6 days, the laboratory has failed to comply with KEBS (1996).

Rates

The Contractor shall provide a price for the following: –

- Record set complete (each).

There shall be a provisional maximum of three 1 borehole completion record sets, which shall include dry or abandoned boreholes.

Borehole Camera Video Log

Upon completion of pump testing, the Contractor shall provide Video Log the well in color on DVD no sooner than seven (7) days nor more than ten (10) days following final pumping. The Video Log shall be provided to the WRA in three DVD/flash disk copies

BILL OF QUANTITIES FOR DRILLING, CASING AND DATA COLLECTION

LOCATION: Njumbi High School, Mathioya Sub-County Murang'a County
 GEOGRAPHICAL COORDINATES: Longitude 36.952155; Latitude: -0.64146
 Elevation: 1861 amsl

BILL OF QUANTITIES No. 1 PROPOSED DEPTH: 350m

ITEM	DESCRIPTION	UNIT	QTY		RATES KShs
1.1	Mobilisation/set-up/camp/water supply/restitution/demobilisation				
A	Mobilise drilling plant/camp and set up/demobilise	LS	1		
B	Providing water for drilling and camp	LS	1		
1.2	DRILLING				
A	drilling 305mm diameter hole to accommodate surface casing	M	12		
B	drilling 203mm diameter from base of surface casing to 100 metres	M	88		
C	drilling 203 mm diameter hole to allow for 152 mm diameter finished cased hole from 100 to 350	M	25		
1.	Sample collection, storage and record keeping				
A	Formation samples collected at 2 m intervals, record keeping complete and borehole down the hole lithological logging and storage of the sample for access to WRA	LS	1		
B	In situ Water quality testing at every water struck level (two samples per water struck level)	N	3		
1.4	Logging/ Borehole camera				

A	Geologist logging including rock description in terms of color, texture, shape, roundedness, porosity, weathering etc, after every 2 metres	N	17		
b	Geophysical logging 1. Electric Logging:IP, SP, Lateral, SN, LN, Temperature	M	35		
	2. Gamma Logging:	M	35		
C	A DVD of the color video log of the well casing/screen. NOTE: Only one (1) copy of the video log is required to be submitted to the WRMA	LS			
1.5	supply and installation of casings				
A	Supply and install and/or remove temporary/surface casing	M	12		
B	Supply/install 152mm (6") ID mild steel plain casing	M	25		
C	Supply/install 152mm (6") ID mild steel plasma-slotted screen	M	10		
1.6	Gravel pack				
A	supply and insert gravel pack material	Tonnes	8		
1.7	Well Head				
A	Construct well head with cement grout 1mx1mx1m	LS	1		
B	Supply and install tamper proof well cap	LS	1		
1.8	Development				
A	Installation and removal of development equipment	Hr	12		
B	Actual development	Hr	8		
1.9	Test Pumping and Recovery Measurements				
A	Installation and removal of test pumping equipment	LS	LS		
B	Trial step drawdown test	Hr	10		

C	Trial test recovery measurements	Hr	12		
D	Constant discharge test	Hr	24		
E	Constant test recovery measurements	Hr	12		
1.1	Water quality analysis				
a	Collect water sample and carry out full chemical analysis	N	1		
B	Collect water sample and carry out full bacteriological analysis	N	1		
1.1	Borehole completion record and full report				
	Complete WRMA 009A and 3 copies of all reports bound in one document	LS	1		
	SUB TOTAL -1				

BILL OF QUANTITIES FOR DRILLING, CASING AND DATA COLLECTION
LOCATION: NUU SECONDARY SCHOOL, KITUI COUNTY
GEOGRAPHICAL COORDINATES: Easting: 0428980, Northing: 9882119, Elevation:
633m ASL

