Section II: Schedule of Requirements

1. **Scope of work: -**

The sub-project is to Supply, delivery, and inspection of 12,000 litters combined Vacuum suction - cum-jetting (7,000 litters for Fresh Water & 5,000 litters For Sludge) unit Tankers Mounted on Truck, 6x4 drive type complete with all accessories to Local water and sanitation corporation- Mukalla (MWSLC) warehouses.

1. **Schedule of Requirements**

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| No | LOTs | Description |
| 1 | LOT 5: | Supply, delivery, and inspection of 12,000 litters combined Vacuum suction - cum-jetting (7,000 litters for Fresh Water & 5,000 litters For Sludge) unit Tankers Mounted on Truck, 6x4 **drive type** complete with all accessories. |

1. **GENERAL**
2. This specification is for the manufacture, supply, inspection, testing, delivery to Mukalla Water and Sanitation Local Corporation,
3. The material to be supplied shall be new, unused and of the latest design.
4. Documentary evidence to prove that the material offered comply with the Technical Specifications given below must be provided.
5. Technical Data/Brochures: Bidders must provide relevant technical data detailing the performance parameters of the material or Original manufacturer brochures, where there are more than one model on a brochure; the bidder must highlight the option which they are quoting for in this tender.
6. The supplied goods and materials shall conform to the authoritative standards appropriate to the Goods country of origin. Such standards shall be the latest issued by the institution concerned.
7. **Technical Data/Brochures:** bidders **must** provide relevant technical data detailing the technical data of the material and Original manufacturer brochures, where there is more than one model on a brochure, the bidder, **must** highlight which they are quoting for in this tender.
8. All materials shall be complying with specified International Standards and shall be supplied from reputable and approved manufactures and country of origin.
9. Transport, handle and store all products and materials in accordance with the manufacturer’s recommendations and in a manner that prevents damage or deterioration or excessive distortion.
10. The employer UNOPS / UWS-PMU /(MWSLC) shall have the right to reject any damaged or defective product material.
11. **Warranty & training,**

* Recommended Preventive Maintenance Schedule for the equipment shall be included.
* One-week operation and maintenance training for the technical crew and operators of the unit shall be conducted upon delivery at supplier`s cost. Final testing/inspection shall be done in the destination place (WSLC).
* One-year warranty for the truck and the units System.
* Warranty of after sell service support for the unit shall be available through authorized services centre in the Yemen.

1. **Specifications**

The Units shall be a complete system and shall have the following features/specifications:

**General:**

* The Units assembly component shall be brand new (refurbished , used trucks or the stock for more than 3 years will not be considered ).
* Only established, reputable manufacturers.
* The manufacturer has the ISO certification for QMS & EMS
* Bidder shall be an authorized representative of the manufacturer name in Yemen.
* The truck engine shall be used to power the remaining systems through a hydrostatic drive. Alternatively, the truck engine may be used to power all components through a hydrostatic drive

1. **Trucks and Chassis**

* Chassis must be adequately designed and strengthened to accommodate the load-body and all associated equipment
* Designed to heavy duty export specs, capable of operating in tropical conditions over paved and unpaved roads

1. **Engine**

* Heavy Duty, turbo-charged, water-cooled, diesel, four cycles, with adequate horsepower for the gross vehicle weight rating as per manufacturers published literature.
* Hydraulic power assisted steering,
* The engine electronics will accept a remote variable throttle for stationary operation through transmission mounted PTO and transfer case-driven PTO equipment. The air cleaner is to be manufacturers recommended duel air. Air restriction gauge, dash mounted or approved equal. Engine to include the turbo, injectors, starter, and alternator. Automatic engine shutdown system with low oil pressure, high coolant temperature, and low coolant level shall be provided.
  1. **POWER TRANSMISSION:**
* A standard heavy-duty transmission, geared to be capable of transmission efficiency of 85% is required (complete at GVM).
* A heavy-duty, single-speed Power Take-off shall be provided and shall be compatible with that of chassis transmission. The PTO, shall be activated by an Electric Signal (Hot Shift).
* A fail-safe system (interlinked to the handbrake)
* shall be fitted to prevent the vehicle from being driven with the PTO engaged.
* Dashboard-Mounted warning light to indicate to the driver when the PTO is in the engaged position.
* Power Take-Off controls shall be conveniently mounted in the cab.
* The PTO must run quietly. Gearing shall be selected for minimum engine RPD compatible with recommended pump RPM for correct operating pressure and rates of flow for the refuse body.
* The auxiliary engine shall be used to power either the exhaust fan or water pump. If the auxiliary engine is used to power the exhaust fan, the engine shall also be adequate horsepower for continuous operation of the powered systems at full rated capacity.
  1. **Suspension:**
* Suspension, front and rear heavy duty leaf springs with telescopic shock absorbers at front
  1. **Clutch:**
* Clutch system actuation, Hydraulic and dry single plate

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* 1. **Brake System:**
* Dual circuit, pressure-air, disc brakes with ABS, air dryer. Service brake - dual circuit pressure-air brake acting on wheels of all axles. Emergency brake - spring type, acting on wheels of rear axles. Parking brake - spring type, acting on wheels of rear axles. Auxiliary brake - engine brake, flap type exhaust brake.
  1. **Available from chassis manufacturer as standard.**
* Air Over Hydraulic System
* Cab Left-hand drive
* Power steering
* Air conditioned
* Car audio system
* Orange rotating beacon light on top
  1. **Accessories (for each unit)**
* Rear tow/pintail hook
* Standard tool kit
* Mud flaps
* Safety belts

