Recovery zone

Winter 2019

Plant Spotlight: Town of Jupiter

Author: Paul Juruzak, Plant Facility Manager

The Town of Jupiter Water Utilities Treatment Facility consists of three treatment systems including nanofiltration (membrane softening), ion exchange and reverse osmosis for a combined total of 30 MGD of treatment capacity. All three systems are located at the Town's singular water plant site and each produce finish water that flows to a common clear well for blending before distribution. With the addition of the nanofiltration plant in late 2010, the Town's water plant produces exceptional drinking water and will meet all regulatory requirements for the foreseeable future.

The 14.5 MGD nanofiltration plant and the 1.8 MGD ion exchange plant are supplied by 51 wells that obtain fresh water from the surficial aquifer. These wells vary in depth from 150 to 200 feet below land surface. The reverse osmosis plant is supplied by much deeper wells, completed between 1,200- and 1,600-feet depth in the brackish Upper Floridan Aquifer. Jupiter was one of the first utilities in the country to fully employ these best available treatment technologies to achieve its water supply and quality needs.

The nanofiltration system is very similar to the Town's reverse osmosis desalination facility whereby its membrane process separates contaminants from the raw water to yield a product which greatly exceeds all drinking water standards and is very aesthetically pleasing with little to no color. Jupiter's nanofiltration process design is the first of its kind in the world to employ an innovative approach to reduce treatment energy consumption. Jupiter's "split-feed" nanofiltration process design has resulted in a 15% reduction in energy requirements compared to conventional designs. This exemplifies the Utility's continuing commitment to innovation, efficiency and respect for the environment.

Nanofiltration Plant

Jupitar Water Treatment Plant

Jupitar Water Treatment Plant

Continued on page 3 >

Message From The President

Hello SEDA Members,

It is an honor to be elected to serve as the President of SEDA for the upcoming year. I look forward to leading this Board as we continue to work to improve the Organization for the benefit of our membership.

I'd also like to welcome the two newest board members, Dave MacNevin and Jack Reed. They will be joining our returning board members James Andersen, Jason Bailey, Chris Ballard, Amanda Barnes, Karla Berroteran, Laura Gallindo, Jarrett Kinslow, David Laliberte, Lance Littrell, Mo Malki, Michael Spaetzel and Pierre Vignier.

Both the MOC and Tech Transfer committees are working hard to schedule MOC schools and workshops throughout our entire Southeast territory so that our membership can continue to have the best training available to them when needed. Please continue to check the event calendar on the SEDA website and SEDA app for the latest information on upcoming events as they are scheduled.

If you are interested in serving on a committee, hosting a MOC school, Technology Transfer workshop, or teaching a course, please reach out to me or one of the board members.

Sincerely,

Ronald J Castle II, PE
Harn R/O Systems, Inc.

2019-2020 SEDA Board of Directors

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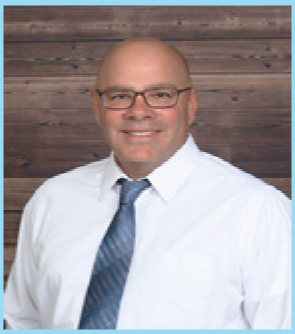

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MOC

Dave E. MacNevin, PhD, PE
Div 2

< continued from cover

In 1988 the Town embarked on an initiative to conserve the fresh water supply, reduce the threat of salt water intrusion and provide a water quality to meet future regulatory requirements. Test wells were drilled into the brackish Upper Floridan Aquifer and pilot studies were conducted using various RO membranes. Today, the 13.7 MGD reverse osmosis (RO) plant is supplied by twelve brackish wells which obtain water from the upper Floridan Aquifer. These wells are approximately 1600 feet deep and 16 inches in diameter and are equipped with horizontal end suction pumps. The water from these wells is delivered to the RO plant through a 24" HDPE raw waterman.

At the RO plant the raw water is pre-treated with a scale inhibitor and then filtered by ten horizontal nominal 5 micron filter units. The pre-treated water is then delivered to eight 1.5 MGD reverse osmosis trains and one 1.7 MGD train all fed by nine high pressure pumps which boosts the pressure to between 200 to 260 psi depending on the specific membrane loaded in the treatment trains.

The early 1988 RO plant included four 1.5 MGD treatment trains that initially utilized Hydranautics CPA2 membranes. These membranes required 260 psi of feed pressure to recover 75% of the feed water supplied to the trains. These membranes rejected 98% of the salt in the feed water. Due to excellent quality of the feed water these membranes operated for 18 years, well beyond industry standards.

In 1997 four new 1.5 MGD treatment trains were added and equipped with more efficient Hydranautics ESPA 2 Membranes. These membranes required between 180 and 200 psi of feed pressure at 75% recovery and 98% salt rejection. These were also the first of the Town's RO membranes to utilize inter-stage energy recovery turbines. The turbines recover the energy from the concentrate stream and use it to boost the pressure to the second stage which allows for lower feed water pressures in the first stage.

