Terms of Reference (TOR)

Borehole Drilling, Construction, Development, Pump Testing, and Water Quality Analysis

1. Background

The Client intends to construct a production borehole to provide a sustainable source of safe drinking water for the target community. A geophysical survey has already been completed, and the recommended drilling location and estimated drilling depth have been identified. The Contractor shall execute the drilling works based on the approved survey report.

2. Objective

The objective of this assignment is to:

- Drill and construct a productive borehole at the location identified in the approved geophysical survey.
- Develop the borehole to achieve optimum yield.
- Conduct pumping tests to determine the sustainable yield and aquifer characteristics.
- Collect water samples for laboratory analysis.
- Submit a comprehensive borehole completion report.

3. Scope of Work

The Contractor shall undertake the following activities:

A. Review of Existing Survey

- Review the geophysical survey report provided by the Client.
- Verify the recommended drilling coordinates on site before mobilization.
- Notify the Engineer immediately if site conditions differ significantly from those indicated in the survey report.

B. Mobilization

- Mobilize all drilling equipment, personnel, materials, and support vehicles.
- Establish temporary site facilities and implement all required health and safety measures.

C. Borehole Drilling

- Drill the borehole at the approved location to the recommended depth or deeper if instructed by the Engineer based on actual geological conditions.
- Maintain detailed drilling logs showing:
    - Geological formations encountered.
    - Water strikes.
    - Drilling depth.
    - Borehole diameter.

  - Static water level.
  - Any drilling challenges encountered.

D. Borehole Construction

Install the borehole using approved materials, including:

- uPVC casing and screens.
- Gravel pack.
- Sanitary seal.
- Cement grouting.

Construction shall comply with the approved borehole design and applicable standards.

E. Borehole Development

Develop the borehole using appropriate methods such as airlifting, surging, and pumping until:

- The discharged water is clear.
- Sand content is within acceptable limits.

F. Pumping Test

Conduct:

- Step-drawdown test 4 Hrs.
- Constant discharge pumping test 72 Hrs.
- Recovery test 6 Hrs.

Record:

- Pumping rate.
- Static water level.
- Dynamic water level.
- Drawdown.
- Recovery rate.
- Sustainable borehole yield.

G. Water Quality Testing

Collect water samples after completion of development and pumping tests for laboratory analysis, including:

- pH
- Turbidity
- Electrical Conductivity (EC)
- Total Dissolved Solids (TDS)
- Iron
- Manganese

- Fluoride
- Nitrate
- Sulphate
- Chloride
- Total Hardness
- Total Coliform
- *E. coli*

H. Site Restoration

- Remove all waste materials from the site.
- Dispose of drilling waste in an environmentally responsible manner.
- Restore the site to a safe and clean condition.

4. Deliverables

The Contractor shall submit:

- Daily drilling records.
- Borehole lithological log.
- Borehole construction details.
- Pumping test report.
- Water quality laboratory report.
- Borehole completion report.
- GPS coordinates of the completed borehole.
- Photographs before, during, and after drilling.

5. Contractor Responsibilities

The Contractor shall:

- Execute the works in accordance with the approved geophysical survey report.
- Provide all labour, equipment, materials, and consumables required for the assignment.
- Comply with all health, safety, environmental, and safeguarding requirements.
- Rectify any defects arising from poor workmanship at no additional cost.