

Waste Recovery through Purge DECA

By Tata Chemicals | Category: Implemented Innovations

The plant produces natural soda ash from mined trona. Impurities that are dissolved in the liquor during the process must be purged to achieve product purity. The contaminants are removed from the evaporators, generating a waste stream of liquor that is saturated in soda ash, but contains high levels of contaminants. Some of this waste stream is sold to a local power utility, but the remainder is discharged in the containment ponds. The liquor forms deca crystals in the pond, depleting the storage capacity. A purge deca recovery plant was built to recover this lost sodium stream, producing additional soda ash and extending the life of the tailings pond system.



The Context



The trona ore consists of impurities like soluble soda ash and insoluble solids (mostly shales) and other soluble salts (chlorides and sulfates)



Approximately 91,000 metric tons per year soda ash equivalent of waste liquor was being deposited into the ponds



Soda ash in the liquor waste stream crystallizes into deca in the ponds, reducing their capacity to hold water and tailings



Over time the ponds were filling up with deca, calling in a need for expansion or dredging

This process has heavy cost and environmental impacts

Impact of the Innovation

Revenue in 2017
\$3.6 mn



The Innovation

The Purge Deca recovery plant was built to utilize an evaporative cooling process to crystallize the waste purge liquor stream into decahydrate without re-entraining the contaminants back into the final product. This recrystallized stream is then introduced back into the plant production stream and finished into soda ash.



Overcoming Challenges

Optimizing the waste recovery plant has been a challenge. Additional instrumentation, automation, training and documentation efforts have resolved majority of the initial challenges.