

EXHIBIT A – SCOPE OF WORK City of Douglas

Well 18 - Replacement Well Design

September 13, 2024

INTRODUCTION

This Scope of Services describes the professional engineering services to be provided by Carollo Engineers (Consultant) for assisting the City of Douglas (City) in the Well 18 - Replacement Well Design (Project).

The City has six active wells, and four of those wells have recently begun showing signs of cavitation or breaking suction during sustained pumping, which may be related to dropping groundwater levels. Pumping capacity limitations are impacting the City's ability to provide adequate source water for peak demands. The purpose of this project is to supplement the City's water supply by replacing an existing older well (Well 11) with a replacement well (new Well 18) at the same site, but with higher capacity.

The project will result in potable water system improvements including the following:

- New water production well located in the southern portion of 15th Street Park in Parcel 41014001K:
 - » Production well with expected capacity of 800 to 1,000 gallons per minute (gpm).
 - » Hydropneumatic tank and appurtenances.
 - » Site structures including:
 - Electrical gear shade structure.
 - Hydropneumatic tank foundation.
 - » Approximately 200 feet of 12-inch pipe from the new Well 18 connecting to the existing Well 11 connection point to the water system and storage tanks on site.
 - Well site improvements such as fence location modifications required to accommodate the new well within the site.

The Consultant shall provide the engineering and professional services for the project as described in this scope of services. The purpose of the services is to provide for and complete preliminary and final design, including construction documents and permitting for the improvement projects identified above. Any scope required for engineering services during construction will be provided separately. The services shall include adequate quality assurance/quality control reviews to produce construction documents consistent with industry standards, and which are suitable for obtaining a contractor's cost proposal, and subsequently building the improvements.

SCOPE OF SERVICES

The Project Scope of Services includes the following major tasks, which are detailed below:

- Task 1 Project Management and Meetings.
- Task 2 Final Design.
- Task 3 Permitting Assistance and Coordination.

TASK 1 – PROJECT MANAGEMENT AND MEETINGS

The scope associated with this task includes:

- Coordination calls (Microsoft Teams or similar) will be scheduled as necessary for the Project duration with the City and other members of the team. Up to six meetings are assumed.
- Consultant will prepare and distribute agendas and meeting materials. Consultant will document action items and decisions as part of the meeting minutes and coordination calls.
- Consultant will perform quality assurance/quality control reviews of deliverables in this Scope of Services prior to their submittal to the City.
- Consultant will manage professional services and subconsultants to provide efficient completion of the Project. Consultant will prepare and submit monthly invoices and associated progress reports to the City.
- Project administration activities including budget management, schedule management, and preparation of monthly invoices and status update reports.

DELIVERABLES

- Attendance at meetings, as required or at the request of the City.
- Meeting agendas and meeting notes with key outcomes, decisions, and action items for meetings Consultant runs (electronic PDF).
- Monthly invoices and status update reports.

TASK 2 – PRELIMINARY AND FINAL DESIGN

2.1 Preliminary Site Layout

Consultant will draft multiple (up to two) site layout alternatives for purposes of confirming design direction. Consultant will meet virtually with the City to review and receive input, and will finalize the site layout based on that input to proceed to final design. Consultant anticipates one site visit as a part of the project.

2.2 Hydraulic Evaluation

Consultant will complete hydraulic evaluations to determine design criteria, pipe pressure rating, and surge protection equipment selection. The results of the hydraulic evaluation will be incorporated into the design.

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2.3 Surge Evaluation

Consultant has started reviewing pressure surge issues within the water system as part of a previous scope and will complete this review and provide recommendations regarding the surge control measures required for the site. If the surge evaluation indicates that another well site(s) is most appropriate for a hydropneumatic tank a separate proposal will be provided for that design.

