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To: Chairman Kelby Robison & MVWD Board of Directors

From: Joseph Davis, General Manager

Date: October 19, 2026

Subject: Arrow Canyon #3 Drilling and Testing Oversight

Background:

At last month's board of directors meeting, staff informed the directors of the negotiations of a proposed professional services agreement to perform field geohydrologic services associated with the drilling and testing of Arrow Canyon #3.

Proposed Scope of Services

- Attend on-site pre-construction meetings with prospective drilling contractors.
- Log cuttings from exploratory boring: to describe lithologic samples (cuttings) collected from the boring, immediately prior to the running of geophysical logs in the open borehole.
- Geophysical logging: observe the geophysical logging of the exploratory borehole to make a go/no go decision on reaming the borehole for a production well and finalize the production well design.
- Rig development: on site full time (24/7) during rig development of the well to document progress by measuring and recording field parameters (temperature, pH, conductivity, and sand content) until the field parameters stabilize.
- Pump development and pumping tests: After a test pump is installed in the well, oversee and document pump development of the well. Staff will measure and record pumping rate, depth to water, specific capacity (calculated), sand content, temperature, pH, and conductivity.
- Step drawdown test: An 8- to 10-hour variable rate step-drawdown test will be conducted after pump development is complete. Data will be collected, analyzed, and used to calculate well efficiency and to recommend a pumping rate for the constant rate pumping test.

1. Constant Rate Pumping Test: on-site at all times for the duration of a 24-hour constant rate pumping test to manually measure water levels in Arrow Canyon 3 (pumping well) and Arrow Canyon 2 (observation well2) and will also be responsible for working with the driller to maintain a constant pumping rate during the test.

- Data Analysis and Reporting: Data collected during the pumping test will be analyzed to determine the appropriate long-term pumping rate for the well, which can be used to select the permanent pump size and setting. Aquifer testing data will also be used to calculate aquifer parameters which can be utilized by the District in any future groundwater modeling efforts. A summary report will be prepared and provided to the District that includes a lithologic log and well completion schematic, copies of geophysical logs, and a recommended pumping rate for the well.

Recommended Motion: Ratify the GZA revised scope of work contract for the Arrow Canyon 3 Well Drilling & Testing Oversight for an amount not to exceed $87,760.18

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GZA GeoEnvironmental, Inc.
d/b/a Glorieta Geoscience

October 12, 2026

Mr. Joe Davis
General Manager
Moapa Valley Water District
601 N. Moapa Valley Blvd.
Overton Nevada, 89040

RE: Revised Scope of Work and Cost Estimate for Arrow Canyon 3 Well Drilling and Testing Oversight

Dear Joe,

Glorieta Geoscience[1] (GGI) is pleased to submit this proposal to provide the Moapa Valley Water District (MVWD) with field geohydrologic services associated with the drilling and testing of Arrow Canyon Well #3 as described below.

Proposed Scope of Services

1. Attend on-site pre-construction meeting with prospective drilling contractors.
2. Log cuttings from exploratory boring: A senior staff person will come to the site at the end of the exploratory drilling to describe lithologic samples (cuttings) collected from the boring, immediately prior to the running of geophysical logs in the open borehole.
3. Geophysical logging: A senior staff person will be on site to observe the geophysical logging of the exploratory borehole. The geophysical logs will be used in conjunction with the log of the borehole from drill cuttings to make a go/no go decision on reaming the borehole for a production well and, assuming the decision is made to proceed with reaming, used to finalize the production well design.
4. Rig development: GGI staff will be on site full time (24/7) during rig development of the well to document progress by measuring and recording field parameters (temperature, pH, conductivity, and sand content) until the field parameters stabilize.
5. Pump development and pumping tests: After a test pump is installed in the well, a senior level GGI staff member will be on site to oversee and document pump development of the well. Staff will measure and record pumping rate, depth to water, specific capacity (calculated), sand content, temperature, pH, and conductivity.
6. Step drawdown test: An 8- to 10-hour variable rate step-drawdown test will be conducted after pump development is complete. Data will be collected, analyzed, and used to calculate well efficiency and to recommend a pumping rate for the constant rate pumping test.
7. Constant Rate Pumping Test: A field technician will be on-site at all times for the duration of a 24-hour constant rate pumping test to manually measure water levels in Arrow Canyon 3 (pumping well) and Arrow Canyon 2 (observation well[2]), and will also be responsible for working with the driller to maintain a constant pumping rate during the test. In addition to the manual water level measurements, an automated water level pressure transducer will be installed in Arrow Canyon 2 to collect depth to water measurements during the test.

