

# FilmTec™ Membranes

## FilmTec™ BW30-400 Elements: Municipal Application on Well Water

### System Description

The Island Water Association (IWA) on Sanibel Island operates a 4-MGD reverse osmosis plant using all FilmTec™ elements to produce drinking water for island residents. Each of the six trains consists of a 14-by-6 staging array with 6 elements per vessel for a total of 120 elements per train. The system operates at a recovery of 80%, with a feedwater total dissolved solids level typically in the range of 2700 to 3000 mg/l and a feedwater temperature of 29 °C. The permeate flow rate is 450-500 gpm per train depending on demand for water, with an average flux rate typically in the range of 15-16 gfd (gallons per square foot per day). The feedwater is a low-fouling well water which results in very stable operation. The pressure drop is low, and the trains have been cleaned once in the last two years due to problems with the antiscalant.

### Element Selection

FilmTec™ RO elements have been in use at IWA for the last 10 years. The elements in Trains A, B and C were replaced with a new generation of FilmTec™ thin-film composite elements after 8 years of service and before the end of their normal useful life. These new elements are even more efficient and have allowed for an incremental increase in capacity of about 21% while maintaining the original membrane flux. The advantage to IWA was that they were able to cancel a major plant expansion just by replacing membrane elements. This also allowed IWA to accelerate other needed improvements to the water plant.

| BW30-400 Properties | Minimum Performance Specifications | Average QA Data for Installed Elements | Stabilized Field Performance |
|---------------------|------------------------------------|--|------------------------------|
| Product flow (GPD)  | 9765                               | 11764                                  | 9975                         |
| Salt Rejection      | 98                                 | 98.6                                   | 99.2-99.4                    |

### Results and Discussion

Train C started up on August 4, 1993, with FilmTec™ BW30-400 elements. The normalized salt rejection and the normalized permeate flow rate versus time are plotted for the first 500 days of service in Figure 1. As can be seen, the performance has been quite stable over this time period. The normalized permeate flow rate is down only about 5%, and the normalized salt rejection has been in the range of 99.2% to 99.4% over most of this time period. Also, Table 1 lists the actual feed, concentrate, and permeate analysis as performed on samples collected on September 29, 1993,

compared to the permeate quality predicted by ROSA (FilmTec's Reverse Osmosis System Analysis computer program). The actual permeate quality is significantly better than predicted under the assumption of average 99.0% rejection under standard test conditions.