In 2006, the original four trains (from 1988) were retrofitted with Dow Filmtec BW30LE-440/XLE-440 membranes to create a hybrid system including the addition of inter-stage turbines. Also, at the same time a ninth train was constructed and loaded with the same Dow Filmtec membranes and its capacity was and still is 1.7 MGD.


Surficial Aquifer Well


14.5 MGD Nanofiltration Trains


Floridan Aquifer Well

To stabilize the aggressive RO permeate, a 1.8 MGD Ion Exchange Plant was constructed in 1999. This plant consists of four 8-feet diameter vessels which contain an anion exchange resin to remove organic carbon and color from water produced from the surficial aquifer wellfield. The ion exchange process removes color, retains the carbonate alkalinity and reduces the overall caustic dosage required to stabilize the RO permeate. This innovation not only reduces treatment costs but improves the overall quality of the water delivered to the customer.

In 2016 all Hydranautics ESPA 2 membranes were replaced with Dow/Filmtec Eco-Pro 440 membranes.

The raw Floridan Aquifer water has approximately 3 ppm of dissolved hydrogen sulfide. To remove the H2S, the permeate from the nine trains is acidified to lower the pH and sent to three packed tower degassifiers. Chlorine is added at the bottom of the degassifier for disinfection. The permeate gravity flows to a common clear well where ammonia is added to produce chloramines.

1988 RO Train

Ion Exchange Plant

The Town uses a brackish tidal portion of the nearby C-18 canal for RO concentrate disposal. Before the concentrate is released, it is acidified to lower the pH, pumped to two degassifiers to remove hydrogen sulfide and add dissolved oxygen.

The sulfide liberated during the scrubbing processes is treated on site through two ARI Mobile Bed Absorbers which uses a chelated iron solution. Jupiter was the first to use this technology for potable water treatment which provides a cost-effective means of achieving odor control. In 2007, a chlorine and caustic scrubber system was also added to the concentrate disposal system for redundancy.

The Town has multiple ground storage tanks with a total capacity of 29.5 MGD and a finished water, high service pumping capacity including 19 pumps with a total rated capacity of 57,500 gallons per minute (82.8 MGD).

Our commitment to utilizing cutting edge technology has led to the ability to keep operating and maintenance costs low while preserving Florida's fresh water resources. These strategic goals have resulted in our facility receiving over 50 awards in the last three decades. Most recently, the SEDA 2019 Outstanding Membrane Plant Award for Large Facilities and the AWWA/AMTA 2019 Membrane Facility of the Year Award.

Technical Transfer Workshop Review

Author: Karla Berroteran-Castellon, Water Treatment Plant Superintendent, Village of Wellington, Tech Transfer Comm Chair

On June 25th, 2019, the City of Clearwater hosted a SEDA technical transfer workshop entitled Feed water Supply and Pretreatment, at the reverse osmosis (RO) Plant#2. A total of 17 participants attended the event. The class was taught by four instructors: Cathleen Jonas and Jim Dozier (HSW Engineering, Inc.), Skip Beach (R.C. Beach & Assoc. Inc.), and Katherine Lee (SafBon Water Technology, Inc.). Sponsors for the workshop were Safbon Water Technology, JLA Geosciences, and RC Beach Associates, Inc.

Cathleen Jonas started the morning session with an explanation of the occurrence of brackish water zones in aquifers and the process for developing a brackish water wellfield as source water for a reverse osmosis municipal water supply. She reviewed the importance of wellfield modeling in selecting well locations, and the importance of well field maintenance once the wells are placed into service to ensure wellfield health and longevity. Jim Dozier reviewed techniques for characterizing the hydrology of brackish water zones and obtaining a vertical water quality profile to determine the brackish water zone. He also covered examples of other programs that can be used in conjunction with groundwater modeling to guide wellfield operational strategies for maintaining source water quality within its desired salinity range. Skip Beach gave an overview of the basics of vertical turbine pumps, construction and operation. He explained design features and critical elements to consider when sizing and selecting a vertical turbine pump along with different motor classifications and their proper application. He reviewed proper installation techniques and start-up and testing, as well as monitoring and recommended maintenance practices. After lunch, Katherine Lee discussed the basics of ultrafiltration and outlined pertinent topics for the proper design and maintenance of ultrafiltration pretreatment system. She reviewed applications of ultrafiltration in drinking water and industrial water, cleaning process analysis and interpretation of trending data, troubleshooting and membrane integrity monitoring. Following the classroom training, the workshop attendees were then taken on a tour of City of Clearwater's RO Plant#2 given by, Glen Daniel, Chief Operator.

