

**Bid Tabulation Packet
for
Solicitation PNC2117097P1**

**Engineering Services for Water and Wastewater
Services**

Bid Designation: Public



Broward County Board of County Commissioners

Bid #PNC2117097P1 - Engineering Services for Water and Wastewater Services

Creation Date Jul 3, 2018

End Date Nov 7, 2018 5:00:00 PM EST

Start Date Oct 10, 2018 6:20:02 PM EDT

Awarded Date Not Yet Awarded

PNC2117097P1--01-01 Engineering Services for Water and Wastewater Services					
Supplier	Unit Price	Qty/Unit	Total Price	Attch.	Docs
Craven Thompson & Associates, Inc.	First Offer -	1 / each		Y	Y
Product Code: Agency Notes:		Supplier Product Code: Supplier Notes: Craven, Thompson & Associates, Inc. has 2 cases to report. We were only able to submit 1 case on the "Litigation History Form". Both cases are included in Section 8 of our Submittal along with the backup documentation. There is not enough room on the Volume of Previous Work Attestation Form to report all contracts that Craven Thompson has received payment for within the last 5 years. Please refer to Section 7 for a complete list.			
CDM Smith	First Offer -	1 / each		Y	Y
Product Code: Agency Notes:		Supplier Product Code: Supplier Notes:			
R. J. Behar & Company, Inc. [Ad]	First Offer -	1 / each		Y	Y
Product Code: Agency Notes:		Supplier Product Code: Supplier Notes:			
Black & Veatch	First Offer -	1 / each		Y	Y
Product Code: Agency Notes:		Supplier Product Code: Supplier Notes:			
300 Engineering Group, P.A. [Ad]	First Offer -	1 / each		Y	Y
Product Code: Agency Notes:		Supplier Product Code: Supplier Notes:			
CES Consultants, Inc.	First Offer -	1 / each		Y	Y
Product Code: Agency Notes:		Supplier Product Code: Supplier Notes:			
Carollo Engineers	First Offer -	1 / each		Y	Y
Product Code: Agency Notes:		Supplier Product Code: Supplier Notes: Uploaded Documents Evaluation Criteria - Category 2, Evaluation Criteria Category 3, Letters of Intent, Insurance Requirements, Vendor References, Broward County Tax, Authority to Conduct Business in FL, Litigation - Sub			
Stantec Consulting Services Inc.	First Offer -	1 / each		Y	Y
Product Code: Agency Notes:		Supplier Product Code: Supplier Notes:			
Calvin, Giordano & Associates, Inc. [Ad]	First Offer -	1 / each		Y	Y
Product Code: Agency Notes:		Supplier Product Code: Supplier Notes:			
Miller Legg	First Offer -	1 / each		Y	Y
Product Code: Agency Notes:		Supplier Product Code: Supplier Notes:			
Chen and Associates	First Offer -	1 / each		Y	Y

Product Code:		Supplier Product Code:			
Agency Notes:		Supplier Notes:			
Hazen and Sawyer, P.C.	First Offer -	1 / each		Y	Y
Product Code:		Supplier Product Code:			
Agency Notes:		Supplier Notes:			
Keith and Associates, Inc.	First Offer -	1 / each		Y	Y
Product Code:		Supplier Product Code: Category 1			
Agency Notes:		Supplier Notes:			

Supplier Totals

f CDM Smith				\$0.00	
Bid Contact	Carissa Burlakos piersonjl@cdmsmith.com Ph 407-618-7481	Address	101 Southhall Lane, Suite 200 Maitland, FL 32751		
Bid Notes	We acknowledge receipt of Addendum # 1.				
Agency Notes:		Supplier Notes:	We acknowledge receipt of Addendum # 1.		Head Atch: 
f Keith and Associates, Inc.				\$0.00	
Bid Contact	Dodie Keith marketing@keithteam.com Ph 954-788-3400	Address	301 East Atlantic Boulevard Pompano Beach, FL 33060		
Supplier Code	VC0000038979				
Qualifications	CBE DBE SB WBE				
Agency Notes:		Supplier Notes:			Head Atch: 
f CES Consultants, Inc.				\$0.00	
Bid Contact	Rudy Ortiz cesinfo@cesconsult.com Ph 305-827-2220 Fax 305-827-1121	Address	880 SW 145th Ave Suite 106 Pembroke Pines, FL 33027		
Supplier Code	VC0000038829				
Qualifications	CBE DBE MBE SB				
Agency Notes:		Supplier Notes:			Head Atch: 
f 300 Engineering Group, P.A. [Ad]				\$0.00	
Bid Contact	Rodolfo Remon reremon@300engineering.com Ph 786-352-6788	Address	3850 BIRD ROAD Suite 601 MIAMI, FL 33146		
Qualifications	DBE MBE SB				
Agency Notes:		Supplier Notes:			Head Atch: 
f Miller Legg				\$0.00	
Bid Contact	Cara Pasquale cpasquale@millerlegg.com Ph 954-436-7000	Address	1800 N. Douglas Road, Suite 200 Pembroke Pines, FL 33024		

Qualifications	SB		
Bid Notes	We have submitted Confidential Financial material by hand; this is noted in Section 8 of our electronic submittal		
Agency Notes:		Supplier Notes:	Head Attch: 
		We have submitted Confidential Financial material by hand; this is noted in Section 8 of our electronic submittal	
f	Black & Veatch		\$0.00
Bid Contact	Sheree Little littlesz@bv.com Ph 813-207-7930	Address	4890 West Kennedy Blvd Suite 950 Tampa, FL 33609
Agency Notes:		Supplier Notes:	Head Attch: 
f	Calvin, Giordano & Associates, Inc. [Ad]		\$0.00
Bid Contact	Marty Evans procurement@cgasolutions.com Ph 954-921-7781 Fax 954-921-8807	Address	1800 Eller Drive Suite 600 Fort Lauderdale, FL 33316
Agency Notes:		Supplier Notes:	Head Attch: 
f	Chen and Associates		\$0.00
Bid Contact	Peter Moore pmoore@chenmoore.com Ph 954-730-0707	Address	500 W Cypress Creek Road Suite 630 Fort Lauderdale, FL 33309
Qualifications	DBE MBE SB		
Agency Notes:		Supplier Notes:	Head Attch: 
f	Hazen and Sawyer, P.C.		\$0.00
Bid Contact	Julie Forgione jforgione@hazenandsawyer.com Ph 954-987-0066 Fax 954-987-2949	Address	4000 Hollywood Boulevard, 750N Hollywood, FL 33021
Agency Notes:		Supplier Notes:	Head Attch: 
f	Carollo Engineers		\$0.00
Bid Contact	Elizabeth Fujikawa efujikawa@carollo.com Ph 561-868-5400	Address	2056 Vista Parkway West Palm Beach, FL 33411
Bid Notes	We acknowledge Addendum No. 1. We have delivered our Financial Documents due to Confidentiality. We are submitting on both Category 2 & 3.		
Agency Notes:		Supplier Notes:	Head Attch: 
		We acknowledge Addendum No. 1. We have delivered our Financial Documents due to Confidentiality. We are submitting on both Category 2 & 3.	

f R. J. Behar & Company, Inc. [Ad]		\$0.00
Bid Contact	Robert Behar bbeh@rjbehar.com Ph 954-680-7771 Fax 954-680-7781	Address 6861 SW 196 Ave Suite 302 Pembroke Pines, FL 33332
Supplier Code	VC0000040324	
Qualifications	DBE MBE SB	
Agency Notes:	Supplier Notes:	Head Attch: 
f Stantec Consulting Services Inc.		\$0.00
Bid Contact	Grace Morales grace.morales@stantec.com Ph 305-445-2900 Fax 305-445-3366	Address 901 Ponce de Leon Blvd., #900 Coral Gables, FL 33134
Agency Notes:	Supplier Notes:	Head Attch: 
f Craven Thompson & Associates, Inc.		\$0.00
Bid Contact	Patrick Gibney pgibney@craventhompson.com Ph 954-739-6400	Address 3563 NW 53 Street Fort Lauderdale, FL 33309
Agency Notes:	Supplier Notes:	Head Attch: 

**

Carollo Engineers

Bid Contact **Elizabeth Fujikawa**
efujikawa@carollo.com
Ph 561-868-5400

Address **2056 Vista Parkway**
West Palm Beach, FL 33411

Bid Notes **We acknowledge Addendum No. 1. We have delivered our Financial Documents due to Confidentiality.**
We are submitting on both Category 2 & 3.

Item #	Line Item	Notes	Unit Price	Qty/Unit	Attch.	Docs
PNC2117097P1--01-01	Engineering Services for Water and Wastewater Services	Supplier Product Code: Supplier Notes: Uploaded Documents Evaluation Criteria - Category 2, Evaluation Criteria Category 3, Letters of Intent, Insurance Requirements, Vendor References, Broward County Tax, Authority to Conduct Business in FL, Litigation - Sub	First Offer -	1 / each	Y	Y
Supplier Total						\$0.00

Carollo Engineers

Item: Engineering Services for Water and Wastewater Services

Attachments

Evaluation Criteria_Category 2-Water_Carollo Engineers Inc.docx

Evaluation Criteria_Category 3-Wastewater_Carollo Engineers Inc.docx

Letters of Intent_Carollo Engineers.pdf

Authority to Conduct Business in FL - Carollo Engineers Inc..pdf

Broward County Tax - Carollo Engineers Inc..pdf

Insurance Requirements_Carollo Engineers.pdf

Vendor References_Carollo Engineers.pdf

Litigation_Carollo Engineers_sub Chen Moore.pdf

Evaluation Criteria Response Form

Engineering Services for Water and Wastewater Services Category 2 Water Treatment

Vendor Response

1. Ability of Professional Personnel: Maximum 30 points

Describe the qualifications and relevant experience of the Project Manager and all key staff that are intended to be assigned to this project. Include resumes for the Project Manager and all key staff described. Include the qualifications and relevant experience of all subconsultants' key staff to be assigned to this project.

Carollo Engineers, Inc., (Carollo) is a nationally recognized firm that was established in 1933 to solely provide water, wastewater, and stormwater related services. Our South Florida staff brings expertise on local technical and regulatory issues gathered from addressing the day-to-day needs of numerous local clients since we opened our first Florida office in 2001.

a: Describe prime consultant's proposed key project team members (not sub-consultants) as they directly relate to water supply and treatment plant projects in Florida. Specifically, list personnel that have experience designing, permitting, and providing construction management services for these projects. **Points Value:** 15

We understand that there may be a wide array of potential projects under this contract. As a result, we drew from the depth of experience of our South Florida staff to create our project team. For a particular project, we will select the most qualified Project Manager from our pool to best lead the work. All of our potential Project Managers excel in communication skills, which is essential to being able to work with your staff to understand your needs and feedback, and in turn clearly translate that information to our project team. Supporting our Project Manager will be a team of engineers, experts in their respective fields, who will bring lessons learned from prior projects. This combination of knowledgeable, highly motivated local staff, and dedicated firm-wide support will make certain that the quality and responsiveness of our services are exceptional.

b: Describe sub-consultant's proposed key project team members as they directly relate to water supply and treatment plant projects in Florida. Specifically, list personnel that have experience designing, permitting, and providing construction management services for these projects.

Points Value: 15

Our subconsultants are also experts in their respectable fields. For example, Mario Gamboa of Gamboa Engineers was previously Carollo's Chief I&E/Electrical Engineer. Peter Moore at Chen Moore has spent his entire career focusing on South Florida projects.

Evaluation Criteria Response Form

Engineering Services for Water and Wastewater Services Category 2 Water Treatment

Vendor Response

2. Project Approach: Maximum 25 points

a: Describe the prime Vendor's approach to the project.
Points Value: 15

We believe that our innovative ideas efficiently solve our client's needs, saving costs, and increasing operability. Innovation is not a process but rather an outcome-created by challenging ourselves to "THINK DIFFERENTLY" about all the possibilities.

- A Fresh Approach
- Proven Experience
- Doing More with Less
- Using Innovative Tools
- Partnering for Collaboration

b: Describe how the prime Vendor will use sub-consultant's in the project. Include potential Architects, Civil Engineers, Environmental Engineers, Structural Engineers, Mechanical Engineers, Electrical Engineers, Geotechnical Engineers, Geologists, Hydrologists, Hydrogeologists, Landscape Architects and Professional Land Surveyors.

Points Value: 10

To provide the most value to the County for this contract, Carollo has thoughtfully selected an exceptional lineup of subconsultants to amplify and complement the technical expertise of our staff. We have an established relationship with our subconsultants. In fact, we have been working with Gamboa Engineers and Stoner & Associates on Broward County's High Service Pump Stations and Storage Tanks General Services contract for the past three years. Below you will see brief firm profiles for each subconsultant, demonstrating the expertise each brings to the Team.

3. Past Performance: Maximum 30 points

Describe prime Vendor's experience on projects of similar nature, scope and duration, along with evidence of satisfactory completion, both on time and within budget, for the past five years. Provide a minimum of three projects with references.

Vendor should provide references for similar work performed to show evidence of qualifications and previous experience. Refer to **Vendor Reference Verification Form** and submit as instructed. Only provide references for non-Broward County Board of County Commissioners contracts. For Broward County contracts, the County will review performance evaluations in its database for vendors with previous or current contracts with the County. The County considers references and performance evaluations in the evaluation of Vendor's past performance.

We are a local firm who understands your issues. We are also experts in the local concerns of utilities like yours in South Florida, addressing the day-to-day needs of Broward County WWS as well as the South Central Regional Wastewater Treatment and Disposal Board, Palm Beach County, Miami-Dade County, and Cities of Sunrise, Pompano Beach, and Margate. We understand the issues that you are facing: water reliability and availability; meeting treatment goals; managing energy costs; accounting for variability in chemical and labor costs; providing for future flexibility; meeting regulatory requirements of FDEP and the Health Department; and, of course, developing capital plans within a rapidly recovering economy.

Evaluation Criteria Response Form

Engineering Services for Water and Wastewater Services Category 2 Water Treatment

Vendor Response

What does all this mean? Carollo brings a proven track record of projects similar to those anticipated to be performed under your General Services contract, completed on time and within budget, with an emphasis on industry-leading technology to maximize your dollars. We have included reference letters and evaluations that speak to our knowledge and service to our clients.

a: Describe experience and provide specific examples of projects designing, permitting and providing construction management services on water treatment plants of a capacity greater than 5 million gallons per day (peak capacity), water distributing pump stations, and storage tanks in the state of Florida within the last five (5) years. For each project listed, identify your firm's role as a prime consultant or as a sub-consultant. Further identify your firm's role in the project for discipline, expertise, and work element provided. **Points Value:** 10

Carollo's water treatment and supply experience includes over 100 water treatment plants ranging in size from less than 1 mgd to over 600 mgd. We are at the forefront of technology in Florida, with expertise in all aspects of lime softening, nanofiltration (NF) and reverse osmosis (RO) treatment. We have designed over 150 water pumping facilities with capacities as high as 650 mgd. Our pump station designs serve a number of specific functions including raw water delivery to treatment plants, irrigation pumping, well water pumping, treated water delivery to distributions systems, intermediate transmission line boosting, and inter pressure zone transfers.

b: Describe experience and provide specific examples of familiarity with regulatory issues related to water supply and treatment specific to south east Florida utilities. **Points Value:** 10

Carollo actively tracks regulatory development and has extensive experience assisting utilities in the production of high quality water that meets local and federal standards. Having completed permit renewals for water systems throughout the state, the Carollo team has the experience to thoroughly review permit status and make recommendations as to current and future regulatory compliance. Carollo has also worked with utilities to engage in voluntary actions to meet more stringent goals, such as the American Water Works Association Partnership for Safe Water.

Evaluation Criteria Response Form

Engineering Services for Water and Wastewater Services Category 2 Water Treatment

Vendor Response

c: Describe experience and provide specific examples of projects designing, permitting, and providing construction management services for water supply wells in the state of Florida within the last five (5) years. **Points Value:** 5

Carollo is a recognized leader in the design and construction of aquifer storage and recovery wells, wellhead treatment, and potable production well projects. We have provided design and construction management services for more than 50 water wells throughout the Southwest. We also have extensive experience in master planning, water resources planning, capacity studies, and evaluations directed toward enhancing water quality, permitting and complying with emerging regulations.

4. Workload of the Firm:

For the prime Vendor only, list all completed and active projects that Vendor has managed within the past five years. In addition, list all projected projects that Vendor will be working on in the near future. Projected projects will be defined as a project(s) that Vendor is awarded a contract but the Notice to Proceed has not been issued. Identify any projects that Vendor worked on concurrently. Describe Vendor’s approach in managing these projects. Were there or will there be any challenges for any of the listed projects? If so, describe how Vendor dealt or will deal with the projects’ challenges.

Points Value: 5

As a national firm, Carollo has a continuous workload of hundreds of projects at any particular time, at various stages of completion from kickoff to final completion. As examples, we have included representative completed and active projects for Carollo in South Florida over the last five years, indicating the breadth and depth of our local experience.

5. Location:

Refer to **Vendor’s Business Location Attestation Form** and submit as instructed.

A Vendor with a principal place of business location (also known as the nerve center) within Broward County for the last six months, prior to the solicitation submittal, will receive five points; a Vendor not meeting all of the local business requirements will receive zero points. The following applies for a Vendor responding as a Joint Venture (JV): if a member of the JV has 51% or more of the equity and meets all of the local business requirements, the JV will receive three points; if a member of the JV has 30 to 50% of the equity and meets all of the local business requirements, the JV will receive two points; and if a member of the JV has 10% to 29% of the equity and meets all of the local business requirements, the JV will receive one point. **Points Value:** 5

As required by the RFP, the “Vendor’s Business Location Attestation Form” has been filled out and submitted.

Evaluation Criteria Response Form

Engineering Services for Water and Wastewater Services Category 2 Water Treatment

Vendor Response

6. Willingness to Meet Time and Budget Requirements:

This solicitation is for the award of a continuing contract. The specific projects requiring professional services under the agreement have not yet been identified. However, in general, explain your firm's approach in meeting "project specific" time and budget requirements and indicate whether Vendor is committed to meet these requirements when identified under this agreement.

YES = 2 Points NO = 0 Points

Points Value: 2

YES, We understand the nature of General Services contracts. Some assignments need immediate, sometimes same day response times, while others are less urgent. Our DEPTH AND BREADTH OF STAFF allows us to respond to immediate needs from our local office which is just minutes away. For longer term assignments, Carollo develops a Project Management plan that establishes the plan to meet schedule, scope, budget and quality.

7. Volume of Previous Work:

Refer to **Volume of Previous Work Attestation Form** and the **Volume of Previous Work Attestation Joint Venture Form** and submit as instructed. The calculation for Volume of Previous Work is all amounts paid to the prime Vendor by Broward County Board of County Commissioners at the time of the solicitation opening date within a five-year timeframe. The calculation of Volume of Previous Work for a prime Vendor previously awarded a contract as a member of a Joint Venture firm is based on the actual equity ownership of the Joint Venture firm. Three points will be allocated to Vendors paid \$0 - \$3,000,000); 2 Points will be allocated to Vendors paid \$3,000,001 - \$7,500,000; 1 Point will be allocated to Vendors paid \$7,500,001 - \$10,000,000; 0 Points will be allocated to Vendors paid over \$10,000,000). Payments for prime Vendor will be verified by the Purchasing Division.

Points Value: 3

As required by the RFP, the "Volume of Previous Work Attestation Form" has been filled out and submitted. Carollo has been paid less than \$3 million to date by Broward County Board of County Commissioners.



Engineering Services for Water and Wastewater Services

SOLICITATION PNC2117097P1

CATEGORY NO. 2 | WATER TREATMENT SYSTEMS | 101279





3440 Hollywood Boulevard, Suite 465, Hollywood, Florida 33021
P. 954.837.0030 F. 954.837.0035

November 7, 2018

Broward County Board of County Commissioners
Attn: Environmental Engineering 1 FL
2555 W Copans Road
Pompano Beach, FL 33069

Subject: Solicitation PNC2117097P1 – Professional
Engineering Services for Water and Wastewater Services

Dear Selection Committee:

As we prepare this qualifications statement, we reflect on some of the challenges faced by Broward County’s Water and Wastewater Services staff. We understand the absolute need for the reliability of the pump station at District 3A and the implications of its impacts on the Fort Lauderdale airport. We are also aware that your sludge dewatering equipment at the water treatment plants is aged and at the end of its useful life. Lastly, we know how complex it is to provide reuse water to the Lighthouse Point community when several factors have to be balanced, such as whether you build a new pipe from the closest reuse connection or tap into the existing outfall for potential savings. To successfully address these issues, they require not just a conventional approach, but innovative thinking to incorporate the latest in available, proven technologies and out-of-the-box ideas that are fiscally responsible and easy to operate and maintain.

As your review our credentials, we encourage you to ask yourself the question: “Why have so many clients across the country, and particular throughout Florida, turned to Carollo for their most important water and/or wastewater projects?” We believe that our clients have selected us because of our proven ability to creatively identify and cost-effectively implement the best solutions. We’ve always believed that this creativity and innovation is not a process, but rather the natural outcome of the enthusiasm of each and every Carollo employee to challenge themselves to “think differently” when solving our client’s needs. This philosophy evolved out of necessity during our initial years as a company, around the Great Depression of the 1930s, and has since become the cornerstone of our culture.

Water is all we do, it’s our focus, our business and our passion. We are one of the only engineering firms in the ENR Top 100 Rankings with a total commitment to water. What our singular focus means for you is access to the best water talent in the industry, along with exceptional client service and innovative technical solutions. It also means complete dedication to you and your needs, because we live and die by our reputation in the water industry, success on your projects, which includes extraordinary client satisfaction, is an absolute must!

We look forward to continuing to work with the Water and Wastewater Services staff to “**THINK DIFFERENTLY**” and solve your needs.

Sincerely,

CAROLLO ENGINEERS, INC.

Elizabeth Fujikawa, P.E., LEED AP
Vice President and Project Manager

300.51.BWC004 | d35ee22b52874fff8462a0bf70320cc1.docx

WORKING WONDERS WITH WATER

Water is our focus, our business, and our passion. During our 85 year history, Carollo has successfully complete more than 25,000 projects. Unlike the majority of our competitors, we solely provide water and wastewater services and that’s where we focus our resources and energy, every day of every year. As a result, we are known in the industry for our innovative solutions.

What does that mean for Broward County WWS? Simply this: access to the latest available technologies, delivered by staff that are committed to your industry, resulting in cost effective and operable solutions for your needs.

*We acknowledge receipt of Addendum No. 1.

THINK
Differently



WATER
OUR FOCUS
OUR BUSINESS
OUR PASSION

CONTENTS

**01 ABILITY OF PROFESSIONAL
PERSONNEL**

02 PROJECT APPROACH

03 PAST PERFORMANCE

- A Designing, Permitting, and
Construction Management for Water
Treatment Plant, Water Distributing
Pump Stations, and Storage Tanks
- B Regulatory Issues Water Supply and
Treatment
- C Designing, Permitting, and
Construction Management for Water
Supply Wells

04 WORKLOAD OF THE FIRM

05 LOCATION

**06 WILLINGNESS TO MEET
TIME AND BUDGET
REQUIREMENTS**

**07 VOLUME OF PREVIOUS
WORK**

RESUMES





1. Ability of Professional Personnel

The BEST of Both Worlds – **LOCAL EXPERTS** Supported by National Bench Strength

Carollo Engineers, Inc., (Carollo) is a nationally recognized firm that was established in 1933 to solely provide water, wastewater, and stormwater related services. Our South Florida staff brings expertise on local technical and regulatory issues gathered from addressing the day-to-day needs of numerous local clients since we opened our first Florida office in 2001. As illustrated in the map on page 2, we now provide water and wastewater services throughout the state.

85 YEARS <i>Working Wonders</i>	45 OFFICES Nationwide	1k+ Employees NATIONWIDE
 17 Years in FLORIDA	6 FLORIDA offices	80+ FLORIDA Employees
Focus exclusively on water and wastewater services		
Multi disciplined		

Water is our focus, our business, and our passion. During our 85-year history, Carollo has successfully complete more than 25,000 projects. Unlike the majority of our competitors, we solely provide water and wastewater services and that’s where we focus our resources and energy, every day of every year. As a result, we are known in the industry for our innovative solutions.

What does that mean for Broward County WWS? Simply this: access to the latest available technologies, delivered by staff that are committed to your industry, resulting in cost effective and operable solutions for your needs.

The best indicator of our ability to exceed expectations is that over 90 percent of our local work comes from “repeat” clients such as these: Broward, Palm Beach, and Miami-Dade Counties; the South Florida Water Management District; the South Central Regional WWTDB; and the cities of Pompano Beach, Margate, Sunrise, West Palm Beach, and Boynton Beach. All projects cited throughout this Evaluation Criteria include references.

Required Depth of **EXPERTS** to Meet Your Needs

We understand that there may be a wide array of potential projects under this contract. As a result, we drew from the depth of experience of our South Florida staff to create our project team. For a particular project, we will select the most qualified Project Manager from our pool to best lead the work. All of our potential Project Managers excel in communication skills, which is essential to being able to work with your staff to understand your needs and feedback, and in turn clearly translate that information to our project team. Supporting our Project Manager will be a team of engineers, experts in their respective fields, who will bring lessons learned from prior projects. Our organizational structure is shown below. This combination of knowledgeable, highly motivated local staff, and dedicated firm-wide support will make certain that the quality and responsiveness of our services are exceptional. Resumes are included at the end of this Evaluation Criteria.



Subconsultants:

- | | |
|--|---|
| 1. JLA Geosciences | 5. Stoner & Associates, Inc. |
| 2. McNabb Hydrogeologic Consulting, Inc. | 6. RADISE, Inc. |
| 3. Gamboa Engineers, LLC | 7. Cordova Rodriguez & Associates, Inc. |
| 4. Chen Moore, Inc. | |

Benefits to the Carollo Team's Organizational Structure

- ✓ A **Contract Manager** with a history of success delivering similar projects for the County, servicing WWS for this contract as one single point of contact for all projects.
- ✓ Multiple **Project Managers** capable of overseeing the delivery of projects across a wide range service areas and disciplines.
- ✓ Dedicated **Project Delivery Team** of subject matter experts assigned to deliver tasks in support of all projects.
- ✓ **Support Discipline Leads** skilled in their respective areas of practice providing support to the project delivery teams.

Senior Leadership and Specialty Expertise

Successful completion is about more than the design firm. More important to the effort are the key team members who will be delivering your work. Our team includes seasoned project delivery design specialists, each with a key role to meet the technical requirements of your project(s).

Key Staff Experience

Key Personnel	Years of Experience	WTPs Greater than 5 mgd	Water Pump Stations	Storage Tanks	Water Supply Wells	SE Florida Regulatory Issues	Design, Permitting, CM
Liz Fujikawa, PE	31	4	4	4	4	4	4
Chuck Sinclair, PE	27	4	4			4	4
Chris Reinbold, PE	15	4	4	4	4	4	4
Lyle Munce, PE	32	4	4	4	4	4	4
Bob Cushing, PhD, PE	27	4	4	4	4	4	4
Vinnie Hart, PE	35	4	4	4	4	4	4
Tom Gillogly, PhD, PE	26	4	4	4	4	4	4
Jennifer Nyfennegger, PhD, PE	11	4	4	4	4	4	4
Mark Ludwigson, PE	16	4	4	4	4	4	4
Michael Carzo, CCM	33	4	4	4	4	4	4
Terry Storck	24	4	4	4	4	4	4
Erica Stone, PhD, PE	9	4	4	4	4	4	4
Jess Brown, PhD, PE	19	4	4	4	4	4	4
Joel Smason, PE	42	4	4	4	4	4	4
Jeff Alband, RA	48	4	4	4	4	4	4
Chad Green, PE	9	4	4	4	4	4	4
Mario Gamboa, PE	35	4	4	4	4	4	4
Peter Moore, PE	21	4	4	4	4	4	4
James Anderson, PG	30				4	4	4
David McNabb, PG	26				4	4	4
Luis Rodriguez, PE	25		4	4		4	4

Carollo Key Staff



LIZ FUJIKAWA, P.E.

Contract/Project Manager

31 YEARS OF EXPERIENCE

Liz has extensive experience managing vast and complex water and wastewater projects. She has excellent communication skills, and will be able to work with you to understand your needs, and in turn, translate those needs to our team.



CHUCK SINCLAIR, P.E.

Principal-in-Charge

27 YEARS OF EXPERIENCE

Chuck's work experience includes planning, design, and construction services for water and wastewater collection, conveyance, and treatment facilities. He has been actively involved in the preparation and presentation of project data, client and agency coordination and public outreach.



CHRIS REINBOLD, P.E.

Project Manager

15 YEARS OF EXPERIENCE

Chris's experience includes study, design, permitting, and construction administration services for treatment plants, pumping stations, pipelines, and chemical systems. His continual focus for clients is to seek additional value, savings, or other operational enhancements on each project.



LYLE MUNCE, P.E.

Project Manager

32 YEARS OF EXPERIENCE

Lyle has extensive environmental/civil engineering experience, with an emphasis on municipal water systems. He has served as client manager, project manager, technical reviewer, and construction manager for numerous multi-disciplinary water related projects.



BOB CUSHING, PH.D., P.E.

Quality Manager/Regulatory and Compliance

27 YEARS OF EXPERIENCE

Bob has coupled fundamental concepts with sound engineering practices to provide creative, innovative, and enduring solutions to challenges faced by water and wastewater utilities. He has been responsible for numerous successful treatment facility planning and design projects.



VINNIE HART, P.E.

Quality Manager

35 YEARS OF EXPERIENCE

Vinnie's has extensive experience in planning, design, and expansion of water supply, water treatment, and water distribution facilities. His expertise includes design and operation of pilot plant, water treatment plant, membrane filtration facilities, and UV disinfection for drinking water.



TOM GILLOGLY, PH.D., P.E.

Water Treatment Plant Design,
Permitting

26 YEARS OF EXPERIENCE

Tom has significant experience with selection, implementation, and evaluation of water treatment technologies covering a wide range of water quality issues, including control of disinfection byproducts, inorganic contaminants, taste-and-odor causing compounds, and synthetic organic compounds.



JENNIFER NYFENNEGGER, PH.D., P.E.

Water Treatment Plant Design,
Permitting

11 YEARS OF EXPERIENCE

Jen's experience in civil and environmental engineering, includes applied research, regulatory reviews, planning, and design of water, wastewater, and reclaimed water treatment systems.



MARK LUDWIGSON, P.E.

Water Treatment Plant Design,
Permitting

16 YEARS OF EXPERIENCE

Mark has worked solely in the water environment industry since 2004 and is passionate about water and wastewater systems. He has brought success to a variety of water projects, whether serving as project manager or project engineer. He is trusted for civil, mechanical, and process design discipline work.



MICHAEL CARZO, CCM

Construction Phase and Startup
Services

33+ YEARS OF EXPERIENCE

Michael has contributed to multi-million dollar construction projects throughout the United States, making decisions that impact resource requirements; scope, schedule, and sequence of project activities; client and team satisfaction; risk profile; quality; health, safety, and environmental factors; and financial performance.



TERRY STORCK

Construction Phase and Startup
Services

24 YEARS OF EXPERIENCE

Terry's background focuses on the planning, scheduling, inspections, and coordination of complex projects. He possesses technical knowledge and background in the mechanical, electrical, SCADA, computing and electronic communications areas.



ERICA STONE, PH.D., P.E.

Regulatory and Compliance

9 YEARS OF EXPERIENCE

Erica possesses a Ph.D. in environmental engineering and brings several years of experience with her in the areas of water quality, water treatment, environmental studies, sampling, research, and data analysis.



JESS BROWN, PH.D., P.E.

Regulatory and Compliance

19 YEARS OF EXPERIENCE

Jess is Director of Carollo's Research and Development Practice and leads Carollo's biological drinking water treatment initiative. He has extensive experience in water, wastewater, and reclaimed water treatment specializing in drinking water process, applied research, and water quality testing methods.



JOEL SMASON, P.E.

Structural

42 YEARS OF EXPERIENCE

Joel's expertise includes preparation of preliminary structural designs, client assistance, supervision of personnel, preparation of budgets and estimates, and the development of detailed drawings and specifications. He also has experience with alternative project delivery methods including design-build and construction manager at risk (CMAR).



JEFF ALBAND, R.A.

Architectural

48 YEARS OF EXPERIENCE

Jeff is experienced in the architectural design, planning, detailing, and specifications of water and wastewater treatment plants. Jeff works closely with our engineering staff to develop architectural concepts for structures with low-visibility from surrounding neighborhoods, and a low-profile design to blend visually in with the surrounding terrain.



CHAD GREEN, P.E.

HVAC/Plumbing

9 YEARS OF EXPERIENCE

Chad has extensive experience, and manages the building services group for Carollo. As a building mechanical engineer, he provides all aspects of design services associated with the design of air, heating, cooling, controls, plumbing systems, fire protection systems, odor treatment, and fuel systems.



Carollo is the largest ENR 500 design firm working exclusively in water and wastewater, allowing us to provide unmatched talent and solutions.

An Established Team of Subconsultants

To provide the most value to the County for this contract, Carollo has thoughtfully selected an exceptional lineup of subconsultants to amplify and complement the technical expertise of our staff. We have an established relationship with our subconsultants. In fact, we have been working with Gamboa Engineers and Stoner & Associates on Broward County’s High Service Pump Stations and Storage Tanks General Services contract for the past three years. Below you will see brief firm profiles for each subconsultant, demonstrating the expertise each brings to the Team.

Carollo subconsultant team members all have previous work experience with Broward County and are **FAMILIAR WITH YOUR CULTURE, NEEDS, AND EXPECTATIONS**. We have a seamless working relationship with a proven ability to cohesively deliver high quality work on time and within budget.

Our subconsultants are also experts in their respectable fields. For example, Mario Gamboa of Gamboa Engineers was previously Carollo’s Chief I&E/Electrical Engineer. Peter Moore at Chen Moore has spent his entire career focusing on South Florida projects.



Chen Moore & Associates

500 W Cypress Creek Rd, Suite 630, Fort Lauderdale, FL 33309

Role: Permitting, Civil/Site

Team Member: Peter Moore

Chen Moore and Associates is a multi-discipline consulting firm with offices in Broward, Miami-Dade, Palm Beach, Orange and Alachua Counties. Founded in 1986, Chen Moore and Associates specializes in civil and environmental engineering; landscape architecture; planning; GIS analysis and mapping; transportation, streetscaping and traffic improvements; construction administration; wastewater collection, transmission, reuse; pump station design and rehabilitation; water supply, treatment, and distribution; stormwater system design and master plans; and modeling and permitting of drainage, water distribution, and sewer collection. Dr. Chen founded Chen Moore and Associates with a belief that relationships are the key to the planning, design and construction of successful projects.

Peter Moore, P.E., LEED AP more than 21 years of experience with a wide variety of utility, stormwater, transportation and other infrastructure projects. Since joining CMA in 1999, Mr. Moore has focused on the management, planning, design, permitting, and construction of various utility infrastructure projects for public clients throughout South Florida. Mr. Moore has worked on literally dozens of unique projects for Broward County in his career, literally serving in every role in a project team. Of particular note is Mr. Moore’s experience in value engineering, including projects for Broward County WWS, Miami-Dade Water and Sewer Department and a development client in Saudi Arabia.





Gamboa Engineers, LLC

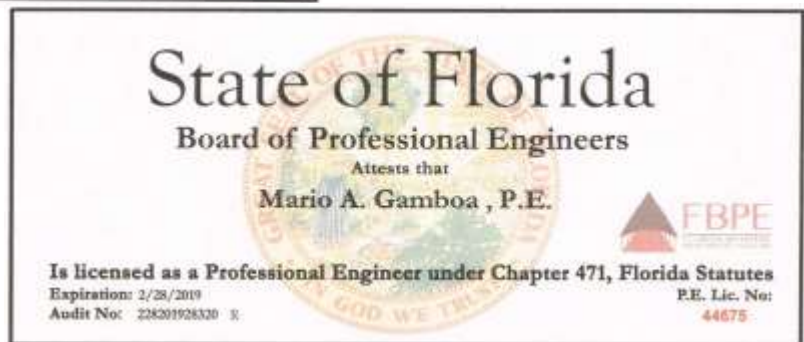
17433 SW 65 Court, Southwest Ranches, FL 33331

Role: Electrical and I&C Engineering

Team Member: Mario Gamboa, P.E.

Gamboa Engineers, LLC was founded by Mario Gamboa, P.E. who was formerly Carollo's, Chief Electrical Engineer for over 15 years. Gamboa Engineers a **CBE** specializing in Electrical and Instrumentation and Control engineering. Due to Mario's close relationship with Carollo, the firms work seamlessly in delivering innovative ideas. Gamboa Engineers is currently providing Electrical and I&C engineering on projects with Carollo for Broward County WWS, Pompano Beach, Margate, Boynton Beach, and the South Central Regional WWTP.

Mario Gamboa, P.E. professional experience spans 35+ years in design; value engineering; engineering management, construction management of numerous municipal and industrial projects. These include expertise focus with electric energy and automation for water treatment, wastewater treatment and pumping stations. Provided electrical design and instrumentation with construction specifications for 115 kV substations, medium voltage class (5-kV through 38-kV) and low-voltage power distribution systems; including prime and standby power generations systems, power for large pumps-motors with 5 kV variable speed controls systems; lighting systems; life safety systems; grounding; lightning protection; and SCADA automation systems.





JLA Geosciences, Inc.

1931 Commerce Lane, Suite 104, Jupiter, FL 33458

Role: Hydrogeology, Wells

Team Member: James Anderson, P.G.

JLA Geosciences, Inc. (JLA) was established in 2003 to provide clear solutions for its clients based on an in-depth knowledge of hydrogeology, groundwater, well systems, regulations and issues that affect water supply development. Their firm’s success has been largely due to their absolute “hands on” approach and involvement in every project. The principal hydrogeologists and professional geologists at JLA have the experience and local presence to make the right choices when and where it is needed: on time and on site. JLA maintains the firm belief that hydrogeology is a field science and that a successful hydrogeologic consultant must consistently provide excellence in the field. Specializing in:

- Hydrogeologic Subsurface Evaluation
- Hydrogeologic Database Search
- Groundwater Flow and Transport Modeling
- Environmental and Water Use Permitting
- Wastewater Disposal & Injection Well Services
- Well Construction Design and Services
- Well Acidization Design and Services
- Water Resource Evaluation
- Master Planning

James Andersen, P.G. has over 30 years working experience in hydrogeology, groundwater water resource investigations, well field design, construction, development, well problem evaluations and well rehabilitation. He has been responsible for the construction of and completion of hundreds of water supply wells in South Florida including over 100 in the Upper Floridan Aquifer. He has an extensive groundwater experience, working with coastal plain aquifer systems; well design; groundwater monitoring, geophysical well logging and interpretation; reverse osmosis (RO) raw water supply investigations and RO concentrate disposal by injection well; aquifer performance testing, analysis and computer modeling; wellfield contamination investigations, collection and analysis of water quality data; rehabilitation of old wells, and supervising various types of drilling.





McNabb Hydrogeologic Consulting, Inc.

601 Heritage Dr. #120, Jupiter, FL 33458

Role: Hydrogeology and Wells

Team Member: David McNabb

McNabb Hydrogeologic Consulting, Inc. is a small Southeast Florida-based hydrogeologic consulting firm specializing in deep injection well design, permitting, resident construction observation, and reporting services. Their focus is to provide efficient, value-oriented deep injection well consulting services. The staff at McNabb Hydrogeologic Consulting offer over 35 years of Florida hydrogeology consulting experience, most of which has been focused on deep injection well systems. The firm is located in Jupiter, Florida and is a South Florida Water Management District and Palm Beach County Water Utilities Department certified Small Business Enterprise (SBE).

David McNabb, P.G. is the president of McNabb Hydrogeologic Consulting, Inc. and brings over 26 years of deep injection well experience to the Carollo team. His experience while working at the FDEP in the Underground Injection Control program from 1992 to 1995 allowed him to develop a strong rapport with regulators and a thorough understanding of regulatory issues related to injection well system design, permitting, testing, construction and operation. While working for other consulting firms from 1995 to 2006 and working almost exclusively on deep injection well projects, Mr. McNabb managed over 50 deep injection well system design, permitting, construction observation, or testing projects. Since forming McNabb Hydrogeologic Consulting, Inc. in 2006, Mr. McNabb has worked exclusively on deep injection well system design, permitting, construction observation, testing and reporting projects.

Sally Durall has worked at McNabb Hydrogeologic Consulting, Inc. since 2008. She is recognized as highly experienced in the field of Class I deep injection wells. Ms. Durall brings over 16 years of deep injection well design, permitting, construction observation, testing and reporting services to the Carollo team. She has provided services during construction for over 25 deep injection well system design, permitting, construction observation, or testing projects.





Cordova Rodriguez & Associates, Inc.

6941 SW 198th Ave., #28, Pembroke Pines, FL 33332

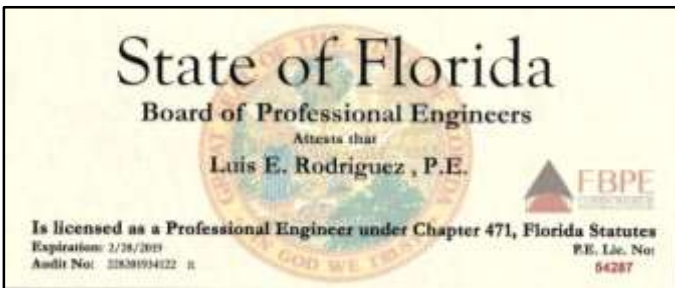
Role: Planning and Civil Engineering

Team Member: Luis Rodriguez, P.E.

Established in 2000, Cordova Rodriguez & Associates, Inc. (CRA) is a **CBE** multi-disciplinary firm which has earned local recognition as an exceptionally qualified and dedicated professional civil engineering and planning consulting firm. CRA is a multi-disciplinary firm with experience in all aspects of civil engineering, analysis and design, planning-current and long range; redevelopment/urban planning and design and sustainable design. Our qualified professionals have experience in design, preparation of contract documents, government approvals and permitting, bidding assistance, construction administration and review services.

Their firm's relevant experience includes studies for both planning and civil engineering, municipal consulting services, neighborhood improvement projects, plans review for several agencies and municipal projects including; airports, seaports, fire stations, parks, churches, residential and commercial developments as well as hundreds of private projects throughout Broward, Miami-Dade, and Palm Beach Counties.

Luis Rodriguez, P.E. over 25 years of experience in civil engineering. His project experience includes design of water distribution systems, sanitary sewer collection systems, sanitary sewer pump stations and force main, paving and drainage design, management of various land development projects, and permitting processing through various local and state agencies. He has extensive experience in construction management and administration.





Stoner & Associates, Inc.

4341 SW 62nd Avenue, Davie, FL 33314

Role: Surveying and Underground Locates

Team Member: Jim Stoner, PSM

Stoner & Associates, Inc. (Stoner) is a **CBE** Professional Land Surveying Consultant and Palm Beach County certified SBE. Their mission is to provide quality land surveying services, while utilizing the latest technology and techniques. Stoner has provided services to numerous municipalities, including, Broward County Aviation Department, South Florida Water Management District, Broward College, Town of Davie, City of Fort Lauderdale, and City of Sunrise. Services provided include:

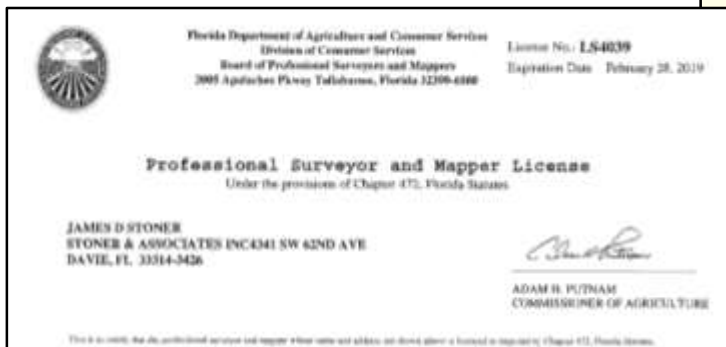
- ALTA/ACSM Land Title Surveys
- Aviation Surveys
- Boundary Surveys
- Construction Layout Surveys
- Engineering Design Surveys
- Environmental Support Surveys
- FDOT Surveys
- Platting
- Specific Purpose Surveys
- Topographic Surveys
- Utility Surveys

Stoner is currently working with Carollo on Broward County’s High Service Pump Stations and Storage Tank General Services contract. Stoner has performed land surveys for most municipalities and numerous governmental agencies and private clients within the Tri-County Area.

James D. Stoner, P.S.M. is a second generation Land Surveyor, with over 45 years of surveying experience in South Florida. He began his surveying career at Williams, Hatfield, & Stoner, Inc. working from the bottom as a Rodman, all the way up to Vice President of the Surveying Department.

Mr. Stoner founded Stoner & Associates, Inc. in 1988, based on the philosophy that attention to detail and quality work would create a successful firm. He manages all aspects of the firm’s growth and development.

Mr. Stoner has supervised both small and large scale surveying projects. His firm has successfully completed numerous roadway and other various projects, while working directly with the clients and consultants.





RADISE International, LC

3296 NW 9th Avenue, Oakland Park, FL 33309

Role: Geotechnical Engineering and Testing

Team Member: Tom Mullin, P.E.

Founded in 1997, RADISE International, LC (RADISE) specializes in providing geotechnical engineering, materials testing and inspection services. RADISE has a staff of 62, including local professional engineers, field and laboratory technicians, geotechnical drillers, inspectors and support staff servicing Broward, Palm Beach, and Miami Dade Counties.

For 20 years, RADISE has provided geotechnical engineering, field and lab construction materials testing, inspection, and quality control services for projects throughout Florida. Their significant experience and a solid background working with both the public and private sectors in South Florida.

Tom Mullin has 40 years of geotechnical engineering experience including water resources engineering including ports and harbors, dams and reservoirs. He has served as Chief Geotechnical Engineer on numerous projects for private and public clients including the South Florida Water Management District (SFWMD), United States Army Corps of Engineers (USACE) and Florida Department of Transportation (FDOT).

He provides quality assurance and quality control; materials testing engineering services including soils, foundations, and geotechnical investigations; vibration monitoring; materials and systems testing; and structural and special assessments testing services.

His skills include foundation design and construction, backfilling, test programs, quality control testing procedures and documentation, installation and evaluation of geotechnical monitoring instrumentation, vibration monitoring and pile load testing. He provides quality assurance oversight; CEI documentation; construction surveillance, inspection and testing; and technical peer review.





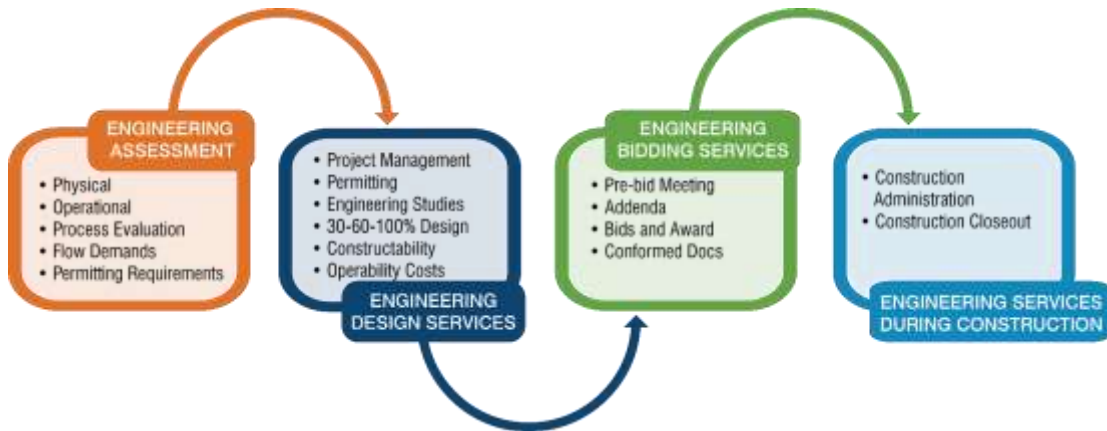
2. Project Approach

THINK differently



At Carollo, we've always believed that innovation is not a process but rather an outcome-created by challenging ourselves to **"THINK DIFFERENTLY"** about all the possibilities.

A typical approach to engineering projects includes four phases: assessment, design, bidding, and construction management:



At Carollo we incorporate a “think differently” attitude into our projects, leading to innovative ideas that result in better answers, such as increased capacity, better treated water quality, lower capital and operational costs, and ease of operation.

“ Strong technical abilities and outreach skills...The final work quality was very good. Consultant coordinated effectively with the Florida DEP and other water management districts in the state to address this important concentrate management problem. **”**

Ashie Akopji, SFWMD

How Do We **THINK DIFFERENTLY** and Exceed your Expectations?

A Fresh Approach: We approach each of our projects with a clean slate, avoiding preconceived notions that could bind us to previous technical solutions. Our experience spans a wide array of technologies, allowing us to address the specific needs of our clients from conventional to leading edge treatment processes.

Proven Experience: We have successfully completed Water Treatment Plant (WTP) projects across the U.S. and throughout Florida, treating a wide variety of water qualities, providing design, permitting, and construction phase services for hundreds of plants with capacities less than 1-mgd to facilities over 600-mgd. We span the technology range to address the specific needs of our clients with conventional tried and true engineering methods, to leading-edge advanced treatment technologies. This experience includes all types of membrane treatment; reverse osmosis (RO), Nanofiltration (NF), electrodialysis reversal (EDR), ultrafiltration (UF), microfiltration (MF), etc.; advanced disinfection/oxidation; ozone, ultraviolet (UV), chlorine dioxide, UV+H₂O₂, etc.; ion exchange (IX), conventional fixed bed and MIEX[®]; and biologically active filtration for and total organic carbon (TOC) reduction and contaminant removal.

Doing More with Less: In today's challenging economic times, we understand the importance of doing more with less by maximizing the opportunities to use our client's existing infrastructure. While there is always an easy answer to "build more," we strive to find solutions that save costs. Common examples from our past projects are: rerating existing processes to increase capacities, converting obsolete tankage into new processes, and finding hydraulic bottlenecks that can be simply remedied.

A local example is Palm Beach County's WTP No. 2, where Carollo's implementation of the world's largest high rate MIEX[®] process increased capacity by 14 percent while reducing color, organics, chemical usage, solids production, and nitrification potential in the distribution system. **We anticipate that Palm Beach County will recognize an annual operational cost savings of \$196,000 to \$333,000.**

Carollo has consistently demonstrated to us that they perform their services to the highest standard, give consideration to our needs and preferences and bring exceptional talent to the projects they undertake, whether they are operational enhancements for full scale designs of new treatment plant additions or processes, such as our new ion exchange project.

Maurice Tobon, PE
Former Director of Engineering,
Palm Beach County Water Utilities Department, FL

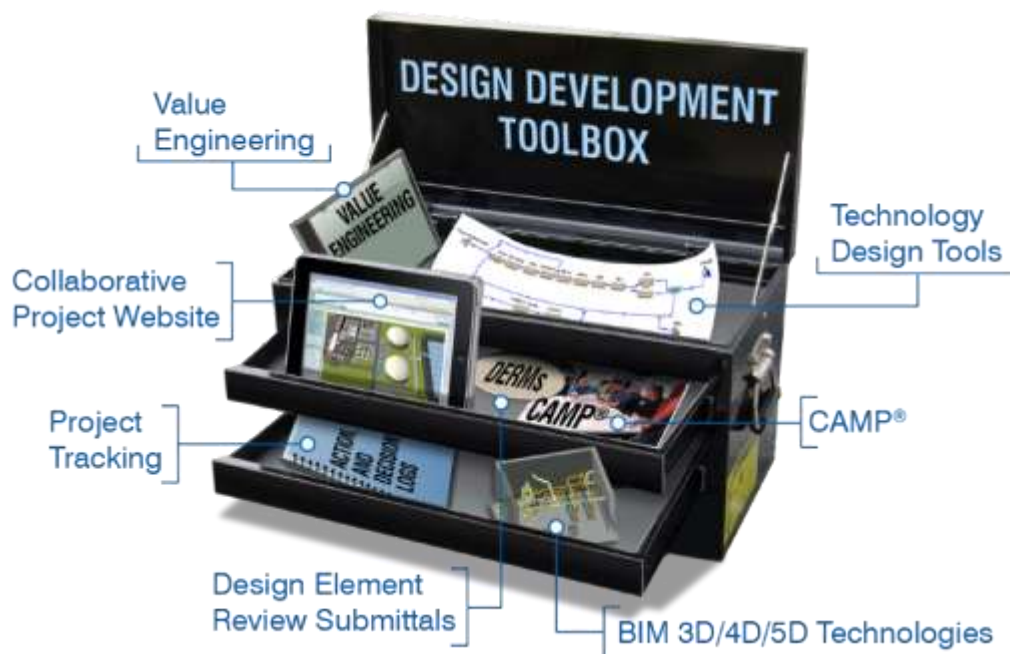
Carollo is staying at the forefront of membrane technology in Florida. A major issue for utilities that use RO membrane treatment is the need to increase recovery and minimize the concentrate waste stream produced as part of the process. Recognizing our expertise, the South Florida Water Management District (SFWMD) selected Carollo to perform a RO Concentrate Minimization study to characterize concentrate recovery opportunities across 14 desalination facilities. **As part of this study, Carollo demonstrated an innovative approach at North Miami Beach's Norwood-Oeffler WTP that cut RO concentrate volumes in half, increasing overall recovery from 75 percent to 88 percent.** By stabilizing the concentrate with lime addition, costs to recover additional water were 65 percent below that of a conventional, energy-intensive approach using thermal evaporation.

Our membrane know-how is not just limited to RO. We recently completed testing for Miami-Dade County's Hialeah-Preston WTP upgrades where we demonstrated sustainable NF recovery up to 93 percent. Operating at this elevated recovery will provide millions of dollars in cost savings to the County versus developing high-cost alternative water supplies.

Using Innovative Tools: Our team is in the forefront of developing and utilizing new tools for our clients. We recognize that maximizing value comes from using the right tools for the right application. These include cloud-based systems for project management, specialized scheduling and cost estimating software, and even laboratory services for leading edge research to yield innovative results.

Partnering for Collaboration: We approach every project with a discussion between the key stakeholders; operators, management and our technical experts. Our experience shows that when we have input from all stakeholders, we can collaboratively obtain a solution that reflects your vision.

The best way to present our approach for a typical task order expected under this Contract is to give examples of how we have successfully approached our past projects. As you read the approach for each of the example projects below, please pay special attention to how we "think differently" to find innovative solutions for complex problems. Each representative project is relevant to a key issue or project that Broward may need to address within the next few years. Our team is committed to developing creative ideas for each of your projects that will result in **cost-effective solutions to solve your needs.**



“ Their work on the project was exceptional both from the technical standpoint where their membrane design achieved a sustainable 93% recovery, and from the managerial standpoint, keeping the project on track and meeting all of our needs, expectations and preferences. ”

Rafael Terrero, PE, BCEE, MASCE,
Assistant Director,
Miami Dade Water and Sewer Department

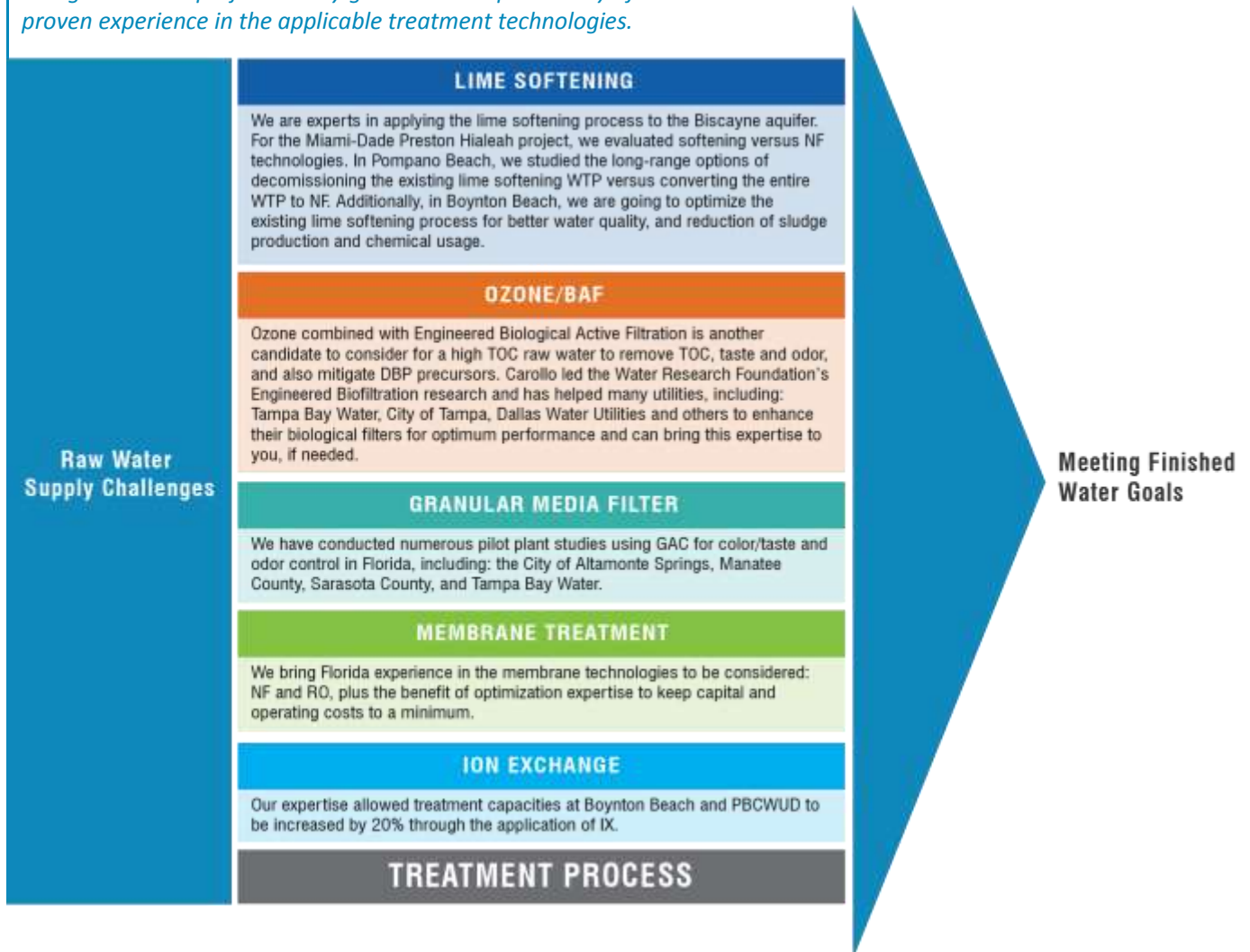
Working WONDERS with Water

We are routinely called on to evaluate existing treatment plants. With today’s economic pressures, our common goals for our evaluations are simply to do more with existing processes, reuse and invest in existing concrete tankage for a new process, and achieve regulatory approval for rerating existing processes.

Local and recent examples of our treatment plant project benefits are:

- **City of Sunrise, Sawgrass WTP.** Increased NF capacity from 18 to 24 mgd by achieving rerating of loading rates and bypassing IX treated water around the NF process.
- **Palm Beach County Water Utilities Department Water Plant No. 2.** Increased capacity by 20% through addition of an IX system (color removal) allowing the bypass of existing softening process.
- **City of Boynton Beach East Water Treatment Plant.** Increased capacity by 20% through addition of an IX system (color removal) allowing the bypass of existing softening process.
- **City of Margate East WWTP.** Modified existing aeration basin into an Integrated Fixed Film Aeration System (IFAS) to double the treatment capacity without expansion.
- **South Central Regional WWTP.** Increased sidewater depth and added a selector zone into existing aeration basins to increase capacity by 25% as well as substantially reduce energy consumption.

WATER SUPPLY. We are thoroughly familiar with the challenges associated with the Biscayne and Floridan aquifers in south Florida, including capacity, salt water intrusion, taste and odor, color, hardness, iron, and manganese. Our project history gives us a complete array of proven experience in the applicable treatment technologies.



Sawgrass Water Treatment Plant Improvements– Ion Exchange Improvements

CITY OF SUNRISE, FLORIDA

The City of Sunrise’s Sawgrass WTP is a membrane softening WTP utilizing nanofiltration (NF) membranes as the primary process to treat source water from the surficial Biscayne aquifer. The use of NF membrane technology results in high water lost in the byproduct waste stream (concentrate). The NF facility operated at approximately 85 percent recovery, therefore, 15 percent of the influent raw water was lost and had to be disposed in an industrial injection well.

The objectives for the new treatment processes included the following:

- Expand WTP capacity.
- Increase overall facility WTP recovery to reduce water loss.
- Improve finished water quality.



APPROACH

IX treatment was evaluated as an alternative treatment to NF membranes to increase the overall water recovery and achieve higher levels of conservation of fresh surficial water. For example, for every 1 million gallons per day (mgd) of treated water that can be diverted from NF membranes to IX treatment, 150,000 gallons of raw water is conserved and is treated to become potable water.

RESULTS

Bench- and pilot-scale demonstration testing of a granular media filtration and fixed ion exchange system was conducted. The treated water quality obtained from pilot testing was then compared to the 15 contaminants listed in the table of Secondary Drinking Water Standards. Many of the parameters were below the SMCLs in the raw water. Two parameters were identified to be above the SMCLs but were effectively reduced or controlled through the IX treatment process:

- Iron (which was oxidized to form particulate iron for removal in the filters through a contact process)
- Color (color is effectively reduced by controlling TOC since the largest contributor to color in the source water is natural organic matter (NOM) primarily in the form of dissolved organic carbon (DOC)).

The IX treatment scheme was found to reduce or control iron and color (color is effectively reduced by controlling TOC since the largest contributor to color in the source water is NOM primarily in the form of DOC). Oxidation and pre-filtration were also identified as treatment steps needed prior to the IX treatment. There were two primary criteria governing the need for oxidation and pre-filtration prior to IX in this treatment scheme, which include:

- Raw water iron – the desired effluent goal is an effluent concentration of less than 0.1 mg/L total iron.
- Removal of suspended solids and other colloidal material – the fixed bed IX treatment system is susceptible to fouling due to the solids material being applied to the resin bed.

Various treatment schemes, were pilot tested for iron control including oxidation alone, coagulation following oxidation, as well as the use of a filter-aid polymer following oxidation. The primary mechanism desired for iron control is oxidation of dissolved iron to form filterable particulate iron. It was determined through pilot testing that oxidation with sodium permanganate yielded the most effective results and lowest residuals production, while operating at a comparable cost (i.e., was not significantly more expensive than any other option).

RESULTS (Cont.)

A dual media pressure pre-filtration system was evaluated in bench- and pilot-scale testing. This pre-filtration system is intended for removal of particulates from the raw water flow stream, which minimizes the true and apparent color content, removes particulate and colloidal iron, and reduces UV absorbance (UVA). A conservative loading rate is utilized to maximize iron and other particulate removal efficiency.

The IX process proposed will be operated in a continuous mode, in which water is passed through columns packed with the selective resin in a plug flow manner. The anion exchange resin removes negatively charged ions with selectivity for specific anions. The specific resin type selected has a high affinity for negatively charged dissolved organic compounds.

The IX effluent water will be blended with the product water (permeate) from the existing NF membrane treatment plant. Water quality projections (excluding disinfection parameters) indicate that the water quality in the clear well after blending both streams will be as shown in the following table. Water savings were calculated to represent the reduction in concentrate loss when operating the IX system in lieu of NF membrane treatment.

Carollo calculated two blend scenarios to represent the range of finished water quality, which were reported when both the NF and IX systems are operating at capacity, as well as when the NF is at half the rated capacity.

The implementation of a new IX system at the Sawgrass WTP is currently underway. The project is considered successful as the proposed treatment scheme meets the stated objectives by:

- 1) conserving water compared to utilizing NF membrane treatment, which also increases the overall facility water recovery,
- 2) the finished water is also improved as the blended water (NF plus IX) is higher in hardness and alkalinity, which results in better water quality for aesthetics and minimizes the corrosion potential in the distribution system.

The estimated construction cost of the proposed improvements is \$13 million. Operating costs were developed, including costs for power, chemicals, and major replacement items (10-year replacement of the fixed bed IX resin was used in the estimate; however, it does not include minor resin maintenance or labor costs). The estimated yearly operating costs are \$306,730 based on operating the system at the design capacity of 7 mgd.

Water Quality for a Blend of 7 mgd IX Effluent and NF at Full and Half Capacity Sawgrass Water Treatment Plant Improvements. City of Sunrise, Florida			
Parameter	At NF Rated Capacity (18 mgd)	At NF Half Capacity (9 mgd)	Units
Calculated Water Savings	0	1.05	mgd
Total Alkalinity	119	154	mg/L as CaCO ₃
Total hardness ^(Note 2)	112	151	mg/L as CaCO ₃
pH	7.74	7.61	-
TDS	260	319	mg/L
Chlorides	64	78	mg/L

Notes:

1. NF water quality parameters based on the highest 75 percentile measurements from Dec. 2007 to Sept. 2009 reported in the MCR. The 75 percentile measurements were used in lieu of averages to develop the "critical case" for blending.
2. Only 7 - 8 mg/L as CaCO₃ from magnesium hardness.

RELEVANCE TO WWS

Carollo has identified, tested, and implemented a potential process to optimize performance at Water Treatment Plant 1A. This treatment process is easy to implement and is very cost effective. Some of the benefits include:

- Eliminate the nuisance raw water ammonia.
- Eliminate assimilable organic carbon making the chloramine residual a lot more stable (resulting in less ammonia release and reduce nitrification).
- Obtain a more stable chlorine demand due to the elimination of ammonia and AOC.

REFERENCE

Timothy Welch, Director of Utilities
777 Sawgrass Corporate Parkway
Sunrise, FL 33325
PH: (954) 888-6055
Email: twelch@sunrisefl.gov

SUBCONSULTANTS

ADS Engineering

City of Boynton Beach East Water Treatment Plant Improvements

CITY OF BOYNTON BEACH, FLORIDA

APPROACH The City owns and operates two water treatment plants (WTP), the East WTP and the West WTP. Both facilities utilize the local surficial aquifer (LSA) as a raw water source. Due to saltwater intrusion issues in the East Wellfield, the City formulated an innovative plan to utilize raw water from the Western Wellfield and treat it with the magnetic ion exchange (MIEX®) process at the East WTP.

RECOMMENDATION Carollo designed and under a D/B process, constructed a 16-mgd MIEX® treatment process to pretreat water from multiple wells prior to the lime softening process. Using this approach, the project brings together a new organics removal MIEX® system for Western Wellfield water and saved costs by using existing excess treatment capacity for hardness removal and filtration at the East WTP. Permitting, equipment procurement, and instrumentation and control programming were all critical to the project schedule.

Highlights of the work included:

- **Design:** A cost-effective solution to increase capacity at the East WTP with minimal disruption.
- **Process Selection:** Various treatment technologies and strategies were evaluated. Carollo recommended using an ion exchange process to allow the decoupling of the lime softening process (hardness removal) from concurrent color removal.
- **Permitting:** Based on water use permitting requirements, the City needed to have the facilities operational as soon as possible to provide the needed additional water treatment production. Permits were procured by the design-build team in stages to shorten the construction schedule.
- **Operations:** Construction required six individual plant tie-ins and shut downs that could not interfere with plant operations. This was completed through detailed planning and coordination with the plant’s operation staff.

RELEVANCE TO WWS Color removal is an issue that Broward addresses everyday. Decoupling color and hardness removal in Broward’s softening process through ion exchange would make the softening process much more effective.

<p>REFERENCE</p> <p>Joe Paterniti, Utilities Director 124 E Woolbright Road Boynton Beach, FL 33435 PH: (561) 742-6400 Email: paternitij@bbfl.us</p>	<p>SUBCONSULTANTS</p> <p>Gamboa Engineers</p>
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Springtree WTP Improvements: Softener, Sludge Dewatering, and Chemical Systems Upgrades

CITY OF SUNRISE, FLORIDA

The City of Sunrise wanted to improve the operations of the existing lime sludge thickening and sludge dewatering residuals processing at the Springtree WTP. The residuals (sludge) are generated from the removal of calcium hardness from the raw water. The sludge produced consist primarily of calcium carbonate hardness.

The City currently uses rotary drum vacuum belt filters to dewater thickened lime sludge. The existing rotary drum vacuum belt filters were installed in the late 1980s and essentially reached the end of their useful life. As a result, the City wanted to replace the vacuum filters and improve the sludge dewatering operation.



APPROACH

Our approach began with an evaluation of the performance of each of the key facilities, revolving around the following key elements:

1. Develop the lowest-cost solution to meets operational and disposal needs and requirements.
2. Maximize use of current infrastructure.
3. Keep solids handling operations simple and robust, while meeting regulatory and water quality requirements.
4. Phase in required solids handling processes and upgrades to meet the plant's solids production requirements.

We considered vacuum filters as a viable candidate to replace the existing units, but also considered other types of mechanical sludge dewatering alternatives to provide additional benefits. Each alternative addressed the handling of residuals as well as solids accumulated from filter backwashes. For each alternative, consideration was given to the following:

- Costs of each alternative: both capital and annual O&M costs.
- Operating parameters for each alternative based on the established residuals production estimates.
- General description of the handling process and operations.

Each alternative required different space requirements to allow operations and maintenance. A key cost parameter was whether available space in the existing solids handling building could be used, if modification to the existing building was necessary, or if a new structure was required. Capital as well as annual O&M costs were developed for three alternatives and captured in a net present value figure. The three alternatives evaluated were:

1. Rotary drum vacuum filters
2. Belt filter presses
3. Plate and frame filter presses

The conclusion was that replacement of the existing rotary drum vacuum filters with new vacuum filters was the most cost effective and best all-around choice. To minimize costs, the existing building was elected to be reused.

We proceeded into detailed design, followed by construction phase management.

RESULTS

The new vacuum filters are now operational and effectively dewatering the sludge.



RELEVANCE
TO WWS

We understand that the dewatering equipment at the treatment Plants 1-A and 2-A are at the end of their useful life and an innovative, comprehensive and proven approach is needed. The results of the Sunrise project and implementation experience will yield the maximum return of investment to WWS.

REFERENCE

Timothy Welch,
Director of Utilities
777 Sawgrass Corporate
Parkway
Sunrise, FL 33325
PH: (954) 888-6055
Email: twelch@sunrisefl.gov

SUBCONSULTANTS

ADS Engineering



3. Past Performance

ENGINEERING EXCELLENCE for Innovative, Cost-Saving Solutions

During our 85-year history, Carollo has successfully led the industry in innovative, cost-saving solutions.

We are currently ranked within Engineering News

Record's (ENR) top 500 design firms. More importantly, ENR ranks Carollo among the top 10 firms for water and wastewater. Carollo only provides water and wastewater-related services, solely hiring staff with the extensive background, training, and dedication to this field. For that reason, we bring an unequaled level of understanding of key supply, treatment, and conveyance issues to solve your needs with proven, industry-leading answers.

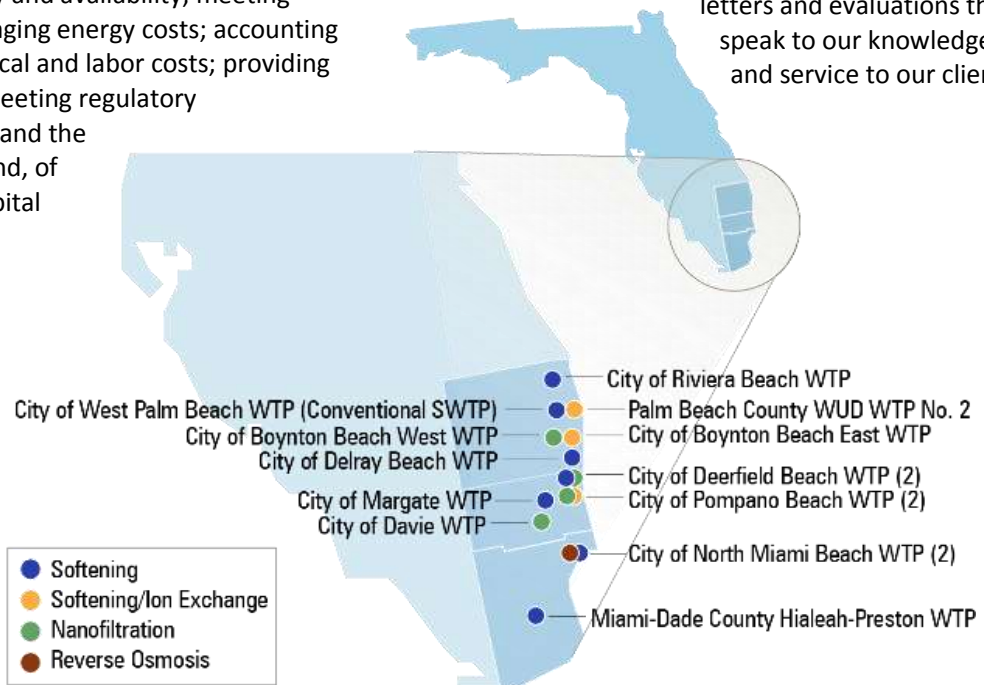
Carollo is the largest ENR 500 design firm working exclusively in water and wastewater, allowing us to provide unmatched talent and solutions.



We Are a LOCAL FIRM WHO UNDERSTANDS Your Issues

We are also experts in the local concerns of utilities like yours in South Florida, addressing the day-to-day needs of Broward County WWS as well as the South Central Regional Wastewater Treatment and Disposal Board, Palm Beach County, Miami-Dade County, and Cities of Sunrise, Pompano Beach, and Margate. We understand the issues that you are facing: water reliability and availability; meeting treatment goals; managing energy costs; accounting for variability in chemical and labor costs; providing for future flexibility; meeting regulatory requirements of FDEP and the Health Department; and, of course, developing capital plans within a rapidly recovering economy.

What does all this mean? Carollo brings a proven track record of projects similar to those anticipated to be performed under your General Services contract, completed on time and within budget, with an emphasis on industry-leading technology to maximize your dollars. Starting on page 3 of this section, we have included reference letters and evaluations that speak to our knowledge and service to our clients.



What Sets **US APART...**

Our Industry Leadership

Carollo only provides services supporting water and wastewater related services. We focus on the water/wastewater industry, fostering a reputation for leadership and innovation. Our leadership role is exemplified by the following:

- **First engineering firm in the waterworks industry to apply computational fluid dynamics (CFD)** the groundbreaking application was optimization of the hydraulic characteristics of an ozone contact chamber. We recently developed a CFD model for your IX contactor design. Improving on the design we did for Palm Beach County's system, incorporated alternating mixer directions to create a more uniform resin bed, which lowered resin loss, and increased efficiency resin contact.
- **Pioneered the use of UV irradiation for drinking water treatment** via multiple research projects with WaterRF and construction of the first full-scale UV validation facility in North America.
- **First engineering firm to incorporate micro- or ultrafiltration in conjunction with lime softening treatment.** This concept was pioneered by Carollo and tested on pilot scale operations in the Midwest. Full-scale, award winning facilities employ this exciting technology, now being utilized by numerous other clients seeking superior water quality at an affordable price.
- **Carollo developed the use of biological active filtration** for the removal of a host of compounds from drinking water supplies, including nitrates, MIB & geosmin, pharmaceutical compounds, perchlorate, and a host of other contaminants. Several pilot testing programs are now underway and full-scale facilities being designed to incorporate these customized removal technologies at vastly reduced cost when compared to alternative treatment technologies, such as RO treatment.
- Multiple times over the last 10 years, **Carollo has led the industry with the most number of papers accepted for presentation at national conferences** (i.e., AWWA, ACE, and WEFTEC), and has consistently been in the top three regarding number of papers presented. Our leadership in the industry has also been recognized with the award of several WaterRF, WaterReuse Foundation, and Water Environment Federation research projects.

Award Winning Recognition

State-of-the-Art MIEX® System



- This project won an award from the Florida Institute of Consulting Engineers.
- The system is the largest MIEX System of its type in North America.
- The system has saved PBC approximately \$310,000/year in operations costs.



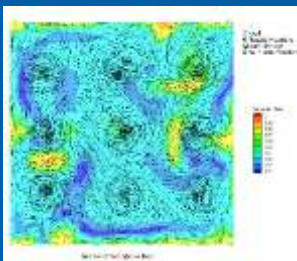
Expansion to 11.6 mgd



- This project won the 2012 Florida Section Design-Build Institute of America (DBIA) Award for Water/Wastewater projects.
- Provided pilot testing, design, and construction phase services for the membrane treatment system.



Design of Pump Station and Inflow Structure



Carollo developed a CFD model for Boynton Beach Utilities IX project, the counter rotating mixers reduce resin loss and increase resin efficiency, **ULTIMATELY REDUCING OPERATIONAL COSTS.**

- The L-8 Flow Equalization Basin Project received the “Engineering Project of the Century” Award from the Florida Engineering Society.



Our Best Proof of GREAT PERFORMANCE is what our past clients say...

Carollo prides itself on the continuing relationships that we have developed with our clients. We have provided letters of recommendation from the following clients:

- Manatee County Utilities
- City of Tampa – Water Department
- Sarasota County Public Works
- City of Orlando
- City of Altamonte Springs – Public Works & Utilities
- City of Daytona Beach Utilities Department
- JEA
- Collier County Public Utilities Division



Innovative Solutions

Innovation is vital to all we do. We work tirelessly to advance the science and engineering of water, finding the most creative and technically sound solutions to meet industry needs.



Superior Service

The satisfaction of our clients means everything. It defines who we are and determines our future. We take this responsibility very seriously, and are committed to providing the highest level of service in the industry.



Talented People

Our people set us apart. From recent graduates to career professionals, we employ some of the best engineers, scientists, and support staff in the industry – all focused 100% on water.



WATER
OUR FOCUS
OUR BUSINESS
OUR PASSION

Our exclusive focus on water helps attract talented people who have a passion for water and the expertise required to solve our most pressing water challenges. We apply that passion and expertise to create innovative, cost-conscious solutions delivered with service that exceeds expectations.

Collaborative Culture

We seek long-term relationships founded in meeting our commitments, developing mutual trust and respect, and fostering a collegial, collaborative working environment.





Utilities
Wastewater
4410 66th Street West
Bradenton, FL 34210
Phone: (941) 792-8811, ext. 5235
www.mymanatee.org/utilities

November 7, 2014

Subject: Services Provided to Manatee County Utilities by Carollo Engineers for Headworks Rehabilitation at the Southwest Water Reclamation Facility

To Whom it May Concern:

Please accept this correspondence as opinion of services provided by Carollo Engineers regarding referenced subject.

Carollo Engineers has recently completed study, design, and most construction phase services for significant upgrades and rehabilitations to Manatee County's 15 mgd Southwest Water Reclamation Facility headworks structure. To date, the County is very pleased with the level of service provided by Carollo Engineers.

They have demonstrated an attention to detail, cost-consciousness, and an overall commitment to the success of the project. They have provided an exceptional level of knowledge and expertise and the proper amount of resources required to ensure a quality product. They have worked especially well with our staff to ensure concerns were addressed and project deadlines achieved.

It is our opinion Carollo Engineers has provided excellent services throughout this project and we believe they have the resources, commitment to quality, and expertise to manage similar efforts. Please feel free to contact me at the number listed below should you have questions or require additional information regarding this matter.

Sincerely,

Jeff Goodwin
Wastewater Division Manager

LARRY BUSTLE * MICHAEL GALLEN * JOHN R. CHAPPIE * ROBIN DISABATINO * VANESSA BAUGH * CAROL WHITMORE * BETSY BENAC
District 1 District 2 District 3 District 4 District 5 District 6 District 7



CITY OF TAMPA

Bob Buckhorn, Mayor

Water Department

Chuck Weber, P.E., Director

June 21, 2017

RE: Carollo Engineers, Inc.

To Whom It May Concern:

I am writing this letter to recommend the professional engineering services of Carollo Engineers, Inc. The City of Tampa Water Department hired Carollo Engineers, Inc. to develop a master plan for the David L. Tippin Water Treatment Facility. This project kicked off last summer and we are currently reviewing the master plan document.

As the City's project manager, I greatly appreciate the leadership of Mr. Larry Elliot, P.E., who led the Carollo project team with his extensive knowledge and years of experience. The Carollo project team produced quality deliverables and performed well. Their comprehensive project approach and solid project structure to the development of the master plan provided ample opportunities for our team to be fully engaged in the overall process. The Carollo team was responsive and attentive.

I would not hesitate to recommend Carollo Engineers, Inc. for another project. If you have any question, please do not hesitate to contact me. I can be reached at (813) 274-7095.

Sincerely,

Seung Park, P.E., Chief Engineer
Tampa Water Department

306 E. Jackson St., SE • Tampa, Florida 33602 • (813) 274-8121 • FAX: (813) 274-7435

www.TampaGov.net



**Survey Questionnaire – Polk County
RFP 18-539, Utilities Design services & Regulatory Support Services**

To: Seung Park, P.E. City of Tampa
(Name of Person completing survey) (Name of Client Company/Firm)

Phone Number: 813-274-7095

Email: seung.park@tampagov.net

Subject: Past Performance Survey of:
David L. Tippin Water Treatment Facility Master Plan

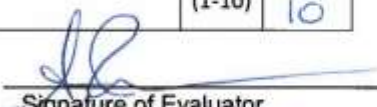
(Project Name)
Consultant Name: Carollo Engineers, Inc.

(Name of firm being surveyed)
Cost of Services: \$987,801 Date Complete: Anticipated May 2018

Rate each of the criteria on a scale of 1 to 10, with 10 representing that you were very satisfied (and would hire the firm/individual again) and 1 representing that you were very unsatisfied (and would never hire the firm/individual again). Please rate each of the criteria to the best of your knowledge. If you do not have sufficient knowledge of past performance in a particular area, leave it blank.

NO	CRITERIA	UNIT	SCORE
1	Ability to manage cost	(1-10)	10
2	Ability to maintain project schedule (complete on-time/early)	(1-10)	9
3	Quality of workmanship	(1-10)	10
4	Professionalism and ability to manage	(1-10)	10
5	Close out process	(1-10)	N/A
6	Ability to communicate with Client's staff	(1-10)	10
7	Ability to resolve issues promptly	(1-10)	9
8	Ability to follow protocol	(1-10)	10
9	Ability to maintain proper documentation	(1-10)	10
10	Appropriate application of technology	(1-10)	10
11	Overall Client satisfaction and comfort level in hiring	(1-10)	10
12	Ability to offer solid recommendations	(1-10)	10
13	Ability to facilitate consensus and commitment to the plan of action among staff	(1-10)	10

Seung Park, P.E.
Printed Name of Evaluator


Signature of Evaluator

Please fax or email the completed survey to: lelliott@carollo.com



November 3, 2014

To Whom It May Concern:

RE: Professional Performance of Carollo Engineers

Sir or Madam:

Sarasota County has maintained a professional relationship with the firm of Carollo Engineers for over ten years. During that time, Carollo has provided us with consulting and engineering services for projects that include research, operation and maintenance, renewal and replacement, and the design and construction of improvements to the county's water and wastewater treatment systems. Most recently, we have been working with Carollo on a major project involving the multi-year expansion of the Central County Water Reclamation Facility which is one of our County's large regional treatment facilities. While Carollo is the local recognized leader in treatment technology, they have also provided valuable services with respect to all forms of utility design and construction.

Staff members of the County have been extremely pleased with the cost, quality, timeliness, and responsiveness of the professional consulting and engineering services that we have received from Carollo. Our association has been very positive and we have always found the principals, staff members, and support staff to be above average in professional capability.

I am confident that our favorable experience with Carollo is reflective of the level of service and satisfaction that others can expect, and I highly recommend them to other potential clients who are seeking quality, professional engineering services that are personally customized to meet their particular project requirements.

Sincerely,



Gregory Rouse, P. E. (FL)
Utilities Technical Manager
Sarasota County Public Works

Capital Management Services • 1001 Sarasota Center Blvd., Sarasota, FL 34240
Tel (941) 861-0533 • Fax (941) 861-0589



CITY OF ORLANDO

October 31, 2014

SUBJECT: Carollo Engineers, Inc.
Letter of Recommendation
City of Orlando City Project 6464
Conserv II Biosolids Dewatering System Improvements

To Whom It May Concern:

In 2013, the City of Orlando (City) selected Carollo Engineers, Inc. (Carollo) for a \$6.5M project to replace the aging biosolids dewatering system at the City's Conserv II Water Reclamation Facility (WRF). The preliminary phase of the project included side-by-side pilot testing of multiple mechanical dewatering systems at the WRF, for which Carollo developed the Pilot Test Protocol, oversaw the testing, and analyzed and summarized the pilot test data. Also included in the preliminary phase of the project was a complete evaluation of the existing dewatering system at the WRF, including the mechanical dewatering equipment, sludge pumping, polymer system, dewatered sludge conveyance system, and odor control system. A series of technical memorandums were developed that formed the basis of design for the dewatering system components.

The City is currently preparing to enter into the final design phase of this project with Carollo. This was the first time we hired Carollo for a design project and we are extremely pleased with that decision. From the start, they have performed very professionally, been extremely responsive and have brought the most qualified and appropriate personnel to service us and our needs as a client. Carollo has delivered on all their promises plus more. The City is looking forward to completing the next phases of this project with Carollo.

In my opinion, Carollo is a top-notch consulting firm with a staff of highly skilled engineers. Based upon my experience on this project, I would have a strong willingness to hire Carollo for future work involving wastewater treatment processes.

Sincerely,

A handwritten signature in blue ink, appearing to read "Kristi L. Fries".

Kristi L. Fries, P.E.
Project Manager
kristina.fries@cityoforlando.net
407-246-3353

CAPITAL IMPROVEMENT & INFRASTRUCTURE DIVISION • PUBLIC WORKS DEPARTMENT
CITY HALL • 400 SOUTH ORANGE AVENUE • ORLANDO, FLORIDA 32801-3302
• Fax (407) 246-2892 • <http://www.cityoforlando.net>



November 10, 2017

Mr. Larry Elliott, P.E.
Senior Vice President
Carollo Engineers, Inc.
200 East Robinson Street, Suite 1400
Orlando, FL 32801

Subject: Performance Assessment/ Direct Potable Reuse

Dear Mr. Elliott,

The City of Altamonte Springs has a long history of being on the forefront of water resources management and implementing creative ideas to serve our utility customers and protect the environment. Through our competitive engineering consultant selection process, our staff chose Carollo Engineers, Inc. (Carollo) to work on our latest and most important water resource project yet, pureALTA. As you are aware, this project required specific unit process expertise, some local knowledge, and a sharp attention to schedule and delivery of tasks to meet funding requirements.

We have been particularly pleased with the exceptional performance by Carollo throughout the design and implementation of this project. Many consulting firms tout their national leaders and resources, but are frequently unable to function and deliver as a single entity. However, the Carollo team was able to use their Florida staff (David Ammerman, Pranjali Kumar) and their California staff (Andy Salveson) completely seamless. Experts were not just a "resume" in a proposal, but active participants vested in the success of the project.

Moreover, throughout the project duration, we had productive and frequent collaboration that resulted in a project that not only met our goals, but one that exceeded our expectations. In fact, pureALTA was awarded the 2017 WaterReuse Innovative Project of the Year.

Carollo team's technical expertise, project management skills and leadership were evident through all intermediate milestones and final project delivery. Based on the caliber of work performed, I look forward to working with Carollo again and recommend them on any future water resources assignments.

Sincerely,

A handwritten signature in blue ink, appearing to read "Ed Torres", is written over a light blue horizontal line.

Ed Torres, M.S., P.E., LEED AP
Director of Public Works & Utilities

225 Newburyport Avenue | Altamonte Springs, FL 32701

www.Altamonte.org



City of Daytona Beach UTILITIES DEPARTMENT

125 Basin Street, Suite 130
Daytona Beach, FL 32114
(386) 671 8800

January 14, 2015

To Whom It May Concern:

Carollo Engineers Inc. (Carollo) was selected by City of Daytona Beach (CODB) to provide continuing professional engineering services for Water and Wastewater treatment. This multi-year contract began in July 2008. The City owns and operates two water reclamation facilities – Westside Regional WRF (WRWRF) with a rated capacity of 15 mgd (adf), 45 mgd peak and Bethune Point WRF (BPWRF) with a rated capacity of 13 mgd (adf), 26 mgd peak.

Under this Contract, Carollo has successfully completed the following projects:

1. **WRWRF Tertiary Filter Evaluation Study.** Carollo prepared a conceptual level analysis of five alternative approaches for improving filtration at WRWRF, thereby providing the City with a reliable filtration system capable of meeting current and potential future permit conditions. Based on the evaluation studies conducted, Carollo recommended to replace the existing automatic backwash (ABW) filters. Completion: 2010.
2. **WRWRF Spill Analysis and Compliance Report.** Due to an unauthorized discharge (spill) from the ABW filters, the City received a warning letter from FDEP. As a result, the City retained Carollo to investigate reasons for this spill and evaluate options to prevent such incidents in future. Carollo evaluated options for preventing future spills at the ABW filters. Completion: 2010.
3. **BPWRF and WRWRF Process Optimization Study.** The BPWRF and WRWRF had not been consistently meeting effluent nitrogen and phosphorus permit requirements and had been using excess chemicals in order to remain in compliance. Carollo was tasked with performing a process optimization study to identify alternatives to help the City provide consistent nitrogen and phosphorus removal and reduce chemical expenditures. Carollo evaluated the historical performance of the facilities; the various operating systems including mixing, internal recycle, and return sludge pumping; and identified and prioritized alternative approaches to improving process performance and minimizing chemical use. Based on the evaluations Carollo recommended facility improvements for optimizing plant performance. Completion: 2012.
4. **Replacement of Influent Screens and Mechanical Mixers at WRWRF and BPWRF.** As part this task, Carollo designed new mechanical screens to replace the existing plant influent screens with an option to rebuild the existing screens. The City elected to rebuild the existing Parkson AquaGuard screens at both facilities. Further, the design also included replacing the existing mechanical mixers in the process basins at both plants with new ragless mechanical mixers. The design was completed in 2013.
5. **BPWRF and WRWRF Operating Permit Renewals.** Carollo assisted the City in preparing and securing the operating permits from FDEP for both facilities. The scope included preparing a capacity analysis report (CAR), a operations and maintenance performance report (OMPR) and permit renewal forms for both facilities. Completion: 2013.

6. **WRWRF RAS-WAS and Reaeration System Improvements.** City retained Carollo to design upgrades to the existing RAS/WAS pump system and Reaeration System Improvements. Carollo designed new RAS/WAS pumps (screw centrifugal pumps) to replace the existing submersible pumps. Improvements to the reaeration system at the bardenpho process includes new positive displacement blowers and coarse bubble diffusers. Design was completed in July 2014.
7. **WRWRF Design of New Tertiary Filters.** After the tertiary filter evaluation study completed by Carollo, the City tasked Carollo with the design and construction of deep-bed filters to replace the existing ABW filters. The scope of services includes preparing bid documents for a new deep-bed filter system. Completion: June 2015.
8. **WRWRF UV System Audit and Peracetic Acid Pilot Study.** The plant has periodically failed to meet the fecal coliform limits for reuse applications. The City is received a warning letter from the FDEP in September 2014. The City retained Carollo to conduct a UV disinfection system audit in October 2014 to assess the operation of the UV system and provide recommendations to improve disinfection. Several recommendations were made including a recommendation to investigate the addition of peracetic acid (PAA) upstream of the UV system to improve the disinfection process. A bench-scale study was conducted in November 2014 and based on the encouraging results from this testing, the City has decided to perform a 60-day full-scale trial for adding PAA upstream of the UV system.

Carollo Engineers, Inc., has been responsive to the city during episodes of non-compliance at the plant facilities. They consistently bring various options for solutions to the compliance issues.

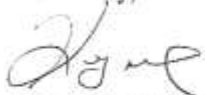
Carollo provides study and design proposals in a timely fashion and schedules are consistently met. I have not personally had the opportunity to manage a construction project with Carollo, but am looking forward to the construction phases of the city's RAS/WAS, Stage 3 and 5 Bardenpho and replacement of the traveling hood filters in the next few years.

The progress meetings initiated by Carollo during the studies and designs are well thought out and address significant (and minor) issues such that everyone including the city's operations staff is given an opportunity to buy in as projects progress. Carollo has provided timely "lunch and learn" meetings to operations staff to evaluate what equipment and processes are most easily assimilated into the existing plants' process trains and match the staff's abilities.

We look forward to our continuing partnership with Carollo Engineers Inc.

If I can be of any further assistance, please do not hesitate to call me.

