**Specifications of Treatment Unites forAttora 9 Well Quantity of 50 m3/hr**

1. **Raw Water Quality Criteria:**

Water containing the following parameters:

1. High concentration of Sulfur(H2S) ranges from (0.26-0.8) ppm
2. Odor Threshold No ranges from (4-6) TON Sulfur
3. Temperature ranges from (30-31.5) C
4. NH4 < 0.14 ppm
5. PH Ranges from (7.26 – 7.28).
6. Iron from (0.57 - 0.74) ppm.
7. All complete analysis is attached.
8. **Recommended Water Quality After Treatment :**

Treated water shall meet the Jordanian specification for Drinking water No 286/2015 and or the latest Version issued during the execution of treatment work, the key parameters mentioned above shall be

1. H2S < 0.05 ppm
2. No Odor
3. NH4 < 0.14 ppm
4. Turbidity < 5 NTU
5. PH Ranges from ( 6.5-8.5)
6. Fe < 0.035 ppm
7. Color < 15 TCU
8. **Basic Treatment Stages:**
9. Stage 1 : Pre-Acidification with (33% HCL) at the beginning of operation.
10. Stage 2 : Aeration ( H2S Removal) & Iron oxidation
11. Stage 3 : Pre\_Chlorination
12. Stage 4 : Filtration
13. Stage 5 : Post Chlorination

**Attached the process flow diagram**

1. **General Design Description :**
   1. WELL water (50 m3/hr) will be pumped to proposed treatment plant .
   2. HCL (33 %) Shall be injected on the line ~10 m before the aeration to bring the PH Value to 6.7
   3. HDPE line shall be installed from the Well to aeration\_ Oxidation tower by treatment works contractor.
   4. The acidified water shall be aerated through (50) m3/hr capacity Aeration \_ Oxidation tower installed above the newly raw water reservoir which shall be constructed.
   5. The treatment plant location ( tower direction) shall be selected taking into consideration the wind direction for reducing the environmental impact of vapor and odor on human activities in the area.
   6. Reservoir capacity of (100) m3 containing three partitions inside as per attached specification. The floor should be constructed of Epoxy coating resisting Sulfur, and declined in the direction of reservoir drainage.
   7. Chlorine shall be injected on the reservoir just after aeration on the first partition to oxidize the remaining of (H2S, Fe) .
   8. Raw water from raw reservoir shall be pumped to the sand filters.
   9. Filtered Water will inlet to the treated water reservoir of ( 100 ) m3 capacity which shall be constructed.
   10. Chlorine shall be injected for treated water in reservoir ( post chlorination stage )
2. **Treatment work materials of construction:**
   1. All material and mechanical works shall be suitable and combatable with drinking water according to NSF 60/ 61.
   2. Shall be suitable for raw water quality before treatment.
   3. Shall be suitable for the treated water after pretreatment, process and post treatment.

**6 Labeling**

Treatment process shall be labeled clearly with the specified colors for both raw water, treated and back wash water.

**7 Submittals**

1. (2) Original Copies of Submittals and drawings shall be submitted to supervision committee before starting the works (in addition to softcopy).
2. (2) Original Copies of operation and maintenance manuals shall be submitted after the completion of the works to supervision committee (in addition to softcopy).

**8 Appendixes**

1. Appendixes (l): labs and field analysis.
2. Appendixes (2) : Process flow Diagram

**9 References**

All bidders shall be certified and showing references for the designing and construction of similar treatment unites.