City of Clearwater classroom

Water Suppy Tech Transfer

City of Clearwater Plant Tour

Membrane Autopsy

Membrane Construction

Hands on Teaching

On August 6th, 2019, a technical transfer workshop entitled Membrane Autopsy was hosted by American Water Chemicals (AWC) at their Plant City, Florida location. A total of 15 participants attended the one day event. The class was taught by three of AWC's experts, namely, Mo Malki, Vana Abbas, and Josh Utter. During the first half of the session Mo and Josh explained different autopsy techniques and provided an introduction to membrane theory, membrane calculation principles, normalization calculations, and how these tools can be used in detecting membrane fouling, membrane scaling, and membrane damage. A hands-on session by Vana and Josh was offered during the second half of the session. During the hands-on session participants were divided into four smaller groups of six and performed routine tests typically conducted on membrane elements during membrane autopsy, including integrity testing, visual inspection of unraveled membrane elements, foulant collection, and chemical solubility tests. At the end of the teaching session AWC provided a tour of their laboratories where attendees were able to observe how a cleaning study is performed after a membrane autopsy. Students collected data from the cleaning study which was analyzed back in the class room.

HAPPY NEW YEAR

FROM SEDA

Using Reverse Osmosis Concentrate to Regenerate A Cation Exchange Process: A Bench-Scale Study

Author: Daniel A. Whalen, M.S., E.I. & Steven J. Duranceau, Ph.D., P.E

Introduction and Background

The disposal of concentrate comprises a considerable fraction of the overall cost and design associated with reverse osmosis (RO) membrane processes. RO concentrate is a waste product that can be disposed of through deep well injection, surface water discharge, sewer, evaporation ponds, land applications, among others. Identifying alternative uses for RO concentrate is a desirable option for utilities in terms of financial savings and sustainability. One alternative involves the use of RO concentrate as a regenerate solution for ion exchange (IX) processes, coupling RO and IX together in a hybrid fashion. This hybrid IX-RO (HIX-RO) process utilizes the high salinity of RO concentrate to regenerate sodium- and chloride-form IX resin, reducing RO process disposal water and decreasing IX regeneration costs.

Figure 1: City of Sarasota Drinking Water Treatment Facility

The City of Sarasota (City), Florida utilizes both RO and IX treatment processes for the production of potable water. The City's RO process consists of three treatment trains operating in a two-stage, 28x14 array, producing 1.5 million gallons per day (MGD) each of treated water from a brackish groundwater source. The City's IX process utilizes four treatment vessels filled with a strong acid cation (SAC) resin in the sodium form to soften groundwater from the Upper Floridan aquifer. Combined, the City's plant capacity is 12 MGD, serving approximately 55,000 residents. Figure 1 displays an aerial view of the City's drinking water treatment facility. The City currently employs the use of Sarasota Bay seawater for regeneration of their cation exchange (CIX) system. Due to fluctuations of the Sarasota Bay water quality from environmental circumstances (i.e. hurricanes, algal blooms, oil spills), and a desire to decrease process costs, the City would like to evaluate the efficiency and performance of RO concentrate as a regenerate stream for CIX. This work investigates the use of brackish water RO concentrate for CIX regeneration through bench-scale studies.

HIX-RO systems involve the coupling of IX and RO processes to meet a desired treatment objective. This can be configured in different arrangements to serve disparate purposes. IX has been used as a polishing step to post-treat RO permeate water for the enhanced removal of trace contaminants, and RO has been used as a treatment process for IX regeneration waste prior to its disposal. Additionally, IX has been used as a pretreatment step to RO for the removal of sparingly soluble salts, increasing RO recovery rates and concurrently regenerating the IX process using RO concentrate. The HIX-RO process under investigation for this study is illustrated in Figure 2, using brackish water RO concentrate to regenerate the sodium-form SAC resin. Table 1 displays water quality characteristics of the City's groundwater feeding the CIX process, and the brackish water RO concentrate. The high sodium content of the rejected RO concentrate makes it a feasible option for regeneration of the SAC resin, however, the high concentrations of calcium, magnesium, and other ions present pose a challenge to regeneration efficiency.