BILL OF QUANTITIES No. 2 PROPOSED DEPTH: 300M

ITE	DESCRIPTION	UN	QTY		RATES Kshs.
1.1	Mobilisation/set-up/camp/water supply/restitution/demobilisation				
a	Mobilise drilling plant/camp and set up /demobilize	LS	1		
b	Providing water for drilling and camp	LS	1		
1.2	DRILLING				
a	drilling 305mm diameter hole to accommodate surface casing	M	12		
b	drilling 203mm diameter from base of surface casing to 100 metres	M	88		
c	drilling 203 mm diameter hole to allow for 152 mm diameter finished cased hole from 100 to 350m below the ground	M	20		
1.3	Sample collection, storage and record keeping				
a	Formation samples collected at 2 m intervals, record keeping complete and borehole down the hole lithological logging and storage of the sample for delivery to WRMA	LS	1		
b	In situ Water quality testing at every water struck level (two samples per water struck level)	No.	3		
1.4	Logging/ Borehole camera				

a	Geologist logging including rock description in terms of color, texture, shape, roundedness, porosity, weathering etc, after every 2 metres	No.	15		
b	Geophysical logging 1. Electric Logging:IP, SP, Lateral, SN, LN, Temperature	M	30		
	3. Gamma Logging:	M	30		
c	A DVD of the color video log of the well casing/screen. NOTE: Only one (1) copy of the video log is required to be submitted to the WRMA	LS			
1.5	supply and installation of casings				
a	Supply and install and/or remove temporary/surface casing	M	12		
b	Supply/install 152mm (6") ID mild steel plain casing	M	20		
c	Supply/install 152mm (6") ID mild steel plasma-slotted screen	M	10		
1.6	Gravel pack				
a	supply and insert gravel pack material	Tonnes	7		
1.7	Well Head				
a	Construct well head with cement grout 1mx1mx1m	LS	1		
b	Supply and install tamper proof well cap	LS	1		
1.8	Development				
a	Installation and removal of development equipment	hr	12		
b	Actual development	hr	8		
1.9	Test Pumping and Recovery Measurements				
a	Installation and removal of test pumping equipment	LS	LS		
b	Trial step drawdown test	hr	10		

c	Trial test recovery measurements	hr	12		
d	Constant discharge test	hr	24		
e	Constant test recovery measurements	hr	12		
1.10	Water quality analysis				
	Collect water sample and carry out full chemical analysis	No.	1		
	Collect water sample and carry out full bacteriological analysis	No.	1		
1.11	Borehole completion record				
	Complete WRMA 009A and borehole completion report and present one bound report containing all the report	LS	1		
	SUB TOTAL-2				
	GRAND TOTAL (sub total -1 + sub total-2)				

EVALUATION CRITERIA

The evaluation of the tenders shall be carried out through the following stages per lot:

Stage	Area of Consideration	Rating/ Scores
Preliminary Evaluation	Compliance with Mandatory Requirements	Elimination
Technical Evaluation	Technical Responsiveness	Pass Mark 70%
Financial Evaluation	Financial Consideration	Price quoted shall contribute to 30 marks of the total score and this shall be evaluated relatively on the basis of lowest quoted price using the formula $PC = PL/P \times 30$ Where; PC is the allocated score, PL is the lowest quoted price of bids passing the technical evaluation and P is the bidder's price under consideration.

STAGE 1- PRELIMINARY (MANDATORY) EVALUATION

Mandatory requirements will determine the satisfactory responsiveness of a Tenderer, failure to meet any of these set requirements as noted hereunder will render a tender non responsive and will automatically be disqualified and not proceed for Technical Evaluation.

A. Mandatory Requirements

No.	Requirements	Yes/No
1.	Registration and possession of a valid License certificate as a practicing borehole drilling contractor from the Ministry of Water & Sanitation and Irrigation in the year 2020.	
2.	Copy of valid certificates of Business registration/Incorporation	
3.	Copy of valid Current CR12 form/ BN whichever is applicable	
4.	Copy of valid Tax compliance certificate KRA	
5.	Copy of valid Business Trading License Permit from County Government	
6.	Valid Certificate of registration with National Construction Authority (NCA) in the Water Works Category	
7.	Original Tender/ Bid security of Kshs 200,000 (Kenya Shillings One Hundred Thousand) in form of Insurance Bond/Bank Guarantee from financial institution recognized by PPRA valid for 30 days from the Tender submission deadline.	
8.	Submission of Two bid documents (clearly marked 'Original' and 'Copy') in a perfect bound (No spiral binding) and correctly serialized / paginated and initialized by binder/ rubber stamped.	
9.	Correctly duly filled and signed Form of Tender in WRA's Tender	

	Document Template)	
10.	Duly filled and signed Confidential Business Questionnaire (certified by Commissioner of Oath as true information given)	
11.	Must fill, sign and stamp anti-corruption declaration form available in the tender document (certified by Commissioner of Oath as true information given)	

Note:

- i. All the Statutory documents will be verified with the relevant organizations by the evaluation committee*
- ii. The tenderers who do not satisfy any of the above requirements shall be considered Non-Responsive and their tenders will not be evaluated further.*

B) TECHNICAL EVALUATION

The evaluation committee shall evaluate the Technical part on the basis of their responsiveness to the technical criteria.

