Project Name: CFA # 0898 San Angelo
Design by: Rod Berry   **Date: 10/26/2010**

Blending Calculations

Raw Water: City

Flow Rate, gpm	: 0.15 gpm	9 gph/216 gpd	Flow through Submicron filters
Conc., mg/l	: 1100.0 ppm		

Treated Water: Filter   Everpure MRS/Conveerted to Nano Filter Membranes

Flow Rate, gpm	: 0.65 gpm	39 gph/936 gpd	Estimated Nano Production
Conc., mg/l	: 58.0 ppm		

Blended Water: City/Nano Filters

Flow Rate, gpm	: 0.8 gpm	48 gph/1,152 gpd	Total blended production
Conc., mg/l	: 250.0 ppm		

Reverse Osmosis System Analysis for FILMTEC™ Membranes

ROSA 7.2.1 ConfigDB u392554_129

Project: CFA 0898

Case: 1

Rod Berry, Ultraclear Water

10/25/2010

Project Information:

Case-specific:

System Details

Feed Flow to Stage 1	2.17 gpm	Pass 1 Permeate Flow	0.65 gpm	Osmotic Pressure:	
Raw Water Flow to System	2.17 gpm	Pass 1 Recovery	30.00 %	Feed	9.32 psig
Feed Pressure	63.85 psig	Feed Temperature	77.0 F	Concentrate	12.90 psig
Flow Factor	0.85	Feed TDS	1124.35 mg/l	Average	11.11 psig
Chem. Dose (100% H2SO4)	0.00 mg/l	Number of Elements	2	Average NDP	46.23 psig
Total Active Area	56.00 ft²	Average Pass 1 Flux	16.72 gfd	Power	0.08 kW
Water Classification: Well Water SDI < 3				Specific Energy	1.93 kWh/kgal

Stage	Element	#PV	#Ele	Feed Flow (gpm)	Feed Press (psig)	Recirc Flow (gpm)	Conc Flow (gpm)	Conc Press (psig)	Perm Flow (gpm)	Avg Flux (gfd)	Perm Press (psig)	Boost Press (psig)	Perm TDS (mg/l)
1	NF90-2540	1	2	2.17	58.85	0.00	1.52	54.60	0.65	16.72	0.00	0.00	57.18

Pass Streams (mg/l as Ion)					
Name	Feed	Adjusted Feed	Concentrate	Permeate	
			Stage 1	Stage 1	Total
NH4	0.00	0.00	0.00	0.00	0.00
K	9.00	9.00	12.47	0.91	0.91
Na	196.21	196.22	273.26	16.47	16.47
Mg	51.50	51.50	73.10	1.10	1.10
Ca	93.20	93.20	132.32	1.93	1.93
Sr	1.99	1.99	2.83	0.04	0.04
Ba	0.21	0.21	0.30	0.00	0.00
CO3	1.40	1.40	2.57	0.00	0.00
HCO3	165.30	165.30	232.47	5.94	5.94
NO3	0.60	0.60	0.68	0.41	0.41
Cl	333.00	333.00	464.30	26.68	26.68
F	0.80	0.80	1.11	0.08	0.08
SO4	264.00	264.00	375.76	3.28	3.28
SiO2	7.12	7.12	10.03	0.32	0.32
Boron	0.00	0.00	0.00	0.00	0.00
CO2	2.42	2.42	2.82	2.42	2.42
TDS	1124.34	1124.35	1581.22	57.18	57.18
pH	7.90	7.90	7.96	6.57	6.57

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Design Warnings

-None-

Solubility Warnings

Langelier Saturation Index > 0

Stiff & Davis Stability Index > 0

BaSO4 (% Saturation) > 100%

Antiscalants may be required. Consult your antiscalant manufacturer for dosing and maximum allowable system recovery.

Stage Details

Stage 1 Element	Recovery	Perm Flow (gpm)	Perm TDS (mg/l)	Feed Flow (gpm)	Feed TDS (mg/l)	Feed Press (psig)
1	0.16	0.34	50.30	2.17	1124.35	58.85
2	0.17	0.31	64.74	1.83	1324.18	56.46

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Scaling Calculations

	Raw Water	Adjusted Feed	Concentrate
pH	7.90	7.90	7.96
Langelier Saturation Index	0.48	0.48	0.82
Stiff & Davis Stability Index	0.76	0.76	0.98
Ionic Strength (Molal)	0.02	0.02	0.04
TDS (mg/l)	1124.34	1124.35	1581.22
HCO3	165.30	165.30	232.47
CO2	2.42	2.42	2.82
CO3	1.40	1.40	2.57
CaSO4 (% Saturation)	4.75	4.75	8.23
BaSO4 (% Saturation)	1828.21	1828.21	2655.86
SrSO4 (% Saturation)	7.40	7.40	11.01
CaF2 (% Saturation)	7.93	7.93	21.59
SiO2 (% Saturation)	5.53	5.53	7.52
Mg(OH)2 (% Saturation)	0.01	0.01	0.02

To balance: 0.01 mg/l Na added to feed.