Innovative Wastewater Projects Managed In The Megacity Of Mumbai– Approaches & Experiences

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Agenda

- Sewerage System Of Mumbai– Statistics
- Present Sewage Disposal system
- Future Plans– Approaches
- Challenges & Experiences
- Conclusion
Sewerage System Of Mumbai

- 130 years old Sewerage System.
- 40% Area Unsewered.
- Water Supply- 3750 mld
- Sewage Generated- 2190 mld.
- Area – 438 Sq.km
- Population- 12.44 million
- Floating population- ?
- Length of Sewer Line - 1987 km.
- No of Pumping Stations - 51
- No of Disposal Points- 7
DRAINAGE ZONES

- COLABA
- WORLI
- BANDRA
- VERSOVA
- MALAD
- GHATKOPAR
- BHANDUP
## Capacities of Existing wwTFs

<table>
<thead>
<tr>
<th>Sr No</th>
<th>Name of Sewerage Zone</th>
<th>Plant Capacity in mld</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>COLABA</td>
<td>41</td>
</tr>
<tr>
<td>2</td>
<td>WORLI</td>
<td>757</td>
</tr>
<tr>
<td>3</td>
<td>BANDRA</td>
<td>797</td>
</tr>
<tr>
<td>4</td>
<td>VERSOVA</td>
<td>180</td>
</tr>
<tr>
<td>5</td>
<td>MALAD</td>
<td>280</td>
</tr>
<tr>
<td>6</td>
<td>BHANDUP</td>
<td>280</td>
</tr>
<tr>
<td>7</td>
<td>GHATKOPAR</td>
<td>386</td>
</tr>
<tr>
<td>Zone</td>
<td>Area</td>
<td>Treatment level</td>
</tr>
<tr>
<td>------</td>
<td>---------</td>
<td>---------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Colaba</td>
<td>Preliminary treatment &amp; discharge through 1.2 km long marine outfall in Harbour</td>
</tr>
<tr>
<td>2</td>
<td>Worli</td>
<td>Preliminary treatment &amp; discharge through 3.4 km long marine outfall in Arabian sea</td>
</tr>
<tr>
<td>3</td>
<td>Bandra</td>
<td>Preliminary treatment &amp; discharge through 3.7 km long marine outfall in Arabian sea</td>
</tr>
<tr>
<td>4</td>
<td>Versova</td>
<td>Preliminary, Primary treatment by way of three stage lagoons &amp; discharge to Malad creek</td>
</tr>
<tr>
<td>5</td>
<td>Malad</td>
<td>Preliminary treatment &amp; discharge to Malad creek</td>
</tr>
<tr>
<td>6</td>
<td>Bhandup</td>
<td>Preliminary &amp; Primary treatment by way of single stage lagoons &amp; discharge to Thane creek</td>
</tr>
<tr>
<td>7</td>
<td>Ghatkoper</td>
<td>Preliminary &amp; Primary treatment by way of single stage lagoons &amp; discharge to Thane creek</td>
</tr>
</tbody>
</table>
Future Plans – Approaches

• New Discharge Standards: BOD – 10 mg./Ltr.
  COD – 50 mg/Ltr
  TSS – 20 mg./Ltr.
  FC – 100 MPN/100 ml
  Total Nitrogen – 10 mg/Ltr
  Total phosphorus – 1 mg/Ltr

• River discharge: BOD – 3 mg/ Ltr

• Open Technology

• DBO – O & M for 15 Years

• Minimum 20% capacity for Recycle & Reuse
### Proposed WwTF capacities in MLD

<table>
<thead>
<tr>
<th>Zone Number</th>
<th>Zone Name</th>
<th>Plant design capacity ADWF (MLD)</th>
<th>Plant design capacity Past Fwd Flow (MLD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Colaba</td>
<td>37</td>
<td>85</td>
</tr>
<tr>
<td>II</td>
<td>Worli</td>
<td>500</td>
<td>1000</td>
</tr>
<tr>
<td>III</td>
<td>Bandra</td>
<td>360</td>
<td>720</td>
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<tr>
<td>III</td>
<td>Dharavi</td>
<td>250</td>
<td>500</td>
</tr>
<tr>
<td>IV</td>
<td>Versova</td>
<td>180</td>
<td>540</td>
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<tr>
<td>V</td>
<td>Malad</td>
<td>454</td>
<td>786</td>
</tr>
<tr>
<td>VI</td>
<td>Bhandup</td>
<td>215</td>
<td>461</td>
</tr>
<tr>
<td>VII</td>
<td>Ghatkoper</td>
<td>337</td>
<td>699</td>
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</table>
Challenges for Implementation of New Projects

• Inadequate land,
• Removal of mangroves as per Environmental Rules on land proposed for STPs
• Clearances from Environment Ministry and Coastal Regulatory Zone authority
• Population– Growth of City, Floating Population
• Location of Existing plants– In the heart of the City & at same place new plants to be constructed
• Data– Quality of Data
• Selection of Technology most Economical (Low Capex & Opex), Feasible, Eco-friendly, Reliable, Proven, with minimum footprint requirement and compatible for future up-gradation of Recycle & Reuse.
• Sludge Disposal
• Energy Generation
Expected Achievements of New Projects

- Conservation of environment
- Improvement in public health of Mumbai City.
- Improvement in Sea aquatic life.
- Improvement in Bathing water standards at sea coast.
- Recycle & Reuse of Water
Make Over Facilities At Bandra WwTf

- 60% Green Cover
- Knowledge Center
- Auditorium, Library, Display of Projects
- Viewing Gallery
- Interconnecting Skywalks
- Fountains & Murals
Conclusion:

- Multiple challenges are faced while implementing Wastewater projects in megacity of Mumbai.

- It’s necessary to tackle the same by using site specific approach & innovative ideas.