Each responsive tender will be given a technical score. Only the Tenderers who score **70%** and above will be considered to be technically responsive and therefore shall qualify for the final stage of the Financial Evaluation. A tender shall be rejected if it fails to achieve the minimum technical score.

The technical evaluation shall be based on the criteria as indicated below;

Table 1

PARAMETER	MAXIMUM POINTS
(i) Key personnel	24
(ii) Contract Completed in the last Five (5) years- Borehole Completion certificates and completion certificates to be attached	40
(iii) Schedules of contractor's equipment- Should include of equipment the log books and location	26
(iv) Audited Financial Report for the last 3 years	10
TOTAL	100

The detailed scoring plan shall be as shown in table 2 below

Table 2

	ITEM DESCRIPTION	POINT SCORED	MAX SCORED
I	Key Personnel to be engaged on the project (Must Attach copies of certificates). The resume and certificates for a particular person should tally and should be attached together		24
	a) Site Hydrogeologist (Attach Certified certificates and valid registration as a water resource professional with the Ministry of Water and Sanitation & Irrigation in 2020), CV		
	Holder of Minimum Degree in Geology (attach certified certificate)-----4		
	Demonstrate registration as a water resources professional (attach valid practicing license from the Ministry of Water & Sanitation and Irrigation for 2020)-----4		
	Attach CV-----1		
	Demonstrate geologist logging/geophysical logging data collection and analysis during drilling-----1		
	b) Drilling supervisor Qualifications /Experience		
	Minimum Diploma in Groundwater Technology/Water Resources management (Attach clear certified certificates)-----4		
	Attach CV.....1		
	Drilling Supervisor to demonstrate sound knowledge of interpreting hydrogeological Survey reports. Drilling completion report writing and including borehole drillers log. 6years experience in Rotary Fluid and Mud drilling and conducting Test pumping of boreholes. Logging of borehole while drilling and collection of drilling rock samples. Conducting Test pumping of borehole.-----3		
	c) Three Rig Operators – attach individual CVs and certificates for each of the three rig operators		
	At least Certificate holder ground water/Drilling technology for each of the drillers-----3		
	Attach CV/Recommendation and demonstrate relevant drilling jobs in the last three years for each of the drillers-----3		
II	Specific Construction & Contract Management Experience (to be filled out as per form 2)		40

	A minimum number of similar contracts specified below that have been satisfactorily and substantially completed as a prime contractor, joint venture member, management contractor or sub-contractor between 1st January 2010 and application submission deadline for the last five years:		
	(a) At least one boreholes drilled to or at least 400m depth. (Attach valid WRMA borehole completion records)-----4		
	(b) Experience in construction of exploratory wells (Attach valid WRMA borehole completion records showing required depths, adequately demonstrate that company delivered on this by completion certificates from client) -----3		
	c) Demonstrate experience in drilling boreholes over 300 m depth (3 points for every borehole demonstrated) in the last five years.....33		
III	Schedules of contractors equipment(as per Form 1) (Shall attach proof or evidence of ownership by the company, if owned or and indicate the ability to lease (attach letter from a prospective the lessor if leased) Provide model, compressor details and logbook whether owned or leased forms as attached		26
	i) A Rig with compressor capable of drilling up to 400m - provide model and log details		
	Owned-----6		
	Leased -----2		
	Not provided-----0		
	ii)A test pumping unit with pumps capable of carrying out step draw down test pumping on borehole with a head of over 400m depth		
	Owned ----4		
	Leased -----2		
	Not provided-----0		
	iii)A dip meter(dipper) capable of measuring up to 400 m head water levels		
	Owned -----4		
	Leased -----2		
	Not provided-----0		
	iv)Logging equipment capable of undertaking geophysical logging for electric logging and gamma logging up to 400metres depth.		
	Owned -----4		
	Leased -----2		
	Not provided-----0		
	v)A borehole camera capable of 400 metres of depth filming		
	Owned -----4		