Sincerely,



Kimberly Dixon, PE
City of Daytona Beach
125 Basin Street, Suite 130
Daytona Beach, Florida 32114
386-671-8807 (Office)
Email: dixonk@codb.us

**Survey Questionnaire – Polk County
RFP 18-539, Utilities Design services & Regulatory Support Services**

To: Deryle Calhoun JEA
(Name of Person completing survey) (Name of Client Company/Firm)

Phone Number: 904-665-8455

Email: calhdi@jea.com

Subject: Past Performance Survey of:

JEA General Engineering Services for Water, Wastewater, and Reclaimed Water

(Project Name)

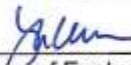
Consultant Name: Carollo Engineers, Inc.
(Name of firm being surveyed)

Cost of Services: \$1.3M Date Complete: Ongoing

Rate each of the criteria on a scale of 1 to 10, with 10 representing that you were very satisfied (and would hire the firm/individual again) and 1 representing that you were very unsatisfied (and would never hire the firm/individual again). Please rate each of the criteria to the best of your knowledge. If you do not have sufficient knowledge of past performance in a particular area, leave it blank.

NO	CRITERIA	UNIT	SCORE
1	Ability to manage cost	(1-10)	10
2	Ability to maintain project schedule (complete on-time/early)	(1-10)	8
3	Quality of workmanship	(1-10)	10
4	Professionalism and ability to manage	(1-10)	10
5	Close out process	(1-10)	10
6	Ability to communicate with Client's staff	(1-10)	10
7	Ability to resolve issues promptly	(1-10)	10
8	Ability to follow protocol	(1-10)	10
9	Ability to maintain proper documentation	(1-10)	10
10	Appropriate application of technology	(1-10)	10
11	Overall Client satisfaction and comfort level in hiring	(1-10)	10
12	Ability to offer solid recommendations	(1-10)	10
13	Ability to facilitate consensus and commitment to the plan of action among staff	(1-10)	10

Deryle Calhoun
Printed Name of Evaluator


Signature of Evaluator

Please fax or email the completed survey to: lelliott@carollo.com



November 7, 2014

Subject: Letter of Recommendation – Carollo Engineers

To Whom it May Concern:

Collier County sought the services of an engineering consultant to plan and design the largest and most complex utility project in the history of the County – the Northeast Regional Utility Facilities, a new 4-mgd Water Reclamation Facility (ultimate 20-mgd) and a 15-mgd Water Treatment Plant (ultimate 45-mgd), co-located on a site along with new administration, collection, and distribution facilities.

Competition for this project was particularly strong, with firms offering their best teams and ideas. Collier County chose Carollo Engineers to complete the work due to their innovative ideas, approach to involve County staff in an interactive fashion throughout all phases of the work, and the outstanding references we received from their previous clients.

True to their word, Carollo involved us intimately in the work, provided great talent for all aspects of the project, and offered a truly refreshing degree of innovation and client responsiveness. Work for the County on numerous other assignments has demonstrated this level of superior service on projects of all sizes.

Collier County gave significant weight to references from other agencies in our decision to hire Carollo. I am confident that if you choose Carollo for your project, you will be extremely pleased with that decision. If you would like to further discuss our experience with Carollo, please contact me directly. You may contact me either by e-mail, at PaulMattausch@colliergov.net, or by telephone at (239) 252-6112.

Sincerely,

A handwritten signature in black ink, appearing to read "Paul E. Mattausch".

Paul E Mattausch

DIRECTOR, NORTHEAST UTILITIES
PUBLIC UTILITIES DIVISION
COLLIER COUNTY GOVERNMENT
3339 TAMiami TRAIL EAST
SUITE 301
NAPLES, FLORIDA 33112-5361
OFFICE 239.252.6112
FAX 239.252.6684
PaulMattausch@colliergov.net



Administration Department • 3339 Tamiami Trail East, Suite 301 • Naples, Florida 34112-5361 • 239-252-2540 • FAX 239-252-6474

A. DESIGNING, PERMITTING, AND CONSTRUCTION MANAGEMENT FOR WATER TREATMENT PLANTS, WATER DISTRIBUTION PUMPING STATIONS, AND STORAGE TANKS

Carollo's water treatment and supply experience includes over 100 water treatment plants ranging in size from less than 1 mgd to over 600 mgd. We are at the forefront of technology in Florida, with expertise in all aspects of lime softening, nanofiltration (NF) and reverse osmosis (RO) treatment. We have designed over 150 water pumping facilities with capacities as high as 650 mgd. Our pump station designs serve a number of specific functions including raw water delivery to treatment plants, irrigation pumping, well water pumping, treated water delivery to distributions systems, intermediate transmission line boosting, and inter pressure zone transfers.

Local Expertise

In Florida, we have optimized softening and membrane processes to reduce chemical usage, sludge production and maximize filter and membrane efficiencies. We have also led the industry with the application of a magnetic ion exchange process (MIEX®) for disinfection byproduct (DBP) and color removal for Palm Beach County and Boynton Beach. Leading the industry also means that a close relationship with the permitting agencies is a must have to avoid project delays.

We have also completed a number of pumping stations and storage tanks in Florida. In fact, we are currently working with Broward County on the Pumping Stations and Storage Tank professional services contract. To date, we have completed the design of new pumping stations and storage tanks for District 3A and 1B1 and a new storage tank for District 2A.

Breadth of Technology

We span the technology range to address the specific needs of our clients with conventional tried and true engineering methods, to leading-edge advanced treatment technologies. This experience includes all types of membrane treatment; RO, NF, EDR, UF, MF, etc.; advanced disinfection/oxidation; ozone, UV, chlorine dioxide, UV+H₂O₂, etc.; ion exchange, conventional fixed bed and MIEX®; and biologically active filtration for and TOC reduction and contaminant removal.

Doing More with Less to Save Costs

In today's challenging economic times, we understand the importance of doing more with less by maximizing the opportunities to use our client's existing infrastructure. While there is always an easy answer to "build more," we strive to find solutions that save costs. Common examples from our past projects are: rerating existing processes to increase capacities, converting obsolete tankage into new processes, and striving to unveil and remedy.

A local example is **Palm Beach County's WTP No. 2**, where Carollo's implementation of the world's largest high rate MIEX® process increased capacity by 14 percent while reducing color, organics, chemical usage, solids production, and nitrification potential in the distribution system. We anticipate that Palm Beach County will recognize an annual operational cost savings of \$196,000 to \$333,000.



Palm Beach County WTP No. 2

Carollo is staying at the forefront of membrane technology in Florida. A major issue for utilities that use RO membrane treatment is the need to increase recovery and minimize the concentrate waste stream produced as part of the process. Recognizing our expertise, the **South Florida Water Management District** (SFWMD) selected Carollo to perform a RO Concentrate Minimization study to characterize concentrate recovery opportunities across fourteen desalination facilities. As part of this study, Carollo demonstrated an innovative approach at **North Miami Beach's Norwood-Oeffler WTP** that cut RO concentrate volumes in half, increasing overall recovery from 75 percent to 88 percent. By stabilizing the concentrate with lime addition, costs to recover additional water were 65 percent below that of a conventional, energy-intensive approach using thermal evaporation.

Our membrane know-how is not just limited to RO. We recently completed testing for **Miami-Dade County's Hialeah-Preston WTP** upgrades where we demonstrated sustainable nanofiltration recovery up to 93 percent. Operating at this elevated recovery will provide millions of dollars in cost savings to the County versus developing high-cost alternative water supplies.

Applied Research

Carollo has been at the forefront in Applied Research in the water and wastewater industry to provide innovative solutions to our clients. Some of our recent research includes:

- Over 100 Applied Research projects in the last 5 years covering water, wastewater, reuse, and infrastructure.
- 34 peer-reviewed publications in the last two years.
- Funded research by Water Research Foundation (formerly AwwaRF), USEPA, WRF, WERF, USBR, NWRI, DoD, and municipal clients.
- AwwaRF – Evaluating Biological Regrowth in Distribution Systems.
- AwwaRF – Formation and Decay of Disinfection Byproducts (DBPs) in the Distribution System.
- AwwaRF – Changes in Distribution System Water Quality.
- AwwaRF – Optimizing Chloramine Treatment (Guidance Manual).

Project examples are shown on the following pages.

Why CAROLLO?

The answer is simple...



Similar Project Experience

We have recently completed or are performing the following projects for many clients in South Florida and throughout the State of Florida. The matrix below presents a summary of projects for which we have provided similar services. Detailed project summaries for some select projects are including within this Evaluation Criteria.

Project Information				Role/Services				Features			
Project/	Client	State	Capacity (mgd)	Prime/Sub	Design	Permitting	CM	Water Pump Stations	Storage Tanks	Water Supply Wells	SE Florida Regulatory Issues
Potable Water Storage Tanks and Pumping Stations	Broward County WWS	FL	Various	Prime	4	4	4	4	4		4
Springtree WTP Improvements	City of Sunrise	FL	25	Prime	4	4	4	4		4	4
Sawgrass WTP Expansion	City of Sunrise	FL	24	Prime	4	4	4			4	4
Springtree 4-log Compliance for RO WTP	City of Sunrise	FL	25	Prime	4	4	4				4
Nanofiltration vs Softening Evaluation	City of Pompano Beach	FL	10	Prime				4	4	4	4
Concentrate Disposal	City of Pompano Beach	FL	10	Prime	4	4	4	4			4
Transfer Pump Station Expansion	City of Pompano Beach	FL	10	Prime	4	4	4	4			4
WTP Electrical System Master Plan and Upgrades	City of Pompano Beach	FL	10	Prime	4	4	4	4	4	4	4
D/B of Ion Exchange	City of Boynton Beach	FL	16	Prime	4	4	4			4	4
Filter Valves and Clarifier Upgrade	City of Delray Beach	FL	12	Prime	4	4	4				4
WTP No. 2 Filter Replacement	Palm Beach County WUD	FL	16	Prime	4	4	4				4
Nitrification Action Plan	Palm Beach County WUD	FL		Prime							4
WTP No. 2 Ion Exchange	Palm Beach County WUD	FL	16	Prime	4	4	4			4	4
L-8 Reservoir Pump Station	South Florida Water Management District	FL	290	Prime	4	4	4	4			4
S-470 Reservoir Pump Station	South Florida Water Management District	FL	970	Prime	4	4	4	4			4
S-476 Reservoir Pump Station	South Florida Water Management District	FL	126	Prime	4	4	4	4			4

Preston Hialeah WTP Improvements	Miami-Dade Water and Sewer Dept.	FL	225	Prime	4	4	4
Lime Feed Improvements	City of North Miami Beach	FL	15	Prime	4	4	4

Project Information		Date	Aquifer	Reporting	Design	Permitting	Construction Management & Testing
F-6 (JLA Geosciences, Inc.)	Seacoast Utility Authority	FL	2018	Floridan	4	4	4
WTP 2, 3, 8 & 9 Wellfield Condition Assessment (JLA Geosciences, Inc.)	Palm Beach County Water Utilities Department	FL	2018	Biscayne and Surficial	4		4
PW-11 (JLA Geosciences, Inc.)	Palm Beach County Water Utilities Department	FL	2017	Floridan	4	4	4
OCEC FA-1, FA-2, FA-3, FA-4 (JLA Geosciences, Inc.)	Florida Power and Light	FL	2017	Floridan	4	4	4
F-5 (JLA Geosciences, Inc.)	Seacoast Utility Authority	FL	2017	Floridan	4	4	4
2015 Rehabilitation (JLA Geosciences, Inc.)	Seacoast Utility Authority	FL	2017	Surficial	4	4	4
3W-4, 3W-7, 3W-8, 3W-9, 9W-18, 9W-20, 9W-21, 9W-22, 9W-23 & 9W-24 (JLA Geosciences, Inc.)	Palm Beach County Water Utilities Department	FL	2017	Biscayne and Surficial	4	4	4
3W-2, 3W-3, 9W-10, 9W-12 (JLA Geosciences, Inc.)	Palm Beach County Water Utilities Department	FL	2017	Biscayne and Surficial	4	4	4
TPGW-15, TPGW-16 (JLA Geosciences, Inc.)	Florida Power and Light	FL	2016	Biscayne	4	4	4
F3, F4, F5, F6 (JLA Geosciences, Inc.)	Florida Power and Light	FL	2016	Floridan	4	4	4
2014 Rehabilitation (JLA Geosciences, Inc.)	Seacoast Utility Authority	FL	2016	Surficial	4	4	4
Environmental Site Assessment Reports WTP 2, 3, & 9 (JLA Geosciences, Inc.)	Palm Beach County Water Utilities Department	FL	2016	Biscayne and Surficial	4		
HRIW-1, IW-1, DZMW-1 Mechanical Integrity Test and Operating Permit Application (JLA Geosciences, Inc.)	Seacoast Utility Authority	FL	2016	Boulder	4	4	4
PW-9, PW-10 (JLA Geosciences, Inc.)	Palm Beach County Water Utilities Department	FL	2015	Floridan	4	4	4
Wells 12-20 (JLA Geosciences, Inc.)	City of West Palm Beach	FL	2015	Surficial	4	4	4
NPB-9A (JLA Geosciences, Inc.)	Seacoast Utility Authority	FL	2015	Surficial	4	4	4
Well 37, 60, 62 (JLA Geosciences, Inc.)	Town of Jupiter	FL	2015	Surficial	4	4	4

2013 Rehabilitation (JLA Geosciences, Inc.)	Seacoast Utility Authority	FL	2015	Surficial	4	4	4	4
Well 16 (JLA Geosciences, Inc.)	City of Lake Worth	FL	2014	Surficial	4	4	4	4
2011 Rehabilitation (JLA Geosciences, Inc.)	Seacoast Utility Authority	FL	2014	Surficial	4	4	4	4

Potable Water Storage Tanks and Pumping Stations

BROWARD COUNTY, FLORIDA

Broward County has numerous storage tanks, pumping stations, and chemical feed systems that will be upgraded or built in the next five years. Carollo was selected in 2014 to complete the planning, design, and construction-phase service for every one of these projects, including the following:

- **New 2.5-MG Ground Storage Facility and New High Service Pump Station, Electrical/Generator Room and Chemical Facilities (District 3A).** New variable speed drive pumps, in conjunction with the appropriate control logic, will maintain a relatively stable discharge pressure. Furthermore, the pumps will receive equal use and wear, maximizing the useful life of all four units and providing operations with maximum flexibility.
- **New 5-MG Ground Storage Tank and Existing Storage Tank Repair (District 2A).** Construction constraints included maintaining the existing two pump stations in operation and implementing a temporary bypass line to keep the North HSPS in full service during construction. The new 5.0 MG tank will maximize efficiency in operation of the tanks, in addition to providing an additional 3.5 MG of storage capacity. This additional capacity will provide the facility approximately 16 hours of storage at the projected average flow for 2040.
- **New 1.5-MG Ground Storage Facility, High Service Pump Station, and Chemical Facility. (District 1B1).** The facility is currently comprised of a 1.5 MG finished water storage tank, a high service pump station (HSPS) including four outdoor pumps, a sodium hypochlorite feed system, a diesel engine generator, and a sewer lift station.
- **New Ground Storage Facility, High Service Pump Station, Chemical Facility, and Water Main Extension** (final sizes to be determined during pre-design study) (District 1A2). Design assessment, design, and engineering services during construction of the new Ground Storage Facility, High Service Pump Station, Chemical Facility, and Water Main Extension.

Highlights:

- Finished water storage and pumping system design.
- Standby power and major electrical improvements.
- Chemical system design.
- Neighborhood-friendly design concepts
- Creative constructability and layout features.

Role: Prime Consultant

Dates of Services:

2014 - Ongoing

Reference Contact:

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Carollo is also responsible for construction management of these projects.

Bird's eye view of the Broward County Potable Storage Tanks.

Ion Exchange System Design and Construction Management

CITY OF BOYNTON BEACH, FLORIDA

Boynton Beach owns and operates two WTPs: the East WTP and the West WTP. Both facilities treat local surficial aquifer (LSA) water. A primary driver for the City is directly related to the groundwater availability issue. Given that additional supplies are available from their Western Wellfield, coupled with the under-utilized treatment capacity at the East WTP, the City formulated an innovative plan to utilize raw water from the Western Wellfield and treat it with the MIEX® process to:

- Allow the City to very significantly use existing capacity at the East WTP.
- Provide pre-treatment for a critical treatment objective, the removal of DBPs and color.

Based on water use requirements, the City needed to have the facilities operational as soon as possible to provide the additional water treatment production. Carollo provided design and construction phase services for the \$11-million MIEX® facility as well as ancillary improvements at the West WTP.

Historically water utilities in Southern Florida are highly colored, hard raw water supplies which require that the entire flow be softened to achieve both softening goals and organics (color and DBP precursor compounds) removal goals. With the use of an alternative organic removal technology, such as MIEX®, the process of hardness removal has been de-coupled from the organics removal process.

Using this approach, the project couples a new organics removal MIEX® system for Western Wellfield water with the use of excess treatment capacity for hardness removal at the East WTP. Western Wellfield water is pumped to the East WTP, where the new 16-mgd MIEX® system (expandable to 20-mgd) uses anion exchange resin to



remove organics. This MIEX® treated water is then be treated in the softening basins, as well as partially bypassed around the softeners to increase the water production capacity.

Highlights:

- Lime softening and MIEX® process, design, and construction elements.
- Use of local surficial aquifer as a raw water source.
- Maintenance of plant operation during construction
- Fast-track design and construction

Role: Prime Consultant

Dates of Services:

2016 - 2017

Reference Contact:

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Boynton Beach, FL 33435
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PBCWUD WTP #2 Filter Replacement

PALM BEACH COUNTY, FLORIDA

Carollo provided study and design phase services for this \$13.9-million filter replacement project at PBCWUD Water Treatment Plant #2. The project included replacement of the existing steel vessel dual media filters with new dual media filters. The filters, at the initial loading rate, will provide filtration capacity for 16.4 mgd. The filters and support systems were designed to be expanded in the future to 25 mgd by either adding two new filters and expanding the structure or increasing the hydraulic loading rate of the existing eight filters. Support systems and demolition to accommodate the new filters were also included in the project that include:

- Filtered water clearwell beneath the filters and transfer pump area.
- Transfer pumps that move water from the proposed filter clearwell to the on-site finished water storage tanks.
- Backwash water pumps that provide water from the filter clearwell to the constant head.
- Rate of flow control systems for the on-site ground storage tanks to control flows in and out of the tanks.
- Air scour blowers.
- Overhead walkway to connect the existing softener to the filter operations area of the new filter structure
- Relocation of chemical feed points.



- Backwash water pond including backwash water return pumps. Backwash water was previously disposed to the sanitary sewer and this new concrete lined pond will allow for recycling the backwash water to a point of upstream of the existing softener. Water use at the facility, as a result, will be near 100%.
- Demolition of obsolete ozone contact basin.
- Demolition of one million gallon storage tank to accommodate on-site drainage improvements.

Highlights:

- Filter, transfer pump, storage tank, and softener design elements provide valuable knowledge.
- 3D design allowed for efficiencies and simplified understanding of the multiple project components.

Role: Prime Consultant

Dates of Services:

2013 - 2017

Reference Contact:

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Preston-Hialeah WTP Improvements

MIAMI-DADE WATER AND SEWER DEPT., FLORIDA

Miami-Dade Water and Sewer Department's (WASD's) 225-mgd, \$13.2 million Preston and Hialeah WTPs treat raw water from a combination of four groundwater wellfields, including the Northwest Wellfield (NWWF). Nearby mining activities may trigger the reclassification of the NWWF from groundwater to groundwater under the direct influence of surface water. This potential reclassification has significant implications for the plants by requiring the existing facilities to meet more stringent treatment standards than were originally intended. Portions of the existing softening treatment facilities date back from the mid-1920s to the most recent additions in the early 2000s. Carollo's initial analysis found that constructing the required treatment upgrades at the NWWF reduced costs and community impacts as compared to constructing all the required upgrades within the existing Preston and Hialeah plant fence lines.

Carollo worked closely with WASD staff to analyze potential solutions and tailored a design to meet all treatment requirements while controlling capital costs, retaining flexibility for future cost savings, limiting operator burden, and controlling operation and maintenance (O&M) costs. Carollo used its 3D design capabilities to facilitate review meetings with WASD managers and regulators, while improving quality of drawing production.

The results of Carollo's design evaluations is a design that addresses WASD's reliability requirements, while at the same time minimizing energy usage, optimizing water quality, and facilitating more robust O&M capability.



Highlights:

- Lime softening treatment.
- Condition assessment and operational review.
- Design and layout coordination for alternatives development on a congested plant site.
- Solutions that integrate best use of existing facilities and new facilities and technology.

Role: Prime Consultant

Dates of Services:

2008 - 2016

Reference Contact:

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ENV SP
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Lime Feed Improvements Evaluation

CITY OF NORTH MIAMI BEACH, FLORIDA

The City of North Miami Beach Norwood WTP has a current production capacity of 32 mgd. The plant has two parallel water treatment processes: lime softening and membrane treatment.

The lime softening water treatment process has a capacity of 15 mgd and includes lime softening for hardness reduction, iron, and color removal, followed by stabilization, filtration, and disinfection. The process also includes the addition of polymer to aid the lime softening process, polyphosphate for corrosion control, and fluoride for dental health. Disinfection is achieved by chloramines, with ammonia added after chlorine. The raw water supply is the Biscayne Aquifer.

The membrane treatment process has a capacity of 17 mgd and includes sand separators, three low pressure RO membrane treatment skids, three NF membrane treatment skids, and chemical feed systems. This process was installed in 2008 as part of a plant expansion. The water source is the Biscayne Aquifer for NF treatment and the Floridan Aquifer receives RO treatment, both from a nearby well field. The membrane-treated effluent is blended with the lime softened treated effluent in a blending tank prior to storage and high service pumping to the distribution system.

Carollo provided a comprehensive assessment of the existing lime facilities, including silos, slakers, tanks, pumps, and slurry loops. Solutions were developed to improve the operations, reliability, and maintenance requirements of the lime storage and feed systems.



Highlights:

- Lime softening and NF treatment
- Condition assessment and alternatives development and analysis
- Development of operator friendly concepts within a constrained, operating facility

Role: Prime Consultant

Dates of Services:

2017

Reference Contact:

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Deputy Director of NMB Water
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Springtree WTP Phase II Improvements & Rehabilitation

CITY OF SUNRISE, FLORIDA

The City of Sunrise is continuing to implement rehabilitation improvements to existing facilities at the 25.5 mgd Springtree WTP. These additional improvements are necessary to keep up current operations, improve treatment reliability, improve water quality, and maintain safety. Several facility improvements were completed in the Phase I project which was completed in the second quarter of 2015. Phase II includes the following additional improvements:

- Solids contact clarifiers rehabilitation
- Aeration addition
- South lime silo replacement
- Miscellaneous concrete repairs
- East filters demolition and pump station replacement
- Water stabilization chemical feed system addition
- Thickener supernatant piping modifications
- Sludge dewatering equipment upgrades
- Sodium hypochlorite dilution system
- Miscellaneous concrete repairs

There will be two separate bid packages to expedite the construction of the most vital improvements. Construction began for the first bid package in 2015, which had a bid price of approximately \$3.4 million. It primarily includes the rehabilitation to the solids contact clarifiers and lime silo. When completed, the City will anticipate saving money with reduced lime feed and few residuals production as a result of the newly installed aerators that are associated with the existing solids contact clarifiers.



Construction began for the second bid package in 2016, which had a bid price of approximately \$4.28 million. It primarily includes the water stabilization (accomplished by carbon dioxide addition) and the sludge dewatering equipment upgrades. Once complete, the City anticipates achieving water quality improvements in their distribution system as a result of the lower finished water pH to a level that is optimum for chloramine formation.

Highlights:

- Lime softening and ancillary process improvements
- Processes improvements provide treatment reliability and water quality enhancements.
- Operational improvements will reduce operating costs.
- Maintenance of plant operation during construction and commissioning.

Role: Prime Consultant

Dates of Services:

2016 - 2018

Reference Contact:

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Capital Projects, Project Manager
777 Sawgrass Corporate Parkway
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Sawgrass Water Treatment Plant Expansion Design

CITY OF SUNRISE, FLORIDA

The City of Sunrise implemented a RO WTP to treat brackish Floridan Aquifer well water and to meet obligations in the City’s South Florida Water Management District (SFWMD) Water Use Permit (WUP) that required development of Alternative Water Supplies (AWS) by May 2013. The City also implemented Reuse as an AWS to supplement fresh water supplies under separate agreements. The City initiated design of a project at the Sawgrass WTP to implement 3 mgd of RO membrane treatment. Due to limitations in the availability of fresh water in the regional system, AWS sources were identified to increase treatment plant capacity to meet existing and future water supply needs. The brackish Floridan aquifer required RO treatment due to its mineral content.

Carollo designed the new 3-mgd RO facility (expandable to 6 mgd), together with enhancements to the existing 18-mgd NF facility, facilitating a 30-percent capacity increase to 24 mgd. Special RO design aspects included a raw water main to new treatment facility, sand strainers, and interstage boost pumps. Carollo performed pilot testing of oxidation, filtration, and ion exchange technologies for iron and organics control alternatives from the surficial aquifer source water. Fixed bed vessel type IX was recommended for full-scale implementation and blending with NF permeate. Key benefits included higher hardness and alkalinity in blended water than NF permeate alone, and improved overall recovery.

Highlights:

- Addition of RO would provide alternative source of water to meet current and future needs.
- Re-rating of the current plant allowed an addition of 6 mgd with no additional treatment infrastructure.

Role: Prime Consultant

Dates of Services:

2011 - 2013

Reference Contact:

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Email: twelch@sunrisefl.gov



Palm Beach County WTP MIEX[®] Treatment System Design

PALM BEACH COUNTY, FLORIDA

Carollo provided design, construction administration, and start-up and commissioning services for the Magnetic IX Treatment System project at PBCWUD's WTP 2 in West Palm Beach. This project included the installation of a magnetic ion exchange treatment system to achieve dissolved organic carbon (DOC) control and color reduction from the source water. The IX system replaced an obsolete ozone system used for color control. In addition to DOC removal and color reduction, the IX system reduced the potential for disinfection byproducts (DBPs) formation by removing organic precursors and provided the benefits of reducing the chlorine demand in downstream treatment.

The project included the design of two 25-foot square continuous flow high rate fluidized bed reactors (contactors). Each contactor is hydraulically rated for 9 mgd and operates as an independent process train. A resin regeneration system, utilizes salt brine (sodium chloride) to regenerate the resin by exchanging DOC with chloride ions was included. The regeneration system was designed with a resin regeneration rate of approximately 1.67 gallons of resin regenerated per 1,000 gallons of water treated (600 bed volume). Specific achievements include:

- Full-scale performance exceeded design estimates for organics removal and color control.
- Resin loss rate has been demonstrated to be at the lower end of the identified range.
- System is currently saving PBCWUD approximately \$245,000 per year based on actual observed power and chemical usage.

Highlights:

- Evaluated alternative technologies to remove color and DBPs.
- Ion exchange process allows optimization of lime softening process, increased plant capacity through softening bypass, and saves over \$300K per year in operating costs

Role: Prime Consultant

Dates of Services:

2012

Reference Contact:

Patti Brock
Superintendent
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- System remains the largest of its type in the world.
- As a result of controlling the organics, the DBPs remain at levels comparable to PBCWUD's membrane filtration plants.
- Increased alkalinity, associated with the softening bypass, has resulted in nitrification potential, less distribution system flushing, and has reduced the overall number of customer complaints in the service area.

Electrical Master Plan, Phases I and II, and Design/Construction

CITY OF POMPANO BEACH, FLORIDA

Carollo developed a high service pump station electrical master plan followed by implementation of identified Phase I improvements for the replacement and upgrade of power distribution system with state-of-the-art equipment, including replacement of 4,160 volts outdoor switches, 4,160 /480 volts transformers, 480 volt switchgear, motor control centers and replacement of underground medium voltage cables, to increase the reliability of the electrical system for the WTP and compliance with current building and life safety codes.

Engineering services also included short circuit analysis, protective device coordination analysis and arc-flash analysis for safety and protection of O&M personnel.

Additional services also included serving as the Owner's Representative for a City Wide Energy Efficiency project (performed by Siemens). This work was associated with the installation of new variable frequency drives (VFDs) for the speed control of 700 HP high service water pumps.



Highlights:

- Created WTP wide Electrical Master Plan that was staged to meet capital expenditure requirements.
- Increased reliability of the WTP.

Role: Prime Consultant

Dates of Services:
2017

Reference Contact:

Randy Brown
Utilities Director
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Carollo replaced obsolete outdoor equipment 5 kV Motor Control Centers for the 600- Hp High Service Pumps.

Concentrate Disposal Evaluation and Design

CITY OF POMPANO BEACH, FLORIDA

The City of Pompano Beach (City) has a water treatment plant (WTP) that discharges membrane concentrate to a deep injection well. The injection well was urgently in need of relining in 2017. Carollo assisted the City to maintain operation of the membranes by determining an alternative concentrate disposal method and designing a concentrate disposal pipeline. Five alternatives were identified and evaluated for the disposal of the membrane concentrate. A report was produced which included a summary of each alternative, pipe route, estimated construction cost, construction duration, perceived advantages, and perceived disadvantages.

Carollo worked with the City to select an alternative for final design and construction. Carollo assessed the condition of an existing 10,000 foot long pipeline for potential use to convey the concentrate. The study included field investigations to locate the pipe, delineate the pipe, and observe pressure tests. Carollo prepared a summary report with recommendations and drawings. Carollo designed and coordinated permitting for the concentrate pipeline, which discharges into a sewer force main. The design includes two 8" RPZ backflow preventer assemblies in series for cross-connection prevention. Carollo coordinated with permitting agencies including the FDEP and FDOH in Broward County. The design was complete with permits obtained in 3 months. Carollo also provided engineering services during construction. The pipeline was constructed and commissioned within 6 months of starting design. This allowed the City to take down the deep well and begin relining.

Highlights:

- Evaluation of alternatives.
- Assessment of existing pipeline condition.
- Design and permitting completed in 3 months.

Role: Prime Consultant

Dates of Services:

2017

Reference Contact:

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L-8 Reservoir Pump Station and Inflow Structure Project

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, FLORIDA

Carollo was selected by the SFWMD to provide initial planning and conceptual design of the \$64 million L-8 Reservoir Pump Station and Inflow Structure project in the Loxahatchee area in Palm Beach County, Florida. After completing the initial study and conceptual phases, Carollo's expertise was retained to provide Owner Advisor Services for the procurement, design, and construction of the same project, which became SFWMD's first major alternative delivery project. Under the Owner Advisor's role, Carollo provided and continues to provide technical, contractual, logistical, and managerial knowledge and support.

The most important component of the L-8 Reservoir Pump Station and Inflow Structure project is the 450-cfs unmanned pump station, conceptualized and specified for design build by Carollo. The pump station is comprised of six-800 HP electrical submersible vertical turbine pumps equipped with variable frequency drives, conceptualized to be housed in a below-water substructure, a three-level, self-cleaning intake at the L-8 Reservoir side, from which water is drawn; and a pump station discharge at the L-8 Canal side. The purpose of the pump station is to pump a controlled amount of water (between 150 and 450 cfs depending on the seasonal need) from the Reservoir, into the L-8 Canal to comply with water quality and restoration program requirements. A head differential ranging from one to 55 feet between the reservoir and the canal was to be overcome by the pumps at any flow condition in the 150 to 450 cfs range. Such a wide pump design envelope is not typical of South Florida pump stations and therefore presented a challenge to the SFWMD. Carollo features an expert national mechanical design team that has acquired pump station experience at a diverse range of scopes and applications throughout the country, which allowed Carollo to conceptualize and

specify a state-of-the-art pump station without compromising the possibility for added innovation that the nature of the subsequent design-build phases were expected to bring to the project.

Highlights:

- Drainage and surface water management.
- Innovative design and pump station.

Role: Prime Consultant

Dates of Services:

Construction: Dec. 2017

Reference Contact:

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3301 Gun Club Road
West Palm Beach, FL 33406
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L-8 Reservoir Modifications Pump Station and Inflow Structure

S-470 Reservoir Pump Station Project

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, FLORIDA

Carollo was selected by the SFWMD to provide planning and design of the \$58.5 million S-470 Reservoir Pump Station (PS), which is one of four design phases included in the C-43 West Basin Storage Reservoir (WBSR) project near the LaBelle area in Hendry County, Florida. This design phase also included improvements to the Townsend Canal at the State Road 80 highway bridge; widening of the canal from State Road 80 to the Caloosahatchee River; site improvements; canal armoring design; and infrastructure for SCADA and communication systems. This project is currently in the construction phase.

PS S-470 is a 1500-cfs unmanned pump station which will convey flows from the Caloosahatchee River to the C-43 above ground reservoir, via the Townsend Canal and was designed and specified for construction by Carollo. The pump station is comprised of four direct drive, 2500-HP electric motor driven self-priming pumping units equipped with across the line starters. Each mixed-flow pump has a design capacity of 375-cfs, to achieve the total station design capacity of 1,500 CFS. A head differential ranging from 33.75 to approximately 54 feet between the reservoir and the canal is to be overcome by the pumps at any flow condition within the range of 325 to 425-cfs. Additionally, Carollo developed a draft operations plan that summarized the PS S-470 systems, as well as describe the functional strategy of the Reservoir Pumps and associated systems when excess water in the Caloosahatchee River is available for pumping.



Carollo was also responsible for the design coordination, input, and review for additional project features included in the PS S-470 design package. These features included improvements and slope stabilization of the Townsend Canal; civil and site improvements around the pump station; physical model study of the pump station, intake bays, and intake canal (during design); slope stability analysis; seepage modeling analysis; and SCADA instrumentation and controls. After completing the design phase, Carollo's expertise was retained for engineering during construction of the same project.

Highlights:

- Drainage, canal, and surface water management.
- Large Pump Station (970 mgd)

Role: Prime Consultant

Dates of Services:

Planning & Design: Dec. 2017

Reference Contact:

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S-476 Reservoir Pump Station Project

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, FLORIDA

Carollo was selected by the SFWMD to provide planning and a design update of the \$ 10.7 million S-476 Pump Station, which is one of four design phases included in the C-43 West Basin Storage Reservoir (WBSR) project near the LaBelle area in Hendry County, Florida. The purpose of PS S-476 is to deliver water from the Townsend Canal to the proposed Perimeter Canal which will deliver water for adjacent agricultural uses. It is an electric, can intake style PS that will be operated on demand by District staff during times of agricultural water needs. This design phase also included site improvements and grading; intake channel armoring design; and infrastructure for SCADA and communication systems.

PS S-476 is a 195-cfs unmanned pump station which will convey flows from the Townsend Canal to a Perimeter Canal at the C-43 WBSR Reservoir site and was designed and specified for construction by Carollo. The pump station is comprised of three direct drive, 350-HP electric motor driven, self-priming, can mounted pumps with above the baseplate discharge with soft starters. Each mixed-flow pump has a design capacity of 65-cfs, to achieve the total station design capacity of 195-cfs. A head differential ranging from 18 to approximately 35.5 feet between the reservoir and the Perimeter Canal is to be overcome by the pumps at any flow condition within the normal operating range of 65 to 90-cfs.

Carollo was also responsible for the design coordination, input, and review for additional project features included in the PS S-476 design package. These features included civil and site improvements around the pump station; intake channel armoring design; physical model study of the pump station, intake bay, and intake channel (during construction); and SCADA instrumentation and controls. After completing the design phase, Carollo's expertise was retained for engineering during construction of the same project.



Highlights:

- Drainage, canal, and surface water management.
- Coordinate multiple regulatory agency approvals.

Role: Prime Consultant

Dates of Services:

2015 - Jan. 2016
(Planning & Design complete)

Reference Contact:

Joe Albers, P.E., PM
Principal Engineer
3301 Gun Club Road
West Palm Beach, FL 33406
PH: (561) 682-2591
Email: jalbers@sfwmd.gov

C-43 Reservoir Design and Construction Management

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, FLORIDA

Carollo was selected by the SFWMD to provide planning and design of the Civil Works project, which is one of four design phases included in the C-43 West Basin Storage Reservoir (WBSR) project near the LaBelle area in Hendry County, Florida and is currently in the design phase. Major features of the Civil Works Project include earthen Perimeter Dam with a wave wall to protect the land side from overwash, Separator Dam, Perimeter Canal, public access and recreation facilities, littoral zones, one agricultural pump station, two primary reservoir discharge structures, two emergency reservoir discharge structures, cell balancing structure, and Perimeter Canal water control structures. Each structure included in this design package is described below.

The reservoir water control structures include S-471 and S-473, which release water from the reservoir during the environmental, wet season drawdown scenarios, and between PMP storm events; S-472 and S-474, which are the emergency spillways that discharge water when the reservoir stage in each cell is above elevation 42.0; and the S-475 which is the cell balancing structure which connects Cells 1 and 2 (of the C-43 Reservoir) and allows for equalization between the cells.

The Perimeter Canal water control structures system include gated structures S-477, S-479, S-480, S-481 complex (S-481A, S-481B, and S-481C); broad-crested weir structure S-478; uncontrolled ogee spillways S-482 and S-483; and an agricultural pump station S-479. These structures are comprised of three functional groups; 1) Perimeter Canal Conveyance structures; 2) Irrigation and Drainage structures; and 3) Stage Maintenance structure (only S-478).

The design of these structures included a combination of hydrologic modeling, hydraulic design, and verification using one and three dimensional computational fluid dynamic (CFD) analysis. Each structure has very distinct functions which required hydrologic and CFD modeling of several different scenarios based on their intended purpose. Carollo was involved in the coordination and analysis of model data used for sizing, designing each structure, and armoring downstream of each water control structure.

Carollo was also responsible for the design coordination, input, and review for additional project features included in the Civil Works design package. These features included civil and site improvements around the dam and Perimeter Canal; wave wall design based on overwash criteria; canal and reservoir armoring; optimization of



canal cross-sections to minimize velocities; canal slope stabilization; hydrology modeling and analysis of surface water and groundwater on and around the site; SCADA instrumentation and controls; and Quality Assurance/Quality Control of all project components. Additionally, Carollo developed a draft operations plan that summarizes the reservoir and water control systems, which includes the SCADA instrumentation and controls, piezometer arrays, and water control structures' operation and function.

Integrated with the CMMS work order process.

Highlights:

- Drainage, canal and surface water management.
- CFD modeling to optimize design.

Role: Prime Consultant

Dates of Services:

2014

Reference Contact:

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B. REGULATORY

EXPERTISE IN SOUTHEAST FLORIDA

Carollo actively tracks regulatory development and has extensive experience assisting utilities in the production of high quality water that meets local and federal standards. Having completed permit renewals for water systems throughout the state, the Carollo team has the experience to thoroughly review permit status and make recommendations as to current and future regulatory compliance. Carollo has also worked with utilities to engage in voluntary actions to meet more stringent goals, such as the American Water Works Association Partnership for Safe Water.

Key regulatory issues relevant to southeast Florida, particularly utilities that utilize groundwater, include:

- Increasing chloride concentrations due to saltwater intrusion.
- Enactment of the 2007 Water Supply Availability Rule and SFWMD adoption of the Lower East Coast Water Supply Plan Update, impacting water supply quantity from the Biscayne Aquifer and diversification of sources.
- Current disinfection by product (DBP) regulations, which already provide a challenge to many utilities throughout Florida, are currently included in the EPA's Third Six-Year Review and may become more stringent following the review.
- Expected revisions to the Long-Term Lead and Copper Rule (LCR). The current rule is largely reactive and is expected to be modified to be more proactive requiring more immediate action from utilities.
- Perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) were included in Unregulated Contaminant Monitoring Rule (UCMR) 3 and are included in the fourth Contaminant Candidate List (CCL4) and are expected to be federally regulated in the near future. The UCMR 3 results showed that PFOS/PFOA are present in and/or around Broward County
- The anticipated future regulation of perchlorate may present a challenge for groundwater facilities in areas where perchlorate is likely to be found. The UCMR 1 results indicated that perchlorate is present in southeast Florida (Palm Beach County).

Our regulatory experience also facilitates our ability to permit our projects with regulatory agencies. Early and regular discussions are critical to receiving prompt approvals for treatment process modifications with no surprises.

We have been working in the state of Florida for over 17 years. That experience gives us a solid foundation on all the applicable codes and regulations that apply to our projects. In addition, we are often asked to participate in giving the regulators technical guidance on a national, state and local level. That participation gives us insights as to future directions that the regulations may take, allowing us to give proactive guidance to our clients. Project examples are shown on the following pages.

As an example, **Rod Reardon** worked to assist the Florida Water Environment Association Utility Council in their responses to the U.S. EPA's on EPA's determination that numeric criteria for in-stream nutrient concentrations were necessary for Florida waters to meet the requirements of the Clean Water Act. Work products produced by the project team included briefing and white papers on the treatment technologies that might be needed to meet the proposed criteria, estimates of the cost to implement such technologies, assistance in presenting this information to a panel of the National Research Council regarding the federal rule's compliance costs for utilities, and authoring of several papers and presentations to professional groups to help educate Florida citizens and regulators about the potentially huge cost and environmental implications of EPA's NNC Rule.

Springtree 4-log Compliance for Reverse Osmosis WTP

CITY OF SUNRISE, FLORIDA

The Springtree Reverse Osmosis (RO) Water Treatment Plant (WTP) groundwater compliance strategy used to incorporate a 2-log credit associated with the use of RO membrane treatment in the overall 4-log calculation for virus treatment. The current Guidelines for Four-Log Virus Treatment of Groundwater by FDEP requires continuous monitoring of salt passage for each membrane unit to verify it does not exceed a FDEP-specified maximum, which in this case is 5% . The purpose of this project was to modify the 4-log strategy (including calculations), due to the fact that the specified maximum passage is exceeded, and provide the necessary documentation to the Broward County Health Department (BCHD) to demonstrate the facility's ability to comply with the current regulation without the 2-log virus treatment membrane credit.

Highlights:

- Regulatory compliance for 4-log Rule.
- Coordinated with Broward County Health Dept. to demonstrate compliance.

Role: Prime Consultant

Dates of Services:

2017

Reference Contact:

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Regulatory Assessment of Compliance by Lime Softening versus Nanofiltration

CITY OF POMPANO BEACH, FLORIDA

The City anticipated that the aging lime softening WTP will require capital investment in the next five years to rehabilitate major items including the Accelerators, filters, piping, valves and electrical equipment. As a result, the City wanted to evaluate advantages and disadvantages of the expansion of the nanofiltration WTP versus an upgrade of the lime softening WTP. The evaluation included an assessment of how existing and future regulations would impact both treatment plants.

The regulatory evaluation included:

- Flexibility comparisons between the lime softening and nanofiltration WTPs to meet future regulations: what future regulations are currently being considered, what is the likelihood that these regulations will be enacted, and what is the likelihood that the existing treatment plants (lime softening/dual media filtration versus nanofiltration) would be able to meet the regulations.
- Life-cycle costs to comply with existing and future regulations for continued operation of the lime softening WTP as an alternative to the expansion of the nanofiltration WTP.

For each treatment process, a visual condition assessment of above ground facilities was conducted to assess general condition and determine operational (chemical, power and labor) needs. Improvements to rehabilitate the WTP for a 20-year service life were determined.



In addition, the implementation of MIEX[®] pretreatment was also evaluated to determine if organics removal (TOC reduction) and co-softening would allow the City to eliminate the softening process.

Highlights:

- Evaluated long term regulatory compliance needs as part of a comparative analysis

Role: Prime Consultant

Dates of Services:

2013

Reference Contact:

Randy Brown
Utilities Director
1205 NE 5th Avenue
Pompano Beach, FL 33060
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Nitrification Action Plan

PALM BEACH COUNTY, FLORIDA

Carollo prepared a nitrification action plan for Palm Beach County to outline procedures for preventing, detecting, monitoring, and responding to nitrification episodes, with the overall goal of maintaining consistent target water quality throughout the County’s distribution system. Water quality data analyses were also conducted to:

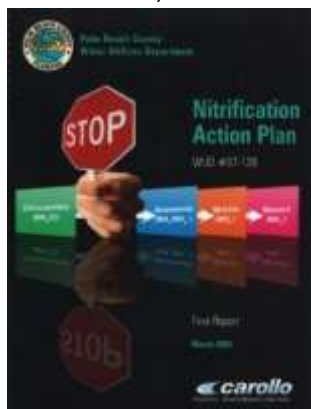
- Assess the extent of nitrification in the distribution system.
- Identify areas where nitrification has historically occurred.
- Determine whether the quality of the water entering the distribution system is conducive to nitrification.
- Examine water quality parameters that have been correlated to nitrification occurrences.
- Propose preliminary trigger points for the nitrification action plan.

Results suggested that nitrification was widespread and severe in two distribution system service areas, and nitrification episodes may have historically occurred in other service areas. A strong correlation was found between water quality measured at points of entry to the distribution system and the occurrence of nitrification. Factors found to contribute to nitrification included:

- High TOC, a food source for nitrifying bacteria.
- High free ammonia, a food source for ammonia oxidizing bacteria.
- Low alkalinity, which allows pH to decrease during distribution, favoring nitrification.
- High water temperature, which supports the growth of bacteria

The study found that given these water quality conditions, modifications in the water treatment process were essential to control nitrification in the distribution system. Recommended actions to control nitrification included:

- Adjust water quality at the treatment plant to limit free ammonia and TOC, meet the target Cl₂:NH₃-N ratio, and maintain adequate total chlorine residual.
- Conduct unidirectional flushing of the affected area(s) of the distribution system if nitrification is observed.
- Cycle the affected storage reservoir(s) if nitrification is observed in one of them.
- For persistent problems, consider supplementing unidirectional flushing or reservoir cycling with breakpoint chlorination.



Carollo prepared a nitrification action plan for Palm Beach County to outline procedures for preventing, detecting, monitoring and responding to nitrification episodes, with the overall goal of maintaining consistent target water quality throughout the County's distribution system.

Highlights:

- Water quality data analysis at distribution system points of entry versus nitrification events.
- Identification of key factors triggering nitrification episodes.
- Recommendations to improve water quality to minimize likelihood of nitrification.
- Response plan to manage nitrification when it is observed.

Role: Prime Consultant

Dates of Services:

2008

Reference Contact:

Juan Guevarez
Director of Plant Operations & Maintenance
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Impacts of Concentrate Reuse

CITY OF POMPANO BEACH, FLORIDA

The City of Pompano Beach operates a membrane water treatment plant and a lime-softening water treatment plant. Membrane concentrate is normally discharged with onsite deep well injection. The deep well was scheduled to be down for relining and alternatives for concentrate discharge were assessed by Carollo to allow the membrane treatment to continue during the deep well relining. Regulatory requirements were determined for each alternative evaluated.

One alternative evaluated was to blend the membrane concentrate with reclaimed water from the City's reclaim water treatment plant. The reclaimed water is distributed to City reuse customers, whom utilize the water for irrigation and watering of crops. Carollo used water quality data from the membrane concentrate and reclaimed water to determine the blended concentration of various constituents of concern, including TDS, sulfate, hydrogen sulfide, iron, sodium, chloride, and color. Resultant blended concentrations were compared to water quality limits drawn from published literature on irrigation with reclaimed water and regulatory requirements. The results indicated that the TDS and chloride levels of the blended water would have a negative impact on lettuce, a crop which is particularly sensitive to salinity. Carollo also found that the blended water would increase the iron content of the reclaimed water and likely result in staining of surfaces exposed to the reclaimed water. An increase of sulfate levels was also found to be a concern as it could result in odors and accompanied complaints from reuse customers. A professional report was prepared to document the results of this study.

Another alternative evaluated was the blending of concentrate with raw water influent to the lime-softening water treatment plant. The following constituents were identified as a concern: iron, calcium, magnesium, and color. Carollo recommended additional evaluations with pilot testing prior to implementing this alternative.



The selected alternative was a temporary concentrate discharge pipeline to direct membrane concentrate to an existing wastewater collection system. Carollo designed, permitted, and oversaw construction of the discharge pipeline and associated controls modifications. Carollo led a meeting with the DEP and prepared a design report to achieve regulatory approval of the discharge system. The system was successfully placed into operation and continues to function as designed.

Highlights:

- Evaluated alternatives for the discharge of membrane concentrate.
- Determined water quality concentrations for blending concentrate with reclaimed water.
- Assessed regulatory requirements.
- Designed and permitted a concentrate discharge pipeline.

Role: Prime Consultant

Dates of Services:

2016 to 2017

Reference Contact:

Randy Brown
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C. DESIGNING, PERMITTING, AND CONSTRUCTION MANAGEMENT FOR **WATER SUPPLY WELLS**, IN THE STATE OF FLORIDA

Carollo is a recognized leader in the design and construction of aquifer storage and recovery wells, wellhead treatment, and potable production well projects. We have provided design and construction management services for more than 50 water wells throughout the Southwest. We also have extensive experience in master planning, water resources planning, capacity studies, and evaluations directed toward enhancing water quality, permitting and complying with emerging regulations. Project examples are shown on the following pages.



Southwest WTP Wells Replacement

CITY OF SUNRISE, FLORIDA

The Southwest WTP is located at 15400 Watermill Road in the Town of Davie and is owned and operated by the City of Sunrise. Several facility improvements (clarifier rehabilitation, filter replacement, addition of ion exchange, disinfection facilities, as well as other miscellaneous improvements) were constructed to enhance treatment system reliability and improve water quality. Due to the age of existing wells and the limitations associated with remaining service life, the City desired to achieve a comparable level of reliability of the other facility improvements so that water supply wells No. 1 and No. 3 were replaced. CONSULTANT designed the items identified below and produce construction documents suitable for obtaining bids for construction to construct the replacement of wells No. 1 and No. 3.

- Specifications and drawings for Wells No. 1, 2 and 3—wells are screened in the Biscayne Aquifer.
- Well pumps are submersible turbine type with a rated flow of 700 gpm.
- Well is carbon steel with FRP lining
- Currently overseeing installation and startup

Highlights:

- Design of three new wells in the Biscayne Aquifer
- Construction management services for installation and startup
- Increased reliability to match other facility improvements

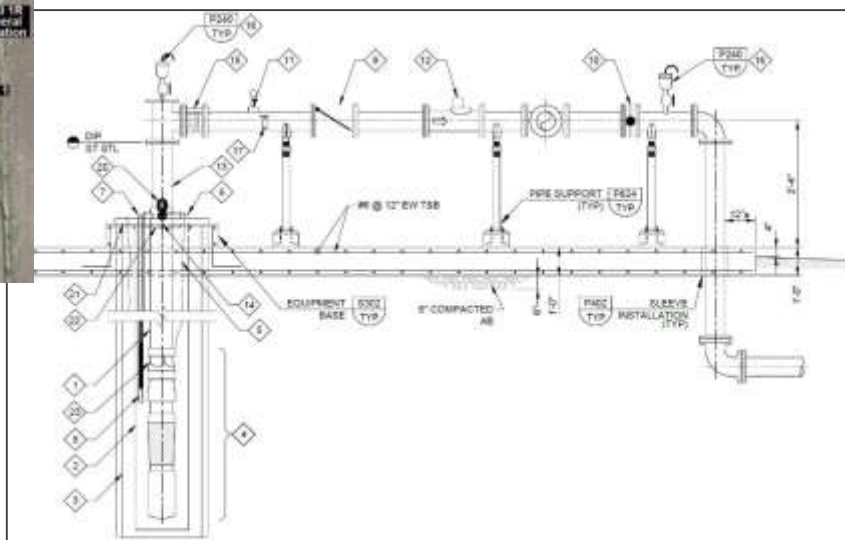
Role: Prime Consultant

Dates of Services:

2018 to On-going

Reference Contact:

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Water Supply Improvements - Phase 1

POLK REGIONAL WATER COOPERATIVE, FLORIDA

Conceptual and Preliminary Design of two RO Water Treatment Plants (15 mgd and 30 mgd), routing studies and conceptual design of 120 miles of pipelines, completion of an integrated water supply study of the Peace Creek Watershed.

Fresh groundwater from the Upper Florida Aquifer is currently the source of potable water supply for essentially all of Central Florida. However, regulators have determined that future potable water supplies must come from alternative sources. To address alternative water supply, Polk County and associated cities formed the Polk Regional Water Cooperative (PRWC) to jointly develop new supplies. Future alternative water supplies (AWS) will involve sources that are more distant and more expensive to treat. To reduce costs and maximize opportunities for co-funding, it is necessary to share AWS sources amongst communities. Previous studies identified three water supply projects and corresponding pipelines that will serve PRWC:

1. Southeast Wellfield
2. West Polk Wellfield
3. Peace Creek Integrated Water Resources Project

Highlights:

- Conceptual and Preliminary Design
- Evaluating alternatives

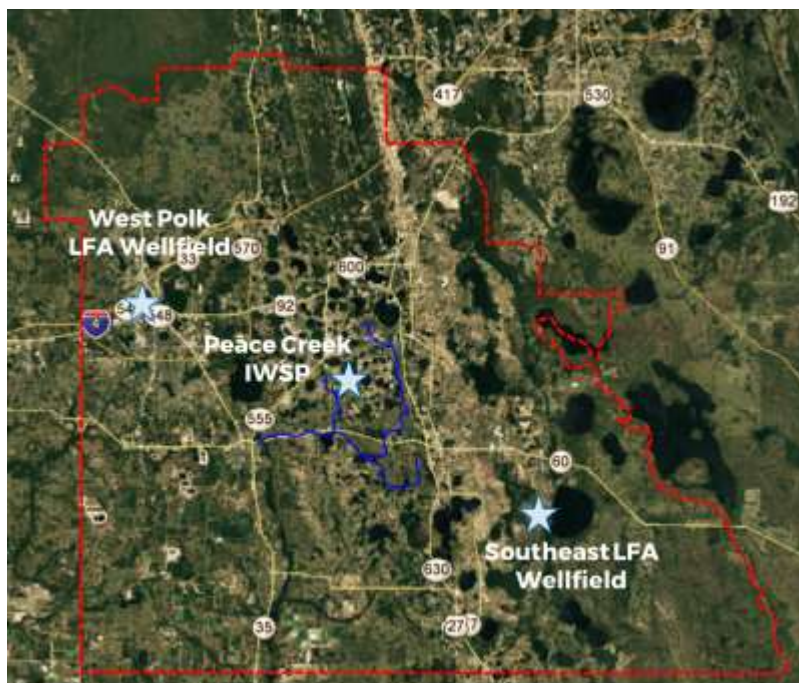
Role: Prime Consultant

Dates of Services:

2017 to On-going

Reference Contact:

Ryan Taylor
Executive Director
Assistant County Manager, Strategic
Projects – Polk County BoCC
PH: (863) 534-6475
Email: ryantaylor@polk-count.net



PRWC selected Carollo Engineers to refine the project concepts for each of these individual projects, optimize the projects as a whole, and develop plans and specifications to the 30% level. With well over 100 miles of pipe, two new reverse osmosis water treatment plants, an aquifer recharge facility, and a budget of over \$600M, this is currently the largest and most complex regional water supply project in Florida.

Surficial Aquifer Production Well Rehabilitation, Water Treatment Plants No. 3 & 9 (WUD13-080)

PALM BEACH COUNTY WATER UTILITIES DEPARTMENT, FLORIDA

JLA Geosciences, Inc. provided hydrogeologic consulting services to Palm Beach County Water Utilities Department (PBCWUD) for the rehabilitation of four (4) surficial aquifer production wells and electrical improvements of two (2) surficial aquifer production wells.

The project included four (4) new replacement (or re-drilled) surficial aquifer production wells, 9W-10, 9W-12, 3W-2, and 3W-3R and electrical improvements at 9W-11 and 9W-13. Replacement wells added 4 mgd capacity and are capable of at least 5.8 MGD firm capacity. Rehabilitation resulted in an increase of historical specific capacity ranging from 108% to 790%.

Role: Prime – JLA Geosciences

Dates of Services:

2013 - 2015

Reference Contact:

Diana Rivera, P.E., PMP

Project Manager

PH: (561) 493-6117

Email: drivera@pbcwater.com



	9W-10	9W-12	3W-2	3W-3R
Historical Specific Capacity (gpm/ft)	21	14	348	--
Post Rehabilitation Specific Capacity (gpm/ft)	95	123	726	320
Percent increase	347%	790%	108%	--

Upper Floridan Aquifer Production Well Design and Construction

PALM BEACH COUNTY UTILITIES, FLORIDA



In 2011, JLA Geosciences, Inc. (JLA) was contracted by Palm Beach County Water Utilities Department (PBCWUD) to provide hydrogeologic consulting services for the construction of Upper Floridan Aquifer (UFA) Production Well PW-8 to supplement the existing reverse osmosis raw water supply for the Glades Utility Authority (GUA), Lake Region Water Treatment Plant (LRWTP). Construction of PW-8 was necessary due to water quality degradation in the Utility's existing FAS wellfield. JLA's scope of services included well design, construction

observation, lithologic and water quality sampling, geophysical logging observation and analysis, well development observation and testing, and pump testing.

Well PW-8 was completed in 2012, with a nominal 19-inch diameter open hole production interval from 1,120 to 1,350 feet BLS. In addition, a 1.3-inch diameter stainless steel, screened piezometer was installed from 900 to 1,000 feet BLS within the annulus of the PW-8 14-inch diameter final casing. Upon completion of the construction and development stage, a five (5)-step, step-drawdown test was conducted to assess the well yield, specific capacity, and water quality. The well had a specific capacity of 31.5 gpm/ft at the design rate of 900 gpm with sand less than 0.1 parts per million (ppm) and silt density index values (SDI) less than

In 2013, JLA provided hydrogeologic consulting services for the construction of two (2) additional UFA wells for the PBCWUD WTP11 in Belle Glade. Construction of PW-9 and PW-10 was necessary due to water quality degradation in the Utility's existing FAS wellfield. JLA's scope of services included well design, construction observation, lithologic and water quality sampling, geophysical logging observation and analysis, well development observation and testing, and pump testing.

In 2015, Wells PW-9 and PW-10 were completed with a nominal 19-inch diameter open hole production interval from 1,052 to 1,363 feet BLS and 1,004 to 1,113 feet BLS, respectively. The final casing string of 120 feet, constructed of 17.4-inch and 14-inch outside diameter Poly Vinyl Chloride (PVC) Certainteed Certalok SDR 17, was installed to a depth of 1,052 feet BLS at PW-9 and 1,004 feet BLS at PW-10. Upon completion of the construction and development stage, a five (5)-step, step-drawdown test was conducted to assess the well yield, specific capacity, and water quality. Specific capacity at the design rate of 900 gallons per minute (gpm) at PW-9 was 33.2 gpm/ft and PW-10, 776 gpm/ft with sand less than 0.1 parts per million (ppm).

In 2016, JLA was contracted again to provide hydrogeologic consulting services for the construction of one (1) additional UFA well (PW-11) for the PBCWUD WTP11 in Belle Glade. JLA's scope of services included well design, construction observation, lithologic and water quality sampling, geophysical logging observation and analysis, well development observation and testing, and pump testing.

In 2018, Well PW-11 was completed with a nominal 19-inch diameter open hole production interval from 1,136 to 1,350 feet BLS. Design of the well included 'contract hold points', which allowed PBCWUD to evaluate water quality during well construction. If 'hold point' water quality deviated from anticipated water quality, the contract allowed for discontinuing of well construction, saving PBCWUD from continuing with costly construction for a well with poor water quality. Final completion water quality met anticipated WTP needs. Specific capacity at the design rate of 900 gallons per minute (gpm) was 33 gpm/ft with sand less than 0.1 parts per million (ppm).

Role: Prime – JLA Geosciences

Dates of Services:

2011 - 2018

Reference Contact:

Hassan Hadjimiry, P.E.

Deputy Director

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Groundwater, Surface Water, and Ecological Monitoring Project

FLORIDA POWER AND LIGHT, FLORIDA

JLA Geosciences, Inc. (JLA) was contracted by Florida Power & Light Company (FPL) to provide hydrogeologic consulting services during construction of fourteen (14) monitor well clusters for the FPL, Turkey Point Plant Groundwater, Surface Water and Ecological Monitoring Plan (The Plan). The Plan was developed in cooperation with FPL, South Florida Water Management District (SFWMD), Florida Department of Environmental Protection (FDEP) and Miami-Dade County Department of Environmental Resource Management (DERM) to identify the spatial distribution of Turkey Point Plant cooling canal system (CCS) water.

Role: Prime – JLA Geosciences

Dates of Services:

2010 - 2016

Reference Contact:

Scott Burns, PG
Utilities Director
PH: (561) 594-4633

JLA services included; daily coordination with the well contractor and FPL; field construction observation during all phases of the project including exploratory coring, geophysical logging, sampling, measurement and testing services; ensuring contractor compliance with applicable regulations; evaluation of hydrogeologic, water quality, and geophysical data; and making monitor well construction recommendations for forty-two (42) discretely screened monitor wells in the Biscayne Aquifer System (BAS).

Drilling and construction activities were conducted under observation and scrutiny from FDEP, SFWMD, DERM, and Biscayne Bay National Park (BBNP) regulators tasked with ensuring FPL compliance to stringent regulatory requirements to work in environmentally sensitive areas within Biscayne Bay National Park (BBNP) and in isolated wetland areas around the Turkey Point Plant. Successful drilling and monitor well construction required unique types of equipment including jack-up barges in BBNP and low impact track-mounted drilling rigs in wetland areas. Despite the many challenges presented by these unique and difficult work environments, JLA garnered special praise from FDEP and SFWMD regulators for excellent quality control practices during oversight of construction activities. These practices ensured efficient project progress, contractor compliance with regulations, and compliance with the intent of The Plan.

In conjunction with extensive field responsibilities, JLA identified discreet flow zones in the BAS and proposed monitor well completion intervals for FPL to SFWMD and FDEP. JLA recommendations for all 42 monitor well completion intervals were approved and accepted by SFWMD and FDEP to facilitate groundwater monitoring in accordance with The Plan.



Upon completion of monitor well construction and testing activities, JLA compiled a comprehensive monitor well construction summary report which included geologic descriptions, geologic interpretations, well construction details, and hydrogeologic cross sections in the study area. The JLA completion report underwent review and approval from SFWMD and FDEP.



Utility Strategic Master Plan

CITY OF FORT LAUDERDALE, FLORIDA

JLA Geosciences, Inc. provided hydrogeologic services for Reiss Engineering and their client, the City of Fort Lauderdale, related to the City's Utility Strategic master plan for the 5 and 10 year horizon. Services include evaluations of water supply issues affecting the City; climate change; Biscayne and UFA raw water supplies; ASR and Reclaim water as it relates to water use permitting.

JLA also performed a visual evaluation of each Biscayne Aquifer production well facility to identify failed or deficient components, and where needed, recommend improvements or enhancements that may restore or improve individual well facilities and reliability. JLA provided a summary of observations made during the inspection, along with recommendations to promote optimal individual well and overall wellfield performance.

Role: Sub – JLA Geosciences

Dates of Services:

2015

Reference Contact:

Edward Talton, P.E.
Reiss Engineering
PH: (407) 697-5358



Lake Worth Evaluation of Historical and Potential Future Saline Intrusion, Surficial Aquifer Water Supply

CITY OF LAKE WORTH, FLORIDA

Due to concerns about historical evidence for saline intrusion occurring in the vicinity of the City of Lake Worth (City) Surficial Aquifer System (SAS) wellfield, the City entered into an operational agreement (Agreement) with South Florida Water Management District (SFWMD). As part of the Agreement, Lake Worth needed to develop a calibrated, density-dependent numerical model to simulate aquifer conditions and wellfield pumpage in the vicinity of its SAS wellfield. The modeling effort was designed to assist in providing reasonable assurances that saline intrusion would not cause harm to the City’s SAS wellfield and the water resource if pumpage was allowed to continue or increase. The modeling effort would evaluate likely causes of historical and potential future saline water migration, and estimate the potential quantities that Lake Worth may safely withdraw from their SAS wellfield.

Role: Prime – JLA Geosciences

Dates of Services:

2015

Reference Contact:

Doug Lovelace
Superintendent of Utilities
PH: (561) 586-1710



The initial phase of groundwater modeling involved update and modification of a constant density MODFLOW model developed and applied previously by JLA to support issuance of a CUP for the Town of Lantana. Simulation of historical conditions from December 2005 through June 2007 demonstrated consistency with the Water Use Basis of Review (BOR) criteria for model calibration of numeric models, and that the Lake Worth MODFLOW model could be used as a suitable framework to construct the variable density SEAWAT model.

Historical SEAWAT simulations evaluated conditions for the period 1939 to 2009. Simulations were run with and without pumping to compare with historically observed monitoring well concentrations. Modeling results for historical simulations documented how even without Lake Worth pumping, landward migration of the saline wedge occurs to a comparable extent, although at a slightly subdued rate, compared to non-pumping scenarios. These findings were consistent with previous variable density modeling studies of the SAS in South Florida, which concluded that landward migration of the saline wedge occurred (and likely continues to occur) in response to lowered coastal water levels due to construction of the regional drainage system.

SEAWAT simulations evaluated future conditions for potential City wellfield operating scenarios that applied various dry season (December-May) and wet season (June-November) pumping rates. Results indicated that continued operation of the Lake Worth SAS wellfield at any of the scenarios evaluated should not result in significant saline intrusion in the vicinity of the wellfield. Lower range withdrawals indicated either decreasing or very slight increasing trends for all monitoring wells. For other scenarios, slight increases above historical maximum concentrations were predicted such that landward migration of the saline interface would range between approximately 130 and 330 ft over a 20-year period. For monitoring wells that to date had not exceeded the SFWMD saline criteria of 250 mg/L, predicted future concentrations remained below the SFWMD threshold.

Although results of potential future wellfield operating scenarios supported continued operation of Lake Worth’s SAS wellfield without harming the wellfield or the water resource, SFWMD required that wellfield operations be modified such that no additional landward migration be predicted for the 20-year simulation period. Consequently, a plan to install additional wells further landward, and to phase-out existing wells at eastern locations, was proposed and subsequently permitted.

SUA PBG WWTP and Hood Road WTP DIWs Mechanical Integrity Testing and Reporting

SEACOAST UTILITY AUTHORITY, PALM BEACH GARDENS, FLORIDA

JLA Geosciences, Inc. provided hydrogeologic consulting services to Seacoast Utility Authority for the planning, construction, testing and reporting of mechanical integrity testing of two (2) Class I injection wells. The MIT testing included wells IW-1 at PGA WWTP and HRIW-1 at the Hood Road WTP. Services included the following: Preparation of two (2) MIT plans for submittal to FDEP and TAC; Review of technical specifications and contract documents; field services during MIT; preparation and submittal of two MIT reports summarizing testing results and operating data.

Role: Prime – JLA Geosciences

Dates of Services:

2014

Reference Contact:

Vince Mollo
Seacoast Utility Authority
PH: (561) 627-2900

Mechanical Integrity Testing for SUA Injection Well No.1 (HRIW-1) was conducted between June 17 and June 18, 2015 at the SUA HRWTP and SUA Injection Well No.1 (IW-1) between March 20 and March 24, 2015 at the SUA PGA WWTP in Palm Beach Gardens, Florida. Testing included the annular pressure test between the 16-inch diameter injection tubing and 24-inch diameter steel injection casing (HRIW-1), pressure test of the 24-inch diameter injection casing (IW-1), a video survey of each well, temperature and gamma ray logging, and a radioactive tracer survey (RTS). Testing was conducted to evaluate the mechanical integrity of the injection well in accordance with requirements of Florida Administrative Code (FAC) 62-528. Additionally, as part of the five (5) year mechanical integrity evaluation, monitor well water quality and pressure data, as well as injection well flow and pressure data were reviewed for the reporting period. Results of the testing and data evaluation indicated that both HRIW-1 and IW-1 met the requirements of FAC 62-528 with respect to mechanical integrity.



Analysis of the PBG WWTP DZMW-1 data indicated water quality freshening and artesian pressure increasing in the lower monitoring zone (LMZ) well starting in April, 2014 indicating the LMZ and upper monitoring zone (UMZ) were connected. After meeting with SUA, JLA generated and submitted a plan to DEP seeking authorization for a downhole investigation of the DZMW-1, LMZ casing that included Fluid Conductivity-Temperature (FCT) Logging, water quality sampling, and downhole video logging. The DZMW-1 investigation plan was approved by DEP on March 17, 2015 and the work was completed on March 19, 2015 by the Florida licensed drilling contractor.

The investigation concluded that there were multiple breaches in the DZMW-1 LMZ casing and SUA began the process of replacing DZMW-1 in its entirety. In 2016, JLA provided hydrogeologic consulting services in the construction and testing of the replacement DZMW-1.

Surficial Aquifer Replacement Well Program

SEACOAST UTILITY AUTHORITY, PALM BEACH GARDENS, FLORIDA

Since 2009, JLA Geosciences, Inc. (JLA) has provided hydrogeologic consulting services Seacoast Utility Authority (SUA) in the rehabilitation and replacement of 23 Surficial Aquifer Production wells throughout their four wellfields. The project has renewed wells with proven performance or space limits, maximized use of existing surface equipment, and utilized specialized drilling equipment to effectively rehabilitate each well.

JLA's unique approach to well rehabilitation seeks to provide site specific solutions which allow our clients to maximize their existing wellfields and understand when changes need to be made. JLA's rehabilitation approach has increased production at SUA's PGA, Burma Road, and Richard Road wellfields by 120% and added 15 MGD of raw water capacity.

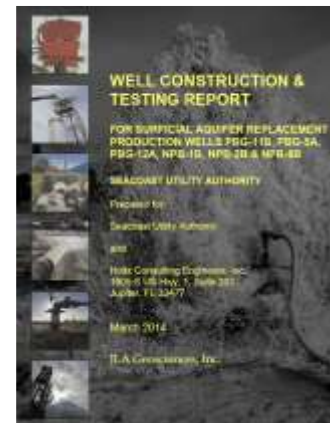
Role: Prime – JLA Geosciences

Dates of Services:

2012 – On-going

Reference Contact:

Vince Mollo
Seacoast Utility Authority
PH: (561) 627-2900



Water Supply Modeling, Permitting, and Water Use Permit Strategy Development

CITY OF WEST PALM BEACH, FLORIDA

JLA Geosciences (JLA) assisted the City of West Palm Beach (City) in evaluating water supply options and obtaining a permit renewal from the South Florida Water Management District (SFWMD). Historically, the City relied on surface water withdrawn from Clear Lake/Lake Mangonia to provide raw water for their water treatment plant. Primary input to these Lakes is via the M-Canal, which conveys water from the City's Water Catchment Area (WCA), as well as the SFWMD regional system. JLA evaluated potential alternative sources for the City's water supply, including groundwater withdrawals from the Surficial and Floridan Aquifers, and also aquifer storage and recovery (ASR).

Role: Prime – JLA Geosciences

Dates of Services:

2012 - 2017

Reference Contact:

David Hanks
Director of Public Utilities
PH: (561) 494-1046

JLA developed and applied a calibrated MODFLOW model of the Surficial Aquifer System (SAS) consistent with SFWMD requirements for consumptive use permitting. This model was constructed by extracting relevant input from the SFWMD Lower East Coast sub Regional (LECs_R) MODFLOW model. According to the model documentation (SFWMD, 2006) the LECs_R model is to be used as an interpretive and predictive tool to perform simulations of proposed water resource projects and/or operational schemes. An example application of the model presented in the documentation report included evaluation of flows to the Loxahatchee River. Concern exists regarding the extent to which, if any, major utilities in northern Palm Beach County may influence flows to the River.

JLA applied their calibrated SAS MODFLOW model to evaluate potential groundwater withdrawals by the City in the vicinity of Clear Lake/Lake Mangonia. This included evaluating the possibility of replacing the City's surface water supply with 30 to 50 groundwater wells completed in the SAS adjacent to Clear Lake/Lake Mangonia. Analytical modeling of the Floridan Aquifer System (FAS) was performed to assess groundwater supply alternatives from the FAS, including two distinct wellfields to supply water for low-pressure reverse osmosis (LPRO) facilities. Modeling results were used to support the City in formulating future plans for water supply, including strategies for securing consumptive use permits from SFWMD.

Activities performed for this project reflect JLA Geosciences approach to groundwater modeling. This includes utilizing to the extent practical existing information so as not to "re-invent the wheel" when developing and applying numerical models. It also involves selecting the appropriate model needed to address the issues and provide the information necessary to get the job done. Such approaches result in efficient use of time and resources and reduced costs to the client. A SFWMD Permit renewal was obtained with the following key project highlights:

- District approval of application in less than 11 months
- Endorsed by Palm Beach County Water Utilities Department
- 20 Year Permit, valid until 2033
- Reliable water supply system for extreme drought conditions
- Includes Regional System allocation of 67 mgd (not included in previous permit)
- Increases allocation from existing sources from 30.6 mgd to 41.2 mgd
- Added: New Eastern wellfield and exist. Western wellfield without AWT wetland recharge up to 60 days drought use
- Added: Alternative water sources (C-17 and C-51) to capture water lost to tide
- Added: Clear Lake Pump Station and Divide Structure
- Authorizes ASR with no limitations for deliveries from C-17 and/or C-51

WPB Aquifer Storage and Recovery Permitting Testing Services

CITY OF WEST PALM BEACH, FLORIDA

JLA Geosciences, Inc. (JLA) provides the City of West Palm Beach with a comprehensive evaluation of the City's Aquifer Storage and Recovery (ASR) facility. In 2000, The City completed construction of its 8 million gallons per day (MGD) ASR facility at the Clear Lake Water Treatment Plant. Considerable thought had been given to plugging the well and abandoning the ASR program over the past several years, although the City knew this would result in loss of a valuable potential water supply option in the future. A request to exempt the aquifer from meeting the standard for total coliform, known as a Limited Aquifer Exemption (LAE), was requested from Florida Department of Environmental Protection (FDEP) by the City in 1998. The LAE process sat idle in Tallahassee for more than 10 years as FDEP showed little to no support for the exemption. The recommendations in the study suggested that ASR would be most cost-effective for the City if the LAE was obtained, which would waive the requirement to disinfect the water prior to storage. Negotiations with FDEP Tallahassee eventually resulted in the Department's support for the exemption as difficult technical issues were resolved. The Department issued a Final Notice to Exempt the Aquifer in 2011, which was signed by the Secretary of the Department. Completion of the LAE process for the City of West Palm Beach is a monumental step forward for ASR systems in Florida and makes the City a pioneer in untreated surface water ASR in the state.

Currently, JLA is assisting the City with its ASR Cycle testing program. As of June 2015, the Cycle Testing is in Cycle 5. JLA's scope of work has included equipment evaluation and restoration, development of a reconditioning plan for the unused ASR system, developing preliminary pre-cycle testing procedures, providing training to City staff for ASR Cycle testing procedures and sampling, performing complete water quality sampling throughout Cycle testing, project management, and review, analysis and preparation of Monthly Operating Reports (MORs) to FDEP.

Role: Prime – JLA Geosciences

Dates of Services:

2013 to On-going

Reference Contact:

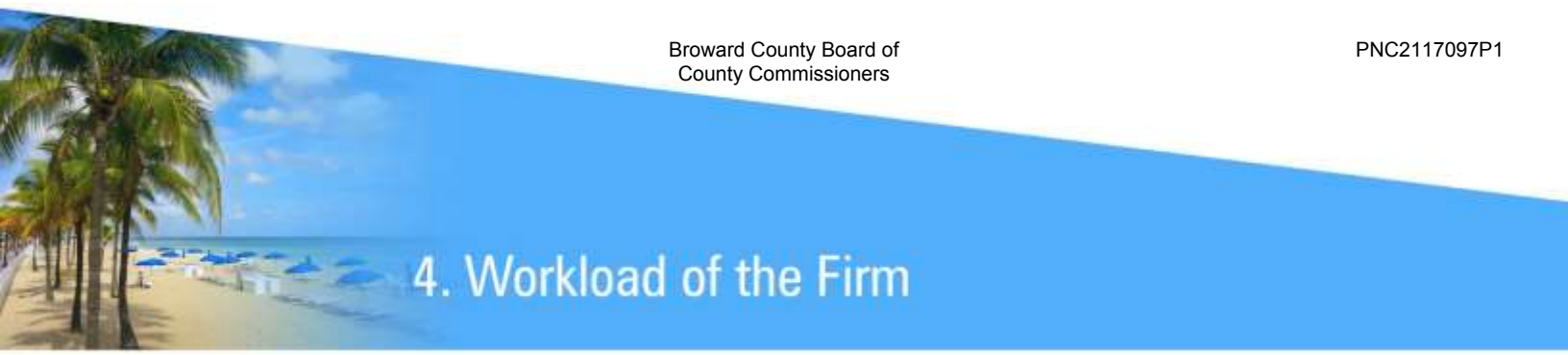
Poonam Kalkat, Ph.D.

Utilities Director

PH: (561) 494-1046

Email: pkalkat@wpb.org





4. Workload of the Firm

We are **CONFIDENT** that our key team members and firm have the capacity and resources to deliver your projects within your desired time-frame.

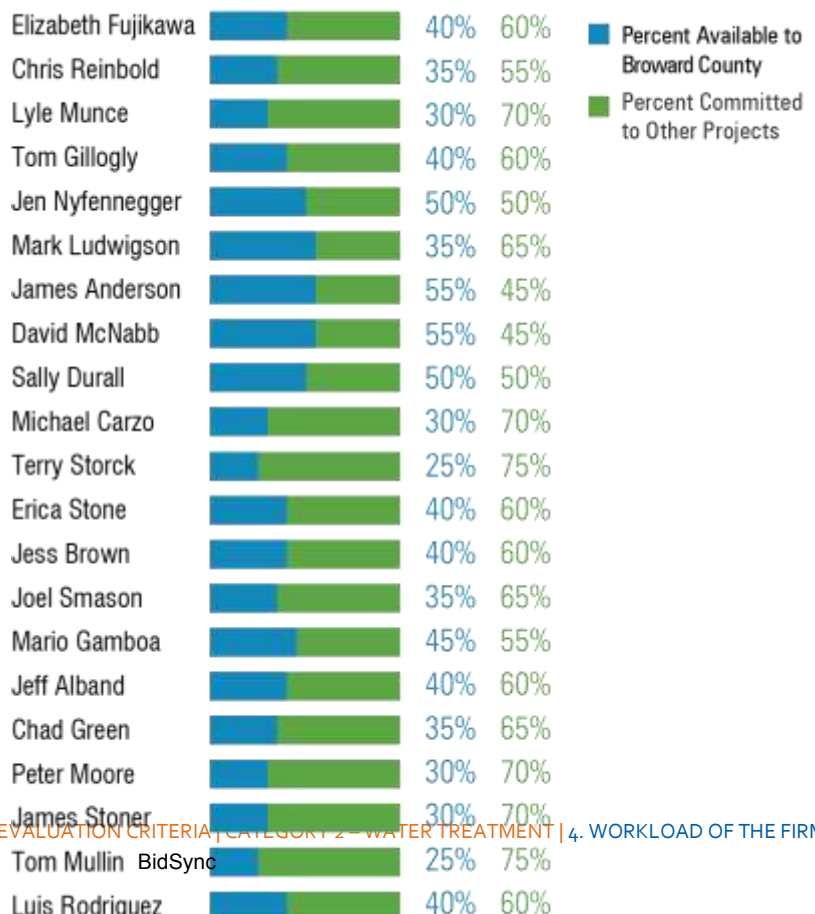
As a highly-ranked national firm that specializes in water and wastewater projects, Carollo continuously executes a high volume of work across a wide range of disciplines. Our firm-wide workload committed to active and on-going projects generally ranges between 65 and 70 percent.

As a result, we have more than ample capacity to respond to our client's needs regardless of the size and nature of the work we undertake.

As a specialty water/wastewater firm, we offer all the benefits of a small firm focused day to day on water and wastewater with the large firm benefits of national perspectives.

The availability of each staff member to participate in this project is included in the below graphic. The level of availability indicated in this graph shows that all key staff have ample capacity for this project and that we are ready to "hit the ground running".

Our Team is Available for Your Project



Completed and Active Projects

As a national firm, Carollo has a continuous workload of hundreds of projects at any particular time, at various stages of completion from kickoff to final completion. As examples, listed below are representative completed and active projects for Carollo in South Florida over the last five years, indicating the breadth and depth of our local experience.

<i>Client</i>	<i>Project</i>	<i>Status</i>
Broward County	High Service Pumping Station and Storage Tanks	Active
City of Boynton Beach	General Engineering Consultant	Active
	Progressive D/B of Ion Exchange Facility	Completed
	Study for Centralized HVAC	Completed
	Engine Generator Prepurchase	Completed
	WTP No. 2 MIEX System	Completed
City of Davie	Utility Master Plan	Active
City of Pompano Beach	General Engineering Consultant	Active
	Concentrate Pipeline Connection	Completed
	Electrical Master Plan Phase 1 Improvements	Completed
	Evaluation of Lime Softening versus Nanofiltration	Completed
	Transfer Pump Station Construction Services	Projected
	Water Supply Plan	Projected
City of Margate	General Engineering Consultant	Active
	East WWTP Upgrade	Active
	Assessment of Accelerator Wall Integrity	Completed
City of North Miami Beach	Force main Replacement	Active
City of Sunrise	General Engineering Consultant	Active
	Springtree Renewal and Replacement	Completed
	Springtree RO WTP	Completed
	Springtree WTP Sodium Hypochlorite Tank Replacement	Completed
	Sawgrass RO WTP	Completed
	Sawgrass WTP Rerate Improvements	Completed
Miami-Dade County	Design Services for Wastewater Treatment Related to the Ocean Outfall Legislation Projects – SFWWTP Design Package 1	Active
	Hialeah-Preston Nanofiltration Plant	Completed
Palm Beach County Water Utilities	WTP No. 2 Filter Replacement	Completed
South Central Regional WWTDDB	General Engineering Consultant	Active
	Bulk Hypochlorite Storage and Feed Facility	Active
	Progressive D/B of Aeration System and Capacity Improvements	Active
South Florida Water Management District	General Engineering Consultant	Active
	C-43 Reservoir Improvements	Active
	L-8 Pump Station	Completed
Village of Wellington	General Engineering Consultant	Active
City of Delray Beach	General Engineering Consultant	Active
	Water Treatment Plant Construction Management	Active

Carollo's Approach to Managing Projects

Our Overall Approach to Work

Carollo's overall philosophy is founded on simple precepts:

- ***Hire and hold on to the best people in the business.*** The most critical element for a successful project is the individuals that do the work. Carollo aggressively recruits highly experienced and successful engineers along with the top engineering graduates entering the work force. Our training and mentoring process allows younger engineers to become industry leaders. The County will benefit extensively from our management philosophy due to the dedication of our Client Services Manager, Liz Fujikawa, as well as the entire team. We also create successful teaming environments by developing communication skills and a commitment to building and maintaining lasting client relationships.
- ***Specialize in the planning, design, and construction management of water projects.*** This is our core business. Our success hinges solely upon our ability to provide cost-effective and responsive service to our clients.
- ***Focus on client service.*** Carollo knows the value of listening to our clients and recognizes that successful projects result from our staff working as an extension of your staff. This commitment to listening and valuing client input is the cornerstone of Carollo's 85 years of success. We take pride in the large number of clients with whom we have maintained continuing relationships. We have worked with some clients for over seven decades — validating the quality of our work, cost control, and ability to meet schedules. We strive to live up to our mission statement, "Dedicated to creative, responsive, quality water solutions to those we serve."
- ***Key senior staff involvement in each and every project stage.*** This provides you with top management interest, clear accountability and responsiveness, and helps make sure that the necessary staff and resources are committed to each assignment.
- ***Involvement of your end-users.*** We advocate establishing a core team of your engineering, operations, maintenance, and construction (if applicable) staff who will remain involved in the project from the initial planning through completion. This core team will be responsible for review of all design-related documents and participate in project workshops. The result is a better product, broader buy-in and support, and project continuity that will reduce revisiting previously made decisions.

Addressing Challenges

Our commitment to frequent communication—to look ahead, anticipate issues, and promptly reach resolution, reduces the potential for project issues. The more the entire team engages, the lower the likelihood of challenges occurring. Sometimes, in spite of best intentions and use of best practices, challenges do arise.

Our approach is for any potential issues to be immediately resolved at the lowest possible level. We view resolution as one of the most rewarding byproducts of successful teamwork. If prompt resolution of a challenge does not occur, then it is automatically taken to the next level of management. The automatic escalation process maintains working relationships and allows any challenge to be resolved in a timely manner.



At Carollo, we listen to your goals and make sure that we can add value to your project.

Carollo's Project Management Approach
Communicates and Emphasizes FIVE KEY Areas

-  **1** UPFRONT PLANNING

-  **2** TIMELY AND EFFECTIVE DECISION MAKING

-  **3** COLLABORATION AND COMMUNICATION

-  **4** SCOPE, BUDGET, AND SCHEDULE CONTROL

-  **5** QUALITY

 **Upfront Planning**

At the beginning of all projects, Carollo develops a comprehensive plan to guide the work, a practice we will also apply to the preliminary and final design phases of this project. We tailor each plan using our detailed work plan that corresponds to the scope of work. The work plan communicates the relationship between project deliverables and tasks, giving the team a better understanding of the activities that must be grouped, delivered, and discussed in workshops.

The final work plan will be fundamentally based on the graphical work plan presented previously, and communicates specific project expectations to the design team (i.e., what they deliver, when they deliver it, and how much effort is expected to complete a task). The work plan will be updated continuously to serve as a project management tool that allows the team to focus on providing an organized, seamless delivery of work efforts.



Timely and Effective Decision Making

The County and Carollo must make decisions efficiently and effectively to stay on schedule and meet the designated budget. This project requires the County's input and involvement, as well as Carollo's punctual response to requests and feedback. Our job is to provide the County with the information needed so that timely decisions can be made.

The effectiveness of the decision process is based on answers to the following fundamental questions:

- What decision has to be made?
- When does the decision have to be made?
- Who are the decision makers?
- What information is needed to make the decision?
- How will that information be formatted to allow for a comprehensive understanding of the decision?

What is the decision's cost and schedule impacts?

We will use managed workshops to facilitate the decision-making process as our approach is driven by face-to-face interactions with County staff. Many of these workshops have been identified in our work plan. Instead of relying on feedback from a draft memorandum, we focus our efforts on managed workshops that include clear communication of the required decisions, a detailed analysis of the decision, and a workshop record of comments that will be updated with the final decision log.



Collaboration and Communication

One of the most critical considerations is to identify who will be involved in the project and how much time they will contribute. As previously mentioned, our work and schedule rely heavily on the decisions made during the managed workshops, so the attendance of those involved with the project is crucial. It is important to provide the participants with adequate time to review and provide important feedback. Because the nature of the necessary decisions may vary, stakeholders with relevance to the selected task will be invited accordingly to the meeting.



Scope, Budget, and Schedule Control

Our project managers are responsible for and accountable to the County to effectively manage our team’s scope, budget, and schedule. He will submit monthly project management reports that update the status of the scope, budget, and schedule. Project managers and key members of your project team will also have bi-weekly telephone calls to update the project status and discuss any projects issues/concerns.

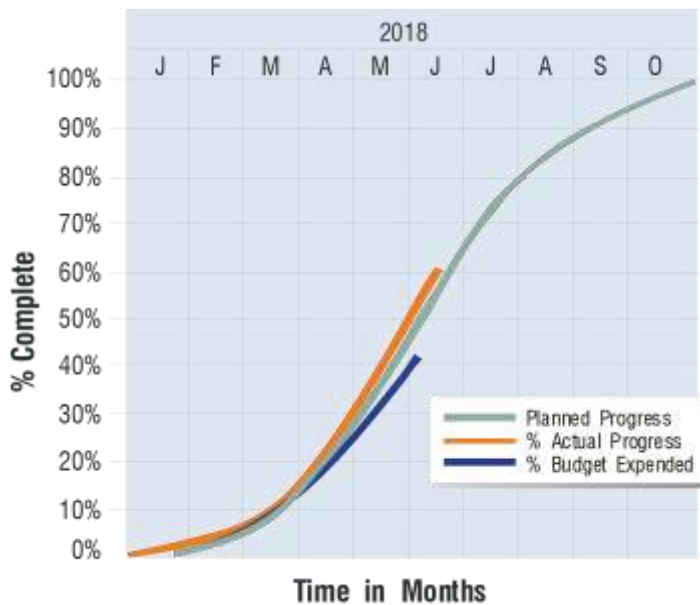
Monthly Progress Monitoring and Reporting

Project scope changes are tracked through the project decision log, which will be included in the monthly project management reports. Any decision that may change the scope of services will be identified and linked to a separate scope monitoring log. These items will be tracked using the date of identification, potential for budget or schedule impact, and required date of resolution. Items in the scope monitoring log will be reviewed with the County as needed. No work will be initiated on out-of-scope services without the County’s input and confirmation.

Earned value management (EVM) is used to analytically and accurately assess the project budget, track schedule status, monitor progress, and take appropriate corrective action if required. The basic elements of our EVM approach include:

- Identification of the budget and schedule at the start of the project for each scope item of every subtask.
- Graphic presentation of the relationship between schedule and budget monitored in an “S” curve throughout the project.
- Monthly calculation of each subtask’s “earned” value. This is done by estimating the remaining work necessary to complete the scope, without considering the budget expended. The overall project status is simply the sum of the subtask “earned” values.
- Communication of project status. The planned earned value and expenditure versus actual earned value and expenditure are graphically compared and are included in the monthly invoice.

By using the EVM method, the status of the project budget and schedule are clear to both the management team and the County. To identify the source of the deviation, a team member must simply inspect the “earned” value of the subtask. Establishing rigorous reporting procedures enables your Carollo team and the County’s management staff to focus on developing solutions rather than searching for the source of the problem.



The “S” Curve is a graphical illustration of the project plan, showing how the project will be completed on time and within the labor=hour budget.



Quality

To meet or exceed the County’s quality expectations, Carollo will follow our established quality management (QM) procedures. Carollo’s QM program is straightforward: we use seasoned engineering leads to employ time-tested quality review procedures for each deliverable throughout the project. More specifically for this project, Bob Cushing and Vinnie Hart will be responsible for implementing our in-house QM tools— standard specifications, design checklists, independent process and discipline review, and constructability review —at the appropriate stages during the preliminary and final design phases of the project.

This in-house process includes 10 specific phases of peer review and checking, each phase with definitive activities, participants, and deliverables. Each phase of the QM process is documented with a comment/resolution log, so we have a complete record of comments made, and the rationale behind the change/response.



Our approach will focus on quality throughout all phases to deliver a project that is correct, on-time, on-budget, achieves the scope, and meets or exceeds your expectations.

5. Location

As required by the RFP, the “Vendor’s Business Location Attestation Form” has been filled out and submitted.

Principal Place of Business

Our work principal place of business:

Carollo Engineers, Inc.
2700 Ygnacio Valley Road, Suite 300
Walnut Creek, California 94598

PH: 925-932-1710

Fax: 925-930-0208

www.carollo.com

Where Will Carollo’s Work Be Performed?

Our work will be led by our Broward office and primarily supported by our south Florida staff.

Carollo Engineers, Inc.
3440 Hollywood Boulevard, Suite 465
Hollywood, FL 33021

PH: 954-837-0030

Fax: 954-837-0035



6. Willingness to Meet Time and Budget Requirements

Meeting Project Specific Time and Budget Requirements

We understand the nature of General Services contracts. Some assignments need immediate, sometimes same day response times, while others are less urgent. **Our DEPTH AND BREADTH OF STAFF allows us to respond to immediate needs from our local office which is just minutes away.** For longer term assignments, Carollo develops a Project Management plan that establishes the plan to meet schedule, scope, budget and quality.

What Do Our Clients Say?

“The Evaluation of Long-Range Treatment Options: Nanofiltration versus Lime Softening study that Carollo provided was excellent. The report provided very good data and financial detail in which the Utility will be able to make decisions on future treatment methods and repair and replacement projects (R&R). We now can make plans for financing the work that we need to accomplish. The executive summary clearly communicated the path we needed to progress on. Our team enjoyed working with Carollo Engineers on this study. We look forward to working with them in the future.”

— Randy Brown, Utilities Director
City of Pompano Beach, FL

“Carollo Engineers has performed very professionally, been extremely responsive, and brought the most qualified and appropriate personnel to service us and our needs as a client.”

— Timothy Welch, PE, Utilities Director
City of Sunrise, FL

“The Carollo Team exceeded all of our expectations. They were professional and easy to work with. They are experts in what they do. I would not hesitate to recommend them.”

— Mikes Maillakakis, Senior Project Manager
Lee County Utilities, FL

Carollo is **COMMITTED** to meeting schedule and budget requirements for all tasks under this Contract.



7. Volume of Previous Work

As required by the RFP, the “Volume of Previous Work Attestation Form” has been filled out and submitted. Carollo has been paid less than \$3 million to date by Broward County Board of County Commissioners.



RESUMES

- Elizabeth Fujikawa
- Chuck Sinclair
- Chris Reinbold
- Lyle Munce
- Robert Cushing
- Vinnie Hart
- Tom Gillogly
- Jennifer Nyfennegger
- Mark Ludwigson
- James Anderson
- David McNabb
- Sally Durall
- Michael Carzo
- Terry Storck
- Erica Stone
- Jess Brown
- Joel Smason
- Mario Gamboa
- Jeff Alband
- Chad Green
- Peter Moore
- James Stoner
- Tom Mullin
- Luis Rodriguez



Elizabeth Fujikawa, P.E., BCEE

Elizabeth Fujikawa, a vice president with Carollo Engineers, has 31 years of engineering experience. Her experience includes design and construction management on projects with capital construction costs of up to \$240 million, including two of the U.S.'s largest treatment plants: Chicago's Jardine Water Plant (1,000-mgd), and the Metropolitan Water Reclamation District of Greater Chicago's Stickney Water Reclamation Plant (1,200-mgd). Relevant experience includes the following projects.