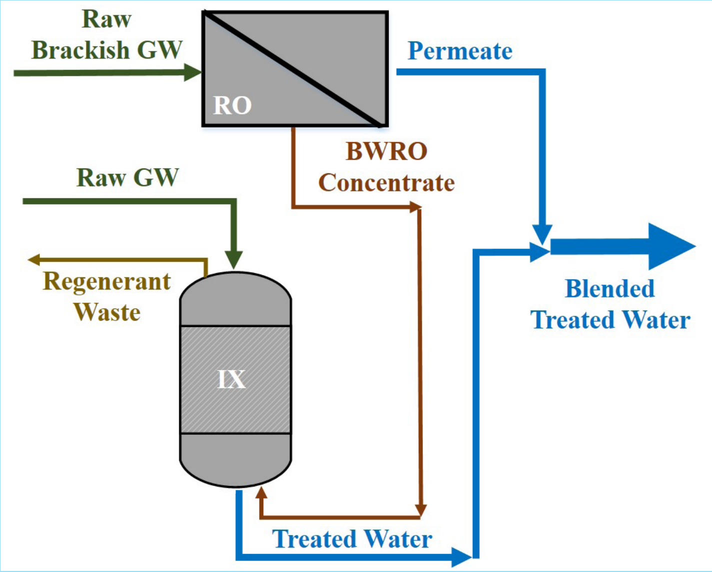


Figure 2: Flow Diagram of Proposed HIX-RO Process

Parameter	Units	Groundwater	RO Concentrate
pH	s.u	7.68	8.10
Conductivity	µS/cm	1,090	12,500
Turbidity	NTU	0.180	0.340
Alkalinity	mg/L as $CaCO_3$	171	513
Sulfate	mg/L	396	3,550
Chloride	mg/L	25.2	2,900
Bromide	mg/L	<0.200	9.93
Fluoride	mg/L	0.490	4.68
Calcium	mg/L	126	1,170
Magnesium	mg/L	60.2	601
Sodium	mg/L	13.5	1,150
Potassium	mg/L	2.46	110
Strontium	mg/L	21.8	97.1
TDS	mg/L	830	9,240

Table 1: Water Quality Characteristics (Average)

Bench-Scale Study

Bench-scale column tests were performed using AmberliteTM IR 120-Na SAC resin to evaluate the efficiency of brackish water RO concentrate as an IX regenerate solution. Resin was loaded into three separate 15 mm glass columns at a resin bed depth of 229 mm, seen in Figure 3, and fed a bulk supply of the City's groundwater via peristaltic pumps at a flowrate dimensionally analogous to the surface loading rate of the City's full-scale system. 3 mm glass beads were used as support media below the resin beds to prevent resin loss. Each column was backwashed with distilled water for approximately five minutes to evenly distribute the resin beds and remove unwanted particulates that may have been present within the virgin cation resin. The columns were then operated in parallel under the parameters shown in Table 2, until exhaustion of the SAC resin was achieved.

Figure 3: Bench-Scale Columns Housing Cation Exchange resin

Parameter	Units	Value
Flowrate	mL/min	20.0
Column Diameter	mm	15.0
Total Bed Height / Column	mm	229
Bed Volume / Column	mL	40.5
Surface Loading Rate	gpm/SF	2.80
Empty Bed Contact Time / Column	min	2.00

Table 2: Bench-Scale Operating Parameters

Continued on page 14 >

Congratulations to all award winners!

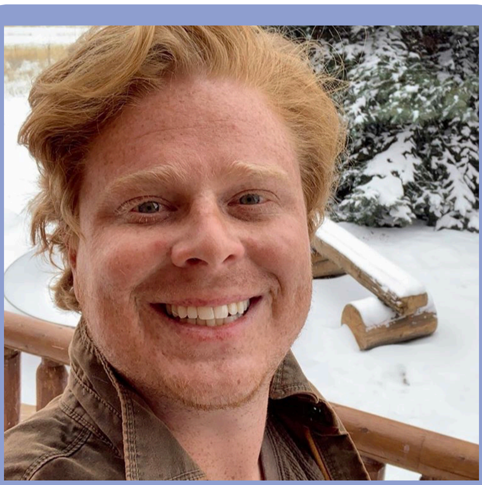
OUTSTANDING MEMBRANE PLANT AWARD
Small System < 5 MGD Presented to: Coral Springs Improvement District Water Treatment Plant, Coral Springs, FL

OUTSTANDING MEMBRANE PLANT AWARD
Large System > 5 MGD Presented to: Town of Jupiter Water Treatment Plant, Jupiter, FL

OUTSTANDING MEMBRANE PLANT OPERATOR AWARD
Ronald Claunch, Lead Water Plant Operator A, City of Tarpon Springs, FL

LIFETIME ACHIEVEMENT AWARD
Tony Fogel, Chief Water Plant Operator, Town of Jupiter, FL

WATER QUALITY PERSON OF THE YEAR AWARD
Dr. Steven Duranceau, PE, University of Central Florida



EDUCATOR OF THE YEAR AWARD
Duggan Jacobs - Jacobs Air Water, Inc.

VENDOR OF THE YEAR AWARD
American Water Chemicals

SCHOLARSHIP WINNER
Carlyn Higgins

PRESIDENT'S RECOGNITION AWARD
Monica Pazahanick, PE - Hazen and Sawyer

PRESIDENT'S RECOGNITION AWARD
Karla Berroteran – Village of Wellington

SPECIAL RECOGNITION AWARD
City of Ormond Beach Public Works, Utilities – LPRO and Lime Softening Water Treatment Plant

Outstanding Service for Board Service:

