



Offer and Acceptance

State of Arizona
State Procurement Office
100 N. 15th Ave. Suite 201
Phoenix, AZ 85007

SOLICITATION NO.: ADSP016-00005912 Request
for Qualifications: 2016 Annual Professional
Services List

PAGE
1

Offeror: Hazen and Sawyer

OF
1

OFFER

TO THE STATE OF ARIZONA:

The Undersigned hereby offers and agrees to furnish the material, service or construction in compliance with all terms, conditions, specifications and amendments in the Solicitation and any written exceptions in the offer. Signature also certifies Small Business status.

Hazen and Sawyer

Company Name

1400 E. Southern Avenue, Suite 650

Address

Tempe

Arizona

85282

City

State

Zip

Signature of Person Authorized to Sign Offer

Kevin Alexander

Printed Name

Vice President

Title

Phone: (760) 525-3281

Fax:

ccourter@hazenandsawyer.com

Contact Email Address

By signature in the Offer section above, the Offeror certifies:

1. The submission of the Offer did not involve collusion or other anticompetitive practices.
2. The Offeror shall not discriminate against any employee or applicant for employment in violation of Federal Executive Order 11246, State Executive Order 2009-9 or A.R.S. §§ 41-1461 through 1465.
3. The Offeror has not given, offered to give, nor intends to give at any time hereafter any economic opportunity, future employment, gift, loan, gratuity, special discount, trip, favor, or service to a public servant in connection with the submitted offer. Failure to provide a valid signature affirming the stipulations required by this clause shall result in rejection of the offer. Signing the offer with a false statement shall void the offer, any resulting contract and may be subject to legal remedies provided by law.
4. The Offeror certifies that the above referenced organization IS/ X IS NOT a small business with less than 100 employees or has gross revenues of \$4 million or less.

ACCEPTANCE OF OFFER

The Offer is hereby accepted.

The Contractor is now bound to sell the materials or services listed by the attached contract and based upon the solicitation, including all terms, conditions, specifications, amendments, etc., and the Contractor's Offer as accepted by the State.

This Contract shall henceforth be referred to as Contract No. ADSP016-00005912

The effective date of the Contract is March 1, 2016

The Contractor is cautioned not to commence any billable work or to provide any material or service under this contract until Contractor receives purchase order, contract release document or written notice to proceed.

State of Arizona
Awarded this

29 day of February 2016

Procurement Officer



ATTACHMENT I – General Qualifications
**ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912**

STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007

(If a firm has branch offices, complete for each specific branch office seeking work.)

1. **Annual Request for Qualifications**

a. FIRM (OR BRANCH OFFICE) NAME:	Hazen and Sawyer
b. FIRM (OR BRANCH OFFICE) STREET:	1400 E. Southern Avenue, Suite 650
c. FIRM (OR BRANCH OFFICE) CITY:	Tempe
d. FIRM (OR BRANCH OFFICE) STATE:	AZ
e. FIRM (OR BRANCH OFFICE) ZIP CODE:	85282
f. YEAR ESTABLISHED:	1951
(g1). OWNERSHIP - TYPE:	Design Professional Corporation
(g2) OWNERSHIP - SMALL BUSINESS STATUS:	
h. POINT OF CONTACT NAME AND TITLE:	Curtis D. Courter, P.E., Senior Associate
i. POINT OF CONTACT TELEPHONE NUMBER:	480-436-7959
j. POINT OF CONTACT E-MAIL ADDRESS:	ccourter@hazenandsawyer.com
k. NAME OF FIRM (If block 1a is a branch office):	



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2. EMPLOYEES BY DISCIPLINE

a. Discipline Title	b. Function: Primary (P) or Secondary (S)	c. No. of Employees - Firm	d. No. of Employees - Branch
Architect	P	11	0
CADD Technician	P	68	3
Chemical Engineer	P	0	1
Civil Engineer	P	21	4
Construction Inspector	P	9	0
Construction Manager	P	103	0
Cost Engineer/Estimator	P	1	0
Electrical Engineer	P	33	0
Environmental Engineer	P	18	0
Environmental Scientist	P	21	0
Hydraulic Engineer	P	21	0
Mechanical Engineer	P	9	0
Project Manager	P	25	0
Sanitary Engineer	P	0	0
Structural Engineer	P	29	0
Technician/Analyst	P	34	0
Water Resources Engineer	P	159	0
Other	P	270	0
Other (Administrative)	P	39	0
Other (Economists)	P	2	0
Other (O&M Specialists)	P	4	0
Total		877	8



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3. PROFILE OF FIRM'S EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST YEAR

a. Approximate No. of Projects	b. Experience	c. Revenue Index Number <i>(see below)</i>
3	Solid Wastes	6
4	Industrial Waste Treatment	6
124	Surveying; Platting; Mapping	6
139	Testing and Inspection Services	6
1,076	Cost Estimating	6
74	Energy Conservation	6
219	Heating; Ventilating; Air Conditioning	6
100	Master Planning (Planning (Community))	7
463	Master Planning (Planning (Site))	6
56	Water Resources	7
59	Electrical Studies and Design	3
120	Environmental Impact Studies, Assessments or Statements	8
1,076	Cost Estimating; Engineering and Analysis; Parametric Costing; Forecasting (Financial/Rate Studies)	6
59	Sustainable Design Cost	3
18	Dams (Earth; Rock)	8
80	Design-Build	4
186	Plumbing and Piping Design	8
63	Storm Water Handling and Facilities	9
165	Construction Management	10
465	Water Supply	10
1,260	Sewage Collection, Treatment and Disposal	10

PROFESSIONAL SERVICES REVENUE INDEX NUMBER

- | | |
|---------------------------------------|---|
| 1. Less than \$100,000 | 6. \$2 million to less than \$5 million |
| 2. \$100,000 to less than \$250,000 | 7. \$5 million to less than \$10 million |
| 3. \$250,000 to less than \$500,000 | 8. \$10 million to less than \$25 million |
| 4. \$500,000 to less than \$1 million | 9. \$25 million to less than \$50 million |



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	<p>(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE</p> <p>Project Manager, providing study and design phase services for upgrades along the 99th Avenue Interceptor. The first Phase includes field odor monitoring and pipeline condition assessment, evaluation of alternative sewer alignments, potential upgrades to an existing odor control facility and an air jumper across the New River. Recommended improvements will be designed in a later phase that will also include additional evaluations to address issues related to the siphon crossing the New River.</p>	<p><input checked="" type="checkbox"/> Check if project performed with current firm</p>						
4.	<p>(1) TITLE AND LOCATION (<i>City and State</i>)</p> <p>Chromium 6 Water Treatment Facilities Project, Coachella Valley Water District, CA</p> <p>(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE</p> <p>Mr. Courter is leading the design of 10 miles of raw and finished water transmission pipelines and upgrades to multiple PRV stations. This \$200 million project includes design of 23 Strong Base Anion (SBA) and 2 Weak Base Anion (WBA) Ion Exchange Treatment Plants (IXTPs) to treat water from 30 wells in the District's system; a Central Resin Regeneration Facility (CRRF), and upgrades to 3 existing arsenic treatment IXTPs. The project will be constructed through a CMAR project delivery.</p>	<table border="1"> <tr> <th colspan="2">(2) YEAR COMPLETED</th> </tr> <tr> <td>Professional Services</td> <td>Construction (if applicable)</td> </tr> <tr> <td>2015</td> <td>2017 (Projected)</td> </tr> </table> <p><input checked="" type="checkbox"/> Check if project performed with current firm</p>	(2) YEAR COMPLETED		Professional Services	Construction (if applicable)	2015	2017 (Projected)
(2) YEAR COMPLETED								
Professional Services	Construction (if applicable)							
2015	2017 (Projected)							
5.	<p>(1) TITLE AND LOCATION (<i>City and State</i>)</p> <p>Cr6 Treatment Design for Wells 13A, AA and 1E, Indio Water Authority, CA</p> <p>(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE</p> <p>Cr6 Treatment Design for Wells 13A, AA, and 1E, Indio Water Authority, CA – Mr. Courter is providing project management support and QA/QC for the fast-track design of three Strong Base Anion (SBA) Treatment Facilities for wells 1E, AA, and 13A to meet the Cr6 MCL and produce sufficient water to enable IWA to meet peak summer water demands. The project includes design permitting, construction administration and startup services. Design was initiated in February 2015 and the three facilities began operation in July 2015.</p>	<table border="1"> <tr> <th colspan="2">(2) YEAR COMPLETED</th> </tr> <tr> <td>Professional Services</td> <td>Construction (if applicable)</td> </tr> <tr> <td>2015</td> <td>2015</td> </tr> </table> <p><input checked="" type="checkbox"/> Check if project performed with current firm</p>	(2) YEAR COMPLETED		Professional Services	Construction (if applicable)	2015	2015
(2) YEAR COMPLETED								
Professional Services	Construction (if applicable)							
2015	2015							



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4. Resumes of Key Personnel Proposed for this Contract *(Complete one Section #4 for each key person.)*

a. NAME Kevin Alexander, PE	b. ROLE IN THIS CONTRACT Project Director / Technical Lead	c. YEARS EXPERIENCE	
		1. TOTAL 19.5	2. WITH CURRENT FIRM 2 Years and 1 Month

d. LOCATION <i>(City and State)</i> San Diego, CA
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e. EDUCATION <i>(DEGREE AND SPECIALIZATION)</i> BS Civil Engineering, University of Missouri Rolla	f. PROFESSIONAL TRAINING - REGISTRATIONS Professional Engineer: Arizona (33411), California, Florida, Idaho, Oklahoma, Texas, Washington, NCEES
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g. OTHER PROFESSIONAL QUALIFICATIONS <i>(Organizations, Awards, etc.)</i> Professional Activities American Water Works Association AZWA American Membrane Technology Association CA-NV CA Water Reuse Association Water Environment Federation
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H. RELEVANT PROJECTS

	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	
		Professional Services	Construction (if applicable)
1.	Newland Communities, Goodyear, Arizona	2013-2014	2016(Estimated)
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Water Treatment Feasibility Study including analysis of Activated Alumina treatment and Reverse Osmosis. Treatment was required for fluoride, arsenic and nitrate in a local groundwater. Project included sizing, layouts, and estimating costs for each treatment process estimated at \$25Million to \$30Million. The Phase 1 study was completed for \$35,000 in 2014. A second \$20,000 phase negation phase is currently underway, while the developer finalizes agreements with the City of Goodyear. Design is anticipated to proceed in 2015.	<input checked="" type="checkbox"/>	Check if project performed with current firm
2.	West Basin Desalination Plant Decommissioning Project, Redondo Beach, CA	2014	2015 (estimated)
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Developed plans and specifications for the demolition of a seawater desalination demonstration plant at the SeaLab in Redondo Beach, CA. Project is estimated at \$1.3M for removing equipment and cleaning up the site for future uses. Engineering contract value is for \$125,000	<input checked="" type="checkbox"/>	Check if project performed with current firm
3.	Loudon Water, Fairfax, Virginia	Project is Ongoing	2018-2020 Estimated
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Providing business masterplanning and design services for an 11 MGD expansion of an existing 11 MGD biological nutrient removal facility known as the Broadrun Water Reclamation Plant. Tasks include evaluation of existing MBR membrane condition to determine best practices for saving money on current operations as well as planning for the 11 MGD Expansion. Design services will begin after the development of the business plan.	<input checked="" type="checkbox"/>	Check if project performed with current firm
4.	Texas Water Development Board, Water Reuse Guidance Document Development, Austin, Texas	2014	N/A



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ADSPO16-00005912

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	<p>(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE</p> <p>Assisted with development of a Water Reuse planning document for Direct Potable Reuse in Texas. The document is to help regulators, water agencies and engineers with planning and implementing Direct Potable Reuse Projects. The role includes assistance with development of treatment technology and overall treatment trains for DPR. In addition provided development of pilot testing plans and protocols for guiding DPR projects to the right technology selection.</p>	<p><input checked="" type="checkbox"/> Check if project performed with current firm</p>		
	<p>(1) TITLE AND LOCATION (<i>City and State</i>)</p> <p>Coachella Valley Water District, Chrome 6 Treatment Study, Palm Desert, California</p>	<p>(2) YEAR COMPLETED</p> <table border="1"> <tr> <td data-bbox="938 451 1237 535">Professional Services 2014(Ongoing)</td> <td data-bbox="1237 451 1477 535">Construction (if applicable) 2015-2018 estimated</td> </tr> </table>	Professional Services 2014(Ongoing)	Construction (if applicable) 2015-2018 estimated
Professional Services 2014(Ongoing)	Construction (if applicable) 2015-2018 estimated			
5.	<p>(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE</p> <p>The Coachella Valley Water District is planning to implement a \$300M project to add treatment for Chrome 6 based on the new California regulation of 10 PPB. The study included evaluation of multiple treatment alternatives including oxidation/filtration, ion exchange and surface water importation and treatment. The study is also looking at concentrate treatment alternatives, brine recovery and recharge and recovery to allow for maximum benefit of groundwater and surface water. The study is to be completed in early 2015, and the project will move to design and CMAR projects to implement the new treatment systems.</p>	<p><input checked="" type="checkbox"/> Check if project performed with current firm</p>		



