

CASE STUDY

Country : Belgium
Site : Tank cleaning facility
Date : 08/09/22
Revision : 1
Prepared by : S. Jarrige

System details

-	Water type	:	brackish
-	Feed flow	:	10.3 m ³ /h
	Permeate flow	:	7.1 m ³ /h
	Recovery	:	70 %
	Feed water T°	:	15-20 °C
-	Number of units	:	1
	Stage configuration	:	2 + 2 PV
	Membranes per PV	:	4
	Concentrate recycling	:	partial
	Membrane type	:	-
-	CIP tank	:	- m ³
	CIP pump characteristics	:	---- m ³ /h @ 4.0 bars
	Accessories	:	electrical heating system

Plant particulars

The feed water comes from a cleaning facility for food tanks (sugar & chocolate). The treatment line includes :

- oil & fat separation
- DAF
- MBR
- UF
- 5 & 1 µm cartridge filters
- 2-stage RO at 70% recovery (configuration 2 + 2 with 4 mb per PV)

The main foulants are **biofilm & organics**.

Genesol 704, our highly versatile alkaline cleaner, is the product of choice for these types of deposits.

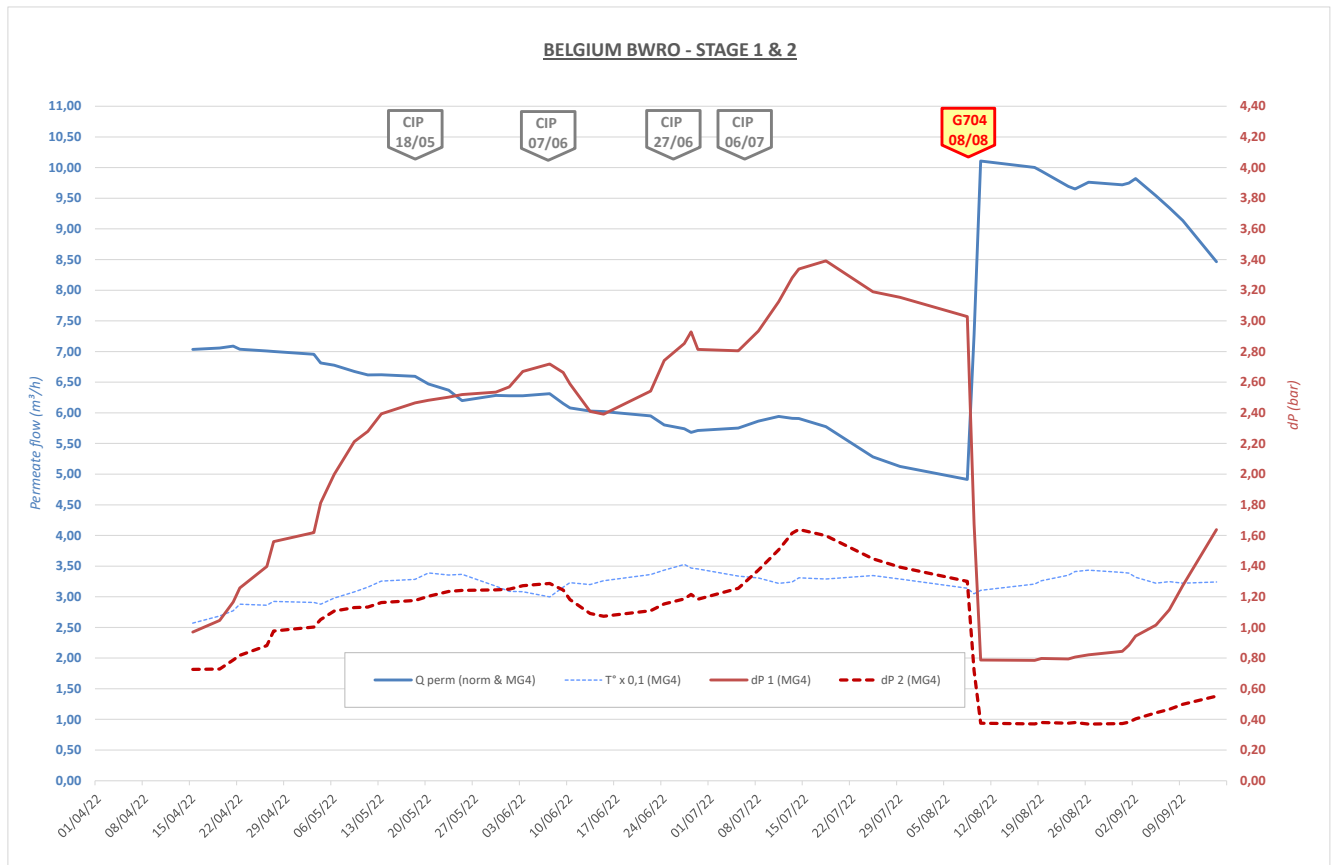
Cleaning results

By the time Genesys was contacted, 4 CIP's had already been performed over a period of only 2 months (on 18/05, 07/06, 27/06, 06/07). The cleaning procedures were based on the continuous recirculation of a solution of Genesol 704 + various other chemicals.

However, they had little effect on the dP, highlighting the equal importance of product implementation & choice.

As the fouling was out of control (stage 1 dP > 3.0 bars for 4 membranes), Genesys was finally contacted & devised a very different cleaning protocol for Genesol 704, involving long soaking periods to give the chemicals time to penetrate the deposits & break them down.

The results speak for themselves :



In order to compare results, average values have been used :

- before cleaning : from 28/06 to 18/07 (8 values)
- after cleaning : from 09/08 to 02/09 (10 values)

The CIP results are therefore extremely satisfactory :

	<i>before CIP</i>		<i>after CIP</i>		
- normalized permeate flow :	5.82 m ³ /h	⇒	9.81 m ³ /h	=	+ 4.0 m³/h i.e. +68.6%
- differential pressure 1 :	3.38 bar	⇒	0.86 bar	=	- 2,52 bar i.e. - 74.6%
- differential pressure 2 :	1.63 bar	⇒	0.39 bar	=	- 1,24 bar i.e. - 76.1%
- feed pressure stage 1 :	8.40 bar	⇒	6.12 bar		
- electricity consumption :	0.413 kWh	⇒	0.300 kWh	=	- 27.2 % per m ³ permeate

Both permeate flow & dP were stable for ~3 weeks after the CIP, then a rapid dP increase & simultaneous production decrease started again (inflexion point around 02/09)

⇒ **Routine cleaning with Genesol 704 every 4 weeks was therefore advised to optimize RO operation**