

S&B Water's SED Technology Solves Nitrate Problem for Weizmann Institute of Science, Israel

The Weizmann Institute of Science, located in Rehovot, Israel, is one of the top-ranking multidisciplinary research institutions in the world. The Institute covers an area of 1.2 square kilometers, and gathers together 2,500 scientists, technicians and research students devoted to adventuring into the unknown. The Institute has a few wells on its grounds, used for drinking water and for irrigation within the campus.

Challenge

In 2007, the MCL of Nitrate in the National Drinking Water Regulations changed from 90 ppm (20.3 ppm as N) to 70 ppm (15.8 ppm as N). In light of the change, two of the Institute's wells were prohibited from use for drinking water supply and the Institute had to rely on external water suppliers.

In the course of time, municipal and national water tariffs were increased. Management looked for solutions in order to solve nitrate problems, which would enable reopening of the Institute's wells. Three treatment technologies were examined: Ion exchange (IX), Reverse Osmosis (RO) and Selective ElectroDialysis (SED).

Solution

Shikun & Binui Water considered two options to treat the water – SED and reverse osmosis. The company built an engineering model of each option, which was then fed into a financial analysis of construction costs, maintenance costs, and the cost of materials, chemicals and electricity. At the end of the process, SED

was chosen as the most cost-effective technology from a ten-year operations perspective.



Results

The plant has been operational since February 2008 at a capacity of 450,000 gallons per day. Plant readings are as follows:

Parameter	Data [metric]	Data [US]
Feed flow to SED stack	1680 m ³ /day	444,000 gallon/day
SED plant recovery, %	94.29	94.29
Feed Nitrate, ppm	94 as NO ₃ ⁻	21.2 as N
Product Nitrate, ppm	39 as NO ₃ ⁻	8.8 as N
Feed TDS, ppm	825	825
TDS removal, %	30.30%	30.30%
Plant energy consumption	0.6 kWh/m ³	2.3 kWh/1,000 gallons