Over the years, Palm Beach County’s Water Treatment Plant 9 (WTP 9) has undergone perpetual change. Originally built in 1971 as a lime-softening plant capable of producing 14 mgd, the plant desperately needed to be upgraded by the 1990s. Technology had evolved since the original plant was built, and drawings for a new, modernized plant began in 1997. Now the 30-year-old lime plant is a state-of-the-art, 27-mgd nanofiltration water treatment plant.

WTP 9 is now producing water quality to the highest health standards and also to the highest aesthetic standards, of color, odor and taste. The new and improved WTP 9 is also uniquely designed to blend into the existing community. The facility is surrounded with earthen berm consisting of Florida native plants and trees, which mesh perfectly with the existing neighborhoods and golf course. The WTP 9 has earned bragging rights for a beautiful facility.

OPERATIONAL ISSUES

With a new maximum production of twenty-eight millions of gallons a day, there is no room for error. Early on it became apparent there were several issues with the upgraded water plant that required special attention. The first issue was dealing with excessive sand and silt from the six new wells and fifteen twenty-five year old production wells. Sand and silt will destroy membranes in the treatment process. Pretreatment cartridge filters protect the membranes, but sand and silt fouls them quickly. To solve this problem, the WTP 9 team decided to install a self-backwashing 50 micron sand strainer prior to the pretreatment filters. WTP 9 was the first membrane treatment plant to install a sand strainer for this purpose. The system protects the cartridge filters from fouling, reduces the frequency of filter changes per year, and saves considerable money.

Another issue was dealing with the high concentration of hydrogen sulfide gas (rotten egg smell) in the ground water. To get rid of this problem, the utility installed four degasification towers and two odor-scrubbing towers. The odor-control system reduces the hydrogen sulfide problem significantly.

MEETING OUR DRINKING WATER NEEDS

After several years of operation, WTP 9 was having difficulty producing water to meet its designed capacity. Several issues arose with the production of wells that limited their flow. Another problem associated the limited flow rate was the inability to rotate and allow the wells to rest which is critical in maintaining its life expectancy. Staff also needed to take wells offline for normal routine maintenance which also affects production capacity. It became apparent additional production wells will be required. We were able to get six new wells for the plant, with each well producing approximately 900 gallons per minute. Prior to construction of the new wells, extensive testing was performed to find the best combination of well screening and matching gravel packs. As a result of this extensive testing, WTP 9 was able to select the best match to produce the best water. Last year, when these six new wells came on line, every well had low sand and silt production. This further reduced the backwashing frequency of the sand and further reduced cartridge filter change outs; resulting in even more energy, labor and cost savings. Gaining these new wells was an important upgrade for WTP 9.

IT TAKES A TEAM….

Staying on top a facility that spans across 18 acres of land that may seem like a tall task. But with a staff of eighteen dedicated professionals, projects are done quickly and efficiently. There is an open forum staff meeting every morning to discuss any issues with the water plant, what was accomplished the previous day and what each individual will be working on during the day. Having this open forum allows everyone

Continued on page 7 >
President’s Message

Happy summer to everyone! This summer got started with excitement and looks to close out with even more excitement over the coming months.

First, I want to say thank you to the membership and for the opportunity to serve you another term on the Board of Directors. This will be my third consecutive term and fifth year on the Board. While the time has flown, I have seen several positive movements and initiatives put forth for the Organization and worked with some top-notch people over the past four years. From doubling the number of Technical Transfers we offer every year, to shaking up the Membrane Operator Certification School to facilitate bite sized pieces of the curriculum, to sharing some great times with many of you at the Spring Symposiums, I have sincerely enjoyed my participation as a Board Member.

Further, I am honored to be nominated and selected to serve in the role as President for the coming year. I’ll look to carry on the numerous improvements of the Organization while continuing the educational service and community engagement with the industry’s Operators, Engineers, Utility Managers, Vendors and Students throughout the southeast region. Over the coming year, I invite each of you to seek out any Board Member (check the website if you are unaware of who to contact) including myself with any ideas to make our Organization more effective at providing value to your professional career or your organization. We see a significant value to municipalities in joining SEDA as well as individual Operators. As a Board, we have been, and will continue looking to strengthen the value you receive from your SEDA membership.

