Sub Section X – Operation and Maintenance

1.0 SCOPE OF WORK – OPERATION & MAINTENANCE OF SEWAGE PUMP HOUSE’S & STP’S

1. Operations
   a. Daily Operations of Sewage Pumping station & Sewage Treatment Plant
      The Contractor shall carry out all facility operation and waste water disposal operations indicated below; in accordance with Good Operating Practices, as set out in this Contract. The Facility operation and waste water disposal operations shall include, but not be limited to the following.
      • Operating Sewage Pumping Station and Treatment Plant to maintain the quality of treated sewage within the standards prescribed in the tender, operate electrical equipment during power failures by operating generators, operate the centrifuge for sludge drying and treat incoming sewage at prescribed standards through optimal dosing
      • Carrying out daily cleaning of grit channels and removal of screenings and disposal of floating matter in grit dewatered sludge out of premises.
      • Carrying out continuous flow measurements of treated & untreated sewage and recording the same online / offline.
      • Collecting samples of influent and effluent and analyzing them daily to determine the quality of sewage and performance of the treatment plant and
      • Providing security for facilities and system at all times.

   b. Contingency plan
      Developing and implementing contingency plans in respect of responses to natural disasters, periods of power failure, storm water inflow into sewers during monsoon, de-silting of units of treatment plants, constraint operations or other similar emergencies to maintain the quality of treated sewage.

   c. Energy Audit
      The Operator shall take all necessary measures to minimize the power consumption in carrying out its operations. The energy audit operations shall include, but not be limited to the following.
      • Reducing electricity consumption by regulating pumping through suitable modifications to the operating schedules.
      • Maintaining power factor and demand to avoid penalty
      • Installing more efficient pumping equipment and following better maintenance practices for electrical installation.

   d. Repairs and Maintenance (in STP premises)
      The Contractor shall carry out preventive, routing maintenance and break down maintenance Operations for proper upkeep of plant in accordance with good operating practices. The following items shall be included in such maintenances.

      i) Pumping Station Complex:
         • De-silting of wet well at least twice a year and disposing silt.
         • Replacing damaged pipes, fittings and valves.
         • Replacing damaged level indicator
         • Replacing damaged lighting conductor
         • Replacing ladders and
         • Waterproofing of leaking roof / dry well.

      ii) Pumping Machinery and Treatment Plant Equipment
         • Dewatering and de-silting of sludge sump, chlorination tank, chemical dosing tanks at least twice a year as per approved programs and disposal of silt.
• Cleaning and maintaining all rising mains/sewers in the plant area at least four times a year.
• Repairing and replacing damaged pipes, fittings and valves for suction and delivery pipe.
• Repairing and replacing pump impellers, body, bearings shafts column pipes.
• Repairing and replacing motors
• Repairing and replacing starters, circuit breakers, capacitors
• Repairing and replacing vanes and/or gears of agitators
• Repairing and replacing transformer.
• Repairing of blowers, decanter, diffusers, chlorinator, chemical dosing equipments & centrifuge.

iii) Building and Civil Structures
• Water proofing leaking roofs of the buildings.
• The preventive and routine maintenance shall include all repairs and provision of spares material and tools required for these repairs. The Contractors shall also carry out breakdown maintenance and repairs. The labour, tools and plant, spares shall be arranged by the Contractor. The following spares shall be the respective responsibility of the Contractor and the Authority during preventive routing and breakdown maintenance.

2. Advice Early Warning:
The Contractor is to warn the Engineer at the earliest opportunity of specific likely future events or circumstances that may adversely affect the operations or the condition of the facilities and / or system. The Contractor shall cooperate with the Engineer in making and considering proposals for how the effect of such an event or circumstances can be avoided or reduced and in carrying out any resulting instruction of the Engineer

The Contractor shall also advise the Authority from time to time, on improving the quality of operations, reduction in water / energy losses and betterment practices.

3. Replacing
The Contractor shall utilize the office space, provided by the Authority to establish its monitoring and reporting office along with computer and peripherals. It shall also obtain a telephone connection and maintain the same through the Contract period. All data transfers and updates made to the Authority shall be affected through the said telecommunications medium.

The Contractor shall carry out all reporting indicated below and as set out in this Contract. The reporting shall include, but not be limited to the following
• Daily summary of Operations at Pumping Stations – A daily report providing information at each pumping station on the hours of pumping quantity of sewage pumped and energy consumed during the day.
• Daily summary of Operations at Sewage Treatment Plant – A daily report of operation of the diffuses, agitators, decanter and other equipment at the sewage treatment plants providing information on the quantity of sewage treated, hours of operation of equipment, energy consumed and use of chemicals.
• Sewage Quality Monitoring – A daily report monitoring the quality of raw and treated sewage through the analysis of samples.
• Sewer / Storm Water Drains / wet well & other units etc. Monthly cleaning report sewer / storm water drain de-silted and record of silt disposed at disposal sites.

4. Authority’s Responsibilities
The Authority shall be responsible for procuring obtaining and maintaining Authority Clearances required, however that the Contractor shall be responsible for maintaining the conditionality of any such clearance, if such maintenance falls within the preview of the Contractor.

UIT-AJMER shall supervise the Contractor’s Operations at all times and notify the Contractor of any defects that are found. Such checking shall not affect the Contractors responsibilities. The Engineer may instruct the Contractor to search for a defect and to uncover and test any work that the UIT-AJMER considers may have a defect.
The Authority shall be responsible for
- Energy charges and treated effluent testing charges from State PCB if required.
- Maintaining administrative control over the personnel, facilities and system.

5. Contractors Responsibilities
The contractor shall maintain properly and keep intact all assets / works / facilities / system of the Authority throughout the contract period and shall hand over the same in good working condition at the end of the Contract. The Contractor shall not modify or alter any operations regarding the facilities and / or system without prior written permission of the UIT-AJMER or its representative.

The contractor shall procure all spare parts required for the maintenance of equipment excluding those to be supplied by the Authority. The Contractor shall warrant to the effect that all the spares shall be procured from the authorized sources and be of the best quality and fit for the purpose for which it is being used.

The Contractor is expected to carry out the work in such a manner as not because any damage to public property on account of negligence or otherwise. The contractor shall be fully responsible for making good the damages so caused by him entirely at his own cost.

The assets / works / facilities / systems of the Authority shall be at the risk and in the sole charge of the Contractor and it shall be responsible for making good any loss or damage there to arising from any cause whatever including that due to a theft or robbery.

The Contractor shall provide adequate engineering equipment, maintenance staff, inventories plant and machinery and all other things, whether of a temporary or permanent nature required for carrying out operations under the Contract.

The Contractor shall carry out its Operations, so far as compliance with the requirement of the Contract permits, so as not to interfere unnecessarily or improperly with:
- The convenience of the public
- The access to use and occupation of public or private roads and footpaths to or of properties.

