

<b>ANNEX 1: SERVICES DESCRIPTION</b>		
<b>MAINTENANCE ACTIVITIES ON SOC WATER SUPPLY SYSTEM &amp; WATER TREATMENT BLDG11</b>		
<b>SERVICE NUMBER</b>	<b>TYPE OF INTERVENTION</b>	<b>FREQUENCY</b>
<b>ORDINARY MAINTENANCE</b>		
1206105	LAB. TESTS FOR WATER POTABILITY	SEMI-ANNUAL
1190476	SCHEDULED MAINTENANCE INTERVENTION ON WATER TREATMENT SYSTEM AT BLDG 11	MONTHLY
<b>EXTRAORDINARY ACTIVITIES</b>		
1206074	ADDITIONAL ON-DEMAND SERVICES	ON REQUEST
1206106	SANITIZATION OF THE POTABLE WATER PIPELINE	ON REQUEST
1203087	REPAIR - LABOUR	ON REQUEST
1178355	SPARE PARTS	ON REQUEST

<b>ORDINARY MAINTENANCE</b>
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**LAB. TESTS FOR WATER POTABILITY**

SERVICE DESCRIPTION: The contractor shall perform the intervention as detailed below:

Verification of water potability at SOC premises, performed by specialized/qualified/certified laboratory of analysis and including the sample collection on site:

Each water test includes the following activities:

- Sampling service: Sampling service performed by specialized technician on site performed with a suitable/needed number of bottles (sterile, polyethylene, single-

use type) of 400 ml; the water sampling point will be indicated NSPA SOC CTO;

- Water analysis service: Activity to be performed by an accredited laboratory in accordance with UNI CEI EN ISO/IEC 17025:2005 and in compliance with the current Europeans/Italians Laws and regulation in force; Each water test shall include at least the following parameters:

Physical chemical parameters: Heat - Odor - PH - Conductivity at 25° - Turbidity - Salinity - Total hardness (CaCO<sub>3</sub>).

Non-metallic inorganic constituents: Ammonium - Nitrates (NO<sub>3</sub>) - Nitrites (NO<sub>2</sub>) - Chlorides (Cl) – Fluorides – Sulphates – Phosphates.

Metals and metal species: Calcium (Ca) - Magnesium (Mg).

Microbiological parameters: Bacterial count at 37° - Bacterial count at 22° - Total coliform count - Faecal coliform count - Enterococci count - Pseudomonas Aeruginosa count - Search and count of Legionella spp.

- Release of official analysis results (signed/certified by specialized/qualified doctor), certifying the conformity/non-conformity of the water potability against current applicable laws/ limit values of reference.
- Travel charges related to Contractor personnel.

*Unit of measure: PU (per unit)*

## **SCHEDULED MAINTENANCE INTERVENTION**

**SERVICE DESCRIPTION:** The contractor shall perform the scheduled maintenance interventions as detailed below:

The scheduled maintenance interventions shall include:

- All Travel on Duty (TDY) costs for Contractor's personnel;
- Minimum checks/activities detailed and scheduled in the OEM maintenance manual of the plant;
- Any provision of manpower/spare parts needed to perform the ordinary maintenance interventions and prevention safety checks interventions detailed and scheduled in the OEM maintenance manual of the plant;
- Consumables for cleaning activities;
- All spare parts must be brand new.

The scheduled maintenance interventions **do not** include:

- Extraordinary maintenance intervention for repairing activities;
- Manpower for extraordinary maintenance (repair of small accidents, revisions

and reconditions due to supervening legal provisions, prompt intervention on unexpected failures, etc.);

- Spare parts for the repair of problems or revision activities of the components.

The maintenance personnel must:

- be specifically qualified to carry out all tasks it is assigned to (mainly specialized personnel with the enabling license as Technician for the operation and maintenance of water purification systems);
- be, basically, always the same to guarantee the continuity of knowledge about individual devices;
- be composed of at least n.2 specialized technicians as provided by current law.
- perform all the preventive maintenance operations detailed in the official OEM maintenance manual;
- Check the good condition of the components and, if inefficiencies are detected or the replacement/revision of parts is needed.