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4. Resumes of Key Personnel Proposed for this Contract *(Complete one Section #4 for each key person.)*

a. NAME		b. ROLE IN THIS CONTRACT		c. YEARS EXPERIENCE	
Doug Kobrick, PE		Project Manager / Technical Lead		1. TOTAL 34	2. WITH CURRENT FIRM 1
d. LOCATION <i>(City and State)</i>					
Tempe, AZ					
e. EDUCATION <i>(DEGREE AND SPECIALIZATION)</i>			f. PROFESSIONAL TRAINING - REGISTRATIONS		
MS Civil/Environmental Engineering, Arizona State University BS Civil Engineering, Brown University			Professional Engineer: Arizona (20787)		
g. OTHER PROFESSIONAL QUALIFICATIONS <i>(Organizations, Awards, etc.)</i>					
Professional Activities AZ Water Association Chair of the Wastewater Treatment Committee Member of the Conference Program Committee American Water Works Association Long-term member, Water Conservation Division Water Environment Federation American Public Works Association					

H. RELEVANT PROJECTS

	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	
		Professional Services	
1.	Water System Improvements, Globe, AZ	2015	
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Project Engineer, providing study, design, and construction phase services for a variety of water system improvements, including field investigations (flow and pressure monitoring), hydraulic modeling, and identification of system improvements to create a new pressure zone; detailed design of Phase 1 improvements to split the zone; and conceptual layout of Phase 2 improvements to improve flow conditions and pressure in isolated pockets; and construction administration services including ESDC and construction inspection.		
2.	99th Avenue Interceptor at New River, EPCOR, Peoria, AZ	2015	
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Project Engineer, providing study and design phase services for upgrades along the 99th Avenue Interceptor. The first Phase includes field odor monitoring and pipeline condition assessment, evaluation of alternative sewer alignments, potential upgrades to an existing odor control facility and an air jumper across the New River. Recommended improvements will be designed in a later phase that will also include additional evaluations to address issues related to the siphon crossing the New River.		
3.	Cr6 Treatment Design for Wells 13A, AA and 1E, Indio Water Authority, CA	2015	2015
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Cr6 Treatment Design for Wells 13A, AA, and 1E, Indio Water Authority, CA – Mr. Kobrib is providing project management support and QA/QC for the fast-track design of three Strong Base Anion (SBA) Treatment Facilities for wells 1E, AA, and 13A to meet the Cr6 MCL and produce sufficient water to enable IWA to meet peak summer water demands. The project includes design permitting, construction administration and startup services. Design was initiated in February 2015 and the three facilities began operation in July 2015.		
4.	Coachella Valley Water District Source of Supply Study (Palm Desert, CA)	Ongoing	
	(2) YEAR COMPLETED Professional Services Ongoing Construction (if applicable)		



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ADSPO16-00005912

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	<p>(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE</p> <p>Project engineer and task leader evaluating options in a \$850,178 study to a balanced water resource portfolio including groundwater with chromium 6 treatment, use of Colorado River water, and a decentralized approach (POU/POE). The evaluation is on-going and includes treatment process selection and plant siting, conceptual design, and cost estimating for treatment of over forty 2000 gpm groundwater wells and a potential 20 mgd surface water treatment plant. Stakeholder communications, public outreach, and engagement of an expert panel were also integrated in the project to gain support for the implementation plan of the selected approach.</p>	<p><input checked="" type="checkbox"/> Check if project performed with current firm</p>		
5.	<p>(1) TITLE AND LOCATION (<i>City and State</i>)</p>	<p>(2) YEAR COMPLETED</p> <table border="1"> <tr> <td data-bbox="852 493 1193 535">Professional Services</td> <td data-bbox="1193 493 1510 535">Construction (if applicable)</td> </tr> </table>	Professional Services	Construction (if applicable)
	Professional Services	Construction (if applicable)		
<p>(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE</p>	<p><input type="checkbox"/> Check if project performed with current firm</p>			



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4. Resumes of Key Personnel Proposed for this Contract *(Complete one Section #4 for each key person.)*

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
		1. TOTAL	2. WITH CURRENT FIRM
Troy Walker	Project Manager / Technical Lead	21	3

d. LOCATION *(City and State)*

Tempe, AZ

e. EDUCATION *(DEGREE AND SPECIALIZATION)*

BE Chemical Engineering, University of New South Wales, Australia

Graduate of CO-OP Scholarship Program

f. PROFESSIONAL TRAINING - REGISTRATIONS

Member of Engineers Australia

g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)*

Professional Activities

- AWWA – Membrane Process Committee
- AWWA – Membrane Systems Subcommittee
- American Membrane Technology Association
- Water Reuse Foundation
- Southwest Membrane Operators Association
- South Central Membrane Operators Association

Presentations

- IWES Membrane Plant Design and Operation Short Course - Presenter (2007-2012)
- Ca-NV AWWA Annual Conference, "Critical Control Point Assessment to Quantify Robustness and Reliability of Multiple Treatment Barriers for a DPR Scheme" (October 2014)
- WaterReuse Annual Conference, "Direct Potable Reuse Projects 13-03 (Critical Control Point Assessment to Quantify Robustness and Reliability of Multiple Treatment Barriers for a DPR Scheme) and 13-13 Development of Operation and Maintenance Plan and Training and Certification Framework for Direct Potable Reuse (DPR) Systems" (September 2014)
- American Membrane Technology Association Membrane Technology Conference. "Know When to Hold 'em, Know When to Fold 'em. How long will low pressure membranes last?" (March 2014)
- South Central Membrane Association, San Antonio, TX, "Mastering Membrane Management: Getting the Best Value from your Membranes in the Long Run (August 2014)
- KN/TN AWWA, Chattanooga, TN, "Low Pressure Membrane Filtration Where Have We Been and Where Are We Headed?" (July 2014)
- AWWA/SWMOA Joint Conference, Newport, CA, "Seawater Design Hurdles" (July 2014)
- AZ Water, Glendale, AZ, "Droughts and Flooding Rains, Australia's Large Scale Water Recycling and Desalination Experience" (May 2014)
- SCMA Workshop, Fort Worth, TX, "Microfiltration and Ultrafiltration Tips and Traps" (April 2014)
- SCMA Workshop, Alamogordo, NM "Why I Wish I Had a Pilot Plant" (April 2014)
- American Membrane Technology Association, Membrane Technology Conference "High Pressure Membrane Plant Design" Workshop (March 2014)
- WaterReuse Industrial Reuse Conference, "Water Recycling for Industry: The Australian Experience" (December 2013)
- University of North Carolina, "Direct and Indirect Reuse" (October 2013)
- South Central Membrane Association, South Padre Is, Texas, "Large Scale Desalination: The Australian Experience" (October 2013)
- Veolia Water Technical Director's Conference Asia-Pacific. Presentation on climate impact on water operations in Australia. Shenzhen, China. (2011)
- Australian Water Association, Membranes and Desalination Specialty Conference, "Western Corridor Recycled Water Project Update" (February 2011)
- IWA Reuse Conference, Presenter, Brisbane Australia "Western Corridor's Bundamba Advanced Water Treatment Plant" (2009)
- American Membrane Technology Association Conference, Memphis Tennessee "Australia's Western Corridor Recycled Water Project Regulation of an Indirect Potable Recycling Scheme Down Under" (2009)

Selected Publications

Contribution of a chapter to the International Water Association's book Milestones in Water Reuse. Chapter 10 – Western Corridor Recycled Water Scheme; 2013.

H. RELEVANT PROJECTS

	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	
		Professional Services	Construction (if applicable)
1.	Carson Plant, West Basin Municipal Water District, Carson, CA	Ongoing	
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE	<input checked="" type="checkbox"/>	Check if project performed with current firm
	Mr. Walker is the Project Manager for the Design of 2.0 MGD tertiary MBR system and Upgrade of MF system to provide recycled water for industrial reuse.		



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2.	(1) TITLE AND LOCATION (<i>City and State</i>) Chromium 6 Water Treatment Facilities Project, Coachella Valley Water District, CA	(2) YEAR COMPLETED	
		Professional Services 2015	Construction (if applicable) 2017 (Projected)
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm		
	This \$200 million project includes design of 23 Strong Base Anion (SBA) and 2 Weak Base Anion (WBA) Ion Exchange Treatment Plants (IXTPs) to treat water from 30 wells in the District's system; a Central Resin Regeneration Facility (CRRF), and upgrades to 3 existing arsenic treatment IXTPs. The project will be constructed through a CMAR project delivery.		
3.	(1) TITLE AND LOCATION (<i>City and State</i>) Water Reuse Research Foundation (National) "Critical Control Point Assessment to Quantify Robustness and Reliability of Multiple Treatment Barriers of a DPR Scheme"	(2) YEAR COMPLETED	
		Professional Services 2015	Construction (if applicable)
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm		
	Leading, operationally focused research as part of the Water Reuse Foundation Direct Potable Reuse Initiative. This project is collaborating with numerous utilities nationally, including the City of Scottsdale, to develop a design and operational methodology to ensure the reliability of direct potable treatment processes. Role – Principal Investigator Project Value – Approx. \$540,000		
4.	(1) TITLE AND LOCATION (<i>City and State</i>) Wateruse Research Foundation - Development of Operation and Maintenance Plan and Training and Certification Framework for Direct Potable Reuse (DPR) Systems (WRRF-13-13)	(2) YEAR COMPLETED	
		Professional Services 2015	Construction (if applicable)
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm		
	Leading, operationally focused research as part of the Water Reuse Foundation Direct Potable Reuse Initiative. This project is collaborating with numerous utilities nationally, including the City of Scottsdale, to develop an operator certification framework, and an operations management framework to ensure the operational reliability of direct potable reuse. Role – Principal Investigator Project Value – Approx. \$300,000		
5.	(1) TITLE AND LOCATION (<i>City and State</i>) Coachella Valley Water District, California. Groundwater treatment options study	(2) YEAR COMPLETED	
		Professional Services 2014	Construction (if applicable)
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm		
	Investigation of groundwater treatment options for the management of Chrome VI in groundwater supplies. This has involved concept design, costing and evaluation of ion exchange systems, centralized regeneration facilities and of surface water treatment processes to supplement supplies. Role – Technical concept design of mobile ion exchange and centralized regeneration facility. Project value – \$420,000		



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4. Resumes of Key Personnel Proposed for this Contract *(Complete one Section #4 for each key person.)*

a. NAME Lisa Melton	b. ROLE IN THIS CONTRACT Task Lead/Project Engineer	c. YEARS EXPERIENCE	
		1. TOTAL 15	2. WITH CURRENT FIRM 6
d. LOCATION <i>(City and State)</i> Tempe, AZ			
e. EDUCATION <i>(DEGREE AND SPECIALIZATION)</i> MSCE University of Dayton, 2013 BSCE University of Dayton, 2004		f. PROFESSIONAL TRAINING - REGISTRATIONS Professional Engineer: Arizona (61320)	

g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)*

Ms. Melton is an Assistant Engineer in Hazen and Sawyer's Tempe office. She has 6 years of experience in planning, design, operation, and construction of water and wastewater facilities. She has prepared master plans, drawings and specification for various projects. Ms. Melton has assisted with project design that includes pump station design, process equipment selection, hydraulic modeling, and coordination with mechanical, structural and electrical sub-disciplines.

Professional Activities

AZ Water – BioSolids Committee and Young Professionals Committee
 Water Environment Federation
 American Water Works Association

Technical Presentations

"Expose Your Vulnerabilities Before a Crisis", Melton, L. and Sajdak, N., presented at the 2014 SW Ohio AWWA Section Meeting, June 27, 2014.
 "Effect of Chloride and Sulfate on the Mineralogy and Morphology of Synthetically Precipitated Copper Solids" Melton, L., presented at the 2008 Water Quality Technology Conference, Cincinnati, OH, November 16-20, 2008.

H. RELEVANT PROJECTS

1.	(1) TITLE AND LOCATION <i>(City and State)</i> Water System Improvements, Globe, AZ	(2) YEAR COMPLETED	
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Project Engineer, providing study, design, and construction phase services for a variety of water system improvements, including field investigations (flow and pressure monitoring), hydraulic modeling, and identification of system improvements to create a new pressure zone; detailed design of Phase 1 improvements to split the zone; and conceptual layout of Phase 2 improvements to improve flow conditions and pressure in isolated pockets; and construction administration services including ESDC and construction inspection.	Professional Services 2015	Construction (if applicable) 2016
		<input checked="" type="checkbox"/> Check if project performed with current firm	
2.	(1) TITLE AND LOCATION <i>(City and State)</i> 99th Avenue Interceptor at New River, EPCOR, Peoria, AZ	(2) YEAR COMPLETED	
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Project Engineer, providing study and design phase services for upgrades along the 99th Avenue Interceptor. The first Phase includes field odor monitoring and pipeline condition assessment, evaluation of alternative sewer alignments, potential upgrades to an existing odor control facility and an air jumper across the New River. Recommended improvements will be designed in a later phase that will also include additional evaluations to address issues related to the siphon crossing the New River.	Professional Services 2015	Construction (if applicable) 2016 (Projected)
		<input checked="" type="checkbox"/> Check if project performed with current firm	
3.	(1) TITLE AND LOCATION <i>(City and State)</i> Chromium 6 Water Treatment Facilities Project, Coachella Valley Water District, CA	(2) YEAR COMPLETED	
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE	Professional Services 2015	Construction (if applicable) 2017 (Projected)
		<input type="checkbox"/> Check if project performed with current firm	



