

QuantumFlux Case Study

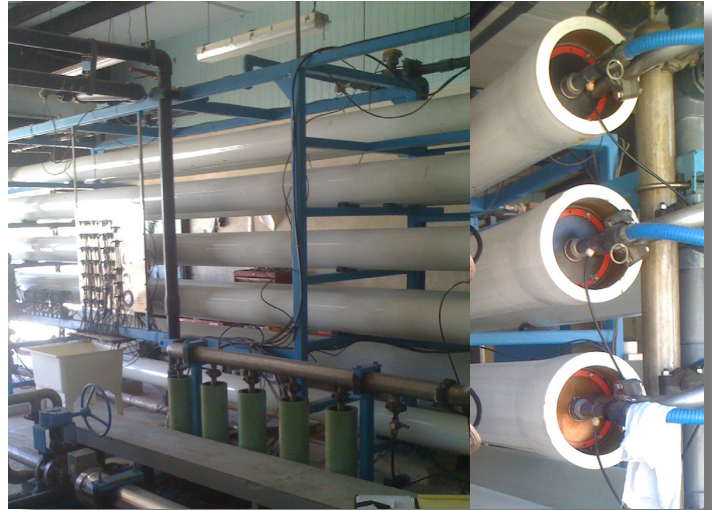
Cayman Brac

Installation Overview

Site Location	Cayman Islands
Installation Date	July 1, 2011
Scale	556 m ³ /d (146,880 USGPD)
Product	Qfx SW 365 ES
Offering	Membrane Performance Contract
Client	Water Authority Cayman

System Description

Cayman Brac is a single train 2-pass SWRO plant with inland feed wells. The plant provides potable water to the Cayman Brac distribution system and uses five ERI PX25 energy recovery devices, a Wheatley HP125 PD Pump and a Grundfos booster pump. It was originally designed with 36 (6x6) FILMTEC™ SW30HR elements and 36 (6x6) FILMTEC 4-inch BW30-4040 BWRO elements. The second pass is a 2-stage 4-into-2 design.



The flow and feed streams are given in Table 1. Conversion is estimated at 37%.

Process Flow Diagram

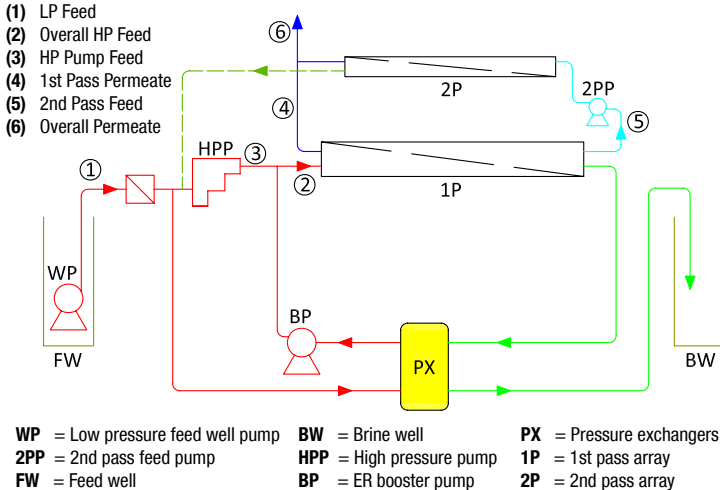


Table 1: Plant operating parameters **PRIOR** to installation of QuantumFlux elements.

Stream	BAR (PSIG)	m ³ /h (USGPM)	TDS
LP Feed	1.6 (23)	59.3 (261)	30,973
Overall HP Feed	70.6 (1,024)	59.3 (261)	34,380
HP Pump Feed	70.6 (1,024)	23.2 (102)	30,973
1 st Pass Permeate	0.69 (10)	15.2 (67)	120
2 nd Pass Feed	14.1 (205)	6.6 (29)	289
Overall Permeate	0.69 (10)	20.4 (90)	50
Specific Energy	3.47 kWh/m ³ (13.14 kWh/1,000 USG)		
1 st Pass Recovery	37%		

Note: Temperature range is between 25° to 29°C

Table 2: Plant operating parameters **AFTER** installation of QuantumFlux elements.

Stream	BAR (PSIG)	m ³ /h (USGPM)	TDS
LP Feed	1.6 (23)	57.7 (254)	30,620
Overall HP Feed	44.8 (650)	57.7 (254)	31,445
HP Pump Feed	44.8 (650)	23.2 (102)	30,620
1 st Pass Permeate	0.69 (10)	16.1 (71)	263
2 nd Pass Feed	14.1 (205)	6.81 (30)	544.7
Overall Permeate	0.69 (10)	21.6 (95)	110
Specific Energy	2.49 kWh/m ³ (9.44 kWh/1,000 USG)		
1 st Pass Recovery	40%		

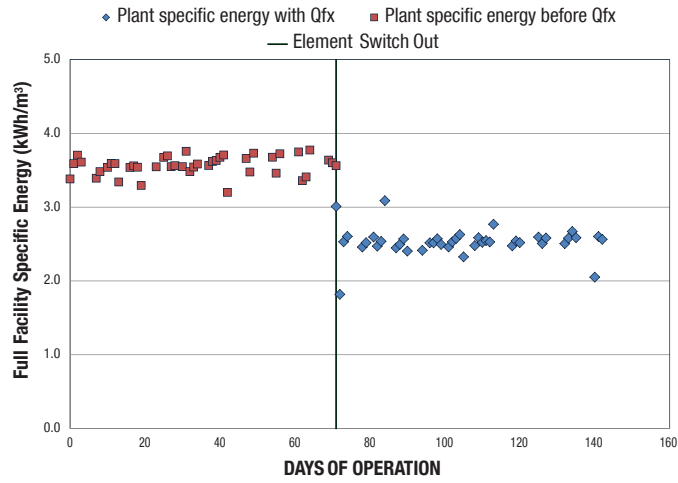
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Retrofit Performance Results

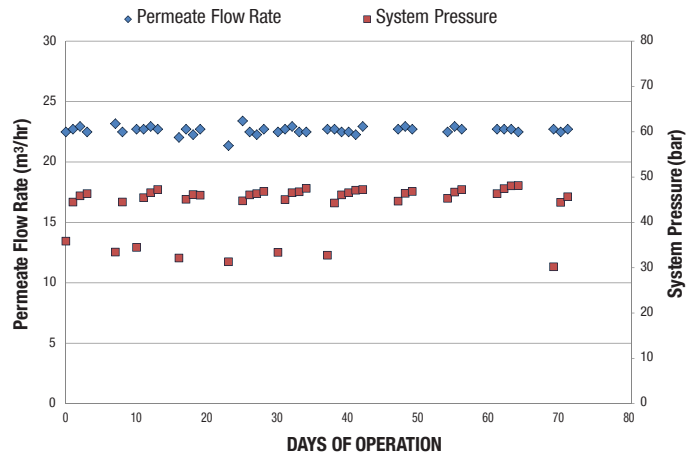
NanoH₂O installed Qfx SW 365 ES elements and consequently saved Water Authority Cayman 0.98 kWh/m³ (3.7 kWh/1,000 USG), or 28%, by lowering the pressure from 70.6 BAR (1,024 PSIG) to 44.8 BAR (650 PSIG) while exceeding their required permeate quality. In addition, NanoH₂O offered the client an opportunity to partner with NanoH₂O through the company's unique Membrane Performance Contracts offering.

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Specific Energy



Permeate Flow Rate vs. System Pressure



Feed Salinity vs. Permeate Salinity