Mo Malk   Paul Jacobs   Jarrett Kinslow, PE

SAVE THE DATE

2020 SPRING SYMPOSIUM!

20/20 CLEAR VISION FOR MEMBRANES IN THE FUTURE

MAY 31–JUNE 3, 2020   CAPE CORAL, FL

Membrane Operators Certification (MOC) Update

Author: Chris Ballard, Toray Membranes USA, MOC Comm Chair

The SEDA Membrane Operator Certification (MOC) school Module I, introductory course to membrane systems, was presented on July 9th-11th, 2019, at the City of Pompano Beach, Florida, water treatment plant. Inspiring instructors included James Christopher and Andrea Netcher of Tetra Tech, Inc. along with Kirk Lai of Hydranautics, Rafael Lemus of Classic Controls, Jim Andersen of JLA Geosciences, and Jason Bailey of Avista Technologies. Topics for the 2 ½ day course covered introduction to membrane processes, water supplies for membrane systems, water chemistry, chemical treatment, post-treatment, and mechanical components of membrane systems. City of Pompano Beach staff lead by Phil Hyer, Jason Mraz, and Tom Dineen were gracious hosts for the course and conducted an impressive tour of their water treatment plant giving opportunity for the class of nineteen students to ask additional questions to supplement the classroom instruction. Sponsors for the course were Tetra Tech, Avista Technologies, and Toray Membrane USA, Inc.

City of Pompano Beach

City of Pompano Beach

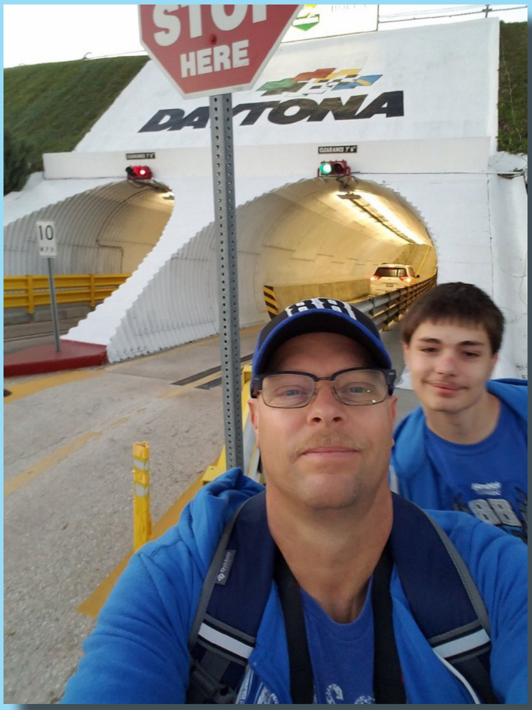
From July 23rd-25th, 2019, MOC Module II, focusing on reverse osmosis (RO) and nanofiltration membrane systems was held at the Town of Jupiter Water Treatment Facility in Jupiter, Florida. Sponsors of the course were Kimley-Horn & Associates, American Water Chemicals and Toray (NF) Membrane USA, Inc. The 2 ½ day course included advanced membrane systems information including applications and pretreatment methods for RO/NF systems as well as data collection, data normalization, operation, maintenance and concentrate disposal. Distinguished instructors for the course included John Potts from Kimley-Horn & Associates, Mo Malki from American Water Chemicals, James Christopher from Tetra Tech, David MacNevin from CDM Smith, and Rod Miller from JLA Geosciences. An enlightening tour of Jupiter's Water Treatment Facility was given by the Town's Plant Facility Manager, Paul Jurczak and Chief Operator, Tony Fogel, on the last day of the course. The tour was an excellent example of dedication to detailed operation and maintenance of a water plant. There was much enthusiasm from the class of twenty-four students to ask questions during the tour.

Please contact SEDA's administrator at admin@southeastdesalting.com if you are interested in hosting or have recommendations for future MOC School locations. A minimum of 12 attendees must be registered to hold a class so reach out to other facilities in your area to see if they are also interested. Check the Upcoming Events section of this newsletter and the SEDA website for future SEDA events.

Member Spotlight

How long have you been a member of SEDA?
I joined SEDA in January of 2013

Why did you join SEDA?
I heard there was an organization that I could obtain more training on membrane plants and receive CEU's while doing it. Through SEDA, I would also acquire a certification on operating an R.O. membrane facility that I have heard may be required one day.



Ronald Claunch

What is something that you have gained/or hope to gain by being a member of SEDA?
I hope to continue to gain knowledge of membrane operations to be used at the new City of Tarpon Springs R.O. Facility. What I have gained is more confidence in my abilities to be able to run the brackish water facility for the city, and this has allowed me to advance my career to a new and higher level.

How did you get involved in the Water or Wastewater Industry?
In 2005 I was working as a garbage truck driver. As a father with three kids, I was looking for a more stable career with benefits. I put in an application with the city of Tarpon Springs for building maintenance. Six months passed and I finally got a call from them asking if I would be interested in a job with the water distribution department. I started with the city on Jan 19, 2006, and for the next five years I worked in the distribution dept. and during that time received my distribution II license. In 2011, I learned that the City was going to build a RO facility, and I was intrigued about learning all I could. Over the next few years, I worked as hard as I could to learn about the RO process and pursuing my drinking water operator's license. Before the plant opened in June of 2015, I obtained certification in brackish water and MOC 2 along with my class B water treatment plant operator's license. When we opened the plant in 2015, I was promoted to the lead operator's position that I currently still have. During this time and as soon as my 5 years were up, I took and passed my "A" water operator's license.