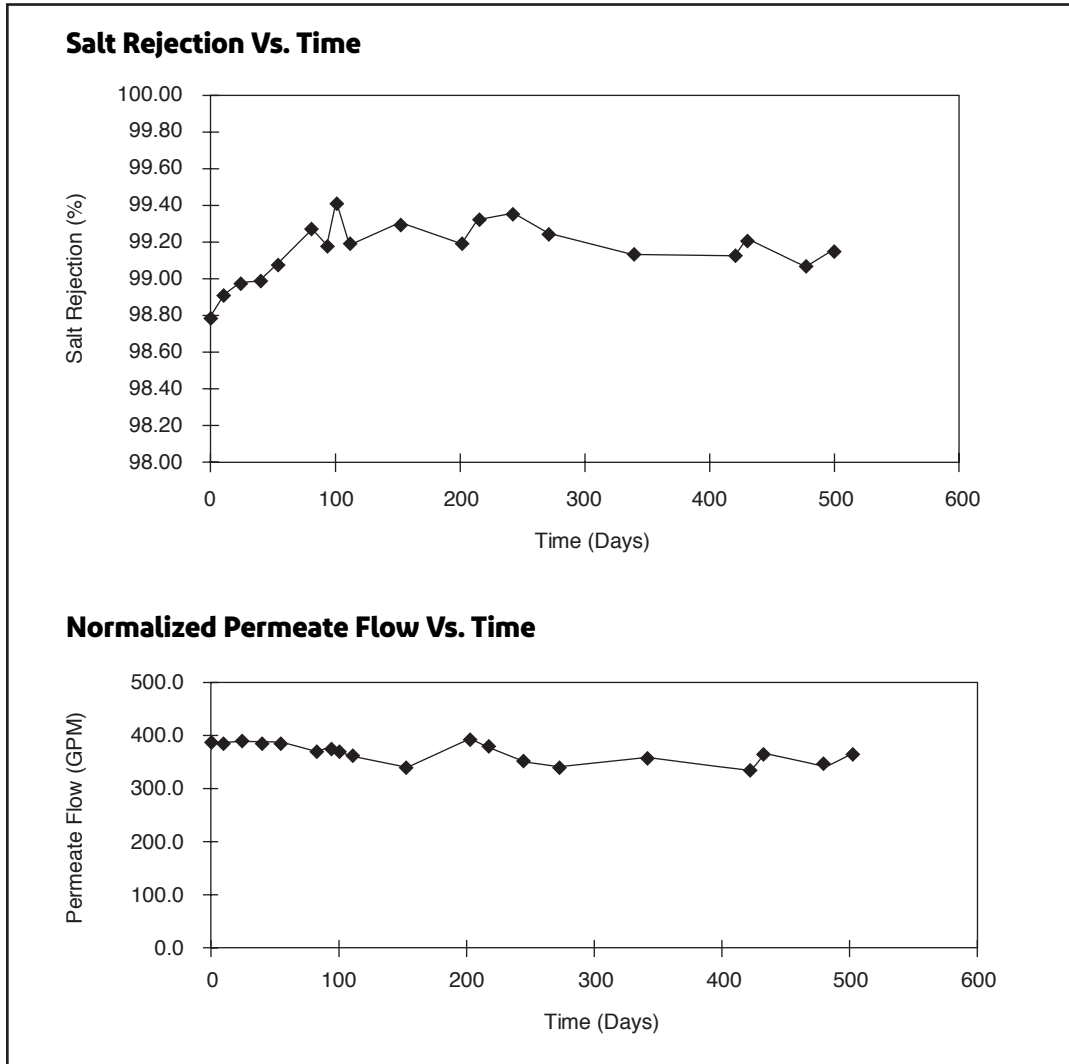
**Table 1.** Actual Vs. Predicted Permeate Quality in Train C at Sanibel Island

| Ion              | Actual Analysis / Sampled 9-29-93 |                  |               |                              |
|------------------|-----------------------------------|------------------|---------------|------------------------------|
|                  | Feed mg/l                         | Concentrate mg/l | Permeate mg/l | Rosa Predicted Permeate mg/l |
| Na               | 770                               | 3600             | 29            | 26.4                         |
| Mg               | 110                               | 501              | 1.0           | 2.2                          |
| Ca               | 98                                | 480              | 0.84          | 1.7                          |
| Sr               | 9.9                               | 48               | 0.09          | 0.2                          |
| HCO <sub>3</sub> | 195                               | 933              | 7             | 7.4                          |
| Cl               | 1330                              | 5890             | 35            | 42.4                         |
| SO <sub>4</sub>  | 380                               | 1740             | 9             | 6.7                          |
| <b>Total</b>     | <b>2893</b>                       | <b>13192</b>     | <b>82</b>     | <b>87</b>                    |

## FilmTec™ Membranes

For more information about FilmTec™ membranes,  
call DuPont Liquid Separations business:  
North America ..... 1-800-447-4369  
Latin America ..... (+55) 11-5188-9345  
Europe ..... (+31) 20-691-6268  
Japan ..... (+81) 3-5460-2100  
Australia ..... (+61) 2-9776-3226  
<http://www.DuPont.com/liquidseps>

Figure 1.



Notice: No freedom from any patent owned by Seller or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other governmental enactments. Seller assumes no obligation or liability for the information in this document. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.

Published May 1998.

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



[dupont.com/water](http://dupont.com/water)

No freedom from infringement of any patent or trademark owned by DuPont or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other government enactments. The product shown in this literature may not be available for sale and/or available in all geographies where DuPont is represented. The claims made may not have been approved for use in all countries. DuPont assumes no obligation or liability for the information in this document. References to "DuPont" or the "Company" mean the DuPont legal entity selling the products to Customer unless otherwise expressly noted. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.

DuPont™, the DuPont Oval Logo, and all products, unless otherwise noted, denoted with ™, or ® are trademarks, service marks or registered trademarks of affiliates of DuPont de Nemours, Inc. © 2020 DuPont de Nemours, Inc. All rights reserved.

Form No. 45-D01509-en CDP, Rev. 2  
February 2020