Permissions: The Contractor shall obtain all required permissions, sanctions clearances and permits for carrying out its Operations, including Contractors clearances and shall be fully responsible for carrying out the operations in a safe and secure manner, consistent with the law of the land, laws and regulations regarding such facilities and / or System and directives of any Authority and planning permissions.

Safety: The Contractor shall be responsible for the safety of all activities on the site and shall be absolutely and solely responsible for any and all kinds of injuries or damages to persons and property of any description whatever may be caused by or result from the operations carried out, whether these may have been carried out skilfully and carefully and strictly in conformity with the provision of the specifications or not.

Discoveries: All fossils, coins, articles of value or antiquity and structures and other remains or things of geological or archaeological interest discovered on the Site shall as between the Authority and the Contractor, be deemed to be the absolute property of the Authority. The Contractor shall take reasonable precautions to prevent its workmen or any other persons from removing or damaging any such article or thing and shall, immediately upon discovery thereof and before removal, acquaint the Engineer of such discovery and carry out the UIT-AJMER instructions for dealing with the same.

The Contractor shall be responsible for payment of reinstatement charges for roads, footpaths and land as per the Authority’s rates.

The Contractor shall take full responsibility for the adequacy stability and safety of all Site operations.

6. Staff & Labour:
   A. Engagement of Staff & Labour
The Contractor shall employ skilled, semi-skilled and unskilled labour in sufficient numbers to carry out its operations at the required rate of progress and of quality to ensure workmanship of the degree specified in the Contract for timely fulfilling of the Contractor’s obligations under the Contract and to the satisfaction of the UIT-AJMER.

The Contractor shall not employ in connection with the operations any child who has not completed his/her fifteenth year of age. It shall also not employ an adolescent who has not completed his / her eighteenth year unless he/she is certified fit for carrying out operations as an adult as prescribed under clause b) of such section (2)(of Section 69 of the factories Act 1948.

The Contractor shall provide its staff, a minimum of two sets of uniforms with the titles UIT-AJMER inscribed on the back and subject to approval of the Authority. Each worker on duty shall wear a clean uniform whenever on duty.

The Contractor shall be required by the Engineer deliver to it, to such forms and at such intervals as the Engineer may prescribed a return showing the numbers of the several classes of staff employed by the Contractor on the site and such other information as the Engineer may require.

If the UIT-AJMER asked the Contractor to remove a person who is a member of the Contractor’s staff stating the reasons, the Contractor shall ensure that the person leave the site within seven (7) days and has no further connection with operations under the Contract.

At all times during continuance of the Contract, the Contractor and its sub-contractors shall abide by all existing and future labour enactment and rules made there under, regulations, notifications and bye-laws of the Central, State or Local Government. The Contractor shall keep the Authority indemnified in case any action is taken against UIT-AJMER by any Authority on account of contravention of any of the provisions of any Act or rules made there under, regulations or notifications including amendments.

If the Authority is caused to pay or reimburse such amounts as may be necessary to carry or observe, or for non-observance of the provisions stipulated in the notifications/bye-laws/acts/rules/regulations including amendments if any, on the part of the Contractor and in connection with labor enactment, the Engineer shall have the right to deduct any money due to the Contractor including its amount of security deposit. The Engineer shall also have the right to recover from the Contractor, any sum required or estimated to be required for making good the loss or damage suffered by the Authority.

B. Contractor’s Superintendence

The Contractor shall provide all necessary superintendence while carrying out its operations and as long thereafter as the UIT-AJMER may consider necessary for the proper fulfilling of the Contractor’s obligations under the Contract. The Contractor shall nominate a competent and authorized representative (Contractor Representative) approved of by the Engineer which approval may at any time be withdrawn. The Contractor’s Representative shall give its whole time to the superintendence of the operations. The Contractor’s Representative shall receive, on behalf of the Contractor, instructions from the Engineer which shall be deemed received by the Contractor.

C. Contract Performance

Management Meetings:

Either the UIT-AJMER or the Contractor may require the other to attend a management meeting. The business of a management meeting shall be to review the plans for remaining Operations and to deal with matters raised in accordance with any advice. The UIT-AJMER shall record the business of management meetings and is to provide copies of its record to those attending the meeting and to the UIT-AJMER either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.

The UIT-AJMER may instruct the Contractor to rectify defects and deficiency in its Operations. Alternatively, the Authority shall carry out the operations on its own and deduct the amount incurred in attending to such defaults from the next payment due to the operation. The deduction of such damages
shall not relieve the Contractor from its obligations to carry out the operations, or from any other of its obligations and liabilities under the Contract.

**Notwithstanding anything stated above:**
If the Authority is of the opinion that the actions of the Contractor is deemed as an event of default of services and the event persists beyond one (1) day the Authority shall be entitled to invoke the Security deposit and carry out the operations through another Contractor or departmentally. The Authority shall then proceed as per tender conditions.

6. **Liquidated Damages and Penalties for O/M works:**
The basis for applying penalties is to restrict Contractor from deviating from disposing all raw/treated waste water efficiently from the service area – as per fixed schedule and as per stipulations prescribed in the tender.

The Contractor is also expected to carry out the instructions of the Engineer or its representative from time to time, maintain the System in accordance with good Operating Practices attend to Customer complaints, refrain from offering operations without due authorization where so required and follow other requirements under this Contract.

The Contractor shall be subject to the following liquidated damages and penalties for its failure to carry out its operations as indicated below:

<table>
<thead>
<tr>
<th>Basis of Penalty</th>
<th>Penalty Benchmark</th>
<th>Penalty Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failure to maintain BOD/COD/SS/Oil/grease/pH levels within prescribed limits. Detected as per reports of daily samples sent to PCB by the Authority and outlet quality to be achieved as per tender provisions</td>
<td>Up to 2 Occurrence/month</td>
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<tr>
<td></td>
<td>2 to 5 Occurrences / month</td>
<td>Rs.1000/- per occurrence</td>
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<tr>
<td></td>
<td>5 to 10 occurrences/month</td>
<td>Rs.10,000/- per occurrence</td>
</tr>
<tr>
<td></td>
<td>Above 10 Occurrences/month</td>
<td>Termination</td>
</tr>
<tr>
<td>Not maintaining optimum wet well level of pumping station</td>
<td>Up to 2 Occurrences /month</td>
<td>Nil</td>
</tr>
<tr>
<td></td>
<td>2 to 20 Occurrences / month</td>
<td>Rs.1000/-per occurrence</td>
</tr>
<tr>
<td></td>
<td>Above 10 Occurrences /month</td>
<td>Termination</td>
</tr>
<tr>
<td>Increasing power consumed : The contractor has to establish and get approved from the Engineer the “maximum guaranteed power consumption” for entire operations</td>
<td>For Power increased beyond current base level based on wastewater discharge schedules and persisting over a two-month billing period</td>
<td>Rs.4.50 /KWH on additional power consumption. Or prevailing billing tariff rates applied by AVVNLA Authority whichever is higher.</td>
</tr>
<tr>
<td>When a generator is used the electricity consumption shall be determined as follows : Electricity consumption 9KWH) + 1.10 times the Electricity Equivalent of diesel consumed (KWH)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inadequate maintenance of facilities / System</td>
<td>For each case detected.</td>
<td>--</td>
</tr>
<tr>
<td>Inappropriate de-silting of sewers and clearing of silt in premises.</td>
<td>Per Occurrences</td>
<td>Rs.1000/- per occurrences</td>
</tr>
</tbody>
</table>
| Inadequate contingency plan | For each case submitted. | -----
| Delay in recording wet well levels, energy meter reading power failure time or diesel consumption | Per Occurrence | Rs.100/- per occurrence. |
| Duty staff not wearing uniform or it being dirty. | Per Occurrence | ------ |
| Non-attendance of Customer complaints in time or adequately | Per Occurrence | ------ |
7. Intellectual Property & Confidential Information