2.4 Surveying and Mapping

Consultant will provide survey sufficient for the design of the well replacement:

- Topographic survey: Prepare existing grade Civil 3D surface adjusted to horizontal datum NAD83, and vertical datum NAVD88. Map scale will be 1 inch equals 40 feet:
 - » Develop survey map that includes 1 foot topographic contours and significant vegetation.
 - » Culture (man-made features), e.g., above-ground utilities, blue stake markings, edge of pavement, curbs, sidewalks, road signs, streetlights, traffic signal posts, fences, driveways, mailboxes, and drainage structures.
- Property ownership: Verify property ownership through readily accessible public information. Survey
 data provided will not entail a property or boundary survey. It is assumed that the well replacement
 will take place within the existing park boundary and no legal descriptions will be required.
- Utility records: Identify utility owners affected by the project and perform record research with each to obtain as-built information.
- Conduct static Global Positioning System (GPS) survey for control verification.
- Provide staking of well casing location of well prior to drilling and verification of well casing location following drilling.
- Consultant will utilize the services of Psomas for surveying; Psomas scope and fee is provided in Exhibit B.

2.5 Design Plans and Specifications

Consultant will prepare a Preliminary (30 percent) and Final (90 and 100 percent) design package for the replacement well project. The Preliminary Design will include the following:

- Development of preliminary site civil and mechanical drawings.
- Development of equipment design criteria.
- Electrical loads and one-line diagrams.
- Process and instrumentation diagram (P&ID).
- Estimate of well pump sizing (due to the timing for drilling the new well, it is anticipated that the design will be completed based on assumed data, and then the design will require revisions following well drilling and testing).

The Preliminary Design will be summarized in a draft Basis of Design Report (BODR) and submitted to the City for review. Comments will be incorporated into the final BODR, which will be completed during the detailed design to ensure consistency between BODR and the final plans and specifications.

The Final Design will include the following elements:

- Civil Engineering including demolition, site layout and access, chain link fencing, and maintaining existing grading and drainage patterns at the site.
- Structural Engineering including well and hydropneumatic tank equipment pads.
- Mechanical Engineering including mechanical/piping design and hydraulic evaluation for on-site piping and pump.
- Electrical Engineering including lighting, power, instrumentation, controls, security and other systems, similar in level of complexity and design concept to other City well sites. Electrical engineering will be provided by subconsultant Jensen Engineering; scope of work for electrical is included as Exhibit C.

As stated previously, the budget assumes that the well drilling and testing will not be completed prior to the completion of the Final Plans due to the project schedule. Assumptions, based on information to be provided by BasinWells, will be utilized to provide the required data for well pump selection and electrical equipment sizing. The plans will likely require revisions following the well drilling. One round of revisions to the well pump selection is built into the project costs. If major revisions are required, such as to the horsepower because of an unexpected condition in the well, an additional scope of work may be provided.

The Consultant will incorporate the City's review comments into the subsequent submittal. The Consultant will prepare a tabulation of the review comments and the proposed resolution for each comment. A brief explanation for each comment that is not incorporated will be provided.

Detailed plans and specifications will be developed and submitted to the City for review and approval at the following completion stages:

- 90 percent Agency Review Documents.
- 100 percent Final Construction Documents.

Plans will be prepared in accordance with the most current version of City engineering standards and other standards such as Arizona Department of Environmental Quality and International Building Codes as adopted by the City, as applicable. Plans will be prepared using AutoCAD 2022, 22 inch by 34 inch in size, and will be prepared on Consultant standard plan sheets. The Consultant's technical specifications will be used, where appropriate. Electronic copies (PDF) of the final design review submittal documents will be provided.

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2.6 Engineer's Opinions of Probable Construction Cost

A detailed opinion of probable construction cost will be prepared for the 90 and 100 percent submittals and will be consistent with the Class 3 and Class 2 construction cost opinion definitions provided by the Association for the Advancement of Cost Engineering (AACE) International. The cost opinions will be developed using a spreadsheet model and database that draws information on unit cost and construction data from bid tab summaries, vendor costing information from Consultant, and RS Means published unit costs. Budgetary quotes will be solicited from suppliers for major equipment.

