# TERMS OF REFERENCE FOR DRILLING /WATER YARD INSTALLATION IN ABYEI ADMINISTRATIVE AREA

**Title: Terms of Reference for drilling and upgrade of two boreholes into water yards in Abyei Administrative Area**

1. **Background**

Danish Refugees Council (DRC) is an International Humanitarian Organization that provides humanitarian assistance to South Sudanese communities, including internally displaced people (IDPs), refugees, and returnees across the country. With funding from US government, DRC is planning to drill and upgrade two (2) boreholes into mini water yards with complete installation of pump systems, tower and tank reservoir and therefore seeks the services of competent and reputable firms to undertake these works that will be situated in Abyei Administrative Area.

The administrative area (Abye) is home to the Ngok Dinkas and the Misseriya a nomadic Arabic tribe from Sudan. This area remains a disputed territory between South Sudan and Sudan and is located in the border between the two countries. Perennial tensions between ethnic groups over land right and other internal rift have led to the emergency of armed youth groups with lots of intercommunal violence. These conflicts (intercommunal), climate shocks and chronic poverty among others have resulted into increased vulnerability among the returnees, Internally Displace Persons (IDP’s) and Host communities causing high demand for life saving activities such as WASH, Shelter, protection etc.

**Objectives of the assignment.**

The objective of this TOR is to state roles and responsibilities of DRC and Contractor in order to drill and upgrade two boreholes into mini water yards to provide safe water to communities in Abyei Administrative Area and meet the WASH minimum standards.

1. **Scope of work** 
   1. **Summary**

The contractual tasks involved in this contract will constitute the drilling and solarization of two (02) productive boreholes upgraded into mini water yards. The work shall include; hydro-geological survey, drilling to a minimum (90m) with 8’diameter and depending on the geological formation, installation of casing and screens, installation of graded gravel pack, both provided by the contractor. Including development of the boreholes, disinfection and construction of the raised platforms complete, Solarization (solar and submersible pump systems complete), tower, reservoir and secured chain link fence installation.

The contractor is expected to provide all sets of suitable drilling equipment that can adaptively drill the various formations encountered to achieve the depth and diameter required, and a team with the perquisite skills and experience to undertake this work in accordance with the highest WASH standards and within the contractual agreement in Abyei Administrative Area.

* 1. **Drilling locations**

The contractor shall drill and upgrade the two (02) boreholes/mini water yards at the exact locations designated by DRC within the counties in the Abyei Administrative Area (within Abyei center, Amethaguok and Rumamier areas).

## Siting of boreholes

The exact siting of the borehole shall be done by community representatives and DRC staff where access is possible and population concentration is high in order to address the water needs in accordance with minimum sphere standards. The contractor must thereafter locate at least three potential sites for the borehole and prioritize them. The final site selection will be made in collaboration between the contractor's staff, DRC Technical staff, and the community. The contractor will submit a hydrogeological report to DRC.

The contractor shall be responsible for conducting vertical electrical depth sounding (VES) geophysical surveys on the drilling sites. The contractor must have competent staff, equipment, and software to carry out the surveys and interpret the data.

* 1. **Technical specification**

Construction materials shall be provided by the contractor, who is expected to supply internationally certified materials and handle them with care to avoid loss on site and to perform the work professionally without any material wastage.

## Supervision

The execution of the TOR shall be supervised by the DRC designated technical staff. Lithological samples shall be collected by the contractor every 2m or every drill pipe; whichever gives the smallest interval. The installation of the casing string, gravel pack, solar and submersible pump system, development and the pumping test shall be conducted in the presence of the DRC technical staff to verify the yield of the well and yard productivity of minimum 1m3/hr or more to meet the community need.

Condition and specifications of the equipment and materials utilized will be subject to approval by DRC and should be disclosed by the drilling organization before the drilling commences.