	Leased -----2		
	Not provided-----0		
	vii) EC meter		
	Owned -----4		
	Leased -----2		
	Not provided-----0		
IV	Annual audited financial reports (last three (3) years)		10
	At least one of the annual turnover greater or equal to the cost of the project	10	
	Annual turn-over below the cost of the project	2	
TOTAL SCORE			100

STAGE3: FINANCIALEVALUATION

NOTE: Evaluation using the following formula: Price quoted shall contribute to 30 marks of the total score and this shall be evaluated relatively on the basis of lowest quoted price using the formula

$$PC = PL/P \times 30$$

Where; **PC** is the allocated score,

PL is the lowest quoted price of bids passing the technical evaluation

and

P is the bidder's price under consideration.

The total score is the sum of the technical evaluation score plus the financial evaluation score. The successful bidder shall be awarded the contract on the basis of combined score: Technical and Financial

ANNEX 1

Form 1. Forms for Equipment

The Bidder shall provide adequate information to demonstrate clearly that it has the capability to meet the requirements for the key equipment listed in Evaluation and Qualification Criteria. A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Bidder. The Bidder shall provide all the information requested below, to the extent possible. Fields with asterisk (*) shall be used for evaluation.

Type of Equipment*		
Equipment Information	Name of manufacturer,	Model and power rating
	Capacity*	Year of manufacture*
Current Status	Current location	
	Details of current commitments	
Source	Indicate source of the equipment <input type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

The following information shall be provided only for equipment not owned by the Bidder.

Owner	Name of owner	
	Address of owner	
	Telephone	Contact name and title
	Fax	Telex
Agreements	Details of rental / lease / manufacture agreements specific to the project	

ANNEX 2

Form 2 Specific Construction and Contract Management Experience

Bidder's

Name: _____

Date: _____

Similar Contract No.	Information			
Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor <input type="checkbox"/>	Member in JV <input type="checkbox"/>	Management Contractor <input type="checkbox"/>	Sub-contractor or <input type="checkbox"/>
Total Contract Amount			Ksh. *	
If member in a JV or sub-contractor, specify participation in total Contract amount			*	
Employer's Name:				
Address:				
Telephone/fax numberE-mail:				

Form 2 (cont.)

Specific Construction and Contract Management Experience (cont.)

Similar Contract No.	Information
Description of the similarity in accordance with Sub-Factor 4.2(a) of Section III:	
1. Amount	
2. Physical size of required works items	
3. Complexity	
4. Methods/Technology	
5. Construction rate for key activities	
6. Other Characteristics	

SECTION V: STANDARD FORMS

List of Standard Forms

- (i) Form of Invitation for Tenders
- (ii) Form of Tender
- (iii) Letter of Acceptance
- (iv) Form of Agreement
- (v) Form of Tender Security
- (vi) Performance Bank Guarantee
- (vii) Performance Bond
- (viii) Bank Guarantee for Advance Payment
- (ix) Qualification Information
- (x) Tender Questionnaire
- (xi) Confidential Business Questionnaire
- (xii) Details of Sub-Contractors
- (xiii) Request for Review Form

FORM OF INVITATION FOR TENDERS

_____ [date]

To: _____ [name of Contractor]
_____ [address]

Dear Sirs:

Reference: _____ [Contract Name]

You have been prequalified to tender for the above project.

We hereby invite you and other prequalified tenderers to submit a tender for the execution and completion of the above Contract.

A complete set of tender documents may be purchased by you from _____

[mailing address, cable/telex/facsimile numbers].

Upon payment of a non-refundable fee of Kshs _____

All tenders must be accompanied by _____ number of copies of the same and a tender security in the form and amount specified in the tendering documents, and must be delivered to

[address and location]

at or before _____ (time and date). Tenders will be opened immediately thereafter, in the presence of tenderers' representatives who choose to attend.

Please confirm receipt of this letter immediately in writing by cable/facsimile or telex.