The Parties agree that all details, plans, manuals documentation, specifications, schedules, programs, reports, calculations and other work relating to the Facilities and / or Systems and the provision of operations pursuant to this Contract (hereafter referred to as “Proprietary Material”) which have been or are hereafter written, originated or made by any of them or any of their respective employees, sub-contractors or agents and by the persons related to the Contractor in connection with this contract shall be owned by and be the property of the Authority. The determination of information as Proprietary Materials shall be made at the sole discretion of the Authority.

The Contractor shall have an irrevocable royalty-free, non-exclusive license to use the Proprietary Material during the term of this contract for all purposes connected with fulfilling its obligations hereunder. However, this license shall not be transferable to any party other than to a permitted assignee under this Contract. Such license shall not continue after the suspension or termination of this Contract or the discharge by the Contractor of its duties hereunder.

8. Confidentiality

The Contractor shall cause the persons related to the Operator not to, without the prior written consent of the Authority, at any time, divulge or disclose to any person or use for any purpose unconnected with the operations, proprietary material under this contract. This shall not apply to information:

- Already in the public domain otherwise than by breach of this Contract.
- Already to the possession of the receiving party before it was received from the office party in connection with this Contract and which was not obtained under any obligation of confidentiality; or
- Obtained from a third person who is free to develop the same and which was not obtained under any obligation of confidentiality.

The Contract shall, whenever required take necessary steps to ensure that all persons employed by it, under this Contract comply with the Indian Official Secrets Act 1923 (XIX of 1923) and agree that it applies to them and shall continue to apply even after completion of this Contract.

No photographs of the Facilities or System or any part there of or equipment employed thereon shall be taken or permitted by the Contractor to be taken by any of its employees or any employees of its sub-contractor without the prior approval of the Engineer in writing and no such photographs shall be published or otherwise circulated without the approval of the Engineer in writing.

The Authority shall use its best efforts to ensure that the confidential proprietary information relating to the Contractor is not made public. However, the Authority shall not be liable in any manner whatsoever in case such information becomes public.

9. Assignment

The Contractor shall not subcontract the whole of the operations or a substantial part thereof. Except where otherwise provided by the Contract, the Contractor shall not subcontract any part of the operations without the prior consent of the Engineer. Any such consent shall not relieve the Contractor from any liability or obligations under the Contract and it shall be responsible for the acts, defaults and neglects of any subcontractor, its agents, servants or workmen as fully as if they were the acts, defaults or neglects of the Contractor, its agents, servants or workmen.

The Contractor shall not be required to obtain such consent for:

- The provision of labour
- The purchase of materials specified in the contract.

In the event of a Subcontractor having undertaken towards the Contractor in respect of the work executed or the goods, materials, plant or operation supplied by such Subcontractor, any continuing obligation extending for a period exceeding that of the contract period under the Contract, the Contractor shall at any time,
after the expiration of such period assign to the Authority, at the Authority’s request and cost, the benefit of such obligation for the unexpired duration thereof.
10. Default of Contractor

10.1 Event of Default

a) At any time after the Commencement Date, the Engineer may investigate each case where the Contractor has failed to properly perform the operations in accordance with this Contract. The Engineer shall issue a notice to the Contractor, instructing him to rectify the failure within a reasonable time.

b) An event of default on the part of its Contractor being unable to fulfill its services obligations under the Contract shall be deemed as a serious default and is said to have occurred doubts any of the following causes.

c) The Engineer certifies to the Authority with a copy to the Contractor that in its opinion the Contractor
   • Has repudiated the Contractor.
   • Without reasonable excuse has failed to commence Operations in accordance with the Contract and pursuant to the Commencement date; or failed to complete the Operations within the time stipulated for completion.

d) Gross misconduct of the Contractor

e) Despite previous warning from the Engineer, in writing, is otherwise persistently or flagrantly neglecting to comply with any of its obligations under the Contract.

f) Contractor persistently fails to follow. Good operating practices in execution of the Contract.

g) If the Contractor changes the use to which any part or whole of the Site is put or initiates a variation without the required approval of the Engineer.

h) The Contractor stops providing the operation for one day and the stoppage has not been authorized by the Engineer.

i) The Engineer gives notice that failure to correct a particular defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Engineer.

j) If the Contractor is in breach of any law or statute governing the operations.

k) The Contractor does not maintain a security which is required and

l) The Contractor, in the judgement of the Authority has engaged in Corrupt Practices fraudulent Practices in competing for or in carrying out the Operations under the Contract.

m) If the Contract fails to obtain or keep in force the insurance requirements under this contract.

n) The Contractor (in case of a consortium) has modified the composition of the consortium and/or the responsibility of each member of the consortium without prior approval of the Authority.

o) The Contractor is enable to maintain the composition and structure of its organization due to any of the following causes:
   • The Contractor enters into voluntary or involuntary bankruptcy, or liquidation.
   • The Contractor becomes insolvent.
   • A receiver, administrator, trustee or liquidator is appointed over any substantial part of its assets and
   • Any act is done or event occurs with respect to the Contractor or its assets which under any applicable law has substantially similar effect to any of the foregoing acts or events.’

10.2 Consequences of Default

a) It is a default by the Contractor is said to have occurred pursuant to the Authority may after giving three days notice to the Contractor enter upon the Site, the facilities and / or system and terminate the Contract without thereby releasing the Contractor from any of its obligations under the contract, or
affecting the rights and authorities conferred on the Authority by the Contract. The Authority may use so much of the Contractor’s equipment, temporary works and materials as it may think proper.

b) If the Contract is terminated because of an Contractor’s event of default, the Authority shall be entitled to invoke the Security Deposit and carry out the Operations through a successor Contractor or departmentally and at the risk and cost of the Contractor. If the total amount due to the Authority exceeds any payment due to the Contractor the difference shall be a debt payable to the Authority,

c) If the Contract is terminated because of an Contractor’s event of default, all materials on the site, plant, equipment and temporary works shall be deemed to be the property of the Authority.

d) Unless prohibited by law, the Contractor shall, if so instructed by the Engineer within 3 days of such entry and terminated referred to, assigns to the Authority the benefit of any Contract for the supply of any goods or materials or operations which the contractor may have entered into for the purposes of the contract.