ATTACHMENT I – General Qualifications

**ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912**

**STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007**

	<p>(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE</p> <p>Ms. Melton is the project engineer for the design of 10 miles of raw and finished water transmission pipelines and upgrades to multiple PRV stations. This \$200 million project includes design of 23 Strong Base Anion (SBA) and 2 Weak Base Anion (WBA) Ion Exchange Treatment Plants (IXTPs) to treat water from 30 wells in the District's system; a Central Resin Regeneration Facility (CRRF), and upgrades to 3 existing arsenic treatment IXTPs. The project will be constructed through a CMAR project delivery.</p>	<p align="right"><input checked="" type="checkbox"/> Check if project performed with current firm</p>				
4.	<p>(1) TITLE AND LOCATION (<i>City and State</i>)</p> <p>City of North Olmsted, Wastewater Treatment Plant Improvement, North Olmsted, OH</p> <p>(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE</p> <p>Process lead for new Headworks Facility design and modeling of facility hydraulic as part of improvements to 7 MGD facility with expanded peak flow capacity of 40 MGD. New facilities included Pretreatment Building with perforated plate screens, press and grit removal, Aeration Tank Expansion and modifications to existing Aeration Tanks to support VLR process, Secondary Clarifiers, Tertiary filters, Ultraviolet Disinfection, Post Aeration, Sludge Holding and Solids Handling Facilities. Responsible for the design of Pretreatment facilities and evaluation of multiple manufactures for perforated plate screening and grit collection and dewatering equipment. Design of site piping for non-potable water loop and plant pump stations. Coordination with sub-disciplines including HVAC, electrical and architecture for design of new structure.</p>	<table border="1"> <thead> <tr> <th colspan="2" data-bbox="852 409 1510 441">(2) YEAR COMPLETED</th> </tr> </thead> <tbody> <tr> <td data-bbox="852 441 1177 514">Professional Services 2015</td> <td data-bbox="1177 441 1510 514">Construction (if applicable)</td> </tr> </tbody> </table> <p align="right"><input checked="" type="checkbox"/> Check if project performed with current firm</p>	(2) YEAR COMPLETED		Professional Services 2015	Construction (if applicable)
(2) YEAR COMPLETED						
Professional Services 2015	Construction (if applicable)					
5.	<p>(1) TITLE AND LOCATION (<i>City and State</i>)</p> <p>Hamilton WRF Biosolids Master Plan, City of Hamilton, Ohio</p> <p>(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE</p> <p>Developed a biosolids master plan for evaluation of the solids treatment process at the City of Hamilton WRF, a 25 MGD plant. Activities included review of current treatment capacity and process limitations, identifying feasible alternatives for unit processes with consideration of future growth and regulatory factors, and documenting recommended improvements and design criteria associated with the proposed upgrades and expansion. The study will likely be sited for the elimination of the composting process while expanding their onsite solids handling capabilities.</p>	<table border="1"> <thead> <tr> <th colspan="2" data-bbox="852 735 1510 766">(2) YEAR COMPLETED</th> </tr> </thead> <tbody> <tr> <td data-bbox="852 766 1177 840">Professional Services 2012</td> <td data-bbox="1177 766 1510 840">Construction (if applicable)</td> </tr> </tbody> </table> <p align="right"><input checked="" type="checkbox"/> Check if project performed with current firm</p>	(2) YEAR COMPLETED		Professional Services 2012	Construction (if applicable)
(2) YEAR COMPLETED						
Professional Services 2012	Construction (if applicable)					



ATTACHMENT I – General Qualifications
ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912

STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007

4. Resumes of Key Personnel Proposed for this Contract *(Complete one Section #4 for each key person.)*

a. NAME Amanda Marcucci	b. ROLE IN THIS CONTRACT Project Engineer – Pipelines/Pump Stations	c. YEARS EXPERIENCE	
		1. TOTAL 8	2. WITH CURRENT FIRM 1

d. LOCATION *(City and State)*

Tempe, AZ

e. EDUCATION <i>(DEGREE AND SPECIALIZATION)</i> BS Civil Engineering, University of Utah, 2005	f. PROFESSIONAL TRAINING - REGISTRATIONS Professional Engineer: Arizona (AZ 53208), Michigan
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g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)*

Amanda Marcucci has 8 years of experience in creating design plans, cost estimates, and specifications, as well as designing pipelines, pump stations, and reservoirs. She is familiar with design protocol for water and sewer conveyance.

H. RELEVANT PROJECTS

1.	(1) TITLE AND LOCATION <i>(City and State)</i> Chromium 6 Water Treatment Facilities Project, CVWD, Coachella, CA	(2) YEAR COMPLETED	
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Ms. Marcucci is the project engineering for the design of 10 miles of raw and finished water transmission pipelines and upgrades to multiple PRV stations. This \$200 million project includes design of 23 Strong Base Anion (SBA) and 2 Weak Base Anion (WBA) Ion Exchange Treatment Plants (IXTPs) to treat water from 30 wells in the District's system; a Central Resin Regeneration Facility (CRRF), and upgrades to 3 existing arsenic treatment IXTPs. The project will be constructed through a CMAR project delivery.	Professional Services 2015	Construction (if applicable) 2017 (Projected)
		<input type="checkbox"/> Check if project performed with current firm	
2.	(1) TITLE AND LOCATION <i>(City and State)</i> Yavapai Hills Lower Pump Station (Zone 7) Design, City of Prescott, AZ:	(2) YEAR COMPLETED	
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Project engineer for design and construction support for a new potable water pump station to replace an existing aged pump station. The project includes installation of new pumps, associated controls and appurtenances, and an above-grade building enclosure. The pumps will increase city capacity from existing 300-gpm pump to 1,630-gpm firm capacity. Deliverables will include a preliminary design report, cost estimate, and a geotechnical report. Design reviews will occur at the 30 percent, 60 percent, and 90 percent levels.	Professional Services 2012	Construction (if applicable)
		<input type="checkbox"/> Check if project performed with current firm	
3.	(1) TITLE AND LOCATION <i>(City and State)</i> Zone 39 Water System Improvements, City of Prescott, AZ:	(2) YEAR COMPLETED	
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Project engineer for the Zone 39 water line replacements design project for the City of Prescott. She assisted with public information, data collection, pipeline design services, contractor submittal reviews, and other construction support services. The project included nearly 7,400 linear feet of water line replacements, design of a new Pioneer pump station, and design of a new 1.33-mg steel reservoir on Indian Hill.	Professional Services 2008	Construction (if applicable)
		<input type="checkbox"/> Check if project performed with current firm	
4.	(1) TITLE AND LOCATION <i>(City and State)</i> Wastewater System Expansion Program, Lake Havasu City, AZ:	(2) YEAR COMPLETED	
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE As project engineer, she assisted with hydraulic modeling of the sewer system, layout of the sewer alignment, design of the sewer mains and laterals, field data collection, and addressing homeowner questions and concerns at public meetings. This project included the design of a municipal sewer system for two sub-basins in Lake Havasu City, including service laterals for approximately 3,400 parcels.	Professional Services 2009	Construction (if applicable)
		<input type="checkbox"/> Check if project performed with current firm	
5.	(1) TITLE AND LOCATION <i>(City and State)</i> Town of Quartzsite Sewer Master Plan, Town of Quartzsite, AZ	(2) YEAR COMPLETED	
		Professional Services 2011	Construction (if applicable)



ATTACHMENT I – General Qualifications

ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912

STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007

(3) BRIEF DESCRIPTION (*Brief scope, size, cost, etc.*) AND SPECIFIC ROLE

Check if project performed with current firm

Project engineer responsible for entering Town as-built data into GIS, analyzing unit generation rates, identifying potential flowrate generation from potential sewer expansion areas, evaluating the capacity of the existing sewer system, prioritizing future sewer improvement projects, and preparing the master plan report. The town experiences a large seasonal influx of tourist populations in the winter months, which puts severe pressure on the wastewater collection and treatment facilities. To alleviate this concern, Atkins is providing a master plan update evaluating these seasonal impacts to the collection system, documenting the treatment plant updates, and coordinating these upgrades with the approved 208 Plan.



ATTACHMENT I – General Qualifications
ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912

STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007

4. Resumes of Key Personnel Proposed for this Contract *(Complete one Section #4 for each key person.)*

a. NAME Steven C. Rohrer	b. ROLE IN THIS CONTRACT Tech Advisor Wastewater Treatment	c. YEARS EXPERIENCE	
		1. TOTAL 26	2. WITH CURRENT FIRM 1

d. LOCATION *(City and State)*

San Diego, CA

e. EDUCATION *(DEGREE AND SPECIALIZATION)*

BSE Mechanical Engineering / Environmental Studies
 Arizona State University

f. PROFESSIONAL TRAINING - REGISTRATIONS

Professional Engineer: Arizona (47640), California

g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)*

Mr. Rohrer has served as Principal-In-Charge, Project Manager, Deputy Project Manager or lead project engineer for numerous municipal and industrial projects. His experience includes the management, design, permitting, construction administration, and field engineering of major wastewater treatment plants and water treatment projects, as well as sludge processing projects, odor control studies and designs and environmental remediation and restoration. His delivery experience includes using conventional and alternative project delivery methods including construction manager at risk (CM@Risk) and design-bid-build delivery approaches. Projects have included the coordination of multi-disciplined, multi-location and multi-firm teams delivering complex projects on time and within budget.

Professional Activities

American Water Works Association (AWWA)

AZ Water Association

H. RELEVANT PROJECTS

1.	(1) TITLE AND LOCATION <i>(City and State)</i> Chromium 6 Water Treatment Facilities Project, CVWD, Coachella, CA	(2) YEAR COMPLETED	
		Professional Services 2015	Construction (if applicable) 2017 (Projected)
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Mr. Rohrer is leading the IXTP upgrades for the design of 10 miles of raw and finished water transmission pipelines and upgrades to multiple PRV stations. This \$200 million project includes design of 23 Strong Base Anion (SBA) and 2 Weak Base Anion (WBA) Ion Exchange Treatment Plants (IXTPs) to treat water from 30 wells in the District's system; a Central Resin Regeneration Facility (CRRF), and upgrades to 3 existing arsenic treatment IXTPs. The project will be constructed through a CMAR project delivery.	<input checked="" type="checkbox"/> Check if project performed with current firm	
2.	(1) TITLE AND LOCATION <i>(City and State)</i> Sub-Regional Operating Group: 91st Avenue Wastewater Treatment Plant – Unified Plant 2001 (UP01) Expansion Project Construction Administration Office Engineer / Phoenix AZ:	(2) YEAR COMPLETED	
		Professional Services 2001	Construction (if applicable) 2008
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Deputy Project Manager/DQL responsible for the coordination of office services during the CM@Risk contract construction phase of the \$150 million expansion to the 91st Avenue WWTP to increase the plant capacity to 205 mgd. Responsibilities included management of RFIs, RFAs, clarifications, submittal/record document reviews and associated budgets. The project includes: new interceptor and junction structure; new influent metering and sampling facilities; new headworks facility (bar screens, grit basins and residuals handling facilities); new primary sedimentation basins and pump station; new aeration basins and blower facility; new secondary sedimentation basins and RAS/WAS pump station; new headworks odor control facilities (including chemical handling); new centrate facilities (including aeration, blower, and sedimentation facilities); solids handling facility and solids thickening facility improvements; new electrical substation and distribution; new influent and effluent conveyance facilities and site work. Project delivered under the CM@R delivery method.	<input type="checkbox"/> Check if project performed with current firm	
3.	(1) TITLE AND LOCATION <i>(City and State)</i> Sub-Regional Operating Group: 91st Avenue Wastewater Treatment Plant – Mechanical Sludge Dewatering Centrifuge Study and Engineering Design Services / Phoenix AZ	(2) YEAR COMPLETED	
		Professional Services 2013	Construction (if applicable) 2014
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Project Manager responsible for the study and design for infrastructural support for a newly converted digested sludge-dewatering machine. The project included modifying the existing mechanical support facilities (digested sludge feed piping, polymer piping, odor control, centrate, dewatered cake piping) to accommodate the converted centrifuge at the Solids Handling Facility (SHF). The work associated with the conversion of one thickening centrifuge to dewatering service will include demolition of existing structural elements and equipment, modifications to piping, electrical, instrumentation, controls and control strategy if	<input type="checkbox"/> Check if project performed with current firm	



ATTACHMENT I – General Qualifications
ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912

STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007

the existing support facilities, as well as coordination of the design with centrifuge manufacturer.

4.	(1) TITLE AND LOCATION (<i>City and State</i>)	(2) YEAR COMPLETED	
	Sub-Regional Operating Group: SRO/SAI Odor Study, Technology Evaluation and Conceptual Design / Phoenix AZ	Professional Services 2015	Construction (if applicable)
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE		
	<p>Project Manager responsible for the odor control assessment of the Salt River Outfall (SRO) and the Southern Avenue Interceptor (SAI) sewers which includes approximately 50 miles of pipe ranging in size from 36-inches to 84-inches in diameter. The project included evaluation of existing hydraulic flow data, interceptor modeling, field odor sampling of both liquid and headspace vapor, odor technology evaluation, conceptual planning and design.</p>		
	<input type="checkbox"/> Check if project performed with current firm		
5.	(1) TITLE AND LOCATION (<i>City and State</i>)	(2) YEAR COMPLETED	
	Pima County Regional Water Reclamation Facility - Ina Road WRF Digested Sludge Transfer Pump Replacement Project / Tucson AZ	Professional Services 2012	Construction (if applicable) 2013
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE		
	<p>Project Manager/DQL for the detailed design for the replacement of five (5) digested sludge transfer pumps, including piping modifications, electrical upgrades, AFD Drives, SCADA connections and structural modifications. The plants solids handling facilities are being expanded to handle the expansion to 50 MGD of the Ina Road WRF sludge as well as all waste activated sludge from the Water Reclamation Campus constructed near the existing Roger Road WRF.</p>		
	<input type="checkbox"/> Check if project performed with current firm		



ATTACHMENT I – General Qualifications
ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912

STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007

4. Resumes of Key Personnel Proposed for this Contract *(Complete one Section #4 for each key person.)*

a. NAME Ryan Rhoades	b. ROLE IN THIS CONTRACT Project Manager / Task Lead	c. YEARS EXPERIENCE	
		1. TOTAL 16	2. WITH CURRENT FIRM 1

d. LOCATION *(City and State)*

Palm Desert, CA

e. EDUCATION *(DEGREE AND SPECIALIZATION)*

BS Civil Engineering, South Dakota State University

f. PROFESSIONAL TRAINING - REGISTRATIONS

Professional Engineer: Arizona (41009)

g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)*

Mr. Rhoades is a registered Professional Engineer in Arizona with over 16 years of experience. Through a focused career progression and a robust foundation of project delivery roles, his expertise and client service emphasis broadly spans from engineering consulting, design, construction management, and utility management. His experience provides an excellent foundation through tactical approaches, fundamental technical competence, and client/stakeholder relations.

