**VOLUME 1**

**SECTION 4**

# FORMS 4.6.1 TO 4.6.10

# TECHNICAL QUALIFICATIONS

VOLUME 1

SECTION 4

# FORM 4.6.1 OVERVIEW OF THE TENDERER’S PERSONNEL

i - Overview

a - Directors and management ........................

b - Administrative personnel ........................

c - Technical personnel

- Engineers ........................

- Surveyors

- Foremen ........................

- Mechanics

- Technicians ........................

- Machine operators

- Drivers ........................

- Other skilled personnel

- Labourers and unskilled personnel ........................

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Total ===========

ii - Site operatives to be employed on the contract (if relevant)

a - Site management ........................

b - Administrative personnel ........................

c - Technical personnel

- Engineers ........................

- Surveyors

- Foremen ........................

- Mechanics

- Technicians ........................

- Machine operators

- Drivers ........................

- Other skilled personnel

- Labourers and unskilled personnel ........................

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Total ===========

Signature ....................................................

(*person(s) authorised to sign on behalf of the tenderer*)

Date ............................................

VOLUME 1

SECTION 4

# FORM 4.6.2

# PLANT

Plant proposed and available for implementation of the contract[[1]](#footnote-1)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **DESCRIPTION (type/make/model)** | **Power/ capacity** | **No of units** | **Age (years)** | **Owned (O) or hired (H)/ and percentage of ownership** | **Origin (country)** | **Current approximate value in euro or national currency** | **Proposed by (in case of a joint tender, indicate the name of the consortium member proposing the plant)** |
| ***A)*** | **CONSTRUCTION PLANT** |  |  |  |  |  |  |  |
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| --- | --- | --- | --- | --- | --- | --- | --- |
|  | DESCRIPTION (type/make/model) | Power/ capacity | No of units | Age (years) | Owned (O) or hired (H)/ and percentage of ownership | Origin (country) | Current approximate value in euro or national currency |
| ***B)*** | **VEHICLES AND TRUCKS** |  |  |  |  |  |  |
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| ***C)*** | **OTHER PLANT** |  |  |  | / |  |  |
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Signature ...........................................................

(*person(s) authorised to sign on behalf of the tenderer*)

Date................................................

VOLUME 1

SECTION 4

# FORM 4.6.3

# WORK PLAN AND PROGRAMME

4.6.3.1 State the proposed location of your main office on the site, stations (steel/concrete/asphalt structures), warehouses, laboratories, accommodation, etc. (sketches to be attached as required).

4.6.3.2 Give a brief outline of your programme for completing the works in accordance with the required method of construction and stated time of completion.

4.6.3.3 Attach a critical milestone bar chart (schedule of execution) representing the construction programme and detailing relevant activities, dates, allocation of labour and plant resources, etc.

4.6.3.4 If the tenderer plans to subcontract part of the works, he must provide the following details:

|  |  |  |  |
| --- | --- | --- | --- |
| **Work intended to be subcontracted** | **Name and details of subcontractors** | **Value of subcontracting as percentage of the total cost of the project** | **Experience in similar work (details to be specified)** |
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Signature .......................................................

(*person(s) authorised to sign on behalf of the tenderer*)

Date .....................................

VOLUME 1

SECTION 4

# FORM 4.6.4

# EXPERIENCE AS CONTRACTOR

**4.6.4.1** List of contracts of similar nature and scale performed during the past 8 years

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name of project/type of works** | **Total value of works the contractor was responsible for2** | **Period of contract** | **Start date** | **Percentage of works completed** | **Contracting authority and place** | **Prime contractor (P) or subcontractor (S)** | **Final acceptance issued? - Yes - Not yet (current contracts) – No** |
| **A) In home country** |  |  |  |  |  |  |  |
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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name of project/type of works** | **Total value of works the contractor was responsible for[[2]](#footnote-2)** | **Period of contract** | **Start date** | **Percentage of works completed** | **Contracting authority and place** | **Prime contractor (P) or subcontractor (S)** | **Final acceptance issued? - Yes - Not yet (current contracts) – No** |
| **B) Abroad** |  |  |  |  |  |  |  |
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**4.6.4.2[[3]](#footnote-3)** Please attach here available references and certificates from the relevant contracting authorities

Signature .......................................................................................