11. Default of Authority

11.1 Events of Default

a) An event of default on the part of the Authority, affecting the performance of the Contractor’s operations shall be deemed to have occurred due to any of the following causes.

b) The Authority does not give access to part of the Site by the commencement date.

c) The Authority does not make a payment certified by the Engineer within 90 days from the day of receipt of th Engineer’s Certificate.

d) The Engineer instructs the Contractor to stop providing the operations and the instruction is not withdrawn within 3 days and

e) The Authority is in breach of any law or statute governing this Contract.

11.2 Consequences of Default

1. Pursuant to the Contractor may terminate its employment under the Contract by giving notice to the Engineer with a copy to the Municipal Commissioner. Such termination shall take effect 14 days after giving the said notice.

2. If the Authority, before the expiry of the above notice period, or immediately thereafter removes the cause of its default, the Contractor’s entitlement shall lapse in respect of such defaults, and the Contractor shall continue with / resume normal working as soon as is reasonably possible.
12. Risks, Indemnification's & Insurance

A. Risks
All risks of loss of or damage to physical property and of personal injury and death which arise during
and in consequence of the performance of the Contract other than the risks stated, is the responsibility of
the Contractor.

B. Indemnification
1. The Contractor shall indemnify and keep indemnified the Authority against all losses and claims for
injuries or damage to any property whatsoever which may arise out of or in consequence of the operations
and against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in
respect of or in relation thereto.

2. The Contractor shall at all times indemnify the Authority against all claims, damages or compensation
under the provision of:
- Payment of wages Act 1936
- Minimum Wages Act 1948
- Employers Liability Act 1938
- The Workmen’s Compensation Act 1923
- Indian Factories Act 1948 and

Or any modifications thereof and rules made there under from time to time or as a consequence or any
accident or injury to any workman or other persons in or about the Operations, whether in the
employment of the Contractor or not save and except where such accident or injury have resulted from
any act of the Authority, their agents or servants and also against all cost, charges and expenses of any
suit, action of proceedings arising out of such accident or injury and against all sum and sums which may
with the consent of the Contractor be paid to comprise or compound any such claim without limiting its
obligations and liabilities as above provided. The Contractor shall insure against all claims damages or
compensation payable under the various acts mentioned above or any modifications thereof or any other
law relating thereto.

C. Insurance
The Contractor shall provide in the joint names of the Authority and the Contractor insurance cover from
the Commencement date to one year beyond the end of the Contract Period for the Contractor’s risks
covering:
- Loss of or damage of property (except the Facilities, System and Equipment) in connection with the
  Contract.
- Personal injury or death; and
- The Contractor’s All risk (CAR) Insurance Policy.
- The covers shall be obtained from the Directorate of Insurance, Maharashtra State only.

The Contractor may at its own discretion provide for the following insurance covers
- Loss or damage to the Facilities and / or System and
- Loss of or damage to equipment.
- Such cover may be taken either from the Directorate of Insurance, UP State or from any
  other Insurance company with the approval of the Authority.

The Contractor shall deliver policies and certificates to the Engineer for an approval before the
Commencement Date. All such insurance shall provide for compensation to be payable in the types and
proportions of currencies required to rectify the loss or damage incurred.

If the Contractor or any of its Subcontractors does not provide any of the policies and certificates
required, the Authority may affect the insurance, which the Contractor should have provided and recover
the premiums the contractor has paid from payments otherwise due to the Contractor or, if no payment is
due, the payment of the premiums shall be a debt due to the Authority.
13. Force Majeure

A. Force Majeure Events

A Force Majeure Event as defined is said to have occurred if any such event arises after the issue of the Letter of Award of Contract and extends for a period greater than thirty days, outside the control of both parties, thereby rendering it impossible or unlawful for either party to fulfill its contract obligations under the law governing the Contract. The Force Majeure Events are:

- War, invasion, mobilization, requisition or embargo;
- Rebellion, revolution, insurrection or military or usurped power or civil war;
- Contamination by radio-activity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel radioactive toxic explosive or other hazardous properties of any explosive nuclear assembly or nuclear component of such assembly;
- Riot commotion or disorder, unless solely restricted to employees of the Contractor or of its Subcontractors;
- Floods and any other calamity resulting from climatic imbalances;
- Provided always that such events are beyond the control of the parties and have a materially adverse effect on the operations.

The Contractor shall be under no liability whatsoever in consequence of any of the Force Majeure events referred to in this clause whether by way of indemnity or otherwise.

Both parties shall be released from further performance pursuant to any Force Majeure events occurring outside the control of both parties and extending for a period greater than 180 days.

If the Contract is frustrated by a Force Majeure event, the UIT-AJMER shall certify that the Contract has been frustrated. The Contractor shall make the site safe and stop operations as quickly as possible after receiving this certificate.

14. Consultation and Duty to Mitigate

For so long as the period of Force Majeure is continuing the affected party shall consult with the other parties on the period and effect of the Force Majeure event, and the affected party shall use all reasonable endeavours to alleviate its effects on the performances of its obligations under this contract. The other party shall afford reasonable assistance to the affected party to alleviate the effect of the Force Majeure event on the performance by the affected party of its obligations under this Contract. The affected Party shall use its best efforts to continue to perform its obligations hereunder and to correct or cure the same during the subsistence of such Force Majeure Event.
15. Consequences of Force Majeure
If and to the extent that any of the Force Majeure events listed above results in loss or damage to the Facility and / or System the Contractor shall promptly give notice to the Authority. The Authority may direct the Contractor to rectify this loss or damage to the extent required by the Authority at costs to be mutually agreed between the parties. The Contractor shall expeditiously rectify the loss or damage and shall be entitled to payment of such costs. In the event that the parties are not able to reach an agreement on the cost of rectification, the Authority may cry out the rectification works by itself or through any agency nominated by it. The Contractor shall provide all cooperation required to complete such rectification expeditiously.

16. Resumption of Performance
When the affected party is able to resume performance of its obligations under this Contract, it shall give to the other party a written notice to that effect and shall promptly, and in any event within 3 days resume performance of its obligation hereunder:

- The obligations and liabilities of the parties under this contract would continue as long as Force Majeure event does not impede the performance.
- There shall be no penalty / liquidated damages applicable in the period of subsistence of a Force Majeure.

17. Taking over Process
At the end of the Contract period and subject to the provisions or its earlier terminations except on account of default of the Contractor, the Contractor shall request the Engineer to take over the Facilities and / or System. The Authority shall take over the facilities and / or System within 7 days of such a request being made. The Contractor shall:

- Cease all further operations except for such operations as may be necessary and instructed by the Engineers’ Representative for the purpose of making safe or protecting those parts of the Facilities and / or System and any operations required to leave the Site in a clean and safe condition.
- Hand over all documents and supplies for which the Contractor has received payment and
- Remove Contractor’s equipment which is on the Site and repatriate its entire staff and labor from the site.
- Provide adequate training to ensure complete transfer of technology of entire operation & maintenance of systems/automation etc. to the successor Contractor to the satisfaction of the Engineer.