What is the most recent book you have read or concert you have been to?
Well let's see, the last concert I went to was Garth Brooks, in the swamp and the current book that I am reading is Eat That Frog by Brian Tracy.

What activities do you enjoy in your free time?
Well I like spending time with my family. I enjoy going to car shows in my area. When I can, I like to go help my brother-in-law with his race car. My son and I work on the pit crew and I will drive it sometimes. I also like working on my old truck, and putting modifications on my corolla hatchback with my youngest son. I enjoy photography and like to take nature pictures although I'm still learning to use my camera. I like to be outside as much as possible, even if it's just hanging out by the pool.

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Results and Discussion

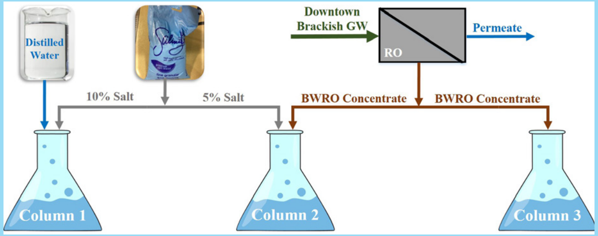

Figure 4: Regenerate Solutions

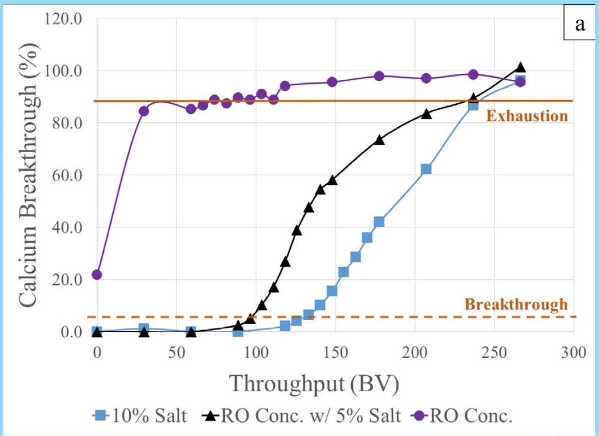

Figure 5a: Calcium Saturation Loading Curves

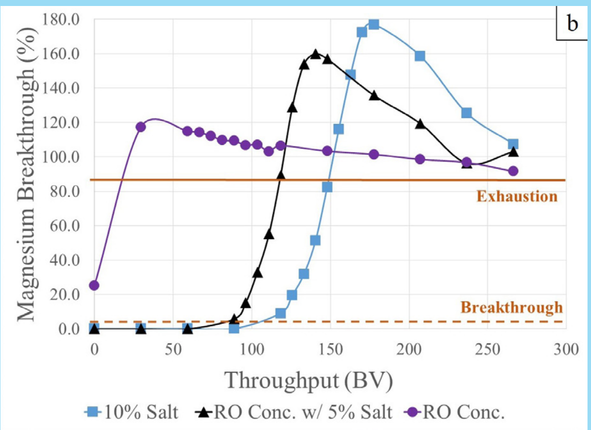

Figure 5b: Magnesium Saturation Loading Curves

Each column was regenerated in a counter-current flow configuration, using different solutions to identify changes in operating efficiency. Seen in Figure 4, column 1 was regenerated using the manufacturer's recommendation of 10% salt, column 2 was regenerated with the City's RO concentrate supplemented with 5% salt, and column 3 was regenerated with just the City's RO concentrate. A rinse cycle of distilled water was performed post-regeneration to remove over-saturated ions that may still be present. Once regenerated, the columns were operated in parallel until exhaustion was reached using a bulk supply of the City's groundwater. Samples were collected at periodic time intervals and analyzed to develop saturation loading curves of the SAC resin for different ionic constituents.

Figure 5 identifies the breakthrough and exhaustion of calcium and magnesium for each column. Calcium removal efficiency drops by 4% from manufacturer recommended conditions when regenerated with the City's RO concentrate supplemented with 5% salt, and a further 60% when regenerated with the City's RO concentrate. The same trend is seen with magnesium, dropping 21% and 93% respectively. Calcium and magnesium leakage was also observed in column 3 under RO concentrate regeneration conditions of 29.3 mg/L and 16.4 mg/L, values that already exceed breakthrough concentrations at the start of operation.

These preliminary results indicate that incomplete regeneration occurred when the City's RO concentrate was used. This could have been the result of the effectiveness of the low salinity of the RO concentrate (under 10,000 mg/L total dissolved solids) and/or the high cation compositions of calcium and magnesium (1,170 mg/L and 601 mg/L respectively) found in the RO concentrate. However, it is interesting that with the addition of 5% salt to the City's RO concentrate, efficiencies improved and ionic leakage was eliminated, demonstrating that regenerate salt supplementation as a viable option for investigation. Additional studies are recommended to be implemented to identify the impacts of scale inhibitor formulation that is present in the City's RO concentrate and determine the optimal salt supplementation amount needed to efficiently regenerate the IX process.