(*person(s) authorised to sign on behalf of the tenderer*)

Date ..................

VOLUME 1

SECTION 4

# FORM 4.6.5

# DATA ON JOINT VENTURES

|  |
| --- |
| **4.6.5.1** Name ...................................................................................... |
| **4.6.5.2** Managing board’s address ..................................................  ..................................................................................................  Telex ..........................................................  Telephone .........................Fax..................................E-mail..... |
| **4.6.5.3** Agency in the state of the contracting authority, if any (for joint ventures/consortia with a foreign lead member )  Office address ...........................................................................  ..................................................................................................  Telex ..........................................................  Telephone ..............................Fax......................................... |
| **4.6.5.4** Names of members  i) ..............................................................................................  ii) ..............................................................................................  iii) ..............................................................................................  Etc. ............................................................................................ |
| **4.6.5.5** Name of lead member  ..................................................................................................  .................................................................................................. |
| **4.6.5.6** Agreement governing the formation of the joint venture/consortium  i) Date of signature: ................................................................  ii) Place: ...................................................................................  iii) Enclosure — joint venture/consortium agreement |
| **4.6.5.7** Proposed division of responsibilities between members (in %) with an indication of the type of work to be performed by each  ..................................................................................................  ..................................................................................................  ..................................................................................................  ..................................................................................................  .................................................................................................. |
|  |

Signature: ..................................................................................

(*person(s) authorised to sign on behalf of the tenderer*)

Date: .....................

VOLUME 1

SECTION 4

# FORM 4.6.6

# LITIGATION HISTORY

Please provide information on any history of litigation or arbitration resulting from contracts executed, whether as main contractor or as consortium-member, during the last 5 years or currently under execution.

A separate sheet should be used for each partner of a joint venture/consortium.

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Ruling FOR or AGAINST tenderer** | **Name of client, cause of litigation, and matter in dispute** | **Disputed amount (current value in euro or NC)** |
|  |  |  |  |

Signature ......................................................................................

(*person(s) authorised to sign on behalf of the tenderer*)

Date ..................

**VOLUME 1**

SECTION 4

# FORM 4.6.7

# QUALITY ASSURANCE SYSTEM(S)

Please provide details of the quality assurance system(s) you propose using to ensure successful completion of the works.

Signature .................................................

(*person(s) authorised to sign on behalf of the tenderer*)

Date ..................

VOLUME 1

SECTION 4

# FORM 4.6.8

# ACCOMMODATION FOR THE SUPERVISOR

Please attach sketches and data detailing the accommodation and facilities intended to be provided by the tenderer under the relevant items in the bill of quantities/breakdown of the overall price.

Signature .................................................

(*person(s) authorised to sign on behalf of the tenderer*)

Date ..................

VOLUME 1

SECTION 4

# FORM 4.6.9

**TECHNICAL sOLUTION**

**DESCRIPTIONS OF AND SPECIFICATIONS FOR THE TECHNICAL SOLUTION**

The technical proposal shall be prepared in accordance with the requirements given under Employer’s Requirements in Volume 3.

The technical proposals will be subject to examination and incompliant proposals (proposals which are not found to be adequate for the required works) will be rejected and compliant proposals will be evaluated.

The Tenderer shall prepare a Technical Solution/ Proposal which shall be concise with the maximum number of pages as indicated hereafter. The topics to be covered for the different zones of the plant shall as follows:

**Description of treatment philosophy and process design**

* A description of the plant and the treatment philosophy (3 pages);
* Biological process design parameters and calculations for all main treatment units, e.g volumes, surface areas, sludge age, sludge loads, hydraulic and sludge surface loads, surplus sludge production, re-circulation ratio, return sludge ratio, oxygen and air consumption, chemical consumption etc. (5 pages);
* Sludge process design parameters for all main treatment units, i.e. volumes, surface areas, sludge loads, hydraulic loads, retentions time, biogas production, chemical consumption, expected moisture contents, supernatant etc (5 pages).
* Proposed process equipment (to be presented in schedules in later section)
* Operating and Maintenance Costs to be guaranteed (to be presented in Volume 4 – Financial Offer).