The Contractor shall supply to the Engineer a detailed account of the total amount that the Contractor considers payable under the Contract before the end of the Contract Period. The Engineer within 28 days of receiving the Contractor’s account shall certify any final payment that is due to the Contractor, or indicate to the Contractor the corrections or additions that are necessary. If the final account is still unsatisfactory, after the Contractor resubmits it, the Engineer shall decide on the amount payable to the Contractor and issue a payment certificate.

The Authority shall any time, within a period of 90 days from the Completion Date or Termination Date as applicable, carry out an independent assessment of the facilities and / or system departmentally or through a Successor Contractor. Any deficiencies in the facilities and / or System shall be made good by or at the cost of the Contractor so as to bring the facilities and / system into Good Repair and proper working condition as handed over at the Commencement Date and subsequent works done pursuant and normal wear and tear excepting.

18. Repairs and Maintenance Schedules
1. Pumping Station and Treatment Plant Complex:
As per indicated period checking the operation, correcting defects, attending to calibration and setting is required attending to minor repairs and proper upkeeping) such as cleaning and painting) required for the following :

i. Monthly
- Sewage level indicators in wet well
- Manholes
- Wet well interiors
- Roof and surroundings and
• Lightning arrestors.

ii. Annual
• Leakages in structures
• Ladders
• Railings
• Structural damages to the wet and dry well and
• Overflow drain.

2. Pumping Machinery and Treatment Plant Equipment:
As per indicated period checking the operation, correcting defects attending to calibration and setting is
required attending to minor repairs and proper up keeping) such as cleaning and painting) required for the
following:

i. Daily
• Screens/ Grit Channels
• Moving parts of screens and grit removal equipment, Blowers /Agitators / Pumps/ Agitators
  /Return Sludge pumps/ Chemical mixer/Centrifuge/Decanter
• Stuffing box
• Bearing and
• Vibration, balancing on Decanter, chemical dosing and mixing, Motors
• Contact tightness
• Cable insulation near the lugs.
• Panels Breaker and Starter
• Contacts of relay and circuit breaker and
• Setting of over-current relay, no-volt coil and tripping mechanism and off in the dash pot relay.
• Transformer Sub-station
• Ground Operated Dis-connectors (GOD)
• Contacts of GOD and of Over Current (OC) relays
• Radiators and
• Earth pit

ii. Monthly
• Screens and Grit channels
• Chains in mechanically operated components
• Screens performance
• Transformer
• Oil in transformer
• Relay alarm circuit
• Load (Amperes) and
• Voltage

iii. Quarterly
• Transformer
• Bushing and
• Dehydrating breathers

iv. Half-Yearly
• Pumps / Blowers /Agitators / Compressor /Decanters/Centrifuge
• Gland of stuffing box
• Gland bolts
• Gland packing
• Alignment of pump aerator and drive and
• Oil lubricated bearings
• Motors
• Tripping elements for motor protection
• Contact points and
• Fuse ratings

v. Annual
• Paint screens, grit removal mechanism, scrapers, scrapers, motors, pipes,
• Valves, fittings, agitators and inlet/outlet weirs with two coats of anticorrosive paints.
• Replace worn out parts of mechanical equipment in sewage pumping station and sewage treatment plant.

3. Buildings and Civil Structures:
Carry out routine maintenance and minor repairs including cleaning, repairs to plaster, doors, windows and painting.

i. Daily
• Sweep the premises
• Clean the floors and parts inside the building
• Clear the cobwebs and other biological growth
• Maintenance of horticulture
• Disposal and transportation of dewatered sludge

ii. Half-Yearly
• Repair damaged floor, plaster, roof, leakages and
• Repair damaged doors, windows and other fixtures.

1. General Requirements for Operation and Maintenance
The Contractor shall operate and maintain the entire Plant within its contract price for a total operation and maintenance period of 1825 days (5 years) from the date of taking over of the plant (or such unit) by the Employer. The operation and maintenance period shall include the defect liability period and shall commence from the date of taking over by the Employer. All necessary repairs, maintenance, overhaul, replacements etc., shall be made during the O & M to maintain the Plant at the status of formal handing over after the P G test. At the end of O & M period the plant shall be handed over to the Employer in fully functional and new condition except normal wear and tear.

The price for O & M bill shall include supply of all tools, tackles, spares, lubricants, laboratory chemical, glassware and polyelectrolyte. The water and power supply shall be made by the Contractor but power and water bills shall be paid by the Employer as per actual directly to the concerned authorities. The power consumed shall be within the guaranteed figures as indicated by the bidder in the section X technical schedule of volume 1. Power consumption exceeding this is subject to penalty as said in the above section. The scope shall include but not limited to the following items.

1. Operation and Maintenance including Civil, Electrical, Mechanical and all allied works

2. Sampling and testing of influent sewage based on the tests and frequency desired by the Employer’s representative and in general in accordance with the CPHEEO manual on Sewerage and Sewage Treatment.

3. Sampling and testing of additional samples for the day to day O & M of the STP and as mutually agreed from time to time between the Contractor and the Employer’s representative.
4. Sampling of final treated effluent to ensure that the guarantee parameters are as stipulated in the bid document. The sampling frequency to be as per relevant norms of Rajasthan Pollution Control Board or higher as decided by Employer's representative. The Employer reserves right to collect samples at random at the will of the Employer through any agency nominated by him. Employer shall have right to seek part of sample collected by the Contractor without any prior intimation to cross check the results on random basis. However the analysis charges of such samples shall be borne by Employer.

5. O & M of all functional and utility buildings, infrastructure and common areas Within the Plant campus.

6. Proper maintenance of Water Supply, Sewerage, Roads, Paths, lawns including trimming and upkeep of gardens etc.,

7. Maintenance of Proper records of sampling as per approved Performa.

8. Loading, Unloading and Transportation of screenings, Wet sludge and wet grit out of treatment Plant site at his cost as directed by Employer’s representative within 20 km from the Plant at the place as directed by the Employer’s representative from time to time. The wet sludge shall be collected and disposed of by the contractor. Any revenue accruals by sale of sludge shall be to the benefit of the Contractor.

9. Maintenance of log books of all the machinery not connected to the PLC / SCDA shall be done separately & collectively, at the STP fortnightly and monthly reports of all such machinery and parameters monitored by the PLC shall be generated and hardcopy along with soft copy shall be got approved by the Employer’s representative. These reports shall contain sufficient appropriate and adequate data to make the records meaningful and amenable to analysis for evaluating the performance of the Plant as well as to help in O & M decisions.

