

# FilmTec™ NF270-400 Element Helps National Park Service Improve Water Quality

## The Challenge

From the Denver Service of the National Park Service

- **Raw Water:** 570 ppm TDS and conductivity of 880  $\mu\text{mho/cm}$
- **Treatment Goals:**
  - Rejection of TDS, Sulfates and Hardness to meet EPA Secondary standards
  - High rejection of organic carbon to meet EPA standards
  - Moderate removal of Calcium and Low Removal of Alkalinity ( $\text{HCO}_3^-$ ) to maintain corrosion protection and taste (at least 400  $\mu\text{mho/cm}$  in the permeate)
- **Other Objectives:**
  - Retain desired hardness without excessive blending of Microfiltration and Nanofiltration permeate
  - Maximize energy efficiency for lowest operating expense



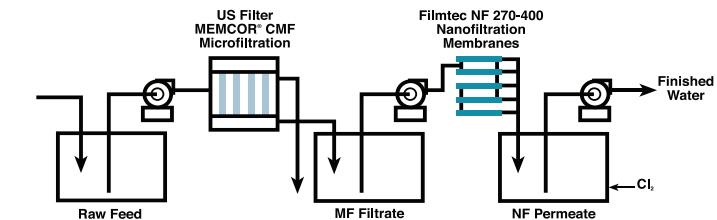
Overton Beach Marina, Overton, Nevada

## The System

- Microfiltration: USFilter’s MEMCOR® CMF
- Nanofiltration: 2 x 2 x 1 Array of 8-inch, 4-element vessels
- 100,000 gpd (380  $\text{m}^3/\text{d}$ ) of potable water
- Design: Denver Service Center, National Park Service

## The Results

- Selective rejection
- Increased mineral passage
- Eliminated the need for blending
- Achieved high rejection of TOC
- Improved energy efficiency
- High productivity at low pressure



### Water Quality Results

| DISSOLVED COMPONENT             | FEED (ppm) | PERMEATE (ppm) | REJECTION (%) |
|---------------------------------|------------|----------------|---------------|
| Total Dissolved Solids          | 573        | 250            | 56            |
| Alkalinity ( $\text{HCO}_3^-$ ) | 134        | 97             | 28            |
| Ca <sup>++</sup>                | 5.4        | 14             | 74            |
| Total Organic Carbon            | 3.6        | 0.2            | 94            |

The conductivity of the combined permeate was 403  $\mu\text{mho/cm}$  after one day of operation and 416  $\mu\text{mho/cm}$  after 3 weeks

### Operational Savings

| OPERATING PARAMETER  | VALUE                         |
|----------------------|-------------------------------|
| Net Feed Pressure    | 50 psi (3.4 bar)              |
| Concentrate Pressure | 25 psi (1.7 bar)              |
| Average Flux         | 14.0 gfd (23.8 $\text{lmh}$ ) |
| Recovery             | 80.0%                         |
| Temperature          | 78 °F (25.6 °C)               |

Three weeks after startup, the system produced up to 100,000 gpd (380  $\text{m}^3/\text{d}$ ) at a feed pressure of just 50 psi (3.4 bar).

FilmTec™ NF270-400 Element selected for future installations at Lake Mead.

**Have a question?** Contact us at: [dupont.com/water/contact-us](https://www.dupont.com/water/contact-us)

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