The Contractor also undertakes to dispose at his own personal care and in accordance with the applicable law in force, the wastes generated during checks, maintenance and repairs.

NSPA SOC Taranto will appoints the contractor as third responsible person for the operation and maintenance of the entire plant; the mentioned delegation, that will cover all maintenances period, includes all responsibilities in charge to the contractor in accordance with the relevant legislation in force.

#### DETAIL OF ACTIVITIES

Each scheduled maintenance intervention shall include:

- Maintenance booklet updating: All equipment object of the service will have to be equipped with a "maintenance booklet" that will remain stored at Southern Operational Centre and will be updated by the qualified maintenance technician during the verification and technical update interventions. In case the maintenance booklet is not present, it will be the Contractor responsibility to establish a plant booklet to keep at NSPA SOC for future checks.
- Release of final detailed report, filled and signed by the technician, which must include the description of eventual unscheduled maintenance activities needed.
- All prevention safety check and maintenance activities scheduled in the official OEM maintenance and use manual.

Each maintenance intervention includes also the below listed activities:

- Cleaning of the plant entire area and all the equipment making up the system (electrical panel, electro-agitators, lifting pumps, filtration units, pressurization units, dosing units, tanks);
- Visual check to verify the integrity of the systems on all parts and mechanisms needed for safety and proper functioning;
- Check of the correspondence of the as-built scheme to real plant situations;

- Check and needed adjustment of the flow rate of the lifting pump which bring up the water collected from the washing grids from the underground tank to the first above ground tank;
- Maintenance, washing and calibration of the PAC dosing pump including of:
  - Replacement of the reagent supply and suction tube if needed - minimum frequency every six months;
  - Cleaning the pump body of the dosing group with 3% hydrochloric acid solution - minimum frequency every six months;
  - Descaling by immersion in a 10% hydrochloric acid solution of the reagent injection valves located at the ends of the delivery pipes;
- All reagents levels monitoring, including the supply and top-up of them where needed;
- Maintenance, washing and calibration of the flocculants dosing pump, including of:
  - Replacement of the reagent supply and suction tube if needed (minimum frequency every six months);
  - Cleaning the pump body of the dosing group with 3% hydrochloric acid solution (minimum frequency: every six months);
  - Descaling by immersion in 10% hydrochloric acid solution of the injection valves of the reagents placed at the ends of the delivery pipes (minimum frequency: every six months);
- Check and possible adjustment of the flow rate of the pump for lifting the treated water to the storage tank;
- Operating check of the float switches (or sensors and warning lights if present) installed in the storage tanks or if installed in the reagent tanks;
- Operating check and needed adjustment of the flow rate of the single screw pump for the extraction of the sludge from the bottom and the releasing to the bag filter;
- Operating check of the fast electric agitator installed in the fast mixing tank;
- Operating check of the slow electric agitator installed in the flocculation tank.
- Check and verification of the adsorption action of the activated carbon placed in the filtration unit;
- Check and verification of the lamellar packs placed in the final sedimentation tank;
- Operating check of the autoclave units for water outflow distribution and related regulation of the flow rate;
- Operating check of the fuses, thermal relays, warning lights and switches in the electrical control panels related to the plants;
- Verification of the wear state of contacts, coils and contactors;
- Check the calibration of the general switches, voltmeters and ammeters;
- Verification of the electric absorption of all equipment;
- Integrity check of the hydraulic connections and related wear state;
- Integrity check of the electric connections and related wear state;
- Correct operation checking of all the automatism inherent in the system.

The service includes the supply and replacement of the below listed supplies/chemicals

needed for the proper chemical- physical process:

- Polyelectrolyte - AKIFLOC 6617 (Where needed);
- Ferric Chloride - Solution at 20% (Where needed);
- Activated carbon - Akicarbos 3427 – n.4 bags of 25 Kg/EA (Replacement once/year);
- Draining bags for the dewatering compartment of the chemical sludge produced by the plant (n.10 where needed).