Distinguishing Qualifications

- Project Management
- Utility Management Consulting
- Water Quality and Water Treatment
- Water and Wastewater Operations
- Water Reuse Studies
- Membranes and Concentrate Management
- Mine Water Treatment
- Odor Control Studies
- Civil and Process Mechanical Design
- Construction Mgmt and Resident Engineering

H. RELEVANT PROJECTS

1.	(1) TITLE AND LOCATION <i>(City and State)</i> Indirect Potable Reuse Investigation; WaterReuse Research Foundation, Tucson, AZ	(2) YEAR COMPLETED	
		Professional Services 2015	Construction (if applicable)
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Project Manager. Managing a tailored collaboration pilot project with Tucson Water and the University of Arizona to investigate the use of soil aquifer treatment, nanofiltration, ozone, and Granular Activated Carbon (GAC) to economically treat effluent to drinking water standards.	<input type="checkbox"/> Check if project performed with current firm	
2.	(1) TITLE AND LOCATION <i>(City and State)</i> Water Utility Management Staff Augmentation; Town of Gilbert, AZ	(2) YEAR COMPLETED	
		Professional Services 2014	Construction (if applicable)
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Project Manager. Led a team of six full-time management and operations supervisors including a water director, water quality manager, and plant superintendents to manage the Town of Gilbert's Water Department serving a population of over 300,000. A separate team performed a water quality compliance audit that led to improvements implemented by the Town.	<input type="checkbox"/> Check if project performed with current firm	
3.	(1) TITLE AND LOCATION <i>(City and State)</i> SAI/SRO Interceptor Odor Control Project, SROG/City of Phoenix, AZ	(2) YEAR COMPLETED	
		Professional Services 2015	Construction (if applicable)
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Project Manager. Managing an odor control study and concept design of a major interceptor system with a major partner that will result in fewer complaints.	<input type="checkbox"/> Check if project performed with current firm	
4.	(1) TITLE AND LOCATION <i>(City and State)</i> Water Master Plan Update; City of Scottsdale, AZ	(2) YEAR COMPLETED	
		Professional Services	Construction (if applicable)



ATTACHMENT I – General Qualifications

**ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912**

**STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007**

		2014	
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE	<input type="checkbox"/>	Check if project performed with current firm
	Water Quality Lead. Task lead for evaluating data and regulations in regards to water quality for water system planning and operations for the Scottsdale water service area including 64 mgd and 30 mgd WTPs. The evaluation consisted of developing compliance strategies for current and future regulations with a focus on disinfection byproducts (DBPs) and Long Term 2 SWTR.		
	(1) TITLE AND LOCATION (<i>City and State</i>)	(2) YEAR COMPLETED	
	Concentrate Management Pilot, U.S. Bureau of Reclamation and City of Goodyear, AZ	Professional Services 2014	Construction (if applicable)
5.	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE	<input type="checkbox"/>	Check if project performed with current firm
	Project Manager. Responsible for the project management of a pilot study for the concentrate management of a brackish water desalination plant Reverse Osmosis (RO) reject. The design includes seven treatment cells to demonstrate natural treatment wetlands with various plant and media configurations that were used to collect data for removal of contaminants from the water.		



ATTACHMENT I – General Qualifications
ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912

STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007

4. Resumes of Key Personnel Proposed for this Contract *(Complete one Section 4 for each key person.)*

a. NAME Jacqueline K. Rhoades, PE	b. ROLE IN THIS CONTRACT Project Manager / Project Engineer	c. YEARS EXPERIENCE	
		1. TOTAL 8	2. WITH CURRENT FIRM 2

d. LOCATION <i>(City and State)</i> Palm Desert, CA
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e. EDUCATION <i>(DEGREE AND SPECIALIZATION)</i> MS Environmental Engineering, University of Arizona BS Chemical Engineering, University of Arizona	f. PROFESSIONAL TRAINING - REGISTRATIONS Professional Engineer (Civil): Arizona, 52758 Water Treatment Plant Operator (Grade 2), Arizona OP032499
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g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)*

Honors and Awards

Young Professional (YP) of the Year | AZ Water Association | 2013
 Select Society of Sanitary Sludge Shovelers (5S) | AZ Water Association | 2013
 Busch Prize Nominee | ARCADIS | 2012
 Quentin Mees Research Award | AZ Water Association | 2011 | Using Chlorine Dioxide to Reduce TTHM Formation: A Full- Scale Evaluation

Professional Activities

AZ Water Association Secretary, Board of Directors, Committee Member, Committee Chair
 Water Research Foundation PAC Member
 American Water Works Association cVOC Regulatory Affairs Office Advisory Work Group Water Environment Association
 Engineers without Borders
 Water for People

Selected Publications

Eaton, A., Chowdhury, Z., Shaw, J., Roberson, J. A., "The State of the Science of Analytical Methods for cVOCs" Journal AWWA, Vol. 104 Iss. 11, 2012, Page Range E572- E581, 10 Pages.
 Shaw, J., Passantino, L., Chowdhury, Z., Hayes, T., Kindred, M., "Using Chlorine Dioxide to Reduce Distribution System THM Formation: Costs, Benefits, and Operational Implications" Proceedings, Annual Conference and Exposition, American Water Works Association (AWWA), Chicago IL, July 23, 2010.
 Shaw, J.K., Cotton-Leto, C.A., Chowdhury, Z.K., Archibald, E., "Planning for Compliance: An Evaluation of Water Quality Conditions that Could Trigger the Need for Treatment Changes," Proceedings, Water Quality Technology Conference (WQTC) and Exposition, American Water Works Association (AWWA), Seattle WA, November 15- 19, 2009.
 Shaw, J.K., Pepe, L.K., Ela, W., Saez, E., "Damage Control: Managing the Residuals Generated During Arsenic Treatment," Proceedings, 2008 Water Quality Technology Conference and Exposition, American Water Works Association, Cincinnati OH, November 16-20, 2008.
 Shaw, J., Fathordoobadi, S., Zelinski, B., Ela, W., Saez, A., "Stabilization of arsenic-bearing solid residuals in polymeric matrices" Journal of Hazardous Materials, 152:3:1115, April 15, 2008

H. RELEVANT PROJECTS

	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	
		Professional Services Ongoing	Construction (if applicable)
1.	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Project engineer and task leader evaluating options in a \$850,178 study to a balanced water resource portfolio including groundwater with chromium 6 treatment, use of Colorado River water, and a decentralized approach (POU/POE). The evaluation is on-going and includes treatment process selection and plant siting, conceptual design, and cost estimating for treatment of over forty 2000 gpm groundwater wells and a potential 20 mgd surface water treatment plant. Stakeholder communications, public outreach, and engagement of an expert panel were also integrated in the project to gain support for the implementation plan of the selected approach.	<input checked="" type="checkbox"/>	Check if project performed with current firm
	(1) TITLE AND LOCATION <i>(City and State)</i> City of Coachella/Indio Water Authority Chromium-6 Treatment And Compliance Study (Indio, CA)	Professional Services Ongoing	Construction (if applicable)
2.	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Project engineer and task leader evaluating groundwater treatment options in a \$250,424 study for 26 wells totaling over 86 mgd production capacity. The study is on-going and includes development of treatment process selection, cost development, and conceptual design. A regional surface water treatment plant will also be considered for treatment of Colorado River water and distribution system infrastructure upgrades will be identified.	<input checked="" type="checkbox"/>	Check if project performed with current firm
	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	
3.	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	



ATTACHMENT I – General Qualifications

**ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSPO16-00005912**

**STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007**

	California Water Company Treatment Evaluation (Los Angeles, CA)	Professional Services Ongoing	Construction (if applicable)
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE Examined treatment options for a groundwater well with hydrogen sulfide, color, manganese, and ammonia. As a project engineer, work on this \$58,288 study included a water quality review, bench-scale testing, development of a pilot-scale test plan, and an update of planning level treatment cost estimates. Pilot-testing is on-going.	<input checked="" type="checkbox"/> Check if project performed with current firm	
4.	(1) TITLE AND LOCATION (<i>City and State</i>) California American Water - Chromium 6 Treatment Analysis	(2) YEAR COMPLETED	
		Professional Services 2014	Construction (if applicable)
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE As a project engineer on this \$20,000 study, examined water quality, land availability, proximity of individual wells, residuals disposal, and capital and O&M costs for chromium 6 treatment options for three California American systems impacted by the proposed California MCL.	<input checked="" type="checkbox"/> Check if project performed with current firm	
5.	(1) TITLE AND LOCATION (<i>City and State</i>) Water Research Foundation and Coachella Valley Water District – Hexavalent Chromium Implementation Plans (Palm Desert, CA)	(2) YEAR COMPLETED	
		Professional Services 2014	Construction (if applicable)
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE As a project engineer developed the implementation plan report that presented the system alternatives to combine and treat groundwater to comply with the California MCL for chromium 6. The Hazen and Sawyer portion of the evaluation (\$57,850) considered water quality, land availability, proximity of individual wells, residual disposal, and capital and O&M costs.	<input checked="" type="checkbox"/> Check if project performed with current firm	



ATTACHMENT I – General Qualifications
ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912

STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007

4. Resumes of Key Personnel Proposed for this Contract *(Complete one Section #4 for each key person.)*

a. NAME Richard J. Pope	b. ROLE IN THIS CONTRACT Tech Advisor – Odor Control	c. YEARS EXPERIENCE	
		1. TOTAL 36	2. WITH CURRENT FIRM 1
d. LOCATION <i>(City and State)</i> New York, New York			
e. EDUCATION <i>(DEGREE AND SPECIALIZATION)</i> BS Civil Engineering Manhattan College 1977 MS Environmental Engineering Manhattan College 1979		f. PROFESSIONAL TRAINING - REGISTRATIONS Professional Engineer: New York, Michigan Board Certified Environmental Engineer (BCEE)	
g. OTHER PROFESSIONAL QUALIFICATIONS <i>(Organizations, Awards, etc.)</i>			

Mr. Pope is responsible for managing Hazen and Sawyer's corporate-wide odor control services. He heads a company team of odor specialists who provide full-service, long-term odor control planning by conducting field investigations, performing odor dispersion modeling to further define off-site impacts, and assisting in selecting the level of control required. He also recommends odor control programs, selects cost-effective control equipment, conceptualizes system layouts, directs detail designers, reviews shop drawings, conducts performance tests, provides operations training and systems troubleshooting, meets with and advises communities and citizens' advisory groups, develops public relations and neighborhood outreach programs, and provides expert testimony. His background includes developing immediate and long-term odor control and corrosion plans for more than 200 facilities around the country and beyond. The plans emphasize simple solutions where viable, and innovative and/or sophisticated solutions where necessary, but always developed in concert with the owner through careful evaluation, planning, and staging. The staged immediate and long-term cost-effective odor control strategies vary from process modifications to chemical addition, and from wet scrubbing to biological systems.