First, I’d like to welcome and congratulate the recently elected/re-elected Board Members including Division I Directors: Michael Bailey, P.E. of Cooper City Utility; Edward Stover of Coral Springs Improvement District; Division II Directors: Paul Jacobs of Jacobs Air and Water; Jarret Kinslow, P.E. of Tetra Tech; Division III Director: Lance Littrell, P.E. of Reiss Engineering; and seated as the At-Large Director: Amanda Barnes, P.E. of Jupiter Utilities. In line with providing additional value to you, I have wonderful news; the Board has expanded to 15 Directors from the previous count of 11 Directors. The expansion of the Board was announced at the annual membership meeting for those of you who weren’t able to attend the Spring Symposium. In conjunction with the recently elected/re-elected board members, the expanded seats of the Board were nominated and selected by the Board of Directors following the 2015 Spring Symposium. With a warm welcome, I get to announce the appointed Board Members for the expanded seats as Division I Director: James Hewitt of Hilton Head Island PSD; Division II Director: Mo Malki of Alkema Solutions, Inc.; Division III Director: Charlie McAllister of Fedco USA; and the At-Large Director: Christopher Kuzler, P.E. of King Engineering Associates, Inc. This was a tall task that carried much debate over the past year and I am pleased to announce and welcome the new Members to the Board.

Now let’s get into the fun stuff… Our committee Chairs have been planning over the last couple of months and are gearing up for quite a number of events that will certainly be close to your area. First, the Technical Transfer Committee is siting one-day educational events at the following locations this year: North Miami Beach, Palm Bay, Palm Coast, Jupiter, and Virginia so no shortage of opportunities to get quality CEUs from our industry’s experts. Our MOC Committee is gearing up for modules to be presented at Hilton Head and Boca Raton through this year and several locations and modules are lining up for 2016. Keep an eye on the SEDA website (www.southeastdesalting.com) for updates on each event and locations for new events as they are scheduled.

Of course, don’t forget to book your calendars for June 5th to 8th, 2016 for the Annual Symposium. Next year’s event is held at a popular destination for the entire family in Bonita Springs. Mark your calendars because we want to share the excitement with you at this fun filled resort.

Keep an eye out for the next newsletter and website updates as we have a lot of goals for this year. New MOC Modules, new Technical Transfers, and maybe even a name change to reflect our complete membrane coverage are in the works. What are your suggestions? What can we improve? Feel free to email your thoughts to me at lrlittrell@reisseng.com.

Have a great finish to the summer and come join us at the next event. Give us a call or drop us an email to register, we look forward to seeing you there.

All the best,

Lance R. Littrell, P.E. Reiss Engineering, Inc.
Dear SEDA Members,

Hello! It has been a pleasure to serve you as SEDA President for the past two years. I am truly honored to be a part of such a great organization! I have witnessed firsthand during my tenure on the Board of Directors your commitment as SEDA members to improving water quality through membrane treatment and providing opportunities to the water and wastewater industry for continued education in membrane technology. I have watched you interact and network with fellow SEDA members building both professional relationships and long term friendships. And I have been encouraged by your success stories in overcoming operational and maintenance challenges using strategies you have learned through SEDA and from other SEDA members who have experienced similar challenges. I want to commend you on the role you have played as a SEDA member in electing the SEDA Board of Directors over the years. The Boards I have been honored to serve on have consisted of dedicated, hardworking, selfless, smart individuals who truly desire to make SEDA a better organization every day. Keep up the good work! As the outgoing President, I want to assure you that SEDA is in good hands! I am excited about the vision the SEDA Board has for SEDA’s future and look forward to participating with you in making it a reality. I encourage you to get involved! Thank you for your continued membership and support. I look forward to seeing you at a future SEDA event!

Amanda Z. Barnes, P.E.
2014-2015 Outgoing SEDA President
2015 Symposium Recap: Who was there?

By: Lance Littrell, Program Chair

Thank you and congratulations to the members that attended the 2015 Spring Symposium at the Hutchinson Island Marriott Beach Resort and Marina on Florida’s Treasure Coast. The event was quite a success for SEDA as we received numerous attendee comments focused on the great technical program as well as the always popular family style atmosphere SEDA is accustomed to delivering. From the networking social event Sunday evening, to the Operator Challenge and facility tours of Martin County’s Tropical Farms Treatment Plant, attendees enjoyed a playful atmosphere full of technical education.