Education

MSE Environmental Engineering, University of Michigan, 1986

BS Chemistry, University of Illinois, Urbana-Champaign, 1984

Licenses

Professional Engineer, Florida, Illinois, Wisconsin

Civil Engineer, Delaware

Certification

LEED Accredited Professional, Green Building Certification Institute, 2006

Professional Affiliations

American Water Works Association

International Ozone Association

Water and Wastewater Treatment

→ Project manager for the Broward County Potable Water Storage Tanks, Pumping Systems, and Chemical Systems. This project includes the assessment, design and construction phase management of new ground storage tanks, new high service pump stations, and new sodium hypochlorite and ammonia feed and storage systems for disinfection. These improvements will be implemented at four locations within the County.

→ Project manager for a Bulk Sodium Hypochlorite Storage and Feed Facility for the South Central Regional Wastewater Treatment and Disposal Board, Florida. The facility will receive and store 12.5% sodium hypochlorite and meter the feed to the inlet to the tertiary filters for reuse.

→ Project manager for the Progressive Design/Build of the Aeration System Replacement and Capacity Improvement project for the South Central Regional Wastewater Treatment and Disposal Board, Florida. Work includes capacity improvements from 24 to 30 mgd, aeration system replacement with single stage centrifugal blowers, and hydraulic modifications to increase the sidewater depth of the plant.

→ Project manager for the City of Boynton Beach, Florida, Ion Exchange Treatment System and East Water Treatment Plant Improvements Progressive Design Build. This project includes initial engineering and constructability evaluations, permitting, design, and construction of a 16.0-mgd ion exchange system, associated ancillary systems, and raw water transmission main modifications.

→ Project manager for an evaluation of long range treatment by Lime Softening versus Nanofiltration for the City of Pompano Beach, Florida. The project evaluated advantages and disadvantages to bring the existing lime softening treatment plant into a 20-year life cycle condition versus an expansion of the nanofiltration treatment plant.

→ Project manager for the Central Lake County Joint Action Water Agency, Illinois, Ozone System Upgrade project. The project evaluated Air Fed versus Oxygen Fed (Vacuum Swing Adsorption) alternatives to supply the ozone generators. The project was designed and constructed using packaged Vacuum Swing Adsorption units.

→ Project manager for the Pompano Beach, Florida, Electrical System Master Plan for the water treatment plant. The project consisted of master planning and design services for replacement and upgrade of electrical power distribution system with state-of-the-art equipment and materials.

→ Project manager for the Pompano Beach, Florida, Electrical System Phase I Upgrades. Work included motor control center replacements and installation of new variable frequency drives for the high service pump station. Services include final design and opinion of construction cost, bidding services, construction support services.

→ Project manager for Owner's Representative Services for the City of Pompano Beach, Florida Electrical System energy efficiency project. Served as Owner's Representative during upgrades by Siemens to reduce energy usage at the water treatment facility.

Elizabeth Fujikawa, P.E., BCEE

→ Technical reviewer for the Miami-Dade County, Florida, 225-mgd Hialeah-Preston Water Treatment Plant chemical systems improvements.

→ Staff engineer for the Tampa Bay Water, Florida, Hydrogen Sulfide Treatment Improvements at the Lithia Water Treatment Plant. The current hydrogen sulfide removal facility will be replaced with a new, more reliable process. This new 45-mgd hydrogen sulfide removal facility will use ozone treatment and the project will be delivered with the Engineer-Procure-Construction Management (EPCM) approach.

→ Technical reviewer for the upgrade of raw water intake zebra mussel and icing control for the City of Evanston, Illinois.

Publications/Presentations

→ Low, M., Fujikawa, E., Gillogly, T. "Progressive Color Control: Boynton Beach's High-Rate Fluidized IX System". Paper presented at the Florida Water Resource Conference, West Palm Beach, FL, April 2017.

→ Wicklein, E., Low, M., Fujikawa, E., and Pazahanick, M. "Mixers, Headers, Rotation, and Baffles: Optimizing a Completely Mixed IX Bed for Organics Removal through CFD Analysis." Proceedings of the Water Quality Technology Conference, Indianapolis, Indiana, November 2016.

→ Fujikawa, E. "Ozonation at the Central Lake County Joint Action Water Agency: Start-up through First Year of Operation." Proceedings of the 11th Ozone World Congress, International Ozone Association, San Francisco, CA, September 1993.

→ Fujikawa, E., Grasso, D., and Weber, W.J., Jr. "Ozone Mass Transfer in a Gas-Sparged Turbine Reactor." *Water Pollution Control Federation, Research Journal*, Volume 62, Number 3, May/June 1990.

→ Fujikawa, E., Farver, B.T., and Robson, C.M. "Ozone Equipment: Profit from Experience." *Water Engineering and Management*, Volume 137, Number 2, February 1990.

→ Fujikawa, E., Farver, B.T., and Robson, C.M. "Ozonation in America: An Evolution of Success." *Water Engineering and Management*, Volume 136, Number 10, October 1989.

→ Fujikawa, E. "Status of U.S. Drinking Water Treatment Ozonation Systems." Proceedings of the International Ozone Association's Ozonation Systems and Drinking Water Treatment Conference, Myrtle Beach, SC, December 1988.

→ Fujikawa, E. "USA Applications of Ozonation for Drinking Water Treatment." Proceedings of the International Ozone Association's European Conference on Ozone in Water Quality, London, England, October 1988.

→ Fujikawa, E., Grasso, D., and Weber, W.J., Jr. "Rates of Ozone Mass Transfer and Decomposition in Waste Treatment Systems." Presented at the 59th Annual Conference of the Water Pollution Control Federation, Los Angeles, CA, October 1986.



Charles T. Sinclair, P.E.

Chuck Sinclair is a Senior Vice President with Carollo and serves as a Senior Client Services Manager. His project experience covers a broad range of civil and environmental engineering projects. His municipal and public works experience includes planning, design, and construction services for water and wastewater collection, conveyance, and treatment facilities. He also has extensive experience in storm water management and large water resources projects, including ecosystem restoration.

Mr. Sinclair has specific expertise in project and program management for large municipal and public utility programs, as well as civil works programs for federal agencies. He has been actively involved in the preparation and presentation of project data, client and agency coordination and public outreach.

Education

MS Civil Engineering,
University of North
Carolina, 1999

BS Civil Engineering,
Clemson University, 1991

Licenses

Professional Engineer,
Florida

Professional Affiliations

American Society of Civil
Engineers

American Public Works
Association

American Water Works
Association

Water Environment
Federation

Relevant Experience

→ Program director for the Miami-Dade Water and Sewer Department's Wastewater Collection and Transmission System in Support of Consent Decree, Miami, Florida. The project consisted of design of over 50 pipeline and pump station projects mandated by Consent Decree. In this role, he directed a large, multi-disciplined team made up of numerous staff and multiple subconsultant partner firms. He served as the primary point of contact for coordinating between the production team with the program managers and the staff at MDWASD. In order to meet the strict timelines required by the Consent Decree, he planned and managed the quick mobilization of multiple design teams, and worked closely with the program managers and MDWASD staff to develop streamlined processes for phasing of deliverables and document reviews. Despite starting several months late due to uncontrollable delays in the award of the design contract, the design teams were able to meet all milestone dates in the first 18 months of the contract term.

→ Program manager for an open-ended engineering consulting services contract for the Broward County Aviation Department in Broward County, Florida. The project consisted of environmental engineering services; airside infrastructure studies and improvements; safety, security, and communication projects; tenant improvements; airport facility refurbishments and improvements; terminal development improvements; landside infrastructure studies; airport development;

and airport capital project support. Responsibilities included all administrative, financial, and staffing needs of the projects, as well as planning and scheduling future projects as needed by the Department. He led a team of specialty subconsultants in support of BCAD's development programs via a five-year, \$11.4 million task order contract.

→ Project principal for this open-ended professional services contract providing miscellaneous engineering services for the Miami-Dade Water and Sewer Department in support of upgrades to the Alexander Orr Water Treatment Plant, Miami-Dade County, Florida. He was responsible for making sure that the team provided the appropriate technical resources to assure delivery of quality service and products on time and within budget.

→ Project advisor in support of the Comprehensive Everglades Restoration Plan for the Jacksonville District, U.S. Army Corps of Engineers, Jacksonville, Florida. This project included working closely with the Project Managers and technical team members in identifying scope of services for each project as well as project schedule and estimated cost. Responsibilities included serving as an extension of the Corps' Project Management Division staff in development of this program approach and he was also involved in the support of several project development teams in assisting them with developing Project Management Plans. Involved in facilitating many of the Project Development Team meetings during the development of the Project Management

Charles T. Sinclair, P.E.

Plans for over 20 CERP projects. As part of this project, he was involved in the Design Coordination Team meetings between Program Management staff of the Corps and SFWMD, developed and conducted presentations at meetings and assisted in the facilitation of discussions on topics of concern.

→ Project principal for the U.S. Army Corps of Engineers, Program, and Project Management Support for Restoration of Hurricane Protection System for Southern Louisiana, New Orleans, Louisiana. This project included leading a team to support the New Orleans District and the Mississippi Valley Division in managing and executing this \$6 billion program. Assisted with development of task orders, coordination with subconsultants and teaming partners, and working with the Corps to identify resource needs. Another important part of his role was to identify staff within the partner firms to fill critical roles within the program and assure their integration to the program team.

→ Technical advisor and co-facilitator for a charette for the Kansas City and Omaha Districts of the U.S. Army Corps of Engineers that focused on the development of a Program Management Plan (PgMP) for the Missouri River Fish and Wildlife Mitigation Program (Mitigation Program). Products of the charette included a Charette Report that documented the minutes of the charette. Important outputs of the charette included revised process flow charts, an annotated PgMP outline, and a preliminary draft PgMP. Responsibilities included serving as quality and technical reviewer of the final PgMP document presented to the Corps and distributed for public review and comment. Acted as a technical advisor to the interagency team that developed the outline of the PgMP. He was part of a team that planned and facilitated the week-long charette that featured a one-day stakeholder conference. Approximately 18 individuals from the Kansas City and Omaha Districts participated in the charette and an additional 30 representatives of partners or

stakeholders attended the stakeholder conference.

→ Program manager for an open-ended consulting services contract for the Capital Region Airport Commission at the Richmond International Airport in Richmond, Virginia. This five-year program included more than 50 individual projects, which ranged from stormwater management, to wetlands mitigation and permitting, to hazardous waste characterization and remediation, to facilities planning, assessment, and design. Responsible for all administrative, financial, and staffing needs of the projects, as well as planning and scheduling future projects as needed by the Commission. Acted as the project manager for several design projects, including a 300-acre wetland creation area, and a 40-acre stormwater management facility.

→ Project principal for an open-ended professional services contract for Florida Power and Light, Miami, Florida. The project included support in the development of the project to construct Nuclear Units #6 and #7 at the Turkey Point site. The project provided environmental and engineering services including the planning and evaluation of potential cooling water supply sources; conceptual design of potable and reclaimed water pipeline transmission systems; conceptual design of an advanced wastewater treatment system; traffic studies and conceptual design of access roadways; and conducting an assessment of reliability for primary and secondary water sources.



Chris T. Reinbold, P.E.

Chris Reinbold, an associate with Carollo, has 14 years of experience that includes study, design, permitting, and construction administration services for treatment plants, pumping stations, pipelines, and chemical systems. His continual focus for clients is to seek additional value, savings, or other operational enhancements on each project.

Education

MS Civil Engineering,
North Carolina State
University, 2008

BS Civil Engineering,
University of North
Carolina at Charlotte,
2003

Licenses

Professional Engineer,
Florida, North Carolina

Professional Affiliations

American Water Works
Association

Florida Engineering
Society

Relevant Experience

→ Project manager for the City of Riviera Beach Utility District (CRBUD), Florida, Water Treatment Plant Evaluation. This project includes the evaluation of the process systems at the CRBUD Water Treatment Plant to determine the expected performance of each process system. The evaluation will identify expected performance of each process system in terms of intended function and capacity along with a review of meeting established permitted regulatory criteria. This effort included review of existing documents, performing process calculations, interviews with operations staff, and review of application permits and regulatory criteria. Also included was the evaluation of the existing treatment system hydraulics. Carollo will also provide training seminars to CRBUD staff based upon topics identified during the above evaluation.

→ Project manager for the City of Sunrise, Florida, Sawgrass Water Treatment Plant membrane replacement, acid modifications, ion exchange (IX), and other improvements. This project includes two bid packages. The first is to replace the nanofiltration membrane elements for the existing 24-mgd treatment plant and demolish and replace the sulfuric acid pumps. The second is to install an oxidation, pre-filtration, and IX system to treat surficial aquifer water for iron, control color, and reduce organics. This treatment train is separate and parallel to the existing membrane filtration train. Following degasification of the membrane permeate, the IX treated water will be blended with it to optimize finished water hardness and alkalinity. The City will experience cost savings (through power and chemical reduction), reduced distribution system maintenance, increased water use, and improved overall finished water quality.

→ Project manager for the City of Sunrise, Florida, Southwest Water Treatment Plant Ion Exchange (IX) & Improvements. This project includes addition of a 2-mgd fixed bed vessel IX system for color control and organics reduction at an existing lime softening plant. Other improvements include the replacement of well 2, replacement of the diesel engine backup generator and associated fuel storage tank, salt storage for IX regeneration, waste equalization, demolition of the existing lime silo for construction of a new larger silo to install two Owner furnished slakers, and associated electrical and I&C features. The addition of the IX system will allow the City to improve finished water quality as well as meet regulatory requirements associated with disinfection byproducts while implementing a new disinfection system to meet the Groundwater Rule.

→ Project engineer for the South Florida Water Management District Caloosahatchee River (C-43) West Basin Reservoir project. This project is composed of a 170,000 ac-ft above-ground reservoir including internal and external embankments, internal control and outflow water control structures, canals, and two pump stations (S-470 and S-476). The pumping design capacity of the S-470 is 1,500 cfs while the design capacity for the S-476 is 195 cfs. This project is being designed and constructed with four separate bid packages.

→ Project manager for the City of Sunrise, Florida Springtree Water Treatment Plant Phase II Improvements & Rehabilitation. This project included renewal and upgrades to the existing four (4) 6-mgd each solids contact clarifiers, additional of raw water aerators, replacement of the south lime silo, concrete structure rehabilitation for the filters and flume, demolition of the existing east filters and transfer pump, addition of a new transfer pump station rated for 12-mgd, addition of a water stabilization (CO₂) system, extension of

Chris T. Reinbold, P.E.

washwater return piping to connect to the two west softeners, and replacement of the existing rotary drum vacuum filter belts and appurtenances for lime sludge dewatering. This project was designed and is being constructed in two separate bid packages.

→ Project manager during study/design and construction manager during construction for the Palm Beach County Water Utilities Department, Florida, Water Treatment Plant No. 2 Filter Replacement project. This project includes a new filter structure with dual media filters rated for an initial capacity of 16.4 mgd and designed to be high rated to an ultimate capacity of 25 mgd. The filter structure also includes a clearwell, transfer and backwash pumps, air scour blowers, electrical room, and chemical feed connections. The new filters replace existing steel vessel filters at each lime softening train that are to be demolished along with a 1.0 million gallon storage tank. Other items include site grading, drainage, paving, and yard piping to support the new facilities with demolition of the old.

→ Technical advisor for the Palm Beach County Water Utilities Department (PBCWUD) Water Master Plan Update, Florida. Project included development of a new water master plan for PBCWUD to recommend capital improvements to meet the County's 20-year water needs. Demand projections developed by PBCWUD were reviewed and confirmed, and updated peaking factors were developed based on historical production and SCADA data. Carollo assisted the County in updating its Infowater hydraulic model and developed and facilitated a calibration program. Based on modeling results and evaluation of PBCWUD treatment and storage facilities, a 20-year Capital Improvements Plan (CIP) was developed to sustain the County's future water demands.

→ Design manager for the City of Sunrise, Florida, Sawgrass 3-mgd Reverse Osmosis Water Treatment Plant. This project included the preparation of a procurement bid package and the general construction bid package, including 3 mgd of reverse osmosis treatment at the existing 18-mgd Sawgrass Water Treatment Plant. Included in the

reverse osmosis system design were cartridge filters, two-stage reverse osmosis treatment, degasification, air quality control scrubbers, clean-in-place system, and chemical systems. Also included in this project was the uprating of the existing nanofiltration treatment system from 18 to 24 mgd along with other renewal and improvement items.

→ Design manager for the City of Sunrise, Florida, Springtree Water Treatment Plant Sodium Hypochlorite Tank Replacement, Reverse Osmosis Water Treatment Plant, and Controls Building and High Service Pump "A." The project was executed as three separate bid packages. The first was to replace four 15,000-gallon each sodium hypochlorite tanks on an accelerated schedule. The second was to prepare a procurement bid package and then general construction bid package including the design of 3 mgd of reverse osmosis treatment, with 1.5 mgd to be procured and installed in the first phase, at the existing 24-mgd Springtree Water Treatment Plant. The reverse osmosis design included conversion of an ASR well to a Floridan aquifer production well, sand strainers, cartridge filters, two-stage reverse osmosis treatment, degasification, air quality control scrubbers, clean-in-place system, and chemical systems. The third bid package included the addition of a new plant controls building, new 12-mgd high service pumping station, and miscellaneous renewal and improvements to the existing softeners.

→ Project engineer for the South Florida Water Management District L-8 Reservoir Inflow Structure and Pump Station Conceptual Plan and Procurement of the Design-Build Contract and Construction Management Services. The L-8 Reservoir is part of an ongoing \$64M project to deliver a one-of-a-kind reservoir of 46,000 ac-ft capacity in Southeast Florida. The reservoir included a 450 cfs pumping station and a 2,000 cfs inflow structure.



Lyle D. Munce, P.E.

Lyle Munce, a Project Manager with Carollo Engineers, has 31 years of environmental/civil engineering experience, with an emphasis on municipal water systems. He has served as client manager, project manager, project engineer, quality control coordinator, technical reviewer, and construction manager for numerous multi-disciplinary water related projects. Mr. Munce's project experience and technical expertise include membrane treatment, lime softening treatment, pilot- and bench-scale programs, raw and finished water quality analysis, concentrate injection well design and permitting, and air stripping and odor control. In addition he is experienced in preliminary and detailed final design of water treatment systems, water well design and permitting, comprehensive master planning, water treatment feasibility evaluations, Design Build document production, construction management and administration, design of water and wastewater transmission facilities, utility system acquisition, and water systems operations consultation.

Education

MS Sanitary Engineering,
South Dakota State
University, 1987

BS Civil Engineering,
South Dakota State
University, 1985

Licenses

Professional Engineer,
Florida

Professional Affiliations

Florida Engineering
Society

American Water Works
Association

Relevant Experience

→ Principal-in-charge for the City of Riviera Beach Utility District (CRBUD), Florida, Water Treatment Plant Evaluation. This project includes the evaluation of the process systems at the CRBUD Water Treatment Plant to determine the expected performance of each process system. The evaluation will identify expected performance of each process system in terms of intended function and capacity along with a review of meeting established permitted regulatory criteria. This effort included review of existing documents, performing process calculations, interviews with operations staff, and review of application permits and regulatory criteria. Also included was the evaluation of the existing treatment system hydraulics. Carollo will also provide training seminars to CRBUD staff based upon topics identified during the above evaluation.

→ Principal-in-charge for the South Florida Water Management District L-8 Reservoir Inflow Structure and Pump Station Conceptual Plan and Design. The L-8 Reservoir is part of an ongoing \$64 M project to deliver a one-of-a-kind reservoir of 46,000 ac-ft capacity in Southeast Florida. This reservoir included a 450 cfs pumping station and a 3000 cfs inflow structure. Mr. Munce's responsibilities included the overall project management and technical leadership for the appurtenant facilities. He was also responsible for the Procurement of the Design-Build contract.

→ Principal-in-charge for the Procurement of the Design-Build contract of the L-8 Reservoir Modifications, Pump Station, and Inflow Structure project for the South Florida Water Management District. This project will control water flow for restoration and water quality buffering in the Stormwater Treatment Areas (STAs) of southeast Florida.

→ Project manager for the City of Sunrise, Florida, Springtree Water Treatment Plant Improvements Project. Project elements include general renewal and replacement of the 24-mgd lime softening facility, design of a fluidized bed ion exchange treatment system, a 1.5-mgd RO treatment system and the repurposing of an existing ASR well to a Floridan production well. General site improvements included stormwater management system redesign as part of the overall project.

→ Project manager for the City of Sunrise, Florida, 18-mgd Sawgrass Water Treatment Plant Improvements Project. Project elements include an organics control treatment system with chemical oxidation, pre-filtration, and fixed-bed ion exchange; evaluating conversion of an existing nanofiltration treatment train to RO; and the design of an independent RO treatment system.

→ Project manager for the Palm Beach County Water Utilities Department (PBCWUD), Florida Water Treatment Plant (WTP) Magnetic Ion Exchange (MIEX®) Treatment System No. 2. Responsible for design of a 16.4-mgd MIEX® treatment

Lyle D. Munce, P.E.

system to achieve color reduction and dissolved organic carbon removal from the source water, as well as reduce disinfection byproducts (DBPs). The system will process raw water from PBCWUD's System 2 WTP by flowing it through ion exchange contactors utilizing state of the art pumping systems where greater than 70% of the organic content of the water will be removed. The flow from this system subsequently flows through the remainder of the existing lime softening treatment plant and then to service area distribution. The MIEX[®] system replaces an obsolete ozone system and will save the County approximately \$265,000/yr. in operating costs, compared to the ozone generation system. At the time of startup and commissioning (early 2011) this system will be the largest of its type in North America. General site improvements and stormwater management system redesign was incorporated into the overall design and construction efforts.

→ Partner-in-charge/Project manager for the PBCWUD Water Treatment Plant 8 – Ion Exchange Bench-Scale Bypass Study. Providing services to study the potential impacts to the ion exchange treatment system at System 8 WTP should some amount of un-softened water be blended with the influent to the ion exchange system.

→ Project manager for the PBCWUD Nitrification Plan. Prepared a plan to outline procedures for preventing, detecting, monitoring, and responding to nitrification episodes, with the overall goal of maintaining consistent target water quality throughout the County's distribution system.

→ Partner-in-charge/Project manager for the PBCWUD, Florida Distribution System Security Enhancement Program – Phase 1 Study. This project is the first phase of a distribution system upgrade, which includes performing a TEVA-SPOT analysis to determine the best locations for sensor placement in the distribution system. The project also involves the latest software technologies available for distribution system security.

→ Project manager for a pilot study with the South Florida Water Management District (SFWMD), L-63N (Taylor Creek/Nubbin Slough) Aquifer Storage and Recovery system. Piloted UV, UV/TiO₂, and pasteurization technologies for surface water disinfection treatment of total and fecal coliform in the Taylor Creek canal.

→ Project manager/Project engineer for the SFWMD surface water Compartment C Stormwater Treatment Area project. Providing engineering services during construction of a Compartment C Stormwater Treatment Area in an effort to clean up waters flowing to the Everglades. Construction includes new seepage canals, inflow canal, spreader and collector canals, grated inflow structures, and associated levees.

→ Project manager for the SFWMD's Water Desalination Concentrate Management and Piloting project, which was completed in December 2009. This water resource project effort included the review and evaluation of brackish water RO concentrate at up to 20 desalination WTPs located within the SFWMD service area. The feasibility portion of the project identified four potential treatment methods to recover additional water from RO concentrate. The method deemed most appropriate for SE Florida utilities was piloted at the North Miami Beach Norwood Water Treatment Facility. It was determined that he piloted method of recovery was a viable alternative for WTPs within the SFWMD service area.

→ Project manager for the Palm Beach County Water Utilities Department (PBCWUD) Florida Water Conservation Evaluation. Investigated whether water conservation could be a part of the future solution to meeting water needs in the most cost-effective manner. The evaluation showed that water demands could be reduced 8-14 percent over 20-30 years, and that water conservation could provide up to 35 percent of new water needs by 2035. The 30-year present value of cost savings could be as high as \$30 million.



Robert S. Cushing, Ph.D., P.E., BCEE

Dr. Robert Cushing is a senior vice president with Carollo Engineers. He has 27 years of experience in applied environmental science and engineering. Throughout his career, he has coupled fundamental concepts with sound engineering practices to provide creative, innovative, and enduring solutions to challenges faced by water and wastewater utilities. He has been responsible for numerous successful treatment facility planning and design projects, as well as studies and programs for improving distribution system water quality.

Dr. Cushing has practiced nationally, providing service to a broad cross-section of the industry, from some of the largest and most visible utilities (e.g., New York City and Washington, D.C.) to very small applications with important and unique issues (e.g. Ouray National Fish Hatchery, Utah).

Education

PhD Civil Engineering,
University of Texas,
Austin, 1993

MS Civil Engineering,
University of Texas,
Austin, 1990

BS Petroleum
Engineering, University of
Texas, Austin, 1984

Licenses

Professional Engineer,
Florida, North Carolina,
South Carolina, Illinois,
Virginia

Professional Affiliations

American Academy of
Environmental Engineers,
Board Certified
Environmental Engineer

American Water Works
Association, (AWWA)
Florida Section AWWA

- Founding Chair
Region 10
- Trustee-at-Large

Founding Director
International Ultraviolet
Association

Water Environment
Federation

Reviewer for: ASCE
Journal of Environmental
Engineering
Environmental Science
and Technology
Journal of the American
Waterworks Association
Water Research

Relevant Experience

→ Technical advisor and quality assurance for the MSKP Town and County Utility, LLC, Fort Myers, Florida, Babcock Ranch Community Site. The 30-acre utility site houses the water treatment plant (WTP) and waste water treatment plant to accommodate future growth for the planned community. The WTP will increase the flow from 0.25 to 1.25-mgd. This new water system consists of a new reverse osmosis (RO) treatment plant, storage tank, high-service pump station, and distribution piping. Groundwater bypass is treated with anion exchange to reduce capital and operating cost while improving finished water quality. RO concentrate is disposed to a reuse system and used for irrigation.

→ Principal-in-charge and project manager for the Collier County, Florida, Northeast Regional Water Treatment Plant. This \$70 million Greenfield 10-mgd brackish RO treatment plant (expandable to 40-mgd) includes a design that must respond to degrading water quality and more than 8-mg/L of hydrogen sulfide. Key features of the RO design include no-acid pretreatment, noise isolation of the RO feed pumping, accessibility to all instruments and valves, and pressure exchanges for energy recovery.

→ Technical advisor and quality assurance for pilot testing and engineering analysis of water treatment technologies on Lake Okeechobee as part of the \$8.4 billion Comprehensive Everglades Restoration Program (CERP). This study evaluated

alternatives for treating Lake Okeechobee water prior to injection in Aquifer Storage and Recovery (ASR) wells. Pilot study results were used to develop design criteria and cost estimates for the 1.5-billion gallon per day ultimate capacity. The selected treatment train consists of bank filtration (BF), ozonation, and UV disinfection.

→ Technical advisor and quality assurance for Tampa Bay Water's, Florida, hydrogen sulfide treatment improvements at the Lithia Water Treatment Plant. Tampa Bay Water is tasked with developing, storing, and supplying water to Hillsborough, Pasco, and Pinellas counties and the cities of New Port Richey, St. Petersburg, and Tampa in a manner that reduces environmental effects of excessive or improper withdrawals. The South Central Hillsborough Regional Wellfield is owned by Tampa Bay Water, and groundwater from this facility is treated at the Hillsborough County Lithia Water Treatment Plant. The finished water from the Lithia WTP currently meets hydrogen sulfide removal requirements as specified in their Master Water Supply Contract. However, Tampa Bay Water will replace the current hydrogen sulfide removal facility with a new, more reliable process, and own and operate the new facility. This new hydrogen sulfide removal facility will rely on an ozonation process, and the delivery of this project will use an Engineer-Procure-Construction Management (EPCM) approach.

→ Technical advisor and quality assurance for the Rehabilitation and Expansion of the North Lee County (NLC), Florida, Reverse

Robert S. Cushing, Ph.D., P.E., BCEE

Osmosis Water Treatment Plant from 4.9 to 11.6-mgd. The NLC Reverse Osmosis WTP was completed in 2006 at a cost of over \$30 million and was supposed to produce 6-mgd, however, a maximum flow of 4.9-mgd only was achieved. Bob oversaw the design phase of the design/build delivery of the improvements and expansion, which included major upgrades to the treatment plants electrical systems, increasing reverse osmosis feed pump sizes from 75 to 200 HP, and the addition a turbine assisted booster pump as an interstage booster pump device. The cost of the required improvements to meet the nameplate capacity for this facility is \$17 million.

→ Technical advisor and quality assurance for Sarasota County, Florida, Environmental Services' Carlton Water Treatment Plant Inhibitor Feed System project. Carollo provided preliminary design, final design, permitting, and construction services for a new corrosion inhibitor feed system. Project included: analysis of various corrosion control strategies; finished water quality evaluation; water blending analysis using the RTW model and laboratory jar testing methods; and determination of preliminary design criteria for pH adjustment and corrosion inhibitor feed. Design services included: chemical metering pumps for feeding orthophosphate (corrosion inhibitor) and hydrochloric acid; a 2,500 gallon fiberglass storage tank for the orthophosphate; and a chemical transfer pump.

→ Principal-in-charge for the Tampa Bay Water, Florida, Well Chemical Feed Permitting and Design project, Tampa, Florida. Provided design and construction permitting services for a new on-site disinfection and corrosion inhibitor chemical feed system for a small system well.

→ Principal-in-charge for the preliminary expansion design for the City of Venice Gardens Water Treatment Facility in Sarasota County, Florida. The preliminary engineering report was generated to obtain the construction permit prior to detailed design. The expansion of the facility includes upgrades and expansion of five existing

membrane trains, including conversion from single stage to two stage arrays and the addition of interstage boost energy recovery devices for flux balancing and energy savings. New post treatment facilities include a new degasifier and chemical scrubber for hydrogen sulfide removal, a carbon dioxide solution feed system for pre-degasifier pH adjustment, and post treatment alkalinity recovery. The carbon dioxide system, in conjunction with a new scale inhibitor system, allows for acid free operation of the RO system.

→ Technical advisor and quality assurance for the City of Palm Coast, Florida, Nanofiltration Water Treatment Plant expansion from 2.5 to 9.6-mgd. Florida Water Services selected Carollo and Harn R/O Systems as the design build team to design, permit, and construct the expansion in a challenging schedule of only 13 months. Design build services included the re-design of existing nanofiltration equipment and chemical feed systems, the addition of four additional membrane trains, and two additional degasification towers. Re-design of the existing process saves the owner approximately \$100,000 per year in Operations and Maintenance costs by taking advantage of new technology.

→ Principal-in-charge for the expansion of South Island Public Service District's Water Treatment Plant in Hilton Head, South Carolina, from 1.5 to 3-mgd. The expansion included the evaluation of how to maximize the use of South Island Public Service District's existing reverse osmosis equipment and evaluation of the electrical and mechanical infrastructure to assess any required upgrades. Carollo developed designs and specifications for new reverse osmosis treatment equipment and associated electrical and mechanical system upgrades.



Vincent S. Hart, P.E.

Vincent Hart, an executive vice president with Carollo, has 25 years of experience in planning, design, and expansion of water supply, water treatment, and water distribution facilities. He has been involved with multiple bench and pilot studies involving design and expansion of water treatment facilities, including ultraviolet (UV) disinfection, and has written various publications and given presentations on the subject. Mr. Hart has served as water supply engineer for design and operation of pilot plant facilities and water treatment plant expansion projects. His areas of expertise include pilot plant design and operation, water treatment plant design and operation, membrane filtration facilities, and UV disinfection for drinking water.

Education

MS Environmental Engineering, Virginia Polytechnic Institute and State University, 1994

BS Environmental Engineering, Syracuse University, New York, 1992

Licenses

Professional Engineer, Colorado, Missouri, Minnesota, Kansas, New Jersey, North Carolina, Tennessee

Certification

LEED Accredited Professional, Green Building Certification Institute, 04/18/2009

Professional Affiliations

American Water Works Association

Water Environment Federation

American Society of Civil Engineers

National Association of Corrosion Engineers

Relevant Experiences

→ Technical Advisor for the Palm Beach County, Florida, Water Treatment Plant No. 8 Ion-Exchange (IX) Study. Carollo performed study phase services to develop and evaluate potential IX alternatives for discussion, review, selection, and implementation. Carollo evaluated both the high-rate fluidized bed IX technology and fixed-bed vessel (both on raw and filtered water flow streams). IX was considered to control the organics and resulting color in the finished water. A 20-mgd fixed-bed vessel system was recommended, which will treat the full rated capacity at WTP 8 along with the existing system.

→ Technical advisor for the City of Tampa, Florida, 120-mgd David L. Tippin Water Treatment Plant Water Master Plan. The project examined the condition and process performance of the existing plant. The current treatment process utilizes 120 mg/L of ferric sulfate at a coagulation pH of around 4.2. Due to the corrosivity of the water, high chemical costs, and volume of solids, the City wanted to examine alternatives to the existing treatment process. One of the alternatives is the use of MIEX® for organics removal. The master plan is complete and the City is moving forward with piloting of the MIEX® system.

→ Technical advisor for the Lee County Utilities, Florida, Corkscrew Water Treatment Plant Filter Scaling Evaluation. The 15.0-mgd Corkscrew Water Treatment Plant is a groundwater treatment facility. Mr. Hart utilized MINEQL+ to qualify and quantify precipitation occurring in the existing filters. He also served as technical advisor on the

North Lee County Water Treatment Plant Injection Well Scaling Evaluation.

→ Technical advisor for the City of Tampa, Florida, 110-mgd David L. Tippin Water Treatment Plant Water Master Plan, which included examination of finished water quality. Mr. Hart came up with an innovative approach to removing carbonate from the system in order to produce a higher finished water pH without excessive calcium carbonate precipitation. This approach to treatment will be pilot tested by the City.

→ Project engineer for the Palm Beach County, Florida, Water Treatment Plant No. 2 Ion-Exchange Treatment System. Carollo provided design, construction administration, and startup and commissioning services for a magnetic ion exchange (MIEX®) treatment system at Water Treatment Plant 2. The project included installation of an MIEX® treatment system to achieve dissolved organic carbon control and color reduction from the source water. In addition, the ion-exchange system reduced the potential for disinfection byproduct formation by removing organic precursors and provided the benefits of reducing the chlorine demand in downstream treatment.

→ Design engineer/technical advisor for the Palm Beach County, Florida, Water Treatment Plant 2 MIEX® System Preliminary and Final Design. The system was a state-of-the-art MIEX® system, which currently is the largest of its type in North America. The system was designed for color reduction, dissolved organic carbon removal, and disinfection byproduct removal. The capacity of the MIEX® treatment facility is 16.4 mgd. Palm Beach County saved \$293,000/year in

Vincent S. Hart, P.E.

operating costs by decommissioning the existing ozone system.

→ Technical advisor for the Tohopekaliga Water Authority, Florida, Harmony Water Treatment Plant MIEX® System Improvements, which involved troubleshooting the 0.5-mgd MIEX® system. The challenge with this source water was the elevated levels of hydrogen sulfide and organics. Regeneration of the resin was poor and the excess amount of hydrogen sulfide was causing regeneration problems, as well as overall system corrosion. Alternatives considered included packed tower aeration to remove the excessive amounts of hydrogen sulfide.

→ Technical advisor for the City of Boynton Beach, Florida, Ion Exchange Treatment System and East Water Treatment Plant Improvements Progressive Design-Build. The project included initial engineering and constructability evaluations, permitting, design, and construction of a 16.0-mgd ion exchange system (MIEX®), associated ancillary systems, and raw water transmission main modifications.

→ Project manager for the City of Olathe, Kansas, Water Treatment Plant No. 2 Expansion Study. The project involved a report that evaluated 11 different expansion options for the City's existing conventional softening plant (expansion from 17 to 30 mgd). The study allowed for expanding the existing softening basin capacity from 17 mgd to 38.25 mgd without building any new treatment basins. After using a detailed decision-making tool with stakeholders, the decision was made to expand the facility using membrane treatment. The final process treatment train resulted in a 33% reduction in lime use, 60% reduction in carbon dioxide use, and a significant reduction in residuals production.

→ Project manager for the City of Manhattan, Kansas, Water Treatment Plant and Wellfield Expansion Study. Tasks included defining water supply, treatment, and transmission needs for the next 40 years. Carollo developed the population and water demand projections for the City's future

service area. The report evaluated expansion alternates for the existing conventional softening facility. It was determined that, by operating the new wells and constructing wells in the appropriate location, the raw water hardness could be significantly reduced. This, in combination with reconfiguring the basins, uprating the filters, replacing the lime system, reconfiguring the transfer pump station operation, and optimizing the fluoride feed dose, is estimated to save the City approximately \$5 million in operations and maintenance costs (net present value) and \$4.5 million in capital costs (net present X value).

→ Project engineer for the City of Olathe, Kansas, Concept Plan for the Water Treatment Plant 1 and Harold Street Wastewater Treatment Plant Chlorine Improvements. Examined the safety of the chlorine systems at each plant, and recommended a gaseous chlorine scrubber at Water Treatment Plant 1 and a solid calcium hypochlorite tablet system at Harold Street Wastewater Treatment Plant.

→ Process expert for the East Bay Municipal Utility District, California, In-Line Water Treatment Plants Pre-Treatment Evaluation and Planning Study. The project identified process alternatives for the District's Orinda Water Treatment Plant (WTP) (200 mgd), Walnut Creek WTP (160 mgd), and Lafayette WTP (25 mgd) to address changing water quality conditions and sources, improve taste and odor, help address future contaminants, and improve treatment plant resiliency. The project included pilot testing of Actiflo™, Actiflo™ Carb, ozone, and filtration to refine pre-design parameters and assist with development of capital and operational costs.

→ Project engineer for the Pinellas County, Florida, Fats, Oils, and Grease (FOG) Storage and Feed Facilities Design-Build. The project included design of a 5,000-gallon FOG storage tank with mixing (recirculation) and future heating capability, unloading pump and grinder, and two FOG feed pumps. The project also included a PLC with programming to allow for consistent feed of FOG to the digesters over an entire day.



Thomas E.T. Gillogly, Ph.D., P.E.

Dr. Thomas Gillogly is a vice president with Carollo Engineers. He has significant experience with selection, implementation, and evaluation of water treatment technologies covering a wide range of water quality issues, including control of disinfection byproducts, inorganic contaminants, taste-and-odor causing compounds, and synthetic organic compounds.

Education

PhD Environmental Engineering, University of Illinois, Urbana-Champaign, 1999

MS Civil Engineering, University of Illinois, Urbana-Champaign, 1995

BS Chemical Engineering, Engineering and Public Policy, Carnegie-Mellon University, Pennsylvania, 1993

Licenses

Professional Engineer, Florida

Civil Engineer, Nevada

Professional Affiliations

American Water Works Association (93-Present)

- Inorganic Contaminants Water Quality Committee (Chair 04-09, V. Chair 03-02, 11-Present)
- Taste & Odor Treatment Chemicals Standards Committee (Chair 08-Present)
- Organic Contaminants Research Committee (01-06)
- Taste and Odor Committee (97-02, 07-Present)
- Activated Carbon Committee
- Emerging Contaminants Research Committee (10-Present)
- Membrane Process Committee (10-Present)

Dr. Gillogly has served on the Journal American Water Works Association (AWWA) Peer Review Editorial Board (2011-2016), and has held Chair or Vice Chair positions in various AWWA and International Water Association committees. He has served as peer reviewer for the Journal AWWA, Water Science and Technology, and Water Research. He has sat on the U.S. Environmental Protection Agency's (USEPA) Small Business Innovation Research (SBIR – Drinking Water) Evaluation Panel (2012) and served as a judge for the American Academy of Environmental Engineers – Excellence in Environmental Engineering Awards Competition (2011, 2012).

Relevant Experience

→ Deputy project manager for the Miami-Dade Water and Sewer Department, Florida, Design of the Hialeah and Preston (225 mgd combined) Water Treatment Plants. This project identified process modifications and improvements to the conventional lime softening water treatment plants to address a reclassification of one of the water sources as Ground Water Under the Direct Influence of Surface Water.

→ Project Manager for the Boynton Beach, Florida, Ion Exchange Treatment System and East Water Treatment Plant Improvements Progressive Design Build, Phase I. This project includes initial engineering and constructability evaluations, permitting, design, and construction of a 16.0 mgd ion exchange (MIEX®) system, associated ancillary systems, and raw water transmission main modifications.

→ Technical Advisor for an evaluation of long range treatment by Lime Softening versus nanofiltration for the City of Pompano Beach, Florida. The project evaluated advantages and disadvantages to bring the existing lime softening treatment plant into a 20-year life cycle condition versus an expansion of the nanofiltration treatment plant. Deputy project manager for the Miami-Dade Water and Sewer Department, Florida, Ground Water Under the Direct Influence of Surface Water (GWUDI) Upgrades (50-percent design). This ongoing effort will result in design of the world's largest nanofiltration process (165

mgd). Processes being designed in 3-D include prefiltration; rapid mix; cartridge filtration; 3-stage nanofiltration, >93-percent recovery; ultraviolet; degasifiers; deep well, ~3,000 feet; concentrate injection; standby power generation, 37.7-MW natural gas turbines installed; on-site, high-strength, 12 percent, hypochlorite generation, 15,000 ppd installed; LEED Silver control, operations, and laboratory area; low-service pumping; one-mile site access road; and overall development of the 83-acre site. The water from these processes will be finished, blended with conventional lime softened water, and distributed from the existing Hialeah-Preston pumping stations 8.5 miles away. Construction costs are estimated to be approximately \$600 million.

→ Technical Advisor for the Broward County, Florida, Potable Water Storage Tanks, Pumping Systems, and Chemical Systems. Phase I of this project included the design assessment of new ground storage tanks, new high service pumping stations, and new sodium hypochlorite and ammonia feed and storage systems for disinfection. These improvements will be implemented at four of the County's Districts for potable water distribution.

→ Technical advisor for the City of Sunrise, Florida, Springtree and Southwest Water Treatment Plants Improvements Groundwater Rule 4-Log Compliance. This project evaluated water quality, identified plant improvements, and coordinated with local regulators to obtain 4-log virus

Thomas E.T. Gillogly, Ph.D., P.E.

Professional Affiliations

International Water
Association (96-02, 08-
Present)

- Off-Flavours in the
Aquatic Environment
(V. Chair 09-Present)

Florida Green Building
Coalition (08-Present)

International Ozone
Association (00-04)

International Ultraviolet
Association (00-02)

inactivation credit compliance for the two
water treatment plants.

→ Deputy project manager for the Miami-Dade Water and Sewer Department, Florida, Groundwater Under the Influence of Surface Water (GWUDI) Upgrades (50-percent design). This ongoing effort will result in design of the world's largest nanofiltration process (165 mgd). Processes being designed in 3-D include prefiltration; rapid mix; cartridge filtration; 3-stage nanofiltration, >93-percent recovery; UV; degasifiers; deep well, ~3,000 feet; concentrate injection; standby power generation, 37.7-MW natural gas turbines installed; on-site high-strength, 12 percent, hypochlorite generation, 15,000 ppd installed; LEED Silver control, operations, and laboratory area; low-service pumping; one-mile site access road; and overall development of the 83-acre site. The water from these processes will be finished, blended with conventional lime softened water, and distributed from the existing Hialeah-Preston pumping stations 8.5 miles away. Construction costs are estimated to be approximately \$600 million.

→ Deputy project manager for the Miami-Dade Water and Sewer Department, Florida, Geophysical Investigation at the Northwest Wellfield (NWWF). The 63-acre NWWF sludge receives lime residuals generated through softening at the Hialeah and Preston Water Treatment Plants. This project identified potential leaks within the crushed limestone berm (~25 feet above MSL), mapped their extent, and identified soft/weak zones.

→ Deputy project manager for the Miami-Dade Water and Sewer Department (WASD), Florida, Floridan Blending Evaluation. This evaluation enabled WASD to modify its recently approved South Florida Water Management District Consumptive Use Permit to eliminate the required blending of Floridan Aquifer water with Biscayne Aquifer water prior to treatment. Approved modifications were based on raw and finished water quality analyses, corrosion indices, consumer complaint reports, and cost analyses of

nanofiltration/reverse osmosis treatment technologies.

→ Project Manager for Tampa Bay Water (TBW), Florida, Morris Bridge Booster Pump Station (MBBPS) Energy Audit. An energy audit was performed on the 30-mgd MBBPS. Operational records, field audit (lighting and building envelope), and pump testing were used to identify energy efficiency measures (EEMs). The pump testing performed on all three pumps (VFDs; 600- to 900-hp), demonstrated pumps were operating close to original conditions.

→ Project manager for the City of Margate, Florida, Water System Assessment. The project evaluated the water distribution system (210 miles; 3,460 valves; 2- to 30-inch diameter pipe) to identify areas in need of pipe redundancy and additional water valves to increase localized pipe isolation. To support this, the existing water model (InfoWater) was revised and updated with the latest pipe data as well as the addition of existing operational gate valves in the distribution system to fulfill the purpose of the water assessment. Cost estimates were developed for recommended improvements.

→ Project manager for the City of Margate, Florida, Water and Force Main Aerial Crossings Condition Assessment. This project provided a condition assessment of seventeen water and force main aerial canal crossings. Based on on-site inspections and laboratory analyses alternative options to address system integrity and safely extend the life of the water and force main aerial crossings were identified with budgetary cost estimates for each improvement.

→ Project manager for the City of Margate, Florida, Aerial Crossings Replacement, Repair and Rehabilitation. These projects provide survey, design, permitting, and engineering service during construction for the replacement of two crossings, repair of two crossings, and the rehabilitation of ten other aerial crossings over canals. These included both water distribution and force mains, AVARs, guard fans, etc.



Jennifer S. Nyfennegger, Ph.D., P.E.

Dr. Jennifer Nyfennegger is an Associate with Carollo Engineers and Southeast regional lead for the Carollo Research Group. She has 11 years of experience in civil and environmental engineering, including applied research, planning, and design of water, wastewater, and reclaimed water treatment systems.

Education

PhD Environmental Engineering, University of Florida, Gainesville, 2008

BS Environmental Engineering, University of Florida, Gainesville, 2003

Licenses

Professional Engineer, Florida

Professional Affiliations

American Water Works Association

Water Environment Federation

Relevant Experience

→ Technical Advisor for the City of Tampa's David L. Tippin Water Treatment Facility Master Plan, including regulatory review of existing and future regulations to guide facility planning of this 120-mgd plant to reliably meet customer demands over the planning horizon.

→ Project manager for Lee County, Florida, Water and Wastewater Utility System Review and Annual Comprehensive Reports (2011 - 2017). This project includes an annual assessment of the utility system operations to ascertain whether it is managed, operated, and maintained in an efficient, economical manner that is within accepted municipal standards. The project included annual facilities inspections, operations review for conformance to regulations, review of insurance requirements and compliance with bond resolutions, and benchmarking of utility performance data. Prepared an annual report describing the condition of the utility system as well as recommendations to maintain the utility system in good condition.

→ Technical advisor for the City of West Palm Beach, Florida, Water Treatment Plant Water Quality Deviation Investigation - Particle Charge and Biological Filter Evaluation to the utility to meet regulatory requirements for turbidity removal. Technical lead for assessment of the biological filters, including analysis of biological activity, evaluation of filter monitoring/controls, and media replacement recommendations.

→ Project manager for the Lee County, Florida, System-wide Corrosion Control Study. The project provided a comprehensive evaluation in accordance with the Lead and Copper Rule for the entire Lee County Utilities finished water distribution system and six water treatment facilities. Evaluated the effectiveness of

seven corrosion control alternatives, and provided recommendations to optimize corrosion control treatment.

→ Project engineer for the Orange County Utilities (OCU), Florida, 4-Log Virus Removal Demonstration project. Carollo provided professional services to evaluate the capability of achieving 4-log virus treatment at ten OCU water supply facilities for compliance with EPA's Ground Water Rule. Responsibilities included technical review of treatment evaluations and documentation submitted to Florida Department of Environmental Protection (FDEP).

→ Project engineer for Ground Water Rule Compliance at the Lee County, Florida, Pinewoods and North Lee County Water Treatment Plants. Responsible for completing evaluations demonstrating 4-log virus treatment and preparing the required documentation to FDEP.

→ Design engineer for the Manatee County, Florida, Lake Manatee Water Treatment Plant Filter Upgrade Project. This project includes retrofit of the surface water treatment plant's existing dual-media filters with submerged ultrafiltration membranes. The design capacity of the ultrafiltration membranes will produce 52-mgd (net), making it the largest ultrafiltration membrane retrofit in the country. Responsibilities include pre-treatment evaluation, development of plans and technical specifications, pilot testing to evaluate performance of two membrane systems, and permitting.

→ Project engineer for Sarasota County, Florida, Dona Bay Treatability Study. The purpose of the Treatability Analysis project was to evaluate possible treatment scenarios for the development of a new potable water supply in Sarasota County. Excess run-off withdrawn from Cow Pen Slough would serve as the new water supply and decrease the volume of fresh water

Jennifer S. Nyfennegger, Ph.D., P.E.

entering Dona Bay, which harms shellfish and other valuable habitat in this estuarine system. This project included design, permitting, and operation of a pilot treatment train on a greenfield site including - biological roughing filters, ion exchange for color removal, ultrafiltration, and reverse osmosis.

→ Project engineer for the Manatee County, Florida, Manatee Water Treatment Plant Biological Roughing Filter Basis of Design. The project included preliminary design and permitting of Biological Roughing Filters (BRF) to replace the plant's existing powdered activated carbon system for removal of taste-and-odor (T&O) causing compounds, particularly MIB and geosmin. The BRF employs a biological filtration process, in which naturally occurring bacteria form biofilms on the filter media and degrade T&O compounds to innocuous, odorless end-products. The design includes six granular activated carbon filter beds to treat 54-mgd of raw water.

→ Assistant project engineer for the Rehabilitation and Expansion of the Lee County, Florida, North Lee County RO Water Treatment Plant from 4.9 to 11.6-mgd. Responsibilities for this progressive design-build project included pilot testing to validate the efficacy of eliminating sulfuric acid addition to the membrane feed water, design of the carbonic acid (i.e., CO₂) and odor control systems, and development of the preliminary design report, standard operating procedures, and web-based electronic O&M Manual and permitting.

→ Technical advisor for the City of Altamonte Springs, Florida, Potable Reuse Pilot Study. Pilot testing included ozone/biofiltration, ultrafiltration, GAC, and UV advanced oxidation. Unlike many previous potable reuse pilot projects, Altamonte is using an ozone/biofiltration system as the core of their treatment process instead of reverse osmosis. Ozone/biofiltration offers an economical alternative destroying pollutants at lower energy use without a waste stream. This project included collaboration with FDEP

regarding future regulatory framework for direct potable reuse.

→ Co-Principal Investigator for Water Research Foundation Project 4719: A Biofiltration Guidance Manual for Rapid-Rate Filtration Facilities. This project included development of an educational and practical operations resource for the design, operation, maintenance, and monitoring of biologically active rapid-rate gravity filters. This manual will offer practical and readable guidance for operators, regulators, engineers, manufacturers, and researchers in the water industry.

→ Project engineer for the Sarasota County, Florida, 2011 Water Supply Master Plan Update. Carollo provided an update to the County's previous Water Supply Master Plan, including revised demand projections, evaluation of potential future water supply sources, and an analysis to identify solutions for a range of different planning scenarios. Based on the selected projections, a 10-year CIP was developed and recommendations will be presented to the County Commission.

→ Project engineer for development of the Sarasota County, Florida, Comprehensive Plan Water Facilities Supplement Memorandum. This memorandum was developed to supplement the County's 2005-2006 Water Supply Master Plan and provide information needed for the County's 2009 Comprehensive Plan Amendment. The supplemental information included a summary of planning efforts; inventory of treatment, storage, and distribution systems; analyses for level of service standards including updated water demand projections and discussion of facility capacity; and an updated ten-year work plan.

Project engineer for the City of Punta Gorda, Florida, 2009 Water Supply Master Plan Update. Developed updated demand projections and identified potential projects for future water supply. New water supply projects were evaluated for their potential to provide diversity and sustainability in supply sources through 2050.



Mark N. Ludwigson, P.E.

Mark Ludwigson has over 16 years of engineering experience with projects across the country and here in Broward County. He has worked solely in the water environment industry since 2004 and is passionate about water and wastewater systems. Mr. Ludwigson has brought success to a variety of water projects, whether serving as project manager or project engineer. He is trusted for civil, mechanical, and process design discipline work.

Education

MS Engineering,
University of Wisconsin,
Milwaukee, 2010

BS Engineering
Mechanics (Structural
Analysis Major),
University of Wisconsin,
Madison, 2001

Licenses

Professional Engineer,
Florida, Wisconsin

Certification

Certificate, Project
Management Bootcamp,
PSMJ Resources, 2017

Certificate, Project
Management Qualified,
Management and
Strategy Institute, 2014

Certificate, Quality
Management in the
Design Organization,
American Society of Civil
Engineers, Florida, 2014

Certified, 10-Hour OSHA
Construction Safety and
Health, Safe-Con, LLC,
2013

Certificate, Confined
Space Attendant, Entrant,
and Entry Supervisor,
Symbiont, Wisconsin,
2009

Professional Affiliations

Florida Engineering
Society

Florida Water
Environment Association

Water Environment
Federation

Relevant Experience

→ Project engineer for new potable water storage tanks and pumping systems for four sites in Broward County, Florida. Mr. Ludwigson led the process and mechanical designs for the following improvements: ground storage tanks ranging in size from 1.5 MG to 5.0 MG, high service pump stations ranging from 8 mgd to 30 mgd, chemical feed systems, 4-log disinfection systems, yard piping, and associated improvements. The improvements are under construction at three of the sites.

→ Project engineer for a new water storage tank and high service pump station at a Naval Air Station in Key West, Florida. Project included a new 0.5 MG glass lined steel tank and a pump station with vertical turbine pumps.

→ Project engineer for the City of Sunrise, Florida, Springtree Water Treatment Plant Phase II Improvements and Rehabilitation project. Work includes rehabilitating the solids contact clarifiers, replacement of a lime silo, concrete repairs, demolition of filters, a new 12 mgd transfer pump station, a new carbon dioxide storage and feed system, thickener supernatant return pipe modifications, and improvements to the lime sludge thickening and dewatering process, including new rotary drum vacuum filters.

→ Project engineer for the City of Sunrise, Florida, Sawgrass Water Treatment Plant Ion Exchange and Other Improvements project. Work includes the addition of a 3 mgd ion exchange treatment system, sodium permanganate feed system, a new chemical building, and a degasifier cleaning system utilizing hydrochloric acid.

→ Project manager for an Evaluation of Lime Feed Improvements for the City of

North Miami Beach and NMB Water.

Improvements were identified the existing lime feed storage and feed systems. Several upgrade alternatives were presented including layouts and cost estimates.

→ Project manager for Membrane Treatment System Improvements for the City of North Miami Beach and NMB Water. The design included the following improvements for the reverse osmosis and nanofiltration membrane treatment systems: addition static mixers on the raw water lines, replacement of sulfuric acid and antiscalant chemical feed system components, and replacement of craddles for membrane supports.

→ Project engineer for construction management services for the Palm Beach County Water Utilities Department Water Treatment Plant No. 2 Filter Replacement project in West Palm Beach Florida. This project includes a new filter structure with dual media filters rated for an initial capacity of 16.4 mgd and designed to be high rated to an ultimate capacity of 25 mgd.

→ Project manager for a Concentrate Disposal project for the City of Pompano Beach. Alternatives for disposal of membrane concentrate were developed and compared, including introducing concentrate into a reclaimed water plant. A new concentrate disposal pipeline was designed, permitted, and constructed in 2017.

→ Project manager for finished water transfer pump station improvements at the City of Pompano Beach Water Treatment Plant. The pump station has a rated capacity of 35 MGD. The design includes resizing of five 50 HP vertical mixed flow pumps, the addition of VFD's, an hydraulic assessment, HVAC upgrades, and miscellaneous structural improvements.

Mark N. Ludwigson, P.E.

Awards

Kelman Award, Top Magazine Article, Central States Water Environment Association, 2012

Graduate Student Paper Competition Winner, Water Environment Federation, 2011

Quote

Clean water is the basis of life on this amazing planet.

→ Project engineer for the design of a new raw water intake pipeline for the City of Rock Island, Illinois. The 2,600 foot pipeline included a river crossing below a slough of the Mississippi River and a levee wall utilizing horizontal directional drilling. The water intake structure is part of a U.S. Army Corps lock and dam. The pipeline crosses a portion of Arsenal Island, owned by the U.S. Army. The pipe route avoids an endangered mussel sanctuary and bald eagle roosting site.

→ Project engineer for a new wastewater collection and water distribution system for a community in Big Pine Key, Florida. Mr. Ludwigson was the professional engineer for the design, which included over 2,000 ft of sewer piping, 100 service connection, a lift station with grinder pumps, and over 2,000 ft of water distribution piping. Mr. Ludwigson coordinated for required permits.

→ Project engineer for the City of Margate, Florida, West Wastewater Treatment Plant Coagulant Feed System project. Work includes settling jar testing for chemical selection, design of a new coagulant storage and feed system, chemical containment, and injection in a clarifier splitter box.

→ Project manager for a study and preliminary design to meet lower discharge limits for phosphorus and temperature for a wastewater discharger. Project involved designing a tertiary sand filtration system with minimal chemical addition and metal residuals to avoid toxicity in the receiving stream. A wastewater cooling system was also designed to reduce thermal effects on the cold-water trout stream. A new permit was negotiated with regulatory agencies.

→ Project engineer for design and construction services of a new 265 mgd wet weather treatment system for the City of Rock Island, Illinois. Mr. Ludwigson was responsible for the design of the treatment equipment including two 150 foot diameter clarifiers, sludge pumps, degritting cyclones, classifiers, and a gravity thickener.

→ Project engineer for design and construction services of two remote wet

weather treatment facilities for the City of Rock Island, Illinois. The facilities were engineered to capture the first flush of wet weather sewerage and pump it back to the wastewater collection system after the event. Additional flow was treated by enhanced clarification, aeration, and chlorine disinfection.

→ Project engineer for biosolids dewatering and odor control improvements for the City of Beloit Water Pollution Control Facility in Beloit, Wisconsin. Installed improvements included a new belt filter press, improved polymer feed system, new sludge pumps, a new weight controlled storage hopper, and new biofilter bed for odor control.

→ Project engineer for a regional waste to energy project for GreenWhey Energy located in Turtle Lake, Wisconsin. The facility collects waste from over 10 food processing facilities and generates 3.2 million watts of electricity and 362 million BTU per day of heat. Mr. Ludwigson led the preliminary design and site layout for the facility which included two 2,000,000 gallon high rate anaerobic digesters and two internal combustion engines.

→ Lead engineer for six 80-foot diameter secondary clarifiers for the Shady Hills Wastewater Treatment Plant, Pasco County, Florida. Mr. Ludwigson was the lead engineer for the clarifier equipment and he performed necessary calculations. Design included dual suction headers, energy dissipation baffles, scum collection, and hot dip galvanized steel.

→ Project engineer for the lift station and forcemain facility plan for the Cherry Valley Pump Station, owned by the Rock River Water Reclamation District in Rockford, Illinois. The project included increasing the effective wet well volume by 100 percent, increasing the firm pumping capacity to 18.5 mgd, assessing the existing 30-inch prestressed concrete cylinder pipe (PCCP) forcemain, and designing a new 13,800 foot long force main, with a combination of horizontal directional drilling and open cut methods.

CURRICULUM VITAE

JAMES L. ANDERSEN, P.G.

Principal Hydrogeologist, JLA Geosciences, Inc.



QUALIFICATIONS

AND EXPERIENCE

President of JLA Geosciences, Inc., Jupiter, Florida and is responsible for company operations, project management, technical oversight, well design and construction phase services team leader. Mr. Andersen has over 30 years working experience in hydrogeology, groundwater water resource investigations, well field design, construction, development, well problem evaluations and well rehabilitation. He has been responsible for the construction of and completion of hundreds of water supply wells in South Florida including over 100 in the Upper Floridan Aquifer. He has an extensive groundwater experience, working with coastal plain aquifer systems; well design; groundwater monitoring, geophysical well logging and interpretation; reverse osmosis (RO) raw water supply investigations and RO concentrate disposal by injection well; aquifer performance testing, analysis and computer modeling; wellfield contamination investigations, collection and analysis of water quality data; rehabilitation of old wells, and supervising various types of drilling. Mr. Andersen has served as a Florida Chamber of Commerce short course instructor for environmental permitting, an invited speaker for the Florida Department of Environmental Protection on contamination cleanup, a regular conference speaker for AWWA, AWRA, AGWT, AMTA and SEDA on topics such as Aquifer Storage and Recovery, hydrogeology, water use permitting and well design, construction and rehabilitation strategies. Jim serves on the Southeast Desalting Association and Palm Beach County Natural Resources Protection boards. He is also on the board and Secretary of Connect Consulting, Inc., a hydrogeologic and well rehab specialty consulting firm.

PROJECT EXPERIENCE

Principal Hydrogeologist/Project Hydrogeologist, Rehabilitation of Water Treatment Plant No. 3 & 9 Surficial Aquifer Production Wells, Palm Beach County Water Utilities Department, Delray Beach and Boca Raton, Florida (2015-2016) Provided hydrogeologic consulting services during construction phases for rehabilitation program of WTP 3 and 9. Project included four (4) new replacement or re-drills of surficial aquifer production wells and electrical improvements. Replacement wells added 4 MGD capacity and are capable of at least 5.8 MGD firm capacity.

Principal Hydrogeologist/Project Hydrogeologist, FPL Turkey Point FLEX UFA Cooling Water Well, Homestead, Dade County, FL. (2015) Project design, construction and testing of one (1) new 2,000 gpm, 20-inch diameter FRP Upper Floridan aquifer well. The well was constructed within the Unit 3&4 Protected Area to provide beyond-design-basis-event cooling water.

Principal Hydrogeologist/Project Hydrogeologist, FPL Turkey Point Seawater Intake Wells for Supplemental CCS Supply, Homestead, Dade County, FL. (2015) Project design, construction and testing of two (2) new 12,000 gpm, 36-inch diameter Biscayne Aquifer seawater supply wells located on the Point. Combined with one smaller existing well, the project produced over 45 MGD of supplemental cooling water for the CCS during the 2015 summer months.

Principal Hydrogeologist/Project Hydrogeologist, FPL Turkey Point Units 3&4 Uprate Monitoring Plan Implementation, Homestead, Dade County, FL. (2010, 2015) Project included installing 16 cluster monitor wells in and around the Turkey Point Plant Cooling Canal System (CCS), including land based, wetland based, CCS

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based and Biscayne Bay based drilling systems. Project included collaboration/coordination with SFWMD, FDEP, Biscayne National Park, Miami-Dade, US Geological Survey and FPL. Geotechnical work included continuous coring, aquifer system flow zone mapping, sophisticated geophysical logging, and cluster well construction to depths of 200 feet.

Principal Hydrogeologist/Project Hydrogeologist, Dewatering Permit Services, Monitoring, Loxahatchee River Environmental Control District, Jupiter, Florida (2015). Provided professional hydrogeologic consulting services to prepare a SFWMD dewatering permit application for gravity sewer installation and provided monitoring oversight. Evaluated and addressed potential for adverse impacts on existing legal users of groundwater resource, natural surface water bodies, and movement of saline water.

Principal Hydrogeologist/Project Hydrogeologist, ASR Permitting, Testing Services, The City of West Palm Beach, West Palm Beach, Florida. (2009-2018, ongoing) Project scope of services included assisting the City in obtaining funding opportunities with cycle testing activities through various entities, assistance with obtaining FDEP Underground Injection Control (UIC) permit modification, UIC monitor well design, permitting, construction and bidding phase services, exploration of Limited Aquifer Exemption assistance through FDEP, ASR Cycle Testing assistance, and evaluation of the City's recovery discharge alternatives.

Principal Hydrogeologist/Project Hydrogeologist, Bio-solids Processing Facility Industrial Wastewater Force Main Construction Dewatering Permit, New England Fertilizer Company (NEFCO)/Solid Waste Authority (SWA), West Palm Beach, Florida. (2012) Project scope of services included preparation of a dewatering plan, including analytical modeling, to South Florida Water Management District for the construction of a new Industrial Wastewater Force Main for SWA Biosolids Processing Facility.

Principal Hydrogeologist/Project Hydrogeologist, Class V Reverse Osmosis Concentrate Injection Well Permitting and Design Services, La Gorce Country Club, Miami Beach, Florida. (2011-2012, ongoing) Project scope of services included all phases of injection well permitting and construction, including preparation of the FDEP injection well construction and testing permit (approved), well design and contractor bidding services, in addition to observation and testing during construction, mechanical integrity testing and well summary report preparation.

Principal Hydrogeologist/Project Hydrogeologist, Injection Well Mechanical Integrity Testing and Rerate Testing, Seacoast Utility Authority, Palm Beach Gardens, Florida. (2010) Included permitting and FDEP UIC rerating of a 24-inch, 3,320 feet deep domestic wastewater injection well and preparation of the MIT summary report. Mechanical integrity testing included an injection casing pressure test, high resolution temperature survey, video survey and radioactive tracer survey. JLA also performed rerating injection test of Injection well IW-1 including conducting a 24-hour injection test in order to permit the well at a higher rate. The successful test resulted in FDEP permitting the well at the higher rate of 10 fps.

ACADEMIC BACKGROUND

Bachelor of Science - Geology; Florida Atlantic University, 1985.

40 hour Hazardous Materials Health and Safety Training, Geraghty & Miller, 1989.

PROFESSIONAL REGISTRATION

State of Florida, Professional Geologist, No. 1103

McNabb Hydrogeologic Consulting, Inc.**Project Related Experience****McNabb Hydrogeologic Consulting, Inc. (2006-present)**

President/Hydrogeologist- Provide hydrogeologic consulting services with emphasis on deep injection well systems design, permitting, testing and construction oversight services.

Port St. Lucie Injection Well Systems – Provided regulatory compliance assistance for each of the City's deep injection well systems. Services provided included operating permit renewals and mechanical integrity testing of the City injection well systems. Additional services included plugging and abandonment of the Northport WWTP injection well system, acidization of the Glades WWTP injection well, and repair of the JEA WTP injection well.

Florida Power & Light Okeechobee Clean Energy Center Deep Injection Well System – Provided design, permitting, construction oversight and reporting services for the deep injection well system at the FPL Okeechobee Clean Energy Center. The system consists of two Class I deep injection wells constructed to a depth of 3,200 feet and a dual zone monitor well. The wells were completed with a 24-inch diameter final casing and 18-inch diameter FRP injection tubing.

Florida Power & Light Turkey Point Exploratory/Injection Well – Provided design, permitting and construction oversight services for a 3,230 foot deep exploratory well and dual-zone monitor well at the FPL Turkey Point site. The wells were constructed to Class I injection well standards with a 24-inch diameter final casing and 18-inch diameter FRP injection tubing. Provided permitting services for the conversion of the exploratory well to a Class I deep injection well. Assisted FPL in the preparation of injection well system (12 injection wells and 6 dual-zone monitor wells) preliminary construction schedule.

City of Lake Worth Class I Industrial Deep Injection Well System – Provided design, permitting and construction oversight services for a 3,300 foot deep injection well system for disposal of reverse-osmosis concentrate. The well is used for disposal of reverse-osmosis concentrate.

Okeechobee Utility Authority Deep Injection Well – Provided construction oversight services for construction of a 3,200-foot deep Class I deep injection well and associated 2,000 foot deep dual-zone monitor well at the Cemetery Road Wastewater Treatment Plant.

Fort Pierce Utilities Authority Water Treatment Facility Industrial Deep Injection Well IW-2 – Provided consulting services for design and permitting of Class I Industrial deep injection well IW-2 at the Authority's Water Treatment Facility.

Imperial Irrigation District Deep Injection Wells – Provided construction oversight services for construction of two 2,750-foot deep Class I deep injection wells at the El Centro Generation Center in El Centro, California.

Florida Power & Light West County Energy Center Deep Injection Well System – Provided design, permitting, construction oversight and expert witness services for the deep injection well system at the FPL West County Energy Center. The system consists of two Class I deep injection wells constructed to a depth of 3,400 feet and a dual zone monitor well. The wells were completed with a 20-inch diameter final casing and 16-inch diameter FRP injection tubing. Also provided mechanical integrity testing and injection well system permit renewal services.

City of West Palm Beach Dual-Zone Monitor Wells – Provided construction oversight services for construction of three 2,300-foot deep dual-zone monitor wells associated with the Class I deep injection well system at the East Central Water Reclamation Facility. The project included the plugging and abandonment of three monitoring tubes that are no longer in service.

Martin County Utilities North W/WWTF Dual-Zone Monitor Well – Provided design, permitting and construction oversight services for construction of one 2,229-foot deep dual-zone monitor well associated with the Class I deep injection well at the North Water/Wastewater Treatment Facility. The project included the plugging and abandonment of two monitoring tubes that are no longer in service.

City of West Palm Beach Injection Wells IW-1 through IW-7 – Provided mechanical integrity testing professional and operating permit services for seven deep injection wells at the East Central Water Reclamation Facility.

LBFH, Inc. (2003 – 2006) - Hydrogeology Manager

Hydrogeology manager focused primarily on deep injection well, Aquifer Storage and Recovery (ASR) well, and production well design, permitting and construction management projects. Duties included groundwater-related project business development and project management for deep injection well, shallow injection well, aquifer storage and recovery well, and production well projects.

Martin County Tropical Farms Class I Industrial Deep Injection Well System – Project manager for the design, permitting and construction oversight for two Class I Industrial deep injection wells used for disposal of reverse osmosis concentrate and treated wastewater.

City of Belle Glade - Provided mechanical integrity testing engineering services for the Belle Glade wastewater disposal deep injection well. Provided monitor well repair engineering services for the City's dual-zone monitor well. Repair included installation of an FRP liner after the lower monitor zone steel casing had developed holes due to corrosion.

Arcadis, Inc. (2002 – 2003) - Deep Injection Well Services Program Manager

Served as the firm's program manager for deep injection well design, permitting, and construction oversight projects. Duties included project business development for deep injection well projects. Additional responsibilities included technical quality control of Groundwater Program projects.

CH2M HILL, Inc. (1995 – 2002) - Project Manager and Hydrogeologist

Was responsible for managing projects involving siting, design, construction oversight, testing, and obtaining permits for deep injection wells and ASR wells. Work included siting and design of injection wells and ASR wells, preparation of Florida Department of Environmental Protection (FDEP) injection well permit applications and responses to requests for information, development and interpretation of deep injection well and ASR well construction and testing programs, preparation of construction contract documents and management of well construction contracts. Other responsibilities included providing resident observation services during well construction and testing, and preparation of well construction completion reports. Communication with clients and contractors was an integral part of the responsibilities.

City of Boynton Beach Injection Well Retrofit – Served as project manager for the design, permitting, services during construction and reporting for the modification of the City's injection well. The project included installation of a 12-inch diameter FRP liner inside an existing Class I injection well with a 16-inch diameter final steel casing.

City of Key West – Project manager of a \$4.8 million deep injection well facility. Responsibilities included design of the injection well facility, preparation of permit applications, management of field personnel, communications with the FDEP, and management of the budget for the project. The project was completed under budget and on schedule. Also prepared the FDEP-approved plugging and abandonment plan for a 2,000 foot deep exploratory well located approximately 1 mile from the injection well site.

Florida Department of Environmental Protection, Underground Injection Control (1992-1995) Professional Geologist

Responsibilities included the review and evaluation of Class I and Class V injection well and ASR well permit applications and proposed well construction and testing plans. Also responsible for reviewing well construction and testing engineering reports, weekly construction progress reports, monthly operating reports, and performing annual inspections of Class I injection well facilities. Interaction with consultants and key utility staff were instrumental in resolving regulatory issues.

Mobil Oil Corporation (1987-1992) Exploration Geologist

Was responsible for conducting large-scale regional geologic studies to assess the hydrocarbon potential of numerous Mesozoic rift basins. Also conducted short-term and long-term mapping projects for much of Southeast Asia and South America, using conventional and computer-aided design.

Education

1985, B.S. Geology, Indiana University

1991, M.S. Geology, University of Texas at Arlington

McNabb Hydrogeologic Consulting, Inc.

Project Related Experience**McNabb Hydrogeologic Consulting, Inc., Jupiter, Florida - (February 2008-present)**

Project Geologist/Project Manager- Provide hydrogeologic consulting services with emphasis on deep injection well design, permitting, construction resident observation, and mechanical integrity testing services.

Florida Power & Light Okeechobee Clean Energy Center Injection Well System – Provided construction oversight services for construction of 2 deep injection wells and 1 dual-zone monitor well. The injection wells were drilled to a depth of 3,200 feet and each have a capacity of 9.6 mgd.

Okeechobee Utility Authority Cemetery Road WWTP Class I Deep Injection Well System – Provided construction oversight services for construction of a 3,200-foot Class I deep injection well and associated dual-zone monitor well at the Cemetery Road Wastewater Treatment Plant.

City of Lake Worth Class I Industrial Deep Injection Well System – Provided construction oversight services for construction of a 3,300-foot Class I deep injection well and associated dual-zone monitor well at the Lake Worth Reverse-Osmosis Water Treatment Plant.

Florida Power & Light Turkey Point Injection Well System – Provided construction oversight services for construction of a 3,200-foot deep injection well and associated dual-zone monitor well. The injection well has a permitted disposal capacity of 15.59 mgd.

Martin County Utilities North W/WWTP Dual-Zone Monitor Well – Provided construction oversight services for construction of one 2,300-foot deep dual-zone monitor well associated with the Class I deep injection well system at the County's North Water and Wastewater Treatment Plant. The project also included the oversight of the plugging and abandonment of the original dual-zone monitor well.

Port St. Lucie Injection Well Systems – Provided regulatory compliance assistance for each of the City's deep injection well systems. Services provided included preparing operating permit renewals and mechanical integrity testing field services for the City injection well systems.

Florida Power & Light West County Energy Center Injection Well System – Provided construction oversight services for the conversion of exploratory well EW-2 to Class I deep injection well IW-1. The conversion included installation of a 16-inch diameter FRP injection liner installed to a depth of 2,769 feet, installation of an annular pressure system, mechanical integrity testing of the converted well and performance of two short-term injection tests up to a rate of 8.5 mgd. This was followed by construction of IW-2. IW-2 was constructed to a total depth of 3,250 feet, a 20-inch diameter final casing and 16-inch diameter FRP injection liner.

City of West Palm Beach East Central Regional WRF Dual-Zone Monitor Wells – Provided construction oversight services for construction of three 2,300-foot deep dual-zone monitor wells associated with the Class I deep injection well system at the East Central Water Reclamation Facility. The project included the plugging and abandonment of three monitoring tubes that were no longer in service.

Palm Beach County Water Utilities Western Region WWTP Deep Injection Well Rehabilitation – Provided resident observation and consulting services for well rehabilitation of a Class I deep well at the County's Western Region WWTP. The project included chlorinating, acidization and development of the injection well and injectivity testing.

Martin County Utilities North W/WWTP Dual-Zone Monitor Well – Provided construction oversight services for construction of one 2,300-foot deep dual-zone monitor well associated with the Class I deep injection well system at the County's North Water and Wastewater Treatment Plant. The project also included the oversight of the plugging and abandonment of the original dual-zone monitor well.

City of Port St. Lucie Northport WWTP Deep Injection Well MIT – Provided field services for mechanical integrity testing of a Class I deep injection well at the City's Northport Wastewater Treatment Plant.

City of West Palm Beach East Central Regional WRF IW-7 MIT – Provided field services for mechanical integrity testing of a Class I deep injection well.

McNabb Hydrogeologic Consulting, Inc.

City of Key West Richard A. Heyman Environmental Protection Facility MITs – Provided field services for mechanical integrity testing of two Class I municipal deep injection wells and the City's Environmental Protection Facility.

Charlotte County East Port WRF Deep Injection Well MIT – Provided field services for mechanical integrity testing of a Class I municipal deep injection well at the County's East Port Water Reclamation Facility.

Bonita Springs Utilities Water Treatment Facility – Provided resident observation and consulting services for mechanical integrity testing at the Bonita Springs Utilities Reverse Osmosis Water Treatment Facility Class I deep injection well.

Bonita Springs Utilities Wastewater Reclamation Facility – Provided resident observation and consulting services for mechanical integrity testing at the Bonita Springs Utilities Wastewater Reclamation Facility Class I deep injection well.

ARCADIS, Inc. (1999 – 2008) - Hydrogeologist

Staff hydrogeologist focused primarily on deep injection well and Floridan production well design, permitting and construction management. Responsibilities included design of deep injection and water supply wells, preparation of Florida Department of Environmental Protection (FDEP) injection well and Water Management District production well permit applications, responses to requests for information, development and interpretation of deep injection well and production well construction and testing programs, preparation of construction contract documents and management of well construction contracts. Other responsibilities included providing resident observation services during well construction and testing, and preparation of well construction completion reports.

City of Port St. Lucie James E. Anderson Class I Industrial Deep Injection Well System – Provided construction oversight services for construction of a Class I Industrial deep injection well system for disposal of reverse osmosis concentrate at the City's James E. Anderson Reverse Osmosis Water Treatment Plant. Also provided resident observation and consulting services for mechanical integrity testing and operating permit renewal.

City of Port St. Lucie Westport Class I Industrial Deep Injection Well System – Provided construction oversight services for construction of a tubing and packer design deep injection well system for disposal of wastewater and reverse osmosis concentrate at City's Westport Wastewater Treatment Plant. Also provided consulting services for mechanical integrity testing and operating permit renewal for the deep injection well system.

City of Port St. Lucie Westport Deep Injection Well IW-2 – Provided design and permitting services for a second deep injection well to be constructed at the City's Westport Wastewater Treatment Facility for the disposal of wastewater.

City of Port St. Lucie South Regional (Glades) Deep Injection Well System – Provided design and permitting services for a deep injection well system for disposal of wastewater for the City's South Regional Wastewater Treatment Facility.

Village of Wellington Class I Industrial Deep Injection Well System – Provided construction oversight services during the construction of an injection well system for disposal of reverse osmosis concentrate at the Village of Wellington Reverse Osmosis Water Treatment Facility. Responsibilities included communication with the contractor and regulatory agencies, interpretation of test data, and preparation of the engineering report summarizing the construction of testing of the wells.

Key Largo Wastewater Treatment District Deep Injection Well System – Provided design and permitting services for a deep injection well system for disposal of wastewater for a new wastewater facility in Key Largo, Florida.

Florida Governmental Utility Authority Deep Injection Well System – Provided design and permitting services for a deep injection well system for the Golden Gate Wastewater Treatment Facility for disposal of wastewater.

Florida Governmental Utility Authority Floridan Aquifer Supply Wells – Provided design and technical specifications for the construction and testing of multiple Floridan Aquifer wells for the Florida Governmental Utility Authority water treatment facilities located in Collier, Polk, and Osceola Counties, Florida.

Education

1999, B.S. Geology, University of Tennessee at Knoxville



Michael A. Carzo, CCM

Michael Carzo is a program / construction manager with over 33 years of experience in water, wastewater, and public and private sector utility projects. He has contributed to multi-million dollar construction projects throughout the United States, making decisions that impact resource requirements; scope, schedule, and sequence of project activities; client and team satisfaction; risk profile; quality; health, safety, and environmental factors; and financial performance. Mr. Carzo's direct responsibilities include directing and supervising construction field activities and staff, office engineering, inspection, materials testing, and field contract administration. He routinely serves as a liaison between consultants, design professionals, operations personnel, and regulatory agencies. Mr. Carzo also oversees progress meetings, construction scheduling, constructability plan review, contractor claims review and processing, change order review and processing, project close-out, and coordinates guaranty and warranty items.

Education

Professional Certificate -
Project Management
University of Phoenix,
Arizona, 2010

Licenses

Certified Construction
Manager, Arizona
Water Distribution
System Operator, Grade
2, Arizona

Certification

Certificate, 30 Hour
Construction, OSHA,
Arizona, 5/14/17
Certificate, CCM,
Construction
Management Association
of America,
Certificate, Chlorination,
Wallace and Tiernan,
New Jersey
Certificate, OSHA 29 CFR
1926, OSHA,
Certificate, Red Cross
First Aid and CPR, Red
Cross
Training, OSHA Trips,
Spills, and Falls, OSHA
Training, Confined Space
Training,

Relevant Experience

→ Resident project representative for the City of Chandler, Arizona - Ocotillo Water Reclamation Facility. Mr. Carzo provided construction administration and resident engineering inspection services of wet process and solid stream facilities for this \$120 million project. His duties included resident engineering inspections; conducting construction meetings with the Contractor and Owner; reviewing and approving equipment shop drawings and operations and maintenance (O&M) manuals; answering requests for information (RFIs); processing and approving Contractor monthly payment applications and change order proposals; as well as general construction site management and daily coordination with the Contractor and City's Project Manager.

→ Construction manager for the Ak-Chin Indian Community, Arizona - \$47 million, 2.0-mgd Regional Water Reclamation Facility. The project involved maintaining client contact and identifying and tracking stakeholder budget issues. Other work efforts included engineering project management duties such as conducting contract negotiations, project planning and set-up, sub-consultant management, schedule management, planning for and executing appropriate QA/QC, tracking costs versus budget, identifying and resolving potential scope and budget issues, and client management. Work components included Influent Pump Station, Fine Screens, Biological Treatment Basin, GE Zenon Membrane bioreactor, Feed Forward

and dewatering pumps, Ultraviolet disinfection facility, Vadose zone recharge wells; as well as close out and start up services.

→ Construction manager / resident inspector for the City of Surprise, Arizona - SPA-2, 2.0-mgd Membrane Water Reclamation Facility. This project included construction administration and resident engineering inspection services for a new 2.0-mgd water reclamation facility, designed to produce Class A+ reclaimed water. Design elements included a common wall construction and a membrane bioreactor to eliminate the need for conventional sedimentation, filtration, and disinfection facilities, thus minimizing excavation, concrete, and electrical construction costs. The facility was constructed using the Construction Manager-at-Risk project delivery method.

→ Construction manager for the City of Surprise, Arizona - \$100 million 8.0-mgd Water Reclamation Facility Expansion. This project involved construction administration and resident engineering inspection services of wet process and solid stream facilities. Duties included resident engineering inspections, conducting construction meetings with Contractor and Owner, reviewing and approving equipment shop drawings and O&M manuals, answering RFIs, processing and approving Contractor monthly payment applications and change order proposals, general construction site management, and daily coordination with the Contractor and City's Project Manager. The design used the master-planned

Michael A. Carzo, CCM

modular WRF process, and included influent pump stations, inclined screens, grit chambers, biological nutrient removal using the Kruger bio-denitro oxidation ditch system, secondary clarifiers, disk filter effluent filtration system, solids thickening and dewatering centrifuges, and an aerobic sludge digester treatment system.

→ Construction inspector for the City of Riverside, California - Regional Water Quality Control Plant Expansion. Project involved a \$200 million expansion and retrofit of a wastewater treatment plant, which was the largest membrane bioreactor (MBR) retrofit in the United States. Innovations included energy efficient, linear motion digester mixers; enhanced Fats, Oil, and Grease (FOG) station for grease to gas energy production; and OpenCEL waste activated sludge (WAS) disintegration system expansion. Other project elements included construction of four new circular clarifiers, primary effluent equalization basin, primary equalization pump station, primary sludge pump station, fine screen facility, an additional aeration basin, scour air blower building, odor control biofilters, expansion of an existing chlorine contact basin, waste WAS disintegration process facility, sludge blending tanks, two new anaerobic digesters, fog receiving and processing station, digester gas storage facility, bulk chemical feed and facility, primary electrical control building, stormwater retention ponds, standby generators, and operation and maintenance office improvements.

→ Program construction manager for the Seminole County, Florida - Potable Water Interconnect Phase II. The project involved various interconnect use - tie-ins with surrounding towns and cities with the Seminole County potable water systems.

→ Construction manager for the Seminole County, Florida - \$2.2 million Residential Reclaimed Retrofit Phase III Project. The project involved construction of 4-10 inch diameter reclaimed water distribution mains, individual reclaimed water services / meters, and related appurtenances.

→ Construction manager for the Seminole County, Florida - \$1.3 million Country Club Row and Finish Water Mains Project. Project included installing over two miles of 24 inch HDPE raw water main and 20 inch HDPE of finished water main from the Country Club Water Treatment Plant to the well tie-in of the existing main.

→ Construction manager for the Seminole County, Florida - Woodcrest 5 Force Main Pump Station. The project involved a new duplex pump station including transmission and discharge mains, wet well, pumps, control panel, piping and valves, new generator, and two automatic transfer switches; County highway transportation paving, signal, stripping, and storm sewer replacement.

→ Construction manager and senior inspector for the Seminole County, Florida - \$70 million Southeast Regional Water Treatment Plant and Markham Water Treatment Plant Upgrade Projects. Project involved demolishing selected structures; and constructing a new electrical building, ozone treatment system, transfer pump system, Granular Activated Carbon system, sodium hypochlorite disinfection system, Ion Exchange, ground storage tank modifications, High Service Pump modifications, electrical system, and instrumentation and control system.

→ Program construction manager for the Seminole County, Florida - \$10 million Indian Hills Chlorination Upgrade. The project involved upgrade and replacement of sodium hypochlorite tanks and electric building facilities.

→ Program construction manager for the Seminole County, Florida - \$3.7 million State Road-46 Force Main and Reclaimed Water Line. The project involved installation of over 14,000 feet of 24 inch PVC force main and 30 inch ductile iron reclaimed water line. The installation consisted over several large Jack and Bore's and Horizontal Directional Drills on FDOT highway. FDOT inspection regulated project that included paving.



Terry Storck

Terry Storck joined Carollo in 2013. His background focuses on the planning, scheduling, inspections, and coordination of complex projects. He possesses technical knowledge and background in the mechanical, electrical, SCADA, computing and electronic communications areas. Representative experience includes:

Education

United States Air Force, 1978-1984, Lowery Air Force Technical School, Denver, CO - 1978

Certification

Certified, Earthwork Construction Inspection - Level 1, FDOT

Certified, Final Estimates - Level 1, FDOT

Certified, Asphalt Paving Technician - Level 1, FDOT

Certified, Critical Structures Construction Issues, FDOT

Certified, Critical Structures Construction Issues - Supplement, FDOT, January 2012

Certified, Nuclear Gauge Safety

Certified, HAZMAT, USDOT

Certified, OSHA Electrical Regulations

Certified, Electrical Safety Part 1

Certified, Electrical Safety Part 2

Certified, NEC - Electrical Grounding

LEED Accredited Professional, Green Building Certification Institute, 2006

Inspection

→ Construction representative responsible for construction observation on Pump Station Inspection WO #4600000794-WO 3 for the South Florida Water Management District in Loxahatchee, Florida. Project elements included hurricane hardening and service bridge replacement at Pump Station S-5A.

→ Senior project representative and senior inspector for the South Florida Water Management District Reservoir, Pump Station and Inflow Structure. The L8 project consists of the design build of infrastructure that would allow for full functionality of a 46,000 acre-man-made reservoir in Palm Beach County, Florida. This reservoir will provide storage for water that will be released in a controlled manner into the regional canals system (shared by several Counties), for restoration under the Comprehensive Everglades Restoration Plan, and for water quality buffering in Southeast Florida's Stormwater Treatment Areas (STAs) – a vast amount of wetlands that maintain the environmental equilibrium of the region. The infrastructure that will make this possible consists of a 450 cfs (291 mgd) pump station, a 3,000 cfs (1,940 mgd) inflow structure, and geotechnical modifications of the levees that surround the reservoir. Responsibilities include overseeing civil, mechanical, electrical and controls inspections in accordance with approved submittals, plans and specifications. In addition, he performs the on-site quality verification process of new construction.

Previous Experience - Inspection

→ CEI Project engineer/senior inspector for the South West Florida Water Management District Lake Hancock Drainage Control Structure/Station. Responsibilities included overseeing inspections on a major CIP concrete and steel sheet piling drainage

structure controlling all water from Lake Hancock. Mr. Storck oversaw inspections of CIP concrete, duct banks, electrical, mechanical, shop drawings, contractors' pay requests, communications equipment, submittal review, and conformance with plans and specifications. Performed the on-site QA process of electrical/mechanical equipment layouts, and monitored and reported any field changes, inspection observations, and deficiencies.

→ Lead electrical inspector for the South Florida Water Management District Everglades Compartment B project. Responsible for overseeing inspections of multiple pump stations in the Florida Everglades Restoration Projects. Duties included overseeing inspections of electrical installations in accordance with approved submittals, plans, and specifications. He performed the on-site quality assurance process of electrical/mechanical equipment layouts, and monitored and reported field changes, inspection observations, and deficiencies on each project. He was assigned to the following projects with SFWMD: Pump Stations G-434, G436, G-435, STA's - North Build Out (NBO), and South Build Out (SBO).

Previous Experience - Construction Management

→ Construction project manager and senior inspector for Sarasota County, Florida, for Lemon Bay/Roberts Bay Sediment and Erosion projects. On the stabilization project, Mr. Storck performed on-site quality assurance, including civil earthwork, concrete, electrical/mechanical equipment layouts, and monitored and reported progress. He also performed site inspections, observations, and deficiencies of project.

→ Project manager of construction for dbRight LLC – Design Builders, Miami,

Terry Storck

Florida. Responsible for the establishment and implementation of new construction schedules, provided key communication to the field, contracted engineers and subcontractors. In addition, he performed on-site inspections and observations of construction activities, in order to comply with plans and specifications as well as project schedules. Mr. Storck maintained a web-based project management reporting system and scheduling system for clients (Project Mates). He managed the reviews of contractor drafts, agreements, and pay applications.

→ Senior project manager of the Office Depot Construction Department, Boca Raton, Florida. Prepared the planning and scheduling of new store construction and commissioning for the regional development teams. He was responsible for ensuring on-time delivery for store openings and daily coordination with engineers, architects, and contractors. He successfully achieved the opening of 68 stores in the western U.S. in a 1-1/2 year period. In addition to performing on-site observation of construction inspections, tracking compliance to project plans and specifications, he established and maintained schedules, and provided key communication from the field. Other management duties included the reviews of contractor drafts and agreements and scheduling building engineering studies with utilities engineering, mechanical, and fire protection consultants.



Erica D. Stone, Ph.D., P.E.

Dr. Erica Stone joined the Carollo team in March 2009. Dr. Stone possesses a Ph.D. in environmental engineering and brings several years of experience with her in the areas of water quality, water treatment, environmental studies, sampling, research, and data analysis.

Education

PhD Environmental Engineering, University of Central Florida, Orlando, 2008

BS Environmental Engineering, University of Central Florida, Orlando, 2006

Licenses

Professional Engineer,
Florida

Professional Affiliations

Florida Section American Water Works Association

Florida Water Environment Federation

Relevant Experience

→ Project manager for Toho Water Authority, Florida, Parkway WTP Disinfection Byproduct Mitigation project. Project included testing, evaluation, preliminary, and final design for DBP precursor mitigation to help reduce the DBP levels in the distribution system below Stage 2 limits. Strategies evaluated include operational modifications, ion exchange, and granular activated carbon.

→ Project manager for the JEA, Florida, Desktop Evaluation for DBP Control Strategies. Performed a desktop evaluation of alternatives to reduce water age, control THM formation kinetics, and oxidize or remove precursors to identify solutions for DBP violations observed in a remote area of the distribution system.

→ Project engineer for the City of Tampa, Florida David L. Tippin Water Treatment Facility Water Master Plan. The project involved all aspects of the plant from the raw water intake through finished water storage and pumping. This master plan includes a benchmarking effort to compare operations and performance of the plant to utilities with similarly sized plants with similar complexity, process systems, and raw water quality.

→ Project engineer for the City of Daytona Beach, Florida, Brenan WTP Disinfectant Mixing Study. Carollo reviewed the location of disinfection injection and developed recommendations related to dosing and mixing of both chemicals to maintain a sufficient chlorine to ammonia ratio.

→ Project engineer for the Polk County, Florida, Cherry Hill WPF Design. The project involves a new water production facility design with sodium hypochlorite disinfection.

→ Assistant project manager for the Polk County Utilities, Florida, Dinner Lake South Storage and Booster Station Preliminary and Final Design, permitting, bidding, and construction services. This project involves

design of a new 1-million gallon ground storage tank, new high service distribution pump system with supplemental sodium hypochlorite system for disinfection and an electrical building to support the Central Regional Utility Service Area.

