**تقرير تأهيل الابار الجوفية في فلامية**

**Rehabilitation of Groundwater Well 15-18/005**

**Basic information**

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

Well Id Number: 15-18/005

Well location: Falamya\_ Qalqilya District

Well coordinates: X= 151877 Y=. 181093 Z=110

Water quality: potable water and used for agriculture and domestic demands

Number of farmers :80

Domestic use: 120 families

Total irrigated area dunum: 250

Average number of working hours per day in summer: 20 hours

Average number of working hours per day in winter: 4 hours

Well total depth (meter): 210

Drilling hole diameter (inch): 12

Casing: 12 inches

Pump setting below surface (meter): 168

Diameter of pumping pipes (inch): 6

Well pump type and capacity at well site: submersible closed pump 50 (m3/hr)

Highest dynamic pressure reading (bar): 1. There is a booster pump at the site and tank fiber glass tank capacity 60 m3

Pump capacity at highest pressure: 50 (m3/hr)

Well crookedness: minor

Electric Power: Available transformer and no voltage drop

Static water level below surface (m): **98**

Dynamic: not know, but no air noticed

Well rehabilitation partially 3 years ago

Technical malfunction: High power consumption 20 kilowatt above normal (75 kw/55kw)

**Design Proposed Quantities well 15-18/005 (work includes Supply and Install)**

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| --- | --- | --- |
| **Item** | **Description** | **Qty** |
| 1 | **Submersible turbine:** supply and install submersible turbine (closed impellers) with capacity **70 cubic meter** per hour at total dynamic head **200 meter** with 3000 rpm. The maximum motor turbine size 9 inches. It includes built in non return valve, shroud, connections to discharge pipe and discharge head (80\*80\*5cm), protection cables overload and temperature sensor RTD (PT100). The motor is permanent magnet and inverter duty (10-1). This item includes all works to dismantle the existing pumping pipe and turbine and re install new pump and pumping equipments. | 1 |
| 2 | **Submersible electric cable** **3x95 mm2** (1FL, 3GI3 quality insulation)+ **1x50 mm2** .with the following specifications:  The cable is flat with a light blue outer sheath, drinkable conductors for permanent submersion in potable water, to respective depths and up –to 600 meters. It is water resistance tested according to the European standard EN 505825-2-21 (AD8 condition complete submersion in water) and meets the requirements of BS 6920, and IEC 60228 covering the suitability of non-metallic materials and products for use in contact with water. The EPR (Ethylene Propylene Rubber) insulation and Elastomeric Cross-linked outer sheath should provide a robust and water-tight barrier.  The voltage rating is 0.6/1kV and a temperature rating of -25Co to +90 Co. It is suitable for use in water of a maximum temperature of 80Oc. This item includes connections to submersible motor fixing with special stainless steel ties and protection sheets over the entire length | 1 |
| 3 | **Electric panel**: suitable electric panel three cabinets ip 66 with inverter **100 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 180 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 | 180 m |
| 5 | **Access pipes** to monitor water level using pvc pipes sch 80 /1.25 inches used for hydrostatic water level measurements | 185 m |
| 6 | **Pressure gauge** 16 bar | 2 |
| 7 | **Flow Switch (**one piece suitable for 6" pipes**) and pressure switches (PN** 16 bar 2 pieces for high and low pressure). | L.S |
| 8 | **Pressure relief valve 2 inch** for mechanical protection of high pressure include wash out and water piping | 1 |
| 9 | **Fittings:** all fittings are 6 inch as PN 16 includes: gate valves, non return valve, dressers, flexible connection, tees and elbows 2 inch air valve, water meter. | L.S |
| 10 | **Booster pumps:** dismantle the existing booster pumps in the site and all fittings. Supply and installtwo identical vertical booster pumps capacity **65 m3 at 55 meter** and replace all connections and fittings with new ones. This item includes replacing the existing control panel, pump fittings and install new items as follows:  suitable control panel for both boosters and equipped with inverter and all protection sensors against high pressure low pressure, no flow, low voltage and spikes, surge arresters, low water level in the tank, high water level in the balance tank high motor temperature overload. It includes, power cables, control cables, cooling fans, alarm for all 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 tons...etc. All devices and cables to match the load and motor size.  **It also includes:**  **Fittings 4" :**all fittings are 4 inch as PN 16 include: 4 gate valves, 2 non return valves, 4 dressers, 2 flexible connections...tees and elbows, two 2 inch air valves, 2 water meters, 2 air release valves, 2 pressure relief valves, 2 pressure gauges and all cables and pipes exactly similar quantities to the existing fittings installed at the site. | L.S |
| 11 | **Steel pipes:** replace existing pipes and fitting to install new pipes and fittings 6 inch diameter and thickness 3.96 mm | 24 m |

**Recommendation:**

This well supplies water for domestic and agricultural purpose to Falamya Village. The well capacity is lower than neighboring groundwater wells and relatively deeper than other wells in the area. In the past few years the turbine went through several failures and maintenance of equipments. Therefore, it is proposed to install new submersible pump to avoid the chronic breaking of shafts. The existing pump has very low efficiency and consumes about 20 kilo watt more than anticipated. This well extract water to a balance tank at the site, then water is pumped using two booster pumps: one for agriculture and the other one for domestic. These two pumps and fittings are deteriorated and need replacement. The new proposed design will increase the capacity of the well by 15 m3 per hours and restore the previous stable conditions. This will enable to meet the demands to expand the agricultural area and domestic demands and to save power and maintenance costs.