Kicking off the Symposium, attendees got to network with peers across the southeast swapping stories of successful cleanings and reminiscing of past SEDA events while enjoying the scenery of the Treasure Coast.

Monday’s full itinerary of technical presentations covered a number of topics from the basic fundamentals of RO, MF, UF and MBR membrane treatment to new concerns such as emerging contaminants and disinfection byproducts. Following lunch, our previous Plant of the Year award winners contributed by sharing their successes as well as some prominent facilities perspectives on asset management and maintenance programs. Closing out the afternoon, attendees were updated on the general direction of the organization through the annual membership meeting and topped off with plenty of food and drinks while extending networks with other peers around the industry.

Tuesday morning offered a split session of hands-on educational interaction on the topics of instrument calibration, membrane autopsy encounter and solids filtration techniques as well as a facility tour hosted by Martin County’s Tropical Farms Water Treatment Plant. Both the hands-on sessions and the facility tour were well-received educational opportunities for those that attended. Offering a break in the technical program, the awards luncheon highlighted several members and facilities accomplishments and honors throughout the year. A list of the award winners and their awards are as follows:

- **Outstanding Membrane Plant Award - Large System > 5 MGD:** Palm Beach County Water Treatment Plant #9
- **Outstanding Membrane Plant Award - Small System < 5 MGD:** Town of Smithfield, Virginia RO Plant
- **Vendor of the Year Award:** Hydranautics/Nitto Group Company
- **Instructor of the Year:** Neil Gorman, Jacobs Air Water Systems
- **Outstanding Membrane Plant Operator Award:** John Niederhiser, North County Regional WTP, Collier County
- **Lifetime Achievement Award:** Brian Matthews, City of Palm Coast
Tuesday afternoon and Wednesday morning continued the delivery of technical topics and operational challenges through facility case studies. Topics including zero liquid discharge, cleaning, and facility transition to operation provided valuable insight to resolving challenges that hamper our southeast region’s utilities. Lastly, the ever popular Operator Challenge did not disappoint with entertainment as well as prizes for participating operators. While they may not have known the sound of a Wookie, there were no shortage of answers for the membrane themed game show.

On behalf of SEDA and the Program Committee, I’d like to offer a special thank you to all the presenters and tour guides as their voluntary involvement continues to make the SEDA Symposium a valuable resource for our membership and region. Additionally, I would like to thank the exhibitors and sponsors for their generous contribution to supporting the Organization as well as this Symposium. Without these volunteers, exhibitors and sponsors, our events would not be such a success or provide the level of education to our membership.

For those of you that weren’t able to attend, mark your calendars for June 5-8th of 2016 as we look forward to seeing you at our 2016 Symposium at the Hyatt Regency Coconut Point Resort and Spa located in Bonita Springs, Florida.

2015 Distinguished Service Awards

President’s Recognition Awards

Special Recognition Awards

Robert O. Vernon “Operator of the Year” Award

By: Harold Fravel, Jr., Ph.D., American Membrane Technology Association

The American Membrane Technology Association (AMTA) gives out the Robert O. Vernon “Operator of the Year” award annual from nominees all over the United States. This award recognizes operators who strive to constantly improve operations in a membrane facility. This year’s award went to Michael Vernon of the Indian River County Utilities in FL for his dedication and recognition by his colleagues for leading by example and for his active role in troubleshooting problems. Michael was the 2014 SEDA Operator of the year and was nominated by SEDA for this national award. Michael was given his award at the Membrane Technology Conference and Exposition in Orlando, FL this past March.

By: Harold Fravel, Jr., Ph.D., American Membrane Technology Association
Continued from cover... to improve their communication skills and builds a bridge between the operators and maintenance staff, making them a unified team. Working together, the WTP 9 team completes many big projects in-house, including changing out their own membranes. This in itself was a very critical decision. In 2006 after seeing a decline in our permeate water production, a loss of about 400 to 500gpm per train. We have 8 trains that consist of 69 vessels (47 first stage, 22 second stage, with 483 membranes in total). We checked our numbers and did some investigation and decided that by removing our lead element it would give us better production. This change however caused each train to come back to their peak performance of 1890 gpm. And with continued cleanings, flushing’s and monitoring of the membranes performance. Thru autopsies throughout the years we were able to exceed the manufactures recommended life expectancy of 7 years and got 11 years, an extra 4 years of use. Based on the manufactures recommendations we realized that a membrane change out was emanate, so we made plans and budgeted monies for our membrane change-out. By December 2013 the staff at WTP 9 had changed out the membranes from 7 of our 8 trains with substantial cost savings to the County. The WTP 9 team is responsible for maintaining and ensuring the drinking water produced is of its highest standards possible.