→ Project engineer for the Polk County, Florida, Gibson Oaks Water Production Facility Study, Design, and EDSC. The Gibson Oaks WPF will be a 5.9 MGD (MDD) regional facility in the eastern portion of the NWRUSA and will replace the existing Lake Gibson, Timberidge, and Sherwood Lakes WPFs. The project will increase water system reliability/redundancy by providing a second potable water distribution system loop in the eastern portion of the service area. Additionally, the Project is intended to provide additional WPF capacity needed to serve existing and future development in the area.

→ Project engineer for the Manatee County, Florida, Lake Manatee WTP Filter Upgrade. Project includes retrofitting existing granular media filters with ultrafiltration membranes with work including membrane supplier pre-qualification and procurement, proof pilot testing, detailed design, and construction.

→ Project engineer for the Manatee County, Florida, Lake Manatee WTP UF Filter Hydraulic Selection project. Project included evaluation of various structural, hydraulic, and cost alternatives to help the County select either a pressurized or submerged ultrafiltration membrane configuration for their upcoming retrofit project.

→ Project engineer for the Manatee County, Florida, Water Distribution System Master Plan and Hydraulic Model Peer Review. Project included review of the County's distribution system master plan and hydraulic model and recommendations for improvements.

Erica D. Stone, Ph.D., P.E.

- Project engineer for the Manatee County, Florida, Lake Manatee WTP Filter Upgrade Project Delivery. Project included analysis of alternative project delivery alternatives for the upcoming ultrafiltration membrane retrofit project.
 - Project engineer for preparing the Manatee County, Florida, Water Supply Facilities Work Plan Update. The Plan described how the County intends to address projects outlined in the Southwest Florida Water Management District's Regional Water Supply Plan. The plan described the water system including service area, facility descriptions, water demand projections, water supplies, and identification of water supply surpluses or deficiencies through the 2035 planning period. The Plan also includes information on the County's reuse system.
 - Project engineer for the update to the Manatee County, Florida, Capacity Analysis Report for the water system and water treatment plant. The report was updated to meet the requirements of FAC 62-555.348 and summarized the County's raw water supplies, treatment facility capacities, and finished water storage per FAC requirements. The report outlined the County's future plans for water supply, treatment, and storage, and compares the County's projected water demands with the maximum day plant capacity.
 - Project engineer for Royalty Resorts of Florida to complete the Emergency Preparedness and Response Plan for the water system at Sun-N-Fun Resort in Sarasota, Florida. This plan is a requirement of the Florida Department of Environmental Protection, as described in Florida Administrative Code (FAC) Rule 62-555.350(15).
 - Project engineer for a capacity study for the City of Springfield, Missouri. The project included calculating demand projections for future water plant expansion project planning.
 - Project engineer for bench-scale testing an ion exchange column for the City of Sunrise, Florida. The project included evaluation of alternatives for reducing organics and disinfection byproducts in chlorinated water.
 - Project engineer for corrosion inhibitor water quality testing for Indian River County, Florida. The project included testing water quality at the plant to determine the cause of precipitation problem with corrosion inhibitor addition.
 - Project engineer for pre-proposal jar testing with MIEX® and coagulation and bench-scale test for ion exchange for the City of Cocoa, Florida. The proposal was for upgrades to the existing facility to reduce organics and disinfection byproducts.
 - Project engineer for four-log virus treatment demonstration for Orange County, Florida. Dr. Stone documented four-log treatment for each of the 10 water supply facilities for Orange County Utilities for submission to FDEP for the Ground Water Rule.
 - Project engineer for filing grant applications with water management district for Orange County, Florida. Dr. Stone filed grant applications to the St. Johns River Water Management District for funding for water conservation programs for Orange County Utilities. Programs included an automatic meter reading pilot study and integrating their system for tracking and notifying customers with high water usage.
- Project engineer for Sarasota County, Florida, Siesta Key Water System Evaluation. Carollo provided professional engineering services to perform a phased project to evaluate the water distribution system on Siesta Key and provided recommendations for improvements. Responsibilities included: Developed and calibrated a hydraulic model using GIS database of pipelines and hydrants; developed and analyzed various demand, fire flow, and water age scenarios in the hydraulic model; and analyzed the criticality of interconnects, pump stations, and major pipelines. Dr. Stone also made recommendations for field verifications and critical projects and developed a standard protocol for hydraulic modeling of the County's water system



Jess C. Brown, Ph.D., P.E.

Dr. Jess Brown is Director of Carollo's Research and Development Practice and leads Carollo's biological drinking water treatment initiative. He has 19 years of experience in water, wastewater, and reclaimed water treatment specializing in drinking water process, applied research, and water quality testing methods. His work covers conventional through advanced treatment and has resulted in over 125 national and international presentations, 18 peer-reviewed publications, and 2 American Water Works Association (AWWA) best paper awards.

Education

PhD Environmental Engineering, University of Illinois, Urbana, 2002

MS Environmental Engineering, University of Illinois, Urbana, 1999

BS Civil Engineering, University of Illinois, Urbana, 1998

BA Environmental Science and Public Policy, Harvard University, 1995

Licenses

Professional Engineer, Florida

Professional Affiliations

American Water Works Association

- Biological Drinking Water Treatment Committee Chair, 2011-2014
- Biological Drinking Water Treatment Symposium Founding Chair, 2013
- Biological Drinking Water Treatment Symposium Chair, 2016
- Water Science & Research Division Trustee, 2010
- Inorganic Contaminants Research Committee Chair, 2006-2009

International Water Association

- Biofilms in Drinking Water Systems Conference, Scientific Committee

Relevant Experience

→ Technical advisor for a potable reuse demonstration pilot for the City of Altamonte Springs, Florida. Technical lead for the ozone/biofiltration portion of the demonstration.

→ Technical advisor for a Salt Lake City Department of Public Utilities, Utah, Wellhead PCE Treatment project. The project included a desktop process selection evaluation, and preliminary design, final design, and construction services for the selected PCE treatment process train. Process selection included an analysis of biological filtration, granular activated carbon adsorption, air stripping, and UV/H₂O₂ technologies with respect to the following criteria: multiple contaminant applicability, process robustness, cost, operability, environmental impact, constructability, and flexibility.

→ Project manager for a Sarasota County, Florida, project that developed new surface and groundwater sources. The project included an evaluation of historical raw water quality, a reservoir blending analysis, a desktop process selection exercise, bench-testing for process screening, a six-month pilot study to develop design and operating criteria for new water treatment facilities, a regional water impact assessment, and development of cost estimates.

→ Project engineer for a 5-mgd EDR and 3.8-mgd BIOBROx® design and construction project at the Magna Water District (Magna, Utah). The BIOBROx® facility will destroy perchlorate and nitrate within an EDR concentrate stream. The effluent from the BIOBROx® process may be used directly for secondary investigation.

→ Project manager for a three-year study designed to understand and control household copper pitting in Sarasota County. The work has involved numerous corrosion control studies, pitting trend analysis, and a public relations campaign.

→ Lead engineer for a white paper study designed to evaluate the design, operation, performance, cost, and footprint implications of installing a fixed-bed biological wellhead treatment for the Los Angeles Department of Water and Power to remove nitrate and perchlorate from groundwater.

→ Project engineer for a Water Research Foundation Project 2639, "Public Perception of Tap Water Chlorinous Flavor." The project defined customer attitudes and perceptions about chlorinous taste and odors in an effort to help utilities address this issue. The project included working with a marketing research firm to develop and execute a market survey to analyze customer perceptions of water quality and health risk in target markets across the United States, assessing public sensitivity to chlorine and chloramine residuals in different water utility markets, correlating these results to physical and literature data and developing short- and long-term recommendations for water utility managers to improve customer satisfaction.

→ Project engineer for Water Research Foundation Project 2638, "Customer Attitudes and Perceptions of Point-of-Use Applications and Bottled Water." The report was one of Water Research Foundation's top ten best sellers for 2003. The project identified the reasons underlying individuals' decisions to use alternatives to tap water. Twelve utility markets located throughout the U.S. were surveyed to identify factors that trigger consumer purchasing choices. The work included performing a water

Jess C. Brown, Ph.D., P.E.

Professional Affiliations

Water Environment
Federation

- Biofilm Reactor

Technology Conference
Technical Committee

Awards

Golden Spigot Award,
American Water Works
Association, Water
Quality & Technology
Division, 2016

Young Alumnus Award,
University of Illinois Civil
and Environmental
Engineering Alumni
Association, 2009

Water Science and
Research Division Best
Paper Award, American
Water Works Association,
2003, Abiotic & Biotic
Perchlorate Removal

Research Division Best
Poster Award, American
Water Works Association,
1999, Biological
Perchlorate Removal

Water Quality &
Technology Division Best
Paper Award, American
Water Works Association,
2013, Engineered
Biofiltration: Enhanced
Biofilm Performance
Through Nutrient and
Peroxide Addition

quality data review, surveying utility management, working with a marketing research firm to develop and execute a customer questionnaire, and to develop a set of short- and long-term recommendations for water utilities to improve customer service and communications.

→ Lead investigator on a study designed to evaluate the use of granular activated carbon filtration for the removal of perchlorate and nitrate from drinking water. As an extension of this research, he developed and constructed metal-catalyzed activated carbon filters to enhance removal kinetics.

→ Project engineer for a one-year pilot-study designed to evaluate treatment, construction, and cost of integrating an ultrafiltration membrane system into the water treatment plant at the Kansas City Missouri Water Services Department. Responsible for the construction and overall operation of the membrane pilot plant, coordination of extensive water quality monitoring, analysis of water quality and system performance data, development of full-scale cost estimates, and preparation of integration recommendations for the final report.

→ Project manager for a Bureau of Reclamation study evaluating the removal of boron by reverse osmosis membranes. The first phase of the study surveyed and documented boron rejection by full-scale RO drinking water treatment plants. The second phase of the study involved bench-scale RO testing and modeling to clarify the relationship between percent boron rejection and other membrane parameters such as water permeation, pH, and salt rejection efficiency.

→ Co-principal investigator for a Water Research Foundation/Dallas Water Utilities/Tampa Bay Water Tailored Collaboration on Optimizing Engineered Biofiltration (WRF 4346). The project will involve 14-month parallel pilot studies at DWU and Tampa Bay Water designed to further investigate and refine operational

modifications for ozone/biofiltration processes that will yield improved hydraulic and water treatment performance. The primary goal of this work was to establish the groundwork for moving biofiltration from a passive process designed and operated around conventional filtration objectives to an intentionally operated biological system, i.e., Engineered Biofiltration. Engineered Biofiltration targets multiple water quality objectives while maintaining or even improving hydraulic performance.

→ Principal investigator for Water Research Foundation Project 4496: Converting Conventional Filters to Biofilters. The overall objective of the project was to develop a Biofiltration Conversion Assessment Tool & Guidance Manual to support water treatment utilities considering a conversion to biofiltration. Through a literature review, survey, and case studies of utilities that have previously converted or are going through the conversion process, this work generated, cataloged, and summarized potential challenges and identified best practices for addressing the issues associated with biofilter conversion. Recommendations were made on decision-making for a conversion; the process parameters to be changed and monitored before and after a conversion, and metrics of a successful conversion.

→ Project manager for a Southwest Florida Water Management District project designed to evaluate the mechanisms of subsurface arsenic mobilization in the Southwest Florida hydrogeologic setting. ASR injection pretreatment strategies will be developed to help minimize subsurface arsenic mobilization.

→ Technical advisor for a South Florida Water Management District project investigating the use of two technologies for treating canal water prior to ASR well injection. The two technologies being tested include a UV/slurry and pelletized TiO₂ system and a pasteurization process.

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Joel D. Smason, P.E., S.E.

Joel Smason has 40 years of experience as a structural design engineer for water and wastewater treatment plants and nuclear power plant design. As a senior structural design engineer, Mr. Smason's responsibilities include preparation of preliminary structural designs, client assistance, supervision of personnel, preparation of budgets and estimates, and the development of detailed drawings and specifications. He also has experience with alternative project delivery methods including design-build and construction manager at risk (CMAR).

Education

MS Structural Engineering, University of Illinois, Urbana-Champaign, 1976

BS Structural Engineering, University of Illinois, Urbana-Champaign, 1975

Licenses

Structural Engineer, Arizona, Illinois, New Mexico

Civil Engineer, Nevada

Professional Engineer, South Carolina, Missouri, North Carolina, Texas, Illinois, Florida

Certification

Certificate, Confined Space Entry Training

Professional Affiliations

American Society of Civil Engineers

AZ Water Association

Structural Engineering Association of Illinois

Relevant Experience

→ Structural engineer for the Sarasota County, Florida Venice Gardens Water Treatment Facility Upgrades. Provided preliminary and final design for the expansion of five existing membrane trains including conversion from single stage to two stage arrays and the utilization of a hybrid membrane array for flux balancing. New post treatment facilities included a degasifier and rehabilitated chemical scrubbers for hydrogen sulfide removal; a carbon dioxide solution feed system for pre-degasifier pH adjustment and alkalinity recovery; a concentrate pump station for offsite concentrate disposal; new and upgraded caustic soda, aqua ammonia, sodium hypochlorite, and corrosion inhibitor systems; and an updated control system.

→ Structural engineer for the South Florida Water Management District Field Station Roof Replacement. Participating in structural design to replace roofs of four buildings in the West Palm Beach Field Station that were deemed necessary to be replaced. Design features include removing and reinstalling roof gutters; disposing of and replacing existing roof blanket installation, metal standing seam roof panels, eve struts, purlins and stiffeners, exhaust discharge stacks, and hanging ceiling lights; sandblasting and repainting, and designing cable ladder climbing systems.

→ Structural engineer for the Collier County Northeast Water Treatment Plant/Water Reclamation Facility Design, Florida. This project involved facility planning, new co-located water and wastewater facilities, brackish groundwater RO treatment, public access reuse quality, state-of-the-art I&C to maximize reliability, design of a 10-

mgd brackish RO water treatment plant, energy recovery devices, and increased efficiency by providing newer technology on control systems.

→ Structural engineer for the City of Northport, Florida Water Treatment Plant Enhancement Study. The purpose of this study was to evaluate treatment enhancements to increase the reliable production and quality of water from the water treatment plant. This would also augment the City's ability to supplement the regional water system. The potential enhancements to the water treatment plant were investigated in terms of improvements to the existing conventional treatment facilities, as well as addition of new treatment facility component for reduction of total dissolved solids (TDS).

→ Structural engineer for the Tampa Bay Water Lithia Hydrogen Sulfide Removal Facility Utilizing Ozone Treatment – Predesign, Procurement, and Construction Support Services.

→ Structural engineer and Lead Field Evaluator for the City of Tempe, Arizona - Johnny G. Martinez Water Treatment Plant (JGMWTP) and South Tempe Water Treatment Plant (STWTP) Filter Rehabilitation project. An initial Filter Master Plan was also developed to aid the City with planning future filter upgrades that could improve performance and potentially reduce long-term operating costs. The goal for the JGMWTP was to extend the eight filters' operating life an additional 10-15 years by replacing the existing degraded filter media, and rehabilitating specific filter components. The goal for the STWTP was to perform maintenance activities on the filters to maintain good performance. After the study phase, the evaluations resulted in physical

Joel D. Smason, P.E., S.E.

improvements to the filter controls and operations.

→ Structural engineer for the Filter Improvements Project for the City of Temple, Texas. Evaluated the filtration process and equipment at the City's 30 mgd Conventional Water Treatment Plant, including the filter operation and performance and provided the City with alternatives to increase filter runtimes and improve backwash efficiency. Project included rehabilitation of the existing filters.

→ Structural engineer for North Texas Municipal Water District Wylie WTP Plant II Filter Evaluation and Rehabilitation. This project included a comprehensive filter evaluation for all 40 filters at Plant II for the Wylie Water Treatment Plant. The filters were physically examined and repairs were made to leaking walls and pipes. The filter media was replaced and the backwash troughs raised.

→ Structural engineer for the Ak-Chin Indian Community Surface Water Treatment Plant Design, Maricopa, Arizona. Project involved design of a new 2.25-mgd surface water treatment plant. The treatment plant was based on Zenon 500D membrane technology and was equipped with the necessary facilities to provide treated water capable of meeting all primary potable water quality standards (as defined by EPA) under historical raw water quality conditions. Other design elements included a new raw water pump station, a new raw water line from the existing pipeline to the proposed surface water treatment plant site, a new finished water pipeline to connect the new treatment facility to the existing system distribution infrastructure, a wastewater pipeline to convey plant wastes and drain water to the existing sewer system, and redesign of the proposed DYK finished water storage tank and canned pump station to a traditional buried concrete reservoir.

→ Structural engineer for the Val Vista WTP Mesa Flow Split Design project, City of Phoenix, Arizona. Providing an evaluation of design concept alternatives and final design

for a new flow-splitting feature that will divert flows from the City of Mesa's portion of the plant production to a contact-time reservoir (Reservoir No. 1) upstream of the granular activated carbon (GAC) system. Work includes new reservoir baffling, new inlet/outlet connections for Reservoir No. 1, new outlet piping, and new chemical feed piping. The design will incorporate much of the existing plant infrastructure to reduce costs and improve constructability, while providing operational flexibility for both Mesa and Phoenix. Project also involves a new Remote Terminal Unit (RTU) and fiber optic connection cable linking the new RTU to existing RTU and addressing critical plant and transmission main hydraulic constraints.

→ Structural engineer for the 24th Street Water Treatment Plant Rehabilitation project, City of Phoenix, Arizona. The project involved a feasibility study, preliminary design, final design, construction administration, and inspection services to review potential rehabilitation work items that included the retrofit of new raw water pumps, discharge check valves, and variable speed drives into the existing pump bay and main switchgear building. Other rehabilitation work included a new mixing system for the thickened sludge storage tank, flocculator drive system component replacements, and the construction of a new copper sulfate feed facility. The project was delivered under a CMAR contract.

Structural engineer for the Gilbert North Water Treatment Plant 15-mgd expansion to 40 mgd, Town of Gilbert, Arizona. This project involved planning, permitting, preliminary and final design, and construction services, with future planning to 60 mgd. The predesign phase included an evaluation of existing treatment processes, identification of future water quality regulations, and an evaluation of alternative treatment processes at the plant. Also included were an ozonation and biofiltration pilot study and the design of ozone facilities and biological active filters for the expanded plant. The project received the 2003 Engineering Excellence Grand Award by ACEC.

Mario A. Gamboa, PE

Education

*BS Electrical Engineering,
Florida International
University, 1981*

*Engineering Management
Graduate Level Studies,
Florida International
University, 2004.*

Licenses

*Electrical Engineer,
Florida*

*Electrical Engineer,
California*

*Electrical Contractor,
California*

*Master Electrician, Various
Counties in Florida*

Professional Affiliations

Institute of *Electrical* and
Electronics Engineers

Expertise with Building Codes

*Florida Building Code
International Building
Code*

*Key NFPA Guidelines and
Standards:*

NFPA - 1 Fire Code

*NFPA-70 National
Electrical Code*

*NFPA-70-E Standards for
Electrical Safety in the
Workplace*

NFPA-101 Life Safety Code

*NFPA-110 Standards for
Emergency and Standby*

Power Systems

*NFPA-820 Fire Protection
in Wastewater Treatment
Facilities.*

Mr. Gamboa's professional experience spans 35 years in design; value engineering; engineering management, construction management of numerous municipal and industrial projects. These include expertise focus with electric energy and automation for water treatment, wastewater treatment and pumping stations. Provided electrical design and instrumentation with construction specifications for 115 kV substations, medium voltage class (5-kV through 38-kV) and low-voltage power distribution systems; including prime and standby power generations systems, power for large pumps-motors with 5 kV variable speed controls systems; lighting systems; life safety systems; grounding; lightning protection; and SCADA automation systems.

Engineering Management duties included Client Oriented Services, leadership and mentoring of engineering and support staff, project and quality control management, achievement of Team Goals.

Representative current project assignments include:

Wastewater Projects

- Electrical engineer for the Central County Water Reclamation Facility Phase 3 and Phase 4 Expansion and Main Lift Station Upgrade, Sarasota County Utilities Department, Florida. Project included design of an upgrade to the 480 volts power distribution and SCADA system that included switchgear with provisions to synchronize two generators; new motor control centers, underground ductbanks, pumps with variable frequency (speed) controllers, and new programmable controllers. Mr. Gamboa provided design services and currently provides engineering support during construction.

Water Projects

- Electrical engineer for the City of Pompano Beach Water Treatment Lime Softening Plant, Electrical Improvements Master Plan project. This project included separate phases for the design and construction to replace 5 kV power distribution switchgear, synchronizing switchgear and controls for two 900 kW – 5 kV standby power generators, 5 kV motor control centers, 600 volts switchgear, 5 kV /480 volts transformers.

- Electrical engineer for Sarasota County Venice Gardens Water Treatment Plant Upgrades Pre-Design project. Task included pre-design evaluation of electrical 480 volts power distribution system capacity, standby generator capacity and PLC configuration for improvements to the existing water treatment membranes.

Infrastructure Water Projects

- Engineer for Electrical Assessment of three (3) Water Reuse Pumping Stations, Manatee County Water Utilities. Project included Power System Analysis of utility power, motor control center, 200 HP VFDs and standby power generator, for compliance with NFPA-72E for installing equipment arc flash labels.

- Electrical Engineer for Odessa and US 41 Booster Pumping Stations – Pressure Modifications Projects, Tampa Bay Water. Project includes Analysis of utility power, switchboard, 250 HP VFDs, 75 HP VFDs and standby power generator, to comply with NFPA-72E and electrical system modifications.

- Lead Electrical Engineer for Lift Station No. 1 Rehabilitation Project, City of Saint Petersburg, Florida. Provided design services for construction of wet well with three pumps, variable speed controls, standby power generator and remote telemetry controls



Jeffrey C. Alband, R.A.

Jeffrey Alband, a chief architect with Carollo Engineers, has more than 48 years of experience in the architectural design, planning, detailing, and specifications of water and wastewater treatment plants. Jeff works closely with our engineering staff to develop architectural concepts for structures with low-visibility from surrounding neighborhoods, and a low-profile design to blend visually in with the surrounding terrain. Many of these structures include administration, operation, and headworks buildings, as well as microbiology and instrumentation laboratories, and reservoirs.

Education

BS Architecture,
Lawrence Technological
University, 1971

Licenses

Architect, Arizona, Illinois,
Michigan, Utah, Colorado

Relevant Experience

→ Project architect for the South Florida Water Management District Miami Field Station Building B47 Replacement, Florida.

Carollo provided design services for the replacement of the Miami Field Station Building B47, a pre-engineered metal building which was damaged by a windstorm and later on torn down since it was declared not repairable. Project consisted of the development of structural, HVAC, and architectural drawings for a foundation and a metal building, which has four offices.

→ Project architect for the City of Boynton Beach, Florida, Ion Exchange Treatment System and East Water Treatment Plant Improvements Progressive Design Build. This project includes initial engineering and constructability evaluations, permitting, design, and construction of a 16.0-mgd ion ex-change system, associated ancillary systems, and raw water transmission main modifications.

→ Project architect for the City of Pompano Beach, Florida, Water Treatment Plant Transfer Pump Station Improvements. This project provided for redundancy and reliability for the City's water treatment plants, specifically the transfer of treated water into the clearwell. The scope included upgrade of electrical equipment for the transfer station and Ancillary improvements for HVAC, access, lighting and wall insulation in the transfer station.

→ Project architect for Broward County, Florida, Potable Water Storage Tanks, Pumping Systems, and Chemical Systems. This project includes the assessment, design and construction phase management of new ground storage tanks, new high service pump stations, and new sodium

hypochlorite and ammonia feed and storage systems for disinfection. These improvements will be implemented at four locations within the County.

→ Project architect for Palm Beach County WTP 2 Filter Replacement project. Carollo provided design, permitting, and bid services. The new dual media filters with reinforced concrete construction replaced the existing filters. The filter addition also includes backwash and transfer pumps, a filter air scour system, a washwater recovery basin and pump station, associated electrical and instrumentation, site grading, paving, and drainage improvements.

→ Project Architect for the City of Prescott, Arizona – Well No. 3 Equipping project that involved well drilling, permitting assistance, design, and construction administration services. Design components included well discharge piping, an adsorptive media arsenic treatment system, electrical gear, and a tablet feeder disinfection system.

→ Project Architect for the Ak-Chin Indian Community, Maricopa, Arizona – Surface Water Treatment Plant. This project involved design and construction of a new surface water treatment plant and associated infrastructure that included a new 2.25-mgd surface water treatment facility, redesign of the proposed DYK finished water storage tank and canned pump station, finished water pipeline, raw water line, and a raw water pump station.

→ Project Architect for the City of Phoenix, Arizona – 24th Street Water Treatment Plant Rehabilitation project. This project involved a feasibility study, preliminary design, final design, construction administration, and inspection services to review potential rehabilitation work items that included the retrofit of new raw water pumps, discharge

Jeffrey C. Alband, R.A.

check valves, and variable speed drives into the existing pump bay and main switchgear building. Other rehabilitation work included a new mixing system for the thickened sludge storage tank, flocculator drive system component replacements, and the construction of a new copper sulfate feed facility. The project was delivered under a CMAR contract.

→ Project Architect for the City of Phoenix, Arizona – 24th Street Water Treatment Plant Granular Activated Carbon (GAC) Implementation/Disinfection Byproduct (DBP) Mitigation project. The design of improvements included a reservoir outlet weir box and preliminary design and final design of post-filter GAC Contactors capable of treating 140-mgd for reduction in TOC for DBP control in the Phoenix water distribution system. This project included design of a diversion structure, supply pump station, backwash (fluffing) pump station, and plant water supply for the contactors.

→ Project Architect for the City of Phoenix, Arizona – Val Vista Water Treatment Plant Solids Handling Facilities design and construction. This project included a two-story, 27,000-sq/ft dewatering facility that houses centrifuges, sludge pumps, sludge conveyors, scrubbers, and operators' facilities. The design included a drive for sludge hauling vehicles.

→ Project Architect for the City of Phoenix, Arizona – Val Vista Water Treatment Plant Internal Upgrades. This project included the retrofit of vertical flocculators into existing horizontal flocculation basins and numerous site security improvements. The site security improvements involved the site perimeter fencing replacement/modifications, screening wall additions for critical equipment, construction of a new entrance guardhouse, and coordination with the CMAR during design.

→ Project Architect for the City of Phoenix, Arizona – Union Hills Water Treatment Plant 160-mgd Improvements. Structured in multiple phases, design and construction of this "fast-track" project utilized the CMAR

project delivery method. The primary focus of this project was to increase the facility's reliability to produce 160 mgd of deliverable capacity during high raw water turbidity events. This \$37M project included the rehabilitation of 32 existing filters and construction of 4 new filters, new pretreatment facilities, new chemical feed facilities, and new dewatering facilities.

→ Project Architect for the City of Phoenix, Arizona – Union Hills Water Treatment Plant Expansion. The detailed design concept for the water treatment plant incorporated a modular layout for ease of expansion to the ultimate 240-mgd treatment capacity. Architectural designs included an EPA certified laboratory with a 1,500-sq/ft lab and 500-square-foot operator's lab; and a microbiology, instrumentation, and wet lab. Additional buildings included administrative offices and staff and multi-use rooms.

→ Project Architect for the City of Phoenix, Arizona – Union Hills Water Treatment Plant Minor Modifications project to increase security at the facility and improve contact time in the finished water reservoir.

→ Project Architect for the City of Peoria, Arizona – Greenway Water Treatment Plant Phase 1. Architectural designs include an operations center, disinfection building, ozone generation building, chemical building, and finished water pump station.

→ Project Architect for the Town of Gilbert, Arizona – North Water Treatment Plant Phase 1. The buildings included design of a laboratory for the initial 15-mgd surface water treatment plant. The architecture was designed with low visibility from the surrounding residential neighborhood. The project was awarded the 1997 Engineering Excellence Merit Award by the Arizona Consulting Engineers Association.

→ Project Architect for the Town of Gilbert, Arizona – Lindsay Road Pump Station and Reservoir, which was part of the Gilbert Water System Improvements Phase project.



Chad Green, P.E.

Chad Green is a supervisory building mechanical engineer, has 9 years of engineering experience, and manages the building services group for Carollo. As a building mechanical engineer, he provides all aspects of design services associated with the design of air, heating, cooling, controls, plumbing systems, fire protection systems, odor treatment, and fuel systems. His project experience includes:

Education

BS Mechanical Engineering, University of Texas, Arlington, 2009

Licenses

Professional Engineer, New Mexico, Washington, Texas, Oregon, Colorado, Oklahoma, Arkansas, Florida, Illinois, Minnesota

Mechanical Engineer, Nebraska, California, Arizona, Utah, Nevada

Professional Affiliations

American Society of Heating, Refrigeration, and Air Conditioning Engineers

Relevant Experience

→ Lead Building Mechanical Engineer for the Lake Manatee Water Treatment Filter Upgrade, Manatee County, Florida.

Supervised engineers for plumbing and fire protection designs, calculations, code reviews, drawings, specifications, and construction services related to the project. Scope included a chemical building consisting of sodium bisulfite, citric acid, caustic soda, hydrochloric acid, sodium hypochlorite, CIP, and hot water.

→ Lead Building Mechanical Engineer for the C-43 West Basin Reservoir Project, South Florida Water Management District. Supervised engineers for HVAC/plumbing and generator fuel system designs, calculations, code reviews, drawings, specifications, and construction services related to the project. Scope included the S-470 Pump Station, S-476 Pump Station, S-471 Pump Station Control Building, S-473 Pump Station Control Building, S-475 Pump Station Control Building, S-477 Pump Station Control Building, S-479 Pump Station Control Building, S-481A Pump Station Control Building, and IT Communication Equipment Shelter.

→ Lead Building Mechanical Engineer for the 1B1 High Service Pump Station, Broward County District, Fort Lauderdale, Florida. Supervised junior Engineers for HVAC/plumbing and generator fuel system calculations, designs, code reviews, drawings, specifications, and construction services. Scope included HVAC/plumbing for the pump station which included a pump room, sampling lab, restroom, electrical room, generator room, and chemical rooms.

→ Lead Building Mechanical Engineer for the 3A High Service Pump Station, Broward County District, Dania Beach, Florida.

Supervised junior Engineers for HVAC/plumbing and generator fuel system calculations, designs, code reviews, drawings, specifications, and construction services. Scope included HVAC/plumbing for the pump station which included a pump room, sampling lab, restroom, electrical room, generator room, and chemical rooms. Lead Building Mechanical Engineer for the Water Treatment Plant Transfer Pump Station Improvements, City of Pompano Beach, Florida. Supervised junior Engineers for HVAC calculations, designs, code reviews, drawings, and construction services. Scope included an electrical building.

→ Lead Building Mechanical Engineer for the Sawgrass Water Treatment Plant Ion Exchange and Other Improvements, City of Sunrise, Florida. Provided HVAC/plumbing/fire protection calculations, designs, code reviews, drawings, and construction services. Scope included an electrical room and chemical room. Scope also included fire protection design for the chemical room.

→ Lead Building Mechanical Engineer for the Water Treatment Plant II Filter Replacement, Palm Beach County Water Utilities, Florida. Provided HVAC/plumbing designs, calculations, code reviews, and construction services related to the Water Treatment Plant II. Scope included a filter gallery, blower room, and electrical room.

→ Lead Building Mechanical Engineer for the Wemlinger Water Purification Facility HVAC Improvements Project, Aurora Water, Colorado. Supervised engineers for HVAC designs, calculations, code reviews, drawings, specifications, and construction services related to the project. Scope included an administration building consisting of office spaces and a laboratory. An initial condition assessment was

Chad Green, P.E.

performed to determine suitable HVAC technologies for renovation of the building. The design included implementing a new variable refrigerant flow system along with a building management system for optimized control of the system. In addition, detailed sequencing was analyzed to limit disruption of building staff during construction.

→ Lead Building Mechanical Engineer for the Richland Chambers Lake Pump Station Chloramine Feed Optimization, Tarrant Regional Water District, Texas. Supervised engineers for HVAC designs, calculations, code reviews, drawings, specifications, and construction services related to the project. Scope included a chlorine storage room, chlorine feed room, ammonia room, and caustic facility.

→ Lead Building Mechanical Engineer for the Ullrich Water Treatment Plant Lime Feed Improvement Project, City of Austin, Texas. Supervised engineers for HVAC designs, calculations, code reviews, drawings, specifications, and construction services related to the project. Scope included a four story lime building with an electrical equipment level, mechanical level, metering level, and slaking level.

→ Lead Building Mechanical Engineer for the Lebanon Water Treatment Plant, City of Lebanon, Oregon. Supervised engineers for HVAC/plumbing and fire protection designs, calculations, code reviews, drawings, specifications, and construction services related to the project. Scope include a pre-treatment building consisting of a chemical area, fluoride room, membrane area, pump area, electrical room, administration spaces, and stand-alone electrical building.

→ Lead Building Mechanical Engineer for the Griswold Water Purification Plant Raw Water Structure – Phase II, City of Aurora, Colorado. Supervised engineers for HVAC designs, calculations, code reviews, drawings, specifications, and construction services related to the project. Scope included a RW structure.

→ Lead Building Mechanical Engineer for the Wemlinger Water Purification Facility CT

Chamber design, Aurora Water, Colorado. Supervised engineers for HVAC designs, calculations, code reviews, drawings, specifications, and construction services related to the project. Scope included a north pipe gallery, south pipe gallery, CT chamber, and electrical room.

→ Lead Building Mechanical Engineer for the Webster Drive Pump Station Improvements, City of Martinez, California. Supervised engineers for HVAC designs, calculations, code reviews, drawings, specifications, and construction services related to the project. Scope included a pump station.

→ Lead Building Mechanical Engineer for the Arcadia Lake Water Treatment Plant Expansion, City of Edmond, Oklahoma. Supervised junior Engineers for HVAC/plumbing /fire protection designs, calculations, code reviews, drawings, specifications, and construction services related to the project. Scope included a filter building, pre-ozone building, ozone generation building, post-ozone contactor building, GAC building, chemical building, lime building, recycle pump station, thickened sludge pump station, dewatering building, high lift pump station, low lift pump station, and generator building. Geothermal ground source cooling was utilized on this project for all cooling and heating of facilities. Scope included fire protection designs for the pre-ozone building, ozone generation building, post-ozone contactor building, chemical building, and lime building.

Lead Building Mechanical Engineer for the I-35 Complex Booster Pump Station and Ground Storage Tank Improvements Project, City of Edmond, Oklahoma. Supervised junior Engineers for HVAC/plumbing designs, calculations, code reviews, drawings, specifications, and construction services related to the project. Scope included a pump station which included a pump room, electrical and mechanical room. Geothermal ground source cooling was utilized on this project for all cooling and heating of facilities.



**PETER MOORE, P.E., LEED AP,
ENV SP, F. ASCE
PRINCIPAL IN CHARGE**

Education

Bachelor of Science, Civil Engineering,
University of Florida, 1997

Master of Engineering, Civil
Engineering, University of Florida, 2004

Registration

Professional Engineer, Florida, 58709,
2002

Professional Affiliations

- American Society of Civil Engineers
- American Water Works Association
- Florida Engineering Society
- Florida Engineering Leadership
Institute
- FICE
- FEF
- Florida Stormwater Association
- National Society of Professional
Engineers

Certifications

- Certified Stormwater Inspector
- LEED Accredited Professional



Mr. Moore is the president of CMA with more than 21 years of experience with a wide variety of utility, stormwater, transportation and other infrastructure projects. Since joining CMA in 1999, Mr. Moore has focused on the management, planning, design, permitting, and construction of various utility infrastructure projects for public clients throughout South Florida. Mr. Moore has worked on literally dozens of unique projects for Broward County valued

at \$100M in his career, literally serving in every role in a project team. Of particular note is Mr. Moore's experience in value engineering, including projects for Broward County WWS, Miami-Dade Water and Sewer Department and a development client in Saudi



Arabia. Including his assistance as a reviewer and design guideline developer for the firm's work in the Republic of Panama, Mr. Moore has an additional \$500M of international project exposure to give him the full arsenal of tools to serve Broward County. A lifelong Broward County Resident, Mr. Moore has his Bachelor of Science and Master of Engineering in Civil Engineering, is a licensed professional engineer in Florida and has been elected as a Fellow of the American Society of Civil Engineers (ASCE) for his lifetime achievements and contributions to civil engineering. To show his understanding of today's issues, Mr. Moore also is an Envision Sustainability Professional and a LEED Accredited Professional (two additional certifications specializing in sustainability). He is a past president and board member of numerous local, regional and national professional societies and non-profit organizations. Mr. Moore will be the principal in charge on this contract.

Project Experience

Broadview Park Neighborhood Improvement Program. The Broadview Park Neighborhood Improvement Program (BNIP) was the last of the Neighborhood Infrastructure Improvements projects to be carried out by Broward County in the unincorporated areas. Chen Moore and Associates was selected as the prime consultant for the Basis of Design Report (BODR) and to design and administer the construction of improvements to subsequent bid packages. The three Bid Packages addressed water, sanitary sewer and drainage improvements, while introducing sidewalks and enhancing the community's roadway and landscape.

The basis of design report included population projections, an analysis of water source and sewage discharge points and a hydraulic model of the water, wastewater and stormwater systems.



The first bid package included the replacement of the entire water distribution system within the neighborhood, which was previously owned and maintained by a private utility. This project was designed utilizing digital orthography and aerial maps to fast track the replacement.

The second and third bid packages included conversion of the entire area from septic to gravity collection, the installation of a backbone forcemain network and connection into an inline booster station, installation of a positive drainage system, sidewalks, hardscape and landscape improvements.

An added fourth bid package was the design of a 20” water main to serve as the transmission source water for the area. Also change ordered into the project was the installation of a 20” raw water main for future use. The project was complicated by groundwater contamination, proximity to a wellfield, the existence of a fire station and elementary school in the neighborhood and the existence of rock in the area. All of the projects were completed on budget and on or ahead of schedule.

Ft Lauderdale FM Rehab, HDD & Swageline (1-4). Chen Moore and Associates (CMA) is the prime consultant for the 30” Emergency Force Main Rehabilitation project in the City of Fort Lauderdale. This innovative design-build project, led by Murphy Pipeline Contractors (MPC) was undertaken to provide both mainline force main replacement for aging infrastructure and to provide additional redundancy in case of future issues. The contract was divided into four (4) phases within the City of Fort Lauderdale. The nearly 20,000 linear feet of pipeline is being rehabilitated through a combination of swagelining, directional drilling, and traditional open cut installation over these four phases. CMA provided planning, design, permitting and engineering services during construction. Environmental compliance, subaqueous crossing, public involvement and maintenance of traffic in the busy Sistrunk and Himmarshee Business Districts were some of the additional project complexities. CMA also provided dewatering permitting and groundwater modeling due to contaminated sites within quarter mile of the projects.

Fort Lauderdale-Hollywood International Airport Stormwater Master Plan Update. Under Phase 1 of this project, Broward County Aviation Department (BCAD) retained Chen Moore and Associates (CMA) to update the FLL Stormwater Master Plan (SWMP), which was completed by a previous consultant in 2001. CMA reviewed the data and analysis from all prior reports, converted the existing stormwater model from SWMM to ICPR, and updated the ICPR model with any new system data and new projects provided by BCAD. CMA updated the existing conditions stormwater model and created the future conditions stormwater model to assess alternative drainage improvements needed to achieve required and desired Levels of Service (LOS) for various storm events. The stormwater model was used to run rainfall scenarios for the comparison of pre-development (existing) conditions versus post-development (future) conditions from a water quantity (runoff) and water quality (storage) perspective. The stormwater model was used to analyze the performance of the existing Primary Stormwater Management System (PSMS). Phase 1 for this project included the following work items:

- Review and verify earlier work by other consultants during 2001-2005
- Convert previous SWMM stormwater model to ICPR model
- Obtain updated topographic data for TIN development
- Calculate updated hydrologic parameter for drainage basins
- Conduct analysis of various system improvement alternatives
- Prepare Stormwater Master Plan Update





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James D. Stoner, P.S.M.
President



Education

Land Surveying Program

Palm Beach Community College, 1979

Professional Registrations

State of Florida Professional Surveyor and Mapper

License Number LS4039, 1983

Professional Affiliations

Former Vice President Florida Surveying and Mapping Society – State Level
Former President Florida Surveying and Mapping Society – Broward Chapter
Former Florida Surveying and Mapping Society – Area 6
American Congress on Surveying and Mapping
Leadership Broward

Professional Experience

- **South Florida Water Management District**
 - STA 3/4 – Topographic Survey
 - East Coast Buffer Cells 28 & 29 – Boundary Survey
 - C-4 Canal Conveyance – Topographic Survey
 - Lake Hicpochee – Boundary and Topographic Surveys

- **Broward County Aviation**
 - Annual Runway Approach Surface Surveys
 - Numerous Lease Parcel Surveys
 - Design Surveys for Expansion of Airport Terminals



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- **Broward College Continuing Contract for Surveying Services**
 - North Campus – Boundary survey overall Campus
 - Central Campus - Boundary survey overall Campus
 - South Campus - Boundary survey overall Campus
 - Numerous Topographic and As-built Surveys for expansion of Facilities

- **City of Sunrise Continuing Contract for Surveying Services**
 - Southwest Water Treatment Plant – As-Built Survey
 - Sunrise Road Improvements – Various Topographic Surveys
 - Five Vacant Parcels – Boundary Surveys
 - Park City Water Treatment Plant – Updated Boundary Survey
 - Passive Park – Topographic and Utility Surveys
 - City Hall Parking Lot – Topographic Survey
 - N.W. 44th Street – Topographic Survey
 - Lutheran Church Site Acquisition – Boundary Survey

- **Town of Davie Continuing Contract for Surveying Services**
 - Oakes Road Fire Station – Boundary Survey
 - Lift Station Number 11 Improvement Project – Topographic Survey
 - Silver Lakes Park – Construction Layout Survey
 - Wachovia Bank Parcels – Boundary, Topographic, & Tree Surveys
 - Parks & Recreation Building at Pine Island Park – Topographic Survey
 - Orange Drive – Topographic & Tree Surveys
 - Eastside Community Hall – Topographic & Tree Surveys
 - N-20 Canal – Topographic Survey
 - Public Works Gas Pump Station – Topographic Survey
 - S.W. 130th Avenue Canal – Topographic Survey
 - Sunny Lake Expansion – Boundary Survey



Tom Mullin, P.E.
RADISE International, L.C.
Vice President
Chief Geotechnical Engineer

Professional Registration and Certifications:

- Professional Engineer, #43366 (Florida), 1990

Education:

- MS, Civil/Geotechnical Engineering, University of Illinois
- BS, Civil Engineering, University of Illinois

Capabilities:

- Water Resources Engineering
- Soils and Foundation Engineering
- Civil and Major Earthworks Engineering Design
- Civil Construction Management
- Geotechnical Instrumentation and Monitoring
- Groundwater Hydrogeology
- Quality Control Testing and Inspection Oversight
- Peer Review

Mr. Mullin has 40 years of geotechnical engineering experience including water resources engineering including ports and harbors, dams and reservoirs. He has served as Chief Geotechnical Engineer on numerous projects for private and public clients including the South Florida Water Management District (SFWMD), United States Army Corps of Engineers (USACE) and Florida Department of Transportation (FDOT).



Mr. Mullin has managed projects involving major high rise towers, commercial buildings, power generating and industrial facilities, as well as transportation and landfill projects in Florida, Puerto Rico and the Caribbean.

He provides quality assurance and quality control; materials testing engineering services including soils, foundations, and geotechnical investigations; vibration monitoring; materials and systems testing; and structural and special assessments testing services.

His skills include foundation design and construction, backfilling, test programs, quality control testing procedures and documentation, installation and evaluation of geotechnical monitoring instrumentation, vibration monitoring and pile load testing. He provides quality assurance oversight; CEI documentation; construction surveillance, inspection and testing; and technical peer review.

REPRESENTATIVE PROJECTS:

Chief Geotechnical Engineer and/or Principal Design Consultant for the following projects:

East Central Regional Water Reclamation Facility (ECRWRF) Biosolids Improvement Project, Palm Beach County, FL

Geotechnical engineering and field/laboratory testing services for the new construction of a Dewatering Building and Odor Control Facility. The structures are part of an overall design package for the upgrade of the ECRWRF Biosolids Project.

Wastewater Lift Station Rehabilitation, Palm Beach County, FL

Project consisted of providing geotechnical engineering including field and laboratory testing services.

Lake Hicpochee Dispersed Water Management Plan, Glades and Hendry Cos, FL

Geotechnical Engineering Services.

Southern Transmission Main Crossing of I-95 and the Turnpike, Palm Beach County, FL

Geotechnical Engineering including field and Laboratory Testing Services.

Eastpointe Pump Station Design, Palm Beach County, FL

Geotechnical Engineering, Engineering During Construction, Construction Material Testing and QC Services.

Hillsboro Canal Bank Stabilization, Broward and Palm Beach Counties, FL

Geotechnical Engineering and Construction Material Testing Services.

STA-1 West Expansion Area 1, Palm Beach County, FL

Geotechnical Engineering & Construction Material Testing Services.

C-44 Reservoir - Discharge Canal, Spillway Structure, Martin County, FL

Construction Engineering Inspection and Material Testing Services.

Herbert Hoover Dike Culverts 11 and 16, Palm Beach and Martin County, FL

Construction Engineering Inspection and Material Testing Services.

Herbert Hoover Dike Culverts 5 and 5A, Palm Beach County, FL

Geotechnical Engineering and Construction Material Testing Services.

Herbert Hoover Dike Culverts 4A and 3, Palm Beach and Hendry County, FL

Construction Engineering Inspection and Material Testing Services.

EAA A-1 Flow Equalization Basin (FEB) Construction, Palm Beach County, FL

Construction Engineering Inspection, QA and Construction Material Testing Services.

L-40 and L-85 Levees Evaluation, Palm Beach County, FL

Geotechnical Engineering Services.

East Coast Protective Levee Rehabilitation, Palm Beach, Broward and Miami-Dade Cos, FL

Construction Engineering Inspection, QA and Lab Testing Services.

L-8 Divide Structure, Palm Beach County, FL

Geotechnical Engineering and Construction Material Testing Services.

Compartment C, Stormwater Treatment Area, Hendry County, FL

Geotechnical Engineering for the civil design development of 6,240 acres of impounded manmade wetlands in a large Stormwater Treatment Area Flow Way.

Dredging and Spoils Containment Facility Design, 1500 Ac. Critical Lake Trafford Dredging Restoration, Collier County, FL

Geotechnical Engineering for the civil design preparation for 3 phases of the lakes dredging over a 7-year period.

Stormwater Treatment Area 5 Flow Way 3 and STA 6 Section 2, Hendry County, FL

Geotechnical Engineering for the design development of 4000 Acres of impounded man made wetlands.

Peer Design Review, Stormwater Treatment Areas 1W, #5 and #6, Palm Beach County, FL

Geotechnical peer reviews of geotechnical analyses and levee designs by others for 3 SFWMD Stormwater Treatment Areas.

Luis E. Rodriguez, P.E.

Cordova Rodriguez & Associates, Inc.

PROJECT MANAGER

Mr. Rodriguez is a licensed professional engineer and has over 25 years of experience in civil engineering. His project experience includes design of water distribution systems, sanitary sewer collection systems, sanitary sewer pump stations and force main, paving and drainage design, management of various land development projects, and permitting processing through various local and state agencies. He has extensive experience in construction management and administration.



Education:

BS, Civil Engineering, 1993,
Cornell University, New York

Certifications:

Licensed Professional Engineer
in Florida

Employment:

Cordova Rodriguez & Associates,
Inc.: 12 years

Employee of other Engineering
Firms: 13 years

References:

Franklin Torrealba, PE
Director
300 Engineering Group, P.A.
(305) 763-9829

RELEVANT EXPERIENCE:

Broward County Reclaimed Water Plant Expansion: The project scope included horizontal three (3) new buildings; a Water Filter, Chlorine Contact tank, and an electrical building to accommodate generators for the water treatment plant. Responsibilities included: civil site modifications as required to maintain adequate grading for the new facilities, to provide service roads and to expand the existing storm water collection system to compensate for the addition of the new structures. Two (2) detention areas were added as part of a plant-wide system to address the grading and drainage for the new structures. In addition, the scope included drafting of the process, structural and electrical drawings for the new facilities.

Port Everglades Terminal 25: Responsible for the design, permitting and construction management of the expansion of Terminal 25 at Port Everglades. Site work improvements for the updated terminal included re-routing of approximately 500 linear ft. of 12" water main and the installation of over 300 linear ft. of gravity sewer main. The drainage design consisted of over 3,500 linear ft. of exfiltration trench in conjunction with two (2) stormwater drainage wells.

Port Everglades Terminal 26: Scope of work included the conversion of a loading dock to a passenger drop off area, earthwork associated with raising the site over three (3) feet in elevation, paving grading and drainage for drop off area, relocation of 10" fire line and backflow preventer, sanitary sewer extension, permitting with Florida Department of Environmental Protection (FDEP), Broward County and City of Hollywood.

Miami International Airport-South Terminal Expansion Project Office Trailer: Prepared design calculations and construction documents for pump station upgrade serving the South Terminal trailer complex. Scope included permitting and coordination with Miami-Dade Aviation Department (MDAD), Miami-Dade DERM, Building and Zoning Department. Provided construction observation and final certification services and coordinated with electrical engineer on the pump station electrical components.

Port Everglades Terminal 4 Slip 2: The Slip 2 Expansion project is for the extension of the existing slip by approximately 225'. This project included the excavating of the existing slip, demolition and relocation of the existing utilities, as well as grading and drainage work. The scope consisted of installing over 670 LF of 12" water main with two (2) fire hydrants.



OCTOBER 2018

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RODRIGUEZ**
& ASSOCIATES, INC.

Mekdeci Residence Water Main Extension: Responsible for design, permitting, and construction observation for installation of approximately 500 LF of 12-inch water main extension per MDWASD's standards. The scope of work included air release valves, water services & meter boxes, and required fire hydrant assembly per code requirements.

Port Everglades Terminal 4: Site work required for conversion of container yard to 172 spaces surface parking lot, passenger and bus drop off areas. The scope included over 300 LF of 6" and 8" water main extension / replacement, two (2) new fire hydrant and replacement of existing sewer lateral. It included permitting and coordination with Florida Department of Environmental Protection (FDEP) and Broward County for four (4) Class IV storm water drainage wells, the City of Fort Lauderdale Building Department.

Garcia Water Main Extension: Design of a water main extension for 207 LF of 8" water main to service a single-family residence. It included a connection to an existing 16" water main, permitting and construction administration.

Miami-Dade Water and Sewer Department

Consent Decree / Settlement Agreement Section (CD/SA): Assigned to WASD CD/SA section to work on various duties. Responsibilities included the submittal and tracking of various pump stations and force main upgrades with Miami-Dade County Building Department, DERM, FDOT, FDEP and Miami-Dade County Health Department. Responsible for coordination with FPL and other utilities in anticipation of the proposed upgrades.

Westview Place: Scope of work included the design of a sanitary sewer pump station to serve a 35-townhome development. The project included the design of 625 LF-12-inch water main, 175 LF 8-inch water main, 600 LF – 8-inch sanitary gravity sewer main, sanitary sewer pump station and 60 LF of four (4) inch force main connection to an existing force main. Responsibilities included permitting through Miami-Dade DERM, the City of North Miami, and the health department. It also included coordination with FPL for the crossing of a major transmission line along NW 119 Street.

Frank Valverde Property, Sewer Extension, S.W. 84th Avenue and S.W. 8th Street: Responsible for the design of sanitary sewer extension for 95 LF of 8-inch gravity main connecting to existing sewer main for a new gas station. Responsibilities included preparation of design documents for an 8-inch sewer main and preparation of technical specifications. Coordinated with MDWASD regarding permitting and approvals of plans. Also responsible for permitting and final certification.

The Program Management Team (PMT)

Responsibilities included the monitoring and tracking of Miami-Dade WASD pump stations for NAPOT criteria, evaluating out-of-compliance pump stations and preparing engineering reports recommending upgrades to comply with FDEP consent Decree requirements. Assisted with permitting of various pump station upgrades through the Miami-Dade County Building Department, DERM and other agencies. Coordinated with utility companies (FPL, telephone, cable companies) in anticipation of upcoming pump stations and force main upgrades.



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Evaluation Criteria Response Form

Engineering Services for Water and Wastewater Services Category 3 Wastewater Treatment

Vendor Response

1. Ability of Professional Personnel: Maximum 30 points

Describe the qualifications and relevant experience of the Project Manager and all key staff that are intended to be assigned to this project. Include resumes for the Project Manager and all key staff described. Include the qualifications and relevant experience of all subconsultants' key staff to be assigned to this project.

Carollo Engineers, Inc., (Carollo) is a nationally recognized firm that was established in 1933 to solely provide water, wastewater, and stormwater related services. Our South Florida staff brings expertise on local technical and regulatory issues gathered from addressing the day-to-day needs of numerous local clients since we opened our first Florida office in 2001.

a: Describe prime consultant's proposed key project team members (not sub-consultants) as they directly relate to wastewater treatment and disposal projects in Florida. Specifically, list personnel that have experience designing, permitting, and providing construction management services for these projects.

Points Value: 15

We understand that there may be a wide array of potential projects under this contract. As a result, we drew from the depth of experience of our South Florida staff to create our project team. For a particular project, we will select the most qualified Project Manager from our pool to best lead the work. All of our potential Project Managers excel in communication skills, which is essential to being able to work with your staff to understand your needs and feedback, and in turn clearly translate that information to our project team. Supporting our Project Manager will be a team of engineers, experts in their respective fields, who will bring lessons learned from prior projects. This combination of knowledgeable, highly motivated local staff, and dedicated firm-wide support will make certain that the quality and responsiveness of our services are exceptional.

b: Describe sub-consultant's proposed key project team members as they directly relate to wastewater treatment and disposal projects in Florida. Specifically, list personnel that have experience designing, permitting, and providing construction management services for these projects.

Points Value: 15

To provide the most value to the County for this contract, Carollo has thoughtfully selected an exceptional lineup of sub-consultants to amplify and complement the technical expertise of our staff. Below you will see brief firm profiles for each subconsultant, demonstrating the expertise each brings to the Team. Our sub-consultants are all locally based in South Florida and include Broward County certified SBE firms as well as other small businesses recognized by the State and other local municipalities.

Evaluation Criteria Response Form

Engineering Services for Water and Wastewater Services Category 3 Wastewater Treatment

Vendor Response

2. Project Approach: Maximum 25 points

a: Describe the prime Vendor's approach to the project.
Points Value: 15

At Carollo, we've always believed that innovation is not a process but rather an outcome-created by challenging ourselves to "THINK DIFFERENTLY" about all the possibilities.

- A Fresh Approach
- Proven Experience
- Doing More with Less
- Using Innovative Tools
- Partnering for Collaboration

b: Describe how the prime Vendor will use sub-consultant's in the project. Include potential Architects, Civil Engineers, Environmental Engineers, Structural Engineers, Mechanical Engineers, Electrical Engineers, Geotechnical Engineers, Geologists, Hydrologists, Hydrogeologists, Landscape Architects and Professional Land Surveyors.

Points Value: 10

Our proposed sub-consultants provide experience and expertise that round out the capabilities of our team in specialized areas. This expertise includes:

- Chen Moore: Civil/site engineering, permitting, and landscape architecture.
- Cordova Rodriguez and Associates: Civil engineering and planning, permitting
- Gamboa: Electrical Engineering and Instrumentation & Controls
- Stoner and Associates: Surveying and mapping
- Radise: Geotechnical engineering and materials testing
- JLA Geosciences: Deep Injection Wells, hydrogeologic modeling
- McNabb Hydrogeologic: Deep Injection Wells, hydrogeologic modeling

Carollo has a past record of successfully completing projects with each of these sub-consultant partners. In fact, we have been working with Gamboa Engineers and Stoner & Associates on Broward County's High Service Pump Stations and Storage Tanks General Services contract for the past three years.

Evaluation Criteria Response Form

Engineering Services for Water and Wastewater Services Category 3 Wastewater Treatment

Vendor Response

3. Past Performance: Maximum 30 points

Describe prime Vendor's experience on projects of similar nature, scope and duration, along with evidence of satisfactory completion, both on time and within budget, for the past five years. Provide a minimum of three projects with references.

Vendor should provide references for similar work performed to show evidence of qualifications and previous experience. Refer to **Vendor Reference Verification Form** and submit as instructed. Only provide references for non-Broward County Board of County Commissioners contracts. For Broward County contracts, the County will review performance evaluations in its database for vendors with previous or current contracts with the County. The County considers references and performance evaluations in the evaluation of Vendor's past performance.

We are a local firm who understands your issues. We are also experts in the local concerns of utilities like yours in South Florida, addressing the day-to-day needs of Broward County WWS as well as the South Central Regional Wastewater Treatment and Disposal Board, Palm Beach County, Miami-Dade County, and Cities of Sunrise, Pompano Beach, and Margate. We understand the issues that you are facing: meeting treatment goals; managing energy costs; accounting for variability in chemical and labor costs; providing for future flexibility; meeting regulatory requirements; and, of course, developing capital plans within a rapidly recovering economy.

What does all this mean? Carollo brings a proven track record of projects similar to those anticipated to be performed under your General Services contract, completed on time and within budget, with an emphasis on industry-leading technology to maximize your dollars. We have included reference letters and evaluations that speak to our knowledge and service to our clients.

a: Describe experience and provide specific examples of projects designing, permitting and providing construction management services for secondary wastewater treatment plants, utilizing activated sludge treatment and anaerobic digestion systems, of a capacity greater than 40 million gallons per day annual average daily flow in the state of Florida within the last five (5) years. For each project listed, identify your firm's role as a prime consultant or as a sub-consultant. Further identify your firm's role in the project for discipline, expertise, and work element provided.

Points Value: 10

Carollo's wastewater treatment and disposal experience includes hundreds of wastewater treatment plants ranging in size from less than 1 mgd to over 500 mgd. We are at the forefront of technology in Florida, with expertise in all aspects of activated sludge and anaerobic digestion.

Although there are a limited number of wastewater treatment plants in Florida with a capacity of 40 mgd or greater, Carollo has experience with many of them including:

- COWWTP and SDWWTP, Miami-Dade Water and Sewer Department, FL, 112.5 mgd
- Buckman Wastewater Treatment Facility, JEA, FL, 52.5 mgd
- Conserv II Water Reclamation Facility, City of Orlando, FL, 21 mgd

Evaluation Criteria Response Form

Engineering Services for Water and Wastewater Services Category 3 Wastewater Treatment

Vendor Response

A detailed description of Carollo's experience with each of these projects is included below as well as descriptions of numerous other projects that are comparable to Broward County's North Regional Wastewater Treatment Plant.

b: Describe experience and provide specific examples of familiarity with regulatory issues related to wastewater treatment and disposal specific to south east Florida utilities. At a minimum, cite specific examples of the following: experience with ocean outfalls, experience with reclaimed water, experience with Class I deep injection wells. For each example listed, identify your firm's role as a prime consultant or as a subconsultant. Further identify your firm's role in the project for discipline, expertise, and work element provided.

Points Value: 10

Carollo actively tracks regulatory issues and has extensive experience assisting utilities in the treatment of wastewater that meets local and federal standards. Having completed permit applications and renewals for wastewater systems throughout the state, the Carollo team has the experience to thoroughly review permit status and make recommendations as to current and future regulatory compliance.

The Carollo team has extensive experience in regulatory compliance and operations related to ocean outfalls, reclaimed water, and Class 1 deep injection wells. Our experience for numerous projects is described in the sections below.

c: Describe experience and provide specific examples of projects designing, permitting and providing construction management services for wastewater pump stations with split case horizontal centrifugal pumps (in-line stations) and submersible pumps. Include examples within the following ranges: 0 – 100 H.P., 100 - 200 H.P., and over 200 H.P. For each project listed, identify your firm's role as a prime consultant or as a sub-consultant. Further identify your firm's role in the project by discipline, expertise, and work element provided.

Points Value: 5

The Carollo team has designed hundreds of wastewater pumping facilities with capacities as high as 500 mgd. Our wastewater pump station designs serve a number of specific functions including wastewater delivery to treatment plants, intermediate transmission in-line boosting, and transfer pumping within wastewater treatment facilities.

We also have experience with the wide range of pumping systems and equipment commonly utilized for wastewater pumping including horizontal centrifugal pumps and submersible pumps. Included in the project descriptions below are examples Carollo's experience with pump stations with a range of pump sizes from very small to over 200 H.P.

Evaluation Criteria Response Form

Engineering Services for Water and Wastewater Services Category 3 Wastewater Treatment

Vendor Response

4. Workload of the Firm:

For the prime Vendor only, list all completed and active projects that Vendor has managed within the past five years. In addition, list all projected projects that Vendor will be working on in the near future. Projected projects will be defined as a project(s) that Vendor is awarded a contract but the Notice to Proceed has not been issued. Identify any projects that Vendor worked on concurrently. Describe Vendor's approach in managing these projects. Were there or will there be any challenges for any of the listed projects? If so, describe how Vendor dealt or will deal with the projects' challenges.

Points Value: 5

As a national firm, Carollo has a continuous workload of hundreds of projects at any particular time, at various stages of completion from kickoff to final completion. As examples, listed in Section 4 are representative completed and active projects for Carollo in South Florida over the last five years, indicating the breadth and depth of our local experience.

5. Location:

Refer to **Vendor's Business Location Attestation Form** and submit as instructed.

A Vendor with a principal place of business location (also known as the nerve center) within Broward County for the last six months, prior to the solicitation submittal, will receive five points; a Vendor not meeting all of the local business requirements will receive zero points. The following applies for a Vendor responding as a Joint Venture (JV): if a member of the JV has 51% or more of the equity and meets all of the local business requirements, the JV will receive three points; if a member of the JV has 30 to 50% of the equity and meets all of the local business requirements, the JV will receive two points; and if a member of the JV has 10% to 29% of the equity and meets all of the local business requirements, the JV will receive one point. **Points**

Value: 5

Since opening our first office in Broward County 13 years ago, Carollo has been committed to the Broward community and served as a responsible business partner. Our staff that live Broward County are active in our communities and strive to leave a positive mark through active participation in civic, social and philanthropic organizations.

Like many national firms, our corporate headquarters is located outside of Broward County, but we are proud to be a local Broward County firm.

As required by the RFP, the "Vendor's Business Location Attestation Form" has been filled out and submitted.

6. Willingness to Meet Time and Budget Requirements:

This solicitation is for the award of a continuing contract. The specific projects requiring professional services under the agreement have not yet been identified. However, in general, explain your firm's approach in meeting "project specific" time and budget requirements and indicate whether Vendor is committed to meet these requirements when identified under this agreement.

YES = 2 Points NO = 0 Points

Points Value: 2

YES, we are willing and committed to meet time and budget requirements for each project assignment. We understand the nature of General Services contracts. Some assignments need immediate, sometimes same day response times, while others are less urgent. Our depth and breadth of staff allows us to respond to immediate needs from our local office which is just minutes away. For longer term assignments, Carollo develops a Project Management plan that establishes the plan to meet schedule, scope, budget and quality.

Evaluation Criteria Response Form

Engineering Services for Water and Wastewater Services Category 3 Wastewater Treatment

Vendor Response

7. Volume of Previous Work:

Refer to **Volume of Previous Work Attestation Form** and the **Volume of Previous Work Attestation Joint Venture Form** and submit as instructed. The calculation for Volume of Previous Work is all amounts paid to the prime Vendor by Broward County Board of County Commissioners at the time of the solicitation opening date within a five-year timeframe. The calculation of Volume of Previous Work for a prime Vendor previously awarded a contract as a member of a Joint Venture firm is based on the actual equity ownership of the Joint Venture firm. Three points will be allocated to Vendors paid \$0 - \$3,000,000); 2 Points will be allocated to Vendors paid \$3,000,001 - \$7,500,000; 1 Point will be allocated to Vendors paid \$7,500,001 - \$10,000,000; 0 Points will be allocated to Vendors paid over \$10,000,000). Payments for prime Vendor will be verified by the Purchasing Division.

Points Value: 3

As required by the RFP, the "Volume of Previous Work Attestation Form" has been filled out and submitted. Carollo has been paid less than \$3 million over the past 5 years by Broward County Board of County Commissioners.



Engineering Services for Water and Wastewater Services

SOLICITATION PNC2117097P1

CATEGORY NO. 3 | WASTEWATER TREATMENT SYSTEMS | 100957





3440 Hollywood Boulevard, Suite 465, Hollywood, Florida 33021
P. 954.837.0030 F. 954.837.0035

November 7, 2018

Broward County Board of County Commissioners
Attn: Environmental Engineering 1 FL
2555 W Copans Road
Pompano Beach, FL 33069

Subject: Solicitation PNC2117097P1 – Professional
Engineering Services for Water and Wastewater Services

Dear Selection Committee:

As we prepare this qualifications statement, we reflect on some of the challenges faced by Broward County’s Water and Wastewater Services staff. We understand the absolute need for the reliability of the pump station at District 3A and the implications of its impacts on the Fort Lauderdale airport. We are also aware that your sludge dewatering equipment at the water treatment plants is aged and at the end of its useful life. Lastly, we know how complex it is to provide reuse water to the Lighthouse Point community when several factors have to be balanced, such as whether you build a new pipe from the closest reuse connection or tap into the existing outfall for potential savings. To successfully address these issues, they require not just a conventional approach, but innovative thinking to incorporate the latest in available, proven technologies and out-of-the-box ideas that are fiscally responsible and easy to operate and maintain.

As your review our credentials, we encourage you to ask yourself the question: “Why have so many clients across the country, and particular throughout Florida, turned to Carollo for their most important water and/or wastewater projects?” We believe that our clients have selected us because of our proven ability to creatively identify and cost-effectively implement the best solutions. We’ve always believed that this creativity and innovation is not a process, but rather the natural outcome of the enthusiasm of each and every Carollo employee to challenge themselves to “think differently” when solving our client’s needs. This philosophy evolved out of necessity during our initial years as a company, around the Great Depression of the 1930s, and has since become the cornerstone of our culture.

Water is all we do, it’s our focus, our business and our passion. We are one of the only engineering firms in the ENR Top 100 Rankings with a total commitment to water. What our singular focus means for you is access to the best water talent in the industry, along with exceptional client service and innovative technical solutions. It also means complete dedication to you and your needs, because we live and die by our reputation in the water industry; success on your projects, which includes extraordinary client satisfaction, is an absolute must!

We look forward to continuing to work with the Water and Wastewater Services staff to **“THINK DIFFERENTLY”** and solve your needs.

Sincerely,

CAROLLO ENGINEERS, INC.

Elizabeth Fujikawa, P.E., LEED AP
Vice President and Project Manager

300.51.BWC004 | 66231b8109314feb8eaf20ea0f7dc4d6.docx

WORKING WONDERS WITH WATER

Water is our focus, our business, and our passion. During our 85 year history, Carollo has successfully complete more than 25,000 projects. Unlike the majority of our competitors, we solely provide water and wastewater services and that’s where we focus our resources and energy, every day of every year. As a result, we are known in the industry for our innovative solutions.

What does that mean for Broward County WWS? Simply this: access to the latest available technologies, delivered by staff that are committed to your industry, resulting in cost effective and operable solutions for your needs.

**We acknowledge receipt of Addendum No. 1.*



WATER
OUR FOCUS
OUR BUSINESS
OUR PASSION

CONTENTS

**01 ABILITY OF PROFESSIONAL
PERSONNEL**

02 PROJECT APPROACH

03 PAST PERFORMANCE

- A Designing, Permitting, and Construction Management for Secondary Wastewater Treatment Plants
- B Regulatory Issues Related to Wastewater Treatment and Disposal
- C Designing, Permitting, and Construction Management for Wastewater Pump Stations and Split Case Horizontal Centrifugal Pumps

04 WORKLOAD OF THE FIRM

05 LOCATION

**06 WILLINGNESS TO MEET
TIME AND BUDGET
REQUIREMENTS**

**07 VOLUME OF PREVIOUS
WORK**

RESUMES



1. Ability of Professional Personnel

The BEST of Both Worlds – **LOCAL EXPERTS** Supported by National Bench Strength

Carollo Engineers, Inc., (Carollo) is a nationally recognized firm that was established in 1933 to solely provide water, wastewater, and stormwater related services. Our South Florida staff brings expertise on local technical and regulatory issues gathered from addressing the day-to-day needs of numerous local clients since we opened our first Florida office in 2001. As illustrated in the map on page 2, we now provide water and wastewater services throughout the state.



Water is our focus, our business, and our passion. During our 85-year history, Carollo has successfully complete more than 25,000 projects. Unlike the majority of our competitors, we solely provide water and wastewater services and that’s where we focus our resources and energy, every day of every year. As a result, we are known in the industry for our innovative solutions.

What does that mean for Broward County WWS? Simply this: access to the latest available technologies, delivered by staff that are committed to your industry, resulting in cost effective and operable solutions for your needs.

The best indicator of our ability to exceed expectations is that over 90 percent of our local work comes from “repeat” clients such as these: Broward, Palm Beach, and Miami-Dade Counties; the South Florida Water Management District; the South Central Regional WWTDB; and the cities of Pompano Beach, Margate, Sunrise, West Palm Beach, and Boynton Beach. All projects cited throughout this Evaluation Criteria include references.

Required Depth of **EXPERTS** to Meet Your Needs

We understand that there may be a wide array of potential projects under this contract. As a result, we drew from the depth of experience of our South Florida staff to create our project team. For a particular project, we will select the most qualified Project Manager from our pool to best lead the work. All of our potential Project Managers excel in communication skills, which is essential to being able to work with your staff to understand your needs and feedback, and in turn clearly translate that information to our project team. Supporting our Project Manager will be a team of engineers, experts in their respective fields, who will bring lessons learned from prior projects. Our organizational structure is shown below. This combination of knowledgeable, highly motivated local staff, and dedicated firm-wide support will make certain that the quality and responsiveness of our services are exceptional. Resumes are included at the end of this Evaluation Criteria.



Subconsultants:

- | | |
|--|---|
| 1. JLA Geosciences | 5. Stoner & Associates, Inc. |
| 2. McNabb Hydrogeologic Consulting, Inc. | 6. RADISE, Inc. |
| 3. Gamboa Engineers, LLC | 7. Cordova Rodriguez & Associates, Inc. |
| 4. Chen Moore, Inc. | |

Benefits to the Carollo Team's Organizational Structure

- ✓ A **Contract Manager** with a history of success delivering similar projects for the County, servicing WWS for this contract as one single point of contact for all projects.
- ✓ Multiple **Project Managers** capable of overseeing the delivery of projects across a wide range service areas and disciplines.
- ✓ Dedicated **Project Delivery Team** of subject matter experts assigned to deliver tasks in support of all projects.
- ✓ **Support Discipline Leads** skilled in their respective areas of practice providing support to the project delivery teams.

Senior Leadership and Specialty Expertise

Successful completion is about more than the design firm. More important to the effort are the key team members who will be delivering your work. Our team includes seasoned project delivery design specialists, each with a key role to meet the technical requirements of your projects.

Carollo Key Staff



LIZ FUJIKAWA, P.E.

Contract/Project Manager

31 YEARS OF EXPERIENCE

Liz has extensive experience managing vast and complex water and wastewater projects. She has excellent communication skills, and will be able to work with you to understand your needs, and in turn, translate those needs to our team.



CHUCK SINCLAIR, P.E.

Principal-in-Charge

27 YEARS OF EXPERIENCE

Chuck's work experience includes planning, design, and construction services for water and wastewater collection, conveyance, and treatment facilities. He has been actively involved in the preparation and presentation of project data, client and agency coordination and public outreach.



JUAN OQUENDO, P.E.

Project Manager

14 YEARS OF EXPERIENCE

Juan's project experience covers a broad range of civil and environmental engineering projects. His experience includes planning, design, and construction services for water and wastewater treatment facilities. He also has extensive experience in biosolids management, storm water, and climate resiliency.



ROBERTO ORTIZ, P.E.

Project Manager

40 YEARS OF EXPERIENCE

Bob has led teams in planning and design of water and wastewater facilities for Miami-Dade, Broward, and Palm Beach Counties. He is familiar with your unique challenges as his entire career has been spent in South Florida.



RANDY BRALEY, P.E.

Project Manager

36 YEARS OF EXPERIENCE

Randy's vast design management experience includes practically all aspects of wastewater and reuse process treatment elements, including preliminary, primary, secondary, and tertiary treatment, solids handling, and effluent disposal.



ROD REARDON, P.E.

Wastewater Treatment Plant Design,
Permitting, Pump Stations

39 YEARS OF EXPERIENCE

Rod has particular expertise in advanced wastewater treatment processes, including membrane technologies, for the removal of nutrients and for producing reclaimed water fit for various types of reuse.



BOB CUSHING, PH.D., P.E.

Quality Manager/Regulatory and Compliance

27 YEARS OF EXPERIENCE

Bob has coupled fundamental concepts with sound engineering practices to provide creative, innovative, and enduring solutions to challenges faced by water and wastewater utilities. He has been responsible for numerous successful treatment facility planning and design projects.



LARRY ELLIOTT, P.E.

Quality Manager

35 YEARS OF EXPERIENCE

Larry has vast experience in planning, preliminary design, detailed design, and construction phase-services for water and wastewater treatment and conveyance facilities ranging in capacity from 1 mgd to more than 300 mgd.



DAVID AMMERMAN, P.E.

Wastewater Treatment Plant Design, Permitting, Pump Stations

32 YEARS OF EXPERIENCE

David's experience in water reuse, including planning studies, master plans, permitting, preliminary and final design, construction, and facility start-up and operations.



SUDHAN PARANJAPE, P.E.

Wastewater Treatment Plant Design, Permitting, Pump Stations

20 YEARS OF EXPERIENCE

Sudhan's experience includes nutrient removal processes such as 4-stage Bardenpho™ and MLE process, and advanced treatment processes such as membranes. He has also worked on wastewater residuals treatment processes involving anaerobic digestion, sludge dewatering and drying.



BILL MARSHALL, P.E.

Wastewater Treatment Plant Design, Permitting, Pump Stations

17 YEARS OF EXPERIENCE

Bill has served as a professional engineer in the areas of planning, permitting, design, and construction of various municipal water, wastewater, and reclaimed water projects. His expertise consists of preliminary and final design engineering phase services of municipal water, wastewater, and reclaimed water systems.



JESS BROWN, PH.D., P.E.

Regulatory and Compliance

19 YEARS OF EXPERIENCE

Jess is Director of Carollo's Research and Development Practice and leads Carollo's biological drinking water treatment initiative. He has extensive experience in water, wastewater, and reclaimed water treatment specializing in drinking water process, applied research, and water quality testing methods.



MICHAEL CARZO, CCM

Construction Phase and Startup
Services

33 YEARS OF EXPERIENCE

Michael has contributed to multi-million dollar construction projects throughout the United States, making decisions that impact resource requirements; scope, schedule, and sequence of project activities; client and team satisfaction; risk profile; quality; health, safety, and environmental factors; and financial performance.



TERRY STORCK

Construction Phase and Startup
Services

24 YEARS OF EXPERIENCE

Terry's background focuses on the planning, scheduling, inspections, and coordination of complex projects. He possesses technical knowledge and background in the mechanical, electrical, SCADA, computing and electronic communications areas.



STEVE WALKER, C.W.P.

Construction Phase and Startup
Services

34 YEARS OF EXPERIENCE

Steve's expertise in the operation and management of wastewater treatment facilities, brings a unique owner's perspective to plant operations from his experience in both private industry and municipalities.



JOEL SMASON, P.E.

Structural

42 YEARS OF EXPERIENCE

Joel's expertise includes preparation of preliminary structural designs, client assistance, supervision of personnel, preparation of budgets and estimates, and the development of detailed drawings and specifications. He also has experience with alternative project delivery methods including design-build and construction manager at risk (CMAR).



JEFF ALBAND, R.A.

Architectural

48 YEARS OF EXPERIENCE

Jeff is experienced in the architectural design, planning, detailing, and specifications of water and wastewater treatment plants. Jeff works closely with our engineering staff to develop architectural concepts for structures that support code compliance and operability.



CHAD GREEN, P.E.

HVAC/Plumbing

9 YEARS OF EXPERIENCE

Chad has extensive experience, and manages the building services group for Carollo. As a building mechanical engineer, he provides all aspects of design services associated with the design of air, heating, cooling, controls, plumbing systems, fire protection systems, odor treatment, and fuel systems.

An Established Team of Subconsultants

To provide the most value to the County for this contract, Carollo has thoughtfully selected an exceptional lineup of subconsultants to amplify and complement the technical expertise of our staff. We have an established relationship with our subconsultants. In fact, we have been working with Gamboa Engineers and Stoner & Associates on Broward County's High Service Pump Stations and Storage Tanks General Services contract for the past three years. Below you will see brief firm profiles for each subconsultant, demonstrating the expertise each brings to the Team.

Carollo subconsultant team members all have previous work experience with Broward County and are **FAMILIAR WITH YOUR CULTURE, NEEDS, AND EXPECTATIONS**. We have a seamless working relationship with a proven ability to cohesively deliver high quality work on time and within budget.



Chen Moore & Associates

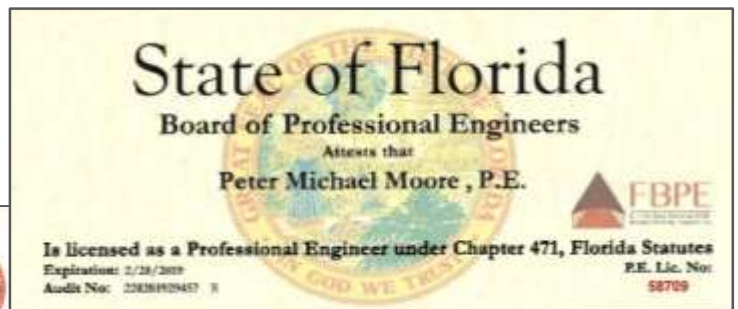
500 W Cypress Creek Rd, Suite 630, Fort Lauderdale, FL 33309

Role: Permitting, Civil/Site Engineering

Team Member: Peter Moore

Chen Moore and Associates is a multi-discipline consulting firm with offices in Broward, Miami-Dade, Palm Beach, Orange and Alachua Counties. Founded in 1986, Chen Moore and Associates specializes in civil and environmental engineering; landscape architecture; planning; GIS analysis and mapping; transportation, streetscaping and traffic improvements; construction administration; wastewater collection, transmission, reuse; pump station design and rehabilitation; water supply, treatment, and distribution; stormwater system design and master plans; and modeling and permitting of drainage, water distribution, and sewer collection. Dr. Chen founded Chen Moore and Associates with a belief that relationships are the key to the planning, design and construction of successful projects.

Peter Moore, P.E., LEED AP more than 21 years of experience with a wide variety of utility, stormwater, transportation and other infrastructure projects. Since joining CMA in 1999, Mr. Moore has focused on the management, planning, design, permitting, and construction of various utility infrastructure projects for public clients throughout South Florida. Mr. Moore has worked on literally dozens of unique projects for Broward County in his career, literally serving in every role in a project team. Of particular note is Mr. Moore's experience in value engineering, including projects for Broward County WWS, Miami-Dade Water and Sewer Department and a development client in Saudi Arabia.





Gamboa Engineers, LLC

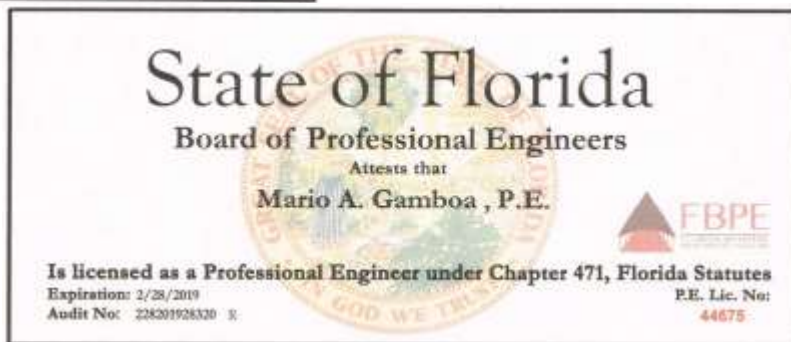
17433 SW 65 Court, Southwest Ranches, FL 33331

Role: Electrical and I&C Engineering

Team Member: Mario Gamboa, P.E.

Gamboa Engineers, LLC was founded by Mario Gamboa, P.E. who was formerly Carollo's, Chief Electrical Engineer for over 15 years. Gamboa Engineers a CBE specializing in Electrical and Instrumentation and Control engineering. Due to Mario's close relationship with Carollo, the firms work seamlessly in delivering innovative ideas. Gamboa Engineers is currently providing Electrical and I&C engineering on projects with Carollo for Broward County WWS, Pompano Beach, Margate, Boynton Beach, and the South Central Regional WWTP.

Mario Gamboa, P.E. professional experience spans 35+ years in design; value engineering; engineering management, construction management of numerous municipal and industrial projects. These include expertise focus with electric energy and automation for water treatment, wastewater treatment and pumping stations. Provided electrical design and instrumentation with construction specifications for 115 kV substations, medium voltage class (5-kV through 38-kV) and low-voltage power distribution systems; including prime and standby power generations systems, power for large pumps-motors with 5 kV variable speed controls systems; lighting systems; life safety systems; grounding; lightning protection; and SCADA automation systems.





JLA Geosciences, Inc.

1931 Commerce Lane, Suite 104, Jupiter, FL 33458

Role: Hydrogeology, Wells

Team Member: James Anderson, P.G.

JLA Geosciences, Inc. (JLA) was established in 2003 to provide clear solutions for its clients based on an in-depth knowledge of hydrogeology, groundwater, well systems, regulations and issues that affect water supply development. Their firm’s success has been largely due to their absolute “hands on” approach and involvement in every project. The principal hydrogeologists and professional geologists at JLA have the experience and local presence to make the right choices when and where it is needed: on time and on site. JLA maintains the firm belief that hydrogeology is a field science and that a successful hydrogeologic consultant must consistently provide excellence in the field. Specializing in:

- Hydrogeologic Subsurface Evaluation
- Hydrogeologic Database Search
- Groundwater Flow and Transport Modeling
- Environmental and Water Use Permitting
- Wastewater Disposal & Injection Well Services
- Well Construction Design and Services
- Well Acidization Design and Services
- Water Resource Evaluation
- Master Planning

James Andersen, P.G. has over 30 years working experience in hydrogeology, groundwater water resource investigations, well field design, construction, development, well problem evaluations and well rehabilitation. He has been responsible for the construction of and completion of hundreds of water supply wells in South Florida including over 100 in the Upper Floridan Aquifer. He has an extensive groundwater experience, working with coastal plain aquifer systems; well design; groundwater monitoring, geophysical well logging and interpretation; reverse osmosis (RO) raw water supply investigations and RO concentrate disposal by injection well; aquifer performance testing, analysis and computer modeling; wellfield contamination investigations, collection and analysis of water quality data; rehabilitation of old wells, and supervising various types of drilling.





McNabb Hydrogeologic Consulting, Inc.

601 Heritage Dr. #120, Jupiter, FL 33458

Role: Hydrogeology, Wells

Team Member: David McNabb

McNabb Hydrogeologic Consulting, Inc. is a small Southeast Florida-based hydrogeologic consulting firm specializing in deep injection well design, permitting, resident construction observation, and reporting services. Their focus is to provide efficient, value-oriented deep injection well consulting services. The staff at McNabb Hydrogeologic Consulting offer over 35 years of Florida hydrogeology consulting experience, most of which has been focused on deep injection well systems. The firm is located in Jupiter, Florida and is a South Florida Water Management District and Palm Beach County Water Utilities Department certified Small Business Enterprise (SBE).

David McNabb, P.G. is the president of McNabb Hydrogeologic Consulting, Inc. and brings over 26 years of deep injection well experience to the Carollo team. His experience while working at the FDEP in the Underground Injection Control program from 1992 to 1995 allowed him to develop a strong rapport with regulators and a thorough understanding of regulatory issues related to injection well system design, permitting, testing, construction and operation. While working for other consulting firms from 1995 to 2006 and working almost exclusively on deep injection well projects, Mr. McNabb managed over 50 deep injection well system design, permitting, construction observation, or testing projects. Since forming McNabb Hydrogeologic Consulting, Inc. in 2006, Mr. McNabb has worked exclusively on deep injection well system design, permitting, construction observation, testing and reporting projects.

Sally Durall has worked at McNabb Hydrogeologic Consulting, Inc. since 2008. She is recognized as highly experienced in the field of Class I deep injection wells. Ms. Durall brings over 16 years of deep injection well design, permitting, construction observation, testing and reporting services to the Carollo team. She has provided services during construction for over 25 deep injection well system design, permitting, construction observation, or testing projects.





Cordova Rodriguez & Associates, Inc.

6941 SW 198th Ave., #28, Pembroke Pines, FL 33332

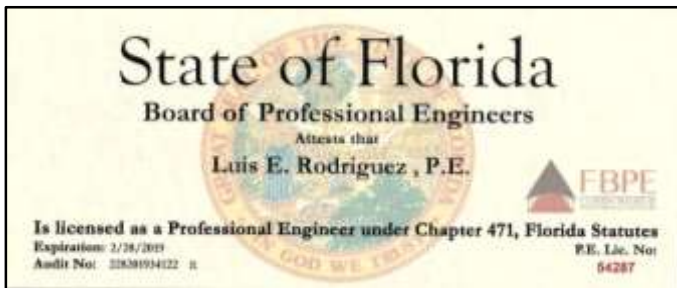
Role: Planning and Civil Engineering

Team Member: Luis Rodriguez, P.E.

Established in 2000, Cordova Rodriguez & Associates, Inc. (CRA) is a **CBE** multi-disciplinary firm which has earned local recognition as an exceptionally qualified and dedicated professional civil engineering and planning consulting firm. CRA is a multi-disciplinary firm with experience in all aspects of civil engineering, analysis and design, planning-current and long range; redevelopment/urban planning and design and sustainable design. Our qualified professionals have experience in design, preparation of contract documents, government approvals and permitting, bidding assistance, construction administration and review services.

Their firm's relevant experience includes studies for both planning and civil engineering, municipal consulting services, neighborhood improvement projects, plans review for several agencies and municipal projects including; airports, seaports, fire stations, parks, churches, residential and commercial developments as well as hundreds of private projects throughout Broward, Miami-Dade, and Palm Beach Counties.

Luis Rodriguez, P.E. over 25 years of experience in civil engineering. His project experience includes design of water distribution systems, sanitary sewer collection systems, sanitary sewer pump stations and force main, paving and drainage design, management of various land development projects, and permitting processing through various local and state agencies. He has extensive experience in construction management and administration.





Stoner & Associates, Inc.

4341 SW 62nd Avenue, Davie, FL 33314

Role: Surveying and Underground Locates

Team Member: Jim Stoner, PSM

Stoner & Associates, Inc. (Stoner) is a **CBE** Professional Land Surveying Consultant and Palm Beach County certified SBE. Their mission is to provide quality land surveying services, while utilizing the latest technology and techniques. Stoner has provided services to numerous municipalities, including, Broward County Aviation Department, South Florida Water Management District, Broward College, Town of Davie, City of Fort Lauderdale, and City of Sunrise. Services provided include:

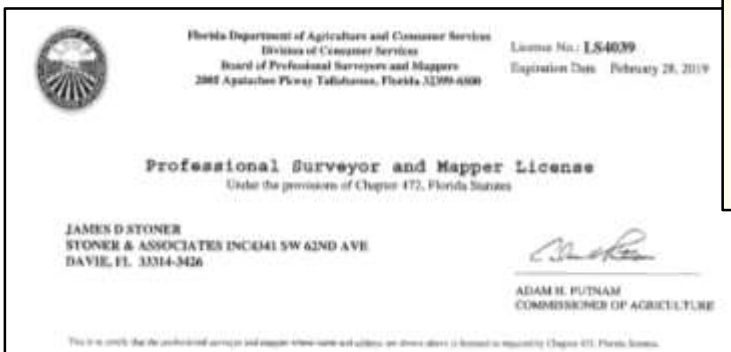
- ALTA/ACSM Land Title Surveys
- Aviation Surveys
- Boundary Surveys
- Construction Layout Surveys
- Engineering Design Surveys
- Environmental Support Surveys
- FDOT Surveys
- Platting
- Specific Purpose Surveys
- Topographic Surveys
- Utility Surveys

Stoner is currently working with Carollo on Broward County’s High Service Pump Stations and Storage Tank General Services contract. Stoner has performed land surveys for most municipalities and numerous governmental agencies and private clients within the Tri-County Area.

James D. Stoner, P.S.M. is a second generation Land Surveyor, with over 45 years of surveying experience in South Florida. He began his surveying career at Williams, Hatfield, & Stoner, Inc. working from the bottom as a Rodman, all the way up to Vice President of the Surveying Department.

Mr. Stoner founded Stoner & Associates, Inc. in 1988, based on the philosophy that attention to detail and quality work would create a successful firm. He manages all aspects of the firm’s growth and development.

Mr. Stoner has supervised both small and large scale surveying projects. His firm has successfully completed numerous roadway and other various projects, while working directly with the clients and consultants.





RADISE International, LC

3296 NW 9th Avenue, Oakland Park, FL 33309

Role: Geotechnical Engineering and Testing

Team Member: Tom Mullin, P.E.

Founded in 1997, RADISE International, LC (RADISE) specializes in providing geotechnical engineering, materials testing and inspection services. RADISE has a staff of 62, including local professional engineers, field and laboratory technicians, geotechnical drillers, inspectors and support staff servicing Broward, Palm Beach, and Miami Dade Counties.

For 20 years, RADISE has provided geotechnical engineering, field and lab construction materials testing, inspection, and quality control services for projects throughout Florida. Their significant experience and a solid background working with both the public and private sectors in South Florida.

Tom Mullin has 40 years of geotechnical engineering experience including water resources engineering including ports and harbors, dams and reservoirs. He has served as Chief Geotechnical Engineer on numerous projects for private and public clients including the South Florida Water Management District (SFWMD), United States Army Corps of Engineers (USACE) and Florida Department of Transportation (FDOT).

He provides quality assurance and quality control; materials testing engineering services including soils, foundations, and geotechnical investigations; vibration monitoring; materials and systems testing; and structural and special assessments testing services.

His skills include foundation design and construction, backfilling, test programs, quality control testing procedures and documentation, installation and evaluation of geotechnical monitoring instrumentation, vibration monitoring and pile load testing. He provides quality assurance oversight; CEI documentation; construction surveillance, inspection and testing; and technical peer review.



2. Project Approach

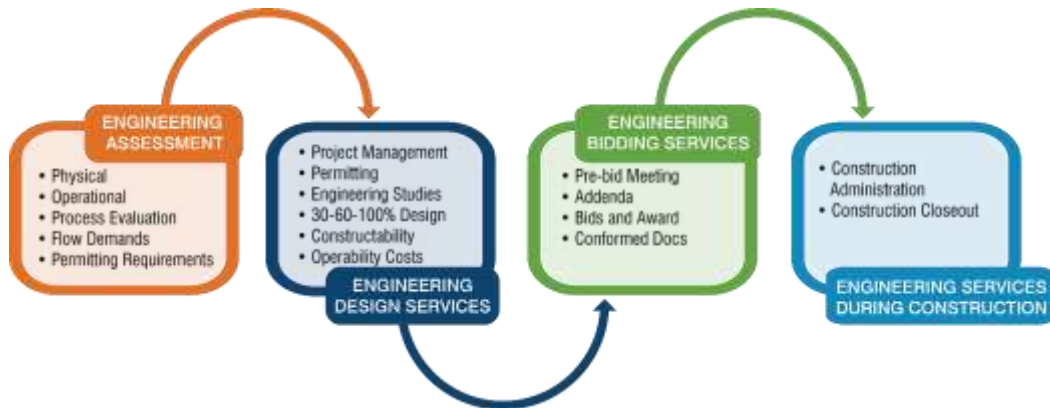
THINK
differently



At Carollo, we've always believed that innovation is not a process but rather an outcome-created by challenging ourselves to **"THINK DIFFERENTLY"** about all the possibilities.

The Standard Project Approach

A typical approach to engineering projects includes four phases: assessment, design, bidding, and construction management:



At Carollo, we incorporate a “think differently” attitude into our projects, leading to innovative ideas that result in better answers, such as increased capacity, better treated water quality, lower capital and operational costs, and ease of operation.

How Do We **THINK DIFFERENTLY** and Exceed your Expectations?

A Fresh Approach

We approach each of our projects with a clean slate, avoiding preconceived notions that could bind us to previous technical solutions. Our experience spans a wide array of technologies, allowing us to address the specific needs of our clients from conventional to leading edge treatment processes.

Proven Experience

We have successfully completed Wastewater Treatment Plant (WWTP) projects across the U.S. and throughout Florida, addressing a wide variety of treatment needs, providing design, permitting, and construction phase services for hundreds of plants. We span the technology range to address the specific needs of our clients with conventional tried and true

engineering methods, to leading-edge advanced treatment technologies. Our design experience incorporates nearly every type of wastewater treatment process, ranging from headworks with fine screens to coarse screens, conventional activated sludge to biological nutrient removal processes, cloth filters to membranes, and UV to ozone. Our solids process experience ranges from dissolved air flotation thickeners to rotary drum thickeners, egg-shaped digesters to two-phased digestion, and from screw presses to centrifuges. We bring state-of-the-art solutions to our clients employing resource recovery solutions like OSTARA®, membrane bioreactor technology, and high rate sanitary sewer overflow and combined sewer overflow processes such as ACTIFLO®.