**Drawings**

* Plan in appropriate scale showing the layout of the entire plant including buildings, roads, walkways, fence etc.;
* Plan with main wastewater and sludge pipelines;
* Schematic electrical layout of the total installation in the form of single line diagrams showing power supply lines, switchboards, control boards and main switching equipment;
* System configuration charts for SCADA, PLC systems, central control system, communication systems and computer systems;
* Hydraulic profile through the entire plant;
* Process and instrumentation diagram (P & I diagram) showing all process units, all electrical drives, all flow lines and instrumentation. The diagram should also include flow routes with quantities;
* Drawings with appropriate plans and sections of buildings, tanks and major chambers, including e.g. internal dimensions and showing the main equipment.

The Tenderer shall present the Tender Drawings as per the following List.

| Drawing No. | Title | **Scale** |
| --- | --- | --- |
| 1 | General layout of the plant with finished levels | 1:500 |
| 2 | Process instrumentation Diagram (PID) – base and alternative | No scale |
| 3 | Hydraulic diagram/profile of WWTP including finished ground levels and outlet | 1:500/1:100 |
| 4 | Transformer, HV and LW Electric Schematic Diagram | No scale |
| 5 | SCADA Schematic Diagram | No scale |
| 6 | Inlet Pump Station, Screen House & Blower room- layout | 1:100 |
| 7 | Inlet Pump Station Screen House & Blower room – main section | 1:100 |
| 8 | Grit and grease removal chamber – plan and sections | 1:100 |
| 9 | Primary Tanks – layout and section | 1:100 |
| 10 | Aeration tank(s) - layout and sections | 1:100 |
| 11 | Secondary Sedimentation tank(s) – layout and sections | 1:100 |
| 12 | Sludge/liquid separation – plan | 1:100 |
| 13 | RAS and SAS Pumping Station, Distribution chamber to SST or MBR, Selector tank and – plan | 1:100 |
| 14 | RAS and SAS Pumping Station, Distribution chamber to SST, Selector tank and - section | 1:100 |
| 15 | Effluent discharge system - plan | 1:100 |
| 16 | Treated effluent water supply system - Layout | 1:100 |
| 17 | Laboratory - plan | 1:100 |
| 18 | Thickener, digester, sludge silo, dewatering building – layout and sections | 1:100 |
| 19 | Blower station – plan | 1 :100 |
| 20 | Administration building – Plans | 1 :100 |

The Contracting Authority reserves the right to request during the evaluation of the tender, additional information, calculations, drawings, etc.

**Schedules**

The Tenderer shall enter in the following tables the details of the process equipment proposed. Brand names/ manufacturer may be provided but they will not be evaluated.

The Contractor’s proposals in the schedules or in his technical solution shall not imply acceptance of the proposed equipment by the Contracting Authority. On instruction to commence, the Contractor shall prepare a concept design and design for building permit as required in the technical requirements and Serbian legislation which shall be approved by the Supervisor and by Serbian institutions where applicable. Where there is no ambiguity between his technical solution and the technical requirements, the Contractor must adhere to the following technical solution.

The Tenderer shall present the equipment he proposes for the technical solution in the following tables.

Some of the technical requirements for which proposals are requested from the Contractor are minimum requirements. If there is any conflict between the minimum requirements indicated in this schedule and the technical requirements in Volume 3 of the Contract, the Contract requirements shall prevail.

Suggested equipment types are presented in the schedules and the Contractor can select one of the identified types or propose his own provided that the minimum requirements are compliant.