1. **Tanker**

* The tank shall be hydrostatically tested.
* The body and rear door shall be constructed of at least 5mm thick plate high grade steel plate St-37.
* The tank exterior shall be spray-painted with two coats of superior quality anti-corrosive primer and two coats of enamel metal paint of a reputable make, white colour on all exterior surfaces that is normally painted with colour other than black.
* The sludge compartment tank shall be internally coated with two coats of epoxy paint to resist corrosion due to weak acids.
* Under chassis shall be coated with anti-corrosion.
* The rear door shall be liquid tight by means of a self-compensating seal, and shall be locked by means of at least four (4) manual latches.
* The tank shall be provided with 2-sight glass located at the end dish of the tank to measure the volume of sewage inside the tank. Sight glass shall be tempered-proof material and can be easily replaced.
* Shall be provided with automatic sensing device to prevent overfilling (Sniffer valve releasing vacuum when tank is Full).

1. **Controls**

* All controls for the operation and of the workings of the machine must be fitted to an illuminated, lockable, water resistant control panel that is attached and moves with the hose reel.
* The intention is for all controls in the control panel to be electrical switches that will activate the necessary function and servos either pneumatic or hydraulic and all actions will be fully adjustable and at variable speeds for the operation of the machine
* All servos and valves must be mounted in a safe and easily accessible place for ease of maintenance.
* All electrical devices are splash resistant.
* Separate control panel shall be provided complete with the following:
* Operation of the pumps/throttle
* Accelerator control
* Gauge and indicators
* Hourly meter for vacuum pump

1. **HIGH PRESSURE JETTING PUMP**

* The equipment shall be fitted with a triplex plunger, reciprocating pump having a flow and pressure rating of 160 bars at 300LPM respectively.
* High pressure reciprocating pump driven by truck PTO
* Pump with adjustable pressure regulating valves, saftely valae and pressure guaue.
  1. **High Pressure Water Hose for Jetting Trucks**
     1. **General**
* Sewer cleaning and water jetting hose used for high pressure water cleaning and jetting application .
* Bonded Construction
* Slim Profile and Light Weight
* Flexible and Kink Resistant
* Black Colour Denotes 4000 PSI
* Low Coefficient of Friction
* Excellent Cut Gouge and Abrasion Resistance
* 4,000 PSI working pressure
* Suitable for environment of temperature from -40ºC to +57ºC.
* 1-inch size.
  + 1. **Construction:**
* High Pressure Water Hose 1” for Jetting Trucks
* Tube – Polyester Elastomer.
* Reinforcement – Two Polyester Braid.
* Cover – Proprietary Urethane Blend “Tuff-Skin”
* Cover Colour – Black, Non-Perforated

1. **Vacuum Pump:**

* *Aspiration of the effluent from sewer and drain water lines and chambers shall be carried out on the principle of generating high vacuum in the sludge compartment for siphoning out effluents, liquids slurry, sludge and other materials from depths of 6 meter.*
* Shall be water cooled vacuum pump.
* Heavy duty / multi-cylinder type, strong high- pressure, continuous duty
* Automatic lubrication with drip oilers and sight glasses
* Continues duty at 85 % vacuum
* Automatic lubrication, drip oilers with sight glasses

**5.1 VACUUM LINE ACCESSORIES: -**

* Primary & secondary shut-off A suction group pneumatically operated Four-way
* Additional sections of Aluminium tube shall be provided for extending the vacuum hose to a depth of at least 6 m. below ground level. These sections shall be flanged and shall attach by quick-coupler.
* valve (for a suction-pressure position) and non-return valve are also initially installed by the pump manufacturer
* Exhauster is directly driven from cab-controlled P.T.O
* The truck and the unit system must be furnished with all necessary controls & gauges. / safety devices for improved efficiency and easy – safe operation, with all Other STD specifications

1. **Other Requirements**

* The unit shall be provided with two (2) SS 304 check red plate hose trays, one on each side of the tank and extending along the full length of the tank, capable of securely holding the quantity of 100mm hoses.
* The unit shall be provided with three heavy Duty spiral suction hoses,.The hose shall be 3 meters in length with Aluminium or galvanized steel quick-connect fittings on each end and provided with male-female couplings. The hose shall be made of rigid transparent PVC wall with polyester reinforcement, high pressure and highly flexible.
* The hose shall have the following conditions:
* Hose should be working pressure: min. 5 kgf/cm2, and bursting pressure: min. 17 kgf/cm2
* Lockable toolbox permanently attached to the truck.
* All bolts and nuts with direct contact to sludge shall be made of stainless-steel material.
* 90 degrees bend shall not be allowed for the discharge or suction port to prevent any clogging of sands and grits.

**General Delivery requirements and Comparative Data Table:**

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| UNOPS Requirements | |
| Delivery time | Bidder shall deliver the goods DAP within 5 months after PO signature. |
| Delivery place and Incoterms rules | Delivery at Place DAP (unloaded customs cleared) to Mukalla Water and Sanitation Local Corporation (MWSLC) Warehouses. |