Doing More with Less

In today's challenging economic times, we understand the importance of doing more with less by maximizing the opportunities to use our client's existing infrastructure. While there is always an easy answer to "build more," we strive to find solutions that save costs. Common examples from our past projects are: rerating existing processes to increase capacities, converting obsolete tankage into new processes, and finding hydraulic bottlenecks that can be simply remedied.

A recent example of this is our discovery of a 25 percent Annual Average Daily Flow capacity increase at the South Central Regional Wastewater Treatment Plant. Highlights of this are featured in the case study below.

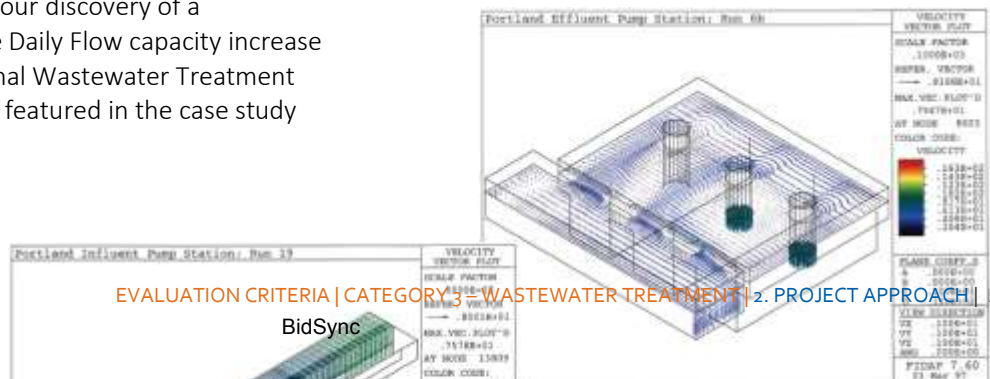


Using Innovative Tools

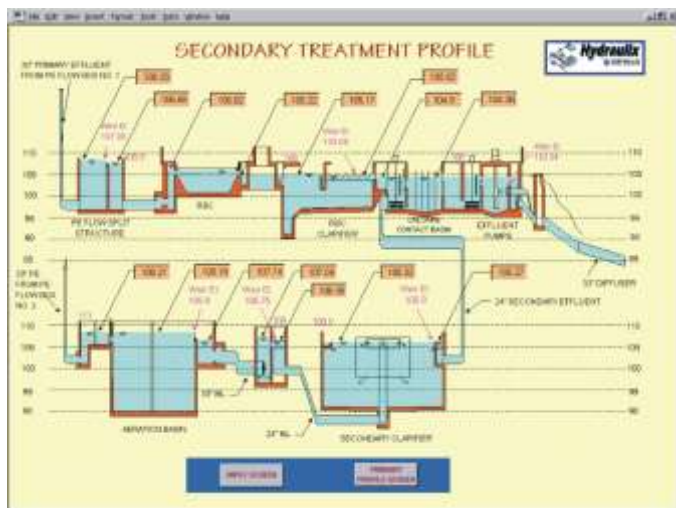
Our team is in the forefront of developing and utilizing new tools for our clients. We recognize that maximizing value comes from using the right tools for the right application. These include cloud-based systems for project management, specialized scheduling and cost estimating software, and even laboratory services for leading edge research to yield innovative results.

Computational Fluid Dynamics

Carollo also uses computational fluid dynamics (CFD), a modeling technique by which flow patterns within a hydraulic facility, such as a pump station's wet well or a downstream flow splitting box, can be simulated numerically. This tool allows us to fully understand the flow streams within these facilities in an effort to minimize short circuiting, reduce vortex formation, and address sedimentation. The foundation for the CFD models is based on a highly accurate and advanced modeling technique called the finite element method. Such high-accuracy models were previously used by the aerospace, biomedical, and defense industries. With the advent of high speed computers, and in response to our clients' optimization needs, Carollo has refined and adapted these high-accuracy models for application within the water and wastewater industry.



EVALUATION CRITERIA | CATEGORY 3 – WASTEWATER TREATMENT | 2. PROJECT APPROACH |



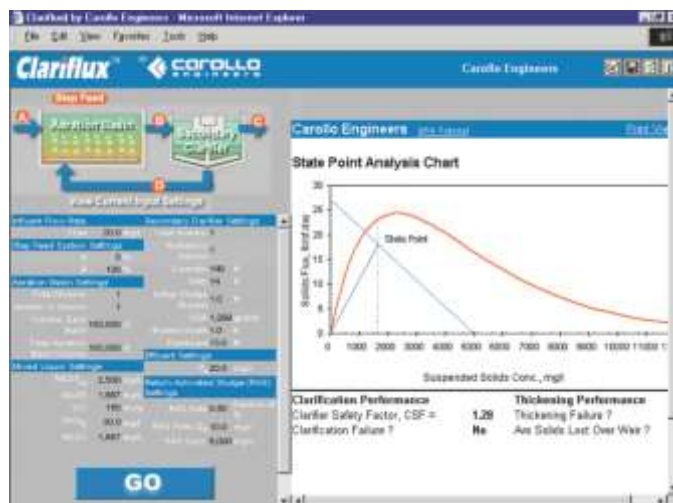
Hydraulix® Hydraulic Model

Hydraulix is a hydraulic modeling tool developed by Carollo to evaluate plant hydraulics. What sets Hydraulix® apart from other hydraulic models is its integration of a sophisticated graphical user interface with an easy-to-use computational format. The development of the Hydraulix® model bridges the gap between non-user-friendly design spreadsheets and complicated commercial models. It is an acknowledgment of a common theme we have heard from clients over the past few years — a desire on the part of the plant staff to have an easy-to-use hydraulic tool that will help them optimize plant operation. Hydraulix® utilizes advanced graphical user interface features and can be used effectively even by nonexperts. The pictorial format allows the user to “click” process units on or off and to evaluate the resulting impact on the plant hydraulics. The model can be used to answer the many “what if” questions that typically emerge during the day-to-day operation of a treatment plant. Hydraulix® can also be used to analyze different operational configurations and to establish hydraulic capacities under these configurations.

Clariflux® Activated Sludge Solids Model

Clariflux® is an activated sludge simulation model developed by Carollo that provides a visual depiction of the solids interactions occurring between the aeration basins and the secondary clarifiers in an activated sludge process. Understanding these interactions can be critical for both design and operation because the overall success of the process depends on the ability to capture solids to prevent their escape in the effluent, and to adequately thicken in the clarifiers. Solids flux theory provides the theoretical background that describes these interactions; however, because of the complicated nature of the theory and the mathematical analysis involved in its application, it is generally not used in operational practice. As a result, the solids interactions in the activated sludge process are often poorly understood, and operational decisions relating to these interactions tend to be made on a trial-and-error basis.

Clariflux® removes the guesswork by providing a userfriendly tool for investigating the impact of different operational changes at a desktop level. The user-friendly graphical user interface allows the model to be easily used, even by non-experts. Using a click-and-configure approach, plant operations staff can easily configure the input screen to match the actual plant operational setup, and observe the resulting impact of operational changes on solids inventory in the activated sludge process. The model allows the user to analyze the impact of different parameters, including mixed-liquor suspended solids concentration, return rate, and sludge settleability.



Clariflux® is an effective operational tool that can be used to evaluate and optimize different operational configurations at a desktop level before changes are made to actual plant operation.

“*Their work on the project was exceptional both from the technical standpoint where their membrane design achieved a sustainable 93% recovery, and from the managerial standpoint, keeping the project on track and meeting all of our needs, expectations and preferences.*”

Rafael Terrero, PE, BCEE, MASCE,
Assistant Director,
Miami Dade Water and Sewer Department

Partnering for Collaboration: We approach every project with a discussion between the key stakeholders; operators, management and our technical experts. Our experience shows that when we have input from all stakeholders, we can collaboratively obtain a solution that reflects your vision.

The best way to present our approach for a typical task order expected under this Contract is to give examples of how we have successfully approached our past projects. As you read the approach for each of the example projects below, please pay special attention to how we "think differently" to find innovative solutions for complex problems. Each representative project is relevant to a key issue or project that Broward may need to address within the next few years. Our team is committed to developing creative ideas for each of your projects that will result in **cost-effective solutions to solve your needs.**

Our Overall Approach to Work

Carollo's overall philosophy is founded on simple precepts:

- ▶ **Hire and retain the best people in the business.** *The most critical element for a successful project is the individuals who do the work. Carollo aggressively recruits highly experienced and successful engineers along with the top engineering graduates entering the work force. Our training and mentoring process allows younger engineers to become industry leaders. TWA will benefit from our management philosophy due to the dedication of our Principal-in-Charge, Larry Elliott, and our entire team. We also create successful teaming environments by developing communication skills and a commitment to building and maintaining lasting client relationships.*
- ▶ **Specialize in the planning, design, and construction management of water projects.** *This is our core business. Our success hinges solely upon our ability to provide cost-effective and responsive service to our clients.*
- ▶ **Focus on client service.** *Carollo knows the value of listening to our clients and recognizes that successful projects result from our staff working as an extension of your staff. This commitment to listening and valuing client input is the cornerstone of Carollo's 85 years of success. We take pride in the large number of clients with whom we have maintained continuing relationships. We have worked with some clients for over 80 years — validating the quality of our work, cost control, and ability to meet schedules. We strive to live up to our mission statement, "Dedicated to creative, responsive, quality water solutions to those we serve."*
- ▶ **Key senior staff involvement in each and every project stage.** *This provides you with top management interest, clear accountability and responsiveness, and helps make sure that the necessary staff and resources are committed to each assignment.*
- ▶ **Involvement of your end-users.** *We advocate establishing a core team of your engineering, O&M, and construction (if applicable) staff who will remain involved in the project from the initial planning through completion. This core team will be responsible for review of all design-related documents and participate in project workshops. The result is a better product, broader buy-in and support, and project continuity that will reduce revisiting previously made decisions.*

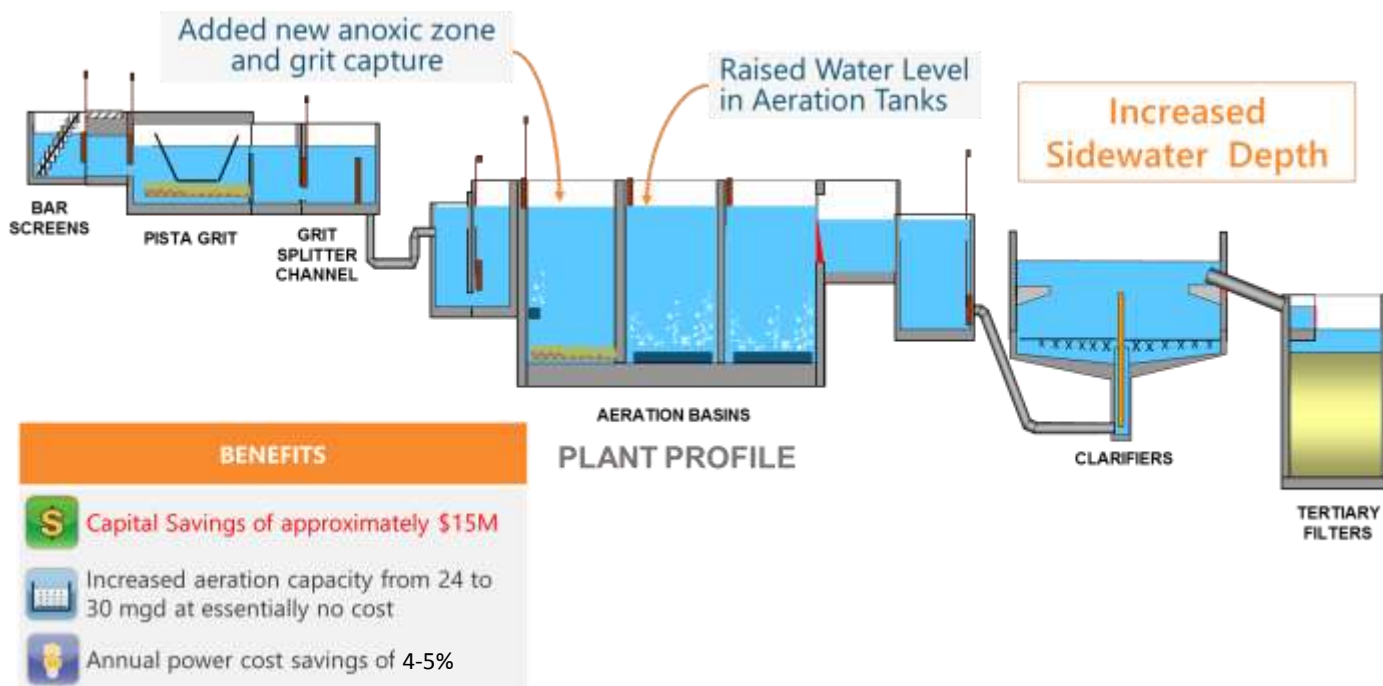
CASE STUDY

THINKING DIFFERENTLY to Discover Hidden Capacity Unused for 26 Years at the SCRWWTP

The South Central Regional Wastewater Treatment Plant, located in Delray Beach, was constructed with a capacity of 12.0 mgd annual average daily flow in 1979, and later expanded to 24.0 mgd in 1987. Similar to Broward’s North Regional Wastewater Treatment Plant, the SCRWWTP has a process consisting of influent screens, grit removal in a Pista Grit system, aeration and secondary clarification followed by tertiary filtration. Also similar to the North Regional Plant, the SCRWWTP had mechanical aeration that was later converted to fine bubble diffusers in 1992.

As part of the aeration system replacement project, Carollo evaluated options to increase treatment capacity. In evaluating the hydraulic profile, the project team discovered an unused 2.3 foot sidewater depth in the aeration basins that could be gained by a simple increase in the effluent weir elevation. **The sidewater depth increase resulted in a 25 percent capacity increase, an annual power cost savings of 4 to 5%, and an approximate \$15M capital cost savings.**

South Central Regional WWTP D/B Aeration/Capacity Improvements





3. Past Performance

ENGINEERING EXCELLENCE for Innovative, Cost-Saving Solutions

During our 85-year history, Carollo has successfully led the industry in innovative, cost-saving solutions.

We are currently ranked within Engineering News

Record's (ENR) top 500 design firms. More importantly, ENR ranks Carollo among the top 10 firms for water and wastewater. Carollo only provides water and wastewater-related services, solely hiring staff with the extensive background, training, and dedication to this field. For that reason, we bring an unequaled level of understanding of key supply, treatment, and conveyance issues to solve your needs with proven, industry-leading answers.

Carollo is the largest ENR 500 design firm working exclusively in water and wastewater, allowing us to provide unmatched talent and solutions.



We Are a LOCAL FIRM WHO UNDERSTANDS Your Issues

We are also experts in the local concerns of utilities like yours in South Florida, addressing the day-to-day needs of Broward County WWS as well as the South Central Regional Wastewater Treatment and Disposal Board, Palm Beach County, Miami-Dade County, and Cities of Sunrise, Pompano Beach, and Margate. We understand the issues that you are facing: water reliability and availability; meeting treatment goals; managing energy costs; accounting for variability in chemical and labor costs; providing for future flexibility; meeting regulatory requirements of FDEP and the Health Department; and, of course, developing capital plans within a rapidly recovering economy.

What does all this mean? Carollo brings a proven track record of projects similar to those anticipated to be performed under your General Services contract, completed on time and within budget, with an emphasis on industry-leading technology to maximize your dollars. We have

included reference letters and evaluations that speak to our knowledge and service to our clients.



What Sets **US APART...**

Our Industry Leadership

Carollo only provides services supporting water and wastewater related services. We focus on the water/wastewater industry, fostering a reputation for leadership and innovation. Our leadership role is exemplified by the following:

- **First engineering firm in the waterworks industry to apply computational fluid dynamics (CFD)** the groundbreaking application was optimization of the hydraulic characteristics of an ozone contact chamber. We recently developed a CFD model for your IX contactor design. Improving on the design we did for Palm Beach County's system, incorporated alternating mixer directions to create a more uniform resin bed, which lowered resin loss, and increased efficiency resin contact.
- **Pioneered the use of UV irradiation for drinking water treatment** via multiple research projects with WaterRF and construction of the first full-scale UV validation facility in North America.
- **First engineering firm to incorporate micro- or ultrafiltration in conjunction with lime softening treatment.** This concept was pioneered by Carollo and tested on pilot scale operations in the Midwest. Full-scale, award winning facilities employ this exciting technology, now being utilized by numerous other clients seeking superior water quality at an affordable price.
- **Carollo developed the use of biological active filtration** for the removal of a host of compounds from drinking water supplies, including nitrates, MIB & geosmin, pharmaceutical compounds, perchlorate, and a host of other contaminants. Several pilot testing programs are now underway and full-scale facilities being designed to incorporate these customized removal technologies at vastly reduced cost when compared to alternative treatment technologies, such as RO treatment.
- Multiple times over the last 10 years, **Carollo has led the industry with the most number of papers accepted for presentation at national conferences** (i.e., AWWA, ACE, and WEFTEC), and has consistently been in the top three regarding number of papers presented. Our leadership in the industry has also been recognized with the award of several WaterRF, WaterReuse Foundation, and Water Environment Federation research projects.

Award Winning Recognition



State-of-the-Art MIEX® System



- This project won an award from the Florida Institute of Consulting Engineers.
- The system is the largest MIEX System of its type in North America.
- The system has saved PBC approximately \$310,000/year in operations costs.



Expansion to 11.6 mgd



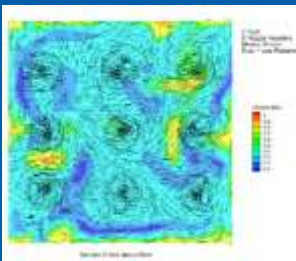
- This project won the 2012 Florida Section Design-Build Institute of America (DBIA) Award for Water/Wastewater projects.
- Provided pilot testing, design, and construction phase services for the membrane treatment system.



Design of Pump Station and Inflow Structure



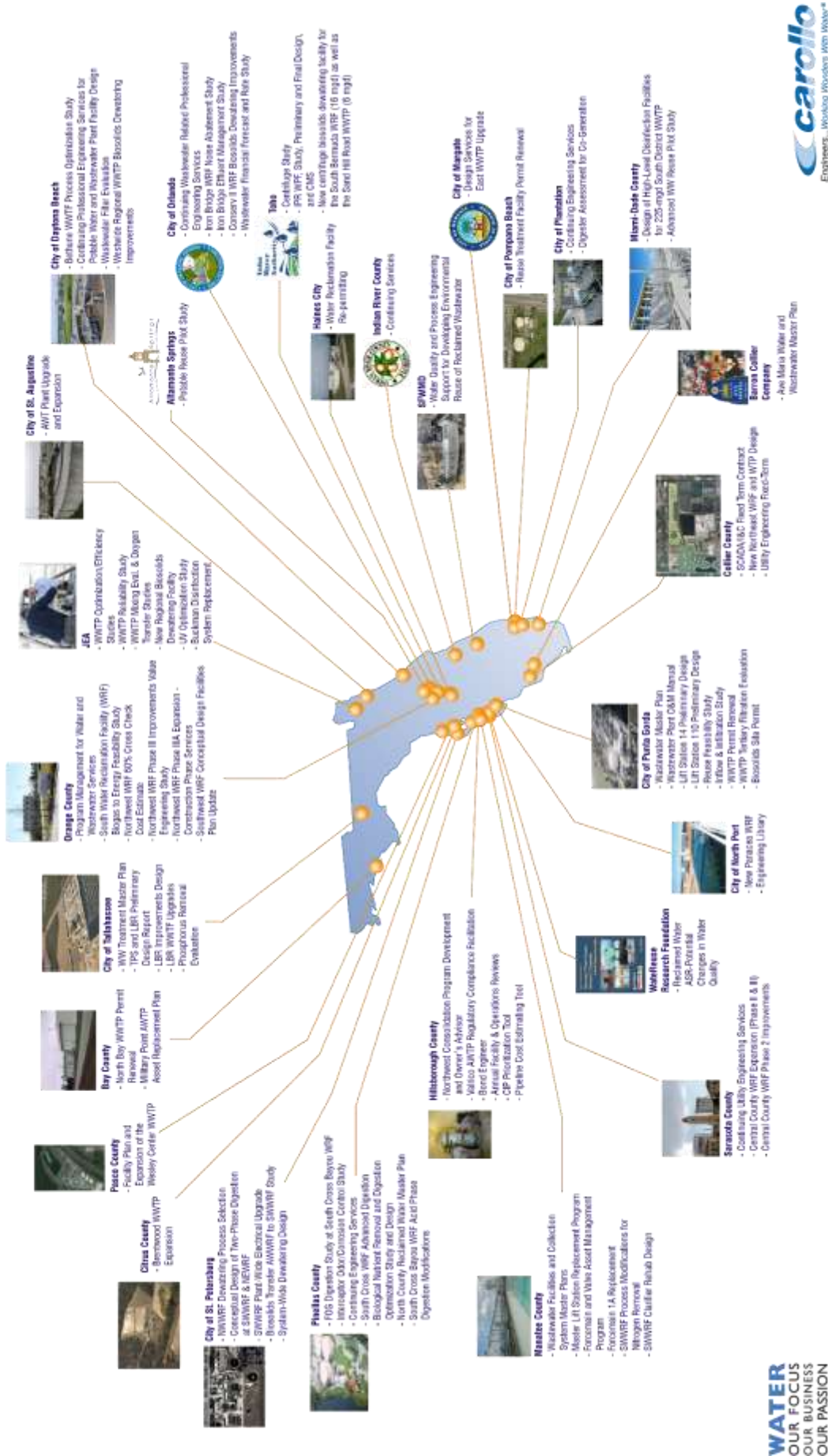
- The L-8 Flow Equalization Basin Project received the "Engineering Project of the Century"



Carollo developed a CFD model for Boynton Beach Utilities IX project, the counter rotating mixers reduce resin loss and increase resin efficiency, **ULTIMATELY REDUCING OPERATIONAL COSTS.**

Award from the Florida Engineering
Society.

Carollo's Representative Experience – Florida Wastewater Projects



Our Best Proof of GREAT PERFORMANCE is what our past clients say...

Carollo prides itself on the continuing relationships that we have developed with our clients. We have provided letters of recommendation from the following clients:

- Manatee County Utilities
- City of Orlando
- Orange County Utilities
- City of Punta Gorda
- Sarasota County
- City of Sunrise
- Florida Water Services



Innovative Solutions

Innovation is vital to all we do. We work tirelessly to advance the science and engineering of water, finding the most creative and technically sound solutions to meet industry needs.



Superior Service

The satisfaction of our clients means everything. It defines who we are and determines our future. We take this responsibility very seriously, and are committed to providing the highest level of service in the industry.



WATER
OUR FOCUS
OUR BUSINESS
OUR PASSION

Our exclusive focus on water helps attract talented people who have a passion for water and the expertise required to solve our most pressing water challenges. We apply that passion and expertise to create innovative, cost-conscious solutions delivered with service that exceeds expectations.

Talented People

Our people set us apart. From recent graduates to career professionals, we employ some of the best engineers, scientists, and support staff in the industry – all focused 100% on water.



Collaborative Culture

We seek long-term relationships founded in meeting our commitments, developing mutual trust and respect, and fostering a collegial, collaborative working environment.





Utilities
Wastewater
4410 66th Street West
Bradenton, FL 34210
Phone: (941) 792-8811, ext. 5235
www.myanatee.org/utilities

November 7, 2014

Subject: Services Provided to Manatee County Utilities by Carollo Engineers for Headworks Rehabilitation at the Southwest Water Reclamation Facility

To Whom it May Concern:

Please accept this correspondence as opinion of services provided by Carollo Engineers regarding referenced subject.

Carollo Engineers has recently completed study, design, and most construction phase services for significant upgrades and rehabilitations to Manatee County's 15 mgd Southwest Water Reclamation Facility headworks structure. To date, the County is very pleased with the level of service provided by Carollo Engineers.

They have demonstrated an attention to detail, cost-consciousness, and an overall commitment to the success of the project. They have provided an exceptional level of knowledge and expertise and the proper amount of resources required to ensure a quality product. They have worked especially well with our staff to ensure concerns were addressed and project deadlines achieved.

It is our opinion Carollo Engineers has provided excellent services throughout this project and we believe they have the resources, commitment to quality, and expertise to manage similar efforts. Please feel free to contact me at the number listed below should you have questions or require additional information regarding this matter.

Sincerely,

Jeff Goodwin
Wastewater Division Manager

LARRY BUSTLE * MICHAEL GALLEN * JOHN R. CHAPPIE * ROBIN DISABATINO * VANESSA BAUGH * CAROL WHITMORE * BETSY BENAC
District 1 District 2 District 3 District 4 District 5 District 6 District 7



CITY OF ORLANDO

October 31, 2014

SUBJECT: Carollo Engineers, Inc.
Letter of Recommendation
City of Orlando City Project 6464
Conserv II Biosolids Dewatering System Improvements

To Whom It May Concern:

In 2013, the City of Orlando (City) selected Carollo Engineers, Inc. (Carollo) for a \$6.5M project to replace the aging biosolids dewatering system at the City's Conserv II Water Reclamation Facility (WRF). The preliminary phase of the project included side-by-side pilot testing of multiple mechanical dewatering systems at the WRF, for which Carollo developed the Pilot Test Protocol, oversaw the testing, and analyzed and summarized the pilot test data. Also included in the preliminary phase of the project was a complete evaluation of the existing dewatering system at the WRF, including the mechanical dewatering equipment, sludge pumping, polymer system, dewatered sludge conveyance system, and odor control system. A series of technical memorandums were developed that formed the basis of design for the dewatering system components.

The City is currently preparing to enter into the final design phase of this project with Carollo. This was the first time we hired Carollo for a design project and we are extremely pleased with that decision. From the start, they have performed very professionally, been extremely responsive and have brought the most qualified and appropriate personnel to service us and our needs as a client. Carollo has delivered on all their promises plus more. The City is looking forward to completing the next phases of this project with Carollo.

In my opinion, Carollo is a top-notch consulting firm with a staff of highly skilled engineers. Based upon my experience on this project, I would have a strong willingness to hire Carollo for future work involving wastewater treatment processes.

Sincerely,

A handwritten signature in blue ink, appearing to read "Kristi L. Fries".

Kristi L. Fries, P.E.
Project Manager
kristina.fries@cityoforlando.net
407-246-3353

CAPITAL IMPROVEMENT & INFRASTRUCTURE DIVISION • PUBLIC WORKS DEPARTMENT
CITY HALL • 400 SOUTH ORANGE AVENUE • ORLANDO, FLORIDA 32801-3302
• Fax (407) 246-2892 • <http://www.cityoforlando.net>



WATER RECLAMATION DIVISION

Larry G. Tunnell, PE, PG, *Manager*

9150 Curry Ford Road
Orlando, Florida 32825-7600
Telephone: 407-254-9685
Fax: 407-254-9899
Email: Larry.Tunnell@ocfl.net

October 23, 2014

To Whom It May Concern:

Carollo Engineers Inc. (Carollo) was selected by Orange County Utilities (OCU) to provide Program Management services for water and wastewater treatment. This multi-year contract began in June 2009 and ended in May 2014.

Under this Contract, Carollo successfully completed the following tasks.

- **Southwest Water Reclamation Facility Conceptual Design Update** – Prepared a planning level document for recommendation of the most appropriate biological treatment process for a new 5 mgd advanced wastewater treatment plant to serve the Southwest Service Area of Orange County, FL. The treatment goal was to achieve the Florida AWT requirement of 5:5:3:1 (concentrations of BOD:TSS:TN:TP in mg/L). A detailed planning level biological treatment alternatives analysis for five process alternatives including (a) Five-stage Bardenpho with secondary clarifiers and disk filters; (b) Five-stage Bardenpho with secondary clarifiers and tertiary membrane filters; (c) Five stage Bardenpho with membrane bioreactors; (d) Three-stage BNR with denitrification filters; and (e) Step-feed BNR. Comparison was based on several economical and non-economical parameters. A conceptual level site layout for the entire facility and preliminary activated sludge basin layouts were prepared as part of the comparison. The planning level document also included future phase add-on advanced treatment processes such as ozone followed by GAC and low and high-pressure membranes were evaluated to produce effluent amenable to direct aquifer recharge.
- **Northwest Water Reclamation Facility Phase III Expansion (expand facility from 7.5 mgd to 11.25 mgd) Value Engineering Study** – Conducted a Value Engineering Study with a goal to reduce the capital costs from \$56M to less than \$35M.
- **Eastern Water Reclamation Facility Phase V Expansion (19 mgd to 24 mgd) Value Engineering Study** - Conducted a Value Engineering Study with a goal to reduce the capital costs from \$89M to less than \$50M.
- **South Water Reclamation Facility Phase V Expansion (43 mgd to 56 mgd) Value Engineering Study** - Conducted a Value Engineering Study with a goal to reduce the capital costs from \$120M to less than \$80M.
- **South Water Reclamation Facility (43 mgd) Optimization** – Conducted process optimization study to investigate increasing the capacity of the Southeast Oxidation Ditch from a design capacity of 7.5 mgd to 10.0 mgd.
- **South Water Reclamation Facility (43 mgd) Platform Mechanical Mixer Evaluation** – Performed a full-scale pilot study (90 days) to test side-by-side four platform mechanical mixers for anoxic basins. The results of the study were compiled and recommendations were made for OCU to include up to three manufacturers in the bid specifications.
- **South Water Reclamation Facility (43 mgd) Biogas to Energy Alternatives Analysis** – Planning level study for implementing cogeneration project using biogas produced at the anaerobic digesters at the South Water Reclamation Facility. The study included the following three elements:
 - Evaluate various energy recovery (power generation) technologies using biogas.

Carollo Evaluation
October 24, 2014
Page 2

- Perform a market survey and evaluate introduction of fats, oil, and grease (FOG) to the anaerobic digesters to increase gas production.
- Prepare an energy recovery alternatives analysis document including an executive summary
- **South Water Reclamation Facility (43 mgd) Disk Filter Evaluation Study** – Conducted a full-scale side-by-side pilot study of four major disk filters in municipal market as part of an evaluation study. The pilot study was conducted for three weeks and several parameters were monitored including Turbidity, TSS, Phosphorus, Fecal Coliforms, Headloss, Backwash volume and frequency etc. Further the evaluation included several economic and non-economic criteria. The results of the study were compiled and recommendations were made for OCU to include up to three manufacturers in the bid specifications.

Carollo's performance on this contract has been excellent. Work was performed on time for the budgeted amount. Carollo's staff is very professional and proactive in meeting the County's needs and provided the highest level of technical expertise. Carollo was reselected for this contract again in June 2014 for a period of three years with options for up to two one-year extensions.

Please call with any further questions.

Respectfully,



Larry Tunnell, P. E., P.G, Manager
Orange County Utilities
Water Reclamation Division



City of Punta Gorda, Florida

*Utility Department
326 W. Marion Avenue
Punta Gorda, Florida 33950
941-575-3339*

September 8, 2015

Re: Laura Baumberger, P.E., Carollo Engineers, Inc.

To whom it may concern:

I am pleased to write this letter of recommendation for Laura Baumberger. The City of Punta Gorda has been working with Ms. Baumberger and Carollo Engineers on several water and wastewater treatment, water distribution, wastewater collection, and master planning projects since 2006. Carollo is our consulting engineer of record for water and wastewater planning studies, and Ms. Baumberger has successfully managed and led our department to completion of 27 projects over the past nine years. Ms. Baumberger demonstrated early in her work with us that she is an exceptional engineer and manager.

I have found the way in which Ms. Baumberger manages projects to be invaluable. She has consistently guided our City through a well-organized process involving many stakeholders to reach consensus and buy-in regarding our future water supply sources in a number of water master planning efforts. She is very well organized and thrives in complex and complicated situations. She regularly reports to our Utility Advisory Board and has facilitated workshops with our City Council, which has helped the Utilities Department communicate the City's water supply goals, challenges, and programs to a diverse group of elected and appointed officials. Without exception, she was able to bring diverse groups to consensus on a variety of complicated decisions.

Another notable success was her management and engineering role in modeling and evaluating the City's water distribution system. Ms. Baumberger and her team assisted the City in identifying a number of water distribution operational improvements during modeling efforts and made recommendations for changes in operation that have substantially decreased the City's distribution system energy costs.

Aside from her engineering and management skill, Ms. Baumberger is someone that my staff truly enjoys working with. Although she brings the utmost professionalism to any project and situation, we have appreciated her easygoing personality and commitment to being a team player. While sincerely devoted to her work, she is also very enjoyable to be around.

The City has been very satisfied with the performance of Ms. Baumberger and Carollo Engineers. I would recommend them to any utility with water or wastewater planning or design needs looking for a consultant that has demonstrated the ability to successfully complete a variety of diverse projects.

If at any time you wish to discuss our experience with Ms. Baumberger or Carollo, please feel free to contact me at 941-575-3339.

Sincerely,

Tom Jackson
Utilities Director
City of Punta Gorda

In Beautiful Charlotte County



November 3, 2014

To Whom It May Concern:

RE: Professional Performance of Carollo Engineers

Sir or Madam:

Sarasota County has maintained a professional relationship with the firm of Carollo Engineers for over ten years. During that time, Carollo has provided us with consulting and engineering services for projects that include research, operation and maintenance, renewal and replacement, and the design and construction of improvements to the county's water and wastewater treatment systems. Most recently, we have been working with Carollo on a major project involving the multi-year expansion of the Central County Water Reclamation Facility which is one of our County's large regional treatment facilities. While Carollo is the local recognized leader in treatment technology, they have also provided valuable services with respect to all forms of utility design and construction.

Staff members of the County have been extremely pleased with the cost, quality, timeliness, and responsiveness of the professional consulting and engineering services that we have received from Carollo. Our association has been very positive and we have always found the principals, staff members, and support staff to be above average in professional capability.

I am confident that our favorable experience with Carollo is reflective of the level of service and satisfaction that others can expect, and I highly recommend them to other potential clients who are seeking quality, professional engineering services that are personally customized to meet their particular project requirements.

Sincerely,



Gregory Rouse, P. E. (FL)
Utilities Technical Manager
Sarasota County Public Works



September 27, 2012

Ms. Deborah Beatty & Selection Committee Members
Toho Water Authority

RE: Cypress Lake WTP, Wellfield and Water Main

Dear Ms. Beatty:

This is a letter offered for the purposes of recommending a firm who is currently applying for consideration for selection as a consultant for your water treatment and main project. I have worked with Carollo Engineers, Inc. in the City of Sunrise for the past three (3) years, and we have recently implemented an extensive water and wastewater treatment and system rehabilitation, renewal and expansion in our City and I want to highly recommend this firm for these services.

Carollo Engineers, Inc. have performed very professionally, been extremely responsive and brought the most qualified and appropriate personnel to service us and our needs as a client. They have already completed designs for a Reverse Osmosis Water Treatment Facility, replacement of Sodium Hypochlorite disinfection facility, and a rehabilitation of our oldest lime softening water treatment plant.

This firm delivers proposals, design services and client satisfaction promptly and to the highest possible level, at reasonable pricing. We are quite satisfied with our experience working with Carollo Engineering, Inc. and have been thoroughly satisfied with the services we've received from Larry Elliot, P.E., Lyle Munce, P.E., Chris Rheinbold and the rest of their support team at the local Sunrise, FL office.

If you have any specific questions for us about our projects or experiences working with Carollo Engineering, Inc. you may contact me at (954) 888-6055.

Sincerely,

A handwritten signature in blue ink, appearing to read "Timothy A. Welch".

Timothy A. Welch, P.E.
Utilities Director
City of Sunrise



December 31, 2003

Mr. Robert S. Cushing, Ph.D., P.E.
Partner
Carollo Engineers, P.C.
401 N. Cattlemen Road, Suite 306
Sarasota, Fl 34232

RE: FWS Reference Letter

Dear Bob:

Florida Water Services (FWS) is a private company providing water and wastewater services to more than half a million residents in 120 communities throughout Florida. In April of 2003, Florida Water Services contracted with Harn R/O Systems to provide the design/build delivery of the Palm Coast Membrane Softening Plant Expansion from 3.2 to 6.4-mgd. Harn R/O retained Carollo Engineers to provide professional engineering services for this \$2.5-million construction project. Carollo's services also included design through final expansion to 9.6-mgd.

FWS elected to expand the Palm Coast Membrane Softening Plant using a design/build delivery due to a challenging schedule that required the work to be completed in only 15-months. Carollo has been instrumental in keeping this project on schedule. Carollo completed the Preliminary Engineering Report (PDR) and FDEP construction permit application in 6 weeks from notice to proceed. The permit was approved by FDEP 2-weeks after submittal. FDEP staff commented that this was a record time for permit processing from their office and was largely due to the quality of Carollo's PDR and permit application package.

Carollo has stayed on-time and on-budget while delivering a value-added design. Only one change order has resulted from this project, and it includes some changes to the project scope that we initiated. Design innovations offered by Carollo also promise to save FWS over \$100,000 per year in O&M savings due to the addition of VFDs and interstage booster pumps.

P.O. Box 609520 / Orlando, Florida 32860-9520 / Phone (407) 598-4100

Water For Florida's Future

A. DESIGNING, PERMITTING, AND CONSTRUCTION MANAGEMENT SERVICES FOR **WASTEWATER TREATMENT PLANTS** IN THE STATE OF FLORIDA

Carollo is a leader in the planning, design, and construction for wastewater treatment facilities. We have planned and designed wastewater treatment projects of varying complexity and using a vast array of differing technologies.

Unmatched Wastewater Treatment Plant Design Experience

Carollo is nationally recognized for our technical capabilities and our ability to offer advanced solutions that are practical, affordable, and reliable. We have a solid foundation in water and wastewater treatment process evaluation and design and have conducted multiple projects for many of our clients. This has allowed us to respond to the ever-evolving needs of our clients while providing industry standard, yet innovative, solutions. Our focus is to maximize the use of existing infrastructure whenever possible, promote environmental conservation, and make the best technologies available at a competitive cost.

Our design experience incorporates nearly every type of wastewater treatment process, ranging from headworks with fine screens to coarse screens, conventional activated sludge to biological nutrient removal processes, cloth filters to membranes, and UV to ozone. Our solids process experience ranges from dissolved air flotation thickeners to rotary drum thickeners, egg-shaped digesters to two-phased digestion, and from screw presses to centrifuges. We bring state-of-the-art solutions to our clients employing resource recovery solutions like OSTARA®, membrane bioreactor technology, and high rate sanitary sewer overflow and combined sewer overflow processes such as ACTIFLO®.

As shown on the map on the next page, our wastewater experience is extensive in the State of Florida.

WASTEWATER SERVICES PROVIDED BY CAROLLO:

- Master and Facility Planning
- Wastewater Treatment Design
- Infrastructure Design
- Hydraulic Modeling
- Biosolids Management
- Water Reuse
- Renewable Energy Technologies
- Odor Control Testing and Design
- Greenhouse Gas Monitoring and Reporting
- Applied Research and Pilot Studies
- Electrical and Arc Flash Studies
- SCADA Programming Services
- Financial Analysis
- Permitting Support
- Operations Support
- Asset Management
- Grant Funding Assistance
- Construction Management

Experience by the Numbers



B. REGULATORY ISSUES RELATED TO WASTEWATER TREATMENT AND DISPOSAL SPECIFIC TO SOUTHEAST FLORIDA

Carollo is known for our innovative approaches to solving increasingly complex regulatory compliance challenges faced by utilities. We are extremely active in research and have built a reputation for applying the latest in technologies. Over the past 10 years alone we have provided innovative engineering solutions for more than 200 wastewater treatment facilities ranging in capacity from 1.0 to 300 mgd. Many of these projects were award-winning and all-inclusive (planning, design, construction services, and O&M assistance) projects to solve the same complex issues faced by Broward County such as stringent effluent requirements, changing water resources, siting issues, budget constraints, and aging equipment-issues. Our recent projects demonstrate our ability to successfully balance complex technical, legal, regulatory, and institutional issues to produce clear, concise, cost-effective, and implementable solutions as recognized by our industry awards. For example:

Carollo can also assist WWS in the regulatory arena based on our experience and working relationships with regulatory agencies. One of the keys to our success in implementing challenging projects is our ability to initiate and maintain close coordination with the various regulatory agencies responsible for permitting these projects. We have a long history of working closely with federal and state of Florida regulatory agencies such as the FDEP, to successfully implement cutting edge utility projects. The following are a few examples of the technical support which has been provided by Carollo to regulatory agencies in their development of regulatory guidelines, as well as our strong working relationship with these regulatory agencies:

- Carollo was part of the FDEP Technical Advisory Committee that developed Florida's current reuse regulations.
- Carollo staff held key roles in developing the EPA Guidelines for Water Reuse.
- Carollo supported the FWEA Utility Council for the proposed EPA numeric nutrient criteria.
- Carollo was a key participant in Reuse coordinating committee related to clarification of the water management districts role in reuse.

More recently we have worked closely with FDEP to gain approval for a soil-aquifer treatment based potable reuse pilot study for the TOHO Water Authority, in Orlando, we have conducted workshops with FDEP on the 50 MGD indirect potable reuse Tampa Augmentation Project and are members of

the ongoing Florida Potable Reuse Commission which is formulating a framework for Florida's next generation of potable reuse regulations. All these examples of our relationships and working experience with regulatory agencies can be clearly extrapolated to WWS and its regulatory framework.

Experience on projects directly related to OOL compliance. Carollo is currently involved with the Ocean Outfall Legislation and has ongoing work to help the Miami-Dade Water and Sewer Department (MDWASD) attain compliance. All three of MDWASD's regional WWTPs need to comply with the OOL legislation. The Ocean Outfall Legislation resulted in a \$5.3 Billion program to upgrade all their three WWTPs and build a new western WWTP. Carollo is part of the team of design engineers tasked to complete the engineering studies and design efforts to upgrade MDWASD WWTPs to meet OOL requirements. Carollo is currently working on the design phase of proposed improvements at the South District WWTP for MDWASD aimed at meeting the OOL requirements by 2025.

Carollo is a recognized leader in the design and construction of aquifer storage and recovery wells, wellhead treatment, and potable production well projects. We also have extensive experience in master planning, water resources planning, capacity studies, and evaluations directed toward enhancing water quality, permitting and complying with emerging regulations.

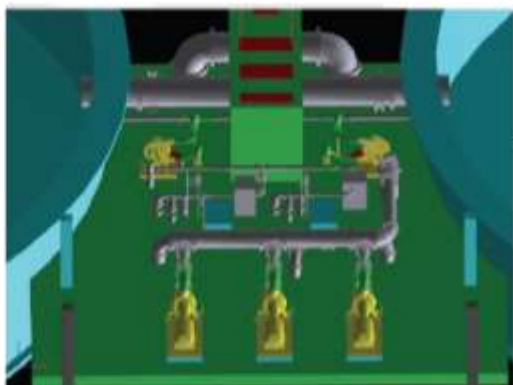
C. DESIGNING, PERMITTING, AND CONSTRUCTION MANAGEMENT SERVICES FOR WASTEWATER PUMP STATIONS

WASTEWATER INFRASTRUCTURE EXPERTS

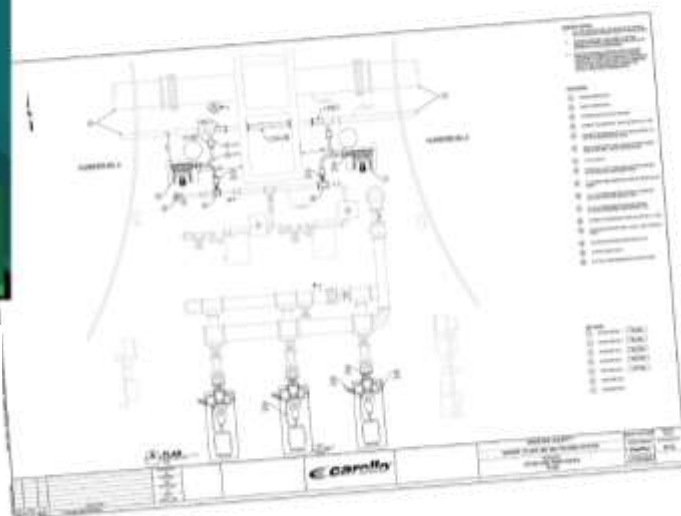
Carollo has worked with cities, public utility districts, and community groups to provide planning and/or design for more than 1,000 wastewater infrastructure projects. We match the needs of our clients with the latest technology to achieve innovative and cost-effective results. We have provided engineering solutions for wastewater pipelines and pump stations capable of handling flows ranging from less than 1 mgd to over 650 mgd in capacity. Successfully managing these projects has required developing measures to identify and procure environmental documentation, maintain facility operation during construction, and find ground-breaking ways to reduce costs and maintain schedules. We are also experienced in coordinating public awareness programs to minimize disruption of business and residential activities during construction and in providing transportation planning and control.

Sanitary Sewer Pump Stations

Carollo has planned, designed, and/or assisted in the construction of over 500 wastewater pump stations. These pumping facilities serve a number of specific functions, including influent, effluent, RAS, WAS, combined sewer overflow, storm water, and No. 3 water pumping. Our pump station designs range in size from 1 mgd to 600 mgd and have individual horsepower capacities of up to 2,500. These facilities have included various types of pump configurations including wet pit (propeller, mixed flow, and turbine type), dry pit, submersible, self-cleaning, vertical, horizontal, solids handling, and screw pumps. Pump drives include constant-speed and multi-speed electric motors and various types of variable-speed drives including variable frequency drives; gas, diesel, and dual-fuel engines; gear drives; and V-belt drives. Many of these projects have involved innovative features to minimize community and environmental impacts, such as special architectural treatments and odor and noise control measures.



Producing detailed plans and specifications make all the difference when it comes reducing errors and costs. Carollo employs 3-D design on our projects with results in fewer conflicts and change orders.



PAST PERFORMANCE

Our Past Performance on projects similar to what is anticipated under this General Engineering Services Contract demonstrates our ability to deliver a wide range of assignments on time and within the budget that WWS has set for each project. The matrix below presents a summary of recent projects for which we have provided similar services as outlined in your solicitation. Detailed project summaries for some selected projects are included on the following pages.

Project Info			Role/Services				Scope Elements						
Project/Client	State	Capacity (mgd)	Role (prime/sub)	Design	Permitting	Construction Support	Activated Sludge	Anaerobic Digestion	Recycled Water	Ocean Outfall	Deep Injection Wells	Pump Station (type)	Pump Station (size)
Miami-Dade/B&C Design Services for Wastewater Treatment Related to the Ocean Outfall Legislation Projects	FL	112.5	S	4	4	4	4		4	4		DPSPS	185 hp (6)
JEA – Buckman WWTF Biosolids Conversion	FL	52.5	P	4	4	4		4				PDPS	500 – 100 hp
JEA Buckman Disinfection System Replacement	FL	52.5	P	4	4	4	4		4				
City of Orlando – Conserv II Water Reclamation Facility	FL	21	P	4	4	4	4					HNCP, PDP, SPCP	40 hp (4) 40 hp (4) 15 hp (3)
South Central Regional Wastewater Treatment and Disposal Board – SCRWWTP Aeration System Replacement and Capacity Upgrade	FL	24	S (D/B)	4	4	4	4			4	4		
City of Margate – Design Services for East WWTP Upgrade – IFAS Conversion	FL	7.9	P	4	4		4				4		
City of Daytona Beach – Westside Regional WRF Improvements	FL	15	P	4	4	4	4		4			SP, SCP	40 hp (2) 75 hp (4) 40 hp (4)
Pasco County – Wesley Center WWTP Rehabilitation and Expansion	FL	9	P	4	4	4	4		4			TPS,DPSPS, SPS,IBPS	150 hp (5)
Toho Water Authority – South Bermuda WRF Upgrades and Expansion	FL	16	P	4	4	4	4		4			RAS/WAS	
Orange County Utilities – Program Management Wastewater Services	FL	11.25/ 24/56	P		4	4	4	4	4				

Project Info			Role/Services				Scope Elements						
Project/Client	State	Capacity (mgd)	Role (prime/sub)	Design	Permitting	Construction Support	Activated Sludge	Anaerobic Digestion	Recycled Water	Ocean Outfall	Deep Injection Wells	Pump Station (type)	Pump Station (size)
Sarasota County, Central County Water Reclamation Facility Expansions	FL	8	P	4	4	4	4		4			Various	10 - 370 hp
Manatee County – Southwest WRF Headworks and Clarifier Improvements	FL	15	P	4		4	4		4				
Collier County – Planning and Design for WRF/WTP	FL	4/10	P	4	4		4		4		4	Various	10 – 1,600 hp
Pinellas County – WWTP Planning and Design	FL	33	P	4	4	4		4	4				
City of Tallahassee – Lake Bradford Road WWTF Improvements	FL	4.5	P	4	4		4		4			Various	10 – 540 hp
City of St. Petersburg – Northeast Water Reclamation Facility Improvements	FL	16	P	4		4	4		4				
City of Punta Gorda – Wastewater Treatment Plant Permit Renewals	FL	4	P		4		4				4		
Pinellas County Sewer Interceptor Rehab at 94 th and 86 th	FL		P	4	4	4							
Miami-Dade County – South District Wastewater Treatment Plant High – Level Disinfection Design – Hazen Sawyer (sub)	FL	225	S	4	4	4	4	4	4	4	4	Screw ps	8 – 400 hp
Manatee County – Utility Engineering Services for Booster Pump Station 428 Force Main	FL	3.7	P	4	4	4						VDPS, IBPS	100 hp
City of Plantation – Regional Wastewater Treatment Plant and Central Water Plant Pump Speed Controller Upgrades	FL		P								4		
Pinellas County – South Cross Bayou Water Reclamation Facility Acid-Phase Digestion Modifications	FL	33	P	4				4					
Martin County Utilities – Tropical farms W/WWRF Injection Well System – McNabb Hydrogeologic Consulting, Inc.	FL		P	4	4	4					4		
Miami-Dade County – FPL Turkey Point Injections Well System – McNabb Hydrogeologic Consulting, Inc.	FL		P	4	4	4					4		
City of Lake Worth – Injection Well System – McNabb Hydrogeologic Consulting, Inc.	FL		P	4	4	4					4		

Project Info			Role/Services				Scope Elements						
Project/Client	State	Capacity (mgd)	Role (prime/sub)	Design	Permitting	Construction Support	Activated Sludge	Anaerobic Digestion	Recycled Water	Ocean Outfall	Deep Injection Wells	Pump Station (type)	Pump Station (size)
Palm Beach County – Deep Injection Well Rehabilitation and Capacity Re-Rating – JLA Geosciences, Inc.	FL		P		4						4		

VDPS = Vertical Dry-Pit Submersible Pump
 DPSPS = Dry-Pit Submersible Pump Station
 IBPS= In-line Booster Pump Station

VTPS = Vertical Turbine Pump Station
 SPS = Submersible Pump Station
 PDPS = Positive Displacement Pump Station

HNCP = Horizontal Non-clog Centrifugal Pump
 SPCP = Self-Priming Centrifugal Pump

National Experience Designing Large Wastewater Lift Stations

Project	Capacity (mgd)	Wet Pit/Dry Pit Configuration	Flow Range Analysis	Force Main Sizing	Wet Well Sizing and Configuration	Pump Sizing and Configuration	Flood Mitigation
Orange County Sanitation District Ocean Outfall Booster Pump Station	600	4		4	4	4	4
Dallas Water Utilities Activated Sludge Influent Pump Station	350		4	4	4	4	
Dallas Water Utilities Southside WWTP Influent Pump Station C Evaluation	348	4	4			4	
Orange County Sanitation District Plant 2 Headworks Influent Pump Station	340	4	4		4	4	4
Orange County Sanitation District Plant 1 Headworks Influent Pump Station	328	4	4		4	4	4
SROG/City of Phoenix 91 St. Ave. WWTP Effluent Pump Station	300		4	4	4	4	4
Denver Metro Wastewater Reclamation District Primary Effluent Pump Station	269	4	4	4	4	4	4
City of Portland Swan Island Pump Station	220	4	4	4	4	4	4
City of Salem Influent Pump Station	210		4		4	4	
City of San Jose WWTP Influent Pump Station	160	4	4	4	4	4	4
City of Garland Duck Creek WWTP Influent Pump Station	140		4		4	4	
Sacramento Regional County Sanitation District Arden Pump Station	100	4	4	4	4		
Vallejo Sanitation and Flood Control District Influent Pump Station	60	4	4	4	4	4	4
NTWMD Stewart Creek West Influent Pump Station	53		4	4	4	4	
City of Turlock WWTP Influent Pump Station	40		4		4	4	
City of Modesto River Trunk Pump Station	40		4	4	4	4	4
City of Phoenix Cave Creek WWTP Influent Pump Station	32	4	4		4	4	
Upper Trinity Regional Water District Riverbend WRP Influent Pump Station	20		4	4	4	4	
McAllen Public Utilities Balboa Lift Station	20		4	4		4	
City of Frisco Lone Star Ranch Lift Station	13		4	4	4	4	
Roseville Pleasant Grove WWTP Influent Pump Station	12		4		4	4	4

Design Services for Wastewater Treatment Plants Related to the Ocean Outfall Legislation Projects

MIAMI-DADE WATER AND SEWER DEPARTMENT,
FLORIDA

The Project ST-2D consists of the design of a new Electrical Distribution Building 3 (EDB 3) at the Miami-Dade Water and Sewer Department (MDWASD) South District Wastewater Treatment Plant (SDWWTP). The project includes power distribution planning for the eventual redistribution of new, existing, and future process loads between existing Electrical Distribution Building 2 (EDB 2) and new EDB 3. Electrical Distribution Building 1 (EDB 1) will be repurposed to electrical storage following the electrical power redistribution of process loads completed under this project.

Feasibility Evaluation. As part of the assignment, an initial feasibility evaluation was performed to select the most appropriate equipment. Evaluation of feasible alternatives for on-site power generation considered plant staff preferences and financial ramifications, including capital cost, operating cost, maintenance cost, and the assumed curtailment agreement value. Eight alternatives for on-site engine-generation equipment at SDWWTP were evaluated. The alternatives combined options for low speed and high speed; two- and four-stroke; diesel, gas, and dual-fuel; Tier rating and curtailment capabilities; and overall number of engine-generators.

Recommendations included the following:

- Recommended that MDWASD keep and, if possible, expand their curtailment agreement with FPL. Recommended that any new engine-generator unit to be installed at the SDWWTP be of the non-emergency type. This accommodates the flexibility in operation desired by plant staff.
- Recommended the implementation of a hybrid termed Alternative 7 for the engine generators in EDB 3, consisting of a combination of diesel and natural gas units, with additional diesel storage. This allows for operation under emergency conditions for a longer period when compared to diesel only units, assuming that the natural gas service is not affected.
- The high-speed hybrid alternative provides for higher financial benefits to MDWASD, as the operational expenditures to comply with the curtailment agreement as well as emergency operation, were greatly reduced due to the low cost of operating natural gas engines compared to diesel units.

Developed risk factors, flexibility of operations, regulatory requirements, capital and operation costs for the life of the project using a Montecarlo Simulation Analysis to develop the alternatives.

Qualifying Projects

Highlights:

- Ocean Outfall Legislation Compliance
- Air Quality Emissions/Permitting
- Electrical Improvements

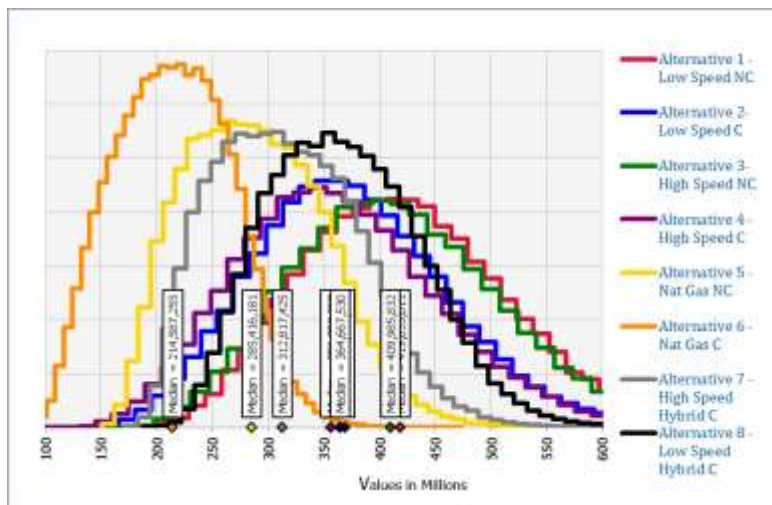
Role: Subconsultant
(Prime Consultant – B&V)

Dates of Services:

December 2013 - Ongoing

Reference Contact:

Jim Ferguson
Senior Program Manager
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Email:
James.Ferguson@miamidade.gov



Buckman Biosolids Capital Conversion Projects

JEA, FLORIDA

JEA performed a Biosolids Management Study in 2016-17 (BMS) to develop a vision and a plan for improving its biosolids management system over a 20-year period, with emphasis on systems and technologies with a projected lifetime of greater than 30 years. The BMS identified the following capital improvement projects. The order of projects listed below are organized in the order of how these will be designed, permitted and constructed.

The JEA Buckman Biosolids Management Facility serves as a regional residuals management facility that treats sludge from 9 treatment plants totaling 90 mgd of wastewater (total biosolids treated today are around 60 Dry tons/d).

Carollo was selected to design and construct the 9 projects. Project 1 is design and construction of a post aerobic digester (PAD) following the anaerobic digesters. The PAD process will remove up to 80% of nitrogen, 10% additional volatile solids reduction and also reduce odors and improve dewaterability.

Project 2 is design and construction of a new biosolids process facility comprising of new rotary drum thickeners and centrifuges for dewatering.

PROJECT NUMBER 1	Construct a DigestorePAD™ process for nitrogen removal in the recycle stream and other benefits such as further volatile solids reduction, minimize odor and struvite formation and improve sludge dewaterability.
PROJECT NUMBER 2	Construct a new Biosolids Process Facility for thickening, dewatering and truck loading.
PROJECT NUMBER 3	Add cogeneration capacity with a new 800 KW engine generator using digester gas. Also design affordable and efficient digester gas cleaning and conditioning equipment.
PROJECT NUMBER 4	Demolish existing Biosolids Process Building and reuse any components that are in good condition at the new Biosolids Process Facility.
PROJECT NUMBER 5	Double the size of the existing Vacuum Truck Unloading Facility including a new odor control system.
PROJECT NUMBER 6	Construct a new Electrical and Instrumentation Building with storage and workshop space (Single Story - 8,100 sf).
PROJECT NUMBER 7	Construct a new Operation and Maintenance Building (Single Story - 7,000 sf).
PROJECT NUMBER 8	Construct a new Pump Maintenance Building (Single Story - 17,000 sf).
PROJECT NUMBER 9	Construction of a new Raw Sludge Holding Tank

Qualifying Projects

Highlights:

- Post aerobic digestion to reduce 80+% of nutrients in the recycle stream and 10+% additional volatile solids destruction, odor mitigation and potential increase in cake dewaterability.
- Biosolids thickening and dewatering process evaluation and design of system improvements.
- Performed evaluation, Preliminary and Final Design phase services.

Role: Prime Consultant

Dates of Services:

2018 to 2023 (Est.)

Reference Contact:

Deryle Calhoun
Director of Water & Waste Treatment
PH: (904) 665-8455
Email: calhdi@jea.com

Project 3 is design of digester gas cleaning/scrubbing equipment and allow JEA to sell the gas to a third party vendor and get renewable credits.

Project 4 is demolition of the existing biosolids processing facility. This will be done after the construction and successful start-up of the new biosolids processing facility.

Project 5 includes upgrades and expansion of the existing Vacuum Truck Unloading Facility.

Project 6, 7 and 8 include a new electrical and instrumentation building, operation and maintenance building and a pump maintenance building respectively.

Buckman Street WWTF Improvements

JEA, FLORIDA

The Buckman Street WWTF (52.5 mgd) is currently under design for a new UV disinfection system to replace the aging and outdated technology of their existing UV disinfection system. Carollo was contracted to evaluate the disinfection technology to be used at Buckman moving forward, then provide procurement support of the UV equipment and preliminary design, final design, and construction phase services for the construction of the new UV disinfection system and associated upgrades to remedy hydraulic restrictions between the clarifiers and disinfection system.

Prior to this contract, Carollo has performed several other tasks at the Buckman Street WWTF including:

- UV optimization study,
- UV replacement study,
- Effluent hydraulic evaluation, and
- Design of HVAC improvements at the MCC building.

Qualifying Projects

Highlights:

- Design, Final Design, and Construction Phase Services

Role: Prime Consultant

Dates of Services:

2010 – Opn-going

Reference Contact:

Deryle Calhoun
Director of Water & Waste Treatment
PH: (904) 665-8455
Email: calhdi@jea.com



As part of a general services contract, Carollo has studied, designed, and permitting a variety of improvement projects at the Buckman WWTF.

Conserv II Water Reclamation Facility Biosolids Dewatering System Improvements Final Design and Construction Management

CITY OF ORLANDO, FLORIDA

The City of Orlando's Conserv II WRF provides service to a majority of the southwest section of Orlando. The WRF is currently permitted to treat 21 mgd annual average daily flow (AADF). Treatment process modifications are currently under construction to increase the permitted capacity to 25 mgd AADF.

Carollo is tasked with upgrading the existing biosolids dewatering system. The existing sludge treatment train includes gravity belt thickening followed by conventional anaerobic digestion with belt filter press (BFP) used for dewatering and final disposal by hauling offsite to land application. The major components of the existing biosolids dewatering system are reaching the end of their useful life. Carollo performed the preliminary study and evaluation. This study recommended the following improvements:

- Construct a new aerated WAS holding tank and new WAS feed piping.
- Remove cover at the existing digested sludge holding tank to convert the tank to an unmixed WAS storage under emergency only.
- Replace the four existing belt filter presses with new 3-belt design belt filter presses.
- Replace the existing four sludge feed pumps with new progressive cavity pumps and associated piping.
- Replace the existing belt conveyor cake conveyance system with a shaftless screw conveyor system.
- Replace the existing polymer storage and feed system with a packaged liquid polymer feed system.
- Replace the existing vacuum assisted wash water system with a new washwater system.
- Add a new biological odor control system to treat foul air from each dewatering belt filter press unit and modifications to the existing dewatering building ventilation system.
- Implement necessary modifications to the Dewatering building HVAC and plumbing, structural modifications to house the new dewatering equipment and associated electrical and instrumentation controls upgrades.

Carollo is also tasked with improvements to the existing return activated sludge (RAS), waste activated sludge (WAS) pumping systems, scum pumping systems, gravity collection drains for the biosolids, and a new aerated WAS holding tank. Carollo is performing the alternative analysis and developing the construction design documents for the recommended pumping system improvements and the biosolids improvements identified above

Qualifying Projects

Highlights:

- Biosolids evaluation and design of system improvements.
- Design upgrades to RAS and WAS pumping systems.
- Performed evaluation, Preliminary and Final Design phase services.

Role: Prime Consultant

Dates of Services:

2015 – Dec. 2018 (Est.)

Reference Contact:

Kristi Fries
Project Manager
PH: (407) 246-3353
Email: kristina.fries@cityoforlando.net

"This was the first time we hired Carollo for a design project and we are extremely pleased with that decision. From the start, they have performed very professionally, been extremely responsive and have brought the most qualified and appropriate personnel to service us and our needs as a client. Carollo has delivered on all of their promises plus more."

Kristi Fries, PE, Project Manager, City of Orlando, FL

SCRWWTP Aeration System Replacement and Capacity Upgrade

SOUTH CENTRAL REGIONAL WASTEWATER TREATMENT AND DISPOSAL BOARD, FLORIDA

South Central Regional Wastewater Treatment and Disposal Board (SCRWWTDB) contracted Carollo with two tasks: 1) Apply innovative ideas to inexpensively increase treatment capacity, and 2) Create cost effective improvements to generate operational cost savings to fund future improvements. The WWTP is permitted for an average daily flow of 24 mgd and treats an average of 17 mgd, with peak wet weather flows to 43 mgd.

The project work includes:

- Aeration Blower Replacement. New blowers will replace the multi-stage centrifugal blowers. Alternative blower technologies were assessed to select a technology and configuration to best fit existing aeration and electrical infrastructure, and maximize energy cost savings. Blowers will be sized to maintain operation from the existing to future annual average flow of 30 mgd.
- Hydraulic Modifications. The plant has several hydraulic bottlenecks that need to be remedied. Hidden capacity was discovered by raising the side water depth in the aeration basin, about a 9 percent oxygen transfer gain for substantial energy savings.
- Addition of a Selector Zone. The first aeration zone will be converted to a 4-zone anoxic selector, featuring coarse bubble zones. The selector will innovatively remove grit as-well-as condition the mixed liquor to improve settling and reduce overload of the tertiary filters.
- Aeration Basin Cleaning, Grit Removal, and Diffuser Replacement. The aeration basins will be cleaned, removing accumulated grit and rags, which were limiting capacity and negatively impacting performance. The existing ceramic diffusers will be replaced with a fine bubble diffuser system, increasing oxygen transfer efficiency, overall treatment performance, and provide energy savings by reducing the overall air demand.
- Air Header Piping Rehabilitation. Repair and rehabilitation work will be conducted on the existing 30" stainless steel air header yard piping to repair existing air leaks.

Highlights:

- Increased capacity through addition of selector zone and increased aeration sidewater depth.
- Saved energy by 9 percent through increased oxygen transfer efficiency.
- Identified and remedied hydraulic bottlenecks to allow increased capacity.

Role: Prime Consultant

Dates of Services:

2018 – 2023 (Est.)

Reference Contact:

Doug Levine
Chief of Operations
PH: (561) 272-7061
Email: dlevine@scrwwtp.org

Margate Design Services for East WWTP Upgrade – IFAS Conversion

CITY OF MARGATE, FLORIDA

Carollo's innovative application of leading edge and cost-effective technologies enables the East Wastewater Treatment Plant (East WWTP) to greatly increase capacity, enhance long-term reliability, and provide treatment flexibility to accept its ever increasing overall wastewater treatment role for the City of Margate's Department of Environmental and Engineering Services (City).

The City's 7.9-mgd West Wastewater Treatment Plant (West WWTP), centered on a rotating biological contactor (RBC) secondary treatment process, is facing rapid attrition of its RBC units through old age, thus permanently reducing treatment capacity. In response, the City must increase the treatment capacity of the 2.2-mgd East WWTP to meet overall City wastewater treatment needs. With the need to transition liquid treatment roles in the City, the East WWTP needs to be flexible to handling as much flow as possible, and meet potentially nutrient removal.

At the East WWTP, adding every drop of capacity possible as it becomes a long-term treatment work-horse must be accomplished at the lowest life-cycle cost. Additionally, optimizing plant-wide liquid and solids treatment requires the two plants to work cohesively as the East facility takes up slack from the West. In principle, the more treatment accomplished by the East WWTP the better.

The Margate Wastewater Treatment Facility (WWTF) consists of the East activated sludge treatment train and the West rotating biological contactor (RBC) treatment train with a permitted three-month average daily flow (TMADF) capacity of 10.1 mgd. The two treatment trains share common disinfection, effluent disposal, and residuals dewatering systems. Presently, the raw wastewater can be split between the two treatment trains via a tee on the influent force main with a manual flow control valve.

The scope of the improvements under design for the East treatment train includes the following:

- Upgrade the influent flow control valves for automated control.
- Add a magnetic flow meter on the raw influent piping to the East train for redundancy to the existing strap-on ultrasonic flow meter.
- Replace the 6-mm influent drum screen with a 3-mm influent drum screen.
- Replace the existing surface aerators with more efficient, medium bubble diffusers and associated blowers and air piping.
- Add integrated fixed film media (IFAS) and associated equipment into the existing activated sludge aeration basins to accommodate attached growth microorganisms.
- Add subdividing walls to the existing aeration basin to create an unaerated selector zone for improved settling characteristics of the biomass in the clarifier.
- Replace the mixed liquor piping in-kind.
- Replace the electrical power supply, instrumentation, and controls for the aeration system.
- Modify the waste activated sludge piping at the West treatment train to allow WAS to be directed from the East treatment train to the two existing digesters for added redundancy of digestion process.

Highlights:

- Increases capacity of the aeration system from 2.2 to 4 mgd.
- IFAS technology eliminated need to expand number of basins.
- Selector zone addition increased settleability of biomass.

Role: Prime Consultant

Dates of Services:

2018

Reference Contact:

Sierra Marrero
Dept. of Environmental & Engineering
Services
PH: (954) 972-0828
Email: smarrero@margatefl.com

Westside Regional WRF Improvements

CITY OF DAYTONA BEACH, FLORIDA

Carollo was retained to design several improvements to this Florida Advanced Wastewater Treatment Plant (AWT). The plant has a permitted capacity of 15 mgd, AADF and 45 mgd peak flow, providing reclaimed water to a reuse distribution system with wet-weather flow discharge to the Halifax River. Carollo prepared bidding documents for several upgrades while performing the following tasks:

- 1) **Tertiary Filter Evaluation Study.** Prepared conceptual level analysis of five improvement alternatives. Recommended replacing existing backwash filters with new deep-bed sand filters.
- 2) **Process Optimization Study.** Performed study to provide consistent nitrogen and phosphorus removal and reduce chemical expenditures. Evaluated historical performance of the facilities, the various operating systems, and identified and prioritized alternative approaches to improve performance and minimize chemical use. Recommended improvements including upgrade of the Bardenpho Stages 3 and 5 aeration systems.
- 3) **Influent Screens and Mechanical Mixers Replacement.** Designed new mechanical replacement screens with an option to rebuild. The City elected to rebuild the Parkson AquaGuard screens. Design included replacing existing mixers in the Bardenpho Stage 1 (anaerobic) process basins with new ragless mechanical mixers.
- 4) **RAS/WAS System Improvements.** Designed new pumps (screw centrifugal pumps) to replace the existing submersible pumps.
- 5) **New Tertiary Deep-Bed Sand Filters Design.** Prepared design documents for filters to handle the peak hour flow of 45 mgd with eight filter cells, filtered water clearwell and a mudwell.
- 6) **Stage 3 Improvements.** Designed improvements to the Stage 3 Bardenpho process, including replacing existing 150 HP mechanical surface aerators with larger 200 HP aerators and other ancillary support.
- 7) **CMAR Procurement and Project Bidding Assistance.** Prepared CMAR RFP and participated as a non-voting technical member.

Highlights:

- Process optimization study and recommendations.
- Replacement of aging process components.
- Tertiary filter study and design.

Role: Prime Consultant

Dates of Services:

2015- 2019 (Est.)

Reference Contact:

Shannon Ponitz
Utilities Engineering Manager
PH: (386) 671-8825
Email: ponitzS@codb.us



Westside Wesley Center WWTP Rehabilitation and Expansion

PASCO COUNTY UTILITIES, FLORIDA

Pasco County Utilities (PCU) is consolidating its interconnected system of seven WWTPs. As a result, the Wesley Center WWTP (WCWWTP) will receive a significant share of the generated sewage.

The WCWWTP is a Type I conventional activated sludge wastewater facility operated under permit No. FLA016094 pursuant to Rules 62-600 and 62-610 FAC. In 2007, the WCWWTP was expanded from 3.0 to 6.0 mgd capacity with a future build-out of 9.0 mgd.

Pasco County selected Carollo to perform a facility condition assessment and full evaluation, which identified and prioritized the improvements to the WCWWTP. These updates accommodate expansion to treat future flows and correct deficiencies caused by aging, corrosion, and construction. The County requested that Carollo perform the preliminary and final design on the priority improvements, which include new headworks and odor control, aeration system upgrades to each aeration tank, new chlorine contact tanks, new effluent transfer pump station, upgraded filter backwash and mudwell system, a new chemical system, as well as the upgrades to the electrical and instrumentation system. Carollo worked with the County throughout the design. The project is now under construction.

- New headworks and odor control.
- Process improvements to the existing biological train.
- Upgraded the clarifier drives and scum removal/pumping systems.
- New chlorine contact tank and effluent transfer pump station.
- New filter backwash mudwell and automate backwashing cycle for filters.
- Expanded the sodium hypochlorite chemical system.
- Installed new drain pump station
- Miscellaneous concrete and structural repair work at the biological basins, filter structures and sludge holding tanks.

Highlights:

- Upgrades addressed aging infrastructure.
- New headworks, aeration system, chlorine contact and filters.
- Facility condition assessment and evaluation.

Role: Prime Consultant

Dates of Services:

2016- 2020 (Est.)

Reference Contact:

Michael Carballa
Project Manager
PH: (386-671-8825
Email: mcarballa@pascocountyfl.net



South Bermuda WRF Upgrades and Expansion

TOHO WATER AUTHORITY, FLORIDA

Carollo was hired by Toho Water Authority to design upgrades to the South Bermuda WRF to expand the facility from 14 mgd to 16 mgd with peak flow of up to 40 mgd. This includes a new grit removal system, addition of a new secondary clarifier, improvements to the RAS and WAS pump stations, addition of disk filters, a new reclaimed water storage tank, expansion of the sodium hypochlorite system and other ancillary support systems.

As part of the new grit removal facility, Carollo evaluated two options including retrofitting an unused primary clarifier with HeadCell® 12-tray units versus a brand new standalone structure with two new HeadCell® 12-tray units complete with the Eutek slurry-cup and grit-snail grit washer/separators systems. A CFD model was developed to determine the flow splitting features to distribute the flow evenly as well as ensuring grit does not settle out in the approach channels.

Carollo provided planning through construction and start-up services, permitting activities, bidding and CMAR construction delivery. The design is anticipated to be completed in June 2018 and construction is anticipated to be completed by June 2019.

In a related project, Carollo also designed a new centrifuge biosolids dewatering facility for the South Bermuda WRF as well as the Sand Hill Road WWTP, which has a rated capacity of 6.0 mgd.

Highlights:

- Expansion of SBWRF from 14 mgd to 16 mgd with peak flow capacity of 40 mgd.
- New Grit Removal System designed around the HeadCell®.
- 12-tray vortex grit removal system.

Role: Prime Consultant

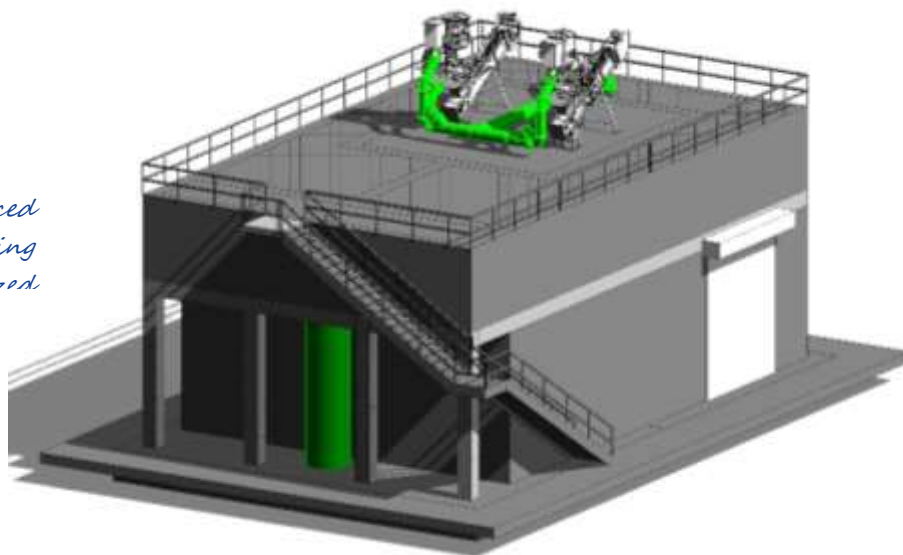
Dates of Services:

2016- 2019 (Est.)

Reference Contact:

Lan Zhou
Project Manager
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Email: lzhou@tohowater.com

*3D Design enhanced
owner input providing
tailored optimized*



North, Eastern, and South WRF Facilities Plan and Capital Improvement Programs

ORANGE COUNTY UTILITIES, FLORIDA

North WRF – Project is based on performing an asset management evaluation and condition assessment of existing assets. Project will prepare a Facilities Plan and Capital Improvement Program for a 20 year planning horizon.

Eastern WRF – Carollo is providing engineering services to prepare a conceptual design for the Phase VI upgrade and expansion of Orange County Utilities (OCUs) Eastern Water Reclamation Facility (EWRF). The primary objective of this task authorization is to prepare a conceptual design for the recommended facilities and a planning level opinion of probable cost of construction. The information presented in the facilities plan will be used to prepare a request for proposal (RFP) to hire a design consultant for this work. Carollo will provide professional engineering services to assist OCU with a condition assessment and asset management evaluation at the potable water facilities in the East Service Area, including: Eastern Regional Water Supply Facility (WSF), Bonneville Repump Facility, Eastern Regional Wellfield, and Eastern Remote Wellfield (previously referred to as the Econ Wellfield). OCU maintains an IBM Maximo® computerized maintenance management system (CMMS) that is used to organize and track assets within the Utility System. Carollo is working with OCU to update the asset inventory for the facilities, conduct a condition assessment of the assets, and evaluate criticality and risks using an asset management approach that has been customized based on the preferences of the OCU Water Division.

South WRF – Carollo is developing a Facilities Plan and Capital Improvement Program for SWRF. SWRF is currently rated for 43-mgd ADF. The Phase V Improvements are currently in construction to expand the capacity to 56-mgd ADF. The Facilities Plan will define the near term plan (ten-year with early out options) and long term plan (twenty-year) for development of the 20-year Capital Improvement Program. It will develop a conceptual Buildout Plan based on current trends in technology through the year 2050. The Facilities Plan will build upon the Asset Management Program and Condition Assessment Pilot developed by Carollo in November 2016.



Highlights:

- Asset evaluation and condition assessment.
- Upgrade and expansion of plant capacity.
- Developing Facilities Plan and CIP.

Role: Prime Consultant

Dates of Services:

On-going

Reference Contact:

Mark Ikeler
Chief Engineer
PH: (407) 254-9705
Email: markc.ikeler@ocfl.com

Central County Water Reclamation Facility Expansions

SARASOTA COUNTY, FLORIDA

Sarasota County needed to increase the capacity of its Central County Water Reclamation Facility (CCWRF) due to anticipated future flow increases from the consolidation of developer operated utilities and a septic tank replacement program. In a previous project, Carollo provided facility planning services, as well as the design of the Phase 2 Expansion to increase the CCWRF capacity from 4 mgd to 5.4 mgd on a maximum month average daily flow (MMADF) basis. This project (Phases 3 and 4) subsequently increased the capacity to 8 mgd.

During construction of Phase 2, Carollo completed the design documents for Phase 3 with the intent that Phase 3 would start after the completion of Phase 2. However, decreases in population projections and funding due to the economic downturn put the project on hold. The original Phase 3 design documents were completed in November 2008 and included a new 8 mgd MMADF (17.3 mgd PHF) headworks, an additional anoxic basin, new aeration basin, new blower building, two new clarifiers, two new deep-bed filters, new chlorine contact tank, improvements to the sludge holding facilities, and a new operation and maintenance building.

In November 2014, Carollo redesigned the remaining elements from the Phase 3 design project and repackaged them into two separate bid packages (Phases 3 and 4). Elements included as part of the Phases 3 and 4 expansion included the additional anoxic basin, new aeration basin, new mixed liquor and internal recycle pumps, two new clarifiers, two additional deep bed filters, a new chlorine contact tank, and improvements to the sludge holding facilities (new blowers and replacement of existing floating aerators with coarse bubble diffusers).

Highlights:

- WRWRF tertiary filter evaluation study
- Phased implementation
- Process evaluation and optimization
- Facility capacity expansion
- Effluent filter additions and renovations
- New anoxic and aeration basins
- Sludge holding improvements
- Permitting
- Services from preliminary design through start-up

Role: Prime Consultant

Dates of Services:

2014 - 2018

Reference Contact:

Greg Rouse
Manager, Utilities/Environmental
PH: (941) 861-0548
Email: grouse@scgov.net



A new anoxic basin, aeration basin, and air and process piping was constructed to expand the MLE

Bidding was completed for the new Phase 3 package (with the Phase 4 package included as an additive alternative) in July 2015. Construction started in December 2015 on both phases simultaneously and construction was completed in February 2018.

Staff members of the County have been extremely pleased with the cost, quality, timeliness, and responsiveness of the professional consulting and engineering services that we have received from Carollo.

—Gregory Rouse, PE, Utilities Technical Manager,
Sarasota County Public Works

Southwest WRF Headworks and Clarifier Improvements

MANATEE COUNTY, FLORIDA

The Southwest Water Reclamation facility (SWWRF) has a permitted capacity of 22 mgd and experienced significant deterioration. The four secondary clarifier’s mechanisms and the headworks equipment are more than 20 years old and beyond their useful life. Much of the equipment and concrete affiliated with the headworks was deteriorated and in need of restoration or replacement.

Carollo designed the project in multiple phases to allow the plant to maintain operations while making all the improvements to the headworks, clarifiers, and other renovated equipment and systems. The headworks upgrades were designed to maintain the facility in operation by isolating the individual channels. The replacement of the clarifier’s mechanisms, screenings conveyors, and grit classifiers will dramatically improve plant reliability and efficiency.

These new scum pumps allowed the City to eliminate the scum wet wells, which had been a source of odors and problematic operation and maintenance. These new variable frequency drives will improve the operational efficiency and prolong the life of the existing pumps. Following bidding, Carollo was contracted to provide construction and startup services.



Highlights:

- New screenings conveyors, grit cyclones, and classifiers will improve plant reliability.
- Renovation of deteriorated headworks and related equipment.
- Eliminated scum wet wells—a source of odors and O&M problems.

Role: Prime Consultant

Dates of Services:

Design: Clarifiers 1 & 2 - 2011;
Clarifiers 3 & 4 - 2013;
Headworks – 2012

Construction: Clarifiers 1 & 2 - 2013;
Clarifiers 3 & 4 - 2015;
Headworks – 2015

Reference Contact:

Anthony Benitez
Project Engineer II
PH: (941) 708-7450
Email: Anthony.benitez@mymanatee.org

"They have demonstrated an attention to detail, cost-consciousness, and an overall commitment to the success of the project. They have provided an exceptional level of knowledge and expertise and the proper amount of resources required to ensure a quality product. They have worked especially well with our staff to ensure concerns were addressed and project deadlines achieved."

*Jeff Goodwin, Wastewater Division Manager
Manatee County, FL*

Southwest Martin County Utilities Tropical Farms W/WWTF Injection Well System

MARTIN COUNTY UTILITIES, CITY OF STUART, FLORIDA

McNabb Hydrogeologic Consulting, Inc. (MHC), MHC staff managed the design, permitting, bidding, and construction oversight of the Tropical Farms deep injection well system. The project consisted of the design and construction of two Class I, industrial deep injection wells and an associated dual-zone monitor well. The injection wells were constructed with to a total depth of 3,200 feet and were completed with 26-inch diameter final casing and 18-inch diameter FRP injection tubing. The injection well system is used for disposal of reverse osmosis concentrate and treated wastewater. The bid price was successfully negotiated from \$14.87 million to \$8.94 million. During the construction process, Mr. McNabb successfully negotiated with FDEP to reduce the amount of laboratory analyses required to be performed on rock cores collected during construction. The reduced testing requirements reduced the final cost of the deep injection well system by \$50,000. Project also included groundwater modeling performed by JLA Geosciences, Inc. teamed with MHC.

Highlights:

- Design, permitting, and construction services for deep injection well
- Regulatory coordination with FDEP

Role: Prime – McNabb Hydrogeological Consulting, Inc.

Dates of Services:

2015 - 2016

Reference Contact:

Daryl Schuler
PH: (772) 223-7957



Southwest Deep Injection Well Rehabilitation and Capacity Re-Rating

PALM BEACH COUNTY WATER UTILITIES DEPARTMENT, FLORIDA

Palm Beach County Water Utilities Department (PBCWUD) owns and operates a deep injection well system at the Western Region Wastewater Treatment Plant for disposal of treated municipal effluent. The injection well system operates in accordance with Florida Department of Environmental Protection (FDEP) operating permit which limits the disposal capacity of the injection to a maximum of 10.2 million gallons per day (mgd), which is equivalent to an injection velocity of 8 feet per second. Since being placed into operation the injection well has experienced relatively high injection pressures due in part to partial plugging of the injection zone with plastics and other solids that have been pumped down the well. The well has undergone rehabilitation on numerous occasions to remove the solids from the injection zone in order to decrease injection pressures.

JLA Geosciences assisted PBCWUD in the re-rating of the permitted maximum disposal capacity of the injection well and rehabilitation of the well to decrease the operating injection pressures. JLA's scope of work included review of IW-1 acidization plan; site visits; preparation of a draft short-term injection testing and submittal to DEP; preparation of Requests for Additional Information; review shop drawing submittals, technical interpretations of the drawings, specifications, and Contract Documents; onsite observation of the well acidization and short-term injection testing work; Technical Memorandum detailing the procedures and interpreted results of the well rehabilitation and short-term injection test; and preparation a draft request for minor modification to the permit.

Highlights:

- Design, permitting, and construction services for deep injection well rehabilitation.
- Re-rating of maximum disposal capacity.

Role: Prime – JLA Geosciences, Inc.

Dates of Services:

2015 - 2016

Reference Contact:

Brian Shields
PH: (561) 493-6000

4. Workload of the Firm

We are **CONFIDENT** that our key team members and firm have the capacity and resources to deliver your projects within your desired time-frame.

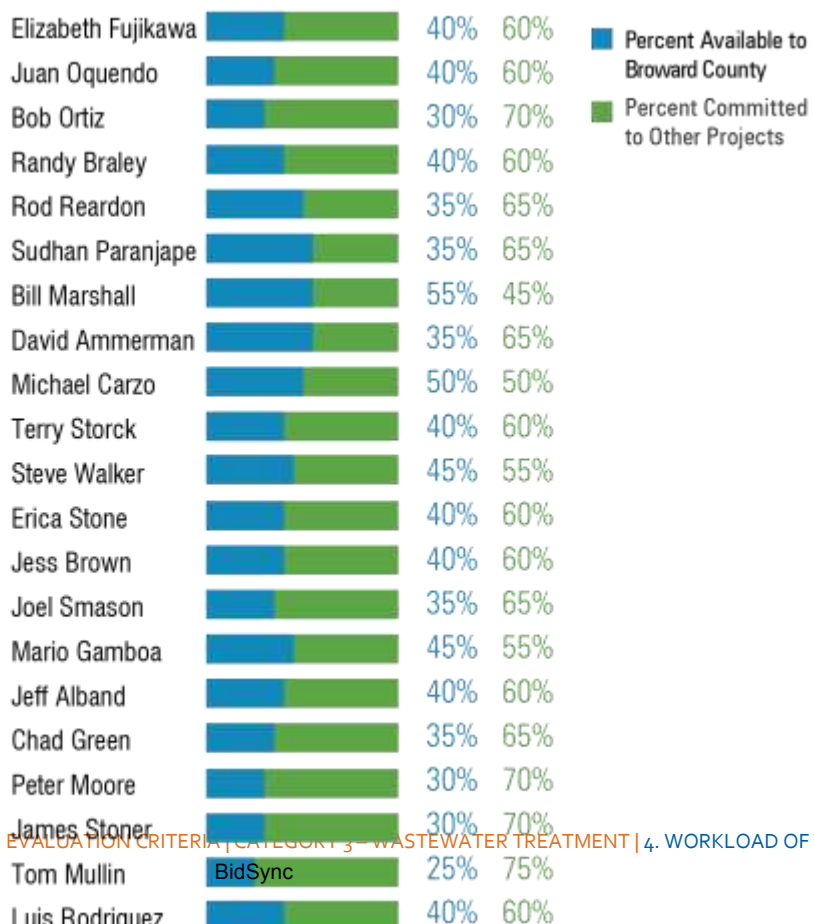
As a highly-ranked national firm that specializes in water and wastewater projects, Carollo continuously executes a high volume of work across a wide range of disciplines. Our firm-wide workload committed to active and on-going projects generally ranges between 65 and 70 percent.

As a result, we have more than ample capacity to respond to our client's needs regardless of the size and nature of the work we undertake.

As a specialty water/wastewater firm, we offer all the benefits of a small firm focused day to day on water and wastewater with the large firm benefits of national perspectives.

The availability of each staff member to participate in this project is included in the below graphic. The level of availability indicated in this graph shows that all key staff have ample capacity for this project and that we are ready to "hit the ground running".

Our Team is Available for Your Project



Completed and Active Projects

As a national firm, Carollo has a continuous workload of hundreds of projects at any particular time, at various stages of completion from kickoff to final completion. As examples, listed below are representative completed and active projects for Carollo in South Florida over the last five years, indicating the breadth and depth of our local experience.

<i>Client</i>	<i>Project</i>	<i>Status</i>
Broward County	High Service Pumping Station and Storage Tanks	Active
City of Boynton Beach	General Engineering Consultant	Active
	Progressive D/B of Ion Exchange Facility	Completed
	Study for Centralized HVAC	Completed
	Engine Generator Prepurchase	Completed
	WTP No. 2 MIEX System	Completed
City of Davie	Utility Master Plan	Active
City of Pompano Beach	General Engineering Consultant	Active
	Concentrate Pipeline Connection	Completed
	Electrical Master Plan Phase 1 Improvements	Completed
	Evaluation of Lime Softening versus Nanofiltration	Completed
	Transfer Pump Station Construction Services	Projected
	Water Supply Plan	Projected
City of Margate	General Engineering Consultant	Active
	East WWTP Upgrade	Active
	Assessment of Accelerator Wall Integrity	Completed
City of North Miami Beach	Force main Replacement	Active
City of Sunrise	General Engineering Consultant	Active
	Springtree Renewal and Replacement	Completed
	Springtree RO WTP	Completed
	Springtree WTP Sodium Hypochlorite Tank Replacement	Completed
	Sawgrass RO WTP	Completed
	Sawgrass WTP Rerate Improvements	Completed
Miami-Dade County	Design Services for Wastewater Treatment Related to the Ocean Outfall Legislation Projects – SFWWTP Design Package 1	Active
	Hialeah-Preston Nanofiltration Plant	Completed
Palm Beach County Water Utilities	WTP No. 2 Filter Replacement	Completed
South Central Regional WWTDB	General Engineering Consultant	Active
	Bulk Hypochlorite Storage and Feed Facility	Active
	Progressive D/B of Aeration System and Capacity Improvements	Active
South Florida Water Management District	General Engineering Consultant	Active
	C-43 Reservoir Improvements	Active
	L-8 Pump Station	Completed
Village of Wellington	General Engineering Consultant	Active
City of Delray Beach	General Engineering Consultant	Active
	Water Treatment Plant Construction Management	Active

Carollo's Approach to Managing Projects

Our Overall Approach to Work

Carollo's overall philosophy is founded on simple precepts:

- ***Hire and hold on to the best people in the business.*** The most critical element for a successful project is the individuals that do the work. Carollo aggressively recruits highly experienced and successful engineers along with the top engineering graduates entering the work force. Our training and mentoring process allows younger engineers to become industry leaders. The County will benefit extensively from our management philosophy due to the dedication of our Client Services Manager, Liz Fujikawa, as well as the entire team. We also create successful teaming environments by developing communication skills and a commitment to building and maintaining lasting client relationships.
- ***Specialize in the planning, design, and construction management of water projects.*** This is our core business. Our success hinges solely upon our ability to provide cost-effective and responsive service to our clients.
- ***Focus on client service.*** Carollo knows the value of listening to our clients and recognizes that successful projects result from our staff working as an extension of your staff. This commitment to listening and valuing client input is the cornerstone of Carollo's 85 years of success. We take pride in the large number of clients with whom we have maintained continuing relationships. We have worked with some clients for over seven decades — validating the quality of our work, cost control, and ability to meet schedules. We strive to live up to our mission statement, "Dedicated to creative, responsive, quality water solutions to those we serve."
- ***Key senior staff involvement in each and every project stage.*** This provides you with top management interest, clear accountability and responsiveness, and helps make sure that the necessary staff and resources are committed to each assignment.
- ***Involvement of your end-users.*** We advocate establishing a core team of your engineering, operations, maintenance, and construction (if applicable) staff who will remain involved in the project from the initial planning through completion. This core team will be responsible for review of all design-related documents and participate in project workshops. The result is a better product, broader buy-in and support, and project continuity that will reduce revisiting previously made decisions.

Addressing Challenges

Our commitment to frequent communication—to look ahead, anticipate issues, and promptly reach resolution, reduces the potential for project issues. The more the entire team engages, the lower the likelihood of challenges occurring. Sometimes, in spite of best intentions and use of best practices, challenges do arise.

Our approach is for any potential issues to be immediately resolved at the lowest possible level. We view resolution as one of the most rewarding byproducts of successful teamwork. If prompt resolution of a challenge does not occur, then it is automatically taken to the next level of management. The automatic escalation process maintains working relationships and allows any challenge to be resolved in a timely manner.