# Roles and responsibilities of the parties to the contract

## Contractor: The Contractor shall note the following

* Food, accommodation, and storage facilities: The Contractor shall make their own arrangements for food, accommodation, and storage facilities on the ground.
* Plant and equipment: The Contractor shall provide all plant and equipment and share a list of their equipment, including drilling plant and tools, as part of the tender document.
* Key person: The Contractor shall nominate one key person who shall be responsible for the assignment on their behalf and shall be the Contractor's site representative. This person is indicated on the list of personnel which is part of the tender document.
* Transportation and security: The Contractor shall arrange for the transportation and security of all equipment and staff. They shall take all necessary precautions to ensure the security and safety of works, materials, equipment, and people associated with the works.
* Liaison with local authorities: DRC shall liaise with the local authorities to ensure that the roads/sites are accessible to the contractor in order for them to execute the works in a timely manner.

## DRC

* Responsible for coordinating with local authorities, communities, and other stakeholders in matters relating to this drilling work.
* Pay the contractor in accordance to the agreement set forth in the contract.
* Conduct regular monitoring visits, inspections, and certification of the portion of the completed work.
* Provide guidance and technical advice, and support during the execution when deemed necessary.
* **DRC** will not be responsible for any injuries or deaths sustained by the contractor or any individuals subcontracted by the contractor to execute this work.
* DRC has “Zero Tolerance approach” to Sexual exploitation and abuse and does not allow any partner supplier, subcontractor, agent or any individual engaged by DRC to engage in any form of sexual abuse or exploitation against Vulnerable or other adult’s associating with its work.
* Sexual exploitation and abuse by humanitarian workers constitute acts of gross misconduct and are therefore grounds for termination of contract.

# Drilling

## Drilling Procedure

The contractor shall be responsible for selecting the appropriate drilling procedure for the geology of the drilling site. The diameter must be adequate to accommodate the final borehole casing diameter plus a minimum annular space of 50 mm. The contractor may choose to either drill a hole of the desired diameter on the first pass or to drill a smaller diameter test hole and then ream it to the final size. Regardless of the procedure used, payment shall only be made for the sufficient water source that meets the required water standards

## Drilling Method and Fluid

The drilling method, drilling plant, drilling fluid, and fluid additives are subject to approval and must be mentioned in the tender document. The drilling fluid and additives must be nontoxic and biodegradable. The contractor is responsible for supplying the drilling fluid and additives.

## Drill Cuttings

Drill cuttings must be placed in containers provided by the contractor. The contractor must have sufficient sample containers at the site to accommodate all of the samples collected. The samples must be kept available for inspection until the supervisor gives permission to dispose of them.

## Driller's Report

During the drilling, completion, and development of the borehole, the contractor must maintain a detailed driller's report. The report must give a complete description of all formations encountered, the number of meters drilled, the number of hours spent drilling, any shutdowns due to breakdowns, the length and type of casing and screen set, and other pertinent data as requested by the DRC WASH Engineer. The format of the report must be approved by the supervisor in advance and must be signed by both the driller and the supervisor on a daily basis.

In addition, the contractor must measure and monitor the following:

The depth of the borehole in progress

The static water/mud level in the borehole

The different depths of water strike and aquifers

The penetration rates at various strata or when changing tools

## Payment

## Payment shall be done after 100% completion of the work as shall be certified by DRC’s representative.

The Contractor shall be paid 90% and the remaining 10% paid after the defect liability period of 6 months.

The SUPPLIER shall invoice the PURCHASER after completion of work, invoices must clearly indicate the SUPPLIER’S bank and bank account number for payment to be made.

The terms of payment shall be thirty (30) working days after presentation of an invoice and signed Certificate of Completion of Service.

VAT shall be paid in compliance with the binding regulations, national law and international agreements concerning the execution of the program. VAT and other taxes shall not be paid on the funds originating from European Community funds or USA funding

## Borehole construction

The final depth of the borehole and the other relevant depths involved in the design of the borehole shall be determined from measurements made by the contractor and the supervisor. The design of the borehole (intervals to be cased and screened, screen slot opening, etc.) are to be approved by the supervisor.