**Ciganski Ključ**

Inlet Pumping Station

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Unit | Minimum Requirements | Contractor’s Proposal |
| No of pumps | No+No | Duty only/ duty+standby/ duty+assist |  |
| Duty flow per pump, QWWF1 | m3/h | Contractor to state |  |
| Volume of inlet sump | m3 | Contractor to state |  |
| Duty head | m | Contractor to state |  |
| Energy efficiency | % | >70% |  |
| Type of pumps |  | Radial flow solids handling impellers/ Vortex (recessed) solids handling impellers/ Centrifugal screw impellers/ other |  |
| Minimum performance acceptance | ISO 9906 | 3B |  |
| Control system |  | water level/ throttled valve/ VFD |  |

Coarse screens

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Unit | Minimum Requirements | Contractor’s Proposal |
| No of units | No+No | Duty only/ duty+standby/ duty+assist |  |
| Spacing between bars | mm | <30mm |  |
| Design flow for each screen, QWWF2 | m3/h | Contractor to state |  |
| Maximum differential head | m | Contractor to state |  |
| Type of Screens |  | chain or cable driven screen/ reciprocating rake screens/ continuous self-cleaning screens/ arc screens/ other |  |
| Screenings removal |  | hand rake/ mechanical/ automatic |  |

Signature .................................................

(*person(s) authorised to sign on behalf of the tenderer*)

Date ..................

Fine Screens

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Unit | Minimum Requirements | Contractor’s Proposal |
| No of units | No+No | Duty only/ duty+standby/ duty+assist |  |
| Opening size | mm | <6mm |  |
| Maximum design flow for each screen, QWWF2 | m3/h | Contractor to state |  |
| Maximum differential head | m | Contractor to state |  |
| Type of Screens |  | Single rake bar screen/ multiple rake bar screen/ perforated plate/ step screen/ band screen/ other |  |
| Screenings removal |  | screw conveyor/ screw press/ wash and press/ other |  |
| Reduction in weight | % | >40% |  |

Storm Tank

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Unit | Minimum Requirements | Contractor’s Proposal |
| No of units | No+No | Duty only/ duty+standby/ duty+assist |  |
| Length of unit | m | Contractor to state |  |
| Width of unit | m | Contractor to state |  |
| Depth | m | 4 |  |
| Retention time | hour | ≥2 |  |
| Maximum design flow for each unit | m3/h | Contractor to state |  |
| Return flow to treatment |  | Gravity/ pumped |  |
| Number of pumps |  | None/ Duty only/ duty+standby/ duty+assist |  |
| Capacity each pump | m3/h | Contractor to state |  |
| Pump control |  | Water level/ VFD/ other |  |
| Type of pump |  | air lift/ suction/ recessed impeller/ other |  |

Signature .................................................

(*person(s) authorised to sign on behalf of the tenderer*)

Date ..................

Grit channel

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Unit | Minimum Requirements | Contractor’s Proposal |
| No of units | No+No | Duty only/ duty+standby/ duty+assist |  |
| Length of unit | m | Contractor to state |  |
| Width of unit | m | Contractor to state |  |
| Agitated water volume | m3 | Contractor to state |  |
| Retention time | minutes | ≥5 |  |
| Maximum design flow for each unit, QWWF1 | m3/h | Contractor to state |  |
| Number of blowers |  | Duty only/ duty+standby/ duty+assist |  |
| Type of blower |  | Multistage Centrifugal/ single-stage geared/ high speed direct drive/ positive displacement -Rotary Lobe/ other |  |
| Capacity each blower | Nm3/h | - |  |
| Air distribution along channel | Nm3/m/min | >0.3 |  |
| Turndown ratio | % duty | <40 |  |
| Energy efficiency | % | >65 |  |
| Blower control |  | throttled valve/ VFD/ other |  |
| Type of grit pumps |  | air lift/ suction/ recessed impeller/ other |  |
| Grit removal |  | airlift pump, scraper bridge, suction scraper, centrifugal pumps in end hopper |  |
| Grit treatment |  | washer/ classifier, other |  |

Signature .................................................

(*person(s) authorised to sign on behalf of the tenderer*)

Date ..................

