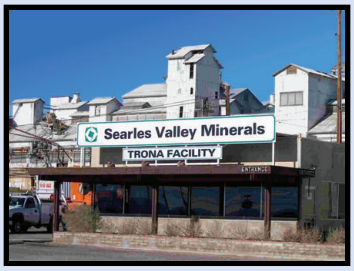
Scale Prevention in Heat Exchangers



Brine scale accumulation caused system shutdown for an hour twice a day

The Brine from Searles Lake is comprised of 300,000 ppm TDS

Flow-Tech was also installed on distribution pipes

FLOW-TECH HVAC
WATER TREATMENT SYSTEMS

Case Study: Mineral Fouling in Heat Exchangers

Searles Valley Minerals

Installation:	June 2012
Issue:	Mineral build-up caused operation shutdown for 1 hour twice daily
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. A 24" header supplies the brine to four large plate and frame heat exchangers. For years, rapid mineral fouling reduced heat transfer efficiency costing hundreds of thousands of dollars annually from increased energy consumption, production shutdowns, and flushing each heat exchanger for one hour twice a day with 180° F process liquor to remove the scale on the plates.

Results

Flow-Tech kept the heat exchangers significantly cleaner. The customer realized a 93% savings by decreasing cleaning frequency from twice a day to once a week. The increased productivity, improved heat transfer rates, reduced labor, and reduced process fluid provided a positive return on investment in less than three months.

The results were so profound that Searles Valley Minerals committed to installing Flow-Tech systems on many other appliations. The brine solution scales up their well pumps and miles of distribution piping. Flow-Tech has been working exceptionally well on all three aplications since June of 2012.

Flow-Tech prevents scale from the brine from an underground lake even in the adverse conditions of Death Valley

5594 N. Hollywood Ave, #202 | Milwaukee, Wisconsin 53217 | (414) 964-0072 | info@flowtechsystems.com | flowtechsystems.com/hvac

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Borax Plant

Heat Exchangers

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Customer testimonial from initial trial:

"Searles Valley Minerals (SVM) has four plate frame heat exchangers installed in a parallel configuration designed to inject 130F brine into salt formations spanning a ten square mile area in Trona, CA. This installation requires each heat exchanger to be flushed for one hour twice a day with 180F process liquor to remove the mineral deposits within the plates. SVM in collaboration with Flow Tech Systems (FTS) initiated a six month test process to determine the viability of the Flow Tech technologies in reducing scaling.

SVM installed two FTS transmitters spaced seven feet apart on the circulation fluid pipeline which operates at 90F providing the greatest potential for scaling. The initial FTS estimate of effective operational area included the two nearest heat exchangers with respect to the FTS transmitter installation and limited effect on the two furthest heat exchangers. The result of the first month testing verified FTS initial estimate with the two nearest heat exchangers transitioning to a one week flush cycle with the two furthest heat exchangers remaining on the previous described flushing regime.

The six month testing process concluded in January 2013 providing a three month payback and reducing the flush cycle for the two nearest heat exchangers to once a week. SVM installed in January 2013 a second FTS system on the other side of heat exchanger skid closer to the furthest heat exchangers described previously. The FTS performance mirrored the existing FTS system with a 15% improvement in temperature rise across the heat exchangers driven by their design and age.

These four heat exchangers function as mission critical components to the overall warm solution mining process for SVM. SVM recommends FTS as a viable solution to address scaling in plate frame heat exchangers while also extending their operational life."

- David Hakim
Operations Engineer

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