H. RELEVANT PROJECTS

1.	(1) TITLE AND LOCATION <i>(City and State)</i> Odor Control Study – Freeport McMoran Sierrita Mine, Green Valley, AZ	(2) YEAR COMPLETED	
		Professional Services 2016 (Projected)	Construction (if applicable)
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Mr. Pope worked on a team of engineers studying odor complaints from a local community, evaluated release of odors from the mining operation, identified key odor sources and worked with the regulatory agency to keep them informed of the steps that were being taken to understand the nuisance odor issues at the plant. Scope: Design study. Project Value: \$40,000	<input checked="" type="checkbox"/>	Check if project performed with current firm
2.	(1) TITLE AND LOCATION <i>(City and State)</i> SRO/SAI Interceptor Odor Control Study	(2) YEAR COMPLETED	
		Professional Services 2015	Construction (if applicable) TBD
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE The SRO/SAI Interceptor Odor Control Study investigated current and potential future odor generation in the 23-mile long Salt River Outfall Interceptor (SRO) and the 20-mile long Southern Avenue Interceptor (SAI). Both interceptors range in size from 48 to 84 –inches in diameter and are jointly owned by the Sub-Regional Operating Group (SROG) cities (Glendale, Mesa, Phoenix, Scottsdale, and Tempe) and operated by the City of Phoenix. Field work for the study has been completed. Recommendations in the draft report include implementing vapor phase odor control stations on the two sewer interceptors, and are under review by SROG.	<input checked="" type="checkbox"/>	Check if project performed with current firm
3.	(1) TITLE AND LOCATION <i>(City and State)</i> City of Mesa: Baseline Road Odor Control Study / Mesa AZ	(2) YEAR COMPLETED	
		Professional Services 1999	Construction (if applicable) 2001
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Served as technical director for assessment of odor problems emanating from a siphon facility serving the City of Mesa. An inefficient passive air jumper line created odor complaints from neighbors upstream and downstream of the inverted siphon. Upstream chemical addition managed to dampen the odor load at the siphon. A biofilter was designed and installed downstream of the siphon to control residual odors associated with the siphon structure.	<input type="checkbox"/>	Check if project performed with current firm
4.	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	



ATTACHMENT I – General Qualifications
ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912

STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007

City of Phoenix: Odor Control Master Plan / Phoenix AZ.	Professional Services 1988	Construction (if applicable)
(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE Developed an odor control master plan for the 23rd and 91st Avenue treatment plants and the wastewater collection system in Phoenix. Performed comprehensive field odor surveys, identified key odor sources, ranked the sources based on off-site impact potential, and recommended an immediate action plan to reduce odors quickly, and a long-range plan that proposed permanent, effective odor control. Was responsible for the design of the control technology installed at the 23rd Avenue plant and is responsible for the ongoing 91st Avenue plant odor control design. Developed model odor control strategies based on sewer conditions and odor complaints that could be applied to any similar location throughout the city's wastewater collection network.	<input type="checkbox"/> Check if project performed with current firm	
(1) TITLE AND LOCATION (<i>City and State</i>) City of Phoenix: Salt River Outfall Odor Control / Phoenix AZ.	(2) YEAR COMPLETED Professional Services 2003	
5. (3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE The SRO is a 54 to 90-in-diam relatively flat-slope sewer that is over 24 miles long and collects wastewater and reclamation facility solids from several communities as it delivers the wastewater to the 91st Avenue WWTP. The key elements of the project consisted of: [1] identifying and quantifying hydrogen sulfide (H ₂ S) and odors from the SRO sewer, [2] evaluating odor control alternatives, and [3] recommending an effective odor control strategy. Special attention was given to the selection of sample locations in order to characterize the odor/corrosion load potential from each of the communities discharging wastewater to the SRO. All of the targeted compounds were analyzed in a mobile laboratory at the sample collection sites, thereby providing instant feedback to the field team. In addition, the project team conducted jar test studies in the field to evaluate the aqueous sulfide removal capabilities of various chemicals added to the SRO sewer. The project team recommended an H ₂ S and odor control strategy within the SRO, and reduced the impact of odors released from the SRO on the adjacent communities. (#9)	<input type="checkbox"/> Check if project performed with current firm	



ATTACHMENT I – General Qualifications
ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSPO16-00005912

STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007

4. Resumes of Key Personnel Proposed for this Contract *(Complete one Section #4 for each key person.)*

a. NAME		b. ROLE IN THIS CONTRACT		c. YEARS EXPERIENCE	
Regina Shnayderman		Project Engineer / CADD		1. TOTAL 12	2. WITH CURRENT FIRM 1
d. LOCATION <i>(City and State)</i>					
Tempe, AZ					
e. EDUCATION <i>(DEGREE AND SPECIALIZATION)</i>			f. PROFESSIONAL TRAINING - REGISTRATIONS		
BS Engineering Science St. Petersburg State Polytechnic University, St. Petersburg, Russia			EIT AZ 11182		
g. OTHER PROFESSIONAL QUALIFICATIONS <i>(Organizations, Awards, etc.)</i>					

H. RELEVANT PROJECTS

1.	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	
	Chromium 6 Water Treatment Facilities Project, CVWD, Coachella, CA	Professional Services 2015	Construction (if applicable) 2017 (Projected)
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE	<input checked="" type="checkbox"/> Check if project performed with current firm	
	Ms. Shnayderman is the designer for 23 separate Strong Base Anion Well Treatment Facilities. Each treatment facility will reduce Cr6 concentrations from the well water before discharging to the distribution system.		
2.	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	
	Copper SX/EW Project, CS Mining, LLC., Utah	Professional Services 2014-2015	Construction (if applicable)
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE	<input type="checkbox"/> Check if project performed with current firm	
	Responsible for piping systems and piping equipment design, selection, and production of 2-D and 3-D drawings.		
	<ul style="list-style-type: none"> Performed pumps and piping systems calculations using PipeFlo program. Performed pumps selection based on calculations results and to ensure equipment compliance with project requirements. Worked on water, slurry and other liquid distribution and storage design. Developed preliminary tank design based on project and industry codes requirements. Reviewed vendors' drawings for pumps, tanks, valves, safety showers, and other project equipment to evaluate and select equipment suitable for project specification. Worked with procurement department to complete equipment quotes, purchase orders, technical bid analysis and other reports. Developed engineering specification for project construction and equipment based on master specification, industry regulations and project design criteria. Prepared piping drawings in coordination with civil plans, structural drawings, P&ID and construction schedules. Performed pipe sizing and piping materials selections based on engineering calculations and product requirements. Created 3D models, 2D layouts, ISO-drawings and details drawings for piping and pumping systems utilizing Auto CAD-2014 and CADWorx, Plant3D, Revit 2014, Navisworks. 		
3.	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	
	Greens Creek Mine, Hecla Mining Company, Alaska	Professional Services 2014-2015	Construction (if applicable)
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE	<input type="checkbox"/> Check if project performed with current firm	
	Responsible for piping systems and piping equipment design, selection, and production of 2-D and 3-D drawings.		
	<ul style="list-style-type: none"> Performed pumps and piping systems calculations using PipeFlo program. Performed pumps selection based on calculations results and to ensure equipment compliance with project requirements. Worked on water, slurry and other liquid distribution and storage design. Developed preliminary tank design based on project and industry codes requirements. Reviewed vendors' drawings for pumps, tanks, valves, safety showers, and other project equipment to evaluate and select equipment 		



ATTACHMENT I – General Qualifications

**ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSPO16-00005912**

**STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007**

suitable for project specification.

- Worked with procurement department to complete equipment quotes, purchase orders, technical bid analysis and other reports.
- Developed engineering specification for project construction and equipment based on master specification, industry regulations and project design criteria.
- Prepared piping drawings in coordination with civil plans, structural drawings, P&ID and construction schedules.
- Performed pipe sizing and piping materials selections based on engineering calculations and product requirements.
- Created 3D models, 2D layouts, ISO-drawings and details drawings for piping and pumping systems utilizing Auto CAD-2014 and CADWorx, Plant3D, Revit 2014, Navisworks.

(1) TITLE AND LOCATION (*City and State*)

Morelos Tailing Project, Minera Media Luna, Mexico

(2) YEAR COMPLETED

Professional Services
2014

Construction (if applicable)

(3) BRIEF DESCRIPTION (*Brief scope, size, cost, etc.*) AND SPECIFIC ROLE

Check if project performed with current firm

Responsible for piping systems and piping equipment design, selection, and production of 2-D and 3-D drawings.

4.

- Performed pumps and piping systems calculations using PipeFlo program.
- Performed pumps selection based on calculations results and to ensure equipment compliance with project requirements.
- Worked on water, slurry and other liquid distribution and storage design.
- Developed preliminary tank design based on project and industry codes requirements.
- Reviewed vendors' drawings for pumps, tanks, valves, safety showers, and other project equipment to evaluate and select equipment suitable for project specification.
- Worked with procurement department to complete equipment quotes, purchase orders, technical bid analysis and other reports.
- Developed engineering specification for project construction and equipment based on master specification, industry regulations and project design criteria.
- Prepared piping drawings in coordination with civil plans, structural drawings, P&ID and construction schedules.
- Performed pipe sizing and piping materials selections based on engineering calculations and product requirements.
- Created 3D models, 2D layouts, ISO-drawings and details drawings for piping and pumping systems utilizing Auto CAD-2014 and CADWorx, Plant3D, Revit 2014, Navisworks.

(1) TITLE AND LOCATION (*City and State*)

(2) YEAR COMPLETED

Professional Services

Construction (if applicable)

(3) BRIEF DESCRIPTION (*Brief scope, size, cost, etc.*) AND SPECIFIC ROLE

Check if project performed with current firm

5.



ATTACHMENT I – General Qualifications

**ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912**

**STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007**

4. Resumes of Key Personnel Proposed for this Contract *(Complete one Section 4 for each key person.)*

a. NAME Jack C. Kiefer, Ph.D.	b. ROLE IN THIS CONTRACT Resources, Economics and Planning	c. YEARS EXPERIENCE	
		1. TOTAL 23	2. WITH CURRENT FIRM 7
d. LOCATION <i>(City and State)</i> Marion, IL			
e. EDUCATION <i>(DEGREE AND SPECIALIZATION)</i> PhD Southern Illinois University, Geography MA Southern Illinois University, Monetary Economics, Development Economics BA Southern Illinois University, Economics		f. PROFESSIONAL TRAINING - REGISTRATIONS	

g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)*

Professional Activities

American Water Works Association
American Water Resources Association

Selected Publications

Analysis of Changes in Water Use under Regional Climate Change Scenarios. 2013. J. Kiefer, J. Clayton, B. Dziegielewski, and J. Henderson. Copyright © Water Research Foundation, Denver.

“Appropriate Design and Evaluation of Water Use and Conservation Metrics and Benchmarks”. 2010. B. Dziegielewski and J. Kiefer. *Journal of the American Water Works Association*, Volume 102, No. 6.

Water Conservation Measurement Metrics. 2010. B. Dziegielewski and J. Kiefer. American Water Works Association, Denver CO. Copyright © American Water Works Association, Ben Dziegielewski, Jack C. Kiefer. All Rights Reserved.

U.S. Water Demand, Supply and Allocation: Trends and Outlook. B. Dziegielewski and J. Kiefer. 2007. IWR Report 2007-R-03, Institute for Water Resources, Alexandria, Virginia.

H. RELEVANT PROJECTS

	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	
		Professional Services	Construction (if applicable)
1.	Water Research Foundation Project 4458, Water Demand Forecasting in Uncertain Times: Isolating the effects of the Great Recession (National/Denver, CO)	Ongoing	
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE This project is evaluating the impact of the recent economic downturn on water demand, which includes 10 utility participants. The project will develop case studies to examine how economic pressures affect demand and how economic indicators may be used to improve water demand forecasting. In addition, a broad national survey of utilities will be undertaken to gain perspectives and observations on recession impacts at large. (Specific Role: Principal Investigator; Budget: \$360,000; to be completed fall 2015)	<input checked="" type="checkbox"/>	Check if project performed with current firm
2.	Water Research Foundation Project 4735, Methodology for Determining Baseline Commercial, Institutional and Industrial End Uses of Water (National/Denver, CO)	Ongoing	
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE This project is defining best practices for evaluating water use in the CII sector for the purposes of forecasting, rate-making, water budgeting, and efficiency planning. The methodology will prescribe sources of information, classification, and survey techniques for estimating water use patterns in the heterogeneous CII sector. (Specific Role: Principal Investigator; Budget: \$225,000; to be completed spring 2015)	<input checked="" type="checkbox"/>	Check if project performed with current firm
3.	Enhancements to New York City's Long-Term Water Demand Forecasting Model, New York City Department of Environmental Protection (New York, New York)	Professional Services May 2014	Construction (if applicable)



ATTACHMENT I – General Qualifications

**ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSPO16-00005912**

**STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007**

	<p>(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE</p> <p>This project made incremental improvements to NYC DEP's long-term water demand forecasting model to incorporate key future trends and uncertainties related to water efficiency and climate. The updated model included a water efficiency index, climatic variables, and residual variance factors at both annual and monthly time steps, which supports development of multiple forecast scenarios. (Specific Role: Technical Director; Budget: \$292,200)</p>	<p><input checked="" type="checkbox"/> Check if project performed with current firm</p>		
<p>4.</p>	<p>(1) TITLE AND LOCATION (<i>City and State</i>)</p> <p>Water Demand Management Plan, Tampa Bay Water, FL</p> <p>(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE</p> <p>The focus of Tampa Bay Water's Water Demand Management Plan (DMP) was to identify achieved water savings from both natural plumbing replacement and active utility-sponsored programs and to estimate the potential and net economic benefits from additional future investments in water conservation as an alternative source of water supply. The project involved the matching of parcel data to water customer billing information across all customers served in the region, including the mapping of Florida Department of Revenue classifications to CII customers, and cost-effectiveness analysis and ranking of alternative programs. (Specific Role: Project Manager; Budget: \$1,015,370)</p>	<p>(2) YEAR COMPLETED</p> <table border="1"> <tr> <td>Professional Services Dec 2013</td> <td>Construction (if applicable)</td> </tr> </table> <p><input checked="" type="checkbox"/> Check if project performed with current firm</p>	Professional Services Dec 2013	Construction (if applicable)
Professional Services Dec 2013	Construction (if applicable)			
<p>5.</p>	<p>(1) TITLE AND LOCATION (<i>City and State</i>)</p> <p>Water Research Foundation Project 4263, Analysis of Changes in Water Use under Regional Climate Change Scenarios (National/Denver, CO)</p> <p>(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE</p> <p>This study investigated potential impacts of climate change on water demand and principal urban water sector. The study reviewed and developed methods for modeling the connection of weather to water use and demand variability, as well as methods for demand forecasting that can incorporated climate change forecasts. The study developed 6 case studies to estimate the potential impact of climate change using regionally downscaled climate scenarios. (Specific Role: Principal Investigator; Budget: \$360,000)</p>	<p>(2) YEAR COMPLETED</p> <table border="1"> <tr> <td>Professional Services Dec 2013</td> <td>Construction (if applicable)</td> </tr> </table> <p><input checked="" type="checkbox"/> Check if project performed with current firm</p>	Professional Services Dec 2013	Construction (if applicable)
Professional Services Dec 2013	Construction (if applicable)			



ATTACHMENT I – General Qualifications
ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912

STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007

4. Resumes of Key Personnel Proposed for this Contract *(Complete one Section #4 for each key person.)*

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
Victor H. Panez	CADD Designer	1. TOTAL 16	2. WITH CURRENT FIRM 1
d. LOCATION <i>(City and State)</i>			
Tempe, AZ			
e. EDUCATION <i>(DEGREE AND SPECIALIZATION)</i>		f. PROFESSIONAL TRAINING - REGISTRATIONS	
Associate of Occupational Studies Degree Drafting/CAD Technology, 1999			
g. OTHER PROFESSIONAL QUALIFICATIONS <i>(Organizations, Awards, etc.)</i>			
Accomplished, results-oriented CAD technician with over 15 years of expertise in the consulting field providing 3D CAD Design and CAD Coordination services for projects throughout Arizona. Experienced in AutoCAD, AutoCAD MEP, MicroStation and OpenPlant Piping system. Currently working as Lead CAD coordinator and drawings manager for several projects with the Scottsdale Office of Water Works Engineers.			