Acknowledgments

The work reported herein was funded by University of Central Florida (UCF) agreement number 16208213 with the City of Sarasota, Florida. Any opinions, findings, and conclusions expressed in this material are those of the authors and do not necessarily reflect the view(s) of UCF, it's Research Foundation or Board of Governors. The authors wish to acknowledge the City of Sarasota Utilities staff, specifically Verne Hall, Peter Perez, and Katherine Gusie for their assistance and support, without whom this work would not have been possible. Equipment and technical advice provided by Tonka WaterTM, a U.S. Water brand and their representative EnviroSales of Florida, Inc. were greatly appreciated and valued. The contributions of students in the UCF Water Quality Engineering laboratories who assisted in field and laboratory work were also greatly appreciated.

The Traveling Troubleshooter: Data collection…correct …?

Author: Anonymous

The Lime Softening plant was off-line and shut down. Startup of the new R/O plant was complete. Four multiple MGD Trains, online in automatic, and running smooth. Stubbs Gripschtik, clipboard in hand, headed out to collect the first and most important operating data point from each Train. This data point would be used to determine future membrane maintenance and the effectiveness of that maintenance.

Operators Bettie Presterpin and Bobby Tippings joined Stubbs at Train #1. Yesterday they were lime softening water plant operators and today it's all-new, new equipment, new process, and new data to collect and monitor. Stubbs knew the seemingly daunting and overwhelming task now confronting the operators would become routine over time. Stubbs handed the clipboard to Bettie and a conductivity meter to Bobby. "Okay, let's go collect some data," he said over the din of the running water plant.

Sample and Instrument Panel

Pausing as they walked over to the instrument panel, he turned and continued, "A vital part of operating membrane systems is precise," he hesitated, "no… accurate…umm no, correct data collection. You could say the collected data is precise if the values are close to each other or accurate if their average is close to the value of the parameter being measured. I prefer collected data be correct, free from bias and error."

He continued, "The interpretation of correct (normalized) historical operating data helps forecast preventive maintenance schedules and is very valuable in determining when membranes need to be chemically cleaned, cleaning effectiveness, or need replacement. It also alerts you to deviations taking place over time, for example; system increases or decreases in key operating parameters which may indicate membrane fouling, leaking "O" rings, failed or malfunctioning instruments and or supporting equipment." indicate membrane fouling, leaking "O" rings, failed or malfunctioning instruments and or supporting equipment."

"So here we go", Stubbs completed then turned toward the instrument and sample panel at Train #1. Bettie and Bobby turned to find an impressive array of instruments, gauges, and gizmos. They stood silent, looking at the panel, then down at the datasheet, then back to Stubbs. He caught their gaze and said, "And SCADA, we'll need to have a look at that data as well.

Gripschtik-y Note:

Data collection with an awesome selection of variables. Which is correct? Which do I record? What's the difference?

For those of you with Analog Systems (systems without a PLC or SCADA); Lucky you!

Welcome to Our New Members

VARONICA BEAL
CITY OF PUNTA GORDA

RUSSELL BINDER
CITY OF PUNTA GORDA

DEANGELO DAGASTINO
CITY OF PUNTA GORDA

MICHAEL DRENNAN
CITY OF VENICE

BEN FARIA
CITY OF PUNTA GORDA

CAMILO GALEANO
CITY OF HOLLYWOOD

BRYAN GAYOSO
VILLAGE OF WELLINGTON

JASON HANCHUK
VILLAGE OF WELLINGTON

SUSANNA HASLINGER
CITY OF PUNTA GORDA

SCOTT HOLLEY
CITY OF PUNTA GORDA

MATT KEENEY
CITY OF PUNTA GORDA

MARILYN LAMBERT
CITY OF PLANTATION

LARRY LEWIS
CITY OF PUNTA GORDA

BILLIE MCNEELY
PIEDMONT TRIAD REGIONAL WATER AUTHORITY

ANJULI PANSE
VILLAGE OF WELLINGTON

MIKE RAMANKO
CITY OF PUNTA GORDA

COREY ROBINSON
VILLAGE OF WELLINGTON

ANDREW SCHMIDT
AMERICAN WATER ACCIONA AGUA LLC

JOSEPH SNOW
CITY OF PUNTA GORDA

TOM SPENCER
CITY OF PUNTA GORDA

HENRY STEPHENS
CITY OF PUNTA GORDA

STEVE URICH
CITY OF PLANTATION

BRAD WOLAK
VILLAGE OF WELLINGTON

Legislative Update

Author: Dave McNevin, PhD, Tetra Tech and Pierre Vignier, City of Port St. Lucie

America's Water Infrastructure Act of 2018

The ratification of the America's Water Infrastructure Act (AWIA) of 2018 rewrites a part of the Safe Drinking Water Drinking Act, subtitled 1433, under Community Water System Risk and Resilience Assessments anti-terrorism provisions.