Primary Settling Tank and Thickener

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Unit | Minimum Requirements | Contractor’s Proposal |
| Settling - No of units | No+No | Duty only/ duty+standby/ duty+assist |  |
| Diameter of unit | m | Contractor to state |  |
| Water depth | m | Contractor to state |  |
| Retention time | hour | ≥1 |  |
| Maximum Design flow for each unit, QWWF1 | m3/h | Contractor to state |  |
| Sludge removal |  | Gravity/ piston pump/ other |  |
| Thickener - No of units | No+No | Duty only/ duty+standby/ duty+assist |  |
| Thickened Sludge dry solids | %DS | ≥5% |  |

Activated Sludge Tank

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Unit | Minimum Requirements | Contractor’s Proposal |
| No of units – Phase I | No+No | Duty only/ duty+standby/ duty+assist |  |
| Length of lane | m | Contractor to state |  |
| Width of lane | m | Contractor to state |  |
| Water depth | m | Contractor to state |  |
| Sludge age – Phase I | day | ≥4 |  |
| Maximum Design flow for each unit - QDWF | m3/h | Contractor to state |  |
| Maximum loading for each unit | pe | Contractor to state |  |
| Aeration type |  | Membrane disk/ tube diffuser/ plate diffuser/ perforated tube |  |
| Oxygen transfer in clean water | gO2/Nm³air/ m water depth | ≥ 22 |  |
| Standard aeration efficiency in clean water | kgO2/kWh | >4.5 |  |

Signature .................................................

(*person(s) authorised to sign on behalf of the tenderer*)

Date ..................

Secondary Settlement Tank

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Unit | Minimum Requirements | Contractor’s Proposal |
| No of units | No+No | Duty only/ duty+standby/ duty+assist |  |
| Diameter of unit | m | Contractor to state |  |
| Water depth | m | Contractor to state |  |
| Maximum surface load (maximum flow to treatment) | m/h | <1.4 |  |
| Sludge removal |  | Suction/ scraper-gravity/ scraper- pumped/ other |  |
| Return Sludge dry solids @ QDWF | % | ≥5% |  |

Blower

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Unit | Minimum Requirements | Contractor’s Proposal |
| No of units – Phase I | No+No | Duty only/ duty+standby/ duty+assist |  |
| Type of blower |  | Multistage Centrifugal/ single-stage geared/ high speed direct drive/ positive displacement -Rotary Lobe/ other |  |
| Capacity each blower | Nm3/h | Contractor to state |  |
| Blower control |  | VFD/ other |  |
| Turndown ratio | %duty | <40 |  |
| Energy efficiency | % | >65 |  |

Signature .................................................

(*person(s) authorised to sign on behalf of the tenderer*)

Date ..................

Return Sludge Pumping Station

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Unit | Minimum Requirements | Contractor’s Proposal |
| No of pumps | No+No | Duty only/ duty+standby/ duty+assist |  |
| Duty flow per pump, QRS | m3/h | Contractor to state |  |
| QRS: QDWF | % | Contractor to state |  |
| QRSmax: QDWF | % | ≥200 |  |
| Volume of inlet sump | m3 | Contractor to state |  |
| Duty head | m | Contractor to state |  |
| Energy efficiency | % | >70% |  |
| Type of pumps |  | Radial flow solids handling impellers/ Vortex (recessed) solids handling impellers/ Centrifugal screw impellers/ other |  |
| Control system |  | VFD or other |  |

Mechanical Excess Sludge Thickening

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Unit | Minimum Requirements | Contractor’s Proposal |
| No of Units | No+No | Duty only/ duty+standby/ duty+assist |  |
| Duty flow per unit, QRS | m3/h | Contractor to state |  |
| Type of thickener |  | Gravity belt/ drum screen/ centrifuge/ other |  |
| Thickened sludge dry solids concentration | %DS | ≥5% |  |
| Polyelectrolyte consumption | g/kg DS | <7.0 |  |

Signature .................................................

(*person(s) authorised to sign on behalf of the tenderer*)

Date ..................

