Offer and Acceptance

SOLICITATION NO.: ADSPO16-00005912 Request for Qualifications: 2016 Annual Professional Services List

PAGE 1 OF 1

Offeror: Engineering & Geologic Water & Wastewater Services, LLC

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

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.

Engineering & Geologic Water & Wastewater Services,LLC
Company Name

dba Fluid Solutions
~~2727 N Third Street, Ste 300~~
Address

Phoenix | AZ | 85004
City | State | Zip

sharden@flusol.com
Contact Email Address

Signature of Person Authorized to Sign Offer

Norman W. Fain, III
Printed Name

Member
Title

Phone: 602 707-7777

Fax: 602 707-7778

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 X **IS/ ___ 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. ADSPO16-00005912.

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, contact release document or written notice to proceed.

State of Arizona Awarded this 29 **day of** February **20** 16

Procurement Officer

Offer and Acceptance

SOLICITATION NO.: ADSPO16-00005912 Request for Qualifications: 2016 Annual Professional Services List

PAGE 1 OF 1

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State of Arizona Awarded this 29 **day of** February **20** 16

Procurement Officer

	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

(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:	Engineering & Geologic Water & Wastewater Services, LLC dba Fluid Solutions
b. FIRM (OR BRANCH OFFICE) STREET:	2727 N Third Street, Ste 300
c. FIRM (OR BRANCH OFFICE) CITY:	Phoenix
d. FIRM (OR BRANCH OFFICE) STATE:	AZ
e. FIRM (OR BRANCH OFFICE) ZIP CODE:	85004

f. YEAR ESTABLISHED:	1998

(g1). OWNERSHIP - TYPE:	LLC
(g2) OWNERSHIP - SMALL BUSINESS STATUS:	Yes

h. POINT OF CONTACT NAME AND TITLE:	Norm Fain, III; Member, Principal Engineer
i. POINT OF CONTACT TELEPHONE NUMBER:	602-707-7777
j. POINT OF CONTACT E-MAIL ADDRESS:	nfain@flusol.com

k. NAME OF FIRM *(If block 1a is a branch office)*:	

2. EMPLOYEES BY DISCIPLINE

a. Discipline Title	b. Function: Primary (P) or Secondary (S)	c. No. of Employees - Firm	d. No. of Employees - Branch
CADD Technician	P	1	
Civil Engineer	P	1	
Construction Manager	S	1	
Environmental Engineer	S	1	
Sanitary Engineer	P	1	
Technician/Analyst	P	1	
Water Resources Engineer	S	1	
Total		4	

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

a. Approximate No. of Projects	b. Experience	c. Revenue Index Number *(see below)*
14	Codes; Standards; Ordinances	2
2	Conservation and Resource Management	1
7	Construction Management	1
16	Cost Estimating; Cost Engineering and Analysis; Parametric	2
4	Design-Build – Preparation of Requests For Proposals	1
9	Forensic Engineering	2
11	Hydraulics and Pneumatics	2
6	Infrastructure	1
8	Pipelines (Cross-Country – Liquid and Gas)	2
9	Plumbing and Piping Design	2
2	Sewage Collection, Treatment and Disposal	1
5	Specifications Writing	1
11	Water Resources; Hydrology; Ground Water	1
4	Water Supply; Treatment and Distribution	1
2	Waste Water Treatment Facility	1
8	Water Well Rehabilitation; Water Well Work	1

PROFESSIONAL SERVICES REVENUE INDEX NUMBER

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

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
Norm Fain, III	Principal Engineer	31	17

d. LOCATION *(City and State)*
Fluid Solutions, Phoenix, AZ

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. PROFESSIONAL TRAINING - REGISTRATIONS
B. Sc., Civil Engineering Technology Northern AZ University, 1984	Professional Engineer, Civil, Arizona (#25969) 1992 Licensed General Engineering Contractor, Arizona (#127525) 1998

g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)*
Publications: "Wastewater A Resource"; Arizona/Nevada Academy of Science
"The Future of Wastewater in Goodyear Arizona – Treatment and Use"; Water Environmental Federation, American Water Works Association, Arizona Water Pollution Control Association (Arizona Water Association)
"Protection of Base Flows of the San Pedro River"; American Public Works Association (Arizona Chapter), Arizona Water Pollution Control Association (Arizona Water Association)

H. RELEVANT PROJECTS

1.

