

# FWEA Manasota Chapter

Vol 12 - November 2012

## Message from the Steering Committee

*By Lindsay Marten, EI, LEED AP, Stantec  
Public Relations/Webmaster Chair*

### FWEA Manasota Chapter Wraps Up 2012

The FWEA Manasota Chapter would like to take the time to recap the noteworthy events that took place at the end of 2012. From the community-based gatherings that raised money and awareness for great causes to the quarterly luncheons where presentations were given to a roomful of water and wastewater professionals, there was never a dull moment within the Chapter.

The FWEA Manasota Chapter along with FSAWWA Region X hosted the 4th annual Water For People Kayak and Picnic event on October 12, 2012, from 4:00 p.m. to 7:30 p.m. at the Phillippi Creek Estate Park. Paddlers and volunteers of all ages and skills suited up for a serene afternoon of kayaking along Roberts Bay. Silent Sports Outfitters of Nokomis provided boats and guides to ensure that the participants had a safe and enjoyable time.



*Kristiana Dragash and Lindsay Marten pose for a photo while searching for wildlife in Roberts Bay.*

Roberts Bay offered calm waters, wildlife of all varieties, and picturesque scenery for adventurous kayakers to explore. The day ended perfectly with delicious Mexican food and cold beverages provided by Baja Boys Mexican Surf Grill of Sarasota, outdoor games, and music. The event brought friends, families, and members of the water profession together while raising awareness and funds for Water For People.

The 10<sup>th</sup> annual AWWA Model Water Tower Competition was held on November 3, 2012, from 8:30 a.m. to 1:00 p.m. at Carlos E. Haile Middle School in Bradenton. It was a successful turnout, with an abundance of students and volunteers that showed up to participate in this nationwide competition. Water quality professionals from the community joined forces, including members from our very own Manasota Chapter, to help plan and partake in this national event. The



*Stantec volunteers, Dick Michael (left) and Paul Lewis (center), test a high school student's model water tower at the hydraulics station.*

Manasota Chapter also helped with a monetary donation to help provide food for the occasion. This event introduced students to water issues and water professionals from their community by challenging them to

*Continued on page 2*

# Calendar of Upcoming Events

## NOVEMBER

**15** ASCE Suncoast Branch Meeting, Sarasota

**25-29** FSAWWA Annual Conference, Orlando

**29** FWEA/FBC Benchmarking Workshop, St. Petersburg

## DECEMBER

**6** FWEA Manasota Chapter Luncheon, Lakewood Ranch\*

**13** FES Myakka Chapter Christmas Social, Sarasota



## November

SUN	MON	TUE	WED	THU	FRI	SAT
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

## December

SUN	MON	TUE	WED	THU	FRI	SAT
						1
2	3	4	5	6 FWEA Manasota Luncheon*	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

*Continued from page 1*

design and construct miniature water storage towers. Students creatively constructed the models themselves while taking into account structural, hydraulic, and cost efficiency, along with design ingenuity. Involvement also showed students the countless opportunities available in this valuable field. The activities, participation gifts, and prizes made the contest an enjoyable learning experience for everyone.

If you were unable to attend the previous events, you're in luck! The last luncheon of the year will be held on December 6, 2012, at the Polo Grill in Lakewood Ranch. Cindi Mick, Director of North Port Utilities, will be presenting to a roomful of intrigued local professionals concerned with water quality and the environment. Cindi's discussion will include her recent Rwanda Water For People trip and diversifying sources for long-term sustainability at the North Port Reverse Osmosis (RO) Plant. We hope to see you there!

2012 has been packed with events and exciting updates. On behalf of the FWEA Manasota Chapter, we would like to thank all of the participants, volunteers, presenters, and sponsors for making these events possible. Keep your eyes and ears open for more great opportunities and occasions to come in 2013!



