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Scope of Works

Boreholes flushing by airlifting, test pumping, pump installation, solar photovoltaic power system installation including all control ancillaries thereto, tank tower installation, tank installation including all plumbing ancillaries thereto, construction of a gated fence to house tank tower and the wellhead and construction of concrete livestock water trough.

Description:

The successful contractor shall execute and complete the works specified in this scope of works including any additional work as may be instructed by the authorized agents of NCA. The works shall be conducted in accordance with the NCA Contract Conditions for works as specified under Annex-A of this tender document, and the design documents developed by NCA WASH Programme and shall be communicated to competent contractors at the first stage of the procurement process.

The bidder shall endeavor to read and understand all documents specified in the tender. All bidder's personnel, equipment, materials, consumables, and other items and services, whether of a temporary or permanent nature, required in the execution, completion and remedying of defects in the works shall be clearly listed indicating their current conditions.

All steel components shall be Mild Steel (MS), concrete shall be grade C20/20 (1:2:4), plastic pipes shall be HDPE (pressure rating PN-16), iron pipes used shall be galvanized, hot dip.

The works to be undertaken by a successful bidder shall include but not limited to:

1. **Flushing/surging the borehole – this is to be done to clean any clogged screen thereby improving the borehole yield:**
   - Mobilization of suitable compressor equipment capable of delivering a minimum of 145 PSI or 10 bars of pressure below the pump installation depth.
   - Flushing of borehole by airlifting with a compressor of 10bar for a minimum of 3 hours until the turbidity is less than 5 NTU.
2. **Pump Testing:**
   - Perform a minimum 4hour constant rate test and 1-hour recovery test to determine the minimum yield. Yield, draw-down and recovery data are to be reported on standard borehole log. The test is to be conducted below the depth of pump delivering minimum 3000 liters per hour at the installation depth (for the borehole at Mayen Gumel).
   - Collect water sampling and testing for biological and Physio-Chemical on at least 3 water samples, by an independent reputable laboratory- Note: Original copies of results of the Water quality testing, showing date of sampling and date of analysis must be availed by the contractor prior to payment for completed work. The analysis to be checked against GOSS and WHO standards, and levels to be permissible before further construction.

3. **Borehole Disinfection:**
   - Disinfect the borehole with hypochlorite calcium solution 50mg/liter with all required related activities. After 24 hours test for residual chlorine level ensuring that it meets the WHO recommended limits for drinking water at 0.2mg/L and not exceeding 2.0mg/L.

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4. **Construction of steel tank tower (see details in drawing):**
   - Construct 6 metres high steel water tank tower to carry two cylindrical plastic tanks each 5,000 litres capacity and black in colour.
   - The steel structures of the tank tower shall be coated in black oil-based paint to finish
   - The tower shall be anchored by 6 concrete footings as detailed in the drawing.

5. **Installation of 2 cylindrical plastic tanks on the tank tower (see details in drawing):**

   - Install two plastic tanks (as detailed in the drawing)
   - Connect all plumbing (as detailed in the drawing).

6. **Install of an array comprising 12 solar photovoltaic panels fixed to a suitable rack mounted on the tank tower (see details in drawing):**

   - Install 12 solar panels each of watt peak 120 watts connected in series (as detailed in the drawing)
   - Use suitable metal racks to safeguard the solar panels from theft, vandalism or prevent from being blown away by wind (as detailed in the drawing).
   - Provide grounding to the solar rack using a suitable earth rod
   - Solar panel cells should be of monocrystalline type – any type of solar panel supplied other than the specified shall be rejected.

7. **Install Submersible Pump:**
   - Construct 12cm thick C20/20 (1:2:4) concrete platform 1.5m diameter on crushed stone hardcore base to the pipe to the base. This platform holding the wellhead shall be floodproof by ensuring that it is raised above the historical annual flood levels recorded in the area.
   - Connect the approved submersible pump (matching the borehole yield with the power) through the supplied control panel to the power system
   - Provide grounding for the pump through the suitable earthing rod
8. **Provide mechanical plumbing of the entire works (see details in drawing):**

   - Install a non-return valve on the riser mains pipe between the wellhead and the tank.
   - Install a water metre between the non-return valve and the tank.
   - Install the washout pipe including its gate valve.

9. **Construct a gated chain link fence to house the tank stand and the wellhead (see details in drawing):**

   - Construct a chain link fence that enclose the water supply system: wellhead, tank tower and the power source. The chain-link fence shall be anchored at the bottom using concrete. The fence shall have a lockable gate.

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