GOING GREEN

Operating a modernized nanofiltration plant means keeping up with evolving technology. The WTP 9 team is constantly looking forward and discussing new projects to improve the plant and its treatment process. They have already developed future plans for their disinfection system. Instead of the current configuration of having two chlorine pumps running at the same time, soon there will be just one pump feeding a common manifold system. An associated ongoing project is converting the facility’s chlorine valves from manual to automatic, helping operators regulate the flow of chlorine more efficiently. Staffs have also embraced “Going Green” in an effort to be one of the most efficient treatment plants in the County. WTP 9 team is replacing the facility’s old high-service pumps with new variable-frequency drives. Replacing these pumps is expected to reduce energy costs by 30 percent. Working together, Chief Operator Thomas Dineen, Industrial Electrician Carlos Silva and Painter Miguel Vergara formulated a plan to further reduce power consumption and save money. First on their to-do list was changing the ceiling paint to a high-gloss white. Changing the ceiling paint color enabled WTP 9 to replace their high-pressure sodium lights to low-watt fluorescent lights to cut energy costs. In addition, Carlos Silva has been replacing the plant’s old transformers and ballasts and installing power compact tubes with equivalent lighting. Throughout this project, Vincent Munn and lead operator James Lee worked closely with Florida Power and Light and as a result of their efforts; WTP 9 has received a significant rebate from FPL. But the WTP 9 team isn’t resting on its laurels. The team is improving lighting requirements even further with new LED lights. According to Chief Operator Tom Dineen, many benefits come from switching to LED lighting. The primary benefit of LED bulbs is their extraordinary long life span—11 years of continuous use with an estimated efficiency rating of 80-90 percent. LED lights also are free from toxic materials, 100 percent recyclable, and produce little infrared light or ultraviolet emissions. LED bulbs alone will reduce WTP 9’s lighting carbon footprint by one-third. The WTP 9 team also plans to conserve energy by installing solar panels. The panels will be put on the facility’s newly constructed pavilion, acting as the main power source for the building’s exhaust fans and lighting. In addition, any unused power from the panels will be redirected back into the water plant’s main power supply to help reduce energy costs. Thru the years WTP 9 has received many prestigious awards and accolades for their excellence in a number of different categories.


Palm Beach County Directors Award 2004

AWWA 2011 Excellence Award for “Class A Water Treatment Facility.

In short, the WTP 9 team has transformed the facility from an outdated relic to an ultramodern plant while continuing to embrace new technology.
The Influence of Cleaning Solution pH on Membrane Foulants

By Mo Malki, Alkema Solutions, Inc.

Cleaning solution pH is one of the most important aspects of the cleaning procedure. Everyone knows that a high pH cleaning and a low pH cleaning are part of a good cleaning program. But many neglect the importance of maintaining the target pH throughout the entire procedure.

When performing high pH membrane cleaning, the pH decreases as chemical is consumed by the reaction with foulants. This makes the cleaning solution less effective, and more cleaning chemical must be added. The opposite is true with low pH membrane cleaning, where the reaction with scales results in an increased cleaning solution pH. In that case, more chemical must be added to lower the pH so that the solution can continue to dissolve scale.

**Don’t forget to check the solution pH every 15 minutes throughout the entire duration of the membrane cleaning, and do adjust the pH back to the target range as necessary by adding more chemical.**

**High pH**

- Cleaning at high pH makes organic acids negatively charged so that they repel each other and disperse into the cleaning solution. The higher the pH, the higher the fraction of organic acids that become negatively charged. Cleaning at pH 10 is typically only effective for very light biological fouling.

  **For moderate organic and/or biological fouling, do clean at pH >11, and for heavy fouling, do clean at a pH of at least 12.**

- Many high pH cleaning chemicals tend to foam. They contain surfactants that attract to hydrophobic foulants, like oils and biofilm, and emulsify them into solution.