At Carollo, we listen to your goals and make sure that we can add value to your project.

Carollo's Project Management Approach
Communicates and Emphasizes FIVE KEY Areas

-  **1** UPFRONT PLANNING

-  **2** TIMELY AND EFFECTIVE DECISION MAKING

-  **3** COLLABORATION AND COMMUNICATION


-  **4** SCOPE, BUDGET, AND SCHEDULE CONTROL

-  **5** QUALITY

 **Upfront Planning**

At the beginning of all projects, Carollo develops a comprehensive plan to guide the work, a practice we will also apply to the preliminary and final design phases of this project. We tailor each plan using our detailed work plan that corresponds to the scope of work. The work plan communicates the relationship between project deliverables and tasks, giving the team a better understanding of the activities that must be grouped, delivered, and discussed in workshops.

The final work plan will be fundamentally based on the graphical work plan presented previously, and communicates specific project expectations to the design team (i.e., what they deliver, when they deliver it, and how much effort is expected to complete a task). The work plan will be updated continuously to serve as a project management tool that allows the team to focus on providing an organized, seamless delivery of work efforts.

 **Timely and Effective Decision Making**


The County and Carollo must make decisions efficiently and effectively to stay on schedule and meet the designated budget. This project requires the County's input and involvement, as well as Carollo's punctual response to requests and feedback. Our job is to provide the County with the information needed so that timely decisions can be made.

The effectiveness of the decision process is based on answers to the following fundamental questions:

- What decision has to be made?
- When does the decision have to be made?
- Who are the decision makers?
- What information is needed to make the decision?
- How will that information be formatted to allow for a comprehensive understanding of the decision?

What is the decision's cost and schedule impacts?

We will use managed workshops to facilitate the decision-making process as our approach is driven by face-to-face interactions with County staff. Many of these workshops have been identified in our work plan. Instead of relying on feedback from a draft memorandum, we focus our efforts on managed workshops that include clear communication of the required decisions, a detailed analysis of the decision, and a workshop record of comments that will be updated with the final decision log.

 **Collaboration and Communication**

One of the most critical considerations is to identify who will be involved in the project and how much time they will contribute. As previously mentioned, our work and schedule rely heavily on the decisions made during the managed workshops, so the attendance of those involved with the project is crucial. It is important to provide the participants with adequate time to review and provide important feedback. Because the nature of the necessary decisions may vary, stakeholders with relevance to the selected task will be invited accordingly to the meeting.



Scope, Budget, and Schedule Control

Our project managers are responsible for and accountable to the County to effectively manage our team’s scope, budget, and schedule. He will submit monthly project management reports that update the status of the scope, budget, and schedule. Project managers and key members of your project team will also have bi-weekly telephone calls to update the project status and discuss any projects issues/concerns.

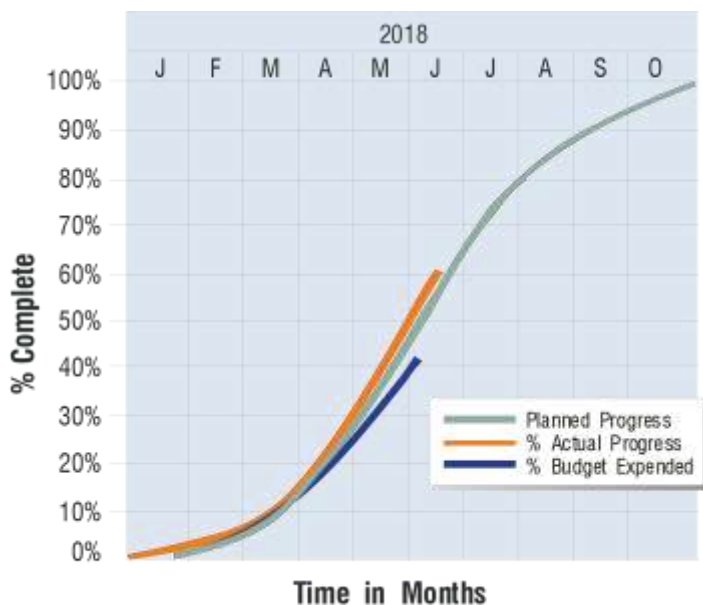
Monthly Progress Monitoring and Reporting

Project scope changes are tracked through the project decision log, which will be included in the monthly project management reports. Any decision that may change the scope of services will be identified and linked to a separate scope monitoring log. These items will be tracked using the date of identification, potential for budget or schedule impact, and required date of resolution. Items in the scope monitoring log will be reviewed with the County as needed. No work will be initiated on out-of-scope services without the County’s input and confirmation.

Earned value management (EVM) is used to analytically and accurately assess the project budget, track schedule status, monitor progress, and take appropriate corrective action if required. The basic elements of our EVM approach include:

- Identification of the budget and schedule at the start of the project for each scope item of every subtask.
- Graphic presentation of the relationship between schedule and budget monitored in an “S” curve throughout the project.
- Monthly calculation of each subtask’s “earned” value. This is done by estimating the remaining work necessary to complete the scope, without considering the budget expended. The overall project status is simply the sum of the subtask “earned” values.
- Communication of project status. The planned earned value and expenditure versus actual earned value and expenditure are graphically compared and are included in the monthly invoice.

By using the EVM method, the status of the project budget and schedule are clear to both the management team and the County. To identify the source of the deviation, a team member must simply inspect the “earned” value of the subtask. Establishing rigorous reporting procedures enables your Carollo team and the County’s management staff to focus on developing solutions rather than searching for the source of the problem.



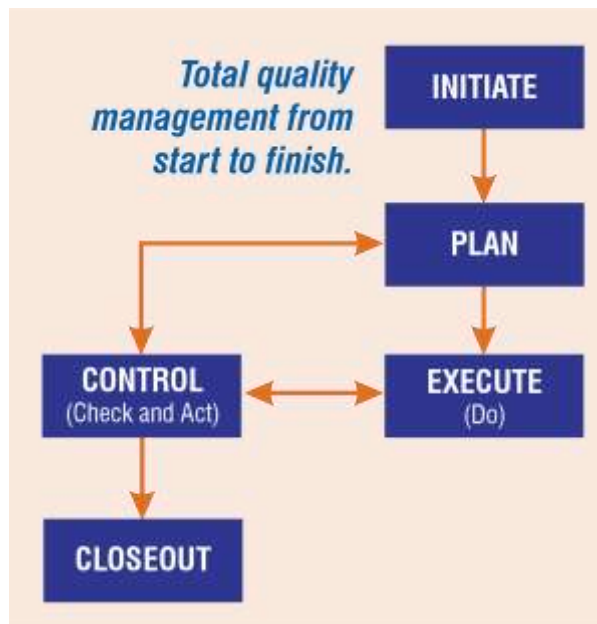
The “S” Curve is a graphical illustration of the project plan, showing how the project will be completed on time and within the labor=hour budget.



Quality

To meet or exceed the County’s quality expectations, Carollo will follow our established quality management (QM) procedures. Carollo’s QM program is straightforward: we use seasoned engineering leads to employ time-tested quality review procedures for each deliverable throughout the project. More specifically for this project, Bob Cushing and Vinnie Hart will be responsible for implementing our in-house QM tools— standard specifications, design checklists, independent process and discipline review, and constructability review —at the appropriate stages during the preliminary and final design phases of the project.

This in-house process includes 10 specific phases of peer review and checking, each phase with definitive activities, participants, and deliverables. Each phase of the QM process is documented with a comment/resolution log, so we have a complete record of comments made, and the rationale behind the change/response.



Our approach will focus on quality throughout all phases to deliver a project that is correct, on-time, on-budget, achieves the scope, and meets or exceeds your expectations.

5. Location

As required by the RFP, the “Vendor’s Business Location Attestation Form” has been filled out and submitted.

Principal Place of Business

Our work principal place of business:

Carollo Engineers, Inc.
2700 Ygnacio Valley Road, Suite 300
Walnut Creek, California 94598

PH: 925-932-1710

Fax: 925-930-0208

www.carollo.com

Where Will Carollo’s Work Be Performed?

Our work will be led by our Broward office and primarily supported by our south Florida staff.

Carollo Engineers, Inc.
3440 Hollywood Boulevard, Suite 465
Hollywood, FL 33021

PH: 954-837-0030

Fax: 954-837-0035



6. Willingness to Meet Time and Budget Requirements

Meeting Project Specific Time and Budget Requirements

We understand the nature of General Services contracts. Some assignments need immediate, sometimes same day response times, while others are less urgent. **Our DEPTH AND BREADTH OF STAFF allows us to respond to immediate needs from our local office which is just minutes away.** For longer term assignments, Carollo develops a Project Management plan that establishes the plan to meet schedule, scope, budget and quality.

What Do Our Clients Say?

“The Evaluation of Long-Range Treatment Options: Nanofiltration versus Lime Softening study that Carollo provided was excellent. The report provided very good data and financial detail in which the Utility will be able to make decisions on future treatment methods and repair and replacement projects (R&R). We now can make plans for financing the work that we need to accomplish. The executive summary clearly communicated the path we needed to progress on. Our team enjoyed working with Carollo Engineers on this study. We look forward to working with them in the future.”

— Randy Brown, Utilities Director
City of Pompano Beach, FL

“Carollo Engineers has performed very professionally, been extremely responsive, and brought the most qualified and appropriate personnel to service us and our needs as a client.”

— Timothy Welch, PE, Utilities Director
City of Sunrise, FL

“The Carollo Team exceeded all of our expectations. They were professional and easy to work with. They are experts in what they do. I would not hesitate to recommend them.”

— Mikes Maillakakis, Senior Project Manager
Lee County Utilities, FL

Carollo is COMMITTED to meeting schedule and budget requirements for all tasks under this Contract.



7. Volume of Previous Work

As required by the RFP, the “Volume of Previous Work Attestation Form” has been filled out and submitted. Carollo has been paid less than \$3 million to date by Broward County Board of County Commissioners.



RESUMES

- Elizabeth Fujikawa
- Chuck Sinclair
- Juan Oquendo
- Bob Ortiz
- Randy Braley
- Rod Reardon
- Bob Cushing
- Larry Elliott
- Sudhan Paranjape
- Bill Marshall
- Scott Richards
- David Ammerman
- James Anderson
- David McNabb
- Sally Durall
- Michael Carzo
- Terry Storck
- Steve Walker
- Erica Stone
- Jess Brown
- Joel Smason
- Mario Gamboa
- Jeff Alband
- Chad Green
- Peter Moore
- James Stoner
- Tom Mullin
- Luis Rodriguez



Elizabeth Fujikawa, P.E., BCEE

Elizabeth Fujikawa, a vice president with Carollo Engineers, has more than 25 years of engineering experience. Her experience includes design and construction management on projects with capital construction costs of up to \$240 million, including two of the U.S.'s largest treatment plants: Chicago's Jardine Water Plant (1,000-mgd), and the Metropolitan Water Reclamation District of Greater Chicago's Stickney Water Reclamation Plant (1,200-mgd). Relevant experience includes the following projects.

Education

MSE Environmental Engineering, University of Michigan, 1986

BS Chemistry, University of Illinois, Urbana-Champaign, 1984

Licenses

Professional Engineer, Florida, Illinois, Wisconsin

Civil Engineer, Delaware

Certification

LEED Accredited Professional, Green Building Certification Institute, 2006

Professional Affiliations

American Water Works Association

International Ozone Association

Water and Wastewater Treatment

→ Project manager for the Broward County Potable Water Storage Tanks, Pumping Systems, and Chemical Systems. This project includes the assessment, design and construction phase management of new ground storage tanks, new high service pump stations, and new sodium hypochlorite and ammonia feed and storage systems for disinfection. These improvements will be implemented at four locations within the County.

→ Project manager for a Bulk Sodium Hypochlorite Storage and Feed Facility for the South Central Regional Wastewater Treatment and Disposal Board, Florida. The facility will receive and store 12.5% sodium hypochlorite and meter the feed to the inlet to the tertiary filters for reuse.

→ Project manager for the Progressive Design/Build of the Aeration System Replacement and Capacity Improvement project for the South Central Regional Wastewater Treatment and Disposal Board, Florida. Work includes capacity improvements from 24 to 30 mgd, aeration system replacement with single stage centrifugal blowers, and hydraulic modifications to increase the sidewater depth of the plant.

→ Project manager for the City of Boynton Beach, Florida, Ion Exchange Treatment System and East Water Treatment Plant Improvements Progressive Design Build. This project includes initial engineering and constructability evaluations, permitting, design, and construction of a 16.0-mgd ion exchange system, associated ancillary systems, and raw water transmission main modifications.

→ Project manager for an evaluation of long range treatment by Lime Softening versus Nanofiltration for the City of Pompano Beach, Florida. The project evaluated advantages and disadvantages to bring the existing lime softening treatment plant into a 20-year life cycle condition versus an expansion of the nanofiltration treatment plant.

→ Project manager for the Central Lake County Joint Action Water Agency, Illinois, Ozone System Upgrade project. The project evaluated Air Fed versus Oxygen Fed (Vacuum Swing Adsorption) alternatives to supply the ozone generators. The project was designed and constructed using packaged Vacuum Swing Adsorption units.

→ Project manager for the Pompano Beach, Florida, Electrical System Master Plan for the water treatment plant. The project consisted of master planning and design services for replacement and upgrade of electrical power distribution system with state-of-the-art equipment and materials.

→ Project manager for the Pompano Beach, Florida, Electrical System Phase I Upgrades. Work included motor control center replacements and installation of new variable frequency drives for the high service pump station. Services include final design and opinion of construction cost, bidding services, construction support services.

→ Project manager for Owner's Representative Services for the City of Pompano Beach, Florida Electrical System energy efficiency project. Served as Owner's Representative during upgrades by Siemens to reduce energy usage at the water treatment facility.

Elizabeth Fujikawa, P.E., BCEE

→ Technical reviewer for the Miami-Dade County, Florida, 225-mgd Hialeah-Preston Water Treatment Plant chemical systems improvements.

→ Staff engineer for the Tampa Bay Water, Florida, Hydrogen Sulfide Treatment Improvements at the Lithia Water Treatment Plant. The current hydrogen sulfide removal facility will be replaced with a new, more reliable process. This new 45-mgd hydrogen sulfide removal facility will use ozone treatment and the project will be delivered with the Engineer-Procure-Construction Management (EPCM) approach.

→ Technical reviewer for the upgrade of raw water intake zebra mussel and icing control for the City of Evanston, Illinois.

Publications/Presentations

→ Low, M., Fujikawa, E., Gillogly, T. "Progressive Color Control: Boynton Beach's High-Rate Fluidized IX System". Paper presented at the Florida Water Resource Conference, West Palm Beach, FL, April 2017.

→ Wicklein, E., Low, M., Fujikawa, E., and Pazahanick, M. "Mixers, Headers, Rotation, and Baffles: Optimizing a Completely Mixed IX Bed for Organics Removal through CFD Analysis." Proceedings of the Water Quality Technology Conference, Indianapolis, Indiana, November 2016.

→ Fujikawa, E. "Ozonation at the Central Lake County Joint Action Water Agency: Start-up through First Year of Operation." Proceedings of the 11th Ozone World Congress, International Ozone Association, San Francisco, CA, September 1993.

→ Fujikawa, E., Grasso, D., and Weber, W.J., Jr. "Ozone Mass Transfer in a Gas-Sparged Turbine Reactor." *Water Pollution Control Federation, Research Journal*, Volume 62, Number 3, May/June 1990.

→ Fujikawa, E., Farver, B.T., and Robson, C.M. "Ozone Equipment: Profit from Experience." *Water Engineering and Management*, Volume 137, Number 2, February 1990.

→ Fujikawa, E., Farver, B.T., and Robson, C.M. "Ozonation in America: An Evolution of Success." *Water Engineering and Management*, Volume 136, Number 10, October 1989.

→ Fujikawa, E. "Status of U.S. Drinking Water Treatment Ozonation Systems." Proceedings of the International Ozone Association's Ozonation Systems and Drinking Water Treatment Conference, Myrtle Beach, SC, December 1988.

→ Fujikawa, E. "USA Applications of Ozonation for Drinking Water Treatment." Proceedings of the International Ozone Association's European Conference on Ozone in Water Quality, London, England, October 1988.

→ Fujikawa, E., Grasso, D., and Weber, W.J., Jr. "Rates of Ozone Mass Transfer and Decomposition in Waste Treatment Systems." Presented at the 59th Annual Conference of the Water Pollution Control Federation, Los Angeles, CA, October 1986.



Charles T. Sinclair, P.E.

Chuck Sinclair is a Senior Vice President with Carollo and serves as a Senior Client Services Manager. His project experience covers a broad range of civil and environmental engineering projects. His municipal and public works experience includes planning, design, and construction services for water and wastewater collection, conveyance, and treatment facilities. He also has extensive experience in storm water management and large water resources projects, including ecosystem restoration.

Mr. Sinclair has specific expertise in project and program management for large municipal and public utility programs, as well as civil works programs for federal agencies. He has been actively involved in the preparation and presentation of project data, client and agency coordination and public outreach.

Education

MS Civil Engineering,
University of North
Carolina, 1999

BS Civil Engineering,
Clemson University, 1991

Licenses

Professional Engineer,
Florida

Professional Affiliations

American Society of Civil
Engineers

American Public Works
Association

American Water Works
Association

Water Environment
Federation

Relevant Experience

→ Program director for the Miami-Dade Water and Sewer Department's Wastewater Collection and Transmission System in Support of Consent Decree, Miami, Florida. The project consisted of design of over 50 pipeline and pump station projects mandated by Consent Decree. In this role, he directed a large, multi-disciplined team made up of numerous staff and multiple subconsultant partner firms. He served as the primary point of contact for coordinating between the production team with the program managers and the staff at MDWASD. In order to meet the strict timelines required by the Consent Decree, he planned and managed the quick mobilization of multiple design teams, and worked closely with the program managers and MDWASD staff to develop streamlined processes for phasing of deliverables and document reviews. Despite starting several months late due to uncontrollable delays in the award of the design contract, the design teams were able to meet all milestone dates in the first 18 months of the contract term.

→ Program manager for an open-ended engineering consulting services contract for the Broward County Aviation Department in Broward County, Florida. The project consisted of environmental engineering services; airside infrastructure studies and improvements; safety, security, and communication projects; tenant improvements; airport facility refurbishments and improvements; terminal development improvements; landside infrastructure studies; airport development;

and airport capital project support. Responsibilities included all administrative, financial, and staffing needs of the projects, as well as planning and scheduling future projects as needed by the Department. He led a team of specialty subconsultants in support of BCAD's development programs via a five-year, \$11.4 million task order contract.

→ Project principal for this open-ended professional services contract providing miscellaneous engineering services for the Miami-Dade Water and Sewer Department in support of upgrades to the Alexander Orr Water Treatment Plant, Miami-Dade County, Florida. He was responsible for making sure that the team provided the appropriate technical resources to assure delivery of quality service and products on time and within budget.

→ Project advisor in support of the Comprehensive Everglades Restoration Plan for the Jacksonville District, U.S. Army Corps of Engineers, Jacksonville, Florida. This project included working closely with the Project Managers and technical team members in identifying scope of services for each project as well as project schedule and estimated cost. Responsibilities included serving as an extension of the Corps' Project Management Division staff in development of this program approach and he was also involved in the support of several project development teams in assisting them with developing Project Management Plans. Involved in facilitating many of the Project Development Team meetings during the development of the Project Management

Charles T. Sinclair, P.E.

Plans for over 20 CERP projects. As part of this project, he was involved in the Design Coordination Team meetings between Program Management staff of the Corps and SFWMD, developed and conducted presentations at meetings and assisted in the facilitation of discussions on topics of concern.

→ Project principal for the U.S. Army Corps of Engineers, Program, and Project Management Support for Restoration of Hurricane Protection System for Southern Louisiana, New Orleans, Louisiana. This project included leading a team to support the New Orleans District and the Mississippi Valley Division in managing and executing this \$6 billion program. Assisted with development of task orders, coordination with subconsultants and teaming partners, and working with the Corps to identify resource needs. Another important part of his role was to identify staff within the partner firms to fill critical roles within the program and assure their integration to the program team.

→ Technical advisor and co-facilitator for a charette for the Kansas City and Omaha Districts of the U.S. Army Corps of Engineers that focused on the development of a Program Management Plan (PgMP) for the Missouri River Fish and Wildlife Mitigation Program (Mitigation Program). Products of the charette included a Charette Report that documented the minutes of the charette. Important outputs of the charette included revised process flow charts, an annotated PgMP outline, and a preliminary draft PgMP. Responsibilities included serving as quality and technical reviewer of the final PgMP document presented to the Corps and distributed for public review and comment. Acted as a technical advisor to the interagency team that developed the outline of the PgMP. He was part of a team that planned and facilitated the week-long charette that featured a one-day stakeholder conference. Approximately 18 individuals from the Kansas City and Omaha Districts participated in the charette and an additional 30 representatives of partners or

stakeholders attended the stakeholder conference.

→ Program manager for an open-ended consulting services contract for the Capital Region Airport Commission at the Richmond International Airport in Richmond, Virginia. This five-year program included more than 50 individual projects, which ranged from stormwater management, to wetlands mitigation and permitting, to hazardous waste characterization and remediation, to facilities planning, assessment, and design. Responsible for all administrative, financial, and staffing needs of the projects, as well as planning and scheduling future projects as needed by the Commission. Acted as the project manager for several design projects, including a 300-acre wetland creation area, and a 40-acre stormwater management facility.

→ Project principal for an open-ended professional services contract for Florida Power and Light, Miami, Florida. The project included support in the development of the project to construct Nuclear Units #6 and #7 at the Turkey Point site. The project provided environmental and engineering services including the planning and evaluation of potential cooling water supply sources; conceptual design of potable and reclaimed water pipeline transmission systems; conceptual design of an advanced wastewater treatment system; traffic studies and conceptual design of access roadways; and conducting an assessment of reliability for primary and secondary water sources.

→ Program manager for an open-ended environmental services contract for the Virginia Department of Military Affairs, Virginia. Projects under this contract included oversight of underground storage tank removal and sampling at various National Guard facilities within the commonwealth of Virginia.



Juan R. Oquendo, P.E.

Juan Oquendo is a Vice President with Carollo and serves as a Project Manager in the South Florida region. His project experience covers a broad range of civil and environmental engineering projects. His municipal and public works experience includes planning, design, and construction services for water and wastewater collection, conveyance, and treatment facilities. He also has extensive experience in biosolids management, storm water, and climate resiliency. Relevant experience is included below.

Education

BS Civil Engineering,
University of Puerto Rico,
Mayaguez, 2004

Licenses

Professional Engineer,
Florida, Georgia, Texas

Certification

Certificate, Environmental
Engineering, University of
Puerto Rico at Mayaguez,
Utah

Professional Affiliations

American Society of Civil
Engineers

American Water Works
Association

Florida Water
Environmental
Association - West Coast
Chapter

Miami Dade Resilient
Utility Coalition - Board
Member

Water Environment
Federation

Relevant Experience

→ Project Manager for the Miami Dade Water and Sewer Department (MDWASD) Design Services for WWTP Related to the Ocean Outfall Legislation Projects, Miami, FL. MDWASD must undertake improvements at all of its regional plants (South, Central, and North) in order to comply with the requirements of the Ocean Outfall Legislation (OOL). The estimated value for this program is \$5.3 Billion. The scope includes the design of upgrades of treatment process such as aeration basins, clarifiers, headwork structures and flow equalization facilities. The work also includes new high level disinfection facilities, deep well pump stations and deep wells for effluent disposal.

→ Project engineer for the Miami-Dade Central District Wastewater Treatment Plant Condition Assessment, Florida. Updated the 2008 Condition Assessment developed for the Rehabilitation and Repairs of the Central District Wastewater Treatment Plant. The condition assessment included a detailed evaluation of all the wastewater treatment plant processes and assets and preparing the list of the now the consent decree projects (scope, cost and schedule). The report also provided recommendations for implementation of projects that will allow plant compliance with new operating permit conditions. Comprehensive study and report for wastewater treatment facilities.

→ Project engineer and technical leader for the Miami-Dade Central District Wastewater Treatment Plant (CDWWTP) Digester Rehabilitation Project, Miami, Florida. Responsible for design improvements to the CDWWTP digester 16 anaerobic digesters, including; sludge mixing system and mechanism, tank

rehabilitation, tank covers, digester gas handling system, digester heating system (including review of the I&C engines) and overall process design.

→ Project Manager for the City of Valparaiso, Indiana, Co-digestion Study. The City was interested in investigating the feasibility of accepting high-strength waste material at its existing Elden Kuehl Wastewater Treatment Facility, from sources in and around the Valparaiso community. The primary purpose in receiving and processing high organic strength (HOS) waste is to enhance biogas generation for use in beneficial energy production, including heat and electricity generation, primarily for on-site demands. The purpose of this study was to determine the advantages and disadvantages associated with accepting high organic strength (HOS) waste at the Facility.

→ Project Manager for the design and construction of the Fulton County, Georgia, Big Creek Water Reclamation Facility Immediate Needs Rehabilitation Project. The project had a goal of providing critical upgrades to yield near-term improvements to a 24-mgd plant. The upgrades were needed to increase plant capacity, operational reliability, and compliance in a range of project areas. Juan was also responsible for design of sludge thickening facilities, modifications to the plant aerobic digesters and new sludge dewatering equipment. The sludge dewatering equipment consisted of 6 (4 currently, 2 future) Huber ROS3Q 800 units capable of dewatering approximately 800 lbs. /hr. of total solids.

→ Project Manager for the City of Atlanta, Georgia, South River Water Reclamation Center (WRC) New Thickening and

Juan R. Oquendo, P.E.

Publications

Oquendo, J. "Saving Money and Eliminating Odors While Dewatering Sludge? No Way." Proceedings of the Florida Water Resources Conference, Orlando, Florida, April 2014.

Oquendo, J. "Setting the Course for Miami Dade's Central District WWTP Anaerobic Digesters Rehabilitation." Proceedings of the South Florida Water and Wastewater Expo, Florida, 2011.

Barksdale, J. Petrik, B., and Oquendo, J. "Evaluation of Energy Recovery Options for Converting Aerobic Digesters to Anaerobic Digestion." In Florida Water Resources Journal, 2011.

Barksdale, J. and Oquendo, J. "Evaluation of Energy Recovery Options for Converting Aerobic Digesters to Anaerobic Digestion." Proceedings of the Florida Water Resources Conference, Orlando, Florida, April 2010.

Dewatering Centrifuges. The project consisted of the rehabilitation of the South River WRC thickening and sludge dewatering buildings, including the installation of 3 sludge thickening centrifuges and 4 sludge dewatering centrifuges along with sludge pumping and other ancillary equipment. The project also included the replacement of the existing dry polymer facilities with new liquid/emulsion polymer facilities.

→ Project Manager for the City of Atlanta, Georgia, R.M. Clayton Water Reclamation Center (WRC) Anaerobic Digester Upgrades. The project consisted of the design of the rehabilitation of 4 anaerobic digesters at the City of Atlanta 122-mgd R.M. Clayton WRC to bring the digesters to compliance with EPA and State standards. The work included replacing the sludge mixing equipment with new pump mixing system, new heat exchangers and hot water boilers, sludge and hot water pumping along with all electrical and instrumentation upgrades needed. Two smaller digester tanks will also be rehabilitated and equipped with mixing systems for use as secondary (sludge holding) digester tanks.

→ Project engineer and Technical Lead for the design of the biosolids facility at the South Wastewater Treatment Plant in Baton Rouge, Jefferson Parish, Louisiana. The project included the design of two new hot water boilers, heat exchangers and digester gas management improvements for the existing anaerobic digesters system. The project also included the design of new sludge holding tanks and replacement of the existing anaerobic digesters mixing system, design of new digester covers and process evaluation of the entire solids handling system. Responsible for the process/mechanical design and the multidisciplinary coordination. Overall project construction cost was \$111M.

→ Project engineer for the design of the repairs at the North Miami Beach, Florida, Norwood Oeffler Water Treatment Plant. The design included repairs to the reverse osmosis and nanofiltration skids, high-service and high-pressure pumps, sand

separator and other water treatment processes.

→ Design manager for the Miami Dade County Master Pump Station No. 3, Florida. Project consisted of design, permitting, bidding services, and engineering services during construction for the new Master Pump Station 3 and associated manholes/shafts of the 48-inch, 52-inch and 30-inch gravity sewers. Led the design of the master pump station and developed design documents (drawings and technical specifications) for the gravity manholes and Master Pump Station 3 consisting of two buildings (pump station and generator building), pumps, piping, valves and other mechanical appurtenances, electrical and instrumentation and control features, ventilation system, standby power generation and odor control. The pump station receives 29-mgd from the City of Miami Brickell service area and pumps the raw sewage to the Central District Wastewater Treatment Plant. The design was on an accelerated schedule to allow the new Brickell Shopping Center and high rise apartment complex to be constructed on time. Construction cost for the project was \$26M.

→ Led the preliminary design for two 7.5-MG ground storage irrigation tanks and two 2.5-MG ground storage potable water tanks for the City of Cape Coral, Florida. The scope included also the design of two new pump stations, irrigation and potable water. The irrigation pump station will house five 7,800-gpm pumps and the potable water pump station will house four 2,950-gpm pumps. The design came on budget and ahead of schedule by 30 days.

→ Project manager for the City of Tampa, Florida, San Carlos Pump Station Vibration Analysis. Provided technical and management oversight for a 2-day vibration test and evaluation report needed to determine the cause for high vibration levels reported at the Pump Station Pump Motor No. 1. This issue has led the City to lock out certain motor and pump operating speeds, thereby limiting the pump station's pumping capacity and operational flexibility during wet weather events.



Education

MBA, Business Administration, Florida International University, 1989

MS, Environmental Engineering, University of Colorado, 1977

BS, Civil Engineering, University of Florida, 1974

Licenses

Professional Engineer, Florida, Colorado

Professional Affiliations

American Water Works Association, (AWWA) Florida Section AWWA

- Past Chair, Region VII

Roberto Ortiz, P.E.

Roberto (Bob) Ortiz has led project teams in the planning and design of improvements to water and wastewater facilities for Miami-Dade, Broward, and Palm Beach Counties. He is familiar with the unique challenges associated with completing projects in this region, including adhering to the demanding local and state permitting requirements. Mr. Ortiz has over 40 years of experience in major environmental and infrastructure projects and programs in South Florida. He has held various positions on these projects, from project engineer to principal-in-charge. In addition, he has significant experience in project management, project delivery, and quality assurance/quality control, as well as technical aspects of projects such as design, construction services, and associated tasks. His relevant experience is included below:

Relevant Experience

→ Principal-in-charge for the Miami Dade Water and Sewer Department (MDWASD) North District Wastewater Treatment Plant Headworks Upgrades, Miami, Florida. This project was one of WASD's first consent decree projects. It included a complete headworks renovation including replacement of old bar screens, compacting and sludge dewatering equipment, electrical gear, ventilation and odor control facilities.

→ Principal-in-charge for the Miami Dade Water and Sewer Department secondary clarifier upgrades at the North District Wastewater Treatment Plant, Miami, Florida. Project proceeded on accelerated schedule to address down time experienced with existing clarifier failures. Work included development of design and specifications for the procurement and installation of ten new secondary clarifier mechanisms under a fast track schedule, which was successfully met.

→ Principal-in-charge for the Miami Dade Water and Sewer Department (MDWASD) chlorination system replacement at the North District Wastewater Treatment Plant, Miami, Florida. Project included evaluation of various alternative types of disinfection for the plant and a cost evaluation of these. Work also included design of the recommended alternative, which consisted of the use of hypochlorite (bulk) to replace an aged gas/liquid chlorine system. The upgraded system design consisted of the use of bulk storage and feed of hypochlorite solution to replace an aged gas/liquid chlorine system. The proposed design faced the challenge of having a limited space to

locate the new facilities. This was successfully overcome by using existing space as much as possible and increasing the existing space only nominally.

→ Principal-in-charge for the City of Sunrise Sawgrass Wastewater Treatment Plant Headworks Upgrades, Florida. The project consisted of assessment of potential technologies to replace an existing screening and grit removal system and develop recommendations on selected technologies. Recommendations on selected technology was made and a design for the proposed improvements was made, including modifications to the existing yard piping and flow distribution structure downstream of the headworks.

→ Principal-in-charge for the Miami Dade Water and Sewer Department North District Wastewater Treatment Plant Deep Injection Well Pump Station Improvements project, Miami, Florida. This project consisted of the design of two additional pumps. Existing equipment and wetwell configuration were evaluated to ascertain the maximum hydraulic capacity of the station and evaluate and identify any hydraulic deficiencies that could possibly restrict peak pumping capacity. A desktop modeling effort and a physical model study of the wetwell confirmed that the existing wetwell configuration was not suitable for required increases in pump capacity needed to match the permitted capacity of the injection wells. Therefore, final design included replacement of four existing pumps as well as installation of two additional pumps as well as modifications to the pump suction configuration. The effort also included replacing the existing

Roberto Ortiz, P.E.

discharge (cone) valves with ball valves and adding flow control valves to the injection wellheads.

→ Principal-in-charge for the Miami-Dade Water and Sewer Department assessment of lift stations 114, 115, 116 and 117, Miami, Florida. This project consisted of an accelerated schedule for the assessment of existing lift stations and the recommended improvements needed to address noted deficiencies. Work included development of alternatives for upgrading of the lift stations and evaluation of alternatives. Recommendations on the preliminary design of the selected alternative, project schedule and costs were also provided as part of the work.

→ Project manager for the Miami Dade Water and Sewer Department (MDWASD) Pump Station Improvement Project (1st and 2nd Consent Decree), Miami, Florida. Directed the upgrade of 160 lift and pump stations for MDWASD as a result of 1st and 2nd consent decree orders. The design work required very close coordination with MDWASD's Program Manager to standardize all design improvements across the facilities. The project was successfully completed on time and within budget.

→ Client services manager for the proposed Miami Dade Water and Sewer Department South District Water Reclamation Plant, Miami, Florida. Led a multi-disciplined engineering team that provided planning and design services to prime consultant for a first-of-its-kind advanced wastewater treatment facility slated to produce reclaimed water for groundwater replenishment of the Biscayne Aquifer in South Miami-Dade County, Florida. This project required extensive regulatory assessment and pilot testing to determine final process requirements. The treatment process proposed the removal of nitrogen and phosphorus to very low levels, as well as removal of emerging pollutants of concern.

→ Principal-in-charge for the Miami Dade Water and Sewer Department North District Wastewater Treatment Plant (NDWWTP) Flood Protection and Sea Level Rise Basis of Design Report (BODR), Miami, Florida. The

general stormwater management system at the NDWWTP has not proven to be very effective and the site experiences significant flooding during certain weather events. This project consisted of developing a Basis of Design Report (BODR) for the rehabilitation of the stormwater management system. The scope of work consisted of conducting topographic surveys, percolation tests and Phase I and Phase II environmental site assessments to develop up to three proposed alternatives for stormwater management on the site. The project also looked at how the existing site perimeter barriers provided protection against wave and storm surge impacts under projected sea level rise.

→ Principal-in-charge for the City of Sunrise Water Reuse System Evaluation Phase I Reuse System Planning, Florida. This project involved a screening of potential sites within the City's service area to determine if significant offset/credits could potentially be obtained through irrigation permit retirement. Through the use of groundwater modeling, it was determined that significant offsets and credits could be obtained; however, it was believed that with additional refinement of sites and customers served, even greater offset/credit potential could be obtained. As a result, preliminary concepts of reuse distribution system layouts were developed along with a preliminary cost estimate that demonstrated that this approach was feasible compared to other alternative water supply options.

→ Principal-in-charge for the City of Sunrise Water Reuse System Evaluation Phase I and II, Florida. In Phase II, Mr. Ortiz directed the evaluation of the City's proposed conceptual level reuse distribution system, the proposed configuration and layout for each phase as well as the associated planning-level cost estimates. As part of this effort a new all-pipe computer model of the proposed reuse distribution system was created using the GIS Water GEMS hydraulic model with the recommended size and layout of the proposed reuse distribution system.



Brandon (Randy) Braley, P.E., BCEE

Randy Braley, a Project Manager, has 36 years of experience serving as strategist and manager for challenging water and wastewater projects for numerous public and private clients across the U.S. and abroad. He has managed wastewater reclamation planning and design projects with capacity to 99 mgd, and served as design project manager for major wastewater projects that include secondary and nutrient removal. His vast design management experience includes practically all aspects of wastewater and reuse process treatment elements, including preliminary, primary, secondary, and tertiary treatment, solids handling, and effluent disposal.

Prior to joining Carollo, he served as the leader of global business units for a large international consulting firm. He created a sustainable and profitable business operation in Africa, Middle East, and Central Asia Region. He served clients with projects covering water supply, treatment and distribution; wastewater collection, treatment and reuse; sustainability; management consulting; institutional and capacity building; program management; and public education.

Education

MS Civil Engineering,
Northeastern University,
1986

BS Civil Engineering,
University of Maine, 1978

Licenses

Professional Engineer,
Florida

Professional Engineer,
Maine

Civil Engineer, New
Hampshire

Professional Engineer,
Connecticut

Civil Engineer,
Massachusetts

Certification

Board Certified
Environmental Engineer
(BCEE), American
Academy of
Environmental Engineers

Professional Affiliations

American Academy of
Environmental Engineers,
Board Certified
Environmental Engineer

American Water Works
Association

Water Environment
Federation

Relevant Experience

→ Design Manager for Miami-Dade Water and Sewer Department South District WWTP Expansion, Miami, Florida. This project consisted of the design of two 20 million-gallon Equalization Tanks, a 40-mgd firm capacity Pump Station, modifications to Headworks Building 2, Wet Chemical Odor Control Facility, and an Electrical Substation Building.

→ Manager for the design development and review of a wastewater treatment process for the Marine Corps Base Camp Pendleton Design-Build Program, Naval Facilities Engineering Command (NAVFAC), California. Responsible for the design of two biological nitrogen removal water reclamation plants—the new 4-mgd “North” plant and the 2.5-mgd expansion to the “South” plant, and a 10-MW photovoltaic solar energy facility.

→ Project manager for the Southwest Water Reclamation Facility (SWWRF) Headworks Improvements for the City of St. Petersburg, Florida. The project included preliminary evaluations of options for expanding the capacity and grit removal facilities at the plant.

→ Technical advisor for the engineer for the South Central Regional Wastewater Treatment Plant in Delray, Florida. Project consisted of a temporary, bulk sodium hypochlorite disinfection feed system for the 24-mgd wastewater treatment plant.

→ Project director/program manager for the Sulaibiya Water Reclamation Facility, Build-Operate-Transfer (BOT) project, Kuwait. Led program management and BOT advisory services on the 99-mgd water reclamation facility—the world’s most advanced project of its kind at the time, which produces high quality water for unrestricted reuse and aquifer recharge. The \$450-million privately financed, 30-year concession project uses biological nutrient removal followed by ultrafiltration and reverse osmosis to meet extraordinary effluent requirements.

→ Project director for the Water Authority of Jordan, Wadi Mousa Wastewater Treatment Plant, Jordan, funded by the United States Agency for International Development. This project consisted of the design of a 1.8-mgd nitrogen removal wastewater treatment plant and effluent reuse system that protects the UNESCO World Heritage Site of Petra.

→ Senior officer and advisor for the design of a 430-dry tons/day anaerobic digestion and cogeneration facility for the Regional Water Reclamation Plant for Mey Ezor Dan Cooperative Agriculture Water Society Ltd. The \$180-million, two-stage anaerobic digester facility achieves Class A quality biosolids and includes eight thermophilic digesters and an 11.2-MW biogas cogeneration system.

Brandon (Randy) Braley, P.E., BCEE

- Project director for the JAFZA Water Reclamation Facility, Dubai, United Arab Emirates. This project consisted of the design of a 28-mgd, membrane bioreactor water reclamation facility for build-own-operate delivery by General Electric Water & Process Technologies.
- Project manager for the Passaic Valley Sewerage Commission, New Jersey, Biosolids Centrifuge Dewatering Facility Design (530-dry tons/day).
- Project manager for the South Essex Sewerage District, Salem, Massachusetts, Facilities Planning, and Conceptual Design Project. This 30-mgd secondary wastewater treatment facility in urban Salem included a region-wide siting process, and a compact design with stacked secondary clarifiers.
- Project engineer for the Facility Planning and Conceptual Design of the 570-mgd Deer Island Wastewater Treatment Plant for the Massachusetts Water Resources Authority, Boston, Massachusetts. Responsibilities included evaluation and design of preliminary treatment, primary treatment, and secondary sedimentation, including innovative stacked clarifiers for a dramatically reduced footprint.
- Project director, independent technical consultant on behalf of the underwriting financial institution, Morgan Stanley for financing of Chicago Biosolids Project, Illinois. Directed technical and implementation assessment of the \$43-million, 150-dry tons/day biosolids drying project Quality reviewer for the City of Boynton Beach, Florida, Ion Exchange Treatment System and East Water Treatment Plant Improvements Progressive Design Build Project. Work includes permitting, design, and construction of a 16.0-mgd ion-exchange system, associated ancillary systems, and west wellfield and transmission line modifications.
- Technical advisor for the City of Pompano Beach, Florida, Study and Design of a Backup Concentrate Disposal System. Project consisted of the study and design of a backup concentrate disposal system for a 10-mgd nanofiltration plant. The project includes identification and evaluation of disposal alternatives and selection of a recommended plan, followed by design and bidding services.
- Project director for the Zai Water Treatment Plant, Amman, Jordan, funded by the United States Agency for International Development. Project consisted of design-build improvements to the 32-mgd water treatment plant. This \$5.5-million project responded to a water quality crisis in Jordan by designing, procuring and installing new water treatment facilities in 10 months.
- Project coordinator for a Municipal Water Resources Program for West Bank, Palestine, funded by the United States Agency for International Development. This project consisted of the design of water supply systems to provide water to Bethlehem, Hebron, and Jenin. The design included four 2,600-foot deep wells of 700 gpm capacity each, 17 reservoirs, seven pumping stations, and 41 miles of high-pressure transmission main.
- Proposal strategist, contract negotiator, management advisor, and program manager for the Lesotho Highlands \$1.2-billion Water Project – Phase II, Africa. Mr. Braley guided his client to a win in a highly competitive procurement for program management for the \$1.2 billion water supply dam and tunnel project. Activities included developing and guiding implementation of the proposal pricing approach, as well as leading contract negotiations for the client resulting in the execution of a fair and balanced contract.
- Project manager for the design of six water and wastewater treatment plants in Egypt, funded by the United States Agency for International Development. The project consisted of the design of a 40-mgd water treatment plant for the City of Mansoura that treated Nile River source water using innovative, low energy treatment processes.



Robert S. Cushing, Ph.D., P.E., BCEE

Dr. Robert Cushing is a senior vice president with Carollo Engineers. He has 27 years of experience in applied environmental science and engineering. Throughout his career, he has coupled fundamental concepts with sound engineering practices to provide creative, innovative, and enduring solutions to challenges faced by water and wastewater utilities. He has been responsible for numerous successful treatment facility planning and design projects, as well as studies and programs for water reuse and discharge.

Dr. Cushing has practiced nationally, providing service to a broad cross-section of the industry, from some of the largest and most visible utilities (e.g., New York City and Washington, D.C.) to very small applications with important and unique issues (e.g. Ouray National Fish Hatchery, Utah).

Education

PhD Civil Engineering,
University of Texas,
Austin, 1993

MS Civil Engineering,
University of Texas,
Austin, 1990

BS Petroleum
Engineering, University of
Texas, Austin, 1984

Licenses

Professional Engineer,
Florida, North Carolina,
South Carolina, Illinois,
Virginia

Professional Affiliations

American Academy of
Environmental Engineers,
Board Certified
Environmental Engineer

American Water Works
Association, (AWWA)
Florida Section AWWA

- Founding Chair
Region 10
- Trustee-at-Large

Founding Director
International Ultraviolet
Association

Water Environment
Federation

Reviewer for: ASCE
Journal of Environmental
Engineering
Environmental Science
and Technology
Journal of the American
Waterworks Association
Water Research

Relevant Experience

→ Technical advisor and quality assurance for the Collier County Northeast Water Reclamation Facility (NEWRF) design, Florida. Responsible for design of secondary clarification, scum pumping, return and waste activated sludge (RAS/WAS) pumping, and dewatering facilities for the first phase of the NEWRF project (4-mgd) with facilities designed to accommodate the ultimate design capacity of 20-mgd.

→ Technical advisor and quality assurance for the City of Tallahassee Wastewater Treatment Master Plan that includes a long-term treatment and disposal strategic plan. The plan encompasses all current wastewater treatment and disposal facilities, including the 4.5-mgd Lake Bradford Road WWTF, the 27.5-mgd Thomas P. Smith WRF, the Southeast Farm (SEF) effluent spray irrigation disposal site, the planned Tram Road Reuse, and the Southwest Spray Field.

→ Principal-in-charge for the preliminary engineering design project involving the expansion from 4-mgd to 8-mgd of the Sarasota County, Florida, Central County Water Reclamation Facility. The existing facility performed biological nitrogen removal using an oxidation ditch with surface brush rotor aerators. The project involved the process conversion to a diffused-air Modified Ludzack Ettinger (MLE) mode with internal partitioning of the ditches to generate anoxic zones. Performed process modeling using Biotran (Carollo-developed software) and BioWin to

determine the treatment capacity provided by various combinations of additional MLE modules with internal or external anoxic zones and secondary clarifiers, thus providing the County a series of capacity expansion options to choose from.

→ Principal-in-charge for the City of St. Petersburg, Florida, Two-Phase Digestion Evaluation study. The study of the digestion facilities at the city's four regional Water Reclamation Facilities concluded that conversion of the digestion facilities to the two-phase mode of digestion would result in potential savings of about \$500,000 per year.

→ Principal-in-charge for the Pinellas County, Florida, South Cross Bayou Water Reclamation Facility FOG Digestion Study. Designed laboratory scale testing protocol of batch and semi-continuous FOG digestion using dewatered FOG and sludge from the 33-mgd South Cross Bayou WRF. Integrated the testing results into digestion mass and energy balance models. It was concluded that digestion of the present dewatered FOG quantity of 1,500 gallons per day would save the County \$130,000 to \$180,000 annually in natural gas purchased for the biosolids dryer and that Pinellas County could realize significantly higher savings by accepting additional FOG from FOG handling companies.

→ Technical advisor and quality assurance for the City of St. Petersburg, Florida, Clarifier Rehabilitation at the Albert Whitted Water Reclamation Facility. This project includes an inspection of the four existing

Robert S. Cushing, Ph.D., P.E., BCEE

secondary clarifiers; developing options for rehabilitation or replacement of the clarifiers; and development of a preliminary design report.

→ Technical advisor and quality assurance for the Wastewater System Improvements for the City of North Port. This project includes preliminary design, final design, and construction phase services for a new City owned 2-mgd wastewater treatment plant and a preliminary design criteria review for a new developer owned 2-mgd wastewater treatment plant. Preliminary design phase will evaluate treatment options that are consistent with the existing City's wastewater treatment plant and site considerations for the new 2-mgd City owned wastewater plant. Preliminary design criteria review for the developer owned plant will ensure process and equipment consistency with the City owned plants.

→ Principal-in-charge for the Collier County, Florida, Ductwork South County Water Reclamation Facility Additional Ductwork Interconnections and Improvements to the Odor Control Systems. Collier County contracted with Carollo to provide additional odor control ducting improvements to maximize the overall reliability of the 16-mgd South County Water Reclamation Facility odor control systems. The improvements include interconnecting the odor control systems for the flow equalization basins, headworks, and aeration basins; providing two additional odor control drops for the headworks and tie into the existing odor control ductwork; disconnecting the existing odor control ductwork from the aeration blower intake header; disconnecting the existing odor control ductwork from the aeration basin anoxic zones; and replacing a previously repaired section of the existing unused interconnection between the headworks and the aeration basins.

→ Technical advisor and quality assurance for an Inflow and Infiltration (I&I) Study in the City of Punta Gorda, Florida, wastewater collection system. The I&I Study was conducted in two phases. Phase 1 – Infiltration included the following tasks:

Developed and conducted testing plans throughout the collection system to quantify and map locations of brackish groundwater infiltration in the system. Conducted a mass balance to determine key areas for improvement; evaluated the potential of water softener regenerate or brine that could be contributing to chloride concentrations in wastewater; and developed a corrective action plan that will allow the City to continue its infiltration reduction efforts. The corrective action plan included an assessment of the chloride reduction potential, cost estimates for prospective repairs or replacement of pipes, and future strategies to progress towards incremental chloride reduction goals. Phase 2 – Inflow included the following tasks: Reviewed previous data available on operations and maintenance records, inspection and repair reports, flow records, lift stations, smoke testing, and documented bypasses and overflows. Evaluated data to identify eight lift station basins that are impacted the most from inflow during a rain event. Prepared a detailed test plan for the eight lift station basins identified and conducted flow monitoring in these basins. Evaluated the results to develop a prioritized list of basins that need further evaluation or improvements to reduce inflow.

→ Principal-in-charge for the City of Punta Gorda, Florida, Wastewater Treatment Plant Operations and Maintenance (O&M) Manual. The purpose of this project was to write a plant specific O&M Manual for the City's wastewater treatment plant. The City required an update to its O&M Manual to document the current operations and maintenance procedures at the WWTP and to meet Florida Department of Environmental Protection requirements. The O&M Manual included all treatment processes and ancillary chapters such as laboratory procedures and reporting, safety, standard operating procedures, and others.



Larry E. Elliott, P.E., BCEE

Larry Elliott, a senior vice president with Carollo Engineers, has 35 years of experience in environmental engineering. He has served as technical director, project manager, and Principal-in-charge with the ultimate responsibility for the quality, schedule, and budget for a variety of projects. These include planning, preliminary design, detailed design, and construction phase-services for water and wastewater treatment and conveyance facilities ranging in capacity from 1 mgd to more than 300 mgd.

Education

MS Civil Engineering,
University of Missouri,
Rolla, 1982

BS Civil Engineering,
University of Missouri,
Rolla, 1980

Licenses

Professional Engineer,
Florida, Kansas,
Oklahoma, Missouri,
Colorado, Arkansas

Civil Engineer, Nebraska

Professional Affiliations

American Water Works
Association, Member
Coagulation and
Flocculation Committee

American Water Works
Association (Florida,
Kansas, and Missouri
Sections), Board of
Trustees for five years
(Kansas Section)

Florida Water
Environment Association
Utilities Council

Kansas Water
Environment Association

Missouri Water
Environment Association

American Academy of
Environmental Engineers,
Board Certified
Environmental Engineer

American Public Works
Association

Wastewater Treatment Facilities

→ Principal-in-charge for the Tohopekaliga Water Authority (Toho), Florida, Centrifuge Study. Prepared a study to compare commercially available centrifuge dewatering technologies and recommended three manufacturers for future bidding. The scope of work included a Centrifuge Technology Evaluation and a report.

→ Principal-in-charge for the JEA, Florida, Buckman Wastewater Treatment Facility Preliminary Investigations for Optimizing the Current UV System. The UV system optimization study consisted of an on-site visit to evaluate the UV system performance including sleeve fouling, wiper performance, UV dose monitoring and control, and indicator microbe inactivation; a cost/benefit analysis to evaluate long-term operating data; and identification of UV system improvements that reduce UV system O&M costs and increase UV dose delivery reliability.

→ Principal-in-charge for the Pasco County, Florida, Wesley Center Wastewater Treatment Plant Rehabilitation Expansion. Carollo is providing facility planning, preliminary design, final design, and construction- phase services for the rehabilitation and expansion of the County's 6-mgd wastewater treatment plant, expanding its capacity to 9-mgd.

→ Principal-in-charge for the City of Daytona Beach, Florida, Westside Regional Water Reclamation Facility. Carollo conducted an UV audit to assess the operation of the existing UV System.

→ Principal-in-charge for the City of Orlando, Florida, Biosolids Dewatering Project. This on-going project for the City's 25-mgd Conserv II Wastewater Treatment

Plant included piloting of differing dewatering technologies and detailed condition assessments of the existing facility in preparation for design of new dewatering system, as well as sludge pumping conveyance systems. Also included in the project is the replacement of belt filter presses for dewatering at the City's 40-mgd Iron Bridge Wastewater Treatment Plant.

→ Principal-in-charge for the Orange County Utilities, Florida, Program Management Services for Water and Wastewater. Some of the assignments completed under this contract include: 1) Business Plan for Central Laboratory operated by the Utilities Department; 2) Evaluation and Documentation of 4-log virus removal compliance at WTPs (total of 9 plants); 3) Southwest Service Area Conveyance Facilities Plan Update; 4) Southwest WRF Conceptual Design Update; 5) Northwest WRF – Phase III Expansion – Value Engineering Study; 6) Eastern Regional WRF – Phase V Expansion – Value Engineering Study.

→ Project director for the predesign and final design of the City of Springfield, Missouri, Northwest Wastewater Treatment Plant expansion to 9.0-mgd. Facilities included peak flow retention basin improvements, new submersible influent pumps, a new headworks with grit removal and new screening systems, a selector basin, aeration basin improvements, secondary clarification improvements, UV disinfection, odor control, and other related appurtenances. Other work focused on repairing and/or replacing deteriorated components of the plant identified during the multi-discipline assessment of the plant's infrastructure.

→ Project manager for the Miami-Dade County Water and Sewer Department,

Larry E. Elliott, P.E., BCEE

Florida, South District Wastewater Treatment Plant Improvements. This project consisted of the preliminary design and detailed design services to design 285-mgd of on-site hypochlorite disinfection systems, new standby generator systems and diesel storage tank farm, new intermediate screw lift pumps, and plant-wide electrical improvements. This work was completed as part of a comprehensive high level disinfection (HLD) project for the County.

→ Project director for the City of Plantation, Florida, Regional Wastewater Treatment Plant and Central Water Plant Pump Speed Controller Upgrades. This project consisted of the design and construction management of the Pumps Speed Controller Upgrade Project at the Plantation Regional Wastewater Treatment Plant and Central Water Treatment Plant. The project included services for replacing obsolete magnetic type drives with state of the art VFDs for the speed control of wastewater effluent-deep well pumps, RAS pumps, transfer pumps, high service water pumps, and new state of the art PLCs with Operator-Machine graphics that facilitate automation and remote control.

→ Project director for the Fayetteville Public Works Commission, North Carolina, Cross Creek Water Reclamation Facility Methane Cogeneration Study. The feasibility study involved installing cogeneration facilities to better utilize the excess digester gas. The study considered three technologies for cogeneration, reciprocating engines, microturbines, and fuel cells. Gas production values were estimated, preliminary layouts were developed, and performance projections based on current conditions and possible future enhanced digester operations were considered.

→ Project director for Charlotte-Mecklenburg Utilities, North Carolina, Mallard Creek Water Reclamation Facility Clarifier and Related Improvements. This project consisted of adding a final clarifier and return activated sludge pumping, two new oxic recycle pumping stations, and flow distribution / hydraulic improvements to the 12-mgd Mallard Creek Water Reclamation Facility.

This project also included a process evaluation, recommendations for improvements to the effluent filters, and modifications to address improper flow splitting to the basins.

→ Principal-in-charge for a facility plan for City of Kansas City, Missouri, 120-mgd Blue River Wastewater Treatment Plant. This was a comprehensive study of the plant's infrastructure, which consisted of developing a plan comprised of short-term and long-term improvements to rehabilitate the facility. This project also included an optimization study of the plant's operating protocol, staffing assignments, and purchasing procedures. The final work product was a phased and prioritized implementation plan that considered reliability, condition, regulatory mandates, and available funding.

→ Principal-in-charge for process evaluations and detailed design of a UV disinfection system for the City of Wichita, Kansas, 42-mgd Wastewater Treatment Plant. This project was completed following a detailed review of several alternative disinfection scenarios where UV was deemed most feasible.

→ Principal-in-charge for the City of Tampa Augmentation Project (TAP). This project seeks to use natural treatment systems (wetlands and soil aquifer treatment) to return highly treated reclaimed water from the Howard F. Curren Advanced Wastewater Treatment Plant to the regional raw water supply.

→ Principal investigator/project manager for the development of the Water Research Foundation Management Strategy Manager (Manager) for water treatment plant infrastructure assessment. The Manager is a comprehensive software package with a full complement of asset management components, including asset inventory; asset assessment, including condition and criticality; asset valuation using the modified and straight-line depreciation approaches; prioritized reports and photos for CIP development and operations and maintenance optimization; and the ability to track assets over time.



Roderick D. Reardon, P.E., BCEE

Roderick Reardon is an environmental engineer with 39 years of experience in the study, design, and operation of municipal wastewater facilities. Mr. Reardon has particular expertise in advanced wastewater treatment processes, including membrane technologies, for the removal of nutrients and for producing reclaimed water fit for various types of reuse. As Carollo's National Wastewater Technology Leader, Mr. Reardon is responsible for a wastewater technology team that manages acquisition, compilation, transfer, and consistent application of wastewater processes and technology throughout the company. For specific projects, he performs as project manager/engineer or as process specialist.

During his career, Mr. Reardon has worked as a project engineer, project manager, and wastewater process specialist on a wide variety of environmental engineering projects, including facility plans, water and wastewater transmission systems, and numerous wastewater treatment plants ranging in size from 0.1 to over 600 mgd. He managed an innovative capacity study at an advanced wastewater treatment facility that won the Grand Prize in Research in the American Academy of Environmental Engineering Excellence in Environmental Engineering competition. He also directed the process selection and final design for the first nitrogen removal facility on Puget Sound.

Education

MS Civil and Sanitary Engineering, Lehigh University, 1977

BS Chemical Engineering, Lehigh University, 1973

Licenses

Professional Engineer, Florida, Washington, Tennessee, Alabama, Pennsylvania, Mississippi

Professional Affiliations

American Academy of Environmental Engineers (Board Certified – Water Supply and Wastewater)

American Chemical Society

American Membrane Technology Association

American Water Works Association

Florida Water Environment Association,

International Water Association

Water Environment Federation

Relevant Experience

→ Process engineer for the Orange County Sanitation District (OCSD), California, Primary Treatment Optimization Study (P1-116) at the OCSD Plant No. 1. Assisted in a modeling study that evaluated the effect that the performance of chemically enhanced primary treatment had on the cost of operating downstream processes.

→ Project director for the Charlotte-Mecklenburg Utilities, North Carolina, Mallard Creek Water Reclamation Facility Final Clarifier and Related Improvements Study and Design. The project included adding a final clarifier, mixed liquor recycle pumps, and flow distribution/hydraulic improvements.

→ Process specialist for additional services for the City of Tallahassee, Florida, Lake Bradford Road Water Reclamation Facility Improvements. Provided advice, process engineering, and modeling to identify alternative process configurations capable of providing economical nitrogen removal for an interim period at the existing wastewater plant.

→ Project manager for the final design of the City of Tallahassee, Florida, Lake Bradford Road Water Reclamation Facility Improvements. To protect the water quality

in Wakulla Springs, a Settlement Agreement between the City, the State of Florida, and other parties required the City to upgrade its wastewater treatment to meet water quality limits of 3.0 mg/L total nitrogen and 2.5 mg/L total phosphorus. Managed final design to upgrade the existing 4.5-mgd Lake Bradford Road secondary facility to meet these stringent limits using membrane bioreactor technology combined with a four-stage nitrogen removal process.

→ Project engineer for the Preliminary Design Report for the City of Tallahassee, Florida, Lake Bradford Road Water Reclamation Facility Improvements. Assisted in the process design for proposed upgrades to the existing wastewater treatment facilities and preparation of the preliminary design report used by the City to obtain a wastewater permit from the State of Florida.

→ Technical advisor and project manager for work done to assist the Florida Water Environment Association Utility Council in their responses to the U.S. EPA's on EPA's determination that numeric criteria for in-stream nutrient concentrations were necessary for Florida waters to meet the requirements of the Clean Water Act. Work products produced by the project team included briefing and white papers on the

Roderick D. Reardon, P.E., BCEE

treatment technologies that might be needed to meet the proposed criteria, estimates of the cost to implement such technologies, assistance in presenting this information to a panel of the National Research Council regarding the federal rule's compliance costs for utilities, and authoring of several papers and presentations to professional groups to help educate Florida citizens and regulators about the potentially huge cost and environmental implications of EPA's NNC Rule.

→ Task leader for the Orange County Utilities, Florida, Water, and Wastewater Facilities Program Management. Continuing services for program management are being provided under this contract, including a variety of planning, engineering, and management services necessary to implement the County's Capital Improvement Program for water, wastewater, and reclaimed water facility improvements and various other projects necessary for facility management and utility operation, compliance, and optimization.

→ Senior process engineer for an update to the Facility Plan for the Southwest Water Reclamation Facility (SWWRF), Orange County Utilities, Florida. Provided direction, advice, and review for a re-evaluation of the selection of the best treatment technologies to meet current and possible future water quality standards. The SWWRF will be a new 5.0-mgd plant providing advanced wastewater treatment and reclaimed water supply for the County's Southwest Service Area.

→ Project advisor for the Hillsborough County, Florida, Northwest Regional Wastewater Consolidation Program Assistance. Hillsborough County has undertaken a program to regionalize their Northwest Service Area by decommissioning three of the four existing facilities and consolidating treatment at one regional facility. Provided review and advice to the County on matters related to wastewater treatment from the development of the strategic implementation plan through review of the

design/build proposals, and refinement of the specific project components. Participated in a VE for the project. Part of the VE evaluated the use of surface aerators vs. fine pore aeration.

→ Senior project engineer for the Daytona Westside Regional Wastewater Treatment Facility Tertiary Filter Evaluation study for the City of Daytona Beach, Florida. This study evaluated the performance of existing automatic backwash filters, and identified and evaluated promising alternatives for rehabilitation or replacement of the filters that would minimize long-term capital investment and operating costs, while continuing to provide a filter system that is consistent with the City's NPDES water quality requirements.

→ Process engineer supporting the development of a capital cost estimate to upgrade and expand the wastewater treatment facilities at a large potato and corn processing plant in the California Central Valley.

→ Lead process engineer for the mainstream biological nutrient removal process for the expansion and upgrade of the Edmond, Oklahoma, Coffee Creek Water Resource Recovery Facility. The project consists of upgrading the Coffee Creek facility to meet new regulatory requirements on the discharge of nitrate nitrogen and expected future limits on total phosphorus while expanding the treatment capacity in two phases from 9 to 12 mgd. Included capacity expansion and conversion of mechanical surface aeration to fine pore diffused aeration.

→ Process advisor and reviewer for the Babcock Ranch Wastewater Treatment Facilities, Florida. Babcock Ranch is a planned residential community being developed on the 17,000-acre Babcock Ranch property near Ft. Myers that will ultimately have a population of about 50,000. The wastewater treatment facilities will meet limits in the reclaimed water for both nitrogen and phosphorus. The project is being constructed in two phases using a design/build approach.



Sudhanva V. Paranjape, P.E.

Sudhan Paranjape has focused experience with water and wastewater treatment plant process and detail design. His experience ranges from process design of several conventional and advanced water treatment processes including high rate clarification such as Actiflo™ process, biologically activated filtration, reverse osmosis membranes, air stripping, and ozonation.

Education

ME Environmental Engineering, Old Dominion University, Norfolk, VA, 1997

BS Civil Engineering, University of Pune, India, 1993

Licenses

Professional Engineer, Florida, Virginia

Professional Affiliations

Water Environment Federation

Florida Water Environment Association
- Biosolids Committee

Mr. Paranjape's wastewater experience includes process/detail design of nutrient removal processes such as 4-stage Bardenpho™ and MLE process, and advanced treatment processes such as membranes. He has also worked on wastewater residuals treatment processes involving anaerobic digestion, sludge dewatering and drying.

Mr. Paranjape is active in Water Environment Federation (WEF) and was author of a Chapter on Energy use in *Water Treatment Plants for Manual of Practice No. 32 - Energy Conservation in Water & Wastewater Treatment Facilities*.

Relevant Experience

→ Project manager for the Program Management services for Water and Wastewater for a multi-year contract with Orange County Utilities. The work includes the following work assignments: 1) Business Plan for Central Laboratory operated by the Utilities Department; 2) Evaluation and Documentation of 4-log virus removal compliance at Water Treatment Plants (total of 9 plants); 3) Southwest Service Area Conveyance Facilities Plan Update; 4) Southwest Water Reclamation Facility Conceptual Design Update; 5) Northwest Water Reclamation Facility – Phase III Expansion – Value Engineering Study; 6) Eastern Regional Water Reclamation Facility – Phase V Expansion – Value Engineering Study.

→ Project manager for the Tohopekaliga (Toho) Water Authority Florida, Centrifuge Study. Prepared a study to compare commercially available centrifuge dewatering technologies and recommended three manufacturers for future bidding. The scope of work included a Centrifuge Technology Evaluation and preparation of a report.

→ Project manager for the design of upgrades to the existing return activated sludge/waste activated sludge (RAS/WAS) pump station at the West Side Regional Wastewater Treatment Plant (15-mgd) for the City of Daytona Beach, Florida. The project comprises a new RAS/WAS pump station with new horizontal non-clog

centrifugal pumps, new belt filter press feed pumps and addition of coarse bubble aeration with blowers for the reaeration zone of the 5-stage Bardenpho™ process.

→ Project manager for the design of new tertiary deep-bed granular medium filters to replace the existing ABW filters at the West Side Regional Wastewater Treatment Plant (15-mgd) for the City of Daytona Beach, Florida. A total of 8 deep-bed granular medium filters will be design and constructed to treat a flow of 15-mgd adf and 45-mgd peak.

→ Project manager for the Tertiary Filter evaluation study for the West Side Regional Wastewater Treatment Plant for the City of Daytona Beach, Florida. The study includes performing condition assessment and capacity evaluation of existing ABW Traveling Bridge Filters. Further the study evaluated three alternate filter types to replace the existing filters - Deep Bed Granular media filters, Cloth Disk filters and membrane filters.

→ Project manager for the design of improvements/upgrades to the biosolids dewatering system at the Conserv II Water Reclamation Facility (25-mgd) for the City of Orlando, Florida. The facility has four 2-meter belt filter presses (BFP). A pilot study was conducted to evaluate three dewatering technologies—new BFPs, centrifuges and screw presses. Based on pilot test results, the 3-belt BFPs were chosen as the dewatering technology. A

Sudhanva V. Paranjape, P.E.

preliminary design report was prepared that also evaluated sludge pumping, cake conveyance and storage facilities. Final design for these improvements was completed in February 2016.

→ Project manager for the City of Orlando, Florida, 40-mgd Iron Bridge Dewatering System Improvements. The design includes replacing the existing 2-belt filter presses and gravity belt thickener with 3-belt filter presses and associated sludge feed pumps and polymer feed system. Design will be completed in October 2016.

→ Project manager for the design of acid-phase digestion upgrades to the anaerobic digestion system at South Cross Bayou Water Reclamation Facility, Pinellas County Utilities. As part of this project, two acid phase digesters and new hot water boiler system are being designed to upstream of the existing egg-shaped digesters. The acid phase digesters will be fed a mixture of thickened waste activated sludge and fats, oil, and grease (FOG) which will result in greater methane gas production in the egg digesters.

→ Project engineer for the design of a 4.5-mgd adf, membrane bioreactor (MBR) wastewater treatment plant expansion for the City of Tallahassee. Specifically in charge of the design of the Plant Headworks including two Cog Rake type mechanical bar screens, sludge degritting equipment; Fine screen structure including two center-flow band type screens; design of process air blowers; Membrane bioreactor tanks including all membrane equipment such as membrane cassettes, piping, permeate pumps, membrane scour blowers and associated blower building. The project documents were completed to 80% design level when the City decided to shelve the project due to lack of funds.

→ Project engineer for the design of an 8-mgd adf (17-mgd peak) plant headworks for the Central County Wastewater Treatment Plant, Sarasota County Utilities, Florida. The headworks comprised of two perforated plate screens followed by a vortex-type grit removal system.

→ Project manager and lead design engineer for the St. Johns County, Florida, Northwest WWTP Preliminary Design. Served as project manager and lead design engineer for a new "greenfield" wastewater treatment plant for northern St. Johns County. The facility will be an AWT Plant and supply reclaimed water for green space irrigation. Providing project management and overall project direction, he has been integrally involved with process evaluation for this new WWTP. As part of process design, he evaluated five options for this plant: MLE w/DENITE filters, 4-Stage Bardenpho™ process with clarifiers and disk filters; 5-Stage Bardenpho™ process with clarifiers and disk filters; 4-Stage Bardenpho™ process with MBR and Phase Isolation Oxidation ditch with secondary anoxic tanks, clarifier and disk filters in detail. The BIOWIN model was used for comparison of my spreadsheet calculations. Other treatment processes evaluated are disinfection with bulk sodium hypochlorite and ultraviolet disinfection systems.

→ Project manager and lead design engineer for the St. Johns County, Florida, Anastasia Island WWTP Expansion. Served as project manager and design manager for the expansion of the wastewater treatment plant. The expansion includes rehabilitation of plant pump station with new submersible pumps; a new headworks with fine screens and grit removal system; a separate new four-stage Bardenpho™ treatment train with two new clarifiers; expansion of the chlorine contact chamber; a new solids dewatering building with a new belt filter press and truck loading bay.

→ Project manager for the City of Green Cove Springs, Florida, Reclaimed Water System Improvements Project for the South Wastewater Treatment Plant. Served as a project manager for the reclaimed water system improvements for the South WWTP which included a tertiary disk filter followed by chlorination followed by effluent reuse pumping system. The existing gaseous chlorination system was replaced by Bulk Sodium Hypochlorite system.



William D. Marshall, P.E.

Bill Marshall is engaged primarily with municipal wastewater and reclaimed water projects, from Carollo's Orlando, Florida office. He has served as a professional engineer in the areas of planning, permitting, design, and construction of various municipal water, wastewater, and reclaimed water projects. Mr. Marshall's expertise consists of preliminary and final design engineering phase services of municipal water, wastewater, and reclaimed water systems. He has past experience with the planning, design, permitting, and construction of private development enterprises, including a \$456,000,000 baseball stadium in downtown San Diego, California.

Education

BS Civil and Environmental Engineering, University of Vermont, 2000

Licenses

Professional Engineer, Florida
Civil Engineer, California

Professional Affiliations

Engineers Without Borders
Florida Engineering Society
Water Environment Federation
WB South Central Florida Professional Chapter and EWB University of Central Florida Chapter for Water/Sanitation Projects in Belle Anse, Haiti
- Former Project Leader

Relevant Experience

→ Project manager for the Eastern Water Reclamation Facility (EWRF) Phase V Improvements Project, Orange County, Florida. Responsible for preliminary and final design engineering, permitting, bidding and construction administration services. The project will increase the treatment capacity of the facility from 19-mgd to 24-mgd. It includes both new and improvements to existing facilities. The project consist of the following new facilities; a 10,500 square feet preliminary treatment structure rated for 110-mgd, aeration and mixing improvements to four biological nutrient removal (BNR) reactors, 2,100 square feet supplemental carbon storage and metering building, two return and waste activated sludge (WAS) pumping stations, a 125-foot secondary clarifier, a chlorine contact basin, four secondary effluent reject diversion structures, a 32-mgd secondary effluent reject pump station, 52-mgd of additional effluent pumping capacity, a 5-mgd implant reuse pumping station and a 1,500 square feet electrical building. The project consist of the following improvements to existing facilities; abandonment of the existing preliminary treatment structure, supplemental aeration and mixing facilities to four existing BNR reactors, improvements to three return and waste activated sludge pumping stations, architectural and electrical improvements to multiple buildings, lining and re-grading a 32 AC reject storage pond, and miscellaneous site civil and roadway improvements.

→ Project manager for Eastern Water Reclamation Facility Centrifuge Dewatering Improvements Project, Orange County, Florida. Responsible for preliminary and final design engineering, permitting, bidding and

construction administration services. The project will provide the capacity to dewatering waste activated sludge (WAS) for the design wastewater flow of 24-mgd. The project will include construction of a new 4,500 square feet building to house three centrifuge units elevated above a dual truck loading area. The project also includes a new WAS booster pump station, improvements to two existing WAS holding tanks and WAS pumping facilities.

→ Project engineer for the South Water Reclamation Facility (SWRF) Phase V Improvements Project, Orange County, Florida. Responsible for final design engineering, permitting, and bidding services. The project will increase the treatment capacity of the facility from 43-mgd to 56-mgd. It includes both new and improvements to existing facilities. Mr. Marshall was responsible for the following facilities; a new 51.25 Equalization Pumping Station, a new 36-mgd Effluent Transfer Pumping Station, two new 10 mg Ground Storage Tanks, three new Influent Screens and Compactors, Grit Removal Equipment Improvements, Yard Piping and Site Civil Improvements.

→ Project engineer for the South Water Reclamation Facility (SWRF) Influent Pumping Station Expansion and Upgrades Project, Orange County, Florida. Responsible for preliminary design for expanding the capacity of the Influent Pumping Station from 110-mgd up to 170-mgd with an ultimate capacity of 216-mgd. The project will provide the influent pumping capacity for the SWRF Phase V Improvements, a \$62.4 million project that Mr. Marshall was the project engineer. Preliminary design included a cost comparative for five alternative pump

William D. Marshall, P.E.

station configurations and performing Computational Fluid Dynamic (CFD) analysis.

- Project manager for the Northwest Water Reclamation Facility (NWRF) & Eastern Water Reclamation Facility (EWRF) Disk Filter Improvements Project. Responsible for preliminary and final design engineering for adding 63.8-mgd of tertiary filtration capacity at two existing Orange County Water Reclamation Facilities. Six new disk filters will be installed at the NWRF to provide 33.8-mgd of filtration capacity. Five new disk filters will be installed at the EWRF to provide 30.0-mgd of filtration capacity. The project will provide the filtration capacity for the EWRF Phase V Improvements, a \$53.3-million project.
- Project engineer for the Eastern Water Reclamation Facility Phase IV-C Improvements Project, Orange County, Florida. Responsible for the preliminary and final design engineering, permitting, bidding and construction administration services for a \$27.7 million, 5-mgd biological treatment expansion including the following improvements; 3.7-mg modified step feed biological nutrient removal reactor (Basin 7), 12,500 square feet electrical/generator/blower building, 125-foot diameter secondary clarifier, clarifier electrical building, RAS/WAS pump station, in-plant lift station, diesel fuel storage facilities and site civil. The project was constructed with change orders totaling less than \$70 thousand in relation to the bid documents. (Awarded 2011 AGC Horizon Award "General Contractor, Municipal/Utility, Renovation - \$15 – 30 million category").
- Project engineer for the Phase 1A Reclaimed Water System Improvements Project, Haines City, Florida. Responsible for preliminary and final engineering design phase services, bidding, permitting and construction administration services for a \$4.3 million project comprised of a effluent pump station modifications, hydro-pneumatic tank, fine screen strainers, bulk sodium hypochlorite storage and metering

buildings, site civil, 3.5 miles of transmission (24-inch) and distribution (6-inch) pipelines.

- Quality control reviewer for the Iron Bridge Effluent Management Improvements Project, City of Orlando, Florida. QC reviewer for a new 37.5-mgd pump station, new aluminum covers for the Deep Bed Filters and South Chlorine Contact Basin, a new electrical building and improvements at the existing Wetlands Transmission Main and Eastern Regional Reclaimed Water Distribution System interconnect.
- Project engineer for Phase I Public Access Reuse Storage and Pumping Facilities, Winter Garden, Florida. Responsible for preliminary and final engineering design phase services, permitting, bidding, construction administration and operations services for a \$2.9 million project comprised of a 1.2 mg ground storage tank, high service pumping station, effluent pump station modifications, site civil, transmission (12-inch) and distribution (8-inch) pipelines.
- Project engineer for Jabel Ali Sewage Treatment Plant Phase II, Dubai Municipality, United Arab Emirates. Responsible for the collaborated design of the activated sludge storage, thickening and dewatering processes as part of the expansion of an existing 80-mgd facility to 180-mgd. Mr. Marshall was a project engineer responsible for final design engineering for activated sludge storage, thickening and dewatering improvements.
- Project engineer for Martin Slough Interceptor Project, Eureka, California. Responsible for final design engineering phase services for the abandonment of 16 lift stations as part of a conversion to a gravity system comprised of 6 miles of interceptor and collector sewer.
- Project engineer responsible for the Phase 1B Reclaimed Water System, Haines City, Florida. Responsible for preliminary and final engineering design phase services for a future 3-mg ground storage tank, high service, and transfer pumping station, fine screen strainers, site civil, bulk sodium hypochlorite storage, and metering improvements.



M. Scott Richards, P.E.

Scott Richards has 15 years of industry experience, completing numerous projects throughout the state of Florida. He serves as a client service manager, project manager, and technical lead. His broad background of projects for municipal clients includes planning, design, permitting, and construction of treatment, conveyance, and collection systems. He specializes in pump stations and pipeline systems, including potable and reclaimed water transmission/distribution, and wastewater collection systems. This includes the design of new systems and the replacement/rehabilitation of existing systems.

Education

BS Mechanical
Engineering, University of
Florida, Florida, 2002

Licenses

Professional Engineer,
Florida

Professional Affiliations

American Water Works
Association

Florida Water
Environmental
Association

Mr. Richards also provides expertise including hydraulic modeling, master planning, asset management, utility studies, bond reports, SCADA system improvements, and equipment energy analysis. Having previously worked for a water filtration manufacturer, he has a specific background with filtration systems, pumps, and control systems.

Mr. Richards is a hands-on engineer who takes pride in listening to and understanding his client's needs, in order to produce quality product. His relevant experience includes:

Relevant Experience

→ Project manager for Broward River Crossing Reclaimed Directional Drill, JEA, Jacksonville, Florida. The project included the installation of a reclaimed water main crossing underneath the Broward River. The crossing consists of approximately 3000 linear feet of 30-inch HDPE pipeline, installed via directional drill underneath the River and two railroad crossings. This pipeline will allow for reclaimed water to be transferred from JEA's District II WWTP to commercial customers on the east side of the Broward River. Responsibilities included project management, design, permitting, and construction oversight for the project.

→ Project manager for the City of Daytona Beach Lift Station 4, Daytona Beach, Florida. Project included replacement of Lift Station No 4, including construction of a new lift station, removal of the existing, and transition to the new station. The new duplex pump station included a permanent diesel backup pump, a force main extension, replacement gravity sewer, and associated roadway repair. Responsibilities included project management, design, permitting, and construction services for the project.

→ Project manager for the Lift Stations No. 1 and 3 Replacement, Nassau County, Florida. Project included replacement of Lift

Stations No. 1 (triplex) and No. 3 (duplex). This required the reevaluation of the sewer basin area, system hydraulics, temporary bypass planning, and complete design two new replacement stations. This includes electrical, structural, site work with fencing, and landscape. Responsibilities included project management, design, permitting, and construction services for the project.

→ Project manager for the Orlando Utilities Commission Taft-Vineland Utilities, Orlando, Florida. The project included water pipeline relocates associated with major roadway improvements. The water main adjustments included 16 and 20 inch mains over approximately 2.3 miles along Taft-Vineland Road, including a 16 inch main jack and bore crossing underneath the Florida Turnpike. Responsibilities included project management, design, permitting, and construction services for the project.

→ Project engineer for the Orlando International Airport (MCO) South Automated People Mover Utilities, Greater Orlando Aviation Authority, Orlando, Florida. This project included the initial phases of the South Terminal for the airports expansion, which will include a rail terminal facility, hotel, parking garage and 64 additional airline gates. The Civil work (roadway/drainage/utilities) includes planning and design for the expansion, with

Awards

Florida Section AWWA
Region III Volunteer of
the year, 2011

Florida Section AWWA
Public Affairs Council
Chair's Award for
Distinguished Service,
2013

M. Scott Richards, P.E.

utilities consisting of approximately 17,500 linear feet (LF) of 16-inch water main, 3,300 LF of 6-inch force main, 2,000 LF of 10-inch reclaim main and 2 wastewater pump stations. Pipeline installation included open cut for new construction, along with directional drilling under a canal, and jack and bore crossings of Jeff Fuqua Blvd to connect to existing utilities. Utility master planning was conducted using facility flow data based projected passenger data. Responsibilities included design, permitting, and construction services of the utility system.

→ Project engineer for multiple projects with the Seminole Tribe of Florida - Hard Rock Casino and Hollywood Reservation, Hollywood, Florida. Projects included the design of sewer and water distribution system improvements for several utility projects (Hard Rock Loop, 64th Avenue water line replacement, Main Lift Station, Sewer Improvements along Stirling Rd., water and sewer improvements along Sheridan St. and 60th Ave and the Okalee Village sewer system), within the Hollywood Reservation. The water main project included key crossings near the intersection of Sheridan St and 441, including multiple directional drill and jack and bore crossings. Responsibilities included design, permitting, and construction services.

→ Project engineer for the Taft/Sheridan Street Area Water Improvements, City of Hollywood, Florida. Project included the installation of a new replacement of the water distribution system in the City of Hollywood between Taft and Sheridan Street and between State Road 7 and N. 66th Avenue. This includes engineering services for survey, design, and preparation of construction documents, regulatory assistance, bid and award assistance, and construction phase services for the installation of approximately 44,200 LF of 4-inch, 6-inch, 8-inch water, and 12-inch mains. This primarily residential area previously consisted of "back-of-lot" water services with small galvanized and AC water mains. The new design replaces the existing water distribution system with new "street-

side" pipeline, which includes new service stub-outs and fire hydrants. Customer services/meters were transferred/relocated to the new pipeline. As part of the pipeline replacement, all neighborhood roads and impacted major intersections were repaved. This project included primarily open cut installation, but also included directional drill and jack and bore crossings of major intersections. Responsibilities included design, permitting, and construction services.

→ Project engineer for the Druid Hills Water Main Upgrades, Seminole County Environmental Services Department (SCESD), Seminole County, Florida. The project included water main system replacement/upgrades in the Druid Hills sub-division. This includes engineering services for survey, design and preparation of construction documents, regulatory assistance, bid and award assistance, and construction phase services for the installation of approximately 18,000 LF of 6 to 12-inch mains. This primarily residential area previously consisted of approximately 18,000 lineal feet of 1.5 to 4 inch galvanized, AC, and PVC water main pipe that needed replacement. The upgrade replaced the existing pipe with 8-inch piping, primarily installed by horizontal directional drilling (HDD). In preliminary design, a hydraulic model was developed for the system to improve the hydraulics and provide a fire flow backbone to the system. The team also coordinated hydraulic model results for a new water supply inter-connection point with SCESD's interconnect design consultant. Responsibilities included hydraulic modeling and support of the design, permitting, and construction services



David K. Ammerman, P.E.

David Ammerman has over 32 years of experience in water reuse, including planning studies, master plans, permitting, preliminary and final design, construction, and facility start-up and operations. He formerly served as AECOM's national practice leader for water reuse. He is the author of numerous papers on the subject of water reuse and was a principal author of the 1992 and 2004 EPA Guidelines for Water Reuse as well as a contributing author to the 2012 EPA Guidelines for Water Reuse. He is a member of the WEF/AWWA Reuse Committee and is the Past-President of WateReuse Florida. David also served on the technical advisory panel that revised Florida's reuse regulations.

As a member of Carollo's water reuse practice group, David supports national business development and technical practice demands, which will include serving as a project manager and technical advisor for key projects. David is well known in the reuse industry, and he will help further Carollo's mission of being dedicated to creative, responsive, quality solutions to those we serve.

Education

MS Agricultural
Engineering, University of
Florida, 1986

BSE Agricultural
Engineering, University of
Florida, 1984

Licenses

Professional Engineer,
Florida

Professional Affiliations

American Society of
Agricultural Engineers

Florida Department of
Environmental Protection
Technical Advisory
Committee on Reuse
Regulation

Florida Water
Environment Association
Reuse Committee

Water Environment
Federation Reuse
Committee

Alpha Epsilon

Gamma Sigma Delta

Relevant Experience

→ Project manager for the City of Altamonte Springs, Florida, Potable Reuse Pilot Study. Carollo worked with the City to design, construct, and operate a 20-gpm potable pilot treatment process. The facilities have been running since November of 2016 and are achieving excellent results. Unlike many previous potable pilot projects Altamonte is using an ozone/biologically active carbon filter (O₃/BAF) as the core of their treatment process instead of Reverse Osmosis/ Advanced Oxidation Processes (RO/AOP). This choice was made primarily because the City of Altamonte has no economical means of disposing of the concentrate generated by RO. The O₃/BAF process has the added benefit of substantially lower construction and operating costs. The objectives of this project are: 1. Achieve regulatory compliance. 2. Use appropriate technologies to provide robust treatment and a cost-efficient supply. 3. Assist the City with public education and outreach.

→ City of Tampa Augmentation Project (TAP) Project manager for the City of Tampa Augmentation Project TAP. The City of Tampa is undertaking an implementation program for the Tampa augmentation project (TAP). This project seeks to use natural treatment systems (wetlands and soil aquifer treatment) to return highly treated reclaimed water from the Howard F Curran advanced wastewater treatment plant to the regional raw water supply. Elements of this

project applicable to determining the feasibility of potable reuse include a detailed analysis of applicable FDEP and Water Management District regulations, estimate of reclaimed water yields, and evaluation of the cost of the augmentation program in comparison to other alternative water supplies..

→ Project manager for the Toho Potable Reuse Feasibility Analysis, Florida. Toho operates a number of RIB systems as weather management to their public access reuse system. The recently completed Central Florida Water Initiative (CFWI) has determined alternative water supplies will be necessary to meet future water supply needs. Carollo developed a conceptual level 6-mgd Indirect Potable Reuse (IPR) treatment processes using soil aquifer treatment (SAT) using the existing RIBs. SAT is a proven IPR strategy in California and Arizona but has not been proven to work in Florida's course soils. Carollo's planning level analysis suggested SAT could potentially provide significant costs savings over a more traditional IPR treatment process. The project report included a detailed pilot testing program to confirm the viability and suitability of a SAT based IPR treatment system. Carollo is currently working with the TWA to construct and operate soil column studies to demonstrate the SAT based potable reuse process to FDEP. If successful the TWA intends to move forward with a 6 mgd SAT based potable reuse project.

David Ammerman, P.E.

→ Project manager for the Iron Bridge Effluent Management Study for the City of Orlando, Florida. The study focused on the city's Iron Bridge water reclamation facility which is a 40 MGD capacity Bardenpho plant. This facility currently provides a limited amount of water to an urban reuse program, sends water to a 2,000 acre man-made wetlands system for additional treatment with a surface water discharge. Any water in excess of irrigation demands and the capacity to pump water to the wetlands system is disposed of with a direct surface water discharge into an adjacent water body. As part of a previous project David provided construction services to upgrades to the Iron Bridge Bardenpho treatment process. The effluent management study considered how recently adopted surface water numeric nutrient criteria will affect the Iron Bridge permit. Alternatives evaluated include improvements to the wetlands transmission system which would reduce the need for a direct surface water discharge, expansion to the urban reuse system, and upgrades to the treatment process allowing the city to meet the new surface water quality criteria.

→ Technical advisor for the Altamonte Springs Reclaimed Water Transmission System A-First Transmission System Pipeline Project for the City of Altamonte Springs, Florida. Under this program the city constructed a 24 inch diameter - five-mile long reclaimed water transmission pipe to deliver reclaimed water to the city of Apopka's storage facilities. This project was expedited to meet grant funding requirements from the FDEP, FDOT and St. Johns River Water Management District. This transmission pipe is a critical element of an innovative water resource program which will include the reuse of stormwater from the upcoming I-4 improvements program.

→ Project manager for the Stormwater Reuse Project for the City of Orlando, Florida. This project included development of a preliminary design for the use of reclaimed water and stormwater for urban irrigation in the Lake Nona development.

This included evaluation of stormwater and ground water resources, hydraulic modeling of the transmission/distribution system and design of a stormwater pumping station based on current regulatory guidelines for the use of stormwater for unrestricted access irrigation.

→ Technical advisor for the Lake Simcoe Reuse Feasibility Study, Canada. The study developed a conceptual level analysis of the potential to implement effluent reuse in the Lake Simcoe basin. This included a total of 14 municipalities each with their own wastewater treatment plant and unique permit limits. GIS data was used to determine land use in the vicinity of each plant. Working with local agricultural experts David also developed water use estimates as a function of irrigated area and crop type. Similar area weighted water demand were also developed for urban and industrial land use. The project was able to demonstrate that reuse was cost competitive to upgrades to the treatment plants as a means of reducing nutrient loadings to Lake Simcoe.

→ Principal editor and contributing author for the agricultural reuse section of the 2012 Update to the EPA Guidelines for Water Reuse.

→ Project manager for the 1992 and 2004 Update to the EPA Guidelines for Water Reuse. The 2004 update included over 100 contributing authors and reviewers, each an expert in a particular element of reuse. Development of the Guidelines involved a number of national and international workshops to review drafts and refine the direction of the update.

→ Project manager for Residential Reuse System Development for the City Venice, Florida. The project included the development of an expanded residential reuse system in Venice, which integrated the requirements of the wastewater system with the benefits afforded to the potable water system. To assist in the effort, David was involved in the preparation and presentation of a public workshop on reuse to the city council and citizens of Venice.

CURRICULUM VITAE

JAMES L. ANDERSEN, P.G.

Principal Hydrogeologist, JLA Geosciences, Inc.



QUALIFICATIONS

AND EXPERIENCE

President of JLA Geosciences, Inc., Jupiter, Florida and is responsible for company operations, project management, technical oversight, well design and construction phase services team leader. Mr. Andersen has over 30 years working experience in hydrogeology, groundwater water resource investigations, well field design, construction, development, well problem evaluations and well rehabilitation. He has been responsible for the construction of and completion of hundreds of water supply wells in South Florida including over 100 in the Upper Floridan Aquifer. He has an extensive groundwater experience, working with coastal plain aquifer systems; well design; groundwater monitoring, geophysical well logging and interpretation; reverse osmosis (RO) raw water supply investigations and RO concentrate disposal by injection well; aquifer performance testing, analysis and computer modeling; wellfield contamination investigations, collection and analysis of water quality data; rehabilitation of old wells, and supervising various types of drilling. Mr. Andersen has served as a Florida Chamber of Commerce short course instructor for environmental permitting, an invited speaker for the Florida Department of Environmental Protection on contamination cleanup, a regular conference speaker for AWWA, AWRA, AGWT, AMTA and SEDA on topics such as Aquifer Storage and Recovery, hydrogeology, water use permitting and well design, construction and rehabilitation strategies. Jim serves on the Southeast Desalting Association and Palm Beach County Natural Resources Protection boards. He is also on the board and Secretary of Connect Consulting, Inc., a hydrogeologic and well rehab specialty consulting firm.

PROJECT EXPERIENCE

Principal Hydrogeologist/Project Hydrogeologist, Rehabilitation of Water Treatment Plant No. 3 & 9 Surficial Aquifer Production Wells, Palm Beach County Water Utilities Department, Delray Beach and Boca Raton, Florida (2015-2016) Provided hydrogeologic consulting services during construction phases for rehabilitation program of WTP 3 and 9. Project included four (4) new replacement or re-drills of surficial aquifer production wells and electrical improvements. Replacement wells added 4 MGD capacity and are capable of at least 5.8 MGD firm capacity.

Principal Hydrogeologist/Project Hydrogeologist, FPL Turkey Point FLEX UFA Cooling Water Well, Homestead, Dade County, FL. (2015) Project design, construction and testing of one (1) new 2,000 gpm, 20-inch diameter FRP Upper Floridan aquifer well. The well was constructed within the Unit 3&4 Protected Area to provide beyond-design-basis-event cooling water.

Principal Hydrogeologist/Project Hydrogeologist, FPL Turkey Point Seawater Intake Wells for Supplemental CCS Supply, Homestead, Dade County, FL. (2015) Project design, construction and testing of two (2) new 12,000 gpm, 36-inch diameter Biscayne Aquifer seawater supply wells located on the Point. Combined with one smaller existing well, the project produced over 45 MGD of supplemental cooling water for the CCS during the 2015 summer months.

Principal Hydrogeologist/Project Hydrogeologist, FPL Turkey Point Units 3&4 Uprate Monitoring Plan Implementation, Homestead, Dade County, FL. (2010, 2015) Project included installing 16 cluster monitor wells in and around the Turkey Point Plant Cooling Canal System (CCS), including land based, wetland based, CCS

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Andersen, J.

based and Biscayne Bay based drilling systems. Project included collaboration/coordination with SFWMD, FDEP, Biscayne National Park, Miami-Dade, US Geological Survey and FPL. Geotechnical work included continuous coring, aquifer system flow zone mapping, sophisticated geophysical logging, and cluster well construction to depths of 200 feet.

Principal Hydrogeologist/Project Hydrogeologist, Dewatering Permit Services, Monitoring, Loxahatchee River Environmental Control District, Jupiter, Florida (2015). Provided professional hydrogeologic consulting services to prepare a SFWMD dewatering permit application for gravity sewer installation and provided monitoring oversight. Evaluated and addressed potential for adverse impacts on existing legal users of groundwater resource, natural surface water bodies, and movement of saline water.