(1) TITLE AND LOCATION *(City and State)*
JRC Goodyear Airport Engineering & Design Services
Goodyear, AZ

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
see below	see below

XX Check if project performed with current firm

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Evaluation, design, permitting, plans, specifications, bidding services, construction observation and preparation of record drawings and Operations & Maintenance Manual for upgrades to wastewater treatment facility at a small airport. Maricopa County Environmental Services has mandated improvements to a blower, sludge drying bed liner, and back up power.
5% complete. Project Budget: $102,291 ROLE: Principal Engineer

2.

(1) TITLE AND LOCATION *(City and State)*
Province Well Abandonment
Maricopa, AZ

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2015	2015

XX Check if project performed with current firm

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Meritage Homes wanted to abandon a well at its Province development. Following ADWR's established rules for abandoning wells, we submitted Change of Ownership and Notice of Intent to Abandon a Well forms on behalf of our client. We prepared bidding documents and assisted Meritage Homes in selecting a contractor, and oversaw the abandonment process. Record Drawings were prepared for final submission to ADWR.
Project Budget: $11,260 ROLE: Principal Engineer

3.

(1) TITLE AND LOCATION *(City and State)*
Adero Canyon Water Booster Design
Fountain Hills, AZ

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
see below	see below

XX Check if project performed with current firm

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Design and permitting services for new water booster station at an existing tank site. The intent is to install two pumps to meet normal development demands and one pump for peak events such as fire suppression. Preliminary efforts include review of existing hydraulic modeling and preparation of preliminary site layout and load calculations. The deliverable for this effort will be a Design Report, as required by Maricopa County Environmental Services. The next phase will be preparation of plans and specifications. Final phase will be assistance with the bidding process; construction oversight; and permitting to include Record Drawings and Operations & Maintenance Manual.
40% complete. Project Budget: $11,260 ROLE: Principal Engineer

4.

(1) TITLE AND LOCATION *(City and State)*
Central Water System Feasibility Study
Thatcher, AZ

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
see below	N/A

XX Check if project performed with current firm

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Evaluation of potential purchase of a water system. The client, Eastern AZ College, currently gets its water from the City of Safford, which owns the Central Water System. Potable water costs of the College could be reduced by ¾, if a private utility company purchases the Central System and services the College. Our objective is to identify and quantify potential deficiencies in the water system that will need to be improved to serve the college campus and maintain current service as required by Fire Ratings. The analysis will be based on hydraulic models.
90% complete. Project Budget: $14,730 ROLE: Principal Engineer

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
David Heighway	Project Engineer	25	9

d. LOCATION *(City and State)*
Fluid Solutions, Phoenix, AZ 85004

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. PROFESSIONAL TRAINING - REGISTRATIONS
B. Sc., Civil Engineering Rose-Hulman Institute of Technology, 1982	Professional Engineer, Arizona (#46334) 2007 Professional Engineer, Illinois (#062-049139) 1994 Professional Engineer, Indiana (#19700474) 1997

g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)*
Associations: Arizona Water Association; American Water Works Association

H. RELEVANT PROJECTS

1.

(1) TITLE AND LOCATION *(City and State)*
Courtland Homes Water Master Plan Update, Site Plans, Construction Documents
Surprise, AZ

(2) YEAR COMPLETED
Professional Services: see below
Construction (if applicable): N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — XX Check if project performed with current firm

This has been an ongoing project since 2013. Fluid Solutions originally prepared a water master plan for a development in 2007. In 2013, the land developer again contacted us requesting an updated water master plan as well as developing site plans and construction documents for three wells and a water storage facility. Permitting continues with the City of Surprise and most activity in 2015 has been preparing water modeling for the City's review.

Project revenue to date since 2013 is $120,536 and specifically for 2015 is $20,354. ROLE: Project Engineer

2.

