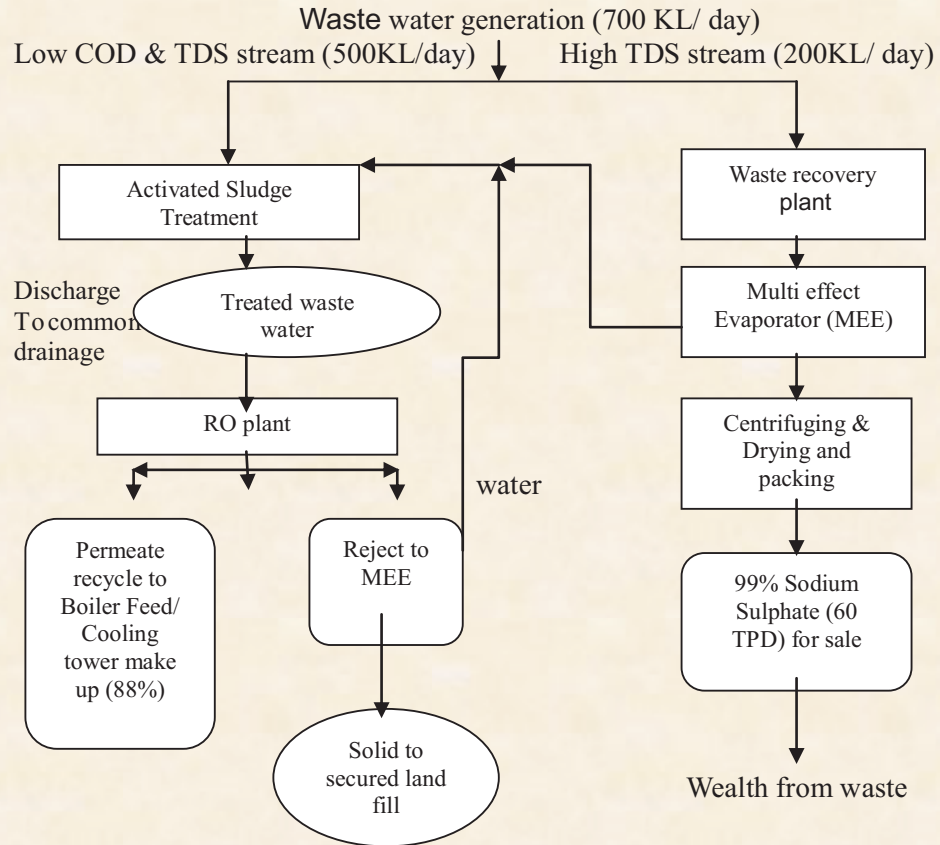


<b>Intervening Technology/ Technique</b>	<b>Recycling of entire Treated Waste Water with low TDS and low COD through Reverse Osmosis in the Process and Conserve Natural Resource and become Zero Liquid Discharge (ZLD) unit.</b>
<b>About the industry</b>	M/s. Atul Limited (Aromatics Division) is the largest manufacturer of p-Cresol in the world, located at Ankleshwar, Gujarat. Aromatics Division is also the largest producer of p-Anisic Aldehyde and p-Anisyl Alcohol in the world and also the leading manufacturer of Manganese Sulphate and Sodium Sulphite.
<b>Implemented Techniques/ Technology</b>	<p><b>Before</b></p> <ul style="list-style-type: none"> <li>● After the tertiary treatment of waste water with low TDS and low COD, it was discharged to the Final Effluent Treatment Plant (FETP) (NCT) at Ankleshwar for final treatment. It increases the environment load on NCT for further treatment.</li> </ul> <p><b>After</b></p> <ul style="list-style-type: none"> <li>● DCS (Distributed Control System) based RO plant having 700 m<sup>3</sup>/day capacity has been installed.</li> <li>● It is a three stage RO plant designed at max discharge pressure of 42 bars to achieve the max water recovery as permeate.</li> <li>● Treated Waste Water coming from ETP tertiary treatment is again pre-treated in RO plant with defined chemicals to remove hardness, oil/grease if any, and suspended solid in traces to meet the desired norms of RO feed water. Pre-treatment process is very critical for the membrane life and water recovery.</li> <li>● Pre-treated water is then passed through a Dual Media Filter (DMF) followed by Ultra Filtration system (UF). After UF, water is fed through RO system in multi stages and clear water having very low TDS is recovered as permeate for recycling in the process.</li> <li>● Rejected water having high TDS is sent to a multi-effect evaporator system for removal of solids through Centrifuge. Solid coming out from Reject stream is non-toxic &amp; non-hazardous and used in secured land fill.</li> <li>● Average recovery of water as permeate presently established is in the range of 85-88%. The operation is being stabilized and optimized to enhance the recovery to &gt; 90% in RO. Total Water Recovery from RO and MEE put together is presently about 99%. Permeate water having TDS as low as 25 ppm is used as boiler feed water and makeup water in cooling tower. The RO plant has been successfully commissioned resulting in complete stoppage of Waste Water discharge in the common pipe line and achieving Zero-liquid discharge (ZLD) objective.</li> </ul>



**Waste water treatment methodology: complete recovery & recycle of water**



Benefits	Before	After
<i>Economic</i>	<ul style="list-style-type: none"> <li>Company paid amount to NCT (Narmada Clean Technology) for final treatment of waste water with low TDS (Total Dissolved Solid) and COD (Chemical Oxygen Demand).</li> </ul>	<ul style="list-style-type: none"> <li>Achieved Zero liquid discharge concept and recycle the entire water in to process as well as utility.</li> </ul>
<i>Environmental</i>	<ul style="list-style-type: none"> <li>High Water Consumption</li> <li>High waste water discharge quantity.</li> </ul>	<ul style="list-style-type: none"> <li>Reduction in the water consumption from 24 KL/Day/MT to 6 KL/Day/MT of product.</li> </ul>
<i>Social</i>	<ul style="list-style-type: none"> <li>Negligence of workers on useful resources going as waste</li> </ul>	<ul style="list-style-type: none"> <li>Workers skills to conserve resources have improved the EMS of the company.</li> </ul>