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We are currently seeking a Vice-Chair  
and additional members at large.*

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# Consultant's Corner: A New Water Treatment Plant and Process for Arcadia

By Julie Karleskint, PE - Hazen and Sawyer

## Introduction

The City of Arcadia, FL, is currently replacing their 3-mgd Lime Softening Water Treatment Plant (WTP) with a new 1.5-mgd WTP using ion exchange technology. The existing plant has reached the end of its serviceable life and treatment of groundwater for the removal of radionuclides is necessary to maintain compliance with state drinking water standards, along with treatment for hardness, sulfides, organic carbon, and fluoride to meet optimum water quality goals. After evaluating several treatment technologies, it was determined that ion exchange would be the most cost-effective option for the City to meet water quality standards and provide optimum water quality. A reduction in treatment capacity was also provided since the City's water supply source, groundwater from the intermediate aquifer, was limited based on current pumping and permitted capacity. The reduced capacity also allows the City to reduce staffing from 16 hours/day to 6 hours/day, which will result in reduced operational cost.

## Review of Ground Water Quality

Groundwater is supplied by the intermediate aquifer. Table 1 provides a summary of existing groundwater quality based on analysis of the combined wells that discharge to the WTP.

Based on this typical groundwater quality, treatment is necessary for the removal of radium 226 and gross alpha which exceed primary drinking water standards. Even though fluoride concentrations exceed secondary standards, which is a considered a primary standard in Florida, it was determined that fluoride standards could be met by good well field management and a small amount can also be removed by anion exchange.

Concentrations of sulfide, total organic carbon (TOC), and hardness are also of concern in order to reduce chlorine demand, meet TTHM water quality standards, and avoid excessive scaling of the water.

## Concerns over Ion Exchange Disposal

Ion exchange was determined to be the most cost effective treatment for radionuclides and can also provide treatment for reduction of sulfides, hardness, and TOC. Cation exchange is commonly used for the removal of radionuclides and hardness. Anion exchange can be utilized for the removal of sulfides, organic carbon, and possibly some fluoride. Therefore, selection of the ion exchange process will provide treatment that meets all primary and secondary drinking water standards for final finished water quality. However, since ion exchange can utilize a significant amount of salt in its process, there were concerns as to how much salt would be added to the wastewater system if all the water was treated.

Table 1. Arcadia Groundwater Quality

PARAMETER	RESULT	UNIT
Sulfide	1.58	mg/L
Iron	0.03	mg/L
Color	11	units
Turbidity	0.5	NTU
Alkalinity	220	mg/L
Calcium Hardness	47	mg/L
Chloride	19	mg/L
Fluoride	2.26	mg/L
Hardness	258	mg/L
Sulfate	20	mg/L
TOC	5.2	mg/L
Aluminum	<0.02	mg/L
Sodium	31	mg/L
Gross Alpha	26	pCi/L
Radium 226	9	pCi/L
Radium 228	1	pCi/L
Bicarbonate Alkalinity	220	mg/L

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# Consultant's Corner: A New Water Treatment Plant and Process for Arcadia [cont.]

By Julie Karleskint, PE - Hazen and Sawyer

The City's Wastewater Plant (WWTP) is a 2-mgd trickling filter plant with high-level disinfection to provide public access reuse. The plant provides reclaimed water to orange groves, a golf course, cemetery, parks and residential customers with a back-up surface water discharge for wet weather. High concentrations of salt in irrigation water can reduce crop productivity by reducing the amount of water available to the crops due to competing ions and cause soils to become sodic resulting in a degraded soil structure (T.A. Bauder, et.al.). Therefore, the amount of salt that would be added to the wastewater plant as a result of the ion exchange process was a significant concern.

Pilot testing was performed to evaluate the resins for both the cation and anion systems. The cation system provides softening and radium removal and the anion system provides for the removal of sulfide and TOC. The pilot test evaluated the efficiency of the resins with respect to brine regeneration, vessel head losses and the approximate run time length for both the cation and anion resins.

Using the data obtained by the pilot testing, it was determined that 50 percent of the groundwater could be bypassed around the cation exchange system and recombined prior to the anion exchange system to meet radionuclide water quality standards. The testing also showed that with the addition of aeration prior to anion exchange, the efficiency can be increased resulting in longer runs prior to regeneration being required. Aeration promotes biological oxidation in the anion exchange vessels and the establishment of sulfur-oxidizing bacteria that can bacteriologically oxidize the sulfide. Thus reducing the amount of salt required. Based on the pilot testing, it



*Anion Vessel Influent In-Line Aerator*

was determined then that all the water could be treated through the anion exchange process resulting in reduced sulfide and TOC concentration, which would result in a lower chlorine demand. Using this blend, it was estimated that approximately 1,500 lbs/salt would be required to treat 1 MG of water. The expected water quality from this treatment process is shown in Table 2.