DELIVERABLES

- Survey, including topography, culture, and utilities.
- Draft BODR.
- Design submittals (30 percent, 90 percent, 100 percent) (PDF).
- Comments resolution summaries for each stage.
- Final BODR (PDF).
- Opinions of probable construction costs (90 percent and 100 percent).

TASK 3 – PERMITTING ASSISTANCE AND COORDINATION

The Consultant will provide the following permitting submittals and coordination with regulatory agencies:

- Arizona Department of Environmental Quality Approval-to-Construct.
- City of Douglas Building Codes.
- It is assumed that the City will pay any required permit fees directly.

Consultant will prepare drawing and specification revisions if required by regulatory agencies. The 90 percent Agency Review plan set will be used for permitting, with revisions entailing the 100 percent plans.

SCHEDULE

The preliminary project schedule is as follows:

Notice to Proceed Design	October 2024
Preliminary Design (30 percent) Complete	November 2024
Detailed Design (90 percent for Agency Review) Complete	January 2024
Detailed Design (100 percent) Complete	March 2024

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BUDGET

The budget estimate and billing rates for the planned services are presented in Exhibit D. Proposal assumes billing on a time and materials basis with a not-to-exceed amount of \$205,792. Task line-item budgets are shown for estimating purposes only and do not represent individual not-to-exceed amounts. Actual expenditures for individual tasks will vary from task estimates.

PROJECT ASSUMPTIONS

The services delivered under this Scope of Work are subject to the following project assumptions:

- 1. <u>Client-provided Information and Services</u>: Client will furnish the Consultant available studies, reports, and other data pertinent to the Consultant's services; obtain or authorize the Consultant to obtain or provide additional reports and data as required; and furnish to the Consultant services of others required for the performance of the Consultant's services. The Consultant will be entitled to use and rely upon all such information and services provided by the Client or others in performing the Consultant's services under this Contract.
- 2. <u>Documents</u>: Documents, including drawings and specifications, prepared by the Consultant pursuant to this Contract are not intended or represented to be suitable for reuse by Client or others for this Project or on any other project. Any reuse of completed documents or use of partially completed documents without written verification or concurrence by the Consultant for the specific purpose intended will be at the Client's sole risk and without liability or legal exposure to the Consultant.
- 3. <u>Standard of Care</u>: Consultant will complete the services required hereunder in accordance with the prevailing engineering standard of care by exercising the skill and ability ordinarily required of engineers performing the same or similar services, under the same or similar circumstances, in the State of Arizona.
- 4. <u>Access</u>: Client will arrange for access to and make all provisions for the Consultant to enter upon public and private property as required for the Consultant to perform services hereunder required for Consultant, subcontractors, and second-tier subcontractors to perform services hereunder.
- 5. <u>Reuse of Documents</u>: Any reuse of completed documents or use of partially completed documents without written verification or concurrence by Engineer for the specific purpose intended will be at City's sole risk and without liability or legal exposure to Engineer.
- 6. <u>Participation and Schedule Support</u>: Client will participate in coordination meetings to facilitate the sharing of information, provide guidance, and respond to requests for information. Client will provide timely review of deliverables in accordance with the project schedule. Client will provide review comments on deliverables in writing within two weeks of delivery.
- 7. <u>Estimates and Projections</u>: In providing opinions of cost, financial analyses, economic feasibility projections, schedules, and quantity and/or quality estimates for potential projects, Consultant has no control over cost or price of labor and material; unknown or latent conditions of existing equipment or structures that may affect operation and maintenance costs; competitive bidding procedures and market conditions; time or quality of performance of third parties; quality, type, management, or

direction of operating personnel; the incoming water quality and/ or quantity; the way facilities are operated and/or maintained; and other economic and operational factors that may materially affect the ultimate project elements, including, but not limited to, cost or schedule. Therefore, Consultant makes no warranty that the Client's actual project costs, financial aspects, economic feasibility, schedules, and/or quantities or quality realized will not vary from Consultant's opinions, analyses, projections, or estimates.

