Construction of Sewage Network and Waste Water Treatment Plant (WWTP) in the Municipality of Berane

Volume 4 – Schedules

Section 2. Schedule of Guarantees

Lot 1 Only

June 2015

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# PROCESS GUARANTEE

Hereby guarantees on compliance with the Employer’s Requirements shall be fully completed and duly signed and shall be used during Tests on Completion prior to issuing Taking Over Certificate (coinciding with Use Permit) and Tests after completion.

The WWTP shall achieve at all times the requested performance criteria included in the Employer’s Process Requirements and comply with the effluent discharge criteria within guaranteed operational costs.

## Treated Effluent

The Contractor guarantees that the WWTP of Berane shall produce the following treated effluent quality:

Table 1 - Guaranteed Effluent Quality

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Unit** | **European Directive** *on Urban Wastewater* ***No 91/271/EEC*** *for discharge to areas not designated as sensitive waters (Ordinary Zone)* | **Required  Standards** |
| Biochemical Oxygen Demand at 20ºC without nitrification | mg/l | 25 | 25 |
| Chemical Oxygen Demand | mg/l | 125 | 125 |
| Total Suspended Solids | mg/l | 35 | 35 |
| Total Kjeldahl Nitrogen | mg/l | 15 | 15 |
| Total P-PO4 | mg/l | 2 | 2 |

The compliance with the above table shall apply for all load conditions of the plant for the design phase.

Control of the effluent meeting the standards shall be performed according to the EU Urban Wastewater Directive 91/271/EEC (Annex I, Table 3).

## Oxygen Transfer

The Contractor hereby guarantees that the oxygen transfer efficiency of the installed aeration system shall meet the data provided in the following table:

Table 2 - Oxygen Transfer Efficiency

|  |  |
| --- | --- |
| **Specific Test Standard and Name** | **Value** |
| Oxygen Transfer efficiency - Biological Reactor | *To be inserted by the Tenderer*  …………………………………….. kg O2/kWh  (>2kg O2/kWh (ATV Standard, clean water) |

## Sludge Treatment

The following three parameters shall be guaranteed by the Bidder:

1. **Dry Solids Content of Thickened Sludge**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter 3** | **Unit** | **Minimum accepted by the Employer/Beneficiary** | **Guaranteed by the Contractor** |
| Minimum content of dry matter in the thickened sludge | % dry matter | 5% | **……………………..** |

1. **Polymer usage for mechanical thickening**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter 2** | **Unit** | **Maximum accepted by the Employer/Beneficiary** | **Guaranteed by the Contractor** |
| Polymer – type  …………….  100% active substance | kg per tonne  dry matter (sludge) | 7 kg/t ds | **……………………..** |

1. **Dewatering capacity**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter 1** | **Unit** | **Minimum accepted by the Employer/Beneficiary** | **Guaranteed by the Contractor** |
| Minimum capacity of duty sludge dewatering equipment | kg dry solids/day | 800 kg ds/d | **……………………..** |

1. **Polymer usage for dewatering**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter 2** | **Unit** | **Maximum accepted by the Employer/Beneficiary** | **Guaranteed by the Contractor** |
| Polymer – type  …………….  100% active substance | kg per tonne  dry matter (sludge) | 10 kg/t ds | **……………………..** |

1. **Dry Solids Content of Dewatered Sludge**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter 3** | **Unit** | **Minimum accepted by the Employer/Beneficiary** | **Guaranteed by the Contractor** |
| Minimum content of dry matter in the dewatered sludge | % dry matter | 25 % ds | **……………………..** |

# Guaranteed operational costs

## Energy Consumption

**NOTE**: The Tenderers shall enclose technical justification and the methodology that has been used for calculation of energy consumption for three cases of the plant load: 100%, 80% and 60% from the full plant load.

In the table below the Bidder declares the guaranteed values for the energy consumption for three load possibilities for BOD, relative to 100%, 80% and 60% of the plant BOD design flow and load as presented in Volume 3-1 Section 2.

The calculation of the energy consumption shall be based on the motor list and calculation of electrical consumption included in the Bidder’s technical proposal.