The gravel pack should consist of well graded river gravel. Under no condition should rock chippings be used. The material should be free of shale, mica, clay, dirt or organic impurities of any kind. The material should be carefully introduced into the hole to avoid bridging. The last 6 meters of annular space shall be filled with cement grout to provide a sanitary seal after the development of the borehole.

## Borehole development

The contractor shall develop the borehole by a combination of jetting with water and surging with air. The borehole shall be developed with great care to avoid any damage to the casings and screens. The development shall continue until the borehole is judged to be free of sand and other drilling cuttings by the supervisor.

## Pump testing

The contractor shall conduct a pumping test on every successful borehole. The pump testing shall be at a constant yield and continuous pumping of 5m3/h for a period of 10 hours. Immediately after the pumping, the contractor shall measure the water-level recovery in the borehole over a minimum period of 1 hour, unless the water level has recovered to the original level before.

During both the pumping and the recovery periods, the contractor shall measure the water level in the borehole using a calibrated electronic sensing device. The water level measurements are to be taken in accordance to the schedule indicated by the supervisor. The contractor shall analyze the results of the pumping test and report the results on forms provided by the supervisor before further installations.

## Water quality analysis

During the pumping test, the contractor shall collect water samples from the borehole for water quality analysis. The samples shall be collected from the pump flow direct into the container. The containers shall be labelled with the borehole number, date and time of sampling. The information shall be entered into a form provided by the supervisor.

The contractor shall have tests carried out in a laboratory approved by the supervisor to determine the following parameters: colour, odour, taste, electrical conductivity, pH, turbidity, temperature, manganese, total hardness, Iron, chloride, fluoride, arsenic, nitrate and sulphate. Microbial parameters shall comprise faecal coliform counts, all have to comply with World Health Organisation (WHO)/National Water Quality guidelines/standards.

## Borehole disinfection

After completion of the pumping tests the contractor shall undertake final disinfection of the borehole with a hypochlorite calcium (HTH 70% Chlorine). A jar test to determine a solution-generating concentration of 0.5mg/L of free chlorine residual chlorine after a contact time of 30 minutes with be used to disinfect the water. The chlorine shall be applied uniformly throughout the entire depth of the water in the borehole. All accessible portions of the borehole above the water shall also be wetted with a chlorine solution.

## Construction of concrete pad and animal Trough

The Contractor shall construct a concrete pad around the borehole casing sticking above the ground (around 30cm) and continuous with the underlying 6 m cement grout in the sanitary seal. The pad shall be 2m in diameter. The concrete shall be cast over a layer of compacted hard core with a minimum thickness 200 mm above the ground and continuous with the underlying cement grout. The drainage channel shall be at least 6 m long, sloping away from the pad. The animal trough should be 1.8m. The Contractor shall ensure that the sides of the pad are straight by properly anchoring the forms. The top of the pad shall be troweled to a smooth surface. The contractor shall keep the surface of the concrete pad moist for a period of 72 hours after the concrete has been placed.

## Installation of Indian Mark II hand pump pedestal/water yards.

Prior to leaving a borehole unattended at any time, the contractor shall place a temporary cap on the borehole casing. An Indian Mark II hand pump will be installed awaiting setting of the concrete, however for lifting water beyond 45m water yards will be constructed refer to the technical drawing/BoQ. All necessary parts and tools for the installation are provided by the contractor.

Thereafter, the contractor shall then install all the solarization system replacing any temporary handpump accessories prior to the full development of the yard’s fence, tower and appropriate tank capacity as specified in the BoQ to render the borehole fit for utilization.

# Additional role of the contractor

1. The contractor is responsible for the construction and completion of all work described in the contract and contractual documents, including the ToRs and annexes. The contractor must provide all labor, materials, tools, equipment, transportation, food, and supplies necessary to complete the work in accordance with the specifications and terms of the contract. The contractor cannot deviate from the construction designs or specifications without seeking and receiving permission and approval from the client (DRC).
2. If the contractor is unable to complete the drilling or has to abandon the borehole due to loss of tools, accidents, or any other unforeseeable circumstances, the contractor must remove the casings or drive pipes already in the hole and refill it with clay or concrete. All materials extracted from the hole after refilling it will become the property of the contractor. DRC will not pay for any of the work carried out, and will only authorize the drilling of a new hole, at a site near the abandoned one, if necessary, at the contractor's expense.

# Health & Safety

The contractor's team leader must take reasonable precautions to prevent death or injury to persons during all undertaken activities. These precautions include, but are not limited to:

* Providing crew members with safety helmets, hard-toed boots, heavy-duty gloves, and protective glasses
* Ensuring that all tools and equipment are in a safe condition
* Ensuring that employees adopt safe working methods
* Providing the drilling crew with a uniform to be worn at the site. Military-looking clothing is not permitted at any time.

Under this contract, the contractor's team leader is obligated and responsible to safeguard the safety and security of its personnel, the drilling crew's equipment and other property, and personnel's personal effects and other property. The contractor's team leader must develop a security plan in consultation with DRC, including detailed procedures to cover evacuation, personnel, equipment, unlawful interference, and prevention of sabotage.

# Interface between DRC and the Contractor.

* The parties to this agreement as well as the stakeholders for this project should ensure there is a good line of communication and coordination for seamless implementation.
* All relevant communication and coordination in regard to this contract should be channeled through the focal person designated from DRC to work with the contractor in the field.
* The contractor can consult DRC technical team for any guidance or advisory assistance such as interpretation of the work during the execution of this contract.

# Handing Over.

* A joint inspection on the drilling works will be conducted with different parties including county local authorities, community leaders, DRC and the Contractor. Should there be a case of defaults in any components, it has to be rectified by the contractor before final handing over.
* The contractor will hand over the water facility to DRC and DRC will hand over to the community. DRC will carry out post-construction monitoring for a period of three months as a defect liability period.

# REQUIREMENTS OF THE CONTRACTOR FOR THE TENDER

Experience

* To be accepted to participate in the tender process, contractors must provide evidence of satisfactory completion of boreholes drilling in South Sudan with other NGOs or the government
* Demonstrate financial capacity to handle large contracts

Equipment and Workforce

* Contractors must submit a list of the drilling equipment they will use for the contract, specifying the name, model, quantity, and year of manufacturing.
* All equipment listed must be in perfect operational condition. If changes are required during the execution of the contract, the contractor must put in place equipment of similar characteristics and inform DRC in writing.
* Contractors must also submit a list of the workforce they intend to use for the project, detailing the percentage of females and males.

Time for Completion:

* The contract is valid for 2 months and contractor must be in position to complete the work within a maximum of 2 months after the signing of the contract.
* For the tender process, the contractor must submit a work schedule that aligns activities with the completion period.
* Any bid whose schedule goes beyond the project estimated completion period of 2 months will not be accepted.
* In the case of delays in the implementation process of the project, penalties will follow with immediate effect. The penalty criteria will be stipulated in the contract document.

Legal Documents from the Government of South Sudan

* The contractor must present a copy of the following:
  + Valid operation license
  + Valid Certificate of incorporation
  + Valid tax clearance certificate

Bidding Amount

* Companies participating in this tender must submit a fully completed bill of quantities (BoQ) with the unit prices for each activity.
* The full amount quoted should cover all expenses for the completion of the activities under the contract, as well as any indirect costs and/or administrative costs that the contractor must incur.

# DEFECT LIABILITY PERIOD

10% of the total contract sum shall be retained for a period of six (6) months after the contract completion date to ensure the contract corrects any defects/failures arising from the completed works. Payment of the retention shall be upon verification and approved by the Engineer/supervisor that completed facilities remain functional after 6 months of completion.

# **Application Process: (As shall be guided by the procurement team)**