Principal Hydrogeologist/Project Hydrogeologist, ASR Permitting, Testing Services, The City of West Palm Beach, West Palm Beach, Florida. (2009-2018, ongoing) Project scope of services included assisting the City in obtaining funding opportunities with cycle testing activities through various entities, assistance with obtaining FDEP Underground Injection Control (UIC) permit modification, UIC monitor well design, permitting, construction and bidding phase services, exploration of Limited Aquifer Exemption assistance through FDEP, ASR Cycle Testing assistance, and evaluation of the City's recovery discharge alternatives.

Principal Hydrogeologist/Project Hydrogeologist, Bio-solids Processing Facility Industrial Wastewater Force Main Construction Dewatering Permit, New England Fertilizer Company (NEFCO)/Solid Waste Authority (SWA), West Palm Beach, Florida. (2012) Project scope of services included preparation of a dewatering plan, including analytical modeling, to South Florida Water Management District for the construction of a new Industrial Wastewater Force Main for SWA Biosolids Processing Facility.

Principal Hydrogeologist/Project Hydrogeologist, Class V Reverse Osmosis Concentrate Injection Well Permitting and Design Services, La Gorce Country Club, Miami Beach, Florida. (2011-2012, ongoing) Project scope of services included all phases of injection well permitting and construction, including preparation of the FDEP injection well construction and testing permit (approved), well design and contractor bidding services, in addition to observation and testing during construction, mechanical integrity testing and well summary report preparation.

Principal Hydrogeologist/Project Hydrogeologist, Injection Well Mechanical Integrity Testing and Rerate Testing, Seacoast Utility Authority, Palm Beach Gardens, Florida. (2010) Included permitting and FDEP UIC rerating of a 24-inch, 3,320 feet deep domestic wastewater injection well and preparation of the MIT summary report. Mechanical integrity testing included an injection casing pressure test, high resolution temperature survey, video survey and radioactive tracer survey. JLA also performed rerating injection test of Injection well IW-1 including conducting a 24-hour injection test in order to permit the well at a higher rate. The successful test resulted in FDEP permitting the well at the higher rate of 10 fps.

ACADEMIC BACKGROUND

Bachelor of Science - Geology; Florida Atlantic University, 1985.

40 hour Hazardous Materials Health and Safety Training, Geraghty & Miller, 1989.

PROFESSIONAL REGISTRATION

State of Florida, Professional Geologist, No. 1103

McNabb Hydrogeologic Consulting, Inc.

Project Related Experience

McNabb Hydrogeologic Consulting, Inc. (2006-present)

President/Hydrogeologist- Provide hydrogeologic consulting services with emphasis on deep injection well systems design, permitting, testing and construction oversight services.

Port St. Lucie Injection Well Systems – Provided regulatory compliance assistance for each of the City's deep injection well systems. Services provided included operating permit renewals and mechanical integrity testing of the City injection well systems. Additional services included plugging and abandonment of the Northport WWTP injection well system, acidization of the Glades WWTP injection well, and repair of the JEA WTP injection well.

Florida Power & Light Okeechobee Clean Energy Center Deep Injection Well System – Provided design, permitting, construction oversight and reporting services for the deep injection well system at the FPL Okeechobee Clean Energy Center. The system consists of two Class I deep injection wells constructed to a depth of 3,200 feet and a dual zone monitor well. The wells were completed with a 24-inch diameter final casing and 18-inch diameter FRP injection tubing.

Florida Power & Light Turkey Point Exploratory/Injection Well – Provided design, permitting and construction oversight services for a 3,230 foot deep exploratory well and dual-zone monitor well at the FPL Turkey Point site. The wells were constructed to Class I injection well standards with a 24-inch diameter final casing and 18-inch diameter FRP injection tubing. Provided permitting services for the conversion of the exploratory well to a Class I deep injection well. Assisted FPL in the preparation of injection well system (12 injection wells and 6 dual-zone monitor wells) preliminary construction schedule.

City of Lake Worth Class I Industrial Deep Injection Well System – Provided design, permitting and construction oversight services for a 3,300 foot deep injection well system for disposal of reverse-osmosis concentrate. The well is used for disposal of reverse-osmosis concentrate.

Okeechobee Utility Authority Deep Injection Well – Provided construction oversight services for construction of a 3,200-foot deep Class I deep injection well and associated 2,000 foot deep dual-zone monitor well at the Cemetery Road Wastewater Treatment Plant.

Fort Pierce Utilities Authority Water Treatment Facility Industrial Deep Injection Well IW-2 – Provided consulting services for design and permitting of Class I Industrial deep injection well IW-2 at the Authority's Water Treatment Facility.

Imperial Irrigation District Deep Injection Wells – Provided construction oversight services for construction of two 2,750-foot deep Class I deep injection wells at the El Centro Generation Center in El Centro, California.

Florida Power & Light West County Energy Center Deep Injection Well System – Provided design, permitting, construction oversight and expert witness services for the deep injection well system at the FPL West County Energy Center. The system consists of two Class I deep injection wells constructed to a depth of 3,400 feet and a dual zone monitor well. The wells were completed with a 20-inch diameter final casing and 16-inch diameter FRP injection tubing. Also provided mechanical integrity testing and injection well system permit renewal services.

City of West Palm Beach Dual-Zone Monitor Wells – Provided construction oversight services for construction of three 2,300-foot deep dual-zone monitor wells associated with the Class I deep injection well system at the East Central Water Reclamation Facility. The project included the plugging and abandonment of three monitoring tubes that are no longer in service.

Martin County Utilities North W/WWTF Dual-Zone Monitor Well – Provided design, permitting and construction oversight services for construction of one 2,229-foot deep dual-zone monitor well associated with the Class I deep injection well at the North Water/Wastewater Treatment Facility. The project included the plugging and abandonment of two monitoring tubes that are no longer in service.

City of West Palm Beach Injection Wells IW-1 through IW-7 – Provided mechanical integrity testing professional and operating permit services for seven deep injection wells at the East Central Water Reclamation Facility.

McNabb Hydrogeologic Consulting, Inc.

LBFH, Inc. (2003 – 2006) - Hydrogeology Manager

Hydrogeology manager focused primarily on deep injection well, Aquifer Storage and Recovery (ASR) well, and production well design, permitting and construction management projects. Duties included groundwater-related project business development and project management for deep injection well, shallow injection well, aquifer storage and recovery well, and production well projects.

Martin County Tropical Farms Class I Industrial Deep Injection Well System – Project manager for the design, permitting and construction oversight for two Class I Industrial deep injection wells used for disposal of reverse osmosis concentrate and treated wastewater.

City of Belle Glade - Provided mechanical integrity testing engineering services for the Belle Glade wastewater disposal deep injection well. Provided monitor well repair engineering services for the City's dual-zone monitor well. Repair included installation of an FRP liner after the lower monitor zone steel casing had developed holes due to corrosion.

Arcadis, Inc. (2002 – 2003) - Deep Injection Well Services Program Manager

Served as the firm's program manager for deep injection well design, permitting, and construction oversight projects. Duties included project business development for deep injection well projects. Additional responsibilities included technical quality control of Groundwater Program projects.

CH2M HILL, Inc. (1995 – 2002) - Project Manager and Hydrogeologist

Was responsible for managing projects involving siting, design, construction oversight, testing, and obtaining permits for deep injection wells and ASR wells. Work included siting and design of injection wells and ASR wells, preparation of Florida Department of Environmental Protection (FDEP) injection well permit applications and responses to requests for information, development and interpretation of deep injection well and ASR well construction and testing programs, preparation of construction contract documents and management of well construction contracts. Other responsibilities included providing resident observation services during well construction and testing, and preparation of well construction completion reports. Communication with clients and contractors was an integral part of the responsibilities.

City of Boynton Beach Injection Well Retrofit – Served as project manager for the design, permitting, services during construction and reporting for the modification of the City's injection well. The project included installation of a 12-inch diameter FRP liner inside an existing Class I injection well with a 16-inch diameter final steel casing.

City of Key West – Project manager of a \$4.8 million deep injection well facility. Responsibilities included design of the injection well facility, preparation of permit applications, management of field personnel, communications with the FDEP, and management of the budget for the project. The project was completed under budget and on schedule. Also prepared the FDEP-approved plugging and abandonment plan for a 2,000 foot deep exploratory well located approximately 1 mile from the injection well site.

Florida Department of Environmental Protection, Underground Injection Control (1992-1995) Professional Geologist

Responsibilities included the review and evaluation of Class I and Class V injection well and ASR well permit applications and proposed well construction and testing plans. Also responsible for reviewing well construction and testing engineering reports, weekly construction progress reports, monthly operating reports, and performing annual inspections of Class I injection well facilities. Interaction with consultants and key utility staff were instrumental in resolving regulatory issues.

Mobil Oil Corporation (1987-1992) Exploration Geologist

Was responsible for conducting large-scale regional geologic studies to assess the hydrocarbon potential of numerous Mesozoic rift basins. Also conducted short-term and long-term mapping projects for much of Southeast Asia and South America, using conventional and computer-aided design.

Education

1985, B.S. Geology, Indiana University

1991, M.S. Geology, University of Texas at Arlington

McNabb Hydrogeologic Consulting, Inc.

Project Related Experience

McNabb Hydrogeologic Consulting, Inc., Jupiter, Florida - (February 2008-present)

Project Geologist/Project Manager- Provide hydrogeologic consulting services with emphasis on deep injection well design, permitting, construction resident observation, and mechanical integrity testing services.

Florida Power & Light Okeechobee Clean Energy Center Injection Well System – Provided construction oversight services for construction of 2 deep injection wells and 1 dual-zone monitor well. The injection wells were drilled to a depth of 3,200 feet and each have a capacity of 9.6 mgd.

Okeechobee Utility Authority Cemetery Road WWTP Class I Deep Injection Well System – Provided construction oversight services for construction of a 3,200-foot Class I deep injection well and associated dual-zone monitor well at the Cemetery Road Wastewater Treatment Plant.

City of Lake Worth Class I Industrial Deep Injection Well System – Provided construction oversight services for construction of a 3,300-foot Class I deep injection well and associated dual-zone monitor well at the Lake Worth Reverse-Osmosis Water Treatment Plant.

Florida Power & Light Turkey Point Injection Well System – Provided construction oversight services for construction of a 3,200-foot deep injection well and associated dual-zone monitor well. The injection well has a permitted disposal capacity of 15.59 mgd.

Martin County Utilities North W/WWTP Dual-Zone Monitor Well – Provided construction oversight services for construction of one 2,300-foot deep dual-zone monitor well associated with the Class I deep injection well system at the County's North Water and Wastewater Treatment Plant. The project also included the oversight of the plugging and abandonment of the original dual-zone monitor well.

Port St. Lucie Injection Well Systems – Provided regulatory compliance assistance for each of the City's deep injection well systems. Services provided included preparing operating permit renewals and mechanical integrity testing field services for the City injection well systems.

Florida Power & Light West County Energy Center Injection Well System – Provided construction oversight services for the conversion of exploratory well EW-2 to Class I deep injection well IW-1. The conversion included installation of a 16-inch diameter FRP injection liner installed to a depth of 2,769 feet, installation of an annular pressure system, mechanical integrity testing of the converted well and performance of two short-term injection tests up to a rate of 8.5 mgd. This was followed by construction of IW-2. IW-2 was constructed to a total depth of 3,250 feet, a 20-inch diameter final casing and 16-inch diameter FRP injection liner.

City of West Palm Beach East Central Regional WRF Dual-Zone Monitor Wells – Provided construction oversight services for construction of three 2,300-foot deep dual-zone monitor wells associated with the Class I deep injection well system at the East Central Water Reclamation Facility. The project included the plugging and abandonment of three monitoring tubes that were no longer in service.

Palm Beach County Water Utilities Western Region WWTP Deep Injection Well Rehabilitation – Provided resident observation and consulting services for well rehabilitation of a Class I deep well at the County's Western Region WWTP. The project included chlorinating, acidization and development of the injection well and injectivity testing.

Martin County Utilities North W/WWTP Dual-Zone Monitor Well – Provided construction oversight services for construction of one 2,300-foot deep dual-zone monitor well associated with the Class I deep injection well system at the County's North Water and Wastewater Treatment Plant. The project also included the oversight of the plugging and abandonment of the original dual-zone monitor well.

City of Port St. Lucie Northport WWTP Deep Injection Well MIT – Provided field services for mechanical integrity testing of a Class I deep injection well at the City's Northport Wastewater Treatment Plant.

City of West Palm Beach East Central Regional WRF IW-7 MIT – Provided field services for mechanical integrity testing of a Class I deep injection well.

McNabb Hydrogeologic Consulting, Inc.

City of Key West Richard A. Heyman Environmental Protection Facility MITs – Provided field services for mechanical integrity testing of two Class I municipal deep injection wells and the City's Environmental Protection Facility.

Charlotte County East Port WRF Deep Injection Well MIT – Provided field services for mechanical integrity testing of a Class I municipal deep injection well at the County's East Port Water Reclamation Facility.

Bonita Springs Utilities Water Treatment Facility – Provided resident observation and consulting services for mechanical integrity testing at the Bonita Springs Utilities Reverse Osmosis Water Treatment Facility Class I deep injection well.

Bonita Springs Utilities Wastewater Reclamation Facility – Provided resident observation and consulting services for mechanical integrity testing at the Bonita Springs Utilities Wastewater Reclamation Facility Class I deep injection well.

ARCADIS, Inc. (1999 – 2008) - Hydrogeologist

Staff hydrogeologist focused primarily on deep injection well and Floridan production well design, permitting and construction management. Responsibilities included design of deep injection and water supply wells, preparation of Florida Department of Environmental Protection (FDEP) injection well and Water Management District production well permit applications, responses to requests for information, development and interpretation of deep injection well and production well construction and testing programs, preparation of construction contract documents and management of well construction contracts. Other responsibilities included providing resident observation services during well construction and testing, and preparation of well construction completion reports.

City of Port St. Lucie James E. Anderson Class I Industrial Deep Injection Well System – Provided construction oversight services for construction of a Class I Industrial deep injection well system for disposal of reverse osmosis concentrate at the City's James E. Anderson Reverse Osmosis Water Treatment Plant. Also provided resident observation and consulting services for mechanical integrity testing and operating permit renewal.

City of Port St. Lucie Westport Class I Industrial Deep Injection Well System – Provided construction oversight services for construction of a tubing and packer design deep injection well system for disposal of wastewater and reverse osmosis concentrate at City's Westport Wastewater Treatment Plant. Also provided consulting services for mechanical integrity testing and operating permit renewal for the deep injection well system.

City of Port St. Lucie Westport Deep Injection Well IW-2 – Provided design and permitting services for a second deep injection well to be constructed at the City's Westport Wastewater Treatment Facility for the disposal of wastewater.

City of Port St. Lucie South Regional (Glades) Deep Injection Well System – Provided design and permitting services for a deep injection well system for disposal of wastewater for the City's South Regional Wastewater Treatment Facility.

Village of Wellington Class I Industrial Deep Injection Well System – Provided construction oversight services during the construction of an injection well system for disposal of reverse osmosis concentrate at the Village of Wellington Reverse Osmosis Water Treatment Facility. Responsibilities included communication with the contractor and regulatory agencies, interpretation of test data, and preparation of the engineering report summarizing the construction of testing of the wells.

Key Largo Wastewater Treatment District Deep Injection Well System – Provided design and permitting services for a deep injection well system for disposal of wastewater for a new wastewater facility in Key Largo, Florida.

Florida Governmental Utility Authority Deep Injection Well System – Provided design and permitting services for a deep injection well system for the Golden Gate Wastewater Treatment Facility for disposal of wastewater.

Florida Governmental Utility Authority Floridan Aquifer Supply Wells – Provided design and technical specifications for the construction and testing of multiple Floridan Aquifer wells for the Florida Governmental Utility Authority water treatment facilities located in Collier, Polk, and Osceola Counties, Florida.

Education

1999, B.S. Geology, University of Tennessee at Knoxville



Michael A. Carzo, CCM

Michael Carzo is a program / construction manager with over 33 years of experience in water, wastewater, and public and private sector utility projects. He has contributed to multi-million dollar construction projects throughout the United States, making decisions that impact resource requirements; scope, schedule, and sequence of project activities; client and team satisfaction; risk profile; quality; health, safety, and environmental factors; and financial performance. Mr. Carzo's direct responsibilities include directing and supervising construction field activities and staff, office engineering, inspection, materials testing, and field contract administration. He routinely serves as a liaison between consultants, design professionals, operations personnel, and regulatory agencies. Mr. Carzo also oversees progress meetings, construction scheduling, constructability plan review, contractor claims review and processing, change order review and processing, project close-out, and coordinates guaranty and warranty items.

Education

Professional Certificate -
Project Management
University of Phoenix,
Arizona, 2010

Licenses

Certified Construction
Manager, Arizona

Water Distribution
System Operator, Grade
2, Arizona

Certification

Certificate, 30 Hour
Construction, OSHA,
Arizona, 5/14/17

Certificate, CCM,
Construction
Management Association
of America,

Certificate, Chlorination,
Wallace and Tiernan,
New Jersey

Certificate, OSHA 29 CFR
1926, OSHA,

Certificate, Red Cross
First Aid and CPR, Red
Cross

Training, OSHA Trips,
Spills, and Falls, OSHA

Training, Confined Space
Training,

Relevant Experience

→ Resident project representative for the City of Chandler, Arizona - Ocotillo Water Reclamation Facility. Mr. Carzo provided construction administration and resident engineering inspection services of wet process and solid stream facilities for this \$120 million project. His duties included resident engineering inspections; conducting construction meetings with the Contractor and Owner; reviewing and approving equipment shop drawings and operations and maintenance (O&M) manuals; answering requests for information (RFIs); processing and approving Contractor monthly payment applications and change order proposals; as well as general construction site management and daily coordination with the Contractor and City's Project Manager.

→ Construction manager for the Ak-Chin Indian Community, Arizona - \$47 million, 2.0-mgd Regional Water Reclamation Facility. The project involved maintaining client contact and identifying and tracking stakeholder budget issues. Other work efforts included engineering project management duties such as conducting contract negotiations, project planning and set-up, sub-consultant management, schedule management, planning for and executing appropriate QA/QC, tracking costs versus budget, identifying and resolving potential scope and budget issues, and client management. Work components included Influent Pump Station, Fine Screens, Biological Treatment Basin, GE

Zenon Membrane bioreactor, Feed Forward and dewatering pumps, Ultraviolet disinfection facility, Vadose zone recharge wells; as well as close out and start up services.

→ Construction manager / resident inspector for the City of Surprise, Arizona - SPA-2, 2.0-mgd Membrane Water Reclamation Facility. This project included construction administration and resident engineering inspection services for a new 2.0-mgd water reclamation facility, designed to produce Class A+ reclaimed water. Design elements included a common wall construction and a membrane bioreactor to eliminate the need for conventional sedimentation, filtration, and disinfection facilities, thus minimizing excavation, concrete, and electrical construction costs. The facility was constructed using the Construction Manager-at-Risk project delivery method.

→ Construction manager for the City of Surprise, Arizona - \$100 million 8.0-mgd Water Reclamation Facility Expansion. This project involved construction administration and resident engineering inspection services of wet process and solid stream facilities. Duties included resident engineering inspections, conducting construction meetings with Contractor and Owner, reviewing and approving equipment shop drawings and O&M manuals, answering RFIs, processing and approving Contractor monthly payment applications and change order proposals, general construction site management, and daily coordination with

Michael A. Carzo, CCM

the Contractor and City's Project Manager. The design used the master-planned modular WRF process, and included influent pump stations, inclined screens, grit chambers, biological nutrient removal using the Kruger bio-denitro oxidation ditch system, secondary clarifiers, disk filter effluent filtration system, solids thickening and dewatering centrifuges, and an aerobic sludge digester treatment system.

→ Construction inspector for the City of Riverside, California - Regional Water Quality Control Plant Expansion. Project involved a \$200 million expansion and retrofit of a wastewater treatment plant, which was the largest membrane bioreactor (MBR) retrofit in the United States. Innovations included energy efficient, linear motion digester mixers; enhanced Fats, Oil, and Grease (FOG) station for grease to gas energy production; and OpenCEL waste activated sludge (WAS) disintegration system expansion. Other project elements included construction of four new circular clarifiers, primary effluent equalization basin, primary equalization pump station, primary sludge pump station, fine screen facility, an additional aeration basin, scour air blower building, odor control biofilters, expansion of an existing chlorine contact basin, waste WAS disintegration process facility, sludge blending tanks, two new anaerobic digesters, fog receiving and processing station, digester gas storage facility, bulk chemical feed and facility, primary electrical control building, stormwater retention ponds, standby generators, and operation and maintenance office improvements.

→ Program construction manager for the Seminole County, Florida - Potable Water Interconnect Phase II. The project involved various interconnect use - tie-ins with surrounding towns and cities with the Seminole County potable water systems.

→ Construction manager for the Seminole County, Florida - \$2.2 million Residential Reclaimed Retrofit Phase III Project. The project involved construction of 4-10 inch diameter reclaimed water distribution mains, individual reclaimed water services / meters, and related appurtenances.

→ Construction manager for the Seminole County, Florida - \$1.3 million Country Club Row and Finish Water Mains Project. Project included installing over two miles of 24 inch HDPE raw water main and 20 inch HDPE of finished water main from the Country Club Water Treatment Plant to the well tie-in of the existing main.

→ Construction manager for the Seminole County, Florida - Woodcrest 5 Force Main Pump Station. The project involved a new duplex pump station including transmission and discharge mains, wet well, pumps, control panel, piping and valves, new generator, and two automatic transfer switches; County highway transportation paving, signal, stripping, and storm sewer replacement.

→ Construction manager and senior inspector for the Seminole County, Florida - \$70 million Southeast Regional Water Treatment Plant and Markham Water Treatment Plant Upgrade Projects. Project involved demolishing selected structures; and constructing a new electrical building, ozone treatment system, transfer pump system, Granular Activated Carbon system, sodium hypochlorite disinfection system, Ion Exchange, ground storage tank modifications, High Service Pump modifications, electrical system, and instrumentation and control system.

→ Program construction manager for the Seminole County, Florida - \$10 million Indian Hills Chlorination Upgrade. The project involved upgrade and replacement of sodium hypochlorite tanks and electric building facilities.

→ Program construction manager for the Seminole County, Florida - \$3.7 million State Road-46 Force Main and Reclaimed Water Line. The project involved installation of over 14,000 feet of 24 inch PVC force main and 30 inch ductile iron reclaimed water line. The installation consisted over several large Jack and Bore's and Horizontal Directional Drills on FDOT highway. FDOT inspection regulated project that included paving.



Terry Storck

Terry Storck joined Carollo in 2013. His background focuses on the planning, scheduling, inspections, and coordination of complex projects. He possesses technical knowledge and background in the mechanical, electrical, SCADA, computing and electronic communications areas. Representative experience includes:

Education

United States Air Force, 1978-1984, Lowery Air Force Technical School, Denver, CO - 1978

Certification

Certified, Earthwork Construction Inspection - Level 1, FDOT

Certified, Final Estimates - Level 1, FDOT

Certified, Asphalt Paving Technician - Level 1, FDOT

Certified, Critical Structures Construction Issues, FDOT

Certified, Critical Structures Construction Issues - Supplement, FDOT, January 2012

Certified, Nuclear Gauge Safety

Certified, HAZMAT, USDOT

Certified, OSHA Electrical Regulations

Certified, Electrical Safety Part 1

Certified, Electrical Safety Part 2

Certified, NEC - Electrical Grounding

LEED Accredited Professional, Green Building Certification Institute, 2006

Relevant Experience

→ Construction representative responsible for construction observation on Pump Station Inspection WO #4600000794-WO 3 for the South Florida Water Management District in Loxahatchee, Florida. Project elements included hurricane hardening and service bridge replacement at Pump Station S-5A.

→ Senior project representative and senior inspector for the South Florida Water Management District Reservoir, Pump Station and Inflow Structure. The L8 project consists of the design build of infrastructure that would allow for full functionality of a 46,000 acre-man-made reservoir in Palm Beach County, Florida. This reservoir will provide storage for water that will be released in a controlled manner into the regional canals system (shared by several Counties), for restoration under the Comprehensive Everglades Restoration Plan, and for water quality buffering in Southeast Florida's Stormwater Treatment Areas (STAs) – a vast amount of wetlands that maintain the environmental equilibrium of the region. The infrastructure that will make this possible consists of a 450 cfs (291 mgd) pump station, a 3,000 cfs (1,940 mgd) inflow structure, and geotechnical modifications of the levees that surround the reservoir. Responsibilities include overseeing civil, mechanical, electrical and controls inspections in accordance with approved submittals, plans and specifications. In addition, he performs the on-site quality verification process of new construction.

→ CEI Project engineer/senior inspector for the South West Florida Water Management District Lake Hancock Drainage Control Structure/Station. Responsibilities included overseeing inspections on a major CIP concrete and steel sheet piling drainage structure

controlling all water from Lake Hancock. Mr. Storck oversaw inspections of CIP concrete, duct banks, electrical, mechanical, shop drawings, contractors' pay requests, communications equipment, submittal review, and conformance with plans and specifications. Performed the on-site QA process of electrical/mechanical equipment layouts, and monitored and reported any field changes, inspection observations, and deficiencies.

→ Lead electrical inspector for the South Florida Water Management District Everglades Compartment B project. Responsible for overseeing inspections of multiple pump stations in the Florida Everglades Restoration Projects. Duties included overseeing inspections of electrical installations in accordance with approved submittals, plans, and specifications. He performed the on-site quality assurance process of electrical/mechanical equipment layouts, and monitored and reported field changes, inspection observations, and deficiencies on each project. He was assigned to the following projects with SFWMD: Pump Stations G-434, G436, G-435, STA's - North Build Out (NBO), and South Build Out (SBO).

→ Construction project manager and senior inspector for Sarasota County, Florida. for Lemon Bay/Roberts Bay Sediment and Erosion projects. On the stabilization project, Mr. Storck performed on-site quality assurance, including civil earthwork, concrete, electrical/mechanical equipment layouts, and monitored and reported progress. He also performed site inspections, observations, and deficiencies of project.

→ Project manager of construction for dbRight LLC – Design Builders, Miami, Florida. Responsible for the establishment and implementation of new construction schedules, provided key communication to

Terry Storck

the field, contracted engineers and subcontractors. In addition, he performed on-site inspections and observations of construction activities, in order to comply with plans and specifications as well as project schedules. Mr. Storck maintained a web-based project management reporting system and scheduling system for clients (Project Mates). He managed the reviews of contractor drafts, agreements, and pay applications.

→ Senior project manager of the Office Depot Construction Department, Boca Raton, Florida. Prepared the planning and scheduling of new store construction and commissioning for the regional development teams. He was responsible for ensuring on-time delivery for store openings and daily coordination with engineers, architects, and contractors. He successfully achieved the opening of 68 stores in the western U.S. in a 1-1/2 year period. In addition to performing on-site observation of construction inspections, tracking compliance to project plans and specifications, he established and maintained schedules, and provided key communication from the field. Other management duties included the reviews of contractor drafts and agreements and scheduling building engineering studies with utilities engineering, mechanical, and fire protection consultants.



Steven J. Walker, C.W.P.

Steven Walker, with more than 34 years of experience in the operation and management of wastewater treatment facilities, brings a unique owner's perspective to plant operations from his experience in both private industry and municipalities. Mr. Walker also serves on the State of Colorado's Water and Wastewater Operators Certification Board. Additionally, Mr. Walker is Carollo's Operations Assistance Group Leader, and as such, he directs the efforts of our licensed clean water specialists. His relevant experience is listed below.

Education

BS Technical and Industrial Administration, Metropolitan State College of Denver, 1997

AAS Water Quality Management, Red Rocks Community College, 1990

Licenses

Industrial WWTP Operator, Class A, Colorado

Wastewater Treatment Plant Operator, Grade IV, California

Wastewater Treatment Plant Operator, Class A, Colorado

Professional Affiliations

Colorado Water and Wastewater Plant Operators Certification Board Member

American Water Works Association

Rocky Mountain Water Environment Association

RMWEA/RMSAWWA Joint Technical Activities Committee

Water Environment Federation

Relevant Experience

→ Operations coordinator for the San Jose Santa Clara Regional Wastewater Facility, California, CIP Program O&M Coordination Support. Developed O&M coordination support for the \$2 billion CIP program including methodology, tools, and procedures to integrate O&M input into project designs (Design-Bid-Build and Progressive Design-Build) and establish methods to ensure the plant achieves permit criteria. Steve developed a comprehensive Shutdown Coordination plan to execute project-driven shutdowns. He also developed an annual operations plan and documented process operating strategies.

→ Principal operations specialist and project lead for the Albuquerque Bernalillo County Water Utility Authority, New Mexico, Facility Management Training and Development Services. Provided guidance to eliminate ammonia and nitrate related permit violations. Developed initiatives to address the gaps, and trained staff on use. He conducted gap analysis to determine steps to improve operations and maintenance of the wastewater treatment plant. He also conducted staffing analysis to align operations staffing with facility requirements to optimize personnel. In addition he developed comparable initiatives and training at the water treatment plant, including process-focused procedures and awareness for the ozone contact system.

→ Operations specialist for the City of Longmont, Colorado, supporting \$33M Design-Build for BNR and biosolids handling improvements, from study through commissioning. Steve provided a comprehensive sampling, data collection,

and analysis review for improved process awareness and facility optimization. He also developed emergency response protocols and procedures for the water and wastewater treatment facilities. In addition he provided guidance for moving to unmanned plant operation. Conducted "lessons learned" meetings between City of Longmont and the City of Boulder to transition the 75th St. Wastewater Treatment Plant to unmanned operation.

→ Operations specialist for the City of Riverside, California, Regional Water Quality Control Plant. Coordinating O&M activities and process optimization with \$192M Capital Improvements by improving process awareness through comprehensive sampling, data collection, and analysis review. He also provided staffing and workload gap analysis for all work groups.

→ Operations specialist for the North Texas Municipal Water District's Wylie Treatment Plant upgrades, specializing in chemical handling, site safety, and security.

→ Startup and commissioning specialist for the Eastern Municipal Water District, Perris, California. Provided training and commissioning services, facility management and optimization protocols for four treatment plants – Temecula, Perris, San Jacinto, and Moreno Valley.

- Commissioned new Headworks at San Jacinto in fall 2014.
- Steve's innovative startup and commissioning plans allowed beneficial use of all the new processes much sooner than planned while saving the Owner significant contractor overhead and risk.
- Developed and provided an operational awareness program

Awards

William D. Hatfield
Award, Outstanding
Performance and
Professionalism, Water
Environment Federation,
2005, Operation of a
Wastewater Treatment
Facility

Steven J. Walker, C.W.P

that saves the District over 10% annually on total dewatering costs.

→ Operations specialist for the Eagle River Water and Sanitation District, Vail, Colorado. Focus areas included optimizing existing treatment processes, improving process awareness, and improving staff training.

→ Startup and commissioning specialist for the Post Point Wastewater Treatment Facility, Bellingham, Washington. Provided operability review at each design phase. Provided training for conversion from high purity oxygen to the BNR process and process optimization protocols for facility optimization, and decommissioning guidance.

→ Operations specialist for the City of Sunnyvale, California 2016 Facility Master Plan. Provided O&M direction and developed control strategies for the new Headworks and Flow Diversion structures. He developed a staffing reorganization plan to proactively realign O&M staff with changing process footprints, improved automation, and increased instrumentation.

→ Operations specialist and Owner's Advisor for the Hi-Desert Municipal Water District in Yucca Valley, CA, for the Design-Build and staffing of the wastewater treatment plant and collections system.

→ Principal operations specialist for the Orange County Sanitation District, California, Primary Solids Thickening Optimization project. Developed optimization methods to improve primary solids thickening at Plant 1.

→ Startup and commissioning specialist for the Western Regional Wastewater Treatment Facility, Hancock County, Mississippi. Provided commissioning services and developed process sampling and data recording protocols.

→ Operations specialist for the Orange County Utilities in Orlando, Florida. Provided operational assessment to establish means to address consent order issues.

→ Operations specialist for Hillsborough County's Valrico Advanced Wastewater Treatment Plant, Brandon, Florida. Conducted gap analysis for bond holders due to ongoing effluent permit violations. Identified O&M shortcomings and wrote SOPs for each unit process.

→ Operations specialist for the East Bay Municipal Utilities District (EBMUD) Energy Independence Program - Solar 50 Turbine Installation, Oakland, California. Wrote standard operating procedures (SOPs) to integrate the Solar 50 turbine and its supporting systems into daily operation.

→ Provided start-up and advice for the Design of the San Luis Obispo County, Los Osos Water Recycling Facility, California. This is a new 1.2-mgd wastewater treatment and water recycling plant located on California's central coast. Carollo provided project development, preliminary design, and final design services for this facility.

→ Operations specialist for the City of Carson City, Nevada, Optimization Methods Study. Provided analysis and recommended methods to stabilize the dewatering process at the City's wastewater treatment plant.

→ Operations specialist providing staffing analyses for the Water Pollution Control Facility Design Improvements Project for the City of Everett, Washington.

→ Operations specialist for the Willow Lake Headworks and Primary Treatment Improvements Design Project for the City of Salem, Oregon. Worked closely with staff to develop an innovative O&M manual for operating the facility.

→ Startup and commissioning specialist for the Western Regional Wastewater Treatment Facility, Hancock County, Mississippi. Provided commissioning services and developed process sampling and data recording protocols.



Erica D. Stone, Ph.D., P.E.

Dr. Erica Stone joined the Carollo team in March 2009. Dr. Stone possesses a Ph.D. in environmental engineering and brings several years of experience with her in the areas of water quality, water treatment, environmental studies, sampling, research, and data analysis.

Education

PhD Environmental Engineering, University of Central Florida, Orlando, 2008

BS Environmental Engineering, University of Central Florida, Orlando, 2006

Licenses

Professional Engineer, Florida

Professional Affiliations

Florida Section American Water Works Association

Florida Water Environment Federation

Relevant Experience

→ Project engineer for the Tohopekaliga (Toho) Water Authority, Florida, Centrifuge Study. This project consisted of a study to compare commercially available centrifuge dewatering technologies and recommending three manufacturers for future bidding. The scope of work included a Centrifuge Technology Evaluation and preparation of a report.

→ Project manager and project engineer for the City of Orlando, Florida, Conserv II WRF Effluent Analyzer Storage Improvements. Project included replacing storage sheds, water quality analyzers, and sampling pumps at chlorine contact tank as well as electrical upgrades.

→ Project engineer for the City of Orlando, Florida, Conserv II WRF Biosolids Dewatering Improvement Basis of Design Report. Project included comparison and selection of various dewatering technologies to upgrade the aging belt filter presses at the facility.

→ Project engineer for the Bay County Utility Services, Florida, Local Limits Headworks Loading Analysis. Project included collection and analysis of water quality data from local users to establish pre-treatment ordinance and permit limits.

→ Project engineer for the City of Daytona Beach, Florida, Westside Regional WRF Stage 3 Improvements. Project included evaluation of alternatives and design for supplemental aeration, internal recycle, and hydraulic improvements.

→ Project engineer for the City of Daytona Beach, Florida, Westside Regional WRF PAA Pilot Study. Project included permitting approvals and reporting on results of addition of paracetic acid to the facility effluent to help with disinfection.

→ Project engineer for the Manatee County, Florida, Southwest WRF Rerating Study and Operating Permit Renewal. Project included evaluation of existing facility and proposed design improvements for potential of rerating the capacity. The permit renewal application included preparation of capacity analysis report and operations and maintenance performance reports.

→ Project engineer for the Manatee County, Florida, Water Reclamation Facilities Master Plan. Responsibilities included compilation of existing facility unit process data and evaluation of capacities for all three of the County's facilities.

→ Project engineer for the Manatee County, Florida, North WRF Operating Permit Renewal. Responsibilities included a site visit for evaluation of existing facility condition and assistance with preparation of permit renewal application including capacity analysis report and operations and maintenance performance report.

→ Project engineer for the Manatee County, Florida, Southeast WRF Operating Permit Renewal. Responsibilities included a site visit for evaluation of existing facility condition and assistance with preparation of permit renewal application including capacity analysis report and operations and maintenance performance report.

→ Project manager and project engineer for Inflow and Infiltration Study of Southwest and Rubonia areas of the collection system for Manatee County, Florida. Project included collection of chloride data and flow data from specified areas of the collection system for identification and prioritization of CIP projects to reduce inflow and infiltration.

→ Project engineer for Ozonia 3X Lamp Age Testing, Leonia, New Jersey. Responsibilities include regular site visits to

Erica D. Stone, Ph.D., P.E.

the Ozonia R&D facility to witness lamp tests at various lamp age milestones.

- Project engineer for the Orange County Utilities, Florida, Eastern WRF Consent Order Support. Project included assistance with negotiations with FDEP regarding a consent order for phosphorus limit violations and assistance with developing a project to offset consent order fines.
- Project engineer for the City of Punta Gorda, Florida, WWTP Permit Renewal. The permit renewal application included preparation of capacity analysis report and operations and maintenance performance reports summarizing the existing facility condition observed from a site visit.
- Project engineer for the Hillsborough County, Florida, Northwest Service Area Discharge Elimination planning. Responsibilities included WRF process selection alternatives analysis, cost estimating, and consolidation evaluation for the existing facilities in the Northwest Service Area.
- Project engineer for the Braden River Utilities, Florida, Reclaimed Water Operation and Maintenance Documents and Inspections. Responsibilities included inspection of existing reclaimed water facilities and preparation of operation and maintenance documents for permitting.
- Project engineer for the Orange County Utilities, Florida, South WRF Phosphorus Removal Facilities Evaluation. Project included evaluation of alternatives (including biological and chemical removal and recovery) to reduce effluent phosphorus in the reclaimed water at the South WRF.
- Project engineer for the Orange County Utilities, Florida, Disk Filter Evaluation Study and Pilot Test. Project included side-by-side pilot testing of four disk filter manufacturers to evaluate performance under average and peak flow conditions and well as solids upset conditions. The four pilot units were evaluated and compared for inclusion in specifications for upcoming filter expansions and the County's three WRFs.
- Project engineer for the City of Daytona Beach, Florida, Influent Screening and Mixer specifications. Project included evaluation and selection of alternatives for specifying replacement influent screens and process mixers at both of the City's WRFs.
- Project engineer for the Permit Renewal Application for the Bay County Utility Services, Florida, Military Point Advanced Wastewater Treatment Facility. The permit renewal application included preparation of capacity analysis report and operations and maintenance performance reports for both facilities.
- Project engineer for the City of Dothan, Alabama, Wastewater Treatment Plant Facility Plan. Project included process alternatives evaluation for selection of the configuration for an upcoming plant expansion.
- Project engineer for the Sarasota County, Florida, Engineer Report for Utility System Revenue Bonds. Responsibilities included inspection and condition assessments of the County's six wastewater treatment plants as well as one additional facility to be acquired.
- Project engineer for the City of St. Petersburg, Florida, Asset Management Assistance at the Southwest WRF. Project included condition assessment of facility assets and assistance to City staff in incorporating condition assessment data into their system and scoring assets to prioritize maintenance.
- Project engineer for two water reclamation facilities permit renewal applications for the City of Daytona Beach, Florida. The permit renewal application included preparation of capacity analysis report and operations and maintenance performance reports for both facilities.
- Project engineer for evaluation of regulatory compliance for Hillsborough County, Florida. Evaluation was for a consent order at one of their water reclamation facilities.



Jess C. Brown, Ph.D., P.E.

Dr. Jess Brown is Director of Carollo's Research and Development Practice and leads Carollo's biological drinking water treatment initiative. He has 19 years of experience in water, wastewater, and reclaimed water treatment specializing in drinking water process, applied research, and water quality testing methods. His work covers conventional through advanced treatment and has resulted in over 125 national and international presentations, 18 peer-reviewed publications, and 2 American Water Works Association (AWWA) best paper awards.

Education

PhD Environmental Engineering, University of Illinois, Urbana, 2002

MS Environmental Engineering, University of Illinois, Urbana, 1999

BS Civil Engineering, University of Illinois, Urbana, 1998

BA Environmental Science and Public Policy, Harvard University, 1995

Licenses

Professional Engineer, Florida

Professional Affiliations

American Water Works Association

- Biological Drinking Water Treatment Committee Chair, 2011-2014
- Biological Drinking Water Treatment Symposium Founding Chair, 2013
- Biological Drinking Water Treatment Symposium Chair, 2016
- Water Science & Research Division Trustee, 2010
- Inorganic Contaminants Research Committee Chair, 2006-2009

International Water Association

- Biofilms in Drinking Water Systems Conference, Scientific Committee

Relevant Experience

→ Technical advisor for a potable reuse demonstration pilot for the City of Altamonte Springs, Florida. Technical lead for the ozone/biofiltration portion of the demonstration.

→ Technical advisor for a Salt Lake City Department of Public Utilities, Utah, Wellhead PCE Treatment project. The project included a desktop process selection evaluation, and preliminary design, final design, and construction services for the selected PCE treatment process train. Process selection included an analysis of biological filtration, granular activated carbon adsorption, air stripping, and UV/H₂O₂ technologies with respect to the following criteria: multiple contaminant applicability, process robustness, cost, operability, environmental impact, constructability, and flexibility.

→ Project manager for a Sarasota County, Florida, project that developed new surface and groundwater sources. The project included an evaluation of historical raw water quality, a reservoir blending analysis, a desktop process selection exercise, bench-testing for process screening, a six-month pilot study to develop design and operating criteria for new water treatment facilities, a regional water impact assessment, and development of cost estimates.

→ Project engineer for a 5-mgd EDR and 3.8-mgd BIOBROx[®] design and construction project at the Magna Water District (Magna, Utah). The BIOBROx[®] facility will destroy perchlorate and nitrate within an EDR concentrate stream. The effluent from the BIOBROx[®] process may be used directly for secondary investigation.

→ Project manager for a three-year study designed to understand and control household copper pitting in Sarasota County. The work has involved numerous corrosion control studies, pitting trend analysis, and a public relations campaign.

→ Lead engineer for a white paper study designed to evaluate the design, operation, performance, cost, and footprint implications of installing a fixed-bed biological wellhead treatment for the Los Angeles Department of Water and Power to remove nitrate and perchlorate from groundwater.

→ Project engineer for a Water Research Foundation Project 2639, "Public Perception of Tap Water Chlorinous Flavor." The project defined customer attitudes and perceptions about chlorinous taste and odors in an effort to help utilities address this issue. The project included working with a marketing research firm to develop and execute a market survey to analyze customer perceptions of water quality and health risk in target markets across the United States, assessing public sensitivity to chlorine and chloramine residuals in different water utility markets, correlating these results to physical and literature data and developing short-and long-term recommendations for water utility managers to improve customer satisfaction.

→ Project engineer for Water Research Foundation Project 2638, "Customer Attitudes and Perceptions of Point-of-Use Applications and Bottled Water." The report was one of Water Research Foundation's top ten best sellers for 2003. The project identified the reasons underlying individuals' decisions to use alternatives to tap water. Twelve utility markets located throughout the U.S. were surveyed to identify factors that trigger consumer purchasing choices. The work included performing a water

Professional Affiliations

Water Environment
Federation

- Biofilm Reactor

Technology Conference
Technical Committee

Awards

Golden Spigot Award,
American Water Works
Association, Water
Quality & Technology
Division, 2016

Young Alumnus Award,
University of Illinois Civil
and Environmental
Engineering Alumni
Association, 2009

Water Science and
Research Division Best
Paper Award, American
Water Works Association,
2003, Abiotic & Biotic
Perchlorate Removal

Research Division Best
Poster Award, American
Water Works Association,
1999, Biological
Perchlorate Removal

Water Quality &
Technology Division Best
Paper Award, American
Water Works Association,
2013, Engineered
Biofiltration: Enhanced
Biofilm Performance
Through Nutrient and
Peroxide Addition

Jess C. Brown, Ph.D., P.E.

quality data review, surveying utility management, working with a marketing research firm to develop and execute a customer questionnaire, and to develop a set of short- and long-term recommendations for water utilities to improve customer service and communications.

→ Lead investigator on a study designed to evaluate the use of granular activated carbon filtration for the removal of perchlorate and nitrate from drinking water. As an extension of this research, he developed and constructed metal-catalyzed activated carbon filters to enhance removal kinetics.

→ Project engineer for a one-year pilot-study designed to evaluate treatment, construction, and cost of integrating an ultrafiltration membrane system into the water treatment plant at the Kansas City Missouri Water Services Department. Responsible for the construction and overall operation of the membrane pilot plant, coordination of extensive water quality monitoring, analysis of water quality and system performance data, development of full-scale cost estimates, and preparation of integration recommendations for the final report.

→ Project manager for a Bureau of Reclamation study evaluating the removal of boron by reverse osmosis membranes. The first phase of the study surveyed and documented boron rejection by full-scale RO drinking water treatment plants. The second phase of the study involved bench-scale RO testing and modeling to clarify the relationship between percent boron rejection and other membrane parameters such as water permeation, pH, and salt rejection efficiency.

→ Co-principal investigator for a Water Research Foundation/Dallas Water Utilities/Tampa Bay Water Tailored Collaboration on Optimizing Engineered Biofiltration (WRF 4346). The project will involve 14-month parallel pilot studies at DWU and Tampa Bay Water designed to further investigate and refine operational

modifications for ozone/biofiltration processes that will yield improved hydraulic and water treatment performance. The primary goal of this work was to establish the groundwork for moving biofiltration from a passive process designed and operated around conventional filtration objectives to an intentionally operated biological system, i.e., Engineered Biofiltration. Engineered Biofiltration targets multiple water quality objectives while maintaining or even improving hydraulic performance.

→ Principal investigator for Water Research Foundation Project 4496: Converting Conventional Filters to Biofilters. The overall objective of the project was to develop a Biofiltration Conversion Assessment Tool & Guidance Manual to support water treatment utilities considering a conversion to biofiltration. Through a literature review, survey, and case studies of utilities that have previously converted or are going through the conversion process, this work generated, cataloged, and summarized potential challenges and identified best practices for addressing the issues associated with biofilter conversion. Recommendations were made on decision-making for a conversion; the process parameters to be changed and monitored before and after a conversion, and metrics of a successful conversion.

→ Project manager for a Southwest Florida Water Management District project designed to evaluate the mechanisms of subsurface arsenic mobilization in the Southwest Florida hydrogeologic setting. ASR injection pretreatment strategies will be developed to help minimize subsurface arsenic mobilization.

→ Technical advisor for a South Florida Water Management District project investigating the use of two technologies for treating canal water prior to ASR well injection. The two technologies being tested include a UV/slurry and pelletized TiO₂ system and a pasteurization process.



Joel D. Smason, P.E., S.E.

Joel Smason has 40 years of experience as a structural design engineer for water and wastewater treatment plants and nuclear power plant design. As a senior structural design engineer, Mr. Smason's responsibilities include preparation of preliminary structural designs, client assistance, supervision of personnel, preparation of budgets and estimates, and the development of detailed drawings and specifications. He also has experience with alternative project delivery methods including design-build and construction manager at risk (CMAR).

Education

MS Structural Engineering, University of Illinois, Urbana-Champaign, 1976

BS Structural Engineering, University of Illinois, Urbana-Champaign, 1975

Licenses

Structural Engineer, Arizona, Illinois, New Mexico

Civil Engineer, Nevada

Professional Engineer, South Carolina, Missouri, North Carolina, Texas, Illinois, Florida

Certification

Certificate, Confined Space Entry Training

Professional Affiliations

American Society of Civil Engineers

AZ Water Association

Structural Engineering Association of Illinois

Relevant Experience

→ Structural engineer for the Sarasota County, Florida Venice Gardens Water Treatment Facility Upgrades. Provided preliminary and final design for the expansion of five existing membrane trains including conversion from single stage to two stage arrays and the utilization of a hybrid membrane array for flux balancing. New post treatment facilities included a degasifier and rehabilitated chemical scrubbers for hydrogen sulfide removal; a carbon dioxide solution feed system for pre-degasifier pH adjustment and alkalinity recovery; a concentrate pump station for offsite concentrate disposal; new and upgraded caustic soda, aqua ammonia, sodium hypochlorite, and corrosion inhibitor systems; and an updated control system.

→ Structural engineer for the South Florida Water Management District Field Station Roof Replacement. Participating in structural design to replace roofs of four buildings in the West Palm Beach Field Station that were deemed necessary to be replaced. Design features include removing and reinstalling roof gutters; disposing of and replacing existing roof blanket installation, metal standing seam roof panels, eve struts, purlins and stiffeners, exhaust discharge stacks, and hanging ceiling lights; sandblasting and repainting, and designing cable ladder climbing systems.

→ Structural engineer for the Collier County Northeast Water Treatment Plant/Water Reclamation Facility Design, Florida. This project involved facility planning, new co-located water and wastewater facilities, brackish groundwater RO treatment, public access reuse quality, state-of-the-art I&C to maximize reliability, design of a 10-mgd brackish RO

water treatment plant, energy recovery devices, and increased efficiency by providing newer technology on control systems.

→ Structural engineer for the City of Northport, Florida Water Treatment Plant Enhancement Study. The purpose of this study was to evaluate treatment enhancements to increase the reliable production and quality of water from the water treatment plant. This would also augment the City's ability to supplement the regional water system. The potential enhancements to the water treatment plant were investigated in terms of improvements to the existing conventional treatment facilities, as well as addition of new treatment facility component for reduction of total dissolved solids (TDS).

→ Structural engineer for the Tampa Bay Water Lithia Hydrogen Sulfide Removal Facility Utilizing Ozone Treatment – Predesign, Procurement, and Construction Support Services.

→ Structural engineer and Lead Field Evaluator for the City of Tempe, Arizona - Johnny G. Martinez Water Treatment Plant (JGMWTP) and South Tempe Water Treatment Plant (STWTP) Filter Rehabilitation project. An initial Filter Master Plan was also developed to aid the City with planning future filter upgrades that could improve performance and potentially reduce long-term operating costs. The goal for the JGMWTP was to extend the eight filters' operating life an additional 10-15 years by replacing the existing degraded filter media, and rehabilitating specific filter components. The goal for the STWTP was to perform maintenance activities on the filters to maintain good performance. After the study phase, the evaluations resulted in physical improvements to the filter controls and operations.

Joel D. Smason, P.E., S.E.

→ Structural engineer for the Filter Improvements Project for the City of Temple, Texas. Evaluated the filtration process and equipment at the City's 30 mgd Conventional Water Treatment Plant, including the filter operation and performance and provided the City with alternatives to increase filter runtimes and improve backwash efficiency. Project included rehabilitation of the existing filters.

→ Structural engineer for North Texas Municipal Water District Wylie WTP Plant II Filter Evaluation and Rehabilitation. This project included a comprehensive filter evaluation for all 40 filters at Plant II for the Wylie Water Treatment Plant. The filters were physically examined and repairs were made to leaking walls and pipes. The filter media was replaced and the backwash troughs raised.

→ Structural engineer for the Ak-Chin Indian Community Surface Water Treatment Plant Design, Maricopa, Arizona. Project involved design of a new 2.25-mgd surface water treatment plant. The treatment plant was based on Zenon 500D membrane technology and was equipped with the necessary facilities to provide treated water capable of meeting all primary potable water quality standards (as defined by EPA) under historical raw water quality conditions. Other design elements included a new raw water pump station, a new raw water line from the existing pipeline to the proposed surface water treatment plant site, a new finished water pipeline to connect the new treatment facility to the existing system distribution infrastructure, a wastewater pipeline to convey plant wastes and drain water to the existing sewer system, and redesign of the proposed DYK finished water storage tank and canned pump station to a traditional buried concrete reservoir.

→ Structural engineer for the Val Vista WTP Mesa Flow Split Design project, City of Phoenix, Arizona. Providing an evaluation of design concept alternatives and final design for a new flow-splitting feature that will divert flows from the City of Mesa's portion of the plant production to a contact-time reservoir (Reservoir No. 1) upstream of the granular

activated carbon (GAC) system. Work includes new reservoir baffling, new inlet/outlet connections for Reservoir No. 1, new outlet piping, and new chemical feed piping. The design will incorporate much of the existing plant infrastructure to reduce costs and improve constructability, while providing operational flexibility for both Mesa and Phoenix. Project also involves a new Remote Terminal Unit (RTU) and fiber optic connection cable linking the new RTU to existing RTU and addressing critical plant and transmission main hydraulic constraints.

→ Structural engineer for the 24th Street Water Treatment Plant Rehabilitation project, City of Phoenix, Arizona. The project involved a feasibility study, preliminary design, final design, construction administration, and inspection services to review potential rehabilitation work items that included the retrofit of new raw water pumps, discharge check valves, and variable speed drives into the existing pump bay and main switchgear building. Other rehabilitation work included a new mixing system for the thickened sludge storage tank, flocculator drive system component replacements, and the construction of a new copper sulfate feed facility. The project was delivered under a CMAR contract.

→ Structural engineer for the Gilbert North Water Treatment Plant 15-mgd expansion to 40 mgd, Town of Gilbert, Arizona. This project involved planning, permitting, preliminary and final design, and construction services, with future planning to 60 mgd. The predesign phase included an evaluation of existing treatment processes, identification of future water quality regulations, and an evaluation of alternative treatment processes at the plant. Also included were an ozonation and biofiltration pilot study and the design of ozone facilities and biological active filters for the expanded plant. The project received the 2003 Engineering Excellence Grand Award by ACEC.

Mario A. Gamboa, PE

Education

*BS Electrical Engineering,
Florida International
University, 1981*

*Engineering Management
Graduate Level Studies,
Florida International
University, 2004.*

Licenses

*Electrical Engineer,
Florida*

*Electrical Engineer,
California*

*Electrical Contractor,
California*

*Master Electrician, Various
Counties in Florida*

Professional Affiliations

Institute of *Electrical* and
Electronics Engineers

Expertise with Building Codes

*Florida Building Code
International Building
Code*

*Key NFPA Guidelines and
Standards:*

NFPA - 1 Fire Code

*NFPA-70 National
Electrical Code*

*NFPA-70-E Standards for
Electrical Safety in the
Workplace*

NFPA-101 Life Safety Code

*NFPA-110 Standards for
Emergency and Standby*

Power Systems

*NFPA-820 Fire Protection
in Wastewater Treatment
Facilities.*

Mr. Gamboa's professional experience spans 35 years in design; value engineering; engineering management, construction management of numerous municipal and industrial projects. These include expertise focus with electric energy and automation for water treatment, wastewater treatment and pumping stations. Provided electrical design and instrumentation with construction specifications for 115 kV substations, medium voltage class (5-kV through 38-kV) and low-voltage power distribution systems; including prime and standby power generations systems, power for large pumps-motors with 5 kV variable speed controls systems; lighting systems; life safety systems; grounding; lightning protection; and SCADA automation systems.

Engineering Management duties included Client Oriented Services, leadership and mentoring of engineering and support staff, project and quality control management, achievement of Team Goals.

Representative current project assignments include:

Wastewater Projects

- Electrical engineer for the Central County Water Reclamation Facility Phase 3 and Phase 4 Expansion and Main Lift Station Upgrade, Sarasota County Utilities Department, Florida. Project included design of an upgrade to the 480 volts power distribution and SCADA system that included switchgear with provisions to synchronize two generators; new motor control centers, underground ductbanks, pumps with variable frequency (speed) controllers, and new programmable controllers. Mr. Gamboa provided design services and currently provides engineering support during construction.

Water Projects

- Electrical engineer for the City of Pompano Beach Water Treatment Lime Softening Plant, Electrical Improvements Master Plan project. This project included separate phases for the design and construction to replace 5 kV power distribution switchgear, synchronizing switchgear and controls for two 900 kW – 5 kV standby power generators, 5 kV motor control centers, 600 volts switchgear, 5 kV /480 volts transformers.
- Electrical engineer for Sarasota County Venice Gardens Water Treatment Plant Upgrades Pre-Design project. Task included pre-design evaluation of electrical 480 volts power distribution system capacity, standby generator capacity and PLC configuration for improvements to the existing water treatment membranes.

Infrastructure Water Projects

- Engineer for Electrical Assessment of three (3) Water Reuse Pumping Stations, Manatee County Water Utilities. Project included Power System Analysis of utility power, motor control center, 200 HP VFDs and standby power generator, for compliance with NFPA-72E for installing equipment arc flash labels.
- Electrical Engineer for Odessa and US 41 Booster Pumping Stations – Pressure Modifications Projects, Tampa Bay Water. Project includes Analysis of utility power, switchboard, 250 HP VFDs, 75 HP VFDs and standby power generator, to comply with NFPA-72E and electrical system modifications.
- Lead Electrical Engineer for Lift Station No. 1 Rehabilitation Project, City of Saint Petersburg, Florida. Provided design services for construction of wet well with three pumps, variable speed controls, standby power generator and remote telemetry controls



Jeffrey C. Alband, R.A.

Jeffrey Alband, a chief architect with Carollo Engineers, has more than 48 years of experience in the architectural design, planning, detailing, and specifications of water and wastewater treatment plants. Jeff works closely with our engineering staff to develop architectural concepts for structures with low-visibility from surrounding neighborhoods, and a low-profile design to blend visually in with the surrounding terrain. Many of these structures include administration, operation, and headworks buildings, as well as microbiology and instrumentation laboratories, and reservoirs.

Education

BS Architecture,
Lawrence Technological
University, 1971

Licenses

Architect, Arizona, Illinois,
Michigan, Utah, Colorado

Relevant Experience

→ Project architect for the South Florida Water Management District Miami Field Station Building B47 Replacement, Florida.

Carollo provided design services for the replacement of the Miami Field Station Building B47, a pre-engineered metal building which was damaged by a windstorm and later on torn down since it was declared not repairable. Project consisted of the development of structural, HVAC, and architectural drawings for a foundation and a metal building, which has four offices.

→ Project architect for the City of Boynton Beach, Florida, Ion Exchange Treatment System and East Water Treatment Plant Improvements Progressive Design Build. This project includes initial engineering and constructability evaluations, permitting, design, and construction of a 16.0-mgd ion ex-change system, associated ancillary systems, and raw water transmission main modifications.

→ Project architect for the City of Pompano Beach, Florida, Water Treatment Plant Transfer Pump Station Improvements. This project provided for redundancy and reliability for the City's water treatment plants, specifically the transfer of treated water into the clearwell. The scope included upgrade of electrical equipment for the transfer station and Ancillary improvements for HVAC, access, lighting and wall insulation in the transfer station.

→ Project architect for Broward County, Florida, Potable Water Storage Tanks, Pumping Systems, and Chemical Systems. This project includes the assessment, design and construction phase management of new ground storage tanks, new high service pump stations, and new sodium

hypochlorite and ammonia feed and storage systems for disinfection. These improvements will be implemented at four locations within the County.

→ Project architect for Palm Beach County WTP 2 Filter Replacement project. Carollo provided design, permitting, and bid services. The new dual media filters with reinforced concrete construction replaced the existing filters. The filter addition also includes backwash and transfer pumps, a filter air scour system, a washwater recovery basin and pump station, associated electrical and instrumentation, site grading, paving, and drainage improvements.

→ Project Architect for the City of Prescott, Arizona – Well No. 3 Equipping project that involved well drilling, permitting assistance, design, and construction administration services. Design components included well discharge piping, an adsorptive media arsenic treatment system, electrical gear, and a tablet feeder disinfection system.

→ Project Architect for the Ak-Chin Indian Community, Maricopa, Arizona – Surface Water Treatment Plant. This project involved design and construction of a new surface water treatment plant and associated infrastructure that included a new 2.25-mgd surface water treatment facility, redesign of the proposed DYK finished water storage tank and canned pump station, finished water pipeline, raw water line, and a raw water pump station.

→ Project Architect for the City of Phoenix, Arizona – 24th Street Water Treatment Plant Rehabilitation project. This project involved a feasibility study, preliminary design, final design, construction administration, and inspection services to review potential rehabilitation work items that included the retrofit of new raw water pumps, discharge

Jeffrey C. Alband, R.A.

check valves, and variable speed drives into the existing pump bay and main switchgear building. Other rehabilitation work included a new mixing system for the thickened sludge storage tank, flocculator drive system component replacements, and the construction of a new copper sulfate feed facility. The project was delivered under a CMAR contract.

→ Project Architect for the City of Phoenix, Arizona – 24th Street Water Treatment Plant Granular Activated Carbon (GAC) Implementation/Disinfection Byproduct (DBP) Mitigation project. The design of improvements included a reservoir outlet weir box and preliminary design and final design of post-filter GAC Contactors capable of treating 140-mgd for reduction in TOC for DBP control in the Phoenix water distribution system. This project included design of a diversion structure, supply pump station, backwash (fluffing) pump station, and plant water supply for the contactors.

→ Project Architect for the City of Phoenix, Arizona – Val Vista Water Treatment Plant Solids Handling Facilities design and construction. This project included a two-story, 27,000-sq/ft dewatering facility that houses centrifuges, sludge pumps, sludge conveyors, scrubbers, and operators' facilities. The design included a drive for sludge hauling vehicles.

→ Project Architect for the City of Phoenix, Arizona – Val Vista Water Treatment Plant Internal Upgrades. This project included the retrofit of vertical flocculators into existing horizontal flocculation basins and numerous site security improvements. The site security improvements involved the site perimeter fencing replacement/modifications, screening wall additions for critical equipment, construction of a new entrance guardhouse, and coordination with the CMAR during design.

→ Project Architect for the City of Phoenix, Arizona – Union Hills Water Treatment Plant 160-mgd Improvements. Structured in multiple phases, design and construction of this "fast-track" project utilized the CMAR

project delivery method. The primary focus of this project was to increase the facility's reliability to produce 160 mgd of deliverable capacity during high raw water turbidity events. This \$37M project included the rehabilitation of 32 existing filters and construction of 4 new filters, new pretreatment facilities, new chemical feed facilities, and new dewatering facilities.

→ Project Architect for the City of Phoenix, Arizona – Union Hills Water Treatment Plant Expansion. The detailed design concept for the water treatment plant incorporated a modular layout for ease of expansion to the ultimate 240-mgd treatment capacity. Architectural designs included an EPA certified laboratory with a 1,500-sq/ft lab and 500-square-foot operator's lab; and a microbiology, instrumentation, and wet lab. Additional buildings included administrative offices and staff and multi-use rooms.

→ Project Architect for the City of Phoenix, Arizona – Union Hills Water Treatment Plant Minor Modifications project to increase security at the facility and improve contact time in the finished water reservoir.

→ Project Architect for the City of Peoria, Arizona – Greenway Water Treatment Plant Phase 1. Architectural designs include an operations center, disinfection building, ozone generation building, chemical building, and finished water pump station.

→ Project Architect for the Town of Gilbert, Arizona – North Water Treatment Plant Phase 1. The buildings included design of a laboratory for the initial 15-mgd surface water treatment plant. The architecture was designed with low visibility from the surrounding residential neighborhood. The project was awarded the 1997 Engineering Excellence Merit Award by the Arizona Consulting Engineers Association.

→ Project Architect for the Town of Gilbert, Arizona – Lindsay Road Pump Station and Reservoir, which was part of the Gilbert Water System Improvements Phase project.



Chad Green, P.E.

Chad Green is a supervisory building mechanical engineer, has 9 years of engineering experience, and manages the building services group for Carollo. As a building mechanical engineer, he provides all aspects of design services associated with the design of air, heating, cooling, controls, plumbing systems, fire protection systems, odor treatment, and fuel systems. His project experience includes:

Education

BS Mechanical Engineering, University of Texas, Arlington, 2009

Licenses

Professional Engineer, New Mexico, Washington, Texas, Oregon, Colorado, Oklahoma, Arkansas, Florida, Illinois, Minnesota

Mechanical Engineer, Nebraska, California, Arizona, Utah, Nevada

Professional Affiliations

American Society of Heating, Refrigeration, and Air Conditioning Engineers

Relevant Experience

→ Lead Building Mechanical Engineer for the Lake Manatee Water Treatment Filter Upgrade, Manatee County, Florida.

Supervised engineers for plumbing and fire protection designs, calculations, code reviews, drawings, specifications, and construction services related to the project. Scope included a chemical building consisting of sodium bisulfite, citric acid, caustic soda, hydrochloric acid, sodium hypochlorite, CIP, and hot water.

→ Lead Building Mechanical Engineer for the C-43 West Basin Reservoir Project, South Florida Water Management District. Supervised engineers for HVAC/plumbing and generator fuel system designs, calculations, code reviews, drawings, specifications, and construction services related to the project. Scope included the S-470 Pump Station, S-476 Pump Station, S-471 Pump Station Control Building, S-473 Pump Station Control Building, S-475 Pump Station Control Building, S-477 Pump Station Control Building, S-479 Pump Station Control Building, S-481A Pump Station Control Building, and IT Communication Equipment Shelter.

→ Lead Building Mechanical Engineer for the 1B1 High Service Pump Station, Broward County District, Fort Lauderdale, Florida. Supervised junior Engineers for HVAC/plumbing and generator fuel system calculations, designs, code reviews, drawings, specifications, and construction services. Scope included HVAC/plumbing for the pump station which included a pump room, sampling lab, restroom, electrical room, generator room, and chemical rooms.

→ Lead Building Mechanical Engineer for the 3A High Service Pump Station, Broward County District, Dania Beach, Florida.

Supervised junior Engineers for HVAC/plumbing and generator fuel system calculations, designs, code reviews, drawings, specifications, and construction services. Scope included HVAC/plumbing for the pump station which included a pump room, sampling lab, restroom, electrical room, generator room, and chemical rooms. Lead Building Mechanical Engineer for the Water Treatment Plant Transfer Pump Station Improvements, City of Pompano Beach, Florida. Supervised junior Engineers for HVAC calculations, designs, code reviews, drawings, and construction services. Scope included an electrical building.

→ Lead Building Mechanical Engineer for the Sawgrass Water Treatment Plant Ion Exchange and Other Improvements, City of Sunrise, Florida. Provided HVAC/plumbing/fire protection calculations, designs, code reviews, drawings, and construction services. Scope included an electrical room and chemical room. Scope also included fire protection design for the chemical room.

→ Lead Building Mechanical Engineer for the Water Treatment Plant II Filter Replacement, Palm Beach County Water Utilities, Florida. Provided HVAC/plumbing designs, calculations, code reviews, and construction services related to the Water Treatment Plant II. Scope included a filter gallery, blower room, and electrical room.

→ Lead Building Mechanical Engineer for the Wemlinger Water Purification Facility HVAC Improvements Project, Aurora Water, Colorado. Supervised engineers for HVAC designs, calculations, code reviews, drawings, specifications, and construction services related to the project. Scope included an administration building consisting of office spaces and a laboratory. An initial condition assessment was

Chad Green, P.E.

performed to determine suitable HVAC technologies for renovation of the building. The design included implementing a new variable refrigerant flow system along with a building management system for optimized control of the system. In addition, detailed sequencing was analyzed to limit disruption of building staff during construction.

→ Lead Building Mechanical Engineer for the Richland Chambers Lake Pump Station Chloramine Feed Optimization, Tarrant Regional Water District, Texas. Supervised engineers for HVAC designs, calculations, code reviews, drawings, specifications, and construction services related to the project. Scope included a chlorine storage room, chlorine feed room, ammonia room, and caustic facility.

→ Lead Building Mechanical Engineer for the Ullrich Water Treatment Plant Lime Feed Improvement Project, City of Austin, Texas. Supervised engineers for HVAC designs, calculations, code reviews, drawings, specifications, and construction services related to the project. Scope included a four story lime building with an electrical equipment level, mechanical level, metering level, and slaking level.

→ Lead Building Mechanical Engineer for the Lebanon Water Treatment Plant, City of Lebanon, Oregon. Supervised engineers for HVAC/plumbing and fire protection designs, calculations, code reviews, drawings, specifications, and construction services related to the project. Scope include a pre-treatment building consisting of a chemical area, fluoride room, membrane area, pump area, electrical room, administration spaces, and stand-alone electrical building.

→ Lead Building Mechanical Engineer for the Griswold Water Purification Plant Raw Water Structure – Phase II, City of Aurora, Colorado. Supervised engineers for HVAC designs, calculations, code reviews, drawings, specifications, and construction services related to the project. Scope included a RW structure.

→ Lead Building Mechanical Engineer for the Wemlinger Water Purification Facility CT

Chamber design, Aurora Water, Colorado. Supervised engineers for HVAC designs, calculations, code reviews, drawings, specifications, and construction services related to the project. Scope included a north pipe gallery, south pipe gallery, CT chamber, and electrical room.

→ Lead Building Mechanical Engineer for the Webster Drive Pump Station Improvements, City of Martinez, California. Supervised engineers for HVAC designs, calculations, code reviews, drawings, specifications, and construction services related to the project. Scope included a pump station.

→ Lead Building Mechanical Engineer for the Arcadia Lake Water Treatment Plant Expansion, City of Edmond, Oklahoma. Supervised junior Engineers for HVAC/plumbing /fire protection designs, calculations, code reviews, drawings, specifications, and construction services related to the project. Scope included a filter building, pre-ozone building, ozone generation building, post-ozone contactor building, GAC building, chemical building, lime building, recycle pump station, thickened sludge pump station, dewatering building, high lift pump station, low lift pump station, and generator building. Geothermal ground source cooling was utilized on this project for all cooling and heating of facilities. Scope included fire protection designs for the pre-ozone building, ozone generation building, post-ozone contactor building, chemical building, and lime building.

→ Lead Building Mechanical Engineer for the I-35 Complex Booster Pump Station and Ground Storage Tank Improvements Project, City of Edmond, Oklahoma. Supervised junior Engineers for HVAC/plumbing designs, calculations, code reviews, drawings, specifications, and construction services related to the project. Scope included a pump station which included a pump room, electrical and mechanical room. Geothermal ground source cooling was utilized on this project for all cooling and heating of facilities.



**PETER MOORE, P.E., LEED AP,
ENV SP, F. ASCE
PRINCIPAL IN CHARGE**

Education

Bachelor of Science, Civil Engineering,
University of Florida, 1997

Master of Engineering, Civil
Engineering, University of Florida, 2004

Registration

Professional Engineer, Florida, 58709,
2002

Professional Affiliations

- American Society of Civil Engineers
- American Water Works Association
- Florida Engineering Society
- Florida Engineering Leadership
Institute
- FICE
- FEF
- Florida Stormwater Association
- National Society of Professional
Engineers

Certifications

- Certified Stormwater Inspector
- LEED Accredited Professional



Mr. Moore is the president of CMA with more than 21 years of experience with a wide variety of utility, stormwater, transportation and other infrastructure projects. Since joining CMA in 1999, Mr. Moore has focused on the management, planning, design, permitting, and construction of various utility infrastructure projects for public clients throughout South Florida. Mr. Moore has worked on literally dozens of unique projects for Broward County valued

at \$100M in his career, literally serving in every role in a project team. Of particular note is Mr. Moore's experience in value engineering, including projects for Broward County WWS, Miami-Dade Water and Sewer Department and a development client in Saudi



Arabia. Including his assistance as a reviewer and design guideline developer for the firm's work in the Republic of Panama, Mr. Moore has an additional \$500M of international project exposure to give him the full arsenal of tools to serve Broward County. A lifelong Broward County Resident, Mr. Moore has his Bachelor of Science and Master of Engineering in Civil Engineering, is a licensed professional engineer in Florida and has been elected as a Fellow of the American Society of Civil Engineers (ASCE) for his lifetime achievements and contributions to civil engineering. To show his understanding of today's issues, Mr. Moore also is an Envision Sustainability Professional and a LEED Accredited Professional (two additional certifications specializing in sustainability). He is a past president and board member of numerous local, regional and national professional societies and non-profit organizations. Mr. Moore will be the principal in charge on this contract.

Project Experience

Broadview Park Neighborhood Improvement Program. The Broadview Park Neighborhood Improvement Program (BNIP) was the last of the Neighborhood Infrastructure Improvements projects to be carried out by Broward County in the unincorporated areas. Chen Moore and Associates was selected as the prime consultant for the Basis of Design Report (BODR) and to design and administer the construction of improvements to subsequent bid packages. The three Bid Packages addressed water, sanitary sewer and drainage improvements, while introducing sidewalks and enhancing the community's roadway and landscape.

The basis of design report included population projections, an analysis of water source and sewage discharge points and a hydraulic model of the water, wastewater and stormwater systems.



The first bid package included the replacement of the entire water distribution system within the neighborhood, which was previously owned and maintained by a private utility. This project was designed utilizing digital orthography and aerial maps to fast track the replacement.

The second and third bid packages included conversion of the entire area from septic to gravity collection, the installation of a backbone forcemain network and connection into an inline booster station, installation of a positive drainage system, sidewalks, hardscape and landscape improvements.

An added fourth bid package was the design of a 20" water main to serve as the transmission source water for the area. Also change ordered into the project was the installation of a 20" raw water main for future use. The project was complicated by groundwater contamination, proximity to a wellfield, the existence of a fire station and elementary school in the neighborhood and the existence of rock in the area. All of the projects were completed on budget and on or ahead of schedule.

Ft Lauderdale FM Rehab, HDD & Swageline (1-4). Chen Moore and Associates (CMA) is the prime consultant for the 30" Emergency Force Main Rehabilitation project in the City of Fort Lauderdale. This innovative design-build project, led by Murphy Pipeline Contractors (MPC) was undertaken to provide both mainline force main replacement for aging infrastructure and to provide additional redundancy in case of future issues. The contract was divided into four (4) phases within the City of Fort Lauderdale. The nearly 20,000 linear feet of pipeline is being rehabilitated through a combination of swagelining, directional drilling, and traditional open cut installation over these four phases. CMA provided planning, design, permitting and engineering services during construction. Environmental compliance, subaqueous crossing, public involvement and maintenance of traffic in the busy Sistrunk and Himmarshes Business Districts were some of the additional project complexities. CMA also provided dewatering permitting and groundwater modeling due to contaminated sites within quarter mile of the projects.

Fort Lauderdale-Hollywood International Airport Stormwater Master Plan Update. Under Phase 1 of this project, Broward County Aviation Department (BCAD) retained Chen Moore and Associates (CMA) to update the FLL Stormwater Master Plan (SWMP), which was completed by a previous consultant in 2001. CMA reviewed the data and analysis from all prior reports, converted the existing stormwater model from SWMM to ICPR, and updated the ICPR model with any new system data and new projects provided by BCAD. CMA updated the existing conditions stormwater model and created the future conditions stormwater model to assess alternative drainage improvements needed to achieve required and desired Levels of Service (LOS) for various storm events. The stormwater model was used to run rainfall scenarios for the comparison of pre-development (existing) conditions versus post-development (future) conditions from a water quantity (runoff) and water quality (storage) perspective. The stormwater model was used to analyze the performance of the existing Primary Stormwater Management System (PSMS). Phase 1 for this project included the following work items:

- Review and verify earlier work by other consultants during 2001-2005
- Convert previous SWMM stormwater model to ICPR model
- Obtain updated topographic data for TIN development
- Calculate updated hydrologic parameter for drainage basins
- Conduct analysis of various system improvement alternatives
- Prepare Stormwater Master Plan Update





4341 S.W. 62nd Avenue, Davie, Florida 33314
T: (954) 585-0997 • F: (954) 585-3927 • www.stonersurveyors.com

James D. Stoner, P.S.M.
President



Education

Land Surveying Program
Palm Beach Community College, 1979

Professional Registrations

State of Florida Professional Surveyor and Mapper
License Number LS4039, 1983

Professional Affiliations

Former Vice President Florida Surveying and Mapping Society – State Level
Former President Florida Surveying and Mapping Society – Broward Chapter
Former Florida Surveying and Mapping Society – Area 6
American Congress on Surveying and Mapping
Leadership Broward

Professional Experience

- **South Florida Water Management District**
 - STA 3/4 – Topographic Survey
 - East Coast Buffer Cells 28 & 29 – Boundary Survey
 - C-4 Canal Conveyance – Topographic Survey
 - Lake Hicpochee – Boundary and Topographic Surveys
- **Broward County Aviation**
 - Annual Runway Approach Surface Surveys
 - Numerous Lease Parcel Surveys
 - Design Surveys for Expansion of Airport Terminals



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- **Broward College Continuing Contract for Surveying Services**
 - North Campus – Boundary survey overall Campus
 - Central Campus - Boundary survey overall Campus
 - South Campus - Boundary survey overall Campus
 - Numerous Topographic and As-built Surveys for expansion of Facilities

- **City of Sunrise Continuing Contract for Surveying Services**
 - Southwest Water Treatment Plant – As-Built Survey
 - Sunrise Road Improvements – Various Topographic Surveys
 - Five Vacant Parcels – Boundary Surveys
 - Park City Water Treatment Plant – Updated Boundary Survey
 - Passive Park – Topographic and Utility Surveys
 - City Hall Parking Lot – Topographic Survey
 - N.W. 44th Street – Topographic Survey
 - Lutheran Church Site Acquisition – Boundary Survey

- **Town of Davie Continuing Contract for Surveying Services**
 - Oakes Road Fire Station – Boundary Survey
 - Lift Station Number 11 Improvement Project – Topographic Survey
 - Silver Lakes Park – Construction Layout Survey
 - Wachovia Bank Parcels – Boundary, Topographic, & Tree Surveys
 - Parks & Recreation Building at Pine Island Park – Topographic Survey
 - Orange Drive – Topographic & Tree Surveys
 - Eastside Community Hall – Topographic & Tree Surveys
 - N-20 Canal – Topographic Survey
 - Public Works Gas Pump Station – Topographic Survey
 - S.W. 130th Avenue Canal – Topographic Survey
 - Sunny Lake Expansion – Boundary Survey



Tom Mullin, P.E.
RADISE International, L.C.
Vice President
Chief Geotechnical Engineer

Professional Registration and Certifications:

- Professional Engineer, #43366 (Florida), 1990

Education:

- MS, Civil/Geotechnical Engineering, University of Illinois
- BS, Civil Engineering, University of Illinois

Capabilities:

- Water Resources Engineering
- Soils and Foundation Engineering
- Civil and Major Earthworks Engineering Design
- Civil Construction Management
- Geotechnical Instrumentation and Monitoring
- Groundwater Hydrogeology
- Quality Control Testing and Inspection Oversight
- Peer Review

Mr. Mullin has 40 years of geotechnical engineering experience including water resources engineering including ports and harbors, dams and reservoirs. He has served as Chief Geotechnical Engineer on numerous projects for private and public clients including the South Florida Water Management District (SFWMD), United States Army Corps of Engineers (USACE) and Florida Department of Transportation (FDOT).



Mr. Mullin has managed projects involving major high rise towers, commercial buildings, power generating and industrial facilities, as well as transportation and landfill projects in Florida, Puerto Rico and the Caribbean.

He provides quality assurance and quality control; materials testing engineering services including soils, foundations, and geotechnical investigations; vibration monitoring; materials and systems testing; and structural and special assessments testing services.

His skills include foundation design and construction, backfilling, test programs, quality control testing procedures and documentation, installation and evaluation of geotechnical monitoring instrumentation, vibration monitoring and pile load testing. He provides quality assurance oversight; CEI documentation; construction surveillance, inspection and testing; and technical peer review.

REPRESENTATIVE PROJECTS:

Chief Geotechnical Engineer and/or Principal Design Consultant for the following projects:

East Central Regional Water Reclamation Facility (ECRWF) Biosolids Improvement Project, Palm Beach County, FL

Geotechnical engineering and field/laboratory testing services for the new construction of a Dewatering Building and Odor Control Facility. The structures are part of an overall design package for the upgrade of the ECRWF Biosolids Project.

Wastewater Lift Station Rehabilitation, Palm Beach County, FL

Project consisted of providing geotechnical engineering including field and laboratory testing services.

Lake Hicpochee Dispersed Water Management Plan, Glades and Hendry Cos, FL

Geotechnical Engineering Services.

Southern Transmission Main Crossing of I-95 and the Turnpike, Palm Beach County, FL

Geotechnical Engineering including field and Laboratory Testing Services.

Eastpointe Pump Station Design, Palm Beach County, FL

Geotechnical Engineering, Engineering During Construction, Construction Material Testing and QC Services.

Hillsboro Canal Bank Stabilization, Broward and Palm Beach Counties, FL

Geotechnical Engineering and Construction Material Testing Services.

STA-1 West Expansion Area 1, Palm Beach County, FL

Geotechnical Engineering & Construction Material Testing Services.

C-44 Reservoir - Discharge Canal, Spillway Structure, Martin County, FL

Construction Engineering Inspection and Material Testing Services.

Herbert Hoover Dike Culverts 11 and 16, Palm Beach and Martin County, FL

Construction Engineering Inspection and Material Testing Services.

Herbert Hoover Dike Culverts 5 and 5A, Palm Beach County, FL

Geotechnical Engineering and Construction Material Testing Services.

Herbert Hoover Dike Culverts 4A and 3, Palm Beach and Hendry County, FL

Construction Engineering Inspection and Material Testing Services.

EAA A-1 Flow Equalization Basin (FEB) Construction, Palm Beach County, FL

Construction Engineering Inspection, QA and Construction Material Testing Services.

L-40 and L-85 Levees Evaluation, Palm Beach County, FL

Geotechnical Engineering Services.

East Coast Protective Levee Rehabilitation, Palm Beach, Broward and Miami-Dade Cos, FL

Construction Engineering Inspection, QA and Lab Testing Services.

L-8 Divide Structure, Palm Beach County, FL

Geotechnical Engineering and Construction Material Testing Services.

Compartment C, Stormwater Treatment Area, Hendry County, FL

Geotechnical Engineering for the civil design development of 6,240 acres of impounded manmade wetlands in a large Stormwater Treatment Area Flow Way.

Dredging and Spoils Containment Facility Design, 1500 Ac. Critical Lake Trafford Dredging Restoration, Collier County, FL

Geotechnical Engineering for the civil design preparation for 3 phases of the lakes dredging over a 7-year period.

Stormwater Treatment Area 5 Flow Way 3 and STA 6 Section 2, Hendry County, FL

Geotechnical Engineering for the design development of 4000 Acres of impounded man made wetlands.

Peer Design Review, Stormwater Treatment Areas 1W, #5 and #6, Palm Beach County, FL

Geotechnical peer reviews of geotechnical analyses and levee designs by others for 3 SFWMD Stormwater Treatment Areas.

PROJECT MANAGER

Mr. Rodriguez is a licensed professional engineer and has over 25 years of experience in civil engineering. His project experience includes design of water distribution systems, sanitary sewer collection systems, sanitary sewer pump stations and force main, paving and drainage design, management of various land development projects, and permitting processing through various local and state agencies. He has extensive experience in construction management and administration.



Education:

BS, Civil Engineering, 1993,
Cornell University, New York

Certifications:

Licensed Professional Engineer
in Florida

Employment:

Cordova Rodriguez & Associates,
Inc.: 12 years

Employee of other Engineering
Firms: 13 years

References:

Franklin Torrealba, PE
Director
300 Engineering Group, P.A.
(305) 763-9829

RELEVANT EXPERIENCE:

Broward County Reclaimed Water Plant Expansion: The project scope included horizontal three (3) new buildings; a Water Filter, Chlorine Contact tank, and an electrical building to accommodate generators for the water treatment plant. Responsibilities included: civil site modifications as required to maintain adequate grading for the new facilities, to provide service roads and to expand the existing storm water collection system to compensate for the addition of the new structures. Two (2) detention areas were added as part of a plant-wide system to address the grading and drainage for the new structures. In addition, the scope included drafting of the process, structural and electrical drawings for the new facilities.

Port Everglades Terminal 25: Responsible for the design, permitting and construction management of the expansion of Terminal 25 at Port Everglades. Site work improvements for the updated terminal included re-routing of approximately 500 linear ft. of 12" water main and the installation of over 300 linear ft. of gravity sewer main. The drainage design consisted of over 3,500 linear ft. of exfiltration trench in conjunction with two (2) stormwater drainage wells.

Port Everglades Terminal 26: Scope of work included the conversion of a loading dock to a passenger drop off area, earthwork associated with raising the site over three (3) feet in elevation, paving grading and drainage for drop off area, relocation of 10" fire line and backflow preventer, sanitary sewer extension, permitting with Florida Department of Environmental Protection (FDEP), Broward County and City of Hollywood.

Miami International Airport-South Terminal Expansion Project Office Trailer: Prepared design calculations and construction documents for pump station upgrade serving the South Terminal trailer complex. Scope included permitting and coordination with Miami-Dade Aviation Department (MDAD), Miami-Dade DERM, Building and Zoning Department. Provided construction observation and final certification services and coordinated with electrical engineer on the pump station electrical components.

Port Everglades Terminal 4 Slip 2: The Slip 2 Expansion project is for the extension of the existing slip by approximately 225'. This project included the excavating of the existing slip, demolition and relocation of the existing utilities, as well as grading and drainage work. The scope consisted of installing over 670 LF of 12" water main with two (2) fire hydrants.



Mekdeci Residence Water Main Extension: Responsible for design, permitting, and construction observation for installation of approximately 500 LF of 12-inch water main extension per MDWASD's standards. The scope of work included air release valves, water services & meter boxes, and required fire hydrant assembly per code requirements.

Port Everglades Terminal 4: Site work required for conversion of container yard to 172 spaces surface parking lot, passenger and bus drop off areas. The scope included over 300 LF of 6" and 8" water main extension / replacement, two (2) new fire hydrant and replacement of existing sewer lateral. It included permitting and coordination with Florida Department of Environmental Protection (FDEP) and Broward County for four (4) Class IV storm water drainage wells, the City of Fort Lauderdale Building Department.

Garcia Water Main Extension: Design of a water main extension for 207 LF of 8" water main to service a single-family residence. It included a connection to an existing 16" water main, permitting and construction administration.

Miami-Dade Water and Sewer Department

Consent Decree / Settlement Agreement Section (CD/SA): Assigned to WASD CD/SA section to work on various duties. Responsibilities included the submittal and tracking of various pump stations and force main upgrades with Miami-Dade County Building Department, DERM, FDOT, FDEP and Miami-Dade County Health Department. Responsible for coordination with FPL and other utilities in anticipation of the proposed upgrades.

Westview Place: Scope of work included the design of a sanitary sewer pump station to serve a 35-townhome development. The project included the design of 625 LF-12-inch water main, 175 LF 8-inch water main, 600 LF – 8-inch sanitary gravity sewer main, sanitary sewer pump station and 60 LF of four (4) inch force main connection to an existing force main. Responsibilities included permitting through Miami-Dade DERM, the City of North Miami, and the health department. It also included coordination with FPL for the crossing of a major transmission line along NW 119 Street.

Frank Valverde Property, Sewer Extension, S.W. 84th Avenue and S.W. 8th Street: Responsible for the design of sanitary sewer extension for 95 LF of 8-inch gravity main connecting to existing sewer main for a new gas station. Responsibilities included preparation of design documents for an 8-inch sewer main and preparation of technical specifications. Coordinated with MDWASD regarding permitting and approvals of plans. Also responsible for permitting and final certification.

The Program Management Team (PMT)

Responsibilities included the monitoring and tracking of Miami-Dade WASD pump stations for NAPOT criteria, evaluating out-of-compliance pump stations and preparing engineering reports recommending upgrades to comply with FDEP consent Decree requirements. Assisted with permitting of various pump station upgrades through the Miami-Dade County Building Department, DERM and other agencies. Coordinated with utility companies (FPL, telephone, cable companies) in anticipation of upcoming pump stations and force main upgrades.



OCTOBER 2018

**CORDOVA
RODRIGUEZ**
& ASSOCIATES, INC.



LETTER OF INTENT BETWEEN BIDDER/OFFEROR AND COUNTY BUSINESS ENTERPRISE (CBE) FIRM/SUPPLIER

This form is to be completed and signed for each CBE firm. If the PRIME is a CBE firm, please indicate the percentage performing with your own forces.

Solicitation No.: PNC2117097P1

Project Title: Engineering Services for Water and Wastewater Services

Bidder/Offeror Name: Carollo Engineers, Inc.

Address: 3440 Hollywood Blvd., Suite 465 **City:** Hollywood **State:** FL **Zip:** 33021

Authorized Representative: Elizabeth Fujikawa, P.E. **Phone:** 954-837-0030

CBE Firm/Supplier Name: Cordova Rodriguez & Associates, Inc.

Address: 6941 SW 196th Ave., #28 **City:** Pembroke Pines **State:** FL **Zip:** 33332

Authorized Representative: Rosana D. Cordova, P.E. **Phone:** 954-880-0180

- A. This is a letter of intent between the bidder/offeror on this project and a CBE firm for the CBE to perform work on this project.
- B. By signing below, the bidder/offeror is committing to utilize the above-named CBE to perform the work described below.
- C. By signing below, the above-named CBE is committing to perform the work described below.
- D. By signing below, the bidder/offeror and CBE affirm that if the CBE subcontracts any of the work described below, it may only subcontract that work to another CBE.

Work to be performed by CBE Firm

Description	NAICS ¹	CBE Contract Amount ²	CBE Percentage of Total Project Value
Civil	341330		8.00 %
			%
			%

AFFIRMATION: I hereby affirm that the information above is true and correct.

CBE Firm/Supplier Authorized Representative

Signature: Title: Principal Date: 10/22/18

Bidder/Offeror Authorized Representative

Signature: _____ Title: _____ Date: _____

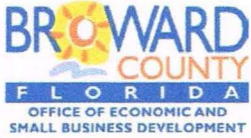
¹ Visit Census.gov and select [NAICS](#) to search and identify the correct codes. Match type of work with NAICS code as closely as possible.

² To be provided only when the solicitation requires that bidder/offeror include a dollar amount in its bid/offer.

In the event the bidder/offeror does not receive award of the prime contract, any and all representations in this Letter of Intent and Affirmation shall be null and void.

Rev.: June 2018

Compliance Form No. 004



LETTER OF INTENT BETWEEN BIDDER/OFFEROR AND COUNTY BUSINESS ENTERPRISE (CBE) FIRM/SUPPLIER

This form is to be completed and signed for each CBE firm. If the PRIME is a CBE firm, please indicate the percentage performing with your own forces.

Solicitation No.: PNC2117097P1

Project Title: Engineering Services for Water and Wastewater Services

Bidder/Offeror Name: Carollo Engineers, Inc.

Address: 3440 Hollywood Blvd., Suite 465 City: Hollywood State: FL Zip: 33021

Authorized Representative: Elizabeth Fujikawa, P.E. Phone: 954-837-0030

CBE Firm/Supplier Name: Gamboa Engineers, LLC

Address: 17433 SW 65th Court City: SW Ranches State: FL Zip: 33331

Authorized Representative: Mario A. Gamboa Phone: 954-533-1121

- A. This is a letter of intent between the bidder/offeror on this project and a CBE firm for the CBE to perform work on this project.
- B. By signing below, the bidder/offeror is committing to utilize the above-named CBE to perform the work described below.
- C. By signing below, the above-named CBE is committing to perform the work described below.
- D. By signing below, the bidder/offeror and CBE affirm that if the CBE subcontracts any of the work described below, it may only subcontract that work to another CBE.

Work to be performed by CBE Firm

Description	NAICS ¹	CBE Contract Amount ²	CBE Percentage of Total Project Value
Electrical and I&C	238210		15.00 %
			%
			%

AFFIRMATION: I hereby affirm that the information above is true and correct.

CBE Firm/Supplier Authorized Representative

Signature: Mario A. Gamboa Title: Manager Date: 10-25-2018

Bidder/Offeror Authorized Representative

Signature: _____ Title: _____ Date: _____

¹ Visit Census.gov and select [NAICS](#) to search and identify the correct codes. Match type of work with NAICS code as closely as possible.

² To be provided only when the solicitation requires that bidder/offeror include a dollar amount in its bid/offer.

In the event the bidder/offeror does not receive award of the prime contract, any and all representations in this Letter of Intent and Affirmation shall be null and void.



LETTER OF INTENT BETWEEN BIDDER/OFFEROR AND COUNTY BUSINESS ENTERPRISE (CBE) FIRM/SUPPLIER

This form is to be completed and signed for each CBE firm. If the PRIME is a CBE firm, please indicate the percentage performing with your own forces.

Solicitation No.: PNC2117097P1

Project Title: Engineering Services for Water and Wastewater Services

Bidder/Offeror Name: Carollo Engineers, Inc.

Address: 3440 Hollywood Blvd., Suite 465 City: Hollywood State: FL Zip: 33021

Authorized Representative: Elizabeth Fujikawa, P.E. Phone: 954-837-0030

CBE Firm/Supplier Name: Stoner & Associates, Inc.

Address: 4341 SW 62nd Avenue City: Davie State: FL Zip: 33314

Authorized Representative: James Stoner Phone: 954-585-0997

- A. This is a letter of intent between the bidder/offeror on this project and a CBE firm for the CBE to perform work on this project.
- B. By signing below, the bidder/offeror is committing to utilize the above-named CBE to perform the work described below.
- C. By signing below, the above-named CBE is committing to perform the work described below.
- D. By signing below, the bidder/offeror and CBE affirm that if the CBE subcontracts any of the work described below, it may only subcontract that work to another CBE.

Work to be performed by CBE Firm

Description	NAICS ¹	CBE Contract Amount ²	CBE Percentage of Total Project Value
Surveying and Mapping	541360		2.00 %
			%
			%

AFFIRMATION: I hereby affirm that the information above is true and correct.