(1) TITLE AND LOCATION *(City and State)*
Quartzsite Elementary School Well & Tank Rehabilitation
Quartzsite, AZ

(2) YEAR COMPLETED
Professional Services: 2015
Construction (if applicable): 2015

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — XX Check if project performed with current firm

The school's on-site non-potable water system consists of 2 wells, 2 storage tanks, and a booster station. One well was sealed and taken out of service, but could be used as an emergency back-up if repaired and re-equipped. The other well was cleaned and submersible pump and motor assembly installed. One tank was demolished due to extensive corrosion. The new replacement tank was installed in a new location, along with necessary piping modifications. New booster and jockey pumps were installed in the booster station.

Project Budget: $112,455 ROLE: Project Engineer, Construction Observation

3.

(1) TITLE AND LOCATION *(City and State)*
Ash Creek Elementary School Admin & Classroom Septic Systems
Pearce, AZ

(2) YEAR COMPLETED
Professional Services: 2015
Construction (if applicable): 2015

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — XX Check if project performed with current firm

Replace two septic tanks and leach fields and demolish the old tanks.
Design, construction, and permitting. Main duties included initial design, subcontractor coordination, multiple site visits, preparation of Record Drawings and submittal of Approval of Construction application.

Final Cost: $173,390 ROLE: Project Engineer, Construction Observation

4.

(1) TITLE AND LOCATION *(City and State)*
Kirkland Elementary School Well & Disinfection System
Kirkland, AZ

(2) YEAR COMPLETED
Professional Services: see below
Construction (if applicable): see below

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — XX Check if project performed with current firm

Replace existing well, install a disinfection system and storage tank.
Observed well drilling and obtained new source sampling. Site layout and staking with subcontractor. Coordination with electrical engineering subcontractor. Design and calculations for well, meter and booster pumps.
Professional Services-75% completed; Construction Services-50% completed. Project budget: $526,628
ROLE: Project Engineer, Construction Observation

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 *(City and State)*	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
ASH CREEK ELEMENTARY SCHOOL ADMIN & CLASSROOM SEPTIC SYSTEMS Pearce, AZ	2015	2015

23. PROJECT OWNER'S INFORMATION

c .PROJECT OWNER	d .ORIGINAL BUDGET/NTE AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
Ash Creek Elementary School District #53	193,310	173,390

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

The school was experiencing problems with two of the three septic tanks and leach fields. One tank was too small for the current flow and a second tank was found to have excessive roots penetrating it. The associated leach fields serving these tanks were both failing. The third system did not exhibit any failures. It was also necessary to comply with ADEQ's maximum nitrogen discharge requirements while correcting the failing systems.

Three options were evaluated: A) replace the existing septic system with a properly sized system; B) add acreage; and C) install nitrogen reduction treatment. Option C was the most costly and therefore not recommended. Option B was not likely to succeed, since obtaining just the correct amount of acreage would require a change in platting to allow a lot split. This left Option A as the most viable and cost effective.

Once this was determined, further considerations included: 1) combining both tanks and leach fields into a common system; 2) replacing both tanks and combining the leach fields; and 3) replacing both tanks and both leach fields. Due to site constraints of school facilities and State Code setback requirements, the most cost effective solution was to replace both tanks and both leach fields. The final project included design, construction, and permitting of new septic systems for the Administration and Classroom buildings along with demolition of the old septic tanks.

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 *(City and State)*	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
COPPER RIM ELEMENTARY BOOSTER & TANK EVALUATION & REHABILITATON Globe, AZ	2015	2015

23. PROJECT OWNER'S INFORMATION

c .PROJECT OWNER	d .ORIGINAL BUDGET/NTE AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
Globe Unified School District #1	751,651	649,822

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

The school's booster station and storage tank provide both the water needs and fire protection for the school.

The water storage tank is a 300,000-gallon welded steel tank constructed in 1981. Scope of work for rehabilitation of the tank included spot welding, blasting, recoating (both interior and exterior), gauges (repair of old and installation of new), and disinfection per state guidelines.

For over a year, the booster station had to be run manually because it was not operating properly. Our investigation determined the problems stemmed from the system reaching the end of service life of many of its components. Design and construction services included the replacement of multiple gate valves and two fire pumps; rebuilding two booster pumps; and installation of 1000 gallon hydroneumatic tank. Additionally, electrical and control components including control panels, discharge flow meters, voltage starters, pressure transmitters, etc. were replaced.