Anaerobic Digester Tank

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Unit | Minimum Requirements | Contractor’s Proposal |
| No of units | No+No | Duty only/ duty+standby/ duty+assist |  |
| Construction material |  | Concrete/ coated steel/ stainless steel |  |
| Insulation - Coefficient of heat transfer, U | W.m-2.°C-1 | <0.4 |  |
| Diameter of unit | m | Contractor to state |  |
| Water depth | m | Contractor to state |  |
| Raw blended input sludge dry solids | %DS | 5 – 7% |  |
| Maximum Design flow for each unit at QDWF | m3/h | Contractor to state |  |
| Hydraulic Retention time | days | ≥20 |  |
| Process temperature | oC | ≥35 |  |
| Volatile solids reduction | % | >40% |  |
| Mixer type |  | Draft tube/ Chopper pump mixing/ biogas mixing/ vertical impeller/ linear motion mixer |  |
| Mixer Energy efficiency | W/m3 digester | <10 |  |
| Mixer Velocity gradient (G) | s-1 | >50 |  |
| Digester Volume turnover | hour | <1 |  |

Signature .................................................

(*person(s) authorised to sign on behalf of the tenderer*)

Date ..................

Biogas Treatment

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Unit | Minimum Requirements | Contractor’s Proposal |
| Humidity control - filters |  | Gravel/ ceramic filters |  |
| No of units | No+No | Duty only/ duty+standby/ duty+assist |  |
| Humidity control - Chiller |  | None/ Chiller |  |
| No of units | No+No | Duty only/ duty+standby/ duty+assist |  |
| Output temperature | °C | <5 |  |
| No of Desulphurisation units | No+No | Duty only/ duty+standby/ duty+assist |  |
| Type of equipment |  | Alkaline scrubber/ granular iron oxide adsorbents/ activated carbon |  |
| No of Siloxane removal units | No+No | Duty only/ duty+standby/ duty+assist |  |
| Type of equipment |  | Activated carbon/ silica gel/ molecular sieve |  |
| No of Gasholder | No+No | Duty only/ duty+standby/ duty+assist |  |
| Type of equipment |  | Double membrane/ Coated steel |  |
| Biogas storage | hour | ≥8 |  |
| No of gas flare units |  | Duty only/ duty+standby/ duty+assist |  |
| Gas flare turndown ratio | 1:n | <1:5 |  |

Signature .................................................

(*person(s) authorised to sign on behalf of the tenderer*)

Date ..................

Biogas Consumers

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Unit | Minimum Requirements | Contractor’s Proposal |
| **Boilers** |  |  |  |
| No of units | No+No | Duty only/ duty+standby/ duty+assist |  |
| Design capacity | kW | Contractor to state |  |
| Efficiency | % | >89% |  |
| Turndown | % | <20 |  |
| NOx emissions | g/NOx/kWhe | <0.5 |  |
| Carbon monoxide – CO emissions | g/CO/kWhe | <0.5 |  |
| NOx emissions | mg/Nm3 | <250 |  |
| Carbon monoxide – CO emissions | Mg/Nm3 | <300 |  |
| **Co-Generation** |  |  |  |
| No of units | No+No | Duty only/ duty+standby/ duty+assist |  |
| Design capacity | kWe | Contractor to state |  |
| Efficiency - electric | % | 30% – 45% |  |
| Efficiency – thermal | % | 40% – 55% |  |
| Efficiency - total | % | >80% |  |
| Turndown | % | <50 |  |
| Service interval | hours | >2000 |  |
| NOx emissions | g/NOx/kWhe | <0.5 |  |
| Carbon monoxide – CO emissions | g/CO/kWhe | <0.5 |  |
| NOx emissions | mg/Nm3 | <250 |  |
| Carbon monoxide – CO emissions | Mg/Nm3 | <300 |  |

Signature .................................................

(*person(s) authorised to sign on behalf of the tenderer*)

Date ..................