This new statutory requirement in section 2013 (a) – (f) of the AWIA requires all community water systems serving more than 3,300 persons shall review its risk and resilience assessment emergency response plans (ERPs) at least once every five years to determine if it should be revised.

This assessment encompasses of being better prepared in identifying risk to systems from malevolent acts and natural hazards, otherwise known as the "all threats", and measure the system resilience of all system workings from the source water and throughout of the distribution facilities, including physical barriers, chemicals, technology systems, financial infrastructure, and monitoring practices of the system.

Each qualified Community Water System (CWS) shall submit a completion review certification to the Environmental Protection Agency disclosing that assessments were reviewed and revised, if applicable. The deadlines for complying with the AWIA Risk and Resilience Assessment requirement are between March 31, 2020 and Dec. 31, 2021, depending on water system size. The EPA will provide details about submittal procedures no later than by August 1, 2019.

States and USEPA Take Aim at Regulating PFAS in Drinking Water

In February 2019, USEPA published "EPA's PFAS Action Plan", outlining the agency's approach to lead the national effort to understand PFAS and reduce PFAS risks to public health. The approach includes more than 20 actions EPA plans to take between now and 2022 to tackle the challenge.

Early indications are that USEPA will focus the next Unregulated Contaminant Monitoring Rule (UCMR 5) on PFAS, including many compounds not yet widely sampled. During a July 2019 webinar, USEPA previewed a list of 69 candidate compounds under consideration for potential sampling by drinking water utilities in UCMR 5. USEPA must narrow this list of compounds to no more than 30 compounds before issuing the UCMR 5 proposal in Summer 2020. PFAS compounds dominated the list, comprising 29 of the 69 compounds presented. UCMR 3 only included six (6) PFAS compounds. UCMR 5 is anticipated to have a final rule issued in late 2021, with public water systems (PWSs) monitoring between 2023-2025.

Meanwhile, states continue to take action to regulate PFAS in drinking water through health advisories, notification levels, or enforceable maximum contaminant levels (MCLs). New Hampshire enacted the lowest MCLs for PFOA (12 ng/L) and PFOS (15 ng/L) in September 2019. In August 2019, California took the first step towards MCLs for PFAS setting notification levels for PFOA (5.1 ng/L) and PFOS (6.5 ng/L) to "the lowest levels at which they can be reliably detected using currently available and appropriate technologies."

Membrane separation technologies (RO/NF) have demonstrated robust removal of the spectrum of PFAS compounds, with demonstrated removals >99% for long-chain and short-chain PFAS compounds.

SEDA QUIZ

By: Brian Matthews, City of Palm Coast

1. When Feed-water enters the membrane, a portion permeates the membrane and the portion that doesn't is called?
   A. Concentrate
   B. Brine
   C. Reject
   D. All the above

2. Why is the portion that doesn't permeate the membrane called this?
   A. Most of the water permeates the membrane leaving most of the dissolved solids behind
   B. Most of the dissolved solids permeate the membrane leaving most of the water behind
   C. There were three inventors each coming up with their own name for this portion
   D. None of the above

3. The portion that did not permeate is defined in the American Heritage Dictionary as?
   A. Unknown, could not be defined
   B. To gather together in one main body
   C. The amount of a specified substance in a unit amount of another substance
   D. B and C

4. What becomes of the portion of the feed stream that did not permeate the membrane?
   A. It is evaporated
   B. It is injected deep into the earth
   C. It is discharged to a water body
   D. All of the above

5. The membrane may require more frequent cleaning due to which of the following?
   A. The high service pump was wired wrong and rotating in the wrong direction
   B. The wrong post-treatment chemical dose is fed
   C. The wrong pre-treatment chemical dose is fed
   D. The operator on the evening shift called in sick

6. What type of permit is required to discharge the portion of the feed that does not permeate the membrane to a body of water?
   A. A Domestic Waste discharge permit
   B. A solid waste discharge permit
   C. An operating permit
   D. An Industrial Waste discharge permit under the NPDES program

7. What does NPDES stand for?
   A. National Pollutant Discharge Elimination System
   B. Natural Pollutant Discharge Elimination System
   C. National Pollutant Discharge Elimination Site
   D. National Policy for Discharge Elimination

8. Which of the following membrane configurations separate the feed stream into two separate flows?
   A. Spiral wound
   B. Hollow fine fiber
   C. MF and UF
   D. A and B

9. If too much of the feed stream is permeating the membrane, what might happen to the feed side of the membrane?
   A. Without enough water, it could dry out
   B. Without enough water, it could scale up
   C. Without enough water, it would become too dense to flow
   D. Without enough water, the bacteria would be thirsty and die

10. If the wrong pre-treatment chemical or wrong dose is fed to the membrane feed stream, what could go wrong?
    A. The membrane could be damaged
    B. Nothing
    C. The membrane will need to be cleaned more frequently
    D. A and C

Answers can be found on the SEDA website at
http://www.southeastdesalting.com/members-only/quiz/

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