10. Security of the campus and contents therein shall be Contractor’s responsibility.

11. The records maintained by the Contractor shall be produced periodically to the Employer’s representative for proper monitoring. The Employer's representative’s remarks shall be attended to on next submission. Consolidated summary reports shall be furnished to the Employer monthly, quarterly and yearly containing salient features.

The Contractor shall also maintain history sheets of overhauling, maintenance, replacement of all the important electrical and mechanical equipment

The O & M shall include the appropriate preventive maintenance of equipment as per the manufacturer’s recommendation.

The operation, maintenance and repairs services shall be performed according to the following.

Down time: The Plant shall never be operated at less than 50% of its design capacity due to maintenance and repair reasons. The period of such exceptional operation shall not exceed two consecutive days and shall not be more than three days a
week. The maximum downtime of the whole Plant shall not exceed 8 hours. The periods for repairs and maintenance have to be communicated to the Employer’s representative at least one month in advance. For machinery and equipment which requires maintenance to be carried out by manufacturer/manufacturer’s authorized representative, the down time shall not exceed 30 days. Employer reserves the right to impose penalty, should there be any default by Contractor on this account. The penalty amount will be deducted in the next O & M bill if adequate resins are not furnished by the Contractor for delay.

Operation of the Plant as per O & M Manual:

The Plant shall be operated according to the rules and procedures laid down in the O & M manual. The Plant must be in position to work at the design capacity at any time.

Awareness & Cleanliness

The Contractor and his staff shall maintain a high degree of awareness in operation and maintenance of the Plant and all relevant safety codes and procedures. At all times the Plant, its equipment and surrounds shall be kept clean and in order including the buildings, floors, walls, roofs, windows, and garden etc.

Frequency of Preventive maintenance

The preventive maintenance shall be carried out according to the preventive maintenance schedule of the Plant. The regular staff may be reinforced with short-term specialists by the Contractor for special maintenance tasks, after duly informing the Employer’s representative of the need and the schedule.

Repairs

Repairs shall be made as and when needed very promptly on the spot or at the Contractor’s / Manufacturer’s workshop. The need of repair on the spot or at the Contractor’s workshop has to be defined in co-ordination with the Employer’s representative and according to the status of spare parts availability.

Spare parts

The Contractor shall keep a reasonable stock of spare parts so that the down time of equipment can be kept within the limits specified. The contents of the stock and the reorder level of the inventory have to be approved by the Employer’s representative.

Transportation

All necessary transportation shall be arranged and made by the Contractor at his own expense.

Consumables

The Contractor has to ensure that there is always there is sufficient stock of 15 days of consumables, laboratory
Chemicals The Contractor has to ensure that there is always there is minimum stock of 30 days requirement of Polyelectrolyte & chemical for H₂S scrubbing (if applicable).

2 GENERAL OBLIGATION
The Contractor shall operate and maintain the entire Plant under this contract for the period specified in this contract which shall be extendable for a further period of five years at the Employer’s option with a suitable increase to be discussed in the last six month of five year O & M contract.

The Contractor will submit a detailed operation and maintenance plan for approval of Employer’s representative. All operation and maintenance activities shall be carried out strictly in accordance with the approved plan.

The services shall include but not be limited to the following items.

a) Operation and maintenance of the sewage treatment plant from the inlet chamber up to disposal into Existing Nallah,
b) Training for the O & M staff of designated by Employer’s requirement.
c) Generation and maintenance of periodic reports.

A triparty agreement for O & M between UIT-AJMER, Contractor and Municipal Councils Ajmer-Pushkar shall be executed at the time issue of notice to proceed.

3 OPERATION
3.1 Operational services
The Contractor shall operate the complete sewage treatment Plant and associated services on a continuous 24-hour basis.

The Contractor shall operate and utilize the control and monitoring systems provided. If found necessary, he shall make adjustments (within the operation range) of the control system and equipment, so that the Plant operation matches the treatment process requirements.

If it is determined that the facility is not capable of meeting the design parameters for any reason beyond the Contractor’s control and not attributable to him, the Contractor shall determine the specific cause of failure/ abnormality in the Plant functioning and report to the Employer’s representative and seek his directives on the necessary corrective action to be taken/adopted.

The Contractor will be required to furnish the details of electricity consumption in the format prescribed by the Employer’s representative.

All consumables, Polyelectrolyte, and spare required operating and maintaining the Contractor shall provide the Plant in good condition. The grit, Screenings, Wet sludge and other garbage generated in the plant shall be removed from the site on daily basis. No accumulation of such residues shall be permitted within the Plant campus without express application by Contractor giving adequate reasons as well as permission of Employer’s representative. The Contractor shall such residues in conformity to Environmental regulations/ rules in force. The Employer’s Representative may, if required, decide the mode and timing of disposal of such residues in consultation with concerned Environmental and Civic Authorities. Such
directions shall be followed by the Contractor promptly, both in letter and spirit, without any reservations and without any increase in O&M /other costs. The loading, unloading and transportation cost of these shall be borne by the Contractor and shall be included in the price quoted by the Contractor for O&M.

The Contractor at his own expense shall provide all tools, cleaning, and house keeping equipment, security and safety equipment

3.2 Laboratory services

a) The Contractor shall perform all tests, sampling and analyses regularly as approved by the Employer’s requirement and as per the O & M standards

b) The Contractor will submit in his offer a complete list of laboratory equipment and materials in accordance with the analysis program required, if in addition to the mandatory list of laboratory equipment said in annexure ‘C’

3.3 Manpower

The Contractor shall provide experienced managerial, technical, supervisory, laboratory, administrative, and non-technical personnel and labour necessary to operate and maintain the treatment Plant and works properly, safely and efficiently on a continuous 24 hour basis for the full term of the O & M period. While doing so due consideration shall be given to the labour laws in force.

The qualification and capability of Contractor’s personnel shall be appropriate for the tasks they are assigned to perform. The staff provided shall be fully trained in the operation of the works before being given responsibility. If, in opinion of the Employer’s representative, a member of Contractor’s staff is considered to be insufficiently skilled or otherwise inappropriate for the assigned task, and Employer’s representative informs the Contractor in writing, the Contractor shall replace him with a person of appropriate skills and experience for the task, approved by the Employer’s representative, within one month of being so informed.

The bidder shall propose in his tender a staff management structure for the operation and maintenance of works. The suggested structure (minimum) shall be as follows at each STP):

<table>
<thead>
<tr>
<th>Plant Manager*</th>
<th>1</th>
<th>full time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shift – in Charge*</td>
<td>2</td>
<td>(one at each STP)</td>
</tr>
<tr>
<td>Electrician</td>
<td>1</td>
<td>(General Shift)</td>
</tr>
<tr>
<td>Instrumentation Engineer*</td>
<td>1</td>
<td>(General Shift)</td>
</tr>
<tr>
<td>Mechanic</td>
<td>1</td>
<td>(General shift)</td>
</tr>
<tr>
<td>Chemist</td>
<td>2</td>
<td>(1-Sr chemist* and 1-Jr Chemist)</td>
</tr>
<tr>
<td>Operator / helpers</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Security staff</td>
<td>as required for round the clock security.</td>
<td></td>
</tr>
</tbody>
</table>

* Key staff

The Employer may require a suitable change in the structure on the basis of design, automation and other relevant parameters it deems fit.
The Contractor shall provide all secretarial support, printing and publishing services, office furniture and office supplies as required. It shall also ensure that all labor welfare laws and regulations are followed, including weekly rests, rotation of duties.