8. <u>Third Parties</u>: The services to be performed by the Consultant are intended solely for the benefit of the City. No person or entity not a signatory to the Agreement shall be entitled to rely on the Consultant's performance of its services hereunder, and no right to assert a claim against the Consultant by assignment of indemnity rights or otherwise shall accrue to a third party as a result of the Agreement or the performance of the Consultant's services hereunder.

PSOMAS

September 13, 2024

EXHIBIT B

Balancing the Natural and Built Environment

Kara Festa, PE Carollo Engineers, Inc One S. Church Ave, Suite 1820 Tucson, AZ 85701

Subject: City of Douglas Well Site 11 Site Expansion Design Survey Psomas 7CAR240301

Kara,

In accordance with your request, Psomas is pleased to submit this proposal for Professional Services for the above referenced project. Psomas will provide mapping of topography for engineering design of a well site expansion and addition of a new well, new well site staking, and as-built survey of the new well location.

Psomas proposes to provide the Scope of Services as detailed in Exhibit "A" for an estimated fee of \$8480.00 per the attached fee break-down. This proposal will be in effect for a period of 30 days from this date.

If you have any questions concerning the proposal, please do not hesitate to give me a call at (520) 690-7805. We appreciate the opportunity to provide our services to Carollo and the City of Douglas.

Respectfully Submitted,

Respectfully Submitted,

PSOMAS

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Attachments: Exhibit "A" Scope, Fee Schedule Breakdown, Standard Hourly Rates

September 13, 2024

EXHIBIT "A"

SCOPE OF SERVICES

Project: City of Douglas Well Site 11 Site Expansion Design Survey

Job Number: 7CAR240301

Psomas will provide Survey Services for the Design of Douglas Well Site 11 Site Expansion and Addition of a Second Well. The proposed location for the new well is to the Northwest corner of the existing site, expanding that site to the North and (possibly) East.

1. **Topographic Survey Existing and Proposed Well Site - (76001)**

Psomas will prepare a topographic map with 1-foot contours of an existing site location approximately 150 feet long and 150 feet wide. Project coordinates will be Arizona State Plane, East Zone (NAD83) and referenced to NAVD88 vertical datum.

Psomas' mapping will include surface features such as asphalt, curb & gutter, visible evidence of utilities, and any BlueStake markings present. Please note: 811 Arizona BlueStake does not typically respond to BlueStake tickets for surveys. Utility locations will be shown per observed evidence on, and adjacent to, the subject property and/or per any reference documents provided to Psomas regarding utility locations. If you require additional information regarding sub-surface utilities, Psomas can provide SUE services for an additional fee.

2. New Well Location/Drilling Staking - (76206)

Psomas will provide the necessary staking to prepare the new well to be drilled. Any staking will be provided at the request of Carollo and will require 48 hours advance notice. Staking includes up to 1 trip to the well site.

3. As-Builts Survey New Well Location - (76191)

After the new well location has been drilled, Psomas will provide an As-Built Survey on the new well location for Carollo to verify the drilled location to their Design plans.

Fee......\$8480.00

Exceptions:

- 1. Legal Descriptions and easement exhibits are not included in this scope but can be provided, if required, and will be billed as T&M or under a separate contract agreement.
- 2. Property Boundaries/ROW location are not included in this scope but can be provided, if required, and will be billed as T&M or under a separate contract agreement.

Any additional services outside of this Scope of Services can be provided on a Time-and-Material basis at Psomas's Standard Hourly Rates.