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 *(City and State)*	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
KIRKLAND ELEMENTARY SCHOOL WELL & DISINFECTION SYSTEM Kirkland, AZ	see below	see below

23. PROJECT OWNER'S INFORMATION

c. PROJECT OWNER	d. ORIGINAL BUDGET/NTE AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
Kirkland Elementary School #23	526,628	see below

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

The school's water system is experiencing contamination problems showing the presence of coliform requiring frequent disinfection of the well. We concluded the best course of action is to replace the existing well, install a disinfection system and storage tank.

The design effort includes preparation of drawings for construction and permitting through ADEQ and Yavapai County. Accessory items for design include a storage tank and booster system to provide adequate contact time for disinfectant to meet requirements; storage, metering pump, and injector for the disinfection system; and electrical design to provide power to the motors, sensors, and alarms associated with the project.

Engineering services during construction include the review of proposed equipment for installation and preparation of final Record Drawings for close-out submittals as well as coordination and observation of the work in progress.

Construction services will be provided in two stages. The first stage is the well replacement which includes drilling and development of a new well; and abandonment of the old unused well. The second stage of work includes installation of the well pump, well head hydraulic control, and piping to storage; a 10,000 gallon storage tank with level controls to operate the well pump; the disinfection system; a booster station and bladder tank to maintain system pressures; and a 2" main line from the new booster station to the point of connection to the distribution system.

Professional Services are 75% completed. Final design is pending permitting.
Construction Services are 50% completed. The well and disinfection system are complete, pending new source approval. Equipment for the storage tank, booster station and bladder tank has been ordered and site work is on-going to allow installation as the equipment arrives.
Project will be completed within budget.

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 *(City and State)*	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable*
MODEL CREEK WATER SYSTEM IMPROVEMENTS Yarnell, AZ	2015	2015

23. PROJECT OWNER'S INFORMATION

c .PROJECT OWNER	d .ORIGINAL BUDGET/NTE AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
Yarnell Elementary School District #52	109,370	109,370

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

The school's water system is a combined system that services both domestic water needs and fire protection requirements for the campus. The school had frequent alarm conditions due to pressures falling below fire system setpoints. Subsequent actions included:

a) Fire Suppression System Alarms – replaced pressure switches with units that can be adjusted by operations staff. Miscellaneous piping and plumbing changes were made for safety reasons.
b) Pump Cycles – rapid pump cycles were causing premature wear of the pump. A 500 gallon hydropneumatic tank was installed, replacing a 44 gallon bladder tank. This reduced the pressure fluctuations associated with too frequent stop-start cycles of the booster pump.
c) Pump Condition – The packing and pump shaft in the fire pump were replaced so the pump would operate properly.
d) Safety Issues – several electrical code problems were addressed for the lighting panel, booster pump control panel and well conduit.

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 *(City and State)*	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
QUARTZSITE ELEMENTARY SCHOOL WELL & TANK REHABILITATION Quartzsite, AZ	2015	2015

23. PROJECT OWNER'S INFORMATION

c .PROJECT OWNER	d .ORIGINAL BUDGET/NTE AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
Quartzsite Elementary School District #4	112,455	112,455

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

The school's on-site non-potable water fire suppression system consisted of 2 wells, 2 storage tanks, and a booster station.

Perforations in the well casing of Well #1 showed signs of corrosion with most being 50-90% blocked and therefore it was determined this well should be taken out of service. It was sealed, but could be used as an emergency back-up if repaired and re-equipped. Well #2 was cleaned, developed using an air lift pump and surge technique, and a new submersible pump and motor assembly installed.

Due to extensive corrosion, Tank #1 was demolished. A replacement tank was installed in a new location allowing easier access for maintenance activities. Piping modifications were necessary to incorporate the new tank. Minor repairs were performed for Tank #2. Fencing was modified and access gates added to improve access between the tanks and the well.

The booster station required new booster and jockey pumps. The cost of rebuilding the old pumps vs new replacement pumps were comparable so new pumps were installed.

Engineering Drawings of Changes were prepared. Since the well was already permitted; the system is strictly for non-potable use; and the electrical components were reused, additional permitting was not required. However, ADWR was informed of the changes, as required by statute.