  Surfactants must be present in a high enough concentration to form micelles – clusters of surfactant molecules that group together and build up a tremendous attraction to hydrophobic foulants.

  Some plant operators are irritated by foaming and try to control it by reducing the dosage of cleaning chemical. This will reduce the surfactant to below the critical micelle concentration (CMC), making the cleaning solution much less effective. Membrane cleaning may then have to be performed more frequently, which probably outweighs the hassle of dealing with foam.

  **Don’t reduce the dosage of cleaning chemical just to avoid foaming; doing so will drastically reduce the effectiveness of your cleaning. Always use the dosage recommended by your chemical supplier.**

**Low pH**

- Organic acids in Natural Organic Matter (NOM) and biofilms become negatively charged at high pH, but lose that charge at low pH. Some permeate is always produced by the membranes during cleaning which creates a “drag”, pulling uncharged foulant into the membrane.

  **Don’t clean at low pH when organics are present, it only compacts them into the membrane, since they no longer have repulsion charges.**

  All biofilms contain proteins, and acidic solutions hydrolyze proteins into positively charged amino acids. The cationic amino acids can irreversibly bind to the negatively charged membrane surface.

  **Don’t ever perform a low pH cleaning ahead of a high pH cleaning if biological fouling is suspected.**

- Low pH membrane cleaning involves a reaction of chemical with carbonate, phosphate, or hydroxide scales. These reactions are very fast, and because acid molecules are consumed, there is an instant increase in pH.

  Soaking a scale at a neutralized pH defeats the purpose of a low pH cleaning. **Do circulate to continuously remove solution saturated with dissolved scale and replace it with fresh low pH solution.**

  **Don’t soak when trying to remove carbonate scales with low pH membrane cleaning; it will only serve to lengthen your required cleaning time.**

Always consult your membrane manufacturer regarding pH, temperature and flowrate tolerances prior to any membrane cleaning.

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**We need your input for the SEDA Newsletter!**

- Share your experiences with others
- Take this opportunity to place your company or plant in the news
- Contributions are welcome. Please submit articles to momalki@membranechemicals.com

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SEDA QUIZ

By: Brian Matthews, City of Palm Coast

1. The two major categories of membrane processes used in water treatment are:
   A. Electrodialysis (ED) and Micro Filtration (MF)
   B. Permeable (pressure driven) and Non-Permeable
   C. Reverse osmosis (RO) and Ion Exchange (IX)
   D. Ultrafiltration (UF) and Nanofiltration (NF)

2. Which of the following statements are NOT true about osmosis:
   A. Osmosis is the spontaneous flow of water from a dilute solution to a concentrated solution when separated by a semi-permeable membrane
   B. Osmotic pressure is a thermodynamic property dependent on hydrolysis
   C. Osmotic pressure is a property of the semi-permeable membrane
   D. Osmosis occurs in living organisms

3. If the feedwater TDS decreases, then the:
   A. Osmotic pressure increases
   B. Osmotic pressure decreases
   C. Permeate quality declines
   D. Applied pressure decreases

4. High salt passage in conjunction with higher than normal permeate flow could be an indication of:
   A. Excessive membrane fouling
   B. Operation at higher than design recovery
   C. Chemical degradation of the membrane
   D. An improvement in operating efficiency

5. A system with a permeate flow of 100 gpm, and concentrate flow of 25 gpm, is said to be operating at:
   A. 80% recovery
   B. 75% recovery
   C. 20% recovery
   D. 25% recovery

6. What calculation is used to convert degrees Fahrenheit to degrees Celsius?
   A. \((\text{°F} - 32) \times 0.555\)
   B. \((1.8 \times \text{°C}) + 32\)
   C. \(273.15 + (\text{°F} - 32) \times 0.555\)
   D. \((\text{°F} + 273.15) - 32 \times 0.555\)

7. Percent (%) Recovery is expressed mathematically as? \((Q = \text{Flow})\)
   A. \(\left(\frac{Q_{\text{in}}}{Q_{\text{out}}}\right) \times 100\)
   B. \(\left(\frac{Q_{\text{in}}}{Q_{\text{out}}}\right) \times 100\)
   C. \(\left(\frac{Q_{\text{mem}}}{Q_{\text{in}}\text{ or }Q_{\text{out}}}\right) \times 100\)
   D. \(\left(\frac{Q_{\text{in}}}{Q_{\text{mem}}}\right) \times 100\)