Schedule of Rates									
Job Classification	Hourly Rates								
Survey Manager	160.00								
Project Surveyor	150.00								
Survey Crew Chief	100.00								
Survey Crew- 1 Man GPS	100.00								
Survey Crew- 2 Man Standard	175.00								
Survey Crew- 3 Man – Safety Req.	250.00								
Survey Tech - AutoCAD	95.00								
Survey Instrument Tech	75.00								
Survey Project Administrator/Coordinator	100.00								

2024 Psomas Tucson Survey Rates

	Douglas Well Site 11	BY:	RJI	JOB NO: 7CAR240301						Trav	Cos	st + %	Labor				
BLI		DATE:	09/13/24				_					0	5.	00%	Cost	Total Task	Total %\$
LC	Employee	SM	PS	ST	PA	SI	PC)	2C				Di	irect	Hours		Total %H
-		\$160.00	\$150.00	\$95.00	\$100.00	\$75.00	\$100	.00	\$175.00								
76001	Торо	\$ 320	\$ 600	\$ 760	\$ 100		\$ ^	100	\$ 2,100				\$	-	\$3,980	\$3,980	46.9%
	150'x150'	2	4	8	1		1		12						28		48.3%
76206	New Well Location/Drilling Staking	\$ 160	\$ 300		\$ 100		\$ -	100	\$ 1.400				\$	-	\$2.060	\$2.060	24.3%
	1 day	1	2		1		1		8				- T		13	+_,	22.4%
76191	As-Built Survey New Well Location	\$ 160	\$ 300	\$ 380	\$ 100		\$ -	100	\$ 1,400				\$	-	\$2,440	\$2,440	28.8%
	1 day	1	2	4	1		1		8				-		17	<i> </i>	29.3%
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	Total Hours	4	8	12	3	0	3		28	0	0	0			58		
	Total Cost	\$ 640	\$ 1,200	\$ 1,140	\$ 300	\$-	\$ 3	300	\$ 4,900	\$-	\$ -	\$ -	\$	-	\$8,480	\$ 8,480	
	Total % Hours	6.9%	13.8%	20.7%	5.2%	0.0%	5.2	%	48.3%	0.0%	0.0%	0.0%					100.0%
	Total % Cost	7.5%	14.2%	13.4%	3.5%	0.0%	3.5	%	57.8%	0.0%	0.0%	0.0%	0.	.0%			100.0%



September 6, 2024

EXHIBIT C

Kara D. Festa, P.E. Carollo Engineers, Inc. 4600 East Washington Street, Suite 500 Phoenix, AZ 85034

Re: City of Douglas Well 11 Replacement.

Dear Kara,

The following is our proposal to provide electrical engineering services for the electrical and instrumentation design for the replacement of the existing well 11 with a new well at the same site. The existing electrical service is sized at 400 amp 480V 3 phase and the existing well is 150HP. It is anticipated that the existing service will be sufficient to power the new well motor. The following is the anticipated scope of work:

Design Scope:

- One site Visit to investigate the existing electrical installation.
- Review the existing electrical service to determine if sufficient capacity is available to power a new pump. This will be determined once the well motor is selected. In the event the service is not sufficient, we will design a new electrical service with capacity for the new well. The electric utility that serves this site is APS. If required, we will coordinate with APS for the service design to provide an upgraded electric service to the well site transformer. Design of the service to the transformer primary is by the Utility.
- Design a new starter for the well motor. The type of starter will be selected by the City. The starter will be either a VFD, or soft starter.
- Design a new stand-alone RTU panel with communications to adhere to the City of Douglas requirements. The RTU panel design will include detailed panel layout with bill of material and terminal block installations for the RTU panel.
- Design will include all associated instrumentation as required for the well site.
- Security: The electrical panels, control panels and the site gates will be equipped with intrusion detection limit switches connected to the RTU PLC.

Deliverables:

Design Phase:

- Draft design report (Electrical and Instrumentation narrative).
- Technical Electrical Specifications.
- Schematic Diagrams for the pump starter/controller and the RTU.



- Electrical site plans. (Including coordination with the Electric Utility.) Background drawing file in AutoCAD format to be developed by Carollo Engineers and delivered to Jensen for use in the preparation of the electrical site plans.
- Process and instrumentation Diagram.
- Single Line/Conduit Diagrams.
- Panel Layout Details with bill of material.
- Signed and sealed final PDF format drawings 24" X 36" size and Cad drawings in AutoCad 2020 format.
- One copy of submittal drawings and specifications at the 60%, 95%, 100%. All submittals will be provided electronically.