H. RELEVANT PROJECTS

1.	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	
	Water System Improvements, Globe AZ	Professional Services 2015	Construction (if applicable) 2016
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE	<input checked="" type="checkbox"/> Check if project performed with current firm	
Designer, providing study, design, and construction phase services for a variety of water system improvements, including field investigations (flow and pressure monitoring), hydraulic modeling, and identification of system improvements to create a new pressure zone; detailed design of Phase 1 improvements to split the zone; and conceptual layout of Phase 2 improvements to improve flow conditions and pressure in isolated pockets; and construction administration services including ESDC and construction inspection.			
2.	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	
	Chromium 6 Water Treatment Facilities Project, CVWD, Coachella, CA	Professional Services 2015	Construction (if applicable) 2016 (Projected)
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE	<input checked="" type="checkbox"/> Check if project performed with current firm	
This \$200 million project includes design of 23 Strong Base Anion (SBA) and 2 Weak Base Anion (WBA) Ion Exchange Treatment Plants (IXTPs) to treat water from 30 wells in the District's system; a Central Resin Regeneration Facility (CRRF), and upgrades to 3 existing arsenic treatment IXTPs. The project will be constructed through a CMAR project delivery.			
3.	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	
	JOC Booster Pump Stations – City of Phoenix, Arizona	Professional Services Ongoing	Construction (if applicable)
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE	<input type="checkbox"/> Check if project performed with current firm	
Being the lead Designer for 4 Booster Pump Stations for the City of Phoenix. Being the lead CAD Coordinator for the City of Phoenix projects. Making sure the CAD Standards are met for the City of Phoenix.			
4.	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	
	Scottsdale Water Campus AWT – Microfiltration and Reverse Osmosis – City of Scottsdale, Arizona	Professional Services 2015	Construction (if applicable) 2014
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE	<input type="checkbox"/> Check if project performed with current firm	
The 11.9mgd Water Campus Advanced Water Treatment Plant (AWT). I took the lead in finishing the RECORD Drawings for the City of Scottsdale and made sure the City received all CAD Files and Drawings for the project's completion.			



ATTACHMENT I – General Qualifications
ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912

STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007

4. Resumes of Key Personnel Proposed for this Contract *(Complete one Section #4 for each key person.)*

a. NAME Eric Dole	b. ROLE IN THIS CONTRACT Tech Lead – Water Treatment	c. YEARS EXPERIENCE	
		1. TOTAL 19	2. WITH CURRENT FIRM 18

d. LOCATION *(City and State)*

San Diego, CA

e. EDUCATION *(DEGREE AND SPECIALIZATION)*

BS Civil Engineer, Arizona State University, 1999

f. PROFESSIONAL TRAINING - REGISTRATIONS

Professional Engineer – Arizona (40354)

g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)*

Mr. Dole is an Associate with Hazen and Sawyer, who specializes in energy efficiency of pumps and blowers, process optimization of water/wastewater treatment systems, ZLD treatment research, and project management. He has over 15 years of experience specializing in sustainable infrastructure engineering and carbon footprint reduction. Mr. Dole is certified in various demand side management (DSM) rebate programs in Arizona.

Professional Activities

American Water Works Association
 Water Reuse Foundation

H. RELEVANT PROJECTS

1.	(1) TITLE AND LOCATION <i>(City and State)</i> Water System Improvements, Globe AZ	(2) YEAR COMPLETED	
		Professional Services 2015	Construction (if applicable) 2016
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Designer, providing study, design, and construction phase services for a variety of water system improvements, including field investigations (flow and pressure monitoring), hydraulic modeling, and identification of system improvements to create a new pressure zone; detailed design of Phase 1 improvements to split the zone; and conceptual layout of Phase 2 improvements to improve flow conditions and pressure in isolated pockets; and construction administration services including ESDC and construction inspection.	<input checked="" type="checkbox"/>	Check if project performed with current firm
2.	(1) TITLE AND LOCATION <i>(City and State)</i> Phase 1 Chromium Treatment Facilities Design and Engineering During Construction, Coachella Valley Water District, Palm Desert, CA:	(2) YEAR COMPLETED	
		Professional Services 2016	Construction (if applicable) 2019
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Design Lead for the Central Regeneration Facility that will be used to regenerate strong based anion resin from more than two dozen well treatment facilities. This 45 acre facility includes the truck loading and offloading facilities, resin storage, regeneration facilities, and associated evaporation ponds. Project development includes preliminary design and permitting, CMAR procurement, detailed design and engineering services during construction.	<input checked="" type="checkbox"/>	Check if project performed with current firm
3.	(1) TITLE AND LOCATION <i>(City and State)</i> Chromium Treatment Design for Wells 13A, AA and 1E, Indio Water Authority, Indio, CA:	(2) YEAR COMPLETED	
		Professional Services 2015	Construction (if applicable) 2015
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Design lead responsible for the design of Strong-Base Anion Exchange Treatment System for three existing wells. Design also included additional new equipment, appurtenances, grading, water piping, and valves at the well sites. The project will bring the wells into compliance with new California drinking water regulations for Chromium 6. Project development includes detailed design and engineering services during construction.	<input checked="" type="checkbox"/>	Check if project performed with current firm
4.	(1) TITLE AND LOCATION <i>(City and State)</i> City of Scottsdale Water Dept. Micro-turbine Energy Recovery Project:	(2) YEAR COMPLETED	
		Professional Services 2014	Construction (if applicable)
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Mr. Dole provided oversight of data collection and calculation needed to accurately determine the energy recovery potential of replacing the most feasible of the 400+ pressure reducing valve stations in the city with micro-turbines. Mr. Dole worked with the Federal Energy Regulatory Commission and several micro-turbine manufacturers to determine the payback logistics. As a result the study, two sites were short-listed for micro-turbine replacement of PRV stations. These sites are	<input type="checkbox"/>	Check if project performed with current firm



ATTACHMENT I – General Qualifications

ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSPO16-00005912

STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007

currently being designed for full scale installations and will be the first distribution system micro-turbine project in Arizona.

5.	(1) TITLE AND LOCATION (<i>City and State</i>)	(2) YEAR COMPLETED	
		Professional Services	Construction (if applicable)
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE	<input type="checkbox"/> Check if project performed with current firm	



ATTACHMENT I – General Qualifications
ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912

STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007

4. Resumes of Key Personnel Proposed for this Contract *(Complete one Section 4 for each key person.)*

a. NAME Charles Witt	b. ROLE IN THIS CONTRACT Technician	c. YEARS EXPERIENCE	
		1. TOTAL 3.5	2. WITH CURRENT FIRM 2
d. LOCATION <i>(City and State)</i> Tempe, AZ			
e. EDUCATION <i>(DEGREE AND SPECIALIZATION)</i> Arizona State University – Chemical Engineering expected in 2017 Palomar/MiraCosta Community College		f. PROFESSIONAL TRAINING - REGISTRATIONS N/A	

g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)*

Professional Activities
N/A

H. RELEVANT PROJECTS

	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	
		Professional Services	Construction (if applicable)
1.	Water System Improvements, Globe AZ	2015	2016
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Providing study, design, and construction phase services for a variety of water system improvements, including field investigations (flow and pressure monitoring), hydraulic modeling, and identification of system improvements to create a new pressure zone; detailed design of Phase 1 improvements to split the zone; and conceptual layout of Phase 2 improvements to improve flow conditions and pressure in isolated pockets; and construction administration services including ESDC and construction inspection.	<input checked="" type="checkbox"/>	Check if project performed with current firm
2.	West Basin Ocean Water Desalination Demonstration Facility Decommissioning Project – Redondo Beach, CA	2014	2015 (estimated)
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Lead drafter for the project. Worked with a Hazen & Sawyer design engineer for mechanical and structural disciplines developing plans for the decommissioning of a seawater desalination demonstration plant at the SeaLab in Redondo Beach, CA. Project included creating a salvage plan to demolish existing pipes and salvage existing equipment for potential buyers. The project is currently in the final design stage.	<input checked="" type="checkbox"/>	Check if project performed with current firm
3.	Newland Communities – Goodyear, AZ	2014	2016 (estimated)
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Developed preliminary design drawings of new WTP and of alternative configurations for potential future plant expansion in multiple phases. This initial phase includes evaluation and design of a new RO facility that includes, evaporation ponds, RO trains, CIP system, cartridge filters, an electrical room and control room. Phase 2 expansion would entail addition of additional RO trains. Project is currently in-planning and design for the facility is anticipated to commence in 2015. Original Fee: \$55k Original Construction Cost: \$27.8 million (Estimated)	<input checked="" type="checkbox"/>	Check if project performed with current firm
4.	Coachella Valley Water District – Coachella, CA	2014	2015-2018 (estimated)
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE The Coachella Valley Water District is planning to implement a \$300M project to add treatment for Chrome 6 based on the new California regulation of 10 PPB. Developed preliminary design drawings for alternatives evaluation and cost estimating evaluate multiple treatment technologies, including oxidation/filtration, ion exchange and surface water importation and treatment. The project is in the planning phase and design is anticipated to commence in 2015.	<input checked="" type="checkbox"/>	Check if project performed with current firm



ATTACHMENT I – General Qualifications

ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSPO16-00005912

STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007

5.	(1) TITLE AND LOCATION (<i>City and State</i>)	(2) YEAR COMPLETED	
	West Basin Municipal Water District Operation Support – Carson, CA	Professional Services 2014	Construction (if applicable) N/A
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE	<input type="checkbox"/> Check if project performed with current firm	
	Analyzed client data as part of a performance evaluation of RO and MF systems for all West Basin facilities. Data was compiled and evaluated to provide recommendations on improving systems performance. Additional water quality and equipment performance data is currently being collected and analyzed.		



ATTACHMENT I – General Qualifications
ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912

STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007

4. Resumes of Key Personnel Proposed for this Contract *(Complete one Section 4 for each key person.)*

a. NAME Daniel B. Edwards, PE	b. ROLE IN THIS CONTRACT Instrumentation and Control Engineer	c. YEARS EXPERIENCE	
		1. TOTAL 29	2. WITH CURRENT FIRM 29
d. LOCATION <i>(City and State)</i> Raleigh, NC			
e. EDUCATION <i>(DEGREE AND SPECIALIZATION)</i> ME West Virginia Institute of Technology BSCE West Virginia Institute of Technology		f. PROFESSIONAL TRAINING - REGISTRATIONS Professional Engineer: Arizona (60250) North Carolina, Florida, Virginia, District of Columbia, Maryland, Georgia, Ohio, Michigan, Texas, Tennessee, Massachusetts	
g. OTHER PROFESSIONAL QUALIFICATIONS <i>(Organizations, Awards, etc.)</i>			

Professional Activities
 International Society for Automation
 American Water Works Association
 Water Environment Federation
 North Carolina AWWA-WEA
 Automation Committee, Past Chair
 WERF - Member of Exploratory and Issue Area Teams for Global Sensors Project

H. RELEVANT PROJECTS

1.	(1) TITLE AND LOCATION <i>(City and State)</i> Chromium 6 Water Treatment Facilities Project, CVWD, Coachella, CA	(2) YEAR COMPLETED	
		Professional Services 2015	Construction (if applicable) 2016 (Projected)
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Mr. Edwards is the instrumentation and controls engineer for the design of 10 miles of raw and finished water transmission pipelines and upgrades to multiple PRV stations. This \$200 million project includes design of 23 Strong Base Anion (SBA) and 2 Weak Base Anion (WBA) Ion Exchange Treatment Plants (IXTPs) to treat water from 30 wells in the District's system; a Central Resin Regeneration Facility (CRRF), and upgrades to 3 existing arsenic treatment IXTPs. The project will be constructed through a CMAR project delivery.	<input checked="" type="checkbox"/>	Check if project performed with current firm
2.	(1) TITLE AND LOCATION <i>(City and State)</i> SCADA System Replacement, North and South Durham WRFs Durham, NC	(2) YEAR COMPLETED	
		Professional Services 2013	Construction (if applicable) Ongoing
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Mr. Edwards supervised design services required to replace the operator interface software for both 20 mgd WRFs as part of a larger chemical feed and nutrient removal improvements project. The project featured object-oriented Human-Machine Interface software with remote thin client technology, incorporated the latest concepts in high-performance HMI application and alarm management design, and included coordination with the City's existing data management software. The BNR controls for both facilities were modified to use state-of-the-art ammonia-based dissolved oxygen control strategies. Cost of the controls portion of the project was \$2,106,000	<input checked="" type="checkbox"/>	Check if project performed with current firm
3.	(1) TITLE AND LOCATION <i>(City and State)</i> SCADA System Rockville, MD	(2) YEAR COMPLETED	
		Professional Services 2013	Construction (if applicable) Ongoing
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE Mr. Edwards was Project Manager for a SCADA system evaluation, preliminary design, and final design for the project. The project incorporated existing and future water storage tanks, pressure reducing valves, and a booster pumping station into a comprehensive SCADA system. The SCADA system allows personnel from the water treatment plant and distribution system to monitor and control these remote facilities. The design was coordinated with the City Information Technology staff to ensure all relevant standards were met. Cost of the system is approximately \$500,000.	<input checked="" type="checkbox"/>	Check if project performed with current firm
4.	(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	