The CV resumes of the Contractor personnel shall be submitted to the Employer's representative for acceptance at least two months before anticipated commencement of the pre-commissioning of test. Normal time duty hours for the Contractor’s O & M personnel may be modified as necessary and agreed by the Employer’s representative. A rotating shift schedule shall be established by the Contractor and approved by the Employer’s representative who will ensure that an adequate number of the Contractor’s staff will be available for duty at Plant 24 hours each day, 7 days week, including national holidays.

In the event that it is necessary for more than one of the Contractor’s O & M personnel to be absent from the Plant, for whatever reason, the Contractor shall provide a qualified replacement at his own expense and ensure that specified project duty coverage is maintained. If substitute key personnel are required for a period longer than 15 days, their CV must be approved in advance by the Employer’s representative.

The O & M personnel shall be dedicated solely to the specified duties and responsibilities and shall not be diverted to perform Contractor’s administrative duties, construction arrangement, office management, or other non-O & M activities. Adequate support staff shall be provided by the Contractor in order avoid any such diversion.

The bidder shall provide justification of the labour cost proposed by him for all personnel.

The Contractor shall include in his cost medical and accident insurance expenses of all the staff employed by him along with all provisions of the labour welfare acts prescribed from time to time by the State and Central Government. Adequate insurance cover shall also be maintained during O & M period for all short-term employees, as well as casual, temporary employees and visitors.

Employer is not liable for any situation arising due to any accident/mishap of whatever nature occurring in the Plant premises.

3.4 Safety

The Contractor shall be responsible for safety of his staff during O & M of the Plant and shall procure, provide and maintain all safety equipment necessary for satisfactory O & M such as gasmasks, gloves, boots, mats etc.,

1. The Contractor shall utilize safety awareness procedures in every element of operation and maintenance.

2. The Contractor shall emphasize site safety including adoption of
   (a) Safe working procedures
   (b) Cleanliness and care of the plant as a whole
   (c) Accident and hazardous conditions prevention and reporting.
   (d) Safe practice while working near digester / gas holder areas
The Contractor shall impart safety training to all members at regular intervals, especially for new comers.

The Contractor shall provide Notice boards and display boards at appropriate locations detailing precautions to be taken by O & M personnel to work in conformity to regulations and procedures and by the visitors to the Plant.

The Contractor shall notify the Employer’s representative immediately if any accident occurs whether on-site or off site in which Contractor is directly involved and results in any injury to any person, whether directly concerned with the site or a third party. Such initial notification may be verbal and shall be followed comprehensive report within 24 hours of the accident.

3.5 Reporting

The Contractor shall prepare consolidated daily reports, weekly and monthly reports on Plant operation and maintenance and submit to the Employer’s representative. The daily reports are to be submitted within first working hour of the next day. The monthly reports shall be submitted on the first day of the next month and within two working hours.

Overall reporting formats shall be approved by Employer’s representative and may have to be modified from time to time as required and approved by Employer’s representative. Contractor may have to prepare and submit additional reports on particular matters and incidents as and when required by the Employer’s representative for each significant occurrence.

4 MAINTENANCE

4.1 Maintenance of Installed Plant

The Contractor shall ensure the continuity of the Plant operations and the breakdown or the deterioration in performance of the Plant under normal operating conditions of any items of the Plant and equipment and component parts thereof shall be minimized.

The classes of maintenance provided shall comprise full Operational maintenance and standby Maintenance.

Full operational maintenance comprises the planned and regular maintenance carried out by the Contractor on a day-to-day basis, including cleaning, lubricating, minor adjustment, together with the preventive and corrective maintenance plan for those items of the Plant and equipment within the treatment works which have been commissioned and made operational.

Standby maintenance comprises the planned and regular maintenance carried out by the Contractor including cleaning, lubricating, periodic, and minor adjustment of all items of Plant and equipment within the treatment works which have been installed but have not yet been made operational.

The Contractor shall carry out the maintenance of the Plant installations in accordance with the requirements of the O & M Manual and to the approved maintenance plan. The Contractor shall strictly adhere to the manufacturers’ recommendations with respect to equipment maintenance, and only use types and grades of lubricants to be used. The frequency of lubrication, adjustments to be made regularly, and recommended spare parts by the
equipment/machine/instrument manufacturer/supplier shall be carried out and appropriate inventory shall be held in store.

4.2 Building and Site Maintenance

The Contractor shall be responsible for:

- The full maintenance of building and all electrical, ventilation, plumbing and drainage installation in the building.
- Building and housekeeping maintenance.
- Full maintenance of the site water and wastewater services, cabling and earthing systems, and the site road lighting system.
- Site maintenance including the upkeep of landscaped areas/ tree Plantation etc.,
- The telephone installations in all buildings.

The building services and housekeeping maintenance shall be undertaken on all buildings and services installations.

Routine housekeeping maintenance shall be carried out in accordance with procedures specified in the Operation and Maintenance Manual which shall be approved by the Employer’s representative.

4.3 Preventive Maintenance

The Contractor shall plan the day-to-day and the preventive maintenance. This planning must include for each equipment the estimated necessary hours in preventive maintenance and break down maintenance. It shall also include the qualification of the foreseen maintenance personnel.

The Contractor shall provide the yearly requirement of spare parts and consumable needed for the maintenance of each piece of equipment for the day-to-day maintenance, preventive maintenance, and foreseen break down maintenance/overhaul, if any.

5. TRAINING

5.1 General

(a) The Contractor shall be responsible for instruction and training of all his personnel in all aspects of Plant operation and maintenance till the end of the operation and maintenance period. The Contractor shall also be responsible for training personnel designed by the Employer who will operate the Plant at the expiry of the contract.

The Contractor will make available for this purpose competent staff and as well as propose schedule information that may be necessary for effective execution of the training programs.

The training shall be organized in two (2) stages as follows:
• Basic technical training education to be carried out during the final stages of the
errection period of the contract through literature, manuals, handouts
demonstration at site, etc.
• Intensive on-the-job training during commissioning and maintenance period.

(b) By the end of this training period these personnel should be able to carry out
their respective duties efficiently under the supervision of Employer’s
representatives and supervisory staff of the Employer.
The Contractor shall provide at his cost all local transportation, literature,
computers, CDs and other related hardware and stationery to be used by trainers
and trainees during the training period.