Yours faithfully,

Authorized Signature

Name and Title

FORM OF TENDER

TO: _____ [Name of Employer] _____ [Date]

_____ [Name of Contract]

Dear Sir,

1. In accordance with the Conditions of Contract, Specifications, Drawings and Bills of Quantities/Schedule of Rates for the execution of the above named Works, we, the undersigned offer to construct, install and complete such Works and remedy any defects therein for the sum of Kshs.
 [Amount in figures] Kenya Shillings

_____ [Amount in words]

2. We undertake, if our tender is accepted, to commence the Works as soon as is reasonably possible after the receipt of Water Resources Authority's Representative's notice to commence, and to complete the whole of the Works comprised in the Contract within the time stated in the Appendix to Conditions of Contract.
3. We agree to abide by this t e n d e r until _____ [Insert date], and it shall remain binding upon us and may be accepted at any time before that date.
4. Unless and until a formal Agreement is prepared and executed this tender together with your written acceptance thereof, shall constitute a binding Contract between us.
5. We understand that you are not bound to accept the lowest or any tender you may receive.

Dated this _____ day of _____ 20 _____

Signature _____ in the capacity of _____

duly authorized to sign tenders a on
c Tendere

_____ [Address of Tenderer]

Witness; Name _____

Address _____

Signature _____

Date__ (Amend accordingly if provided by Insurance Company)

LETTER OF ACCEPTANCE

_____ *[date]*

To: __
[name of the Contractor]

[address of the Contractor]

Dear Sir,

This is to notify you that your Tender dated __
for the execution of _____
[name of the Contract and identification number, as given in the Tender documents]
for the Contract Price of Kshs. _____ *[amount in*
figures] *[Kenya Shillings _____ (amount in words)]* in
accordance with the Instructions to Tenderers is hereby accepted.

You are hereby instructed to proceed with the execution of the said Works in
accordance with the Contract documents.

Authorized Signature Name
and Title of Signatory
Attachment: Agreement

FORM OF AGREEMENT

THIS AGREEMENT, made the _____ day of _____ 20____ between _____ of [or whose registered office is situated at] _____ (herein after called “Water Resources Authority”) of the one part AND _____ of [or whose registered office is situated at] _____ (herein after called “the Contractor”) of the other part.

WHEREAS Water Resources Authority is desirous that the Contractor executes

(Name and identification number of Contract) (hereinafter called “the Works”) located at _____ *[Place/location of the Works]* and Water Resources Authority has accepted the tender submitted by the Contractor for the execution and completion of such Works and the remedying of any defects therein for the Contract Price of Kshs [Amount in figures], Kenya Shillings [Amount in words].

NOW THIS AGREEMENT WITNESSETH as follows:

1. In this Agreement, words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
2. The following documents shall be deemed to form and shall be read and construed as part of this Agreement i.e.
 - (i) Letter of Acceptance
 - (ii) Form of Tender
 - (iii) Conditions of Contract Part I
 - (iv) Conditions of Contract Part II and Appendix to Conditions of Contract
 - (v) Specifications
 - (vi) Drawings
 - (vii) Priced Bills of Quantities/Priced Schedule of Rates [whichever is applicable]
3. In consideration of the payments to be made by Water Resources Authority to the Contractor as hereinafter mentioned, the Contractor hereby covenants with Water Resources Authority to execute and complete the Works and remedy any defects therein in conformity in all respects with the provisions of the Contract.

4. Water Resources Authority hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties thereto have caused this Agreement to be executed the day and year first before written.

The common Seal of _____

Was hereunto affixed in the presence of _____

Signed Sealed, and Delivered by the said _____

Binding Signature of Employer __

Binding Signature of Contractor _____

In the presence of (i) Name _____

Address _____

Signature _____

[ii] Name __

Address _____

Signature _____

FORM OF TENDER SECURITY

WHEREAS (Hereinafter called “the Tenderer”)
has
submitted his tender dated for the construction of
.....
..... (*Name of Contract*)

KNOW ALL PEOPLE by these presents that WE having our
registered office at(hereinafter called “the Bank”), are bound unto
.....(hereinafter called “Water Resources Authority”) in the sum
of Kshs.....for which payment well and truly to be made to the
said Employer, the Bank binds itself, its successors and assigns by these presents
sealed with the Common Seal of the said Bank this Day of
.....20.....