8. If ED and EDR are electrically driven processes, how does the water pass through the membrane?
   A. The positive electrical charge attracts the water’s electrons pulling the water through
   B. The negative electrical charge attracts the water’s protons pulling the water through
   C. The water does not pass through the membrane
   D. The water reacts with the electricity causing nano-sparks that push the water through

9. Chemical dosages are usually expressed as:
   A. A percentage
   B. Gallons per day
   C. Milligrams per liter or ppm
   D. Pounds per square inch

10. Section 304 of EPCRA states, if a reportable quantity (RQ) of a CERCLA regulated material is released into the environment, what agency or agencies must be contacted immediately (within 15 minutes) by the owner or the operator (facility representative)?
    A. The State Warning Point (SWP – 800-320-0519)
    B. The National Response Center (NRC – 800-424-8802)
    C. The DOH
    D. Both A. and B., when in doubt, CALL BOTH AS FINANCIAL PENALTIES CAN BE SEVERE!

How do I Know if it is Time to Clean?

This question is frequently asked, but not always answered correctly.

If you look at the raw data that has been collected over the last several months and compare it with data taken today you may not reach the correct conclusion easily.

Data Normalization

Today almost all of the major membrane manufacturers will provide you with a normalization program for their products. I can’t encourage you strongly enough to take advantage of this valuable tool.

It is almost impossible to determine the proper time to clean a membrane system without normalized data. The greater the fluctuations of temperature and TDS in the feed water, the greater the need for normalized data.

Many systems are operated on feed waters that vary considerably seasonally or even daily. Determining the actual performance of one of these systems is like trying to hit a moving target. The calculations that are built into the normalization program will make all the corrections automatically.

If you trend the normalized data you will get an accurate picture of how your system is actually performing. It then becomes relatively easy to determine if the pressure differentials are increasing as well as where they may be changing. If the change is occurring in one stage this may be a clue to a possible process problem and the need to clean. I can not stress strongly enough the need to use normalized data when making decisions about cleaning your membrane system.

If you have a tip or a suggestion for a future article please contact Ben Mohlenhoff at (772) 546-6292 or bmohlenhoff@aerexindustries.com
Legal Requirements
By Miguel Arroyo, City of Fort Lauderdale

One of the challenges in running a water plant is ensuring that it properly and accurately implements all the applicable regulatory and legal requirements. These requirements come from a variety of sources; federal, state, county, etc.

As water professionals it is in our best interest to document each of these requirements. This can be achieved through a variety of electronic tracking tools. Perhaps, the most convenient would be to set up a spreadsheet that captures the elements of your legal requirements. For example, agency, title, description, and a link to the requirement language should be mandatory to the format. Then, on a periodic basis (annually) each of these elements will need to be reviewed and updated as needed. Furthermore, as the regulations evolve additional requirements would need to be included or deleted.

The effort involved in the log preparation is a preamble to verifying and eventually documenting each regulatory and legal requirement and demonstrating which organizational procedures implement them. The procedures should also be included in the same log and reviewed for adequacy on a periodic basis, usually annually.

In closing, these efforts would allow the organization to demonstrate to both their respective board and regulators that all the regulations and legal requirements that have the potential to impact the plant operations or its environmental compliance are being addressed. Ultimately, the Facility Manager (or his/her designee) would have the responsibility to communicate these rules and legal requirements to their suppliers, consultants, staff, etc. that perform work or activities for the facility that have the potential to impact their environmental compliance.
WELCOME NEW MEMBERS

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THE ISLAND WATER ASSOCIATION

JEFF ANDERSON
WATERSURPLUS

JUSTIN BARRINGTON
P.E., LEED A.P.
CITY OF BOCA RATON, UTILITY SERVICES DEPARTMENT

CHRISTOPHER BARTLEY
CITY OF POMPANO BEACH WATER TREATMENT PLANT

JEREMY BOOKER
CITY OF BOCA RATON, UTILITY SERVICES DEPARTMENT

BRENT BRODIE

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**Inside Recovery Zone Summer 2015**

