

September 29, 2022

Cochise County Engineering & Natural Resources Department  
Attn: Mark Apel, Project Manager  
1415 West Melody Lane  
Building F  
Bisbee, AZ 85603

**RE: Cochise County ALERT System Implementation  
Planning Year 12/13 (FY 22/23 and 23/24)**

Dear Mark:

Thank you for requesting a scope and fee from JE Fuller/Hydrology and Geomorphology, Inc. (JE Fuller) to continue to maintain Cochise County's (County) ALERT flood warning system. The following is a scope of work and fee proposal for the referenced project. The purpose of this phase of the project is to continue to maintain the system by providing scheduled support services for components of the County ALERT system and the gages previously installed by Arizona Department of Water Resources (ADWR) located within the County.

**Scope of Work**

**General Description**

The purpose of this Scope of Work (SOW) is to detail the tasks and fees associated with maintaining the Cochise County ALERT System expected to occur during Fiscal Years (FY) 2022/23 and FY 2023/2024. Previous contract work fulfilled the County's 5-Year Plan to build out the system; this phase currently proposed focuses on maintaining existing stations rather than developing additional station locations.

Upon completion of this SOW, the County will have 2 years of recommended routine maintenance performed for fourteen (14) County-owned remote sensor/repeater stations and for eight (8) ALERT stations previously installed by ADWR located within the County. The following paragraphs provide an outline of the expected efforts and fees associated with this phase of the project.

**Task 1: Scheduled Maintenance (County-Owned Stations)**

Routine scheduled preventative maintenance shall be performed once per year for the duration of this project (twice overall) to each remote sensor station owned and operated by Cochise County, to ensure proper operation of the ALERT system. Scheduled maintenance at remote sensor stations shall ideally take place during the early spring prior to the advent

of the summer monsoon or during autumn prior to potential winter rains, and shall include the following tasks:

- Remove battery and replace with freshly-conditioned battery as needed,
- Calibrate and clean tipping bucket,
- Test/check solar panel charging system,
- Clean out funnel,
- Test radio/cable/antenna output/reflection,
- Test/calibrate stream stage sensor (if present),
- Inspect all housing components for damage,
- Inspect grounding system,
- Paint touch up,
- Make minor repairs and/or adjustments such as re-sealing weather-tight connections, tightening loose fitting/fasteners, adjusting top section lock, etc. and
- Test overall data throughput and precision.

Cochise County currently owns and operates 14 ALERT remote stations (13 remote sensor stations, 1 repeater station), as well as a base station database. This scope of work includes maintenance to the 14 ALERT remote stations owned and operated by the County as well as continued operation and maintenance of the ALERT database located at the offices of JE Fuller (see below).

**ALERT FY22-23, 23/24 MAINTENANCE (COUNTY-OWNED STATIONS)**

<b>ALERT Station</b>	<b>ID</b>	<b>Last Maintained</b>
Willow Lakes	3020	6/8/2022
Muleshoe Precip.	3021	3/24/2022
Dos Cabezas	3022	3/23/2022
St. David	3023	6/28/2022
Dos Cabezas Pk	3030	6/8/2022
Kartchner Caverns	3031	6/9/2022
Cascabel	3032	6/9/2022
Muleshoe Stream	3033	3/24/2022
West Turkey Creek	3040	6/7/2022
Juniper Flat (Repeater)	3042	3/23/2022
Bisbee	3043	6/8/2022
Douglas	3044	7/28/2022
Hunter Canyon	3053	6/9/2022
Fort Grant Road (reported low values)	3067	11/19/2021

JE Fuller recommends that the county budget for a modest amount of spare equipment for replacing damaged or faulty equipment. The recommended equipment includes:

- 1 3306 Transmitter, Tx = 170.250
- 1 J-pole antenna
- 1 solar panel kit (including solar panel, regulator, cable, mount etc...)
- 1 power amp
- 1 tipping bucket top section with tipping bucket rain gauge.

The attached detailed fee estimate includes these items under direct costs.

This task also includes maintenance of the Cochise County instances of JEFDAQ and JEFMAP which are being hosted by JE Fuller. This work includes routine data quality checks and edits, and metadata management which also includes modifications to notification thresholds, notification groups and alarm settings.