THE CONDITIONS of this obligation are:

1. If after tender opening the tenderer withdraws his tender during the period of
tender validity specified in the instructions to tenderers

Or

2. If the tenderer, having been notified of the acceptance of his tender by Water
Resources Authority during the period of tender validity:

(a) fails or refuses to execute the form of Agreement in accordance with the
Instructions to Tenderers, if required; or

(b) fails or refuses to furnish the Performance Security, in accordance with the
Instructions to Tenderers;

We undertake to pay to Water Resources Authority up to the above amount upon
receipt of his first written demand, without Water Resources Authority having
to substantiate his demand, provided that in his demand Water Resources
Authority will note that the amount claimed by him is due to him, owing to
the occurrence of one or both of the two conditions, specifying the occurred
condition or conditions.

This guarantee will remain in force up to and including thirty (30) days after the
period of tender validity, and any demand in respect thereof should reach the
Bank not later than the said date.

[Date] [
[Seal]

[signature of the Bank] [Witness]

PERFORMANCE BANK GUARANTEE

To: _____ (*Name of Employer*) _____ (*Date*)
_____ (*Address of Employer*)

Dear Sir,

WHEREAS _____ (hereinafter called "the Contractor") has undertaken, in pursuance of Contract No. _____ dated _____ to execute _____ (hereinafter called "the Works");

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognised bank for the sum specified therein as security for compliance with his obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee: NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of Kshs. _____ (*amount of Guarantee in figures*) Kenya Shillings__ (*amount of Guarantee in words*), and we undertake to pay you, upon your first written demand and without civil or argument, any sum or sums within the limits of Kenya Shillings (*amount of Guarantee in words*) as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

We further agree that no change, addition or other modification of the terms of the Contract or of the Works to be performed thereunder or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this Guarantee, and we hereby waive notice of any change, addition, or modification.

This guarantee shall be valid until the date of issue of the Certificate of Completion.

SIGNATURE AND SEAL OF THE GUARANTOR _____

Name of Bank _____

Address _____

Date _____ (Amend accordingly if provided by Insurance Company)
PERFORMANCE BOND

By this Bond, We _____ of (or whose registered office is situated at] _____ as Principal (hereinafter called "the Contractor") and _____ of [or whose registered office is situated at]

_____ as Surety (hereinafter called "the Surety"), are held and firmly bound unto _____ of [or whose registered office is situated at] _____

as Obligee (hereinafter called "Water Resources Authority") in the amount of Kshs. _____ [amount of Bond in figures] Kenya Shillings

_____ [amount of Bond in words], for the payment of which sum well and truly, the Contractor and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS the Contractor has entered into a Contract with Water Resources Authority dated the _____ day of _____ 20_____ for the execution of _____ [Name of Contract] in accordance with the Contract documents, Specifications and amendments thereto, which to the extent herein provided for, are by reference made part hereof and are hereinafter referred to as the Contract.

NOW THEREFORE, the Condition of this Obligation is such that, if the Contractor shall promptly and faithfully perform the said Contract (including any amendments thereto), then this obligation shall be null and void; otherwise it shall remain in full force and effect. Whenever the Contractor shall be, and declared by Water Resources Authority to be, in default under the Contract, Water Resources Authority having performed Water Resources Authority's obligations thereunder, the Surety may promptly remedy the default, or shall promptly:

- (1) complete the Contract in accordance with its terms and conditions; or
- (2) obtain a tender or tenders from qualified tenderers for submission to Water Resources Authority for completing the Contract in accordance with its terms and conditions, and upon determination by Water Resources Authority and the Surety of the lowest responsive tenderer, arrange for a Contract between such tenderer and Employer and make available as work progresses (even though there should be a default or a succession of defaults under the Contract or Contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the Contract Price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof.

The term "Balance of the Contract Price", as used in this paragraph, shall mean the total amount payable by Water Resources Authority to the Contractor under the

Contract, less the amount properly paid by Water Resources Authority to the Contractor; or

(3) pay Water Resources Authority the amount required by Water Resources Authority to complete the Contract in accordance with its terms and conditions up to a total not exceeding the amount of this Bond.

The Surety shall not be liable for a greater sum than the specified penalty of this Bond.

Any suit under this Bond must be instituted before the expiration of one year from the date of issuance of the Certificate of Completion.