ATTACHMENT I – General Qualifications

**ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912**

**STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007**

<p>SCADA System Evaluation and Design Project Cape Fear Public Utility Authority, Wilmington, NC</p>	<p>Professional Services Ongoing</p>	<p>Construction (if applicable)</p>
<p>(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE</p> <p>Mr. Edwards is currently serving as project manager for a project to evaluate and design improvements for CFPUA's SCADA systems. Under this project, Hazen and Sawyer will initially evaluate and document the Authority's existing SCADA infrastructure. Vulnerabilities in both operational and cyber-based security will be identified. The project will include working with the Authority water, wastewater, and IT staffs to develop a vision for a unified, enterprise-wide SCADA system to serve all of the utility's needs. The training needs of the Authority's staff and the potential for insourcing SCADA service and support will be assessed and recommendations made. The final phase of the project will include developing plans and specifications to implement that vision in a prioritized manner. Total costs for the recommended improvements will likely exceed \$3,000,000.</p>	<p><input checked="" type="checkbox"/> Check if project performed with current firm</p>	
<p>(1) TITLE AND LOCATION (<i>City and State</i>)</p> <p>Wastewater Pumping SCADA System Town of Cary, NC</p>	<p>(2) YEAR COMPLETED</p> <p>Professional Services 2013</p> <p>Construction (if applicable) Procurement Underway</p>	
<p>5. (3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE</p> <p>Mr. Edwards was Project Manager for the design of the project which included new remote telemetry units (RTUs) and cellular communications at eight Tier 1 pumping stations, along with the electrical and control work necessary to provide the desired monitoring and control functions. This project provides the basic infrastructure for a future Town-wide SCADA system for 43 wastewater pumping stations. The system architecture is based on the latest version of Wonderware System Platform and was closely coordinated with the control system for a major regional wastewater treatment facility. Cost of the system is \$980,000.</p>	<p><input checked="" type="checkbox"/> Check if project performed with current firm</p>	



ATTACHMENT I – General Qualifications
ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912

STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007

4. Resumes of Key Personnel Proposed for this Contract (Complete one Section 4 for each key person.)

a. NAME Gerald J. Ratasky, PE	b. ROLE IN THIS CONTRACT Electrical Engineer	c. YEARS EXPERIENCE	
		1. TOTAL 38	2. WITH CURRENT FIRM 20
d. LOCATION (City and State) Raleigh, NC			
e. EDUCATION (DEGREE AND SPECIALIZATION) BSEE University of Toledo		f. PROFESSIONAL TRAINING - REGISTRATIONS Professional Engineer: Arizona (57733), California, North Carolina, Texas, South Carolina, Virginia, Maryland, District of Columbia, Georgia, Florida, Ohio, Michigan, Illinois, Pennsylvania, Minnesota	
g. OTHER PROFESSIONAL QUALIFICATIONS (Organizations, Awards, etc.) Professional Activities International Society for Automation, Senior Member			

H. RELEVANT PROJECTS

1.	(1) TITLE AND LOCATION (City and State) Chromium 6 Water Treatment Facilities Project, CVWD, Coachella, CA	(2) YEAR COMPLETED	
		Professional Services 2015	Construction (if applicable) 2016 (Projected)
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE Mr. Ratasky is the electrical engineer for the design of 10 miles of raw and finished water transmission pipelines and upgrades to multiple PRV stations. This \$200 million project includes design of 23 Strong Base Anion (SBA) and 2 Weak Base Anion (WBA) Ion Exchange Treatment Plants (IXTPs) to treat water from 30 wells in the District's system; a Central Resin Regeneration Facility (CRRF), and upgrades to 3 existing arsenic treatment IXTPs. The project will be constructed through a CMAR project delivery.	<input checked="" type="checkbox"/>	Check if project performed with current firm
2.	(1) TITLE AND LOCATION (City and State) Thomas P. Smith WRF Improvements Project, City of Tallahassee, FL	(2) YEAR COMPLETED	
		Professional Services 2011	Construction (if applicable) Ongoing
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE Mr. Ratasky directed the electrical design of the project at the 26.5-mgd facility. Major process facilities include new headworks, primary clarifiers, activated sludge upgrades for AWT nutrient removal, denitrification filters, anaerobic digestion, centrifuge dewatering, and thermal sludge drying. The electrical design included a complete renovation of the power distribution system. Dual utility supplies provide power to a new 15kV Class switchgear assembly with provisions for future standby generators. The new switchgear supplies power to low voltage power distribution and motor control equipment to support all the new process facilities. The project design team used AutoCAD 3D for new structures and for modeling the yard piping and electrical ductbanks. All motor control centers were designed as Intelligent MCCs utilizing Devicenet for communication with the PLC. Wireless network points were installed throughout the plant for utilization of wireless pen tablets for process control. Cost: \$180M – estimated. Status: Construction is expected to be complete in 2015.	<input checked="" type="checkbox"/>	Check if project performed with current firm
3.	(1) TITLE AND LOCATION (City and State) East Central Regional WRF Biosolids Improvements, City of West Palm Beach, FL	(2) YEAR COMPLETED	
		Professional Services Ongoing	Construction (if applicable)
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE Mr. Ratasky is directing the electrical design of the biosolids improvements at the 70-mgd facility. The project includes upgrade of an existing gravity belt thickening facility, new waste activated sludge storage with PD blowers, installation of six new anaerobic digesters and associated equipment, five new dewatering centrifuges, new septage and FOG receiving stations, and conversion of an existing aerobic digester to an aeration basin. The electrical system design includes modifications to the main power distribution system. New 5kV class switchgear was provided to supply the digester, dewatering, and thickening facilities. The new 5kV switchgear is supplied from the existing main power distribution switchgear lineup, which is connected to dual utility supplies and standby turbine generators. The new switchgear supplies power to low voltage power distribution and motor control equipment to support all the new process facilities. Cost: \$90M - estimated. Status: Construction has not started yet but is expected to be complete in 2016.	<input checked="" type="checkbox"/>	Check if project performed with current firm
4.	(1) TITLE AND LOCATION (City and State)	(2) YEAR COMPLETED	



ATTACHMENT I – General Qualifications
ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912

STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007

Southwest WWTP High Level Disinfection Improvements, City of Sunrise, FL	Professional Services 2013	Construction (if applicable) Ongoing		
<p>(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE</p> <p>Mr. Ratasky directed the electrical design for the project at the 0.99-mgd facility, which included a new main electrical building to house the new low voltage power distribution and motor control equipment. The new low voltage power circuit breaker switchgear serves as the plant's new service entrance equipment and will supply all new and existing loads in the plant. One new diesel-fueled standby generator set and provisions for a second machine are incorporated into the electrical design. Cost: \$20M - estimated. Status: Construction is expected to be complete in 2016.</p>	<input checked="" type="checkbox"/> Check if project performed with current firm			
<p>(1) TITLE AND LOCATION (<i>City and State</i>)</p> <p>Granite City Water Treatment Facility Clearwell Addition, Illinois American Water, Granite City, Il</p>	<p align="center">(2) YEAR COMPLETED</p> <table border="1"> <tr> <td data-bbox="933 619 1226 682">Professional Services 2013</td> <td data-bbox="1226 619 1469 682">Construction (if applicable) 2013</td> </tr> </table>		Professional Services 2013	Construction (if applicable) 2013
Professional Services 2013	Construction (if applicable) 2013			
<p>5. (3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE</p> <p>Mr. Ratasky directed the design of electrical improvements for the addition of a 2.5-mgd clearwell to serve the 15-mgd WTF. This was a design-build project. Cost: \$9,590,000.</p>	<input checked="" type="checkbox"/> Check if project performed with current firm			



ATTACHMENT I – General Qualifications
ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912

STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007

4. Resumes of Key Personnel Proposed for this Contract (Complete one Section 4 for each key person.)

a. NAME Adam D. Overbay, PE, SE	b. ROLE IN THIS CONTRACT Structural Engineer	c. YEARS EXPERIENCE	
		1. TOTAL 18	2. WITH CURRENT FIRM 17
d. LOCATION (City and State) Charlotte, NC			
e. EDUCATION (DEGREE AND SPECIALIZATION) MCE North Carolina State University BSCE North Carolina State University		f. PROFESSIONAL TRAINING - REGISTRATIONS Professional Engineer: Arizona (57509), California, North Carolina, South Carolina, Georgia, Virginia, Indiana, Iowa, Delaware, Pennsylvania, Tennessee, New York, Florida Structural Engineer: California, Illinois	
g. OTHER PROFESSIONAL QUALIFICATIONS (Organizations, Awards, etc.) Professional Activities American Concrete Institute, ACI Committee 350, Environmental Engineering Concrete Structures - Associate Member American Institute of Steel Construction International Concrete Repair Institute American Society of Civil Engineers			

H. RELEVANT PROJECTS

1.	(1) TITLE AND LOCATION (City and State) Chromium 6 Water Treatment Facilities Project, CVWD, Coachella, CA	(2) YEAR COMPLETED	
		Professional Services 2015	Construction (if applicable) 2016 (Projected)
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE Mr. Overbay is the structural engineer for the design of 10 miles of raw and finished water transmission pipelines and upgrades to multiple PRV stations. This \$200 million project includes design of 23 Strong Base Anion (SBA) and 2 Weak Base Anion (WBA) Ion Exchange Treatment Plants (IXTPs) to treat water from 30 wells in the District's system; a Central Resin Regeneration Facility (CRRF), and upgrades to 3 existing arsenic treatment IXTPs. The project will be constructed through a CMAR project delivery.	<input checked="" type="checkbox"/> Check if project performed with current firm	
2.	(1) TITLE AND LOCATION (City and State) Muddy Creek Wastewater Treatment Plant – Clarifier Upgrades Winston-Salem, NC	(2) YEAR COMPLETED	
		Professional Services 2012	Construction (if applicable) 2014
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE The upgrades at Muddy Creek involved the design and construction of a new 125' diameter reinforced concrete clarifier, upgrades to existing tanks, an expansion to the plant distribution structure, and the addition of precast and metal buildings to the site. We also designed repairs to failing prestressed concrete pipe. Mr. Overbay was the lead structural engineer (EOR). Total project cost was \$12M.	<input checked="" type="checkbox"/> Check if project performed with current firm	
3.	(1) TITLE AND LOCATION (City and State) Improvements and Upgrades to the Irwin Creek Wastewater Treatment Plant Charlotte, NC	(2) YEAR COMPLETED	
		Professional Services 2012	Construction (if applicable) 2014
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE The Irwin Creek project was a significant expansion of an 80 year old WWTP. The project involved the construction of a new electrical building, reinforced concrete tank, and generator building. It also included major renovations to the Influent Pump Station and other site structures. These renovations included condition assessment and concrete repair. Mr. Overbay was the lead structural engineer (EOR). Total project cost was \$20.9M.	<input checked="" type="checkbox"/> Check if project performed with current firm	
4.	(1) TITLE AND LOCATION (City and State) Oxygen Plant Demolition at Plant No. 2 Huntington Beach, CA	(2) YEAR COMPLETED	
		Professional Services 2014	Construction (if applicable) 2015



ATTACHMENT I – General Qualifications

**ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912**

**STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007**

	<p>(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE</p> <p>Mr. Overbay served as the lead structural engineer for this project which will remove disused Air Separation Facilities. Mr. Overbay's role included evaluating the existing structure for revisions to equipment and designing and detailing required strengthening of the existing building support system. Total project cost is \$1.5 M.</p>	<input checked="" type="checkbox"/> Check if project performed with current firm		
5.	<p>(1) TITLE AND LOCATION (<i>City and State</i>)</p> <p>Noman Cole Pollution Control Plant – Dry Ash Handling System Improvements Fairfax County, VA</p> <p>(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE</p> <p>Mr. Overbay led the structural design (EOR) of the modifications to the existing structures. These modifications included constructing a reinforced concrete and steel frame inside the existing multistory building to support pumps on an elevated floor. The project also included the design of strengthening to allow the additions of large openings to existing masonry walls. Total project cost is \$3.9M.</p>	<p>(2) YEAR COMPLETED</p> <table border="1"> <tr> <td data-bbox="938 520 1237 571">Professional Services 2013</td> <td data-bbox="1237 520 1477 571">Construction (if applicable) 2015</td> </tr> </table> <input checked="" type="checkbox"/> Check if project performed with current firm	Professional Services 2013	Construction (if applicable) 2015
Professional Services 2013	Construction (if applicable) 2015			



ATTACHMENT I – General Qualifications

**ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912**

**STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007**

5. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present no more than five (5) projects. Complete one Section 5 for each project.)

a. TITLE AND LOCATION <i>(City and State)</i>	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION <i>(If applicable)</i>
Water System Improvements, Globe AZ	2016	2016

23. PROJECT OWNER'S INFORMATION

c. PROJECT OWNER	d. ORIGINAL BUDGET/NTE AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
City of Globe, AZ	Original Fee: \$158,582 / Total D/B: \$653,870	D/B: 90%, On Budget

f. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT *(include scope, size, and length of project)*

The City of Globe contracted with Mortensen Construction and Hazen and Sawyer as a design build team to evaluate the City's distribution system and design improvements to re-create a lower pressure zone in the central core of the City. The evaluation includes:

- Developing and performing a field pressure and flow logging program to confirm the appropriate locations and sizing of PRVs to form the pressure zone.
- Modeling / desk top analysis to confirm system needs and identify the appropriate solution for the pressure zone.
- Development of a basis of design memorandum summarizing the evaluation and proposed improvements.
- Performing wire-to-water testing to evaluate energy improvements related to the project in order to confirm eligibility for utility (APS) rebates.
- Detailed design of the recommended improvements, including a combination of abandoning or replacing existing PRVs and installation of new PRVs at more optimal locations.
- Engineering services during construction, including shop drawing reviews, responding to RFI and field inspections.
- Project completion and close out services including O&M manual compilation, developing a plan of system cut-over, developing WIFA funding documentation, as-built drawings and updates to the hydraulic model.



