

TENDER No.239/2011
**DESIGN, BUILD, OPERATION & MAINTENANCE OF THE AL AMERAT WASTEWATER
TREATMENT PLANT, PUMPING STATIONS AND TREATED EFFLUENT WORKS**

CONTRACT A1

- 1 The Purchaser is a government-owned company that was established in 2003 with the mission to build and operate world class wastewater infrastructure to serve the Muscat Governorate, including sanitary sewer networks, sewage treatment plants, and treated effluent (TE) distribution networks (to facilitate reuse).
- 2 The Purchaser's Muscat Wastewater Master Plan has divided Muscat Governorate into seven sewerage catchments for project implementation: Al Amerat, Al Ansab, Al Bustan, Al Hajir, As Seeb, Darsait, and Quriyat. The Purchaser has undertaken the Al Amerat Wastewater Project to provide sewerage and wastewater treatment infrastructure for Al Amerat and Al Hajir catchments (the Project Area), both of which are located in Al Amerat Wilayat. The Al Amerat Catchment is drained by Wadi Aday, and the Al Hajir Catchment is drained by Wadi Maieh.
- 3 Al Amerat Wilayat is one of the six wilayats (provinces) that comprise Muscat Governorate. Al Amerat is the second largest of these wilayats, with a total area of 992 square kilometres, and the fourth most populous, with a current population of about 50,000 (mid-year 2008 estimate). The population in Al Amerat Wilayat has been projected to reach 110,000 by about 2025. Based on the current structural plan and plots allocated by the Ministry of Housing, the population in Al Amerat Wilayat is expected eventually to exceed 260,000.
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- 5 The Al Amerat Wastewater Project will be implemented in stages, as demand for sewerage services increases with population growth and development. The initial (Phase 1) implementation will include gravity sewer networks, sewage pumping stations and sewage rising mains, wastewater treatment plants, and treated effluent distribution networks, which will be provided through multiple contracts. Separate infrastructure facilities will be provided in the Al Amerat and Al Hajir catchments. Future implementation (after Phase 1) will include extensions to sewer and treated effluent networks, additional pumping stations and rising mains, and expansion of pumping station and treatment plant capacities.

- 6 Phase 1 implementation for Al Amerat Catchment is being conducted under four separate contracts that are identified as follows. ***The first of these, Contract A1, is the current contract.***
- **Al Amerat Wastewater Project Contract A1** – Design, Build, Operation and Maintenance of Al Amerat Sewage Treatment Plant (STP) and related Works, including a Tanker Facility, Sewage Pumping Stations, Rising Mains, Treated Effluent Storage Reservoir, and Treated Effluent Pumping Station
 - **Al Amerat Wastewater Project Contract A2** – Sewer and Treated Effluent Pipelines in Al Amerat Western Area
 - **Al Amerat Wastewater Project Contract A3** – Sewer and Treated Effluent Pipelines in Al Amerat Northern Area
 - **Al Amerat Wastewater Project Contract A4** – Sewer and Treated Effluent Pipelines in Al Amerat Eastern Area
- 7 The sewer lines to be installed under Contract A3 are located in the sub-catchment of Al Amerat Sewage Pumping Station No. 1 (APS1) and will contribute flows to APS1. The sewer pipelines to be installed under Contract A2 and Contract A4 are located in the sub-catchment of Al Amerat Sewage Pumping Station No. 2 (APS2) and will contribute flows to APS2. Close liaison with the contractors carrying out the sewer works will be necessary as part of this Contract A1, and the sufficiency of liaison/interaction/interface with and between these other contractors shall be the responsibility of the Contract A1 Contractor.
- 8 Connections to the new gravity sewers provided under Contracts A2, A3 and A4 shall be made at the sewage pumping stations (APS1 and APS2). The Contract A1 Contractor shall be responsible for coordinating and completing all work required to make these connections and properly treat all the wastewater received from the connected sewers.
- 9 The wastewater received at APS1 will be pumped via twin rising mains to APS2. The combined wastewater received at APS2 (from both rising mains and gravity sewers) will be pumped via twin rising mains to the headworks of the Al Amerat Sewage Treatment Plant (STP). The Contract A1 Contractor shall be responsible for design and construction of these two pumping stations (APS1 and APS2) and their associated rising mains.
- 10 The Al Amerat STP shall use membrane biological reactor (MBR) technology in a biological treatment configuration based on the Modified Ludzack-Ettinger (MLE) process, along with proven technologies for preliminary treatment, waste activated sludge (biosolids) handling, disinfection, and odour control to meet the specified effluent quality standards and performance requirements (see PS3 for details).
- 11 The treatment capacity to be installed in Phase 1 is based on an average annual wastewater flow of 18,000 m³/day received at Al Amerat STP, and this is expected to meet demand until about 2028. However, the design and layout of Al Amerat STP shall provide for efficient future expansion(s) of treatment capacity to meet projected demand in the year 2050, corresponding to an average annual influent flow of 36,000 m³/day. (See PS3 for additional details.)