No right of action shall accrue on this Bond to or for the use of any person or corporation other than Water Resources Authority named herein or the heirs, executors, administrators, successors and assigns of Water Resources Authority.

In testimony whereof, the Contractor has hereunto set his hand and affixed his seal, and the Surety has caused these presents to be sealed with his corporate seal duly attested by the signature of his legal representative, this _____ day of _____ 20____

SIGNED ON _____ SIGNED ON _

On behalf of _____ On behalf of _____
[Name of Contractor] [Name of Surety]

By _____ By ____

In the capacity of _____ In the capacity of _

In the presence of; Name _____ In the presence of; Name _____

Address _____ Address _____

Signature _____ Signature _____

Date _____ Date _

BANK GUARANTEE FOR ADVANCE PAYMENT

To: _____ [name of Employer] _____ (Date)
_____ [address of Employer]

Gentlemen,

Ref: _____ [name of Contract]

In accordance with the provisions of the Conditions of Contract of the above-mentioned _____ Contract, We, [name and Address of Contractor] (hereinafter called "the Contractor") shall deposit with

_____ [name of Employer] a bank guarantee to guarantee his proper and faithful performance under the said Contract in an amount of Kshs.

_____ [amount of Guarantee in figures] Kenya Shillings
_____ [amount of Guarantee in words].

We, _____ [bank or financial institution], as instructed by the Contractor, agree unconditionally and irrevocably to guarantee as primary obligator and not as Surety merely, the payment to _____ [name of Employer] on his first demand without whatsoever right of objection on our part and without his first claim to the Contractor, in the amount not exceeding Kshs

_____ [amount of Guarantee in figures] Kenya Shillings
_____ [amount of Guarantee in words],

such amount to be reduced periodically by the amounts recovered by you from the proceeds of the Contract.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed thereunder or of any of the Contract documents which may be made between [name of Employer] and the Contractor, shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

No drawing may be made by you under this guarantee until we have received notice in writing from you that an advance payment of the amount listed above has been paid to the Contractor pursuant to the Contract.

This guarantee shall remain valid and in full effect from the date of the advance payment under the Contract until _____ (name of Employer) receives full payment of the same amount from the Contract.

Yours faithfully,

Signature and Seal _

Name of the Bank or financial institution _____

Address _____

Date _

Witness: Name: _____

Address: _____

Signature: _

Date: _____

QUALIFICATION INFORMATION

1. Individual Tenderers or Individual Members of Joint Ventures

1.1 Constitution or legal status of tenderer (attach copy or Incorporation Certificate);

Place of registration: _____

Principal place of business _____

Power of attorney of signatory of tender _____

1.2 Total annual volume of construction work performed in the last five years

Year	Volume	
	Currency	Value

1.3 Work performed as Main Contractor on works of a similar nature and volume over the last five years. Also list details of work under way or committed, including expected completion date.

Project name	Name of client and contact person	Type of work performed and year of completion	Value of Contract
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

1.4 Major items of Contractor's Equipment proposed for carrying out the Works. List all information requested below.

Item of Equipment	Description, Make and age (years)	Condition(new, good, poor) and number available	Owned, leased (from whom?), or to be purchased (from whom?)
_____	_____	_____	
_____	_____	_____	

1.5 Qualifications and experience of key personnel proposed for administration and execution of the Contract. Attach biographical data.

Position (general)	Name	Years of experience	Years of experience in
Project Manager			proposed position
	_____	_____	_____
	_____	_____	_____
(etc.)			

1.6 Financial reports for the last five years: balance sheets, profit and loss statements, auditor's reports, etc. List below and attach copies.

1.7 Evidence of access to financial resources to meet the qualification requirements: cash in hand, lines of credit, etc. List below and attach copies of supportive documents.

1.8 Name, address and telephone, telex and facsimile numbers of banks that may provide reference if contacted by Water Resources Authority.

1.9 Statement of compliance with the requirements of Clause 1.2 of the Instructions to Tenderers.

1.10 Proposed program (work method and schedule) for the whole of the Works.

2 Joint Ventures

- 2.0 The information listed in 1.1 – 2.0 above shall be provided for each partner of the joint venture.
- 2.1 The information required in 1.11 above shall be provided for the joint venture.
- 2.2 Attach the power of attorney of the signatory(ies) of the tender authorizing signature of the tender on behalf of the joint venture
- 2.3 Attach the Agreement among all partners of the joint venture (and which is legally binding on all partners), which shows that:
 - a) all partners shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms;
 - b) one of the partners will be nominated as being in charge, authorized to incur liabilities and receive instructions for and on behalf of any and all partners of the joint venture; and
 - c) the execution of the entire Contract, including payment, shall be done exclusively with the partner in charge.

