***SCOPE OF WORK***

# Scope of Works

#  General: -

The general scope of work procure, supply, installing, testing, training and commissioning, operating, handing over of complete system Solar PV Water Pumping System. As required in specifications but not specifically included in the following items: -

* Suitable amount of solar PV modules with its mounting structures and arrangements to enhance the availability of solar radiation to achieve the max output power to run Submersible AC pump adequate to lift desired quantity of water via appropriate controller (solar pump inverter VFD) and all accessories
* Solar water pumping systems shall be installed as per the specifications provided in the RFQ technical specifications, and the manufactures recommendations according to approved catalogues and manuals.
* The good quality material and applying the latest available technologies with high quality and warranty for each item .

# Detailed Scope:

* The WORK to be performed under this document shall consist of furnishing system, tools, equipment, materials, supplies, and manufactured articles, and furnishing all labour, transportation, and services, including fuel, power, water, and essential communications, and performing all work or other operations required for the fulfilment of the Contract in strict accordance with the Contract Documents. The WORK shall be complete, and all work, materials, and services not expressly indicated or called for in the Contract Documents which may be necessary for the complete and proper construction of the WORK in good faith shall be provided by the CONTRACTOR as though originally so indicated, at no increase in cost to the EMPLOYER.
* The contractor is also required to make sure that all required materials, equipment’s, subsystem is included in his offer to deliver a completed and functional system., includes but not limited the following components:
	+ Solar PV modules consisting of required number of Crystalline PV modules;
	+ Fixed Mounting structures suitable for number of PV panels;
	+ PV combiner box;
	+ Solar pump inverter (VFD with built in MPPT controller) with Generator connections.
	+ Submersible AC pump set (Motor & Pump) with suitable Cables and Accessories;
	+ System Cables (DC & AC);
	+ Raiser Pipes and Joints;
	+ PVC pipe for cable holding.
	+ Earthing, short-circuit, surge and lightning protections for whole system including existing generator earthing.
	+ Mechanical Water Flow Meter and valves.
	+ Chain Link Fences with two leaflets gate to protect the system.
	+ Plastic water tank with water point consist tap with septic tank and animal basin
* The contractor should take into account the site condition in terms of obstacles and shadings and the north direction.
* This scope of works is not meant to be a comprehensive definition of works, but merely a guide for the items of work contained within this tender package.
* Installation of PV system & Water Pumping System components shall be done in accordance with manufacturer operation manual adequate to lift desired quantity of water, bidders will be required to submit stamped operation and manuals prior commencement of works.
* Site levelling, the contractor shall survey and conduct all site levelling such as cut and backfill in any type of soil, removing/cut the existing asphalt/tiles, laying 15 cm sand above conduit, safety electrical cables with safe depth from existing ground level, re-pavement, and all related civil work
* The contractor shall carry out any operational costs to finish the installation at location.
* The Contractor shall generate a site plan, which indicates the structural and electrical works that is required for the successful completion of the Project such has to be approved by Medair
* Removing the old existing bore wells' pumping units including pumps, motors, cables, riser pipes, flow meters complete with all accessories and deliver to well management or general Authority for rural water supply projects; all required costs for dismantle shall be bared by the contractor.
* The contractor shall clear, from all areas planned for the work, materials, debris, etc, prior to the commencing of work
* Contractor shall clear, from all areas planned for the work, materials, debris, etc, after complete installation.

# Procurement

* Procurement and expediting tasks for all equipment and materials are the responsibility of the Contractor;
* The equipment and materials shall be purchased by the contractor, and it is understood that the cost of this equipment, materials, shipping and transportation;
* All of the procured material shall be brand new with valid warranty certificates;

# Project Execution

* Once the CONTRACT is awarded, the contractor is entitled to carry out detailed site visit, site survey with Medair representative to identify components locations, cabling routing, and any other necessary works;
* A Regular status meeting with Medair representative shall be carried out to discuss current and planned activities and significant issues;
* The contractor has to submit the final a stamped design and shop-drawings to be verified and approved by Medair
* The Contractor must provide work installation plan and implementation period such has to be approved by Medair.
* The contractor responsible of any defect or damage in any components of the solar pump system until the completion of commissioning of the system;

#  Manuals, Catalogues and Drawings

* Bidder shall submit catalogues and data sheets of all the offered PV systems equipment with detailed technical specifications for the proposed systems and components. In addition, the contractor shall submit all required doc’s such as Shop Drawings, catalogues, factor acceptance tests, test reports by other accredited parties. The offered PV systems shall be capable to operate in the climatic site conditions ensuring the system sustainability and durability
* All as built drawings and layout shall be prepared using AutoCAD including but not limited to: as belt drawing , PV layout, cable routing, and structural design pumping system layout;

# Construction

* Contractor shall implement its standard Quality Assurance / Quality Control plan for construction activities on the Project Site;
* The contractor shall supply all labour, tools, machinery, equipment and equipment transportation for all work;
* The contractor shall keep the site clean and orderly throughout the duration of construction;
* The contractor shall provide permanent equipment marking, labelling and signage for the project;
* The contractor shall fully comply with all applicable notification, safety and work rules when working
* It is the contractor responsibility to clean the modules once the construction work is completed

# Commissioning

* The contractor shall provide a time plan and test procedure for the process of commissioning;
* The contractor shall offer all goods and materials for inspection examination and witness testing. He shall inform the Medair or his authorized representative of the date when the goods and materials will be ready for inspection and witness testing. If the tests are beyond the resources of the supplier, he shall make arrangements for these to be carried out elsewhere;
* Such testing should include the following tests as minimum:
* Cable insulation and continuity test: such tests should be carried before commending installation;
* System earthing test: The earth resistance should be measured to ensure operators safety;

# System Warranty and After Sales

* At least one year warranty from the operation date of each supplied items. (any another warranty will not be accepted) and workshop warranty of each supplied items as per in its description specification.

# System Training:

* The awarded contractor shall carry our comprehensive training for 2 personnel where the solar system will be installed, the training will be focusing on system operation, maintenance and troubleshooting, the training scope shall be approved by Medair, the activities shall include but not limited to the following:
* Solar pump operation
* Solar Inverter operation
* System isolation
* System monitoring
* Fault diagnosis
* Safety and emergency shutdown procedure
* User manuals, operation manuals and drawings must be provided in Arabic and in English.

#  Final Completion

* The Contractor shall complete any required document or list, clean up the construction site and remove any temporary structures, equipment or services, and construction debris;
* Copies of all final approvals and certifications shall be provided to Medair.
* The Contractor shall provide two (2) hard copy sets and one soft copy of the final Project as-built documentation;

# Contract Method

* The WORK hereunder will be constructed under a unit price contract comprised of both unit price items and lump sum items.