As a separate task, Hazen also performed additional modeling evaluation to support a parallel design build project for construction of two 1 MG storage tanks in the system. The evaluation identified appropriate system storage volume and storage siting and resulted in the elimination of one tank, saving the City at least \$500,000. The results of this evaluation were summarized in a separate technical memorandum.

Both of these projects are being paid for with WIFA funding. This funding is only available through December 31, 2015 and thus it is critical that these projects proceed in a timely manner to allow for construction completion by the end of this year.



ATTACHMENT I – General Qualifications

**ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912**

**STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007**

5. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present no more than five (5) projects. Complete one Section 5 for each project.)

a. TITLE AND LOCATION <i>(City and State)</i>	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION <i>(If applicable)</i>
Odor Control Study, Green Valley, AZ	2016	N/A

23. PROJECT OWNER'S INFORMATION

c. PROJECT OWNER	d. ORIGINAL BUDGET/NTE AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
Freeport McRowan, Sierrita Mine	\$40,000	25%, Under Budget

f. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and length of project)

Hazen worked on a team of engineers studying odor complaints from a local community. The evaluation included evaluating the release of odors from the mining operation, identification of key odor sources, and working with the regulatory agency to keep them informed of steps that were being taken to understand the nuisance odor issues at the facility.





ATTACHMENT I – General Qualifications
ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912

STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007

5. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present no more than five (5) projects. Complete one Section 5 for each project.)

a. TITLE AND LOCATION <i>(City and State)</i>	b. YEAR COMPLETED	
Estrella Mountain Ranch Southern Solutions Water Supply Project, Goodyear, Arizona	PROFESSIONAL SERVICES 2014 (Preliminary Design)	CONSTRUCTION <i>(If applicable)</i>

23. PROJECT OWNER'S INFORMATION

c. PROJECT OWNER	d. ORIGINAL BUDGET/NTE AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
Newland Communities, City of Goodyear, Arizona	Original Fee: \$55k Original Construction Cost: \$27.8 million (Estimated)	Total Fee: \$55,000, 100% Complete, on Budget (Preliminary Design) Total Construction Cost: 0% Complete, on Budget

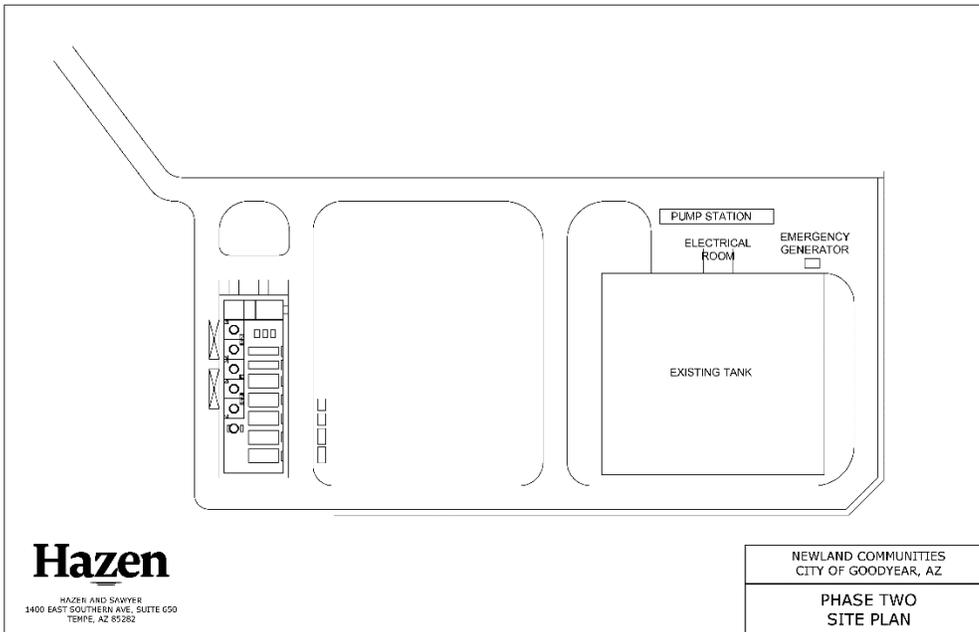
f. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and length of project)

Hazen and Sawyer has completed a feasibility study and preliminary design report for the Southern Solutions Water Supply Project to provide potable water to the Estrella Mountain Ranch Community within Goodyear, Arizona. The next phase of the project is anticipated to begin in early 2016 and include the design of a 2 MGD Reverse Osmosis system treating groundwater in southern Goodyear to remove nitrate, arsenic and fluoride. The overall project includes wellhead pumping stations, 7 miles of raw water and concentrate pipelines and a semi-enhanced evaporation pond system for managing the brine from the facility. Hazen will be responsible for the RO facility design. The project includes permitting and assistance with coordination of City of Goodyear standards.

REFERENCE:
Pete Teiche
Newland Project Manager
602-468-0800

Bill Olson
Division Manager
602-618-9700

KEY TEAM MEMBERS:
Kevin Alexander
Troy Walker
Silvana Ghiu
Jacqueline Rhoades



Hazen

HAZEN AND SAWYER
 1400 EAST SOUTHERN AVE, SUITE 650
 TEMPE, AZ 85282

NEWLAND COMMUNITIES
 CITY OF GOODYEAR, AZ

**PHASE TWO
 SITE PLAN**



ATTACHMENT I – General Qualifications

**ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912**

**STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007**

5. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present no more than five (5) projects. Complete one Section 5 for each project.)

a. TITLE AND LOCATION <i>(City and State)</i> Wastewater On-Call, Camp Verde, AZ	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION <i>(If applicable)</i>

23. PROJECT OWNER'S INFORMATION

c. PROJECT OWNER The Town of Camp Verde, AZ	d. ORIGINAL BUDGET/NTE AMOUNT OF PROJECT \$100,000	e. TOTAL COST OF PROJECT 0%, On Budget
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f. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and length of project)

Hazen was recently selected for an on-call assignment to provide wastewater engineering services on an as-needed basis for three years from 2016 through 2018. This on-call project continues a relationship that began when Hazen team member Doug Kobrick was working as the Town's on-call engineer as an independent consultant. As with Doug's earlier work, assignments are anticipated to include one or all of the study, design and construction phase of each task.





ATTACHMENT I – General Qualifications
ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912

STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007

5. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present no more than five (5) projects. Complete one Section 5 for each project.)

a. TITLE AND LOCATION <i>(City and State)</i>	b. YEAR COMPLETED	
Technical Support for City of Phoenix Water Demand Management Planning, Phoenix, Arizona	PROFESSIONAL SERVICES 2010	CONSTRUCTION <i>(If applicable)</i>

23. PROJECT OWNER'S INFORMATION

c. PROJECT OWNER	d. ORIGINAL BUDGET/NTE AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
City of Phoenix, Arizona	Original Fee: \$650,000	Total Fee: \$650,000

g. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS

REFERENCE:

*Adam Q. Miller
 Planner III - Water Resources
 (602) 262-4575*

KEY TEAM MEMBERS:

Jack Kiefer

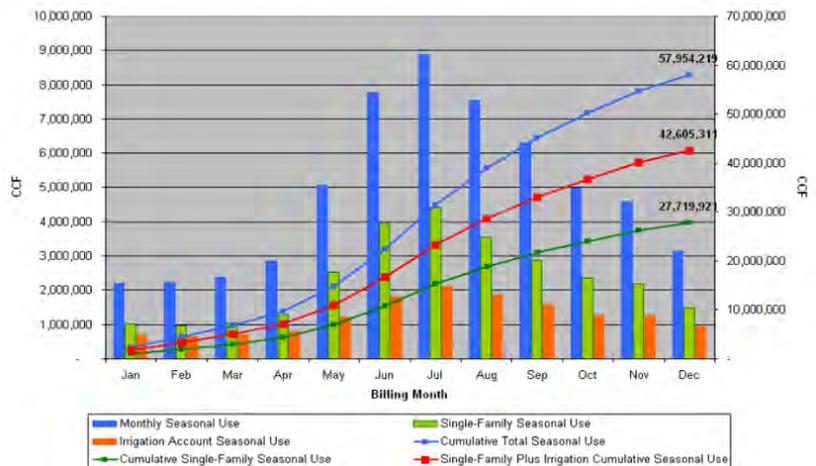
CONTRACT (include scope, size, and length of project)

The City of Phoenix Water Services Department is one of the largest municipal water providers in the southwestern United States, serving about 1.5 million water customers. The City retained Hazen and Sawyer to provide analytical support for the development of its Water Demand Management Plan. This support focused on both long-term water efficiency and water savings potential stemming from acute water shortages.

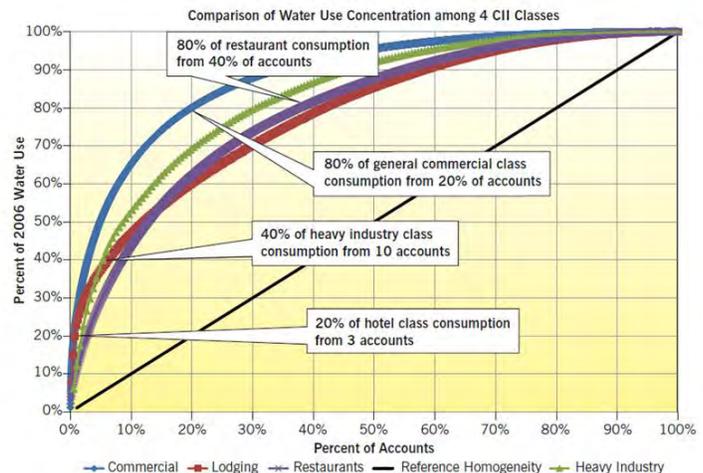
In support of the Plan, Hazen and Sawyer profiled water use trends among 34 type user classifications, focusing on time-series and cross-sectional analysis of variance in per account water use. Thirteen years of monthly consumption records were processed for over 400,000 customer accounts. The data supported water use analyses with respect to:

- Distributional analysis of average water use by sector by month and year, including percentiles and variance measures
- Identification and isolation of irrigation meter consumption to permit more flexible definitions of customers and estimation of outdoor use
- Time series and cross-sectional evaluation of outdoor/irrigation usage and the related potential for water savings from curtailing irrigation in specific sectors
- Seasonal variation due to weather fluctuations stemming from base climate and observed weather conditions, including regression models
- Evaluation of time trends in meter sizes and zero consumption meter readings
- Analysis of recent rate increases and estimates of price elasticity by season
- Examination of differences in price response among low and high water users
- Assessment of the concentration of water use among high users by water use sector, both inclusive and exclusive of dedicated irrigation meters
- Trends in customer preferences for grass landscaping and pool

Monthly and Cumulative Estimates of Seasonal Water Use Quantities 2006 (C.C.F)



Support to Water Services included comprehensive evaluations of seasonal use for the purposes of evaluating curtailment potential from watering restrictions should such acute conditions occur.



Profiling of commercial, industrial, and institutional water users included the development of concentration curves and identification of consistently high water users for specific customer segments.



ATTACHMENT I – General Qualifications

ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912

STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007

installation

A multi-period distributional analysis procedure was developed to identify and sample large users for further analysis. The algorithm is capable of identifying consistently high water users in any particular customer class over any defined time period and was used to identify water efficiency potential, particularly in the nonresidential sector.

An important part of the project was the implementation of customer surveys to gather information that could help characterize trends in water use and to better define customers within given classifications. In collaboration with the City, survey instruments were developed and implemented for the General Commercial, Restaurant, Lodging, and Apartment sectors. In conjunction with matching customer water use information, the surveys identified end use, property, and operational characteristics that were highly correlated with trends in water use. A novel application of fuzzy logic was performed to support the identification and matching of customers and addresses across disparate databases, which were then used for survey implementation. Selected findings were presented at the national-level WaterSmart Innovations conference, including:

- Comprehensive Water Use and Customer Characterization for Efficiency and Shortage Planning (WaterSmart Innovations 2009)
- Implications of the Systematic Integration of Water Efficient Technology (WaterSmart Innovations 2010)



The analyses undertaken in support of Water Services by Hazen and Sawyer identified multiple factors leading to trends in water use.



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6. ADDITIONAL INFORMATION

a. PROVIDE ANY ADDITIONAL INFORMATION YOU FEEL MAY BE NECESSARY TO DESCRIBE YOUR FIRMS QUALIFICATIONS. (ATTACH ADDITIONAL SHEETS AS NEEDED.)

Hazen acknowledges the receipt of Amendment #1 on 12/11/2015.

Federal Tax Identification number: 13-2904652

Additional information has been attached to this submittal.

7. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS

a. Percentage of Total Work Attributable to State, Federal and Municipal Government Work:	98%
b. Percentage of Total Work Attributable to Non-Government Work:	2%

8. AUTHORIZED REPRESENTATIVE. The foregoing is a statement of facts.

Signature: *Kevin Alexander*

Date: December 21, 2015

Name: Kevin Alexander, PE

Title: Vice President