[1] GZA GeoEnvironmental Inc., d/b/a Glorieta Geoscience
[2] Airline readings may also be collected from Arrow Canyon 1, but it is GGI's understanding that an electric sounder cannot be used in the well.

8. Data Analysis and Reporting: Data collected during the pumping test will be analyzed to determine the appropriate long-term pumping rate for the well, which can be used to select the permanent pump size and setting. Aquifer testing data will also be used to calculate aquifer parameters which can be utilized by the District in any future groundwater modeling efforts. A summary report will be prepared and provided to the District that includes a lithologic log and well completion schematic, copies of geophysical logs, and a recommended pumping rate for the well.

Basis of Billings

Our revised estimated total cost to perform the tasks described in this proposal is **$87,760.18**. Billings will be based on actual accrued time and expenses in accordance with the rates and fees shown on the attached spreadsheet.

Sincerely,
GLORIETA GEOSCIENCE

Jim Riesterer
Associate Principal

Paul Drakos
Associate Principal

Josh Simpson
Consultant/Reviewer

Accepted By Joseph Davis
Moapa Valley Water District

Date 10.12.2026

Attachment: GGI estimated cost for Arrow Canyon 3 drilling, construction, and testing

GGI revised estimated cost for Arrow Canyon 3 drilling, construction, and testing

1. Labor	Rate	Unit	Project Coordination, field arrangements	Travel / lodging for Pre-Con	On-Site Pre-Con Meeting	Travel / lodging for one logging + geophys	Log cuttings from exploratory boring[1]	Geophysical logging	Finalize production well design	Travel / lodging for rig development
Principal	$195.00	hr.								
Associate Principal (PD, JR)	$185.00	hr.	4	12	8	12	8	10	4	
Senior Consultant (JS, MH, BP)	$165.00	hr.	8						4	
Senior Project Manager (DG)	$150.00	hr.								
Assistant PM (HS, RW)	$150.00	hr.								
Scientist I (LV, RL, ES)	$125.00	hr.								12
Scientist II (DG, MR)	$115.00	hr.								12
Field Technician (RH)	$95.00	hr.								
Sci II (daily rate)	$1,400.00	day								
Administrative	$50.00	hr.	4							
Total Labor			$2,260.00	$2,220.00	$1,480.00	$2,220.00	$1,480.00	$1,850.00	$1,400.00	$2,880.00
Office Exp.	10.0%	lbr	$226.00	$222.00	$148.00	$222.00	$148.00	$185.00	$140.00	$288.00
Total Direct labor			$2,486.00	$2,442.00	$1,628.00	$2,442.00	$1,628.00	$2,035.00	$1,540.00	$3,168.00
Direct Expenses										
Per Diem (<12hr)	$18.00	day		1		1				
Per Diem (Overnight)	$59.00	day		1		3				
Mileage	$0.75	ea		120		120				120
Sounder	$75.00	day								
Airfare (RT ABQ to Las Vegas)	$750.00	ea		1		1				2
Rental Car	$100.00	day		2		3				5
Lodging	$160.00	ea		1		3				
Trailer Rental	$200.00	ea								
pH/Temp/cond meter	$75.00	day								
Misc (Rental car fuel, airport parking,	$100.00	each		1		2				2
Transducers (AC1 & AC2)	$50.00	day								
Subtotal Direct Expense			$0.00	$1,377.00	$0.00	$2,015.00	$0.00	$0.00	$0.00	$2,290.00
Markup on Direct Expense	15%	Exp	$0.00	$206.55	$0.00	$302.25	$0.00	$0.00	$0.00	$343.50
SUBTOTAL			$2,486.00	$4,025.55	$1,628.00	$4,759.25	$1,628.00	$2,035.00	$1,540.00	$5,801.50
15% Contingency	15%		$372.90	$603.83	$244.20	$713.89	$244.20	$305.25	$231.00	$870.23
NM GRT	0.00000%	ea	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
TOTAL ESTIMATED GGI BUDGET			$2,858.90	$4,629.38	$1,872.20	$5,473.14	$1,872.20	$2,340.25	$1,771.00	$6,671.73