Mechanical Digested Sludge Dewatering

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Unit | Minimum Requirements | Contractor’s Proposal |
| No of Units | No+No | Duty only/ duty+standby/ duty+assist |  |
| Duty flow per unit, QRS | m3/h | Contractor to state |  |
| Type of dewatering equipment |  | Belt press/ centrifuge/ plate press/ twist filter press (Bucher)/ other |  |
| Dewatered sludge dry solids concentration | % | >25 |  |
| Polyelectrolyte consumption | g/kg DS | <10.0 |  |

Advanced Solar Drying

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Unit | Minimum Requirements | Contractor’s Proposal |
| Target DS concentration | % | >50% |  |
| Area of glasshouse | m2 | Contractor to state |  |
| Design Sludge load | kg/m2 | <400 |  |
| Target evaporation rate | T.H2O/m2/year | >1.2 |  |
| Target specific surface area | m2/pe | <0.05 |  |

Signature .................................................

(*person(s) authorised to sign on behalf of the tenderer*)

Date ..................

**WTP Mediana**

Inlet Pumping Station

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Unit | Minimum Requirements | Contractor’s Proposal |
| No of pumps | No+No | Duty only/ duty+standby/ duty+assist |  |
| Duty flow per pump | m3/h | Contractor to state |  |
| Volume of inlet sump | m3 | Contractor to state |  |
| Duty head | m | Contractor to state |  |
| Pump speed | rpm | <1000 |  |
| Energy efficiency | % | >70% |  |
| Type of pumps |  | Radial flow solids handling impellers/ Vortex (recessed) solids handling impellers/ Centrifugal screw impellers/ other |  |
| Minimum performance acceptance | ISO 9906 | 3B |  |
| Control system |  | water level/ throttled valve/ VFD |  |

Settlement Tank

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Unit | Minimum Requirements | Contractor’s Proposal |
| Process operation |  | Batch |  |
| No of treatment lines |  | Contractor to state |  |
| Water depth | m | Contractor to state |  |
| Retention time | hour | Contractor to state |  |
| Maximum Design flow for each line | m3/h | Contractor to state |  |
| Settling period | hour | >2 |  |
| Sludge removal |  | Suction/ scraper-gravity/ scraper- pumped/ gravity/ other |  |

Sludge Thickening

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Unit | Minimum Requirements | Contractor’s Proposal |
| No of treatment lines |  | Contractor to state |  |
| System proposed |  | Settling tank + storage tank/ Thickening/ Storage tank only |  |
| Retention time | hours | 72 |  |
| Sludge concentration | %DS | 3% |  |
| Sludge removal |  | Gravity/ pumped |  |

Signature .................................................

(*person(s) authorised to sign on behalf of the tenderer*)

Date ..................

Sludge Dewatering

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Unit | Minimum Requirements | Contractor’s Proposal |
| No of treatment lines |  | Contractor to state |  |
| System proposed |  | Belt press/ centrifuge/ plate press/ twist filter press (Bucher)/ screw press, geotextile bags, other |  |
| Sludge concentration | %DS | >20% |  |
| Polyelectrolyte consumption | g/kg DS | <10.0 |  |

Signature .................................................

(*person(s) authorised to sign on behalf of the tenderer*)

Date ..................

**Evaluation of the Technical Offer**

The above technical solution will be evaluated for compliance with the minimum requirements where applicable by the evaluation committee.

Proposals below this minimum requirement shall be considered as non-compliance and will result in elimination of the bid from further consideration.

The evaluation will be carried out as described in Volume 1 Section 5 – Evaluation Grid.

Signature ............................................

*(person(s) authorised to sign on behalf of the tenderer)*

Date .................

VOLUME 1

SECTION 4

# FORM 4.6.10

# FURTHER INFORMATION

Tenderers may add here any further information that they deem useful for the evaluation of their tenders.

Signature ............................................

(*person(s) authorised to sign on behalf of the tenderer*)

Date ..................

1. Not all the plant owned by the company. [↑](#footnote-ref-1)
2. Amounts actually paid, without the effect of inflation. [↑](#footnote-ref-2)
3. Please see point 4 in Instructions to Tenders if documentary evidence/proof is needed. [↑](#footnote-ref-3)