CBE Firm/Supplier Authorized Representative

Signature: Title: President Date: 10/19/2018

Bidder/Offeror Authorized Representative

Signature: _____ Title: _____ Date: _____

¹ Visit Census.gov and select [NAICS](#) to search and identify the correct codes. Match type of work with NAICS code as closely as possible.

² To be provided only when the solicitation requires that bidder/offeror include a dollar amount in its bid/offer.

In the event the bidder/offeror does not receive award of the prime contract, any and all representations in this Letter of Intent and Affirmation shall be null and void.

State of Florida

Department of State

I certify from the records of this office that CAROLLO ENGINEERS, INC. is a Delaware corporation authorized to transact business in the State of Florida, qualified on May 25, 2000.

The document number of this corporation is F00000003055.

I further certify that said corporation has paid all fees due this office through December 31, 2018, that its most recent annual report/uniform business report was filed on February 16, 2018, and that its status is active.

I further certify that said corporation has not filed a Certificate of Withdrawal.

*Given under my hand and the
Great Seal of the State of Florida
at Tallahassee, the Capital, this
the Twenty-first day of February,
2018*



Ken DeJoyne
Secretary of State

Tracking Number: CU9695045139

To authenticate this certificate, visit the following site, enter this number, and then follow the instructions displayed.

<https://services.sunbiz.org/Filings/CertificateOfStatus/CertificateAuthentication>

State of Florida

Board of Professional Engineers

Attests that

Carollo Engineers, Inc.



FBPE
FLORIDA BOARD OF
PROFESSIONAL ENGINEERS

Is authorized under the provisions of Section 471.023, Florida Statutes, to offer engineering services to the public through a Professional Engineer, duly licensed under Chapter 471, Florida Statutes.

Expiration: 2/28/2019

Audit No: 228201901827 R

CA Lic. No:

8571

BROWARD COUNTY LOCAL BUSINESS TAX RECEIPT

115 S. Andrews Ave., Rm. A-100, Ft. Lauderdale, FL 33301-1895 – 954-831-4000

VALID OCTOBER 1, 2017 THROUGH SEPTEMBER 30, 2018

DBA:
Business Name: CAROLLO ENGINEERS, INC

Receipt #: 315-581
Business Type: ENGINEER (ENGINEER)

Owner Name: CAROLLO ENGINEERS, INC
Business Location: 3440 HOLLYWOOD BLVD STE 465
HOLLYWOOD
Business Phone: 954-921-3225

Business Opened: 01/01/2005
State/County/Cert/Reg: 8571
Exemption Code:

Rooms Seats Employees Machines Professionals

2

For Vending Business Only						
Number of Machines:				Vending Type:		
Tax Amount	Transfer Fee	NSF Fee	Penalty	Prior Years	Collection Cost	Total Paid
30.00	0.00	0.00	0.00	0.00	0.00	30.00

THIS RECEIPT MUST BE POSTED CONSPICUOUSLY IN YOUR PLACE OF BUSINESS

**THIS BECOMES A TAX RECEIPT
WHEN VALIDATED**

This tax is levied for the privilege of doing business within Broward County and is non-regulatory in nature. You must meet all County and/or Municipality planning and zoning requirements. This Business Tax Receipt must be transferred when the business is sold, business name has changed or you have moved the business location. This receipt does not indicate that the business is legal or that it is in compliance with State or local laws and regulations.

Mailing Address:

CAROLLO ENGINEERS, INC
4600 E WASHINGTON ST STE 500
PHOENIX, AZ 85034

Receipt # 1CP-16-00017322
Paid 08/01/2017 30.00
07/31/2017 Effective Date

2017 - 2018



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

10/23/2018

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Risk Strategies Company 2040 Main Street, Suite 450 Irvine, CA 92614 www.risk-strategies.com CA DOI License No. 0F06675	CONTACT NAME: Risk Strategies Company PHONE (A/C, Ext): 949-242-9240 FAX (A/C, No): E-MAIL: syoung@risk-strategies.com													
	<table border="1"> <thead> <tr> <th>INSURER(S) AFFORDING COVERAGE</th> <th>NAIC #</th> </tr> </thead> <tbody> <tr> <td>INSURER A : Continental Insurance Company</td> <td>35289</td> </tr> <tr> <td>INSURER B : American Casualty Company of Reading, PA</td> <td>20427</td> </tr> <tr> <td>INSURER C : Valley Forge Insurance Company</td> <td>20508</td> </tr> <tr> <td>INSURER D : Continental Casualty Company</td> <td>20443</td> </tr> <tr> <td>INSURER E :</td> <td></td> </tr> <tr> <td>INSURER F :</td> <td></td> </tr> </tbody> </table>	INSURER(S) AFFORDING COVERAGE	NAIC #	INSURER A : Continental Insurance Company	35289	INSURER B : American Casualty Company of Reading, PA	20427	INSURER C : Valley Forge Insurance Company	20508	INSURER D : Continental Casualty Company	20443	INSURER E :		INSURER F :
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INSURER E :														
INSURER F :														

COVERAGES **CERTIFICATE NUMBER: 45010630** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.


INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR <input checked="" type="checkbox"/> Deductible \$0 GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC OTHER:	<input checked="" type="checkbox"/>		6050490317	12/31/2017	12/31/2018	EACH OCCURRENCE \$ \$1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ \$1,000,000 MED EXP (Any one person) \$ \$25,000 PERSONAL & ADV INJURY \$ \$1,000,000 GENERAL AGGREGATE \$ \$2,000,000 PRODUCTS - COMP/OP AGG \$ \$2,000,000 \$
A	<input checked="" type="checkbox"/> AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS ONLY <input checked="" type="checkbox"/> NON-OWNED AUTOS ONLY	<input checked="" type="checkbox"/>		6050490267	12/31/2017	12/31/2018	COMBINED SINGLE LIMIT (Ea accident) \$ \$1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ Deductible: Comp/Coll \$ \$1,000
	<input type="checkbox"/> UMBRELLA LIAB <input type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED RETENTION \$						EACH OCCURRENCE \$ AGGREGATE \$ \$
B	<input checked="" type="checkbox"/> WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N		6050490270	12/31/2017	12/31/2018	<input checked="" type="checkbox"/> PER STATUTE <input checked="" type="checkbox"/> OTH-ER Deductible: \$0
C		N/A		6050490298	12/31/2017	12/31/2018	E.L. EACH ACCIDENT \$ \$1,000,000 E.L. DISEASE - EA EMPLOYEE \$ \$1,000,000 E.L. DISEASE - POLICY LIMIT \$ \$1,000,000
D	<input type="checkbox"/> Professional Liability <input type="checkbox"/> Unlimited Prior Acts			AEH288354410	7/4/2018	7/4/2019	Each Claim: \$3,000,000 Aggregate: \$3,000,000 Deductible: \$100,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Projects as on file with the insured including but not limited to: Engineering Services for Water and Wastewater Services, Solicitation PNC2117097P1. Broward County is included as additional insured on a primary & non-contributory basis with respects to general & auto liability.

CERTIFICATE HOLDER

CANCELLATION

Broward County 115 South Andrews Avenue Fort Lauderdale FL 33301	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.
	AUTHORIZED REPRESENTATIVE  Michael Christian

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Blanket Additional Insured - Owners, Lessees or Contractors - with Products-Completed Operations Coverage Endorsement

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

It is understood and agreed as follows:

- I. The **WHO IS AN INSURED** section is amended to add as an **Insured** any person or organization whom the **Named Insured** is required by **written contract** to add as an additional insured on this **coverage part**, including any such person or organization, if any, specifically set forth on the Schedule attachment to this endorsement. However, such person or organization is an **Insured** only with respect to such person or organization's liability for:
 - A. unless paragraph **B.** below applies,
 1. **bodily injury, property damage, or personal and advertising injury** caused in whole or in part by the acts or omissions by or on behalf of the **Named Insured** and in the performance of such **Named Insured's** ongoing operations as specified in such **written contract**; or
 2. **bodily injury or property damage** caused in whole or in part by **your work** and included in the **products-completed operations** hazard, and only if
 - a. the **written contract** requires the **Named Insured** to provide the additional insured such coverage; and
 - b. this **coverage part** provides such coverage.
 - B. **bodily injury, property damage, or personal and advertising injury** arising out of **your work** described in such **written contract**, but only if:
 1. this **coverage part** provides coverage for **bodily injury or property damage** included within the **products completed operations hazard**; and
 2. the **written contract** specifically requires the **Named Insured** to provide additional insured coverage under the 11-85 or 10-01 edition of CG2010 or the 10-01 edition of CG2037.
- II. Subject always to the terms and conditions of this policy, including the limits of insurance, the Insurer will not provide such additional insured with:
 - A. coverage broader than required by the **written contract**; or
 - B. a higher limit of insurance than required by the **written contract**.
- III. The insurance granted by this endorsement to the additional insured does not apply to **bodily injury, property damage, or personal and advertising injury** arising out of:
 - A. the rendering of, or the failure to render, any professional architectural, engineering, or surveying services, including:
 1. the preparing, approving, or failing to prepare or approve maps, shop drawings, opinions, reports, surveys, field orders, change orders or drawings and specifications; and
 2. supervisory, inspection, architectural or engineering activities; or
 - B. any premises or work for which the additional insured is specifically listed as an additional insured on another endorsement attached to this **coverage part**.
- IV. Notwithstanding anything to the contrary in the section entitled **COMMERCIAL GENERAL LIABILITY CONDITIONS**, the Condition entitled **Other Insurance**, this insurance is excess of all other insurance available to the additional insured whether on a primary, excess, contingent or any other basis. However, if this insurance

CNA75079XX (1-15)
Page 1 of 2

Policy No: 6050490317
Endorsement No:
Effective Date: 12/31/2017

Insured Name: Carollo Engineers, Inc.

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Blanket Additional Insured - Owners, Lessees or Contractors - with Products-Completed Operations Coverage Endorsement

is required by **written contract** to be primary and non-contributory, this insurance will be primary and non-contributory relative solely to insurance on which the additional insured is a named insured.

V. Solely with respect to the insurance granted by this endorsement, the section entitled **COMMERCIAL GENERAL LIABILITY CONDITIONS** is amended as follows:

The Condition entitled **Duties In The Event of Occurrence, Offense, Claim or Suit** is amended with the addition of the following:

Any additional insured pursuant to this endorsement will as soon as practicable:

1. give the Insurer written notice of any **claim**, or any **occurrence** or offense which may result in a **claim**;
2. except as provided in Paragraph IV. of this endorsement, agree to make available any other insurance the additional insured has for any loss covered under this **coverage part**;
3. send the Insurer copies of all legal papers received, and otherwise cooperate with the Insurer in the investigation, defense, or settlement of the **claim**; and
4. tender the defense and indemnity of any **claim** to any other insurer or self insurer whose policy or program applies to a loss that the Insurer covers under this **coverage part**. However, if the **written contract** requires this insurance to be primary and non-contributory, this paragraph (4) does not apply to insurance on which the additional insured is a named insured.

The Insurer has no duty to defend or indemnify an additional insured under this endorsement until the Insurer receives written notice of a **claim** from the additional insured.

VI. Solely with respect to the insurance granted by this endorsement, the section entitled **DEFINITIONS** is amended to add the following definition:

Written contract means a written contract or written agreement that requires the **Named Insured** to make a person or organization an additional insured on this **coverage part**, provided the contract or agreement:

- A. is currently in effect or becomes effective during the term of this policy; and
- B. was executed prior to:
 1. the **bodily injury** or **property damage**; or
 2. the offense that caused the **personal and advertising injury**for which the additional insured seeks coverage.

Any coverage granted by this endorsement shall apply solely to the extent permissible by law.

All other terms and conditions of the Policy remain unchanged.

This endorsement, which forms a part of and is for attachment to the Policy issued by the designated Insurers, takes effect on the effective date of said Policy at the hour stated in said Policy, unless another effective date is shown below, and expires concurrently with said Policy.



NOTICE OF CANCELLATION TO CERTIFICATEHOLDERS

It is understood and agreed that:

If you have agreed under written contract to provide notice of cancellation to a party to whom the Agent of Record has issued a Certificate of Insurance, and if we cancel a policy term described on that Certificate of Insurance for any reason other than nonpayment of premium, then notice of cancellation will be provided to such Certificateholders at least 30 days in advance of the date cancellation is effective.

If notice is mailed, then proof of mailing to the last known mailing address of the Certificateholder on file with the Agent of Record will be sufficient to prove notice.

Any failure by us to notify such persons or organizations will not extend or invalidate such cancellation, or impose any liability or obligation upon us or the Agent of Record.

Broward County
115 South Andrews Avenue
Fort Lauderdale FL 33301

Named Insured: Carollo Engineers, Inc.

Policy Number: 6050490267

Effective Date: 12/31/2017



ADDITIONAL INSURED – PRIMARY AND NON-CONTRIBUTORY

It is understood and agreed that this endorsement amends the **BUSINESS AUTO COVERAGE FORM** as follows:

SCHEDULE

Name of Additional Insured Persons Or Organizations
ANY PERSON OR ORGANIZATION ON WHOSE BEHALF YOU ARE REQUIRED UNDER A WRITTEN CONTRACT OR AGREEMENT.

1. In conformance with paragraph **A.1.c.** of **Who Is An Insured** of Section **II – LIABILITY COVERAGE**, the person or organization scheduled above is an insured under this policy.
2. The insurance afforded to the additional insured under this policy will apply on a primary and non-contributory basis if you have committed it to be so in a written contract or written agreement executed prior to the date of the "accident" for which the additional insured seeks coverage under this policy.

All other terms and conditions of the Policy remain unchanged.

CNA 71527XX (Ed. 10/12)



NOTICE OF CANCELLATION TO CERTIFICATEHOLDERS

It is understood and agreed that:

If you have agreed under written contract to provide notice of cancellation to a party to whom the Agent of Record has issued a Certificate of Insurance, and if we cancel a policy term described on that Certificate of Insurance for any reason other than nonpayment of premium, then notice of cancellation will be provided to such Certificateholders at least 30 days in advance of the date cancellation is effective.

If notice is mailed, then proof of mailing to the last known mailing address of the Certificateholder on file with the Agent of Record will be sufficient to prove notice.

Any failure by us to notify such persons or organizations will not extend or invalidate such cancellation, or impose any liability or obligation upon us or the Agent of Record.

Broward County
115 South Andrews Avenue
Fort Lauderdale FL 33301

Carollo Engineers, Inc.



NOTICE OF CANCELLATION TO CERTIFICATEHOLDERS

It is understood and agreed that:

If you have agreed under written contract to provide notice of cancellation to a party to whom the Agent of Record has issued a Certificate of Insurance, and if we cancel a policy term described on that Certificate of Insurance for any reason other than nonpayment of premium, then notice of cancellation will be provided to such Certificateholders at least 30 days in advance of the date cancellation is effective.

If notice is mailed, then proof of mailing to the last known mailing address of the Certificateholder on file with the Agent of Record will be sufficient to prove notice.

Any failure by us to notify such persons or organizations will not extend or invalidate such cancellation, or impose any liability or obligation upon us or the Agent of Record.

All other terms and conditions of the policy remain unchanged.

This endorsement, which forms a part of and is for attachment to the policy issued by the designated Insurers, takes effect on the Policy Effective date of said policy at the hour stated in said policy, unless another effective date (the Endorsement Effective Date) is shown below, and expires concurrently with said policy unless another expiration date is shown below.

Form No: CC68021A (02-2013)	6050490270
Endorsement Effective Date: 12/31/2017	Policy No: 6050490298
Endorsement No:	Policy Effective Date: 12/31/2017
Underwriting Company: American Casualty Company of Reading, PA	
Valley Forge Insurance Company	

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Workers Compensation

BidSync



PROFESSIONAL LIABILITY AND POLLUTION
INCIDENT LIABILITY INSURANCE POLICY

For All the Commitments you Make

INSURED: Carollo Engineers, Inc.

Policy AEH288354410

Effective 7/4/2018

Endorsement Number

**NOTICE ENDORSEMENT -
CANCELLATION OR NON-RENEWAL**

We agree with **you** that **your** Policy is amended to include the following additional provisions.

1. **Your** Policy will not be:

XX Cancelled by us until we provide at least:

10 days prior written notice if we cancel **your** Policy for Non-payment of Premium;

30 days prior written notice if we cancel **your** Policy for The following reasons:

Any reason other than non-payment of premium.

___ Non-renewed by us until at least ___ days prior written notice is given to the person or entity named in 2. below.

2. Person or Entity:

Broward County
115 South Andrews Avenue
Fort Lauderdale FL 33301

All other terms and conditions of the Policy remain unchanged.

This endorsement, which forms a part of and is for attachment to the Policy issued by the designated Insurers, takes effect on the effective date of said Policy at the hour stated in said Policy and expires concurrently with said Policy unless another effective date is shown above.

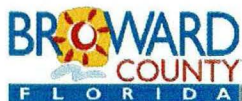
By Authorized Representative James F. Willging
(No signature is required if issued with the Policy or if it is effective on the Policy Effective Date)

James F. Willging

Countersigned by Authorized Representative

256423

(Ed. 10/05)



Vendor Reference Verification Form

Broward County Solicitation No. and Title:

PNC2117097P1 - Engineering Services for Water and Wastewater Services

Reference for: **Carollo Engineers, Inc.**

Organization/Firm Name providing reference:

City of Sunrise

Contact Name: **Luisa F. Arbeláez** Title: **Project Manager** Reference date: **11/05/2018**

Contact Email: **larbelaez@sunrisefl.gov** Contact Phone: **954-888-6009**

Name of Referenced Project: **City of Sunrise-Springtree WTP Water Stabilization and Solids Handling**

Contract No.	Date Services Provided:	Project Amount:
PA 16-003-CE	04/07/2016 to 05/29/2018	\$ 507,978.00

Vendor's role in Project: Prime Vendor Subconsultant/Subcontractor

Would you use this vendor again? Yes No If No, please specify in Additional Comments (below).

Description of services provided by Vendor:

Carollo Engineers performed the design study and construction administration services for the City.

Please rate your experience with the referenced Vendor:	Needs Improvement	Satisfactory	Excellent	Not Applicable
1. Vendor's Quality of Service			<input checked="" type="checkbox"/>	<input type="checkbox"/>
a. Responsive	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Accuracy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Deliverables	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Vendor's Organization:			<input checked="" type="checkbox"/>	<input type="checkbox"/>
a. Staff expertise	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Professionalism	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Turnover	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Timeliness of:			<input checked="" type="checkbox"/>	<input type="checkbox"/>
a. Project	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Deliverables	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. Project completed within budget	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5. Cooperation with:			<input checked="" type="checkbox"/>	<input type="checkbox"/>
a. Your Firm	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Subcontractor(s)/Subconsultant(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Regulatory Agency(ies)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Additional Comments: (provide on additional sheet if needed)

Carollo Engineers' technical knowledge and attention to detail were beneficial to the project. At all times Carollo acted in the City's best interest in every aspect for the duration of the project. All personnel assigned to this project was very responsive. Note that the construction contract sum (Contractor) was \$4,284,000.00 and Carollo's (Consultant) contract was \$507,978.00.

THIS SECTION FOR COUNTY USE ONLY

Verified via: EMAIL VERBAL Verified by: _____ Division: _____ Date: _____

All information provided to Broward County is subject to verification. Vendor acknowledges that inaccurate, untruthful, or incorrect statements made in support of this response may be used by the County as a basis for rejection, rescission of the award, or termination of the contract and may also serve as the basis for debarment of Vendor pursuant to Section 21.119 of the Broward County Procurement Code.



Vendor Reference Verification Form

Broward County Solicitation No. and Title:

PNC2117097P1 - Engineering Services for Water and Wastewater Services

Reference for: **Carollo Engineers, Inc.**

Organization/Firm Name providing reference:

City of Boynton Beach, Florida

Contact Name: **Joe Paterniti**

Title: **Utility Director**

Reference date: **10/24/2018**

Contact Email: **paternitij@bbfl.us**

Contact Phone: **561-742-6423**

Name of Referenced Project: **East Water Treatment Plant Improvements Project.**

Contract No.

Date Services Provided:

Total Project Amount:

R14-054

07/02/2014

to

03/31/2018

\$ 25 million

Vendor's role in Project: Prime Vendor Subconsultant/Subcontractor

Would you use this vendor again? Yes No If No, please specify in Additional Comments (below).

Description of services provided by Vendor:

Carollo Engineers, Inc. was the lead design firm for the East WTP improvements. The progressive design build project included implementation of a 24 MGD magnetic ion Exchange (MIEX) unit to assist with treatment of the City's western wellfield raw water.

Please rate your experience with the referenced Vendor:

	Needs Improvement	Satisfactory	Excellent	Not Applicable
1. Vendor's Quality of Service				
a. Responsive	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Accuracy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Deliverables	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Vendor's Organization:				
a. Staff expertise	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Professionalism	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Turnover	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Timeliness of:				
a. Project	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Deliverables	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. Project completed within budget	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5. Cooperation with:				
a. Your Firm	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Subcontractor(s)/Subconsultant(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Regulatory Agency(ies)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Additional Comments: (provide on additional sheet if needed)

[Signature] 10-24-18
*****THIS SECTION FOR COUNTY USE ONLY*****

Verified via: EMAIL VERBAL Verified by: _____ Division: _____ Date: _____

All information provided to Broward County is subject to verification. Vendor acknowledges that inaccurate, untruthful, or incorrect statements made in support of this response may be used by the County as a basis for rejection, rescission of the award, or termination of the contract and may also serve as the basis for debarment of Vendor pursuant to Section 21.119 of the Broward County Procurement Code.



Vendor Reference Verification Form

Broward County Solicitation No. and Title:

PNC2117097P1 - Engineering Services for Water and Wastewater Services

Reference for: Carollo Engineers, Inc.

Organization/Firm Name providing reference:

Jacobs Engineering

Contact Name: Jorge Camacho Title: Design Manager Reference date: 11/03/2018

Contact Email: Jorge.camacho@Jacobs.com Contact Phone: (787)409-8540

Name of Referenced Project: NMB Water - City of North Miami Beach

Contract No. _____ Date Services Provided: _____ Project Amount: _____

PO# 171237 - Sunshine FM 11/06/2017 to 11/03/2018

Vendor's role in Project: Prime Vendor Subconsultant/Subcontractor

Would you use this vendor again? Yes No If No, please specify in Additional Comments (below).

Description of services provided by Vendor:

Carollo Engineers provided a high quality complete deliverable on a timely manner.

Please rate your experience with the referenced Vendor:	Needs Improvement	Satisfactory	Excellent	Not Applicable
1. Vendor's Quality of Service				
a. Responsive	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Accuracy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Deliverables	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Vendor's Organization:				
a. Staff expertise	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Professionalism	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Turnover	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Timeliness of:				
a. Project	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Deliverables	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. Project completed within budget	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5. Cooperation with:				
a. Your Firm	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Subcontractor(s)/Subconsultant(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Regulatory Agency(ies)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Additional Comments: (provide on additional sheet if needed)

Carollo staff is highly prepared to take on any design task. This firm has strong personal and communication skills, which is important for the success of any project.

THIS SECTION FOR COUNTY USE ONLY

Verified via: EMAIL VERBAL Verified by: _____ Division: _____ Date: _____



Chen Moore and Associates has had no cases filed, pending or resolved with Broward County during our firm's history.

In today's litigious society, businesses are constantly confronted with civil claims and Chen Moore and Associates has not been spared that exposure. With respect to current/pending or past litigation/arbitration in the last seven (7) years CMA has been involved in three cases which are explained in history detailed below. We assert that this history (1) will have no material negative impact on CMA's ability to execute this project, (2) does not display an undesirable pattern of litigation with owners over construction matters and (3) does not have had a claim against its bonding company in the last seven (7) years wherein the bonding company was required to take over and complete the project or pay outstanding liens on the project.

We wish to reiterate that just because we are involved in litigation, it does not reflect on our culpability in the cases. In fact, we believe our full disclosure in these matters displays good faith. We welcome the Evaluation Committee to review CMA and all other vendors for their willingness to disclose active and past cases by visiting any of the respective Clerk of the Court Websites.

A handwritten signature in blue ink, appearing to be "Peter Moore", is written over a horizontal line. The signature is stylized and extends slightly below the line.

Peter Moore, P.E., LEED AP, F.ASCE

Name/Title

October 31, 2018

Date

LITIGATION HISTORY FORM
 Broward County Board of
 County Commissioners

PNC2117097P1

The completed form(s) should be returned with the Vendor's submittal. If not provided with submittal, the Vendor must submit within three business days of County's request. Vendor may be deemed non-responsive for failure to fully comply within stated timeframes.

- There are no material cases for this Vendor; or
- Material Case(s) are disclosed below:
 X

Is this for a: (check type) <input checked="" type="checkbox"/> Parent, <input type="checkbox"/> Subsidiary, or <input type="checkbox"/> Predecessor Firm?	If Yes, name of Parent/Subsidiary/Predecessor: <input type="text"/> Or No <input type="checkbox"/>
Party	
Case Number, Name, and Date Filed	Case No: 11-30999 CA 02; Date Filed: June 4, 2012
Name of Court or other tribunal	11th Circuit Court of Miami-Dade
Type of Case	Bankruptcy <input type="checkbox"/> Civil <input checked="" type="checkbox"/> Criminal <input type="checkbox"/> Administrative/Regulatory <input type="checkbox"/>
Claim or Cause of Action and Brief description of each Count	During a streetscaping project, the complaint alleged that the plaintiff fell off their motor scooter while driving through a
Brief description of the Subject Matter and Project Involved	construction zone. Chen Moore and Associates was a co-defendant in a personal
Disposition of Case (Attach copy of any applicable Judgment, Settlement Agreement and Satisfaction of Judgment.)	injury suit with one count for negligence. Pending <input type="checkbox"/> Settled <input type="checkbox"/> Dismissed <input checked="" type="checkbox"/> Judgment Vendor's Favor <input type="checkbox"/> Judgment Against Vendor <input type="checkbox"/> If Judgment Against, is Judgment Satisfied? <input type="checkbox"/> Yes <input type="checkbox"/> No
Opposing Counsel	Name: David A. Hagen, P.A. Email: hagen.esq@lawyer.com Telephone Number: 305.373.4200

Vendor Name:

LITIGATION HISTORY FORM
 Broward County Board of
 County Commissioners

PNC2117097P1

The completed form(s) should be returned with the Vendor's submittal. If not provided with submittal, the Vendor must submit within three business days of County's request. Vendor may be deemed non-responsive for failure to fully comply within stated timeframes.

- There are no material cases for this Vendor; or
 Material Case(s) are disclosed below:

Is this for a: (check type) <input checked="" type="checkbox"/> Parent, <input type="checkbox"/> Subsidiary, or <input type="checkbox"/> Predecessor Firm?	If Yes, name of Parent/Subsidiary/Predecessor: <input type="text"/> Or No <input type="checkbox"/>
Party	
Case Number, Name, and Date Filed	Case No: 13-025280 CA-01 (05); Date Filed: March 12, 2014
Name of Court or other tribunal	11th Circuit Court of Miami-Dade ^x
Type of Case	Bankruptcy <input type="checkbox"/> Civil <input checked="" type="checkbox"/> Criminal <input type="checkbox"/> Administrative/Regulatory <input type="checkbox"/>
Claim or Cause of Action and Brief description of each Count	Chen Moore and Associates was a co-defendant in a wrongful death action with one count of negligence.
Brief description of the Subject Matter and Project Involved	The complaint alleged that, during a streetscaping project, the decedent fell off the back of a motorcycle while driving through a construction zone.
Disposition of Case (Attach copy of any applicable Judgment, Settlement Agreement and Satisfaction of Judgment.)	Pending <input type="checkbox"/> Settled <input type="checkbox"/> Dismissed <input checked="" type="checkbox"/> Judgment Vendor's Favor <input type="checkbox"/> Judgment Against Vendor <input type="checkbox"/> If Judgment Against, is Judgment Satisfied? <input type="checkbox"/> Yes <input type="checkbox"/> No
Opposing Counsel	Name: <input type="text" value="Hiram M. Montero, P.A."/> Email: <input type="text" value="hmontero@monterolaw.com"/> Telephone Number: <input type="text" value="954.767.6500"/>

Vendor Name:

The completed form(s) should be returned with the Vendor's submittal. If not provided with submittal, the Vendor must submit within three business days of County's request. Vendor may be deemed non-responsive for failure to fully comply within stated timeframes.

- There are no material cases for this Vendor; or
 Material Case(s) are disclosed below:

Is this for a: (check type) <input checked="" type="checkbox"/> Parent, <input type="checkbox"/> Subsidiary, or <input type="checkbox"/> Predecessor Firm?	If Yes, name of Parent/Subsidiary/Predecessor: <input type="text"/> Or No <input type="checkbox"/>
Party	
Case Number, Name, and Date Filed	Case No: 16-011970 CA-01, May 11, 2016
Name of Court or other tribunal	11th Judicial Circuit Court in and for Miami-Dade County, 175 NW 1st Avenue, Miami, FL 33128; City of Miami Beach
Type of Case	Bankruptcy <input type="checkbox"/> Civil <input checked="" type="checkbox"/> Criminal <input type="checkbox"/> Administrative/Regulatory <input type="checkbox"/>
Claim or Cause of Action and Brief description of each Count	The complaint alleged that, during a streetscaping project, the complainant was ejected from a motorcycle while driving through a construction zone
Brief description of the Subject Matter and Project Involved	<input type="text"/>
Disposition of Case (Attach copy of any applicable Judgment, Settlement Agreement and Satisfaction of Judgment.)	Pending <input type="checkbox"/> Settled <input type="checkbox"/> Dismissed <input checked="" type="checkbox"/> Judgment Vendor's Favor <input type="checkbox"/> Judgment Against Vendor <input type="checkbox"/> If Judgment Against, is Judgment Satisfied? <input type="checkbox"/> Yes <input type="checkbox"/> No
Opposing Counsel	Name: <input type="text" value="Hugo V. Alvarez, P.A."/> Email: <input type="text" value="halvarez@alvarezbarbara.com"/> Telephone Number: <input type="text" value="305.263.7700"/>

Vendor Name:

Similar to the Nazario Case, in Castro v. M. Vila, City of Miami Beach, Metro Express, and CMA; Case Number 2016-011970-CA-01, CMA was similarly sued despite having no contractual responsibility with respect to the alleged defective work. This negligence action arose out of the death of a passenger on a motorcycle that is alleged to have hit a sanitary sewer manhole located within the City of Miami Beach. CMA had no responsibility whatsoever relating to sanitary sewer placement or construction

LITIGATION HISTORY FORM
 Broward County Board of
 County Commissioners

PNC2117097P1

The completed form(s) should be returned with the Vendor's submittal. If not provided with submittal, the Vendor must submit within three business days of County's request. Vendor may be deemed non-responsive for failure to fully comply within stated timeframes.

- There are no material cases for this Vendor; or
 Material Case(s) are disclosed below:

Is this for a: (check type) <input checked="" type="checkbox"/> Parent, <input type="checkbox"/> Subsidiary, or <input type="checkbox"/> Predecessor Firm?	If Yes, name of Parent/Subsidiary/Predecessor: <input type="text"/> Or No <input type="checkbox"/>
Party	
Case Number, Name, and Date Filed	<input type="text" value="17-017197-CA-06, 7/31/17"/>
Name of Court or other tribunal	<input type="text" value="11th Judicial Circuit Court in and for Miami-Dade County, 175 NW 1st Avenue, Miami, FL 33128; City of Miami Beach"/>
Type of Case	Bankruptcy <input type="checkbox"/> Civil <input checked="" type="checkbox"/> Criminal <input type="checkbox"/> Administrative/Regulatory <input type="checkbox"/>
Claim or Cause of Action and Brief description of each Count	<input type="text" value="CMA is a co-defendant in a slip and fall accident with one count of negligence."/>
Brief description of the Subject Matter and Project Involved	<input type="text" value="The complaint alleged that, after a streetscaping project, the plaintiff fell and injured themselves on an uneven sidewalk."/>
Disposition of Case (Attach copy of any applicable Judgment, Settlement Agreement and Satisfaction of Judgment.)	Pending <input type="checkbox"/> Settled <input type="checkbox"/> Dismissed <input checked="" type="checkbox"/> Judgment Vendor's Favor <input type="checkbox"/> Judgment Against Vendor <input type="checkbox"/> If Judgment Against, is Judgment Satisfied? <input type="checkbox"/> Yes <input type="checkbox"/> No
Opposing Counsel	Name: <input type="text"/> Email: <input type="text"/> Telephone Number: <input type="text"/>

Vendor Name:

Supplier: **Carollo Engineers**

**GENERAL PROFESSIONAL SERVICES AGREEMENTS
FOR WATER AND WASTEWATER SERVICES**

Broward County Water and Wastewater Services is seeking a Consultant(s) authorized by Chapter 287.055 to provide professional engineering services on a continuing basis for three separate continuing contracts for projects in which construction costs do not exceed \$2,000,000.

Only one contract will be awarded per category. Responders to this RFP may choose to submit for one, all, or any combination of categories under this RFP. There is no prohibition to the number of contracts the County may award to one vendor. Responders must clearly identify which Category (ies) they are submitting for so their qualifications can be properly considered and evaluated for each Category by the Evaluation Committee.

Each proposed contract and their respective scope of services are described in the following paragraphs:

Category No. 1: Distribution and Collection Systems (101190). The specific nature of the work shall include but not be limited to providing professional engineering, pre-design, design, permitting, bid/award, and construction management services related to the rehabilitation, modification, expansion, addition, and/or repair of existing and proposed County owned and or operated: water distribution, wastewater collection, and storm water collection systems.

Category No. 2: Water Treatment Systems (101279). The specific nature of the work shall include but not be limited to providing professional engineering, pre-design, design, permitting, bid/award, and construction management services related to the rehabilitation, modification, expansion, addition, and/or repair of existing and proposed County owned and or operated: water treatment and raw water production systems, and related buildings/structures.

Category No. 3: Wastewater Treatment Systems (100957). The specific nature of the work shall include but not be limited to providing professional engineering, pre-design, design, permitting, bid/award, and construction management services related to the rehabilitation, modification, expansion, addition, and/or repair of existing and proposed County owned and or operated: wastewater treatment and disposal systems, and related buildings/structures.

It is the intention of the County that each proposed Category will result in a continuing contract with a maximum value of \$1,000,000 per year. The initial term will be for a two (2) year period, with the option, at the County's sole discretion, of three (3) consecutive one (1) year renewals.

NOTE: The COUNTY reserves the right to delete all or any portion of the scope of services described above.

Supplier: **Carollo Engineers**

**Standard Instructions to Vendors
Request for Proposals, Request for Qualifications, or Request for Letters of Interest**

Vendors are instructed to read and follow the instructions carefully, as any misinterpretation or failure to comply with instructions may lead to a Vendor's submittal being rejected.

Vendor MUST submit its solicitation response electronically and MUST confirm its submittal in order for the County to receive a valid response through BidSync. Refer to the [Purchasing Division website](#) or contact BidSync for submittal instructions.

A. Responsiveness Criteria:

In accordance with Broward County Procurement Code Section 21.8.b.65, a Responsive Bidder [Vendor] means a person who has submitted a proposal which conforms in all material respects to a solicitation. The solicitation submittal of a responsive Vendor must be submitted on the required forms, which contain all required information, signatures, notarizations, insurance, bonding, security, or other mandated requirements required by the solicitation documents to be submitted at the time of proposal opening.

Failure to provide the information required below at the time of submittal opening may result in a recommendation Vendor is non-responsive by the Director of Purchasing. The Selection or Evaluation Committee will determine whether the firm is responsive to the requirements specified herein. The County reserves the right to waive minor technicalities or irregularities as is in the best interest of the County in accordance with Section 21.30.f.1(c) of the Broward County Procurement Code.

Below are standard responsiveness criteria; refer to **Special Instructions to Vendors**, for Additional Responsiveness Criteria requirement(s).

1. Lobbyist Registration Requirement Certification

Refer to **Lobbyist Registration Requirement Certification**. The completed form should be submitted with the solicitation response but must be submitted within three business days of County's request. Vendor may be deemed non-responsive for failure to fully comply within stated timeframes.

2. Addenda

The County reserves the right to amend this solicitation prior to the due date. Any change(s) to this solicitation will be conveyed through the written addenda process. Only written addenda will be binding. If a "must" addendum is issued, Vendor must follow instructions and submit required information, forms, or acknowledge addendum, as instructed therein. It is the responsibility of all potential Vendors to monitor the solicitation for any changing information, prior to submitting their response.

B. Responsibility Criteria:

Definition of a Responsible Vendor: In accordance with Section 21.8.b.64 of the Broward County Procurement Code, a Responsible Vendor means a Vendor who has the capability in all respects to perform the contract requirements, and the integrity and reliability which will assure good faith performance.

The Selection or Evaluation Committee will recommend to the awarding authority a determination of

a Vendor's responsibility. At any time prior to award, the awarding authority may find that a Vendor is not responsible to receive a particular award.

Failure to provide any of this required information and in the manner required may result in a recommendation by the Director of Purchasing that the Vendor is non-responsive.

Below are standard responsibility criteria; refer to **Special Instructions to Vendors**, for Additional Responsibility Criteria requirement(s).

1. **Litigation History**

- a. All Vendors are required to disclose to the County all "material" cases filed, pending, or resolved during the last three (3) years prior to the solicitation response due date, whether such cases were brought by or against the Vendor, any parent or subsidiary of the Vendor, or any predecessor organization. Additionally, all Vendors are required to disclose to the County all "material" cases filed, pending, or resolved against any principal of Vendor, regardless of whether the principal was associated with Vendor at the time of the "material" cases against the principal, during the last three (3) years prior to the solicitation response. A case is considered to be "material" if it relates, in whole or in part, to any of the following:
 - i. A similar type of work that the vendor is seeking to perform for the County under the current solicitation;
 - ii. An allegation of fraud, negligence, error or omissions, or malpractice against the vendor or any of its principals or agents who would be performing work under the current solicitation;
 - iii. A vendor's default, termination, suspension, failure to perform, or improper performance in connection with any contract;
 - iv. The financial condition of the vendor, including any bankruptcy petition (voluntary and involuntary) or receivership; or
 - v. A criminal proceeding or hearing concerning business-related offenses in which the vendor or its principals (including officers) were/are defendants.
- b. For each material case, the Vendor is required to provide all information identified in the **Litigation History Form**. Additionally, the Vendor shall provide a copy of any judgment or settlement of any material case during the last three (3) years prior to the solicitation response. Redactions of any confidential portions of the settlement agreement are only permitted upon a certification by Vendor that all redactions are required under the express terms of a pre-existing confidentiality agreement or provision.
- c. The County will consider a Vendor's litigation history information in its review and determination of responsibility.
- d. If the Vendor is a joint venture, the information provided should encompass the joint venture and each of the entities forming the joint venture.
- e. A vendor is required to disclose to the County any and all cases(s) that exist between the County and any of the Vendor's subcontractors/subconsultants proposed to work on this project during the last five (5) years prior to the solicitation response.
- f. Failure to disclose any material case, including all requested information in connection with each such case, as well as failure to disclose the Vendor's subcontractors/subconsultants litigation history against the County, may result in the Vendor being deemed non-responsive.

2. **Financial Information**

- a. All Vendors are required to provide the Vendor's financial statements at the time of submittal

in order to demonstrate the Vendor's financial capabilities.

- b. Each Vendor shall submit its most recent two years of financial statements for review. The financial statements are not required to be audited financial statements. The annual financial statements will be in the form of:
 - i. Balance sheets, income statements and annual reports; or
 - ii. Tax returns; or
 - iii. SEC filings.

If tax returns are submitted, ensure it does not include any personal information (as defined under Florida Statutes Section 501.171, Florida Statutes), such as social security numbers, bank account or credit card numbers, or any personal pin numbers. If any personal information data is part of financial statements, redact information prior to submitting a response the County.

- c. If a Vendor has been in business for less than the number of years of required financial statements, then the Vendor must disclose all years that the Vendor has been in business, including any partial year-to-date financial statements.
- d. The County may consider the unavailability of the most recent year's financial statements and whether the Vendor acted in good faith in disclosing the financial documents in its evaluation.
- e. Any claim of confidentiality on financial statements should be asserted at the time of submittal. Refer to **Standard Instructions to Vendors**, Confidential Material/ Public Records and Exemptions for instructions on submitting confidential financial statements. The Vendor's failure to provide the information as instructed may lead to the information becoming public.
- f. Although the review of a Vendor's financial information is an issue of responsibility, the failure to either provide the financial documentation or correctly assert a confidentiality claim pursuant the Florida Public Records Law and the solicitation requirements (Confidential Material/ Public Records and Exemptions section) may result in a recommendation of non-responsiveness by the Director of Purchasing.

3. Authority to Conduct Business in Florida

- a. A Vendor must have the authority to transact business in the State of Florida and be in good standing with the Florida Secretary of State. For further information, contact the Florida Department of State, Division of Corporations.
- b. The County will review the Vendor's business status based on the information provided in response to this solicitation.
- c. It is the Vendor's responsibility to comply with all state and local business requirements.
- d. Vendor should list its active Florida Department of State Division of Corporations Document Number (or Registration No. for fictitious names) in the **Vendor Questionnaire**, Question No. 10.
- e. If a Vendor is an out-of-state or foreign corporation or partnership, the Vendor must obtain the authority to transact business in the State of Florida or show evidence of application for the authority to transact business in the State of Florida, upon request of the County.
- f. A Vendor that is not in good standing with the Florida Secretary of State at the time of a

submission to this solicitation may be deemed non-responsible.

- g. If successful in obtaining a contract award under this solicitation, the Vendor must remain in good standing throughout the contractual period of performance.

4. **Affiliated Entities of the Principal(s)**

- a. All Vendors are required to disclose the names and addresses of “affiliated entities” of the Vendor’s principal(s) over the last five (5) years (from the solicitation opening deadline) that have acted as a prime Vendor with the County. The Vendor is required to provide all information required on the **Affiliated Entities of the Principal(s) Certification Form**.
- b. The County will review all affiliated entities of the Vendor’s principal(s) for contract performance evaluations and the compliance history with the County’s Small Business Program, including CBE, DBE and SBE goal attainment requirements. “Affiliated entities” of the principal(s) are those entities related to the Vendor by the sharing of stock or other means of control, including but not limited to a subsidiary, parent or sibling entity.
- c. The County will consider the contract performance evaluations and the compliance history of the affiliated entities of the Vendor’s principals in its review and determination of responsibility.

5. **Insurance Requirements**

The **Insurance Requirement Form** reflects the insurance requirements deemed necessary for this project. It is not necessary to have this level of insurance in effect at the time of submittal, but it is necessary to submit certificates indicating that the Vendor currently carries the insurance or to submit a letter from the carrier indicating it can provide insurance coverages.

C. **Additional Information and Certifications**

The following forms and supporting information (if applicable) should be returned with Vendor’s submittal. If not provided with submittal, the Vendor must submit within three business days of County’s request. Failure to timely submit may affect Vendor’s evaluation.

1. **Vendor Questionnaire**

Vendor is required to submit detailed information on their firm. Refer to the **Vendor Questionnaire** and submit as instructed.

2. **Standard Certifications**

Vendor is required to certify to the below requirements. Refer to the **Standard Certifications** and submit as instructed.

- a. **Cone of Silence Requirement Certification**
- b. **Drug-Free Workplace Certification**
- c. **Non-Collusion Certification**
- d. **Public Entities Crimes Certification**
- e. **Scrutinized Companies List Certification**

3. **Subcontractors/Subconsultants/Suppliers Requirement**

The Vendor shall submit a listing of all subcontractors, subconsultants, and major material suppliers, if any, and the portion of the contract they will perform. Vendors must follow the instructions included on the **Subcontractors/Subconsultants/Suppliers Information Form** and submit as instructed.

D. Standard Agreement Language Requirements

1. The acceptance of or any exceptions taken to the terms and conditions of the County's Agreement shall be considered a part of a Vendor's submittal and will be considered by the Selection or Evaluation Committee.
2. The applicable Agreement terms and conditions for this solicitation are indicated in the **Special Instructions to Vendors**.
3. Vendors are required to review the applicable terms and conditions and submit the **Agreement Exception Form**. If the **Agreement Exception Form** is not provided with the submittal, it shall be deemed an affirmation by the Vendor that it accepts the Agreement terms and conditions as disclosed in the solicitation.
4. If exceptions are taken, the Vendor must specifically identify each term and condition with which it is taking an exception. Any exception not specifically listed is deemed waived. Simply identifying a section or article number is not sufficient to state an exception. Provide either a redlined version of the specific change(s) or specific proposed alternative language. Additionally, a brief justification specifically addressing each provision to which an exception is taken should be provided.
5. Submission of any exceptions to the Agreement does not denote acceptance by the County. Furthermore, taking exceptions to the County's terms and conditions may be viewed unfavorably by the Selection or Evaluation Committee and ultimately may impact the overall evaluation of a Vendor's submittal.

E. Evaluation Criteria

1. The Selection or Evaluation Committee will evaluate Vendors as per the **Evaluation Criteria**. The County reserves the right to obtain additional information from a Vendor.
2. Vendor has a continuing obligation to inform the County in writing of any material changes to the information it has previously submitted. The County reserves the right to request additional information from Vendor at any time.
3. For Request for Proposals, the following shall apply:
 - a. The Director of Purchasing may recommend to the Evaluation Committee to short list the most qualified firms prior to the Final Evaluation.
 - b. The Evaluation Criteria identifies points available; a total of 100 points is available.
 - c. If the Evaluation Criteria includes a request for pricing, the total points awarded for price is determined by applying the following formula:
$$\frac{(\text{Lowest Proposed Price}/\text{Vendor's Price}) \times (\text{Maximum Number of Points for Price})}{= \text{Price Score}}$$
 - d. After completion of scoring, the County may negotiate pricing as in its best interest.
4. For Requests for Letters of Interest or Request for Qualifications, the following shall apply:
 - a. The Selection or Evaluation Committee will create a short list of the most qualified firms.
 - b. The Selection or Evaluation Committee will either:

- i. Rank shortlisted firms; or
- ii. If the solicitation is part of a two-step procurement, shortlisted firms will be requested to submit a response to the Step Two procurement.

F. Demonstrations

If applicable, as indicated in Special Instructions to Vendors, Vendors will be required to demonstrate the nature of their offered solution. After receipt of submittals, all Vendors will receive a description of, and arrangements for, the desired demonstration. In accordance with Section 286.0113 of the Florida Statutes and pursuant to the direction of the Broward County Board of Commissioners, demonstrations are closed to only the vendor team and County staff.

G. Presentations

Vendors that are found to be both responsive and responsible to the requirements of the solicitation and/or shortlisted (if applicable) will have an opportunity to make an oral presentation to the Selection or Evaluation Committee on the Vendor's approach to this project and the Vendor's ability to perform. The committee may provide a list of subject matter for the discussion. All Vendor's will have equal time to present but the question-and-answer time may vary. In accordance with Section 286.0113 of the Florida Statutes and the direction of the Broward County Board of Commissioners, presentations during Selection or Evaluation Committee Meetings are closed. Only the Selection or Evaluation Committee members, County staff and the vendor and their team scheduled for that presentation will be present in the Meeting Room during the presentation and subsequent question and answer period.

H. Public Art and Design Program

If indicated in **Special Instructions to Vendors**, Public Art and Design Program, Section 1-88, Broward County Code of Ordinances, applies to this project. It is the intent of the County to functionally integrate art, when applicable, into capital projects and integrate artists' design concepts into this improvement project. The Vendor may be required to collaborate with the artist(s) on design development within the scope of this request. Artist(s) shall be selected by Broward County through an independent process. For additional information, contact the Broward County Cultural Division.

I. Committee Appointment

The Cone of Silence shall be in effect for County staff at the time of the Selection or Evaluation Committee appointment and for County Commissioners and Commission staff at the time of the Shortlist Meeting of the Selection Committee or the Initial Evaluation Meeting of the Evaluation Committee. The committee members appointed for this solicitation are available on the Purchasing Division's website under [Committee Appointment](#).

J. Committee Questions, Request for Clarifications, Additional Information

At any committee meeting, the Selection or Evaluation Committee members may ask questions, request clarification, or require additional information of any Vendor's submittal or proposal. It is highly recommended Vendors attend to answer any committee questions (if requested), including a Vendor representative that has the authority to bind.

Vendor's answers may impact evaluation (and scoring, if applicable). Upon written request to the Purchasing Agent prior to the meeting, a conference call number will be made available for Vendor participation via teleconference. Only Vendors that are found to be both responsive and responsible to the requirements of the solicitation and/or shortlisted (if applicable) are requested to participate in a final (or presentation) Selection or Evaluation committee meeting.

K. Vendor Questions

The County provides a specified time for Vendors to ask questions and seek clarification regarding solicitation requirements. All questions or clarification inquiries must be submitted through BidSync by the date and time referenced in the solicitation document (including any addenda). The County will respond to questions via Bid Sync.

L. Confidential Material/ Public Records and Exemptions

1. Broward County is a public agency subject to Chapter 119, Florida Statutes. Upon receipt, all submittals become "public records" and shall be subject to public disclosure consistent with Chapter 119, Florida Statutes. Submittals may be posted on the County's public website or included in a public records request response, unless there is a declaration of "confidentiality" pursuant to the public records law and in accordance with the procedures in this section.
2. Any confidential material(s) the Vendor asserts is exempt from public disclosure under Florida Statutes must be labeled as "Confidential", and marked with the specific statute and subsection asserting exemption from Public Records.
3. To submit confidential material, three hardcopies must be submitted in a sealed envelope, labeled with the solicitation number, title, date and the time of solicitation opening to:

Broward County Purchasing Division
115 South Andrews Avenue, Room 212
Fort Lauderdale, FL 33301

4. Material will not be treated as confidential if the Vendor does not cite the applicable Florida Statute (s) allowing the document to be treated as confidential.
5. Any materials that the Vendor claims to be confidential and exempt from public records must be marked and separated from the submittal. If the Vendor does not comply with these instructions, the Vendor's claim for confidentiality will be deemed as waived.
6. Submitting confidential material may impact full discussion of your submittal by the Selection or Evaluation Committee because the Committee will be unable to discuss the details contained in the documents cloaked as confidential at the publicly noticed Committee meeting.

M. Copyrighted Materials

Copyrighted material is not exempt from the Public Records Law, Chapter 119, Florida Statutes. Submission of copyrighted material in response to any solicitation will constitute a license and permission for the County to make copies (including electronic copies) as reasonably necessary for the use by County staff and agents, as well as to make the materials available for inspection or production pursuant to Public Records Law, Chapter 119, Florida Statutes.

N. State and Local Preferences

If the solicitation involves a federally funded project where the fund requirements prohibit the use of state and/or local preferences, such preferences contained in the Local Preference Ordinance and Broward County Procurement Code will not be applied in the procurement process.

O. Local Preference

Except where otherwise prohibited by federal or state law or other funding source restrictions, a local Vendor whose submittal is within 5% of the highest total ranked Vendor outside of the preference area will become the Vendor with whom the County will proceed with negotiations for a

final contract. Refer to **Local Vendor Certification Form (Preference and Tiebreaker)** for further information.

P. Tiebreaker Criteria

In accordance with Section 21.31.d of the Broward County Procurement Code, the tiebreaker criteria shall be applied based upon the information provided in the Vendor's response to the solicitation. In order to receive credit for any tiebreaker criterion, complete and accurate information must be contained in the Vendor's submittal.

1. **Local Vendor Certification Form (Preference and Tiebreaker);**
2. **Domestic Partnership Act Certification (Requirement and Tiebreaker);**
3. **Tiebreaker Criteria Form: Volume of Work Over Five Years**

Q. Posting of Solicitation Results and Recommendations

The Broward County Purchasing Division's [website](#) is the location for the County's posting of all solicitations and contract award results. It is the obligation of each Vendor to monitor the website in order to obtain complete and timely information.

R. Review and Evaluation of Responses

A Selection or Evaluation Committee is responsible for recommending the most qualified Vendor(s). The process for this procurement may proceed in the following manner:

1. The Purchasing Division delivers the solicitation submittals to agency staff for summarization for the committee members. Agency staff prepares a report, including a matrix of responses submitted by the Vendors. This may include a technical review, if applicable.
2. Staff identifies any incomplete responses. The Director of Purchasing reviews the information and makes a recommendation to the Selection or Evaluation Committee as to each Vendor's responsiveness to the requirements of the solicitation. The final determination of responsiveness rests solely on the decision of the committee.
3. At any time prior to award, the awarding authority may find that a Vendor is not responsible to receive a particular award. The awarding authority may consider the following factors, without limitation: debarment or removal from the authorized Vendors list or a final decree, declaration or order by a court or administrative hearing officer or tribunal of competent jurisdiction that the Vendor has breached or failed to perform a contract, claims history of the Vendor, performance history on a County contract(s), an unresolved concern, or any other cause under this code and Florida law for evaluating the responsibility of a Vendor.

S. Vendor Protest

Sections 21.118 and 21.120 of the Broward County Procurement Code set forth procedural requirements that apply if a Vendor intends to protest a solicitation or proposed award of a contract and state in part the following:

1. Any protest concerning the solicitation or other solicitation specifications or requirements must be made and received by the County within seven business days from the posting of the solicitation or addendum on the Purchasing Division's website. Such protest must be made in writing to the Director of Purchasing. Failure to timely protest solicitation specifications or requirements is a waiver of the ability to protest the specifications or requirements.

2. Any protest concerning a solicitation or proposed award above the award authority of the Director of Purchasing, after the RLI or RFP opening, shall be submitted in writing and received by the Director of Purchasing within five business days from the posting of the recommendation of award for Invitation to Bids or the final recommendation of ranking for Request for Letters of Interest and Request for Proposals on the Purchasing Division's website.
3. Any actual or prospective Vendor who has a substantial interest in and is aggrieved in connection with the proposed award of a contract that does not exceed the amount of the award authority of the Director of Purchasing, may protest to the Director of Purchasing. The protest shall be submitted in writing and received within three (3) business days from the posting of the recommendation of award for Invitation to Bids or the final recommendation of ranking for Request for Letters of Interest and Request for Proposals on the Purchasing Division's website.
4. For purposes of this section, a business day is defined as Monday through Friday between 8:30 a.m. and 5:00 p.m. Failure to timely file a protest within the time prescribed for a proposed contract award shall be a waiver of the Vendor's right to protest.
5. As a condition of initiating any protest, the protestor shall present the Director of Purchasing a nonrefundable filing fee in accordance with the table below.

<u>Estimated Contract Amount</u>	<u>Filing Fee</u>
\$30,000 - \$250,000	\$ 500
\$250,001 - \$500,000	\$1,000
\$500,001 - \$5 million	\$3,000
Over \$5 million	5,000

If no contract proposal amount was submitted, the estimated contract amount shall be the County's estimated contract price for the project. The County may accept cash, money order, certified check, or cashier's check, payable to Broward County Board of Commissioners.

T. Right of Appeal

Pursuant to Section 21.83.d of the Broward County Procurement Code, any Vendor that has a substantial interest in the matter and is dissatisfied or aggrieved in connection with the Selection or Evaluation Committee's determination of responsiveness may appeal the determination pursuant to Section 21.120 of the Broward County Procurement Code.

1. The appeal must be in writing and sent to the Director of Purchasing within ten (10) calendar days of the determination by the Selection or Evaluation Committee to be deemed timely.
2. As required by Section 21.120, the appeal must be accompanied by an appeal bond by a Vendor having standing to protest and must comply with all other requirements of this section.
3. The institution and filing of an appeal is an administrative remedy to be employed prior to the institution and filing of any civil action against the County concerning the subject matter of the appeal.

U. Rejection of Responses

The Selection or Evaluation Committee may recommend rejecting all submittals as in the best interests of the County. The rejection shall be made by the Director of Purchasing, except when a solicitation was approved by the Board, in which case the rejection shall be made by the Board.

V. Negotiations

The County intends to conduct the first negotiation meeting no later than two weeks after approval of the final ranking as recommended by the Selection or Evaluation Committee. At least one of the representatives for the Vendor participating in negotiations with the County must be authorized to bind the Vendor. In the event that the negotiations are not successful within a reasonable timeframe (notification will be provided to the Vendor) an impasse will be declared and negotiations with the first-ranked Vendor will cease. Negotiations will begin with the next ranked Vendor, etc. until such time that all requirements of Broward County Procurement Code have been met. In accordance with Section 286.0113 of the Florida Statutes and the direction of the Broward County Board of Commissioners, negotiations resulting from Selection or Evaluation Committee Meetings are closed. Only County staff and the selected vendor and their team will be present during negotiations.

W. Submittal Instructions:

1. Broward County does not require any personal information (as defined under Section 501.171, Florida Statutes), such as social security numbers, driver license numbers, passport, military ID, bank account or credit card numbers, or any personal pin numbers, in order to submit a response for ANY Broward County solicitation. **DO NOT INCLUDE** any personal information data in any document submitted to the County. If any personal information data is part of a submittal, this information must be redacted prior to submitting a response to the County.
2. **Vendor MUST submit its solicitation response electronically and MUST confirm its submittal in order for the County to receive a valid response through BidSync.** It is the Vendor's sole responsibility to assure its response is submitted and received through BidSync by the date and time specified in the solicitation.
3. The County will not consider solicitation responses received by other means. Vendors are encouraged to submit their responses in advance of the due date and time specified in the solicitation document. In the event that the Vendor is having difficulty submitting the solicitation document through Bid Sync, immediately notify the Purchasing Agent and then contact BidSync for technical assistance.
4. Vendor must view, submit, and/or accept each of the documents in BidSync. Web-fillable forms can be filled out and submitted through BidSync.
5. After all documents are viewed, submitted, and/or accepted in BidSync, the Vendor must upload additional information requested by the solicitation (i.e. Evaluation Criteria and Financials Statements) in the Item Response Form in BidSync, under line one (regardless if pricing requested).
6. Vendor should upload responses to Evaluation Criteria in Microsoft Word or Excel format.
7. If the Vendor is declaring any material confidential and exempt from Public Records, refer to Confidential Material/ Public Records and Exemptions for instructions on submitting confidential material.
8. After all files are uploaded, Vendor must submit and **CONFIRM** its offer (by entering password) for offer to be received through BidSync.

9. If a solicitation requires an original Proposal Bond (per Special Instructions to Vendors), Vendor must submit in a sealed envelope, labeled with the solicitation number, title, date and the time of solicitation opening to:

Broward County Purchasing Division
115 South Andrews Avenue, Room 212
Fort Lauderdale, FL 33301

A copy of the Proposal Bond should also be uploaded into Bid Sync; this does not replace the requirement to have an original proposal bond. Vendors must submit the original Proposal Bond, by the solicitation due date and time.

Supplier: **Carollo Engineers**

VENDOR QUESTIONNAIRE AND STANDARD CERTIFICATIONS
Request for Proposals, Request for Qualifications, or Request for Letters of Interest

Vendor should complete questionnaire and complete and acknowledge the standard certifications and submit with the solicitation response. If not submitted with solicitation response, it must be submitted within three business days of County's request. Failure to timely submit may affect Vendor's evaluation.

If a response requires additional information, the Vendor should upload a written detailed response with submittal; each response should be numbered to match the question number. The completed questionnaire and attached responses will become part of the procurement record. It is imperative that the person completing the Vendor Questionnaire be knowledgeable about the proposing Vendor's business and operations.

1. Legal business name:**Carollo Engineers, Inc.**
2. Doing Business As/ Fictitious Name (if applicable):**N/A**
3. Federal Employer I.D. no. (FEIN):**86-0899222**
4. Dun and Bradstreet No.:**045809316**
5. Website address (if applicable): **www.carollo.com**
6. Principal place of business address: **2700 Ygnacio Valley Road, Suite 300
Walnut Creek, CA 94598**
7. Office location responsible for this project: **3440 Hollywood Blvd., Ste 465
Hollywood, FL 33021**
8. Telephone no.:**954-837-0030** Fax no.:**954-837-0035**
9. Type of business (check appropriate box):
 - Corporation (specify the state of incorporation):**Delaware**
 - Sole Proprietor
 - Limited Liability Company (LLC)
 - Limited Partnership
 - General Partnership (State and County Filed In)
 - Other - Specify
10. List Florida Department of State, Division of Corporations document number (or registration number if fictitious name): **F00000003055**
11. List name and title of each principal, owner, officer, and major shareholder:
 - a) **B. Narayanan, President/CEO**
 - b) **Michael W. Barnes, Secretary**
 - c) **Ash Wason, Treasurer/CFO**
 - d)
12. AUTHORIZED CONTACT(S) FOR YOUR FIRM:

Name: **Elizabeth Fujikawa, P.E.**

Title: **Vice President**

E-mail: **efujikawa@carollo.com**

Telephone No.: **561-868-6409**

Name: **Chuck Sinclair, P.E.**

Title: **Senior Vice President**

E-mail: **csinclair@carollo.com**

Telephone No.: **954-414-8645**

- 13. Has your firm, its principals, officers or predecessor organization(s) been debarred or suspended by any government entity within the last three years? If yes, specify details in an attached written response. Yes No
- 14. Has your firm, its principals, officers or predecessor organization(s) ever been debarred or suspended by any government entity? If yes, specify details in an attached written response, including the reinstatement date, if granted. Yes No
- 15. Has your firm ever failed to complete any services and/or delivery of products during the last three (3) years? If yes, specify details in an attached written response. Yes No
- 16. Is your firm or any of its principals or officers currently principals or officers of another organization? If yes, specify details in an attached written response. Yes No
- 17. Have any voluntary or involuntary bankruptcy petitions been filed by or against your firm, its parent or subsidiaries or predecessor organizations during the last three years? If yes, specify details in an attached written response. Yes No
- 18. Has your firm's surety ever intervened to assist in the completion of a contract or have Performance and/or Payment Bond claims been made to your firm or its predecessor's sureties during the last three years? If yes, specify details in an attached written response, including contact information for owner and surety. Yes No
- 19. Has your firm ever failed to complete any work awarded to you, services and/or delivery of products during the last three (3) years? If yes, specify details in an attached written response. Yes No
- 20. Has your firm ever been terminated from a contract within the last three years? If yes, specify details in an attached written response. Yes No
- 21. Living Wage solicitations only: In determining what, if any, fiscal impacts(s) are a result of the Ordinance for this solicitation, provide the following for informational purposes only. Response is not considered in determining the award of this contract.
Living Wage had an effect on the pricing. Yes No
 N/A
If yes, Living Wage increased the pricing by% or decreased the pricing by%.

Cone of Silence Requirement Certification:

The Cone of Silence Ordinance, Section 1-266, Broward County Code of Ordinances prohibits certain communications among Vendors, Commissioners, County staff, and Selection or Evaluation Committee members. Identify on a separate sheet any violations of this Ordinance by any members of the responding firm or its joint ventures. After the application of the Cone of Silence, inquiries regarding this solicitation should be directed to the Director of Purchasing or designee. The Cone of Silence terminates when the County Commission or other awarding authority takes action which ends the solicitation.

The Vendor hereby certifies that: (check each box)

- The Vendor has read Cone of Silence Ordinance, Section 1-266, Broward County Code of Ordinances; and
- The Vendor understands that the Cone of Silence for this competitive solicitation shall be in effect beginning

upon the appointment of the Selection or Evaluation Committee, for communication regarding this solicitation with the County Administrator, Deputy County Administrator, Assistant County Administrators, and Assistants to the County Administrator and their respective support staff or any person, including Evaluation or Selection Committee members, appointed to evaluate or recommend selection in this RFP/RLI process. For Communication with County Commissioners and Commission staff, the Cone of Silence allows communication until the initial Evaluation or Selection Committee Meeting.

- The Vendor agrees to comply with the requirements of the Cone of Silence Ordinance.

Drug-Free Workplace Requirements Certification:

Section 21.31.a. of the Broward County Procurement Code requires awards of all competitive solicitations requiring Board award be made only to firms certifying the establishment of a drug free workplace program. The program must consist of:

1. Publishing a statement notifying its employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the offeror's workplace, and specifying the actions that will be taken against employees for violations of such prohibition;
2. Establishing a continuing drug-free awareness program to inform its employees about:
 - a. The dangers of drug abuse in the workplace;
 - b. The offeror's policy of maintaining a drug-free workplace;
 - c. Any available drug counseling, rehabilitation, and employee assistance programs; and
 - d. The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;
3. Giving all employees engaged in performance of the contract a copy of the statement required by subparagraph 1;
4. Notifying all employees, in writing, of the statement required by subparagraph 1, that as a condition of employment on a covered contract, the employee shall:
 - a. Abide by the terms of the statement; and
 - b. Notify the employer in writing of the employee's conviction of, or plea of guilty or nolo contendere to, any violation of Chapter 893 or of any controlled substance law of the United States or of any state, for a violation occurring in the workplace NO later than five days after such conviction.
5. Notifying Broward County government in writing within 10 calendar days after receiving notice under subdivision 4.b above, from an employee or otherwise receiving actual notice of such conviction. The notice shall include the position title of the employee;
6. Within 30 calendar days after receiving notice under subparagraph 4 of a conviction, taking one of the following actions with respect to an employee who is convicted of a drug abuse violation occurring in the workplace:
 - a. Taking appropriate personnel action against such employee, up to and including termination; or
 - b. Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a federal, state, or local health, law enforcement, or other appropriate agency; and
7. Making a good faith effort to maintain a drug-free workplace program through implementation of subparagraphs 1 through 6.

The Vendor hereby certifies that: (check box)

- The Vendor certifies that it has established a drug free workplace program in accordance with the above requirements.

Non-Collusion Certification:

Vendor shall disclose, to their best knowledge, any Broward County officer or employee, or any relative of any such officer or employee as defined in Section 112.3135 (1) (c), Florida Statutes, who is an officer or director of, or has a material interest in, the Vendor's business, who is in a position to influence this procurement. Any Broward

County officer or employee who has any input into the writing of specifications or requirements, solicitation of offers, decision to award, evaluation of offers, or any other activity pertinent to this procurement is presumed, for purposes hereof, to be in a position to influence this procurement. Failure of a Vendor to disclose any relationship described herein shall be reason for debarment in accordance with the provisions of the Broward County Procurement Code.

The Vendor hereby certifies that: (select one)

- The Vendor certifies that this offer is made independently and free from collusion; or
- The Vendor is disclosing names of officers or employees who have a material interest in this procurement and is in a position to influence this procurement. Vendor must include a list of name(s), and relationship(s) with its submittal.

Public Entities Crimes Certification:

In accordance with Public Entity Crimes, Section 287.133, Florida Statutes, a person or affiliate placed on the convicted vendor list following a conviction for a public entity crime may not submit on a contract: to provide any goods or services; for construction or repair of a public building or public work; for leases of real property to a public entity; and may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity; and may not transact business with any public entity in excess of the threshold amount provided in s. 287.017 for Category Two for a period of 36 months following the date of being placed on the convicted vendor list.

The Vendor hereby certifies that: (check box)

- The Vendor certifies that no person or affiliates of the Vendor are currently on the convicted vendor list and/or has not been found to commit a public entity crime, as described in the statutes.

Scrutinized Companies List Certification:

Any company, principals, or owners on the Scrutinized Companies with Activities in Sudan List, the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, or the Scrutinized Companies that Boycott Israel List is prohibited from submitting a response to a solicitation for goods or services in an amount equal to or greater than \$1 million.

The Vendor hereby certifies that: (check each box)

- The Vendor, owners, or principals are aware of the requirements of Sections 287.135, 215.473, and 215.4275, Florida Statutes, regarding Companies on the Scrutinized Companies with Activities in Sudan List the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, or the Scrutinized Companies that Boycott Israel List; and
- The Vendor, owners, or principals, are eligible to participate in this solicitation and are not listed on either the Scrutinized Companies with Activities in Sudan List, the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, or the Scrutinized Companies that Boycott Israel List; and
- If awarded the Contract, the Vendor, owners, or principals will immediately notify the County in writing if any of its principals are placed on the Scrutinized Companies with Activities in Sudan List, the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, or the Scrutinized Companies that Boycott Israel List.

I hereby certify the information provided in the Vendor Questionnaire and Standard Certifications:

Elizabeth Fujikawa, P.E.	Vice President	10/31/18
*AUTHORIZED SIGNATURE/NAME	TITLE	DATE

Vendor Name: **Carollo Engineers, Inc.**

* I certify that I am authorized to sign this solicitation response on behalf of the Vendor as indicated in Certificate as to Corporate Principal, designation letter by Director/Corporate Officer, or other business authorization to bind on behalf of the Vendor. As the Vendor's authorized representative, I attest that any and all statements, oral, written or otherwise, made in support of the Vendor's response, are accurate, true and correct. I also acknowledge that inaccurate, untruthful, or incorrect statements made in support of the Vendor's response may be used by the County as a basis for rejection, rescission of the award, or termination of the contract and may also serve as the basis for debarment of Vendor pursuant to Section 21.119 of the Broward County Procurement Code. I certify that the Vendor's response is made without prior understanding, agreement, or connection with any corporation, firm or person submitting a response for the same items/services, and is in all respects fair and without collusion or fraud. I also certify that the Vendor agrees to abide by all terms and conditions of this solicitation, acknowledge and accept all of the solicitation pages as well as any special instructions sheet(s).

Supplier: **Carollo Engineers**

Office of Economic and Small Business Requirements: CBE Goal Participation

- A. In accordance with the Broward County Business Opportunity Act of 2012, Section 1-81, Code of Ordinances, as amended (the "Business Opportunity Act"), the County Business Enterprise (CBE) Program is applicable to this contract. All Vendors responding to this solicitation are required to utilize CBE firms to perform the assigned participation goal for this contract.
- B. The CBE participation goal will be established based on the expected expenditure amount for the proposed scope of services for the project. The Office of Economic and Small Business Development (OESBD) will not include alternate items, optional services or allowances when establishing the CBE participation goal. If the County subsequently chooses to award any alternate items, optional services or allowances as determined by OESBD and the Contract Administrator to be related to the scope of services, OESBD may apply the established CBE participation goal. In such an instance, the County will issue a written notice to the successful Vendor that the CBE participation goal will also apply to the alternate items, optional services or allowances. Vendor shall submit all required forms pertaining to its compliance with the CBE participation goal, as applicable. Failure by Vendor to submit the required forms may result in the rejection of Vendor's solicitation submittal prior to the award or failure to comply with the contract requirements may have an impact on the vendor performance evaluation post award, as applicable.
- C. CBE Program Requirements: Compliance with CBE participation goal requirements is a matter of responsibility; Vendor should submit all required forms and information with its solicitation submittal. If the required forms and information are not provided with the Vendor's solicitation submittal, then Vendor must supply the required forms and information no later than three (3) business days after request by OESBD. Vendor may be deemed non-responsible for failure to fully comply with CBE Program Requirements within these stated timeframes.
1. Vendor should include in its solicitation submittal a **Letter Of Intent Between Bidder/Offeror and County Business Enterprise (CBE) Subcontractor/Supplier** for each CBE firm the Vendor intends to use to achieve the assigned CBE participation goal. The form is available at the following link:
<http://www.broward.org/EconDev/Documents/CBELetterOfIntent.pdf>
 2. If Vendor is unable to attain the CBE participation goal, Vendor should include in its solicitation submittal an **Application for Evaluation of Good Faith Efforts** and all of the required supporting information. The form is available at the following link:
<http://www.broward.org/EconDev/WhatWeDo/Documents/GoodFaithEffortEval.pdf>
- D. OESBD maintains an online directory of CBE firms. The online directory is available for use by Vendors at <https://webapps4.broward.org/smallbusiness/sbdirectory.aspx>.
- E. For detailed information regarding the CBE Program contact the OESBD at (954) 357-6400 or visit the website at: <http://www.broward.org/EconDev/SmallBusiness/>
- F. If awarded the contract, Vendor agrees to and shall comply with all applicable requirements of the Business Opportunity Act and the CBE Program in the award and administration of the contract.
1. No party to this contract may discriminate on the basis of race, color, sex, religion,

national origin, disability, age, marital status, political affiliation, sexual orientation, pregnancy, or gender identity and expression in the performance of this contract.

2. All entities that seek to conduct business with the County, including Vendor or any Prime Contractors, Subcontractors, and Bidders, shall conduct such business activities in a fair and reasonable manner, free from fraud, coercion, collusion, intimidation, or bad faith. Failure to do so may result in the cancellation of this solicitation, cessation of contract negotiations, revocation of CBE certification, and suspension or debarment from future contracts.
3. If Vendor fails to meet or make Good Faith Efforts (as defined in the Business Opportunity Act) to meet the CBE participation commitment (the "Commitment"), then Vendor shall pay the County liquidated damages in an amount equal to fifty percent (50%) of the actual dollar amount by which Vendor failed to achieve the Commitment, up to a maximum amount of ten percent (10%) of the total contract amount, excluding costs and reimbursable expenses. An example of this calculation is stated in Section 1-81.7, Broward County Code of Ordinances.
4. Vendor shall comply with all applicable requirements of the Business Opportunity Act in the award of this contract. Failure by Vendor to carry out any of these requirements shall constitute a material breach of the contract, which shall permit the County to terminate this contract or to exercise any other remedy provided under this contract, the Broward County Code of Ordinances, the Broward County Administrative Code, or other applicable laws, with all such remedies being cumulative.
5. Vendor shall pay its CBE subcontractors and suppliers, within fifteen (15) days following receipt of payment from the County, for all completed subcontracted work and supplies. If Vendor withholds an amount from CBE subcontractors or suppliers as retainage, such retainage shall be released and paid within fifteen (15) days following receipt of payment of retained amounts from the County.
6. Vendor understands that the County will monitor Vendor's compliance with the CBE Program requirements. Vendor must provide OESBD with a Monthly Utilization Report (MUR) to confirm its compliance with the Commitment agreed to in the contract; timely submission of the MUR every month throughout the term of the contract, including amendment and extension terms, is a condition precedent to the County's payment of Vendor under the contract.

Supplier: Carollo Engineers

AFFILIATED ENTITIES OF THE PRINCIPAL(S) CERTIFICATION FORM

The completed form should be submitted with the solicitation response but must be submitted within three business days of County's request. Vendor may be deemed non-responsive for failure to fully comply within stated timeframes.

- a. All Vendors are required to disclose the names and addresses of "affiliated entities" of the Vendor's principal(s) over the last five (5) years (from the solicitation opening deadline) that have acted as a prime Vendor with the County.
- b. The County will review all affiliated entities of the Vendor's principal(s) for contract performance evaluations and the compliance history with the County's Small Business Program, including CBE, DBE and SBE goal attainment requirements. "Affiliated entities" of the principal(s) are those entities related to the Vendor by the sharing of stock or other means of control, including but not limited to a subsidiary, parent or sibling entity.
- c. The County will consider the contract performance evaluations and the compliance history of the affiliated entities of the Vendor's principals in its review and determination of responsibility.

The Vendor hereby certifies that: (select one)

- No principal of the proposing Vendor has prior affiliations that meet the criteria defined as "Affiliated entities"
- Principal(s) listed below have prior affiliations that meet the criteria defined as "Affiliated entities"

Principal's Name:

Names of Affiliated Entities:

Principal's Name:

Names of Affiliated Entities:

Principal's Name:

Names of Affiliated Entities:

Authorized Signature Name: **Elizabeth Fujikawa, P.E.**

Title: **Vice President**

Vendor Name: **Carollo Engineers, Inc.**

Date: **10/31/18**

Supplier: Carollo Engineers

LITIGATION HISTORY FORM

The completed form(s) should be returned with the Vendor's submittal. If not provided with submittal, the Vendor must submit within three business days of County's request. Vendor may be deemed non-responsive for failure to fully comply within stated timeframes.

- There are no material cases for this Vendor; or
- Material Case(s) are disclosed below:

Is this for a: (check type) <input type="checkbox"/> Parent, <input type="checkbox"/> Subsidiary, or <input type="checkbox"/> Predecessor Firm?	If Yes, name of Parent/Subsidiary/Predecessor:
	Or No <input type="checkbox"/>
Party	
Case Number, Name, and Date Filed	
Name of Court or other tribunal	
Type of Case	Bankruptcy <input type="checkbox"/> Civil <input type="checkbox"/> Criminal <input type="checkbox"/> Administrative/Regulatory <input type="checkbox"/>
Claim or Cause of Action and Brief description of each Count	
Brief description of the Subject Matter and Project Involved	
Disposition of Case (Attach copy of any applicable Judgment, Settlement Agreement and Satisfaction of Judgment.)	Pending <input type="checkbox"/> Settled <input type="checkbox"/> Dismissed <input type="checkbox"/> Judgment Vendor's Favor <input type="checkbox"/> Judgment Against Vendor <input type="checkbox"/> If Judgment Against, is Judgment Satisfied? <input type="checkbox"/> Yes <input type="checkbox"/> No
Opposing Counsel	Name: Email: Telephone Number:

Vendor Name: Carollo Engineers, Inc.

Supplier: **Carollo Engineers**

SUBCONTRACTORS/SUBCONSULTANTS/SUPPLIERS REQUIREMENT FORM
Request for Proposals, Request for Qualifications, or Request for Letters of Interest

The following forms and supporting information (if applicable) should be returned with Vendor's submittal. If not provided with submittal, the Vendor must submit within three business days of County's request. Failure to timely submit may affect Vendor's evaluation.

- A. The Vendor shall submit a listing of all subcontractors, subconsultants and major material suppliers (firms), if any, and the portion of the contract they will perform. A major material supplier is considered any firm that provides construction material for construction contracts, or commodities for service contracts in excess of \$50,000, to the Vendor.
- B. If participation goals apply to the contract, only non-certified firms shall be identified on the form. A non-certified firm is a firm that is not listed as a firm for attainment of participation goals (ex. County Business Enterprise or Disadvantaged Business Enterprise), if applicable to the solicitation.
- C. This list shall be kept up-to-date for the duration of the contract. If subcontractors, subconsultants or suppliers are stated, this does not relieve the Vendor from the prime responsibility of full and complete satisfactory performance under any awarded contract.
- D. After completion of the contract/final payment, the Vendor shall certify the final list of non-certified subcontractors, subconsultants, and suppliers that performed or provided services to the County for the referenced contract.
- E. The Vendor has confirmed that none of the recommended subcontractors, subconsultants, or suppliers' principal(s), officer(s), affiliate(s) or any other related companies have been debarred from doing business with Broward County or any other governmental agency.

If none, state "none" on this form. Use additional sheets as needed. Vendor should scan and upload any additional form(s) in BidSync.

1. Subcontracted Firm's Name: **Chen Moore & Associates**

Subcontracted Firm's Address: **500 W Cypress Rd., Ste 630, Ft. Lauderdale, FL 33309**

Subcontracted Firm's Telephone Number: **954-730-0707**

Contact Person's Name and Position: **Peter Moore, President**

Contact Person's E-Mail Address: **pmoore@chenmoore.com**

Estimated Subcontract/Supplies Contract Amount: **200,000**

Type of Work/Supplies Provided: **Permitting, Civil/Site**

2. Subcontracted Firm's Name: **JLA Geosciences, Inc.**

Subcontracted Firm's Address: **1931 Commerce Land, Ste 104, Jupiter, FL 33458**

Subcontracted Firm's Telephone Number: **561-758-2475**

Contact Person's Name and Position: **James Andersen, President**

Contact Person's E-Mail Address: **jandersen@jlageosciences.com**

Supplier: Carollo Engineers

LOBBYIST REGISTRATION REQUIREMENT CERTIFICATION FORM

The completed form should be submitted with the solicitation response but must be submitted within three business days of County's request. Vendor may be deemed non-responsive for failure to fully comply within stated timeframes.

The Vendor certifies that it understands if it has retained a lobbyist(s) to lobby in connection with a competitive solicitation, it shall be deemed non-responsive unless the firm, in responding to the competitive solicitation, certifies that each lobbyist retained has timely filed the registration or amended registration required under Broward County Lobbyist Registration Act, Section 1-262, Broward County Code of Ordinances; and it understands that if, after awarding a contract in connection with the solicitation, the County learns that the certification was erroneous, and upon investigation determines that the error was willful or intentional on the part of the Vendor, the County may, on that basis, exercise any contractual right to terminate the contract for convenience.

The Vendor hereby certifies that: (select one)

- It has not retained a lobbyist(s) to lobby in connection with this competitive solicitation; however, if retained after the solicitation, the County will be notified.
- It has retained a lobbyist(s) to lobby in connection with this competitive solicitation and certified that each lobbyist retained has timely filed the registration or amended registration required under Broward County Lobbyist Registration Act, Section 1-262, Broward County Code of Ordinances.

It is a requirement of this solicitation that the names of any and all lobbyists retained to lobby in connection with this solicitation be listed below:

Name of Lobbyist: **Bernie Friedman**
Lobbyist's Firm: **Becker & Poliakoff**
Phone: **954-985-4180**
E-mail: **bfriedman@beckerlawyers.com**

Name of Lobbyist: **Nick Matthews**
Lobbyist's Firm: **Becker & Poliakoff**
Phone: **954-987-7550**
E-mail: **nmatthews@beckerlawyers.com**

Authorized Signature/Name: Elizabeth Fujikawa Date: 10/31/18

Title: Vice President

Vendor Name: Carollo Engineers, Inc.

Supplier: Carollo Engineers

AGREEMENT EXCEPTION FORM

The completed form(s) should be returned with the Vendor's submittal. If not provided with submittal, it shall be deemed an affirmation by the Vendor that it accepts the terms and conditions of the County's Agreement as disclosed in the solicitation.

The Vendor must either provide specific proposed alternative language on the form below. Additionally, a brief justification specifically addressing each provision to which an exception is taken should be provided.

- There are no exceptions to the terms and conditions of the County Agreement as referenced in the solicitation; or
- The following exceptions are disclosed below: (use additional forms as needed; separate each Article/ Section number)

Term or Condition Article / Section	Insert version of exception or specific proposed alternative language	Provide brief justification for change

Vendor Name: Carollo Engineers, Inc.

Supplier: Carollo Engineers

RFP-RFQ-RLI LOCATION ATTESTATION FORM (EVALUATION CRITERIA)

The completed and signed form and supporting information (if applicable, for Joint Ventures) should be returned with the Vendor's submittal. If not provided with submittal, the Vendor must submit within three business days of County's request. Failure to timely submit this form and supporting information may affect the Vendor's evaluation. Provided information is subject to verification by the County.

A Vendor's principal place of business location (also known as the nerve center) within Broward County is considered in accordance with Evaluation Criteria. The County's definition of a principal place of business is:

1. As defined by the Broward County Local Preference Ordinance, "Principal place of business means the nerve center or center of overall direction, control and coordination of the activities of the bidder [Vendor]. If the bidder has only one (1) business location, such business location shall be considered its principal place of business."
2. A principal place of business refers to the place where a corporation's officers direct, control, and coordinate the corporation's day-to-day activities. It is the corporation's 'nerve center' and in practice it should normally be the place where the corporation maintains its headquarters; provided that the headquarters is the actual center of direction, control, and coordination, i.e., the 'nerve center', and not simply an office where the corporation holds its board meetings (for example, attended by directors and officers who have traveled there for the occasion).

The Vendor's principal place of business in Broward County shall be the Vendor's "Principal Address" as indicated with the Florida Department of State Division of Corporations, for at least six months prior to the solicitation's due date.

Check one of the following:

- The Vendor certifies that it has a principal place of business location (also known as the nerve center) within Broward County, as documented in Florida Department of State Division of Corporations (Sunbiz), and attests to the following statements:

1. Vendor's address listed in its submittal is its principal place of business as defined by Broward County;
2. Vendor's "Principal Address" listed with the Florida Department of State Division of Corporations is the same as the address listed in its submittal and the address was listed for at least six months prior to the solicitation's opening date. A copy of Florida Department of State Division of Corporations (Sunbiz) is attached as verification.
3. Vendor must be located at the listed "nerve center" address ("Principal Address") for at least six (6) months prior to the solicitation's opening date;
4. Vendor has not merged with another firm within the last six months that is not headquartered in Broward County and is not a wholly owned subsidiary or a holding company of another firm that is not headquartered in Broward County;
5. If awarded a contract, it is the intent of the Vendor to remain at the referenced address for the duration of the contract term, including any renewals, extensions or any approved

interim contracts for the services provided under this contract; and

- 6. The Vendor understands that if after contract award, the County learns that the attestation was erroneous, and upon investigation determines that the error was willful or intentional on the part of the Vendor, the County may, on that basis exercise any contractual right to terminate the contract. Further any misleading, inaccurate, false information or documentation submitted by any party affiliated with this procurement may lead to suspension and/or debarment from doing business with Broward County as outlined in the Procurement Code, Section 21.119.

If the Vendor is submitting a response as a Joint Venture, the following information is required to be submitted:

- a. Name of the Joint Venture Partnership
- b. Percentage of Equity for all Joint Venture Partners
- c. A copy of the executed Agreement(s) between the Joint Venture Partners

Vendor does not have a principal place of business location (also known as the nerve center) within Broward County.

Vendor Information:

Vendor Name: **Carollo Engineers, Inc.**

Vendor's address listed in its submittal is:

**2700 Ygnacio Valley Road, Ste 300
Walnut Creek, CA 94598**

The signature below must be by an individual authorized to bind the Vendor. The signature below is an attestation that all information listed above and provided to Broward County is true and accurate.

Elizabeth Fujikawa, P.E.	Vice President	Carollo Engineers, Inc.	10/31/18
_____ Authorized Signature/Name	_____ Title	_____ Vendor Name	_____ Date

Supplier: Carollo Engineers

RFP-RLI-RFQ LOCAL PREFERENCE AND TIE BREAKER CERTIFICATION FORM

The completed and signed form should be returned with the Vendor's submittal to determine Local Preference eligibility, however it must be returned at time of solicitation submittal to qualify for the Tie Break criteria. If not provided with submittal, the Vendor must submit within three business days of County's request for evaluation of Local Preference. Proof of a local business tax should be submitted with this form. Failure to timely submit this form or local business tax receipt may render the business ineligible for application of the Local Preference or Tie Break Criteria.

In accordance with Section 21.31.d. of the Broward County Procurement Code, to qualify for the Tie Break Criteria, the undersigned Vendor hereby certifies that (check box if applicable):

- The Vendor is a local Vendor in Broward County and:
 - a. has a valid Broward County local business tax receipt;
 - b. has been in existence for at least six-months prior to the solicitation opening;
 - c. at a business address physically located within Broward County;
 - d. in an area zoned for such business;
 - e. provides services from this location on a day-to-day basis, and
 - f. services provided from this location are a substantial component of the services offered in the Vendor's proposal.

In accordance with Local Preference, Section 1-74, et. seq., Broward County Code of Ordinances, a local business meeting the below requirements is eligible for Local Preference. To qualify for the Local Preference, the undersigned Vendor hereby certifies that (check box if applicable):

- The Vendor is a local Vendor in Broward and:
 - a. has a valid Broward County local business tax receipt issued at least one year prior to solicitation opening;
 - b. has been in existence for at least one-year prior to the solicitation opening;
 - c. provides services on a day-to-day basis, at a business address physically located within the Broward County limits in an area zoned for such business; and
 - d. the services provided from this location are a substantial component of the services offered in the Vendor's proposal.

Local Business Address: **3440 Hollywood Blvd., Suite 465
Hollywood, FL 33021**

Vendor does not qualify for Tie Break Criteria or Local Preference, in accordance with the above requirements. The undersigned Vendor hereby certifies that (check box if applicabla): The Vendor is not a local Vendor in Broward County.

Elizabeth Fujikawa, P.E.	Vice President	Carollo Engineers, Inc.	10/31/18
AUTHORIZED SIGNATURE/NAME	TITLE	COMPANY	DATE

Supplier: Carollo Engineers

DOMESTIC PARTNERSHIP ACT CERTIFICATION FORM (REQUIREMENT AND TIEBREAKER)

Refer to Special Instructions to identify if Domestic Partnership Act is a requirement of the solicitation or acts only as a tiebreaker. If Domestic Partnership is a requirement of the solicitation, the completed and signed form should be returned with the Vendor's submittal. If the form is not provided with submittal, the Vendor must submit within three business days of County's request. Vendor may be deemed non-responsive for failure to fully comply within stated timeframes. To qualify for the Domestic Partnership tiebreaker criterion, the Vendor must currently offer the Domestic Partnership benefit and the completed and signed form must be returned at time of solicitation submittal.

The Domestic Partnership Act, Section 16 ½ -157, Broward County Code of Ordinances, requires all Vendors contracting with the County, in an amount over \$100,000 provide benefits to Domestic Partners of its employees, on the same basis as it provides benefits to employees' spouses, with certain exceptions as provided by the Ordinance.

For all submittals over \$100,000.00, the Vendor, by virtue of the signature below, certifies that it is aware of the requirements of Broward County's Domestic Partnership Act, Section 16-½ -157, Broward County Code of Ordinances; and certifies the following: (check only one below).

- 1. The Vendor currently complies with the requirements of the County's Domestic Partnership Act and provides benefits to Domestic Partners of its employees on the same basis as it provides benefits to employees' spouses
- 2. The Vendor will comply with the requirements of the County's Domestic Partnership Act at time of contract award and provide benefits to Domestic Partners of its employees on the same basis as it provides benefits to employees' spouses.
- 3. The Vendor will not comply with the requirements of the County's Domestic Partnership Act at time of award.
- 4. The Vendor does not need to comply with the requirements of the County's Domestic Partnership Act at time of award because the following exception(s) applies: (check only one below).
 - The Vendor is a governmental entity, not-for-profit corporation, or charitable organization.
 - The Vendor is a religious organization, association, society, or non-profit charitable or educational institution.
 - The Vendor provides an employee the cash equivalent of benefits. (Attach an affidavit in compliance with the Act stating the efforts taken to provide such benefits and the amount of the cash equivalent).
 - The Vendor cannot comply with the provisions of the Domestic Partnership Act because it would violate the laws, rules or regulations of federal or state law or would violate or be inconsistent with the terms or conditions of a grant or contract with the United States or State of Florida. Indicate the law, statute or regulation (State the law, statute or regulation and attach explanation of its applicability).

Elizabeth Fujikawa, P.E.
Authorized Signature/Name

Vice President
Title

Carollo Engineers, Inc.
Vendor Name

10/31/18
Date

Supplier: Carollo Engineers

VOLUME OF PREVIOUS WORK ATTESTATION FORM

The completed and signed form should be returned with the Vendor's submittal. If not provided with submittal, the Vendor must submit within three business days of County's request. Failure to provide timely may affect the Vendor's evaluation. This completed form must be included with the Vendor's submittal at the time of the opening deadline to be considered for a Tie Breaker criterion (if applicable).

The calculation for Volume of Previous Work is all amounts paid to the prime Vendor by Broward County Board of County Commissioners at the time of the solicitation opening date within a five-year timeframe. The calculation of Volume of Previous Work for a prime Vendor previously awarded a contract as a member of a Joint Venture firm is based on the actual equity ownership of the Joint Venture firm.

In accordance with Section 21.31.d. of the Broward County Procurement Code, the Vendor with the lowest dollar volume of work previously paid by the County over a five-year period from the date of the submittal opening will receive the Tie Breaker.

Vendor must list all projects it received payment from Broward County Board of County Commissioners during the past five years. If the Vendor is submitting as a joint venture, the information provided should encompass the joint venture and each of the entities forming the joint venture. The Vendor attests to the following:

Item No.	Project Title	Solicitation/ Contract Number:	Department or Division	Date Awarded	Paid to Date Dollar Amount
1	Potable Water Storage Tanks and Pumping Systems	R1220410P1	WWS	06/23/2015	2,223,763.84
2					
3					
4					
5					
Grand Total					2,223,763.84

Has the Vendor been a member/partner of a Joint Venture firm that was awarded a contract by the County? Yes No

If Yes, Vendor must submit a **Joint Vendor Volume of Work Attestation Form**.

Vendor Name: Carollo Engineers, Inc.

Elizabeth Fujikawa, P.E.
Authorized Signature/ Name

Vice President
Title

10/31/18
Date

VOLUME OF PREVIOUS WORK ATTESTATION JOINT VENTURE FORM

If applicable, this form and additional required documentation should be submitted with the Vendor's submittal. If not provided with submittal, the Vendor must submit within three business days of County's request. Failure to timely submit this form and supporting documentation may affect the Vendor's evaluation.

The calculation of Volume of Previous Work for a prime Vendor previously awarded a contract as a member of a Joint Venture firm is based on the actual equity ownership of the Joint Venture firm. Volume of Previous Work is not based on the total payments to the Joint Venture firm.

Vendor must list all projects it received payment from Broward County Board of County Commissioners during the past five years as a member of a Joint Venture. The Vendor attests to the following:

Item No.	Project Title	Solicitation/ Contract Number:	Department or Division	Date Awarded	JV Equity %	Paid to Date Dollar Amount
1						
2						
3						
4						
5						
Grand Total						

Vendor is required to submit an executed Joint Venture agreement(s) and any amendments for each project listed above. Each agreement must be executed prior to the opening date of this solicitation.

Vendor Name:

Authorized Signature/ Name

Title

Date