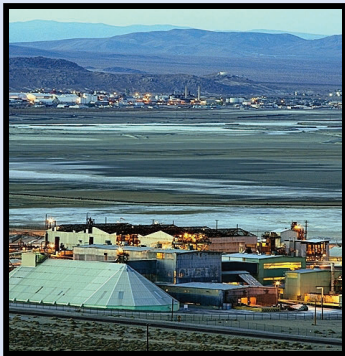


Scale Prevention In Distribution Lines



Brine scale accumulation caused system shutdowns and frequent maintenance



Brine from Searles Lake is comprised of 300,000 ppm Total Dissolved Solids



Flow-Tech was also installed to prevent scale on heat exchangers



Case Study: Distribution Lines and Pump Efficiencies



Searles Valley Minerals

Installation: June 2012

Issue: Mineral build-up required operation shutdown and frequent equipment repair and maintenance

Benefits: Increased productivity, restored heat transfer efficiency, extended equipment life, reduced labor, and reduced chemical use

In order to produce borax, brine is extracted from the underground Searles Lake and pumped through a set of heat exchangers at 130° F before distribution to the main process plant. The brine solution contains up to 300,000 ppm Total Dissolved Solids - which means that up to 30% of the solution is made up of solids.

Fluid Composition	wt. %
Water (H ₂ O)	64.84
Na ₂ B ₄ O ₇ - (Borax (Na ₂ B ₄ O ₇ * 10H ₂ O) - Sodium Borate)	1.86
Sodium Carbonate Na ₂ CO ₃ - (Soda Ash)	3.81
Mole Ratio	1.22
Na ₂ SO ₄ - Sodium Sulfate	6.01
KCl - Potassium Chloride	3.19
NaCl - Sodium Chloride	18.35
CO ₂ - Carbon Dioxide	1.93

Results

Solar Powered Flow-Tech



A 2 mile long, 24" transmission line is used to transport brine from the lake to the production facility. In order to remove scale and restore flow, the line was backwashed weekly. Flow-Tech has prevented scale formation and eliminated the need for even a single backwash cycle since the unit was installed in 2012.

Flow-Tech provides scale prevention even in the adverse conditions of Death Valley and with the brine solution from an underground lake.

Scale Prevention In Distribution Lines



Borax Plant



Pump Skid



Heat Exchanger



Case Study: Distribution Lines and Pump Efficiencies



Results Continued

New Grundfos Pump Skid



The central distribution pump station uses Grundfos pumps to supply brine from the lake to the process and has been operating without any scale related issues since the Flow-Tech units were installed in 2012.

Extraction Well



The Flow-Tech signal tags were installed on well pumps that supply brine from the underground lake to the process. The panels were powered by solar energy.

The results were so profound that Searles Valley Minerals committed to installing Flow-Tech systems on many other applications in addition to the pumps and miles of distribution piping. The brine also scaled up their heat exchangers. Flow-Tech has prevented scale exceptionally well on the heat exchangers, pumps, and pipes since they were installed in June of 2012.

Flow-Tech provides a rapid ROI due to increased productivity, improved heat transfer rates, reduced labor, and reduced chemical consumption