6. ADDITIONAL INFORMATION

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

See attached Resumes and Summary of Services

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:	7%
b.	Percentage of Total Work Attributable to Non-Government Work:	93%

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

Signature: _____ Date: December 15, 2015

Name: Norman W Fain, III Title: Member

Environmental Compliance Services

Permitting Compliance
- Arizona Aquifer Protection Permits (APP)
- Reuse Permits
- Arizona Pollution Discharge Elimination Permits (AZPDES)
- Arizona Underground Water Storage Permits
- Permit Reviews & Renewals

Regulatory Compliance
- Federal Regulations (CWA, SDWA, RCRA, CERCLA)
- Source Water Protection
- Compliance Analysis, Plans, and Implementation

Investigation and Remediation
- Environmental Site Assessments
- Site Characterization Investigations for Hazardous Substance Releases
- Soil and Groundwater Remediation

Third Party Technical Review

Review Services
- Environmental Issues
- Hydrologic Conditions
- Value Engineering

Expert Witness Services
- Litigation Support
- Cost/Contamination Responsibility Allocation
- Technical Review & Opinion
- Contaminant Transport Modeling
- Water Rights
- Groundwater/Surface Water Interactions
- Hydrology/Hydrogeology/ Geomorphology

Contracting Services

Construction Services
- Turn-key Solutions
- Design/Build Capabilities

Water Resource Management

Water Rights
- Applications and Registrations
- Annual Reporting
- Adjudication Support
- Water Use Contract Negotiations

Resource Planning
- Assured Water Supply and Water Adequacy Studies
- Municipal Service Area Supplies and Rights
- Hydrologic/Hydraulic Modeling
- Conservation Plans
- Demand Studies
- Water Budget Analysis
- Groundwater Recharge
- River System Analysis

Supply Development
- Well Location using Surface Geophysics
- Well Site Identification, Well Design, and Aquifer Testing
- Spring Analysis and Collection System Design
- Surface Water Analysis
- Water Rights Appraisal
- Physical/Legal Availability Analysis
- Water Rights Conversion
- Rate Analysis and Development

System Planning and Management
- Master Planning
- Distribution System Modeling and Mapping
- Disinfection System Modeling
- Operations Optimization

Supply Augmentation
- Reclaimed Water Reuse/Recharge
- Reuse/Recharge Master Planning
- Development Guidelines
- Reuse Distribution
- Water Balance and Storage Requirements
- Groundwater Recharge and Recovery Pilot Studies and Facilities Design

Engineering Services

Water System Analysis
- Distribution Modeling
- Disinfection Modeling
- Plant-In-Service Inventory and Valuation
- Operations Optimization

Water System Design
- Wells, Spring Collection, and Surface Water Intakes
- Pipelines and Booster Stations

Water Treatment Design
- Well Head Treatment
- Surface Water Treatment
- Membrane Filtration
- Disinfection
- Corrosion Control

Wastewater System Analysis
- Static & Dynamic Collection System Modeling
- Collection System Master Planning
- Plant-In-Service Inventory and Valuation

Wastewater System Design
- Gravity Sewers
- Lift Stations & Force Mains
- Odor Control Systems

Wastewater Treatment Design
- Mechanical Treatment Systems
- Natural Systems, Lagoons & Wetlands
- Nutrient Removal
- Septage Receiving
- Biosolids Treatment
- Odor Control Systems
- Individual Septic Based Systems
- Corrosion Control and Remediation

NORM FAIN, P.E., PRINCIPAL ENGINEER

Specialization:
Civil and Sanitary Engineering with focus on Water and Wastewater Treatment. Reuse, Recharge, Collection Distribution, and Master Planning

Thirty-one years experience providing civil and sanitary engineering services for public and privately owned projects. Experience in evaluation, design, rehabilitation, and construction services for water and wastewater systems. Mr. Fain is the founding member of Fluid Solutions, founded in 1998. Prior to 1998, experience included other consulting firms, Morton Salt, and Shamrock Water Company.