TENDER QUESTIONNAIRE

Please fill in block letters.

1. Full names of tenderer;

.....

2. Full address of tenderer to which tender correspondence is to be sent (unless an agent has been appointed below);

.....

3. Telephone number (s) of tenderer;

.....

4. Telex of tenderer;

.....

5. Name of tenderer's representative to be contacted on matters of the tender during the tender period;

.....

6. Details of tenderer's nominated agent (if any) to receive tender notices. This is essential if the tenderer does not have his registered address in Kenya (name, address, telephone, telex);

.....

.....

Signature of Tenderer

Make copy and deliver to: _____ (*Name of Employer*)

CONFIDENTIAL BUSINESS QUESTIONNAIRE

You are requested to give the particulars indicated in Part 1 and either Part 2 (a), 2 (b) or whichever applies to your type of business.

You are advised that it is a serious offence to give false information on this Form.

Part 1 – General

Business Name
Location of business premises;.....
Country/Town..... Plot No.....
Street/Road Postal Address.....
Tel No.....
Email.....Nature of
Business..... Current
Trade License No..... Expiring date.....
Maximum value of business which you can handle at any time: KShs.
.....

Name of your bankers.....
Branch.....

Part 2 (a) – Sole Proprietor

Your name in full..... Age.....
Nationality..... Country of Origin.....
Citizenship details

Part 2 (b) – Partnership

Give details of partners as follows:

	<i>Name in full</i>	<i>Nationality</i>	<i>Citizenship Details</i>	<i>Shares</i>
1
2
3

SignatureDate
.....

DETAILS OF SUB-CONTRACTORS

If the Tenderer wishes to sublet any portions of the Works under any heading, he must give below details of the sub-contractors he intends to employ for each portion.

Failure to comply with this requirement may invalidate the tender. (1) Portion of Works to be sublet:

(i) Full name of Sub-contractor and address of head office:

.....

(ii) Sub-contractor's experience of similar works carried out in the last 3 years with

Contract value:

.....

.....

(2) Portion of Works to sublet:

(i) Full name of sub-contractor and address of head office:

.....

.....

(ii) Sub-contractor's experience of similar works carried out in the last 3 years with

contract value:

.....

[Signature of Tenderer)

Date

LETTER OF NOTIFICATION OF AWARD

Address of Procuring Entity

To:___

RE: Tender No.____

Tender Name_____

This is to notify that the contract/s stated below under the above mentioned tender have been awarded to you.

1. Please acknowledge receipt of this letter of notification signifying your acceptance.
2. The contract/contracts shall be signed by the parties within 30 days of the date of this letter but not earlier than 14 days from the date of the letter.
3. You may contact the officer(s) whose particulars appear below on the subject matter of this letter of notification of award.

*(FULL PARTICULARS)*_____

SIGNED FOR ACCOUNTING OFFICER

FORM RB 1

REPUBLIC OF KENYA

PUBLIC PROCUREMENT ADMINISTRATIVE REVIEW BOARD

APPLICATION NO.....OF.....20.....

BETWEEN

AND

.....RESPONDENT (*Procuring Entity*)

Request for review of the decision of the..... (*Name of the Procuring Entity*)
ofdated the...day of20.....in the matter of Tender
No.....of 20...

REQUEST FOR REVIEW

I/We.....,the above named Applicant(s), of address: Physical
address..... Fax No.....Tel. No.....Email, hereby request the
Public Procurement Administrative Review Board to review the whole/part of the
above mentioned decision on the following grounds, namely:-

1.

2. etc.

By this memorandum, the Applicant requests the Board for an order/orders that: -

1.

2. etc

SIGNED (Applicant)

Dated on.....day of/...20...

FOR OFFICIAL USE ONLY

Lodged with the Secretary Public Procurement Administrative Review Board on
..... day of.....20.....

SIGNED

Board Secretary