(c) Towards end of O & M contract period, training shall be conducted once again to
Employer’s personnel or their authorized personnel. This training shall be for a
duration of 30 working days.

6. Operation and Maintenance records

The following are a typical sample form of records (not an exhaustive and
comprehensive) that are required to the maintained by the O & M Contractor. The
details of complete records shall be prepared and submitted by the O & M Contractor
to the Employer’s representative for approval prior to commissioning.

6.1 Record of Screen Chamber

The record of screen chamber contains the information about the duration of
operation of manual and mechanical screen and quality of Screenings discharged
form the Plant. This record shall kept by the Shift –in-charge and contains data on
Plant functioning.

Record of Screen Chamber

| Month: |
| Year: |

<table>
<thead>
<tr>
<th>Date</th>
<th>Mechanical Screen</th>
<th>Manual Screen (if provided)</th>
<th>Qualities of screenings Based on No. of wheel Barrows</th>
<th>Officer on Duty</th>
<th>Oper ators</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours of operation per day</td>
<td>Hours of operation per day</td>
<td>No. of wheel Barrow filled</td>
<td>Quantity of screenings (Cum /d)</td>
<td></td>
</tr>
</tbody>
</table>
6.2. Record of Grit Chamber

The grit chamber record sheet contains the information about the operations of individual grit channels, as well as volume of grit collected and removed. This record is kept by the Employer’s representatives and contain basic data on Plant functioning.

Record of Grit Chamber

Month:

Year:

<table>
<thead>
<tr>
<th>Date</th>
<th>Grit separator s (No.s provided by bidder)</th>
<th>No. of wheel barrows/trailer filled</th>
<th>Grit collection In m3/d</th>
<th>Organic Content in the Grit</th>
<th>Officer on Duty</th>
<th>Operator</th>
</tr>
</thead>
</table>
6.3. Performance data of SBR units

The performance data sheet shall contain the records of the analytical results at the inlet and outlet all the parameters. These parameters are pH, Dissolved Oxygen, BOD & COD, TSS, VSS, Sulphate and Temperature.

Month:
Year:

<table>
<thead>
<tr>
<th>Date</th>
<th>SBR UNITS</th>
<th>SBR UNITS</th>
<th>AFTER CHLORINATION TANK</th>
<th>Officer on duty</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inlet</td>
<td>outlet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a</td>
<td>b</td>
<td>c</td>
<td>d</td>
<td>f</td>
</tr>
<tr>
<td></td>
<td>a</td>
<td>b</td>
<td>c</td>
<td>d</td>
<td>e</td>
</tr>
</tbody>
</table>

a- BOD  
b – COD  
c- Suspended solids/ MLSS  
d- pH  
e - Dissolved oxygen  
f – VSS content  
g – solid concentration in the underflow h-H2S in the gas

6.5 Other Records

The contractor shall maintain detailed record of consumption of Polyelectrolyte and other scrubbing chemicals (if used). Record of wet sludge transported out of the plant site shall be maintained. Similarly record of material movement shall also be maintained as appropriate and approved by Employer’s Representative.

These records shall be available to the Employer’s Representative for scrutiny and copies shall be furnished on demand.
### 6.6 Overall performance of the Plant

The following non-statutory shall also be monitored for the purpose of establishing satisfactory performance of the Plant and the penalties shall be imposed on non-achievement of the same as per the table given below:

<table>
<thead>
<tr>
<th>Basis of Penalty</th>
<th>Penalty Benchmark</th>
<th>Penalty Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failure to maintain BOD/COD/SS/Oil/grease/pH levels within prescribed limits.</td>
<td>Up to 2 Occurrence/month</td>
<td>----</td>
</tr>
<tr>
<td>Detected as per reports of daily samples sent to PCB by the Employer and outlet quality to be achieved as per tender provisions</td>
<td>2 to 5 Occurrences / month</td>
<td>Rs.1000/- per occurrence</td>
</tr>
<tr>
<td></td>
<td>5 to 10 occurrences/month</td>
<td>Rs.10,000/- per occurrence</td>
</tr>
<tr>
<td></td>
<td>Above 10 Occurrences/month</td>
<td>Termination</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Basis of Penalty</th>
<th>Penalty Benchmark</th>
<th>Penalty Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing power consumed :</td>
<td>For Power increased beyond current base level based on wastewater discharge schedules and persisting over a two-month billing period</td>
<td>Rs.4.50 KWH of power increased. Or prevailing billing tariff rates applied by MSED Authority whichever is higher.</td>
</tr>
<tr>
<td>The contractor has to establish and get approved from the Engineer the “maximum guaranteed power consumption” for entire operations</td>
<td>For each case detected</td>
<td>--</td>
</tr>
<tr>
<td>When a generator is used the electricity consumption shall be determined as follows : Electricity consumption (KWH) + 1.10 times the Electricity Equivalent of diesel consumed (KWH)</td>
<td>Per Occurrences</td>
<td>Rs.1000/- per occurrences</td>
</tr>
<tr>
<td>Inadequate maintenance of facilities / System</td>
<td>For each case submitted.</td>
<td>------</td>
</tr>
<tr>
<td>Inappropriate de-silting of sewers and clearing of silt in premises.</td>
<td>Per Occurrence</td>
<td>Rs.100/- per occurrence</td>
</tr>
<tr>
<td>Inadequate contingency plan</td>
<td>Per Occurrence</td>
<td>------</td>
</tr>
<tr>
<td>Delay in recording wet well levels, energy meter reading power failure time or diesel consumption</td>
<td>Per Occurrence</td>
<td>Rs.100/- per occurrence</td>
</tr>
<tr>
<td>Duty staff not wearing uniform or it being dirty.</td>
<td>Per Occurrence</td>
<td>------</td>
</tr>
<tr>
<td>Non-attendance of Customer complaints in time or adequately</td>
<td>Per Occurrence</td>
<td>------</td>
</tr>
</tbody>
</table>
LIST OF ESSENTIAL LABORATORY EQUIPMENT (for each Laboratory)

1. Analytical Balance
2. Autoclave
3. Centrifuge
4. Chlorine Comparator
5. Colony Counters
6. Demineraliser
7. Dissolved Oxygen Sampler
8. Drying oven (hot air)
9. Fume cupboards
10. Hot plates
11. Incubator 20°C (BOD)
12. Kjehldahl Digester Unit
13. Magnetic Stirrers
14. Microscope, binocular with oil immersion and movable stage counting cell
15. Membrane Filter Assembly
16. Muffle Furnace
17. pH meter with reference & spare electrodes
18. pH meter (portable)
19. Refrigerator
20. Sludge sampler
21. Soxhlet extraction unit
22. Spectrophotometer with or without U-V rage or photo electric colorimeter
23. Vacuum pump
24. Water bath (thermostat controlled)
25. Glassware and analytical chemicals as required.
26. Instruments to measure noise level
27. Instruments to measure paint thickness
28. Instruments to measure vibration