Construction Phase:

- Answer questions during bidding process.
- Review shop drawings as required.
- Respond to RFI's.
- Assist in preparation of addendums.
- Participate in construction meetings as needed. We anticipate these meetings will be held virtually.
- Provide As-Built drawings produced from the contractor red-line drawings and from field verification of the as built conditions. This will require one trip to each well site after construction is complete. As built drawing files will be provided in PDF format and in AutoCAD file format electronically.

Design Phase:

We propose to perform this portion of work for the lump sum of \$28,450.00.

Arc Flash Study:

An Arc Flash study is not included. We will provide a specification for this to be performed by the contractor.

Construction Phase:

- Respond to RFIs: Est 2 RFIs:
- Shop drawing reviews: Est 10 submittals with up to 2 reviews.
- Provide As-Built drawings:
- Construction meetings:

We propose to perform this portion of work for the lump sum of \$7,500.00.

Items not included on this project:

- Any RTU, operator interface or controller program or software development.
- Blueprints or copying costs.
- Any radio path surveys.
- Construction Inspections.
- Cost estimates.



- Any Construction administration services not shown above. Additional construction services may be added with a contract amendment.
- Arc Flash Studies or reports.

Thank you, Sincerely,

Dhe Lensen

Dale L. Jensen, P.E.



EXHIBIT D **CITY OF DOUGLAS**

PROFESSIONAL ENGINEERING SERVICES

Water System Engineering Support

Well 18 Replacement Well Design

Budget Estimate

		Labor												
Task	Description	 Project Principal 	 Lead Project Professional 	 A Project Professional 	Professional 8	 Assistant Professional 	\$ Senior Technician	⇔ Technician	 Document Processing/Clerical 	Total Labor Hours	Total Labor Cost	Subconsultants	Other Direct Costs	TOTAL BUDGET ESTIMATE
1	PROJECT MANAGEMENT	4	36	0	0	12	0	32	0	84	\$ 17,956	\$-	\$-	\$ 17,956
1.1	Project Management and Administration	1	16					8		25	5,910			5,910
1.2	Project Meetings	2	12			12		8		34	7,208			7,208
1.3	Meeting Agendas and Notes	1	8					16		25	4,838			4,838
2	FINAL DESIGN	13	118	0	126	60	228	178	24	747	\$ 143,202	\$ 36,930	\$ 1,500	\$ 181,632
2.1	Preliminary Site Layout	2	8		2		12	8		32	6,656		500	7,156
2.2	Hydraulic Evaluations		4		4			16		24	4,176			4,176
2.3	Surge Evaluation		16			60				76	14,948			14,948
2.4	Surveying and Mapping		2					8		10	1,708	8,480		10,188
2.5	Design Plans and Specifications	9	80	0	108	0	192	146	24	559	106,030	28,450	1,000	135,480
2.6	Engineer's Opinions of Probable Construction Cost	2	8		12		24			46	9,684			9,684
3	PERMITTING ASSISTANCE AND COORDINATION	0	4	0	0	12	0	0	8	24	\$ 4,204	\$ -	\$ 2,000	\$ 6,204
3.1	ADEQ Approval to Construct and City of Douglas Building Codes		4			12			8	24	4,204		2,000	6,204
	TOTAL BUDGET ESTIMATE	17	158	0	126	84	228	210	32	\$ 855	\$ 165,362	\$ 36,930	\$ 3,500	\$ 205,792

NOTES:

1. Compensation method is time and materials with a not-to-exceed amount of the Total Budget Estimate shown. Invoiced amounts will reflect actual labor, subconsultant costs, and expenses. 2. Task line item budgets are shown for estimating purposes only and do not represent individual not-to-exceed amounts. Actual expenditures for individual tasks will vary from the task estimates.