**تقرير: تأهيل الابار الجوفية في قلقيليه**

**Rehabilitation of Groundwater Well 15-17/010**

**Basic information**

The listed information is gathered from local well's committee and the technical operator. Therefore is advised to verify where necessary and double check with MoA wells' data registry files.

Well Id Number: 15-18/001

Well location: Falamya\_ Qalqilya District

Well coordinates: X= 149025 Y=. 1780142 Z=85

Water quality: potable water and used for agriculture only

Number of farmers: 75

Total irrigated area dunum: 320

Average number of working hours per day in summer: 12 hours

Average number of working hours per day in winter: 3 hours

Well total depth (meter): 95

Drilling hole diameter (inch): 10

Pump setting below surface (meter): 88

Diameter of pumping pipes (inch): 5

Well pump type and capacity at well site: closed pump 55 (m3/hr)

Highest dynamic pressure reading(bar): 5

Pump capacity at highest pressure: 40 (m3/hr)

Well crookedness: minor

Electric Power: Available transformer and no voltage drop

Static water level below surface (m): **70**

Dynamic: not know, but no air noticed

Well rehabilitation partially 15 years ago

Technical malfunction: old pumping pipes and turbine-low efficiency and high maintenance

**Design Proposed Quantities Well 15-17/010 (work includes Supply and Install)**

|  |  |  |
| --- | --- | --- |
| Item | **Description** | **Qty** |
| 1 | **Vertical turbine:** supply and install vertical turbine (closed impellers) with capacity **80 cubic meter** per hour at total dynamic head **140 meter** with 1500 rpm. The maximum turbine size 8 inches. It includes connections to discharge pipe and discharge head. This item includes all connections to pumping pipes and discharge head and all works to dismantle the existing pumping pipe and turbine and re install new pump and pumping equipments. | 1 |
| 2 | **Vertical hollow shaft motor** (as US motors) duty inverter (1500/1800 rpm) with overload and RTD (PT100) temperature protection relays. Motor size not less than **90 hp**. Class F insulation, service factor 1.15, IP 44 double thrust bearing design, spike resistant wiring, and full load efficiency not less than 94%. | 1 |
| 3 | **Electric panel**: suitable electric panel three cabinets ip 66 with inverter 90 hp compatible with the motor and equipped with inverter Main breaker by pas contactor, changeover, capacitor banks, all protection sensors against high pressure low pressure, no flow, low voltage and spikes, surge arresters, low water level, high motor temperature and overload. It includes, power cables, control cables, cooling fans, alarm for all voltage or phase failures, breakers.. contactors, kilo watt hour meter, earthling, temperature display, relays and timers, multi meter, 24 volt transformer manual and automatic control and display hydrostatic water level circuit, air condition split unit 2 ton...etc  All devices and cables to match the load and motor size. |  |
| 4 | **Pumping pipes**: seamless standard sizes sch40 length 87 meter of diameter 5 inches threaded and epoxy painted from inside and outside or equivalent galvanized pipes..including coupling not less 8 teeth per inch over 12 cm coupling | 87 m |
| 5 | **Retainers and bearings and rubber joints complete set** suitable for the 5" pumping pipes | 29 piece |
| 6 | **Shafts as carbon steel 1040 or equivalent**. Diameter 35 mm and required | 87 m |
| 7 | **Access pipes and all connections** to monitor water level using pvc pipes sch 80 /1.25 inches used for hydrostatic water level measurements | 90 m |
| 8 | **Pressure gauge** 16 bar | 2 |
| 9 | **Flow Switch (**one piece suitable for 6" pipes**) and pressure switches (PN** 16 bar 2 pieces for high and low pressure). | L.S |
| 10 | **Pressure relief valve 2 inch** for mechanical protection of high pressure include wash out and water piping | 1 |
| 11 | **Fittings:** all fittings are 6 inch as PN 16 include: gate valve, non return valve, dresser, flexible connection..tees and elbows 2 inch air valve, water meter | L.S |
| 12 | **Steel pipes:** replace existing pipes and fitting to install new pipes and fittings 6 inch diameter and thickness 3.96 mm | 24 m |
| 13 | **Discharge head:** 5"x 6" including stuffing box | 1 piece |

**Recommendation:**

The pumping pipes are deteriorated and the well pump fall inside the hole and luckily they are able catch it or part of it. Around 50% of the agricultural area is located inside the wall. With the existing pump equipments les than 40 cubic meter can reach the farms. Therefore, it is advised to increase the pumping capacity by 50% (or 30 cubic meter per hour) and install new pumping equipments that enable to reach these areas behind the wall and to meet the expansion of agricultural areas; meanwhile to minimize the maintenance costs and water cuts.