- 12 Other Phase 1 facilities to be constructed at Al Amerat STP include a 16,000 m³ TE storage reservoir (about one day capacity at the design flow rate), along with a pumping station and pipelines for transmitting TE to reuse distribution networks. The design and layout of these facilities shall provide for future expansion(s) of both TE storage and pumping capacity as described in PS6.6.
- 13 A Tanker Facility shall be provided in Phase 1, at a separate location inside the site boundary of the Al Amerat STP, to receive and empty sewage tankers that remove wastewater from properties not connected to sewers, to receive, unload and clean vacuum/jetting trucks used for sewer cleaning, and to fill water tanker trucks with TE for delivery to users not connected to the TE distribution network. Wastewater received at the Tanker Facility will be pumped through a single rising main to the headworks of the Al Amerat STP.
- 14 The Contractor shall be responsible for the design and construction of access roads to APS1, APS2, Al Amerat STP, and the tanker facility, including bridges for wadi crossings. The Contractor shall also design and construct internal roads, footpaths, parking facilities, surface drains, wadi diversion and flood protection, local sewers, potable and reuse water systems, boundary walls, external lighting, and both hard and soft landscaping for each of these sites.
- 15 The Contractor shall be responsible for the design and construction of access roads to APS1, APS2, Al Amerat STP, and the tanker facility, including bridges for wadi crossings. The Contractor shall also design and construct internal roads, footpaths, parking facilities, surface drains, wadi diversion and flood protection, local sewers, potable and reuse water systems, boundary walls, external lighting, and both hard and soft landscaping for each of these sites.
- 16 The Contractor shall design and install power supplies to APS1, APS2, Al Amerat STP, and the Tanker Facility, along with standby power generators to supply 100 percent of power requirements at APS1, APS2, and Al Amerat STP (including the TE storage and pumping facilities).
- 17 Preliminary designs have been prepared for the works to be completed under this Contract A1, including APS1, APS2, sewage rising mains, and the Al Amerat STP (including tanker facility, TE storage reservoir, TE pumping station, and ancillary buildings and services). The Contract Drawings based on the preliminary designs reflect the Purchaser's intent with respect to form, function, and appearance, but should not be considered complete or final (with the exception of Haya's Standard Drawings). The Contractor shall prepare detailed designs and drawings for all the required works and the Contractor shall be solely responsible for the completeness and correctness of his designs.
- 18 There is an existing sewer network and existing sewage treatment plant that serve a small local area in Al Amerat catchment (Shabiya Social Housing in Al Mahaj), the location of which is shown in the Contract Drawings. Replacement of existing sewers in

this area will be conducted under Contract A4. Under this Contract A1 the Contractor shall be responsible for the decommissioning, demolition, removal of debris, and reinstatement of the existing sewage treatment plant.

- 19 All Project Works, including those to be constructed under this Contract A1, are located in an environmentally sensitive area. This applies in particular to the local aquifers and wadis, which are either currently used or have the potential to be used for potable water supply. Preventing contamination of local aquifers and wadis is therefore a prime consideration during the design, construction and operations of all Project facilities.
- 20 The Contractor's design of all Project Works shall take into full account prevailing climatic and environmental conditions in Greater Muscat generally and Al Amerat Wilayat specifically. In particular, extreme conditions of temperature, humidity, windborne dust and sand, and the potential for extreme weather events including tropical cyclones with high winds and heavy rainfall.
- 21 In addition to design and construction, the Contractor shall also be responsible for the operation and maintenance of all Works provided under this Contract A1 for a period of two years after completion of commissioning and Initial Demonstration Testing.