**Table 2. Anticipated Water Quality after Treatment**

PARAMETER	ANTICIPATED WATER QUALITY (MG/L)
Radium 226	<5
Hardness	130
Total Sulfide	<1
TOC	<2
Fluoride	2
Sodium	90

Since only 50 percent of the water is to be treated in the cation exchange columns and biological oxidation in the anion exchange columns significantly reduced salt requirements, it was determined that the annual average sodium and chloride wastewater effluent finished water concentrations would not exceed the wastewater plant effluent limits. The sodium absorption ratio (SAR) was also evaluated since much of the reclaimed water is used for irrigation of citrus and it was determined that a SAR less than 5 could be maintained which is not anticipated to cause negative impacts to reclaimed water users.

## Final Recommendations

Based on the pilot test results and preliminary engineering study, it was recommended that a 1.5-mgd cation and anion ion exchange facility be constructed



*Arcadia Ion Exchange WTP Construction*

with the capability of blending the ion exchange treated streams followed by disinfection, storage and high service

# Consultant's Corner: A New Water Treatment Plant and Process for Arcadia [cont.]

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pumping. Additional treatment for pH adjustment to stabilize the water and control corrosion is also provided. The ion exchange regenerant waste will be captured and stored in tanks on-site and slowly pumped under a flow control loop to the wastewater collection system to minimize impacts to the wastewater treatment plant

process. Just as important, the additional salt load to the WWTP should not negatively impact agricultural reuse based on the SAR. The City is currently proceeding with construction with Cardinal Contractors of Lakewood Ranch with completion anticipated in early 2013.



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## Luncheon Meeting - December 6, 2012

### *Rwanda Water For People Trip and the North Port RO Plant: Diversifying Sources for Long-Term Sustainability*

*by Cindi Mick - Director of Utilities, City of North Port*

#### **Abstract**

In September, Cindi went to Rwanda, a small landlocked country in east-central Africa, with Water For People. Water For People is an organization that helps people in developing countries improve quality of life by supporting the development of locally sustainable drinking water resources, sanitation facilities, and hygiene education programs.

The City of North Port, FL, has been diversifying sources of water with the goal of long-term sustainability. Raw water is treated at the City's WTP, which is currently being expanded to add wells and RO treatment. This project, which will be completed early 2013, is considered the Utility Department's most important current project, which will improve water quality and add capacity for future growth.

#### **Cindi Mick**

Cindi Mick was raised in southern Ohio. She graduated with a degree in Biology from Florida State University and began her career as a Research Biologist at Florida State University.

Cindi's career changed to local government when she moved to Sarasota County. She worked as a supervisor in Pollution Control for Sarasota County, which led to a management position with the City of North Port in 1987. She was the Director of Public Works/Sanitation and the Public Services Director for the City prior to becoming the Director of North Port Utilities in 1992.

While her career with City is most important, Cindi is also committed to volunteer work. She taught English and GED in North Port for years and has worked as a volunteer in Ivory Coast Africa for the Peace Corps. She has participated in water projects with Water For People, traveling to Bolivia, India, Malawi and has just returned from volunteering in Rwanda.

#### **FWEA MANASOTA CHAPTER LUNCHEON MEETING**

##### **FÊTE/POLO GRILL RESTAURANT**

10670 Boardwalk Loop, Lakewood Ranch, FL 34202

Registration - 11:30 • Lunch and Program - 12:00

**Choice #1** - Lynn's Salad with or without Chicken    **Choice #2** - Shaved Prime Rib Sandwich with Kettle Chips

Cost: \$20 for pre-registered members, \$25 for pre-registered non-members  
(please register online or by mail, phone, fax, or e-mail) OR \$25 at the door, \$15 for student  
No credit card payments day of event - check (made payable to FWEA) or cash only please.

*Pre-registration deadline: Friday, November 30*

#### **REGISTRATION FORM**

Registration can be made by mail, phone, fax, or e-mail, with payment mailed in advance or collected at the door.

Name	Company/Affiliation	Phone	Choice of Meal

You can register online at [www.fwea.org](http://www.fwea.org) or register by phone, fax, or e-mail to Linda Maudlin  
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