Each maintenance includes the monthly analysis of the following chemical parameters on both in/out water of the entire plant:

- pH
- Total suspended solid - Solidi Sospesi Totali
- BOD
- COD
- Ammonia NH<sub>4</sub> - Ammoniaca NH<sub>4</sub>
- Nitrous nitrogen - Azoto nitroso (come N)
- Nitric nitrogen - Azoto nitrico (come N)
- Total nitrogen - Azoto totale (come N)
- Phosphorus P - Fosforo (come P)
- Chlorides - Cloruri
- Free active Chlorine - Cloro attivo libero
- Surfactants - Tensioattivi
- Escherichia Coli
- Copper Cu - Rame
- Iron - Ferro
- Manganese
- Aluminium – Alluminio
- Legionella

The original analysis certificates/results, issued by an authorized laboratory and signed by a qualified technician, shall be delivered to the NSPA SOC CTO and available in case of check by the competent authorities (ASL, Provincial Administration, ARPA).

***Unit of measure: PU (per unit)***

<b>EXTRAORDINARY ACTIVITES</b>
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## **ADDITIONAL ON DEMAND SERVICE**

**SERVICE DESCRIPTION:** Special intervention on request needed to solve urgent malfunctions of SOC Water treatment plant and to be performed by a specialized technician within 24 hours after the intervention call (If the request arrives by 10.00 am, the intervention will take place on the same day, for calls made after this time, the Contractor must intervene at most in the following morning); includes the following activities:

1. Transfer of the contractor technician's to SOC and back to the Contractor's premises;
2. All inspections/works activities/ functional checks needed to solve the not foreseen malfunctions of the systems;
3. Updating of the maintenance booklet as foreseen by the law;
4. Release of a detailed report issued/signed by a specialized technician indicating the activities performed, the parts worn/damaged by substitution and danger notes or technical problem noted (mainly for the safety and personnel health); The reports are to be delivered to the SOC CTO;
5. Are included all activities/ genuine OEM small spare parts for replacement needed to perform the intervention in works manlike manner;
6. All works activities must be performed by specialized personnel with the enabling license as Technician for the operation and maintenance of water purification systems.

*Unit of measure: PU (per unit)*

## **REPAIR – LABOUR:**

**SERVICE DESCRIPTION:** Manpower for others extraordinary maintenance interventions, performed on request and by technician specialized in maintenance of water treatment plants; Includes transport costs to and from the workplace, equipment needed to perform maintenance works, overheads and company profits. The actual number of hours performed will be based on the hours recorded on the intervention report, countersigned by NSPA representative, that the Contractor shall draft for each intervention.

All works activities must be performed by specialized personnel with the enabling license as Technician for the operation and maintenance of water purification systems.

*Unit of measure: HR (hourly rate)*

## **SANITIZATION OF THE POTABLE WATER PIPELINE**

**SERVICE DESCRIPTION:** The contractor shall perform the intervention as detailed below:

Each intervention includes the following activities:

- Restoration of drinking water pipes by PRE dosing guaranteed purity film-forming anticorrosive conditioners of the KORROMIND type, compliant with current standards for the treatment of water intended for human consumption in terms of purity, which minimize the presence of iron in the water with the result of drastically reducing the proliferation of bacteria, for the development of which iron is a determining element.
- Hyperchlorination of the entire water system with 50 ppm (parts per million) chlorine aqueous solution for one hour, or 20 ppm for 2 hours) through the use of 2 16,000 liter tanks with attached pumping unit.
- Restoration of drinking water pipes by POST- dosing guaranteed purity film-forming anticorrosive conditioners of the KORROMIND type, compliant with current standards for the treatment of water intended for human consumption in terms of purity, which minimize the presence of iron in the water with the result of drastically reducing the proliferation of bacteria, for the development of which iron is a determining element.

*Unit of measure: PU (per unit)*

## **SPARE PARTS**

**SERVICE DESCRIPTION:** Provision of spare parts needed to perform extraordinary maintenance interventions/repairing works on the systems. Includes shipping costs to NSPA SOC Taranto. The Contractor shall use only brand new, OEM original spare parts as described in the equipment official technical documentation (i.e. operation and maintenance manuals, spare part list, etc..)

*Unit of measure: PU (per unit)*