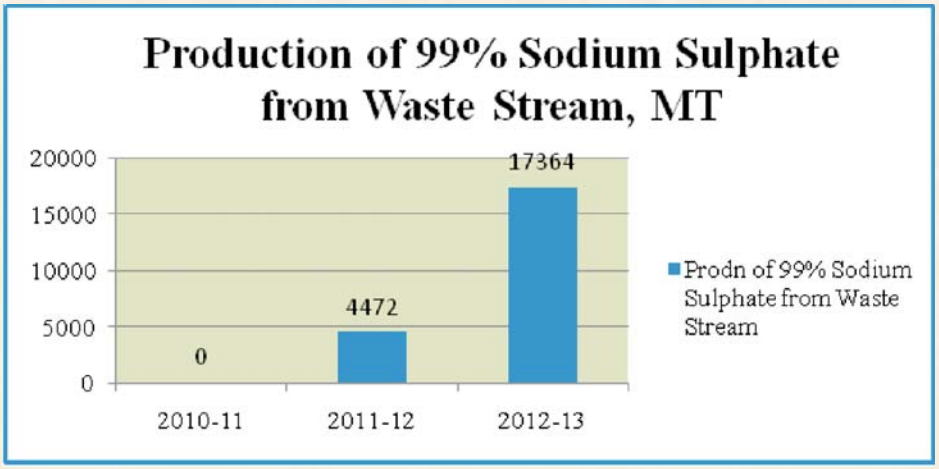
Intervening Technology/ Technique	**Creation of Wealth from High TDS Waste Stream through "Waste Recovery Plant"**

About the industry	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.
Implemented Techniques/ Technology	**Before** ● p-Cresol process consists of mainly three unit processes i.e. sulphonation, high temperature caustic fusion and acidification. In past, acidification of Sodium Cresolate was done using Sulphuric acid in an aqueous phase. This was generating liquid waste stream having high TDS. Treating this high TDS stream in MEE was generating solid mixture which was not saleable and considered to be a solid waste **After** ● New technology for acidification is developed and adopted for acidification of Sodium Cresolate using only Sulphur di-oxide in a continuous process. The major achievement is to generate Sulphur Di-oxide gas from high TDS Liquid Waste Stream of p-Cresol process. This helped industry to recycle methodology and also helps to reduce water consumption per MT of product . ● After acidification with SO2, aqueous phase contains mainly Sodium Sulphite. Therefore, waste stream containing mixed salt in dissolved form, was converted into a much purer aqueous stream containing mainly Na_2SO_3 which is partly recycled in the process and partly taken in Waste recovery plant for SO2 generation for Sodium Cresolate neutralization. ● Waste stream containing Sodium Sulphite is acidified using Sulphuric acid to generate SO2 which is used for acidification of Sodium Cresolate for Cresols production. Pure Sodium Sulphate solution is generated as a result of acidification of aqueous waste stream which is fed to MEE plant to recover saleable pure 99% anhydrous Na2SO4 powder. The entire process is continuous and closed loop. Condensate from MEE plant is partly recycled in the p-Cresol process and partly used in the cooling tower operation.

Multi-Effect Evaporator (MEE) System for handling high TDS streams



Benefits	Before	After
Economic	● Company paid charges to NCT (Narmada Clean Technology) for final treatment of waste water with high TDS (Total Dissolved Solid).	● Revenue generation from waste stream in year 2012-13 around Rs.608 Lac.
Environmental	● Generation of very high amount of waste water and discharged to NCT around 1500 KL/Day	● Reduction in the waste water generation and discharge quantity average 500 KL/Day.
	● High COD (Chemical Oxygen Demand) and TDS load and decrease the efficiency of ETP (Effluent Treatment Plant). ● Solid waste with high TDS comes from MEE (Multiple Effect Evaporator), disposed off to the secure landfill.	● Reduction in the TDS load and COD having 100 ppm to 150 ppm. Increase the efficiency of ETP. ● Recovery of 99% pure sodium sulphate from high TDS liquid Waste Stream.
Social	● Negligence of workers on useful resources going as waste	● Workers skills to conserve resources have improved the EMS of the company.