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<tbody>
<tr>
<td>Michael Bailey (SECRETARY)</td>
<td>Legislative</td>
<td>2015-17</td>
<td>(954) 434-5519</td>
<td><a href="mailto:mbailey@coopercityfl.org">mbailey@coopercityfl.org</a></td>
</tr>
<tr>
<td>Richard Chamness</td>
<td>Awards/Scholarships</td>
<td>2014-16</td>
<td>(561) 338-7325</td>
<td><a href="mailto:rchamness@myboca.us">rchamness@myboca.us</a></td>
</tr>
<tr>
<td>Tony Fogel</td>
<td>Website</td>
<td>2014-16</td>
<td>(321) 288-8571</td>
<td><a href="mailto:anthony.fogel@palmbayflorida.org">anthony.fogel@palmbayflorida.org</a></td>
</tr>
<tr>
<td>James Hewitt</td>
<td>Election</td>
<td>2015-17</td>
<td>(843) 681-50535</td>
<td><a href="mailto:jhewitt@hhpsd.com">jhewitt@hhpsd.com</a></td>
</tr>
<tr>
<td>Edward Stover</td>
<td>Director</td>
<td>2015-17</td>
<td>(954) 796-6665</td>
<td><a href="mailto:eds@fladistricts.com">eds@fladistricts.com</a></td>
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**DIVISION 2 (four seats)**

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<tbody>
<tr>
<td>Jason Bailey (TREASURER)</td>
<td>Finance, Tech Transfer</td>
<td>2014-16</td>
<td>(919) 568-8624</td>
<td><a href="mailto:jbailey@avistatech.com">jbailey@avistatech.com</a></td>
</tr>
<tr>
<td>Paul Jacobs</td>
<td>Membership</td>
<td>2015-17</td>
<td>(813) 888-5556</td>
<td><a href="mailto:paul@tscjacob.com">paul@tscjacob.com</a></td>
</tr>
<tr>
<td>Jarrett Kinslow (VICE PRESIDENT)</td>
<td>Operator Certification</td>
<td>2013-15</td>
<td>(407) 839-3955</td>
<td><a href="mailto:jarrett.kinslow@tetratech.com">jarrett.kinslow@tetratech.com</a></td>
</tr>
<tr>
<td>Mo Malki</td>
<td>Newsletter</td>
<td>2015-16</td>
<td>(813) 246-5448</td>
<td><a href="mailto:momalki@membranechemicals.com">momalki@membranechemicals.com</a></td>
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**DIVISION 3 (three seats)**

<table>
<thead>
<tr>
<th>Member</th>
<th>Committee</th>
<th>Term</th>
<th>Phone</th>
<th>Email</th>
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<tbody>
<tr>
<td>Ron Castle</td>
<td>Technology Transfer</td>
<td>2014-16</td>
<td>(941) 488-9671</td>
<td><a href="mailto:roncastle@hamrosystems.com">roncastle@hamrosystems.com</a></td>
</tr>
<tr>
<td>Lance Littrell (PRESIDENT)</td>
<td>Program &amp; Finance</td>
<td>2013-15</td>
<td>(407) 679-5358</td>
<td><a href="mailto:lrlittrell@reisseng.com">lrlittrell@reisseng.com</a></td>
</tr>
<tr>
<td>Charlie McAllister</td>
<td>Director</td>
<td>2015-16</td>
<td>(941) 953-4608</td>
<td><a href="mailto:cmcallister@fedco-usa.com">cmcallister@fedco-usa.com</a></td>
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**DIVISION AT-LARGE (three seats)**

<table>
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<tr>
<td>Amanda Barnes</td>
<td>By-Laws and Policies</td>
<td>2015-17</td>
<td>(561) 746-5134</td>
<td><a href="mailto:amandab@jupiter.fl.us">amandab@jupiter.fl.us</a></td>
</tr>
<tr>
<td>Chris Kuzler</td>
<td>Membership, Program</td>
<td>2015-17</td>
<td>(813) 880-8881</td>
<td><a href="mailto:ckuzler@kingleading.com">ckuzler@kingleading.com</a></td>
</tr>
<tr>
<td>David Laliberte</td>
<td>Program</td>
<td>2014-16</td>
<td>(919) 833-7152</td>
<td><a href="mailto:dlaliberte@hazenandsawyer.com">dlaliberte@hazenandsawyer.com</a></td>
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