Education

B.Sc., Civil Engineering Technology, Northern Arizona University, 1984

Professional Registration

Professional Engineer, Arizona (#25969)

Licensed General Engineering Contractor, Arizona (#137525)

Professional Associations

Arizona Water Association

Water Environment Federation

American Water Works Association

Total Years Experience: 31

Years with Fluid Solutions: 17

Publications:

"Wastewater, A Resource", Arizona/Nevada Academy of Science

"The Future of Wastewater in Goodyear, Arizona - Treatment and Use", Water Environment Federation / American Water Works Associations / Arizona Water Pollution Control Association (Arizona Water Association)

"Protection of Base Flows of the San Pedro River", American Public Works Association - Arizona Chapter / Arizona Water Pollution Control Association (Arizona Water Association)

Relevant Project Experience

Hydraulic Analysis & Cost Analysis, Central Arizona Water Conservation District

Engineering Manager. Performed and managed hydraulic analysis and capital and life cycle cost analysis for the Central Arizona Water Conservation District for the purpose of recharging excess water for future recovery as water supplies dictate.

Utility Assistance, Multiple Projects

Utility assistance includes integrity evaluation, reconstruction costs for system valuation, master planning, system integrity evaluation for rate studies, and utility formation for water and wastewater systems. Utility master plans and development guidelines have been prepared for individual projects through entire communities.

Water Resource Development, Storage and Booster Stations, Multiple Projects

Engineering Manager. Evaluation, design, and rehabilitation of new and existing wells to meet client needs. Development of springs, stream and canal intakes, and lakes. Projects include work for State of Arizona, Counties, Cities, Towns, Mines, Golf Courses, and Developers. Wells ranging from 100 feet to over 3000 feet deep. Submersible and vertical turbine well pumps. Storage facilities ranging from 10,000 gallon tanks through 10,000,000 gallons in capacity. Booster stations from less than 10 gpm through 83,000 gpm.

Analysis and Design of Water Treatment Systems for Drinking Water and Process Water

Engineering Manger. Evaluation of water quality for safe drinking water and for process water needs. Technologies include blending, adsorption, ion exchange, coagulation/flocculation, filtration, and disinfection. Design of facilities to meet specific water qualities removing select chemical characteristics as necessary for the desired use of the water.

Water and Wastewater Systems Odor and Corrosion Control, Multiple Projects

Engineering Manager. Odor and corrosion control and remediation facilities have been completed for both water and wastewater systems.

Improvements have ranged from chemical and biochemical odor mitigation solutions to odorous and corrosive gases in both water and wastewater supplies.

Analysis and Design of Wastewater Collection, Treatment, Reuse and Recharge Systems

Collection system design, planning, modeling, and flow testing for various sized communities. Sewers have ranged in size from 4-inch low pressure systems to 54-inch gravity systems.

Treatment efforts are based on the end use of the effluent. Treatment methods include mechanical systems, natural systems, and septic systems for wastewaters ranging from industrial to domestic. Treatment plants have ranged from 2,000 gallons per day to 21 million gallons per day.

Reuse, recharge and discharge are the typical methods of disposal. Reuse systems may assist in disposal of water treatment plant brines when mixed with with class A+ effluents for consumptive use on vegetation and recreational lakes. Recharge systems have included evaluation of deep wells, vadose zone wells, and infiltration systems. Successful designs of surface and subsurface infiltration systems throughout Arizona.

Experience in planning, modeling, master planning and design of various systems ranging from small subdivisions to entire Cities.

Construction and Construction Management of Infrastructure Installation

Engineering Manager. Performance of construction services including contractor meetings, questions, shop drawing reviews, record drawings, and field reviews. Capabilities also include providing full service design build solutions integrating our design and construction capabilities.

Construction Capabilities

Construction capabilities include turn-key and design build solutions for clients in both water and wastewater systems. Recent design-build experience includes wastewater treatment plants, water treatment plants, wells, storage tanks, and pipelines.

Expert Witness & Legal Support

Expert witness and legal support has been provided for both water and wastewater projects. Historic projects included nuance odor compliant resolution, utility condemnation dispute resolution, infrastructure improvements dispute resolution and testimony in condemnation cases.

