



# Stable Perchlorate Removal With Reduced Operating Costs & Waste

**CUSTOMER:** NDEP's Nevada Environmental Response Trust (NERT)

**LOCATION:** Henderson, Nevada

## CHALLENGE

In response to perchlorate and other chemical contamination in the Las Vegas Wash vicinity stemming from a former Henderson-based ammonium perchlorate production plant, the Nevada Environmental Response Trust (NERT) was established to take over the property and remediate its contamination from historical operations. Sampling point data in the Las Vegas Wash showed the perchlorate concentration had spread and was as high as 1200 ppb but needed to reduce to 18 ppb according to Nevada provisional action levels.

## SOLUTION

At the direction of the NERT, the hired consulting and engineering firm, Tetra Tech, Inc. sub-contracted APT to pilot test its hydrogen-based gas permeable membrane technology, ARoNite®, which leverages a patented process using a proprietary hollow-fiber membrane biofilm reactor (MBfR) to effectively treat emerging contaminants of concern. At the NERT site, the pilot system consisted of two 20-foot-long shipping storage containers including one for treatment and one for post-treatment of perchlorate, chlorate, and nitrate in the Site's groundwater. The system successfully ran at 2 GPM (later increasing to 2.4 and 3.5 GPM) treating typical influent concentrations of 41 ppm perchlorate, 105 ppm chlorate, and 8 ppm nitrate to non-detected levels.

## WHY ARoNite?

Although ARoNite's all-natural patented process is simple and elegant with few inexpensive inputs (from influent water and power to hydrogen and carbon dioxide), it's capable of solving notoriously difficult water challenges with less energy and hard-to-manage waste by-products. As a result, ARoNite's operating cost is typically one half of comparable FBR systems and requires very little monitoring and adjusting as the system runs itself. Overall, APT's ARoNite solution uniquely offered the NERT and Tetra Tech an environmentally-friendly, stable, and effective removal solution for very high perchlorate levels in the Site's groundwater at a fraction of the cost of others.

## IMPACT

The pilot system has provided a six-month successful reduction demonstration of high perchlorate, chlorate, and nitrate concentrations in the Site's groundwater proving it is a viable option to be implemented. It's also using hydrogen gas as the electron donor instead of ethanol which generates less excess biomass.



*"ARoNite has proven to be a reliable and affordable solution in a scalable form factor for effectively treating the NERT site's high perchlorate levels."*