[1]Log drill cuttings at end of exploratory drilling and be on-site for geophysical logs to finalize production well design

GGI revised estimated cost for Arrow Canyon 3 drilling, construction, and testing

1. Labor	Rate	Unit	Rig Development[2]	Travel / lodging for pump development and pumping test	Pump Development and 24-hr Pumping test[3]	Step drawdown test	Data Analysis	Summary Report	Project Management/ HASP	Contract Admin	Total Units	Total
Principal	$195.00	hr.									0	$0.00
Associate Principal (PD, JR)	$185.00	hr.					8	16	6	2	90	$16,650.00
Senior Consultant (JS, MH, BP)	$165.00	hr.	6	12	30	12	8	40	2		122	$20,130.00
Senior Project Manager (DG)	$150.00	hr.									0	$0.00
Assistant PM (HS, RW)	$150.00	hr.									0	$0.00
Scientist I (LV, RL, ES)	$125.00	hr.	26					8	4		50	$6,250.00
Scientist II (DG, MR)	$115.00	hr.	26	12	12	12	4	8			86	$9,890.00
Field Technician (RH)	$95.00	hr.									0	$0.00
Sci II (daily rate)	$1,400.00	day			2						2	$2,800.00
Administrative	$50.00	hr.								**8**	12	$600.00
Total Labor			$7,230.00	$3,360.00	$9,130.00	$3,360.00	$3,260.00	$11,480.00	$1,940.00	$770.00		$56,320.00
Office Exp.	10.0%	lbr	$723.00	$336.00	$913.00	$336.00	$326.00	$1,148.00	$194.00	$77.00		$5,632.00
Total Direct labor			$7,953.00	$3,696.00	$10,043.00	$3,696.00	$3,586.00	$12,628.00	$2,134.00	$847.00		$61,952.00
Direct Expenses												
Per Diem (<12hr)	$18.00	day		2							4	$72.00
Per Diem (Overnight)	$59.00	day	6	9							19	$1,121.00
Mileage	$0.75	ea		120							480	$360.00
Sounder	$75.00	day			12	1					13	$975.00
Airfare (RT ABQ to Las Vegas)	$750.00	ea		1							5	$3,750.00
Rental Car	$100.00	day		8							18	$1,800.00
Lodging	$160.00	ea	6	6							16	$2,560.00
Trailer Rental	$200.00	ea			3						3	$600.00
pH/Temp/cond meter	$75.00	day	2		3	1					6	$450.00
Misc (Rental car fuel, airport parking,	$100.00	each									5	$500.00
Transducers (AC1 & AC2)	$50.00	day			6						6	$300.00
Subtotal Direct Expense			$1,464.00	$3,167.00	$2,025.00	$150.00	$0.00	$0.00	$0.00	$0.00		$12,488.00
Markup on Direct Expense	15%	Exp	$219.60	$475.05	$303.75	$22.50	$0.00	$0.00	$0.00	$0.00		$1,873.20
SUBTOTAL			$9,636.60	$7,338.05	$12,371.75	$3,868.50	$3,586.00	$12,628.00	$2,134.00	$847.00		$76,313.20
15% Contingency	15%		$1,445.49	$1,100.71	$1,855.76	$580.28	$537.90	$1,894.20	$320.10	$127.05		$11,446.98
NM GRT	0.00000%	ea	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00		$0.00
TOTAL ESTIMATED GGI BUDGET			$11,082.09	$8,438.76	$14,227.51	$4,448.78	$4,123.90	$14,522.20	$2,454.10	$974.05		**$87,760.18**

[2]2 days of rig development, 24/7 coverage plus 1 hr/day travel to/from site

[3]Estimate 16 hours of pump development (sr. staff) followed by step test, 24 hr pumping test and 24 hr recovery (Sci II). Both fly out, assume that driller will provide weir for pumping test.