DAVID A. HEIGHWAY, P.E., PROJECT ENGINEER

Specialization:
Civil and Sanitary Engineering with focus on Water and Wastewater Distribution, Collection, and Master Planning

Education
B.Sc., Civil Engineering

Rose-Hulman Institute of Technology

Professional Registration
Professional Engineer, Arizona (#46334), Illinois (#062-049139), and Indiana (#19700474)

Professional Associations
Arizona Water Association

American Water Works Association

Total Years Experience: 25

Years with Fluid Solutions: 9

Twenty-five years of civil and sanitary engineering experience providing public- and privately-owned water, wastewater, and storm water projects to meet Local, State, and Federal requirements.

Relevant Project Experience

Water

Water distribution system design and modeling have been completed on mains from 2- to 66-inch diameter.

Water Treatment Facilities for groundwater and surface water have been designed for facilities from 35 gpm to 14.0 MGD.

Residuals disposal using land application and landfilling have been designed.

Wastewater

Wastewater experience includes analysis, planning and design of wastewater collection systems, pump stations, treatment facilities, and disposal/reuse facilities.

Collection systems: 8-inch to 48-inch, including areas with existing buildings

Pump stations: 100 gpm to 3.2 MGD.

Force Mains: 4-inch to 24-inch.

Wastewater Treatment Facilities include new construction and upgrades for mechanical treatment facilities ranging from 10,000 gpd to 2.5 MGD.

Effluent disposal projects include discharge reuse and reclamation.

Biosolids disposal includes land filling and land application projects.

Individual systems for commercial facilities without access to public sewers.

San Carlos Unified School District, High School Campus Master Plan, 2010

The school's expanding High School Campus required improvements to the water infrastructure. This included redundancy in the well supply and storage tanks. The Master Planning provided a framework for the District to make improvements to the infrastructure. A pilot well was designed and drilled to provide water quality data for the underground water supply.

Stanfield Elementary School District #24, Stanfield, Pinal County, Arizona, Water Storage Tank Replacement, 2009

Stanfield had two storage tanks with one reaching the end of its useful life. A replacement tank was designed to provide the redundancy and storage volume required. Changes in seismic codes required modification of the remaining existing storage tank to allow the two tanks to work hydraulically together.

Palo Verde Elementary School District #49, Palo Verde, Maricopa County, Arizona, Water Well Rehabilitation and Water System Improvements, 2009

Palo Verde Elementary School had problems with the sediment from their well plugging their RO system filters. The well was modified to screen the majority of the sediment. The water storage tank was cleaned and

disinfected with a back-up booster pump installed for redundancy. During the upgrades, the hydropneumatic tank required replacement. All work was completed without interrupting the school calendar.

American West Quarter Horse Ranch, Rio Verde, Maricopa County, Arizona

An investigation of the existing water and septic system was completed to identify the areas where improvements were needed to covert the water system to a Public Water Supply. Improvements were designed to allow this upgrade so that the Ranch could host public events throughout the year.

Valencia Water Company, Buckeye, Maricopa County, Arizona

Mr. Heighway was involved with numerous projects for Valencia Water Company in 2006 and 2007. These included providing blending plans for Schult and Sonoran Vista, Design of the Arizona Machinery Water Well and Storage Tank, and Water System Model Updates.

Saddle Mountain Unified School District #90, Design-Build of 0.42 MGD WWTP with Recharge and Reuse

Modification of the initial design and construction of a complete mix, multi-stage biological nutrient removal treatment plant that had been abandoned by the initial contractor during construction of the high school. This project updated the design to meet newer regulatory standards.

Stanfield Elementary School District #24, Stanfield, Pinal County, Arizona, Septic System Improvements

Failing leach pits caused Stanfield Elementary to be out of compliance with environmental regulations. Fluid Solutions designed and installed a septic system with effluent pumps, a new septic system for the pre-school buildings, and a replacement leach field for the cafeteria and library buildings. Reuse of existing facilities to the extent possible helped minimize costs to the school.

Palo Verde Elementary School District #49, Palo Verde, Maricopa County, Arizona, Grinder Station Improvements

Improvements were designed into the control systems of the grinder station to reduce or eliminate the frequency at which these pumps were failing. No failures have been reported since completion of this upgrade.