This work does not include the cost to repair/replace major components but does include minor repairs. The deliverable for this task is a completed maintenance form for each site maintained and pertinent photo documentation.

**Task 2: Scheduled Maintenance (ADWR Stations)**

JE Fuller recommends that the county work with ADWR to formally adopt existing ALERT stations in Cochise County and to continue their required maintenance. It has been the practice by other counties in Arizona (e.g. Greenlee County, Pinal County) to perform maintenance on ADWR-owned stations prior to formal adoption in order to assure continuous, reliable operation during the adoption period and to verify that the stations are fully operational at the time the stations are taken over.

The attached table shows ALERT stations currently owned by ADWR located in Cochise County. All ADWR stations are due for recommended routine annual maintenance.

**ALERT FY20/21, 21/22 MAINTENANCE (ADWR-OWNED STATIONS)**

<b>ALERT Station</b>	<b>ID</b>	<b>Last Maintained</b>
Portal	620	6/7/2022
Rucker	3050	6/7/2022
Miller Canyon (down)	3051	3/22/2022
Ash Canyon	3052	3/22/2022
Dragoon	3060	6/8/2022
Wilcox	3070	11/19/2021
King of Lead Mine (down)	3080	3/23/2022
Long Park	3090	6/7/2022

The deliverable for this task is a completed maintenance form for each site maintained and pertinent photo documentation for once-per-year maintenance visits for the duration of this project (twice overall).

### **Fee Estimate**

JE Fuller will perform the outlined Tasks providing labor, services, and materials as described above for a lump sum fee of \$83,817. This proposal includes up to two visits to County- and/or ADWR-owned stations as needed to restore proper function to stations that aren't reporting. A detailed fee estimate table is attached.

### **Schedule**

JE Fuller will start the work immediately upon receipt of your notice to proceed. JE Fuller will endeavor to complete the first round of maintenance tasks prior to the 2023 monsoon. Likewise, the second round of maintenance could be scheduled to be completed before the 2024 monsoon season or deferred if preferred by the County. Assuming late-2022 delivery of notice to proceed, this Scope of Work extends through July 2024.

Thank you again for requesting this Scope of Work and fee estimate from JE Fuller. We are excited about continuing to provide services to the County that will advance towards the common goal of maintaining the County's flood warning capabilities.

Sincerely,

**JE Fuller/Hydrology & Geomorphology, Inc.**



Cyrus D. Miller, P.E., CFM  
Vice President

Attachments:

ALERT Maintenance FY22/23, 23/24 Fee Table

Fee Estimate Table  
**Cochise County ALERT System Maintenance**  
 Fiscal Years (FY) 22/23, 23/24

		<b>Labor Costs</b>						
Contract Task		BI	CM	KS	TA	CH	DT	Totals
		\$164.54	\$154.86	\$98.24	\$101.63	\$124.21	\$155.12	
1	Scheduled Maintenance (14 existing remote locations and 1 existing base station database (hosted), 2 visits each)							
		16	128	142	6	0	20	\$40,117
2	Scheduled Maintenance (8 ADWR Stations, 2 visits each)							
		4	60	80	6	0	0	\$18,419
-	-							
		0	0	0	0	0	0	\$0
<b>Subtotal Labor</b>		<b>20</b>	<b>188</b>	<b>222</b>	<b>12</b>	<b>0</b>	<b>20</b>	<b>\$58,536</b>
		<b>Direct Costs</b>						
		Tasks 1 & 2 Supplies: 42 batteries x \$30/battery, sealant, tape, misc. cables/connectors, grounding, concrete						\$1,500
		ATV to access King of Lead, Long Park, Ash Canyon, Miller/Carr \$350/day						\$1,400
		Task 1 High Sierra Electronics spare equipment, including shipping and Arizona & local taxes						\$5,000
		(Task 1) Annual JEFDAQ/JEFMAP Primary Database and Hosting						\$7,000
		Mileage 4100 miles x \$0.70/mile						\$2,870
		Per Diem \$59 x 16 days x 2 people						\$1,888
		Hotel - 17 nights x \$96/night						\$1,632
		<b>Subtotal Direct Costs</b>						<b>\$21,290</b>
		<b>Contingency (5% of labor and direct costs)</b>						<b>\$3,991</b>
		<b>Grand Total</b>						<b>\$83,817</b>