AWRA 2011 ANNUAL WATER RESOURCES CONFERENCE
Albuquerque, New Mexico
November 7-10, 2011

MEMBRANE TREATMENT PROCESSES TO MANAGE SOURCE WATER QUALITY AND PROTECT HUMAN HEALTH IN PUERTO RICO

Rafael Frias*, Lynnette Ramirez

ABSTRACT: The Puerto Rico Aqueduct and Sewer Authority (PRASA), a public corporation of the government of Puerto Rico, is the sole provider of water and wastewater services in Puerto Rico. The utility serves a population of approximately 4 million residents, plus approximately 5 million visitors annually.In 2005, PRASA divided Puerto Rico into five regions and awarded Program Management Consultant (PMC) contracts to five separate groups for the implementation of an approximately $2 billion Capital Improvement Program (CIP). The CIP included all the water supply and wastewater infrastructure planning, design, construction and initial operations of facilities. The need for these improvements resulted from increasing regulatory requirements, new demand for water supply and wastewater services, and increased level of service and quality.Recent Environmental Protection Agency (EPA) regulations, such as the Long Term 2 Enhanced Surface Water Treatment Rule (LT2 Rule), are aimed to improve drinking water quality and provide additional protection from disease-causing microorganisms in the source water, such as Giardia and Cryptosporidium, and contaminants that can form during drinking water treatment.Most of the water supply in Puerto Rico comes from surface water sources or from groundwater under the direct influence of surface water, which are often exposed to contamination from disease causing microorganisms. In addition, surface water supply is often accessed from low-water intake facilities that provide limited storage volume and, therefore, result in highly variable raw water quality as a result of changes in turbidity during high-intensity rainfall events or from urban development within the source';s watershed. These constant variations in source water quality also present an operating challenge to water treatment facility staff who are constantly managing the treatment processes to assure a high-quality effluent and protect human health.Based on these challenges, PRASA has selected membrane filtration as a physical treatment process to better accommodate the changes in source water quality, while providing additional process reliability and support to its operators. Key capital improvement projects will be discussed, and specifically, the implementation of the three largest membrane facilities in the island, Toa Vaca, Patillas and Yauco Membrane Filtration Plants, which comprise about 70 percent of PRASA's membrane treatment capacity.

* Senior Project Manager, Black & Veatch, 1300 Concord Terrace, Suite 120, Sunrise, FL 33076 USA, Phone: 954-465-6872, Email: friasre@bv.com