Table 3 - Energy Consumption

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | **Energy Consumption (kWh/year)** | | |
| 100% of BOD load | 80% of BOD load | 60% of BOD load |
| **Inlet pumping station:**  Inlet pumping station and coarse screen |  |  |  |
| **Mechanical Treatment:**  Screening building, aerated grit and grease chamber, measurement devices and other loads |  |  |  |
| **SBR feeding pumping station:**  SBR feeding pumping station, mixing unit in equalization tank |  |  |  |
| **Secondary Treatment including aerobic sludge stabilization:**  SBR – blowers for aeration, decanters, excess sludge pumps and other loads |  |  |  |
| **Sludge Building:**  Sludge thickening and dewatering facilities, polymer preparation and dosing stations, sludge conveyors and other loads |  |  |  |
| **Total Gross Energy Consumption (kWh/y)** |  |  |  |
| **UNIT COST FOR ENERGY** | 0.1 € /kWh | | |
| **Total Gross Energy Consumption (€/y) (\*)** |  |  |  |

## Operational Cost Guarantee for Chemicals and Sludge Disposal

In the table below the Bidder declares the guaranteed values for the use of chemicals and sludge to be disposed off for three BOD load possibilities, relative to 60, 80 and 100% of the plant BOD design flow and load as presented in Volume 3-1, Section 2.

Table 4 - Costs for Chemicals and Sludge Disposal

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Description** | | **Quantities and Costs for Chemicals and Sludge Disposal** | | | | | |
| 100% of BOD load | | 80% of BOD load | | 60% of BOD load | |
|  | Unit price (€/t) | t/y | €/y | t/y | €/y | t/y | €/y |
| Polymer usage for thickening | 6000 |  |  |  |  |  |  |
| Polymer usage for dewatering | 6000 |  |  |  |  |  |  |
| Coagulant aid for P removal | 200 |  |  |  |  |  |  |
| Dewatered sludge transport and disposal costs | 50 |  |  |  |  |  |  |
| **Total cost for chemicals and sludge disposal** | |  |  |  |  |  |  |

Unit prices given in table 4 are provisional amounts only for the tendering purposes. The real operational costs would be assessed based on the guaranteed consumption of the consumables, or production of sludge to be disposed off as provided by the Contractor in his tender.

## Summary of Guaranteed Operational Costs

In the table below the Bidder declares the guaranteed values for the yearly costs with operational cost for electricity, chemicals, sludge and debris disposal. The table refers only to the design capacity of the plant at 100% load condition. The total value shall be used in the Contract, as described in Volume 3-1, Section 2.

Table 5 - Summary of Guaranteed Operational Costs

| **Description** | **Annual cost at**  **100% of BOD load**  **€/year** | **Annual cost at**  **80% of BOD load**  **€/year** | **Annual cost at**  **60% of BOD load**  **€/year** |
| --- | --- | --- | --- |
| Gross electrical energy consumption |  |  |  |
| Polymer usage for thickening |  |  |  |
| Polymer usage for dewatering |  |  |  |
| Coagulant aid for P removal |  |  |  |
| Dewatered sludge transport and disposal costs |  |  |  |
| **TOTAL ANNUAL GUARANTEED COST** | (\*) | (\*\*) | (\*\*) |

(\*) To be Included in the Tender Form (please refer to Volume 1 Section 2 /Tender Form)

(\*\*) For measurement purpose only

## Calculation of Net Present Value (NPV)

The Net Present Value of the Guaranteed Operational Costs shall be calculated assuming a discount rate of 8% for a period of 20 years, which results in a capitalisation factor of 14, which shall be presented by the bidder in the following table. The value for the 100% load case shall be transported to the Tender Form, as a guaranteed value for plant design load.

The set of 100%, 80% and 60% values are required for measuring purposes, to verify compliance of the guaranteed operational costs during the guarantee period (“constructed phase guarantee”), which shall be performed in accordance with the procedure described in Volume 3-1, Section 2.

Table 6 - Net Present Value of Guaranteed Operational Costs

|  | **Description** | **Yearly cost at**  **100% of BOD load**  **€/year** | **Yearly cost at**  **80% of BOD load**  **€/year** | **Yearly cost at**  **60% of BOD load**  **€/year** |
| --- | --- | --- | --- | --- |
| 1 | Guaranteed Annual Operational Costs |  |  |  |
| 2 | NPV factor | x 14 | x14 | x14 |
| **3** | **NPV of 20 Years of Operational Costs, 1 x 2** | (\*) | (\*\*) | (\*\*) |
|  | | (\*) To be included in the Tender Form | (\*\*) For measuring purpose only | |

**Penalisation for Incompliance of Guaranteed Operational Costs**

The bidder declares his agreement with the following statement:

*In the case that at the end of the Defects Notification Period, the measured operational cost, determined as explained in Volume 3-1, Section 2, is higher than the guaranteed value, the Contractor shall pay a penalty to the Final Beneficiary equal to the difference between the measured and guaranteed annual operational costs, multiplied by 14, up to 10% of the Accepted Contract Amount.*

# Bidder’s Declaration

The Bidder declares herewith that the information provided in the above process guarantee and the guaranteed operational costs is correct and complete.

Name and first name: […………………………………………………………………]

Duly authorised to sign on behalf of:

[………………………………………………………………………………………...…]

Place and date: […………………………………………………………….………….]

Stamp of the firm/company: